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Disparities in Mental Health Service Use among Racial/Ethnic Minority Elderly

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Abstract

BACKGROUND/OBJECTIVES—We apply the Institute of Medicine definition of healthcare disparities to measure disparities at different junctures of episodes of mental health care and to identify disparities in types of mental health services used.

DESIGN—Four two-year longitudinal datasets from Panels 9–13 (2004–2009) of the Medical Expenditure Panel Surveys were combined.

SETTING—Large-scale surveys of families and individuals and their medical providers across the United States.

PARTICIPANTS—A total of 1658 (981 Whites, 303 Blacks, and 374 Latinos) participants aged 60+ with probable mental health care need.

MEASUREMENTS—Mental health care need was defined as Kessler-6 Scale >12 and PHQ-2 >2. Five aspects of mental health care episodes were analyzed: 1) treatment initiation; 2) adequacy of care; 3) duration of care; 4) number of visits; 5) and expenditures. We assessed whether episodes of care included only prescription drug fills, only outpatient visits, or both.

RESULTS—Treatment initiation and adequacy were lower for Blacks and Latinos than Whites. Latinos experienced episodes with longer duration, increased number of visits, and more expenditures. Blacks and Latinos had significantly lower rates of episodes that consisted of only medication refills. Blacks had significantly greater rates of episodes with only outpatient care visits. Latinos had significantly higher rates of medication plus outpatient visits.

CONCLUSION—Low mental health treatment initiation and poor adequacy suggest the need for culturally appropriate interventions to engage older Blacks and Latinos in mental health care. The surprising findings among Blacks (greater rates of outpatient care visits) and Latinos (higher rates of medication plus outpatient visits) highlight the complexities of the older adult population and suggest new avenues for disparities research.

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Conflict of Interest

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Keywords

ethnicity; mental health service use; disparities; older adults

INTRODUCTION

Disparities in mental health service use by racial/ethnic minority groups are well-documented.^{1–4} It is unknown if racial/ethnic disparities in mental health service use exist for older adults, given the overall low use of specialty mental health services in older age.^{5,6} We reported that lifetime rates of psychiatric illness were not significantly different between older Latinos and Whites, but older Latinos had higher 12-month rates of any depressive disorder compared to Whites.⁷ Older Blacks exhibited equal lifetime and 12-month prevalence of psychiatric disorders.⁷ These results taken in combination with the findings that racial/ethnic minorities tend to receive less overall mental health care,⁴ less outpatient mental health care,^{8,9} and are less likely to visit mental health specialists^{10–13} suggest that older racial/ethnic minority adults may not be receiving needed mental health services.

Episodes of Care

Using episodes of care as a unit of analysis for measuring mental health care is a common method.^{14–18} In theory, an episode of mental health care abides by the following process: initial evaluation, multiple follow-up visits with titration of dose or psychotherapy, a maintenance phase with regular monitoring and treatment over a course of time until recovery or dropout of treatment. In practice, patients may receive multiple episodes of care as they halt and then return to treatment over time. This process often includes several clinicians and other staff from multiple segments of the mental health and health care system.

IOM Definition of Disparities and Mental Health Care Episodes—The Institute of Medicine (IOM) defines disparities in health care as “racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of interventions.”¹ This definition recognizes that differences in need for mental health care, such as higher rates of depression among older Latinos compared to older Whites,^{7,19} should be adjusted for when measuring disparities. Preferences should be reflected in definitions of disparities. However, patient preference measures are often problematic because patients are rarely “fully informed” about their healthcare options.^{1,20,21} Additionally, differences reflecting socioeconomic factors such as income or insurance status should be included in determining disparities.^{10,22}

The IOM definition of health care disparities is used as a conceptual guide for understanding racial/ethnic mental health care disparities. The purpose of this study is two-fold: 1) to measure racial/ethnic disparities at different junctures of episodes of mental health care and 2) to identify disparities in types of mental health services used in an elderly sample. It is hypothesized that there will be disparities in the initiation, adequacy, duration, number of visits, and expenditures of episodes of mental health care of older Whites compared to older Blacks and Latinos.

