HHS Public Access

Author manuscript

Ethn Health. Author manuscript; available in PMC 2023 May 01.

Published in final edited form as:

Ethn Health. 2022 May ; 27(4): 749–769. doi:10.1080/13557858.2020.1814999.

Reducing Racial/Ethnic Disparities in Mental Health Service Use among Emerging Adults: Community-Level Supply Factors

Amanda NeMoyer[a,b], **Mario Cruz-Gonzalez**[a,c], **Kiara Alvarez**[a,c,*], **Ronald C. Kessler**[b], **Nancy A. Sampson**[b], **Jennifer Greif Green**[d], **Margarita Alegría**[a,c,e]

[a]Disparities Research Unit, Department of Medicine, Massachusetts General Hospital, 50 Staniford Street, Boston, MA 02114, United States

[b]Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115, United States

[c]Department of Medicine, Harvard Medical School, 21 Shattuck Street, Boston, MA, 02115, United States

[d]Wheelock College of Education and Human Development, Boston University, 2 Silber Way, Boston, MA 02215, United States

[e]Department of Psychiatry, Harvard Medical School, 21 Shattuck Street, Boston, MA, 02115, United States

Abstract

Objectives: Emerging adulthood—spanning 18 to 29 years of age—is associated with the highest risk for onset of certain behavioral health disorders (e.g., major depression, bipolar disorder, psychosis, substance use disorders) and high prevalence of many behavioral health disorders. Yet, rates of mental health service use remain low in this age range. Racial/ethnic minorities are particularly impacted by individual, cultural/linguistic, and community-level barriers to mental health care. This study examined community-level factors associated with mental health service use and investigated whether these associations varied by race/ethnicity.

Design: This study analyzed individual- and county-level data for emerging adults in the United States (N=3,294) from the nationally representative Collaborative Psychiatric Epidemiological Surveys (CPES). Using the Andersen Model of Health Care Utilization, analyses examined predisposing, enabling, and need factors utilized in prior studies with adult samples as well as novel community characteristics hypothesized to impact service use among emerging adults of diverse racial/ethnic backgrounds. Past-year use of both specialty and any mental health services were assessed, controlling for individual- and community-level variables, and adjusting for presence of past-year mental health disorder, overall health status, and functional impairment. Differences between racial/ethnic minority groups and Non-Latino Whites were tested through a

[*]**Corresponding author:** Kiara Alvarez, 50 Staniford Street Suite 830 Boston, MA 02114; telephone: +1-617-724-1237; kalvarez2@mgh.harvard.edu.

Conflicts of interest

Dr. Kessler received support for his epidemiological studies from Sanofi Aventis; was a consultant for Johnson & Johnson Wellness and Prevention, Sage Pharmaceuticals, Shire, Takeda; and served on an advisory board for the Johnson & Johnson Services Inc. Lake Nona Life Project. Kessler is a co-owner of DataStat, Inc., a market research firm that carries out healthcare research.

multilevel model incorporating random intercepts logistic regression, with analysis focusing on the interaction between race/ethnicity and community-level supply variables.

Results: For past-year use of specialty mental health services, density of hospitals with child wellness programs was linked to service use among Black emerging adults, whereas density of hospitals with linguistic/translation services was linked to service use among Latino emerging adults.

Conclusions: This study expands on previous research in behavioral health disparities to examine ways to improve behavioral health services for an emerging adult population with unmet service needs and identifies specific community-level factors that can improve mental health for racial/ethnic minority emerging adults.

Keywords

emerging adults; mental health; service use; young adults; race/ethnicity; disparities

Characterized by more autonomy than adolescence and more instability than adulthood, the transition period between 18 and 29 years of age has been identified as “emerging adulthood” (Arnett, Žukauskienė, and Sugimura 2014; Walker 2015). During this life stage, individuals face critical life changes (e.g., in legal status, social role) and engage in meaningful identity exploration while seeking self-sufficiency and independence in pursuit of full adulthood (Arnett 2000; Walker 2015). Behavioral health disorders are particularly common during emerging adulthood, as individuals in this age group routinely demonstrate the highest 12-month prevalence rates of all adults (Adams, Knopf, and Park 2014; Arnett, Žukauskienė, and Sugimura 2014) but often wait years before seeking and obtaining treatment (Marino et al. 2016). Over time, mental health needs have increased among young adults (Twenge et al. 2019); however, rates of service use have not similarly increased, suggesting rising rates of unmet need among this population (Mojtabai, Olfson, and Han 2016). In fact, the most recent nationwide survey data indicate that only 37.3 percent of young adults (ages 18 to 25) who meet criteria for any mental illness report obtaining mental health services in the past year (Substance Abuse and Mental Health Services Administration 2019). Further, racial/ethnic disparities in service use are evident among this age group, with Black, Latino, and Asian young adults less likely to use mental health services than White young adults (Hunt et al. 2015).

Conceptual model of mental health care utilization

According to the Andersen Model of Health Care Utilization (Andersen 1995), a confluence of elements influence individuals’ likelihood of service use, including predisposing factors (i.e., demographic characteristics, health beliefs), personal and community-level enabling factors (e.g., insurance coverage, local service availability), and perceived and evaluated need for treatment. Emerging adulthood itself might be considered a predisposing factor (i.e., age), but this developmental stage also exerts unique influence on other predisposing and enabling factors that appear to reduce the likelihood of behavioral health service use (Marino et al. 2016). For example, pursuit of independence and self-sufficiency often leads emerging adults to live independently and take on decision making and other responsibilities

for their own care (Arnett 2000) —a marked shift from youth and adolescence, when parents/caregivers frequently exert control over this aspect of life and facilitate service utilization (Ryan et al. 2015). Further, by living away from family and spending a considerable amount of time alone (Arnett 2000), emerging adults limit the chances that others will observe and point out any apparent behavioral health symptoms, thereby reducing their likelihood of perceiving a need for treatment. Emerging adults' aspirations of self-sufficiency likely also contribute to predisposing health beliefs that value self-reliance over help seeking, even if that preference increases their use of maladaptive coping strategies such as avoidance or substance use (Gulliver, Griffiths, and Christensen 2010).

While in this transitionary period, emerging adults are still developing mental health literacy—awareness of mental health symptoms, ability to recognize need for help, and knowledge of existing and accessible services (Rickwood et al. 2005). Thus, their ability to perceive treatment need may be hindered and their uncertainty about where to find providers —especially likely if they have recently moved to a new area—can impede treatment seeking. Even individuals who received treatment during adolescence frequently experience interruption or discontinuation of services when making the transition from pediatric to adult care (Copeland et al. 2015; Munson et al. 2011; Pottick et al. 2008). Additional logistical factors related to the instability of emerging adulthood include financial concerns related to the cost of services (especially for un- or underinsured individuals), a lack of reliable transportation, and limited time for attending appointments (Gulliver, Griffiths, and Christensen 2010).

Racial/ethnic disparities in predisposing and enabling factors for mental health use

Though the barriers described above contribute to a considerable rate of unmet mental health need among all emerging adults, these issues seem to have distinct influence on young people of color (Hunt et al. 2015). Black, Latino, and Asian individuals in this age group are less likely to use mental health services despite need and, when they do obtain treatment, they typically attend fewer visits (Adams, Knopf, and Park 2014; Marrast, Himmelstein, and Woolhandler 2016; Williams and Cabrera-Nguyen 2016). Cultural and linguistic predisposing factors are sometimes identified as major contributors to this disparity. For example, young Asian Americans have reported that cultural norms downplay the importance of mental health problems and that few mental health professionals have the cultural and linguistic understanding needed to successfully provide them care (Lee et al. 2009). Rather than seeking professional treatment, emerging adults of color may be more likely to manage their problems on their own or obtain support from personal networks (Lee et al. 2009; Narendorf et al. 2018). Further, compared to White emerging adults, young people of color may be less frequently referred to mental health services via primary care (Edbrooke-Childs and Patalay 2019).

Community-level predisposing and enabling factors impacting mental health service use

Several community-level features, defined in this paper using county-level variables from the U.S. Department of Health and Human Services Health Resources Administration Area Resource File, have also helped facilitate unmet mental health need in the United States. At the county level, size and sociodemographic characteristics (e.g., poverty, unemployment rates), individual and institutional provider availability (e.g., mental health specialists, hospitals), and health market conditions (e.g., safety net presence and availability) can all serve as factors supporting or inhibiting future treatment utilization (Olfson 2016; Stockdale et al. 2007). Recently, Cook and colleagues (2013) investigated how county-level provider supply (i.e., density of specialist mental health providers, existence of a community mental health center) and county-level health maintenance organization (HMO) market share (i.e., percentage of county residents enrolled in an HMO) impacted racial/ethnic differences in mental health service use among a general adult population. They found that increased provider supply and HMO market share were linked to increased rates of mental health service use, even when controlling for other individual- and county-level covariates (Cook et al. 2013). Further, service use among Black and Latino individuals appeared to benefit more from the availability of these community-level characteristics than non-Latino Whites, suggesting that these factors may be particularly useful for reducing certain racial/ethnic disparities in access to mental health services (Cook et al. 2013).

