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<p style="color: red;">This report links health assessment screening data from Army Service Members (SMs/Soldiers) reporting post-traumatic stress disorder (PTSD) symptoms, depression symptoms, and hazardous drinking behavior with their administrative medical data to calculate the proportion of SMs who sought behavioral health (BH) care after screening. 2015 data included 143,825 Pre-Deployment Health Assessments (Pre-DHAs), 67,596 Post-Deployment Health Assessments (PDHAs), 67,688 Post-Deployment Health Re-Assessments (PDHRAs), and 657,211 Periodic Health Assessments (PHAs). Screening tools included the Primary Care–Post-Traumatic Stress Disorder (PC-PTSD) tool, Patient Health Questionnaire–2 (PHQ-2), and Alcohol Use Disorders Identification Test–Consumption (AUDIT-C). Consistent with prior data, the highest proportion of SMs reporting PTSD symptoms (11%) was on the PDHRA. SMs were 1.5 times likely screening positive (+) for hazardous drinking behavior on the PDHRA than on the Pre-DHA. In general, SMs who screened (+) for depression symptoms had higher odds of screening (+) for PTSD symptoms compared to SMs who did not screen (+). Those reporting major life stressors had significantly higher odds of screening (+) for PTSD or depression symptoms or hazardous drinking. 26–38% who screened (+) reported moderate to severe depression symptoms; 77–89% who reported moderate or severe PTSD or depression symptoms had at least one prior BH visit. 60–75% with moderate to severe PTSD or depression symptoms who did not receive a referral were already under BH care. Findings show SMs with BH issues are interfacing with the BH care system but evaluation of referral and treatment for SMs with no prior BH care who screen (+) for BH symptoms is needed.</p>					
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**2015 Behavioral Health Risk Assessment
Data Report (BH-RADR)**

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September 2017



Clinical Public Health and Epidemiology Directorate
Division of Behavioral and Social Health Outcomes Practice

**2015 Behavioral Health Risk Assessment Data Report
(BH-RADR)**

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Public Health Report No. S.0008056-15
2015 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 time periods 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. In order to improve Soldier and unit readiness, it is imperative that the information from the screenings is used to develop appropriate interventions that target Soldiers at-risk of developing BH conditions.

Army leadership can determine best practices in regards to screening and treatment options for Soldiers with identified risk. The data are useful for many aspects within Army culture 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 2015, Army Soldiers completed 143,825 Pre-Deployment Health Assessments (Pre-DHAs)¹, 67,596 Post-Deployment Health Assessments (PDHAs)², 67,688 Post-Deployment Health Re-Assessments (PDHRAs)³, and 657,211 Periodic Health Assessments (PHAs)⁴. The current report included the most recently completed health assessment for each Soldier resulting in 87,589 Pre-DHAs, 61,100 PDHAs, 66,631 PDHRAs, and 614,534 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: 4 percent positive on the Pre-DHA, 6 percent positive on the PDHA, and 11 percent on the PDHRA. These findings are consistent with a previous study that reported a higher proportion of Soldiers with PTSD symptoms after returning from deployment with the highest proportions observed at PDHRA.⁵

Soldiers were 1.5 times more likely to screen positive for hazardous drinking behavior on the PDHRA than on the Pre-DHA. This finding supports recommendations to implement prevention efforts during the 6 months following reintegration. However, during the Pre-DHA a Soldier may be more motivated to underreport symptoms for the benefits and experiences associated with deployment than during the PDHRA.

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. BH symptoms can be complex and intertwined with multiple diagnostic categories. To enhance treatment, BH providers should remain aware of common comorbid conditions. 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. By gaining a better understanding of the potential negative impacts of life stressors, leadership, peers, and Family members may be able to better recognize warning signs and identify points of intervention.

On the Pre-DHA, PDHRA, and PHA, 44–57 percent of the Soldiers who completed the PTSD Checklist-Civilian (PCL-C), and 26–38 percent of Soldiers who completed the Patient Health Questionnaire (PHQ)-8 reported moderate to severe PTSD and/or depression symptoms, respectively. Among those who reported moderate or severe symptoms of PTSD and depression, 77–89 percent had at least one BH encounter prior to the health assessment. Healthcare providers on the Pre-DHA and PDHRA indicated 60–75 percent 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 may 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 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**

Army Regulation 40-5⁶, Section 2-19.

4 **Background**

The Division of Behavioral and Social Health Outcomes Practice (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), Army Reserve (AR) Soldiers in the U.S. Army. The 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 2015 (Figure B-1). The health assessment data were linked to administrative medical data 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 Department of Defense (DOD) develops and implements the 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, the PDHRA is completed 90–180 days following return from deployment, and the Army's PHA is completed every year during the Soldier's birth month (Figure 1).