METHODS

Study Population

We assessed disparities in mental health care episodes for older adults with probable need for mental health or substance abuse treatment services from panels 9–13 of the Medical Expenditure Panel Survey (MEPS), corresponding to calendar years 2004–2009. Mental

health need is measured in multiple ways in the MEPS, including four scales measuring mental health for all respondents and household-reported psychiatric diagnoses for respondents with a health care visit, pharmaceutical fill, or a limitation of activity. The first scale is the Kessler 6 Scale (K6) for psychological distress.²³ The K-6 scale has a sensitivity of 90% and specificity of 89%²³ and can discriminate Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) cases from noncases with consistency across sociodemographic subsamples.²⁴ Second, the two-item Patient Health Questionnaire (PHQ-2)²⁵ scale for detecting depression demonstrates strong sensitivity (87%) and specificity (78%) for major depressive disorder among an ethnically diverse outpatient population.²⁶ Third, the mental health component of the SF-12 is a measure of disability with questions in the domains of vitality, social functioning, role and emotion. It has been shown to be effective in distinguishing individuals with and without mental illness.²⁷ Fourth, the self-reported mental health (SRMH) measure is predictive of psychological distress, depressed mood, and functioning²⁸ and is related to psychiatric symptoms and diagnosed mental illness.²⁹

To be included in this study, participants had to be 60+ years of age and scored greater than 12 on the K6²³ (indicating nonspecific psychological distress) or scored greater than 2 on the PHQ-2²⁵ (indicating probable depressive disorder). Panels 9–13 included 9,346 respondents adults age 60+ (6,247 Whites, 1,350 Blacks, and 1,208 Latinos). Of these, 1658 older adults (981 Whites, 303 Blacks, and 374 Latinos) met criteria for inclusion in our study. The Latino sample included individuals of Puerto Rican (17%), Cuban (5%), Dominican (4%), Mexican (63%), and Central/South American (9%) descent; 3% percent were classified as “other.” 50.4% completed the survey in English and 49.6% completed in Spanish. The majority were foreign-born (54.4%). Native Americans and Asian-Americans were excluded because of small sample sizes.

Definition of an Episode of Care

An episode of care begins when there is treatment for a diagnosed psychiatric illness that is preceded by a period of at least twelve weeks of no treatment. This definition of an episode of care has been used in previous studies.^{30,31} To obtain these details, we utilized information provided by MEPS respondents about each prescribed medicine fill and outpatient and office-based provider visit (hereafter referred to as outpatient visit) for each household member. Outpatient care includes primary care provider (PCP) or specialist mental health care (services received from a psychiatrist, psychologist, counselor, or social worker). We considered outpatient care to be a mental health care visit if the treatment was recorded to be for a disorder covered by International Classification of Diseases (ICD-9) codes 291, 292, or 295–314.³² Similarly, psychotropic medications were defined as any prescription drug claim with any of the above ICD-9 codes attached to it. Psychotropic drug fill is a prescribed medicine refill without a mental health care visit or outpatient or office-based visits to assess the progress of the medications.

This self-reported information was subsequently verified and completed by the Agency for Healthcare Research and Quality (AHRQ). Records provided by hospitals, health maintenance organizations, office-based providers, home care agencies, and pharmacies were reviewed by a staff trained to abstract the core data elements for each provider type. Individual respondent information on expenditures provided in the Household Component of the MEPS are always replaced by provider information as the provider information is considered to be more complete and less prone to reporting errors. Trained staff resolves other discrepancies at their discretion.³³ Unfortunately, AHRQ does not reveal specifics on the number and types of discrepancies typically identified.

In addition to these objective scales that are asked of all respondents, the MEPS contains household-reported diagnosis information for every individual reported to have a health care visit, pharmaceutical fill, or limitation of activity. That is, any time a respondent mentions that a visit, fill, or activity limitation has occurred, the surveyor follows up by asking the name of the illness linked to that event or limitation. The response is then translated into an ICD-9 code and reported in the MEPS. For our purposes, we use all reported events and activity limitations that are specifically linked to ICD-9 codes related to mood, anxiety, psychotic, substance use, personality, behavioral and developmental disorders (291, 292, or 295–314).³² This methodology is shown to have strong sensitivity (88%) to provider reports of mental health and substance abuse disorders.³⁴ All study methods and protocols were approved by the Internal Review Board of Cambridge Health Alliance.