Provider supply and other community-level measures of treatment access should also be considered when seeking to address unmet mental health need among emerging adults, especially those from racial/ethnic minority groups (e.g., Hunt et al. 2015). However, the unique qualities of this age group indicate that there may be important differences in the *types* of service availability for which an increased supply would facilitate improved use. Traditional mental health care providers and systems, from which young people with mental health concerns would ostensibly seek treatment, are typically designed for the general adult population and often fail to appeal to emerging adults (MacDonald et al. 2018; Walker 2015). Few intervention programs in practice have been developed or adapted for use with emerging adults; therefore, they seldom focus on topics of importance for emerging adults with mental health symptoms, such as independent living skills (Gilmer et al. 2012; Walker 2015). Importantly, previous research suggests that, when age-appropriate services options are available, service use improves (Gilmer et al. 2012). Young people may also have trouble establishing therapeutic relationships with psychologists and psychiatrists, as these professionals are 50 years of age or older on average, and young people of color may have even more difficulty, given the dominance of White professionals in these fields (Lin 2018). Emerging adults might see these professionals as “clueless” about their experiences and unable to truly help, thereby discouraging traditional treatment seeking (Draucker 2005, 159). Perhaps reflecting these disincentives, emerging adults with mental health needs frequently rely on crisis services, such as emergency departments, inpatient hospitals, and inpatient substance use facilities, to obtain care (MacDonald et al. 2018). This phenomenon seems to be especially prevalent among young people from racial/ethnic minority groups (Lin, Burgess Jr, and Carey 2012).

The present study

Identifying the factors that promote service use among emerging adults, particularly those from populations of color, could help address existing unmet mental health needs and service use disparities between racial/ethnic groups within this population. Thus, the current study sought to examine whether community-level factors (e.g., provider supply, HMO penetration) identified as improving service use and reducing disparities in a general adult sample (Cook et al. 2013) would produce similar effects for an emerging adult sample. Further, we sought to examine other community-level predictors that may be particularly relevant to the needs and preferences of young people and young people of color, such as the county-level availability of: hospitals with linguistic and/or translation services, hospital-based child and teen programs, mental health providers 35 years of age or younger, emergency departments, and inpatient and outpatient substance use services. We examined the effects of these supply variables on mental health service use overall, and then investigated whether those effects varied by race/ethnicity.

Methods

Sample/data sources

We used individual-level data from the Collaborative Psychiatric Epidemiology Surveys (CPES), which joins data from three nationally representative surveys: The National Comorbidity Survey Replication (NCS-R), the National Latino and Asian American Study (NLAAS), and the National Survey of American Life (NSAL). The CPES contains comprehensive epidemiological data regarding the distributions, correlates, and risk factors of mental health disorders. All surveys used the same sampling procedures and the same core questionnaire to assess disorder criteria. Data collection was conducted by the Survey Research Center of the Institute for Social Research at the University of Michigan from early 2001 through the end of 2003. Surveys were administered to a sample of non-institutionalized adults aged 18 or older residing in the conterminous United States. Recruitment, consent, and field procedures were approved by the Institutional Review Boards (IRBs) of the University of Michigan, Harvard Medical School, Cambridge Health Alliance, and the University of Washington. Secondary analyses for this study were approved by the Partners Healthcare IRB.

The NLAAS oversampled areas with large concentrations of Latino and Asian populations, whereas the NSAL oversampled areas with large concentrations of African American and Caribbean Black populations. Response rates were 70.9% for the NCS-R, 75.7% for the NLAAS, and 71.5% for the NSAL. The consolidated CPES sample includes 13,775 respondents, of which 4,184 (30.4%) were White, 2,602 (18.9%) were Latino, 2,046 (14.9%) were Asian, and 4,943 (35.9%) were Black. Given our focus on emerging adults, our sample was limited to respondents who were between 18 and 29 years of age at the time of survey administration. Our final sample included 3,294 respondents, of which 1,160 (35.2%) identified as Black, 888 (27.0%) as White, 749 (22.7%) as Latino, and 497 (15.1%) as Asian.

County-level data were obtained from the 2002 Area Resource File (ARF), a national database created by the U.S. Department of Health and Human Services Health Resources Administration. The ARF provides comprehensive information about available health resources within each county in the United States.

Measures

Mental health service use.—Two dependent variables assessed whether respondents obtained mental health services in the last 12 months: (1) past-year use of mental health services from *any* kind of health professional (e.g., mental health specialist, general practitioner, nurse), and (2) past-year use of mental health services from a mental health *specialist* (e.g., psychiatrist, psychologist, counselor, or social worker).

Individual-level variables.—Previous studies have found that age, gender, marital status, education level, poverty status, employment status, and insurance status are associated with mental health service use after controlling for race/ethnicity (e.g., Alegría et al. 2008). We controlled for these individual-level variables, making some adjustments to better reflect the characteristics of our subsample. Namely, we included age as a continuous variable—unlike prior studies that used it as a categorical variable—given the smaller age range. Additionally, employment status included "student" as a potential response option (in addition to employed, unemployed, homemaker, or on disability). Some reference groups for categorical variables were also selected to better reflect the characteristics of our subsample. Separated/widowed/divorced was selected as the reference group for marital status and permanently disabled/other as the reference group for employment status, given the low proportion of respondents within these two categories. College graduate was selected as the reference group for education level since a higher proportion of respondents in our subsample were still attending college compared to the full CPES sample. In this way, we were consistent with the inclusion of "student" as a potential response option for employment status.

We also adjusted for the presence of any past-year mental health disorder, overall health status, and functional impairment. Mental health disorders were evaluated using a modified version of the World Health Organization's (WHO) Composite International Diagnostic Interview (CIDI), developed for the World Mental Health Survey Initiative (WMH-CIDI; Kessler and Ustün 2004). Respondents' health status was assessed using the presence of any chronic medical condition based on lifetime endorsement of any of the following: arthritis or rheumatism, ulcer in stomach or intestine, cancer, high blood pressure, diabetes or high blood sugar, heart attack, stroke, asthma, tuberculosis, chronic lung disease, and HIV or AIDS. Finally, functional impairment was measured using the component of the WHO Disability Assessment Schedule (WHODAS II; World Health Organization 2001) that assessed the number of days in the previous 30 days where physical/mental health problems restricted the respondents' ability to carry out normal activities.

Community-level variables.—We controlled for county-level sociodemographic characteristics previously associated with mental health service use at the individual level: area poverty status via percent of the county population below the poverty line (2000) and

area employment status via county-level unemployment rate (2002). To correct for small weighted sample sizes in some counties, rates of any past-year mental health disorders at the county-level were approximated using a Bayesian measure shown to reduce the variability of standard measures (Meng et al. 2004). We also controlled for county size using an indicator for counties with a metropolitan area population of 1 million or more individuals.

Our county-level supply variables included: (1) presence of a community mental health center; (2) percentage of individuals receiving insurance via HMO plan (i.e., HMO penetration); (3) density (measured as number per 10,000 residents) of mental health specialists (i.e., psychiatrists, child psychiatrists, psychologists, and social workers); (4) density of mental health specialists less than 35 years old; (5) density of hospitals with community and/or teen outreach services; (6) density of hospitals with a child wellness program; (7) density of hospitals with alcohol/drug abuse inpatient care; (8) density of hospitals with alcohol/drug abuse outpatient care; (9) density of hospitals with an emergency department; and (10) density of hospitals with linguistic/translation services. Definitions for the types of programs provided came from the American Hospital Association's Annual Survey. Community outreach services were defined in the survey as availability of "a program that systematically interacts with the community to identify those in need of services, alerting persons and their families to the availability of services, locating needed services, and enabling persons to enter the service delivery system." Teen outreach services were defined as programs "focusing on the teenager which encourages an improved health status and a healthful lifestyle including physical, emotional, mental, social, spiritual and economic health through education, exercise, nutrition and health promotion." These outreach services were combined into one variable for analysis. Hospitals with child wellness programs included those with programs "that encourage improved health status and a healthful lifestyle of children through health education, exercise, nutrition and health promotion" (American Hospital Association, 2018).

Statistical analysis

We began by examining age- and gender-adjusted racial/ethnic differences in mental health service use and in individual- and county-level variables (Table 1). We tested for significant differences between each racial/ethnic minority group and non-Latino Whites, using chi-square tests for categorical variables and *t*-tests for continuous variables. To account for missing data, we applied multiple imputation using chained equations in Stata version 15.1 (StataCorp 2017).

Next, we estimated multilevel random intercepts logistic regression models to examine the association between county-level supply variables and self-reported past-year mental health service use by race/ethnicity. We used multilevel models to account for the CPES sampling design with respondents (level-1: 3,294 individuals) nested within primary sampling units (level-2: 226 counties). Pooled CPES weights were normalized to the individual- and county-level using U.S. Census county population data from 2000 (Kovačević and Rai 2003) so the final CPES weights reflected the nesting of individuals within counties. We let random intercepts vary by county and held the effects of individual-level covariates fixed. All individual- and county-level covariates were centered at their grand-mean so the

intercept could be interpreted as the log-odds of mental health service use for respondents with the average individual- and county-level characteristics. This type of centering was recommended given our interest in examining the effect of county-level supply variables (Paccagnella 2006).

