Sociodemographic Correlates of Affordable Community Behavioral Health Treatment Facility Availability in Florida: A Cross-Sectional Study

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Abstract

Behavioral health disorders such as mental disorders (MD) and substance use disorders (SUD) are epidemics in the US; however, the availability of treatment and prevention services remains

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low. This study assessed neighborhood-level sociodemographic attributes to characterize the availability of behavioral health treatment facilities in Florida. The American Community Survey and SAMHSA's Behavioral Health Treatment Locator were used to identify behavioral health treatment facilities in Florida and calculate their density by census tract. Spatial lag regression models were used to assess census tract-level correlates of facility density for 390 MD treatment facilities, 518 SUD facilities, and subsets of affordable MD and SUD facilities. Behavioral health treatment facility density was negatively associated with rurality and positively associated with the proportion of non-Latino Black, Latino, insured, and college-educated populations. Stark rural–urban disparities in behavioral health treatment availability present opportunities to prioritize telehealth and mobile interventions and improve treatment utilization.

Introduction

Despite the high prevalence of mental disorder (MD) and substance use disorder (SUD) among Americans, utilization of MD and SUD treatment services remains low. In 2020, among adults 18 years or older, 29% reported any MD or SUD.[1] More specifically, 21% of US adults reported any MD, 5.6% reported serious MD, and 14.5% reported a SUD.[1] However, only 16.9% of adults received inpatient or outpatient services or prescription medication for MD, and among those who needed SUD treatment, only 6.5% received it.[1] These behavioral health treatment disparities vary across the United States (US), with Florida—the nation's third-most populous state[2]—also reporting high MD and SUD which may be untreated.[3] For example, one in three people screened in Florida were diagnosed for depression in 2018.[3] In the USA, Florida has the fourth highest number of people with any mental illness (~2,900,000 residents)[1,3] and the third-highest state prevalence of adults with untreated MDs (63.5%).[3] Additionally, Florida has the fourth highest number of people with SUD (~1,007,000 residents).[3] In 2019 in Florida, 35 people died by overdose daily and estimates predict this to be 55 by the end of 2020.[4] Furthermore, Florida has scored 49th out of the 50 US states and the District of Columbia for access to insurance and mental health treatment.[3] One notable barrier to behavioral health treatment in Florida is the limited availability of behavioral health facilities.[5]

The foundation of effective health care delivery rests upon the physical (and now digital) *availability* of services which is often shaped by structural factors such as population density and zoning. Some proportion of available services comprise service *accessibility*, shaped by social determinants of health such as racial/ethnic identities or gender, and some subsets of accessible services comprise health care *utilization*.[6] Previous studies have explored individual-level disparities associated with MD treatment; however, few have assessed geographical disparities in both MD and SUD treatment availability, and even fewer have assessed the intersection of availability and affordability.[6]

Despite technology such as geographic information systems (GIS) offering much promise in behavioral prevention and treatment research,[5,7,8] GIS is underutilized in assessing multilevel-level behavioral health disparities. GIS is a tool for exploring and visualizing racial/ethnic behavioral health treatment service access throughout place and space.[8,9] Spatial approaches have been used in behavioral health research of treatment, harm reduction, risk behaviors, and alcohol and tobacco outlets/promotion/use.[10,11] GIS has been used at the community, neighborhood, and global level to understand behavioral health disparities and to lead policy, programming, prevention, and treatment efforts.[10,12,13] Perron et al. (2010) assessed the availability of outpatient substance use therapy treatment programs in the USA and found that SUD treatment programming varied by state.[14] However, neighborhood-level geographic factors may also put individuals at risk due to limited treatment

availability: the highest risk for negative treatment outcomes were in census tract level neighborhoods with either high socioeconomic risk (e.g., a higher proportion of residents living below the poverty line) or physical environmental risk (e.g., higher density of alcohol outlets).[15] GIS is particularly useful for identifying "hot spots" of disease burden and spatial mismatches between high disease burden and low availability (i.e., "deserts") of treatment services and facilities.[16]

