

# Regional Variation of Racial Disparities in Mental Health Service Use Among Older Adults

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**Purpose:** Given the paucity of research on the role of geography in mental health care, this study examined whether racial differences in mental health service use varied across geographic regions among older adults. **Design and Methods:** Drawn from the Collaborative Psychiatric Epidemiology Surveys (CPES), blacks ( $n = 1,008$ ) and whites ( $n = 1,870$ ) aged 60 and older were selected for analysis. Logistic regression analyses were conducted. **Results:** Results showed significant racial disparities in mental health service use in the overall sample, as well as significant variation by region. Although no racial differences were observed in the Northeast, West, or Midwest regions, black elders in the South were significantly less likely than whites to use mental health services (odds ratios [OR], 2.08; 95% confidence interval [CI], 1.34–3.23). **Implications:** The findings suggest that improving the access to mental health care in certain regions, the South in particular, may be essential to reduce racial disparities at the national level. Policy implications are discussed.

*Key Words:* Racial disparities, Geography, Mental health, Service use, Regional variation

This study addressed the national priority of reducing or eliminating disparities in health and health care between racial/ethnic minority and nonminority older adults. Despite inconsistent findings on racial/ethnic differences in mental health problems (Barrio et al., 2008; Miranda et al., 2008; Vega & Lopez, 2001; Williams & Earl, 2007), racial and ethnic minorities—especially blacks and Latinos—continue to utilize mental health services at only half the rate of non-Hispanic whites, even after accounting for their mental health status (AHRQ, 2010; Alegría et al., 2002; Cooper-Patrick et al., 1999; Dobalian & Rivers, 2008; Neighbors et al., 2007; Snowden, 1999, 2001; U.S. Department of Health and Human Services, 2001; Wang et al., 2005). It is especially alarming in the field of gerontology that older adults in general are less likely to use mental health services than younger adults (Mackenzie, Pagura, & Sareen, 2010).

Studies investigating factors associated with use of mental health services often rely on Andersen's (1968, 1995) behavioral model of health service utilization, a theoretical framework employed in the present study. Many studies have focused on individual-level factors to explain mental health

service use: predisposing (age, sex, and marital status), enabling (income, poverty, and educational attainment), and need factors (physical and mental health need and perceived health status; Crabb & Hunsley, 2006; Kim, Jang, Chiriboga, Ma, & Schonfeld, 2010; Kim et al., 2011; McAlpine & Mechanic, 2000; Segal, Coolidge, Mincic, & O'Riley, 2005; Sentell et al., 2007; White-Means, 2000). However, Andersen's model implicitly emphasizes the importance of geographic (area-level) factors that affect service use in addition to the individual-level factors.

An emerging body of literature suggests that geography influences mental health (Curtis, 2004; Joe, Baser, Breeden, Neighbors, & Jackson, 2006; Philo, 2005). For example, Philo (2005) suggested that geographic areas that have stressful environments are associated with mental illness. Curtis (2004) also noted in her study conducted in urban areas in the United Kingdom that mental health problems in certain areas are exacerbated by geographic characteristics such as "physical and biological risks, material deprivation, and social fragmentation or anomie." Joe and colleagues (2006) reported that blacks in the Midwest had a significantly higher risk for suicidal attempt than those in the South. This line of research underscores that geographical context is crucial in understanding variations in mental health and access to mental health care.

Despite its importance, little is known about the role of geography in racial and ethnic disparities in mental health care. There are, however, some recent studies on geographic differences in physical health care relating to racial/ethnic disparities. Baicker, Chandra, and Skinvner (2005) demonstrated the contribution of geography to black-white disparities in health care by exploring care for diabetic Medicare beneficiaries in 306 hospital referral regions of the United States. The authors found that areas with large racial disparities in monitoring of hemoglobin A1c often had overall rates of monitoring that were higher than average and, conversely, that areas with small disparities had lower-than-average overall rates. This implies that to reduce disparities at the national level, improving the overall quality of care in low-quality regions may be more effective than attempting to achieve equal rates of care across racial/ethnic groups within regions. Semrad, Tancredi, Baldwin, and Green (2011) also documented racial/ethnic disparities in colorectal cancer screening across geographic regions. These studies consistently emphasize the importance of considering geography when racial and ethnic disparities are examined.

