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This assessment summarizes: (1) BH diagnoses and attrition among trainees from all components in Initial Entry Training (IET), including both officer trainees in the Basic Officer Leader Course [BOLC] and enlisted trainees in One-Station Unit Training [OSUT]), for newly opened areas of concentration (AOC) and military occupational specialties (MOS), respectively. (2) BH diagnosis rates among women and men in the Regular Army (both officers and enlisted Soldiers) with those AOCs/MOSs.

Few trainees received BH diagnoses during training, suggesting that this is not a major factor in attrition from training.

- Only 25 out of 2,435 officer trainees received BH diagnoses during Armor, Engineering, and Infantry BOLC in 2016; all but 4 graduated. There were no significant differences between women and men in the proportion of trainees with BH diagnoses. There was not a pattern of BH diagnosis by component.
- Only 164 of 8,918 enlisted trainees received BH diagnoses during Combat Engineering (12B), Field Artillery (13B/D/F/M/P/R/T), and Ordnance (91A/M/P) OSUT in 2016. Most who did, failed to graduate, and nearly all were discharged.

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Army Public Health Center

Public Health Report

Behavioral Health Surveillance for Gender Integration in the Army, 2016

PHR No. S.0049791-16

General Medical: 500A

September 2017

EXECUTIVE SUMMARY
Behavioral Health Surveillance for Gender Integration in the Army, 2016

1 Purpose

This is the first annual assessment of behavioral health (BH) monitoring conducted by the U.S. Army Public Health Center's Division of Behavioral and Social Health Outcomes Practice for U.S. Army Medical Command during implementation of the Army's gender integration plan (i.e., Army Implementation Plan 2016-01, *Gender Integration*) (Headquarters, Department of the Army Executive Order (HQDA EXORD) 097-16, 2016). This assessment summarizes: (1) BH diagnoses and attrition among trainees from all components in initial entry training (including both officer trainees in the Basic Officer Leader Course (BOLC) and enlisted trainees in One-Station Unit Training (OSUT)) for newly opened military occupational specialties (MOS) and areas of concentration (AOC) and (2) BH diagnosis rates among women and men in the operational Army (both officers and enlisted Soldiers, Regular Army only) with those MOSs/AOCs.

2 Findings

Few trainees received BH diagnoses during training, suggesting that this is not a major factor in attrition from training.

Only 25 out of 2,435 officer trainees received BH diagnoses during Armor, Engineering, and Infantry BOLC in 2016; all but 4 graduated. There were no significant differences between women and men in the proportion of trainees with BH diagnoses. The BH diagnosis showed no pattern by component.

Only 164 of 8,918 enlisted trainees received BH diagnoses during Combat Engineering (12B), Field Artillery (13B/D/F/M/P/R/T), and Ordnance (91A/M/P) OSUT in 2016. Most who did failed to graduate, and nearly all were discharged. In all three types of OSUT, a larger proportion of women than men received BH diagnoses, but the proportion of women and men with BH diagnoses who graduated did not differ significantly. In each type of OSUT, a statistically smaller proportion of National Guard than Regular Army or Army Reserve trainees received BH diagnoses during OSUT.

In the operational Army, women's BH diagnosis rates were about 1.4 times those of men for Soldiers overall and for enlisted Soldiers in Engineering or Ordnance. For officers in Engineering, the relative difference in BH diagnosis rates among women and men decreased over time to 1.4, primarily as a result of an increase in the rate among men. In Field Artillery, the small number of enlisted women resulted in volatile rates, with rate ratios varying between 0.8 and 1.3.

4 Recommendations

- Continue monitoring trainees for BH diagnoses to examine whether the findings reported here remain consistent over time.

- Compare BH diagnoses during other training courses to better understand similarities and differences between different MOSs/AOCs.

- Follow the cohorts of graduates from the training courses for the newly opened occupations to determine when they receive BH diagnoses; how these differ by sex and across occupations; and whether those with diagnoses continue in the same occupation, reclassify into a different occupation, or separate from the Army.

- Examine the overall rate of BH diagnosis among women and men in each MOS/AOC to gauge how rates in the newly opened occupations differ from rates in occupations long available to women.

- Examine rates of specific BH diagnoses by sex and MOS/AOC to determine whether they conform to the usual pattern in which women in the United States have higher diagnosis rates of mood and anxiety disorders than men and lower rates of alcohol use and drug use disorders.

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1 REFERENCES

Appendix A provides the references cited within this document.

2 AUTHORITY

The U.S. Army Public Health Center's (APHC) Division of Behavioral and Social Health Outcomes Practice (BSHOP) prepared this report in accordance with APHC's responsibility under Army Regulation (AR) 40-5, Section 2-19, to provide support to U.S. Army Medical Command (MEDCOM) for comprehensive medical surveillance to identify, prevent, and control evolving health problems. This annual assessment provides information on behavioral health (BH) to supplement the requirement described in the Army Implementation Plan 2016-07, *Gender Integration,* (HQDA EXORD 097-16, 2016) for MEDCOM to provide annual assessments of longitudinal studies.

3 INTRODUCTION

3.1 Purpose

This is the first annual assessment of BH monitoring conducted by APHC/BSHOP for MEDCOM during implementation of the Army's gender integration plan (i.e., Army Implementation Plan 2016-01 (HQDA EXORD 097-16, 2016). This assessment summarizes: (1) BH diagnoses and attrition among trainees from all components in initial entry training (IET, including both officer trainees in the Basic Officer Leader Course [BOLC] and enlisted trainees in One-Station Unit Training [OSUT]) for newly opened military occupational specialties (MOS) and areas of concentration (AOC) and (2) BH diagnosis rates among women and men in the operational Army (both officers and enlisted Soldiers, Regular Army only) with those MOSs/AOCs.

3.2 Directives on Gender Integration from the Secretary of Defense

On 24 January 2013, the Secretary of Defense (SECDEF) rescinded the 1994 Direct Ground Combat Definition and Assignment Rule and directed the integration of women into currently closed units and positions (Memorandum, 2013). On 3 December 2015, the SECDEF directed full integration of women in the Armed Forces (Memorandum, 2015), describing seven broad areas of concern (Table 1).

On 18 March 2016, the Undersecretary of Defense for Personnel and Readiness issued guidance on the "Annual Assessment Regarding the Full Integration of Women in the Armed Forces" (Memorandum, 2016), which directs each military department to provide an annual assessment of its implementation efforts toward full integration, including information and data on the seven areas of concern (Table 1). This document notes that it is critical that the Services "embark on integration with a commitment to monitoring, assessment, and in-stride adjustment that enables sustainable success."