Individual-level sociodemographic characteristics associated with behavioral health treatment disparities include socioeconomic status[17,18], education[19], living in a rural area,[20] having a disability status,[3,18] and race/ethnicity.[21] Behavioral health access disparities among Black and Latino populations also continue to persist. From 2005 to 2014, Black and Latino populations have lower predicted probabilities of having received any MD treatment in the past year, relative to White populations; however, while Hispanic populations fared worse in receiving SUD treatment relative to White populations, a higher percentage of Black populations received SUD treatment relative to White populations.[22,23] Previous reports have found that, across all racial/ethnic groups, service cost or lack of insurance coverage was the most common reason for low utilization of behavioral health services,[24] though each of these factors presents different barriers to obtaining treatment. Since the USA rolled out the Affordable Care Act (ACA) in 2014, Florida remains one of twelve states that chose not to expand eligibility for Medicaid.[25] In states that did, Black and Latino populations were less likely than White populations to list cost of care, lack of insurance, or inadequate insurance as barriers to care, suggesting that other barriers, such as neighborhood-level access, may be responsible for access disparities. Few studies have examined how neighborhood-level sociodemographic factors can limit access to behavioral health treatment facilities. One study observed a rural–urban divide in the distribution of the psychiatric workforce, with rural areas experiencing disproportionately lower availability of psychiatric providers.[26]

This study was aimed at filling this gap in research and examined the association between census tract-level sociodemographic characteristics and the availability of behavioral health treatment facilities—operationalized as facility density—to identify MD and SUD treatment facility deserts in Florida. The study closes by discussing the implications for rural mental health equity and strategies for closing the disparities between mental disorder prevalence and treatment availability in Florida and beyond, particularly in consideration of the COVID-19 pandemic.

Methods

Data

This cross-sectional study used data from two sources: the Substance Abuse Mental Health Service Administration (SAMHSA) Behavioral Health Treatment Services Locator[27] and the US Census rolling 5-year American Community Survey product 2013–2017 (ACS).[28]

Using the SAMHSA Behavioral Health Treatment Services Locator, a search was conducted for all MD and SUD treatment facilities in the state of Florida on March 1, 2020. Facility inclusion criteria included the provision of treatment to the general population, meaning that the facility operation was either a governmental or community organization. Accordingly, facilities solely identifying as the Veteran's Affairs, Department of Defense, and Indian Health Services were excluded, unless these facilities also reported operating as a government or community organization. More specifically, SAMHSA describes MD treatment as "*interventions such as therapy or psychotropic medication that treat a person's mental health problem or condition, reduce symptoms, and improve behavioral functioning and outcomes*"[27] and SUD treatment as "*a broad range of activities or services, including identification of the problem (and engaging the individual in treatment); brief interventions; assessment of substance abuse and related problems including histories of various types of abuse; diagnosis of the problem(s); and treatment planning, including counselling, medical*

services, psychiatric services, psychological services, social services and follow-up for persons with alcohol or other drug problems."[27] Facilities were categorized as providing MD treatment, affordable MD treatment, SUD services, and affordable SUD services. Facilities were considered affordable if they reported either being a Federally Qualified Health Center or accepting modes of payment such as a Sliding Fee Scale based on income, Medicare, Medicaid, and others (outlined in Table 1 under the section "Affordable Facility Criteria").

The ACS is part of the decennial census and is an annual survey which randomly selects 3.5 million addresses to respond to the survey.[28] Selected households are legally required to respond to the survey. Questions are asked about topics such as race, Hispanic ethnicity, poverty status, rurality, college degree obtainment, income, employment, and disability.[28]

Measures

A GIS was used to geocode 859 behavioral health treatment facilities that met the inclusion criteria. First, four Gaussian kernel density estimations (KDE) of behavioral health treatment facilities were created and visualized based on previous research,[29–31] then used to generate density layers of the four types of facilities: (1) MD treatment facilities, (2) affordable MD treatment facilities, (3) SUD treatment facilities, and (4) affordable SUD treatment facilities. After experimenting with three kernel sizes (1-mile, 5-mile, and 10-mile), a 1-mile kernel was ultimately chosen, which has the geographic equivalence of a 20-min walk and maximized variability in the KDE raster surface, with a pixel resolution of 200 m. Then, the dependent measure, the mean facility density by census tract for each of the four facility types, was calculated as a proxy for local facility availability. Neighborhoods are often represented by census tracts, which are statistical subdivisions of a county,[32] and are the smallest areal unit for which demographic variables are considered to be statistically reliable.[33]

This analysis explored correlates of mean behavioral health treatment facility density at the census tract level for each of the four facility types against a set of independent sociodemographic measures from the ACS. This study also investigated several census tract-level characteristics known to be associated with MD and SUD access and utilization, including the proportion of residents who were non-Latino Black (NLB), Latino, living below the poverty line, living in a rural census tract, insured, age 25 years or older with a college degree, and living with a disability.[17–21,24]

