

**2017 Behavioral Health Risk Assessment
Data Report (BH-RADR)**

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2017 Behavioral Health Risk Assessment Data Report
(BH-RADR)

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PUBLIC HEALTH REPORT NO. S.0008056-17
2017 BEHAVIORAL HEALTH RISK ASSESSMENT DATA REPORT
(BH-RADR)

1. SUMMARY

1.1 Purpose

The U.S. Army has implemented systematic screening processes to identify Soldiers at risk for behavioral health (BH) outcomes at different times during a Soldier's military career. This report uses health assessment data to characterize Soldiers who reported post-traumatic stress disorder (PTSD) symptoms, depression symptoms, and hazardous drinking behavior. Using administrative medical data, the proportion of Soldiers seeking care or treatment within 6 months following each health assessment was calculated. To improve Soldier and unit readiness, it is imperative information from these screenings is used to develop appropriate interventions targeting Soldiers at risk of developing BH conditions.

Army Medicine leadership can determine best practices regarding screening and treatment options for Soldiers with identified risk. The data are useful for many aspects including the individual Soldier's personal risk and protective factors; interactions with the Soldier's Family; and the company, battalion, and brigade policies and practices.

1.2 Findings and Recommendations

During 2017, Army Soldiers completed 148,016 Pre-Deployment Health Assessments (Pre-DHAs) (Department of Defense (DOD), 2015a), 70,956 Post-Deployment Health Assessments (PDHAs) (DOD, 2015b), 49,361 Post-Deployment Health Re-Assessments (PDHRAs) (DOD, 2015c), and 719,319 Periodic Health Assessments (PHAs) (DOD, 2016). The current report included the most recently completed health assessment for each Soldier resulting in 91,270 Pre-DHAs, 67,334 PDHAs, 48,717 PDHRAs, and 658,230 PHAs (Figure B-1).

The proportion of Soldiers screening positive on the Primary Care–Post-Traumatic Stress Disorder (PC-PTSD) tool significantly differed across the deployment-related health assessments: 3% positive on the Pre-DHA, 6% positive on the PDHA, and 9% on the PDHRA. These findings are consistent with a previous study, which observed the highest proportion of Soldiers reporting PTSD symptoms at PDHRA (Milliken et al., 2007). The PHA had comparable results with 8% of Soldiers screening positive on the PC-PTSD. The PHA is required by all Army Soldiers including non-activated NG and AR Soldiers as well as non-medically ready Soldiers. While the PHA results serve as an adequate “all Army” baseline, caution should be taken when comparing the deployment-related health assessments and PHA populations. Over time, the proportion of Soldiers screening positive on the PC-PTSD, Patient Health Questionnaire–2 (PHQ-2), and Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) has shown a steady downward trend across all the health assessments (Figures 5–9). The downward trend could be a result of countless factors such as changes to deployment frequency, conditions, and combat exposures; attrition of non-medically ready Soldiers; a decrease in stigma associated with seeking behavioral health care; and an increase in resources for Soldiers seeking help.

In general, across all the health assessments, Soldiers who screened positive for depression symptoms had higher odds of screening positive for PTSD symptoms compared to Soldiers who did not screen positive for depression symptoms. Behavioral health symptoms can be complex and intertwined with multiple diagnostic categories. Continued research on best practices to address the myriad of issues affecting Soldiers is needed, regardless of deployment status. On the Pre-DHA, PDHA, and PDHRA, Soldiers who reported experiencing major life stressors within the past month had significantly higher odds of screening positive for PTSD symptoms, depression symptoms, or hazardous drinking behavior. Further research is needed to identify how specific stressors impact a Soldier's mental readiness. Leadership, peers, and Family members may be able to better recognize warning signs and identify points of intervention from a better understanding of the potential negative impacts of life stressors.

Among Soldiers who screened positive on the PC-PTSD and completed the PTSD Checklist-Civilian (PCL-C) on the Pre-DHA, PDHRA, and PHA, 46–58% reported moderate to severe PTSD symptoms. Among Soldiers who screened positive on the PHQ-2 and completed the Patient Health Questionnaire–8 (PHQ-8) on the Pre-DHA, PDHRA, and PHA, 27–39% reported moderate to severe depression symptoms. Among those who reported moderate or severe symptoms of PTSD or depression, 76–88% had at least one BH encounter prior to the health assessment. Healthcare providers on the Pre-DHA and PDHRA indicated 55–67% of the Soldiers with moderate to severe PTSD or depression symptoms, who did not receive a referral, were already under care for their symptoms. These findings highlight that Soldiers with BH issues are interfacing with the BH care system. However, efforts to evaluate the patterns of referral and treatment among Soldiers who had no prior BH encounters and who screen positive for BH symptoms should be refined or developed. Early intervention and treatment during this period could change the trajectory of symptoms towards increased resiliency and decreased likelihood of prolonged negative medical outcomes.

2. REFERENCES

See Appendix A for a list of referenced material.

3. AUTHORITY

Department of the Army, Regulation 40-5, Section 2-19 (Department of the Army, 2007).

4. BACKGROUND

The Behavioral and Social Health Outcomes Program (BSHOP) of the U.S. Army Public Health Center (APHC) collects, analyzes, and disseminates surveillance data on BH risk among Regular Army (RA), National Guard (NG), and Army Reserve (AR) Soldiers. This Behavioral Health Risk Assessment Data Report (BH-RADR) presents data on Soldiers who completed BH-related screening questions on the Pre-DHA, PDHA, PDHRA, and/or PHA during 2017 (Figure B-1). The health assessment and administrative medical data were linked to assess healthcare utilization before and after screening. The current report characterizes self-reported risk for BH-related outcomes such as PTSD symptoms, depression symptoms, and hazardous drinking behavior. The terms “depression symptoms” and “PTSD symptoms” refer to a Soldier's

responses to items on the screening instruments, while the terms “major depressive disorder (MDD)” and “PTSD” refer to a diagnosis in the Soldier’s medical records.

Per a congressional mandate, the DOD develops and implements a series of deployment health assessments. The Pre-DHA is completed within 120 days prior to a Soldier’s deployment, the PDHA is completed +/- 30 days following return from deployment, and the PDHRA is completed 90–180 days following return from deployment (Figure 1). The Army’s PHA is completed every year during the Soldier’s birth month.

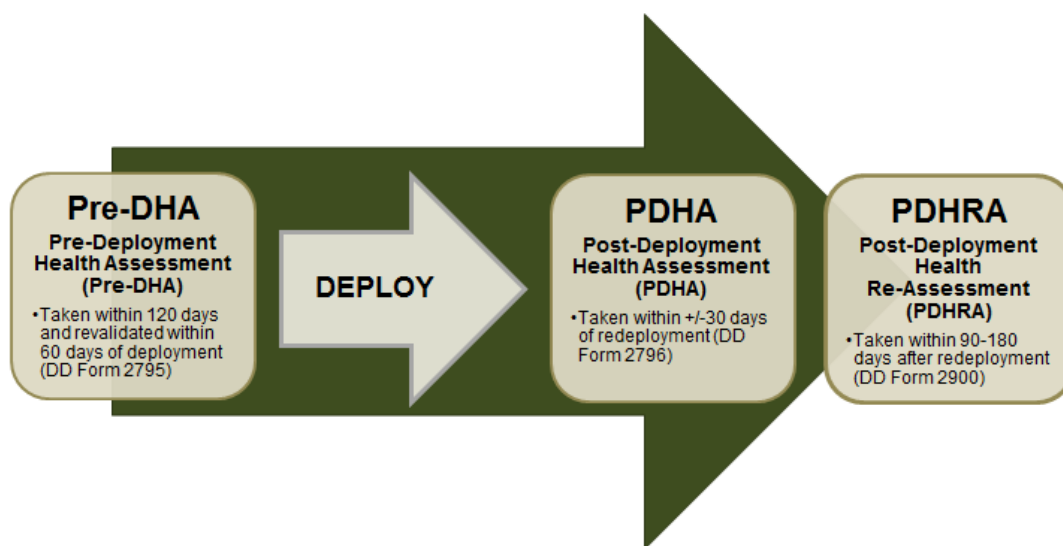


Figure 1. Deployment-Related Health Assessment Process

The DOD implemented new versions of the Pre-DHA, PDHA, and PDHRA in September 2012. These health assessments are now completed electronically using service-specific data systems. For the Army, the health assessments are completed using the Medical Protection System. The health assessments include a two-staged screening process for PTSD and depression symptoms. For PTSD symptoms, a Soldier who screens positive on the 4-question PC-PTSD will be prompted to complete the 17-question PCL-C. For depression symptoms, a Soldier who screens positive on the PHQ-2 will be prompted to complete the PHQ-8. Therefore, in this report, the populations for the second-stage screening tools only include Soldiers who screened positive on the corresponding first-stage screening tool.

This report provides valuable information on Soldier risk; however, several important caveats must be considered when interpreting the data. First, the screening data are self-reported and subject to recall bias and underreporting. Second, the outcomes reported in this document are not exhaustive. Information was not available for the current report for non-clinical BH care provided by Chaplains, Military OneSource, Family Advocacy Program, or other support programs. The findings do not include any clinical record reviews, only encounter and diagnostic indicators from administrative medical data. Third, this report only includes direct and purchased

care medical information from the military healthcare system; however, it does not contain data for BH care or treatment a Soldier received prior to joining the Army or BH care obtained through private insurance. Therefore, results could underestimate the true burden of disease. Fourth, period prevalence data (proportions calculated for single time periods) are not necessarily representative of past or future time points. Finally, the data presented are proportions and not rates. Although proportions are appropriate for public health planning, potential differences in the underlying U.S. Army population over time are not taken into account.

5. METHODS

See Appendix B for the methodology.

6. FINDINGS

6.1 Demographics, Military Characteristics, Behavioral Health Screening, Incident, and Prevalent Diagnoses across All Health Assessments

- Across all the health assessments, the majority of Soldiers were enlisted, male, and between the ages of 17 and 30. NG and AR Soldiers represented a greater proportion of the PHA population, whereas RA was the majority for all three deployment-related health assessments (Table 1). For this report, the PHA represents an all-Army population, since it includes recently deployed, non-deployable, and never deployed Soldiers. Therefore, the PHA serves as the all-Army comparison for the deployment-related health assessments (Pre-DHA, PDHA, and PDHRA) and outcomes presented.
- The prevalence of PTSD and MDD did not differ across the health assessments with 2–3% at the Pre-DHA, 3% at the PDHA, 4% at the PDHRA, and 4–5% at the PHA (Table 2). Of the 1,711 Soldiers with a PTSD diagnosis at the PDHA, 21% (n= 354) were incident (new) PTSD diagnoses. Of the 1,927 Soldiers with a MDD diagnosis, 16% (n=310) were incident MDD diagnoses.
- The proportion of Soldiers who screened positive for PTSD symptoms on the PC-PTSD varied across the deployment-related health assessments: 3% positive on the Pre-DHA, 6% positive on the PDHA, and 9% on the PDHRA (Figure 2).
- Approximately 3% of Soldiers screened positive for depression symptoms on the Pre-DHA compared to 5% on the PDHA and 6% on the PDHRA (Figure 3).
- The proportion of Soldiers who reported hazardous drinking behavior on the AUDIT-C was substantially lower on the PDHA (3%) than the PDHRA (10%) (Figure 4).
- Over time, the proportion of Soldiers screening positive on the PC-PTSD, PHQ-2, and AUDIT-C has shown a downward trend across all the health assessments (Figures 5–9).

- Refer to Appendix C for installation level PC-PTSD, PHQ-2, and AUDIT-C results.
- Refer to Appendix D for demographic and military characteristics for the PC-PTSD, PHQ-2, and AUDIT-C screening populations.