Dependent Variables

Six different aspects of mental health care episodes were analyzed: 1) treatment initiation; 2) adequacy of mental health care; 3) duration of care (days); and 4) number of visits to a healthcare professional; 5) expenditures; and 6) type of treatment received (prescription fills only, outpatient visits only, or both). Treatment initiation marks the beginning of a mental health care episode. It was defined as engaging in outpatient care, prescription drug care, specialty mental health care (psychiatrist, psychologist, counselor, or social worker) or general medical provider care (primary care medical doctor) for mental health or substance abuse issues. Adequacy of mental health care was defined as eight or more mental health care visits or 4+ visits with a prescription fill. This definition of adequacy has been used in previous literature.^{35–37} Duration of mental health care episodes was defined as the number of days each episode lasted. Number of visits of care was defined as the number of outpatient or office-based mental health care visits. Expenditures were measured by summing all direct payments for mental health care provided, including out-of-pocket payments and payments by private insurance, Medicaid, Medicare and other sources.

To better understand patterns of care, we assessed whether individuals had exclusively outpatient visits or exclusively psychotropic drug fills, or whether they had both outpatient visits and prescription fills. We chose not to consider inpatient and ER mental health care visits (approximately 3% of all mental health events) as part of an episode of mental health care.

Independent Variables

Racial/ethnic categories (White, Black, and Latino) were based on U.S. Census definitions. Independent variables were grouped into variables that are adjusted for in the IOM definition of health care disparities (variables related to need for care) and those that are not (variables related to system factors or socioeconomic status).

Independent Variables Measuring Need

In addition to selecting a sub-sample with probable need for mental health care using the criteria of PHQ-2>2 and K6>12, we also adjust for need variables in regression models in order to equalize racial/ethnic groups on severity of need for mental health care. Variables indicating need are the mental and physical health components of the SF-12, any limitation at work due to anxiety, depression, or other mental illness, the PHQ-2 and the K6. Physical health variables were considered as variables indicating need given the high rates of comorbidity between physical ailments and mental disorders^{38–41} and include any limitation due to physical health, body mass index, and a list of eleven priority chronic health illnesses (diabetes, asthma, stroke, emphysema, joint pain, coronary heart disease, angina, myocardial infarction, other heart disease, high blood pressure, and BMI).

Independent Variables Related to System Factors or Socioeconomic Status

SES variables were income, education, health insurance, participation in an HMO, region of the country, employment status, and residence in a metropolitan statistical area (MSA).

Statistical Analyses—To apply the IOM definition of healthcare disparities, we estimate the racial/ethnic differences in episodes of mental health care that are not due to differences in clinical need by conducting the following four steps: 1) estimate a regression model of any mental health care (logistic regression for dichotomous dependent variables and generalized linear models - log link and gamma distribution for the variance - for continuous dependent variables), adjusting for all independent variables described above; 2) transform distributions of need variables described above (any psychiatric disorder, chronic conditions, etc.) to be equal across racial/ethnic groups using a rank and replace method;^{42,43} 3) estimate a prediction of the rate or mean of the dependent variable of interest for each racial/ethnic group by multiplying the coefficient from the original model by the independent variable values (transformed in the case of need variables) and averaging the predictions across racial/ethnic group; and 4) compare mean white estimates with minority estimates with transformed need characteristics. Coefficients from the regression models described in step 2 provide an independent effect of race/ethnicity, adjusting for all independent variables. Comparisons of mean predicted probabilities of minority groups after adjustment for only need variables with mean White estimates (step 4) provide disparity results that are concordant with the IOM definition of healthcare disparities. Both types of results are presented.

RESULTS

Sociodemographic Characteristics

Table 1 examines health status and sociodemographic characteristics among older White, Black, and Latino adults. Older Blacks and Latinos did not differ from Whites in need or severity of mental illness. All three groups tended to have high rates of multiple physical health comorbidities (between 80.1% and 71.6%). Older Blacks and Latinos overall reported having lower income, lower education, greater rates of public insurance, higher likelihood of being enrolled in an HMO, and were more likely to live in an urban area than older Whites. Older Blacks were more likely to live in the South and less likely to live in the Midwest and West than older Whites. Older Latinos were more likely to live in the West and less likely to live in the Midwest than their White counterparts.

Disparities in Mental Health Service Use (IOM-concordant)

Disparities in predicted probabilities of mental health treatment initiation and adequacy were significant using IOM-concordant methods (Table 2). Older Blacks and Latinos had significantly lower predicted initiation and adequacy than older Whites. Among those who initiated mental health care, there were no significant racial/ethnic differences in the predicted number of visits, or episode length between older Blacks and Whites. Significant racial/ethnic differences were found but in the opposite direction than expected. Older Blacks had higher mental health expenditures than older Whites. Older Latinos had greater number of visits, episode length and higher mental health expenditures than older Whites.