Statistical Analysis

Bivariate analyses of the relationship between the sociodemographic factors and the four types of mean behavioral health treatment facility density were performed. The adjusted associations between sociodemographic characteristics and facility density were identified using multivariable ordinary least squares (OLS) regression (Table 2). Multicollinearity was assessed using Pearson's and Spearman's correlation coefficients (i.e., removing any independent variable with an absolute correlation coefficient > 0.7 with any other independent variable) and by ensuring all variance inflation factors were < 5 in our regression models.[34] Initially, the proportions of single parent households and foreign born populations were also included as candidate independent variables in the regression models, but these two measures were excluded due to multicollinearity. The regression residuals of the OLS models were then tested for spatial autocorrelation using Moran's *I* statistic. As spatial autocorrelation was detected, a spatial lag regression model with a queen contiguity-based spatial weight matrix was fitted using GeoDa 1.8.2.[35] Multivariable models were fitted for each of the four facility density measures (all MD treatment facility density, affordable MD treatment facility density, all SUD treatment facility density, and affordable SUD treatment facility density). Finally, sociodemographic characteristics of the census tracts with the lowest quintile density of behavioral health treatment facilities were compared to those with average density using *t*-tests

Table 1
Characteristics of behavioral health treatment facilities in Florida

	Mental disorder treatment facilities		Affordable mental disorder treatment facilities		Substance use disorder treatment facilities		Affordable substance use disorder treatment facilities	
	n	%	**n**	%	**n**	%	**n**	%
Total	390	100	377	100	518	100	415	100
Type of care								
Detoxification	17	4%	17	5%	151	29%	113	27%
Transitional housing, halfway house, or sober home	2	1%	2	1%	67	13%	50	12%
Treatment for co-occurring serious mental health illness/serious emotional disturbance and substance use disorders	304	78%	292	77%	329	64%	277	67%
Facility operation								
Private for-profit organization	129	33%	117	31%	304	59%	210	51%
Private nonprofit organization	248	64%	247	66%	201	39%	192	46%
Governmental organization	13	3%	13	3%	13	3%	13	3%
Federally qualified heath center	24	6%	24	6%	36	7%	36	9%
Affordable facility criteria								
Medicare	239	61%	239	63%	116	22%	116	28%
Medicaid	326	84%	326	86%	208	40%	208	50%
Military insurance (e.g., TRICARE)	205	53%	205	54%	194	37%	194	47%
State-financed health insurance plan other than Medicaid	208	53%	208	55%	154	30%	154	37%
State mental health agency (or equivalent) funds	204	52%	204	54%	32	6%	32	8%
State welfare or child and family service funds	170	44%	170	45%	29	6%	29	7%
Community Mental Health Block Grants	114	29%	114	30%	26	5%	26	6%
US Department of VA funds	96	25%	96	25%	15	3%	15	4%
State corrections or juvenile justice funds	107	27%	107	28%	24	5%	24	6%
Payment assistance (check with facility for details)	101	26%	101	27%	99	19%	99	24%
Community Service Block Grants	80	21%	80	21%	19	4%	19	5%

Table 1
(continued)

	Mental disorder treatment facilities		Affordable mental disorder treatment facilities		Substance use disorder treatment facilities		Affordable substance use disorder treatment facilities	
	n	%	**n**	%	**n**	%	**n**	%
State education agency funds	53	14%	53	14%	11	2%	11	3%
Federal, or any government funding for substance use programs	32	8%	32	8%	209	40%	209	50%
No payment accepted	0	0%	0	0%	6	1%	6	1%
Sliding fee scale (fee is based on income and other factors)	166	43%	166	44%	204	39%	204	49%
Other forms of payment accepted								
Cash or self-payment	362	93%	349	93%	507	98%	404	97%
Private health insurance	336	86%	326	86%	393	76%	320	77%
Facility type								
Outpatient mental health facility	148	38%	146	39%	25	5%	24	6%
Community mental health center	95	24%	94	25%	11	2%	11	3%
Psychiatric hospital or psychiatric unit of a general hospital	78	20%	78	21%	8	2%	8	2%
Multisetting mental health facility (e.g., residential plus outpatient)	13	3%	12	3%	2	0%	2	0%
Partial hospitalization/day treatment	11	3%	7	2%	0	0%	0	0%
Other residential treatment facilities	2	1%	2	1%	0	0%	0	0%

Table 2

Spatial lag regression models of census tract characteristics on four categories of behavioral health treatment facility density in Florida

	Model 1: all MD treatment facilities	Model 2: affordable MD treatment facilities	Model 3: all SUD treatment facilities	Model 4: affordable SUD treatment facilities
Spatial lag term (Rho)	0.529***	0.945***	0.955***	0.951**
Constant	−0.133	−0.104***	−0.130***	−0.115***
Proportion of census tract identifying as non − Latino Black	0.696***	0.058***	0.095***	0.071***
Proportion of census tract identifying as Latino	0.789***	0.114***	0.163**	0.141***
Proportion of census tract that is rural	−0.311***	−0.076***	−0.156***	−0.103***
Proportion of census tract living below the poverty line	−0.163**	−0.008	−0.023	−0.015
Proportion of census tract 25 years and older with college degree	1.393***	0.152***	0.341***	0.226***
Proportion of census tract with health insurance	−0.282***	0.116***	0.117*	0.112**
Proportion of census tract with disability	−0.053	−0.050	−0.025	−0.032

$N = 4208$

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

(Table 3) to help understand how Florida's potential MD and SUD treatment deserts compared to tracts elsewhere in the state.

