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Assessing the Individual, Neighborhood, and Policy Predictors of Disparities in Mental Health Care

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Abstract

This study assesses individual- and area-level predictors of racial/ethnic disparities in mental health care episodes for adults with psychiatric illness. Multilevel regression models are estimated using data from the Medical Expenditure Panel Surveys linked to area-level datasets.

Compared to whites, Blacks and Latinos lived in neighborhoods with higher minority density, lower average education, and greater specialist mental health provider density, all of which predicted less mental health care initiation. Neighborhood-level variables did not have differential effects on mental health care by race/ethnicity.

Racial/ethnic disparities arise because minorities are more likely to live in neighborhoods where treatment initiation is low, rather than a differential influence of neighborhood disadvantage on treatment initiation for minorities compared to whites. Low rates of initiation in neighborhoods with a high density of specialists suggest that interventions to increase mental health care specialists, without a focus on treating racial/ethnic minorities, may not reduce access disparities.

Keywords

Disparities; mental health care; multilevel modeling

INTRODUCTION

While overall prevalence rates of mental illness are similar across racial/ethnic groups (Breslau et al. 2006), the burden of mental illness is greater for minority populations. Latinos and Blacks with mood disorders and Blacks with anxiety disorders are more likely to be persistently ill than whites with these psychiatric disorders (Breslau et al. 2005). In addition, major depressive disorder (MDD) is more likely to become chronic among Blacks and Latinos than among whites (Breslau et al. 2005; Williams et al. 2007), and MDD leads to a higher degree of functional limitation among Blacks than among whites (Williams et al. 2007). In the presence of these disparities in the burden of mental illness, mental health care disparities have persisted, with a widening of Latino-white disparities (Blanco et al. 2007) from 1993 through 2002; and persistent Black-white disparities between 2000 and 2004 (Cook, McGuire, and Miranda 2007). Towards these ends, there have been numerous calls to reduce service gaps (USDHHS 2000).

Improving access to mental health treatment has the potential to reduce disparities in persistence and severity because evidence-based care works as well for minorities as whites (Miranda et al. 2005; Schraufnagel et al. 2006). Despite this potential, we know little about

area-level influences on disparities in mental health treatment, while efforts to engage patients at the individual level are often costly and difficult to reproduce at the population level (Alegria 2009). To this end, this study extends prior work in understanding episodes of mental health care by incorporating individual-, census block group-, county-, and state-level factors to clarify the influence of pathways at multiple levels underlying racial/ethnic disparities in episodes of mental health care. Because the magnitude of disparities in initiation of mental health care are extremely large, we further decompose the relative contribution of each of these factors by racial/ethnic group, thus guiding policy-makers toward areas for which policy changes may have greater relative impact.

Conceptual Models

Individual-level behavioral approaches to understanding who seeks mental health treatment, and why, overlook contextual factors beyond the control of the individual (Pescosolido et al. 1998) and make the assumption that decisions to seek treatment are rationally undertaken based on need for care and availability of services. Our work is guided by two conceptual models incorporating multi-level factors which influence mental health care. First, the Social Ecological Model (Stokols 1996) recognizes that health *behaviors* change because of not only individual-level factors, but also those at the social and physical environment and the policy level. Second, the Network Episode Model (NEM) (Pescosolido 2006) recognizes that understanding mental health care access requires not only understanding behavior change, but also the inter-relationships among the social context, individual episode factors, the illness history of the individual, social supports/networks, and the health care delivery system that lead people to formal treatment.

Recent studies have found *contextual* variables such as provider supply and provider characteristics to be important predictors of mental health care access (Cook et al. 2013) and *compositional* variables such as neighborhood segregation to have important influence on the type of mental health care provider seen during treatment (Dinwiddie et al. 2013). However, more information about the joint influence of compositional and contextual characteristics of neighborhoods is needed to better understand how health care policies, the social environment, and community networks influence disparities in initiation and retention in care. Factors at the individual, neighborhood/county, and state level can all influence disparities via multiple and interacting pathways. We thus explore how the distributions and effects of predictors vary by race/ethnicity, after adjustment for variables at multiple levels: 1) the individual level (predisposing characteristics such as patient perception/stigma of mental health care, enabling characteristics such as health insurance and language proficiency, and need characteristics such as depressive symptoms and psychological distress) (Andersen and Aday 1978; Andersen 1995); 2) neighborhood level (e.g., Census block group differences in insurance status, poverty, and population distribution of racial/ethnic minorities); 3) county level provider supply; and 4) state level (e.g. differences in state mental health care policies and Medicaid eligibility).

Individual-Level Factors—Racial/ethnic minorities are likely to be disadvantaged compared to whites on many characteristics known to influence mental health care. For example, Blacks and Latinos are more likely to be uninsured, a strong negative predictor of

receiving mental health care (Cook et al. 2007; McGuire et al. 2006; Zuvekas and Taliaferro 2003). Multiple barriers contribute to this disparity in coverage, including the greater likelihood that racial/ethnic minorities will be uninsured (Alegria et al. 2012), have jobs that are less likely to offer coverage, and ineligible for public insurance coverage due to citizenship or legal residence requirements (Schur and Feldman 2001). Limited English language proficiency (LEP) among certain Latino subgroups also may lead to mental health care disparities given that LEP individuals are less likely to report having a usual source of care (Ponce, Hays, and Cunningham 2006) and report lower scores for timeliness of care, provider communication, and staff helpfulness than their English-speaker counterparts (Weech-Maldonado et al. 2003). Prior studies have also identified the significant associations of socioeconomic status, age, gender, and urban residence on mental health care access (Alegria et al. 2002; Cook et al. 2007; Cook et al. 2014; Kirby, Taliaferro, and Zuvekas 2006).

