Race/Ethnicity and Geographic Access to Medicaid Substance Use Disorder Treatment Facilities in the United States

Janet R. Cummings, PhD; Hefei Wen, BA; Michelle Ko, MD, PhD; Benjamin G. Druss, MD, MPH

IMPORTANCE Although substance use disorders (SUDs) are prevalent and associated with adverse consequences, treatment rates remain low. Unlike physical and mental health problems, treatment for SUDs is predominantly provided in a separate specialty sector and more heavily financed by public sources. Medicaid expansion under the Patient Protection and Affordable Care Act has the potential to increase access to treatment for SUDs but only if an infrastructure exists to serve new enrollees.

OBJECTIVE To examine the availability of outpatient SUD treatment facilities that accept Medicaid across US counties and whether counties with a higher percentage of racial/ethnic minorities are more likely to have gaps in this infrastructure.

DESIGN, SETTING, AND PARTICIPANTS We used data from the 2009 National Survey of Substance Abuse Treatment Services public use file and the 2011-2012 Area Resource file to examine sociodemographic factors associated with county-level access to SUD treatment facilities that serve Medicaid enrollees. Counties in all 50 states were included. We estimated a probit model with state indicators to adjust for state-level heterogeneity in demographics, politics, and policies. Independent variables assessed county racial/ethnic composition (ie, percentage black and percentage Hispanic), percentage living in poverty, percentage living in a rural area, percentage insured with Medicaid, percentage uninsured, and total population.

MAIN OUTCOMES AND MEASURES Dichotomous indicator for counties with at least 1 outpatient SUD treatment facility that accepts Medicaid.

RESULTS Approximately 60% of US counties have at least 1 outpatient SUD facility that accepts Medicaid, although this rate is lower in many Southern and Midwestern states than in other areas of the country. Counties with a higher percentage of black (marginal effect [ME], −3.1; 95% CI, −5.2% to −0.9%), rural (−9.2%; −11.1% to −7.4%), and/or uninsured (−9.5%; −13.0% to −5.9%) residents are less likely to have one of these facilities.

CONCLUSIONS AND RELEVANCE The potential for increasing access to SUD treatment via Medicaid expansion may be tempered by the local availability of facilities to provide care, particularly for counties with a high percentage of black and/or uninsured residents and for rural counties. Although states that opt in to the expansion will secure additional federal funds for the SUD treatment system, additional policies may need to be implemented to ensure that adequate geographic access exists across local communities to serve new enrollees.
Substance use disorders (SUDs)—including abuse of or dependence on alcohol and/or illicit drugs—are prevalent and associated with numerous adverse health and social consequences, but treatment rates remain low. In 2010, 9% of the US population (ie, 22 million persons) experienced an SUD. Several poor health outcomes are associated with SUDs, including sexually transmitted diseases, human immunodeficiency virus, liver disease, tuberculosis, and increased rates of injuries; social consequences include educational underachievement, poverty rates, and criminal involvement. Yet, despite these associated consequences and the availability of cost-effective treatments, only 13% of individuals in need of SUD treatment receive any specialty services.

The expansion of Medicaid under the Patient Protection and Affordable Care Act of 2010 sets the stage for helping address these long-standing gaps in access to SUD treatment for states that opt in to the expansion. Unlike financing for other health conditions, nearly 80% of funding for SUD treatment comes from public sources, of which Medicaid accounts for approximately one-fourth. States that opt in to the Medicaid expansion will improve health insurance coverage for individuals affected by SUDs and greatly bolster federal funding for the SUD treatment system; the expansion is fully funded by federal dollars in the first 3 years and 90% funded by federal dollars in 2020 and beyond.

However, the Medicaid expansion will improve access only if there is a sufficient infrastructure of facilities and providers available to deliver SUD treatment to new enrollees across communities. Unlike physical and mental health problems, treatment for SUDs is mostly provided by facilities in a separate specialty sector. More than three-fourths of adults who seek SUD treatment outside of self-help programs do so in specialty facilities that typically offer some combination of SUD services, such as detoxification, pharmacotherapy, individual and/or group psychotherapy, and other psychosocial services (eg, 12-step programs, voucher-based incentives), in 1 or more settings (ie, inpatient, residential, or outpatient). Researchers have raised concerns, however, that the extent SUD treatment infrastructure does not have the capacity to provide care for those in need of services.