Table 1. SECDEF's Areas of Concern for Gender Integration [a]

1	Transparent standards
2	Population size
3	Physical demands and physiologic differences
4	Conduct and culture
5	Talent management
6	Operating abroad
7	Assessment and adjustment

Note: [a]SECDEF, 2015

3.3 The Army's Implementation of Gender Integration and MEDCOM's Role

On 6 April 2013, HQDA issued EXORD 112-13 directing Army actions to integrate women into all occupational fields (HQDA, 2013). The Army initiated a deliberate Service-wide effort called Soldier 2020 to open previously closed positions and occupational specialties to women, while maintaining combat effectiveness and ensuring units are filled with the best qualified Soldiers (HQDA, 2013). This EXORD specifically directed MEDCOM to support the development and execution of gender-neutral physical standards and to conduct a longitudinal assessment of the physical demands and injury rates in newly opened occupational fields (to address the seventh area of concern in Table 1). The MEDCOM interpreted this requirement to include behavioral health as an injury that may affect both training and operations.

To support this effort, MEDCOM initiated the Soldier 2020 Injury Rates/Attrition Rates Working Group. Facilitated by the Office of the Surgeon General Rehabilitation and Reintegration Division, the working group comprised subject matter experts from MEDCOM, APHC, U.S. Army Research Institute of Environmental Medicine, U.S. Army Training and Doctrine Command, U.S. Army Forces Command, the National Guard Bureau, U.S. Army Reserve Command, U.S. Army Recruiting Command, and HQDA G-1. The primary objective of the working group was to evaluate research and surveillance on Army injuries, including behavioral health, and on attrition. Staff from the APHC/BSHOP supported the working group, by providing subject matter expertise on BH surveillance, rates and trends, and risk factors. The working group briefed its findings and recommendations to the Chief of Staff, Army (CSA) on 24 June 2015, indicating that there is no medical basis for closing any occupational field to women or men.

On 10 March 2016, HQDA issued EXORD 097-16 to the Army Implementation Plan 2016-01, *Army Gender Integration,* (HQDA, 2016) requiring the Army to execute its plan to open all occupations to qualified personnel regardless of gender by 1 April 2016. The EXORD described the Army's gender integration plan, assigning MEDCOM to conduct injury surveillance among other things. As part of this effort, APHC/BSHOP has analyzed data on BH diagnoses among men and women (all components) training for newly opened MOSs/AOCs during FY2016 and among Soldiers with those MOSs/AOCs in the operational Army (Regular Army only) during the 5-year period Fiscal Year (FY) 2010–FY2016.

4 METHODS

This report summarizes analyses of available data on BH diagnoses, graduation, and attrition among trainees and BH diagnoses among Soldiers in the operational Army.

The trainee population included officer trainees who entered the Basic Officer Leadership Courses for Armor (ABOLC, AOC=19), Engineer (EBOLC, AOC=12), and Infantry (IBOLC, AOC=11) and enlisted trainees who entered OSUT for Combat Engineering (12B), Field Artillery (13B/D/F/M/P/R/T, hereafter "13 Series"), or Ordnance (91A/M/P) during 2016. Trainees (identified by this term throughout the report) were identified from rosters from the Army Training Requirements and Resources System (ATARRS). They may come from any component (Regular Army, Army National Guard, or Army Reserve); however, some courses did not have trainees from all components.

The operational Army population included Regular Army Soldiers identified from personnel data provided by the Armed Forces Health Surveillance Branch (AFHSB) from the Defense Manpower Data Center's (DMDC) master personnel file. Army National Guard and Army Reserve Soldiers were not included because medical records for care they obtain outside the military health system are unavailable. Throughout the report, the term "Soldiers" refers only to Regular Army Soldiers in the operational Army (i.e., it does not including trainees or National Guard or Army Reserve Soldiers). To provide context for the trainee results and for reasons of space, this report presents results only for Soldiers in Armor (MOS/AOC=19), Engineering (MOS/AOC=12), Field Artillery (MOS/AOC=13), Infantry (MOS/AOC=11), and Ordnance (MOS/AOC=91).

Analyses for BOLC trainees are for Calendar Year (CY) 2016. Analyses for OSUT trainees are for FY2016. Analyses for Soldiers are for FY2010–FY2014. This variation is a result of completing the project in phases. Time constraints, due to competing mission requirements, left insufficient time to request additional data and reanalyze them to make the time frames congruent and bring the rate analyses forward to a more recent year.

The APHC/BSHOP bases BH diagnoses on medical encounter data from the Military Heath System Data Repository (MDR), as provided by the Defense Health Agency's AFHSB. A trainee or Soldier has a BH diagnosis if he/she had a medical record in the MDR with a diagnosis code for any of the following: mood disorder, posttraumatic stress disorder (PTSD), other anxiety disorder, adjustment disorder, substance use disorder, personality disorder, psychosis, or attention deficit/hyperactivity disorder (ADHD). (Note: Previous APHC/BSHOP analyses have determined that these are the BH diagnoses that occur most frequently among U.S. Army Soldiers.) Diagnosis codes are from the International Classification of Diseases, Versions 9 or 10 (ICD-9/10). Data from an inpatient medical encounter indicate a BH diagnosis if a BH code occurs in any of the first eight diagnostic positions (Dx1–Dx8). Outpatient data indicate a BH diagnosis if a BH code occurs in the first diagnostic position (Dx1) or in secondary positions (Dx2–Dx4) twice within a year but not on the same day. This methodology is based on a Healthcare Effectiveness Data and Information Set (HEDIS) guideline from the National Committee from Quality Assurance (NCQA, 2010). Diagnosis codes for specific disorders are listed in the Glossary at the end of this report. Each trainee with a BH diagnosis was counted

only once during training, even if he/she received more than one BH diagnosis during that period. Each Soldier with a BH diagnosis was counted only once in each year.

Results for BH diagnoses among trainees are given as the proportion of trainees who received a BH diagnosis during training, the proportion of trainees with BH diagnoses who did/did not graduate, and the proportion of trainees who were discharged or recycled out with BH diagnoses who did not graduate. Results are not given as rates because, in most groups, fewer than 20 trainees received such diagnoses. Rates based on fewer than 20 events are unstable, so that the addition or omission of a single case produces wide fluctuations in the rate (Miniño, 2011). Chi-squared analyses or Fisher exact tests were used to determine whether the proportion of trainees who received a BH diagnosis differed significantly by sex or by component (α=0.05).

Results reported for the operational Army are rates of BH diagnosis per 1000 Soldiers per year. For example, an annual rate of 23 per 1000 indicates that out of every 1000 Regular Army Soldiers serving during that year, 23 received a BH diagnosis at least once. Denominator data (i.e., counts of all Regular Army Soldiers in each fiscal year) were constructed from personnel data from the Defense Medical Data System provided by AFHSB. Denominators were the average, across 12 months, of the count of Regular Army Soldiers in each month. Comparisons of the BH diagnosis rates among women and men are reported as rate ratios, calculated as the BH diagnosis rate among women divided by the BH diagnosis rate among men. For instance, a rate ratio (W/M) of 1.4 indicates that the rate among women is 1.4 times the rate among men. A rate greater than 1 indicates a higher rate among women than men; a rate less than 1 indicates a lower rate among women than men.