Spatial data were managed and analyzed using ArcGIS 10.3.1.[36] Statistical analyses were conducted using R version 3.6.2[37] and GeoDa 1.8.2.[35] All statistical tests were two-sided, and statistical significance was set at alpha < 0.05.

Ethics Approval

All procedures were reviewed by the University of Miami Institutional Review Board and deemed not to be human subject research.

Results

Descriptive Statistics

There were 4208 census tracts with a population of over 100 residents (total $n = 4245$ census tracts) in 2010.[38] Fig. 1, "Distribution of facilities for (A) Mental Disorder Treatment Facilities; (B) Affordable Mental Disorder Treatment Facilities; (C) Substance Use Disorder Treatment Facilities; and (D) Affordable Substance Use Disorder Treatment Facilities," presents tract-level densities by respective quintiles for MD, affordable MD, SUD, and affordable SUD treatment facilities. Table 1 presents descriptive characteristics of behavioral health treatment facilities in Florida, by type. Florida contained 390 MD treatment facilities (Fig. 1A), 377 affordable MD treatment facilities (Fig. 1B), 518 SUD treatment facilities (Fig. 1C), and 415 affordable SUD treatment facilities (Fig. 1D). The density of treatment facilities was concentrated in metropolitan statistical areas (MSA) such as Miami-Fort Lauderdale-Palm Beach, Tampa-St Petersburg-Clearwater, Orlando-Kissimmee-Sandford, Jacksonville, and Tallahassee.

Facility Density Models

There were statistically significant correlations between all independent variables ($p < 0.05$); however, all correlation coefficients were < 0.7, suggesting no multicollinearity.[39] Spatial autocorrelation was confirmed in the residuals of all OLS models using Moran's I statistic, suggesting model misspecification, so the analysis continued by computing spatial regression models of facility density for each facility type. Table 2 (i.e., models 1, 2, 3, and 4) presents a summary of the results of the four spatial lag regression models of facility density for all behavioral health treatment facilities.

For MD treatment facilities (model 1), the proportion of the census tract population that was non-Latino Black ($\beta = 0.696, SE = 0.032, p < 0.001$), Latino ($\beta = 0.789, SE = 0.032, p < 0.001$), and earned a college degree ($\beta = 1.393, SE = 0.093, p < 0.001$) were positively associated with MD provider density. The census tract characteristics of proportion rural ($\beta = -0.311, SE = 0.024, p < 0.001$), below poverty line ($\beta = -0.163, SE = 0.051, p = 0.001$), and with health insurance ($\beta = -0.282, SE = 0.064, p < 0.001$) were negatively associated with MD treatment provider density.

For affordable MD treatment facilities (model 2), the proportion of the population that was non-Latino Black ($\beta = 0.058, SE = 0.009, p < 0.001$), Latino ($\beta = 0.114, SE = 0.010, p < 0.001$), insured ($\beta = 0.116, SE = 0.028, p < 0.001$), and earned a college degree ($\beta = 0.152, SE = 0.026, p < 0.001$) was positively associated with affordable MD provider density while proportion rural ($\beta = -0.076, SE = 0.007, p < 0.001$) was significantly negatively associated with affordable MD provider facility density.

For SUD treatment facilities (model 3), the proportion of the population that was non-Latino Black ($\beta = 0.095, SE = 0.016, p < 0.001$), Latino ($\beta = 0.163, SE = 0.018, p < 0.001$), earned a

Table 3

Comparison of characteristics of census tracts with the lowest quintile (least) availability of affordable behavioral health treatment facilities relative to mean availability

