

OEF/OIF Army Reservists' Postdeployment Mental Health Screens and Linkage to the Veterans Health Administration

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- The views expressed herein are not necessarily those of the Department of Veterans Affairs (VA) or other organizations.
- Disclosures: Some authors are researchers employed by VA and Department of Defense (DoD).

Poll Question

- What is your primary role at VA? Pick the best possible answer.
 - Research
 - Operations
 - Healthcare provider
 - Other

PART I

Army Reservists' Postdeployment
Behavioral Health Needs Associated with Linkage to
Veterans Health Administration

Background

- Approximately one quarter of U.S. service members deployed to Afghanistan and Iraq for Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) have been in the Army as part of the National Guard (ARNG) or Reserve (AR).
- 3-6 months after returning from deployment, they complete DoD's Post-Deployment Health Reassessment Survey (PDHRA).
- Common behavioral health problems for this population include: alcohol misuse, depression, and posttraumatic stress disorder (PTSD).

PDHRA Includes

Alcohol Use Disorders Identification Test-Consumption (AUDIT-C)

12. a. How often do you have a drink containing alcohol?
 Never Monthly or less 2-4 times a month 2-3 times per week 4 or more times a week
- b. How many drinks containing alcohol do you have on a typical day when you are drinking?
 1 or 2 3 or 4 5 or 6 7 to 9 10 or more
- c. How often do you have six or more drinks on one occasion?
 Never Less than monthly Monthly Weekly Daily or almost daily

Patient Health Questionnaire (PHQ-2) for depression

14. Over the LAST 2 WEEKS, how often have you been bothered by the following problems?
- | | <u>Not at all</u> | <u>Few or several days</u> | <u>More than half the days</u> | <u>Nearly every day</u> |
|--|-----------------------|----------------------------|--------------------------------|-------------------------|
| a. Little interest or pleasure in doing things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Feeling down, depressed, or hopeless | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Primary Care Posttraumatic Stress Disorder (PC-PTSD)

13. Have you ever had any experience that was so frightening, horrible, or upsetting that, in the PAST MONTH, you:
- | | | |
|--|---------------------------|--------------------------|
| a. Have had nightmares about it or thought about it when you did not want to? | <input type="radio"/> Yes | <input type="radio"/> No |
| b. Tried hard not to think about it or went out of your way to avoid situations that remind you of it? | <input type="radio"/> Yes | <input type="radio"/> No |
| c. Were constantly on guard, watchful or easily startled? | <input type="radio"/> Yes | <input type="radio"/> No |
| d. Felt numb or detached from others, activities, or your surroundings? | <input type="radio"/> Yes | <input type="radio"/> No |

Research Question

Is screening positive for alcohol misuse, depression, or posttraumatic stress disorder on the PDHRA survey associated with enrolling and receiving care in (“linking” to) the Veterans Health Administration (VHA) after Reserve Component (RC) members demobilize from the Army?

- In other words, are those potentially most in need of care more likely to link to VHA?

Screening positive

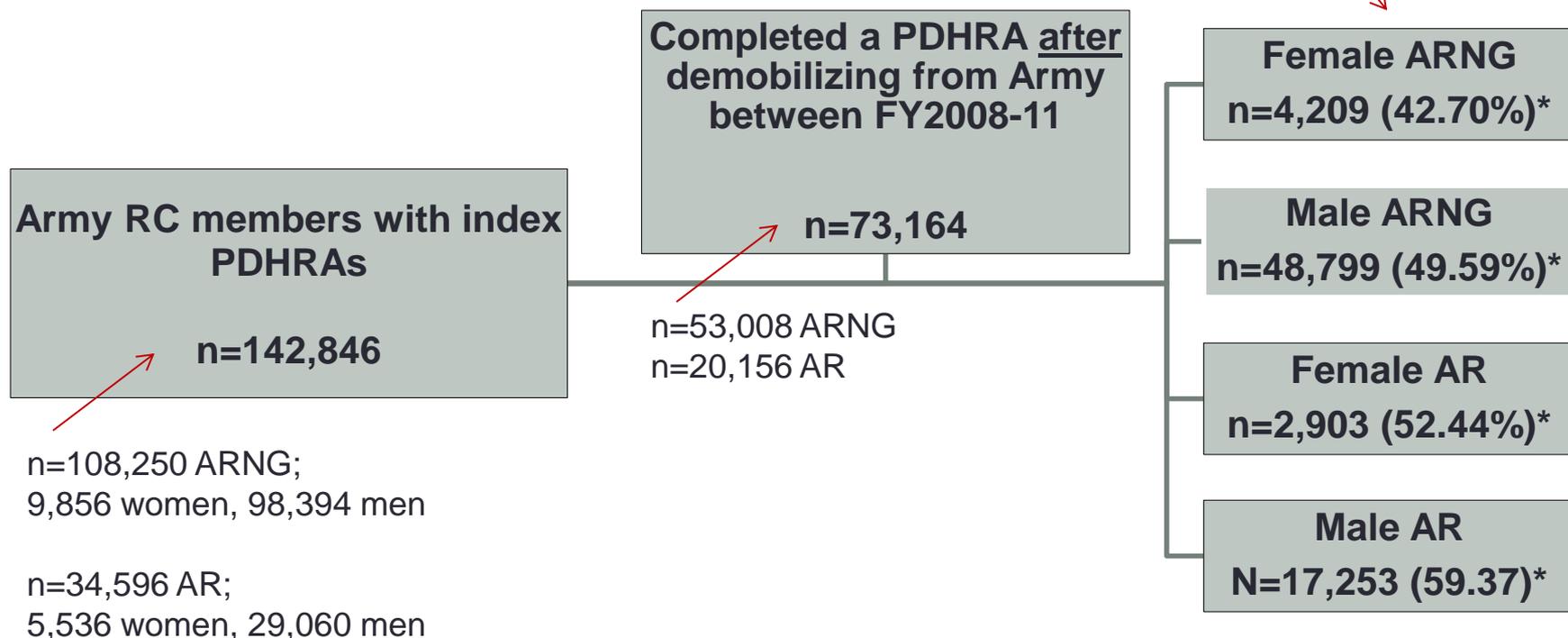
- Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) score of ≥ 5 positive
- Patient Health Questionnaire-2 (PHQ-2) score ≥ 3 positive
- Primary Care PTSD (PC-PTSD) score ≥ 3 positive

Sample

No notable differences between those included vs. excluded from our analysis.

