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DISSERTATION

Disparities in Trauma and Mental Health Service Use

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This document was submitted as a dissertation in September 2010 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Lisa Meredith (Chair), Eunice Wong, and Susan Paddock.

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Abstract

A burgeoning literature suggests that significant disparities in posttraumatic stress disorder (PTSD) risk may exist, especially for racial-ethnic minorities and women. Individuals with PTSD report more barriers to care than those with other anxiety disorders, and only about half of those with PTSD receive even minimally adequate treatment. However, little is known about the interaction of race-ethnicity and gender in trauma and PTSD or about PTSD treatment patterns and preferences by demographic group.

This study examined racial-ethnic and gender disparities in trauma and PTSD, barriers to mental health care, and mental health service utilization. The research employed the Collaborative Psychiatric Epidemiology Surveys, a large, national dataset containing 20,013 diagnostic interviews; 1,194 of those interviewed met criteria for PTSD at some point in their lives. Analyses consisted of design-corrected cross-tabulations and recycled predictions from regression models that controlled for a vector of sociodemographic characteristics.

Significant racial-ethnic and gender disparities were found in trauma and PTSD that are largely unexplained by sociodemographic differences, and there are racial-ethnic and gender interactions for both trauma and PTSD. Perceived barriers with significant racial-ethnic differences for those with PTSD include uncertainty about who to see, the problem not bothering them much, and treatment not working before; there are gender differences in worry about what others will think and inability to get an appointment. Mental health service use for those with PTSD is not significantly different by race-ethnicity after adjusting for sociodemographic characteristics, but men with PTSD have

significantly fewer visits and are less likely to receive minimally adequate treatment than women.

Existing PTSD studies frequently focus on select subpopulations or types of trauma, so this research builds on the literature by using the first studies sufficiently large and diverse to examine disparities in mental health and health services. Results can be used to better target trauma prevention and intervention efforts, improve quality of care and health outcomes for those with PTSD, and inform funding and policy decisions to eliminate disparities in trauma and mental health services.

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Paper I: Disparities in Trauma and PTSD

One of the most striking health disparities is in the area of mental health (National Institutes of Health 2002), yet, there is a paucity of research on mental health disparities to guide policy (United States Department of Health and Human Services 2001). Racial-ethnic minorities make up a growing percentage of the U.S. population, and many enter this country as refugees from war-torn countries or reside in poor urban environments. A burgeoning literature suggests that significant racial-ethnic as well as gender disparities in posttraumatic stress disorder (PTSD) may exist, so it is important to examine how risk varies by racial-ethnic and gender group, to what extent disparities are explained by sociodemographic differences between groups, and whether the same gender patterning in trauma and PTSD may be found across all racial-ethnic groups. This interaction between race-ethnicity and gender in trauma exposure and PTSD has not been studied previously in a national sample.

Most Americans will experience a traumatic event at some point in their lives, and the majority of those who experience trauma will be exposed to multiple types (Kessler, Sonnega et al. 1995). It is estimated that about 8% of individuals who experience a traumatic event will develop PTSD (Kessler, Sonnega et al. 1995). One of the most common anxiety disorders (Kessler, Chiu et al. 2005), PTSD develops after exposure to a traumatic or stressful event, such as combat, disaster, mugging, sexual assault, life-threatening illness or injury, and witnessing serious fights. Symptoms include recurrent and intrusive recollections of the event, avoidance of stimuli associated with the event,

numbing of general responsiveness, and persistent feelings of increased arousal (American Psychological Association 1994).

Previous studies have found that racial-ethnic minorities are at high risk for exposure to trauma and for the onset of PTSD (Pole, Gone et al. 2008). Women are at greater risk of experiencing particular traumas like sexual assault and rape (Kessler, Sonnega et al. 1995). Further, women have both a higher overall prevalence of PTSD (Tolin and Foa 2006; Olff, Langeland et al. 2007) and are much more likely to develop PTSD in response to most traumas (Kessler, Sonnega et al. 1995). However, many PTSD studies focus on select subpopulations or types of trauma, and findings may not generalize to the population. For example, studies focus on veterans (e.g., Tanielian and Jaycox 2008), adolescents (e.g., Sabin, Zatzick et al. 2006), specific traumas like 9/11 (e.g., Boscarino, Adams et al. 2005), or particular injuries like facial injuries (e.g., Chandra, Marshall et al. 2008). Research on PTSD is still relatively young (Tolin and Foa 2006), and PTSD did not appear as a diagnosis in the American Psychiatric Association's official classification guide, the Diagnostic and Statistical Manual of Mental Disorders (DSM), until 1980 (Scott 1990). Thus, compared with other mental disorders, the literature on PTSD is relatively sparse.

This study advances knowledge of PTSD by taking advantage of epidemiologic data to look more in depth at the relationship between race-ethnicity, gender, trauma, and PTSD. Previous population estimates of PTSD were derived from the National Comorbidity Survey (NCS; Kessler, Sonnega et al. 1995), but the Collaborative Psychiatric Epidemiology Surveys (CPES) are the first data sufficiently large and diverse to examine disparities in mental health (Colpe, Merikangas et al. 2004). The CPES

updates the NCS and includes parallel surveys of racial-ethnic minorities. By using this larger, more diverse dataset with additional trauma exposure items and rich sociodemographic information, and by rigorously examining racial-ethnic and gender interactions, this study makes a significant contribution to the literature on disparities in trauma and PTSD.

The key objectives of this study are to 1) examine how risk of trauma and PTSD vary by racial-ethnic and gender group; 2) identify the extent to which sociodemographic differences between groups explain variation in trauma and PTSD; 3) describe any interactions between race-ethnicity and gender in trauma exposure and PTSD. Disparities are defined in this study as differences between the most advantaged racial-ethnic group (i.e., non-Latino Whites) and all other groups, as well as gender differences in health risks and outcomes (Braveman 2006).

Approach

Data source. This study uses the CPES, a large nationally-representative community household survey designed to collect epidemiological data on mental disorders and impairments. This dataset was created by the University of Michigan's Institute for Social Research and merges the National Comorbidity Survey Replication (NCS-R, n=9,282), National Survey of American Life (NSAL, n=6,082), and National Latino and Asian American Study (NLAAS, n=4,649). The NCS-R sample is nationally-representative of English-speaking adults, the NSAL is representative of Black Americans of African and Caribbean descent, and the NLAAS is representative of Latinos (Cuban, Mexican, Puerto Rican, and other Latinos) and Asians (Chinese,

Filipino, Vietnamese, and other Asians) (Pennell, Bowers et al. 2004). Sample sizes were chosen to achieve targeted sample precision for diagnostic estimates and power to detect racial-ethnic group differences (Heeringa, Wagner et al. 2004). Interviews were face-to-face and conducted by professional interviewers in English, Spanish, Mandarin, Cantonese, Tagalog, and Vietnamese (Pennell, Bowers et al. 2004). More information about the CPES data can be found in Heeringa et al. 2004.

Weighting. Study-specific, design-based weights were developed by the CPES investigators to adjust for differential nonresponse and population representation of sociodemographic characteristics. Integrated weights were developed by rescaling the weights for each study based on a multiple frame approach to estimation and inference about population characteristics. This allows analysts to treat the pooled CPES data as a single, complex sample[1] (Heeringa and Berglund 2007).

Sample. The full CPES data contain 20,013 interviews with non-Latino Whites, Vietnamese, Filipinos, Chinese, other Asians, Cubans, Puerto Ricans, Mexicans, other Hispanics, Afro-Caribbeans, African Americans, other race-ethnicities (e.g., Pacific Islander, Native American)[2]. If a respondent chose multiple categories in the NSAL and NLAAS they were assigned based on priority order; if NCS-R cases couldn't be mapped to a racial-ethnic category they were randomly assigned based on Census characteristics of their neighborhood (Heeringa and Berglund 2007). This study focuses on the 15,376 respondents who were given the PTSD module. Of these, 4,199 are non-Latino White;

[1] There are actually two weight vectors for the CPES, since the NCS-R survey has two parts and some respondents were only administered the first part (Heeringa and Berglund, 2007). Because this study focused on trauma and PTSD which are in part two of the NCS-R, analyses utilized the second set of weights and focused on a somewhat smaller sample (i.e., those who took part two of the NCS-R and everyone from the NSAL and NLAAS).

[2] For these analyses, Vietnamese, Filipino, Chinese, and other Asian respondents were considered Asian. Cuban, Puerto Rican, Mexican, and other Hispanic respondents were considered Latino. Afro-Caribbean and African American respondents were combined and noted as AA/AC (these groups have comparable rates of overall trauma, though African Americans are less likely to experience disaster or war). Those in "other" racial-ethnic categories (e.g., Pacific Islanders, Native Americans) were dropped from subgroup analyses because sample sizes were too small to analyze.

2,178 are Asian; 3,263 are Latino, and 5,546 are African American/ Afro-Caribbean (AA/AC). The study includes 6,365 men and 9,011 women.

Measures. There are 29 trauma exposure items in the CPES; respondents were asked if they ever experienced each type of trauma. These items were categorized for analyses into accidents, childhood trauma, disasters, interpersonal trauma, war, sexual trauma, and vicarious trauma. Accidents include exposure to a toxic chemical, life-threatening auto accident, and other life-threatening accidents. Childhood trauma includes being badly beaten by parents and witnessing serious fights at home as a child. Disaster includes exposure to major natural disasters and man-made disasters. Interpersonal trauma includes being kidnapped or held captive; being badly beaten by a partner; being badly beaten by anyone else; and being mugged, held up, or threatened with a weapon. War includes combat, being a relief worker in war, being an unarmed civilian in war, living in a place with ongoing terror, and being a refugee. Sexual trauma includes rape, sexual assault, and stalking. Vicarious trauma includes someone very close dying unexpectedly, having a child with a life-threatening illness or injury, someone very close having a traumatic experience, seeing someone badly injured or killed, accidentally injuring or killing someone, purposely injuring or killing someone, and seeing atrocities or carnage. Indicators for exposure to any trauma, one trauma, two traumas, three traumas, and four or more traumas were also constructed. The item on life-threatening illness and the items on any other traumatic event or an event the respondent does not want to talk about are included in overall trauma analyses but were not categorized.

DSM-IV diagnoses of PTSD were based on the World Health Organization's version of the Composite International Diagnostic Interview (CIDI), a fully-structured, lay-administered, diagnostic interview. The CIDI has been found to have moderate to good individual-level concordance with the Structured Clinical Interview for DSM-IV for prevalence estimates of PTSD, and CIDI prevalence estimates are unbiased (Haro, Arbabzadeh-Bouchez et al. 2006).

Sociodemographic characteristics included in the study were race-ethnicity (non-Latino White, Asian, Latino, AA/AC), gender, age (18-29, 30-44, 45-59, 60+), marital status (married/cohabitating, divorced/separated/widowed, never married), poverty (based on 2001 U.S. Census income-to-needs ratios: income greater than needs, income equals needs, income below needs), health insurance coverage (public/private/other, none), region (Northeast, South, Midwest, West), education (0-11, 12, 13-15, 16+ years), work status (employed, unemployed, not in labor force), and nativity status (US born, non-US born). Table 1 describes the CPES sample used in this study by race-ethnicity.

Analysis procedures. All analyses were completed using Stata 11 and used robust variance estimators to adjust standard errors for the complex sampling design. RAND's Institutional Review Board determined that this study was exempt from human subjects review.

Racial-ethnic disparities in exposure to any trauma, types of trauma, number of traumas, and association between trauma and PTSD were analyzed using logistic regression models that adjusted for sociodemographic characteristics. Recycled predictions (i.e., predictive margins; Graubard and Korn 1999) were calculated by race-ethnicity and gender, and for the interaction of race-ethnicity and gender. Differences by

race-ethnicity and gender were assessed using design-based F tests of regression coefficients, and pairwise differences for significant effects by race-ethnicity were assessed using Sidak-adjusted Wald tests between each minority group and non-Latino Whites. An overall test of racial-ethnic and gender interaction was conducted for each trauma type and association between each trauma type and PTSD, and pairwise tests examined gender differences within each racial-ethnic group.

Unadjusted analyses included weighted cross-tabulations by race-ethnicity and gender as well as tests of significant differences. Adjusted results were compared with unadjusted results to examine the extent to which racial-ethnic and gender differences in trauma and PTSD are explained by other sociodemographic characteristics (e.g., age, poverty, nativity status). Results presented are adjusted unless otherwise noted.

