Trends in Mental Health Services Utilization and Stigma in US Soldiers From 2002 to 2011

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Objectives. We characterized trends in mental health services utilization and stigma over the course of the Afghanistan and Iraq wars among active-component US soldiers.

Methods. We evaluated trends in mental health services utilization and stigma using US Army data from the Health-Related Behavior (HRB) surveys from 2002, 2005, and 2008 (n = 12 835) and the Land Combat Study (LCS) surveys administered to soldiers annually from 2003 to 2009 and again in 2011 (n = 22 627).

Results. HRB and LCS data suggested increased mental health services utilization and decreased stigma in US soldiers between 2002 and 2011. These trends were evident in soldiers with and without posttraumatic stress disorder (PTSD), major depressive disorder (MDD), or PTSD and MDD. Despite the improving trends, more than half of soldiers with mental health problems did not report seeking care.

Conclusions. Mental health services utilization increased and stigma decreased over the course of the wars in Iraq and Afghanistan. Although promising, these findings indicate that a significant proportion of US soldiers meeting criteria for PTSD or MDD do not utilize mental health services, and stigma remains a pervasive problem requiring further attention. (*Am J Public Health.* 2014;104:1671–1679. doi:10.2105/AJPH.2014.301971)

Mental health problems associated with deployment to the wars in Iraq (Operation Iraqi Freedom) and Afghanistan (Operation Enduring Freedom) have had significant impact on military personnel. In studies involving active-component infantry soldiers, as many as 28% of soldiers met self-reported criteria for posttraumatic stress disorder (PTSD) or major depressive disorder (MDD) in the postdeployment period.[1–5] Studies have shown that no more than 40% of soldiers with mental health problems utilize mental health services, and as few as 50% seek intervention following a clinical referral.[1,4,6] Few studies[4] have systematically evaluated trends in mental health services utilization over the course of the wars. Moreover, there has been limited study of trends in mental health stigma.

Mental health stigma is an important barrier to care among soldiers deployed in Iraq and Afghanistan.[5–12] Stigma is particularly salient among soldiers reporting existing mental health problems.[5,10,12,13] Attitudes contributing to stigma are deeply rooted in society, and are reinforced by the military culture of being physically and psychologically resilient. Data obtained at the beginning of the Iraq war suggested that seeking mental health treatment was perceived by at least half of soldiers as likely to have a negative impact on career advancement and that doing so would be associated with a lack of unit support.[5] Consistent with civilian efforts[14] and in response to the available data during and after deployment, the military has implemented a number of initiatives to increase mental health awareness and diminish stigma.[15–20] If these initiatives have been effective, an increasing trend in utilization rates and a decreasing trend in stigma over the course of the wars would be expected.

We aimed to characterize trends in mental health services utilization and stigma in US Army personnel over the course of the Iraq and Afghanistan wars using 2 independent data sources: (1) Army data from the 2002, 2005, and 2008 Health-Related Behavior (HRB) surveys of the Department of Defense[21] and (2) Land Combat Study (LCS) surveys,[2,5,6] which were administered to active-component infantry soldiers by a trained research team 3 to 6 months after deployment annually from 2003 to 2009 and again in 2011.

METHODS

We used a multisample approach to allow for the replication of observed trends in utilization and stigma across 2 independent data sources that employed different sampling strategies and Army populations. Doing so bolstered confidence in the generalizability of these data to the Army at large.

2002, 2005, and 2008 Health-Related Behavior Surveys

Participants and procedures. The eligible population consisted of all active-duty military personnel except recruits, service academy students, persons absent without official leave, and persons who had a permanent change of station at the time of data collection. We used a 2-stage probability design to first select a random sample of 30 to 60 military installations located worldwide, stratified by service and region of the world. In the second stage, we randomly selected active-duty personnel, stratified by pay grade and gender, at the participating installations. We oversampled officers and women because of their smaller numbers. We designed the study so that it provided representative data for each service. For the current study, we restricted analyses to the Army data from the 2002, 2005, and 2008 HRB surveys. In aggregate, the surveys drew a probability sample of 21 795 active-component Army soldiers, with 12 853 completed surveys for an overall response rate of 59.0%. We weighted data for each survey to represent the population of eligible active-duty personnel and made adjustments for the potential biasing effects of differential nonresponse. Table 1 presents the demographic characteristics for the Army population from the HRB surveys for 2002, 2005, and 2008.

