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## Disparity in Depression Treatment among Racial and Ethnic Minority Populations in the United States

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### Abstract

**Objective:** Prior work on racial/ethnic disparities in depression treatment has been limited by the scarcity of national samples that include an array of diagnostic and quality indicators and substantial non-English speaking minorities. Using nationally representative data (n=8762), we evaluate differences in access to and quality of depression treatments between ethnic/racial minority patients and non-Latino whites.

**Method:** Access to mental health care was assessed by whether or not any mental health treatment was received in the past year. Quality treatment for acute depression was defined as four or more specialty/general health provider visits in the past year plus antidepressant use for 30 days or more; or eight or more specialty mental health provider visits of at least 30 minutes in length, with no antidepressant use.

**Results:** For those with last year depressive disorder, 63.7% of Latinos, 68.7% of Asians and 58.8% of African Americans, vs. 40.2% of non-Latino whites, did not access any last year mental health treatment (significantly different at  $p < 0.001$ ). We also found that the disparities in the likelihood of both having access and receiving quality care for depression are significantly different for all minority groups as contrasted to non-Latino whites, except Latinos (marginally significant).

**Conclusion:** Simply relying on present healthcare systems without considering the unique barriers to quality care that apply for ethnic and racial minorities is unlikely to affect the pattern of disparities observed. Populations reluctant to come to the clinic for depression care may have correctly anticipated the limited quality available in usual care.

### INTRODUCTION

A first step in developing priorities to respond to the Public Health Service (PHS)-led “Healthy People 2010” initiative for minority populations is to ascertain the magnitude of disparities in service use for depression at a national level. Despite recent advances in the treatment of mental illness and considerable efforts to improve quality and access (1), there appears to be a significant mismatch between need and treatment in the U.S (2). There is controversy about disparities in quality of care (3) at a national level, showing overall few ethnic and racial disparities for some chronic conditions. Yet there is evidence of striking quality disparities across some groups for psychiatric conditions (4-6). Part of the discrepancy regarding the magnitude of the gap comes from differences in ethnic/racial groups included, whether studies are regional or national, and whether the assessment of need for depression care use diagnostic versus screeners for depression or only symptom measures.

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**Conflicts of Interest:** There are no conflicts of interest to disclose.

Prior work on racial/ethnic disparities in depression treatment has been limited by the scarcity of national samples that include a rich array of diagnostic and quality indicators, and large numbers of non-English speaking minority respondents. This paper takes advantage of a unique opportunity to estimate disparities in access to and quality of depression care using pooled data from the National Institute of Mental Health (NIMH) Collaborative Psychiatric Epidemiological Studies (CPES; 7). These data include the same measures of need and quality, significant numbers of non-English speaking racial and ethnic minorities, and are the most current and comprehensive available to study depression treatment for racial/ethnic minorities. Following a system cost-effectiveness framework (8,9), we evaluate if individuals who could benefit from depression treatment are not treated or inadequately treated. According to this framework, not treating people who would benefit from treatment is a missed opportunity to improve health; and treating people who do not need care increases spending without commensurate health effects.

## DATA AND METHODS

### The CPES Combined Sample

The University of Michigan Survey Research Center (SRC) collected data for the National Latino and Asian American Study (NLAAS; 10), the National Comorbidity Survey Replication (NCS-R; 11) and the National Survey of African American Life (NSAL; 12) known as CPES studies using an adaptation of a multiple-frame approach to estimation and inference for population characteristics (13,14). This allows integration of design-based analysis weights to combine datasets as though they were a single, nationally-representative study (7). Design and methodological information can be found at the CPES website (7).

The CPES studies all focused on collection of epidemiological information on mental disorders and service usage, among the general population with special emphasis on minority groups (15). Interviews for the studies were conducted by professional interviewers from the SRC, with 92.5% of interview in English and 7.5% in other languages (Spanish, Mandarin, Cantonese, Tagalog, and Vietnamese). As described in detail elsewhere (16), the NLAAS is a nationally-representative survey of household residents [18 and older] in the non-institutionalized Latino and Asian populations of the coterminous United States. The final sample included 2,554 Latinos and 2,095 Asian Americans. The weighted response rates were: 73.2% for the total sample; 75.5% for the Latinos; and 65.6% for the Asians (17).

The NCS-R is a nationally representative sample with a response rate of 70.9%. Eligible respondents were English-speaking, non-institutionalized adults ages 18 or older living in civilian housing in the coterminous United States. The NCS-R was administered in two parts: [1] Part I was administered to all English-speaking respondents and included core diagnostic assessments; [2] a subset of Part I respondents also completed Part II of the survey which included additional batteries of questions addressing service use, consequences, other correlates of psychiatric illness and additional disorders, with measures identical to those in the NLAAS.