Geographic accessibility of facilities that both provide outpatient treatment and accept Medicaid will be especially paramount for states that opt in to the expansion. Although treatment in inpatient and residential settings may be required for individuals with acute SUD problems, most SUDs also require long-term care that is more efficiently delivered in outpatient settings. Furthermore, Medicaid rules exclude coverage for many services in residential treatment settings, which constitute a substantial component of the current SUD treatment system. Therefore, the Medicaid expansion will place an even greater demand on the availability of outpatient services. However, to our knowledge, no study has examined the geographic accessibility of the outpatient SUD treatment infrastructure for Medicaid enrollees.

In addition to examining geographic access broadly, there are also several reasons to assess whether the SUD treatment system varies across racially/ethnically diverse communities. Although the annual prevalence of SUDs is similar across white (9.0%), black (8.8%), and Hispanic (9.5%) populations, prior studies have found that blacks and Hispanics are less likely to receive SUD services relative to whites. Researchers have speculated that differences in geographic access to the treatment system could partially explain these lower rates of use for racial/ethnic minorities, and an emerging body of research has found that access to other elements of the health care infrastructure is worse (eg, physician shortages and access to specialty mental health [MH] facilities) and more likely to deteriorate (eg, closures of hospitals and trauma centers) in areas with a high percentage of racial/ethnic minorities.

This study contributes to the literature by examining the extent to which gaps exist in the SUD treatment infrastructure for Medicaid enrollees across US counties and whether communities of color are more likely to experience gaps in this infrastructure. Our results highlight the types of communities that are less likely to have these facilities, and we discuss the implications for states’ decisions about implementing the Medicaid expansion.

Methods

Data Sources

Data were obtained from the 2009 National Survey of Substance Abuse Treatment Services public use file, a national survey sponsored by the Substance Abuse and Mental Health Services Administration of all public and private facilities that provide SUD treatment. The sampling frame comes from the Inventory of Substance Abuse Treatment Services, which includes facilities that are licensed, certified, or otherwise approved by the state substance abuse agency to provide SUD treatment (79% of total facilities) and (2) not licensed or certified, which includes private, for-profit, small group practices and hospital-based programs (21% of total facilities). Of the eligible facilities that were surveyed, a 94% response rate was achieved, and a sample size of 13,317 facilities in all 50 US states was available in the public use file for analysis. Facility-level data from the National Survey of Substance Abuse Treatment Services were aggregated to the county level and merged with data from the Area Resource File.

Measures

Dependent Variable

Facility information was used to assess the number of SUD facilities per county that accepted Medicaid and provided outpatient services in 2009. We created a dichotomous indicator for counties that had at least 1 of these facilities vs counties that had none.

Independent Variables

County-level measures were assessed using the most recent year of data available preceding the year in which the dependent variable was measured, and we included the percentage of residents who were (1) black (2008), (2) Hispanic (2008), (3) living below 100% of the federal poverty level (2008), (4) liv-
ing in a rural area as defined by the Census Bureau (2000),23 (5) enrolled in Medicaid (2007), and (6) uninsured (2008). Models also were adjusted for the total population of the county (2008).

**Statistical Analysis**

Using unpaired 2-sample t tests, we compared sociodemographic characteristics across counties that offered no access to outpatient SUD treatment facilities that accepted Medicaid vs counties that offered access to at least 1 of these facilities. We estimated 2 probit models to examine the association between county racial/ethnic composition and the likelihood that a county offered access to at least 1 outpatient SUD treatment facility that accepted Medicaid. The first model included county-level measures of percentage living in poverty, percentage living in a rural area, and total population. The second model also included county-level measures of the percentage enrolled in Medicaid and percentage uninsured. Both models included state indicator variables to adjust for unmeasured state-level heterogeneity in demographics, political environment, and policies that affect the availability of SUD treatment resources across local communities24,25 as well as an indicator for counties with an SUD treatment facility that had missing survey information, precluding them from inclusion in analyses. Although 260 outpatient facilities had missing survey information about whether Medicaid was accepted, only 21 counties were affected (ie, 1.5% of counties in the analytic sample) when creating the dependent variable at the county level.

