Racial and Ethnic Disparities in Hepatitis C Care in Reproductive-Aged Women With Opioid Use Disorder

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Background. In the United States, hepatitis C virus (HCV) diagnoses among reproductive-aged women are increasing amidst the ongoing opioid and drug overdose epidemic. While previous studies document racial and ethnic disparities in HCV testing and treatment in largely male populations, to our knowledge no national studies analyze these outcomes in reproductive-aged women with opioid use disorder (OUD).

Methods. We analyzed data from a cohort of reproductive-aged women (aged 15–44 years) with diagnosed OUD captured in the TriNetX Research Network, a network of electronic health records from across the United States. Using a log-binomial model, we assessed differences in achieving HCV cascade of care stages (HCV antibody testing, HCV infection [positive HCV RNA test result], linkage to care, and HCV treatment) by race and ethnicity.

Results. From 2014 to 2022, 44.6% of the cohort were tested for HCV antibody. Asian and black/African American individuals had a lower probability of having an HCV antibody test than white individuals (risk ratio, 0.77 [95% confidence interval, .62–.96] and 0.76 [.63–.92], respectively). Among those with HCV infection, only 9.1% were treated with direct-acting antivirals. Hispanic/Latinx individuals had a higher probability of treatment than non-Hispanic/Latinx individuals (risk ratio, 1.63 [95% confidence interval, 1.01–2.61]).

Conclusions. Few reproductive-aged women with OUD are tested or treated for HCV. Disparities by race and ethnicity in HCV testing further exacerbate the risk of perinatal transmission and disease progression among minoritized communities. Interventions are needed to improve overall rates of and equity in HCV screening and treatment for reproductive-aged women.

Keywords. hepatitis C virus; reproductive-aged females; opioid use disorder; disparities.

The opioid overdose epidemic and rising unsafe injection drug use has led to increased hepatitis C virus (HCV) infections in the United States [1]. Among reproductive-aged women admitted to substance use disorder treatment programs between 2004 and 2014, injection opioid use increased 100% (from 10.3% to 20.6% of admissions) [1]. Concomitantly, positive HCV antibody test results among reproductive-aged women in a national laboratory-based study increased by 36% (from 4.4% to 6.0%) between 2011 and 2016 [2], and HCV prevalence during pregnancy increased 1458% (from 0.3 to 5.3 per 1000 pregnancies)

between 1998 and 2018 [3], resulting in increasing risk of perinatal HCV transmissions [4].

Reproductive-aged women are a priority population cited in US HCV elimination goals [5, 6] due to the risk of perinatal transmission, which ranges from 7% to 12% [7, 8]. Effective HCV screening and treatment among reproductive-aged women could reduce liver-related disease and death [9] and perinatal transmission. Current HCV screening guidelines recommend universal one-time screening for all adults, screening during each pregnancy, and periodic testing for those with ongoing HCV risk factors, such as injection drug use [10, 11]. Direct-acting antivirals (DAAs) to treat HCV are highly effective with sustained virologic response (SVR; or cure) >95% [12]. However, women are less likely than males to receive DAA therapy after an HCV diagnosis [13, 14]. While DAA treatment is recommended only after a careful risk-benefit discussion during pregnancy due to minimal safety information [15], screening and linkage to HCV care (LTC) during pregnancy can be a key time and venue to identify and treat people during this unique engagement with the healthcare system [15, 16].

Racial and ethnic disparities in HCV burden and treatment exist, at least among primarily older, male cohorts. The estimated US HCV infection prevalence from 2013 to 2016 was greater for black

(2.29 per 100) than for white (1 per 100) or Hispanic (0.82 per 100) persons [17], and from 2015 to 2021, black persons had the highest percentage increase in HCV incidence (367%) compared with other races [18]. HCV infections are listed more frequently as a cause of death for black (5 per 100 000) and Hispanic (4 per 100 000) persons than for white persons (3 per 100 000) [19]. Some studies found that black non-Hispanic and Hispanic individuals with HCV are also less likely to be treated with DAAs than their white counterparts [20]. To date, however, no studies have examined these racial and ethnic disparities among reproductive-aged women [20, 21].

We aimed to characterize the HCV cascade of care (CoC) [22] among reproductive-aged women with opioid use disorder (OUD) in the United States, using a national network of electronic health records, and to determine whether racial and ethnic disparities exist within HCV CoC stages. These results could help target future interventions to reduce disparities in HCV care and resultant downstream morbidity.