The NSAL is also a nationally-representative survey of household residents in the non-institutionalized Black population that included 3,570 African Americans and 1,621 Black respondents of Caribbean descent. The NSAL had a response rate of 70.9% for the African American sample and 77.7% for the Black Caribbean sample (18). Interviews were conducted in English. In the present study, we use a pooled NLAAS/NCS-R /NSAL sample (n=8762) which includes Asians and Latinos from the NLAAS, non-Latino whites from the NCS-R Part II, and African-Americans from the NSAL. Race/ethnicity categories were based on respondents' self-reports to questions based on U.S. Census categories. The Institutional Review Board Committees of all participating institutions approved all study procedures.

## Diagnostic Assessment

In the NLAAS, NSAL and NCS-R, the presence of lifetime, 12-month psychiatric disorders and subthreshold depressive disorder or minor depressive disorder was evaluated via the World Health Organization Composite International Diagnostic Interview (WMH-CIDI) (19). Diagnoses are based on DSM-IV diagnostic systems. Findings of the instrument show good concordance between DSM-IV diagnoses based on the WMH-CIDI and the SCID (20). Using the WMH-CIDI (19), we classify the pooled NLAAS/NCS-R Part II/NSAL sample into five groups: [1] currently depressed respondents, who meet criteria for last year diagnosis of major depression or dysthymia (n = 1,082); [2] current sub-threshold respondents, but who do not meet criteria for last year diagnosis of major depression or dysthymia (n = 158); [3] lifetime depressed respondents, who meet criteria for lifetime major depression or dysthymia, but who do *not* meet criteria for last year depression or dysthymia (n = 1,230); [4] respondents meeting last year criteria for disorders other than depression (n = 919); and [5] the no-need group, which consists of respondents who did not meet last year criteria for any of psychiatric or substance abuse disorder assessed (n = 7,680). Our main analysis sample for estimating disparities in access includes only 8,762 respondents who belong to the first and fifth groups – currently depressed respondents (n = 1,082) and the no-need group (n = 7,680). In models of disparities in the quality of depression treatment, our analysis sample is further limited to 880 respondents who used services in the past year. We also conduct sensitivity analyses for access to and quality of depression care in which our analysis samples include the additional 158 sub-threshold cases, treating them as depressed respondents.

## Role Impairment and Chronic Medical Conditions

Functional impairment was measured by the World Health Organization Psychiatric Disability Assessment Schedule (WHO-DAS) (21). For the domains of cognition, mobility, self-care, and social functioning, respondents were asked a question ascertaining the number of days in the past 30 when health- or mental health-related problems restricted their ability to carry out tasks related to each domain. We measured the number of chronic medical conditions based on respondents' lifetime endorsement of any of the following: arthritis or rheumatism; an ulcer in the stomach or intestine; cancer; high blood pressure; diabetes or high blood sugar; heart attack; stroke; asthma; tuberculosis; any other chronic lung disease; HIV infection or AIDS.

## Access to and Quality of Depression Treatment

All CPES respondents were asked the same battery of questions about past-year mental health services treatment and use of prescription medication (name of medication, length of usage in past year, how many days medication was used in past month) for problems related to their emotions, nerves, substance use, energy, concentration, sleep, or ability to cope with stress. To define access to mental health care, we assessed whether the respondent received any mental health treatment, defined as at least one visit to a specialty mental health or general medical provider for mental health care in the past year. Although there is no data currently available on the validity or reliability of these measures, they were adapted from measures used in the National Comorbidity Survey (22,23) and were included as core measures of all of the CPES instruments. To characterize quality of depression treatment, we conceptually draw on the Institute of Medicine (24) definition of quality of care: “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”(25). Assessment of quality of depression care was derived based on respondents' report of past-year service use (26). Quality of treatment for acute depression was defined following Wang et al. (2000) as a binary variable which is one if: (a) four or more specialty or general health provider visits in the past year plus antidepressant use for 30 days or more; or (b) eight or more specialty mental health provider visits of at least 30 minutes in length, with no antidepressant use. This measure of quality has

also been used extensively in other studies of health disparities (27-29). In sensitivity analyses, we acknowledge that some respondents in different stages of the course of their illness may be appropriately receiving maintenance care and consider an alternative, broader quality indicator of four or more mental health visits in the past year with any type of formal provider.

### Statistical Analyses

We present sample descriptive statistics (in Table 1) and summarize the types of treatments received by those with and without last year depressive disorder (Table 2). We then estimate a two-stage regression model (Table 3): [1] correlates of “access to any mental health treatment in past year,” and [2] correlates of “quality depression treatment in past year among those who received any mental health care”. We estimate a short specification of this model which only includes adjustments for need and correlates of need classified in the disparities literature such as age and sex (6,30), number of chronic conditions, and level of impairment, as well as an extended specification which also adjusts for marital status, education, insurance, poverty, and region. The poverty measure was constructed through an income-to-needs ratio according to the definition provided by the U.S. Census Bureau (31). When household income was less than family needs (determined by family size and household income using the Census definition), a family was considered in poverty. Categories for the other covariates are included in Table 1. To emphasize the resource allocation issue, we present odds ratios that distinguish between ethnic/racial differences among those who are depressed and ethnic/racial differences among those who are not depressed.