Statistical analyses were conducted using Statistical Analysis Software (SAS®) 9.4.

5 RESULTS

5.1. Behavioral Health Diagnoses during IET, 2016

Few officer trainees in BOLC received BH diagnoses and nearly all graduated (Table 2). In ABOLC, 3 trainees (<1%, 1 woman and 2 men) received BH diagnoses and all graduated. In EBOLC, 14 trainees (2%, 3 women and 11 men) received BH diagnoses and all but one man graduated. In IBOLC, 8 trainees (<1%, all men) received BH diagnoses and 5 graduated. In ABOLC and EBOLC, there were no significant differences between women and men in the proportion with BH diagnoses.

Table 2. Behavioral Health Diagnosis [a,b] and Graduation during Armor, Infantry, and Engineer BOLC, Comparison by Sex, CY2016

Measures – n (%)	**Women**	**Men**	**p-value [c] (W:M)**	**Total**
Armor BOLC	14 (100)	400 (100)		414 (100)
BH Diagnosis during BOLC [d]	1 (7)	2 (<1)	0.098	3 (<1)
Graduated [e]	1 (100)	2 (100)	—	3 (100)
Engineering BOLC	90 (100)	589 (100)		679 (100)
BH Diagnosis during BOLC [d]	3 (3)	11 (2)	0.414	14 (2)
Graduated [e]	3 (100)	10 (91)	1.000	13 (93)
Infantry BOLC	15 (100)	1327 (100)		1342 (100)
BH Diagnosis during BOLC [d]	0 (0)	8 (<1)	1.000	8 (<1)
Graduated [e]	—	5 (63)	—	5 (63)

Notes:

[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.

[b] Based on medical data available February 2017.

[c] Statistical comparison by sex, using Chi-squared or Fisher exact test.

[d] Proportion out of those who started BOLC.

[e] Proportion out of those with a BH diagnosis.

Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

The BH diagnosis during BOLC training showed no pattern by component or by sex within each component (Tables 3 and 4). During ABOLC, 2 Regular Army trainees (<1%, 1 woman and 1 man) and 1 National Guard trainee (1%, a man) received BH diagnoses; all graduated. During EBOLC, trainees who received a BH diagnosis included 9 Regular Army trainees (3%, 2 women and 7 men), 5 National Guard trainees (2%, 1 woman and 4 men), and no Army Reserve trainees. Of these, 1 man, a Regular Army trainee, did not graduate. During IBOLC, 6 Regular Army trainees (<1%, all men) and 2 National Guard trainees (<1%, both men) received BH diagnoses. Of these, 2 Regular Army trainees and 1 National Guard trainee did not graduate.

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Table 3. Behavioral Health Diagnosis [a,b] during Armor, Infantry, and Engineer BOLC, Comparison by Component, CY2016

Measures – n (%)	**Regular Army**	**National Guard**	**Army Reserve**	**p-value [c] (A:G)**	**p-value [c] (A:R)**	**p-value [c] (G:R)**
Armor BOLC [d]	331 (100)	83 (100)	0 (0)			
BH Diagnosis during BOLC [e]	2 (<1)	1 (1)	—	0.490		
Engineer BOLC	354 (100)	226 (100)	99 (100)			
BH Diagnosis during BOLC [e]	9 (3)	5 (2)	0 (0)	0.801	0.216	0.328
Infantry BOLC	1027 (100)	313 (100)	2 (100)			
BH Diagnosis during BOLC [e]	6 (<1)	2 (<1)	0 (0)	1.000	1.000	1.000

Legend: A – Regular Army, G – National Guard, R – Army Reserve.
Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
[b] Based on medical data available February 2017.
[c] Statistical comparison using Chi-squared or Fisher exact test.
[d] No Army Reserve trainees entered Armor BOLC.
[e] Proportion out of those who entered BOLC.
Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

Table 4. Behavioral Health Diagnosis [a,b] during Armor, Infantry, and Engineer BOLC, Comparison by Sex, [c] CY2016

Measures – n (%)	**Women**	**Men**	**p-value [d] (W:M)**	**Total**
Armor BOLC [e]				
Regular Army	13 (100)	318 (100)		331 (100)
BH Diagnosis during BOLC [f]	1 (8)	1 (<1)	0.077	2 (<1)
National Guard	1 (100)	82 (100)		83 (100)
BH Diagnosis during BOLC [f]	0 (0)	1 (1)	1.000	1 (1)
Engineer BOLC				
Regular Army	55 (100)	299 (100)		354 (100)
BH Diagnosis during BOLC [f]	2 (4)	7 (2)	0.635	9 (3)
National Guard	18 (100)	208 (100)		226 (100)
BH Diagnosis during BOLC [f]	1 (6)	4 (2)	0.342	5 (2)
Army Reserve	17 (100)	82 (100)		99 (100)
BH Diagnosis during BOLC [f]	0 (0)	0 (0)	—	0 (0)

Table 4. Behavioral Health Diagnosis [a,b] during Armor, Infantry, and Engineer BOLC, Comparison by Sex, [c] CY2016 (continued)

Measures – n (%)	**Women**	**Men**	**p-value [d] (W:M)**	**Total**
Infantry BOLC				
Regular Army	13 (100)	1014 (100)		1027 (100)
BH Diagnosis during BOLC [f]	0 (0)	6 (<1)	1.000	6 (<1)
National Guard	2 (100)	311 (100)		313 (100)
BH Diagnosis during BOLC [f]	0 (0)	2 (<1)	1.000	2 (<1)
Army Reserve	0 (0)	2 (100)		2 (100)
BH Diagnosis during BOLC [f]	—	0 (0)	—	0 (0)

Legend: M – male, W – women.

Notes:

[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.

[b] Based on medical data available February 2017.

[c] Comparisons by sex are within each component.

[d] Statistical comparison using chi-squared or Fisher exact test.

[e] No Army Reserve trainees entered Armor BOLC.

[f] Proportion out of those who entered BOLC.

Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

The diagnoses in ABOLC included anxiety and adjustment disorders. In EBOLC, the diagnoses included adjustment, anxiety, mood, and alcohol use disorders, as well as ADHD. The diagnoses in IBOLC were the same as those in EBOLC, excluding anxiety disorders.