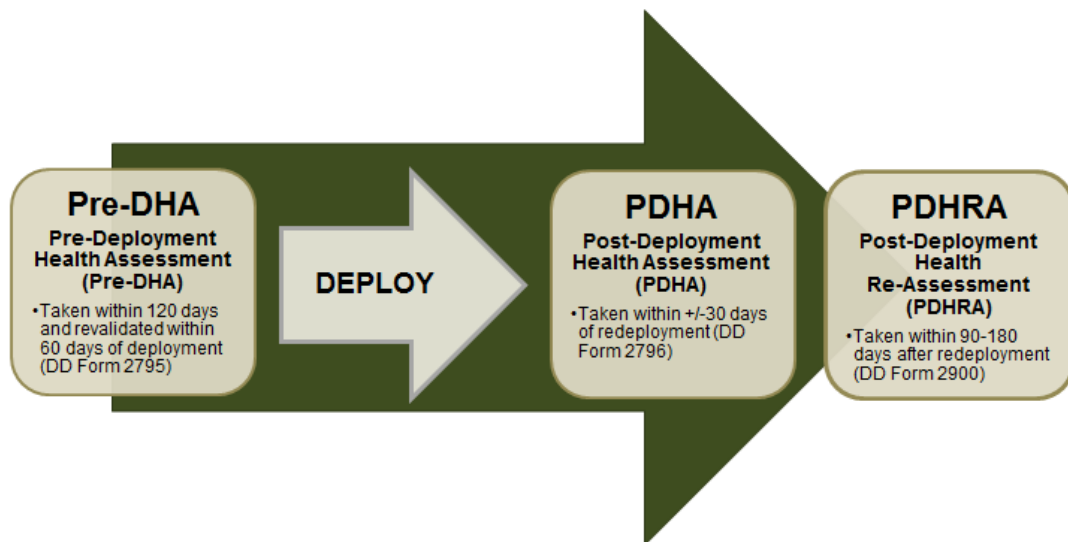


Figure 1. Deployment-Related Health Assessment Process

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 (MEDPROS). The health assessments include a two-staged screening process for PTSD and depression symptoms. For PTSD symptoms, a Soldier who screens positive on the four question PC-PTSD will be prompted to complete the seventeen 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 on non-clinical BH care provided by Chaplains, Military OneSource, Family Advocacy Program, or other support programs was not available for the current report. 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 and 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 and Discussion

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

Across all the health assessments, the majority of Soldiers were enlisted, male and between ages 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) outcomes presented in the current report.

Table 1. The Distribution of Demographics, Military Characteristics, and BH-related Outcomes Stratified by Health Assessment, 2015

Characteristics* - n (%)	Pre-DHA (n=87,589)	PDHA (n=61,100)	PDHRA (n=66,631)	PHA (n=614,534)
Component				
Regular Army	77,017 (88)	44,944 (74)	47,705 (72)	239,851 (39)
National Guard	5,016 (6)	8,925 (15)	9,155 (14)	244,438 (40)
Army Reserve	5,556 (6)	7,231 (12)	9,771 (15)	130,245 (21)
Sex				
Male	78,315 (89)	54,693 (90)	59,398 (89)	509,090 (83)
Female	9,274 (11)	6,407 (10)	7,233 (11)	105,443 (17)
Age				
17–25	34,624 (40)	19,577 (32)	17,913 (27)	227,131 (37)
26–30	22,027 (25)	15,845 (26)	17,544 (26)	126,493 (21)
31–35	13,994 (16)	10,655 (17)	12,260 (18)	95,531 (16)
36–40	8,591 (10)	6,755 (11)	8,102 (12)	64,085 (10)
>40	8,353 (10)	8,268 (14)	10,812 (16)	101,294 (16)
Rank				
E1-E4	40,863 (47)	23,050 (38)	23,004 (35)	282,884 (46)
E5-E9	31,367 (36)	25,433 (42)	29,807 (45)	230,127 (38)
W1-W5	2,842 (3)	8,540 (4)	2,593 (4)	11,964 (2)
O1-O4	10,970 (13)	1,397 (14)	9,258 (14)	74,631 (12)
O5-O10	1,250 (1)	2,272 (2)	1,942 (3)	14,915 (2)
BH Encounter^a				
Prior to the health assessment ^b	34,391 (39)	23,086 (38)	28,913 (43)	214,331 (35)
Within 6 months of the health assessment ^c	15,223 (17)	13,893 (23)	12,579 (19)	85,342 (14)
Incident case ^d	5,305 (6)	5,847 (10)	3,048 (5)	19,331 (3)

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: *Variables 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. ^a 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). ^b Includes any BH-related encounter during a Soldier's military career occurring prior to the health assessment. ^c Any BH-related encounter occurring within 180 days after the health assessment. ^d A Soldier's first BH-related encounter occurring within 6 months following the health assessment.

The prevalence of PTSD and MDD did not differ across the health assessments with 3 percent at the Pre-DHA and PDHA, 5 percent at the PDHRA, and 4 percent at the PHA (Table 2). Of the 1,941 Soldiers with a PTSD diagnosis at the PDHA, 25 percent (n=484) were incident PTSD diagnoses. Of the 1,788 Soldiers with a MDD diagnosis, 33 percent (n=588) were incident MDD diagnoses.

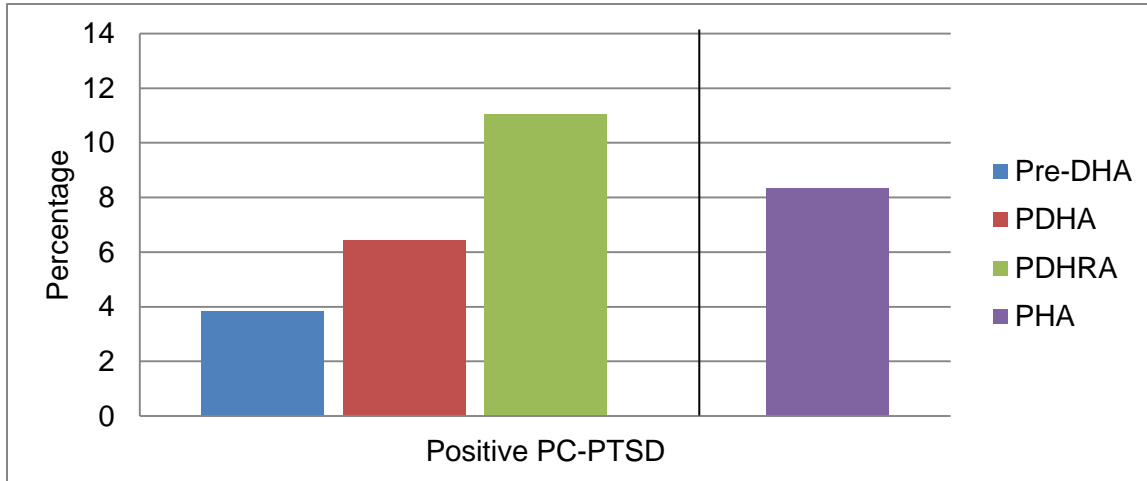
Table 2. Post-Traumatic Stress Disorder (PTSD) and Major Depressive Disorder (MDD) Diagnoses Stratified by Health Assessment, 2015