Independent variables were standardized and marginal effects were calculated for a 1-SD increase in each explanatory variable at the observed value of other covariates using the `margins` command in Stata, version 12.26

We derived an analytic sample for bivariate and multivariate analyses by excluding 1 county missing demographic information in the Area Resource File. Furthermore, 56 counties in 5 states (Arizona, Connecticut, Delaware, Maine, and Massachusetts) were excluded from the regression because of perfect prediction resulting from the use of state indicators (ie, all counties in these 5 states had ≥1 facility that accepted Medicaid); this yielded an analytic sample size of 3085 counties for bivariate and regression analysis.

### Results

Descriptive information about facilities that provided SUD treatment is presented in Table 1 for 3141 US counties from all 50 states. A total of 81.4% of SUD facilities provided treatment in an outpatient setting, 25.4% provided treatment in a residential setting, and 5.9% provided treatment in an inpatient setting. More than half of the SUD treatment facilities accepted Medicaid (7239 [54.4%]), and most of these offered treatment in an outpatient setting (6212 [85.8%]).

At the county level, 69.9% of US counties had at least 1 SUD facility, and 60.3% of US counties had at least 1 outpatient SUD treatment facility that accepted Medicaid. A total of 91.8% of the US population lives in a county with an outpatient SUD facility that accepts Medicaid (Table 1), which is consistent with the finding that these facilities are more likely to be located in counties with larger populations (P < .001) (Table 2).

States in the South and Midwest have an especially high proportion of counties without access to these facilities (Figure).23 The 10 states (in rank order) with the highest proportion of counties that do not offer access to an outpatient SUD facility that accepts Medicaid are Arkansas, North Dakota, Texas, Louisiana, South Dakota, Idaho, Nebraska, Georgia, Nevada, and Minnesota.

Bivariate analyses indicate that, compared with counties that offer no access to outpatient SUD facilities that accept Medicaid (Table 2), counties with at least 1 of these facilities have a lower percentage of residents who are Hispanic (P = .005), living in poverty (P < .001), uninsured (P < .001), and living in a rural area (P < .001). In multivariate regression analysis, the percentage of residents living in a rural area (marginal effect [ME], −9.2%; 95% CI, −11.1% to −7.4%) and the percentage of uninsured residents (−9.5%; −13.0% to −5.9%) were strongly associated with a decreased likelihood that counties have one of these facilities (Table 3, model 2).

Furthermore, counties with a higher percentage of Black residents (ME, −2.5%; 95% CI, −4.7% to −0.4%) and Hispanic residents (−3.0%; −5.2% to −0.8%) were less likely to have any outpatient SUD facility that accepts Medicaid, after adjusting for differences in county poverty and percentage living in a rural area (Table 3, model 1). When measures of county health