Disparities in Types of Mental Health Services Used

Table 3 illustrates disparities in the types of mental health services used. Older Blacks and Latinos were less likely to have episodes in which they only received psychotropic medication fills than their White counterparts. Older Blacks and Latinos were more likely to have episodes with only outpatient care visits (no psychotropic medication fills) than

Whites. Older Latinos were more likely to have episodes with both an outpatient visit and a medication refill than older Whites. These differences persist even after excluding those with left-censored episodes and episodes where PCP visits for physical health reasons were in close proximity to the beginning of a psychotropic-only episode (results available upon request).

Regression Model Results

After adjustment for all (both need and system-level) covariates, older Blacks were less likely to initiate mental health care and less likely to receive adequate mental health care than older Whites (Table 4). No significant differences were observed between older Blacks and older Whites in number of visits, episode length or expenditures. Older Latinos were also less likely to initiate mental health treatment than older whites. There were no significant differences in adequacy of mental health care, number of visits, episode length, or mental health expenditures between older Latinos and older Whites following treatment initiation. Of the other covariates, females were more likely to initiate care and to have adequate care than males. Being older (80+) was a significant negative predictor of adequacy, number of visits, episode length, and mental health expenditures.

After adjustment for need and system-level covariates, older Blacks were more likely to have an episode of mental health care with only outpatient visits than older Whites (Table 5). Older Whites were more likely than older Latinos to have an episode of care with only psychotropic medication fills. Self-rated mental health and being enrolled in an HMO were significant negative predictors of having an episode with only psychotropic medication fills and were significant positive predictors of having an episode of care with a combination of outpatient visits and medication fills.

Interpreting the significance of these race/ethnicity coefficients is not an IOM-concordant method of identifying disparities. However, they tell us about racial/ethnic differences after adjusting for need and system level factors. The significance of other covariates also provides information regarding the underlying pathways by which disparities arise.

DISCUSSION

Our findings present an in depth view of racial/ethnic mental health care disparities and patterns of care among older adults. Our hypotheses that there would be Black-White and Latino-White disparities in treatment initiation and adequacy were supported. These disparities may result from cultural variation in beliefs about the causes of mental illness among older Blacks and Latinos.⁴⁴ Available mental health treatments may not match the preferences, values, and beliefs of older racial/ethnic minorities which can lead to the decision to not access mental health treatment.

Ideally, mental health care treatment decisions are made based on an objective weighing of risks and benefits for different treatments and outcomes. In reality, preferences are based on limited information with influence from prior individual and collective experience that, for racial/ethnic minorities, includes past discrimination and beliefs about the effects of different mental health treatments.^{45–52}

Prior studies have consistently shown that compared to Whites, Blacks are more likely to believe that antidepressants are addictive and not an effective treatment for mental illness.^{51,53} As a result, Blacks have shown a preference for counseling to medications.^{50,51} Consistent with these previous studies, we found that Whites had a higher probability of episodes with only psychotropic medication fills compared to older Blacks, and that episodes of care for Blacks were more likely to include only outpatient-based visits than

their White counterparts. This preference for outpatient-based visits could explain why Blacks had significantly greater expenditures than Whites.

Older Latinos were more likely to have episodes of mental health care with a combination of psychotropic fills and outpatient care, which may explain why older Latinos had a significantly greater number visits, increased length of episode and increased mental healthcare expenditures than older Whites. Previous studies regarding Latinos' mental health treatment preferences are inconsistent. Some studies suggest that Latino adults tend to be averse to taking antidepressant medications when compared to Whites.^{51,52} However, a recent study focusing on older Latinos found that they were willing to speak to a mental health professional and to use medications.⁴⁴ Our identification of greater openness to combination therapy and greater mental health use conditional on access to care among older Latinos compared to Whites are new findings. This suggests that care for older Latinos, *once they decide to access care*, may be a relative success story for the U.S. mental health care system. Increasing understanding of aspects of care in which disparities *do not* exist (use conditional on access to mental health care) may be useful for understanding how to improve aspects of care where disparities do exist (access to mental health care).