METHODS

Database Description
We used data from TriNetX Research Network, a global health research network that links electronic health record data across healthcare organizations (HCOs) and encompasses >113 million patients. Our cohort included persons from 55 US HCOs spanning all 4 US regions from 2014 to 2022. Records include demographic information, inpatient and outpatient encounters, diagnoses, laboratory results, medications, and procedure data [23].

Study Population
We included reproductive-aged women (aged 15–44 years) who had a visit at a participating HCO and any diagnosis of OUD from January 2014 to November 2022. TriNetX identifies sex and does not capture gender. We defined an OUD diagnosis as (1) ≥1 inpatient opioid abuse or dependence code from the *International Classification of Diseases, Ninth Revision* or *Tenth Revision* (*ICD-9/10*); (2) 2 outpatient opioid abuse or dependence codes within 12 months; or (3) 1 outpatient opioid abuse or dependence code and 1 of the following within 12 months: opioid overdose, injection drug-associated infection (endocarditis, septic arthritis, abscess/cellulitis, or infective phlebitis), or a methadone or buprenorphine prescription (Supplementary Appendix 1), based on previous studies [24].

TriNetX-defined race categories include American Indian or Alaska Native (AIAN), Asian, black/African American, white, and unknown race. Ethnicity categories include Hispanic/Latinx, non-Hispanic/Latinx, and unknown.

CoC Stages
We examined completion of the following HCV CoC stages, each dependent on completion of the previous stage and independent of OUD diagnosis timing. If someone completed a later stage, they were assumed to have completed all previous stages.

1. HCV antibody testing: Completed HCV antibody test
2. HCV seropositive: Positive HCV antibody test result
3. HCV infection: Positive HCV RNA test result
4. LTC:
   (a) HCV genotype testing completed,
   (b) Fibrosis staging completed (Fibroscan or FibroSure), or
   (c) A visit with an HCV *ICD-9/10* code as the primary diagnosis [25]
5. Treatment initiation: Evidence of DAA prescription
6. Testing completed for SVR at 12 weeks (SVR12): HCV RNA test completed ≥12 weeks after end of treatment (calculated as ≥20 weeks after treatment start date, assuming a minimum 8-week treatment regimen)
7. HCV cure (SVR12): Negative HCV RNA test result ≥12 weeks after the end of treatment [26]
8. Reinfection: Positive HCV RNA test result after achievement of SVR

Logical Observation Identifiers Names and Codes, Current Procedural Terminology codes, National Drug Codes [27] and RxNorm codes were used to identify laboratory and procedure testing and medications (Supplementary Tables 1–4).

Statistical Analyses
We calculated the number and percentage of individuals achieving each HCV CoC stage, overall and by race and ethnicity. We calculated yearly HCV antibody testing rates by race and ethnicity, defined as the total HCV antibody tests per year divided by the number of presumed HCV-negative women (not previously diagnosed or tested positive) at the beginning of the given year. We also assessed yearly DAA treatment rates.

We used log-binomial models to estimate risk ratios for HCV antibody testing, HCV infection, LTC, and treatment initiation by race and ethnicity with clustered standard errors by HCO. We did not include covariates in our models, as other demographics and comorbid conditions are expected not to confound but rather to mediate the effects of race and ethnicity on HCV CoC stages. To examine whether human immunodeficiency virus (HIV) coinfection, injection drug–related infection, or geographic region (South, Northeast, Midwest, or West) are effect modifiers of the association between race and ethnicity and HCV CoC stages, we fit log-binomial models including interaction terms for race and ethnicity with these variables. Finally, we estimated the time from first positive HCV RNA test result to HCV treatment by race and ethnicity. We created cumulative incidence graphs and used the log-rank test to assess equality in incidence up to 1 year.

Table 1. Demographic Characteristics Among Reproductive-Aged Women With Opioid Use Disorder, by Race