To our knowledge, there is no published research on geographic variations in mental health service use among racially/ethnically diverse older adults. Therefore, the present study examined whether racial differences in mental health service use among older adults varied across geographic regions. Specifically, we examined the use of mental health services as a function of geographic region in a national sample of black and white elders. Given the lack of previous research on this topic in the United States and the exploratory nature of the present analyses, we did not present specific hypotheses regarding which geographic regions might differ.

## Methods

### Sample

The present study was based on nationally representative samples from the Collaborative Psychiatric Epidemiology Surveys (CPES, 2001–2003). Funded by the National Institute of Mental Health (NIMH), the CPES consists of three national surveys: (a) the National Comorbidity Survey Replication (NCS-R), (b) the National Survey of American Life (NSAL), and (c) the National Latino and Asian American Study (NLAAS). Face-to-face interviews were conducted unless the respondent specifically requested a telephone interview or if a face-to-face interview was not feasible. The CPES provides a unique opportunity to understand mental health disparities because it is the first nationally representative data set with sufficient power to allow investigation of cultural influences on mental disorders and utilization of mental health care, with special emphasis on racial/ethnic minority groups. The CPES sample frame was based on a four-stage national area probability sample conducted in a total of 252 geographic areas or primary sampling units (PSUs) across the United States. More detailed information on sampling design is available elsewhere (Heeringa et al., 2004; Pennell et al., 2004).

For the present study, we selected adults aged 60 and older who are blacks ( $n = 1,008$ ) and non-Hispanic whites ( $n = 1,870$ ). As displayed in Table 1, our sample represents 4 regions, 38 states, and 216 counties. Thirteen states were not sampled. The South has the largest number of study participants as well as the highest percentage of counties represented (46.8%). Our use of the general data set along with the unique geographic identifiers (Federal Information Processing Standard [FIPS] codes) included in a restricted data set has been approved by the Institutional Review Board (IRB) at the University of Alabama.

**Table 1. Geographic Distribution of the Sample (*n* = 2,878)**

Geographic Regions/States	<i>n</i> (number of counties)	% (percent of counties)
	2,878 (216)	100.0 (100.0)
Northeast	608 (44)	21.1 (20.4)
Connecticut	26 (4)	4.3 (9.1)
Massachusetts	89 (7)	14.6 (15.9)
New Hampshire	14 (3)	2.3 (6.8)
New Jersey	120 (12)	19.7 (27.3)
New York	312 (13)	51.3 (29.6)
Pennsylvania	47 (9)	7.7 (20.5)
South	1,141 (101)	39.7 (46.8)
Alabama	47 (6)	4.1 (5.9)
Arkansas	13 (1)	1.1 (1.0)
District of Columbia	14 (1)	1.2 (1.0)
Florida	311 (13)	27.3 (12.9)
Georgia	114 (13)	10.0 (12.9)
Louisiana	54 (7)	4.7 (6.9)
Maryland	50 (7)	4.4 (6.9)
Mississippi	41 (5)	3.6 (5.0)
North Carolina	88 (6)	7.7 (5.9)
Oklahoma	22 (1)	1.9 (1.0)
South Carolina	48 (6)	4.2 (5.9)
Tennessee	53 (5)	4.7 (5.0)
Texas	158 (11)	13.9 (10.9)
Virginia	109 (18)	9.6 (17.8)
West Virginia	19 (4)	1.7 (4.0)
Midwest	404 (42)	14.0 (19.4)
Illinois	87 (7)	21.5 (16.7)
Indiana	37 (4)	9.2 (9.5)
Iowa	18 (2)	4.5 (4.8)
Kansas	3 (2)	0.7 (4.8)
Michigan	112 (9)	27.7 (21.4)
Minnesota	33 (5)	8.2 (11.9)
Missouri	23 (6)	5.7 (14.3)
Nebraska	13 (1)	3.2 (2.4)
Ohio	53 (6)	13.1 (14.3)
Wisconsin	25 (3)	6.2 (7.1)
West	725 (29)	25.2 (13.4)
Arizona	31 (2)	4.3 (6.9)
California	505 (13)	69.7 (44.8)
Colorado	30 (5)	4.1 (17.2)
Hawaii	61 (2)	8.4 (6.9)
Nevada	11 (1)	1.5 (3.5)
Oregon	46 (2)	6.3 (6.9)
Washington	29 (3)	4.0 (10.3)
Wyoming	12 (1)	1.7 (3.5)