Results

Description of those with PTSD. Among the 1194 individuals with lifetime PTSD, 429 are non-Latino White, 42 are Asian, 201 are Latino, and 486 are AA/AC. Significant racial-ethnic differences ($p<.01$; weighted unadjusted) were found for all measured sociodemographic characteristics. For example, nearly three-quarters of those with lifetime PTSD are female. Ages range from 18 to 86, but Asians have the largest percentage age 60 and older. Over half of those with lifetime PTSD are married or cohabitating; this drops to just over a third for AA/ACs. Over a quarter of the entire subsample with PTSD is at or below poverty, while nearly half of AA/ACs live at or below poverty. 83.8% have some form of health insurance, but AA/ACs and Latinos are least likely to be insured. While the sample was selected from throughout the U.S., the

majority of Asians reside in the West. Nearly a quarter of the sample has more than 15 years of education, and Asians are most likely to have received higher education. Nearly two-thirds of those with PTSD are employed; Asians are most likely to be out of the labor force. While 98.0% of non-Latino Whites with PTSD are U.S.-born, barely a third of Asians with PTSD were born in the U.S.

Prevalence of trauma by race-ethnicity and gender. The adjusted lifetime prevalence of trauma in the full sample is 82.3%, and there are significant racial-ethnic and gender differences in most types of trauma exposure (see Table 2). Racial-ethnic differences are found for every type of trauma except disasters, and most differences are disparities. AA/ACs are more likely than non-Latino Whites to experience any trauma and four or more traumas, and they are also more likely to experience childhood trauma, interpersonal trauma, war, sexual trauma, and vicarious trauma. Non-Latino Whites, however, are more likely than minorities to experience accidents (i.e., there is no disparity for accidents). Unadjusted rates of trauma exposure are similar to adjusted probabilities (results not shown), except that non-Latino Whites are less likely than Asians to experience childhood trauma and war before adjustments are made. Non-Latino Whites are more likely than Asians and Latinos to experience any trauma and two traumas in unadjusted analyses.

There are also significant differences between men and women on every type of trauma, as well as for any trauma and four or more traumas. Men are significantly more likely to experience accidents, disasters, interpersonal trauma, war, vicarious trauma, any trauma, and four or more traumas, while women are significantly more likely to

experience childhood trauma, sexual trauma, and only one trauma. Unadjusted probabilities are similar to adjusted rates (results not shown).

Trauma exposure interactions. There is a significant interaction between race-ethnicity and gender for every trauma type, as well as any trauma exposure (all $p<.01$; see Figure 1). With a few exceptions, the gender patterning within each racial-ethnic group is similar. For example, women in each racial-ethnic group are less likely than men to experience any trauma, accidents, disasters, interpersonal trauma, war, and vicarious trauma, while women in each group are more likely to experience sexual trauma than men. There is no gender difference for Latinos on childhood trauma, vicarious trauma, or any trauma.

Prevalence of PTSD by race-ethnicity and gender. There are significant racial-ethnic and gender differences in the association between every type of trauma and PTSD (see Table 3). Racial-ethnic differences are not disparities, however: all types of trauma are associated with lower rates of PTSD for Asians and Latinos than for non-Latino Whites. There is no significant difference between AA/ACs and non-Latino Whites in the association between trauma and PTSD. Childhood and sexual trauma are associated with the highest rates of PTSD for all racial-ethnic groups, while vicarious trauma is associated with the lowest rates of PTSD for all groups. Not surprisingly, within each racial-ethnic group, additional trauma exposure is related to a higher probability of PTSD. These patterns are similar without adjusting for other sociodemographic characteristics (results not shown). However, the association between trauma and PTSD is somewhat higher for AA/ACs before adjustments are made, and the pairwise difference between AA/ACs and non-Latino Whites is significant in unadjusted results

for most trauma types. Also, the trauma type least associated with PTSD before adjustments are made is war.

There are also significant gender differences in PTSD: women are much more likely than men to develop PTSD following all types of trauma. Childhood and sexual trauma are most associated with PTSD for both genders, while vicarious trauma is least associated with PTSD. Additional trauma exposure is related to more PTSD for both men and women. The patterns are similar before adjustments are made (results not shown); however, war is least associated with PTSD in unadjusted results for both genders.

PTSD interactions. There are significant interactions between race-ethnicity and gender for the associations between each trauma type and PTSD (all $p<.01$). That is, trauma is associated with significantly higher rates of PTSD for women than for men within each racial-ethnic group for every trauma type examined. Figure 2 shows the association between any trauma and PTSD by race-ethnicity and gender; results are not shown for individual trauma types since patterns are very similar. One exception is that there is no significant gender difference for Latinos on sexual trauma.

Discussion

This research builds on the nascent PTSD disparities literature by examining the relationship between race-ethnicity and gender in trauma and PTSD using the first national dataset large enough to investigate mental health disparities (Colpe, Merikangas et al. 2004). Findings suggest there are significant racial-ethnic and gender differences in most types of trauma that are largely unexplained by other sociodemographic

characteristics. In general, AA/ACs have higher trauma exposure and Asians and Latinos have lower trauma exposure than non-Latino Whites. This suggests that there is only a disparity in trauma exposure for AA/ACs. Men experience more trauma than women, and there are significant interactions between race-ethnicity and gender in trauma exposure. However, all groups have relatively high levels of trauma exposure.

There are also significant differences by group in the association between trauma and PTSD that are unexplained by sociodemographic differences. Trauma is associated with PTSD significantly less for Asians and Latinos than non-Latino Whites even after adjustments are made, suggesting that there is not a disparity in PTSD for Asians and Latinos. In contrast, although AA/ACs have significantly higher rates of PTSD than non-Latino Whites before adjustments are made, this disparity appears to be explained by sociodemographic differences between AA/ACs and non-Latino Whites. Finally, women bear the largest burden of PTSD within each racial-ethnic group and for every type of trauma exposure.

One interesting finding from this study is that Asians have relatively high rates of trauma exposure but low rates of PTSD. Indeed, each category of trauma exposure is associated with lower probability of lifetime PTSD for Asians than for other racial-ethnic groups. This incongruity remains after adjusting for gender, age, marital status, poverty, insurance, region, education, work status, and nativity status, suggesting that there is a discrepancy between trauma experiences and PTSD for Asians. Asian men are significantly more likely to be traumatized than Asian women, although there is no gender difference in the association between trauma and PTSD for Asians.

One explanation for this discrepancy might be that Asians—and especially Asian men—are highly resilient to trauma. That is, there is something about being Asian that is protective against developing PTSD. For example, Asians may come from more collectivistic backgrounds than non-Latino Whites, and these cultures may value harmony and interdependence over individual desires (Pole, Gone et al. 2008). It is also possible that Asians are simply less likely to report PTSD symptoms. For example, emotional control may be viewed as a sign of strength in Asian cultures, public disclosure of mental health issues may be looked down upon, and religious traditions such as Hinduism and Buddhism may promote the endurance of suffering (Pole, Gone et al. 2008).

There also may be cultural differences in measurement of PTSD. However, NLAAS developers paid careful attention to cultural relevance, equivalence, and generalizability across measures, including internal consistency across languages (Alegria, Vila et al. 2004). Further, because the CPES actually diagnosed PTSD in a population sample rather than surveying only those who had been diagnosed in clinical settings, the sample includes all those who met diagnostic criteria, regardless of whether they actually identify as having PTSD.

Post-hoc analyses show that Asians in general report better health status than non-Latino Whites, that this pattern holds for the subsample of those with lifetime PTSD, and that there is no significant difference between Asian men and Asian women on self-reported health status. Other studies have found that the meaning of self-rated health does not vary by racial-ethnic group (Chandola and Jenkinson 2000) but Asians tend to report better health status than non-Latino Whites (Meredith and Siu 1995), so this

provides further evidence that Asians may actually have lower rates of PTSD than non-Latino Whites.

Future research should examine the link between trauma and PTSD in Asians and how that may vary by gender. If indeed Asians are more resilient to trauma, studies could examine which characteristics contribute most to this psychological resilience. Results from such studies could be used to guide prevention and intervention efforts by promoting strategies for addressing distress that resonate with particular subgroups. Within group analyses (i.e., Vietnamese, Filipino, Chinese, other Asians) may also be useful, given the diversity in cultures, languages, and circumstances for migrating to the U.S. (Pole, Gone et al. 2008). Preliminary analyses suggest that Vietnamese participants have high levels of trauma exposure but low levels of PTSD, while Chinese participants have low levels of trauma exposure but high levels of PTSD.

Another interesting finding from this study is the complex relationship between race-ethnicity and gender for childhood trauma and PTSD. Childhood trauma is highly associated with PTSD across racial-ethnic groups and genders, but Latinos and AA/ACs are significantly more likely than non-Latino Whites to experience childhood trauma while Asians are less likely than non-Latino Whites to experience childhood trauma. Women overall report more childhood trauma than men, and rates are higher among AA/AC women than AA/AC men. Notably, however, rates of childhood trauma are higher among Asian men than Asian women. Childhood trauma is more likely to be associated with PTSD for non-Latino Whites than Asians and Latinos and for women than men. There is also a significant racial-ethnic and gender interaction: childhood trauma is associated with a higher risk of PTSD for women compared to men within each

racial-ethnic group, with the exception of Asians where the gender difference is not significant.

Other studies of childhood maltreatment have found mixed results depending on the type of trauma. For example, one study of adolescents found males to be more at risk of supervision neglect and physical neglect than females, but it found few racial-ethnic differences in child maltreatment after adjusting for other sociodemographic characteristics (Hussey, Chang et al. 2006). Another study found that females are more at risk of childhood sexual abuse than males but that there is no difference for physical abuse. It also found that Whites are slightly more at risk for sexual abuse than non-Black minorities, and Blacks are at much higher risk than both Whites and non-Black minorities for physical abuse (Cappelleri, Eckenrode et al. 1993). However, neither study accounted for racial-ethnic and gender interactions or examined PTSD.

Childhood trauma in this study includes items on being badly beaten by parents as a child and witnessing serious physical fights at home as a child, and ad hoc analyses reveal somewhat different patterns for these two items. Being beaten by parents is more common among non-Latino Whites than minorities, but the only gender difference is that Latino men are more likely to report being beaten by parents than Latino women. Witnessing serious physical fights is more common among Latinos and AA/ACs than non-Latino Whites and among women than men. This trauma is more common among women for non-Latino Whites and AA/ACs, but more common among men for Asians. Both childhood traumas are associated with less PTSD for Asians and Latinos than non-Latino Whites, but being beaten by parents is associated with more PTSD for AA/ACs than non-Latino Whites. These differential relationships for particular types of childhood

maltreatment are consistent with the literature (Scher, Forde et al. 2004), but more research is needed on sociodemographic differences in childhood trauma exposure given the disparities identified and the high risk of PTSD associated with childhood trauma. The gender differences for childhood trauma identified within Asians and AA/ACs also indicate the need for targeted prevention with families of Asian boys and AA/AC girls.

An important caveat to this study is that participants with two or more lifetime traumas (i.e., the majority of the sample) were assessed for PTSD based on the event that caused them the most problems, thus anchoring PTSD diagnoses to the trauma participants consider the worst. Previous analyses of associations between particular traumas with PTSD in the NCS have focused on these nominated traumas. Since these events were by definition more traumatizing than those not nominated as worst traumas, associations may have been overestimated (Kessler, Sonnega et al. 1995). The NCS-R participants were determined to have PTSD if they met diagnostic criteria for either event), but the NLAAS and NSAL only examined PTSD for the worst event (or only event, if participants reported a single lifetime trauma). Because of these limitations, and because previous research has found that PTSD risk is similar when assessed for worst trauma or typical trauma (Breslau, Peterson et al. 2004), this study analyzed associations between all reported traumas and PTSD. While participants may not perceive that particular traumas are related to their PTSD diagnosis, this study found that multiple trauma exposure increases the likelihood of PTSD. This suggests that all trauma exposures may contribute in some way to a PTSD diagnosis and should be included when analyzing associations between trauma and PTSD. In preliminary analyses, reported traumas are associated with PTSD roughly half the time that most upsetting traumas are

associated with PTSD, suggesting that the likelihood of developing PTSD following traumatic events may be overestimated in previous research (Kessler, Sonnega et al. 1995; Breslau, Peterson et al. 2004).

Future research could compare associations between trauma and PTSD using all reported traumas, worst traumas, and random traumas to see how the methodology influences results, especially racial-ethnic and gender differences. It might also be informative to examine characteristics of nominated worst traumas (e.g., age at event, frequency or length of time experienced). This study used the standard method of creating binary codes for each traumatic experience, but qualitative characteristics of trauma may be critical to the relationship between trauma and PTSD.