To assess the extent to which the odds of mental health service use vary across counties, we first estimated null random intercept models without any controls and calculated the intraclass correlation coefficient (ICC), which measures the portion of the total variance that results from between-county differences. An ICC equal or close to zero would suggest that mental health service use did not differ between counties, in which case traditional one-level logistic regression models could be more suitable. However, low ICC values does not always rule out the need for multilevel modelling (Barr et al. 2013). We also calculated Muthén and Satorra's (1995) suggested alternative to the ICC, the Design Effect—a value above two would suggest that within-county nesting should be considered.

Then, we examined whether between-county variation in mental health service use was explained by differences in access to health services by adding county-level supply variables together with individual racial/ethnic group indicators, size of the county, and interaction terms between race/ethnicity and supply variables. In this way we study whether the effect of access on mental health service use differed by race/ethnicity (Tables 2 and 3, Model 1). We estimated separate models for each supply variable to decrease the number of interactions and to prevent over-specification. Using Model 1 as the baseline model, we subsequently estimated models that added only individual-level covariates (Tables 2 and 3, Model 2), then added only county-level covariates (Tables 2 and 3, Model 3), and, lastly, added both individual- and county-level covariates (Tables 2 and 3, Model 4). All models were estimated through second order predictive quasi-likelihood methods in the MLwiN software version 3.00 (Charlton 2017), with all significance tests adjusted for multiple imputation and small sample size. Because our interest was to examine whether racial/ethnic differences in use of mental health care could be explained by differences in supply of services, our analysis in all models focused on the interactions between race/ethnicity and county-level supply variables. We only interpreted models when the omnibus test of interactions between racial/ethnic group and the supply variable was significant at the $p < .05$ level, to take a more conservative approach.

Results

Table 1 presents descriptive statistics of emerging adults by race/ethnicity and identifies whether racial/ethnic minority group members significantly differ from Whites for each variable. Emerging adults from racial/ethnic minority backgrounds were less likely than Whites to have used any formal or specialty mental health treatment in the prior 12 months. Compared to Whites, Latinos had less formal education and lower levels of income and were more likely to be unemployed and uninsured. Asians had more formal education than Whites but were less likely to be employed. Sociodemographic characteristics for Blacks followed similar patterns as those observed for Latinos, but their unemployment rate was particularly high. Racial/ethnic minorities all demonstrated lower prevalence rates of past-year mental health disorders and were also less likely to have ever had chronic physical conditions.

Racial/ethnic minorities were more likely to live in urban counties with a population of 1 million or more, counties with higher unemployment rates, and counties with higher rates of poverty. Asians and Blacks were more likely to live in counties with a community mental health center and with a higher density of mental health specialists (including providers under 35 years old). Latinos were more likely to live in counties with a lower density of hospitals with a child wellness program and both Asians and Latinos were more likely to live in counties with a lower density of hospitals with an emergency department.

Tables 2 and 3 present the results of our multilevel logistic regression models for past-year use of any mental health treatment and past-year use of specialist mental health treatment, respectively. We include only the coefficients for the interactions between race/ethnicity and county-level supply variables. A significant positive interaction would indicate that an increase in supply resulted in a stronger benefit for a racial/ethnic group compared to Whites. The ICC from the null model level-2 variance showed that about 8% of the odds of past-year use of *any* mental health service and about 7% of the odds of past-year use of *specialty* mental health treatment was explained by between-county differences. Although the ICC was low, the Design Effect in both cases was above two (average group size was 14.6 respondents per county), suggesting our multilevel logistic regression model approach was appropriate.

When examining *any* past-year mental health treatment (Table 2), we found two significant omnibus tests across all models and supply variables. In Model 3, which controlled only for county-level covariates, the county-level presence of a community mental health center was especially beneficial for Black residents, while higher density of hospitals with alcohol/drug abuse outpatient care was especially beneficial for Latino residents. However, neither result remained significant in Model 4, which additionally controlled for individual-level covariates. For past-year use of *specialty* mental health treatment (Table 3), omnibus tests were significant across all models for two supply variables: (1) density of hospitals with a child wellness program and (2) density of hospitals with linguistic/translation services. Each of these characteristics was independently linked to past-year specialty mental health service use overall (i.e., for all racial/ethnic groups). Further, Black individuals particularly benefited from increased county-level density of hospitals with a child wellness program and Latino individuals especially benefited from increased density of hospitals with linguistic/translation services.

Table 4 presents all the coefficients included in Model 4 of Table 3 to show which individual- and county-level covariates significantly influenced use of specialty mental health care. Here, we only present results from the analyses described above that produced significant Model 4 omnibus tests—specifically, analyses linking both density of hospitals with a child wellness program and density of hospitals with linguistic/translation services to past-year specialty mental health treatment. Significant disparities in specialty mental health care were observed for Black respondents compared to Whites. Additionally, there were several characteristics of emerging adults that seemed to increase the odds of specialty mental health service use in the previous year: being female (compared to male), unemployment (compared to not working because of disability or other reasons), having public insurance (compared to uninsured), having a past-year mental health disorder, having

at least one chronic condition, and being functionally impaired (measured by days out of role). In contrast, respondents who were male, were older, had less than 13 years of education (compared to college graduates), had private insurance (compared to uninsured), and lived in counties with a higher percentage of people in poverty were less likely to seek care from a mental health specialist in the previous year.

Discussion

Using national survey data from the CPES, this study sought to explore the ways in which individual- and community-level factors influence mental health service use among emerging adults in the United States. Additionally, it aimed to identify any specific community-level supply variables that could help reduce racial/ethnic disparities in mental health service use within this population. Results provide further evidence of racial/ethnic treatment disparities among emerging adults and suggest that both individual- and community-level factors play an important role in individuals' likelihood of obtaining mental health treatment. Two county-level supply variables demonstrated significant relationships with past-year use of specialty mental health treatment: density of hospitals with linguistic/translation services and density of hospitals with a child wellness program. Further, significant interactions suggested that, compared to Whites, Latino emerging adults benefited more from having more county-area hospitals with linguistic/translation services and Black emerging adults benefited more from having more county-area hospitals with child wellness programs.

Community-level supply factors

Given their significance in this study, county-level density of hospitals with linguistic/translation services and county-level density of hospitals with child wellness programs appear to serve as community-level enabling factors for specialty mental health service utilization among emerging adults (Andersen 1995). Our sample included many foreign-born respondents who often require or prefer linguistic/translation services to engage with their providers. Hospitals with linguistic/translation services may also demonstrate other characteristics associated with increased outreach and access, such as affiliation with a larger network of hospitals and involvement with community-focused activities (Moseley, Shen, and Ginn 2011), or increased receptivity and recognition in the community. This enabling factor also demonstrated a significant interaction with Latino ethnicity, which may reflect the fact that Spanish is the most common language encountered by medical providers (e.g., Hasnain-Wynia et al. 2006) and, therefore, hospitals with linguistic/translation services may be most likely to have resources for Spanish-speaking patients. Such services may be important even for Latino emerging adults with English proficiency, as they may have family members with limited English skills who they wish to involve in their care. Thus, linguistic/translation services may help hospitals improve access to care for Latino emerging adults.

Availability of local child wellness programs, which focus on health promotion, might contribute to increased use of specialty mental health care among emerging adults because providers that develop youth-specific programming may also be more likely to tailor mental

health services for young people—an important facilitator of service use among emerging adults (Gilmer et al. 2012). Further, if emerging adults resided in the same county during childhood, they may have participated in the available child wellness program and remained connected—or reinitiated the connection—to those services for mental health care during emerging adulthood. This potential explanation could be especially relevant for Black emerging adults, as they may be more likely than White emerging adults to reside with or near their families (e.g., Britton 2013; Sharkey 2012). Further, because trust in providers —or lack thereof—has been identified as an important facilitator or barrier to care for Black men and women (e.g., Thompson, Bazile, and Akbar 2004), it may be that hospitals with child wellness programs are better at developing strong, trusting relationships with the families and clients they see, which could later contribute to a successful transition to adult care.

Alternatively, hospitals with population health initiatives (e.g., child wellness programs) and linguistic/translation services may be larger and have more of a well-known presence in an area (Atkins et al. 2020; Moseley, Shen, and Gin 2011), thereby making emerging adult residents more aware of their mental health treatment options. Community-level variables may help us identify areas at risk for unmet mental health need among emerging adults (i.e., counties with a high percentage of individuals living in poverty) and potential strategies for reducing this need (i.e., increasing the number of local hospitals with linguistic/translation and/or child wellness programs).