### Table 1. Descriptive Statistics for US Substance Use Treatment Infrastructure

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Facility Level</th>
<th>County Level</th>
<th>Population Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%) of Total Facilities (n = 13 317)</td>
<td>No. of Counties With ≥1 Facility, (%) of Total Counties (n = 3141)</td>
<td>% of US Population Living in County With ≥1 Facility</td>
</tr>
<tr>
<td>All substance use treatment facilities</td>
<td>13 317</td>
<td>2194 (69.9)</td>
<td>95.7</td>
</tr>
<tr>
<td>Accept Medicaid</td>
<td>7239 (54.4)</td>
<td>1334 (61.6)</td>
<td>92.4</td>
</tr>
<tr>
<td>Facilities with outpatient substance use treatment</td>
<td>10 834 (81.4)</td>
<td>2160 (68.8)</td>
<td>95.4</td>
</tr>
<tr>
<td>Accept Medicaid</td>
<td>6212 (46.6)</td>
<td>1894 (60.3)</td>
<td>91.8</td>
</tr>
<tr>
<td>Facilities with residential substance use treatment</td>
<td>3386 (25.4)</td>
<td>918 (29.2)</td>
<td>78.3</td>
</tr>
<tr>
<td>Accept Medicaid</td>
<td>1339 (10.1)</td>
<td>595 (18.9)</td>
<td>62.9</td>
</tr>
<tr>
<td>Facilities with inpatient substance use treatment</td>
<td>781 (5.9)</td>
<td>431 (13.8)</td>
<td>56.6</td>
</tr>
<tr>
<td>Accept Medicaid</td>
<td>557 (4.2)</td>
<td>350 (11.1)</td>
<td>48.0</td>
</tr>
</tbody>
</table>
insurance status were included (Table 3, model 2), the finding for the percentage of black residents remained significant (ME, −3.1%; 95% CI, −5.2% to −0.9%), whereas the finding for the percentage of Hispanic residents was no longer significant (−0.7%; −3.1% to 1.7%). In other words, findings from model 2 indicate that a 1-SD increase above the mean in the percentage of black residents in the county reduced the predicted percentage of counties having at least 1 of these facilities from 59.3% to 56.2%.

Supplemental analyses were conducted to further examine the association between racial/ethnic composition and county-level availability of SUD facilities. We estimated the full model with interaction terms between each measure of racial/ethnic composition and the percentage living in a rural area; these interaction terms were not significant, suggesting that an association between racial/ethnic composition and access to 1 of these facilities is not moderated by population density. Because 87.7% of counties with an outpatient SUD facility in-
Abbreviation: FPL, federal poverty level.

Table 3. Regression Examining County Sociodemographics Associated With Availability of an Outpatient Substance Use Treatment Facility That Accepts Medicaid

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black, %</td>
<td>-3.1 (-5.2 to -0.9)</td>
<td>-3.1 (-5.2 to -0.9)</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>-4.8 (-7.0 to -2.7)</td>
<td>-4.8 (-7.0 to -2.7)</td>
</tr>
<tr>
<td>Living in poverty, ≤100% FPL, %</td>
<td>-4.3 (-6.5 to -2.1)</td>
<td>-4.3 (-6.5 to -2.1)</td>
</tr>
<tr>
<td>Living in rural area, %</td>
<td>-3.3 (-5.5 to -1.1)</td>
<td>-3.3 (-5.5 to -1.1)</td>
</tr>
<tr>
<td>Insured with Medicaid, %</td>
<td>-3.0 (-5.2 to -0.8)</td>
<td>-3.0 (-5.2 to -0.8)</td>
</tr>
<tr>
<td>Uninsured, %</td>
<td>-3.0 (-5.2 to -0.8)</td>
<td>-3.0 (-5.2 to -0.8)</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>-2.7 (-4.9 to -0.5)</td>
<td>-2.7 (-4.9 to -0.5)</td>
</tr>
<tr>
<td>Black, %</td>
<td>-2.5 (-4.7 to -0.4)</td>
<td>-2.5 (-4.7 to -0.4)</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>-3.9 (-6.1 to -1.7)</td>
<td>-3.9 (-6.1 to -1.7)</td>
</tr>
<tr>
<td>Living in poverty, ≤100% FPL, %</td>
<td>-3.3 (-5.5 to -1.1)</td>
<td>-3.3 (-5.5 to -1.1)</td>
</tr>
<tr>
<td>Living in rural area, %</td>
<td>-2.2 (-4.4 to -0.0)</td>
<td>-2.2 (-4.4 to -0.0)</td>
</tr>
<tr>
<td>Insured with Medicaid, %</td>
<td>-2.2 (-4.4 to -0.0)</td>
<td>-2.2 (-4.4 to -0.0)</td>
</tr>
<tr>
<td>Uninsured, %</td>
<td>-2.2 (-4.4 to -0.0)</td>
<td>-2.2 (-4.4 to -0.0)</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>-1.7 (-3.9 to 0.5)</td>
<td>-1.7 (-3.9 to 0.5)</td>
</tr>
<tr>
<td>Black, %</td>
<td>-1.6 (-3.8 to 0.6)</td>
<td>-1.6 (-3.8 to 0.6)</td>
</tr>
</tbody>
</table>

Abbreviation: FPL, federal poverty level.