Characteristic	Women, No. (%)[a]					
	White	AIAN	Asian	Black/AA	Unknown Race	Total
Age at cohort entry, mean (SD), y	30.8 (7.4)	29.7 (7.5)	30.4 (8.5)	31.9 (8.1)	30.5 (7.9)	30.9 (7.6)
Gave birth during study period	18 839 (23.1)	293 (32.6)	58 (17.2)	2197 (22.1)	3213 (26.7)	24 600 (23.5)
Mental health diagnosis	28 290 (34.8)	295 (32.8)	123 (36.5)	3511 (35.3)	3052 (25.3)	35 271 (33.7)
HIV diagnosis	2601 (3.2)	38 (4.2)	4 (1.2)	594 (6)	293 (2.4)	3530 (3.4)
Alcohol use disorder	2686 (3.3)	62 (6.9)	12 (3.6)	307 (3.1)	278 (2.3)	3345 (3.2)
Other SUD	3598 (4.4)	52 (5.8)	13 (3.9)	375 (3.8)	293 (2.4)	4331 (4.1)
Injection drug–related infection	13 532 (16.6)	111 (12.3)	50 (14.8)	1602 (16.1)	1619 (13.4)	16 914 (16.2)
HBV diagnosis	1468 (1.8)	6 (0.7)	12 (3.6)	176 (1.8)	138 (1.1)	1800 (1.7)
Region						
South	31 181 (38.3)	97 (10.8)	115 (34.1)	5047 (50.8)	3966 (32.9)	40 406 (38.6)
Northeast	25 785 (31.7)	91 (10.1)	109 (32.3)	3014 (30.3)	2476 (20.5)	31 475 (30.1)
Midwest	14 534 (17.9)	234 (26)	38 (11.3)	1238 (12.5)	1022 (8.5)	17 066 (16.3)
West	9893 (12.2)	478 (53.1)	75 (22.3)	639 (6.4)	4592 (38.1)	15 677 (15)

Abbreviations: AA, African American; AIAN, American Indian or Alaska Native; HBV, hepatitis B virus; HIV, human immunodeficiency virus; SUD, substance use disorder.

[a]Data represent no. (%) of women unless otherwise specified.

Table 2. Demographic Characteristics Among Reproductive-Aged Women With Opioid Use Disorder, by Ethnicity

Characteristic	Women, No. (%)[a]			
	Not Hispanic or Latinx	Hispanic or Latinx	Unknown Ethnicity	Total
Age at cohort entry, mean (SD), y	31.1 (7.5)	29.6 (7.8)	30.6 (7.5)	30.9 (7.6)
Gave birth during study period	17 701 (22.9)	1758 (29.5)	5162 (24.2)	24 621 (23.5)
Mental health diagnosis	28 400 (36.7)	2017 (33.9)	4879 (22.9)	35 296 (33.7)
HIV diagnosis	2871 (3.7)	336 (5.6)	326 (1.5)	3533 (3.4)
Alcohol use disorder	2732 (3.5)	149 (2.5)	465 (2.2)	3346 (3.2)
Other SUD	3557 (4.6)	216 (3.6)	560 (2.6)	4333 (4.1)
Injection drug–related infection	13 312 (17.2)	916 (15.4)	2702 (12.7)	16 930 (16.2)
HBV diagnosis	1505 (1.9)	70 (1.2)	225 (1.1)	1800 (1.7)
Region				
South	34 117 (44.1)	2740 (46)	3572 (16.7)	40 429 (38.6)
Northeast	23 059 (29.8)	1223 (20.5)	7217 (33.8)	31 499 (30.1)
Midwest	14 183 (18.3)	433 (7.3)	2470 (11.6)	17 086 (16.3)
West	6048 (7.8)	1562 (26.2)	8083 (37.9)	15 693 (15)

Abbreviations: HBV, hepatitis B virus; HIV, human immunodeficiency virus; SUD, substance use disorder.

[a]Data represent no. (%) of women unless otherwise specified.

This research was determined to not be human subjects research by the Boston University Medical Center Institutional Review Board. We followed STROBE reporting guidelines for observational cohort studies.

Sensitivity Analysis

As genotype testing can occur by reflex testing and may not imply separate LTC action, we conducted a sensitivity analysis using a LTC definition that did not include genotype testing.

RESULTS

Demographics

In total, 104 625 reproductive-aged women met cohort inclusion criteria. The majority were white (77.8%), followed by unknown race (11.5%), black/African American (9.5%), AIAN (0.9%), and Asian (0.3%; Table 1). Only 5.7% were of Hispanic/Latinx ethnicity, although 11.5% had unknown ethnicity (Table 2).

One-third (33.7%) had ≥1 mental health condition diagnosed. Nearly a quarter (23.5%) had ≥1 delivery over the study period. Few had diagnosed alcohol use disorder (3.2%), nonopioid substance use disorders (4.1%), HIV (3.4%), or hepatitis B virus (1.7%). The average age (SD) was 30.9 (7.6) years at cohort entry and 32.6 (6.9) years at HCV diagnosis.