Table 1. Distribution of Demographics, Military Characteristics, and Behavioral Health-related Outcomes Stratified by Health Assessment, 2017

Characteristics^a - n (%)	Pre-DHA (n=91,270)	PDHA (n=67,334)	PDHRA (n=48,717)	PHA (n=658,230)
Component				
Regular Army	76,600 (84)	45,732 (68)	33,906 (70)	255,070 (39)
National Guard	9,504 (10)	12,492 (14)	8,502 (17)	255,796 (39)
Army Reserve	5,166 (6)	9,110 (19)	6,309 (13)	147,364 (22)
Sex				
Male	81,099 (89)	59,571 (88)	43,482 (89)	539,614 (82)
Female	10,171 (11)	7,763 (12)	5,235 (11)	118,615 (18)
Age				
17–25	44,568 (49)	27,014 (40)	17,672 (36)	242,082 (37)
26–30	19,879 (22)	15,798 (23)	12,122 (25)	137,412 (21)
31–35	12,621 (14)	10,521 (16)	7,915 (16)	103,842 (16)
36–40	7,558 (8)	6,664 (10)	5,120 (11)	73,193 (11)
>40	6,644 (7)	7,337 (11)	5,888 (12)	101,701 (15)
Rank*				
E1-E4	45,159 (50)	27,281 (41)	18,986 (39)	303,519 (46)
E5-E9	30,815 (34)	26,620 (30)	19,949 (41)	240,604 (37)
W1-W5	2,837 (3)	2,372 (4)	1,608 (3)	13,956 (2)
O1-O4	11,181 (12)	9,425 (14)	7,036 (14)	83,809 (13)
O5-O10	1,116 (1)	1,372 (2)	1,092 (2)	16,322 (2)
BH Encounter^b				
Any time prior to the health assessment ^c	36,739 (40)	34,080 (51)	28,019 (58)	240,512 (37)
Within 180 days of the health assessment ^d	21,324 (24)	11,230 (17)	7,782 (16)	71,294 (11)
Incident case ^e	9,482 (10)	3,443 (5)	1,330 (3)	16,027 (2)

Legend:

BH = Behavioral Health

Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

E = Enlisted

W = Warrant

O = Officer

Notes for Table 1:

^aVariables may have missing data which contributed to <3% of the overall population sample. Therefore, individual variable sample sizes vary. Reported proportions for these variables only represent the population with available data.

^b A BH-related ICD-9 code, ICD-10 code, ICD-9 BH-related V or E code, or ICD-10 BH-related R, T, X, or Z code in the Soldier's medical record (inpatient Dx1-Dx8 or outpatient Dx1-Dx4).

^c Includes any BH-related encounter during a Soldier's military career occurring prior to the health assessment.

^d Any BH-related encounter occurring within 180 days after the health assessment.

^e A Soldier's first BH-related encounter occurring within 6 months following the health assessment.

Table 2. Post-Traumatic Stress Disorder (PTSD) and Major Depressive Disorder (MDD) Diagnoses Stratified by Health Assessment, 2017

Diagnosis - n (%)	Pre-DHA (n=91,270)	PDHA (n=67,334)	PDHRA (n=48,717)	PHA (n=658,230)
Prevalent Diagnosis^a				
PTSD	2,199 (2)	1,711 (3)	1,841 (4)	23,700 (4)
MDD	3,089 (3)	1,927 (3)	1,989 (4)	31,164 (5)
Incident Diagnosis^b				
PTSD	185 (<1)	310 (<1)	269 (1)	1,738 (<1)
MDD	423 (<1)	354 (1)	312 (1)	2,922 (1)

Legend: Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

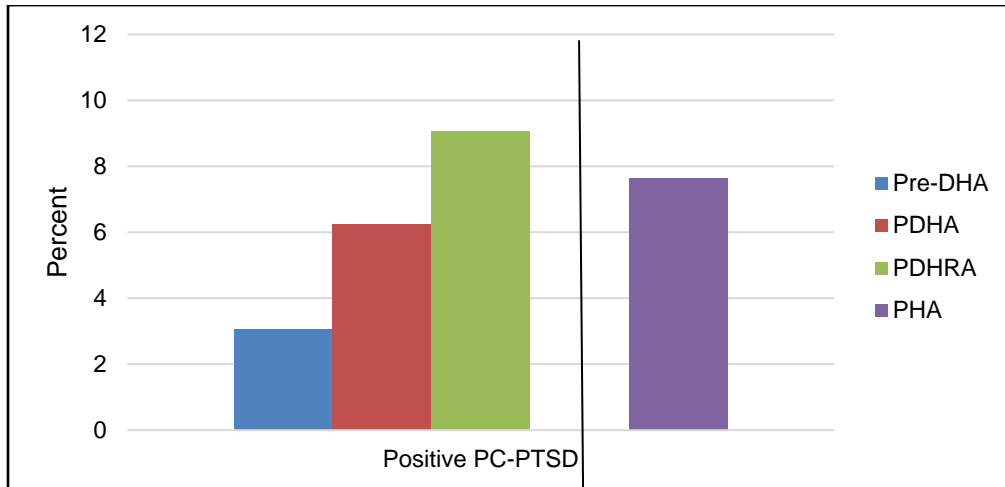
PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

Notes:

^a Soldiers who received an International Classification of Disease Code (ICD)-9 or ICD-10 code of: 309.81, F43.1 (PTSD) or 296.2-296.3, F32, F33 (MDD) any time prior to or within 6 months after the screening.

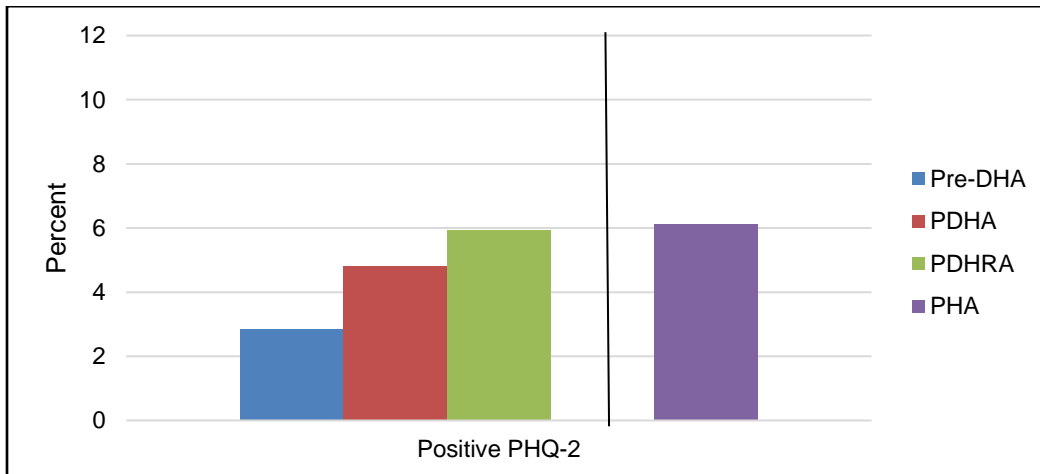
^b A new ICD-9 or ICD-10 code of: 309.81, F43.1 (PTSD); 296.2-296.3, F32, F33 (MDD) within 6 months of the BH screening.



Legend:
Pre-DHA = Pre-Deployment Health Assessment
PDHA = Post-Deployment Health Assessment
PDHRA = Post-Deployment Health Reassessment
PHA = Periodic Health Assessment

Note:
Positive PC-PTSD screen indicated with a "Yes" response to at least 2 of the 4 questions.

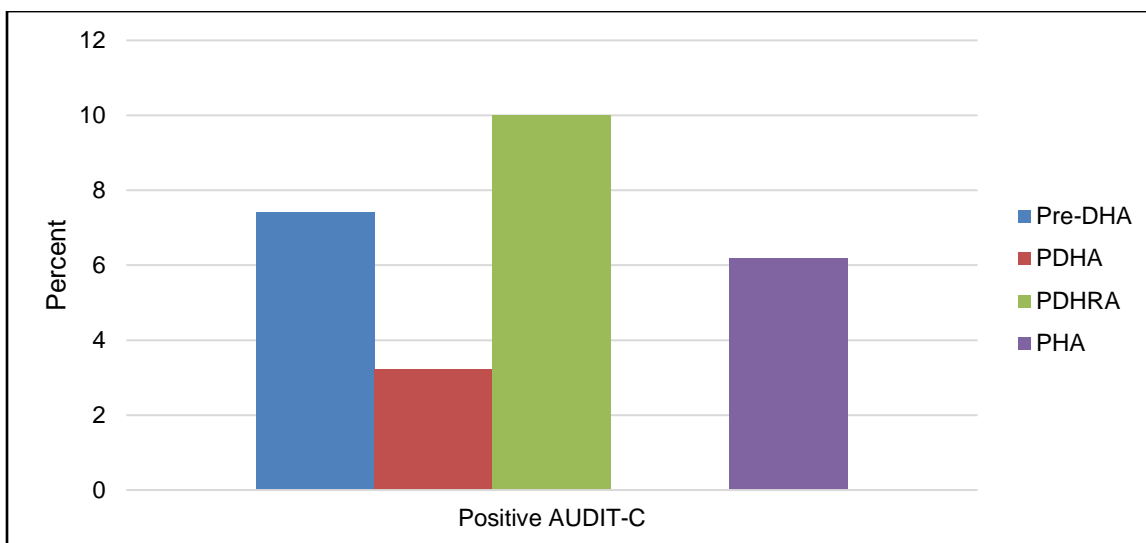
Figure 2. Primary Care–Post-Traumatic Stress Disorder (PC-PTSD) Results, 2017



Legend:
Pre-DHA = Pre-Deployment Health Assessment
PDHA = Post-Deployment Health Assessment
PDHRA = Post-Deployment Health Reassessment
PHA = Periodic Health Assessment

Note:
Positive PHQ-2 screen was a response of "more than half the days" or "nearly every day" to at least 1 of the 2 questions.

Figure 3. Patient Health Questionnaire – 2 (PHQ-2) Results, 2017



Legend:

Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

Note:

Positive AUDIT-C was indicated by a score of 5 or more for males and 4 or more for females.

Figure 4. Alcohol Use Disorders Identification Test–Consumption (AUDIT-C), 2017

6.2 Post-Traumatic Stress Disorder Screening and Symptoms

- Tables 3 and 4 present characteristics of the Soldiers who completed the PC-PTSD and PCL-C, respectively. Soldiers who reported PTSD symptoms on the PC-PTSD screening tool (46–50%) also reported major life stressors. Examples of major life stressors listed on the health assessments included serious conflicts with others, relationship or legal problems, and disciplinary/financial problems (Table 11).
- Table 5 presents the odds of screening positive for PTSD symptoms on the PC-PTSD in the setting of other factors, stratified by a health assessment. Odds ratios are reported for the positive exposure group compared to the negative exposure group for each variable. Although all estimates were significantly associated with screening positive for PTSD symptoms due to large sample sizes, the estimates for screening positive for depression symptoms and experiencing a major life stressor exhibited a meaningful difference. Across all health assessments, Soldiers who screened positive for depression symptoms had higher odds of screening positive for PTSD symptoms compared to Soldiers who did not screen positive for depression symptoms. Soldiers who experienced a major life stressor had significantly higher odds of screening positive for PTSD symptoms compared to Soldiers who did not report a major life stressor across all three deployment-related health assessments.

Table 3. Characteristics of Soldiers Who Completed the Primary Care – Post-Traumatic Stress Disorder (PC-PTSD)^a Stratified by Health Assessment, 2017

Characteristics	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=2,780)	Negative (n=88,383)	Positive (n=4,175)	Negative (n=62,646)	Positive (n=4,368)	Negative (n=43,807)	Positive (n=49,901)	Negative (n=603,480)
≥ 1 deployment ^b	71%	46%	--	--	--	--	41%	25%
Prior BH encounter ^c	81%	39%	73%	49%	79%	55%	72%	34%
BH encounter within 180 days ^d	55%	22%	40%	15%	38%	14%	32%	9%
(+) PHQ-2 ^e	34%	2%	32%	3%	34%	3%	46%	3%
(+) AUDIT-C ^f	18%	7%	7%	3%	21%	9%	14%	6%
(+) combat exposure ^g	--	--	45%	17%	52%	21%	--	--
(+) major life stressors ^h	46%	4%	49%	7%	50%	9%	--	--
(+) BH referral ⁱ	14%	1%	21%	2%	34%	3%	--	--

Legend:

Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

BH = Behavioral Health; (+) = Positive

PHQ-2 = Patient Health Questionnaire

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

Notes:

^a Positive PC-PTSD screen indicated with a “Yes” response to at least 2 of the 4 questions.

^b Reported at least 1 prior deployment on the Pre-DHA or a deployment within the past 5 years on the PHA.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.

^d A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1- Dx8 or outpatient Dx1-Dx4 within 180 days following the health assessment.

^e Depression screening tool: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions.

^f Alcohol consumption screening tool: A score of 5 or more for males and 4 or more for females.

^g Responded “Yes” to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.

^h Indicated experiencing a major life stressor during the past month.

ⁱ Provider indicated a referral to primary care or specialty care mental health.