Of note, we did not identify any significant community-level mental health predictors for Asian individuals in our adjusted models. The overall low rate of service use observed among Asian participants aligns with previous research (Kim et al. 2011; Lee et al. 2011). However, key factors impacting their service use may not have been represented in our study. For example, we found that linguistic/translation services were associated with higher rates of service use among Latino young adults, but not Asian young adults. In the survey used for this study, the Asian sample consisted of respondents of Chinese, Filipino, Vietnamese, and other Asian descent, and surveys were administered in English, Spanish, Chinese, Tagalog, and Vietnamese (Alvarez et al. 2019). Thus, more granular detail on the languages represented in hospital linguistic/translation services would be necessary but not currently available in national county-level health services data. It is possible that linguistic/ translation services are more broadly available for Spanish speakers and Asian languages are not as well represented. Additionally, prior studies of Asian and Asian American individuals have pointed to attitudinal and structural barriers to mental health help-seeking, some of which are culturally relevant (e.g., family stigma and loss of face; Gee et al. 2020), and others which relate to lower likelihood of referral to treatment, whether by formal channels or by family and friends (Chow, Jaffee, & Snowden 2003). These relevant factors were not captured in our examined county-level supply variables, perhaps contributing to our lack of significant community-level findings for Asian emerging adults.

Other relevant factors

The finding that county-level poverty was significantly associated with lower past-year specialty mental health service use aligns with previous national studies linking community

socioeconomic status with specialty behavioral health care (e.g., Gresenz, Stockdale, and Wells 2000; Kim et al. 2018). County-level poverty remained significantly related to mental health service use when mental health service supply variables were included in the model, contrasting with findings obtained in another study with a sample of adolescents (Cummings 2014) and a general adult sample (Cook et al. 2013). In these studies, lower mental health service supply appears to contribute to lower mental health service use in high poverty areas. These differences further support emerging adulthood as a distinct life stage, with unique needs to consider. For example, a focus on achieving autonomy as a young adult may conflict with the higher likelihood that individuals from racial/ethnic minority backgrounds in high poverty areas will experience coercive, rather than voluntary, referral pathways (i.e., via social services or the criminal justice system). Available services in high-poverty areas may also be perceived as lower quality, thus decreasing their assessed usefulness for emerging adults.

Consistent with the Andersen Model for Health Service Utilization (Andersen, 1995), predisposing factors (e.g., age, gender, educational attainment), enabling factors (e.g., employment status, insurance coverage), and need-related factors (e.g., mental and physical health diagnoses, functional impairment) were all identified as related to mental health service use. Similar links between these individual factors and mental health service use have been consistently observed in other studies (e.g., Cooper-Patrick et al. 1999; Lindamer et al. 2012; Vasiliadis et al. 2009) and suggest that research investigating mental health service access should ensure their consideration. For example, we found that individuals with public insurance were more likely to use mental health services than either the uninsured or the privately insured. These results imply the importance of both insurance coverage and affordable care, which may be achieved under public but not private insurance —particularly given that these data were collected prior to national policy efforts to achieve parity between health and mental health insurance coverage. We also found that unemployed individuals were more likely to receive mental health services compared to those in the permanent disability/other category. The percentage of emerging adults in the permanent disability category is small and may be heterogeneous in terms of the reasons for their disability, making it difficult to draw conclusions about this comparison; however, these findings do point to the relevance of further inquiry into how employment status impacts mental health service use at this particular life stage.

We acknowledge study limitations, such as the age of the dataset, as much has changed in the mental health care landscape since 2003, including implementation of the Affordable Care Act. However, the CPES provides the only nationally representative survey data with the necessary level of detail—at the individual and county levels—regarding mental health needs and service use among a racially, ethnically, and linguistically diverse population. Additionally, further consideration of relevant supply variables, such as those related to education (as colleges might offer mental health services to students) could improve the utility of current study results as they relate to emerging adults. Identifying the types of treatment received (e.g., psychotherapy, medication, or both) could also provide further detail to tailor efforts to increase service use among emerging adults. We also recognize that emerging adults, as a group, capture 12-years' worth of life experience and development, with significant within-group differences among individuals in this life phase. Finally, in

comparing racial/ethnic groups defined by the labels White, Black, Latino, and Asian, we do not address heterogeneity within these categories (including cultural and social position variables such language, culture of origin, level of acculturation, and immigrant generation status; varying experiences with racism and discrimination; or the intersection of race and ethnicity such as the experience of Black Latinos), all of which may impact experiences with the mental health system.

In addition to addressing identified limitations, future research might seek to explore the mechanisms underlying observed relationships. For example, further investigation of the two significant supply variables—hospitals with linguistic/translational services and hospitals with child wellness programs—could illuminate why these programs might contribute to increased mental health service use, especially among individuals from racial/ethnic minority backgrounds. Additionally, researchers might pursue the use of qualitative or mixed methods approaches to better understand why and how emerging adults enter mental health treatment and inquire about the role supply variables play in that decision-making process.

Overall, findings suggest that efforts to increase specialty mental health service use among emerging adults should account for their unique needs and consider the facilitating role that local provider options may play. Specifically, developing linguistic/translation services and child wellness programs in community-area care facilities may augment existing service use rates among this age group—especially among Latino and Black individuals. Further evaluation of the ways in which existing linguistic/translation and child wellness programs facilitate specialty mental health service use may inform program improvements to meet the needs of other underserved populations. For example, identifying the pathways by which hospital linguistic/translation services improve service use for Latino emerging adults would be an important step toward extending these benefits to emerging adults from other multilingual backgrounds and to identifying ways to implement program improvements in non-hospital settings. Key to these efforts is acknowledging that, when aiming to reduce racial/ethnic disparities, one size does not fit all. Multiple service pathways and efforts to continuously expand access and improve quality, with attention to varying needs at the individual and community levels, will be critical in addressing the extremely low rates of mental health service use among emerging adults.

Acknowledgements:

Research reported in this publication was supported by the National Institute of Minority Health and Health Disparities (NIMHD) of the National Institutes of Health under Award Number R01MD009719. Dr. Amanda NeMoyer was supported by the National Institute of Mental Health (NIMH) under Award Number T32MH019733. Dr. Kiara Alvarez was supported by the National Institute of Mental Health (NIMH) under Award Number K23MH112841.

NCS data collection was supported by the National Institute of Mental Health (NIMH; R01MH46376). NCS-2 data collection was supported by the National Institute on Drug Abuse (NIDA; R01DA012058). The NCS surveys were carried out in conjunction with the World Health Organization World Mental Health (WMH) Survey Initiative, which was supported by the National Institute of Mental Health (R01MH070884), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the US Public Health Service (R13MH066849, R01MH069864, and R01DA016558), the Fogarty International Center (FIRCA R03TW006481), the Pan American Health Organization, Eli Lilly and Company, Ortho-McNeil Pharmaceutical, Inc., GlaxoSmithKline, and Bristol-Myers Squibb. NLAAS data collection was supported by the National Institute of Mental Health (NIMH; U01MH062209 and U01MH62207) with supplemental support from the Office of Behavioral and Social Sciences Research, Substance Abuse and Mental Health Services Agency, and The Latino Research Program Project P01 MH059876.

NSAL data collection was supported by the National Institute of Mental Health (NIMH; U01-MH57716), with supplemental support from the Office of Behavioral and Social Sciences Research (OBSSR) and the University of Michigan. The views and opinions expressed in this report are those of the authors and should not be construed to represent the views of any of the sponsoring organizations, agencies, or U.S. Government.

References

Adams Sally H, Knopf David K, and Park M Jane. 2014. "Prevalence and Treatment of Mental Health and Substance Use Problems in the Early Emerging Adult Years in the United States: Findings from the 2010 National Survey on Drug Use and Health." Emerging Adulthood 2 (3):163–72. doi: 10.1177/2167696813513563

Alegría Margarita, Chatterji Pinka, Wells Kenneth, Cao Zhun, Chen Chih-nan, Takeuchi David, Jackson James, and Meng Xiao-Li. 2008. "Disparity in Depression Treatment among Racial and Ethnic Minority Populations in the United States." Psychiatric Services 59 (11):1264–72. doi: 10.1176/ps.2008.59.11.1264 [PubMed: 18971402]

Alvarez Kiara, Fillbrunn Mirko, Green Jennifer Greif, Jackson James S., Kessler Ronald C., McLaughlin Katie A., Sadikova Ekaterina, Sampson Nancy A., and Alegría Margarita. 2019. "Race/ethnicity, Nativity, and Lifetime Risk Of Mental Disorders in US Adults." Social Psychiatry and Psychiatric Epidemiology 54, no. 5: 553–565. doi: 10.1007/s00127-018-1644-5 [PubMed: 30547212]

American Hospital Association. 2018. AHA Annual Survey. Retrieved from: https://www.ahadata.com/system/files/media/file/2020/04/AHA_Annual_Survey.pdf

Andersen Ronald M. 1995. "Revisiting the Behavioral Model and Access to Medical Care: Does It Matter?" Journal of Health and Social Behavior:1–10. doi: 10.2307/2137284

Arnett Jeffrey J, Žukauskienė Rita, and Sugimura Kazumi. 2014. "The New Life Stage of Emerging Adulthood at Ages 18–29 Years: Implications for Mental Health." The Lancet Psychiatry 1 (7):569–76. doi: 10.1016/S2215-0366(14)00080-7 [PubMed: 26361316]