	<u>Pre-DHA</u>	<u>PDHA</u>	<u>PDHRA</u>	<u>PHA</u>
Diagnosis - n (%)	(n=87,589)	(n=61,100)	(n=66,631)	(n=614,534)
Prevalent Diagnosis^a				
PTSD	2,751 (3)	1,941 (3)	2,998 (5)	23,739 (4)
MDD	2,500 (3)	1,788 (3)	2,448 (4)	22,857 (4)
Incident Diagnosis^b				
PTSD	335 (<1)	484 (1)	571 (1)	3,103 (1)
MDD	600 (1)	588 (1)	603 (1)	4,829 (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 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.

The proportion of Soldiers who screened positive for PTSD symptoms on the PC-PTSD varied across the deployment-related health assessments: 4 percent positive on the Pre-DHA, 6 percent positive on the PDHA, and 11 percent on the PDHRA (Figure 2). When statistically adjusted for component, age, and sex, Soldiers who completed the PDHA (aOR: 1.62, 95% CI: 1.55–1.69) or PDHRA (aOR: 2.80, 95% CI: 2.69–2.92) had significantly higher odds of screening positive for PTSD symptoms compared to Soldiers who completed the Pre-DHA.

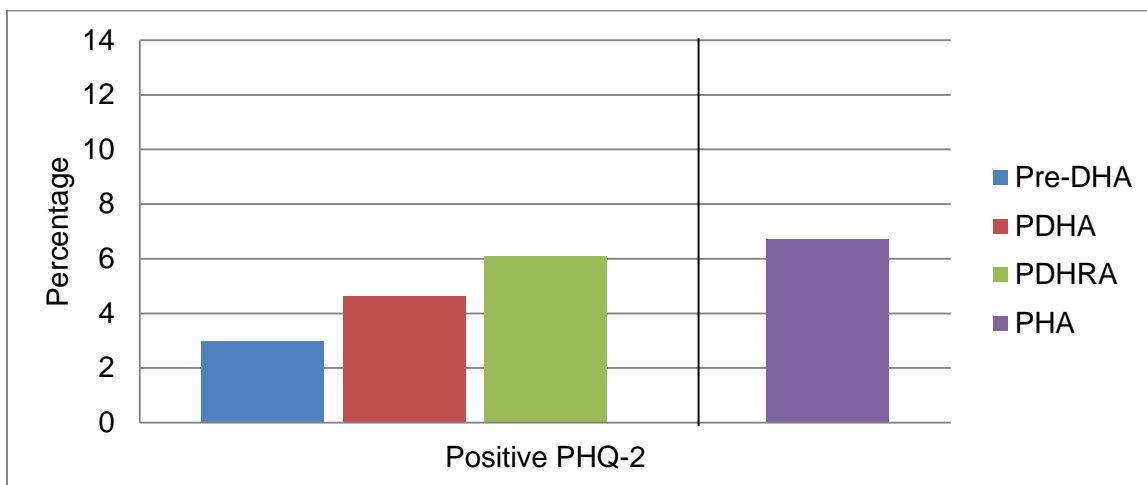


Legend: Pre-DHA – Pre-Deployment Health Assessment; PDHA – Post-Deployment Health Assessment; PDHRA – Post-Deployment Health Reassessment; PHA – Periodic Health Assessment;

Notes: 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, 2015

Approximately 3 percent of Soldiers screened positive for depression symptoms on the Pre-DHA compared to 5 percent on the PDHA and 6 percent on the PDHRA (Figure 3). When statistically adjusted for component, age, and sex, Soldiers had significantly higher odds of screening positive for depression symptoms on the PDHA (aOR=1.60, 95% CI: 1.51-1.68) and PDHRA (aOR=2.11, 95% CI: 2.01-2.22) when compared to the Pre-DHA.

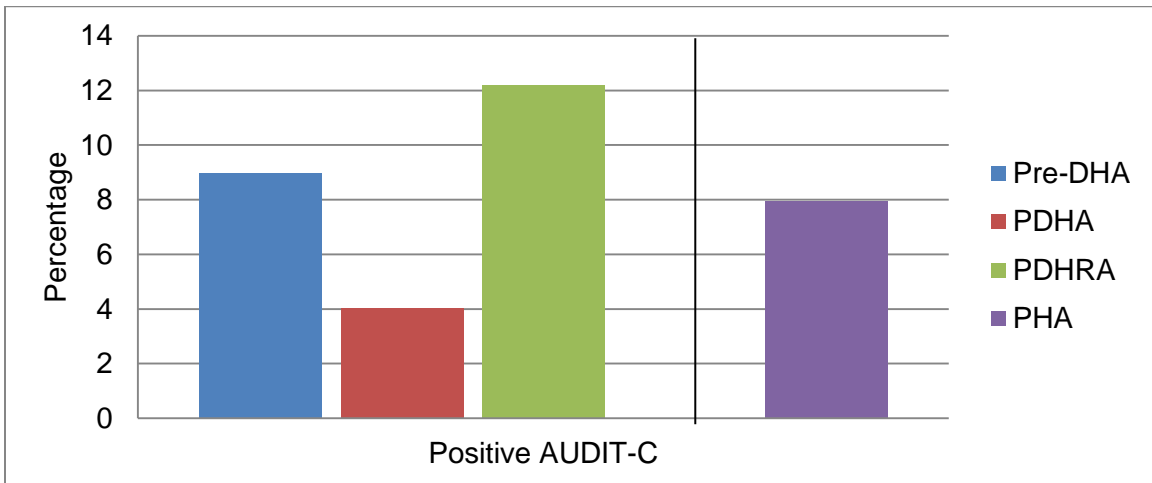


Legend: Pre-DHA – Pre-Deployment Health Assessment; PDHA – Post-Deployment Health Assessment; PDHRA – Post-Deployment Health Reassessment; PHA – Periodic Health Assessment;

Notes: 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, 2015

The proportion of Soldiers who reported hazardous drinking behavior on the AUDIT-C was substantially lower on the PDHA (4%) than the PDHRA (12%) (Figure 4). When statistically adjusted for component, age, and sex, Soldiers had significantly higher odds of screening positive for hazardous drinking behavior on the PDHRA (aOR=1.51, 95% CI: 1.47–1.57) compared to the Pre-DHA.