Table 4. Characteristics of Soldiers Who Completed the Post-Traumatic Stress Disorder Checklist-Civilian (PCL-C)^a Stratified by Health Assessment, 2017

Characteristics	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=1,263)	Negative (n=1,509)	--	--	Positive (n=2,156)	Negative (n=2,197)	Positive (n=28,692)	Negative (n=20,359)
Prior BH encounter ^b	88%	75%	--	--	84%	75%	76%	65%
BH encounter within 180 days ^c	67%	44%	--	--	48%	29%	36%	24%
(+) PHQ-8 ^d	34%	1%	--	--	36%	1%	38%	2%
(+) AUDIT-C ^e	21%	16%	--	--	25%	18%	16%	10%
(+) major life stressors ^f	61%	34%	--	--	64%	37%	--	--
(+) PTSD referral ^g	19%	9%	--	--	37%	22%	--	--
Reason for not receiving a referral ^h	(n=1,021)	(n=1,374)	--	--	(n=1,368)	(n=1,707)		
Already under care	55%	26%	--	--	67%	24%	--	--
Already had a referral	3%	2%	--	--	3%	3%	--	--
No significant impairment	28%	61%	--	--	22%	64%	--	--
Other reasons	14%	12%	--	--	8%	9%	--	--

Legend:

Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

BH = Behavioral Health

(+) = Positive

PHQ-8 = Patient Health Questionnaire–8

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

PTSD = Post-Traumatic Stress Disorder

Notes:

^a Positive PCL-C screen indicated with a score greater than 39.

^b A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1- Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 within 180 days following the health assessment.

^d Depression screening tool: A score greater than 14.

^e Alcohol consumption screening tool: A score of 5 or more for males and 4 or more for females.

^f Indicated experiencing a major life stressor during the past month.

^g Provider indicated a Soldier’s symptoms were indication for a referral.

^h The reason a provider listed for not providing a Soldier with a referral after reporting a Soldier’s PCL-C score indicated the need for a referral.

Table 5. Odds of Screening Positive for Post-Traumatic Stress Disorder Symptoms on the Primary Care – Post-Traumatic Stress Disorder (PC-PTSD)^a Stratified by Health Assessment, 2017

Characteristics- cOR ^b (95% CI)	<u>Pre-DHA</u> (n=91,270)	<u>PDHA</u> (n=67,334)	<u>PDHRA</u> (n=48,717)	<u>PHA</u> (n=658,230)
Prior BH encounter ^c	6.46 (5.88-7.11)	2.83 (2.64-3.03)	3.12 (2.89-3.36)	5.07 (4.97-5.18)
Major life stressor ^d	21.13 (19.46-22.93)	12.11 (11.31-12.95)	10.16 (9.49-10.87)	--
Combat exposure ^e	--	4.09 (3.84-4.36)	3.98 (3.73-4.24)	--
AUDIT-C ^f	2.94 (2.66-3.25)	2.67 (2.36-3.03)	2.76 (2.55-2.99)	2.67 (2.60-2.74)
PHQ-2 ^g	26.35 (24.03-28.91)	15.03 (13.88-16.28)	16.38 (15.08-17.79)	31.59 (30.84-32.35)

Legend:

cOR = Crude Odds Ratio

CI = Confidence Interval

Pre-DHA = Pre-Deployment Health Assessment

PDHA = Post-Deployment Health Assessment

PDHRA = Post-Deployment Health Reassessment

PHA = Periodic Health Assessment

BH = Behavioral Health

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption

PHQ-2 = Patient Health Questionnaire

Notes:

^a Positive PC-PTSD screen indicated with a “Yes” response to at least 2 of the 4 questions.

^b Odd ratios were calculated using SAS 9.4 Cochran-Mantel-Haenszel Chi-Square Test.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.

^d Indicated experiencing a major life stressor during the past month.

^e Responded “Yes” to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.

^f Alcohol consumption screening tool: A score of 5 or more for males and 4 or more for females.

^g Depression screening tool: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions.

6.3 Depression Screening and Symptoms

- Tables 6 and 7 present characteristics of Soldiers who completed the PHQ-2 and PHQ-8, respectively. Among the Soldiers who screened positive on the PHQ-2, 68–79% had at least one BH encounter prior to the health assessment (Table 6). The majority of the Soldiers who completed the PHQ-8 screened positive for moderate to severe PTSD symptoms on the PCL-C (Table 7).
- Soldiers who screened positive for PTSD symptoms had higher odds of screening positive for depression symptoms compared to Soldiers who did not screen positive for PTSD symptoms across all four health assessments (Table 8). Soldiers who

experienced a major life stressor had significantly higher odds of screening positive for depression symptoms compared to Soldiers who did not report a major life stressor for each deployment-related health assessment.

Table 6. Characteristics of Soldiers Who Completed the Patient Health Questionnaire-2 (PHQ-2)^a Stratified by Health Assessment, 2017

Characteristics	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=2,607)	Negative (n=88,604)	Positive (n=3,230)	Negative (n=63,743)	Positive (n=2,857)	Negative (n=45,307)	Positive (n=38,170)	Negative (n=584,636)
≥ 1 deployment ^b	51%	47%	--	--	--	--	36%	25%
Prior BH encounter ^c	67%	40%	68%	50%	79%	56%	69%	34%
BH encounter within 180 days ^d	54%	23%	39%	16%	43%	14%	35%	9%
(+) PC-PTSD ^e	36%	2%	41%	5%	52%	6%	60%	5%
(+) AUDIT-C ^f	21%	7%	8%	3%	24%	9%	15%	6%
(+) combat exposure ^g	--	--	30%	18%	40%	23%	--	--
(+) major life stressors ^h	47%	4%	50%	8%	56%	10%	--	--
(+) BH referral ⁱ	14%	1%	20%	2%	33%	4%	--	--

Legend:

Pre-DHA = Pre-Deployment Health Assessment;

PDHA = Post-Deployment Health Assessment;

PDHRA = Post-Deployment Health Reassessment;

PHA = Periodic Health Assessment;

BH = Behavioral Health; (+) = Positive;

PC-PTSD = Primary Care- Post Traumatic Stress Disorder;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption;

PTSD = Post Traumatic Stress Disorder

Notes:

^a Positive PHQ-2 screen was a response of “more than half the days” or “nearly every day” to at least 1 of the 2 questions.

^b Reported at least 1 prior deployment on the Pre-DHA or a deployment within the past 5 years on the PHA.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.

^d A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 within 180 days following the health assessment.

^e PTSD screening tool: Responded “Yes” to at least 2 of the 4 questions.

^f Alcohol consumption screening tool: A score of 5 or more for males and 4 or more for females.

^g Responded “Yes” to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.

^h Indicated experiencing a major life stressor during the past month.

ⁱ Provider indicated a referral to primary care or specialty care mental health.

Table 7. Characteristics of Soldiers Who Completed the Patient Health Questionnaire-8 (PHQ-8)^a Stratified by Health Assessment, 2017

Characteristics	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=712)	Negative (n=1,893)	--	--	Positive (n=1,058)	Negative (n=1,787)	Positive (n=14,795)	Negative (n=22,788)
Prior BH encounter ^b	81%	62%	--	--	84%	76%	76%	64%
BH encounter within 180 days ^c	81%	47%	--	--	50%	40%	40%	30%
(+) PCL-C ^d	60%	19%	--	--	74%	28%	74%	35%
(+) AUDIT-C ^e	25%	21%	--	--	28%	22%	17%	13%
(+) major life stressors ^f	70%	39%	--	--	72%	47%	--	--
(+) Depression referral ^g	16%	4%	--	--	27%	13%	--	--
Reason for not receiving a referral ^h :	(n=342)	(n=451)	--	--	(n=543)	(n=551)		
Already under care	67%	52%	--	--	74%	50%	--	--
Already had a referral	4%	3%	--	--	3%	3%	--	--
No significant impairment	21%	33%	--	--	16%	39%	--	--
Other reasons	8%	13%	--	--	6%	8%	--	--

Legend:

Pre-DHA = Pre-Deployment Health Assessment;

PDHA = Post-Deployment Health Assessment;

PDHRA = Post-Deployment Health Reassessment;

PHA = Periodic Health Assessment;

BH = Behavioral Health;

(+) = Positive;

PCL-C = Post Traumatic Stress Disorder Checklist – Civilian;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption;

PTSD = Post Traumatic Stress Disorder;

m = months

Notes:

^a Positive PHQ-8 was indicated by a score greater than 14.

^b A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier's career prior to the health assessment.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 within 180 days following the health assessment.

^d PTSD screening tool: A score greater than 39.

^e Alcohol consumption screening tool: A score of 5 or more for males and 4 or more for females.

^f Indicated experiencing a major life stressor during the past month.

^g Provider indicated a Soldier's symptoms were indication for a referral.

^h The reason a provider listed for not providing a Soldier with a referral after reporting the Soldier's PHQ-8 score indicated a need for referral.

Table 8. Odds of Screening Positive for Depression Symptoms on the Patient Health Questionnaire-2 (PHQ-2)^a Stratified by Health Assessment, 2017

Characteristics- cOR^b (95% CI)	<u>Pre-DHA</u> (n=91,270)	<u>PDHA</u> (n=67,334)	<u>PDHRA</u> (n=48,717)	<u>PHA</u> (n=658,230)
Prior BH encounter ^c	3.18 (2.92-3.45)	2.13 (1.97-2.30)	2.90 (2.64-3.17)	4.29 (4.19-4.38)
Major life stressor ^d	21.62 (19.88-23.52)	11.77 (10.92-12.68)	11.52 (10.63-12.48)	--
Combat exposure ^e	--	2.01 (1.86-2.17)	2.26 (2.10-2.45)	--
AUDIT-C ^f	3.63 (3.30-4.00)	2.91 (2.54-3.32)	3.22 (2.94-3.52)	2.81 (2.73-2.90)
PC-PTSD ^g	26.35 (24.03-28.91)	15.03 (13.88-16.28)	16.38 (15.08-17.80)	31.59 (30.84-32.35)

Legend:

cOR = Crude Odds Ratio;

CI = Confidence Interval;

Pre-DHA = Pre-Deployment Health Assessment;

PDHA = Post-Deployment Health Assessment;

PDHRA = Post-Deployment Health Reassessment;

PHA = Periodic Health Assessment;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption;

PC-PTSD = Primary Care Post Traumatic Stress Disorder

Notes:

^a Positive PHQ-2 screen was a response of “more than half the days” or “nearly every day” to at least 1 of the 2 questions.

^b Crude odds ratios were calculated using SAS 9.4 Cochran-Mantel- Haenszel Chi-Square Test.

^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1- Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.

^d Indicated experiencing a major life stressor during the past month.

^e Responded “Yes” to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.

^f A score of 5 or more for males and 4 or more for females.

^g Responded “Yes” to at least 2 of the 4 questions.

6.4 Hazardous Drinking Behavior Screening and Symptoms

- Characteristic differences between the positive and negative AUDIT-C populations (Table 9) do not appear as strong as those differences seen in the PTSD (Table 3) and depression (Table 6) populations. However, Soldiers who reported hazardous drinking behavior had higher odds of reporting major life stressors, PTSD symptoms, and depression symptoms (Table 10).

Table 9. Characteristics of Soldiers Who Completed the Alcohol Use Disorders Identification Test–Consumption (AUDIT-C)^a Stratified by Health Assessment, 2017

Characteristics	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=6,753)	Negative (n=84,480)	Positive (n=2,150)	Negative (n=64,824)	Positive (n=4,823)	Negative (n=43,363)	Positive (n=40,681)	Negative (n=616,928)
≥ 1 deployment ^b	49%	47%	--	--	--	--	28%	26%
Prior BH encounter ^c	44%	40%	57%	51%	61%	57%	40%	36%
BH encounter within 180 days ^d	26%	23%	22%	17%	20%	16%	12%	11%
(+) PC-PTSD ^e	8%	3%	15%	6%	19%	8%	17%	7%
(+) PHQ-2 ^f	8%	2%	12%	5%	14%	5%	14%	5%
(+) combat exposure ^g	12%	5%	21%	18%	32%	23%	--	--
(+) major life stressors ^h	--	--	22%	10%	24%	11%	--	--
(+) BH referral ⁱ	2%	1%	6%	3%	13%	5%	--	--

Legend:

Pre-DHA: Pre-Deployment Health Assessment,
 PDHA: Post-Deployment Health Assessment,
 PDHRA: Post-Deployment Health Reassessment,
 PHA: Periodic Health Assessment,
 BH-Behavioral Health,
 PC-PTSD: Primary Care–Post-Traumatic Stress Disorder,
 PHQ-2: Patient Health Questionnaire;
 m = months

Notes:

- ^a A score of 5 or more for males and 4 or more for females indicated a positive screen.
- ^b Reported at least 1 prior deployment on the Pre-DHA or a deployment within the past 5 years on the PHA.
- ^c A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier’s career prior to the health assessment.
- ^d A BH-related ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 within 180 days following the health assessment.
- ^e Responded “Yes” response to at least 2 of the 4 questions. ^f Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions.
- ^g Responded “Yes” to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.
- ^h Indicate experiencing a major life stressor during the past month. ⁱ Provider indicated a referral to primary care or specialty care mental health.