As with the officer trainees, a small proportion of enlisted trainees received BH diagnoses during training in FY2016; however, most who did failed to graduate and nearly all were discharged (Table 5). In Combat Engineering OSUT, 107 trainees (3%, 31 women and 76 men) received BH diagnoses and 15 (14%, 3 women and 12 men) graduated. All of the 92 trainees with BH diagnoses who did not graduate were discharged, most with the explanation "existed prior to service." In Field Artillery OSUT, 45 trainees (<1%, 10 women and 35 men) received BH diagnoses and 26 (58%, 7 women and 19 men) graduated. Of the 19 trainees with BH diagnoses who did not graduate, 18 were discharged, most for "failure to adapt." In Ordnance OSUT, 12 trainees (2%, 4 women and 8 men) received BH diagnoses and 3 (25%, 1 woman and 2 men) graduated. Of the 9 trainees with BH diagnoses who did not graduate, 8 were discharged, primarily for the "convenience of the government."

In all three types of OSUT, a larger proportion of women than men received BH diagnoses (Table 5). The proportion of women and men with BH diagnoses who graduated did not differ significantly.

Table 5. Behavioral Health Diagnosis [a,b] and Graduation during Combat Engineering (12B), Field Artillery (13 Series), and Ordnance (91A/M/P) OSUT, Comparison by Sex, [c] FY2016

Measures – n (%)	**Women**	**Men**	**p-value [d] (W:M)**	**Total**
Combat Engineering (12B)	456 (100)	3097 (100)		3553 (100)
BH Diagnosis during OSUT [e]	31 (7)	76 (2)	<0.001*	107 (3)
Graduated [f]	3 (10)	12 (16)	0.546	15 (14)
Did Not Graduate [f]	28 (90)	64 (84)		92 (86)
Discharged/Other [g,h]	28 (100)	64 (100)		92 (100)
Field Artillery (13 Series)	329 (100)	4434 (100)		4763 (100)
BH Diagnosis during OSUT [e]	10 (3)	35 (<1)	<0.001*	45 (<1)
Graduated [f]	7 (70)	19 (54)	0.481	26 (58)
Did Not Graduate [f]	3 (30)	16 (46)		19 (42)
Discharged/Other [g,h]	2 (67)	16 (100)		18 (95)
Recycled/Retrained [g]	1 (33)	0 (0)		1 (5)
Ordnance (91A/M/P)	64 (100)	538 (100)		602 (100)
BH Diagnosis during OSUT [e]	4 (6)	8 (1)	0.030*	12 (2)
Graduated [f]	1 (25)	2 (25)	1.000	3 (25)
Did Not Graduate [f]	3 (75)	6 (75)		9 (75)
Discharged/Other [g,h]	3 (100)	5 (83)		8 (89)
Recycled/Retrained [g]	0 (0)	1 (17)		1 (11)

Legend: * – significant difference, M – men, W – women.

Notes:

[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.

[b] Based on medical data available June 2017.

[c] Comparison by sex of BH diagnosis and graduation among trainees with BH diagnosis, but not of disposition following failure to graduate.

[d] Statistical comparison using chi-squared or Fisher exact test.

[e] Proportion out of those who entered training.

[f] Proportion out of those with a BH diagnosis.

[g] Proportion out of those who did not graduate.

[h] Other indicates other non-successful completion.

Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

A significantly smaller proportion of enlisted trainees in Field Artillery OSUT received BH diagnoses than the proportions in Combat Engineering or Ordnance OSUT (Table 6). In addition, a larger proportion of trainees with BH diagnoses graduated from Field Artillery OSUT than from Combat Engineering or Ordnance OSUT.

Table 6. Behavioral Health Diagnosis [a,b] and Graduation during Combat Engineering (12B), Field Artillery (13 Series), and Ordnance (91A/M/P) OSUT, Comparison by OSUT, FY2016

Measures – n (%)	**Combat Engineering (12B)**	**Field Artillery (13 Series)**	**Ordnance (91A/M/P)**	**p-value [c] (12B: 13 Series)**	**p-value [c] (12B: 91A/M/P)**	**p-value [c] (13 Series: 91A/M/P)**
Total Trainees Entering OSUT	3553 (100)	4763 (100)	602 (100)			
BH Diagnosis during OSUT [d]	107 (3)	45 (<1)	12 (2)	<0.001*	0.166	0.018*
Graduated [e]	15 (14)	26 (58)	3 (25)	<0.001*	0.389	0.044*

Legend: *– significant difference.

Notes:

[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.

[b] Based on medical data available June 2017.

[c] Statistical comparison using Chi-squared or Fisher exact test.

[d] Proportion out of those who entered OSUT.

[e] Proportion out of those who with a BH diagnosis.

Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

A statistically smaller proportion of National Guard than Regular Army or Army Reserve trainees received BH diagnoses during OSUT (Table 7). Army Reserve trainees, who were present in substantial numbers only in Combat Engineering OSUT, did not differ from Regular Army trainees in the proportion who received BH diagnoses.

Table 7. Behavioral Health Diagnosis [a,b] and Graduation, during Combat Engineering (12B), Field Artillery (13 Series), and Ordnance (91A/M/P), Comparison by Component, FY2016

Measures – n (%)	**Regular Army**	**National Guard**	**Army Reserve**	**p-value [c] (A:G)**	**p-value [c] (A:R)**	**p-value [c] (G:R)**
Combat Engineering (12B)	2025 (100)	1053 (100)	475 (100)			
BH Diagnosis during OSUT [d]	81 (4)	11 (1)	15 (3)	<0.001*	0.390	0.003*
Field Artillery (13 Series)	3090 (100)	1672 (100)	1 (100)			
BH Diagnosis during OSUT [d]	40 (1)	5 (<1)	0 (0)	<0.001*	—	—
Ordnance (91A/M/P) [e]	456 (100)	146 (100)	0 (0)			
BH Diagnosis during OSUT [d]	12 (3)	0 (0)	—	0.046*	—	—

Legend: * – significant difference, A – Regular Army, G – National Guard, R – Army Reserve.

Notes:

[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.

[b] Based on medical data available June 2017.

[c] Statistical comparison, using chi-squared or Fisher exact test.

Notes, Table 7, continued:
[d] Proportion out of those who entered OSUT.
[e] No Army Reserve trainees entered Ordnance OSUT.
Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

Among Regular Army trainees, a larger proportion of women than men received BH diagnoses in all three types of OSUT (Table 8). This was also the case among Army Reserve trainees in Combat Engineering (12B) OSUT, the only course with a substantial number of Army Reserve trainees. Among National Guard trainees, women and men did not differ in the proportion receiving BH diagnoses.