The study findings should be interpreted in the context of the limitations in our data. First, mental health need was not determined by structured diagnostic measures or measures of symptom severity, but instead by four brief scales/measures of mental illness, potentially causing a misrepresentation of the population in need of mental health care. In defense, these measures have good sensitivity and specificity to diagnosis of mental disorders and nonspecific psychological distress. These factors, and the fact that the MEPS has sufficient numbers of ethnic and racial minority cases to estimate mental health service disparities with precision, makes this a suitable dataset for this analysis. Second our measure of adequacy is only a proxy indicator. To accurately assess adequacy we would need to examine the quality and appropriateness of care given each patient diagnosis, examining the use of effective and appropriate treatments in type, dose, duration, etc. Third is lack of outcome measures. We do not know if those Latinos, who were engaged in more visits and spent more improved compared to Whites, who used less services and spent less, did better as a result of the increased mental health services used. Fourth, because of sample size considerations, the Latinos in this study were treated as a homogeneous group, when they actually comprise different subgroups of varying nationalities. Combining these individuals into a broad category (i.e., Latino) makes statistical testing for disparities possible, but it might mask meaningful results. Fifth, we did not measure cognitive impairment which is widely acknowledged as an important aspect of late life depression.⁵⁴ Sixth, it is unknown whether these were first time ever contacts with mental health services for some of the respondents. If so, this may explain why more visits were required for some but not others (more time required for psychoeducation and general orientation to mental health services).

Our results suggest potential directions for further inquiry. For example, symptom severity measures (i.e. PHQ-9, BDI, etc.) could be added to track patient progress. This would help determine if those who are receiving increased services and spending more on mental health services are improving. A larger sample size of Asian elderly in future research may help to provide information regarding mental health disparities among this fast growing segment of the elderly population. Datasets with larger numbers of Spanish speaking and immigrant Latinos may provide data to understand the effects of sub-ethnicity, language and nativity on disparities.

In summary, we present an in depth view of mental healthcare disparities. We are not aware of any previous studies that have measured mental health care disparities in a strictly older multi-ethnic sample. The combination of low mental health treatment initiation and poor

adequacy of care suggest the need to create culturally appropriate interventions aimed at engaging older racial/ethnic minority adults in mental health care. However, once mental health treatment was initiated, Blacks had significantly greater rates of episodes with only outpatient care visits. Latinos had significantly higher rates of medication plus outpatient visits. Also, rates of treatment initiation and adequacy indicate that the majority of older adults, regardless of race/ethnicity, are not receiving needed mental health care. These unique findings highlight the complexities of the older adult population and may suggest new avenues for disparities research.

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Table 1

Mental and Physical Health Status and Sociodemographic Characteristics of White, Black, and Latino sample (Age 60+ with K6>13 or PHQ-2>2; n=1,658)

	White (n=981)	Black (n=303)	Latino (n=374)
		sig.	sig.
Age			
60-65	27.0%	27.8%	32.5%
65-80	43.3%	49.9%	49.5%
80+	29.7%	22.3% *	18.0% **
Mental Health Status^A			
Severe Psychological Distress (K6>12)	12.9	11.7	13.9
Probable Depressive Disorder (PHQ2>2)	4.1	3.9	4.3
Mental Health Component of SF-12	34.0	36.8	35.5
Self-rated mental health			
Excellent	6.5%	9.2%	5.8%
Very Good	15.2%	15.4%	17.1%
Good	34.4%	39.6%	34.5%
Fair	27.7%	22.2%	29.3%
Poor	16.2%	13.6%	13.3%
Physical Health Status			
1 physical health comorbidity	20.1%	14.2%	15.2%
2+ physical health comorbidities	73.1%	80.1%	71.6%
Physical Health Component of SF-12 ^A	32.3	32.3	31.0 **
Any work limitation	55.9%	56.3%	49.4%
Sex			
Female	58.0%	67.0% **	61.7%
Male	42.0%	33.0% **	38.3%
Marital Status			
Married	49.8%	33.8% **	45.1%
SES			
% Federal Poverty Level			