Both mental health disparities and PTSD are at the center of policy debates, and this study extends prior research on both issues. The literature on PTSD is relatively young, and few studies have used samples that allow population inference about demographic groups with PTSD or examined the intersection of race-ethnicity and gender in PTSD. By describing disparities in trauma and PTSD using a large, national sample, this study targeted a clear gap in our knowledge of the epidemiology of PTSD and provides the foundation for future research on racial-ethnic and gender interactions in mental health.

Table 1. Weighted Sociodemographic Characteristics of CPES Sample^

	Non-Latino White (n=3354)		Asian (n=1393)		Latino (n=2166)		African American/ Afro-Caribbean (n=5380)		Omnibus test of significance	
	%		%		%		%		F(x,y)†	p-value
Gender									5.97	0.003
Male	47.5		47.4		51.8	**	44.3	**		
Female	52.6		52.6		48.2	**	55.7	**		
Age									34.31	0.000
18-29	20.1		26.6	***	35.6	***	25.5	***		
30-44	27.7		35.6	***	35.9	***	34.6	***		
45-59	28.3		24.2	***	18.0	***	23.6	***		
60+	23.9		13.6	***	10.5	***	16.4	***		
Marital status									36.45	0.000
Married/ cohabitating	59.8		68.9	***	62.2		41.4	***		
Divorced/ separated/ widowed	20.6		8.6	***	14.7	***	26.0	***		
Never married	19.6		22.6	*	23.2	**	32.6	***		
Poverty									61.25	0.000
Not in poverty	83.6		78.2	***	61.8	***	63.7	***		
At poverty	11.4		10.0		23.1	***	26.4	***		
Below poverty	5.0		11.8	***	15.1	***	9.9	***		
Health insurance coverage									109.47	0.000
Public and/ or private	90.1		86.4	***	66.7	***	81.8	***		
None	9.9		13.6	***	33.3	***	18.2	***		
Region									23.72	0.000
Northeast	21.4		15.3		15.5		18.3			
Midwest	26.5		8.8	***	9.1	***	17.8	***		
South	32.8		8.6	***	31.9		54.9	***		
West	19.3		67.3	***	43.5	***	9.1	***		
Education									75.78	0.000
0-11 years	13.2		14.7		42.6	***	23.8	***		
12 years	31.4		17.3	***	27.4	**	37.4	***		
13-15 years	28.7		25.3	*	19.8	***	24.4	***		
16+ years	26.8		42.7	***	10.1	***	14.4	***		
Work status									7.16	0.000
Employed	66.0		65.0		64.2		66.5			
Unemployed	5.0		6.0		7.9	***	9.0	***		
Not in labor force	29.0		29.1		27.9		24.5	***		
Nativity status									575.15	0.000
US-born	96.6		22.8	***	48.6	***	93.7	***		
Non US-born	3.4		77.2	***	51.4	***	6.3	***		
DSM-IV Lifetime PTSD									16.49	0.000
Not endorsed	93.1		98.0	***	95.3	***	91.4	**		
Endorsed	6.9		2.0	***	4.7	***	8.6	**		

Notes:

^ Sample weighted using long-form weights that reflect those who participated in the NSAL, NLAAS, or part two of the NCS-R (i.e., were given the PTSD module).

Percentages may not sum to 100 due to rounding.

† Degrees of freedom range from 2-6 for x, 355-993 for y.

*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.

** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.

* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.

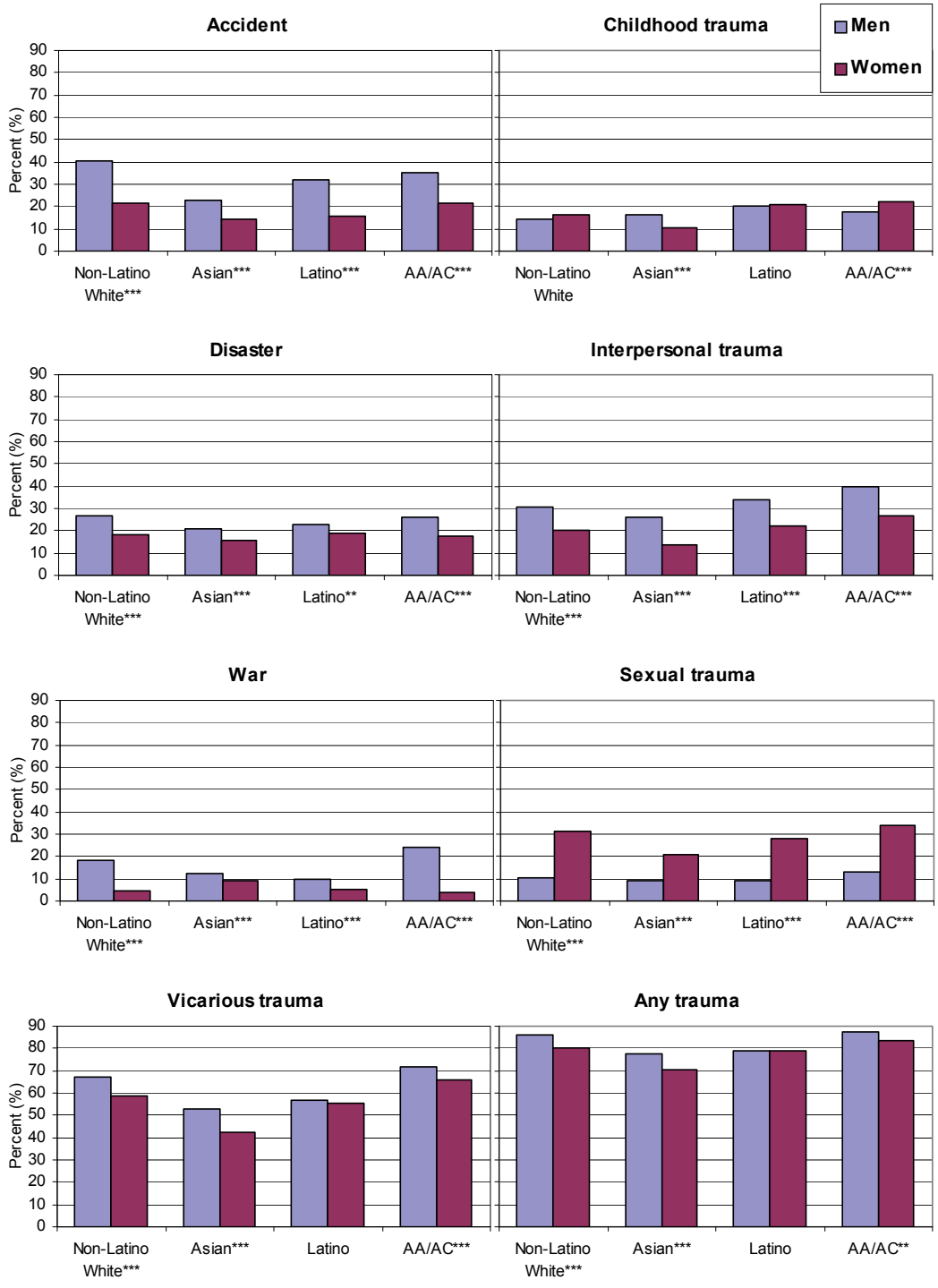
Table 2. Adjusted Weighted Lifetime Prevalence of Trauma by Race-ethnicity and Gender

Race-ethnicity:	Non-Latino White (n=4199)		Asian (n=2178)			Latino (n=3263)			African American/ Afro-Caribbean (n=5546)			Omnibus test of significance	
	%	SE	%	SE		%	SE		%	SE		F(3,163)	p-value
Accident	30.4	1.2	18.2	1.7	***	23.2	1.3	***	28.0	0.8	*	10.70	0.000
Childhood trauma	15.3	0.7	13.0	1.3	*	20.7	1.2	***	20.1	0.9	***	17.59	0.000
Disaster	22.2	1.1	18.1	1.9		20.7	1.6		21.3	1.3		1.22	0.304
Interpersonal trauma	25.1	1.1	19.7	1.8	**	27.8	1.9		32.7	1.3	***	14.34	0.000
War	11.1	0.8	11.1	1.6		7.1	1.1	***	13.5	0.9	**	12.09	0.000
Sexual trauma	21.5	1.0	15.3	1.6	***	19.3	1.4		23.8	1.0	*	6.10	0.001
Vicarious trauma	62.6	1.1	47.4	2.5	***	55.6	1.6	***	68.7	1.1	***	18.55	0.000
Any trauma	83.1	1.0	74.1	2.4	***	78.8	1.5	**	85.6	0.9	*	6.45	0.000
1 trauma	21.0	1.1	25.9	1.9	**	21.3	1.4		18.4	0.9		3.67	0.014
2 traumas	17.9	0.8	16.1	1.6		18.1	1.3		17.3	0.9		0.69	0.558
3 traumas	13.5	0.9	12.8	1.5		13.5	1.1		13.6	0.7		0.11	0.956
4+ traumas	30.4	1.2	19.6	1.8	***	25.6	1.5	**	36.7	1.4	***	15.18	0.000

Gender:	Men (n=6365)		Women (n=9011)		F(1,165)	p-value
	%	SE	%	SE		
Accident	38.1	1.6	20.1	0.7	128.17	0.000
Childhood trauma	15.8	0.8	17.3	0.6	3.90	0.050
Disaster	25.7	1.2	18.1	1.0	26.20	0.000
Interpersonal trauma	32.2	1.3	20.8	0.9	62.56	0.000
War	17.2	0.9	5.1	0.4	160.24	0.000
Sexual trauma	10.6	0.7	30.8	1.0	489.09	0.000
Vicarious trauma	65.4	1.1	58.1	1.2	21.04	0.000
Any trauma	84.8	0.9	80.0	1.0	18.03	0.000
1 trauma	18.5	1.3	23.2	1.1	8.31	0.005
2 traumas	17.7	1.0	17.9	0.7	0.02	0.891
3 traumas	14.1	0.8	12.9	0.9	1.12	0.291
4+ traumas	34.4	1.2	26.0	0.9	46.05	0.000

Notes:
Percentages are recycled predictions after adjusting for race-ethnicity, gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.

Figure 1. Adjusted Weighted Lifetime Prevalence of Trauma Interactions by Race-ethnicity and Gender



Notes:
Percentages are recycled predictions after adjusting for race-ethnicity, gender, race-ethnicity x gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01 for the gender comparison within each racial-ethnic group.
** Significant at p<.05 for the gender comparison within each racial-ethnic group.

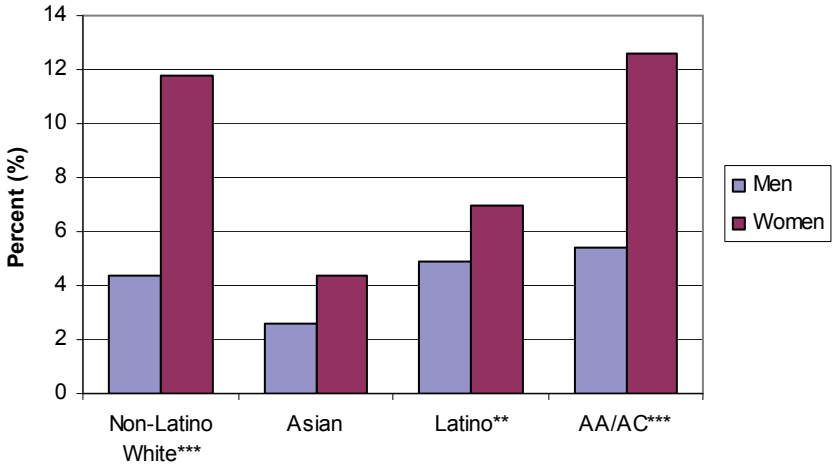
Table 3. Adjusted Weighted Associations Between Trauma and Lifetime PTSD by Race-ethnicity and Gender