Table 10. Odds of Screening Positive for Hazardous Drinking Behavior on the Alcohol Use Identification Test– Consumption (AUDIT-C)^a Stratified by Health Assessment, 2017

Characteristics-cOR ^b (95% CI)	Pre-DHA (n=91,270)	PDHA (n=67,334)	PDHRA (n=48,717)	PHA (n=658,230)
Prior BH encounter ^c	1.18 (1.13-1.24)	1.31 (1.20-1.43)	1.17 (1.10-1.25)	1.15 (1.13-1.18)
Major life stressor ^d	2.75 (2.54-2.98)	2.67 (2.40-2.97)	2.51 (2.33-2.69)	--
Combat exposure ^e	--	1.21 (1.09-1.35)	1.58 (1.48-1.68)	--
PC-PTSD ^f	2.94 (2.66-3.25)	2.67 (2.36-3.03)	2.76 (2.55-2.99)	2.67 (2.60-2.74)
PHQ-2 ^g	3.63 (3.29-4.00)	2.91 (2.54-3.32)	3.22 (2.94-3.52)	2.81 (2.73-2.90)

Legend:

cOR: Crude Odds Ratio,

CI: Confidence Interval,

PC-PTSD: Primary-Care Post-Traumatic Stress Disorder,

PHQ-2: Patient Health Questionnaire-2.

Notes:

^a A score of 5 or more for males and 4 or more for females indicated a positive screen.

^b Odds ratios were calculated using SAS 9.4 Cochran-Mantel-Haenszel Chi-Square Test.

^c A BH-related

ICD-9, ICD-10, or BH-related support code in inpatient Dx1-Dx8 or outpatient Dx1-Dx4 at any point in a Soldier's career prior to the health assessment.

^d Indicated experiencing a major life stressor during the past month.

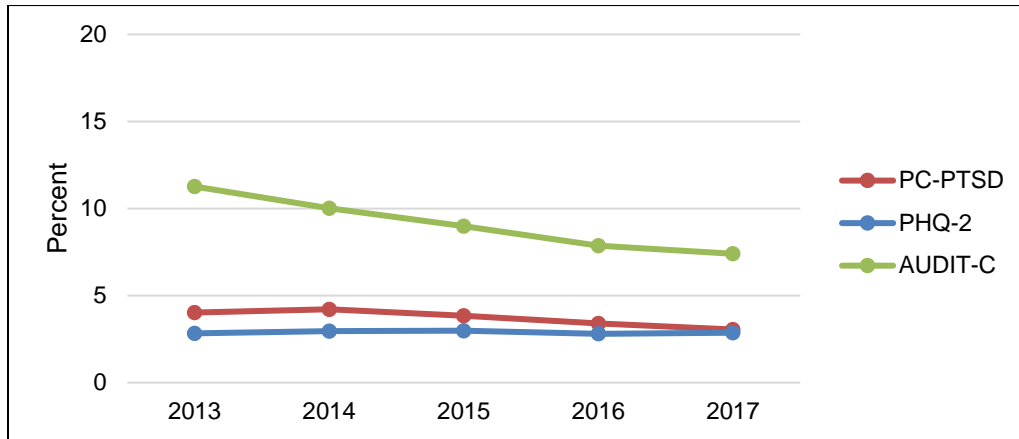
^e Responded "Yes" to fear of being killed, seeing people killed during deployment, or engaged in direct combat where they discharged a weapon.

^f Responded "Yes" to at least 2 of the 4 questions.

^g Responded "more than half the days" or "nearly every day" to at least 1 of the 2 questions.

6.5 Historical Summary of Behavioral Health Screening, 2013–2017, by Health Assessment

- BH screeners were incorporated into the 2012 version of the Pre-DHA, and 2013 was the first full calendar year of implementation. The PHA included the PC-PTSD and PCL-C beginning in 2014.
- Over time, the proportions of Soldiers who screened positive on each BH screener across all health assessments have decreased or remained relatively stable (Figures 5–8). The most notable decrease was the proportion of Soldiers who screened positive on the AUDIT-C screening tool for hazardous drinking behavior, which decreased from 17% in 2013 to 8% in 2017 on the PDHRA (Figure 7).



Legend:

PC-PTSD = Primary Care-Post-Traumatic Stress Disorder;

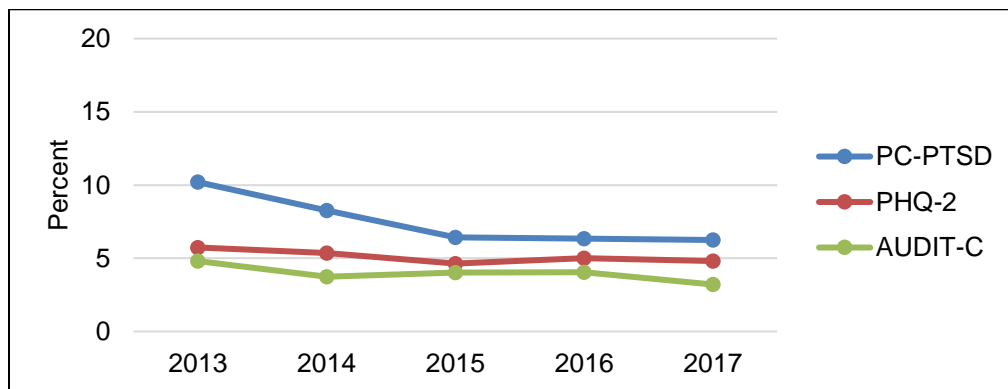
PHQ-2 = Patient Health Questionnaire-2;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption.

Notes:

Positive PC-PTSD: “Yes” response to at least 2 of the 4 questions. Positive PHQ-2: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions. Positive AUDIT-C: A score of 5 or more for males and 4 or more for females indicated a positive screen.

Figure 5. Pre-Deployment Health Assessment, Positive Behavioral Health Screeners 2013–2017



Legend:

PC-PTSD = Primary Care – Post Traumatic Stress Disorder;

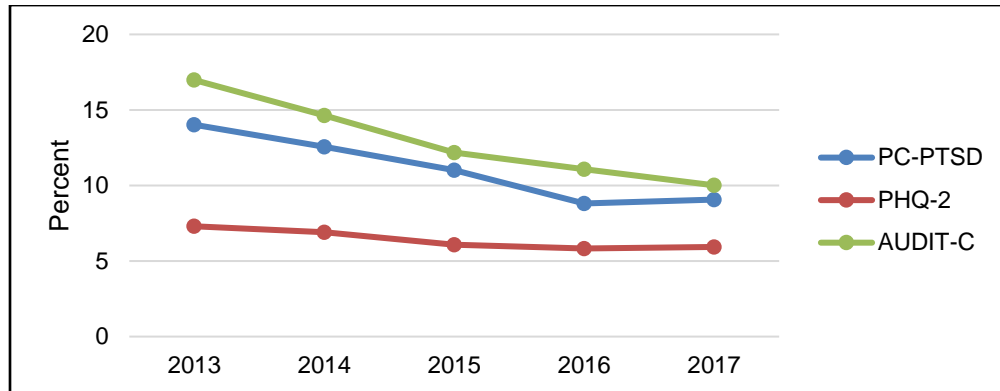
PHQ-2 = Patient Health Questionnaire-2;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption.

Notes:

Positive PC-PTSD: “Yes” response to at least 2 of the 4 questions. Positive PHQ-2: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions. Positive AUDIT-C: A score of 5 or more for males and 4 or more for females indicated a positive screen.

Figure 6. Post-Deployment Health Assessment, Positive Behavioral Health Screeners 2013–2017



Legend:

PC-PTSD = Primary Care – Post Traumatic Stress Disorder;

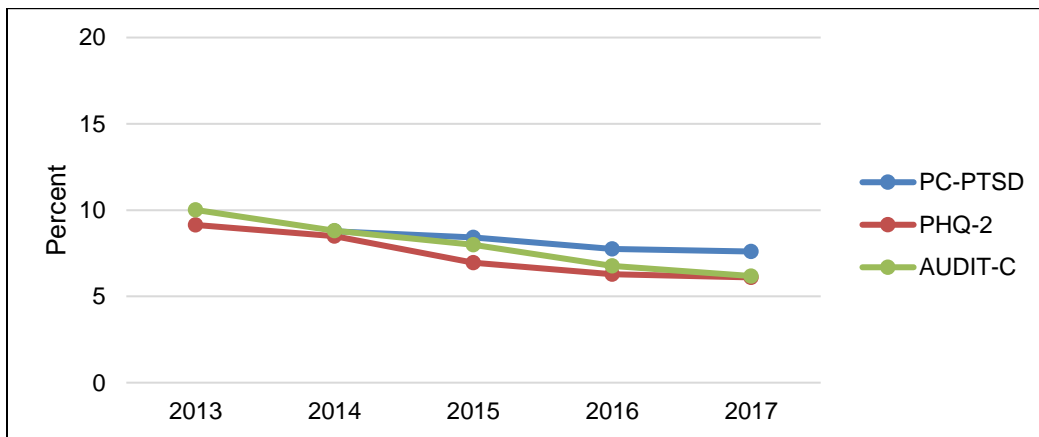
PHQ-2 = Patient Health Questionnaire -2;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption.

Notes:

Positive PC-PTSD: “Yes” response to at least 2 of the 4 questions. Positive PHQ-2: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions. Positive AUDIT-C: A score of 5 or more for males and 4 or more for females indicated a positive screen.

Figure 7. Post-Deployment Health Re-Assessment, Positive Behavioral Health Screeners 2013–2017



Legend:

PC-PTSD = Primary Care – Post Traumatic Stress Disorder;

PHQ-2 = Patient Health Questionnaire -2;

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption.

Notes:

The PC-PTSD was added to the PHA in 2014. Positive PC-PTSD: “Yes” response to at least 2 of the 4 questions. Positive PHQ-2: Responded “more than half the days” or “nearly every day” to at least 1 of the 2 questions. Positive AUDIT-C: A score of 5 or more for males and 4 or more for females indicated a positive screen.

Figure 8. Periodic Health Assessment, Positive Behavioral Health Screeners 2013–2017

6.6 Qualitative Analysis of Reported Stressors

In addition to the quantitative data presented above, qualitative data collected during the health assessment process provides important context to stressors during service. Table 11 presents a sampling of quotes from different components and ranks on their main stressors in the Army.

Table 11. Major Life Stressors Reported by Soldiers on the Pre-DHA, PDHA, and PDHRA, 2017

	Major Life Stressor	Component	Gender	Age	Rank	Deployment
Pre-DHA	"No faith into the lower part of my NCO support channel in terms of my family being taking care of"	Active Army	Male	35	E5	1 prior deployment
	"My oldest son will graduate from high school and start his first year of college while I'm deployed"	Army Reserve	Female	37	E8	Never deployed
	"Caring for an aging parent with major medical conditions"	Army Reserve	Male	47	E7	3 prior deployments
	"Concerns involving spouse and marital issues brought on by PCSing and the upcoming deployment"	Active Army	Male	27	O3	1 prior deployment
PDHA	"Being part of a unit that lacks communication, care or support of my mission"	Active Army	Female	28	E5	10 month deployment to Kuwait and Jordan
	"My wife gave birth while I was home to our daughter and I left within a month of her being born."	Active Army	Male	26	E6	5 month deployment to Niger
	"Recently gotten a divorce; worried about the transition back to the real world after being deployed"	Active Army	Male	36	O3	12 month deployment to Afghanistan
PDHRA	"I have had several incident where I've shown too much aggression towards my co-workers"	Active Army	Male	48	E8	Iraq
	"Girlfriend of 4 years, broke up with me midway through the deployment"	Active Army	Male	25	O2	Afghanistan
	"Sleep and angry outbursts"	Active Army	Male	44	E7	Afghanistan
	"During hurricane Maria I lost my house and all my things"	Army Reserve	Female	22	E4	United States

7 CONCLUSIONS

The goal of the BH-RADR is to offer relevant, accurate, and useful information related to the burden of BH issues and risk for the U.S. Army. The information presented in the current report enhances the Army's ability to monitor the BH screening process and BH encounters and diagnoses for all Army Soldiers, as well as influence policies related to behavioral and social health prevention and intervention initiatives. Over time, the proportion of Soldiers screening positive for PTSD, depression, and hazardous drinking behavior has shown a steady downward trend across all the health assessments (Pre-DHA, PDHA, PDHRA, and PHA). This trend could be a result of many factors such as changes to deployment frequency, conditions, and combat exposures; attrition of non-medically ready Soldiers; a decrease in stigma associated with seeking behavioral health care; and an increase in resources for Soldiers seeking help.