Neighborhood- and County-Level Factors—A significant association exists between mental health care and neighborhood characteristics (Diez Roux and Mair 2010; Truong and Ma 2006), with significant variation across regions of the United States (U.S.) in the assessment and treatment of mental health conditions (Edlund, Belin, and Tang 2006). Evidence is mixed as to whether these neighborhood characteristics influence racial/ethnic disparities in health care. Geographic differences in quality of care explain most of the difference between racial and ethnic groups for a number of medical (non-mental health) procedures among Medicare beneficiaries (Baicker et al. 2004). However, for mental health care access, mental health care provider density, the existence of a community mental health center, and HMO penetration at the county-level explain some, but not all, of the racial/ethnic disparity (Cook et al. 2013). Area differences in disparities may also be attributed to differential area levels of poverty and segregation. Living in segregated communities with greater levels of poverty and lower levels of political empowerment may contribute to feelings of powerlessness, hopelessness and alienation from societal institutions, thereby impeding health care seeking and other healthy behaviors (Braithwaite and Lythcott 1989; LaVeist 1992). Living in neighborhoods with greater residential segregation, defined as the separation of minorities and whites in their place of residence, school, work, or places of worship (LaVeist, Rolley, and Diala 2003), has been shown to account for a large percentage of the Black-white differences in access to medical services (Kirby et al. 2006). These neighborhood-based disparities in health care resources may be especially predictive of racial and ethnic disparities in unmet need for services given that minorities living in segregated and impoverished neighborhoods are more likely to experience social disorder (Cohen, Farley, and Mason 2003), psychological distress (Galea and Vlahov 2005), and to be diagnosed with depression (Weich et al. 2002). We extend prior studies to focus on correlates of mental health care within more finely defined areas, assessing the role of neighborhood characteristics at the Census block group level and healthcare resources at the county level.

State-level Factors—State Medicaid policies may influence access to mental health services both in determining income standards for Medicaid eligibility as well as determining the scope and types of mental health services covered in Medicaid programs.

State regulation of private insurance markets may also influence access to mental health services, for example, via state mental health parity mandates.

We continue a line of health services research centered on identifying place-based health care variations (Fisher, Goodman, and Chandra 2008), identifying how racial/ethnic minorities differ from whites on individual-, neighborhood-, and state-level predictors of mental health care, and how the effects of these predictors differ by race/ethnicity, and whether these differences persist after adjustment for multi-level factors. In doing so, we provide an assessment of the significant predictors of racial/ethnic disparities in mental health care initiation derived from all levels of the social ecological model (Stokols 1996), providing information relevant to policymakers and administrators. We separately identify how the composition of a neighborhood contributes to mental health care disparities (via socio-demographic makeup, exposure to community level supply factors, and state policies), and how these factors influence care differentially for racial/ethnic minority groups (i.e., the moderating effect (interaction) of race/ethnicity and area-level variables).

METHODS

Data Source and Study Sample

We used responses from panels 9–13 (corresponding to years 2004–2009) of the Medical Expenditure Panel Survey (MEPS). The MEPS data provide an in-depth, comprehensive look at health care use and expenditures for a nationally representative sample of the community population during a two-year time period, including detail on individuals' psychotherapy, outpatient, inpatient, ER, office-based visits, and prescription drug use. In the MEPS Household Component, respondents were interviewed about all household members' socio-demographic information, clinical characteristics, and health care use and expenditures. Information regarding health care use and expenditures was verified directly from individual user's medical care providers and pharmacy records in the Medical Provider Component. Through a data use agreement with the U.S. Census Research Data Center, Census block group, county and state identifiers were linked to MEPS participants. Analyses were conducted at the Boston Census Data Center and at the Agency for Healthcare Research and Quality.

Our sample includes non-Latino white, non-Latino African-American or Black, and Hispanic or Latino adults 18 years and older with probable psychiatric disorder ($n=13,211$ episodes of mental health care representing 10,399 individual respondents). Racial/ethnic categories (referred to as white, Black, and Latino from here forward) are based on U.S. Census definitions; because of sample sizes, we were unable to include Native Americans or Asian/Pacific Islanders. We restricted the sample to adults who had probable depressive disorder using the PHQ-2 depression symptom checklist (score ≥ 2) or had severe psychological distress on the K6 scale (score ≥ 13) (Kessler et al. 2003). Limiting the sample to those with clinical need for mental health care is done in an attempt to exclude individuals who may be overusing, or receiving inappropriate care. PHQ-2 scores ≥ 2 have strong sensitivity (86%) and specificity (78%) to a diagnosis of major depressive disorder (Arroll et al. 2010). The K6 scale was designed to maximize the ability to discriminate cases of serious mental illness (SMI) from non-cases, while being amenable to quick and easy administration

in national population surveys such as the MEPS. The K6 is predictive of SMI defined as any individual with a DSM-IV diagnosis and severe impairment by the Alcohol, Drug Use, and Mental Health Administration (ADAMHA) Reorganization Act (Kessler et al. 2003). Both of the PHQ-2 and K-6 scales have been validated in Spanish-speaking populations (Reuland et al. 2009; Stolk, Kaplan, and Szwarc 2014; Valencia-Garcia 2012). The populations captured via PHQ-2 and K-6 did not differ significantly by race/ethnicity.

Outcomes of Interest: Initiation and length of mental health care episodes

Dependent variables are the probability of initiation of care (among 13,211 mental health care episodes of respondents with probable psychiatric disorder) and number of days in a mental health care episode (among 4,474 mental health care episodes of respondents who had probable psychiatric disorder and initiated mental health treatment). A mental health care event was defined similar to a prior study (Cook et al. 2014): (1) PCP or mental health specialist visits (psychiatrist, psychologist, counselor, or social worker) with ICD-9 codes 291, 292, or 295–314 (Zuvekas 2001); (2) prescription drug fills associated with any of these ICD-9 codes; or (3) drug fills from the psychotropic drug class as defined by the Multum Lexicon Drug Database (Multum Information Services 2009). New episodes of mental health care were defined as any mental health treatment that was separated by 12 weeks or more from a previous mental health care event (Cook et al. 2014; Keeler, Manning, and Wells 1988; Tansella et al. 1995). Assessing mental health care by *episodes of care* is one way to more accurately capture the complex treatment patterns seen with mental illness (Cook et al. 2014; Jimenez et al. 2013; Saloner, Carson, and Cook 2014). Episodes allow for more targeted analysis of underlying care-seeking behaviors that drive disparities in mental health care than cross-sectional averages. Further, episodes allow us to more effectively capture treatment behaviors such as the decision to initiate care (as opposed to a count of mental health care visits over a calendar year) that are directly amenable to policy change.