Table 8. Behavioral Health Diagnosis [a,b] during Combat Engineering (12B), Field Artillery (13 Series), and Ordnance (91A/M/P) OSUT, by Component, Comparison by Sex, FY2016

Measures – n (%)	**Women**	**Men**	**p-value [c] (W:M)**	**Total**
Combat Engineering (12B)				
Regular Army	311 (100)	1714 (100)		2025 (100)
BH Diagnosis during OSUT [d]	25 (8)	56 (3)	<0.001*	81 (4)
National Guard	82 (100)	971 (100)		1053 (100)
BH Diagnosis during OSUT [d]	1 (1)	10 (1)	0.592	11 (1)
Army Reserve	63 (100)	412 (100)		475 (100)
BH Diagnosis during OSUT [d]	5 (8)	10 (2)	0.037*	15 (3)
Field Artillery (13 Series)				
Regular Army	230 (100)	2860 (100)		3090 (100)
BH Diagnosis during OSUT [d]	9 (4)	31 (1)	0.002*	40 (1)
National Guard	99 (100)	1573 (100)		1672 (100)
BH Diagnosis during OSUT [d]	1 (1)	4 (<1)	0.263	5 (<1)
Army Reserve	0 (100)	1 (100)		1 (100)
BH Diagnosis during OSUT [d]	—	0 (0)	—	0 (0)
Ordnance (91A/M/P) [e]				
Regular Army	45 (100)	411 (100)		456 (100)
BH Diagnosis during OSUT [d]	4 (9)	8 (2)	0.023*	12 (3)
National Guard	19 (100)	127 (100)		146 (100)
BH Diagnosis during OSUT [d]	0 (0)	0 (0)	—	0 (0)

Legend: * – significant difference at p <0.05, M – men, W – women.
Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
Notes, Table 8, continued:
[b] Based on medical data available June 2017.

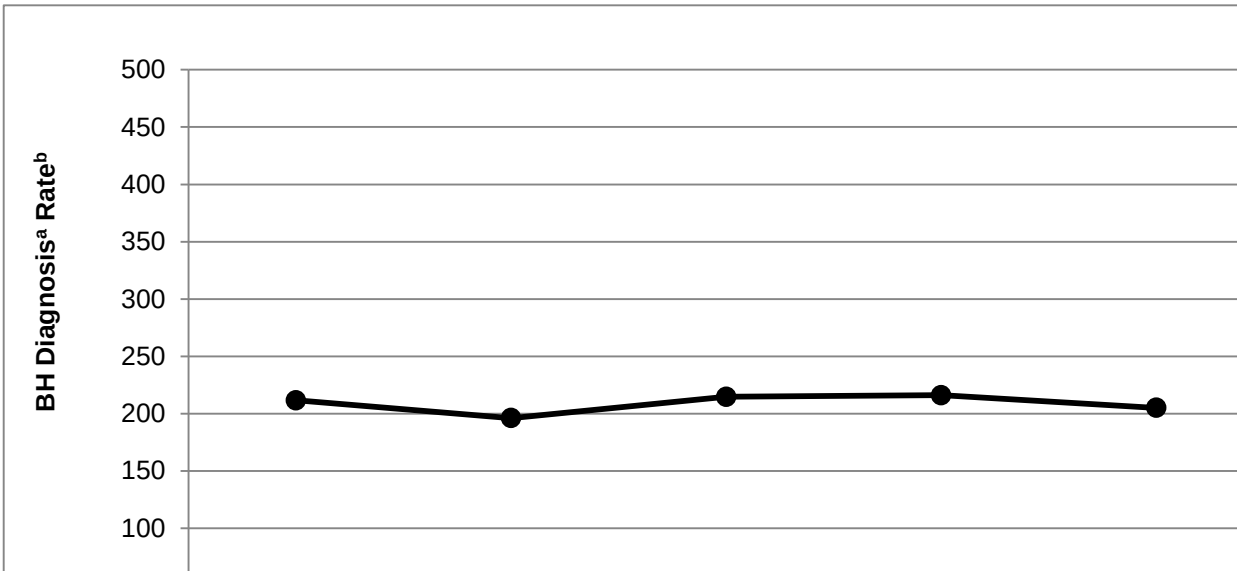
[c] Statistical comparison using chi-squared or Fisher exact test.
[d] Proportion out of those who entered OSUT.
[e] No Army Reserve trainees entered Ordnance OSUT.
Sources: Course rosters and graduation information from ATARRS. AFHSB provided medical data from MDR. Analysis by APHC/BSHOP.

The most common diagnosis, for all three types of training, was adjustment disorder, followed by mood disorders, anxiety disorders (excluding PTSD), and acute stress. Some trainees received more than one diagnosis.

Analyses of time from OSUT entry to BH diagnosis did not show any obvious patterns relative to a specific period of training and are not shown here. However, about a third of BH diagnoses were made during the first 2 weeks of training and about half in the first month.

5.2. Behavioral Health Diagnosis Rates in the Operational Army, FY2010–FY2014

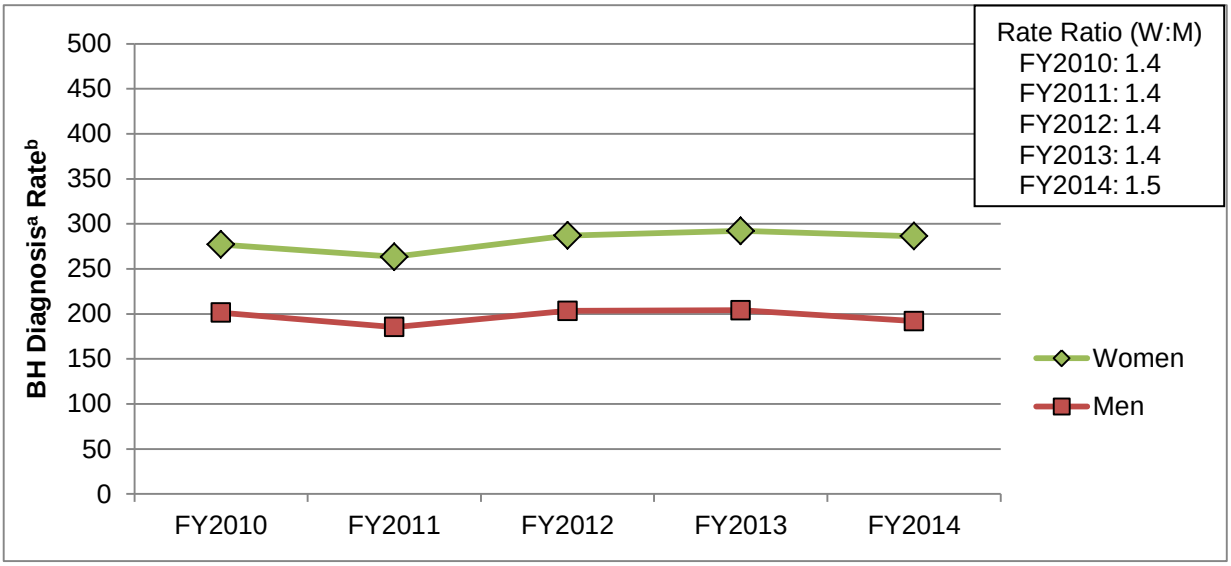
Annual rates of BH diagnosis among Soldiers in the operational Army varied over a narrow range from FY2010 through FY2014 (Figure 1): from a low of 196 per 1000 Soldiers in FY2011 to a high of 216 per 1000 in FY2013. Similarly, rates among women and men showed a narrow range with low and high points in the same years (Figure 2). Rates among women were higher



Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
[b] Rate per 1000 Soldiers.
Sources: AFHSB provided medical data from MDR and population data from the DMDC master personnel file. Analysis by APHC/BSHOP.