This report suggests 71% of positive PTSD screeners on the Pre-DHA had greater than or equal to one deployment compared with 46% of negative PTSD screeners (Table 3). However, it is important to note the literature indicates mere deployment is not necessarily associated with poor mental health outcomes (Reger et al. 2018). Soldiers who are deployed, but never leave the base, have different experiences than individuals who are on frequent combat missions from the deployment base. Reger et al. (2018) proposed how "killing or witnessing death in combat" is a more accurate measure for adverse mental health outcomes than deployment, but this level of detail is not currently available on the Pre-DHA. Therefore, these results should be interpreted with caution.

The report also reveals how individuals who had depression symptoms (as indicated by the PHQ-2) were also more likely to report hazardous drinking behavior (as indicated by the AUDIT-C score). More specifically, 21% of Soldiers with a positive PHQ-2 reported hazardous drinking behavior compared to 7% of Soldiers with a negative PHQ-2 (Table 6). This must be interpreted with caution since there is likely temporal ambiguity (i.e., it is unclear which condition precedes the other). For instance, depression may precede drinking which is thus used as a coping mechanism. Conversely, since alcohol is a depressant, excessive alcohol use may lead to depression. Literature suggests alcohol consumption is often used as a means to self-medicate among Soldiers experiencing BH-related symptoms (O'Brien et al., 2013; Leeies et al., 2013). Evolving Army culture and experiences may pose unique risk factors for Soldiers; therefore, healthcare providers and leadership should continue to be vigilant to identify and adapt prevention efforts focused on alcohol consumption. One example of the effort to improve Soldier screening and care was the Army's recent shift in the oversight of the Alcohol and Substance Abuse Program from the Installation Management Command to the U.S. Army Medical Command. The shift has allowed Soldiers to receive treatment for substance misuse and BH concerns by an integrated team of providers in one centralized location.

Importantly, the referrals to BH care were higher for Soldiers with BH health issues than Soldiers without BH issues. For example, Soldiers with a positive PHQ-2 were referred to BH care 81% of the time (Table 7). The reasons for not being referred include Soldiers being currently under care (67%), already having a referral (4%), was deemed to have no significant impairment (21%), or other reasons (8%). These findings may highlight how Soldiers with BH issues are already interfacing with the BH care system. However, efforts to evaluate the patterns of referral and treatment among Soldiers who had no prior BH encounters and screen

positive for BH symptoms should be refined or developed. Early intervention and treatment during this period could change the trajectory of symptoms and promote resiliency. Future studies should assess the frequency of new cases and the demographic and military characteristics, which are predictive of accessing care. In addition, future reports should aim to elucidate responses in "Another Reason" category to determine if there are any barriers to accessing care. Describing the population of Soldiers who are not seeking care could help identify targeted populations to improve access or time to care.

Lastly, this report suggests there have been important temporal trends in various conditions. From 2013 to 2017, the rates of hazardous drinking behavior have decreased approximately 33% for Soldiers on the Pre-DHA, but the rates of PTSD and depression have remained relatively constant (Figure 5). Downward trends have been observed for all conditions (hazardous drinking, PTSD, and depression) on the PHA (Figure 8). These trends likely coincide with downturns in both Iraq and Afghanistan, but they are important highlights as they indicate a healthier, and thus more ready, force.

8 POINT OF CONTACT

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APPENDIX A

REFERENCES

- Department of the Army. 2007. Regulation 40-5, *Preventive Medicine*.
<https://armypubs.army.mil/>
- DOD. 2016. DD Form 3024, *Annual Periodic Health Assessment*.
<https://www.esd.whs.mil/Directives/forms/>
- DOD. 2015a. DD Form 2795, *Pre-Deployment Health Assessment*.
<https://www.esd.whs.mil/Directives/forms/>
- DOD. 2015b. DD Form 2796, *Post Deployment Health Assessment (PDHA)*.
<https://www.esd.whs.mil/Directives/forms/>
- DOD. 2015c. DD Form 2900, *Post Deployment Health Re-Assessment (PDHRA)*.
<https://www.esd.whs.mil/Directives/forms/>
- Hoge, C.W., S.H. Grossman, J.L. Auchterlonie, L.A. Riviere, C.S. Milliken, and J.E. Wilk. 2014. PTSD treatment for soldiers after combat deployment: low utilization of mental health care and reasons for dropout. *Psychiatric Services*. 65(8):997-1004.
- Leeies, M., J. Pagura, J. Sareen, and J.M. Bolton. 2010. The use of alcohol and drugs to self-medicate symptoms of post-traumatic stress disorder. *Depression and Anxiety*, 27(8):731-736.
- Milliken, C.S., J.L. Auchterlonie, and C.W. Hoge. 2007. Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war. *Jama*, 298(18):2141-2148.
- National Committee of Quality Assurance. 2010. HEDIS® Technical Specifications 2011. Vol. 2. Washington DC: National Committee for Quality Assurance (NCQA).
- O'Brien, C.P., M. Oster, and E. Morden. 2013. Substance use disorders in the U.S. Armed Forces. Washington, D.C. *Institute of Medicine of the National Academies*.
- Reger, M. A., Tucker, R. P., Carter, S. P., and B.A. Ammerman. 2018. Military deployments and suicide: A critical examination. *Perspectives on Psychological Science*, 13(6):688-689.
doi.org/10.1177/1745691618785366

APPENDIX B

METHODS

B-1. DESIGN OVERVIEW

A cross-sectional design was implemented using data from health assessment forms completed in 2017. The proportions of Soldiers who screened positive for PTSD symptoms, depression symptoms, and hazardous drinking behavior were compared between health assessment populations. Using the population of Soldiers at each health assessment, a retrospective design was applied using administrative medical data. BH-related medical encounters and diagnoses were retrospectively ascertained for each Soldier before and within 6 months after completing each health assessment.

B-2. SAMPLE DETERMINATION

The population was restricted to Regular Army, Army Reserve, and National Guard Soldiers who completed at least one health assessment in 2017: Pre-DHA, PDHA, PDHRA, and/or PHA. Each form represents a population of Soldiers corresponding to a period before or after deployment. This translates to four cohorts of Soldiers who were followed for 6 months after health assessment completion. For each health assessment, the most recent health assessment completed by each Soldier during 2017 is used in the analysis. This method ensures each Soldier is represented only once in each health assessment population (Figure B-1).

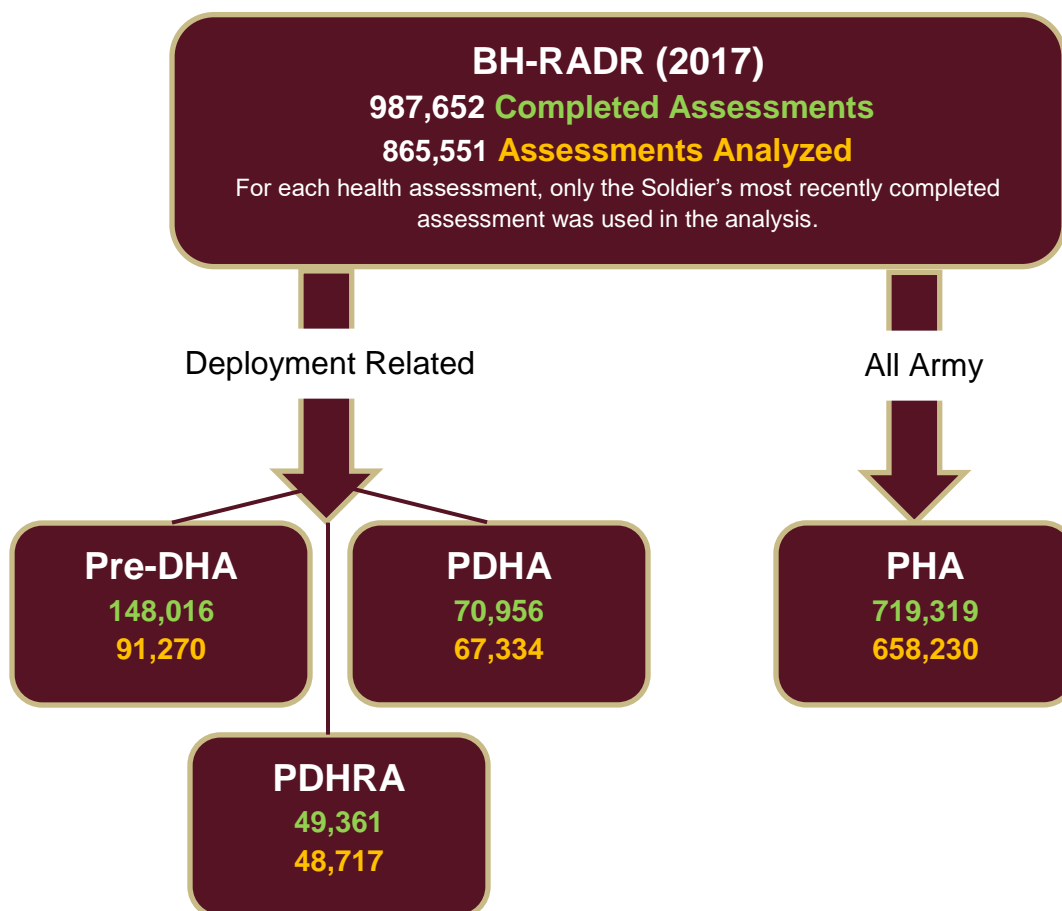


Figure B-1. Health Assessments Completed and Analyzed, 2017

B-3. DATA SOURCES

B-3.1 Pre-DHA, PDHA, PDHRA, and PHA

Demographic (i.e., sex and age) and military (i.e., component and rank) characteristics were extracted from the health assessments and used to describe the population. The responses on three BH instruments were assessed to identify Soldiers who had symptoms related to PTSD, depression, and hazardous drinking habits. The health assessments use an enhanced two-stage screening to identify Soldiers with PTSD and depression symptoms. The first stage requires all Soldiers to complete the PC-PTSD and PHQ-2 instruments. Soldiers who screen positive on the PC-PTSD or PHQ-2 complete a second instrument, PCL-C or PHQ-8, respectively, which captures more information on the severity of their symptoms. Scores on the second screener determine if the Soldier has symptoms of PTSD or depression and are used by the health provider to refer the Soldier to treatment. Furthermore, cut points were modified based on Army regulations requiring physicians to refer Soldiers who reported moderate or severe symptoms to treatment or a follow-up assessment.

B-3.2 Administrative Medical Data

Any BH-related medical data prior to or within 6 months following the health assessments are reported in this publication. BH diagnoses and encounters were obtained from the Military Health System Data Repository, which includes the Comprehensive Ambulatory/Provider Encounter Record-Enhanced, the Standard Ambulatory Data Record, the Standard Inpatient Data Record, the TRICARE Encounter Data Institutional, and the TRICARE Encounter Data Non-Institutional. These health administrative data systems include information from each Soldier's electronic medical records spanning their entire military career while covered under the Army's healthcare program.

B-4. METRICS

B-4.1 PTSD Symptoms

The PC-PTSD is a self-reported screening tool to measure if trauma has affected Soldiers' daily lives over the last 30 days by responding "Yes" or "No" on four questions. A response of "Yes" on two or more questions indicates a positive result and requires the completion of the second instrument, PCL-C. This 17-item instrument measures how bothersome PTSD symptoms (e.g., disturbing dreams, avoidance, and trouble sleeping) have been over the last month using a 5-point scale (i.e., 1=not at all, 5=extremely) with scores ranging from 17 to 85. Soldiers with a score over 39 were categorized as moderate to severe PTSD symptoms. Data from the PC-PTSD were available for the Pre-DHA (CY2013-2017), PHDA (CY2010-2017), PDHRA (CY2010-2017) and PHA (CY2014-2017). Data from the PCL-C were available for the Pre-DHA (CY2013-2017), PDHRA (CY2010-2017) and PHA (CY2014-2017).