Race-ethnicity:	Non-Latino White (n=4199)		Asian (n=2178)			Latino (n=3263)			African American/ Afro-Caribbean (n=5546)		Omnibus test of significance	
	%	SE	%	SE		%	SE		%	SE	F(3,163)	p-value
Accident	10.3	0.7	4.5	1.1	***	7.7	1.0	***	11.8	0.8	11.52	0.000
Childhood trauma	15.2	1.0	6.5	1.6	***	10.0	1.1	***	16.0	1.2	11.71	0.000
Disaster	10.3	1.2	4.2	1.1	***	7.3	1.0	***	11.6	1.2	9.82	0.000
Interpersonal trauma	14.3	1.1	6.2	1.6	***	9.9	1.1	***	14.8	1.0	9.74	0.000
War	11.3	1.7	4.5	1.3	***	8.1	1.4	***	12.4	1.6	9.02	0.001
Sexual trauma	16.4	1.5	7.4	1.9	***	12.2	1.5	***	17.9	1.3	8.38	0.000
Vicarious trauma	9.0	0.6	3.9	1.0	***	6.5	0.7	***	9.7	0.6	9.06	0.000
Any trauma	8.3	0.5	3.6	0.9	***	6.1	0.7	***	9.2	0.6	9.79	0.000
1 trauma	3.0	0.6	1.0	0.3	***	1.9	0.5	***	3.2	0.6	5.70	0.001
2 traumas	4.2	0.5	1.4	0.4	***	2.7	0.4	***	4.6	0.7	9.40	0.000
3 traumas	6.4	0.8	2.2	0.6	***	4.1	0.8	***	7.0	1.0	10.29	0.001
4+ traumas	15.5	1.2	6.9	1.7	***	11.2	1.4	***	15.5	1.1	8.22	0.000

Gender:	Men (n=6365)		Women (n=9011)		F(1,165)	p-value
	%	SE	%	SE		
Accident	5.4	0.4	14.0	0.9	126.39	0.000
Childhood trauma	8.9	0.7	19.1	1.2	107.70	0.000
Disaster	5.7	0.7	13.6	1.5	57.80	0.000
Interpersonal trauma	7.2	0.5	19.1	1.4	102.60	0.000
War	6.2	0.9	14.9	2.1	42.50	0.000
Sexual trauma	12.6	1.4	18.4	1.4	29.48	0.000
Vicarious trauma	4.8	0.3	11.9	0.8	111.78	0.000
Any trauma	4.5	0.3	11.0	0.7	121.50	0.000
1 trauma	1.5	0.3	3.9	0.8	18.92	0.000
2 traumas	2.2	0.3	5.5	0.7	46.75	0.000
3 traumas	3.4	0.5	8.3	1.0	50.27	0.000
4+ traumas	7.8	0.6	20.6	1.5	106.36	0.000

Notes:
Percentages are recycled predictions after adjusting for race-ethnicity, gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.

Figure 2. Adjusted Weighted Associations Between Any Trauma and Lifetime PTSD Interactions by Race-ethnicity and Gender



Notes:
Percentages are recycled predictions after adjusting for race-ethnicity, gender, race-ethnicity x gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01 for the gender comparison within each racial-ethnic group.
** Significant at p<.05 for the gender comparison within each racial-ethnic group.

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Paper II: Disparities in Perceived Barriers to Mental Health Care for those with PTSD

Racial-ethnic minorities experience barriers to accessing health care related to insurance and finances, language, geography, transportation, and cultural familiarity (Institute of Medicine 2003). When accessing mental health care, issues such as discrimination, trust, and communication may be particularly important to minorities (United States Department of Health and Human Services 2001). Studies have also consistently found that men are less likely to seek mental health treatment than women (Koenen, Goodwin et al. 2003), perhaps due to greater perceived stigma and lower ability to interpret distress as a mental health symptom (Wang, Lane et al. 2005).

Minorities with posttraumatic stress disorder (PTSD) may experience additional or different barriers, but research examining which barriers are more salient for particular groups with PTSD is needed (Boscarino, Adams et al. 2005; Wong, Marshall et al. 2006). Similarly, research looking at gender differences in barriers to treatment among those experiencing trauma is limited and inconclusive (Jaycox, Marshall et al. 2004).

Despite the availability of effective treatments for PTSD (Foa, Keane et al. 2000; Ursano, Bell et al. 2004; Veterans Affairs /Department of Defense 2004) and the wide range of negative long-term consequences associated with untreated PTSD (Tanielian and Jaycox 2008), only 7% of those with the disorder seek care within a year of onset. Among those with PTSD who seek treatment eventually, the median duration of delay is 12 years (Wang, Berglund et al. 2005). One reason for the delay is that individuals with PTSD report more barriers to care than those with other anxiety disorders (Koenen,

Goodwin et al. 2003). The most commonly reported barrier among those with PTSD is a lack of perceived need; this is cited even by individuals with severe impairment. Among those who do perceive a need for treatment, commonly cited barriers include expense, uncertainty about where to seek help, thinking the problem will get better by itself, wanting to solve the problem by oneself, and stigma (Kessler 2000). Illness perceptions may also play a role in recognizing the need for professional intervention: a recent study found that many traumatic injury survivors with PTSD believe that their symptoms are a natural reaction to their experience, are functionally adaptive, and will not last long (Wong, Kennedy et al. forthcoming).

Existing PTSD studies often focus on select subpopulations or types of trauma, and findings may not generalize to the population. For example, studies focus on veterans (e.g., Tanielian and Jaycox 2008), adolescents (e.g., Sabin, Zatzick et al. 2006), specific traumas like 9/11 (e.g., Boscarino, Adams et al. 2005), or particular injuries like facial injuries (e.g., Chandra, Marshall et al. 2008). This paper contributes to both the disparities and mental health service use literatures by using a large, national dataset to examine how perceived barriers vary across demographic groups. Participants in this study experienced many different types of trauma, met criteria for PTSD in the past year, and thought they might need professional help but either delayed or avoided seeking treatment.

The key objectives of this study are to 1) describe perceived barriers among those with PTSD; 2) examine how perceived barriers vary by race-ethnicity and gender; 3) identify the extent to which variation in sociodemographic characteristics between groups explain differences in perceived barriers. Disparities in this study are defined as

differences between the most advantaged racial-ethnic group (i.e., non-Latino Whites) and all other groups, as well as gender differences in health risks and outcomes (Braveman 2006).

Approach

Data source. This study uses the Collaborative Psychiatric Epidemiology Surveys (CPES), a large nationally-representative community household survey with unprecedented racial-ethnic diversity and rich mental health status and service use measures. This dataset was created by the University of Michigan's Institute for Social Research and merges the National Comorbidity Survey Replication (NCS-R, n=9,282), National Survey of American Life (NSAL, n=6,082), and National Latino and Asian American Study (NLAAS, n=4,649). The NCS-R sample is nationally-representative, the NSAL contains an oversample of African Americans and Afro-Caribbeans, and the NLAAS contains an oversample of Latinos and Asian Americans (Pennell, Bowers et al. 2004). Sample sizes were chosen to achieve targeted sample precision for diagnostic estimates and power to detect racial-ethnic group differences (Heeringa, Wagner et al. 2004). Interviews were face-to-face and conducted by professional interviewers in English, Spanish, Mandarin, Cantonese, Tagalog, and Vietnamese (Pennell, Bowers et al. 2004). More information about the CPES data can be found in Heeringa et al. 2004.

Weighting. Study-specific, design-based weights were developed by the CPES investigators to adjust for differential nonresponse and population representation of sociodemographic characteristics. Integrated weights were developed by rescaling the weights for each study based on a multiple frame approach to estimation and inference

about population characteristics. This allows analysts to treat the pooled CPES data as a single, complex sample[3] (Heeringa and Berglund 2007).

Sample. The CPES data contain 20,013 interviews with non-Latino Whites, Vietnamese, Filipinos, Chinese, other Asians, Cubans, Puerto Ricans, Mexicans, other Hispanics, Afro-Caribbeans, African Americans, other race-ethnicities (e.g., Pacific Islander, Native American)[4]. If a respondent chose multiple categories in the NSAL and NLAAS they were assigned based on priority order; if NCS-R cases could not be mapped to a racial-ethnic category they were randomly assigned based on Census characteristics of their neighborhood (Heeringa and Berglund 2007).

This study focused on those with past-year PTSD in the CPES who avoided or delayed seeking treatment. 74 of those with past-year PTSD reported not seeking professional help even thought they thought they might need it, and another 160 delayed seeing a professional for at least a month. Of all CPES participants with past-year PTSD, 228 are non-Latino White, 26 are Asian, 118 are Latino, and 209 are African American or Afro-Caribbean (AA/AC). 139 are male, and 463 are female.

Measures. Participants who thought they might need professional help for problems with emotions, nerves, or use of alcohol or drugs but who did not seek care were asked to endorse a list of 14 perceived barriers to care. Those who delayed seeking care for at least a month were queried about this same list. Ronald Andersen's *Behavioral Model of Health Services Use* (Andersen 1995) was used to provide

[3] There are actually two weight vectors for the CPES, since the NCS-R survey has two parts and some respondents were only administered the first part (Heeringa and Berglund, 2007). Because this study focused on PTSD which is in part two of the NCS-R, analyses utilized the second set of weights.

[4] For these analyses, Vietnamese, Filipino, Chinese, and other Asian respondents were considered Asian. Cuban, Puerto Rican, Mexican, and other Hispanic respondents were considered Latino. Afro-Caribbean and African American respondents were combined and noted as AA/AC. Those in "other" racial-ethnic categories (e.g., Pacific Islanders, Native Americans) were dropped from subgroup analyses because sample sizes were too small to analyze.

categories for perceived barriers. This model is well validated and frequently used to understand health care utilization and health outcomes, including in several studies of PTSD (Koenen, Goodwin et al. 2003; Kartha, Brower et al. 2008). Barriers items were categorized into financial, access, internal, stigma, and treatment credibility. Financial barriers include perceptions of health insurance not covering treatment and expense. Access barriers include uncertainty about where to go or who to see, the perception that treatment would take too much time or be inconvenient, inability to get an appointment, and transportation or scheduling issues. Internal barriers include thinking the problem would get better by itself, wanting to handle the problem by oneself, and the problem not being that bothersome at first. Stigma barriers include concern about what others would think and fear of involuntary hospitalization. Treatment credibility barriers include not thinking treatment would work, not being satisfied with available services, and treatment not working before.

DSM-IV diagnoses of PTSD were based on the World Health Organization's version of the Composite International Diagnostic Interview (CIDI), a fully-structured, lay-administered, diagnostic interview. The CIDI has been found to have moderate to good individual-level concordance with the Structured Clinical Interview for DSM-IV for prevalence estimates of PTSD, and CIDI prevalence estimates are unbiased (Haro, Arbabzadeh-Bouchez et al. 2006).

Sociodemographic characteristics included in this study because they may influence access to care (Escarce 2007) are race-ethnicity (non-Latino White, Asian, Latino, AA/AC), gender, age (18-29, 30-44, 45-59, 60+), marital status (married/cohabitating, divorced/separated/widowed, never married), poverty (based on

2001 U.S. Census income-to-needs ratio: income greater than needs, income equals needs, income below needs), health insurance coverage (public/private/other, none), region (Northeast, South, Midwest, West), education (0-11, 12, 13-15, 16+ years), work status (employed, unemployed, not in labor force), and nativity status (US born, non-US born).

Analysis Procedures. All analyses were completed using Stata 11 and used robust variance estimators to adjust standard errors for the complex sampling design. RAND's Institutional Review Board determined that this study was exempt from human subjects review.

Participants with past-year PTSD who avoided or delayed seeking treatment were combined (n=234), since mean comparison tests showed few differences between the two groups. However, those who avoided seeking treatment are less likely than those who delayed seeking treatment to report difficulty getting an appointment, thinking the problem will go away on its own, and the problem not bothering them much (all $p<.05$).

Each barrier was regressed on a vector of sociodemographic characteristics using logistic regression analyses. Recycled predictions (i.e., predictive margins; Graubard and Korn 1999) were then calculated for each race-ethnicity and gender. Significant differences by race-ethnicity and gender were assessed using design-based F tests of regression coefficients, and pairwise differences for significant effects by race-ethnicity were assessed using Sidak-adjusted Wald tests between each minority group and non-Latino Whites.

Perceived barriers were also described by race-ethnicity and gender using weighted cross-tabulations and tests of significance. These unadjusted results were then

compared with the adjusted results to examine the extent to which racial-ethnic and gender differences in perceived barriers are explained by other sociodemographic characteristics (e.g., age, poverty, nativity status). Results presented are adjusted unless otherwise noted.

Results.