CoC Stages

Overall, 44.6% of reproductive-aged individuals with OUD had an HCV antibody test and 22.9% of tests (n = 23 951) were seropositive. Of seropositive individuals, 92.7% (n = 22 193) had an HCV RNA test, and 16.2% (n = 16 968) were ever HCV
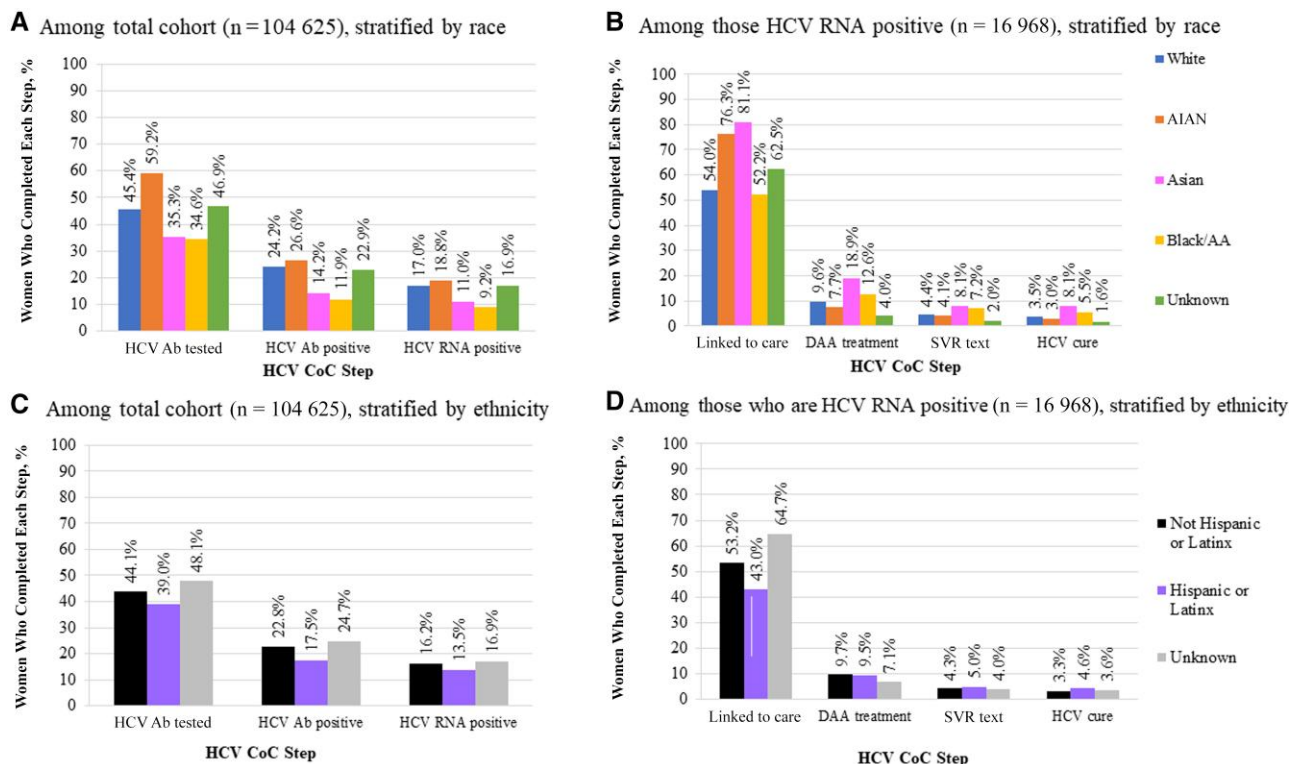
Figure 1. Hepatitis C virus (HCV) cascade of care (CoC) by race and ethnicity, among women of reproductive age with opioid use disorder, stratified by race (*A, B*) and ethnicity (*C, D*) (TriNetX Research Network, 2014–2022). Abbreviations: AA, African American; Ab, antibody; AIAN, American Indian or Alaska Native; DAA, direct-acting antiviral; SVR, sustained virologic response.

RNA positive (Figure 1). Of HCV RNA–positive individuals, 55.2% (n = 9367) were linked to care, and 9.1% (1545) had evidence of a DAA prescription. Of those who started DAAs, 46.5% (719 of 1545) completed SVR12 testing, and of these, 80.5% (579 of 719) were cured. HCV reinfection occurred among 38 individuals (6.6%) after achievement of SVR12.

Outcomes by Race and Ethnicity

AIAN individuals had the highest proportion tested (59.2%), HCV antibody positive (26.6%), and HCV RNA positive (18.8%) compared with other races (Supplementary Table 6). Among Asian individuals, slightly higher proportion of those who were HCV RNA positive started DAA treatment (2.1%), compared with white (1.6%), AIAN (1.4%), and black/African American (0.7%) individuals.