	Affordable mental health treatment facilities			Affordable substance use treatment facilities		
	Least availability	Mean availability	*p* value	Least availability	Mean availability	*p* value
Median age (years)	43.7	38.4	<0.001	46.4	43.2	<0.001
Females	44.8	35.4	<0.001	47.5	44.3	<0.001
Males	37.5	34.6	<0.001	45.3	41.9	<0.001
Mean percent NLW	72%	55.9%	<0.001	73%	56%	<0.001
Mean percent NLB	12.8%	15.8%	<0.001	12%	16%	<0.001
Mean percent Latino	11.6%	23.8%	<0.001	11%	24%	<0.001
Mean percent rural	28.4%	4.5%	<0.001	33%	4%	<0.001
Mean single parent	25.3%	30%	<0.001	24%	30.1%	<0.001
Mean percent insured	85.8%	85.2%	0.030	85.8%	85.7%	0.056
Percent with college degree	15.6%	18.6%	<0.001	14.9%	18.8%	<0.001
Percent disabled	16.1%	13.7%	<0.001	16.7%	13.5%	<0.001
Percent car for work	86.3%	85.8%	0.407	86%	86%	0.217
Percent below poverty line	12.5%	12.03%	0.195	12.4%	12.1%	0.489
Percent in labor force	52.7%	59.1%	<0.001	51.3%	59.5%	<0.001

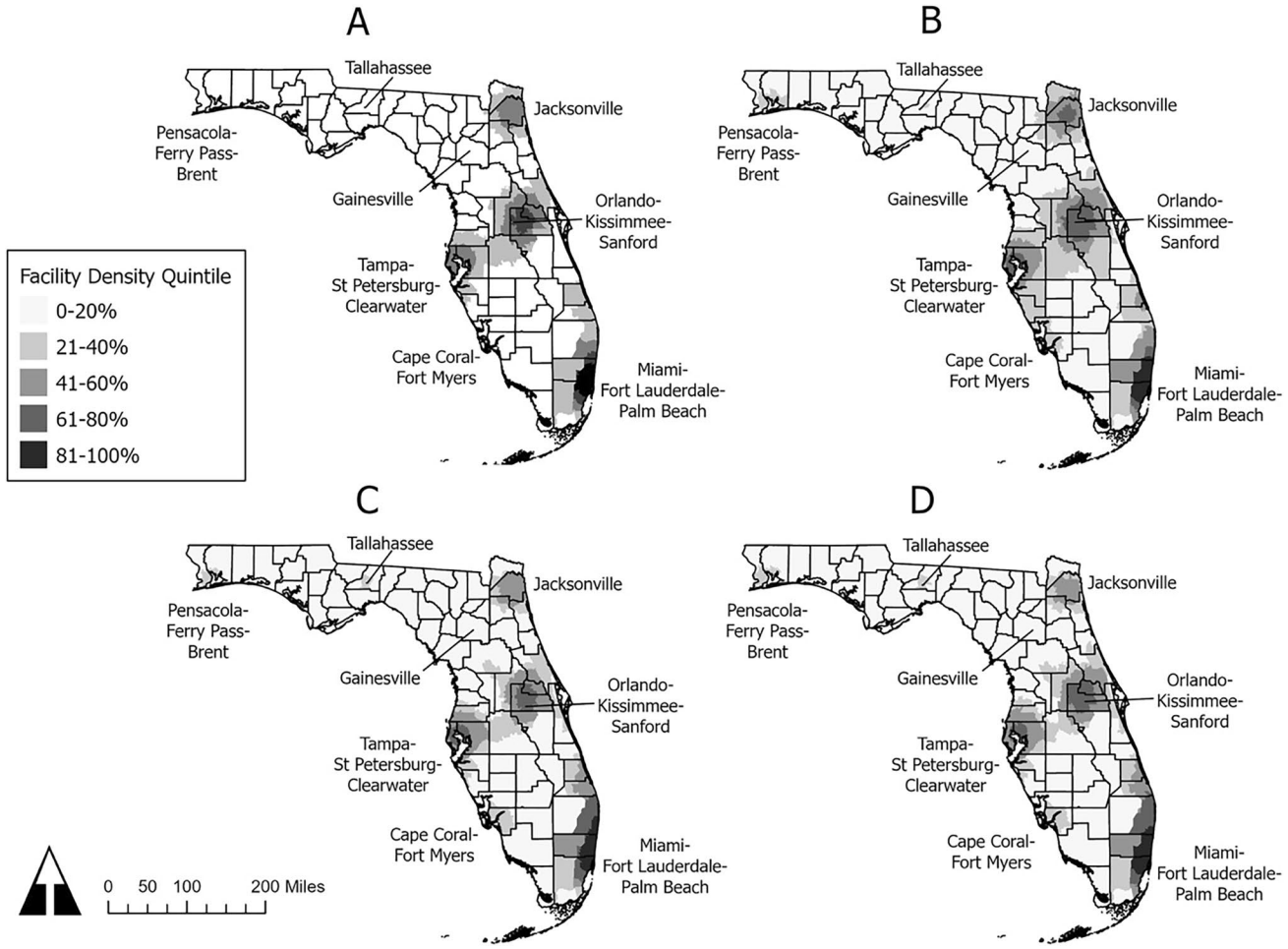

Figure 1

Density distribution across Florida counties for: **A** mental disorder treatment facilities; **B** affordable mental disorder treatment facilities; **C** substance use disorder treatment facilities; and **D** affordable substance use disorder treatment facilities