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

Notes: 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), 2015

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. Forty-two to 50 percent of the Soldiers who reported PTSD symptoms on the PC-PTSD screening tool 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 or financial problems (Table 3).

Table 3. Characteristics of Soldiers Who Completed the Primary Care – Post Traumatic Stress Disorder (PC-PTSD)^a Stratified by Health Assessment, 2015

Characteristics - %	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=3,351)	Negative (n=84,142)	Positive (n=3,894)	Negative (n=58,804)	Positive (n=7,281)	Negative (n=56,804)	Positive (n=35,842)	Negative (n=394,682)
≥ 1 deployment ^b	81	54	--	--	--	--	80	58
BH enc. before health assessment ^c	80	38	65	36	71	40	75	35
BH enc. w/n 6m of health assessment ^d	53	16	54	21	43	16	46	15
(+) PHQ-2 ^e	29	2	29	3	32	3	44	3
(+) AUDIT-C ^f	19	9	8	4	22	11	15	7
(+) combat exposure ^g	--	--	41	14	65	29	--	--
(+) major life stressors ^h	42	5	47	8	50	10	--	--
(+) BH referral ⁱ	17	1	27	2	36	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, 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, 2015

Characteristics - %	Pre DHA		PDHA		PDHRA		PHA	
	Positive (n=1,465)	Negative (n=1,882)	--	--	Positive (n=3,495)	Negative (n=3,761)	Positive (n=19,955)	Negative (n=15,173)
BH enc. before health assessment ^b	89	73	--	--	80	63	80	68
BH enc. w/n 6m of health assessment ^c	70	40	--	--	54	34	52	34
(+) PHQ-8 ^d	52	12			60	13	56	10
(+) AUDIT-C ^e	22	17	--	--	26	19	17	13
(+) major life stressors ^f	57	30	--	--	65	37	--	--
(+) PTSD referral ^g	15	5	--	--	36	21	--	--
Reason for not receiving a referral: ^h								
Already under care	60	24	--	--	66	23	--	--
Already had a referral	5	2	--	--	3	2	--	--
No significant impairment	23	62			22	65	--	--
Other reasons	13	13	--	--	9	11	--	--

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 PTSD Symptoms on the Primary Care – Post Traumatic Stress Disorder (PC-PTSD)^a Stratified by Health Assessment, 2015

Characteristics- cOR ^b (95% CI)	<u>Pre-DHA</u> (n=87,589)	<u>PDHA</u> (n=61,100)	<u>PDHRA</u> (n=66,631)	<u>PHA</u> (n=614,534)
BH encounter before health assessment ^c	6.52 (5.98-7.10)	3.37 (3.14-3.60)	3.71 (3.51-3.91)	5.66 (5.52-5.80)
Major life stressor ^d	14.97 (13.87-16.15)	10.17 (9.48-10.91)	9.14 (8.66-9.64)	--
Combat exposure ^e	--	4.31 (4.03-4.62)	4.47 (4.25-4.71)	--
AUDIT-C ^f	2.53 (2.32-2.77)	2.20 (1.94-2.49)	2.32 (2.18-2.46)	2.38 (2.29-2.43)
PHQ-2 ^g	20.91 (19.13-22.87)	13.39 (12.31-14.57)	15.93 (14.87-17.07)	25.61 (24.89-26.34)

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.

All estimates report the odds of screening positive for PTSD symptoms for the positive exposure group compared to the negative exposure group for each variable (Table 5). 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.

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, 58-73 percent 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).

Table 6. Characteristics of Soldiers Who Completed the Patient Health Questionnaire - 2 (PHQ-2)^a Stratified by Health Assessment, 2015

Characteristics - %	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=2,611)	Negative (n=84,978)	Positive (n=2,821)	Negative (n=58,063)	Positive (n=4,022)	Negative (n=62,114)	Positive (n=40,167)	Negative (n=538,402)
≥ 1 deployment ^b	60	55	--	--	--	--	75	59
BH enc. before health assessment ^c	68	38	58	37	73	41	65	32
BH enc. w/n 6m of health assessment ^d	53	16	54	21	51	17	39	12
(+) PC-PTSD ^e	38	3	40	5	58	8	59	5
(+) AUDIT-C ^f	23	9	9	4	27	11	18	7
(+) combat exposure ^g	--	--	27	15	56	32		
(+) major life stressors ^h	46	5	49	8	60	12	--	--
(+) BH referral ⁱ	17	1	25	3	37	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, (+): 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, 2015

Characteristics - %	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=687)	Negative (n=1,923)	--	--	Positive (n=1,542)	Negative (n=2,466)	Positive (n=11,810)	Negative (n=27,820)
BH enc. before health assessment ^b	86	62	--	--	82	66	77	60
BH enc. w/n 6m of health assessment ^c	76	45	--	--	61	45	51	33
(+) PCL-C ^d	96	75	--	--	97	75	97	73
(+) AUDIT-C ^e	25	22			28	26	19	17
(+) major life stressors ^f	68	39			76	50	--	--
(+) Depression referral ^g	15	5	--	--	36	21	--	--
Reason for not receiving a referral ^h :								
Already under care	72	46	--	--	75	53	--	--
Already had a referral	4	4	--	--	4	3	--	--
No significant impairment	15	37	--	--	15	33	--	--
Other reasons	8	10	--	--	5	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, PCL-C: Post Traumatic Stress Disorder Checklist – Civilian, AUDIT-C: Alcohol Use Disorders Identification Test – Consumption, PTSD- Post Traumatic Stress Disorder.