A higher proportion of non-Hispanic/Latinx individuals completed HCV antibody testing (44.1% vs 39.0% for Hispanic/Latinx individuals), were HCV antibody positive (22.8.% vs 17.5%), or HCV RNA positive (16.2% vs 13.5%), received LTC (8.6% vs 5.8%), and completed DAA treatment (1.6% vs 1.3%).

Regression Analysis

AIAN individuals had a 28% higher probability of HCV antibody testing compared with white individuals (risk ratio [RR], 1.28

[95% confidence interval [CI], 1.9–1.51]; Table 3). Asian and black/African American individuals each had lower probabilities of HCV antibody testing compared with white individuals (RR, 0.77 [95% CI, .62–.96] and 0.76 [.63–.92], respectively). Yet black/African American individuals, compared with white individuals, had an 11% higher probability of HCV infection if HCV antibody positive (RR, 1.11 [95% CI, 1.01–1.21]). There were no statistically significant differences in LTC by race or ethnicity. Of those with LTC, Hispanic/Latinx individuals had a 63% higher probability of initiating DAA treatment than non-Hispanic/Latinx individuals (RR, 1.63 [95% CI, 1.01–2.61]).

Temporal Trends

HCV antibody testing increased from 5.4 to 13.7 tests per 100 individuals from 2014 to 2021 (Figure 2A). Racial disparities in testing persisted over time, with black/African American individuals consistently having lower HCV testing rates than white individuals (Figure 2B). AIAN individuals had higher rates of HCV antibody testing over time compared with other races. In 2014, non-Hispanic/Latinx individuals had higher rates of HCV antibody testing compared with Hispanic/Latinx individuals; however, differences decreased over time, and by 2020 testing rates were similar by ethnicity (Figure 2C). DAA treatment rates steadily

Table 3. Log-Binomial Regression Results for Hepatitis C Virus Cascade of Care Outcomes

	RR for Outcome (95% CI)[a]			
Race or Ethnicity	Antibody Test (n = 104 625)	HCV Diagnosis (n = 22 728)	LTC (n = 11 646)	DAA Treatment (n = 9367)
White (reference)				
AIAN	1.283 (1.090–1.509)[b]	1.02 (.840–1.238)	1.042 (.888–1.222)	0.620 (.171–2.253)
Asian	0.774 (.623–.962)[c]	1.113 (.914–1.356)	…[d]	1.264 (.756–2.114)
Black/AA	0.760 (.628–.919)[b]	1.107 (1.009–1.213)[c]	0.921 (.729–1.163)	1.354 (.902–2.034)
Unknown race	1.018 (.784–1.322)	1.076 (.954–1.213)	0.712 (.352–1.438)	0.377 (.134–1.063)
Non-Hispanic/Latinx (reference)				
Hispanic/Latinx	0.863 (.655–1.137)	1.057 (.847–1.319)	0.839 (.488–1.441)	1.627 (1.013–2.612)[c]
Unknown ethnicity	1.07 (.859–1.333)	0.94 (.827–1.070)	…[d]	0.831 (.465–1.484)

Abbreviations: AA, African American; AIAN, American Indian or Alaska Native; CI, confidence interval; DAA, direct-acting antiviral; HCV, hepatitis C virus; LTC, linkage to care; RR, risk ratio.
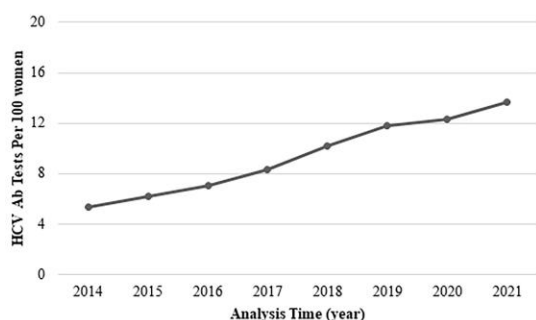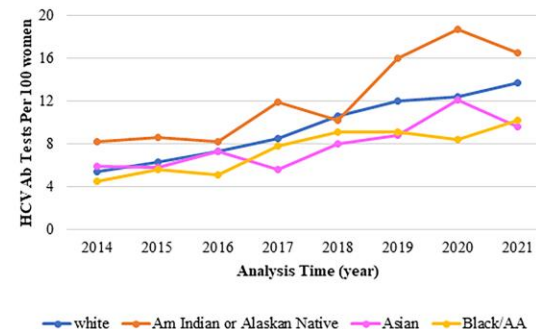[a]All standard errors were clustered at the healthcare organization level.
[b]$P < .01$.
[c]$P < .05$.
[d]The LTC model did not converge with Asian race and unknown ethnicity, so they were removed from this model.
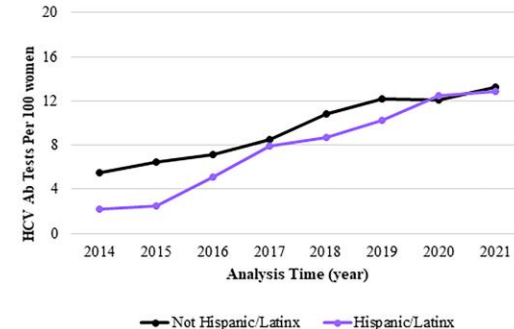
Figure 2. Hepatitis C virus (HCV) antibody (Ab) testing over time, among women of reproductive age with opioid use disorder (*A*), and stratified by race (*B*) and ethnicity (*C*) (TriNetX Research Network, 2014–2021). Abbreviations: AA, African American; AIAN, American Indian or Alaska Native.