Description of those with PTSD. There are significant racial-ethnic differences ($p<.05$; weighted unadjusted) for all sociodemographic characteristics except gender for those with past-year PTSD. Females make up three-quarters of those with PTSD, ages range from 18 to 86, and nearly half are married or cohabitating. Slightly less than a third of those with PTSD are at or below poverty; just over half of AA/ACs with PTSD are in poverty. 84% of those with PTSD have some type of health insurance coverage. The sample was selected from throughout the U.S., but 64% of Asians and 51% of Latinos with PTSD reside in the West, while 46% of AA/ACs with PTSD live in the South. AA/ACs with PTSD have significantly fewer years of education than non-Latino Whites. Nearly 11% of AA/ACs with PTSD are unemployed, while only 2% of non-Latino Whites and Asians with PTSD are unemployed. While 98% of non-Latino Whites with PTSD were U.S.-born, 67% of Asians with PTSD are born outside the U.S.

Perceived barriers among those with PTSD. Figure 1 shows reasons participants may have avoided or delayed seeking mental health care and percent of those with PTSD who endorsed each. Overall the most commonly reported barriers are wanting to handle the problem by themselves (77.2%), thinking symptoms will improve on their own (70.6%), and expense (50.6%). Other commonly reported barriers among those with

PTSD are not thinking treatment will work and uncertainty about who to see. Inability to get an appointment (5.4%) and not being satisfied with available services (17.7%) are the least commonly reported barriers. The ranking of these perceived barriers is the same without controlling for sociodemographic characteristics.

Perceived barriers by race-ethnicity. There are significant racial-ethnic differences in perceived barriers to mental health care among those with PTSD in the categories of access, internal barriers, and treatment credibility (see Table 1). Barriers items with significant differences by race-ethnicity include uncertainty about who to see, the problem not bothering them much, and treatment not working before. In particular, Asians and Latinos are significantly more likely than non-Latino Whites to report uncertainty about who to see (both $p<.05$). AA/ACs are more likely than non-Latino Whites to report that the problem not bothering them much is a reason why they did not see a professional ($p<.10$), while Asians are less likely than non-Latino Whites to report this barrier ($p<.001$). AA/ACs are also less likely than non-Latino Whites to report that treatment did not work before ($p<.05$). There are no significant racial-ethnic differences for those with PTSD related to insurance, expense, inconvenience, inability to get an appointment, scheduling, thinking the problem will improve on its own, wanting to handle on their own, worry what others will think, fear of involuntary hospitalization, not thinking treatment will work, or dissatisfaction with available services (all omnibus tests $p>.10$).

The most commonly reported barriers are different for Asians than non-Latino Whites, Latinos, and AA/ACs. Asians report uncertainty about who to see and not thinking treatment will work as primary barriers, while the non-Latino Whites, Latinos,

and AA/ACs all report desire to handle the problem on their own and thinking the symptoms will improve by themselves as primary barriers to seeking mental health treatment.

Because sample sizes are small in some of the cells, ad hoc analyses compared non-Latino Whites with all racial-ethnic minorities together. A few additional racial-ethnic differences were identified: non-Latino Whites with PTSD are significantly more likely than minorities to cite expense as a perceived barrier, while minorities are significantly more likely than non-Latino Whites to cite wanting to handle the problem on their own and thinking treatment will not work as barriers.

Analyses that did not adjust for sociodemographic characteristics show similar racial-ethnic differences on individual barriers items in all categories except treatment credibility. There are two items that differed between adjusted and unadjusted results: Latinos are more likely than non-Latino Whites to report not thinking treatment would work as a barrier before adjustments are made, and treatment not working before is not significantly different by race-ethnicity before adjustments are made.

Perceived barriers by gender. There are few gender differences in perceived barriers to mental health care after adjusting for sociodemographic differences (see Table 2). The two significant gender differences are that women with PTSD are more likely than men to report worry what others would think (43.2% vs. 22.0%; $p<.05$) as well as inability to get an appointment (8.5% vs. 1.0%; $p<.05$). The most commonly reported barriers to mental health care are similar for men and women: both report that their primary barriers are wanting to handle the problem on their own, thinking the problem will get better by itself, and concerns about cost.

In unadjusted analyses, worry what others will think is again significantly different by gender, but inability to get an appointment is not. Men are more likely than women to report treatment not working before as a barrier in unadjusted analyses.

Discussion.

There is very little research on group differences in perceived barriers to mental health care for those with PTSD, so this study contributes to that limited knowledge base. Results show that the majority of those with PTSD who did not seek treatment perceive wanting to handle the problem on their own and thinking the problem would get better by itself as barriers to seeking mental health care. There are significant racial-ethnic differences in perceived barriers related to access, internal beliefs, and treatment credibility, although only some of these differences would be considered disparities. There are significant gender disparities related to access and stigma. Overall, the similarities between unadjusted and adjusted findings suggest that few racial-ethnic and gender differences in perceived treatment barriers are explained by other sociodemographic characteristics.

Uncertainty about who to see for help is one of the most commonly reported barriers for those with PTSD, and Asians and Latinos are much more likely to report this barrier than non-Latino Whites in both adjusted and unadjusted analyses. This is also the most commonly reported barrier for Asians and the third most commonly reported barrier for Latinos and AA/ACs. Previous research not specific to PTSD suggests that low acculturation may be a significant barrier to help-seeking (West, Kantor et al. 1998), and acculturation may be related to familiarity with mental health treatment options. Though

acculturation was not examined directly in this study because it was not assessed in the NCS-R and NSAL, controlling for nativity status does not account for the disparity in uncertainty about who to see for help. This suggests the need for informational interventions with Asians and Latinos at risk for PTSD to familiarize them with treatment options.

Not thinking treatment will work is a commonly reported barrier among those with PTSD, and Latinos are significantly more likely than non-Latino Whites to report this barrier in unadjusted analyses. This finding echoes a recent study of a predominantly Latino sample of non-treatment seekers with PTSD in which no participant believed professional treatment could completely control their symptoms (Wong, Kennedy et al. forthcoming). However, in adjusted analyses this study did not find a disparity in not thinking treatment will work, suggesting that sociodemographic differences between Latinos and non-Latino Whites explain differential perceptions of treatment effectiveness.

Further, less than half the sample reported that the problem not bothering them much initially is a reason for avoiding or delaying seeking mental health care, but AA/ACs are significantly more likely than non-Latino Whites to cite this barrier while Asians are significantly less likely than non-Latino Whites to perceive this as a barrier (i.e., there is a disparity for AA/ACs but not Asians). Other studies have identified lack of perceived need as a major barrier to seeking mental health treatment for PTSD (Kessler 2000), but it is noteworthy that this barrier is perceived quite differently across racial-ethnic groups. Additional analyses suggest that AA/ACs are exposed to significantly higher rates of trauma than non-Latino Whites and have high rates of PTSD,

so trauma may be somewhat normalized within these cultures and distress related to these experiences may not be viewed as a reason for seeking treatment. This finding that AA/ACs are more likely to report the problem not bothering them much as a barrier to accessing mental health care despite significant need suggests a need for outreach to AA/ACs to help them identify when to seek care following trauma.

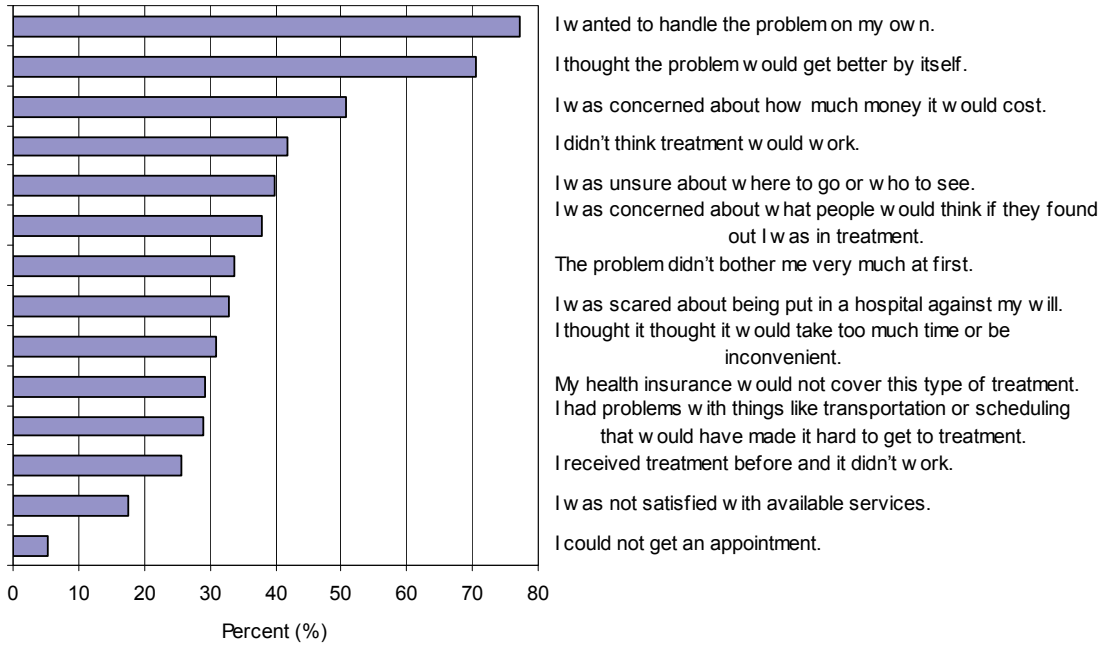
Worry about what others might think is a significant gender difference both before and after adjusting for other sociodemographic characteristics: women with PTSD are approximately twice as likely as men to report this concern. One possible reason for this disparity may be that women and men are exposed to different types of traumas. For example, women are more likely to experience rape and molestation while men are more likely to experience combat and interpersonal violence (Kessler, Sonnega et al. 1995), and it is likely that the former are perceived as more stigmatizing. This suggests the need for outreach tailored to women who have experienced trauma that aims to reduce the stigma of mental health help-seeking.

As with any study, this one has its limitations. The data are cross-sectional, retrospective, and self-reported. Thus the results are dependent on participants accurately reporting their use of mental health services and attitudes toward treatment. Also, barriers are perceived and not necessarily actual barriers, but since reported barriers are what drive motivation for treatment seeking, these results provide useful directions for increasing access to care. Further, while analyses focused on the subpopulation of individuals with diagnosed PTSD, barriers items are not specific to PTSD. That means that participants might not have perceived barriers as a reason for not seeking treatment for PTSD specifically, or even that that they have PTSD. However, all participants met

diagnostic criteria for PTSD and perceived a need for mental health treatment. Finally, sample sizes for some of the analyses were small, leading to limited power to detect racial-ethnic differences, and combining some of the racial-ethnic groups (e.g., all Latinos) may have masked important within group differences. For example, there may be important differences in perceived barriers between Cubans, Puerto Ricans, Mexicans, and other Latinos that this sample is not large enough to identify.

Despite these limitations, this study used the largest and most diverse epidemiological dataset of psychiatric conditions and mental health service use to describe differences in perceived barriers to mental health seeking for those with PTSD. The findings underscore the importance of targeted interventions for those who experience trauma but avoid seeking mental health treatment, and they add to the limited literature comparing perceived barriers across demographic groups. Future research should analyze whether there are interactions between race-ethnicity and gender in perceived barriers, as well as whether disparities in perceived barriers are related to differences in trauma exposure or mental health service use. Such research could be used to improve access to services and quality of care for all groups.

Figure 1. Reasons People with Past-year PTSD Have for Avoiding or Delaying Seeking Treatment Even When They Think They Might Need It



Notes:
Percentages are recycled predictions after adjusting for race-ethnicity, gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
Sample distributions reflect the weighted number of respondents.