	White (n=981)	Black (n=303)	Latino (n=374)
		sig.	sig.
<FPL	16.2%	29.2% **	31.2% **
100–124% FPL	8.4%	9.1%	10.8%
125–199% FPL	20.5%	27.2%	22.3%
200–399% FPL	30.6%	28.1%	25.2%
400%+ FPL	24.3%	6.4% **	10.5% **
Education			
<HS	32.5%	60.3% **	73.4% **
HS Grad	38.3%	24.9% **	15.1% **
Any College	16.5%	10.1% *	3.9% **
College Grad	12.7%	4.7% **	7.6% *
Health Insurance			
Private	43.3%	18.6% **	16.3% **
Any Public Insurance	51.6%	75.6% **	74.1% **
Uninsured	5.1%	5.8%	9.6% *
Managed Care			
HMO	13.2%	22.2% **	28.0% **
Employment			
Employed	12.4%	9.4%	12.4%
Region			
Northeast	16.8%	13.5%	16.2%
Midwest	25.5%	17.7% **	4.4% **
South	40.4%	61.8% **	37.3%
West	17.3%	7.0% **	42.1% **
Urbanicity			
Live in Metropolitan Statistical Area	72.9%	86.2% **	91.6% **

Data: Panels 9–13 (2004–2009) Medical Expenditure Panel Survey

[^]Data from K6, PHQ-2, and SF-12 reflect mean scores, not percentages

* Significantly different from Whites at the $\alpha < .05$ level

** Significantly different from Whites at the $\alpha < .01$ level

Table 2

Disparities in Episodes of Mental Health Care

	Initiation of Care¹ (N=1658)		Adequacy of Care² (N=1658)			
	Estimate	SE	Estimate	SE		
White	34.8%	0.8%	18.7%	0.6%		
Black	14.5%	1.0%	8.0%	0.8%		
B-W Disparity	20.3%	1.3%	14.4%	1.0%		
Latino	24.1%	1.2%	13.6%	1.1%		
L-W Disparity	10.7%	1.4%	5.1%	1.3%		

<i>Among Individuals with Initiation of MH Care</i>						
	# Visits Per Episode (n=650)		# Days Per Episode (n=650)		Expenditures Per Episode (\$; n=650)	
	Estimate	SE	Estimate	SE	Estimate	SE
White	10.0	0.5	133.0	5.0	\$1,212.95	\$69.95
Black	10.6	0.9	147.1	10.8	\$1,786.36	\$251.86
B-W Disparity	-0.6	0.9	-14.1	10.8	\$573.41	\$245.91
Latino	16.9	1.6	190.9	16.6	\$2,423.15	\$274.37
L-W Disparity	-7.0	1.5	-57.9	17.1	\$1,210.20	\$267.65

Data: Panels 9–13 (2004–2009) MEPS

Numbers in bold represent significant disparities at $p < .05$ level

¹Treatment initiation: defined as engaging in outpatient care, prescription drug care, specialty mental health care (psychiatrist, psychologist, counselor, or social worker) or general medical provider care (primary care medical doctor) for mental health or substance abuse issues.

²Adequacy of depression treatment: defined as 8+ mental health care visits or 4+ visits with a prescription fill.

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Table 3
 Patterns of Mental Health Service Use among Individuals with Initiation of Mental Health Care

	Only Outpatient Care (No Psychotropic Drug Fill; n=650)		Only Psychotropic Drug Fill (No OP Care; n=650)		Both Outpatient Care and Psychotropic Drug Fill (n=650)	
	Estimate	SE	Estimate	SE	Estimate	SE
White	12.1%	1.1%	63.9%	1.4%	24.1%	1.3%
Black	35.5%	3.2%	43.8%	3.7%	24.7%	3.0%
B-W Disparity	-23.4%	3.1%	20.0%	3.8%	-0.7%	3.8%
Latino	26.6%	3.2%	35.0%	2.6%	40.4%	2.9%
L-W Disparity	-14.6%	3.2%	28.9%	2.7%	-16.3%	3.0%

Data: Panels 9–13 (2004–2009) Medical Expenditure Panel Survey

Numbers in bold represent significant disparities (or reverse disparities) at the p<.05 level

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Table 4

Coefficient estimates from logistic regression models of episodes of mental health care among those with probable mental health care need