increased until 2020 and then dropped, particularly in Hispanic/Latinx individuals (Supplementary Figure 1*A*–1*C*).

Effect Modification
HIV Status
Individuals of all races and ethnicities, except Asian individuals, had a higher predicted probability of HCV antibody testing if they had HIV (Supplementary Figure 2). There were no significant differences in HCV diagnosis, LTC, or DAA treatment by race and HIV status or ethnicity and HIV status (Supplementary Table 7).

Injection Drug–Related Infections
Among individuals of all races and ethnicities, those who had an injection drug–related infection had a higher predicted

probability of HCV antibody testing (Supplementary Figure 3). There were no significant differences in LTC or DAA treatment by race or ethnicity among those with injection drug–related infection (Supplementary Table 8). The HCV diagnosis model did not converge.

Region
HCV antibody testing predicted probabilities were highest in the West region overall and lowest in the South (Supplementary Figure 4 and Supplementary Table 9). While white individuals had similar predicted probabilities of testing across all 4 regions, AIAN, Asian, and black/African American individuals all had lower predicted probabilities of testing in the South and higher predicted probabilities of testing in the West compared with white individuals. Hispanic/Latinx individuals in the South had the lowest predicted probability of HCV antibody testing.

Time to HCV Treatment
Among 14 825 individuals with HCV, 734 (5%) received DAA treatment within 1 year after their first HCV RNA positive test. The probability of treatment by 1 year was highest for black/African American individuals (0.08), followed by white (0.05), and AIAN (0.03) individuals (Figure 3). The log-rank test shows that there were statistically significant differences in DAA treatment initiation over time by race ($\chi^2 = 9.37$; $P = .009$). There were no differences in the probability of treatment 1 year after HCV diagnosis between non-Hispanic/Latinx (0.05) and Hispanic/Latinx individuals (0.05).

Sensitivity Analysis
Excluding genotype testing, LTC rates decreased from 9.0% to 5.2% among the entire cohort (Supplementary Table 5). In regression models, there was no difference in LTC probability by race or ethnicity (Supplementary Table 10). AIAN individuals, however, had an increased probability of DAA treatment (RR, 1.86 [95% CI, 1.14–3.05]).

DISCUSSION
To our knowledge, this is the first study examining racial and ethnic disparities in the HCV CoC among a large national US cohort of reproductive-aged women. Over time, HCV antibody testing rates increased, but Asian and black/African American individuals were 25% less likely than white individuals to be tested. This finding is similar to those in studies of individuals with substance use disorders, in which black/African American patients had lower rates of HCV testing [28], but it differs from findings in studies of baby boomer cohort members, in which black/African American and Asian patients were more likely to be screened for HCV [29, 30]. Hispanic/Latinx individuals in our cohort had lower HCV antibody testing rates over time than non-Hispanic/Latinx individuals until about 2020. Conversely, AIAN individuals had

the highest probability of HCV antibody testing. There were no statistically significant differences in LTC or treatment by race or ethnicity. However, only 43% of Hispanic/Latinx individuals received LTC, compared with 53% of non-Hispanic/Latinx individuals. This is similar to findings in a study of mostly male patients in an opioid treatment program, in which Hispanic patients had 32% lower odds of LTC compared with non-Hispanic white patients [31].

Overall, few individuals in our study were treated (9.1%), and Hispanic/Latinx individuals were more likely than non-Hispanic/Latinx individuals to be treated, conditional on LTC. This is contrary to a general population study showing that non-Hispanic/Latinx persons are less likely to start DAA treatment [20].