Figure 1. Annual Behavioral Health Diagnosis Rates, per 1000 Soldiers, Regular Army, FY2010–FY2014

than among men. Among women, BH diagnosis rates ranged from 263 to 292 per 1000 female Soldiers. Among men, the range was from 185 to 204 per 1000 male Soldiers. The relative difference, indicated by the rate ratio, remained constant from FY2010 through FY2013 with the rate among women 1.4 times higher than the rate among men. In FY2014, the relative difference increased to 1.5, with the rate among men decreasing more than the rate among women.

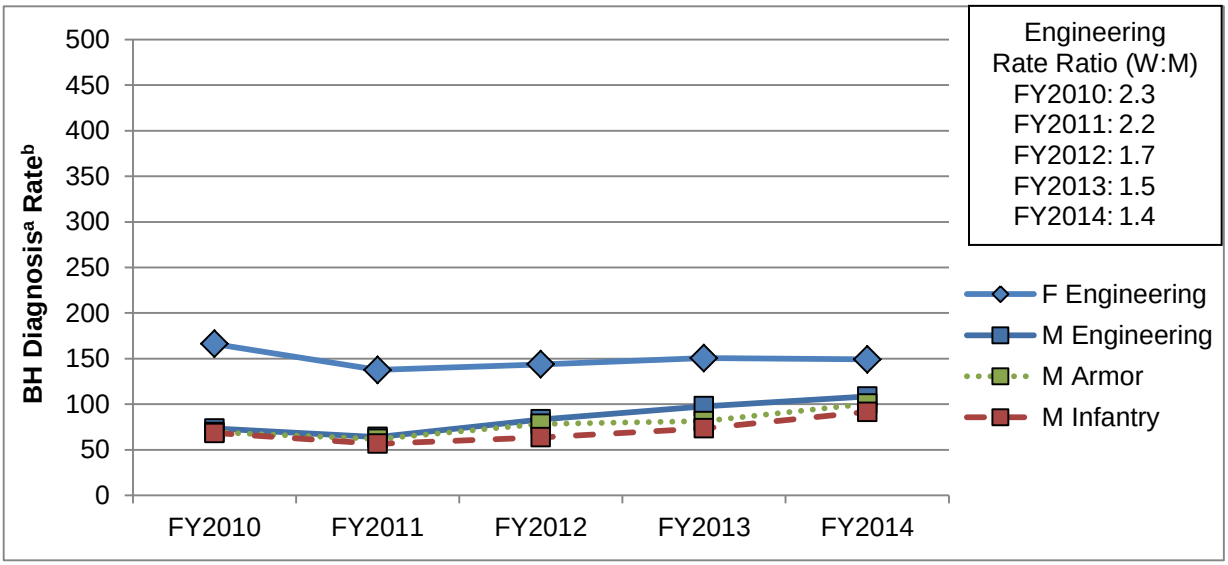


Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
[b] Rate per 1000 Soldiers.
Sources: AFHSB provided medical data from MDR and population data from the DMDC master personnel file. Analysis by APHC/BSHOP.

Figure 2. Annual Behavioral Health Diagnosis Rates, per 1000 Soldiers, by Sex, Regular Army, FY2010–FY2014

The BH diagnosis rates among Regular Army officers in Armor, Engineering, and Infantry provide context for the information on BH diagnoses among trainees in BOLC for those occupations reported above. The BH diagnosis rates among officers (Figure 3) are lower than in the Regular Army as a whole (Figures 1 and 2). Rates show a low point in FY2011 similar to the graphs above and increased thereafter. In Engineering, the BH diagnosis rate among female officers increased from 138 per 1000 in FY2011 to 150 per 1000 in FY2013 and FY2014; among male officers the rate increased from 64 per 1000 in FY2011 to 108 per 1000 in FY2014. The relative differences between the rates—the rate ratios—decreased over the period, with the rate among women 2.3 times the rate among men in FY2010 and 1.4 times in FY2014. For male officers in Infantry the BH diagnosis rate increased from 57 to 92 per 1000 and in Armor

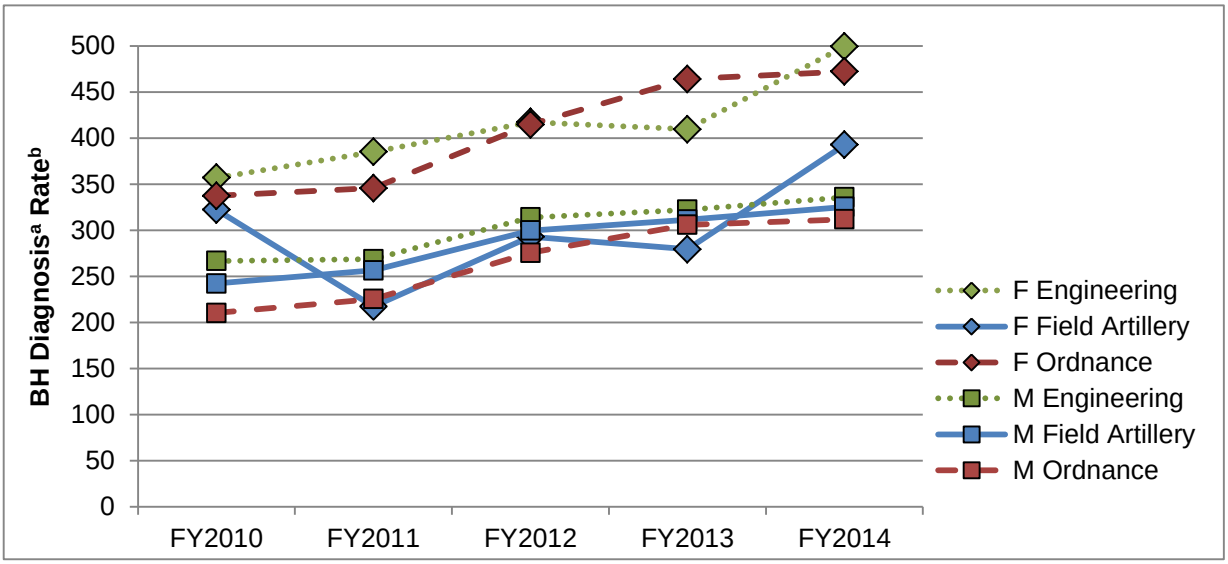
from 62 to 100 per 1000 over the same period. There were no female officers in Infantry or Armor during this period.