Table 1. Adjusted Weighted Perceived Barriers for those with Past Year PTSD who Avoid or Delay Treatment by Race-Ethnicity

	Non-Latino White		Asian			Latino			African American/ Afro-Caribbean			Omnibus test of significance	
	%	SE	%	SE		%	SE		%	SE		F(3,90)	p-value
Financial	**56.2**	**5.8**	**60.8**	**17.6**		**44.8**	**8.9**		**39.6**	**8.2**		**1.03**	**0.380**
Insurance wouldn't cover	30.5	6.4	28.9	21.8		28.6	9.1		22.7	7.5		0.26	0.853
Expensive	53.7	5.4	38.6	17.0		42.4	8.5		37.2	7.9		1.33	0.271
Access	**58.3**	**4.7**	**91.3**	**10.1**	***	**63.9**	**10.7**		**64.1**	**9.6**		**3.07**	**0.030**
Unsure who to see	35.0	6.7	77.7	20.6	**	64.0	11.3	**	50.3	9.4		3.52	0.018
Inconvenient	27.6	4.9	34.0	13.5		42.0	13.2		46.5	9.0		1.16	0.328
Couldn't get appointment	4.7	2.1	NA	NA		6.0	5.1		10.8	10.1		0.20	0.822
Scheduling	30.2	4.4	25.8	19.0		21.5	5.8		28.9	7.5		0.50	0.683
Internal	**87.5**	**3.4**	**76.1**	**19.9**		**96.0**	**3.2**	*	**97.5**	**2.0**	**	**2.22**	**0.090**
Thought would improve on own	69.9	6.1	45.8	19.5		78.8	9.1		71.3	9.2		0.82	0.484
Want to handle on own	75.3	4.8	57.6	26.1		84.6	6.4		84.4	5.4		1.02	0.388
Problem didn't bother much	31.1	2.4	7.0	8.3	***	44.8	11.6		48.9	9.0	*	4.32	0.007
Stigma	**51.9**	**4.9**	**43.9**	**31.5**		**53.5**	**8.4**		**56.0**	**8.5**		**0.08**	**0.970**
Worry what others will think	39.0	4.0	NA	NA		32.4	7.0		34.9	9.5		0.29	0.748
Scared of hospit. against will	30.8	4.7	47.3	29.9		42.5	10.1		38.3	7.0		0.76	0.519
Treatment credibility	**53.7**	**4.7**	**91.2**	**8.3**	***	**63.3**	**9.3**		**57.4**	**10.3**		**5.25**	**0.000**
Don't think treatment will work	38.5	4.3	68.1	19.8		57.2	9.5		48.2	9.1		1.69	0.176
Not satisfied with avail. services	15.9	3.8	22.8	16.6		27.1	7.3		23.8	8.7		0.77	0.511
Treatment didn't work before	26.3	6.3	54.8	19.9		38.3	10.7		7.9	4.7	**	4.49	0.006

Notes:
Sample distributions reflect the weighted number of respondents.
Adjusted percentages are recycled predictions after adjusting for gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.
NA Asians were dropped for analyses since no Asians endorsed these items (i.e., there is complete separation of values).

Table 2. Adjusted Weighted Perceived Barriers for those with Past Year PTSD who Avoid or Delay Treatment by Gender

	Men		Women		p-value	
	%	SE	%	SE		
Financial	**54.4**	**7.9**	**53.0**	**6.4**	**0.890**	
Insurance wouldn't cover	21.8	8.5	32.0	5.6	0.260	
Expensive	52.6	8.5	50.0	6.0	0.820	
Access	**71.0**	**7.9**	**56.1**	**4.8**	**0.110**	
Unsure who to see	44.6	9.1	38.2	6.2	0.410	
Inconvenient	32.2	8.2	30.6	4.4	0.840	
Couldn't get appointment	1.0	1.0	8.5	3.3	0.040	**
Scheduling	34.5	8.5	27.4	3.9	0.440	
Internal	**88.5**	**5.7**	**90.4**	**2.9**	**0.760**	
Thought would improve on own	70.2	9.6	70.7	5.7	0.960	
Want to handle on own	71.8	8.6	79.1	4.5	0.460	
Problem didn't bother much	35.0	9.1	33.4	3.5	0.890	
Stigma	**48.1**	**10.7**	**53.7**	**4.2**	**0.620**	
Worry what others will think	22.0	7.8	43.2	3.7	0.020	**
Scared of hospit. against will	33.1	8.0	33.0	5.4	0.990	
Treatment credibility	**67.4**	**9.5**	**51.8**	**5.5**	**0.200**	
Don't think treatment will work	46.9	11.7	40.0	5.3	0.640	
Not satisfied with avail. services	20.2	6.6	16.9	3.3	0.620	
Treatment didn't work before	33.8	8.9	22.9	5.1	0.240	

Notes:
Sample distributions reflect the weighted number of respondents.
Adjusted percentages are recycled predictions after adjusting for race-ethnicity, age, marital status, poverty, insurance, region, education, work status, and nativity status.
** Significant at p<.05
* Significant at p<.10

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Paper III: Disparities in Mental Health Service Use for those with PTSD

Despite policy interest in eliminating disparities in access to mental health services (United States Department of Health and Human Services 2001), research that examines treatment patterns (Wang, Demler et al. 2002) and preferences (Eisenman, Meredith et al. 2008) by group is scarce. Yet, literature suggests that minorities use less mental health care than non-minorities (Fiscella, Franks et al. 2002), men use less mental health care than women (Rhodes, Goering et al. 2002), and African Americans (Wang, Demler et al. 2002) and men (Wang, Berglund et al. 2000) are less likely to receive adequate treatment for mental illness.

One mental disorder that has garnered attention recently is posttraumatic stress disorder (PTSD), which nearly 4% of Americans met criteria for in the past year (Kessler, Chiu et al. 2005). Despite the availability of effective psychotherapeutic and pharmacological treatments (Foa, Keane et al. 2000; Ursano, Bell et al. 2004; Veterans Affairs /Department of Defense 2004), only about half of those with past-year PTSD report mental health treatment in the past year, and the median number of visits among those who sought treatment is five (Wang, Lane et al. 2005). Unfortunately, even when those with PTSD do receive care it is often inadequate: only 42% those with PTSD who sought mental health treatment in the past year received minimally adequate treatment (Wang, Lane et al. 2005).

There is some evidence that minorities (Gavrilovic, Schützwohl et al. 2005) and men (Elhai, North et al.) are less likely to seek treatment after a traumatic event. However, the literature on service utilization for particular groups with PTSD is

underdeveloped (Berthold, Wong et al. 2007; Pole, Gone et al. 2008), and variation in methodology and samples of existing studies makes it difficult to form sound conclusions (Gavrilovic, Schützwohl et al. 2005).

This study adds to the limited research base on disparities in access to care for PTSD by analyzing racial-ethnic and gender differences in mental health service utilization in a large, diverse, and nationally-representative sample. The research is guided by Ronald Andersen's *Behavioral Model of Health Services Use*, which is well validated and frequently used to understand health care utilization and health outcomes, including in several studies of PTSD (Koenen, Goodwin et al. 2003; Kartha, Brower et al. 2008). Specifically, the interaction between predisposing characteristics (e.g., race-ethnicity, gender) and types of health care received (e.g., provider visits, health care quality, satisfaction) is examined.

The key objectives of this study are to 1) describe mental health service utilization patterns for those with PTSD, including frequency of use, quality of care, and satisfaction; 2) examine how utilization varies by race-ethnicity and gender; 3) identify the extent to which sociodemographic differences between groups explain differences in service use. Disparities in this study are defined as differences between the most advantaged racial-ethnic group (i.e., non-Latino Whites) and all other groups, as well as gender differences in health risks and outcomes (Braveman 2006).

Approach

Data source. This study employed the Collaborative Psychiatric Epidemiology Surveys (CPES), a large nationally-representative community household survey with

unprecedented racial-ethnic diversity and rich mental health status and service use measures. The dataset was created by the University of Michigan's Institute for Social Research and merges the National Comorbidity Survey Replication (NCS-R, n=9,282), National Survey of American Life (NSAL, n=6,082), and National Latino and Asian American Study (NLAAS, n=4,649). The NCS-R sample is nationally-representative, the NSAL contains an oversample of African Americans and Afro-Caribbeans, and the NLAAS contains an oversample of Latinos and Asian Americans (Pennell, Bowers et al. 2004). Sample sizes were chosen to achieve targeted sample precision for diagnostic estimates and power to detect racial-ethnic group differences (Heeringa, Wagner et al. 2004). Interviews were face-to-face and conducted by professional interviewers in English, Spanish, Mandarin, Cantonese, Tagalog, and Vietnamese (Pennell, Bowers et al. 2004). More information about the CPES data can be found in Heeringa et al. 2004.

Weighting. Study-specific, design-based weights were developed by the CPES investigators to adjust for differential nonresponse and population representation of sociodemographic characteristics. Integrated weights were developed by rescaling the weights for each study based on a multiple frame approach to estimation and inference about population characteristics. This allows analysts to treat the pooled CPES data as a single, complex sample[5] (Heeringa and Berglund 2007).

Sample. The CPES data contain 20,013 interviews with non-Latino Whites, Vietnamese, Filipinos, Chinese, other Asians, Cubans, Puerto Ricans, Mexicans, other Hispanics, Afro-Caribbeans, African Americans, other race-ethnicities (e.g., Pacific

[5] There are actually two weight vectors for the CPES, since the NCS-R survey has two parts and some respondents were only administered the first part (Heeringa and Berglund, 2007). Because this study focused on PTSD which is in part two of the NCS-R, analyses utilized the second set of weights and focused on a somewhat smaller sample (i.e., those who took part two of the NCS-R and everyone from the NSAL and NLAAS).

Islander, Native American)[6]. If a respondent chose multiple categories in the NSAL and NLAAS they were assigned based on priority order; if NCS-R cases could not be mapped to a racial-ethnic category they were randomly assigned based on Census characteristics of their neighborhood (Heeringa and Berglund 2007). This study focused on the 602 participants who meet diagnostic criteria for PTSD in the past year. This includes 228 non-Latino Whites, 26 Asians, 118 Latinos, and 209 AA/ACs. 139 are male, and 463 are female.

Measures. Past-year DSM-IV diagnoses of PTSD were based on the World Health Organization's version of the Composite International Diagnostic Interview (CIDI), a fully-structured, lay-administered, diagnostic interview. The CIDI has been found to have moderate to good individual-level concordance with the Structured Clinical Interview for DSM-IV for prevalence estimates of PTSD, and CIDI prevalence estimates are unbiased (Haro, Arbabzadeh-Bouchez et al. 2006).

Aspects of the health care system studied include number of visits and duration of visits in minutes in the past year to psychiatrists, other medical doctors (e.g., general practitioner, cardiologist, gynecologist, urologist), psychologists, social workers, counselors, other mental health professionals (e.g., psychotherapist, mental health nurse), and other health professionals (e.g., nurse, occupational therapist) for problems with emotions, nerves, or substance use. Visits to these health care and health service professionals in this study are considered formal care. Psychiatrists and other medical

[6] For these analyses, Vietnamese, Filipino, Chinese, and other Asian respondents were considered Asian. Cuban, Puerto Rican, Mexican, and other Hispanic respondents were considered Latino. Afro-Caribbean and African American respondents were combined and noted as AA/AC. Those in "other" racial-ethnic categories (e.g., Pacific Islanders, Native Americans) were dropped from subgroup analyses because sample sizes were too small to analyze.

doctors are combined as physicians. Social workers, counselors, and other health professionals are considered allied health providers in analyses.

Participants were also asked about the number of times in the past year they visited religious or spiritual advisors (e.g., minister, priest, rabbi) or other healers (e.g., herbalist, chiropractor, spiritualist) for mental health issues, as well as use of Internet support groups or chat rooms, self-help groups, or mental health hotlines. Visits to these providers are considered informal care. Finally, participants were asked if they took prescription medication (e.g., antidepressants, anxiolytics) under the supervision of a physician in the past year for problems with emotions, nerves, or substance use.

Minimally adequate treatment is an indicator that sets an upper bound on quality of care; it is based on established guidelines for medication evaluation, initiation, and monitoring, as well as clinical trials demonstrating effective psychotherapy (Wang, Demler et al. 2002). This study defined minimally adequate treatment as adequate drug therapy (i.e., prescription for antidepressants or anxiolytics, plus at least four visits with a psychiatrist or medical doctor) or adequate psychotherapy (i.e., at least eight visits with a health care or health services professional averaging at least 30 minutes in length, "talk therapy") in the past year. This definition has been used in other studies of minimally adequate treatment (e.g, Wang, Lane et al. 2005). Treatment helpfulness was defined as treatment helping a lot/some vs. helping a little/not at all for each provider type seen.

Sociodemographic characteristics included in the study because they may influence access to care (Escarce 2007) are race-ethnicity (non-Latino White, Asian, Latino, African American/Afro-Caribbean (AA/AC)), gender, age (18-29, 30-44, 45-59, 60+), marital status (married/cohabitating, divorced/separated/widowed, never married),

poverty (based on 2001 U.S. Census income-to-needs ratio: income greater than needs, income equals needs, income below needs), health insurance coverage (public/private/other, none), region (Northeast, South, Midwest, West), education (0-11, 12, 13-15, 16+ years), work status (employed, unemployed, not in labor force), and nativity status (US born, non-US born). These are considered predisposing characteristics in this study.

Analysis procedures. All analyses were completed using Stata 11 and used robust variance estimators to adjust standard errors for the complex sampling design. RAND's Institutional Review Board determined that this study was exempt from human subjects review.