The rate of HCV testing increased from 6.1% to 8.4% between 2011 and 2016 among reproductive-aged women [2]. The current study extends these findings, showing that overall HCV antibody testing increased to 13.7% by 2021. Despite these increases, by the end of the study only 43.9% of our high-risk cohort were ever tested for HCV.

Missed HCV testing and untreated HCV can cause cirrhosis, liver cancer, and death [32]. Racial and ethnic disparities in testing contribute to inequities in liver-related disease and death. Interventions are necessary to improve HCV screening among reproductive-aged women with OUD, especially among minoritized individuals. Evidence-based interventions to increase screening include opt-out screening, medical chart reminders, and culturally sensitive and race/ethnicity-concordant care [33–36]. Point-of-care HCV RNA testing, just approved in the United States, could bridge the gap between those who test antibody positive but do not complete HCV RNA tests and could reduce loss to follow-up if used in test-and-treat strategies [37]. The 2020 universal testing guidelines aimed to increase screening across all adults, including pregnant persons with the recommendation to test during each pregnancy [38], though more follow-up time is needed to understand the full effects of these recommendations.

We also observed regional differences in testing that could be exacerbating or causing disparities. While white women had similar testing probabilities across regions, minoritized races had lower testing in the South. Hispanic/Latinx women in the South had the lowest HCV antibody testing across groups. Insurance status was unavailable in the data set, potentially explaining regional and racial/ethnic differences in HCV care. For example, states that have not expanded Medicaid are predominately in the South, where we found the lowest HCV antibody testing across all racial and ethnic groups, except among white and non-Hispanic persons.

Overall, only 10% of reproductive-aged women received treatment. Evidence-based interventions to improve HCV care include prescribing medications for OUD alongside HCV treatment [39, 40]. Care models with flexible

A By race (N=12,929)

B By ethnicity (N=11,669)
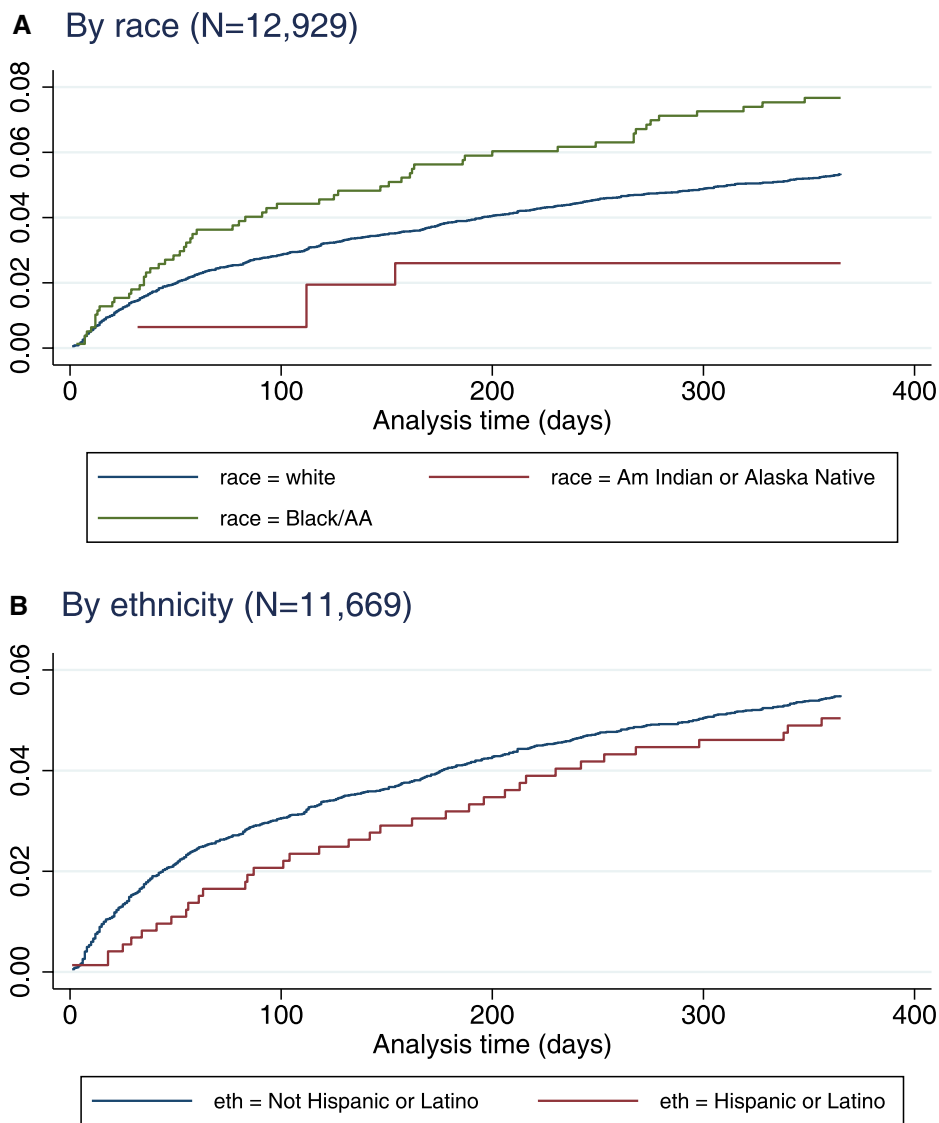
Figure 3. Cumulative incidence of direct-acting antiviral treatment after hepatitis C virus diagnosis, by race (*A*) and ethnicity (*B*). Abbreviations: AA, African American; AIAN, American Indian or Alaska Native.