TABLE 1—Demographic Characteristics of Participants: US Army Health-Related Behavior Survey; 2002, 2005, 2008

Characteristic	2002 (n = 3269), %	2005 (n = 3639), %	2008 (n = 5927), %
Gender			
Male	83.1	85.7	86.5
Female	16.9	14.3	13.5
Age, y			
18–19	6.1	9.9	6.6
20–29	54.0	57.1	54.9
30–39	30.9	22.9	27.9
≥ 40	9.0	10.1	10.6
Rank			
Enlisted (E1–E9)	85.6	83.3	82.7
Officer	14.4	16.7	17.3
Race/ethnicity			
White	60.6	60.7	62.7
African American	27.5	21.8	19.9
Hispanic	7.2	10.5	10.7
Asian	2.4	1.8	2.8
Other	2.3	5.3	3.9
Education			
≤ high school	37.1	37.0	33.2
Some college	44.4	40.7	44.7
College degree	18.6	22.3	22.0

Surveys were provided to soldiers by a trained research team and the data were collected anonymously in group settings at large installations (90%) or were mailed to selected individuals at smaller locations (10%) where it was not feasible to conduct on-site data collection.

Health-Related Behavior survey measures. Mental health services utilization was assessed via self-report. Soldiers were asked to indicate whether they had received counseling or treatment of a mental health or substance abuse problem during the past 12 months. Sources of treatment examined included (1) a mental health professional (e.g., psychologist, psychiatrist, clinical social worker, or other mental health counselor) at a military facility, (2) a civilian mental health professional, (3) a general medical doctor at a military facility, and (4) a general medical doctor at a civilian facility. For the purposes of data analysis, we considered an affirmative response to any of these options to be an indication of mental health service utilization.

The HRB survey included an item assessing stigma that asked soldiers to indicate whether they believed seeking counseling or therapy through the military would have career-damaging effects. Response options were as follows: (1) it definitely would damage a person's career, (2) it probably would damage a person's career, (3) it probably would not damage a person's career, and (4) it definitely would not damage a person's career. For data analysis, we collapsed responses for positive response options (i.e., options 1 and 2) and used them as the criterion variable.

2003–2009 and 2011 Land Combat Study Surveys

Participants and procedures. Anonymous cross-sectional survey data were collected from active-component US soldiers from infantry combat brigade teams (n = 22 627) between 2003 and 2011 following deployment from Iraq (n = 16 537) or Afghanistan (n = 6090). Response rates for 2003 through 2007 were approximately 62%, as reported in Thomas et al.[2] Response rates for 2008, 2009, and 2011 were 46%, 54%, and 75%, respectively. It was not possible to directly compare the demographic data of responders and nonresponders because only responders were allowed an opportunity to provide informed consent for using their data for research purposes. However, data from the LCS have been highly comparable with those of the larger deployed population on the basis of postdeployment health assessments.[2] Data collections were scheduled by research teams in conjunction with data collection sites and took place 3 to 6 months after deployment. This timing of survey administration corresponded with postdeployment health assessments routinely conducted during that time frame.[22] Table 2 displays LCS participants' demographic data by survey year. Survey data collection procedures in the present study were consistent with those reported in other LCS publications.[2,5,6] Other studies using these data suggested that our sample is demographically representative of the Army infantry population at large.[2,5,23] Missing data percentages on main study variables (collapsed across survey year) ranged from 0.7% to 8.4%.

Land Combat Study survey measures. Mental health service utilization was assessed in the LCS samples with the same domains that were used in HRB surveys, although the stem question and referent time differed. For the LCS, soldiers were asked to indicate if they had seen any of the following professionals for a stress, emotional, alcohol, or family problem in the past month: (1) a mental health professional in a military setting, (2) a civilian mental health professional, (3) a general medical doctor in a military setting, or (4) a civilian general medical doctor. Response options for the type of mental health service utilized were identical in LCS data collections performed during years 2003 through 2007. For years 2008, 2009, and 2011, the response format for mental health services utilization was altered. In 2008 and 2009, soldiers were asked to indicate whether they had received professional help concerning a stress, emotional, alcohol, or family problem in the last 3 months. If they answered "yes" to this initial query, they subsequently indicated what type of mental health services they had utilized. In 2011, soldiers were asked whether they had seen any of the same categories of mental health professionals for a stress, emotional, alcohol, or family problem in the past 6 months. To minimize unintended bias introduced into responses