Next, we use the model results from the extended specification to estimate the total disparity in accessing care and receiving quality care for each racial/ethnic group relative to non-Latino whites (Table 4). Using the two-stage model estimates, we generate predicted probabilities of accessing treatment and receiving quality treatment for each race/ethnicity and depression subgroup, using the distribution of covariates from the non-Latino white population. This approach allows us to answer the hypothetical question – what mean level of treatment would Latinos receive if they had the same characteristics as non-Latino whites? McGuire et al. (2006) use a similar approach to compute racial/ethnic disparities in outpatient mental health expenditures (30). In the present study, minority individuals are given the non-Latino white distributions for *all the covariates, including* adjusting for social class-related variables like poverty, insurance coverage, and education to disentangle the effect of social class variables from those of ethnicity/race. We use the bootstrap method to obtain 95% predictive intervals and compare the predicted probabilities between groups defined by race/ethnicity and presence of depression to calculate the disparity for each racial/ethnic group by comparing, for example, the treatment Latinos with depression would receive if they had the same distribution of covariates as non-Latino whites to what non-Latino whites would receive given their own characteristics (32). All analyses were conducted using STATA 9.2 statistical software (33). Models were adjusted for sampling design through a first-order Taylor series approximation, and significance tests were performed using design-adjusted Wald tests (34-36).

## RESULTS

Table 1 shows that there are striking racial/ethnic differences in sample characteristics, including much higher rates of poverty, and lower rates of health insurance coverage among all racial/ethnic minority groups compared to non-Latino whites. Latinos and Asians are much more likely than non-Latino whites and African-Americans to live in the West, while African-Americans are more likely than other groups to live in the South. Current depression is more prevalent among non-Latino whites compared to racial/ethnic minorities. For example, the prevalence of last year depressive disorders was 5.4% for Asians as compared to 11.2% for non-Latino whites. Panel A of Table 2 shows that among those with any 12-month depressive

disorder 63.7% of Latinos, 68.7% of Asians and 58.8% of African Americans, as compared to 40.2% of non-Latino whites with past year depression, did not access any mental health treatment in the last year ( $p<0.001$ ). Among depressed respondents, minorities also were significantly less likely than non-Latino whites to receive quality care in the last year ( $p<0.001$ ) (Table 2, Panel A, Row 3). Although most non-depressed individuals received no treatment, as would be expected, 3.2% of non-Latino whites without last year depression (or lifetime or subthreshold depression) received 4+ provider visits and 30 days or more antidepressant treatment, as compared to 0.7% of Latinos, 1.2% of Asians, and 1.3% of African Americans ( $p<0.001$ ) (Table 2, Panel B, Row 3).

All minority groups with 12-month depressive disorder are significantly less likely than non-Latino whites to receive any mental health care, after adjusting for other factors (Table 3, columns 1-2). Similarly, after adjusting for other factors, racial/ethnic minorities without depression are less likely to receive any treatment compared to non-Latino whites without depression. In sensitivity analyses, in which we included the sub-threshold cases and classified these respondents as depressed, the findings were very similar to those discussed here (results not shown).

Among those with depression that access any care, the findings (Table 3, columns 3 and 4) indicate that while there are statistically significant racial/ethnic differences in the quality of care as a whole, only the African-American versus non-Latino white comparison is statistically significant. That is, African-Americans who used services in the prior year have appreciably lower odds of receiving quality depression care compared to non-Latino whites (OR: 0.24, 95% CI = 0.14-0.43, see column 4). In two alternative sensitivity analyses, these models were re-estimated [1] with the sub-threshold cases included; and [2] with the looser definition of quality of depression care, an indicator of whether respondents received at least 4 visits with any formal mental health provider in the past year, independent of antidepressant medication. The findings were similar to those presented above. Estimates based on analyses of race/ethnicity specific sub-samples rather than a pooled sample yielded similar findings (results not shown).

Table 4 shows racial/ethnic differences in predicted probabilities of accessing treatment and receiving quality depression treatment based on the extended model for each race/ethnicity and depression sub-group, if every minority group had the same distribution of covariates as the non-Latino whites. Among non-Latino whites with depression, about 33 percent are predicted to access treatment and receive quality depression care, compared to about 25.0 percent of Latinos, 18.9 percent of Asians, and 10.4 percent of African-Americans (significantly different for Asians and African Americans at  $p<0.05$ ; and marginally significant for Latinos at  $p<0.07$ ). Among those who do not have depression, almost 3.1 percent of non-Latino whites are predicted to access treatment and receive quality treatment for acute depression; the predicted rates are much lower among racial/ethnic minority groups (Table 4, Panel A). Latinos, Asians and African-Americans with depression are on average 8.5 to 23 percentage points less likely to access mental health treatment and receive quality depression treatment compared to non-Latino whites with similar observed characteristics.