college degree ($\beta = 0.341, SE = 0.045, p < 0.001$), and insured ($\beta = 0.117, SE = 0.048, p = 0.014$) was positively associated with SUD treatment provider density. The proportion of census tract population that was rural ($\beta = -0.156, SE = 0.013, p < 0.001$) was significantly negatively associated with SUD treatment provider density.

For affordable SUD treatment facilities (model 4), the proportion of the population that was non-Latino Black ($\beta = 0.071, SE = 0.011, p < 0.001$), Latino ($\beta = 0.141, SE = 0.013, p < 0.001$), earned a college degree ($\beta = 0.226, SE = 0.032, p < 0.001$), and insured ($\beta = 0.112, SE = 0.034, p = 0.001$) were positively associated with affordable SUD treatment provider density. The proportion that was rural ($\beta = -0.103, SE = 0.009, p < 0.001$) was significantly negatively associated with affordable SUD treatment provider density.

Table 3 presents comparisons of census tract characteristics for the lowest density quintile of behavioral health treatment facilities relative to the mean density across census tracts. Relative to tracts with the mean density of availability, tracts with the lowest density of affordable MD and SUD treatment facilities were significantly older (MD: 44 years vs 38 years, $p < 0.001$; SUD: 46 years vs 43 years, $p < 0.001$) comprised of a higher percentage of non-Latino Whites (MD: 72% vs 56%, $p < 0.001$; SUD: 73% vs 56%, $p < 0.001$), lower percentage of Non-Latino Blacks (MD: 12.8% vs 15.8%, $p < 0.001$; SUD: 12% vs 16%, $p < 0.001$), lower percentage of Latinos (MD: 11.6% vs 23.8%, $p < 0.001$; SUD: 11% vs 24%, $p < 0.001$), higher percentage of people living in rural areas (MD: 28% vs 4%, $p < 0.001$; SUD: 33% vs 4%, $p < 0.001$), lower percentage of single parents (MD: 25% vs 30%, $p < 0.001$; SUD: 24% vs 30%, $p < 0.001$), marginally higher percentage of people insured for MD treatment only (86% vs 85%, $p = 0.030$), lower percentage of people with a college degree (MD: 16% vs 19%, $p < 0.001$; SUD: 15% vs 19%, $p < 0.001$), higher percentage of people with a disability (MD: 16% vs 14%, $p < 0.001$; SUD: 17% vs 14%, $p < 0.001$), and lower percentage of people in the labor force (MD: 53% vs 59%, $p < 0.001$; SUD: 51% vs 60%, $p < 0.001$). There were no significant differences between census tract percentage living below poverty line (MD: 13% vs 12%, $p = 0.195$; SUD: 12% vs 12%, $p = 0.489$). Additional information can be found in Table 3. The unshaded areas in Fig. 1a–d represent these service deserts (i.e., census tracts with the lowest behavioral health treatment facility density).

Discussion

This study used publicly available data to examine the association between census tract characteristics and density of behavioral health treatment facilities. As expected, a higher density of behavioral health treatment facilities was prevalent in major metropolitan areas, such as Miami-Fort Lauderdale-Palm Beach MSA, Tampa-St Petersburg-Clearwater MSA, Orlando-Kissimmee-Sandford MSA, Jacksonville MSA, and Tallahassee MSA, which is consistent with Central Place Theory and the hierarchy of services typically present in urban places.[40] This is consistent with widely observed disparities in the availability of community treatment facilities between urban and rural areas.[5,14,41]

Neighborhood characteristics, including a higher proportion of non-Latino-Black, Latino, college-educated, and insured populations, were associated with higher density of all categories of behavioral health treatment facilities, whereas a higher proportion living in rural areas was associated with lower behavioral health treatment facility density. Census tracts with more residents living below the poverty line were negatively associated with MD treatment facility density but did not have a significant relationship with other facility densities, perhaps because the relationship was accounted for by rural location.