TABLE 2—Demographic Characteristics of Participants: US Army Land Combat Study, 2003–2011

Characteristic	2003[a] (n = 3986), %	2004 (n = 10 334), %	2005 (n = 260), %	2006 (n = 1120), %	2007 (n = 1389), %	2008[b] (n = 1874), %	2009[b] (n = 1077), %	2011[b] (n = 2587), %
Gender								
Male	98.3	98.2	100.0	96.6	91.0	87.5	89.5	93.1
Female	1.7	1.8	0.0	3.4	9.0	12.5	10.5	6.9
Age, y								
18–19	8.7	7.6	6.9	2.1	4.3	5.5	2.8	1.1
20–29	74.2	76.6	75.0	70.5	74.5	68.6	71.5	70.8
30–39	15.6	14.5	17.4	24.4	19.0	20.8	20.9	23.1
≥ 40	1.4	1.3	0.7	3.3	2.3	5.1	4.9	5.0
Rank								
E1–E4	63.6	63.8	53.1	49.5	58.2	62.7	57.6	56.1
E5–E9	29.8	29.8	40.2	39.9	35.9	31.5	34.3	33.6
Officer	6.5	6.4	6.6	10.5	5.9	5.8	8.1	10.3
Race/ethnicity								
White	67.8	69.7	73.4	59.6	68.3	. . .	. . .	. . .
African American	12.6	10.6	7.1	22.7	14.0	. . .	. . .	. . .
Hispanic	12.6	12.2	11.7	9.7	10.6	. . .	. . .	. . .
Asian	3.0	3.3	5.3	2.8	2.8	. . .	. . .	. . .
Other	4.1	4.1	2.5	5.1	4.2	. . .	. . .	. . .
Education								
≤ high school	79.2	57.2	49.8	50.2	48.8	47.8	49.4	48.3
Some college	. . .	32.8	39.2	36.3	41.3	43.7	39.6	39.0
College degree	12.8	10.1	11.0	13.5	9.8	8.5	11.0	12.8

Note. Valid percentage values are reported for each year. Missing data were 1.5% or less for all survey years.
[a]"Some college" was not a response option in 2003; 8.0% of soldiers reported "other" for their educational attainment.
[b]Race/ethnicity data were not collected in Land Combat Study surveys from 2008 to 2011.

obtained in 2008 and 2009 versus 2003 through 2007 and 2011, we created a single yes-or-no utilization item based on responses to any of the categories that were also available for response in the 2003 to 2007 and 2011 surveys; specifically, (1) a mental health professional in a military setting, (2) a civilian mental health professional, (3) a general medical doctor in a military setting, and (4) a civilian general medical doctor. We computed a single utilization yes-or-no categorization by considering a response to any of the items that were surveyed.

We assessed PTSD using the validated 17-item PTSD Checklist.[5,24–26] We summed responses to the 17 items, which yielded a range of possible scores of 17 through 85. Following prior studies in military populations, the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*)[27] criteria, and evidence related to optimal cutoff criteria of the PTSD Checklist for research populations, we required that, for participants to be considered positive for PTSD, their reports include at least 1 intrusion symptom, 3 avoidance symptoms, and 2 hyperarousal symptoms that were at least at the moderate level of severity, and that their total score be 50 or higher.[2,5]

We assessed MDD with the Patient Health Questionnaire-9 (PHQ-9), a validated clinical scale for depression based on *DSM-IV-TR* criteria.[28] This questionnaire is widely used in primary care and specialty mental health settings,[28,29] as well as in active-component military samples.[2,5] We considered that criteria for depression were met if the respondent endorsed at least 5 symptoms per *DSM-IV-TR* criteria, with at least 1 including either "feeling, down, depressed or hopeless" or "having little interest in doing things."

We measured mental health stigma with a 7-item scale assessing beliefs about factors that might affect a soldier's decision to seek mental health services. Soldiers were asked to rate each item on a Likert-type scale that ranged from 1 ("strongly disagree") to 5 ("strongly agree"). We assessed the following components of stigma: trust in mental health professionals, embarrassment, career harm, effects on unit confidence, being treated differently by unit leadership, being blamed for problems by leadership, and being seen as weak. These items were developed by Hoge et al.[5] and have been used in other published studies.[17,23,30–32] We defined the presence of mental health stigma as an affirmative response to any item indicating "agree" or "strongly agree." We computed an affirmative response to any 1 of the 7 items indicating "agree" or "strongly agree" as an overall and singular index of stigma (i.e., any stigma).