## DISCUSSION

The results of these analyses highlight that disparities in access are still a critical issue: all racial/ethnic minority groups were significantly less likely than non-Latino whites to receive access to any mental health treatment. The observed findings reflect that ethnicity/race, even after adjusting for social class-related variables like poverty, insurance coverage, and education, still have an independent effect on access to depression treatment. Several factors could account for the problem in access for minorities. First, there is still significant under-

detection of depression among the less-acculturated ethnic/racial minorities (21). Current approaches which rely on providers detecting depression to facilitate care for depression care may have limited effectiveness, given most (90-85%) ethnic and racial minority respondents had recent contact with the healthcare system in past year but still the majority did not receive treatment. Helping clinicians identify depression for groups with these particular characteristics might prove challenging: data indicate that symptom presentation for mental health disorders varies across racial and ethnic groups, and can differ from what most clinicians are trained to expect, resulting in clinical misdiagnoses (37). For example, Latinos are more likely to somatize psychiatric distress or to express psychiatric illness through cultural idioms of distress such as *ataques de nervios* (38). Second, losing pay from work (39) or the stigma that surrounds mental illness (40) may constrain services use in racial and ethnic minority communities that are subject to unstable and temporary employment and are overrepresented in low-wage jobs (41). For example, ethnic/racial minorities report delays in seeking services due to inability to leave work or take time off from work because of lack of benefits (29). Third, an important factor discouraging minority members from accessing mental health services was their experience of mistreatment by mental health professionals (42-45). For African Americans, Asians and Latinos mistrust of health care professionals and/or concerns about provider competence with their ethnic/racial group may decrease their sense of comfort talking to professionals (31-33). Fourth, minority families appear less likely to recognize depression (46) or may feel that they can adequately provide care without the need for formal providers (47). A minority with a mental illness may be referred into mental health care only when the burden to the family creates undue stress and disruption. Differential referral and treatment patterns by providers have also been posited as a potential mechanism for such access disparities (48). Fifth, there is a limited work force and insufficient funds to support mental health services in safety net settings (49).

We also found that regardless of race/ethnicity, most people who access depression treatment receive inadequate care, with African Americans being particularly unlikely to receive quality care. This can be explained by qualitative analyses of Black community respondents which revealed that their experience of mistreatment and social exclusion by health professionals reverberated on future utilization and on community sentiments toward the mental health system (42). Disparities resulting from barriers to effective communication between racially mismatched patients and providers, particularly for African Americans may be leading to greater discordance regarding a shared understanding of disease causation and effectiveness of treatments (50) and consequently substantial concerns about pharmacological treatments; thereby exacerbating unmet need among African Americans.

There are certain limitations of the present study. The cross-sectional nature of the study design does not permit identifying possible causal directions. Both diagnostic and service use data are based on self-reports which may be subject to incomplete information, particularly if patients do not know if they are being prescribed an antidepressant. It may be that ethnic and racial minorities, since they are less likely to discuss their treatment with their provider, are unaware that they are being treated for depression (24). A further limitation is that there are no psychometric data available for the access or quality measures used in this study. However, as previously mentioned these measures were adapted from the National Comorbidity Study (22,23) and have been widely used in mental health services research. As a result, they were included as core measures of the CPES instruments. Regardless, studies accessing the psychometric properties of these measures are needed. Another limitation is not being able to disaggregate the data by the "Other racial" category, subethnicity, and geographical cities, because of small sample sizes. Only certain minority groups are included, but these are better defined and have larger samples than in most national studies. Finally, the disparity estimates by adjusting the characteristics of the minorities to be the same as those of the non-Latino white population, are strongly model-based, and therefore a different model might lead to a rather

different estimate. We believe that future studies will permit more fine-grained analyses of these important factors linked to these disparities. Regardless of these limitations, these findings paint a stark, recent picture of care for depression among racial and ethnic minorities in the U.S. and clearly point to areas in need of further sustained attention.

## Conclusion

An important area for further research includes understanding what “depression treatments” represent when received by non-Latino whites without apparent depression or other measured mental disorders. This pattern could represent treatment for social problems or general psychological distress, overuse of depression treatments, or appropriate use of antidepressant medications for other medical conditions, such as fibromyalgia, painful diabetic neuropathy, migraines, and chronic back pain (51-53). To the extent that the supply of depression treatments is limited, it may be important to consider how to best distribute those resources across populations that differ in access to quality services, especially for sicker individuals. We may need to evaluate whether use of mental health services by those with no assessed need for care competes with access to treatment for minorities, limiting their access to mental health providers.

Our findings shift the debate to developing policy, practice, and community solutions that can effectively address the barriers that generate these disparities. Simply relying on present systems without considering the unique barriers to quality care that apply for underserved ethnic and racial minorities, is unlikely to affect the pattern of disparities we observed. For example, populations that have been reluctant to come to the clinic for depression care may have correctly anticipated the limited benefits from usual care. One possible point of intervention is the use quality improvement programs to increase quality of care among minorities. Results from a recent randomized clinical trial demonstrated that a practice-initiated quality improvement intervention for depressed primary care patients improved the rate of appropriate care for depression for whites and underserved minorities alike (28,54). Programs such as this one provide plausible strategies for helping combat disparities in depression care. Policy changes might include increased resources for mental health services in safety net clinics; practice changes might include training nurses in motivational interviewing or implementing evidence-based quality improvement programs for depression routinely; community strategies might include home visits by peer counselors to engage patients in understanding the importance of treatment or to provide ancillary services (e.g. transportation, child care, patient advocacy) that facilitate access to care. Future research should focus on developing and evaluating the promise of such strategies.