Predictor variables: individual-level factors

Individual-level covariates are education, income, marital status, region of the country, residence in a metropolitan statistical area (MSA), citizenship status, insurance coverage type (private insurance, Medicaid, Medicare and other public insurance), and participation in an HMO. Variables indicating individual-level need are self-reported mental and physical health, the mental and physical health components of the SF-12, as well as gender and age. Physical health variables, which are also indicators of need given the high rates of comorbidity between physical ailments and mental disorders (Afari et al. 2001; Alexopoulos et al. 1997; Clarke and Meiris 2007; de Groot et al. 2001), are any limitation due to physical health, body mass index (BMI), and the presence of zero, one, or two plus chronic physical health illnesses out of a list of eleven priority physical health conditions queried of all respondents in the MEPS.

Predictor variables: neighborhood, county, and state level factors

Two main sources of area-level data were merged with the MEPS: 2005–09 U.S. American Community Survey (ACS - Census block group-level) (Matheson et al. 2006; Silver, Mulvey, and Swanson 2002), and the 2007 Area Health Resource File (AHRF – county-level). Census block groups are used as proxy representations of neighborhoods and are

typically the best approximation of neighborhoods within epidemiological research (Silver et al. 2002). ACS census block group variables considered as part of the model specification were: median household income and percentage of residents who are living below the poverty level, college graduates, Black, Latino, unemployed, on public assistance, living in female-headed households, foreign-born, and recent immigrants. These factors were chosen because neighborhood structural characteristics of disadvantage and affluence, racial/ethnic composition, residential mobility/instability, among other neighborhood-level factors, are likely to influence health and mental health outcomes (Diez-Roux 1998; Robert 1999; Williams and Collins 2001). We also considered the following list of county-level factors: number of active medical doctors (primary care or any other specialty) per 10,000 county residents, number of active mental health specialists per 10,000 county residents, number of community mental health centers, and percentage of Medicaid- and privately-insured populations enrolled in managed care, and the existence of an academic training center in the county, based on prior studies demonstrating their significant association with mental health care access (Cook et al. 2013). Because of the high collinearity among neighborhood variables and county-level supply variables, we reduced the list of variables by retaining variables that were conceptually distinct from other area-level variables or were consistently significantly associated with episode initiation and episode length in stepwise regression models (reverse and forward). The final specification includes at the block group-level the percentage of residents that are college graduates, Black, Latino, foreign-born, and unemployed; and at the county-level, the density of general health care providers and mental health specialists, and the existence of an academic training center in the county. By including testing for interactions between area-level characteristics and individual level race/ethnicity, we assess whether area characteristics affect individuals differently based on race/ethnicity; for example, whether living in a community with fewer health care providers reduces initiation more for Black than white community members. State level variables considered in the models were indicators of specific state-level Medicaid policies (i.e., eligibility thresholds, co-pay amounts, medication coverage). Because none of the state-level indicators were statistically significant, we opted instead for a state-fixed effects approach, including an indicator for each identifiable state.

Accounting for Missing data

The final sample included 13,211 episodes among 10,399 individuals with probable psychiatric disorder. On average, each respondent had 1.30 episodes of mental health care (1.35 episodes per person for whites, 1.17 episodes per person for Blacks, and 1.15 episodes per person for Latinos). Less than one percent of this sample had missing data on self-reported mental health, the physical and mental health components of the SF-12, and education. These missing data were imputed using the *mi* procedure in Stata (StataCorp 2014). We created five complete datasets, imputed missing values using a chained equations approach, analyzed each dataset, and used standard rules to combine the estimates and adjust standard errors for the uncertainty due to imputation (Little and Rubin 2002; Rubin 1998).

Statistical Analyses

First, we compared whites, Blacks, and Latinos on socio-demographic characteristics and then examined the characteristics of the census Block groups (neighborhoods), counties, and

states where they live. Second, we estimated multi-level regression models of initiation and duration (days) of mental health care episodes for those with probable psychiatric disorder (determined by having a PHQ-2 ≥ 2 representing significant depressive symptoms or K-6 ≥ 13 representing severe psychological distress). For each response, we estimated linear multi-level random effects models following the basic structure:

$$E(Y_{ijk}) = \beta_0 + \beta_R R_i + \beta_{HS} HS_i + \beta_{SES} SES_i + \beta_{state} State_i + cbg_{jk} + e_{ijk}$$

$$cbg_{jk} \sim N(\beta_{cbg} cbg_j + C_k, \sigma_{cbg}^2) \quad (1)$$

$$C_k \sim N(\beta_C C_k, \sigma_C^2)$$

where Y_{ijk} is a measure of mental health care use of individuals i within census block group j and county k (the full model is actually a four level model that includes nesting of mental health care episodes within individuals within Census Block Groups within Counties but we present a three level model here to simplify the presentation), R_i the race/ethnicity of the i^{th} individual, HS_i the vector of individual health status characteristics, SES_i the vector of individual socioeconomic status variables, $State_i$ a vector of dummy variables indicating the respondent's state of residence, cbg_j the vector of Census-block-group-level characteristics, and C_k a vector of county-level characteristics. Assessment of variance components at each level (i.e., σ_{cbg}^2 and σ_C^2) in models without covariates allows for an initial assessment of the partitioning of variance by individual-, Census block group-, county-, and state levels. We estimated linear multilevel models using the *xtmixed* command in Stata 14. Linear models were used in estimation for ease of interpretation and because non-linear models did not converge when incorporating all levels. Significance and direction of covariates were nearly identical in three-level nonlinear models estimated using *xtlogit* for initiation and *xtpoisson* for episode length, and so are not presented here.