Data analysis. Analyses included simple frequency and descriptive statistics and logistic regression. We computed descriptive statistics to characterize the sample in terms of age, gender, race/ethnicity, educational attainment, and rank; we calculated raw percentages for

the criterion variables of interest. We conducted multivariate logistic regression models adjusted for age, gender, rank, and educational attainment. For each logistic regression, the initial year for the sample data analyzed was the referent and was considered the baseline for all statistical comparisons. We computed models for the total sample for both the HRB data and the LCS data. We also computed logistic regressions for those who screened positive for PTSD, MDD, or PTSD and MDD (MH positive) and those who did not (MH negative).

RESULTS

Table 3 provides percentages of utilization of mental health services and perception of mental health stigma among both HRB and LCS participants. Increases in mental health services utilization relative to the baseline year were evident for the HRB and LCS data. For the HRB data, the logistic regression analysis highlighted increases in utilization in both 2005 and 2008 relative to 2002 (Table 4). There was a 75% increase in the proportion of soldiers seeking care in 2008 (28.2%) versus 2002 (16.1%; $P < .05$). For the LCS data, there

TABLE 3—US Army Participants' Utilization of Mental Health Services Utilization and Perception of Stigma Associated With Utilization: Health-Related Behavior Survey and Land Combat Study Survey, US Army, 2002–2011

Variable	Health-Related Behavior Survey, %			Land Combat Study Survey, %							
	2002	2005	2008	2003	2004	2005	2006	2007	2008	2009	2011
Health-Related Behavior Survey (total)											
Mental health service utilization	16.1	19.6	28.2								
Mental health stigma	48.0	45.3	35.3								
Land Combat Study Survey (total)											
Mental health services utilization				7.6	8.4	6.8	14.9	17.2	11.0	12.6	14.8
Any stigma				51.1	47.4	38.9	42.4	44.4	42.9	37.0	43.6
"I don't trust mental health professionals."				20.4	18.7	14.2	18.6	19.9	19.0	15.2	13.7
"It would be too embarrassing."				20.2	19.6	14.2	16.6	15.2	18.9	14.3	22.5
"It would harm my career."				27.8	25.2	18.2	19.2	18.0	18.3	13.0	23.7
"Members of my unit might have less confidence in me."				34.6	31.2	22.3	24.5	23.7	25.1	20.0	28.2
"Members of my unit might treat me differently."				37.1	33.9	23.6	27.8	26.1	26.4	20.2	24.8
"My leaders would blame me for the problems."				23.3	20.9	12.6	15.0	15.7	14.1	11.1	17.2
"I would be seen as weak."				35.1	32.8	21.5	26.5	26.2	25.7	19.2	28.8
Land Combat Study Survey (MH positive)											
Mental health services utilization				19.8	18.6	28.9	35.1	42.1	24.4	27.1	35.8
Any stigma				77.4	68.7	70.3	63.9	69.9	62.8	51.9	71.1
"I don't trust mental health professionals."				35.5	30.8	32.4	32.3	33.0	31.8	24.4	24.4
"It would be too embarrassing."				36.8	33.9	32.4	31.1	32.0	32.0	25.6	41.0
"It would harm my career."				49.6	42.8	37.8	31.0	33.6	32.3	27.4	41.5
"Members of my unit might have less confidence in me."				56.7	49.4	37.8	40.5	44.1	41.1	33.3	53.0
"Members of my unit might treat me differently."				61.8	55.2	45.9	45.8	48.7	42.0	39.1	50.0
"My leaders would blame me for the problems."				47.4	41.5	37.8	32.3	35.3	30.9	24.4	40.2
"I would be seen as weak."				60.4	52.1	43.2	45.6	52.0	44.9	31.2	51.8
Land Combat Study Survey (MH negative)											
Mental health services utilization				5.2	5.8	2.8	9.3	9.8	7.7	10.0	11.4
Any stigma				45.8	41.9	33.3	36.5	36.9	38.0	34.4	39.2
"I don't trust mental health professionals."				17.4	15.6	11.0	14.8	16.0	15.8	13.6	12.0
"It would be too embarrassing."				16.9	15.8	11.0	12.7	10.2	15.8	12.3	19.5
"It would harm my career."				30.1	26.5	19.5	20.0	17.7	21.2	17.6	20.9
"Members of my unit might have less confidence in me."				23.4	20.6	14.8	15.9	13.4	14.9	10.4	24.2
"Members of my unit might treat me differently."				32.2	28.4	19.6	22.8	19.5	22.6	16.8	20.7
"My leaders would blame me for the problems."				18.5	15.5	8.1	10.2	9.8	10.0	8.7	13.5
"I would be seen as weak."				30.0	27.8	17.6	21.3	18.6	21.0	17.1	25.2