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Table 1

Sample Characteristics <sup>†</sup>

Characteristic	Total combined sample n = 8,762		Non-Latino White n = 2,834		Latino n = 1,603		Asian n = 1,435		African American n = 2,890		Chi-square test of difference (P value)
	%	SE	%	SE	%	SE	%	SE	%	SE	
Age category											***
18-34 years	30.6%	± 1.2%	26.6%	± 1.6%	50.1%	± 2.1%	39.3%	± 1.8%	36.4%	± 1.5%	
35-49 years	29.6%	± 1.0%	28.8%	± 1.3%	28.9%	± 1.4%	32.5%	± 2.0%	33.3%	± 0.9%	
50-64 years	21.0%	± 1.1%	22.8%	± 1.5%	12.3%	± 1.0%	17.6%	± 1.4%	18.6%	± 1.0%	
65 years or more	18.8%	± 1.1%	21.8%	± 1.5%	8.7%	± 1.0%	10.6%	± 1.9%	11.7%	± 0.8%	*
Sex											
Male	48.7%	± 1.0%	48.8%	± 1.4%	52.8%	± 1.7%	48.7%	± 1.6%	45.4%	± 1.0%	
Female	51.3%	± 1.0%	51.2%	± 1.4%	47.2%	± 1.7%	51.3%	± 1.6%	54.6%	± 1.0%	***
Marital Status											
Married/cohabitating	60.2%	± 1.1%	62.2%	± 1.4%	64.7%	± 1.6%	70.3%	± 2.1%	43.0%	± 1.1%	
Divorced/separated/widowed	19.3%	± 0.7%	19.4%	± 0.9%	14.5%	± 1.1%	8.0%	± 1.0%	25.4%	± 0.9%	
Never married	20.5%	± 1.1%	18.4%	± 1.5%	20.7%	± 1.4%	21.7%	± 1.6%	31.6%	± 1.5%	***
College Education											
No	75.9%	± 1.1%	73.1%	± 1.5%	90.2%	± 1.2%	58.3%	± 2.1%	85.8%	± 1.2%	
Yes	24.1%	± 1.1%	26.9%	± 1.5%	9.8%	± 1.2%	41.7%	± 2.1%	14.2%	± 1.2%	***
Poverty											
No	87.4%	± 0.6%	91.2%	± 0.7%	73.9%	± 2.1%	83.7%	± 1.4%	77.5%	± 1.4%	
Yes	12.6%	± 0.6%	8.8%	± 0.7%	26.1%	± 2.1%	16.3%	± 1.4%	22.5%	± 1.4%	***
Type of Insurance											
Not insured	12.7%	± 0.8%	8.8%	± 0.9%	34.8%	± 2.9%	12.8%	± 1.3%	17.5%	± 1.0%	
Private through employer	56.0%	± 1.2%	58.3%	± 1.5%	39.4%	± 2.6%	57.4%	± 2.0%	55.4%	± 1.3%	
Private purchased	4.3%	± 0.4%	4.6%	± 0.5%	2.8%	± 0.6%	8.9%	± 1.0%	2.0%	± 0.2%	
Medicare	20.3%	± 1.1%	23.4%	± 1.5%	9.9%	± 1.1%	11.0%	± 1.7%	13.7%	± 0.7%	
Medicaid	4.2%	± 0.3%	2.5%	± 0.4%	11.3%	± 1.2%	5.2%	± 0.9%	8.2%	± 0.8%	
Other	2.5%	± 0.3%	2.3%	± 0.5%	1.8%	± 0.4%	4.7%	± 1.0%	3.2%	± 0.5%	***
Region											
Northeast	19.6%	± 2.7%	20.6%	± 3.6%	18.6%	± 2.1%	18.3%	± 4.1%	15.5%	± 1.1%	