Our findings have important public health implications. First, individuals in rural and uninsured neighborhoods experience inequitable availability of treatment facilities compared to urban and well

insured neighborhoods, as previously identified in the literature at a smaller county-level scale.[42] The state of Florida should consider investing equitably in communities to ensure that minority and disadvantaged populations have full access to affordable services through supporting new treatment facilities or expanding the reach of existing facilities. Although investments can also include the expansion of Medicaid which could increase insurance coverage to include an additional 500,000 Floridians,[43] affordable care service expansion must address disparities among the most vulnerable areas, such as more rural areas. Florida's ratio of one full-time physician per 1500 Medicaid enrollees is among the lowest in the nation.[44] But there is no required ratio of behavioral health treatment providers to enrollees,[44] which further underscores the importance of affordable community behavioral health treatment providers and facilities.

There are behavioral treatment availability disparities between rural and urban neighborhoods. More feasible and impactful options to increase availability of treatment providers and facilities to vulnerable neighborhoods include telehealth and mobile treatment services. Approximately 95% of the rural population and 95% of those who make less than $30,000 a year have access to a cell phone,[45] which suggests that telehealth options may be viable for some behavioral health treatment options, especially given the often remarkable results of these digital platforms[46–48] and their rapid deployment and expansion during the COVID-19 pandemic.[49,50] For maximum reach, telehealth can be funded at a state level[51] and delivered for behavioral health services using audiovisual conferencing[48] and applications via smartphones.[52] Telehealth adjuncts for MD and SUD treatment can be as simple as including short message service[53,54] and e-mail[55] or can be as integrative as the use of a mobile technology platform for supervised administration of methadone and buprenorphine which consists of integrating motivational coaching, adherence monitoring, and electronic pill dispensing (e.g. *MySafeRx*).[56] Existing studies have already demonstrated an increase in the utilization of MD and SUD treatment services in rural areas via telehealth.[57,58] Considering that 96% of Americans own a cell phone[45] and 90% can access the internet,[56] telehealth could be a feasible option to increase availability of certain behavioral health services. Yet, as some telemedicine services may require high bandwidth (i.e., real time videoconferencing services), the high cost of data plans could be a barrier for some low-income and rural residents. Additionally, health disparities such as insurance status can negatively impact telehealth access.[59]

It is noteworthy that mobile treatment services can include community-based services such as assertive community treatment (ACT) or mobile crisis teams.[60] Telehealth and mobile treatment services can include the expansion of current structured evidence-based interventions to include payment options including Medicaid or sliding scale fees. Before the design and adaptation of these interventions, qualitative research could lead to important programmatic considerations and the consideration of implementation science frameworks. A logical next step would be to explore the implementation and dissemination science related components of telehealth and mobile treatment services.[61]

Our suggestions of telehealth and mobile treatment services must also be considered in the context of COVID-19 as the pandemic has exacerbated MD and SUD among Americans, with 73% of the population believing that COVID-19 had a negative effect on emotional or mental health among people with any mental illness in the past year.[1] Additionally, approximately 10% of White populations reported that they were unable to pay for basic necessities like food, heat, or rent; however, 31% of Black and 26% of Latino populations reported being unable to pay for necessities. If individuals are focused on day-to-day survival, there is little space in their lives to seek out MD and SUD treatment.[62] There is also a perception that COVID-19 disrupted behavioral health services in 2020: among adults who received mental health services in 2020, 58.3% reported that services were moved from in-person to telehealth, 38.7% reported delays or cancellations in appointments, 16% reported delays in getting prescriptions, and 10.7% reported inability to access needed care resulting in moderate to severe impact on health.[1] To address the dual burden of the negative mental

health impacts of the COVID-19 pandemic and shift away from in-person interactions to minimize COVID-19 risks,[63] increased efforts towards bolstering telemedicine, ACT, and mobile crisis teams are necessary in Florida. As the COVID-19 pandemic necessitated a shift in MD and SUD treatment modality from in-person to virtual interactions, some individuals may already have familiarity with these virtual systems.[63]

Our analyses found that areas with greater proportion of non-Latino Black and Latino residents were associated with higher behavioral health treatment facility density. Despite having geographically available services, Black and Latino individuals are less likely to seek out behavioral health treatment for MDs and SUDs.[60–62,64] This lack of service uptake exacerbates overdose deaths: in 2020 non-Latino Black Americans had an overdose rate higher than White residents for the first time since 1999 and Latino Americans had an increase of 40% in overdose deaths since 1999.[64,65] Black and Latino residents may be diagnosed with MD or SUD at a lower rate due to the failure of primary care providers in detecting psychological distress among racial minority groups.[66,67]