The model coefficients test the significance of the association between initiation and individual, Census Block Group, county, and state characteristics. The hierarchical nature of the models measures variability across the multi-level structure, and accounts for the non-independence of individuals living in the same area (Raudenbush and Bryk 2002).

To assess underlying area-level mechanisms of disparities, we first identified whether significant predictors differ in distribution by race/ethnicity (suggesting that disparities arise because minorities live in areas with greater disadvantage) and next examined whether there are significant interactions between significant predictors and race/ethnicity (suggesting that the disadvantage is greater for minorities). We re-estimated the model in equation (1) removing individual-level race/ethnicity and SES variables to address the issue that including individual-level covariates correlated with significant neighborhood-level variables may cause the significance of neighborhood-level coefficients to be underestimated

(Bingenheimer and Raudenbush 2004). All standard errors account for MEPS sampling design characteristics using the balanced repeated replication method (AHRQ 2012).

We also used the Blinder-Oaxaca decomposition method (Blinder 1973; Oaxaca 1973) using the *oaxaca* command in Stata (StataCorp 2014) to quantify to what extent the individual-, neighborhood, county-level characteristics and states are associated with the racial and ethnic disparities in initiation of mental health care and what parts of the difference are unexplained in the model. A linear regression model of initiation of mental health care (described above) is estimated separately for each racial/ethnic group and used to generate predicted probabilities of initiation. To assess the contribution of each variable, we calculated the change in the average predicted probability from replacing the minority mean with the white mean of that variable while holding the distributions of the other variables constant. Summing together variables' contribution at each level allows us to calculate how much of the overall difference between groups is explained by each level.

RESULTS

Descriptive Analysis

Blacks and Latinos with probable mental illness were significantly less likely than whites with probable mental illness to initiate care. There were no significant Black-white and Latino-white differences in duration of treatment (Table 1). Compared to whites, Blacks and Latinos were less likely to be married, insured, or live in the West and Midwest, but more likely to be publicly insured, younger, lower income, have lower educational attainment, live in an urban setting (MSA), and report higher (healthier) scores on the mental health component of the SF-12, and greater self-reported mental health. Latinos were more likely than whites to have the MEPS administered in Spanish and to be non-citizens, less likely to have a co-morbid physical health disorder, and less likely to have a limitation of activity. Blacks had lower (less healthy) scores on the physical health component of the SF-12, had higher average BMI and were more likely to live in the South compared to whites.

Compared to whites, Blacks and Latinos lived in Census block groups with higher unemployment rates, fewer college graduates, a greater percentage of non-citizens, and a greater percentage of Black and Latino residents (Table 1). Black residents with probable mental illness lived in counties with a greater density of general MDs, mental health specialists, and training hospitals per 10,000 residents than the counties where whites with probable mental illness lived. Latinos also lived in counties with a greater density of mental health specialists.

Predictors of Initiation of Mental Health Care

The variance components corresponding to the individual, census block group, county, and state were significant, suggesting that there is significant variation in mean initiation at each level (Table 2). The null multi-level model found that 23.7%, 1.9%, 1.4%, and 0.2% of the variance is attributable to the individual, census block group, county, and state level, respectively.

Individual-level factors that predicted greater likelihood of initiating mental health care were: being female, having higher education, living in a MSA, being surveyed in more recent MEPS panels, having physical co-morbidities or limitation of activity, and reporting poorer mental health. Individual-level factors which predicted lower initiation were: being Black or Latino, being publicly insured (vs. privately), being a non-citizen, and scoring higher (healthier) on the physical and mental health components of the SF-12 (Table 2).

At the neighborhood level, living in census block groups with a greater percentage of college graduates, where whites were more likely to reside, was positively associated with mental health treatment initiation. Individuals in counties with greater mental health specialist density, where Blacks and Latinos were more likely to reside, were significantly less likely to initiate treatment. Living in Oklahoma ($p < 0.05$), Florida, Georgia, and Minnesota ($p < .10$) was associated with less initiation of mental health care compared to the 21 smallest states in the U.S.

No significant interactions between race/ethnicity and census block-, county-, or state-level characteristics were observed. In models adjusted for age, insurance, health status, and area-level measures (but not individual-level race/ethnicity or SES), higher percentages of Blacks and Latinos in a neighborhood were negatively associated with initiation of mental health services (results available upon request).

Predictors of Episode Length (Number of Days per Episode)

In multi-level analyses of number of days per episode, the variance components corresponding to the individual, census block group, and state, but not the county, were significant in null models (Table 3). The multi-level model finds that approximately 42%, 9%, 0.3%, and 0.5% of the variance is attributable to the individual, Census block group, county, and state levels, respectively.

Adjusting for individual-, Census block group-, County- and state-level characteristics, Blacks with probable mental illness who initiated care had a shorter length of episode than their white peers (Table 3). The Latino-white disparity was marginally significant. Individual-level factors that predicted greater number of days per treatment episode were public (vs. private) insurance, HMO enrollment, and age 45–54 (compared to 35–44). Meanwhile, factors which predicted fewer days per treatment episode were higher (healthier) scores on the mental health components of the SF-12 and very good (compared to excellent) self-reported mental health status. Individuals living in Texas or Connecticut had shorter episode length compared to individuals living in the 21 smallest states.

No significant interactions between race/ethnicity and census block-, county-, or state-level characteristics were observed. In models adjusted for age, insurance, health status, and area-level measures (but not individual-level race/ethnicity or SES), higher percentages of Blacks in a neighborhood was a significant negative predictor of number of days in an episode of mental health care (results available upon request).