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 a Soldier's PCL-C score indicated the need for a referral.

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 8. Odds of Screening Positive for Depression Symptoms on the Patient Health Questionnaire - 2 (PHQ-2)^a Stratified by Health Assessment, 2015

Characteristics- cOR^b (95% CI)	Pre-DHA (n=87,589)	PDHA (n=61,100)	PDHRA (n=66,631)	PHA (n=614,534)
BH encounter before health assessment ^c	3.43 (3.15-3.73)	2.33 (2.16-2.52)	3.67 (3.42-3.94)	4.02 (3.94-4.11)
Major life stressor ^d	17.05 (15.69-18.53)	10.46 (9.66-11.32)	11.52 (10.77-12.33)	--
Combat exposure ^e	--	2.03 (1.86-2.21)	2.76 (2.58-2.94)	--
AUDIT-C ^f	3.15 (2.86-3.46)	2.37 (2.06-2.72)	2.91 (2.70-3.14)	2.71 (2.63-2.78)
PC-PTSD ^g	20.91 (19.13-22.87)	13.39 (12.31-14.57)	15.93 (14.87-17.07)	25.61 (24.89-26.34)

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, 2015

Characteristics - %	Pre-DHA		PDHA		PDHRA		PHA	
	Positive (n=7,860)	Negative (n=79,688)	Positive (n=2,454)	Negative (n=58,408)	Positive (n=8,057)	Negative (n=58,067)	Positive (n=48,803)	Negative (n=565,509)
≥ 1 deployment ^b	59	55	--	--	--	--	66	60
BH enc. before health assessment ^c	43	39	47	37	47	43	39	35
BH enc. w/n 6m of health assessment ^d	22	17	29	23	23	18	16	14
(+) PC-PTSD ^e	8	3	13	6	20	10	16	8
(+) PHQ-2 ^f	8	3	10	5	13	5	15	6
(+) combat exposure ^g	--	--	17	16	41	32	--	--
(+) major life stressors ^h	13	5	19	10	25	13	--	--
(+) BH referral ⁱ	3	1	8	3	15	6	--	--

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,

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.

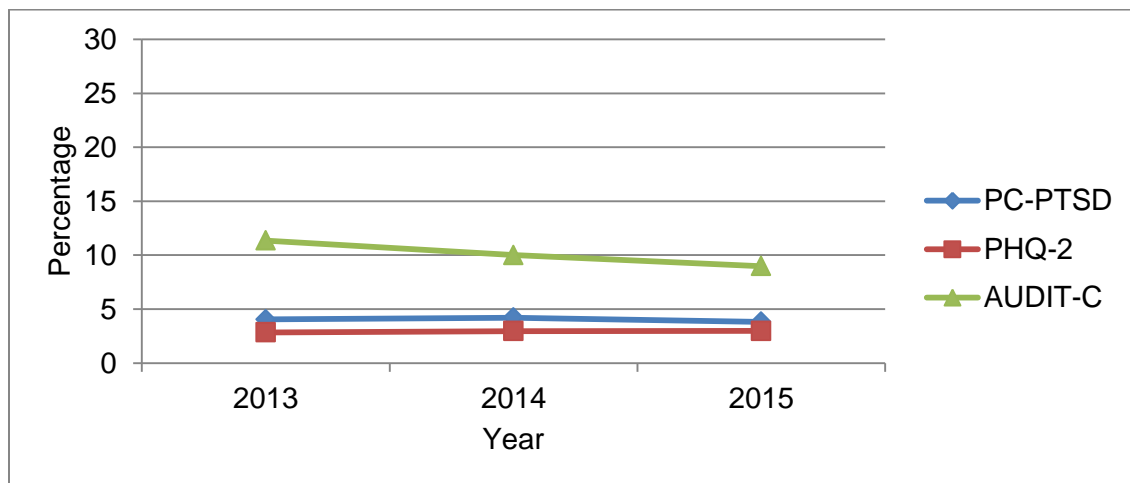
Table 10. Odds of Screening Positive for Hazardous Drinking Behavior on the Alcohol Use Identification Test – Consumption (AUDIT-C)^a Stratified by Health Assessment, 2015

Characteristics-cOR ^b (95% CI)	Pre-DHA (n=87,589)	PDHA (n=61,100)	PDHRA (n=66,631)	PHA (n=614,534)
BH encounter before health assessment ^c	1.21 (1.15-1.27)	1.50 (1.38-1.62)	1.20 (1.14-1.25)	1.20 (1.17-1.22)
Major life stressor ^d	2.51 (2.33-2.70)	2.14 (1.93-2.38)	2.27 (2.14-2.40)	--
Combat exposure ^e	--	1.11 (1.00-1.24)	1.46 (1.40-1.53)	--
PC-PTSD ^f	2.53 (2.31-2.77)	2.20 (1.94-2.49)	2.32 (2.18-2.46)	2.38 (2.29-2.43)
PHQ-2 ^g	3.15 (2.86-3.46)	2.37 (2.06-2.72)	2.91 (2.70-3.14)	2.71 (2.63-2.78)

Legend: cOR: Crude Odds Ratio, CI: Confidence Interval, PC-PTSD: Primary Care Post Traumatic Stress Disorder, PHQ-2: Patient Health Questionnaire -2.

Notes: 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.