Arnett Jeffrey J. 2000. "Emerging Adulthood: A Theory of Development from the Late Teens through the Twenties." American Psychologist 55 (5):469. doi: 10.1037/0003-066X.55.5.469 [PubMed: 10842426]

Atkins Danielle N., Gabriel Meghan Hufstader, Cortelyou-Ward Kendall, and Rotarius Timothy. 2020. "Population Health Initiatives Among Hospitals: Associated Hospital Characteristics." Journal of Healthcare Management 65, no. 3: 187–200. doi://10.1097/JHM-D-19-00025 [PubMed: 32398529]

Barr Dale J, Levy Roger, Scheepers Christoph, and Tily Harry J. 2013. "Random effects Structure for Confirmatory Hypothesis Testing: Keep It Maximal." Journal of Memory and Language 68 (3):255–78. doi: 10.1016/j.jml.2012.11.001

Blanco Carlos, Okuda Mayumi, Wright Crystal, Hasin Deborah S, Grant Bridget F, Liu Shang-Min, and Olfson Mark. 2008. "Mental Health of College Students and Their Non–College-Attending Peers: Results from The National Epidemiologic Study on Alcohol and Related Conditions." Archives of General Psychiatry 65 (12):1429–37. doi: 10.1001/archpsyc.65.12.1429 [PubMed: 19047530]

Britton Marcus L. 2013. "Race/ethnicity, Attitudes, and Living with Parents during Young Adulthood." Journal of Marriage and Family 75 (4):995–1013. doi: 10.1111/jomf.12042

Charlton C, Rasbash J, Browne WJ, Healy M and Cameron B. 2017. "MLwiN Version 3.00." University of Bristol: Centre for Multilevel Modelling.

Chow Julian Chun-Chung, Jaffee Kim, and Snowden Lonnie. 2003. "Racial/ethnic Disparities in the Use of Mental Health Services in Poverty Areas." American Journal of Public Health 93, no. 5: 792–797. doi: 10.2105/AJPH.93.5.792 [PubMed: 12721146]

Cook Benjamin Lê, Doksum Teresa, Chen Chih-Nan, Carle Adam, and Alegría Margarita. 2013. "The Role of Provider Supply and Organization in Reducing Racial/Ethnic Disparities in Mental Health Care in the U.S." Social Science & Medicine (1982) 84:102–9. doi: 10.1016/j.socscimed.2013.02.006. doi: 10.1016/j.socscimed.2013.02.006 [PubMed: 23466259]

Cooper-Patrick L, Gallo JJ, Powe NR, Steinwachs DM, Eaton WW, and Ford DE. 1999. "Mental Health Service Utilization by African Americans and Whites: The Baltimore Epidemiologic Catchment Area Follow-Up." Medical Care 37 (10):1034–45.

doi: 10.1097/00005650-199910000-00007. doi: 10.1097/00005650-199910000-00007 [PubMed: 10524370]

Copeland William E., Shanahan Lilly, Davis Maryann, Burns Barbara J., Angold Adrian, and Costello E. Jane. 2015. “Increase in Untreated Cases of Psychiatric Disorders during the Transition to Adulthood.” Psychiatric Services 66 (4):397–403. doi: 10.1176/appi.ps.201300541. doi: 10.1176/appi.ps.201300541 [PubMed: 25554854]

Cummings Janet R. 2014. “Contextual Socioeconomic Status and Mental Health Counseling Use among US Adolescents with Depression.” Journal of Youth and Adolescence 43 (7):1151–62. doi: 10.1007/s10964-013-0021-7. doi: 10.1007/s10964–013-0021–7 [PubMed: 24114588]

Draucker Claire Burke. 2005. “Processes of mental Health Service Use by Adolescents with Depression.” Journal of Nursing Scholarship 37 (2):155–62. doi: 10.1111/j.1547-5069.2005.00028.x [PubMed: 15960060]

Edbrooke-Childs Julian, and Patalay Praveetha. 2019. “Ethnic Differences in Referral Routes to Youth Mental Health Services.” Journal of the American Academy of Child & Adolescent Psychiatry 58 (3):368–75. e1. doi: 10.1016/j.jaac.2018.07.906 [PubMed: 30768415]

Gee Christina B., Khera Gagan S., Poblete Alyssa T., Kim Barunie, and Buchwach Syeda Y.. 2020l. “Barriers to Mental Health Service Use in Asian American and European American College Students.” Asian American Journal of Psychology 11(2), 98–107. doi: 10.1037/aap0000178

Gilmer Todd P., Ojeda Victoria D., Fawley-King Kya, Larson Barbara, and Garcia Piedad. 2012. “Change in Mental Health Service Use after Offering Youth-Specific versus Adult Programs to Transition-Age Youths.” Psychiatric Services 63 (6):592–6. doi: 10.1176/appi.ps.201100226. doi: 10.1176/appi.ps.201100226 [PubMed: 22422015]

Gresenz Carole Roan, Stockdale Susan E, and Wells Kenneth B. 2000. “Community Effects on Access to Behavioral Health Care.” Health Services Research 35 (1 Pt 2):293–306. [PubMed: 10778816]

Gulliver Amelia, Griffiths Kathleen M, and Christensen Helen. 2010. “Perceived Barriers and Facilitators to Mental Health Help-Seeking in Young People: A Systematic Review.” BMC Psychiatry 10 (1):113. doi: 10.1186/1471-244X-10-113 [PubMed: 21192795]

Hasnain-Wynia Romana, Yonek Julie, Pierce Debra, Kang Ray, and Greising Cynthia Hedges. 2006. “Hospital Language Services for Patients with Limited English Proficiency: Results from a National Survey.” Health Research and Educational Trust. Retrieved from: https://healthlaw.org/wp-content/uploads/2018/09/HRET.Language.Services.pdf

Hunt Justin B, Eisenberg Daniel, Lu Liya, and Gathright Molly. 2015. “Racial/ethnic Disparities in Mental Health Care Utilization among US College Students: Applying the Institution of Medicine Definition of Health Care Disparities.” Academic Psychiatry 39 (5):520–6. doi: 10.1007/s40596-014-0148-1 [PubMed: 25026942]

Kessler Ronald C., and Ustün T. Bedirhan. 2004. “The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI).” International Journal of Methods in Psychiatric Research 13 (2):93–121. doi: 10.1002/mpr.168. [PubMed: 15297906]

Kim Giyeon, Loi Claudia X. Aguado, Chiriboga David A., Jang Yuri, Parmelee Patricia, and Allen Rebecca S.. 2011. “Limited English Proficiency as a Barrier to Mental Health Service Use: A Study of Latino and Asian Immigrants with Psychiatric Disorders.” Journal of Psychiatric Research 45, no. 1: 104–110. doi: 10.1016/j.jpsychires.2010.04.031 [PubMed: 20537658]

Kim Minseop, Garcia Antonio R., Yang Shuyan, and Jung Nahri. 2018. “Area-socioeconomic Disparities in Mental Health Service Use among Children Involved in the Child Welfare System.” Child Abuse & Neglect 82:59–71. doi: 10.1016/j.chiabu.2018.05.018. [PubMed: 29864610]

Kovačević Milorad S, and Rai Shesh N. 2003. “A Pseudo Maximum Likelihood Approach to Multilevel Modelling of Survey Data.” Communications in Statistics-Theory and Methods 32 (1):103–21. doi: 10.1081/STA-120017802

Lee Sunmin, Juon Hee-Soon, Martinez Genevieve, Hsu Chiehwen E., Robinson E. Stephanie, Bawa Julie, and Ma Grace X.. 2009. “Model Minority At Risk: Expressed Needs of Mental Health by Asian American Young Adults.” Journal of Community Health 34 (2):144–52. doi: 10.1007/s10900-008-9137-1. doi: 10.1007/s10900–008-9137–1 [PubMed: 18931893]

Lee Su Yeon, Martins Silvia S., Keyes Katherine M., and Lee Hochang B.. 2011. “Mental Health Service Use by Persons of Asian Ancestry with DSM-IV Mental Disorders in the United States.” Psychiatric Services 62, no. 10: 1180–1186. doi: 10.1176/ps.62.10.pss6210_1180 [PubMed: 21969644]

Lin Luona, Stamm Karen, and Christidis Peggy. 2018. “Demographics of the U.S. Psychology Workforce: Findings from the 2007–16 American Community Survey.” Washington, DC: American Psychological Association. Retrieved from: https://www.apa.org/workforce/publications/16-demographics/report.pdf

Lin Min-Ting, Burgess James F. Jr, and Carey Kathleen. 2012. “The Association between Serious Psychological Distress and Emergency Department Utilization among Young Adults in the USA.” Social Psychiatry and Psychiatric Epidemiology 47 (6):939–47. doi: 10.1007/s00127-011-0401-9. [PubMed: 21643936]

Lindamer Laurie A., Liu Lin, Sommerfeld David H., Folsom David P., Hawthorne William, Garcia Piedad, Aarons Gregory A., and Jeste Dilip V.. 2012. “Predisposing, Enabling, and Need Factors Associated with High Service Use in a Public Mental Health System.” Administration and Policy in Mental Health 39 (3):200–9. doi: 10.1007/s10488-011-0350-3. [PubMed: 21533848]