Decomposition of Disparities in Initiation of Mental Health Care

The predicted likelihood of initiation for whites (the reference group), Blacks, and Latinos was 40%, 24%, and 25%, respectively (Table 4). The observed population characteristics explained 31% of the disparity between whites and Blacks, and 67% of the disparity between whites and Latinos.

Individual-level factors accounted for 59% of the observed Black-white difference. Respondents' gender, age, physical health, mental health, income, and citizenship were major factors associated with the observed disparity in initiation among whites vs. Blacks. Area-level characteristics accounted for 36% of the observed Black-white difference. The smaller percentage of Blacks living in neighborhoods with college educated residents was a significant contributor to the disparity in initiation. The fact that Blacks lived in neighborhoods with greater mean mental health specialist density was a marginally significant contributor ($p < .10$) to the Black-white disparity in initiation. State differences accounted for only 6% of the observed difference.

Individual-level factors accounted for 61% of the observed Latino-white difference. Age, mental health status, insurance status, and citizenship were major individual factors associated with the observed differences in initiation among whites vs. Latinos. Area-level characteristics accounted for 49% of the observed Latino-white difference. The smaller percentage of Latinos living in neighborhoods with college educated residents was a significant contributor to the disparity in initiation. The fact that Latinos lived in neighborhoods with greater mean mental health specialist density was a marginally significant ($p < .10$) contributor to the Latino-white disparity in initiation. State differences accounted for -10% of the observed differences in treatment initiation, meaning that Latinos were more likely than whites to live in states with greater mental health care initiation.

DISCUSSION

Similar to a prior study of disparities in mental health treatment episodes among individuals with probable mental illness (Cook et al. 2014), we identified significant Black-white and Latino-white disparities in initiation of mental health care, and additionally found that these disparities persist even after adjustment for individual-, Census block group-, county-, and state-level characteristics. Furthermore, Blacks with probable mental illness had significantly fewer days per mental health episode than did whites, and Latinos had fewer days by a marginally significant margin. Finding no significant interactions between race/ethnicity and area-level factors suggests that Black-white and Latino-white disparities in initiation of mental health treatment emerge because Blacks and Latinos on average are more likely than whites to reside in areas of disadvantage, and not because living in an area of disadvantage is more detrimental to Blacks and Latinos than whites.

Racial/ethnic differences in mental health care were explained by both compositional and contextual place-based differences, suggesting that the incorporation of a social ecological perspective and the Network Episode Model (NEM) enhances our ability to identify critical influences on disparities in the receipt of mental health care and potential policy levers. The compositional finding that neighborhoods with residents with lower education levels have

lower rates of mental health care access reinforces the importance of the association between neighborhood socioeconomic status and racial/ethnic disparities in accessing care. Families with greater education may be better able to link to quality mental health services and have networks with greater access to medical information and resources (Pescosolido 2006). Individuals in these neighborhoods are also more likely to obtain more comprehensive health insurance coverage and the means to purchase quality mental health care (Dinwiddie et al. 2013).

In addition, the contextual effect of availability of mental health treatment is reflected in mental health specialist density which may have important and under-examined impacts on treatment seeking and receipt of care. The low rates of initiation of mental health care for individuals living in areas of high density of mental health specialty care may seem counterintuitive but echoes prior studies demonstrating that specialists choose not to work with disadvantaged urban patients because of the complexity of their physical and mental health problems, low reimbursement for Medicaid-insured populations, or no reimbursement for uninsured individuals (Fiscella et al. 2002; Fiscella and Williams 2004; Komaromy et al. 1996). Specialist providers, particularly those associated with large urban teaching hospitals, may not be accessible to local residents due to closed panels, a disproportionate number of psychiatric specialists situated in inpatient modalities as opposed to outpatient care, greater involvement in research or supervision of trainees that limits clinical hours, or include a high number of trainees who may see fewer patients.

Other studies have identified that respondents in majority Black communities were more likely to be treated by non-psychiatrists and general doctors, and that respondents in majority Latino neighborhoods were more likely to be treated by general doctors when compared to neighborhoods with lower concentration of racial/ethnic minorities (Dinwiddie et al. 2013). Health care providers may also be reluctant to practice in low-income segregated areas (Gaskin et al. 2012). While Latinos may live in close proximity to major teaching and safety net hospitals, these areas are often limited in the number of *available* mental health services for individuals with subsidized insurance such as Medicaid (Alegria et al. 2002). In addition to the issue of apparent versus actual availability of mental health specialists, there tends to be higher stigma among racial/ethnic minority groups towards seeking mental health care (Ferrari et al. 2015; Latalova, Kamaradova, and Prasko 2014). Treatment in primary care settings may not carry the same stigma as psychiatric treatment by specialty mental health care providers, and PCPs may therefore be better positioned to improve initiation for mental health treatment for racial/ethnic minorities.

Similar to a prior study, we identified significant Black-white and borderline significant Latino-white disparities in length of mental health treatment episode (Cook et al. 2014), but we did not identify any significant neighborhood-level correlates of episode length. Other unmeasured area-level factors are likely to explain these disparities in length of mental health care episodes, given that census block group factors are very important, explaining nearly a third of the variation in length of episode (results not shown). Mechanisms such as proximity to treatment, social networks, and familiarity of specialists with neighborhood norms may operate to increase retention in care and should be investigated in future studies.

We identified that racial/ethnic makeup of a Census block group was a significant predictor of mental health care access and episode length, after removing individual-level race/ethnicity and SES variables from model specifications. This discrepancy in results is evidence of the context vs. composition quandary inherent to multilevel modeling (Bingenheimer and Raudenbush 2004), where it is difficult to interpret whether contextual differences are due to differences in the individuals that make up the neighborhood (i.e., there are more Blacks living in a neighborhood, and Blacks are less likely to initiate care) versus differences in attributes specific to the neighborhood (neighborhoods with a high density of Black individuals reflect a history of residential segregation, a factor that limits access to mental health care). For the latter, adjustment of individual-level variables may absorb important variation at the neighborhood level. For example, individual-level self-rated health may be a proxy for the allostatic load individuals incur over time in certain social and community networks, (McEwen 1998; Todorova et al. 2013) and thus absorb much of the neighborhood variation that might be important. Future qualitative studies may disentangle these contextual and compositional influences.