B-4.2 Depression Symptoms

The PHQ-2 is a two-question, self-reported screening tool to capture how often a person has been bothered by symptoms of depression (e.g., hopelessness, poor appetite, and trouble concentrating) over the last 2 weeks using a 3-point scale (i.e., 0=not at all, 3=nearly every day). A response of "more than half the days" or "nearly every day" on at least one question prompts the completion of the 8-item version of the PHQ. Soldiers with a score over 14 (score range: 0–24) on the PHQ-8 were considered positive for moderate to severe depression symptoms. Data from the PHQ-2 were available for the Pre-DHA (CY2013-2017), PHDA (CY2010-2017), PDHRA (CY2010-2017) and PHA (CY2010-2017). Data from the PHQ-8 were available for the Pre-DHA (CY2013-2017), PDHRA (CY2010-2017) and PHA (CY2010-2017).

B-4.3 Alcohol-use Disorder Symptoms

The AUDIT-C is a self-reported screening tool to evaluate hazardous drinking behaviors or alcohol-use disorders using three questions on the frequency of alcohol consumption. The responses are on a 5-point scale (i.e., a=0, e=4) with total scores ranging from 0 to 12. Using the provider guidelines from the health assessments, males with scores over 5 and females with scores over 4 were considered positive for hazardous drinking behavior. Data from the AUDIT-C were available for the Pre-DHA (CY2013-2017), PHDA (CY2010-2017), PDHRA (CY2010-2017) and PHA (CY2010-2017).

B-4.4 Major Life Stressor

A free text response was used to explain the answer to “Over the past month, what major life stressors have you experienced that are a cause of significant concern or make it difficult for you to do your work, take care of things at home, or get along with other people (for example, serious conflict with other, relationship problems, or a legal, disciplinary or financial problem)?” The major life stressor question is question 13a on the Pre-DHA, 12a on the PDHA, and 10a on the PDHRA.

B-4.5 Combat Exposure

Several questions on the PDHA and PDHRA were used to evaluate combat exposure. Soldiers were asked, for example, about fear of being killed, seeing people killed, and engaging in direct combat where they discharged a weapon. A response of “Yes” to any of the questions indicated combat exposure.

B-4.6 Medical Data

BH ICD-9 codes include those in the range 290–319.99 (excluding tobacco-use diagnoses), as well as certain codes related to sleep disorders, and V-codes related to life circumstance problems, personal trauma, and maltreatment. BH ICD-10 codes include those in the range F01–F99 (excluding tobacco-use diagnoses), as well as R-, T-, X-, and Z-codes related to life circumstance problems, personal trauma, and maltreatment.

B-4.7 BH Encounter

A BH encounter was defined as a BH ICD-9 code, BH ICD-10 code, ICD-9 BH-related V or E code, or ICD-10 BH-related R, T, X, or Z code in any inpatient (Dx1-Dx8) or outpatient (Dx1-Dx4) diagnostic positions. Incident BH encounters refer only to Soldiers with no BH encounters prior to completing the health assessment and at least one BH encounter within 6 months after completing the health assessment.

B-4.8 BH Diagnoses

BH diagnoses were defined as a BH ICD-9 or BH ICD-10 code in any inpatient diagnostic position (Dx1-Dx8) or in the first outpatient diagnostic position (Dx1). BH ICD-9 or ICD-10 codes in the second through fourth outpatient diagnostic positions (Dx2-Dx4) indicated a BH diagnosis only if a second code from the same group of BH ICD-9 or ICD-10 codes occurred in Dx2-Dx4 within a year but not on the same day. These definitions were based on the Healthcare Effectiveness Data and Information Set guidelines from the National Committee for Quality Assurance for major depressive disorders and were applied to all BH conditions (National Committee of Quality Assurance, 2010).

A prevalent BH diagnosis refers to any BH diagnosis prior to the screening or within 6 months following the health assessment. An incident BH diagnosis refers to a new diagnosis within 6 months after the screening. A Soldier with prior BH history can have an incident diagnosis if the diagnosis is the first diagnosis in a given category (Table B-1). For example, a Soldier with a

history of MDD prior to the screening and a PTSD diagnosis within 6 months after the screening would be categorized as having an incident diagnosis of PTSD.

Table B-1. International Classification of Disease-9 and -10 Codes used for Behavioral Health Encounters and Diagnoses

BH Diagnoses	ICD-9 and ICD-10 Codes ^a
Adjustment Disorders	309-309.8, 309.82-309.9, F43.2, F43.8, F43.9
Alcohol Use Disorders	291, 303-305.0, F10
Anxiety Disorders (excludes PTSD)	300.0, 300.10, 300.2, 300.3, F40-F42
Bipolar Disorders	296.0, 296.4-296.8, F30-F31, F34.0
MDD	296.2-296.3, F32-F33
Other Depressive Disorders	296.99, 300.4, 311, F34.1, F34.8, F34.9
Personality Disorders	301, F21, F60
Psychoses	290.8, 290.9, 295, 297, 298, F20, F22-25, F28-F29
PTSD	309.81, F43.1
Substance Use Disorders (excluding tobacco use)	291, 292, 303-305.0, 305.2-305.9, F10-F16, F18-F19

Legend:

ICD = International Classification of Disease

BH = Behavioral Health

PTSD = Post-Traumatic Stress Disorder

MDD = Major Depressive Disorder

Note:

^a Each code includes all subordinate codes (e.g., 301 includes 301.0-301.9).

Soldiers with an incident BH encounter represent those new to the clinical BH care system and reflect the increased BH demand the Army experiences during the 6 months following each health assessment. Prevalent diagnoses represent the overall burden of BH issues among the screened population. The incident and prevalent findings are not mutually exclusive and aim to illustrate two timeframes of healthcare utilization and burden.

APPENDIX C

BEHAVIORAL HEALTH SCREENING RESULTS BY INSTALLATION TABLES

TABLES

- C-1. Pre-Deployment Health Assessment Behavioral Health Screening Results by Installation, 2017
- C-2. Post-Deployment Health Assessment Behavioral Health Screening Results by Installation, 2017
- C-3. Post-Deployment Health Re-Assessment Behavioral Health Screening Results by Installation, 2017
- C-4. Periodic Health Assessment Behavioral Health Screening Results by Installation, 2017

Table C-1. Pre-Deployment Health Assessment Behavioral Health Screening Results by Installation, 2017

INSTALLATION	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
FT. BLISS	6,400	96.2	251	3.8	6,451	97.0	200	3.0	6,150	92.5	501	7.5
FT. BRAGG	12,724	97.5	329	2.5	12,716	97.4	337	2.6	11,972	91.7	1,081	8.3
FT. CAMPBELL	3,389	98.1	64	1.9	3,410	98.8	43	1.2	3,273	94.8	180	5.2
FT. CARSON	5,117	96.0	215	4.0	5,129	96.2	203	3.8	4,912	92.1	420	7.9
FT. DRUM	5,204	97.4	138	2.6	5,189	97.1	153	2.9	4,959	92.8	383	7.2
FT. HOOD	8,482	95.1	437	4.9	8,496	95.3	423	4.7	8,347	93.6	572	6.4
FT. LEWIS	4,334	96.6	151	3.4	4,349	97.0	136	3.0	4,187	93.4	298	6.6
FT. POLK	3,660	97.2	107	2.8	3,658	97.1	109	2.9	3,372	89.5	395	10.5
FT. RICHARDSON	1,691	99.1	16	0.9	1,684	98.7	23	1.3	1,531	89.7	176	10.3
FT. RILEY	4,213	95.8	187	4.3	4,146	94.2	254	5.8	3,939	89.5	461	10.5
FT. STEWART	3,269	96.6	114	3.4	3,290	97.3	93	2.7	3,148	93.1	235	6.9
FT. WAINWRIGHT	1,900	97.4	50	2.6	1,904	97.6	46	2.4	1,778	91.2	172	8.8
HAWAII	2,695	96.5	97	3.5	2,696	96.6	96	3.4	2,568	92.0	224	8.0
OTHER-ATLANTIC	8,478	98.5	133	1.5	8,536	99.1	75	0.9	8,212	95.4	399	4.6
OTHER-CENTRAL	5,324	98.5	83	1.5	5,361	99.1	46	0.9	5,111	94.5	296	5.5
UNSPECIFIED	1,522	95.7	68	4.3	1,525	95.9	65	4.1	1,494	94.0	96	6.0
USAG BAVARIA	3,681	95.8	161	4.2	3,634	94.6	208	5.4	3,326	86.6	516	13.4

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 =Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

Notes:

Only includes installations with at least 500 completed health assessments. Installation assignment was determined from unit identification zip codes.

Table C-2. Post-Deployment Health Assessment Behavioral Health Screening Results by Installation, 2017

INSTALLATION	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
FT. BLISS	5,762	93.4	405	6.6	5,862	95.1	305	4.9	5,960	96.6	207	3.4
FT. BRAGG	7,291	94.1	457	5.9	7,369	95.1	379	4.9	7,468	96.4	280	3.6
FT. CAMPBELL	5,694	94.2	350	5.8	5,737	94.9	307	5.1	5,915	97.9	129	2.1
FT. CARSON	3,395	94.1	213	5.9	3,391	94.0	217	6.0	3,391	94.0	217	6.0
FT. DRUM	1,226	95.2	62	4.8	1,234	95.8	54	4.2	1,174	91.1	114	8.9
FT. HOOD	5,340	92.1	457	7.9	5,415	93.4	382	6.6	5,663	97.7	134	2.3
FT. LEWIS	3,764	94.0	241	6.0	3,823	95.5	182	4.5	3,824	95.5	181	4.5
FT. RILEY	1,653	94.2	102	5.8	1,686	96.1	69	3.9	1,713	97.6	42	2.4
FT. STEWART	1,070	94.1	67	5.9	1,095	96.3	42	3.7	1,091	96.0	46	4.0
OTHER-ATLANTIC	11,577	93.8	760	6.2	11,839	96.0	498	4.0	12,039	97.6	298	2.4
OTHER-CENTRAL	6,448	94.0	412	6.0	6,572	95.8	288	4.2	6,733	98.1	127	1.9
OTHER-PACIFIC	1,191	91.3	114	8.7	1,258	96.4	47	3.6	1,263	96.8	42	3.2
UNSPECIFIED	1,066	92.5	87	7.5	1,076	93.3	77	6.7	1,103	95.7	50	4.3
USAG BAVARIA	1,458	96.3	56	3.7	1,417	93.6	97	6.4	1,443	95.3	71	4.7

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

Notes:

Only includes installations with at least 500 completed health assessments. Installation assignment was determined from unit identification zip codes.

Table C-3. Post-Deployment Health Re-Assessment Behavioral Health Screening Results by Installation, 2017

INSTALLATION	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
FT. BENNING	974	93.0	73	7.0	1,011	96.6	36	3.4	922	88.1	125	11.9
FT. BLISS	3,482	93.4	248	6.6	3,522	94.4	208	5.6	3,292	88.3	438	11.7
FT. BRAGG	2,957	90.0	327	10.0	3,092	94.2	192	5.8	2,975	90.6	309	9.4
FT. CAMPBELL	3,537	93.3	254	6.7	3,598	94.9	193	5.1	3,374	89.0	417	11.0
FT. CARSON	2,639	92.8	206	7.2	2,711	95.3	134	4.7	2,512	88.3	333	11.7
FT. DRUM	1,124	92.7	88	7.3	1,137	93.8	75	6.2	1,110	91.6	102	8.4
FT. HOOD	5,661	90.3	606	9.7	5,776	92.2	491	7.8	5,660	90.3	607	9.7
FT. LEWIS	1,603	92.4	131	7.6	1,636	94.3	98	5.7	1,572	90.7	162	9.3
FT. RILEY	979	93.1	73	6.9	1,005	95.5	47	4.5	914	86.9	138	13.1
FT. STEWART	3,131	92.4	257	7.6	3,168	93.5	220	6.5	3,024	89.3	364	10.7
OTHER-ATLANTIC	8,533	90.0	952	10.0	9,013	95.0	472	5.0	8,682	91.5	803	8.5
OTHER-CENTRAL	3,603	88.9	451	11.1	3,803	93.8	251	6.2	3,635	89.7	419	10.3
OTHER-PACIFIC	972	85.6	163	14.4	1,057	93.1	78	6.9	1,022	90.0	113	10.0

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

Notes:

Only includes installations with at least 500 completed health assessments. Installation assignment was determined from unit identification zip codes.