### Measures

**Mental Health Service Use.**—The CPES assessed use of the following mental health services to represent three service sectors: (a) specialty mental health sector (psychiatrists, psychologists, counselors, and social workers seen in mental health settings, other mental health professionals, and mental health hot-lines), (b) general medical sector (general practitioners, family doctors, nurses, occupational therapists,

and other health professionals seen for mental health problems), and (c) any other service sector (religious or spiritual advisors, counselors, social workers seen in nonmedical settings, or any alternative services). Respondents were asked to report whether or not they used these services during the past 12 months. Their answers were dichotomized to indicate whether they had used any mental health services listed earlier (coded as 1) or not (coded as 0).

**Geographic Areas.**—The CPES provides county-level FIPS codes, which are unique geographic identifiers, that can provide geographical units (e.g., states and counties) in the United States, where each participant may reside. Using these FIPS codes, we were able to classify individuals living in four main regions of the United States (Midwest, Northeast, South, and West) as defined by the U.S. Census Bureau. Although state-level analyses were conducted for descriptive purposes in the present study, county-level analyses were not conducted due to the small sample sizes of older blacks and whites in many counties.

**Covariates.**—Participants' background characteristics were employed as covariates. The variables included in the analyses were age (years), sex (women/men), marital status (married or cohabiting/divorced, separated, widowed, or never married), educational attainment (0–11 years/ 12 years/13–15 years/16 or more years), annual household income (less than \$20K/\$20K–\$34K/\$35K–\$74K/\$75K, or more), and diagnosis of any Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) psychiatric disorder in the past year (yes/no).

### Data Analysis

Pearson's chi-square tests of proportional differences and independent sample *t* tests were used to describe sample characteristics and the use of mental health services and to note statistical differences between blacks and non-Hispanic whites. In order to examine the likelihood of using mental health services, logistic regression analyses were conducted for the entire United States and stratified by region after adjusting for covariates. The proposed model included all covariates and did not use an incremental approach. This approach was chosen due to the relevance of all covariates in the study and there was no violation of Hosmer and Lemeshow's goodness of fit. The logistic regression procedure for the entire United States was

weighted to account for disproportioned sampling among the regions. All analyses were conducted using Statistical Analysis System (SAS) (version 9.2; Institute Inc, Cary, NC).

## Results

### Background Characteristics of the Sample

Table 2 summarizes sample characteristics by race. In concordance with the racial profile of the United States (U.S. Census Bureau, 2001), the South shows the highest percentage of blacks followed by the Northeast. The proportion of blacks residing in the South (49.7%) and Northeast (26.3%) was significantly higher than that of whites residing in these regions (34.2% and 18.3%, respectively), although both regions have a white majority. Socioeconomic variables indicated significant racial differences with blacks both being less educated and having lower levels of income. No racial difference was found for DSM-IV diagnosis. In addition, no significant regional differences were

found in the prevalence of DSM-IV diagnosis ( $\chi^2 = 1.71$ ,  $df = 3$ ,  $p = .635$ ; not presented in tables).