Concluded an outpatient SUD facility that accepts Medicaid, we estimated models in which the dependent variable assessed whether a county had any outpatient facility, regardless of the type of insurance that was accepted. In these models, findings for the percentage of black residents remained significant, whereas the findings for the percentage of Hispanics were not significant.

Finally, using the subsample of counties with at least 1 outpatient SUD treatment facility that accepted Medicaid, we examined the relationship between racial/ethnic composition and (i) the number of SUD outpatient facilities that accepted Medicaid per county and (ii) the annual count of SUD treatment episodes in these facilities per county. The former was estimated with a zero-truncated negative binomial model and the latter with a generalized linear model with a log link and gamma distribution; models were estimated with the same independent variables described above. Counties with a higher percentage of black residents and those with a higher percentage of Hispanic residents had fewer facilities (P < .05) and lower aggregate annual treatment rates of SUD across these facilities (P < .05), before and after adjusting for county-level measures of health insurance.

Discussion

Forty percent of counties in the US do not have a SUD treatment facility that provides outpatient care and accepts Medicaid. Counties in rural areas are much more likely to lack access to outpatient SUD facilities that accept Medicaid, particularly those in Southern and Midwestern states. Our findings also indicate that gaps in the SUD treatment infrastructure are further compounded for areas with a higher proportion of racial and ethnic minorities.

Notably, 6 of the 10 states that have the highest proportion of counties without a facility have indicated their intention to opt out of the Medicaid expansion (ie, Texas, Louisiana, South Dakota, Idaho, Nebraska, and Georgia). In states that are opting out, leaders must be cognizant of the missed opportunity to obtain more federal funding for treatment systems across local communities that are already stretched for resources. The federal Substance Abuse Prevention and Treatment Block Grant—one of the biggest sources of funding for SUD services—has remained relatively stagnant since 2010, and there is concern that impending efforts to reduce federal spending may result in decreased funding for the block grant in coming years. Therefore, for states that choose not to expand Medicaid, any reductions in federal funding may result in worse access to SUD care across local communities than was available before passage of the Patient Protection and Affordable Care Act.

For states that opt in to the expansion, our findings suggest that many rural counties do not have an outpatient SUD facility that accepts Medicaid. To improve access, policymakers could invest resources to expand SUD treatment capacity in primary care safety-net facilities across rural communities by implementing technologies such as telepsychiatry. Additional descriptive analyses using data from the Area Resource File indicated that 78.0% of rural counties with no access to an outpatient SUD treatment facility for Medicaid enrollees have at least 1 primary care safety-net facility (ie, community health center). Thus, most rural counties have a primary care infrastructure that could offer a foundation for improving access to specialized SUD treatment.

The findings from the present study also indicate a modest negative association between minority racial/ethnic composition and access to the SUD treatment infrastructure. Lower access to these facilities in communities of color may be especially problematic in states that opt in to the Medicaid expansion because projections indicate that blacks and Hispanics will be disproportionately affected by the expansion relative to whites. However, our findings also suggest that the mechanisms accounting for lower access to these facilities may differ for counties with a high percentage of Hispanic vs black residents. The negative association between percentage Hispanic and access to any outpatient SUD treatment facility that accepts Medicaid was no longer significant once county-level insurance status was included in the model; additional analyses (not shown) revealed that it was the inclusion of percentage uninsured that accounted for the change in statistical significance. Thus, our results suggest that counties with a high percentage of Hispanic residents may be less likely to have out-

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patient SUD facilities that accept Medicaid because these counties are also more likely to have a high percentage of uninsured residents. Furthermore, counties with a high percentage of Hispanic residents did not differ significantly in their likelihood of having access to any outpatient facility, suggesting that policies aimed at increasing the number of facilities that accept Medicaid may improve geographic disparities in access to SUD treatment for Medicaid enrollees in counties with a large percentage of Hispanics.