Table C-4. Periodic Health Assessment Behavioral Health Screening Results by Installation, 2017

INSTALLATION	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
ABERDEEN PROVING GROUND	1,002	87.7	141	12.3	1,053	92.1	90	7.9	1,088	95.2	55	4.8
BENELUX	326	89.6	38	10.4	331	90.9	33	9.1	349	95.9	15	4.1
FT. BELVOIR	3,129	87.6	441	12.4	3,272	91.7	298	8.3	3,385	94.8	185	5.2
FT. BENNING	6,211	88.9	779	11.1	6,418	91.8	572	8.2	6,587	94.2	403	5.8
FT. BLISS	9,023	90.0	1,007	10.0	9,151	91.2	879	8.8	9,390	93.6	640	6.4
FT. BRAGG	19,150	91.4	1,807	8.6	19,392	92.5	1,565	7.5	19,560	93.3	1,397	6.7
FT. CAMPBELL	12,683	92.1	1,090	7.9	12,731	92.4	1,042	7.6	12,992	94.3	781	5.7
FT. CARSON	11,219	91.1	1,100	8.9	11,376	92.3	943	7.7	11,426	92.8	893	7.2
FT. DETRICK	614	93.2	45	6.8	620	94.1	39	5.9	634	96.2	25	3.8
FT. DIX	2,135	90.5	225	9.5	2,236	94.7	124	5.3	2,246	95.2	114	4.8
FT. DRUM	7,195	92.9	549	7.1	7,189	92.8	555	7.2	7,262	93.8	482	6.2
FT. EUSTIS	2,960	88.7	378	11.3	3,024	90.6	314	9.4	3,203	96.0	135	4.0
FT. GORDON	4,960	88.4	652	11.6	5,074	90.4	538	9.6	5,397	96.2	215	3.8
FT. HOOD	10,200	86.7	1,559	13.3	10,378	88.3	1,381	11.7	11,231	95.5	528	4.5
FT. HUACHUCA	1,984	89.8	226	10.2	2,037	92.2	173	7.8	2,132	96.5	78	3.5
FT. IRWIN	2,273	90.1	250	9.9	2,316	91.8	207	8.2	2,355	93.3	168	6.7
FT. JACKSON	3,075	84.0	584	16.0	3,263	89.2	396	10.8	3,463	94.6	196	5.4
FT. KNOX	4,526	91.3	431	8.7	4,669	94.2	288	5.8	4,668	94.2	289	5.8
FT. LEAVENWORTH	2,001	89.7	229	10.3	2,076	93.1	154	6.9	2,106	94.4	124	5.6
FT. LEE	2,416	82.4	515	17.6	2,595	88.5	336	11.5	2,779	94.8	152	5.2
FT. LEONARD WOOD	4,033	91.3	384	8.7	4,158	94.1	259	5.9	4,167	94.3	250	5.7
FT. LEWIS	17,799	91.0	1,767	9.0	17,951	91.7	1,615	8.3	18,296	93.5	1,270	6.5
FT. MEADE	4,204	91.4	398	8.6	4,283	93.1	319	6.9	4,407	95.8	195	4.2
FT. MYER	1,516	95.3	75	4.7	1,518	95.4	73	4.6	1,520	95.5	71	4.5
FT. POLK	3,861	91.0	382	9.0	3,892	91.7	351	8.3	3,914	92.2	329	7.8
FT. RICHARDSON	2,666	93.7	180	6.3	2,696	94.7	150	5.3	2,608	91.6	238	8.4
FT. RILEY	9,715	93.9	626	6.1	9,717	94.0	624	6.0	9,686	93.7	655	6.3
FT. RUCKER	880	89.9	99	10.1	909	92.8	70	7.2	944	96.4	35	3.6
FT. SAM HOUSTON	6,403	87.6	905	12.4	6,699	91.7	609	8.3	6,955	95.2	353	4.8
FT. SILL	4,521	89.7	518	10.3	4,591	91.1	448	8.9	4,715	93.6	324	6.4
FT. STEWART	9,977	89.6	1,158	10.4	10,131	91.0	1,004	9.0	10,467	94.0	668	6.0
FT. WAINWRIGHT	4,053	93.5	280	6.5	4,042	93.3	291	6.7	3,999	92.3	334	7.7

INSTALLATION	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
HAWAII	13,916	90.8	1,412	9.2	14,087	91.9	1,241	8.1	14,314	93.4	1,014	6.6
JAPAN	1,321	92.3	110	7.7	1,340	93.6	91	6.4	1,365	95.4	66	4.6
OTHER-ATLANTIC	207,685	93.2	15,152	6.8	212,317	95.3	10,520	4.7	209,770	94.1	13,067	5.9
OTHER-CENTRAL	107,255	92.6	8,577	7.4	109,941	94.9	5,891	5.1	107,735	93.0	8,097	7.0
OTHER-EUROPE	817	89.4	97	10.6	840	91.9	74	8.1	853	93.3	61	6.7
OTHER-PACIFIC	33,765	92.3	2,834	7.7	34,626	94.6	1,973	5.4	33,960	92.8	2,639	7.2
PRESIDIO OF MONTEREY	618	92.9	47	7.1	628	94.4	37	5.6	648	97.4	17	2.6
REDSTONE ARSENAL	350	78.5	96	21.5	392	87.9	54	12.1	418	93.7	28	6.3
RHINELAND-PFALZ	4,201	88.9	523	11.1	4,290	90.8	434	9.2	4,439	94.0	285	6.0
STUTTGART	998	90.6	103	9.4	1,033	93.8	68	6.2	1,038	94.3	63	5.7
UNSPECIFIED	3,456	89.6	401	10.4	3,520	91.3	337	8.7	3,641	94.4	216	5.6
USAG ANSBACH	376	92.4	31	7.6	381	93.6	26	6.4	383	94.1	24	5.9
USAG BAVARIA	4,154	90.6	431	9.4	4,158	90.7	427	9.3	4,122	89.9	463	10.1
USAG DAEGU	1,123	89.3	134	10.7	1,151	91.6	106	8.4	1,195	95.1	62	4.9
USAG HUMPHREYS	2,580	93.5	179	6.5	2,598	94.2	161	5.8	2,614	94.7	145	5.3
USAG RED CLOUD	1,742	92.0	152	8.0	1,760	92.9	134	7.1	1,792	94.6	102	5.4
USAG VICENZA	2,072	93.2	150	6.8	2,062	92.8	160	7.2	1,980	89.1	242	10.9
USAG WIESBADEN	901	89.9	101	10.1	919	91.7	83	8.3	931	92.9	71	7.1
USAG YONGSAN	2,944	93.0	222	7.0	2,975	94.0	191	6.0	3,015	95.2	151	4.8
WEST POINT	860	92.2	73	7.8	891	95.5	42	4.5	867	92.9	66	7.1

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 =Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test–Consumption

Notes:

Only includes installations with at least 500 completed health assessments. Installation assignment was determined from unit identification zip codes.

APPENDIX D

DEMOGRAPHICS AND MILITARY CHARACTERISTICS TABLES

- D-1. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Pre-Deployment Health Assessment, 2017
- D-2. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Post-Deployment Health Assessment, 2017
- D-3. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Post-Deployment Health Re-Assessment, 2017
- D-4. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Periodic Health Assessment, 2017

Table D-1. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Pre-Deployment Health Assessment, 2017

DEMOGRAPHICS	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
COMPONENT												
Regular Army	73,705	96.6	2,581	3.4	73,802	96.7	2,484	3.3	70,233	92.1	6,053	7.9
National Guard	9,371	98.7	121	1.3	9,415	99.2	77	0.8	9,024	95.1	468	4.9
Army Reserves	4,916	98.5	74	1.5	4,949	99.2	41	0.8	4,778	95.8	212	4.2
GENDER												
Male	78,304	97.0	2,384	3.0	78,404	97.2	2,284	2.8	74,539	92.4	6,149	7.6
Female	9,688	96.1	392	3.9	9,762	96.8	318	3.2	9,496	94.2	584	5.8
PAY GRADE												
E1-E4	44,058	97.7	1,019	2.3	43,513	96.5	1,564	3.5	41,495	92.1	3,582	7.9
E5-E9	29,159	95.3	1,442	4.7	29,709	97.1	892	2.9	28,428	92.9	2,173	7.1
O1-O4	10,971	98.4	176	1.6	11,041	99.0	106	1.0	10,400	93.3	747	6.7
O5-O9	1,081	97.3	30	2.7	1,106	99.5	5	0.5	1,047	94.2	64	5.8
W1-W5	2,723	96.2	109	3.8	2,797	98.8	35	1.2	2,665	94.1	167	5.9
AGE GROUP (years)												
> 26	43,332	98.1	859	1.9	42,804	96.9	1,387	3.1	40,473	91.6	3,718	8.4
26-30	19,253	97.0	589	3.0	19,322	97.4	520	2.6	18,514	93.3	1,328	6.7
31-35	12,065	95.8	524	4.2	12,284	97.6	305	2.4	11,774	93.5	815	6.5
36-40	7,079	93.9	457	6.1	7,286	96.7	250	3.3	7,006	93.0	530	7.0
< 40	6,263	94.8	347	5.2	6,470	97.9	140	2.1	6,268	94.8	342	5.2
MARITAL STATUS												
Single	39,790	98.2	732	1.8	39,419	97.3	1,103	2.7	37,167	91.7	3,355	8.3
Married	44,334	96.1	1,821	3.9	44,804	97.1	1,351	2.9	43,054	93.3	3,101	6.7
Other	3,858	94.6	222	5.4	3,932	96.4	148	3.6	3,803	93.2	277	6.8
Unknown	10	90.9	1	9.1	11	100.0	0	0	11	100.0	0	0
RACE/ETHNICITY												
White	52,942	97.6	1,277	2.4	52,944	97.6	1,275	2.4	49,860	92.0	4,359	8.0
Black	15,563	94.9	845	5.1	15,654	95.4	754	4.6	15,383	93.8	1,025	6.2
Hispanic	13,223	97.0	409	3.0	13,244	97.2	388	2.8	12,735	93.4	897	6.6
Asian/Pacific Islander	4,330	96.4	164	3.6	4,345	96.7	149	3.3	4,186	93.1	308	6.9
American Indian/Alaskan Native	629	97.2	18	2.8	639	98.8	8	1.2	588	90.9	59	9.1
Other	716	96.8	24	3.2	727	98.2	13	1.8	694	93.8	46	6.2
Unknown	589	93.8	39	6.2	613	97.6	15	2.4	589	93.8	39	6.2
EDUCATION LEVEL												
No High School	231	97.1	7	2.9	233	97.9	5	2.1	208	87.4	30	12.6
High School	56,750	96.9	1,787	3.1	56,533	96.6	2,004	3.4	53,863	92.0	4,674	8.0
Some College	12,041	95.9	518	4.1	12,222	97.3	337	2.7	11,737	93.5	822	6.5
Bachelor's Degree	13,729	97.8	316	2.2	13,853	98.6	192	1.4	13,121	93.4	924	6.6
Masters/Graduate Level	4,151	97.3	116	2.7	4,227	99.1	40	0.9	4,054	95.0	213	5.0
Doctorate	306	99.0	3	1.0	305	98.7	4	1.3	295	95.5	14	4.5
Unknown	784	96.4	29	3.6	793	97.5	20	2.5	757	93.1	56	6.9

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption

E = Enlisted

W = Warrant

O = Officer

Table D-2. Demographics and Military Characteristics of Soldier who Completed the Behavioral Health Screening on the Post-Deployment Health Assessment, 2017