### Mental Health Service Use for All United States and by Background Characteristics

Table 3 displays mental health service use broken down by background characteristics. Of the 2,878 participants, 17.4% reported having used mental health services. Region was significantly related to service use, such that individuals in the Northeast and South reported lower mental health service use than did those in the Midwest and West. Race was significantly related to service use, such that blacks' utilization rate was 6.4% lower than the rate for whites.

All covariates except marital status were significantly related to mental health service use. Those who used services tended to be younger and more educated, and to have greater income. Women were more likely to report using services than men. Those who reported having any DSM-IV

Table 2. Sample Characteristics by Race ( $n = 2,878$ )

Variable	Race		Statistic	df	p value <sup>a</sup>
	Black, <i>n</i> (%)	White, <i>n</i> (%)			
Total	1,008 (35.0)	1,870 (65.0)			
Region					
Northeast	265 (26.3)	343 (18.3)	$\chi^2 = 184.17$	3	<.001
South	501 (49.7)	640 (34.2)			
Midwest	131 (13.0)	273 (14.6)			
West	111 (11.0)	614 (32.8)			
Age (Mean $\pm$ SD)	69.9 $\pm$ 7.5	71.3 $\pm$ 7.9	$t = -4.44$	2,876	<.001
Sex					
Men	376 (37.3)	746 (39.9)	$\chi^2 = 1.85$	1	.174
Women	632 (62.7)	1,124 (60.1)			
Marital Status					
Married	318 (31.8)	986 (52.8)	$\chi^2 = 115.67$	1	<.001
Not married	682 (68.2)	882 (47.2)			
Education					
0–11 years	456 (45.2)	446 (23.9)	$\chi^2 = 144.28$	3	<.001
12 years	276 (27.4)	658 (35.2)			
13–15 years	127 (12.6)	403 (21.6)			
$\geq 16$ years	149 (14.8)	363 (19.4)			
Income					
<\$20k	522 (57.0)	334 (31.6)	$\chi^2 = 115.67$	3	<.001
\$20k–\$34k	179 (19.5)	258 (24.4)			
\$35k–\$74k	152 (16.6)	313 (29.6)			
$\geq$ \$75k	63 (6.9)	153 (14.5)			
Any DSM-IV Diagnosis (12 months)					
Yes	51 (5.2)	83 (4.6)	$\chi^2 = 0.50$	1	.479
No	937 (94.8)	1,735 (95.4)			

Notes. <sup>a</sup>All *p* values were based on a Pearson's  $\chi^2$  and an independent samples *t* test (age variable with mean  $\pm$  SD), DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV.

Table 3. Mental Health Service Use for All United States and By Background Characteristics ( $n = 2,878$ )

Variable	Mental health service use		Statistic	df	p value <sup>a</sup>
	Yes, $n$ (%)	No, $n$ (%)			
Total	500 (17.4)	2,378 (82.6)			
Region					
Northeast	89 (14.6)	519 (85.4)	$\chi^2 = 20.83$	3	<.001
South	170 (14.9)	971 (85.1)			
Midwest	90 (22.3)	314 (77.7)			
West	151 (20.8)	574 (79.2)			
Race					
Black	133 (13.2)	875 (86.8)	$\chi^2 = 18.87$	1	<.001
White	367 (19.6)	1,503 (80.4)			
Age (Mean $\pm$ SD)	69.8 $\pm$ 7.7	71.0 $\pm$ 7.8	$t = -4.44$	2,876	<.001
Sex					
Men	137 (12.2)	985 (87.8)	$\chi^2 = 34.15$	1	<.001
Women	363 (20.7)	1,393 (79.3)			
Marital Status					
Married	216 (16.6)	1,088 (83.4)	$\chi^2 = 1.26$	1	.263
Not married	284 (18.2)	1,280 (81.8)			
Education					
0–11 years	116 (12.9)	786 (87.1)	$\chi^2 = 27.11$	3	<.001
12 years	158 (16.9)	776 (83.1)			
13–15 years	110 (20.8)	420 (79.3)			
$\geq 16$ years	116 (22.7)	396 (77.3)			
Income					
<\$20k	134 (15.7)	722 (84.4)	$\chi^2 = 15.68$	3	.001
\$20k–\$34k	80 (18.3)	357 (81.7)			
\$35k–\$74k	95 (20.4)	370 (79.6)			
$\geq$ \$75k	58 (26.9)	158 (73.2)			
Any DSM-IV Diagnosis (12 months)					
Yes	69 (51.5)	65 (48.5)	$\chi^2 = 125.06$	1	<.001
No	394 (14.8)	2,278 (85.3)			