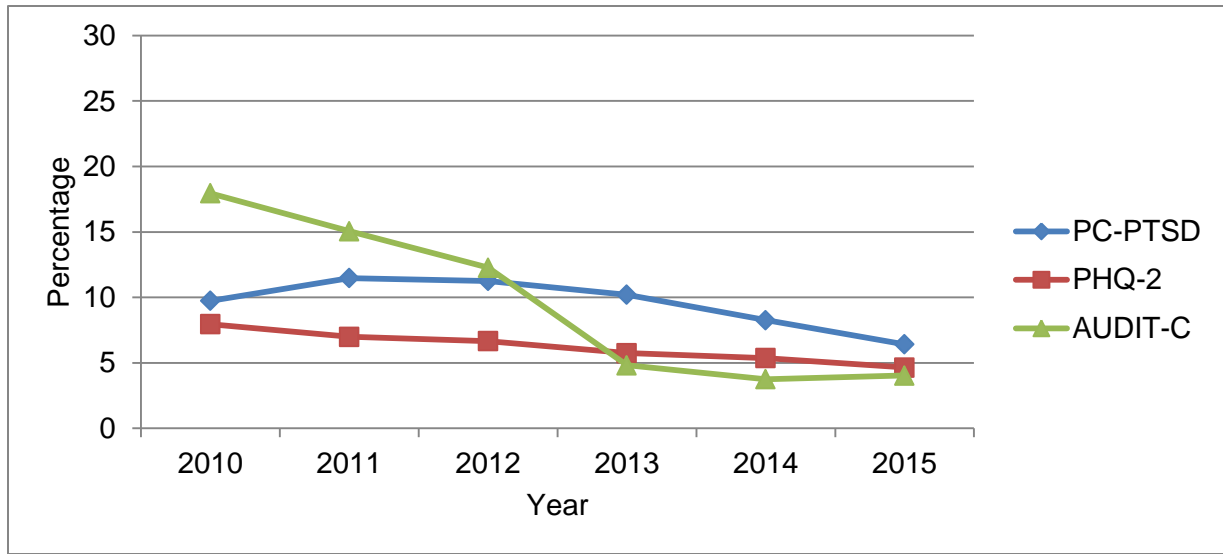
6.5 Historical Summary of BH Screening from 2010–2015 by Health Assessment



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 Pre-DHA did not incorporate BH screeners until the 2012 version of the Pre-DHA and 2013 was the first full calendar year of implementation. 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.

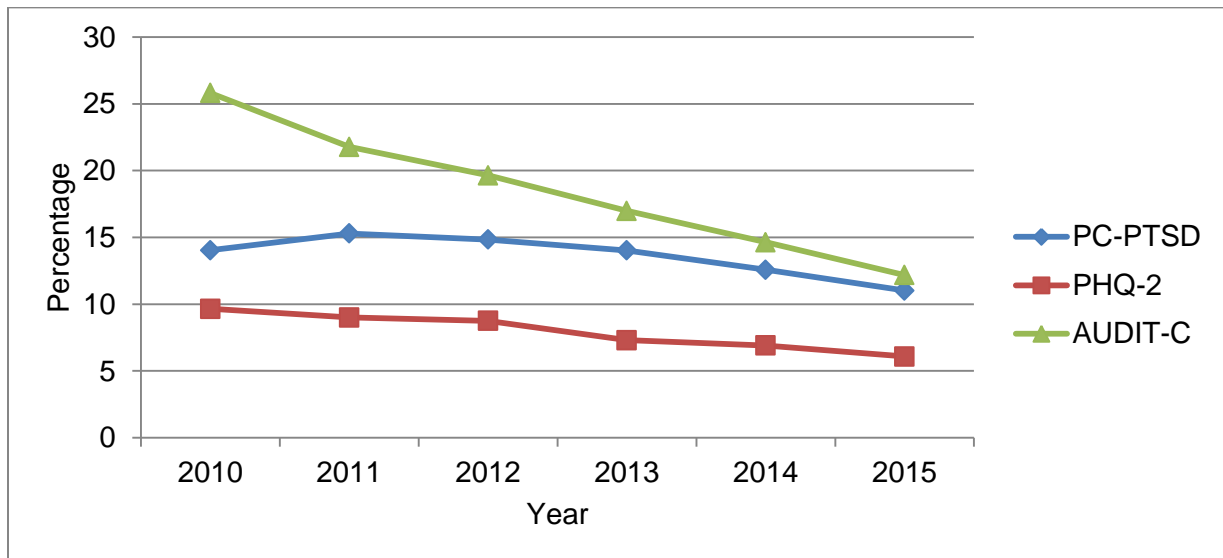
Figure 5. Pre-DHA, Positive BH Screening Tools 2013–2015



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.

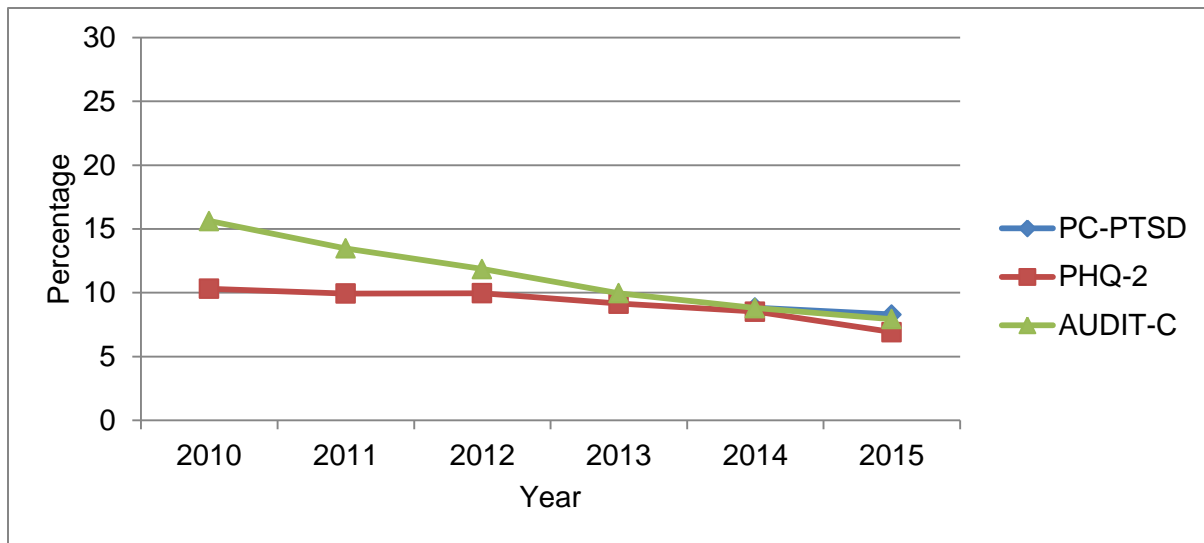
Figure 6. PDHA, Positive BH Screeners 2010–2015