DEMOGRAPHICS	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
COMPONENT												
Regular Army	42,226	93.7	2,818	6.3	42,712	94.8	2,332	5.2	43,376	96.3	1,668	3.7
National Guard	11,767	94.6	670	5.4	11,979	96.3	458	3.7	12,202	98.1	235	1.9
Army Reserves	8,082	92.2	682	7.8	8,335	95.1	429	4.9	8,528	97.3	236	2.7
GENDER												
Male	55,187	94.0	3,508	6.0	55,930	95.3	2,765	4.7	56,808	96.8	1,887	3.2
Female	6,888	91.2	662	8.8	7,096	94.0	454	6.0	7,298	96.7	252	3.3
PAY GRADE												
E1-E4	25,797	95.2	1,291	4.8	25,652	94.7	1,436	5.3	26,198	96.7	890	3.3
E5-E9	23,943	91.6	2,201	8.4	24,761	94.7	1,383	5.3	25,275	96.7	869	3.3
O1-O4	8,906	95.6	409	4.4	9,051	97.2	264	2.8	9,053	97.2	262	2.8
O5-O9	1,251	93.5	87	6.5	1,290	96.4	48	3.6	1,292	96.6	46	3.4
W1-W5	2,178	92.3	182	7.7	2,272	96.3	88	3.7	2,288	96.9	72	3.1
AGE GROUP (years)												
> 26	25,167	95.8	1,100	4.2	25,039	95.3	1,228	4.7	25,360	96.5	907	3.5
26-30	14,778	94.2	907	5.8	14,992	95.6	693	4.4	15,226	97.1	459	2.9
31-35	9,668	92.6	775	7.4	9,919	95.0	524	5.0	10,104	96.8	339	3.2
36-40	5,962	90.3	642	9.7	6,211	94.0	393	6.0	6,374	96.5	230	3.5
< 40	6,500	89.7	746	10.3	6,865	94.7	381	5.3	7,042	97.2	204	2.8
MARITAL STATUS												
Single	26,004	95.7	1,166	4.3	25,924	95.4	1,246	4.6	26,269	96.7	901	3.3
Married	32,793	92.5	2,653	7.5	33,676	95.0	1,770	5.0	34,335	96.9	1,111	3.1
Other	3,273	90.3	351	9.7	3,421	94.4	203	5.6	3,497	96.5	127	3.5
Unknown	5	100.0	0	0	5	100.0	0	0	5	100.0	0	0
RACE/ETHNICITY												
White	38,490	94.9	2,083	5.1	38,946	96.0	1,627	4.0	39,257	96.8	1,316	3.2
Black	10,164	90.8	1,033	9.2	10,376	92.7	821	7.3	10,846	96.9	351	3.1
Hispanic	9,095	92.3	758	7.7	9,318	94.6	535	5.4	9,529	96.7	324	3.3
Asian/Pacific Islander	2,810	94.3	169	5.7	2,835	95.2	144	4.8	2,888	96.9	91	3.1
American Indian/Alaskan Native	438	93.6	30	6.4	446	95.3	22	4.7	450	96.2	18	3.8
Other	637	93.0	48	7.0	653	95.3	32	4.7	668	97.5	17	2.5
Unknown	441	90.0	49	10.0	452	92.2	38	7.8	468	95.5	22	4.5
EDUCATION LEVEL												
No High School	236	95.2	12	4.8	239	96.4	9	3.6	245	98.8	3	1.2
High School	36,180	94.1	2,273	5.9	36,393	94.6	2,060	5.4	37,096	96.5	1,357	3.5
Some College	9,563	91.7	869	8.3	9,883	94.7	549	5.3	10,111	96.9	321	3.1
Bachelor's Degree	11,123	94.4	666	5.6	11,386	96.6	403	3.4	11,441	97.0	348	3.0
Masters/Graduate Level	3,800	93.3	271	6.7	3,926	96.4	145	3.6	3,979	97.7	92	2.3
Doctorate	398	95.4	19	4.6	403	96.6	14	3.4	412	98.8	5	1.2
Unknown	775	92.8	60	7.2	796	95.3	39	4.7	822	98.4	13	1.6

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption

E = Enlisted

W = Warrant

O = Officer

Table D-3. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Post Deployment Health Re-Assessment, 2017

DEMOGRAPHICS	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
COMPONENT												
Regular Army	30,629	91.8	2,754	8.2	31,366	94.0	2,017	6.0	29,918	89.6	3,465	10.4
National Guard	7,583	90.3	815	9.7	7,942	94.6	456	5.4	7,617	90.7	781	9.3
Army Reserves	5,489	87.4	788	12.6	5,902	94.0	375	6.0	5,715	91.0	562	9.0
GENDER												
Male	39,141	91.2	3,761	8.8	40,439	94.3	2,463	5.7	38,526	89.8	4,376	10.2
Female	4,560	88.4	596	11.6	4,771	92.5	385	7.5	4,724	91.6	432	8.4
PAY GRADE												
E1-E4	17,459	93.4	1,236	6.6	17,488	93.5	1,207	6.5	16,610	88.8	2,085	11.2
E5-E9	17,320	87.7	2,421	12.3	18,418	93.3	1,323	6.7	17,769	90.0	1,972	10.0
O1-O4	6,532	93.9	425	6.1	6,753	97.1	204	2.9	6,405	92.1	552	7.9
O5-O9	968	90.0	108	10.0	1,025	95.3	51	4.7	1,003	93.2	73	6.8
W1-W5	1,422	89.5	167	10.5	1,526	96.0	63	4.0	1,463	92.1	126	7.9
AGE GROUP (years)												
> 26	16,466	94.7	918	5.3	16,443	94.6	941	5.4	15,394	88.6	1,990	11.4
26-30	11,061	92.3	926	7.7	11,356	94.7	631	5.3	10,816	90.2	1,171	9.8
31-35	6,986	89.3	837	10.7	7,379	94.3	444	5.7	7,126	91.1	697	8.9
36-40	4,305	85.2	745	14.8	4,687	92.8	363	7.2	4,566	90.4	484	9.6
< 40	4,883	84.0	931	16.0	5,345	91.9	469	8.1	5,348	92.0	466	8.0
MARITAL STATUS												
Single	17,004	94.0	1,082	6.0	17,140	94.8	946	5.2	16,057	88.8	2,029	11.2
Married	24,264	89.6	2,827	10.4	25,423	93.8	1,668	6.2	24,630	90.9	2,461	9.1
Other	2,427	84.4	447	15.6	2,641	91.9	233	8.1	2,557	89.0	317	11.0
Unknown	6	85.7	1	14.3	6	85.7	1	14.3	6	85.7	1	14.3
RACE/ETHNICITY												
White	26,643	92.3	2,209	7.7	27,442	95.1	1,410	4.9	25,833	89.5	3,019	10.5
Black	6,855	86.8	1,038	13.2	7,134	90.4	759	9.6	7,156	90.7	737	9.3
Hispanic	7,314	90.1	803	9.9	7,622	93.9	495	6.1	7,350	90.6	767	9.4
Asian/Pacific Islander	1,750	91.1	170	8.9	1,817	94.6	103	5.4	1,742	90.7	178	9.3
American Indian/Alaskan Native	298	90.0	33	10.0	309	93.4	22	6.6	304	91.8	27	8.2
Other	511	91.6	47	8.4	530	95.0	28	5.0	513	91.9	45	8.1
Unknown	330	85.3	57	14.7	356	92.0	31	8.0	352	91.0	35	9.0
EDUCATION LEVEL												
No High School	169	89.9	19	10.1	173	92.0	15	8.0	166	88.3	22	11.7
High School	25,177	91.4	2,366	8.6	25,734	93.4	1,809	6.6	24,502	89.0	3,041	11.0
Some College	6,645	88.3	882	11.7	7,048	93.6	479	6.4	6,808	90.4	719	9.6
Bachelor's Degree	7,994	92.1	687	7.9	8,329	95.9	352	4.1	7,944	91.5	737	8.5
Masters/Graduate Level	2,852	90.1	315	9.9	3,023	95.5	144	4.5	2,959	93.4	208	6.6
Doctorate	262	94.9	14	5.1	269	97.5	7	2.5	267	96.7	9	3.3
Unknown	602	89.1	74	10.9	634	93.8	42	6.2	604	89.3	72	10.7

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption

E = Enlisted

W = Warrant

O = Officer

Table D-4. Demographics and Military Characteristics of Soldiers who Completed the Behavioral Health Screening on the Periodic Health Assessment, 2017

DEMOGRAPHICS	PC-PTSD				PHQ-2				AUDIT-C			
	No		Yes		No		Yes		No		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%
COMPONENT												
Regular Army	205,828	90.3	22,099	9.7	209,120	91.7	18,807	8.3	214,143	94.0	13,784	6.0
National Guard	229,580	94.1	14,453	5.9	233,507	95.7	10,526	4.3	228,833	93.8	15,200	6.2
Army Reserves	132,464	91.0	13,091	9.0	137,098	94.2	8,457	5.8	136,062	93.5	9,493	6.5
GENDER												
Male	466,375	92.2	39,366	7.8	475,820	94.1	29,921	5.9	472,994	93.5	32,747	6.5
Female	101,497	90.8	10,277	9.2	103,905	93.0	7,869	7.0	106,044	94.9	5,730	5.1
PAY GRADE												
E1-E4	271,438	95.0	14,401	5.0	270,510	94.6	15,329	5.4	267,620	93.6	18,219	6.4
E5-E9	196,826	87.3	28,555	12.7	206,837	91.8	18,544	8.2	210,615	93.4	14,766	6.6
O1-O4	74,380	94.8	4,061	5.2	75,941	96.8	2,500	3.2	74,388	94.8	4,053	5.2
O5-O9	13,873	91.6	1,275	8.4	14,526	95.9	622	4.1	14,410	95.1	738	4.9
W1-W5	11,355	89.4	1,351	10.6	11,911	93.7	795	6.3	12,005	94.5	701	5.5
AGE GROUP (years)												
> 26	217,778	96.4	8,032	3.6	215,661	95.5	10,149	4.5	210,543	93.2	15,267	6.8
26-30	120,361	93.2	8,825	6.8	121,886	94.3	7,300	5.7	121,644	94.2	7,542	5.8
31-35	87,714	90.0	9,768	10.0	91,067	93.4	6,415	6.6	91,647	94.0	5,835	6.0
36-40	58,966	85.7	9,818	14.3	62,652	91.1	6,132	8.9	64,323	93.5	4,461	6.5
< 40	83,053	86.3	13,200	13.7	88,459	91.9	7,794	8.1	90,881	94.4	5,372	5.6
MARITAL STATUS												
Single	267,320	95.6	12,251	4.4	267,011	95.5	12,560	4.5	260,668	93.2	18,903	6.8
Married	267,393	89.4	31,842	10.6	277,717	92.8	21,518	7.2	282,341	94.4	16,894	5.6
Other	33,063	85.6	5,547	14.4	34,900	90.4	3,710	9.6	35,932	93.1	2,678	6.9
Unknown	96	97.0	3	3.0	97	98.0	2	2.0	97	98.0	2	2.0
RACE/ETHNICITY												
White	346,119	93.1	25,670	6.9	352,935	94.9	18,854	5.1	346,703	93.3	25,086	6.7
Black	103,353	88.4	13,537	11.6	106,084	90.8	10,806	9.2	110,856	94.8	6,034	5.2
Hispanic	73,847	91.7	6,654	8.3	75,363	93.6	5,138	6.4	75,900	94.3	4,601	5.7
Asian/Pacific Islander	28,638	92.9	2,185	7.1	28,932	93.9	1,891	6.1	29,073	94.3	1,750	5.7
American Indian/Alaskan Native	3,907	91.5	361	8.5	4,032	94.5	236	5.5	3,968	93.0	300	7.0
Other	9,012	92.8	698	7.2	9,195	94.7	515	5.3	9,183	94.6	527	5.4
Unknown	2,996	84.8	538	15.2	3,184	90.1	350	9.9	3,355	94.9	179	5.1
EDUCATION LEVEL												
No High School	4,513	95.4	217	4.6	4,505	95.2	225	4.8	4,483	94.8	247	5.2
High School	311,516	92.4	25,618	7.6	315,264	93.5	21,870	6.5	313,978	93.1	23,156	6.9
Some College	94,634	89.5	11,158	10.5	98,156	92.8	7,636	7.2	99,555	94.1	6,237	5.9
Bachelor's Degree	98,337	93.0	7,456	7.0	100,928	95.4	4,865	4.6	100,156	94.7	5,637	5.3
Masters/Graduate Level	40,075	91.9	3,517	8.1	41,629	95.5	1,963	4.5	41,736	95.7	1,856	4.3
Doctorate	4,436	95.3	219	4.7	4,532	97.4	123	2.6	4,495	96.6	160	3.4
Unknown	14,361	90.8	1,458	9.2	14,711	93.0	1,108	7.0	14,635	92.5	1,184	7.5

Legend:

PC-PTSD = Primary Care – Post-Traumatic Stress Disorder

PHQ-2 = Patient Health Questionnaire-2

AUDIT-C = Alcohol Use Disorders Identification Test – Consumption

E = Enlisted

W = Warrant

O = Officer

GLOSSARY
ABBREVIATIONS

APHC

U.S. Army Public Health Center

AR

Army Reserve

AUDIT-C

Alcohol Use Disorders Identification Test–Consumption

BH

Behavioral Health

BH-RADR

Behavioral Health Risk Assessment Data Report

BSHOP

Behavioral and Social Health Outcomes Program

CI

Confidence Interval

cOR

Crude Odds Ratio

DOD/DD

Department of Defense

ICD

International Classification of Disease

MDD

Major Depressive Disorder

NG

National Guard

PC-PTSD

Primary Care - Post-Traumatic Stress Disorder

PCL-C

PTSD Checklist-Civilian

PHR No. S.0008056-17

PDHA

Post-Deployment Health Assessment

PDHRA

Post-Deployment Health Re-Assessment

PHA

Periodic Health Assessment

PHQ

Patient Health Questionnaire

Pre-DHA

Pre-Deployment Health Assessment

PTSD

Post-Traumatic Stress Disorder

RA

Regular Army