<sup>a</sup>All  $p$  values were based on a Pearson's  $\chi^2$  and an independent samples  $t$  test (age variable with mean  $\pm$  SD), DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV.

psychiatric disorder were more likely to report using services than those who did not.

#### Logistic Regression of Mental Health Service Use for Entire United States and by Region

Table 4 summarizes the probability of using mental health services as a function of geographic region. Results from logistic regression analyses without controlling for covariates show significant racial and regional differences in mental health service use: older adults who are white (odds ratios [OR], 1.49; 95% confidence interval [CI], 1.20–1.86) and who reside in the Midwest (OR, 1.57; 95% CI, 1.18–2.09) and the West (OR, 1.35; 95% CI, 1.05–1.73) were more likely to use mental health services than those who are black and reside in the South (not presented in tables).

After controlling for all covariates, no regional differences were found in mental health service use in the entire United States. Compared with our finding on significant regional differences from descriptive statistics and logistic regression analyses without covariates, this finding may be related to the differential effects of certain covariates such as sex, education, income, and psychiatric disorders across regions controlled in multivariate analyses. However, racial differences persisted with whites being almost twice more likely to use mental health service than blacks.

Among covariates, women were more than 2.5 times more likely to use services than men. Of the socioeconomic status variables (education and income), only education was found to be a significant predictor of mental health service use, with participants with 16 or more years of education being more than twice



Table 4. Adjusted Odds Ratios (OR) of Mental Health Service Use for All United States and by Region ( $n = 2,878$ )

Predictor	All United States <sup>a</sup>		Northeast		South		Midwest		West	
	OR	95% CI <sup>b</sup>	OR	95% CI <sup>b</sup>	OR	95% CI <sup>b</sup>	OR	95% CI <sup>b</sup>	OR	95% CI <sup>b</sup>
<b>Region</b>										
South	1.00	Referent	—	—	—	—	—	—	—	—
Northeast	0.83	0.57, 1.20	—	—	—	—	—	—	—	—
Midwest	1.13	0.76, 1.69	—	—	—	—	—	—	—	—
West	1.14	0.84, 1.55	—	—	—	—	—	—	—	—
<b>Race</b>										
Black	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
White	1.92*	1.15, 3.22	1.58	0.84, 2.97	2.08**	1.34, 3.23	1.80	0.89, 3.64	1.44	0.70, 2.94
<b>Covariates</b>										
<i>Predisposing Covariates</i>										
Age	0.99	0.97, 1.01	0.98	0.94, 1.02	0.97	0.94, 1.00	0.99	0.95, 1.03	0.98	0.95, 1.02
<b>Sex</b>										
Men	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Women	2.69***	2.01, 3.62	1.86	0.95, 3.63	2.72**	1.64, 4.52	2.06	0.98, 4.32	1.89*	1.07, 3.33
<b>Marital Status</b>										
Married	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Not Married	1.07	0.79, 1.45	0.77	0.37, 1.60	0.81	0.49, 1.34	1.12	0.54, 2.33	1.53	0.84, 2.80
<b>Enabling covariates</b>										
<b>Education</b>										
0–11 years	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
12 years	1.26	0.89, 1.78	2.13	0.97, 4.67	1.17	0.66, 2.07	0.67	0.28, 1.62	1.28	0.64, 2.56
13–15 years	1.02	0.67, 1.54	1.41	0.51, 3.92	1.66	0.87, 3.18	0.57	0.20, 1.60	1.63	0.72, 3.71
≥16 years	2.11**	1.40, 3.18	2.84*	1.09, 7.40	2.79**	1.45, 5.34	1.24	0.49, 3.15	1.72	0.75, 3.95
<b>Income</b>										
<\$20k	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
\$20k–\$34k	1.02	0.71, 1.45	1.03	0.46, 2.28	0.83	0.46, 1.50	2.30	0.90, 5.88	1.35	0.65, 2.80
\$35k–\$74k	0.85	0.59, 1.24	0.81	0.31, 2.11	1.08	0.58, 2.01	1.25	0.48, 3.25	1.14	0.53, 2.47
≥\$75k	1.03	0.66, 1.62	1.39	0.48, 4.07	0.77	0.33, 1.79	1.73	0.54, 5.51	2.59**	1.07, 6.29
<b>Mental health need covariates</b>										
<b>Any DSM-IV Diagnosis (12 months)</b>										
No	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Yes	7.62***	4.77, 12.18	4.66**	1.97, 11.01	6.49**	3.53, 11.93	5.37**	1.86, 15.57	7.70**	3.02, 19.63