Note. MH positive = screened positive for posttraumatic stress disorder (PTSD), major depressive disorder (MDD), or both; MH negative = screened negative for PTSD, MDD, or both. Percentages are based on valid percentage values (i.e., nonmissing data only) for all variables. Any stigma from the Land Combat Study surveys was defined as an affirmative response to any 1 of the 7 stigma items including "agree" or "strongly agree."

TABLE 4—Multivariate Analysis for Year as a Predictor of Mental Health Services Utilization and Stigma Among Participants: Health-Related Behavior Survey and Land Combat Survey, US Army, 2002–2011

Variable and Year	B (SE)	AOR (95% CI)
Health-Related Behavior Survey		
Mental health services utilization		
2002 (Ref)		1.00
2005	0.50 (0.12)	1.64 (1.30, 2.08)
2008	0.79 (0.13)	2.20 (1.69, 2.87)
Stigma		
2002 (Ref)		1.00
2005	−0.12 (0.09)	0.88 (0.74, 1.05)
2008	−0.54 (0.09)	0.58 (0.48, 0.70)
Land Combat Study (total sample)		
Mental health services utilization		
2003 (Ref)		1.00
2004	0.17 (0.09)	1.18 (1.00, 1.41)
2005	0.05 (0.30)	1.04 (0.58, 1.86)
2006	0.98 (0.12)	2.65 (2.09, 3.38)
2007	1.13 (0.11)	3.08 (2.45, 3.83)
2008	0.47 (0.12)	1.59 (1.27, 2.01)
2009	0.97 (0.12)	2.65 (2.09, 3.36)
2011	1.08 (0.10)	2.93 (2.42, 3.56)
Stigma (any)		
2003 (Ref)		1.00
2004	−0.19 (0.04)	0.82 (0.77, 0.90)
2005	−0.54 (0.14)	0.59 (0.45, 0.77)
2006	−0.40 (0.07)	0.67 (0.58, 0.77)
2007	−0.32 (0.07)	0.73 (0.64, 0.83)
2008	−0.35 (0.06)	0.71 (0.63, 0.80)
2009	−0.62 (0.07)	0.54 (0.47, 0.63)
2011	−0.36 (0.05)	0.70 (0.63, 0.78)
"I don't trust mental health professionals."		
2003 (Ref)		1.00
2004	−0.98 (0.05)	0.91 (0.82, 1.00)
2005	−0.44 (0.19)	0.64 (0.44, 0.93)
2006	−0.09 (0.09)	0.91 (0.76, 1.09)
2007	−0.01 (0.08)	1.00 (0.84, 1.16)
2008	−0.04 (0.08)	0.97 (0.83, 1.12)
2009	−0.32 (0.10)	0.72 (0.60, 0.88)
2011	−0.46 (0.08)	0.63 (0.55, 0.73)
"It would be too embarrassing."		
2003 (Ref)		1.00
2004	−0.06 (0.05)	0.94 (0.85, 0.85)
2005	−0.48 (0.19)	0.62 (0.43, 0.90)
2006	−0.25 (0.10)	0.78 (0.65, 0.94)
2007	−0.37 (0.90)	0.69 (0.58, 0.82)
2008	−0.08 (0.10)	0.92 (0.79, 1.08)

Continued

was an overall increase in the proportion of soldiers who reported the use of mental health services from 2003 through 2011. With 2003 as the referent, logistic regressions revealed greater utilization in all years from 2006 to 2011 compared with 2003 (Table 4). Peak percentages of utilization were reported in 2007 (17.2%). The utilization rate reported in 2011 (14.8%) was 2 times greater than the rate reported in 2003 (7.6%), representing a 94% increase in utilization from 2003 to 2011.