Legend: F – female, M – male.
Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
[b] Rate per 1000 Soldiers.
[c] Women were not in Armor or Infantry during this period.
Sources: AFHSB provided medical data from MDR and population data from the DMDC master personnel file. Analysis by APHC/BSHOP.

Figure 3. Annual Behavioral Health Diagnosis Rates, per 1000 Officers, by Sex,[c] Engineering (12 Series), Armor (19 Series), and Infantry (11 Series), Regular Army, FY2010–FY2014

The BH diagnosis rates among Regular Army enlisted men and women in Engineering, Field Artillery, and Ordnance (Figure 4) provide context for the information on BH among enlisted trainees in OSUT for the occupations reported above. The rates among both sexes in all three occupational categories are higher than those for the Regular Army (Figure 2) and increased from FY2010 through FY2014. In Engineering, the rates increased from 357 to 499 per 1000 among women and from 267 to 336 per 1000 among men. In Field Artillery, the increase was from 322 to 393 per 1000 among women and from 242 to 325 per 1000 among men. The fluctuations in the Field Artillery rate among women result from variation in the small number of cases in each year, ranging from 26 to 72. In Ordnance, the rates increased from 337 to 472 per 1000 among women and from 210 to 312 per 1000 among men. The relative difference in rates—the rate ratios (Table 7)—remain relatively stable in Engineering (ranging between 1.3 and 1.5) and Ordnance (1.6 in FY2010 and 1.5 thereafter). In Field Artillery, the rate ratios reflect the fluctuation in the rates among women, ranging from 0.8 to 1.3.



Legend: BH – behavioral health, FY – fiscal year, F – female, M – male.
Notes:
[a] BH diagnosis includes diagnosis with any of the following: mood disorders, PTSD, other anxiety disorders, adjustment disorders, substance use disorders, personality disorders, psychosis, or ADHD.
[b] Rate per 1000 Soldiers.
Sources: AFHSB provided medical data from MDR and population data from the DMDC master personnel file. Analysis by APHC/BSHOP.

Figure 4. Annual Behavioral Health Diagnosis Rates, per 1000 Enlisted Soldiers, by Sex, Engineering (12 Series), Field Artillery (13 Series), and Ordnance (91 Series), Regular Army, FY2010–FY2014

Table 9. Behavioral Health Rate Ratios (Women:Men), Enlisted Soldiers, Engineering (12 Series), Field Artillery (13 Series), and Ordnance (91 Series), Regular Army, FY2010–FY2014

	FY2010	FY2011	FY2012	FY2013	FY2014
Engineering (12)	1.3	1.4	1.3	1.3	1.5
Field Artillery (13)	1.3	0.8	1.0	0.9	1.2
Ordnance (91)	1.6	1.5	1.5	1.5	1.5

Sources: AFHSB provided medical data from MDR and population data from the DMDC master personnel file. Analysis by APHC/BSHOP.

6 LIMITATIONS

The occurrence of a BH ICD-9 or ICD-10 code in the medical record does not necessarily indicate diagnosis of a BH disorder since it may be recorded as a condition to rule out or as a part of the patient's history. In addition, BH diagnosis codes entered by providers who are not certified in mental health may also not be true diagnoses but may have been

recorded as part of an intention to refer. Analyses in this report did not distinguish diagnoses by providers certified in mental health and providers who were not.

Presentation of BH diagnosis rates by 2-character MOS/AOC may mask important differences. For example, the rate among combat engineers (12B) may differ from the rates among geospatial engineers (12Y) or interior electricians (12R). Future analyses will examine BH diagnosis rates by 3-character MOS/AOC.

Analyses reported here vary in using calendar year or fiscal year. Future reports will be reported by fiscal year, which will allow for 6 months follow-up after graduation and provide sufficient time to minimize the lag in medical data.

7 PLAN FOR FUTURE BEHAVIORAL HEALTH SURVEILLANCE

The APHC/BSHOP will continue to monitor BH diagnoses in the courses included in this report and will expand BH monitoring and surveillance to include the following:

- BH diagnosis, graduation, and attrition in—
    - Infantry and Armor OSUT
    - Other BOLC and OSUT training courses (not yet selected) for comparison
- BH diagnosis or other BH problems (as indicated by ICD-10 codes) in 6-, 12-, and 18-month intervals following graduation from—
    - Armor, Engineering, and Infantry BOLC during 2016 and 2017
    - Armor, Engineering, Field Artillery, Infantry, and Ordnance OSUT during 2016 and 2017
    - Other BOLC and OSUT training courses (not yet selected) for comparison
- BH diagnosis rates (any BH diagnosis) among Regular Army Soldiers, by sex, for each 3-character MOS/AOC where at least 20 Soldiers have received BH diagnoses from FY2010 through FY2017
- Diagnosis rates for specific BH disorders among Regular Army Soldiers by sex and by MOS/AOC, where enough cases are available, from FY2010 through FY2017

8 CONCLUSIONS

Few trainees received BH diagnoses during training, suggesting that this is not a major factor in attrition from training. Of 2,435 officer trainees in the BOLC courses reported here, 25 received BH diagnoses during training, and all but 4 graduated. Of the 8,918 enlisted trainees in the OSUT courses reported here, 164 received BH diagnoses during training, and 46 graduated or were recycled or retrained. The small numbers may, in part, result from a so-called “healthy

worker effect" (Shah, 2009), in which people already diagnosed with BH disorders do not seek to enter military training or are screened out by entry processes.

Women and men in Armor and Engineering BOLC did not differ in the proportion who received BH diagnoses. In Infantry BOLC, no women received BH diagnoses. Comparison with other BOLC courses will indicate whether this is generally the case in BOLC or whether it is specific to the newly opened occupations.

In OSUT, a larger proportion of women than men received BH diagnoses. This is consistent with other studies of military trainees, including a study of trainees across all U.S. military services from 2000–2012 (Monahan, 2013) and a study of Air Force trainees in basic military training in 1995–1996 (Talcott, 1999). It is also consistent with BH diagnosis rates in the operational Army, both among Regular Army Soldiers overall (Figure 2) and among Regular Army Soldiers in the Engineering and Ordnance MOSs (Figure 4). This is also the pattern in the general U.S. population: a study by the Centers for Disease Control and Prevention examined outpatient visits for mental health disorders in 2007 and 2008 and found higher rates among women than among men (Reeves, 2011, Table 18).

A significantly smaller proportion of enlisted trainees in Field Artillery OSUT received BH diagnoses than the proportions in Combat Engineering or Ordnance OSUT. In all three types of enlisted courses, the proportion of National Guard trainees with BH diagnoses was significantly less compared with the proportion of Regular Army or Army Reserve trainees who were diagnosed.