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. PDHRA, Positive BH Screeners 2010–2015



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 8. PHA, Positive BH Screeners 2010–2015

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 percent in 2010 to 5 percent in 2015 on the PDHA (Figure 6) and from 26 percent in 2010 to 12 percent in 2015 on the PDHRA (Figure 7).

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.

Overall, there were significant differences in the proportions of Soldiers who screened positive for PTSD, depression, and alcohol-use disorders between the health assessment groups. Additionally, the proportions of Soldiers who screened positive for PTSD or depression symptoms were substantially higher when compared to the preceding health assessment. For instance, Soldiers who completed the PDHRA had two times the odds of screening positive for depression or PTSD when compared to Soldiers who completed the Pre-DHA, which was higher than estimates calculated for PDHA. These findings align with Milliken et al. (2007) that symptoms and stressors related to PTSD and depression are

more prevalent within 3–6 months after deployment and identifiable at the PDHRA time point.^{1,7} This could be due to an exacerbation of symptoms as Soldiers are re-acclimating to garrison life, an increase in reporting over time within the deployment cycle, or new diagnoses. Conversely, the increasing proportion over time could also highlight a “missed opportunity” during the earlier health assessment to identify a Soldier in need of BH-care services. The implementation of the Army’s Embedded Behavioral Health (EBH) model is a great example of the Army’s commitment to reduce potential “missed opportunities” and promote Soldier readiness. EBH provides Soldiers with a multidisciplinary BH team operating in close physical proximity to their work area and works closely with unit leadership. As a result, Soldiers experience expedited care and continuity of care from the same BH provider throughout the deployment and reintegration cycle.⁸

In contrast, Soldiers who completed the PDHA had significantly lower odds of reporting hazardous drinking behavior compared to Soldiers who completed the Pre-DHA. These findings are not well understood but may align with the fact that Soldiers are not allowed to drink during deployment or the relative difficulty of accessing alcohol while deployed. Soldiers who completed the PDHRA had significantly higher odds of screening positive for symptoms of hazardous drinking behavior compared to the Pre-DHA. Literature suggests that alcohol consumption is often used as a means to self-medicate among Soldiers experiencing BH-related symptoms.^{9,10} 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 abuse and behavioral health concerns by an integrated team of providers in one centralized location.

Soldiers who had a prior BH-related encounter had higher odds of screening positive for all three BH conditions across the four health assessment groups compared to Soldiers who did not have a BH-related encounter. This coincides with the findings that, on the Pre-DHA and PDHRA, Healthcare providers indicated 60–75 percent 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 may 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 who screen positive for BH symptoms should be refined or developed. Early intervention and treatment during this period could change the trajectory of symptoms promoting resiliency. Future studies should assess the frequency of new cases and the demographic and military characteristics that are predictive of accessing care. Describing the population of Soldiers who are not seeking care could help identify populations to target to improve access or time to care.

A high prevalence of the co-occurrence of PTSD and depression symptoms in Soldiers across all health assessment groups was also observed. For instance, Soldiers who screened positive for PTSD symptoms had significantly higher odds of screening positive for depression symptoms compared to Soldiers who did not screen positive for PTSD.

Health assessment provider guidelines indicate a Soldier who reports moderate or severe symptoms in addition to functional impairments should receive a referral to care.^{3,4,5}

Future studies that investigate the impact of comorbid BH conditions could provide evidence to support the revision of the provider guidelines to recommend Soldiers who report comorbid BH symptoms receive a referral to BH care.

Future analyses will—

- Provide more in-depth descriptions of subpopulations such as differences across gender, rank, and deployment location to possibly at-risk populations in need of prevention and intervention initiatives.
- Assess differences in receiving a referral/seeking care across demographic, military and deployment characteristics and in a subpopulation of Soldiers with no prior BH history over a cohort of Soldiers from 2012 to 2016.
- Provide installation-level BH-related findings and outcomes.

8 Point of Contact

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Appendix A

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APPENDIX B

Methods

B-1. Design Overview

A cross-sectional design was implemented using data from health assessment forms completed in 2015. The proportions of Soldiers who screened positive for post-traumatic stress disorder (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. Behavioral health (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 2015: Pre-Deployment Health Assessment (Pre-DHA), Post Deployment Health Assessment (PDHA), Post-Deployment Health Re-Assessment (PDHRA), and/or Periodic Health Assessment (PHA). Each form represents a population of Soldiers that corresponds to a period before or after deployment. This translates to four cohorts of Soldiers who were followed for 6 months following health assessment completion. For each health assessment, the most recent health assessment completed by each Soldier during 2015 is used in the analysis. This method ensures that each Soldier is represented only once in each health assessment population (Figure B-1).