appointments and treatment in low-barrier, destigmatized settings (such as harm reduction centers) increase HCV referrals, DAA initiation, and cure rates [41]. In particular, models that offer treatment where HCV is diagnosed, such as within syringe services programs, eliminate the need for referrals and potential drop-off before linkage [41]. Finally, telehealth interventions integrated within treatment programs also increase HCV treatment initiation and completion [42]. The 2025 strategic plan from the Division of Viral Hepatitis, Centers for Disease Control and Prevention [43], calls for increasing HCV testing and LTC among disproportionally affected groups, including establishing culturally appropriate patient education, fostering positive patient-provider relationships, employing diverse clinic staff, and mobilizing existing safety-

net resources. These measures are crucial to address barriers in HCV care among minoritized individuals [18, 30].

Our results should be interpreted within the context of study limitations. LTC is difficult to define in electronic health record data due to the variety of clinicians treating HCV and variability in pretreatment laboratory and imaging evaluations. Our LTC definition is permissive, as genotype testing can occur by reflex testing and may not imply linkage. However, we also incorporated specific fibrosis tests and visit encounter data, demonstrating robust efforts to evaluate HCV disease, and our sensitivity analysis eliminating genotypes from the definition demonstrated no major differences. We could only assess whether DAAs were prescribed, not whether prescriptions were filled. Individuals may have faced treatment restrictions or prior authorization delays,

or may not have filled prescriptions for other reasons, potentially explaining the large drop between the percentage of individuals with LTC and the percentage who started DAA treatment. In addition, we defined SVR12 as an HCV RNA test ≥20 weeks after starting treatment to include patients with 8-week DAA regimens; however, this may capture individuals on 12-week regimens tested early.

We did not require OUD diagnosis before HCV testing, as OUD is undiagnosed in many individuals because of stigma or limited healthcare use due to negative interactions with healthcare providers or fear of mandatory reporting practices during pregnancy [44, 45]. TriNetX HCOs also inconsistently reported medications for OUD (ie, methadone, buprenorphine, or naltrexone), preventing us from evaluating the impact of medications for OUD on the achievement of HCV CoC stages. Insurance status was not available in this data set and could explain differences in healthcare use, including some of the regional differences observed. Furthermore, there was significant missingness and heterogeneity in race and ethnicity reporting by HCO. Race was unknown for 11.5% of our cohort, and ethnicity was unknown for >20%, which may limit the validity of our results and likely limited the power to detect differences. Nonetheless, the sample size was large enough that we were able to observe some key significant differences. Finally, we may be undercounting outcomes for people tested, linked, or treated outside of TriNetX HCOs.

Notwithstanding these limitations, our analysis shows that while HCV testing among reproductive-aged women with OUD has increased over time, access to treatment remains unacceptably low in this population. Furthermore, we highlight racial and ethnic disparities that exist in HCV antibody testing among reproductive-aged women with OUD. These findings underscore the importance of prioritizing and implementing strategies that ensure equitable access to OUD and HCV care.

Policy and healthcare strategies that minimize barriers to HCV testing and care, such as stigma [45], lack of health insurance [46], and childcare needs [47] are paramount to improving the health outcomes of reproductive-aged women and reducing perinatal HCV transmission. Innovative models of care must be implemented and evaluated to ascertain how to best reach parity in HCV care access among reproductive-aged women and to achieve higher rates of HCV identification, treatment, and cure.

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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