	Initiation (N=1658)		Adequacy (N=1658)		# Visits (n=650)		Episode Length (n=650)		\$ Expenditures (n=650)	
	Coef	se	Coef	se	Coef	se	Coef	se	Coef	se
Race/Ethnicity										
(Referent=white)										
Black	-1	[0.25]**	-1	[0.27]**	-0.1	[0.22]	0.1	[0.21]	0.23	[0.30]
Latino	-0.5	[0.22]	-0.4	[0.24]	0.4	[0.23]	0.2	[0.21]	0.52	[0.29]
MH Status										
MH Component of SF-12	-0	[0.01]	-0	[0.01]	-0	[0.01]	0	[0.01]	-0	[0.01]
K6 score	0	[0.02]	0	[0.02]	0	[0.02]	0	[0.02]	0.06	[0.03]
PHQ-2 score	0.01	[0.07]	0	[0.07]	0.1	[0.06]	0.1	[0.06]	0.05	[0.08]
Self-rated mental health										
Very Good	0.17	[0.37]	0.3	[0.48]	0.3	[0.34]	0.2	[0.43]	0.39	[0.58]
Good	0.17	[0.33]	0.5	[0.46]	0.6	[0.32]	0.4	[0.39]	1.25	[0.58]
Fair	0.49	[0.35]	0.7	[0.47]	0.5	[0.32]	0.2	[0.38]	0.87	[0.56]
Poor	0.21	[0.40]	0.6	[0.52]	0.7	[0.38]	0.3	[0.42]	0.96	[0.65]
Health Status										
1 PH comorbidity	0.23	[0.52]	0.3	[0.66]	0.2	[0.32]	-0.1	[0.37]	0	[0.58]
2+ PH comorbidities	0.5	[0.40]	0.7	[0.57]	0.4	[0.49]	0.2	[0.52]	0.43	[0.78]
PH Component of SF-12	0.01	[0.01]	0	[0.01]	0	[0.01]	0	[0.01]	0	[0.01]
Any work limitation	-0	[0.18]	-0.2	[0.23]	0.1	[0.16]	0	[0.15]	0	[0.23]
Other Covariates										
Female	0.47	[0.16]*	0.5	[0.18]*	0.2	[0.14]	0.1	[0.14]	0.07	[0.22]
Age										
65-80	-0.2	[0.22]	-0.6	[0.24]*	-0.3	[0.19]	-0.2	[0.17]	-0.3	[0.24]
80+	-0.4	[0.25]	-1.1	[0.31]**	-0.5	[0.23]	-0.4	[0.22]	-0.7	[0.29]*
Marital Status										
Married	0.13	[0.16]	-0.1	[0.20]	-0.3	[0.14]*	-0.2	[0.14]	-0.3	[0.19]
% Federal Poverty Level										
100-124% FPL	0.52	[0.27]	0.5	[0.30]	0.2	[0.26]	0.3	[0.21]	0.2	[0.32]
125-199% FPL	-0.1	[0.24]	0.2	[0.31]	0.3	[0.22]	0.3	[0.20]	0.63	[0.31]
200-399% FPL	0.17	[0.23]	0.3	[0.28]	0.1	[0.21]	0.1	[0.20]	0.18	[0.25]
400%+ FPL	0.5	[0.25]	0.7	[0.32]	0.3	[0.23]	0.2	[0.22]	0.29	[0.28]
Education										
HS Grad	0.02	[0.19]	-0	[0.23]	-0.3	[0.18]	-0.2	[0.17]	-0.3	[0.22]
Any College	0.26	[0.24]	0.2	[0.27]	-0.1	[0.26]	-0.1	[0.23]	0.1	[0.31]
College Grad	0	[0.28]	0	[0.33]	-0.3	[0.30]	-0.1	[0.26]	-0.1	[0.37]
Health Insurance										
Any Public Insurance	0.07	[0.18]	0.4	[0.22]	0.2	[0.16]	0.2	[0.14]	0.07	[0.22]
Uninsured	-0.1	[0.32]	-0.3	[0.36]	-0.5	[0.26]	-0.4	[0.27]	-0.6	[0.40]

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	Initiation (N=1658)		Adequacy (N=1658)		# Visits (n=650)		Episode Length (n=650)		\$ Expenditures (n=650)	
	Coef	se	Coef	se	Coef	se	Coef	se	Coef	se
Race/Ethnicity										
Managed Care	-0.2	[0.21]	0.2	[0.24]	0.2	[0.18]	0.2	[0.17]	0.01	[0.22]
Employed	-0.1	[0.26]	-0.4	[0.36]	-0	[0.25]	0.3	[0.27]	0.29	[0.31]
Region										
Midwest	-0.4	[0.24]	-0.7	[0.29]	-0.1	[0.22]	-0.2	[0.24]	-0.2	[0.30]
South	-0.4	[0.21]	-0.4	[0.25]	-0	[0.17]	0	[0.17]	0.03	[0.22]
West	-0	[0.25]	-0.4	[0.28]	-0.1	[0.21]	-0.1	[0.21]	-0.1	[0.27]
Urbanicity										
Live in MSA	-0.2	[0.19]	-0.4	[0.22]	0	[0.17]	-0	[0.15]	0.05	[0.22]
Panel	0.02	[0.05]	0	[0.06]	0	[0.05]	-0	[0.05]	0.07	[0.07]
Constant	-1.5	[1.16]	-1.9	[1.40]	1	[1.28]	3.9	[1.19]	4.89	[1.58]