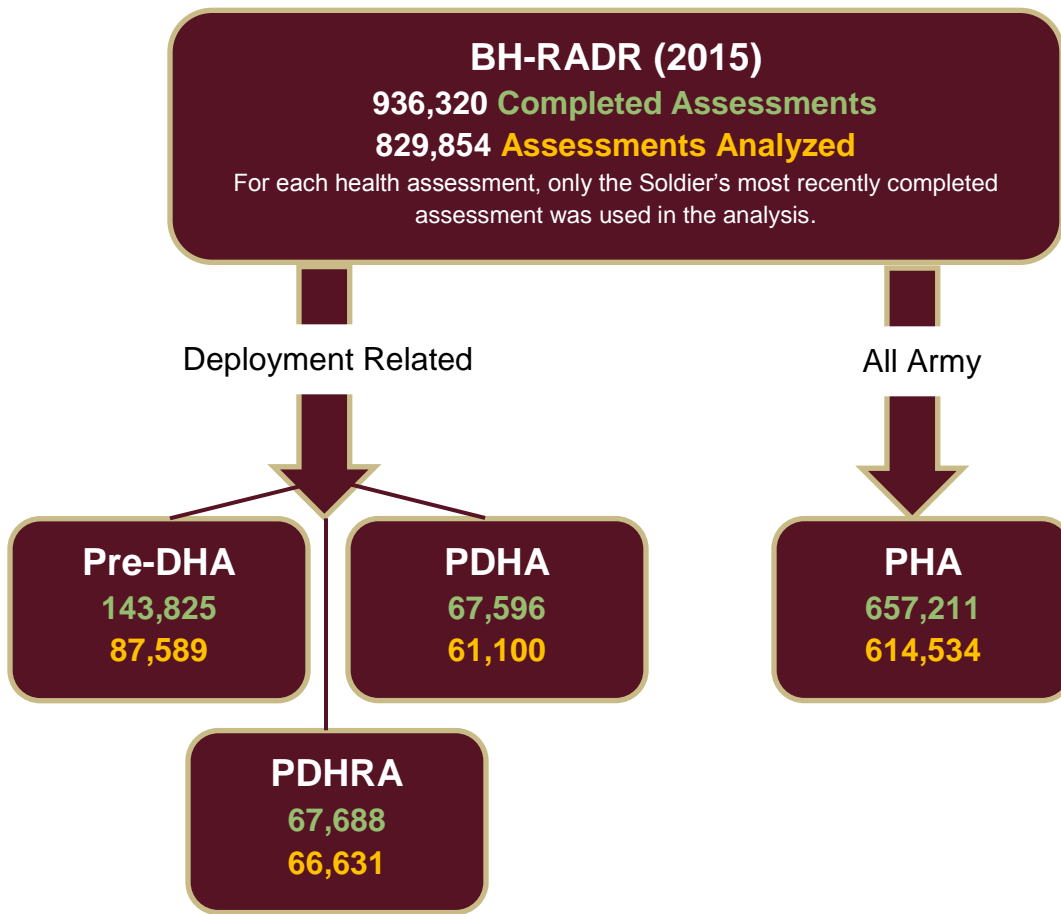


Figure B-1. Health Assessments Completed and Analyzed, 2015

B-3. Data Sources

B-3.1 Health Assessment Forms

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 report focused on these three BH conditions due to the high prevalence in the recently deployed population. An enhanced two-stage screening process was used to identify Soldiers who screened positive for PTSD and depression symptoms. The first stage requires all Soldiers to complete a brief instrument. Soldiers who screen positive complete a second instrument which captures more information on the level of severity of their symptoms. Scores on the second screener determine if the Soldier had 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 that require physicians to refer Soldiers who reported moderate or severe symptoms to treatment or a follow-up assessment.

B-3.2 Administrative medical data

BH-related medical data any time 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 Post-Traumatic Stress Disorder (PTSD) Symptoms

The Primary Care-PTSD (PC-PTSD) is a self-report screening tool that measures 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, PTSD Checklist-Civilian (PCL-C). This 17-item instrument measures how much symptoms of PTSD (e.g., disturbing dreams, avoidance, and trouble sleeping) have been bothersome 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.

B-4.2 Depression Symptoms

The Patient Health Questionnaire (PHQ)-2 is a two-question self-report screening tool that captures how often a person has been bothered by symptoms of depression (e.g., hopelessness, poor appetite and trouble concentrating) over the last two 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.

B-4.3 Alcohol-use Disorder Symptoms

The Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) is a self-reported screening tool that evaluates 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 scores ranging from 0–12. 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.

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 experience 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 International Classification of Disease Codes, 9th Edition (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 (see the Technical Notes document for a complete list).

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. 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 that diagnosis is the first diagnosis in a given category (Table B-1). For example, a Soldier with a history of major depressive disorder (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. ICD-9 and 10 Codes used to isolate BH 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

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. In addition, 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.

B-5 Analysis

Chi-square tests were conducted to compare the proportions of Soldiers who screened positive for PTSD, depression, and hazardous drinking behavior between health assessments. Multivariable logistic regression models were constructed to calculate the odds of screening positive between health assessments while controlling for sex, component, and age. Simple regression models were also constructed to identify the associations between BH conditions and factors indicating exposures to violence and life stressors for each health assessment population. The report presents crude and adjusted odds ratios with 95 percent confidence intervals (Tables 5, 8, and 9). Denominators for specific self-reported variables may vary 1–3 percent due to missing or incomplete information.

Glossary

Abbreviations

aOR

Adjusted Odds Ratio

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 Practice

CI

Confidence Interval

cOR

Crude Odds Ratio

DOD

Department of Defense

EBH

Embedded Behavioral Health

ICD

International Classification of Disease Codes

MDD

Major Depressive Disorder

NG

National Guard

OR

Odds Ratio

PC-PTSD

Primary Care - Post-Traumatic Stress Disorder

PHR No. S.0008056-15

PCL-C

PTSD Checklist-Civilian

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