Results from the Oaxaca-Blinder decomposition for initiation of mental health treatment echo an earlier study decomposing racial/ethnic differences in any ambulatory healthcare services (Kirby et al. 2006) that observed variables explain a small percentage (31% in our study) of the difference between initiation for Blacks and whites. Observed variables explained more of the Latino-white difference in initiation (67%) compared to the Black-white explained difference (31%). There is thus a need for improved data at all levels to better understand what deters racial/ethnic minority residents from initiating mental health treatment in their own communities. Prior literature suggests that incorporation of additional variables related to healthcare experiences, medical knowledge, and resources of the social networks of respondents (Pescosolido 2006), levels and types of perceived discrimination (Burgess et al. 2008), and cultural attitudes and beliefs towards mental health care (Kirby et al. 2006) might improve our ability to identify contributors to mental health care access disparities, and then determine how these factors interrelate across different socio-ecological levels.

The Oaxaca-Blinder analysis suggests important differences between Blacks and Latinos with respect to which individual factors significantly contribute to disparities between each minority group and whites in the sample. Citizenship is a stark example in that it accounted for 50% of the observed Latino-white difference, but accounted for only 5% of the observed Black-white difference, suggesting as in previous decomposition studies using MEPS data that immigration status presents a significant barrier to accessing mental health care for Latinos (Chen and Vargas-Bustamante 2011). There was a similar contrast in how insurance status predicts access differences in that it accounted for 11% ($p=.02$) of the Hispanic-white disparity but only 6% (n.s.) of the Black-white disparity, highlighting the importance of reducing the extremely high rates of uninsurance in the Hispanic population (34% in our sample, compared to 23% for Blacks and 16% for whites). Expanding Medicaid eligibility in states that have opted out of ACA Medicaid expansion is a possible policy solution given the large number of uninsured Hispanics living in states that have opted out of expansion (Garfield and Damico 2016). Both Black and Hispanic SF-12 mental health component scores and self-reported mental health status were on average better (healthier) than whites

and were significant contributors to the lower access to mental health care among Blacks and Latinos compared to whites. The large contribution of mental health status to racial/ethnic differences in mental health care access highlights the importance of the analyst's decision to adjust or not to adjust for measures of clinical need in disparities measurement (Cook, McGuire, and Zaslavsky 2012; McGuire et al. 2006), and suggests the need for future studies that assess the impact of access disparities on mental health outcomes.

A limitation of the study is that the PHQ-2 and K-6 scales used to measure probable psychiatric illness, while having reasonable sensitivity and specificity, are not as precise as diagnostically related instruments. Nor was it possible to disentangle initiation of care for those with varying diagnoses. In the MEPS, only those that initiate care receive an ICD-9 diagnosis codes. Second, we do not have detailed information on a number of factors related to mental health specialist service provision (e.g., whether or not they accept new patients/Medicaid patients, whether they work in highly specialized or more integrated primary care/specialty settings, whether they are trainees or involved in training) to help us understand how specialist mental health care provider density relates to initiation of mental health care access. The use of density of specialty mental health providers as a measure of quality needs to be improved before it will be helpful in identifying policy levers for reducing disparities.

Despite these limitations, we provide further evidence that racial/ethnic disparities in initiation and duration of mental health care persist. Our results suggest underlying mechanisms of disparities related to both compositional and place-based effects. At the neighborhood level, the average education of the neighborhood residents and the density of specialist mental health care providers are associated with disparities in initiation of mental health care. The presence of specialists already practicing in areas of substantial Black and Latino need suggests that greater access to existing resources could reduce disparities. Potential policies to increase access include greater Medicaid reimbursements and incentivizing better integration of primary and specialist mental health care through the Accountable Care Organizations, bundled payments, and other integrated care payment mechanisms.

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Descriptive Statistics of Individual-Level Variables, County-Level, and Census Block Group Characteristics by Race/Ethnicity (n=13,211 mental health treatment episodes/10,399 individuals)

Table 1

Sample Size	White (Ref)			Blacks	Latinos
	7559	2374	3278		
<i>Dependent Variables</i>					
Any Initiation of MH Treatment	40.30%	23.9%	**	24.6%	**
Number of days during Episode of MH Care	13.8	15.3		14.2	
<i>Individual-Level Covariates</i>					
<i>Socio-demographic</i>					
Married	51.9%	26.8%	**	46.5%	**
Female	60.2%	64.0%	**	61.0%	**
Non-English Language of Interview	0.3%	0.2%		40.1%	**
<i>Insurance Status</i>					
Private Insurance	59.6%	35.5%	**	31.5%	**
Uninsured	15.5%	22.8%	**	33.9%	**
Public	24.9%	41.7%	**	34.6%	**
HMO Enrollment (y/n)	26.6%	35.2%	**	34.6%	**
<i>Age</i>					
18–24	8.2%	13.0%	**	12.3%	**
25–34	13.8%	17.2%	**	20.5%	**
35–44	18.6%	21.6%		20.4%	
45–54	22.1%	22.0%		21.8%	
55–64	18.3%	14.7%	**	13.7%	**
65–74	9.6%	6.4%	**	6.7%	**
75 and older	9.4%	5.1%	**	4.6%	**
<i>Income (% FPL)</i>					
<FPL	14.4%	34.9%	**	27.7%	**
Near Poverty (100–124% FPL)	5.0%	7.9%		8.3%	
Low Income 125–199%	15.0%	20.0%	**	21.0%	**
Medium Income (200–399%)	31.7%	24.6%	**	29.0%	**