Stratified by gender and Reserve Component

Did or did not link to VHA within 6 or 12 months



*of those with index PDHRAs

Regression Models

- Analyses stratified by:
 - Reserve Component, given previous research on linkage rates showing differences for ARNG and AR; and
 - Gender, given different nature of behavioral health issues for men and women
- Multivariate mixed effect regression models to predict linkage to VHA both 6 and 12 months after completing an index PDHRA
 - Fixed effect for individual
 - Random effect for VHA facility
- Controlled for demographic, deployment, demobilization, health, and healthcare characteristics included in previous work
- Focus today on key independent variables of interest unique to this analysis – screening scores for AUDIT-C, PHQ-2, and PC-PTSD

Descriptive Statistics: Outcome Variable

	Women linking 6 months after PDHRA	Men linking 6 months after PDHRA	Women linking 12 months after PDHRA	Men linking 12 months after PDHRA
ARNG	41%	38%	48%	44%
AR	29%	23%	37%	29%

- At both time points, women are more likely to link to VHA than men in both ARNG and AR
- For both men and women and at both time points, ARNG more likely to link to VHA than AR
- In previous work, found higher linkage rates for ARNG (57%) and AR (46%) 12 months after index demobilization date. In this analysis, different selection criteria – had to have completed PDHRA and different timing (demobilized→PDHRA→linked?).

Characteristics of ARNG

- N=53,008; 4,909 women and 48,799 men
- Mostly young, single, Non-Hispanic White, Junior Enlisted, living in South
- Some wounded, injured, assaulted, or hurt on last deployment (26% women; 24% men)
- Some previous VHA care
 - Pre-demobilization VHA services as enrollee in VHA system (13% women; 18% men)
 - Pre-demobilization VHA services as non-enrollee (9% women; 6% men)
 - Post-demobilization, pre-PDHRA services as non-enrollee (2% women; 1% men)
- Many have PRIME/TRS after index deployment (44% women; 39% men)
- Some conflict with spouse/family (21% women; 19% men)

Behavioral Health Scores

- Men considerably more likely to have positive AUDIT-C scores (15% women; 28% men)
- Women more likely to have positive PHQ-2 scores (10% women; 7% men)
- 8% of both men and women have positive PC-PTSD scores

Characteristics of AR

- N=20,156; 2,903 women and 17,253 men
- Mostly young, single, Non-Hispanic White, Junior Enlisted, living in South
- Some wounded, injured, assaulted, or hurt on last deployment (27% women; 24% men)
- Some previous VHA care
 - Pre-demobilization VHA services as enrollee in VHA system (16% women; 16% men)
 - Pre-demobilization VHA services as non-enrollee (16% women; 9% men)
 - Post-demobilization, pre-PDHRA services as non-enrollee (1% women; 1% men)
- Many have PRIME/TRS (51% women; 43% men)
- Some conflict with spouse/family (20% women; 17% men)

Behavioral Health Scores

- Men considerably more likely to have positive AUDIT-C scores (11% women; 23% men)
- Women more likely to have positive PHQ-2 scores (9% women; 7% men)
- Women slightly more likely to have positive PC-PTSD scores (9% women; 8% men)

Logistic regressions:
**Behavioral health scores
 & demographic
 characteristics**

Higher odds of linking:

- Men with any positive behavioral health score (except when AUDIT-C score 9-12, 6 months post-PDHRA)
- Women with positive PC-PTSD scores
- With positive PHQ-2 scores (except for ARNG women)
- With increasing age

Lower odds of linking:

- Married AR (except for women 12 months post-PDHRA)
- ARNG women who are Asian or Pacific Islander, 6 months post-PDHRA

	ARNG women 6 months post-PDHRA OR (CI)	ARNG men 6 months post-PDHRA OR (CI)	AR women 6 months post-PDHRA OR (CI)	AR men 6 months post-PDHRA OR (CI)
Key independent variables – behavioral health scores				
AUDIT-C score (AUDIT-C score = 1-4 as reference)				
AUDIT-C score = 0	.85 (.72, 1.01)	1.04 (.98, 1.09)	.95 (.77, 1.17)	.96 (.86, 1.07)
AUDIT-C score = 5-8	1.12 (.92, 1.37)	1.11 (1.06, 1.17)	1.20 (.91, 1.59)	1.14 (1.04, 1.26)
AUDIT-C score = 9-12	.98 (.57, 1.68)	1.15 (1.04, 1.27)	2.07 (.90, 4.78)	1.14 (.92, 1.40)
Positive PC-PTSD Screen (≥ 3)	1.62 (1.24, 2.11)	1.38 (1.27, 1.50)	1.41 (1.03, 1.93)	1.33 (1.16, 1.53)
Positive PHQ-2 (≥ 3)	1.14 (.89, 1.47)	1.34 (1.23, 1.46)	1.59 (1.16, 2.18)	1.46 (1.26, 1.70)
Demographic characteristics				
Age in years	1.01 (1.001, 1.02)	1.009 (1.006, 1.011)	1.01 (1.002, 1.03)	1.01 (1.001, 1.01)
Married	.87 (.75, 1.01)	1.006 (.96, 1.05)	.76 (.62, .92)	.88 (.80, .96)
Race/ethnicity (Non-Hispanic White as reference)				
Non-Hispanic African American	1.09 (.91, 1.31)	.996 (.93, 1.07)	1.12 (.90, 1.40)	.91 (.81, 1.03)
Hispanic	1.22 (.94, 1.58)	.98 (.89, 1.07)	1.13 (.85, 1.48)	1.01 (.89, 1.16)
Asian or Pacific Islander	.62 (.41, .92)	.97 (.85, 1.12)	.86 (.55, 1.33)	.85 (.70, 1.04)
American Indian/Alaska Native	1.21 (.68, 2.13)	1.004 (.81, 1.25)	.50 (.19, 1.30)	.86 (.56, 1.34)
Other	1.48 (.74, 2.94)	1.06 (.83, 1.35)	1.97 (.69, 5.64)	.86 (.49, 1.50)

Logistic regressions,
continued:

Health and healthcare characteristics

Higher odds of linking:

- AR men hospitalized since last deployment
- Wounded, injured, assaulted or hurt on last deployment
- Previous VHA use (except post-demobilization, pre-PDHRA use by AR)
- Conflict with spouse/family (except AR women 6 months post-PDHRA)

Lower odds of linking:

- ARNG men with PRIME/TRS, 12 months post-PDHRA
- AR with PRIME/TRS after index deployment (except women 6 months post-PDHRA)
- Longer gap between demobilization and index PDHRA dates
- Longer drive time to nearest VHA facility (except for women at 12 months post-PDHRA)

	ARNG women 6 months post-PDHRA OR (CI)	ARNG men 6 months post-PDHRA OR (CI)	AR women 6 months post-PDHRA OR (CI)	AR men 6 months post-PDHRA OR (CI)
Health and healthcare characteristics				
Hospitalized since last deployment	1.05 (.73, 1.51)	.99 (.87, 1.13)	.999 (.63, 1.59)	1.50 (1.21, 1.87)
Wounded, injured, assaulted, or hurt on last deployment	1.60 (1.37, 1.86)	1.78 (1.70, 1.87)	2.12 (1.76, 2.56)	1.75 (1.61, 1.90)
Received pre-demobilization^d VHA services as enrollee in VHA system	2.02 (1.61, 2.53)	1.94 (1.84, 2.06)	2.43 (1.91, 3.10)	2.29 (2.07, 2.53)
Received pre-demobilization VHA services as non-enrollee	1.37 (1.08, 1.73)	1.30 (1.19, 1.41)	1.48 (1.17, 1.87)	1.46 (1.29, 1.65)
PRIME/TRS after index deployment	.90 (.79, 1.04)	.97 (.93, 1.01)	.70 (.58, .84)	.92 (.85, 1.001)
Gap (in months) between demobilization date and index PDHRA date	.80 (.76, .84)	.85 (.84, .86)	.84 (.80, .88)	.85 (.83, .87)
Received post-demobilization, pre-PDHRA VHA services as non-enrollee	2.45 (1.43, 4.22)	1.86 (1.55, 2.23)	1.18 (.49, 2.86)	1.47 (.95, 2.28)
Conflict with spouse/family	1.28 (1.06, 1.53)	1.53 (1.45, 1.62)	1.21 (.96, 1.53)	1.55 (1.40, 1.72)
Drive time (in hours) to nearest VHA facility	.85 (.74, .96)	.94 (.90, .98)	.69 (.57, .84)	.90 (.83, .97)

Logistic regressions,
continued:

Deployment and demobilization characteristics

Higher odds of linking:

- ARNG women in FY2009-11 cohorts
- Most men in later cohorts (FY2009-11 ARNG and FY2009-10 AR)
- Women in Midwest (except AR 12 months post-PDHRA)
- AR men with probable serious injury, 12 months post-PDRHA

Lower odds of linking:

- Most higher ranks
- More deployments prior to index deployment (except AR women)
- ARNG men with probable serious injury during index deployment
- AR women with probable serious injury during index deployment, 6 months post-PDHRA
- All AR and ARNG men with repeat deployment in the post-index year

	ARNG women 6 months post- PDHRA	ARNG men 6 months post-PDHRA	AR women 6 months post-PDHRA	AR men 6 months post-PDHRA
	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Deployment and demobilization characteristics				
Rank (Junior enlisted as reference)				
Senior enlisted	.69 (.57, .82)	.83 (.78, .87)	.63 (.50, .81)	.83 (.74, .92)
Junior officer	.80 (.61, 1.05)	.69 (.63, .75)	.63 (.45, .89)	.63 (.54, .75)
Senior officer	.59 (.31, .999)	.72 (.62, .83)	.51 (.32, .81)	.72 (.60, .87)
Warrant officer	.47 (.22, 1.01)	.78 (.67, .91)	.38 (.17, .88)	.91 (.67, 1.22)
Number of deployments prior to index deployment	.83 (.71, .98)	.83 (.80, .87)	.91 (.77, 1.07)	.89 (.84, .95)
Probable serious injury during index deployment	.96 (.57, 1.61)	.78 (.67, .92)	.55 (.31, .96)	1.11 (.87, 1.41)
Cohort (2008 as reference)				
2009	1.42 (1.09, 1.86)	1.26 (1.17, 1.36)	1.21 (.91, 1.59)	1.31 (1.15, 1.48)
2010	1.34 (1.05, 1.71)	1.20 (1.12, 1.29)	1.20 (.92, 1.56)	1.25 (1.11, 1.41)
2011	1.27 (.96, 1.68)	1.14 (1.05, 1.24)	.95 (.72, 1.27)	1.08 (.95, 1.23)
Repeat deployment in the post-index year	.74 (.39, 1.41)	.51 (.42, .61)	.50 (.25, .99)	.36 (.26, .50)
Residence region at end of index deployment (West as reference)				
South	1.30 (.96, 1.76)	1.23 (1.008, 1.51)	1.18 (.87, 1.61)	1.08 (.89, 1.29)
Midwest	1.89 (1.36, 2.62)	1.23 (.99, 1.52)	1.45 (1.04, 2.02)	1.27 (1.05, 1.55)
Northeast	1.24 (.87, 1.78)	1.04 (.83, 1.32)	1.14 (.79, 1.65)	1.19 (.96, 1.46)
Length (in months) of index deployment	.99 (.96, 1.03)	1.01 (.998, 1.02)	1.03 (.99, 1.07)	1.01 (.99, 1.03)

Results Summary

- Women linked to VHA at a higher rate than men by both 6 and 12 months after the PDHRA.
- ARNG linked to VHA at a higher rate than AR for both men and women and by both 6 and 12 months after the PDHRA.
- Women with a positive PC-PTSD score in both ARNG and AR and women with a positive PHQ-2 score in ARNG had significantly higher odds of linking to VHA than women who did not screen positive.
- Men with positive behavioral health scores in all three areas (alcohol misuse, depression, and PTSD) in both ARNG and AR had significantly higher odds of linking to VHA than men who did not screen positive.

Implications

- Encouraging that RC with behavioral health issues tend to link at a higher rate than RC without behavioral health issues
- In particular, more outreach needs to be directed toward RC women with alcohol misuse and ARNG women with depression to encourage them to use the Veteran-specific behavioral health resources available at VHA.