Over the entire course of the LCS administration, 19.1% (n = 4327) were classified as MH positive, defined as meeting self-reported criteria for PTSD, MDD, or PTSD and MDD. Logistic regressions for MH-positive and MH-negative respondents revealed an increase in utilization rates for both subgroups. As can be seen in Table 3, for the MH-positive group, peak utilization occurred in 2007 at 42.1%, which was more than twice that reported in 2003 (19.8%) and 2004 (18.6%). Utilization in 2008 (21.6%), 2009 (25.9%), and 2011 (35.8%) dropped from 2007, but for all years it was greater than the reported rate in 2003. For the MH-negative group, a virtually identical pattern was observed. Logistic regressions for MH-positive and MH-negative respondents revealed an increase in utilization rates for both subgroups (Table 4). In sum, trends for mental health services utilization across LCS years were virtually identical across the total sample and MH-positive and MH-negative subgroups.

For the HRB survey data, we observed a significant decrease in the percentage of soldiers reporting that seeking mental health care would be career damaging, from 48.0% in 2002 to 35.2% in 2008, whereas the percentage reporting perceived stigma did not change statistically between 2002 and 2005 (Table 4). For the LCS data, the percentage of soldiers reporting any stigma in 2011 (43.6%) was approximately 8 percentage points less than that reported in 2003 (51.1%). On an item level, there was large degree of variability evident across survey years for trust in mental health professionals and feelings of embarrassment (Tables 3 and 4). MH-positive and MH-negative subgroup analyses revealed a pattern of trends for any stigma and for individual stigma items virtually identical to the trends observed for the total sample. (Item-specific logistic regression results are not

TABLE 4—*Continued*

2009	−0.44 (0.10)	0.64 (0.53, 0.78)
2011	0.11 (0.07)	1.11 (0.97, 1.27)
"It would harm my career."		
2003 (Ref)		1.00
2004	−0.17 (0.48)	0.84 (0.77, 0.92)
2005	−0.62 (0.17)	0.54 (0.39, 0.76)
2006	−0.55 (0.09)	0.58 (0.48, 0.69)
2007	−0.61 (0.08)	0.54 (0.46, 0.64)
2008	−0.56 (0.08)	0.57 (0.49, 0.66)
2009	−1.00 (0.10)	0.37 (0.30, 0.45)
2011	−0.28 (0.06)	0.76 (0.67, 0.86)
"Members of my unit might have less confidence in me."		
2003 (Ref)		1.00
2004	−0.17 (0.05)	0.84 (0.77, 0.92)
2005	−0.66 (0.16)	0.52 (0.38, 0.71)
2006	−0.52 (0.08)	0.59 (0.50, 0.67)
2007	−0.56 (0.08)	0.57 (0.49, 0.66)
2008	−0.47 (0.07)	0.62 (0.55, 0.71)
2009	−0.79 (0.09)	0.45 (0.38, 0.54)
2011	−0.34 (0.06)	0.72 (0.64, 0.81)
"My unit leadership might treat me differently."		
2003 (Ref)		1.00
2004	−0.16 (0.04)	0.85 (0.78, 0.93)
2005	−0.68 (0.16)	0.51 (0.37, 0.69)
2006	−0.45 (0.08)	0.64 (0.55, 0.75)
2007	−0.54 (0.07)	0.58 (0.51, 0.67)
2008	−0.50 (0.07)	0.61 (0.53, 0.70)
2009	−0.88 (0.09)	0.42 (0.35, 0.49)
2011	−0.61 (0.11)	0.54 (0.48, 0.61)
"My leaders would blame me for the problem."		
2003 (Ref)		1.00
2004	−0.15 (0.05)	0.86 (0.78, 0.95)
2005	−0.75 (0.20)	0.47 (0.32, 0.70)
2006	−0.53 (0.10)	0.59 (0.48, 0.71)
2007	−0.48 (0.09)	0.62 (0.52, 0.73)
2008	−0.57 (0.08)	0.56 (0.48, 0.66)
2009	−0.87 (0.11)	0.42 (0.34, 0.52)
2011	−0.37 (0.07)	0.69 (0.60, 0.80)
"I would be seen as weak."		
2003 (Ref)		1.00
2004	−0.10 (0.04)	0.90 (0.93, 0.98)
2005	−0.70 (0.16)	0.50 (0.36, 0.68)
2006	−0.41 (0.08)	0.67 (0.57, 0.78)
2007	−0.43 (0.07)	0.65 (0.56, 0.75)
2008	−0.43 (0.07)	0.65 (0.57, 0.74)
2009	−0.82 (0.09)	0.44 (0.37, 0.74)
2011	−0.29 (0.06)	0.75 (0.66, 0.84)

Continued

reported for subgroup analyses, although percentages by year and item are provided in Table 3.)