MacDonald Kathleen, Fainman-Adelman Nina, Anderson Kelly K, and Iyer Srividya N. 2018. “Pathways to Mental Health Services for Young People: A Systematic Review.” Social Psychiatry and Psychiatric Epidemiology 53 (10):1005–38. doi: 10.1007/s00127-018-1578-y [PubMed: 30136192]

Marino Leslie, Wissow Lawrence S., Davis Maryann, Abrams Michael T., Dixon Lisa B., and Slade Eric P.. 2016. “Predictors of Outpatient Mental Health Clinic Follow-Up after Hospitalization among Medicaid-enrolled Young Adults.” Early Intervention in Psychiatry 10 (6):468–75. doi: 10.1111/eip.12206. [PubMed: 25639939]

Marrast Lyndonna, Himmelstein David U., and Woolhandler Steffie. 2016. “Racial and Ethnic Disparities in Mental Health Care for Children and Young Adults: A National Study.” International Journal of Health Services 46 (4):810–24. doi: 10.1177/0020731416662736. [PubMed: 27520100]

Meng Xiao-Li, Alegría Margarita, Chen Chih-Nan, and Liu Jingchen. 2004. “A Nonlinear Hierarchical Model for Estimating Prevalence Rates with Small Samples.” In ASA Proceedings of the Joint Statistical Meetings (pp. 110–120). Alexandria, VA: American Statistical Association.

Mojtabai Ramin, Olfson Mark, and Han Beth. 2016. “National Trends in the Prevalence and Treatment of Depression in Adolescents and Young Adults.” Pediatrics 138 (6):e20161878. doi: 10.1542/peds.2016-1878.

Moseley Charles B., Shen Jay J., and Ginn Gregory O.. 2011. “Characteristics of Acute Care Hospitals with Diversity Plans and Translation Services.” Journal of Healthcare Management 56 (1):45–62. doi: 10.1097/00115514-201101000-00008 [PubMed: 21323027]

Munson Michelle R., Scott Lionel D. Jr, Smalling Susan E., Kim HyunSoo, and Floersch Jerry E.. 2011. “Former System Youth with Mental Health Needs: Routes to Adult Mental Health Care, Insight, Emotions, and Mistrust.” Children and Youth Services Review 33 (11):2261–6. doi: 10.1016/j.childyouth.2011.07.015.

Muthén Bengt O., and Satorra Albert. 1995. “Complex Sample Data in Structural Equation Modeling.” Sociological Methodology 25:267–316. doi: 10.2307/271070.

Narendorf Sarah C, Munson Michelle R, Ben-David Shelly, Cole Andrea R, and Scott Lionel D Jr. 2018. “Race and Gender Differences in Attitudes toward Help Seeking among Marginalized Young Adults with Mood Disorders: A Mixed-Methods Investigation.” Psychiatric Rehabilitation Journal 41 (4):277. doi: 10.1037/prj0000312 [PubMed: 30507242]

Olfson Mark. 2016. “Building The Mental Health Workforce Capacity Needed To Treat Adults With Serious Mental Illnesses.” Health Affairs 35 (6):983–90. doi: 10.1377/hlthaff.2015.1619. [PubMed: 27269013]

Paccagnella Omar. 2006. “Centering or Not Centering in Multilevel Models? The Role of the Group Mean and the Assessment of Group Effects.” Evaluation Review 30:66–85. doi: 10.1177/0193841X05275649. [PubMed: 16394187]

Pottick Kathleen J., Bilder Scott, Vander Stoep Ann, Warner Lynn A., and Alvarez Mike F.. 2008. “US Patterns of Mental Health Service Utilization for Transition-Age Youth and Young

Adults." The Journal of Behavioral Health Services & Research 35 (4):373–89. doi: 10.1007/s11414-007-9080-4. [PubMed: 18026842]

Rickwood Debra, Deane Frank P., Wilson Coralie J., and Ciarrochi Joseph. 2005. "Young people's Help-Seeking for Mental Health Problems." Australian e-Journal for the Advancement of Mental Health 4 (3):218–51. doi: 10.5172/jamh.4.3.218.

Ryan Siobhan M., Jorm Anthony F., Toumbourou John W., and Lubman Dan I.. 2015. "Parent and Family Factors Associated with Service Use by Young People with Mental Health Problems: A Systematic Review." Early Intervention in Psychiatry 9 (6):433–46. doi: 10.1111/eip.12211. [PubMed: 25762206]

Sharkey Patrick. 2012. "Temporary Integration, Resilient Inequality: Race and Neighborhood Change in the Transition to Adulthood." Demography 49 (3):889–912. doi: 10.1007/s13524-012-0105-0. [PubMed: 22570056]

StataCorp, LLC. 2017. "Stata Statistical Software: Release 15." In. College Station, TX

Stockdale Susan E, Tang Lingqi, Zhang Lily, Belin Thomas R, and Wells Kenneth B. 2007. "The Effects of Health Sector Market Factors and Vulnerable Group Membership on Access to Alcohol, Drug, and Mental Health Care." Health Services Research 42 (3p1):1020–41. doi: 10.1111/j.1475-6773.2006.00636.x [PubMed: 17489902]

Substance Abuse and Mental Health Services Administration. (2019). Key Substance Use and Mental Health Indicators in the United States: Results from the 2018 National Survey on Drug Use and Health (HHS Publication No. PEP19–5068, NSDUH Series H-54). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

Thompson Vetta L Sanders, Bazile Anita, and Akbar Maysa. 2004. "African Americans' Perceptions of Psychotherapy and Psychotherapists." Professional Psychology: Research and Practice 35 (1):19. doi: 10.1037/0735-7028.35.1.19

Twenge Jean M, Cooper A Bell, Joiner Thomas E, Duffy Mary E, and Binau Sarah G. 2019. "Age, Period, and Cohort Trends in Mood Disorder Indicators and Suicide-Related Outcomes in a Nationally Representative Dataset, 2005–2017." Journal of Abnormal Psychology. doi: 10.1037/abn0000410

Vasiliadis Helen-Maria, Tempier Raymond, Lesage Alain, and Kates Nick. 2009. "General Practice and Mental Health Care: Determinants of Outpatient Service Use." The Canadian Journal of Psychiatry 54 (7):468–76. doi: 10.1177/070674370905400708 [PubMed: 19660169]

Walker Janet S. 2015. "A Theory of Change for Positive Developmental Approaches to Improving Outcomes among Emerging Adults with Serious Mental Health Conditions." The Journal of Behavioral Health Services & Research 42 (2):131–49. doi: 10.1007/s11414-015-9455-x [PubMed: 25694066]

Williams Sha-Lai L, and Cabrera-Nguyen E Peter. 2016. "Impact of Lifetime Evaluated Need on Mental Health Service Use among African American Emerging Adults." Cultural Diversity and Ethnic Minority Psychology 22 (2):205. doi: 10.1037/cdp0000040 [PubMed: 25844566]

World Health Organization. 2001. World Health Organization Disability Assessment Schedule II (WHODAS II). . Geneva, Switzerland: World Health Organization.

Table 1.

Descriptive Statistics of Individual- and County-Level Variables, by Race/Ethnicity (Weighted Age- and Gender-Adjusted)

	Individuals 18-to-29 years old						
	White	**Latino**		**Asian**		**Black**	
	888	**749**		**497**		**1,160**	
Dependent Service Use Variables							
Any Last Year MH Tx	12.5%	4.0%	***	2.1%	***	5.0%	***
Any Last Year Specialist MH Tx	7.9%	2.6%	***	1.4%	***	3.8%	**
Individual-Level Covariates							
Socio-demographic							
Marital Status							
Married/Cohabitating	31.2%	52.3%	***	30.7%		25.4%	*
Separated/Widowed/Divorced	4.4%	4.0%		1.7%	*	3.7%	
Never Married	64.4%	43.7%	***	67.6%		71.0%	*
Education							
0–11 years	12.2%	39.1%	***	8.5%		20.3%	***
12 years	28.9%	31.5%		20.9%	*	44.8%	***
13–15 years	39.7%	22.5%	***	27.5%	**	26.5%	***
16+ years	19.2%	6.9%	***	43.1%	***	8.4%	***
Family Income < FPL	18.0%	26.6%	*	20.3%		32.2%	***
Work Status							
Employed	75.7%	75.4%		69.0%	*	67.0%	**
Student	12.9%	5.8%	**	17.7%		11.7%	
Homemaker	4.1%	7.1%		2.7%		1.8%	*
Unemployed	5.0%	9.3%	*	9.1%		17.0%	***
Perm Disabled/Other	2.3%	2.4%		1.6%		2.5%	
Insurance Status							
Uninsured	17.5%	43.9%	***	17.0%		25.8%	**
Private Insurance	71.0%	38.2%	***	64.3%		55.6%	***
Public	11.5%	17.8%	*	18.8%	*	18.7%	**
Health Status							
Past 12-month MH Disorder	29.7%	17.5%	***	14.5%	***	20.1%	***
Any Chronic Physical Condition	30.2%	22.9%	*	17.5%	***	30.0%	
WHO-DAS Disability Items							
Days Out of Role	0.22	0.16		0.08	*	0.60	**
County-level Covariates							
County-Level Supply Variables							
County with Community MH Center	41.4%	56.3%		60.8%	*	59.0%	*
Density of Specialty MH Providers Per 10k	19.29	28.53	***	30.07	***	29.30	***