	White (Ref)	Blacks	Latinos
Sample Size	7559	2374	3278
High Income (400% + FPL)	33.9%	12.6%	14.0%
<i>Education</i>			
Less than High School	17.5%	31.0%	47.6%
High School or equivalent	36.2%	36.8%	26.7%
Any College	25.2%	22.4%	16.2%
College Graduate or greater	21.1%	9.8%	9.5%
Percent non-citizen	1.2%	2.7%	35.5%
<i>Region</i>			
Northeast	17.4%	15.6%	17.6%
Midwest	24.8%	18.7%	7.2%
South	36.5%	57.3%	35.3%
West	21.3%	8.4%	40.0%
Metropolitan Statistical Area (y/n)	78.1%	86.1%	93.9%
Health Status			
Physical Health Component of SF-12	44.2	42.7	45
<i>Number of Comorbidities</i>			
No Physical Health Comorbidity	62.70%	63.40%	71.70%
One Physical Comorbidity	15.60%	13.90%	12.80%
Multiple Physical Comorbidities	21.70%	22.70%	15.40%
BMI (continuous)	28.7	30.1	28.9
Any Limitation of Activity	25.30%	28.80%	17.80%
Mental Health Status			
Mental Health Component of SF-12	37.7	39	38.7
<i>Self-Reported Mental Health</i>			
Excellent	12.00%	18.60%	18.60%
Very Good	23.20%	22.50%	24.20%
Good	37.10%	30.10%	35.00%
Fair/ Poor	27.70%	28.00%	22.10%
County-Level Supply Covariates			
MD Density (per 10,000)	10.5	11.5	10.7

	White (Ref)	Blacks	Latinos
Sample Size	7559	2374	3278
Specialist Density (per 10,000)	21	25.4 **	25.6 **
Academic training hospital in county	0.006	0.01 **	0.007
<i>Census Block Group-Level Covariates</i>			
Socio-demographic			
Percent College Graduates	27.0%	22.5% **	21.4% **
Percent Black	6.9%	50.6% **	10.4% **
Percent Latino	8.7%	12.0% **	47.1% **
Percent non-citizens	3.8%	4.3% **	9.0% **
Percent Unemployed	4.4%	6.8% **	5.6% **

** Significantly different from the white racial group at the p<.05 level

Table 2

Random Intercepts Multi-level Linear Regression Models of Any Mental Health Treatment Episode Initiation (n=13,211)

	coeff	p	std err
Individual-Level (Ref= Non-Latino White)			
Black	-0.123	**	0.018
Hispanic/Latino	-0.059	**	0.016
Socio-demographic			
Married	0.001		0.010
Female	0.066	**	0.010
Non-English Language of Interview	0.007		0.018
Insurance Status (Ref = Private)			
Uninsured	0.004		0.012
Public	-0.062	**	0.012
HMO Enrollment	0.006		0.011
Age (Ref= 35-44)			
18-24	-0.029		0.018
25-34	-0.015		0.015
45-54	-0.005		0.014
55-64	0.020		0.017
65-74	-0.003		0.020
75 and older	-0.026		0.023
Income (Ref = Income <100% FPL)			
Near Poverty (100-124% FPL)	-0.006		0.017
Low Income (125-200)	-0.007		0.014
Medium Income (200-400%)	0.002		0.014
High Income (400% +)	0.022		0.016
Education (Ref <High School)			
High School or equivalent	0.030	**	0.013
Any College	0.061	**	0.015
College Graduate or greater	0.017		0.018
Non-citizen	-0.056	**	0.016
Metropolitan Statistical Area (y/n)	0.036	**	0.015
MEPS Panel	0.011	**	0.004
Health Status			
Physical Health Component of SF-12	-0.001	**	0.0005
Number of Comorbidities (Ref = 0)			
One Physical Comorbidity	0.021		0.016
Multiple Physical Comorbidities	0.039	**	0.015
BMI	0.001		0.001
Any Limitation of Activity	0.023	*	0.014
Mental Health (MH) Status			

	coeff	p	std err
MH Component of SF-12	-0.005	**	0.0005
<i>Self-Reported MH (Ref = Excellent)</i>			
Very Good	0.071	**	0.014
Good	0.095	**	0.014
Fair/ Poor	0.155	**	0.016
Block Group Socio-demographic			
Percent College Graduates	0.113	**	0.046
Percent Black	0.011		0.029
Percent Latino	-0.042		0.032
Percent non-citizens	0.041		0.073
Percent Unemployed	-0.051		0.182
<i>County-Level Supply Covariates</i>			
MD Density (per 10,000)	0.002		0.001
MH Specialist Density (per 10,000)	-0.001	**	0.000
Academic training hospital in county	0.184		0.300
<i>State (Ref = 21 smallest states)</i>			
Alabama	-0.012		0.029
Arizona	-0.032		0.035
California	-0.015		0.023
Colorado	-0.058		0.048
Connecticut	0.039		0.040
Florida	-0.045	*	0.024
Georgia	-0.057	*	0.034
Illinois	-0.042		0.031
Indiana	-0.023		0.037
Kentucky	-0.010		0.036
Louisiana	0.016		0.038
Maryland	-0.012		0.039
Massachusetts	-0.058		0.039
Michigan	-0.007		0.028
Minnesota	-0.061	*	0.036
Missouri	-0.030		0.043
New Jersey	-0.031		0.032
New York	-0.042		0.029
North Carolina	-0.043		0.031
Ohio	-0.020		0.034
Oklahoma	-0.095	**	0.041
Oregon	-0.003		0.035
Pennsylvania	-0.004		0.034
South Carolina	-0.069		0.050
Tennessee	-0.047		0.031
Texas	-0.002		0.022

	coeff	p	std err
Virginia	-0.034		0.040
Washington	-0.001		0.039
Wisconsin	-0.064		0.043
Constant	0.273	**	0.061
<hr/>			
null model			<u>% of total variance</u>
sd (state)	0.020	**	0.2%
sd(county)	0.054	**	1.4%
sd(block)	0.064	**	1.9%
sd(person)	0.228	**	23.7%
sd(residual)	0.399	**	72.9%

No significant interactions between race/ethnicity and census block-, county-, or state-level characteristics were observed (results were not presented for brevity, but are available upon request).