PART II

Army Reservists' Post-deployment
Behavioral Health Screening Associated with
Reassessment and Treatment after Linkage to Veterans
Health Administration

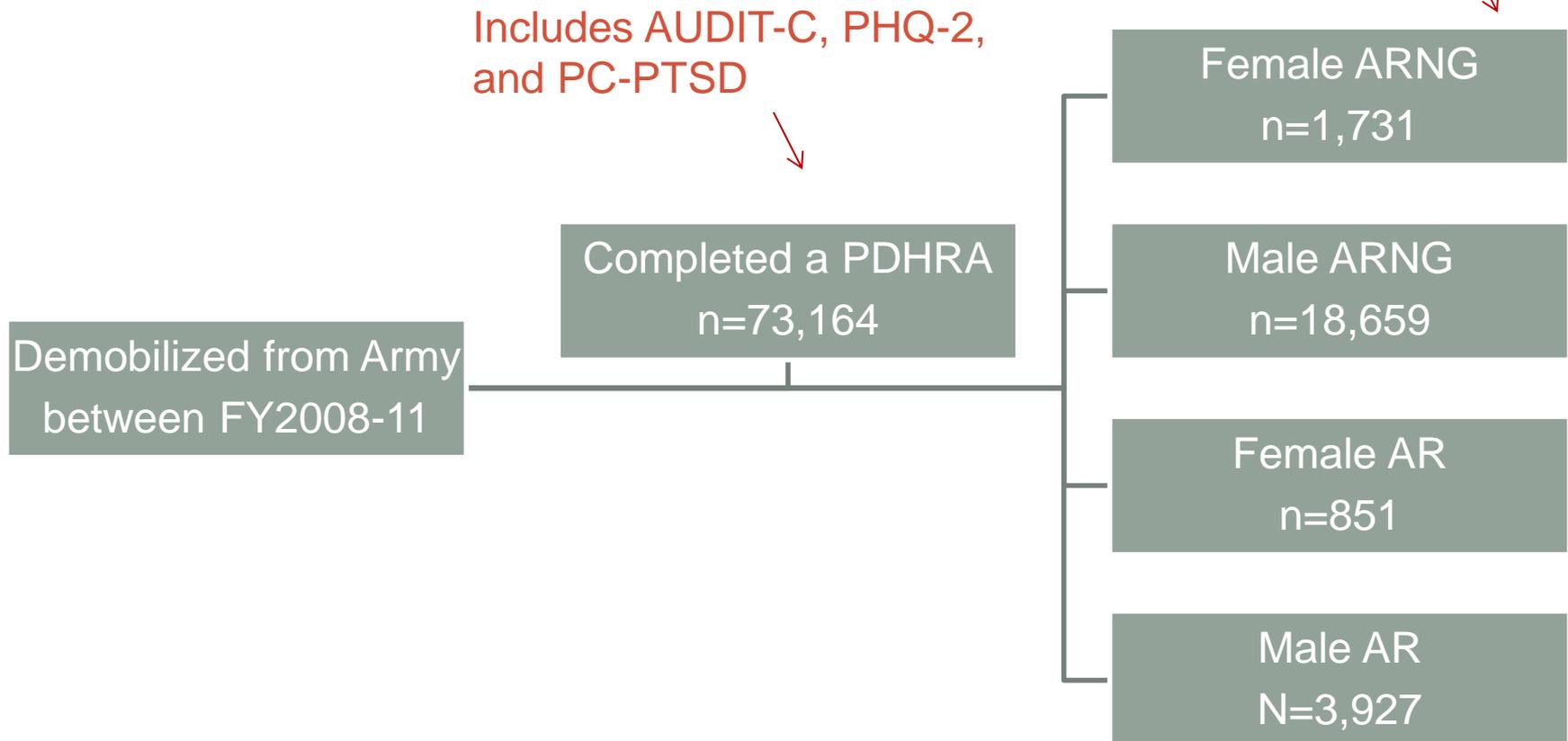
Research Questions

- Are there associations between mental health screen scores (AUDIT-C, PHQ-2, and PC-PTSD) from the PDHRA and reassessment within 6 months in VHA?
 - For Reservists, what is the stability/change in screening-reported symptoms after demobilizing from a recent deployment?
 - Implication related to the necessity of repeated annual (or more often) screening for service members/patients with recent deployments.
- At what rate do new VA enrollees with a recent deployment who screen positive get diagnosed and engaged in mental health treatment?

Samples

Stratified by gender and Reserve Component

25,168 (34%) of which linked to VHA within 6 months after PDHRA



Methods

- Analyses were stratified by component (ARNG and AR) and gender. Examined consistency between:
 - PDHRA and VHA AUD screening results, as well as subsequent AUD diagnosis, and initiation in AUD specialty care.
 - PHQ-2 scores in PDHRA and VHA, as well as subsequent depression diagnosis and psychosocial and medication treatment.
 - PC-PTSD scores in both PDHRA and VHA, as well as PTSD diagnosis and treatment.

Results: Percent Screening Disagreement

Screen negative on PDHRA and screen positive when reassessed within 6 months in VHA.

Screen positive on PDHRA and screen negative when reassessed within 6 months in VHA.

	VHA - ARNG Women	VHA - ARNG Men	VHA + ARNG Women	VHA + ARNG Men	VHA- AR Women	VHA- AR Men	VHA+ AR Women	VHA+ AR Men
AUDIT-C								
PDHRA -			3.97	7.74			3.43	7.31
PDHRA +	45.76	35.06			53.28	39.27		
PHQ-2								
PDHRA -			5.80	5.21			8.77	5.58
PDHRA +	44.86	41.90			46.28	50.11		
PC-PTSD								
PDRHA -			8.85	8.99			7.09	9.42
PDHRA +	33.85	25.00			32.20	27.81		

Alcohol Misuse and AUD in VHA

	ARNG Women	ARNG Men	AR Women	AR Men
Positive AUDIT-C in VHA	10.22	20.93	8.34	18.33

Of those who screened positive for AUD in VHA, the following percent:

Diagnosed with AUD	19.21	20.33	25.35	22.08
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Of those who screened positive for AUD and were diagnosed with AUD, the following percent received:

AUD specialty care	23.53	24.43	11.11	24.53
Received AUD medicine	8.82	2.64	0	4.40