In the operational Army, women's BH diagnosis rates were about 1.4 times those of men for Soldiers overall and for enlisted Soldiers in Engineering or Ordnance. For officers in Engineering, the relative difference in BH diagnosis rates among women and men decreased over time to 1.4, primarily as a result of an increase in the rate among men. Analysis of additional years will show whether the rates continue to converge. Examination of rates in additional MOSs/AOCs will indicate whether a rate ratio of 1.4 is typical of most occupations or whether there is greater heterogeneity. The difference in rates may, in part, indicate that BH is more likely to remain undiagnosed in men than women. Despite the volatility in the rate ratio for enlisted Soldiers in Field Artillery, the highest rate ratio was 1.3 and the lowest 0.8, which suggests that in some occupations, women may have a lower BH diagnosis rate than men.

The finding that women have higher BH diagnosis rates than men is in agreement with the literature on both U.S. Military (AFHSB, 2012; Gadermann, 2012; Kessler, 2014) and Civilian populations (Eaton, 2012; Reeves, 2011), although most studies do not report on BH diagnoses as a whole but on specific diagnoses. Generally, women have been found to have higher rates of mood and anxiety disorders than men and lower rates of alcohol use and drug use disorders. Analysis of specific disorders will show whether diagnosis rates among U.S. Army Soldiers follow this pattern.

9 RECOMMENDATIONS

BH diagnosis during training does not appear to be a major factor in attrition from training. BH diagnosis does not appear to affect graduation for officer trainees in these courses. The failure and separation of enlisted trainees with BH diagnoses may be seen as a useful weeding out of vulnerable persons who might prove to be less resilient Soldiers.

The following expansion of monitoring and surveillance is recommended:

- Continue monitoring trainees for BH diagnoses to examine whether the findings reported here remain consistent over time.
- Compare BH diagnoses during other training courses to better understand similarities and differences between different MOSs/AOCs.
- Follow the cohorts of graduates from the training courses for the newly opened occupations to determine when they receive BH diagnoses, how these differ by sex and across occupations, and whether those with diagnoses continue in the same occupation, reclassify into a different occupation, or separate from the Army.
- Examine the overall rate of BH diagnosis among women and men in each MOS/AOC to gauge how rates in the newly opened occupations differ from rates in occupations long available to women.
- Examine rates of specific BH diagnoses by sex and MOS/AOC to determine whether they conform to the usual pattern in which women in the United States have higher diagnosis rates of mood and anxiety disorders than men and lower rates of alcohol use and drug use disorders.

APPENDIX A

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Glossary

Section I
Abbreviations

ABOLC
Armor basic officer leader course

ADHD
attention deficit/hyperactive disorders

AFHSB
Armed Forces Health Surveillance Branch

AOC
area of concentration

APHC
U.S. Army Public Health Center

AR
Army Regulation

ARI
Army Research Institute for the Behavioral and Social Sciences

ATARRS
Army Training Requirements and Resources System

BH
behavioral health

BOLC
Basic Officer Leader Course

BSHOP
Division of Behavioral and Social Health Outcomes Practice

CSA
Chief of Staff, Army

CY
Calendar Year

DMDC
Defense Manpower Data Center

EBOLC
Engineer Basic Officer Leader Course

EXORD
Execution Order

FY
Fiscal Year

HEDIS
Healthcare Effectiveness Data and Information Set

HQDA
Headquarters, Department of the Army

IBOLC
Infantry Basic Officer Leader Course

ICD-9/10
International Classification of Disease, Version 9/10

IET
Initial Entry Training

MDR
Military Health System Data Repository

MEDCOM
U.S. Army Medical Command

MOS
military occupational specialty

NCQA
National Committee on Quality Assurance

NG
National Guard

OSUT
One-Station Unit Training

PTSD
post-traumatic stress disorders

SECDEF
Secretary of Defense

Section II
Definitions

Cohort: a group of people banded together or treated as a group.

Behavioral Health (BH) Diagnosis Rate: Number of BH diagnoses per 1000 Soldiers per year. For example, a BH diagnosis rate of 25 per 1000 Soldiers in 2010 means that 25 out of every 1000 Soldiers serving in 2010 received a BH diagnosis during 2010.

BH Diagnosis Rate Ratio (Women:Men): Calculated by dividing the BH diagnosis rate among women (W) by the BH diagnosis among men (M). Example: a rate ratio (W:M) equal to 1.5 indicates that the BH diagnosis rate among women was 1.5 times higher than the rate among men.

Military Occupational Specialties (MOS):

Armor (19 series)
- 19D Cavalry scout
- 19K M1 Armor crewmember

Engineer (12 series)
- 12B Combat engineer
- 12C Bridge crewmember

Field Artillery (13 series)
- 13M Multiple Launch Rocket System Crewmember
- 13P Multiple Launch Rocket System operations/fire detection specialist
- 13R Field Artillery Firefinder Radar Operator

Field Mechanical Maintenance (91 series)
- 91A M1 Abrams tank system maintainer
- 91M Bradley Fighting Vehicle System Maintainer
- 91P Artillery Mechanic

Infantry (11 series)
- 11B Infantryman
- 11C Indirect Fire Infantryman

PHR No. S.0047231-16, Behavioral Health Surveillance for Gender Integration in the Army, 2016

Behavioral Health Disorders:

Acute reaction to stress
ICD-9 codes: 308
ICD-10 codes: F43.0.

Adjustment disorders
ICD-9 codes: 309 and subordinate codes, except 309.81 (PTSD)
ICD-10 codes: F32, F38, F39 and subordinate codes

Alcohol Use Disorders
ICD-9 codes: 291, 303, 305.0
ICD-10 codes: F10

Anxiety disorders (i.e., anxiety disorders other than PTSD)
ICD-9 codes: 300.0, 300.10, 300.2, and 300.3
ICD-10 codes: F40–F42.

Attention Deficit/Hyperactivity Disorders
ICD-9 codes: 314
ICD-10 codes: F90

Drug Use Disorders
ICD-9 codes: 292, 304, 305.2–305.9
ICD-10 codes: F11–F19

Mood disorders
ICD-9 codes: 296.0, 296.2, 296.3, 300.4, 311.0
ICD-10 codes: F32, F33, F34.1, F34.8, F34.9
bipolar disorder (ICD-9: 296.0, 296.4, 296.8; ICD-10: F31, F30, F34.0)
other mood disorders (ICD-9: 296, 296.1, 296.9; ICD-10: F39).

Post-traumatic stress disorder (PTSD)
ICD-9 codes: 309.81
ICD-10 codes: F43.1

Personality disorders
ICD-9 codes: 301–301.9
ICD-10 codes: F21 and F60.

Psychosis
ICD-9 codes: 290.8, 290.9, 295, 297, and 298
ICD-10 codes: F20, F22–F25, F28, F29.