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p<.05,

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p<.10

Table 3

Random Intercepts Multi-level Linear Regression Model of Number of Days of Treatment during Episode among Those Receiving Any Mental Health Treatment (N=4474)

	coeff	p	std err
Individual-Level (Ref = Non-Latino White)			
Black	-33.338	**	9.920
Hispanic/Latino	-17.554	*	9.618
Socio-demographic			
Married	-4.812		6.049
Female	-3.049		5.781
Non-English Language of Interview	-18.887		13.066
Insurance Status (Ref = Private)			
Uninsured	-8.714		8.295
Public	16.903	**	7.353
HMO Enrollment	14.763	**	6.657
Age (Ref = 35-44)			
18-24	-17.053		12.291
25-34	-4.451		8.664
45-54	20.076	**	8.876
55-64	3.872		9.342
65-74	-5.620		11.497
75 and older	-16.374		12.841
Income (Ref = Income <100% FPL)			
Near Poverty (100-124% FPL)	4.725		10.664
Low Income (125-199%)	12.830		8.988
Medium Income (200-400%)	7.716		8.453
High Income (400% +)	-6.614		10.064
Education(Ref <High School)			
High School or equivalent	0.872		7.398
Any College	-6.344		8.213
College Graduate or greater	11.244		10.339
Non-citizen	-10.747		11.435
Metropolitan Statistical Area (y/n)	-6.355		8.258
MEPS Panel	-2.986		2.278
Health Status			
Physical Health Component of SF-12	-0.214		0.271
Number of Comorbidities(Ref = 0)			
One Physical Comorbidity	-9.034		7.905
Multiple Physical Comorbidities	0.823		8.017
BMI	-0.216		0.348
Any Limitation of Activity	10.545		6.803
Mental Health (MH)Status			

	coeff	p	std err
MH Component of the SF-12	-0.771	**	0.299
<i>Self-Reported MH (Ref = Excellent)</i>			
Very Good	-20.794	*	11.168
Good	-9.926		10.758
Fair/ Poor	8.681		10.881
Block Group Level Socio-demographic			
Percent College Graduates	21.380		32.432
Percent Black	8.051		16.920
Percent Latino	22.720		22.618
Percent non-citizens	-13.757		48.014
Percent Unemployed	-1.445		119.906
County-Level Supply			
MD Density (per 10,000)	-0.296		0.692
MH Specialist Density (per 10,000)	0.229		0.250
Academic training hospitals in county	56.742		183.706
State (Ref = 21 smallest states)			
Alabama	-0.112		18.108
Arizona	-32.018		20.981
California	-22.430		13.655
Colorado	-16.167		25.888
Connecticut	-36.635	**	17.926
Florida	-0.540		16.709
Georgia	9.364		21.644
Illinois	10.941		19.398
Indiana	10.097		22.101
Kentucky	2.466		21.619
Louisiana	-8.187		18.376
Maryland	-26.433		20.157
Massachusetts	-10.103		26.386
Michigan	-16.580		15.113
Minnesota	28.107		21.500
Missouri	-17.460		15.949
New Jersey	-10.202		19.384
New York	6.749		14.922
North Carolina	4.433		18.585
Ohio	9.631		20.171
Oklahoma	-8.097		30.997
Oregon	-12.966		15.566
Pennsylvania	9.928		16.514
South Carolina	4.570		21.972
Tennessee	-13.620		21.837
Texas	-32.098	**	11.175

	coeff	p	std err
Virginia	4.865		18.603
Washington	-6.909		18.315
Wisconsin	17.646		20.061
Constant	198.817	**	40.443
<hr/>			
null model	sd		<u>% of total variance</u>
sd (state)	10.184	**	0.5%
sd(county)	8.368		0.3%
sd(block)	43.471	**	8.9%
sd(person)	94.458	**	42.0%
sd(residual)	101.351	**	48.3%

No significant interactions between race/ethnicity and census block-, county-, or state-level characteristics were observed (not shown).

**
p<.05,

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p<.10

Table 4
Oaxaca Blinder Decomposition of Initiation of Mental Health Treatment (n=13,211)

	Blacks		Latinos	
	% of observed differences	p	% of observed differences	p
Predicted % initiation	24%		25%	
Total Difference	-16%		-15%	
Total of difference explained by model covariates	31%		67%	
<i>Individual-Level Characteristics</i>				
59%				
Married	5%	0.488	1%	0.497
Female	-6%	**	-1%	0.571
Age	9%	*	5%	**
Physical Health	-9%	**	4%	*
MCS	11%	**	4%	**
Self-reported Mental Health	17%	**	12%	**
Income	19%	*	8%	*
Education	6%	0.336	11%	*
Insurance	6%	0.487	11%	**
Citizenship	5%	**	50%	**
Non-English Interview	0%	0.565	-39%	0.397
MSA	-5%	0.127	-5%	*
Year	1%	0.692	0%	0.807
36%				
<i>Community Characteristics</i>				
Percent College Graduates	20%	**	9%	**
Percent Black	-21%	0.657	-1%	0.663
Percent Latino	2%	0.713	9%	0.712
Percent non-citizens	8%	0.179	22%	0.179
Percent Unemployed	24%	0.122	6%	0.121
MD Density (per 10,000)	-1%	0.653	0%	0.686
MH Specialist Density (per 10,000)	9%	*	5%	*
Academic training hospital in county	-4%	0.201	-1%	0.268
6%				
<i>State Indicators</i>				
-10%				

Reference group (Whites): the predicted initiation of Whites=40%

Note: Among individual factors, positive/negative coefficients indicated the share of explanatory variables positively/negatively associated with the disparities in initiation.

** p<.05,

* p<.10

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