	Individuals 18-to-29 years old					
	White	Latino		Asian		Black	
	888	749		497		1,160	
HMO Penetration %	24.9%	31.7%		41.4%	***	25.8%	
Density of Specialty MH Providers Less than 35 Per 10k	0.10	0.14		0.19	***	0.20	***
Density of Hospitals with Community and/or Teen Outreach Services Per 10k	0.13	0.09		0.08		0.10	
Density of Hospitals with Child Wellness Program Per 10k	0.05	0.02	*	0.02		0.03	
Density of Hospitals with Alc/Drug Abuse Inpatient Care Per 10k	0.01	0.02		0.01		0.02	
Density of Hospitals with Alc/Drug Abuse Outpatient Care Per 10k	0.03	0.03		0.02		0.03	
Density of Hospitals with Emergency Department Per 10k	0.16	0.09	**	0.08	***	0.12	
Density of Hospitals with Ling/Translation Services Per 10k	0.07	0.05		0.04		0.05	
County-Level Socio-Demographic Characteristics							
Urban County with >1 million persons	39.4%	61.3%	*	79.6%	***	66.3%	***
Percent Persons with Family Income <FPL	10.76	15.60	**	11.39		13.98	***
Unemployment Rate, 16+	5.25	7.91	**	6.46	**	6.33	*
County-Level Mental Health Prevalence							
Mental Health Disorder rate	18.73	17.59	**	16.53	***	17.25	***

Note: Asterisks indicate significant differences from White respondents;

*
p<.05

**
p<.01

***
p<.001

Abbreviations: MH = mental health; Tx = treatment; FPL = federal poverty level; WHO-DAS = World Health Organization Disability Assessment Schedule; HMO = health maintenance organization; 10k = 10,000 people

Table 2.

Multi-Level Logistic Regression Models of Mental Health Care Reporting Coefficients of County-Level Supply Variables and their interactions with Race/Ethnicity

	Model 1		Model 2		Model 3		Model 4	
Past 12-month Any Formal Mental Health Treatment								
Null Model between variance	0.28							
County with Community Mental Health Center	−0.65	*	−0.27		−0.92	**	−0.29	
interaction with Latino Ethnicity	1.10		0.42		1.23		0.36	
interaction with Asian Race	1.85		1.06		2.00		0.88	
interaction with Black Race	3.05	*	2.48		3.25	*	2.08	
Between county Variance	0.31		0.89		0.22		0.26	
p-value of F-test (White=Latino=Asian=Black)	0.0718		0.5038		0.0436		0.6152	
Density of Specialty Mental Health Provider Per 10k	−0.01		−0.02	+	−0.02	+	−0.02	
interaction with Latino Ethnicity	0.01		0.00		0.01		−0.01	
interaction with Asian Race	0.03		0.01		0.02		−0.01	
interaction with Black Race	0.06	*	0.06		0.07	*	0.05	
Between county Variance	0.34		0.95		0.26		0.25	
p-value of F-test (White=Latino=Asian=Black)	0.1310		0.4342		0.1158		0.4950	
HMO Penetration %	−1.29		−2.49	*	−1.85	*	−3.27	*
interaction with Latino Ethnicity	0.89		0.36		0.69		−0.48	
interaction with Asian Race	8.73		5.23		8.67		5.89	
interaction with Black Race	7.64	**	8.49	*	7.76	**	7.42	+
Between county Variance	0.28		0.77		0.19		0.07	
p-value of F-test (White=Latino=Asian=Black)	0.0739		0.2327		0.0672		0.2859	
Density of Specialty MH Providers Less than 35 Per 10k	−1.75		−1.50		−1.96		−1.21	
interaction with Latino Ethnicity	2.18		1.19		2.36		1.09	
interaction with Asian Race	2.54		1.82		2.70		1.57	
interaction with Black Race	2.86		2.52		3.10		2.26	
Between county Variance	0.36		0.94		0.29		0.27	
p-value of F-test (White=Latino=Asian=Black)	0.6640		0.9015		0.6114		0.9065	
Density of Hospitals with Community and/or Teen Outreach Services Per 10k	−0.64		−1.31	*	−0.58		−0.22	
interaction with Latino Ethnicity	0.03		1.95		0.86		3.43	
interaction with Asian Race	−26.72		−21.17		−27.74		−23.12	
interaction with Black Race	3.84		4.74		3.94		3.32	
Between county Variance	0.34		0.86		0.28		0.25	
p-value of F-test (White=Latino=Asian=Black)	0.5085		0.5829		0.4799		0.6981	
Density of Hospitals with Child Wellness Program Per 10k	−1.70	***	−0.38		−1.73	***	0.89	
interaction with Latino Ethnicity	−5.94		−9.19		−6.21		−10.45	

	Model 1		Model 2		Model 3		Model 4	
Past 12-month Any Formal Mental Health Treatment								
interaction with Asian Race	−12.06		−4.64		−11.42		−7.08	
interaction with Black Race	5.52	+	5.20		5.22		3.95	
Between county Variance	0.21		0.87		0.16		0.28	
p-value of F-test (White=Latino=Asian=Black)	0.3671		0.6670		0.4078		0.7348	
Density of Hospitals with Alc/Drug Abuse Inpatient Care Per 10k	−7.02	*	−9.14	+	−7.52	*	−5.88	
interaction with Latino Ethnicity	10.46	*	13.48	*	11.22	*	12.39	*
interaction with Asian Race	30.18		36.76		31.72		32.88	
interaction with Black Race	22.67		23.07		24.39		20.00	
Between county Variance	0.36		0.92		0.27		0.26	
p-value of F-test (White=Latino=Asian=Black)	0.0957		0.1491		0.0678		0.1645	
Density of Hospitals with Alc/Drug Abuse Outpatient Care Per 10k	−3.00	**	−2.54		−3.46	**	−0.84	
interaction with Latino Ethnicity	7.04	*	8.27	*	7.98	**	8.23	+
interaction with Asian Race	1.17		6.84		2.78		7.35	
interaction with Black Race	11.06		9.60		11.79		5.67	
Between county Variance	0.32		0.91		0.22		0.28	
p-value of F-test (White=Latino=Asian=Black)	0.0704		0.1771		0.0334		0.2151	
Density of Hospitals with Emergency Department Per 10k	−1.75	***	−2.49	***	−1.77	***	−1.84	*
interaction with Latino Ethnicity	0.63		3.84		0.68		4.57	
interaction with Asian Race	−33.04		−18.28		−33.26		−18.46	
interaction with Black Race	0.89		2.45		0.90		2.07	
Between county Variance	0.06		0.07		0.08		0.07	
p-value of F-test (White=Latino=Asian=Black)	0.9310		0.5618		0.9290		0.6082	
Density of Hospitals with Ling/Translation Services Per 10k	−2.16	***	−1.21		−2.15	***	0.40	
interaction with Latino Ethnicity	4.05		5.72		4.51		5.62	
interaction with Asian Race	−6.29		5.15		−6.48		3.60	
interaction with Black Race	10.08		6.07		10.06		1.04	
Between county Variance	0.16		0.81		0.11		0.29	
p-value of F-test (White=Latino=Asian=Black)	0.3344		0.5011		0.2917		0.5634	

+ p<0.1

* p<.05

** p<.01

*** p<.001

Model 1 includes size of the county, and race/ethnicity and county-level supply variable main effects

Model 2 includes covariates from Model 1 plus individual-level covariates

Model 3 includes covariates from Model 1 plus county-level covariates

Model 4 includes covariates from Model 1 plus county- and individual-level covariates.

Race/ethnicity indicator variables, individual-level covariates and county-level covariates are centered around their sample mean.

Table 3.