Depression in VHA

	ARNG Women	ARNG Men	AR Women	AR Men
Positive PHQ-2 in VHA	10.34	8.77	12.93	8.99

Of those who screened positive for AUD in VHA, the following percent:

Diagnosed with depression	70.95	51.62	64.54	53.54
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Of those who screened positive for AUD and were diagnosed with AUD, the following percent received:

Depression specialty care	74.02	73.49	76.06	75.66
Received MDD first line medicine	68.50	64.73	67.61	69.31
Received MDD all-inclusive medicine	73.23	69.35	69.01	71.96

PTSD in VHA

	ARNG Women	ARNG Men	AR Women	AR Men
Positive PC-PTSD in VHA	14.10	14.41	13.98	15.68

Of those who screened positive for PTSD in VHA, the following percent:

Diagnosed with PTSD	43.44	50.17	47.06	54.54
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Of those who screened positive for PTSD and were diagnosed with PTSD, the following percent received:

PTSD specialty care	73.58	79.54	83.93	79.17
Received PTSD primary medicine	55.66	55.30	53.57	53.87
Received PTSD all-inclusive medicine	57.55	58.45	57.14	57.74

Summary

- Roughly 3-9% of people who screened negative for any of the three behavioral health problems on the PDHRA screened positive when reassessed within 6 months in VHA.
- Conversely, approximately 25-53% of people who screened positive for any of the three behavioral health problems on the PDHRA screened negative when reassessed within 6 months in VHA.
- Among patients who screened positive and were subsequently diagnosed in the VHA system, pharmacological and psychosocial treatment engagement was much higher for depression (65-76%) and PTSD (54-84%) compared to AUD (0-25%).
- Important differences based on gender and service component (ARNG vs. AR) were revealed in diagnosing patterns and engagement in treatment once diagnosed with AUD, depression, and PTSD.

Implications

- For service members who completed the PDHRA within our timeframe, and who linked to VHA within 6 months and were rescreened, we found evidence of apparently emerging and resolving problems.
 - Need to compare to other groups and assess the value of initially more/less frequent screening.
- Although the vast majority of new VHA patients who are diagnosed with depression and PTSD receive needed services, improving initiation of treatment for patients with AUD is critical, especially for women veterans of the Army Reserve.

Questions?

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EXTRA SLIDES

Scoring of AUDIT-C

[from http://www.dhcs.ca.gov/services/medi-cal/Documents/tool_auditc.pdf]

The AUDIT-C is scored on a scale of 0-12.

Each AUDIT-C question has 5 answer choices. Points allotted are:

a = 0 points, b = 1 point, c = 2 points, d = 3 points, e = 4 points

- **In men**, a score of 4 or more is considered positive, optimal for identifying hazardous drinking or active alcohol use disorders.
- **In women**, a score of 3 or more is considered positive (same as above).
- However, when the points are all from Question #1 alone (#2 & #3 are zero), it can be assumed that the patient is drinking below recommended limits and it is suggested that the provider review the patient's alcohol intake over the past few months to confirm accuracy.³
- Generally, the higher the score, the more likely it is that the patient's drinking is affecting his or her safety.

Scoring of PHQ-2

[from https://www.regalmed.com/pdfs/Depression_PHQ2.pdf]

A PHQ-2 score ranges from 0-6. The authors¹ identified a PHQ-2 cutoff score of 3 as the optimal cut point for screening purposes and stated that a cut point of 2 would enhance sensitivity, whereas a cut point of 4 would improve specificity.

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3

Scoring of PC-PTSD

[from <http://www.ptsd.va.gov/PTSD/professional/pages/assessments/assessment-pdf/pc-ptsd-screen.pdf>]

The PC-PTSD is a 4-item screen that was designed for use in primary care and other medical settings and is currently used to screen for PTSD in veterans at the VA. The screen includes an introductory sentence to cue respondents to traumatic events. The authors suggest that in most circumstances the results of the PC-PTSD should be considered "positive" if a patient answers "yes" to any 3 items. Those screening positive should then be assessed with a structured interview for PTSD. The screen does not include a list of potentially traumatic events.

Characteristics^a of ARNG

N=53,008;

4,209 women and 48,799 men

Our sample:

- Mostly young, single, Non-Hispanic White, Junior Enlisted, living in South
- Some wounded, injured, assaulted, or hurt on last deployment (26% women; 24% men)
- Little previous care at VHA
- Many have PRIME/TRS (44% women; 39% men)
- Some conflict with spouse/family (21% women; 19% men)
- Minority have positive AUDIT-C, PC-PTSD, or PHQ-2 scores

Some notable differences between men and women in:

- Marriage rate, race/ethnicity, AUDIT-C and PHQ-2 scores, # of times deployed

CATEGORICAL VARIABLES		WOMEN N (%)	MEN N (%)
Married		1,274 (30.27)	25,285 (51.81)
Race/ethnicity			
	Non-Hispanic White	2,679 (63.65)	38,632 (79.17)
	Non-Hispanic African American	896 (21.29)	5,017 (10.28)
	Hispanic	378 (8.98)	3,141 (6.44)
	Asian or Pacific Islander	156 (3.71)	1,255 (2.57)
	American Indian/Alaska Native	60 (1.43)	425 (0.87)
	Other	40 (0.95)	329 (0.67)
Rank			
	Junior enlisted	2,589 (61.51)	24,992 (51.21)
	Senior enlisted	1,192 (28.32)	18,431 (37.77)
	Junior officer	320 (7.60)	3,372 (6.91)
	Senior officer	69 (1.64)	1,065 (2.18)
	Warrant officer	39 (0.93)	939 (1.92)
Probable serious injury during index deployment ^b			
	Repeat deployment in the post-index year	70 (1.66)	824 (1.69)
	Hospitalized since last deployment	50 (1.19)	767 (1.57)
	Wounded, injured, assaulted, or hurt on last deployment	148 (3.52)	1,170 (2.40)
Cohort ^c			
	2008	409 (9.72)	6,375 (13.06)
	2009	949 (22.55)	12,128 (24.85)
	2010	2002 (47.56)	21,252 (43.55)
	2011	849 (20.17)	9,044 (18.53)
Received pre-demobilization ^d VHA services as enrollee in VHA system			
	Received pre-demobilization VHA services as non-enrollee	550 (13.07)	8,670 (17.77)
	PRIME/TRS after index deployment	373 (8.86)	3,059 (6.27)
Residence region at end of index deployment			
	South	1,865 (44.31)	18,808 (38.54)
	West	1,997 (47.45)	21,887 (44.85)
	Midwest	640 (15.21)	7,611 (15.60)
	Northeast	977 (23.21)	11,743 (24.06)
	Received post-demobilization, pre-PDHRA VHA services as non-enrollee	595 (14.14)	7,558 (15.49)
	Conflict with spouse/family	68 (1.62)	603 (1.24)
AUDIT-C score			
	AUDIT-C score = 0	873 (20.74)	9,130 (18.71)
	AUDIT-C score = 1-4	899 (21.36)	8,144 (16.69)
	AUDIT-C score = 5-8	2,686 (63.82)	27,010 (55.35)
	AUDIT-C score = 9-12	560 (13.30)	11,486 (23.54)
	Positive PC-PTSD Screen (≥ 3)	64 (1.52)	2,159 (4.42)
	Positive PHQ-2 (≥ 3)	336 (7.98)	3,680 (7.54)
CONTINUOUS VARIABLES			
	Age in years	403 (9.57)	3,368 (6.90)
	Length (in months) of index deployment	Mean (SD)	Mean (SD)
	Number of deployments prior to index deployment	27.36 (8.00)	29.87 (8.95)
	Gap (in months) between demobilization date and index PDHRA date	9.28 (2.31)	9.12 (2.28)
	Drive time (in hours) to nearest VHA facility	.24 (.49)	.44 (.63)
		3.10 (1.62)	3.10 (1.78)
		.52 (.57)	.56 (.58)

^aMeasured at month before index deployment unless indicated. ^bIndex refers to a deployment ending in FY2008-2011. ^cCohort refers to fiscal year of index deployment end date. ^dDemobilization refers to a demobilization ending in FY2008-12.

Characteristics^a of AR

(N=20,156;

2,903 women and 17,253 men)

Our sample:

- Mostly young, single, Non-Hispanic White, Junior Enlisted, living in South
- Some wounded, injured, assaulted, or hurt on last deployment (27% women; 24% men)
- Little previous care at VHA
- Many have PRIME/TRS (51% women; 43% men)
- Some conflict with spouse/family (20% women; 17% men)
- Minority have positive AUDIT-C, PC-PTSD, or PHQ-2 scores

Some notable differences between men and women in:

- Marriage rate, race/ethnicity, AUDIT-C, PC-PTSD, and PHQ-2 scores

CATEGORICAL VARIABLES		WOMEN N (%)	MEN N (%)
Married		990 (34.10)	8,998 (52.15)
Race/ethnicity			
	Non-Hispanic White	1,582 (54.50)	12,135 (70.34)
	Non-Hispanic African American	759 (26.15)	2,249 (13.04)
	Hispanic	381 (13.12)	1,832 (10.62)
	Asian or Pacific Islander	1.36 (4.68)	808 (4.68)
	American Indian/Alaska Native	28 (.96)	143 (.83)
	Other	17 (.59)	86 (.50)
Rank			
	Junior enlisted	1,310 (45.13)	7,184 (41.64)
	Senior enlisted	1,055 (36.34)	6,790 (39.36)
	Junior officer	286 (9.85)	1,499 (8.69)
	Senior officer	212 (7.30)	1,449 (8.40)
	Warrant officer	40 (1.38)	331 (1.92)
Probable serious injury during index deployment ^b		88 (3.03)	385 (2.23)
Repeat deployment in the post-index year		77 (2.65)	465 (2.70)
Hospitalized since last deployment		111 (3.82)	430 (2.49)
Wounded, injured, assaulted, or hurt on last deployment		794 (27.35)	4,217 (24.44)
Cohort ^c			
	2008	505 (17.40)	2,848 (16.51)
	2009	734 (25.28)	4,350 (25.21)
	2010	984 (33.90)	6,142 (35.60)
	2011	680 (23.42)	3,913 (22.68)
Received pre-demobilization ^d VHA services as enrollee in VHA system		468 (16.12)	2,691 (15.60)
Received pre-demobilization VHA services as non-enrollee		460 (15.85)	1,602 (9.29)
PRIME/TRS after index deployment		1,469 (50.60)	7,348 (42.59)
Residence region at end of index deployment			
	South	1,277 (43.99)	6,756 (39.16)
	West	462 (15.91)	2,739 (15.88)
	Midwest	658 (22.67)	4,355 (25.24)
	Northeast	506 (17.43)	3,403 (19.72)
Received post-demobilization, pre-PDHRA VHA services as non-enrollee		26 (.90)	101 (.59)
Conflict with spouse/family		566 (19.50)	2,956 (17.13)
AUDIT-C score			
	AUDIT-C score = 0	682 (23.49)	3,037 (17.60)
	AUDIT-C score = 1-4	1,892 (65.17)	10,173 (58.96)
	AUDIT-C score = 5-8	302 (10.40)	3,526 (20.44)
	AUDIT-C score = 9-12	27 (.93)	517 (3.00)
Positive PC-PTSD Screen (≥ 3)		269 (9.27)	1,350 (7.82)
Positive PHQ-2 (> 3)		268 (9.23)	1,174 (6.80)
CONTINUOUS VARIABLES			
Age in years		29.94 (9.46)	31.33 (9.61)
Length (in months) of index deployment		10.02 (2.48)	9.98 (2.46)
Number of deployments prior to index deployment		.37 (.62)	.53 (.72)
Gap (in months) between demobilization date and index PDHRA date		3.76 (2.18)	3.88 (2.16)
Drive time (in hours) to nearest VHA facility		.44 (.52)	.48 (.53)

^aMeasured at month before index deployment unless indicated. ^bIndex refers to a deployment ending in FY2008-2011. ^cCohort refers to fiscal year of index deployment end date. ^dDemobilization refers to a demobilization ending in FY2008-12.