Characteristic	Total combined sample n = 8,762		Non-Latino White n = 2,834		Latino n = 1,603		Asian n = 1,435		African American n = 2,890		Chi-square test of difference (P value) €
	%	SE	%	SE	%	SE	%	SE	%	SE	
Midwest	24.6% ± 1.9%		28.8% ± 2.7%		9.0% ± 1.9%		8.9% ± 2.5%		17.1% ± 1.4%		
South	34.0% ± 2.4%		31.6% ± 3.2%		31.0% ± 5.4%		7.8% ± 2.1%		57.4% ± 2.2%		
West	21.7% ± 2.0%		19.0% ± 2.6%		41.3% ± 4.5%		65.1% ± 4.9%		9.9% ± 0.9%		***
Number of Chronic Conditions											
0	48.0% ± 0.9%		45.3% ± 1.0%		66.4% ± 2.1%		60.8% ± 1.8%		45.6% ± 1.1%		
1	25.6% ± 0.6%		26.0% ± 0.8%		19.9% ± 1.7%		25.5% ± 1.6%		27.9% ± 0.9%		
2+	26.4% ± 0.7%		28.8% ± 0.9%		13.7% ± 1.3%		13.7% ± 1.1%		26.5% ± 1.0%		
WHO-DAS Disability Assessment (mean) ‡											
Days out of role due to mental reason ∂											
	0.29 ± 0.03		0.24 ± 0.04		0.27 ± 0.05		0.07 ± 0.02		0.65 ± 0.08		***
Cognition †	0.90 ± 0.07		0.91 ± 0.09		0.70 ± 0.14		0.34 ± 0.07		1.18 ± 0.13		***
Mobility †	4.47 ± 0.29		4.96 ± 0.38		2.60 ± 0.42		1.20 ± 0.27		4.07 ± 0.28		***
Self-care †	0.89 ± 0.15		0.95 ± 0.20		0.80 ± 0.17		0.20 ± 0.07		0.78 ± 0.11		***
Social Functioning †	0.55 ± 0.06		0.55 ± 0.08		0.32 ± 0.12		0.14 ± 0.05		0.79 ± 0.12		***
Role Functioning †	9.56 ± 0.39		9.36 ± 0.50		7.13 ± 0.62		5.32 ± 0.57		13.70 ± 0.72		***
Disorder Categories ¶											
Any Depressive Disorder in the past 12 months	10.6% ± 0.5%		11.2% ± 0.6%		10.8% ± 0.9%		5.4% ± 0.9%		8.0% ± 0.6%		
No Depressive Disorder in the past 12 months	89.4% ± 0.5%		88.8% ± 0.6%		89.2% ± 0.9%		94.6% ± 0.9%		92.0% ± 0.6%		

\* p < 0.05

\*\* p < 0.01

\*\*\* p < 0.001

† NLAAS Latinos and Asians, NCSR Part II sample, and NSAL data were used. For this analysis we focused on the non-Latino white, Latino, Asian, and African American samples, dropping Native Americans and those in the "Other" race category. We also excluded respondents with a 12-month subthreshold depressive disorder (group 2), those with a lifetime depressive disorder but no 12-month depressive disorder (group 3), those who had a non-depressive diagnosis only (group 4), as well as those NSAL respondents who did not complete all diagnosis batteries. We also dropped those observations with any missing values in the above table.

‡ Wald Tests were conducted for WHO-DAS disability assessment variables

∂ Possible scores range from 0 to 30, with higher scores indicating max disability

✕ Possible scores range from 0 to 100, with higher scores indicating max disability

¶ Any Depressive Disorder diagnostic category includes DSM-IV dysthymia and major depressive episode.

€ The last column of Table 1 shows the p-values from Chi-Squared tests that were conducted to test for differences in each of the characteristics across the racial/ethnic groups

**Table 2**  
Percentages of Respondents in Broad Treatment Categories

Row	Type of Treatment	N of Obs	Panel A										Panel B						
			Any Depressive Disorder <sup>‡</sup> in the past 12 months (N=1,082)					No Depressive Disorder in the past 12 months (N=7,680)					Design-based Adjusted F test for all treatment groups	Adjusted Wald test p value	Design-based Adjusted F test for all treatment groups				
			Non-Latino White	Latino	Asian	African American	Adjusted Wald test p value	Non-Latino White	Latino	Asian	African American	Adjusted Wald test p value							
			Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE	Percentage SE		
1 <sup>‡</sup>	No Treatment, No Antidepressants	40.2	3.1	63.7	4.5	68.7	6.8	58.8	3.2	***	89.9	0.6	96.2	0.6	94.9	0.5	***		
2 <sup>§</sup>	Not Adequate Treatment	26.8	2.8	13.9	2.5	18.1	5.0	29.0	3.1	***	7.0	0.6	3.1	0.5	2.6	0.4	3.8	0.4	***
3 <sup>¶</sup>	Adequate Treatment	33.0	1.9	22.3	4.9	13.1	4.6	12.1	2.5	***	3.2	0.3	0.7	0.3	1.2	0.5	1.3	0.3	***

Notes:

1. Provider can be from the general medical sector, specialty mental health sector, or a counselor or social worker in a non-mental health setting. General medical sector providers include: general practitioner, family doctor, nurse, occupational therapist, or other health professional for a mental health problem. Specialty mental health sector providers include: psychiatrist, psychologist, counselor or social worker seen in mental health settings, or other mental health professional.
2. The column labeled "adjusted Wald test" shows the p-value from a Wald test that was conducted to test for differences in each of the types of treatments across the racial/ethnic groups.
3. The column labeled "design-based adjusted F-test" shows the p-value from an F-test that was conducted to test for racial/ethnic differences in any of the treatment type.

<sup>‡</sup> Any Depressive Disorder diagnostic category includes DSM-IV dysthymia and major depressive episode.

<sup>‡</sup> Group 1 includes respondents receiving no treatment, and no antidepressants

<sup>§</sup> Group 2 includes respondents with no provider visits, but receiving antidepressants, 1-3 provider's visits with antidepressants, 4+ provider visits and antidepressants less than 30 days, 1-7 provider visits and no antidepressants, and those with 8+ provider a visits, but the number of Specialty Mental Health over 30 minutes is less than 8 and no antidepressant use.