DISCUSSION

Independent data sources with divergent sampling strategies revealed a common upward trend in the utilization of mental health services and a downward trend in stigma over the course of the Iraq and Afghanistan wars. The HRB data revealed peak utilization in 2008. The LCS data showed a similar pattern, irrespective of the presence of mental health problems, with a utilization rate in 2011 that was 2 times greater than the rate reported in 2003. These data are consistent with Department of Defense surveillance data on increasing utilization of mental health services on a population basis derived from electronic medical records,[33] and they suggest that soldiers meeting criteria for these mental health problems are nearly twice as likely to seek and obtain mental health services today as at the onset of the wars. Although encouraging, it is notable that approximately two thirds of soldiers who screened positive for mental health problems did not report seeking care from the mental health services that we assessed. Our utilization rate was slightly higher than the rate reported by National Guard soldiers 12 months after deployment (8.5%).[6] Consistent with the utilization rates reported here, the National Comorbidity Survey Replication Study reported that nearly half of civilians meeting major depressive disorder criteria did not utilize mental health services over a 12-month period.[34]

Reports of stigma showed a downward trend over the course of the wars across both samples and multiple aspects of stigma, ranging from fear of career-damaging potential to fear of being seen as weak. Lack of trust in mental health professionals and feelings of embarrassment showed less consistency in trends relative to other aspects of stigma that we assessed. Overall, however, these data suggest that initiatives designed to mitigate stigma associated with seeking mental health services are having salutary effects, although the magnitudes of the trends observed were relatively small and a substantial proportion of soldiers still report stigma. The trends in stigma reported

TABLE 4—*Continued*

Land Combat Study (MH positive)		
Mental health services utilization		
2003 (Ref)		1.00
2004	−0.04 (0.12)	0.96 (0.75, 1.21)
2005	0.50 (0.39)	1.65 (0.77, 3.52)
2006	0.80 (0.18)	2.23 (1.58, 3.15)
2007	1.05 (0.16)	2.87 (2.10, 3.92)
2008	0.22 (0.17)	1.24 (0.90, 1.73)
2009	0.38 (0.22)	1.47 (0.96, 2.23)
2011	0.79 (0.16)	2.21 (1.63, 3.00)
Stigma (any)		
2003 (Ref)		1.00
2004	−0.49 (0.11)	0.61 (0.49, 0.76)
2005	−0.48 (0.38)	0.62 (0.29, 1.30)
2006	−0.75 (0.18)	0.47 (0.34, 0.67)
2007	−0.47 (0.16)	0.62 (0.45, 0.86)
2008	−0.74 (0.16)	0.48 (0.35, 0.65)
2009	−1.19 (0.20)	0.31 (0.21, 0.45)
2011	−0.41 (0.16)	0.66 (0.48, 0.90)
Land Combat Study (MH negative)		
Mental health services utilization		
2003 (Ref)		1.00
2004	0.81 (0.10)	1.08 (0.89, 1.32)
2005	−0.59 (0.42)	0.55 (0.24, 1.27)
2006	0.63 (0.15)	1.88 (1.40, 2.52)
2007	0.62 (0.14)	1.85 (1.42, 2.42)
2008	0.33 (0.13)	1.40 (1.07, 1.81)
2009	0.61 (0.14)	1.83 (1.38, 2.43)
2011	0.79 (0.11)	2.21 (1.78, 2.75)
Stigma (any)		
2003 (Ref)		1.00
2004	−0.21 (0.05)	0.82 (0.75, 0.89)
2005	−0.57 (0.15)	0.57 (0.42, 0.77)
2006	−0.47 (0.08)	0.63 (0.53, 0.74)
2007	−0.43 (0.08)	0.65 (0.56, 0.76)
2008	−0.36 (0.07)	0.70 (0.61, 0.80)
2009	−0.53 (0.08)	0.59 (0.50, 0.69)
2011	−0.34 (0.06)	0.71 (063, 0.80)

Note. AOR = adjusted odds ratio; CI = confidence interval; MH positive = screened positive for posttraumatic stress disorder (PTSD), major depressive disorder (MDD), or both; MH negative = screened negative for PTSD, MDD, or both. All models were adjusted for gender, age, rank, and educational attainment.

here support recent trends observed in a UK military sample assessed from 2008 to 2011.[35]