Notes. <sup>a</sup>Logistic regression analysis for all United States was weighted and normalized due to oversampling in some regions.

<sup>b</sup>All  $p$  values were based on the Wald  $\chi^2$  statistic. CI = confidence interval; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

as likely to use the service than those with less than a high school education. Again, having any DSM-IV psychiatric disorder within the last 12 months was the strongest predictor of using mental health services in the overall sample.

When examining disparities within each region, significant racial differences were found only in the South, with the odds of whites' using mental health services being 2.08 times greater than that of blacks. Without controlling for covariates, results were similar except for the Northeast. Although the significance of the race effect remained the same for the South with some minor changes in OR, the race effect for the Northeast became significant (OR, 1.63; 95% CI, 1.02, 2.61; not presented in tables). When controlling for covariates, older adults residing in the South showed more disparities in using mental health services than the other regions. There were sex differences in both the South and the West, with women more likely to use services than men. Educational differences existed in the Northeast and the South with those having the highest levels of education utilizing service more than those in the lowest category. The West was the only region to show income as a predictor of mental health service use; the odds of using mental health services for those with greater than or equal to \$75,000 annual income were 2.59 times greater than those for individuals with less than \$20,000 annual income. Having any DSM-IV psychiatric disorders in the past 12 months was predictive across all regions, with those having disorders being more likely to use mental health services.

Southern states included in the present study were analyzed to explore the states that specifically contribute to black–white disparities at the national level. Among 15 southern states included in the study, we were able to conduct additional analyses for four states having at least five participants in each cell (black vs white/yes vs no on service use in the past year) of the state-level contingency table. All four states (Florida, Georgia, Texas, and Virginia) consistently showed lower utilization rates among older blacks compared with their white counterparts. The black–white gaps in utilization rates were most apparent in Florida (9.27%) and least apparent in Georgia (1.36%).

## Discussion

Racial differences in mental health service use differ substantially by region. To our knowledge, this is the first study reporting the interactive role of race and geography in mental health service use

among older adults. Using a nationally representative sample, we found clear evidence that black–white disparities in mental health service use at the national level were largely due to racial disparities in the South. Older whites in the South were much more likely to use mental health services than their black counterparts, but there were no significant racial differences in the rest of the country. The findings suggest that to reduce black–white gaps in mental health service use at the national level, special attention should be paid to improve access to mental health care in the South.