Another barrier to MD or SUD treatment could be various stigmas.[68,69] Stigma can affect Black and Latino populations at the level of the systemic provider level (e.g., misdiagnosis, stereotyping), self-stigma (e.g., prejudice), public stigma (e.g., discrimination), and double stigma or intersecting stigmas (e.g., lower SES, distrust of system, and providers). This can result in a barrier to treatment as Black and Latino populations experience lower medical trust and attempt to avoid discrimination and consequently avoid interactions with the MD and SUD treatment system.[70,71] For example, medical mistrust within the Black community was shown to be related to COVID-19 vaccine hesitancy.[63] To increase trustworthiness, behavioral health institutions can initiate difficult community dialogs to increase engagement of communities of color and increase service uptake.[63]

Additionally, it is important that services be culturally tailored, available in other languages, and appropriate to be acceptable and accommodating for Black and Latino residents to improve utilization of existing services.[72–74] Approximately half of SAMHSA Behavioral Health Treatment facilities offered services in Spanish: ideally, all facilities could offer services in both English and Spanish. In addition, previous research found that travel distance to outpatient SUD treatment facilities for Spanish-speaking clients was higher than the county average, suggesting that although availability may be high at the census tract level, these services may not be appropriate for Latinos and they may travel to other more distant places.[75] These factors underscore why the higher geographic *availability* of behavioral health and substance abuse services in urban areas must not necessarily be interpreted as increased *access* for Black and Latino communities. The lower availability observed in rural areas, on the other hand, almost certainly suggests lower access and utilization.

As Latino segregation is negatively associated with self-reported good health and access to a personal healthcare provider, it is especially important that these majority Latino neighborhoods are prioritized by state and local government for MD and SUD treatment intervention options.[76] Our findings suggest that census tracts at the intersection of high proportions of Latinos, rurality, and without health insurance could have more limited availability of affordable community behavioral health treatment providers. Populations facing this additional burden in Florida include Latino seasonal farmworkers, who are often undocumented and not likely captured in Census data.[77] Latino seasonal farmworkers experience high levels of stress, anxiety, and depression yet are marginalized and rendered invisible due to the intersection of multiple social determinants of health, including immigration status.[78–80]

Although Florida increased its mental health and substance abuse treatment budget in 2021 to $137.6 million, thereby increasing per-person spending from $36 to $64, this funding will not expand MD and SUD treatment availability for the general population.[81] Instead, this increased spending will focus on improving the Florida 211 call line which connects callers to mental health and substance use resources, funding telehealth for children living in rural areas, and improving safety for staff and residents at state mental health treatment facilities.[81] Governmental investments

in MD and SUD treatment disparities should be prioritized to mitigate economic burdens and to increase the quality of life among those affected. Large and diverse states such as Florida elicit further examination of health outcomes at more granular levels to understand community-specific factors that improve service availability, particularly as potential models for future majority-minority US regions.

The USA experiences an annual earning loss of $193.2 billion due to serious mental illness; the total economic burden of serious mental illness is $317 billion.[82] However, as of 2019, for every $1 invested into the treatment of common MDs, there is a return of $4 in improved health and productivity.[83] Such neighborhood investments could result in long-term economic savings in the cost of behavioral health care. Future studies should consider qualitative household-level inquiry to better understand experiences accessing behavioral health treatment.

There were several limitations to this study. This was a population-based study using publicly available data which used census tracts as the unit of observation and presents a risk of ecological fallacy because individual-level treatment behavior was not measured. In addition, only those facilities which defined as "community providers" or those providers registered on the SAMHSA Behavioral Health Treatment Locator were included in our analyses. Some service providers may not be listed on the SAMHSA website, or some providers may have stopped service provision since being listed on the website. Future studies of those receiving a MD or SUD diagnosis might examine the effect of sociodemographic variables such as Latino ethnicity, rural residence, insurance, and/or poverty on access to behavioral health treatment facilities and service utilization. Future studies might also consider differences in the types of treatment services offered by individual facilities to better understand barriers to specific types of behavioral health services.

Implications for Behavioral Health

Affordable community-level behavioral health treatment facilities are less available in Florida's more rural census tracts. Facility availability is greater in urban census tracts where racial and ethnic minorities reside, which should translate into greater access and utilization of behavioral health services. Yet, despite greater service availability, racial and ethnic minorities continue to experience access and utilization disparities, and the mental health treatment division continues to widen. This underscores just how powerful other social determinants of health can be in limiting healthcare access and utilization. Because availability and affordability are only two facets of access, future research should consider components such as acceptability, accommodation, and physical/geographic accessibility of services. Future studies should measure the utility of telehealth-delivered interventions that are culturally acceptable and accommodating to minority communities.

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Data Availability Anonymized study data are available upon reasonable request from the lead author.

Declarations

Conflict of interest The authors declare no competing interests.

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