Logistic regressions for ARNG

Behavioral health scores & demographic characteristics

Higher odds of linking:

- Men with any positive behavioral health score
- Women with positive PC-PTSD scores
- With increasing age

Lower odds of linking:

- 6 months post-PDHRA for women who are Asian or Pacific Islander

	Women 6 months post-PDHRA OR (CI)	Women 12 months post-PDHRA OR (CI)	Men 6 months post-PDHRA OR (CI)	Men 12 months post-PDHRA OR (CI)
Key independent variables – behavioral health scores				
AUDIT-C score (AUDIT-C score = 1-4 as reference)				
AUDIT-C score = 0	.85 (.72, 1.01)	.85 (.72, 1.002)	1.04 (.98, 1.09)	1.05 (.99, 1.10)
AUDIT-C score = 5-8	1.12 (.92, 1.37)	1.10 (.90, 1.34)	1.11 (1.06, 1.17)	1.12 (1.06, 1.17)
AUDIT-C score = 9-12	.98 (.57, 1.68)	1.07 (.62, 1.85)	1.15 (1.04, 1.27)	1.16 (1.05, 1.28)
Positive PC-PTSD Screen (≥ 3)	1.62 (1.24, 2.11)	1.69 (1.29, 2.22)	1.38 (1.27, 1.50)	1.40 (1.29, 1.53)
Positive PHQ-2 (≥ 3)	1.14 (.89, 1.47)	1.12 (.87, 1.43)	1.34 (1.23, 1.46)	1.41 (1.29, 1.54)
Demographic characteristics				
Age in years	1.01 (1.001, 1.02)	1.01 (1.001, 1.02)	1.009 (1.006, 1.011)	1.009 (1.006, 1.012)
Married	.87 (.75, 1.01)	.94 (.81, 1.09)	1.006 (.96, 1.05)	.98 (.94, 1.03)
Race/ethnicity (Non-Hispanic White as reference)				
Non-Hispanic African American	1.09 (.91, 1.31)	1.13 (.94, 1.35)	.996 (.93, 1.07)	1.03 (.97, 1.10)
Hispanic	1.22 (.94, 1.58)	1.23 (.96, 1.58)	.98 (.89, 1.07)	.95 (.87, 1.04)
Asian or Pacific Islander	.62 (.41, .92)	.85 (.59, 1.24)	.97 (.85, 1.12)	.98 (.86, 1.12)
American Indian/Alaska Native	1.21 (.68, 2.13)	1.10 (.63, 1.92)	1.004 (.81, 1.25)	.97 (.79, 1.20)
Other	1.48 (.74, 2.94)	1.70 (.59, 2.30)	1.06 (.83, 1.35)	1.09 (.86, 1.38)

Logistic regressions for ARNG, cont'd

Health and healthcare characteristics

Higher odds of linking:

- Wounded, injured, assaulted or hurt on last deployment
- Previous VHA use
- Conflict with spouse/family

Lower odds of linking:

- Men with PRIME/TRS after index deployment, 12 months post-PDHRA
- Longer gap between demobilization and index PDHRA dates
- Longer drive time (except not statistically significant for women at 12 months post-PDHRA)

	Women 6 months post-PDHRA	Women 12 months post-PDHRA	Men 6 months post-PDHRA	Men 12 months post-PDHRA
	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Health and healthcare characteristics				
Hospitalized since last deployment	1.05 (.73, 1.51)	1.22 (.85, 1.74)	.99 (.87, 1.13)	1.07 (.94, 1.21)
Wounded, injured, assaulted, or hurt on last deployment	1.60 (1.37, 1.86)	1.60 (1.37, 1.87)	1.78 (1.70, 1.87)	1.79 (1.71, 1.88)
Received pre-demobilization ^d VHA services as enrollee in VHA system	2.02 (1.61, 2.53)	2.15 (1.71, 2.69)	1.94 (1.84, 2.06)	2.23 (2.11, 2.36)
Received pre-demobilization VHA services as non-enrollee	1.37 (1.08, 1.73)	1.37 (1.08, 1.74)	1.30 (1.19, 1.41)	1.40 (1.28, 1.52)
PRIME/TRS after index deployment	.90 (.79, 1.04)	.94 (.82, 1.07)	.97 (.93, 1.01)	.96 (.92, .998)
Gap (in months) between demobilization date and index PDHRA date	.80 (.76, .84)	.82 (.79, .86)	.85 (.84, .86)	.87 (.86, .88)
Received post-demobilization, pre-PDHRA VHA services as non-enrollee	2.45 (1.43, 4.22)	1.90 (1.10, 3.28)	1.86 (1.55, 2.23)	2.06 (1.71, 2.48)
Conflict with spouse/family	1.28 (1.06, 1.53)	1.36 (1.14, 1.63)	1.53 (1.45, 1.62)	1.53 (1.45, 1.62)
Drive time (in hours) to nearest VHA facility	.85 (.74, .96)	.91 (.80, 1.03)	.94 (.90, .98)	.96 (.92, .997)

Logistic regressions for ARNG, cont'd

Deployment and demobilization characteristics

Higher odds of linking:

- 2009-11 cohorts
- Women in Midwest

Lower odds of linking:

- Most higher ranks
- More deployments prior to index deployment
- Men with probable serious injury during index deployment
- Men with repeat deployment in the post-index year

	Women 6 months post-PDHRA OR (CI)	Women 12 months post-PDHRA OR (CI)	Men 6 months post-PDHRA OR (CI)	Men 12 months post-PDHRA OR (CI)
Deployment and demobilization characteristics				
Rank (Junior enlisted as reference)				
Senior enlisted	.69 (.57, .82)	.68 (.56, .81)	.83 (.78, .87)	.77 (.73, .81)
Junior officer	.80 (.61, 1.05)	.70 (.53, .90)	.69 (.63, .75)	.60 (.56, .66)
Senior officer	.59 (.31, .999)	.58 (.33, 1.02)	.72 (.62, .83)	.62 (.53, .72)
Warrant officer	.47 (.22, 1.01)	.37 (.18, .78)	.78 (.67, .91)	.74 (.64, .86)
Number of deployments prior to index deployment	.83 (.71, .98)	.81 (.69, .95)	.83 (.80, .87)	.86 (.82, .89)
Probable serious injury during index deployment	.96 (.57, 1.61)	.95 (.57, 1.59)	.78 (.67, .92)	.83 (.71, .97)
Cohort (2008 as reference)				
2009	1.42 (1.09, 1.86)	1.43 (1.11, 1.86)	1.26 (1.17, 1.36)	1.24 (1.16, 1.34)
2010	1.34 (1.05, 1.71)	1.37 (1.08, 1.73)	1.20 (1.12, 1.29)	1.18 (1.11, 1.26)
2011	1.27 (.96, 1.68)	1.37 (1.05, 1.80)	1.14 (1.05, 1.24)	1.15 (1.07, 1.25)
Repeat deployment in the post-index year	.74 (.39, 1.41)	.80 (.43, 1.46)	.51 (.42, .61)	.48 (.41, .57)
Residence region at end of index deployment (West as reference)				
South	1.30 (.96, 1.76)	1.12 (.84, 1.49)	1.23 (1.008, 1.51)	1.15 (.95, 1.40)
Midwest	1.89 (1.36, 2.62)	1.58 (1.16, 2.17)	1.23 (.99, 1.52)	1.14 (.93, 1.40)
Northeast	1.24 (.87, 1.78)	1.18 (.84, 1.67)	1.04 (.83, 1.32)	1.02 (.82, 1.28)
Length (in months) of index deployment	.99 (.96, 1.03)	.99 (.96, 1.02)	1.01 (.998, 1.02)	1.018 (1.008, 1.028)