This study did not assess the possible causes of the trends that were observed. There are several potential factors that can be examined in future research. Department of Defense education initiatives focused on enhancing awareness of mental health problems and encouraging help seeking may have helped to destigmatize postcombat mental health problems and increase utilization. With the exception of the Army's Battlemind training program,[17] which showed some evidence of reducing stigma, the effects of these efforts remain largely unexplored. Other possible explanations for the observed trends include (1) efforts to place mental health services in primary care so that they are more accessible and potentially less stigmatizing (e.g., "RESPECT-Mil"[16]) and (2) population-level postdeployment screening for mental health problems initiated by the military, called the Post-Deployment Health Assessment (conducted immediately after deployment) and the Post-Deployment Health Reassessment (conducted 3 to 6 months after deployment). Without systematic research, it will probably not be possible to determine with certainty to what degree these programs have directly affected stigma perceptions and health care utilization.

Several limitations warrant discussion. First, it might be argued that increased utilization was a byproduct of a population-based increase in the prevalence of mental health problems as the wars have continued over a decade.[36] This appears unlikely because utilization increased and stigma decreased similarly across MH-positive and MH-negative subgroups. Second, utilization rates, mental health symptoms, and stigma were based on anonymous self-report surveys. This method of data collection can be associated with over- or underreporting of symptoms, although we observed consistent findings despite the use of independent surveys utilizing different sampling methods. Third, although PTSD and MDD were a particular focus of the LCS, a number of other postwar problems that were not assessed may be related to seeking mental health services. Fourth, we did not assess the frequency and duration of services received or the perceived quality of services. The assessment of provider satisfaction in future studies will provide a clearer picture of mental health services utilization in the Army at large. Specifically, it will be important to determine whether soldiers who initiate treatment remain in care, whether they are satisfied with the care that they receive, and whether the interventions employed are empirically supported, efficacious, and effective. Fifth, the time referent was changed in LCS surveys from the last month to the last 3 months in 2008 and 2009 and to the last 6 months in 2011. These changes are likely to bias the data in the LCS portion of this study toward showing increased utilization in the later years. However, this would not have affected stigma perceptions, which were consistently measured across the LCS study

years, and the LCS data during the 2003 to 2007 time frame when consistent data were obtained mirrored very closely the trends observed in the HRB data from 2002 to 2008. Hence, although the time referent changed in the LCS, the trends were parallel across these 2 independent data sources and consistent across the first 5 study years.

Although the different sampling strategies in the 2 data sources could be viewed as a weakness, the similarity in findings across these 2 very different study groups strongly supports the study conclusions. The HRB surveys utilized a population-based sampling strategy for all US soldiers, which included many soldiers who were not exposed to combat. The LCS surveys were collected after deployment solely among specific infantry combat brigade teams. It is possible that some of the fluctuations in percentages of mental health services utilization and stigma were attributable to differences in level of combat exposure and underlying prevalence of mental health problems, or were unit-specific effects, such as leadership views on mental health or group perceptions on mental health issues. Unfortunately, we cannot determine the cause of the fluctuations. That said, despite the differences in sample characteristics between the HRB and LCS data, as well as the potential influence of unit-specific effects within the LCS data, the pattern of results across both samples was consistent, suggesting increased utilization and decreased stigma. This should not be entirely surprising because Army efforts to increase understanding and diminish perceptions of stigma surrounding mental health issues are not specific to deployed personnel.

This the first study, to our knowledge, to empirically examine trends in mental health services utilization as well as stigma among active-component US soldiers over the course of the wars. Significant efforts have been made to increase mental health services utilization and reduce mental health–related stigma in the US Army. We found an upward trend in mental health services utilization and a corresponding downward trend in stigma, irrespective of changes to the LCS design or differences in population groups. These data thus lend some initial support for the effectiveness of Army at-large initiatives to address growing concerns surrounding soldiers' mental health. Moreover, these findings provide a foundation for further analyses of explanatory factors for the observed changes in utilization and stigma. To conclude, we must caution that stigma remains a pervasive problem, particularly concerning trust levels of mental health providers, and approximately 6 of every 10 soldiers meeting self-reported criteria for PTSD, MDD, or PTSD and MDD are not utilizing mental health services. ■

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Contributors

P. J. Quartana led the overall data analysis and writing of the article. J. Williams was involved in the data analysis. All authors contributed to the initial conceptualization of the article and the interpretation of the data, and reviewed, revised, and approved the article in its final form.

Human Participant Protection

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