Multi-Level Logistic Regression Models of Mental Health Care Reporting Coefficients of County-Level Supply Variables and their interactions with Race/Ethnicity

	Model 1		Model 2		Model 3		Model 4	
Past 12-month Any Formal Mental Health Treatment								
Null Model between variance	0.26							
County with Community Mental Health Center	−0.69	+	0.34		−0.87	*	0.39	
interaction with Latino Ethnicity	1.09		−0.56		1.16		−0.77	
interaction with Asian Race	1.65		0.36		1.74		−0.12	
interaction with Black Race	3.07	*	1.63		3.29	*	1.13	
Between county Variance	0.36		0.26		0.36		0.18	
p-value of F-test (White=Latino=Asian=Black)	0.1649		0.7679		0.1217		0.8341	
Density of Specialty Mental Health Provider Per 10k	−0.01		0.00		−0.01		0.00	
interaction with Latino Ethnicity	−0.01		−0.05		−0.01		−0.07	+
interaction with Asian Race	0.02		−0.01		0.02		−0.03	
interaction with Black Race	0.05	+	0.03		0.05	+	0.02	
Between county Variance	0.40		0.32		0.39		0.21	
p-value of F-test (White=Latino=Asian=Black)	0.3643		0.4144		0.2956		0.2706	
HMO Penetration %	−0.62		−0.95		−0.86		−1.73	
interaction with Latino Ethnicity	−0.85		−3.63		−1.07		−5.15	+
interaction with Asian Race	6.89		2.02		6.83		1.01	
interaction with Black Race	6.18	+	4.10		6.39	+	2.94	
Between county Variance	0.35		0.24		0.34		0.15	
p-value of F-test (White=Latino=Asian=Black)	0.2732		0.4255		0.2324		0.3213	
Density of Specialty MH Providers Less than 35 Per 10k	−1.50		0.39		−1.69		0.47	
interaction with Latino Ethnicity	0.88		−4.19		0.97		−5.91	
interaction with Asian Race	2.20		−0.69		2.33		−0.95	
interaction with Black Race	2.75		0.99		2.98		0.93	
Between county Variance	0.41		0.29		0.41		0.19	
p-value of F-test (White=Latino=Asian=Black)	0.7630		0.8947		0.7241		0.8516	
Density of Hospitals with Community and/or Teen Outreach Services Per 10k	−0.07		−0.48		−0.05		1.23	
interaction with Latino Ethnicity	1.39		6.90		2.11		8.34	+
interaction with Asian Race	−21.01		−16.96		−21.47		−18.61	
interaction with Black Race	3.64		3.71		3.74		1.69	
Between county Variance	0.41		0.35		0.40		0.15	
p-value of F-test (White=Latino=Asian=Black)	0.6175		0.3907		0.5741		0.3681	
Density of Hospitals with Child Wellness Program Per 10k	−6.76	***	−7.39	***	−6.90	***	−7.09	***
interaction with Latino Ethnicity	−1.91		−2.51		−1.92		−9.12	

	Model 1		Model 2		Model 3		Model 4	
Past 12-month Any Formal Mental Health Treatment								
interaction with Asian Race	−4.63		13.57		−4.07		11.98	
interaction with Black Race	11.45	***	13.15	**	11.40	**	13.07	**
Between county Variance	0.00		0.00		0.00		0.00	
p-value of F-test (White=Latino=Asian=Black)	0.0118		0.0145		0.0128		0.0258	
Density of Hospitals with Alc/Drug Abuse Inpatient Care Per 10k	−8.86	+	−13.54	*	−9.89	+	−11.07	
interaction with Latino Ethnicity	13.82	*	21.16	**	14.82	*	20.76	**
interaction with Asian Race	34.28		23.63		35.32		19.12	
interaction with Black Race	18.32		14.57		20.79		11.42	
Between county Variance	0.44		0.33		0.40		0.19	
p-value of F-test (White=Latino=Asian=Black)	0.1673		0.0272		0.1386		0.0533	
Density of Hospitals with Alc/Drug Abuse Outpatient Care Per 10k	−1.90		1.10		−2.13	+	2.75	
interaction with Latino Ethnicity	7.60	*	7.33	+	8.15	*	8.43	+
interaction with Asian Race	4.11		5.21		4.38		6.32	
interaction with Black Race	9.57		2.03		10.04		−3.03	
Between county Variance	0.43		0.34		0.41		0.23	
p-value of F-test (White=Latino=Asian=Black)	0.1179		0.3992		0.0853		0.3194	
Density of Hospitals with Emergency Department Per 10k	−1.33	***	−2.81	***	−1.33	**	−2.16	+
interaction with Latino Ethnicity	2.44		10.29	*	2.44		11.29	*
interaction with Asian Race	−31.86		−9.79		−31.87		−11.02	
interaction with Black Race	0.72		3.44		0.72		2.99	
Between county Variance	0.29		0.04		0.29		0.05	
p-value of F-test (White=Latino=Asian=Black)	0.9015		0.0963		0.9017		0.1239	
Density of Hospitals with Ling/Translation Services Per 10k	−5.78	***	−5.76	***	−5.85	***	−5.06	***
interaction with Latino Ethnicity	8.71	*	12.28	**	9.17	**	13.69	**
interaction with Asian Race	−2.89		17.93		−2.87		17.84	
interaction with Black Race	13.54		8.85		13.75	+	5.37	
Between county Variance	0.00		0.00		0.00		0.02	
p-value of F-test (White=Latino=Asian=Black)	0.0325		0.0198		0.0244		0.0187	

+ p<0.1

* p<.05

** p<.01

*** p<.001

Model 1 includes size of the county, and race/ethnicity and county-level supply variable main effects

Model 2 includes covariates from Model 1 plus individual-level covariates

Model 3 includes covariates from Model 1 plus county-level covariates

Model 4 includes covariates from Model 1 plus county- and individual-level covariates.

Race/ethnicity indicator variables, individual-level covariates and county-level covariates are centered around their sample mean

Table 4.

Multi-level Logistic Regression of Past 12-month Specialists Mental Health Treatment Regressed Upon County-Level Supply Variables, Interactions between MH Provider Supply and Race/Ethnicity, Individual- and County-Level Characteristics

Dependent Variable: Past 12-month Specialty Mental Health Treatment	**Coeff.**	**SE**	**p(t>|T|)**		**Coeff.**	**SE**	**p(t>|T|)**	
Race/Ethnicity								
Latinos	0.03	0.70	0.97		−1.44	0.92	0.12	
Asians	−1.62	2.72	0.55		−2.24	3.21	0.49	
Blacks	−2.55	0.94	0.01	**	−2.31	0.98	0.02	*
County-Level Supply Variables								
Density of Hospitals with Child Wellness Program Per 10k	−7.09	1.70	0.00	***				
interaction with Latino Ethnicity	−9.12	30.49	0.77					
interaction with Asian Race	11.98	82.94	0.89					
interaction with Black Race	13.07	4.45	0.00	**				
Density of Hospitals with Ling/Translation Services Per 10k					−5.06	1.49	0.00	***
interaction with Latino Ethnicity					13.69	4.38	0.00	**
interaction with Asian Race					17.84	52.67	0.73	
interaction with Black Race					5.37	11.79	0.65	
Individual-Level Covariates								
Socio-demographic								
Age	−0.10	0.04	0.02	*	−0.11	0.04	0.01	**
Female (referent: Male)	0.74	0.24	0.00	**	0.83	0.25	0.00	***
Marital Status (referent: Wid/Sep/Div)								
Married/Cohabitating	0.39	0.43	0.37		0.40	0.44	0.37	
Never Married	−0.65	0.47	0.17		−0.74	0.48	0.13	
Education Level (referent: College Graduate+)								
0–11 years	−1.47	0.54	0.01	**	−1.56	0.55	0.00	**
High School Graduate	−1.73	0.39	0.00	***	−1.74	0.39	0.00	***
13–15 years	0.06	0.32	0.84		0.06	0.33	0.87	
Family Income < FPL	0.76	0.46	0.10		0.83	0.44	0.06	+
Employment Status (referent: Perm Disabled/Other)								
Employed	0.89	0.55	0.11		1.12	0.55	0.04	*
Student	1.31	0.67	0.05	+	1.59	0.68	0.02	*
Homemaker	0.83	0.83	0.32		0.79	0.83	0.34	
Unemployed	1.95	0.72	0.01	**	2.03	0.71	0.00	**
Insurance Status (referent: Uninsured)								
Private	−1.71	0.32	0.00	***	−1.64	0.32	0.00	***
Public	0.90	0.29	0.00	**	1.02	0.29	0.00	***
Health Status								
Past 12-month MH Disorder (referent: None)	2.73	0.24	0.00	***	2.80	0.24	0.00	***
Chronic Conditions (referent: None)								

Dependent Variable: Past 12-month Specialty Mental Health Treatment	**Coeff.**	**SE**	**p(t>|T|)**		**Coeff.**	**SE**	**p(t>|T|)**	
Any	1.30	0.23	0.00	***	1.31	0.24	0.00	***
WHO-DAS Disability Items								
Days Out of Role	0.17	0.04	0.00	***	0.16	0.05	0.00	***
County-level Covariates								
County Sociodemographics								
Urbanicity/Size of County (referent: <1 million)								
1 million+	0.13	0.51	0.80		0.31	0.51	0.55	
Percent Persons with Family Income <FPL	−0.08	0.04	0.04	*	−0.07	0.04	0.06	+
Unemployment Rate, 16+	0.04	0.06	0.46		0.07	0.06	0.21	
Bayesian Mental Health Disorder Rate	0.08	0.07	0.22		0.07	0.08	0.36	
Constant	−3.40	2.45	0.16		−3.52	2.63	0.18	

+ p<0.1

* p<.05

** p<.01

*** p<.001

Abbreviations: Coeff = coefficient; SE = standard error; MH = mental health; Tx = treatment; FPL = federal poverty level; WHO-DAS = World Health Organization Disability Assessment Schedule; HMO = health maintenance organization; 10k = 10,000 people