Racial-ethnic and gender differences in past-year use of any mental health services were described by provider type using weighted cross-tabulations and tests of significance (i.e., design-based F tests) in the subpopulation of those with past-year PTSD. Probability of mental health service use after adjusting for sociodemographic characteristics was analyzed using logistic regression, and recycled predictions (i.e., predictive margins; Graubard and Korn 1999) were calculated for each race-ethnicity and gender. Pairwise differences for significant effects by race-ethnicity were assessed using Sidak-adjusted Wald tests between each minority group and non-Latino Whites.

Mean number of past-year mental health visits for those with past-year PTSD was also described by provider type for each race-ethnicity and gender, and differences were examined using design-based F tests. Analyses that adjusted for sociodemographic characteristics were completed using negative binomial regression models and tests of significant differences by race-ethnicity and gender. The negative binomial was used

because of overdispersion (i.e., variance exceeds the mean) in the number of visits; this has the advantages of resistance to outliers and a robust mean. Weighted medians and interquartile ranges (IQR) of past-year mental health service visits were also calculated by provider type for each race-ethnicity and gender.

For those with past-year PTSD who received any mental health care, rates of minimally adequate treatment (i.e., psychotherapeutic, pharmacological, or both) were analyzed using weighted cross-tabulations and logistic regression analyses. Finally, racial-ethnic and gender differences in helpfulness of past-year mental health treatment were assessed by provider type in the subpopulation with past-year PTSD.

Results

Description of those with PTSD. There are significant racial-ethnic differences ($p<.05$; weighted unadjusted) for all sociodemographic characteristics except gender for those with PTSD. Females make up three-quarters of those with PTSD, ages range from 18 to 86, and nearly half are married or cohabitating. Slightly less than a third of those with PTSD are at or below poverty; just over half of AA/ACs with PTSD are in poverty. 84% of those with PTSD have some type of health insurance coverage. The sample was selected from throughout the U.S., but 64% of Asians and 51% of Latinos with PTSD reside in the West, while 46% of AA/ACs with PTSD live in the South. AA/ACs with PTSD have significantly fewer years of education than non-Latino Whites. Nearly 11% of AA/ACs with PTSD are unemployed, while only 2% of non-Latino Whites and Asians with PTSD are unemployed. While 98% of non-Latino Whites with PTSD are U.S.-born, 67% of Asians with PTSD were born outside the U.S.

Mental health service use. Weighted, unadjusted analyses show that 43.3% of those with past-year PTSD received treatment from a formal mental health provider in the past year for problems with their emotions, nerves, or use of alcohol or drugs, and there are significant racial-ethnic disparities in likelihood of seeking care from any formal provider, physician, allied health provider, and informal provider (see Table 1). Non-Latino Whites are significantly more likely to report any mental health service use than AA/ACs (47.3% vs. 29.1%, $p<.01$). Compared with non-Latino Whites, there are similar differences by category of provider: Asians and AA/ACs are less likely to report seeing physicians (23.1% vs. 41.5%, $p<.10$; 25.4% vs. 41.5%, $p<.01$; respectively), AA/ACs are less likely to report seeing allied health providers (8.1% vs. 19.7%, $p<.01$), and all groups are less likely to report use of informal care (9.0% vs. 23.6%, $p<.10$ for Asians; 14.9% vs. 23.6%, $p<.10$ for Latinos; 13.0% vs. 23.6%, $p<.05$ for AA/ACs). The only disparity that remains after adjusting for sociodemographic characteristics is that AA/ACs are less likely to seek care from an allied health provider than non-Latino Whites (9.4% vs. 19.4%, $p<.01$).

There are few gender differences for likelihood of seeking mental health care among those with PTSD, but men are significantly more likely to seek care from a psychologist (16.4% vs. 8.7%, $p<.10$; see Table 2) and women are significantly more likely to seek informal care (24.3% vs. 11.3%, $p<.05$). After adjusting for other sociodemographic differences, the gender difference for psychologist and informal care use remains.

Frequency of mental health service use. Among those with PTSD who sought mental health care in the past year, the mean number of visits to formal providers is 17,

and the median number of visits is 3 (IQR 1-10). There are significant racial-ethnic disparities in the number of formal mental health visits, as well as visits to psychologists and allied health providers (see Table 3). Non-Latino Whites with PTSD have a significantly higher mean number of formal mental health visits than AA/ACs (mean 17.4 vs. 9.0, $p<.05$), although the medians are similar (both 3; IQR 1-10 vs. 1-9). Latinos who saw a psychologist report significantly fewer visits than non-Latino Whites (mean 7.5 vs. 15.2, $p<.10$; median 5 vs. 6), and AA/ACs who saw an allied health provider report significantly fewer visits than non-Latino Whites (mean 7.9 vs. 18.6, $p<.05$; median 4 vs. 6). Frequency of mental health service use is predicted to be higher for racial-ethnic minorities after adjusting for other sociodemographic characteristics, especially for informal care. However, the only predicted racial-ethnic difference in adjusted analyses is that Asians have lower use of allied mental health services than non-Latino Whites (8.2 vs. 18.0, $p<.10$).

There are no differences by gender in the average number of past-year visits to any type of provider for those with PTSD (see Table 4). The median number of mental health visits for those who saw a physician is 2 (IQR 1-5), while the median for those who saw a psychologist is 6 (IQR 2-12), the median for those who saw an allied health provider is 6 (IQR 2-15), and the median for those who saw an informal care provider is 4 (IQR 2-12). The median number of past-year mental health visits for those with PTSD who saw any formal provider is 3 (IQR 1-10). After adjusting for other sociodemographic characteristics, women with PTSD are predicted to have significantly more visits than men to physicians (7.6 vs. 4.8, $p<.05$), allied health providers (20.9 vs. 10.8, $p<.05$), and formal providers (19.8 vs. 11.6, $p<.01$) for mental health-related issues.

Minimally adequate treatment. About 43% of those with PTSD who sought mental health treatment received minimally adequate care. AA/ACs with PTSD are much less likely than non-Latino Whites to receive either minimally adequate drug or talk therapy than non-Latino Whites (21.6% vs. 48.1%, $p<.01$; see Table 5); in particular, they are less likely to receive minimally adequate talk therapy (18.8% vs. 39.9%, $p<.05$). There are no significant racial-ethnic differences in minimally adequate treatment after adjusting for sociodemographic characteristics.

Women with PTSD are more likely than men to receive minimally adequate treatment in unadjusted analyses, but this effect is only evident when those who received drug or talk therapy are combined (49.9% vs. 33.9%, $p<.10$; see Table 6). After adjusting for sociodemographic characteristics, women are more likely than men to receive both minimally adequate drug and talk therapy (37.5% vs. 20.4%, $p<.05$; 42.0% vs. 27.3%, $p<.05$).

Helpfulness of treatment. 89.7% of those with PTSD who sought treatment say it helped a lot or some, and there are significant racial-ethnic disparities (see Table 7). Asians, Latinos, and AA/ACs find formal providers to be less helpful than non-Latino Whites (75.9% vs. 94.5%, $p<.05$; 79.1% vs. 94.5%, $p<.01$, 77.9% vs. 94.5%, $p<.01$). Helpfulness is not reported for Asians who saw psychologists or informal care providers since fewer than five participants reported these items. Non-Latino Whites who saw Psychologists are rated most helpful by non-Latino Whites, while informal providers are rated most helpful by Latinos and AA/ACs. Allied providers are rated least helpful by non-Latino Whites, while physicians are rated least helpful by Latinos and AA/ACs.

Treatment ratings are not significantly different between genders in unadjusted analyses, however psychologists are rated most helpful by men with PTSD while informal care providers are rated most helpful by women with PTSD (results not shown). Physicians are rated as least helpful by both genders. After adjusting for sociodemographic characteristics, there are significant gender differences in helpfulness of physicians and allied health providers. Women with PTSD find physicians more helpful than men (90.8% vs. 76.8%, $p<.05$), while men with PTSD find allied providers more helpful than women (97.1% vs. 83.4%, $p<.05$).

Discussion

This study builds on the limited literature on mental health service utilization for those with PTSD by using a large, national dataset to examine how service use, quality of care, and satisfaction with treatment vary by race-ethnicity and gender. Findings suggest that fewer than half of those with PTSD who seek treatment receive minimally adequate treatment, but nearly 90% are satisfied with services. Racial-ethnic disparities in service use, minimally adequate treatment, and satisfaction with treatment are mostly between non-Latino Whites and AA/ACs and are largely explained by differences in sociodemographic characteristics. There are no gender differences in any mental health service use or satisfaction with services overall; however, men report use of different types of providers, fewer mental health visits, and worse quality of care than women after adjusting for sociodemographic differences.

This study found somewhat lower levels of mental health service utilization for those with PTSD than were found in the NCS-R (Wang, Lane et al. 2005); however, the

CPES sample contains more racial-ethnic minorities who tend to have lower levels of use, so overall estimates of mental health service use among those with PTSD are somewhat attenuated. The fact that this study found no gender difference in any use or frequency of use in unadjusted analyses is surprising given the literature, but differences in use by provider type suggest that men and women with PTSD have different preferences for mental health providers. Future research should address these preferences, especially as they relate to receipt of minimally adequate treatment and satisfaction with care. It is also noteworthy that adjusted analyses of mean number of mental health visits suggest that men with PTSD use mental health care more often than might be expected by their sociodemographic characteristics; thus, while a difference is predicted it is not actually observed.

This study also found that AA/ACs are less likely than non-Latino Whites with PTSD to seek treatment, and once in treatment they have significantly fewer visits. However, the disparity in number of visits appears to be explained by sociodemographic differences between groups. This distinction between any use and frequency of use is an important one because the decision to seek care is likely decided by the patient while the decision about how often to seek care is more likely decided by the health care system (Pohlmeier and Ulrich 1995). Thus there are different policy implications for each.

In ad hoc analyses of sociodemographic predictors of any use and frequency of use, the only predictor of both any use and frequency of use for those with PTSD is not being in the labor market. Having insurance also predicts any use, while being age 60+, a high school graduate (compared with no high school diploma), and unemployed predict

lower probability of mental health service use. Higher level of use is also predicted by being Asian, female, and divorced in the multivariate model.

The low rate of minimally adequate treatment for PTSD found in this study is similar to results from analyses that used only the NCS (Wang, Lane et al. 2005), and there are differences by race-ethnicity and gender as expected. This study found that non-Latino Whites are more likely to receive minimally adequate treatment than AA/ACs, and women are more likely to receive adequate care than men, but that the disparity for AA/ACs is explained by sociodemographic differences between groups. In particular, ad hoc analyses suggest that female gender, being divorced/separated/widowed, being below poverty, and not being in the labor force are associated with greater likelihood of receiving minimally adequate treatment for those with PTSD, while AA/AC race-ethnicity is associated with lower treatment adequacy. In contrast, another study found few predictors of minimally adequate treatment for those with any DSM-IV disorder (Wang, Lane et al. 2005). This suggests that treatment adequacy for PTSD may be better explained by sociodemographic characteristics than treatment adequacy for other mental disorders, and that improving racial-ethnic disparities in treatment adequacy may require addressing predisposing characteristics.

Sensitivity analyses were also conducted using less conservative definitions of minimally adequate treatment (e.g., only two physician visits for drug therapy or talk therapy with any combination of providers). In both unadjusted and adjusted analyses, significant disparities persist between AA/ACs and non-Latino Whites; however, there are no significant gender differences using the broader definitions. This may be due to the lower likelihood of physician use for AA/ACs compared with non-Latino Whites and

lack of gender difference in physician use. These sensitivity analyses suggest that the disparity between AA/ACs and non-Latino Whites is a robust finding, while the gender difference in treatment adequacy may be sensitive to the specification of the indicator for minimally adequate treatment but not to sociodemographic differences between groups. Importantly, however, even using more generous definitions of minimally adequate treatment, a large number of people with PTSD in all sociodemographic groups are not being treated effectively.

Despite the strengths of this study, there are a few notable weaknesses. The data are self-reported, retrospective, and cross-sectional. Respondents may not accurately recall which type of mental health provider they saw, and there is evidence that the interleafed structure of the service utilization questions may have biased downward reported mental health service use (Duan, Alegria et al. 2007). Importantly, past-year mental health service use was for any problem related to emotions or nerves or use of alcohol or drugs, not specifically for PTSD. It is unclear how many participants received evidence-based treatments for PTSD, like Cognitive Behavioral Therapy, Exposure Therapy, and Eye Movement Desensitization & Reprocessing (Institute of Medicine 2010). Similarly, only some antidepressants and anxiolytics are appropriate medications for PTSD (Veterans Affairs /Department of Defense 2004), although there are many important considerations as to which medication is appropriate for an individual (e.g., other comorbid conditions).