In contrast to counties with a high percentage of Hispanic residents, counties with a high percentage of black residents were less likely to have any outpatient SUD facility (regardless of the type of insurance accepted) after controlling for county-level insurance status. These results suggest that simply broadening the mix of payer sources in existing facilities will not be adequate to reduce geographic disparities in access to SUD services in counties with a high percentage of black residents. Another policy option includes expanding SUD treatment capacity in safety-net facilities that provide MH services in these counties because many facilities that focus on MH outpatient services do not routinely provide SUD services. However, a recent study\(^1\) reported that counties with a high percentage of black residents are also less likely to offer access to an outpatient MH treatment facility that serves Medicaid enrollees; therefore, although expansion of SUD treatment services via the MH safety net may improve overall access to care, it may not reduce the disparities for black communities.

The primary care safety net presents another opportunity to expand SUD treatment capacity and may be a more viable option to address racial disparities in geographic access—especially in urban communities. Prior research\(^2\) has shown that urban counties with a high percentage of racial/ethnic minority residents are more likely to have experienced an increase in the number of primary care safety-net clinics (ie, federally qualified health centers) in the past decade. Nationally, however, the number of patients with a primary SUD diagnosis treated at federally qualified health centers in 2007 (alcohol use disorder \(n = 69,076\) and drug use disorder \(n = 79,664\))\(^3\) pales in comparison with the 2.4 million persons (aged \(\geq 12\) years) who received SUD treatment in a specialty facility that same year.\(^4\) These figures suggest that federally qualified health centers would need an infusion of resources to dramatically increase their capacity to treat SUDs and address this infrastructure gap across communities.

A recent report\(^5\) to Congress submitted by the Substance Abuse and Mental Health Services Administration highlighted a major challenge to expanding the SUD treatment capacity in any setting (ie, SUD specialty facility or other health care setting): the shortage of providers with sufficient experience, certification, and/or education to serve this population. Because of this shortage, SUD facilities have reported difficulty hiring and retaining providers. For example, a longitudinal study\(^6\) of SUD treatment centers reported an annual turnover rate of 33% for counselors and 23% for clinical supervisors. This report also highlighted concerns about the diversity of the workforce: although health care providers from racial/ethnic minority backgrounds are more likely than their white peers to practice in minority and underserved communities,\(^7\) racial/ethnic minorities are underrepresented among behavioral health care providers. Consequently, any effort to improve the capacity of the SUD treatment infrastructure in vulnerable communities will also need to increase support for initiatives that address these workforce challenges.\(^8\)

Our study has several limitations. First, the data are limited in that no information is available about the number and percentage of clients served at a given facility who are enrolled in Medicaid or who are uninsured. Thus, we were unable to obtain estimates of the number of individuals served by these facilities in a given county by payment status to examine county-level capacity to treat Medicaid enrollees. Second, it would have been preferable if all county-level measures were available for the same year (2008) preceding the year in which the dependent variable was assessed (2009); however, we used the best data available for each measure from the Area Resource File, and the serial correlation for each county-level measure is high. Finally, individuals living in one county may seek treatment in a different county. Nevertheless, these findings provide information about the types of counties that are less likely to have a facility. Furthermore, counties are an important unit of analysis to consider because they play an important role in the coordination, funding, and provision of health and behavioral health services for disadvantaged populations.\(^9\)

Notwithstanding these limitations, to our knowledge, this study is the first to examine the geographic distribution of the SUD treatment infrastructure for Medicaid enrollees in the United States. We identified large gaps in this infrastructure across many communities, especially in rural areas and in Southern and Midwestern states. Moreover, communities with a higher percentage of racial and ethnic minorities are less likely to have an outpatient SUD facility that serves Medicaid enrollees. In addition to further examining the mechanisms underlying reduced access to these facilities in communities of color, future studies should assess whether differences in geographic access to the SUD treatment infrastructure help explain lower rates of SUD service use among blacks and Hispanics relative to whites. Although the Medicaid expansion will provide states with an opportunity to bolster the SUD treatment system with new federal funds, additional policies may need to be implemented to ensure that there is an infrastructure in place to serve new enrollees who seek SUD treatment across local communities.
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REFERENCES