<sup>¶</sup> Group 3 represents our definition of Adequate Treatment, which include respondents with 4+ provider a visits and antidepressants 30 days or more, or those with 8+ Specialty Mental Health provider visits of at least 30 minutes. If a respondent has 1-3 provider visits and is currently in treatment, he/she is considered as having 4 visits. If respondent has 1-7 visits with a specialty mental health provider visits of at least 30 minutes, and is currently in treatment with specialty mental health provider, he/she is considered as having 8 specialty mental health provider visits. Please note that this definition of adequate treatment only applies to those respondent with a need for mental health treatment.

\* p < 0.05

\*\* p < 0.01

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1000 > p  
\*\*\*

**Table 3**  
 Logistic Regression Results of: Any Depression Treatment; and Adequate Depression Treatment Conditional on Receiving Any Treatment

	(1) Any depression treatment (n=994)		Adjusted Wald Test of Joint Significance		(2) Any depression treatment (n=994)		Adjusted Wald Test of Joint Significance		(3) Adequate treatment among those with any depression treatment (n=491)		Adjusted Wald Test of Joint Significance		(4) Adequate treatment among those with any depression treatment (n=491)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Race/Ethnicity														
With depression <sup>†</sup> , Latino - Non-Latino	0.52	0.31 - 0.89*	***		0.47	0.25 - 0.88*	***		1.26	0.45 - 3.55	***		1.21	0.40 - 3.69
With depression <sup>†</sup> , Asian - Non-Latino	0.40	0.18 - 0.87*			0.33	0.14 - 0.78*			0.89	0.29 - 2.69			0.80	0.24 - 2.74
With depression <sup>†</sup> , African American - Non-Latino White	0.34	0.22 - 0.52***	***		0.33	0.20 - 0.55***	***		0.22	0.12 - 0.41***	***		0.24	0.14 - 0.42***
No depression <sup>†</sup> , Latino - Non-Latino	0.30	0.19 - 0.49***	***		0.27	0.15 - 0.47***	***		0.52	0.17 - 1.63	***		0.51	0.17 - 1.55
No depression <sup>†</sup> , Asian - Non-Latino	0.41	0.27 - 0.64***	***		0.34	0.21 - 0.55***	***		0.85	0.26 - 2.75	***		0.76	0.24 - 2.40
No depression <sup>†</sup> , African American - Non-Latino White	0.37	0.28 - 0.50***	***		0.33	0.23 - 0.46***	***		0.52	0.27 - 1.01	***		0.56	0.28 - 1.13
Age Category														
18-34 years	1.16	0.94 - 1.43			1.18	0.90 - 1.54			1.15	0.70 - 1.89			1.14	0.65 - 2.01
35-49 years	1.10	0.81 - 1.50			1.08	0.73 - 1.61			1.02	0.57 - 1.82			1.01	0.50 - 2.06
50-64 years	0.55	0.34 - 0.88*			0.20	0.09 - 0.45***			0.45	0.22 - 0.95*			0.49	0.18 - 1.27
65 years or more														
Sex														
Male														
Female	1.54	1.22 - 1.94***	***		1.48	1.17 - 1.88**	**		1.27	0.76 - 2.12			1.29	0.79 - 2.12
Number of Chronic Conditions														
0														
1	1.46	1.04 - 2.03*	*		1.43	1.03 - 2.01*	*		0.96	0.61 - 1.50			0.94	0.61 - 1.44
2+	1.43	1.07 - 1.92*	*		1.31	0.97 - 1.77			1.27	0.81 - 2.02			1.30	0.81 - 2.09
WHO-DAS Disability Assessment														
Days out of role >0	2.53	1.64 - 3.90***	***		2.32	1.43 - 3.75**	**		1.99	1.14 - 3.49*	*		2.04	1.20 - 3.48**
Cognition >0	2.19	1.52 - 3.14***	***		2.17	1.61 - 2.91***	***		1.24	0.83 - 1.86			1.28	0.84 - 1.93
Mobility >0	1.35	0.92 - 1.99			1.28	0.88 - 1.85			1.44	0.93 - 2.24			1.51	0.94 - 2.40