Potential reasons for the black–white disparities in mental health service use in the South deserve further discussion. Regional differences in race and culture may influence attitudes toward mental health service use. Previous research suggests that culture is an important predictor of receiving preventive care among racial and ethnic minorities (Goel et al., 2003; Kandula, Wen, Jacobs, & Lauderdale, 2006). Thus, older blacks and whites may have different attitudes toward mental health service use, which may in turn affect willingness to seek professional help for mental health problems. Distrust and poor information regarding general health care procedures (Ibrahim, Siminoff, Burant, & Kwok, 2002) may contribute to racial disparities in mental health care. Regional variations of racial disparities across the United States may also reflect problems with access to mental health care and limits on the availability of mental health services in communities with large proportions of blacks.

Our additional analyses on the four southern states (Florida, Georgia, Texas, and Virginia) consistently showed lower utilization rates among older blacks compared with their white counterparts. This clearly suggests that we need to investigate local- or area-level barriers that impair mental health service utilization rates among older blacks in the South more so than in other areas. It should be also noted that we were not able to test these potential causal factors in the present study because CPES did not measure such variables. Future research should elucidate reasons for the lower mental health service use among older blacks in the South.

The present study has policy implications. In order to reduce racial disparities in the mental health service use across the United States, policy interventions targeting certain geographic areas are needed. Given that racial/ethnic minorities live disproportionately in areas with low quality of care (Baicker et al., 2005), racial disparities in mental

health service use across the United States could be reduced by addressing the problem of regional variations in the utilization of services. Therefore, policymakers should target reducing disparities in mental health care arising from geographic areas, which may in turn improve mental health care received by all U.S. older adults and by minority older adults in particular. Further research is required to provide more information about how geographic and regional factors relate to disparities in mental health service use. More detailed analyses at the county or local level would be desirable to support development of policy interventions.

Some limitations should be noted. First, the lowest level of geography analyzed was the state. Although the CPES provides county-level FIPS codes, sample sizes for older blacks and whites in some areas were not adequate for meaningful comparisons. Second, subgroup differences among older blacks were not examined in the present analysis. Previous research suggests the importance of examining subgroups in health disparities research, reporting evidence of cultural differences between Caribbean blacks and African Americans in the United States (Joe et al., 2006). Future research should consider examining potential subgroup differences. Third, other racial/ethnic groups were not considered in the present study. Future research should examine how geography influences mental health service use in other racial/ethnic groups, such as Latinos/Hispanics and Asians. Fourth, future studies might benefit from analyzing larger numbers of individuals who have DSM-IV diagnoses to allow sufficient statistical power to examine how his might relate to mental health disparities. Our logistic regression model suggested that use of mental health services by those with DSM-IV diagnoses might be affected by different factors compared with those without diagnoses. However, given that the sample is small ( $n = 134$ ), we did not have enough power to detect an association if one exists. Fifth, although the CPES is a nationally representative data, 13 states were not included in our analyzed sample. Finally, the present study did not control for the effects of other important covariates such as religiosity, cultural factors, and local area-level characteristics (e.g., availability of mental health services such as mental health specialists and community mental health centers, rural vs urban differences, percentage of insured populations) that might affect service utilization for mental health problems. A related limitation is that the present

study did not include any variables on regional structure of African American and non-Hispanic whites in the United States, for example, more than 50% of all African Americans in the United States resided in the South region in the 2000 census (the closest one to the data used in the present study; U.S. Census Bureau, 2001). Future research should examine whether these factors are responsible for observed regional differences.

In sum, we found clear evidence that regional variations in mental health service use among older blacks contribute to the black-white disparities in service use at the national level. Future research should examine local and regional barriers that affect mental health service use among older blacks in geographic areas where greater disparities exist. Given that racial disparities existed only in the South across the four regions in the United States, future research should focus on the southern states to conduct more detailed analyses at the state-level to elucidate potential reasons for disparities.

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