However, this unique dataset is state-of-the-art for addressing racial-ethnic and gender disparities in mental health service use, many of the findings are not available in the literature, and the results can be used to improve access to care and quality of care for

those with PTSD. For example, results suggest that while racial-ethnic disparities are largely explained by sociodemographic characteristics and there are few gender differences in service use for those with PTSD, providers (e.g., physicians, psychologists, allied health providers) should be aware that AA/ACs and men with PTSD are less likely to receive minimally adequate treatment, and that satisfaction with treatment is lower among minorities.

Table 1. Any 12-Month Mental Health Service Use for those with Past-year PTSD by Race-ethnicity

	Non-Latino White (N=228)		Asian (N=26)			Latino (N=118)			African Americans/ Afro-Caribbeans (N=209)			Omnibus test of significance	
	%	SE	%	SE		%	SE		%	SE		F(x,y)†	p-value
Unadjusted rates:													
Any physician use	41.5	3.2	23.1	8.2	*	30.3	5.4		25.4	4.1	***	4.52	0.005
Any psychologist use	11.3	2.4	10.0	5.4		14.1	6.1		4.5	2.1		1.26	0.286
Any social worker, counselor, other health professional	19.7	2.1	17.5	6.5		20.7	5.1		8.1	2.5	***	3.05	0.037
Any mental health service use	47.3	3.8	31.1	9.3		36.8	5.3		29.1	5.1	***	4.33	0.008
Any religious/spiritual advisor, other healer, online or self-help group meetings, hotline use	23.6	2.7	9.0	5.2	*	14.9	3.0	*	13.0	3.3	**	3.96	0.011
Adjusted rates:													
Any physician use	39.9	3.3	22.9	8.5		30.9	6.6		33.4	6.0		1.45	0.231
Any psychologist use	11.6	2.3	8.3	4.4		11.8	5.5		5.9	3.1		0.87	0.456
Any social worker, counselor, other health professional	19.4	2.1	17.6	7.8		19.5	5.2		9.4	3.2	***	2.53	0.060
Any mental health service use	45.7	3.7	30.8	10.3		36.6	6.1		37.3	6.8		1.05	0.373
Any religious/spiritual advisor, other healer, online or self-help group meetings, hotline use	20.9	2.5	13.5	7.8		27.7	6.3		18.3	4.3		1.34	0.263

Notes:
Sample distributions reflect the weighted number of respondents.
† Degrees of freedom range from 2-3 for x, 127-358 for y.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.
Adjusted rates are recycled predictions after adjusting for gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.

Table 2. Any 12-Month Mental Health Service Use for those with Past-year PTSD by Gender

	Men (N=139)		Women (N=463)		p-value	
	%	SE	%	SE		
Unadjusted rates:						
Any physician use	37.0	6.8	38.1	4.0	0.892	
Any psychologist use	16.4	4.4	8.7	1.9	0.062	*
Any social worker, counselor, other health professional	15.5	3.9	18.0	2.3	0.639	
Any mental health service use	44.5	7.0	42.8	3.7	0.828	
Any religious/spiritual advisor, other healer, online or self-help group meetings, hotline use	11.3	3.3	24.3	2.7	0.017	**
Adjusted rates:						
Any physician use	39.0	6.8	37.4	3.3	0.851	
Any psychologist use	21.2	4.2	8.0	1.8	0.003	***
Any social worker, counselor, other health professional	17.3	4.6	18.5	2.5	0.848	
Any mental health service use	48.4	6.7	41.7	3.2	0.356	
Any religious/spiritual advisor, other healer, online or self-help group meetings, hotline use	11.0	3.3	24.3	2.6	0.003	***

Notes:
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01
** Significant at p<.05
* Significant at p<.10
Adjusted rates are recycled predictions after adjusting for race-ethnicity, age, marital status, poverty, insurance, region, education, work status, and nativity status.

Table 3. Mean 12-Month Mental Health Service Visits for those with Past-year PTSD Who Sought Treatment by Race-ethnicity

	Non-Latino White			Asian			Latino				African Americans/ Afro-Caribbeans				Omnibus test of significance	
	Mean	SE	N	Mean	SE	N	Mean	SE	N		Mean	SE	N		F(x,y)†	p-value
Unadjusted means:																
Physician visits	6.9	1.2	91	13.7	7.4	7	6.7	1.4	40		5.5	2.1	46		0.41	0.747
Psychologist visits	15.2	2.8	28	NA	NA	NA	7.5	2.6	14	*	13.0	2.8	8		32.47	0.000
Social worker, counselor, other health professional visits	18.6	3.6	45	11.3	3.7	5	23.1	9.3	25		7.9	2.3	18	**	2.62	0.060
All mental health service visits	17.4	2.3	105	25.9	8.0	10	21.4	5.3	47		9.0	2.2	54	**	3.90	0.011
Religious/spiritual advisor, other healer visits, online or self-help group meetings, hotline uses	38.8	10.4	54	NA	NA	NA	21.3	14.0	16		10.9	5.9	27		1.80	0.156
Adjusted means:																
Physician visits	6.2	1.0	91	25.3	13.1	7	11.4	3.5	40		7.1	2.3	46		1.35	0.265
Psychologist visits	13.9	2.3	28	NA	NA	NA	14.2	5.6	14		16.6	7.4	8		0.85	0.474
Social worker, counselor, other health professional visits	18.0	3.3	45	8.2	3.8	5	* 23.0	5.8	25		13.9	3.6	18		3.70	0.017
All mental health service visits	16.2	2.2	105	36.0	15.0	10	27.6	8.9	47		13.6	3.4	54		1.25	0.295
Religious/spiritual advisor, other healer visits, online or self-help group meetings, hotline uses	30.0	6.8	54	NA	NA	NA	165.2	110.5	16		14.6	5.4	27		1.92	0.136

Notes:
Means are among those who saw each type of provider.
Sample distributions reflect the weighted number of respondents.
† Degrees of freedom are (3,82), (3,37), (3,54), (3,62), and (3,97).
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.
Adjusted means are recycled predictions that adjust for gender, age, marital status, poverty, insurance, region, education, work status, and nativity status.
NA No estimate given for Asians on psychologist and informal care visits since the number of participants in each cell was less than 5.

Table 4. Mean 12-Month Mental Health Service Visits for those with Past-year PTSD Who Sought Treatment by Gender

	Men			Women			p-value	
	Mean	SE	N	Mean	SE	N		
Unadjusted means:								
Physician visits	5.2	1.3	42	7.5	1.2	148	0.177	
Psychologist visits	13.7	3.5	17	13.8	2.9	37	0.983	
Social worker, counselor, other health professional visits	13.4	5.3	20	19.8	3.9	74	0.357	
All mental health service visits	14.0	4.0	50	17.8	2.0	173	0.419	
Religious/spiritual advisor, other healer visits, online or self-help group meetings, hotline uses	40.6	20.9	15	32.6	9.2	89	0.729	
Adjusted means:								
Physician visits	4.8	1.0	42	7.6	1.1	148	0.018	**
Psychologist visits	15.0	4.5	17	14.2	2.9	37	0.889	
Social worker, counselor, other health professional visits	10.8	3.3	20	20.9	3.8	74	0.025	**
All mental health service visits	11.6	2.6	50	19.8	2.1	173	0.004	***
Religious/spiritual advisor, other healer visits, online or self-help group meetings, hotline uses	64.8	35.3	15	28.5	7.4	89	0.311	

Notes:
Means are among those who saw each type of provider.
Sample distributions reflect the weighted number of respondents.
*** Significant at p<.01
** Significant at p<.05
* Significant at p<.10
Adjusted means are recycled predictions that adjust for race-ethnicity, age, marital status, poverty, insurance, region, education, work status, and nativity status.

Table 5. Minimally Adequate Treatment for those with Past-year PTSD Who Sought Treatment by Race-ethnicity

	Non-Latino White			Asian			Latino			African Americans/ Afro-Caribbeans				Omnibus test of significance	
	%	SE	N	%	SE	N	%	SE	N	%	SE	N		F(x,y)†	p-value
Unadjusted rates:															
Minimally adequate drug or talk therapy	48.1	5.6	105	52.2	16.9	10	54.7	6.8	47	21.6	5.2	55	***	4.25	0.009
Minimally adequate drug therapy	34.4	7.1	91	13.2	12.3	7	43.3	8.6	40	18.2	6.6	46		1.71	0.176
Minimally adequate talk therapy	39.9	5.1	105	52.2	16.9	10	36.7	7.9	47	18.8	5.8	54	**	2.30	0.084
Adjusted rates:															
Minimally adequate drug or talk therapy	46.8	5.4	105	43.6	19.1	10	58.8	13.6	47	29.5	7.4	55		1.99	0.121
Minimally adequate drug therapy	33.2	6.5	91	9.6	28.0	7	53.3	15.9	40	21.6	10.1	46		1.41	0.246
Minimally adequate talk therapy	38.9	5.0	105	38.3	16.2	10	33.7	8.0	47	31.5	8.0	54		0.28	0.842

Notes:
Sample distributions reflect the weighted number of respondents.
† Degrees of freedom range from 2-3 for x, 82-243 for y.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.
Adjusted rates are recycled predictions that adjust for race-ethnicity, age, marital status, poverty, insurance, region, education, work status, and nativity status.

Table 6. Minimally Adequate Treatment for those with Past-year PTSD Who Sought Treatment by Gender

	Men			Women			p-value
	%	SE	N	%	SE	N	
Unadjusted rates:							
Minimally adequate drug or talk therapy	33.9	7.0	50	49.9	4.8	174	0.058 *
Minimally adequate drug therapy	22.0	7.9	42	37.2	6.6	148	0.147
Minimally adequate talk therapy	28.3	6.6	50	41.0	4.8	173	0.137
Adjusted rates							
Minimally adequate drug or talk therapy	34.6	5.9	50	50.5	4.6	174	0.010 **
Minimally adequate drug therapy	20.4	6.3	42	37.5	6.4	148	0.022 **
Minimally adequate talk therapy	27.3	5.4	50	42.0	4.5	173	0.016 **

Notes:
Sample distributions reflect the weighted number of respondents.
** Significant at p<.05
* Significant at p<.10
Adjusted rates are recycled predictions that adjust for race-ethnicity, age, marital status, poverty, insurance, region, education, work status, and nativity status.

Table 7. Helpfulness of 12-Month Mental Health Service Use for those with Past-year PTSD by Race-ethnicity

	Non-Latino White			Asian			Latino			African Americans/ Afro-Caribbeans			Omnibus test of significance	
	%	SE	N	%	SE	N	%	SE	N	%	SE	N	F(x,y)†	p-value
Unadjusted rates:														
Physician	89.7	2.8	93	82.9	14.3	7	74.6	6.7	41 **	77.1	8.2	49 *	2.82	0.049
Psychologist^	100.0	0.0	29	NA	NA	NA	89.4	9.6	14	90.0	9.9	9	4.56	0.007
Social worker, counselor, other health professional	89.5	3.9	46	65.6	19.7	5	80.8	12.9	25	94.1	4.3	23	0.98	0.376
Any mental health service provider	94.5	1.6	106	75.9	12.1	10 **	79.1	6.9	48 ***	77.9	7.2	57 ***	7.4	0.000
Religious/spiritual advisor, other healer	97.0	3.0	28	NA	NA	NA	100.0	0.0	14	100.0	0.0	19	0.16	0.855
Adjusted rates:														
Physician	86.4	3.9	93	97.3	5.3	7	88.9	6.7	41	87.7	5.9	49	1.06	0.371
Psychologist^														
Social worker, counselor, other health professional	89.5	3.5	46	72.2	19.3	5	78.2	9.1	25	93.7	7.0	23	1.02	0.393
Any mental health service provider	93.6	1.9	106	83.3	14.4	10	83.4	6.8	48	85.4	6.5	57	1.03	0.381
Religious/spiritual advisor, other healer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Sample distributions reflect the weighted number of respondents.
† Degrees of freedom range from 2-3 for x, 90-242 for y.
*** Significant at p<.01 for the pairwise comparison between each minority group relative to non-Latino whites.
** Significant at p<.05 for the pairwise comparison between each minority group relative to non-Latino whites.
* Significant at p<.10 for the pairwise comparison between each minority group relative to non-Latino whites.
^ Neither pairwise comparisons for unadjusted rates or adjusted rates are given for psychologists, since all Whites reported psychologists were helpful (i.e., there is complete separation of values).
NA No estimate given since the number of observations was too small.

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