	(1) Any depression treatment (n=994) OR 95% CI	Adjusted Wald Test of Joint Significance	(2) Any depression treatment (n=994) OR 95% CI	Adjusted Wald Test of Joint Significance	(3) Adequate treatment among those with any depression treatment (n=491) OR 95% CI	Adjusted Wald Test of Joint Significance	(4) Adequate treatment among those with any depression treatment (n=491) OR 95% CI	Adjusted Wald Test of Joint Significance
Self-care>0	0.98 0.54 - 1.76		0.84 0.45 - 1.57		0.66 0.35 - 1.23		0.65 0.35 - 1.19	
Social Functioning>0	1.08 0.73 - 1.58		1.10 0.76 - 1.59		0.93 0.57 - 1.51		0.85 0.53 - 1.37	
Role Functioning>0	1.31 1.02 - 1.68*		1.33 1.02 - 1.74*		0.94 0.62 - 1.42		0.99 0.66 - 1.48	
Marital Status								
Married								
Divorced/separated/widowed			1.53 1.13 - 2.08**				1.16 0.69 - 1.97	
Never married			1.27 0.93 - 1.74				0.95 0.54 - 1.70	
College Education								
No								
Yes			1.33 0.99 - 1.77				1.41 0.85 - 2.34	
Poverty								
Above poverty threshold								
Below poverty threshold			0.86 0.57 - 1.30				0.79 0.37 - 1.68	
Type of Insurance								
Not insured								
Private insurance through employer			1.39 0.90 - 2.13				1.25 0.70 - 2.24	
Privately purchased insurance			1.40 0.74 - 2.65				1.92 0.66 - 5.59	
Medicare			4.22 1.96 - 9.09***				1.23 0.46 - 3.33	
Medicaid			3.89 2.22 - 6.83***				1.79 0.95 - 3.38	
Other			2.92 1.28 - 6.68*				2.38 0.70 - 8.13	
Region								
Northeast								
Midwest			0.78 0.56 - 1.10				0.77 0.46 - 1.29	
South			0.95 0.66 - 1.37				0.82 0.54 - 1.26	
West			1.13 0.82 - 1.57				0.99 0.53 - 1.86	
N of Observations		8762			880			880

Notes:

1. The asterisks next to the confidence intervals indicate the significance level of the odds ratio
2. The column labeled "adjusted Wald test" shows the p-values from Wald tests that were conducted to test for any differences across each characteristic for each of the treatment types
3. Columns 1 and 3 show results from specifications of the "any treatment" and "adequate treatment" models respectively, which include the following covariates: race/ethnicity, age, sex, number of chronic conditions, and WHO/DAS scores.

4. Columns 2 and 4 show results from specifications of the “any treatment” and “adequate treatment” models which additionally include the following covariates: marital status, college education, poverty, insurance status and region.

<sup>7</sup>Depression includes DSM-IV dysthymia and major depressive episode.

- \* p < 0.05
- \*\* p < 0.01
- \*\*\* p < 0.001

**Table 4**  
Racial/Ethnic Comparisons in Accessing and Receiving Adequate Mental Health Treatment by Depression Status

	Panel A—Predicted Probability by Racial/Ethnic Group				Panel B—Difference in Predicted Probability Between Whites and Minorities			
	Sample Estimate	Bootstrapped <sup>†</sup> Mean	Bootstrapped <sup>†</sup> Standard Error	Bootstrapped <sup>†</sup> 95% Confidence Interval	Sample Estimate	Bootstrapped <sup>†</sup> Mean	Bootstrapped <sup>†</sup> Standard Error	Bootstrapped <sup>†</sup> 95% Confidence Interval
Non-Latino White, with depression <sup>‡</sup>	33.4%	33.3%	2.3%	28.9% 37.9%				
Latino, with depression <sup>‡</sup>	25.0%	24.6%	4.1%	16.7% 32.7%	-8.5%	-8.8%	4.7%	0.3% -18.1%
Asian, with depression <sup>‡</sup>	18.9%	18.8%	6.1%	7.9% 31.5%	-14.6%	-14.5%	6.4%	-1.3% -26.1%
African American, with depression <sup>‡</sup>	10.4%	10.4%	2.4%	6.4% 15.7%	-23.0%	-23.0%	3.2%	-16.4% -29.0%
Non-Latino White, without depression <sup>‡</sup>	3.1%	3.1%	0.4%	2.3% 3.9%				
Latino, without depression <sup>‡</sup>	0.6%	0.6%	0.2%	0.3% 1.2%	-2.5%	-2.4%	0.4%	-1.6% -3.3%
Asian, without depression <sup>‡</sup>	1.0%	1.0%	0.4%	0.4% 2.0%	-2.1%	-2.1%	0.5%	-1.0% -3.0%
African American, without depression <sup>‡</sup>	0.8%	0.8%	0.2%	0.4% 1.2%	-2.3%	-2.3%	0.4%	-1.4% -3.2%

Notes:

1. Panel A shows estimates of accessing care and receiving adequate treatment by racial/ethnic group and depression status. These estimates are generated from the long regression specifications, shown in columns 2 and 4 of Table 3.

Using the two-stage model shown in Table 3, we generate predicted probabilities of accessing treatment and receiving quality treatment for each race/ethnicity and depression sub-group, using the distributions of covariates from the non-Latino white population for all racial/ethnic groups.

2. Panel B shows differences in accessing care and receiving adequate treatment by racial/ethnicity and depression status, using the distribution of covariates from the non-Latino white population for all racial/ethnic groups.

3. Bootstrapping was conducted using 1,000 iterations. 95% confidence intervals were obtained using the 2.5 and 97.5 percentiles of the bootstrapped distributions.

<sup>†</sup>1000 iterations were done in bootstrap; 95% confidence interval obtained using 2.5 and 97.5 percentile of bootstrapped values of predicted probability.

<sup>#</sup>Depression includes DSM-IV dysthymia and major depressive episode.