Data: Panels 9-13 (2004-2009) Medical Expenditure Panel Survey

* p<.05;
 ** p<.01;
 *** p<.001

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Table 5
Coefficient estimates from logistic regression models of patterns of mental health service use

Race/Ethnicity	Rx Only (n=650)		Outpatient Only (n=650)		Rx and OP (n=650)	
	Coef	se	Coef	se	Coef	se
(Referent=white)						
black	-0.94	[0.53]	1.25	[0.55]	0.08	[0.52]
hispanic	-1.28	[0.40]	1.12	[0.82]	0.6	[0.47]
MH Status						
mcs2	0.03	[0.02]	-0.06	[0.02]	0	[0.02]
k6sum2	-0.03	[0.03]	0	[0.04]	0.05	[0.03]
phq22	0.16	[0.11]	-0.24	[0.17]	-0.05	[0.11]
mhvgd2	-2.84	[1.07]	17.74	[3.17]	2.5	[1.16]
mhgood2	-3.18	[1.00]	17.72	[3.16]	2.92	[1.09]
mhfair2	-3.68	[1.04]	18.48	[3.10]	3.09	[1.13]
mhpoor2	-3.27	[1.04]	17.63	[3.09]	3.04	[1.14]
Health Status						
comorbid_1	0.35	[1.22]	0.35	[1.03]	-0.56	[1.03]
comorbid_2	0.39	[1.23]	-0.52	[0.97]	-0.03	[1.19]
pcs2	0	[0.02]	-0.02	[0.02]	0.01	[0.02]
actlim1	0.58	[0.29]	-0.42	[0.41]	-0.51	[0.31]
female	0.18	[0.29]	-0.66	[0.46]	0.07	[0.29]
Other Covariates						
Age						
age6580	-0.09	[0.36]	-0.37	[0.53]	0.25	[0.36]
age80	0.15	[0.43]	0.73	[0.61]	-0.83	[0.48]
Marital Status						
marry1x	0.73	[0.26]	-0.85	[0.43]	-0.41	[0.29]
% Federal Poverty Level						
incnear1	-0.88	[0.49]	0.06	[0.58]	0.97	[0.48]
inclo1	-1.36	[0.45]	0.72	[0.54]	1.11	[0.46]
incmid1	-0.85	[0.42]	0.2	[0.49]	0.74	[0.44]
inhigh1	-1.11	[0.51]	-0.39	[0.88]	1.41	[0.56]
Education						
hsgrad	0.43	[0.36]	0.11	[0.59]	-0.59	[0.40]
somecollege	0.41	[0.48]	1.1	[0.56]	-1.32	[0.51]
collegegrad	0.3	[0.49]	0.45	[0.68]	-0.58	[0.49]
Health Insurance						
anypublic	-0.34	[0.31]	0.11	[0.41]	0.43	[0.33]
anyunins	-0.32	[0.56]	-0.04	[0.65]	0.3	[0.51]

Race/Ethnicity	Rx Only (n=650)		Outpatient Only (n=650)		Rx and OP (n=650)	
	Coef	se	Coef	se	Coef	se
anyhmo	-1 *	[0.38]	-0.09	[0.43]	1.04 *	[0.36]
employed	-0.04	[0.48]	-0.16	[0.66]	0.13	[0.48]
midwest	0.85	[0.47]	0.18	[0.71]	-1.2	[0.57]
south	0.23	[0.35]	0.35	[0.55]	-0.47	[0.36]
west	0.09	[0.41]	0.11	[0.73]	-0.11	[0.41]
msay1	0.38	[0.32]	0.54	[0.60]	-0.72	[0.35]
panel	-0.06	[0.09]	0.09	[0.15]	0	[0.10]
Constant	2.41	[2.54]	-17.47	***	-4.18	[2.71]

Data: Panels 9-13 (2004-2009) Medical Expenditure Panel Survey

* p<.05;
 ** p<.01;
 *** p<.001

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