Logistic regressions for AR

Behavioral health scores & demographic characteristics

Higher odds of linking:

- Men with any positive behavioral health score (except not stat. sig. for AUDIT-C score 9-12, 6 months post-PDHRA)
- Women with positive PC-PTSD and PHQ-2 scores
- With increasing age

Lower odds of linking:

- Married individuals (except women 12 months post-PDHRA)

	Women 6 months post- PDHRA OR (CI)	Women 12 months post-PDHRA OR (CI)	Men 6 months post-PDHRA OR (CI)	Men 12 months post-PDHRA OR (CI)
Key independent variables – behavioral health scores				
AUDIT-C score (AUDIT-C score = 1-4 as reference)				
AUDIT-C score = 0	.95 (.77, 1.17)	.92 (.75, 1.12)	.96 (.86, 1.07)	.99 (.90, 1.09)
AUDIT-C score = 5-8	1.20 (.91, 1.59)	1.07 (.82, 1.40)	1.14 (1.04, 1.26)	1.16 (1.06, 1.27)
AUDIT-C score = 9-12	2.07 (.90, 4.78)	1.64 (.71, 3.79)	1.14 (.92, 1.40)	1.34 (1.10, 1.63)
Positive PC-PTSD Screen (≥ 3)	1.41 (1.03, 1.93)	1.58 (1.16, 2.14)	1.33 (1.16, 1.53)	1.47 (1.29, 1.69)
Positive PHQ-2 (≥ 3)	1.59 (1.16, 2.18)	1.47 (1.08, 2.00)	1.46 (1.26, 1.70)	1.51 (1.31, 1.74)
Demographic characteristics				
Age in years	1.01 (1.002, 1.03)	1.02 (1.005, 1.03)	1.01 (1.001, 1.01)	1.01 (1.00, 1.01)
Married	.76 (.62, .92)	.85 (.71, 1.02)	.88 (.80, .96)	.86 (.80, .93)
Race/ethnicity (Non-Hispanic White as reference)				
Non-Hispanic African American	1.12 (.90, 1.40)	1.15 (.93, 1.42)	.91 (.81, 1.03)	.996 (.89, 1.11)
Hispanic	1.13 (.85, 1.48)	1.05 (.81, 1.37)	1.01 (.89, 1.16)	1.03 (.91, 1.17)
Asian or Pacific Islander	.86 (.55, 1.33)	1.01 (.68, 1.51)	.85 (.70, 1.04)	.85 (.70, 1.03)
American Indian/Alaska Native	.50 (.19, 1.30)	.53 (.22, 1.27)	.86 (.56, 1.34)	.96 (.65, 1.43)
Other	1.97 (.69, 5.64)	1.25 (.44, 3.58)	.86 (.49, 1.50)	.84 (.49, 1.41)

Logistic regressions for AR, cont'd

Health and healthcare characteristics

Higher odds of linking:

- Men hospitalized since last deployment
- Wounded, injured assaulted, or hurt on last deployment
- Pre-demobilization VHA use
- Conflict with spouse/family (except women 6 months post-PDHRA)

Lower odds of linking:

- PRIME/TRS after index deployment (except men 6 months post-PDHRA)
- Longer gap between demobilization and index PDHRA date
- Longer drive time to nearest VHA facility

	Women 6 months post-PDHRA	Women 12 months post-PDHRA	Men 6 months post-PDHRA	Men 12 months post-PDHRA
	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Health and healthcare characteristics				
Hospitalized since last deployment	.999 (.63, 1.59)	1.07 (.70, 1.66)	1.50 (1.21, 1.87)	1.29 (1.04, 1.60)
Wounded, injured, assaulted, or hurt on last deployment	2.12 (1.76, 2.56)	1.75 (1.46, 2.10)	1.75 (1.61, 1.90)	1.80 (1.67, 1.95)
Received pre-demobilization ^d VHA services as enrollee in VHA system	2.43 (1.91, 3.10)	2.69 (2.12, 3.41)	2.29 (2.07, 2.53)	2.73 (2.48, 3.01)
Received pre-demobilization VHA services as non-enrollee	1.48 (1.17, 1.87)	1.56 (1.25, 1.95)	1.46 (1.29, 1.65)	1.51 (1.35, 1.70)
PRIME/TRS after index deployment	.70 (.58, .84)	.71 (.60, .84)	.92 (.85, 1.001)	.91 (.84, .99)
Gap (in months) between demobilization date and index PDHRA date	.84 (.80, .88)	.87 (.83, .91)	.85 (.83, .87)	.87 (.85, .89)
Received post-demobilization, pre-PDHRA VHA services as non-enrollee	1.18 (.49, 2.86)	1.31 (.55, 3.09)	1.47 (.95, 2.28)	1.51 (.98, 2.31)
Conflict with spouse/family	1.21 (.96, 1.53)	1.30 (1.04, 1.62)	1.55 (1.40, 1.72)	1.45 (1.31, 1.60)
Drive time (in hours) to nearest VHA facility	.69 (.57, .84)	.76 (.64, .91)	.90 (.83, .97)	.92 (.85, .99)

Logistic regressions for AR, Cont'd

Deployment and demobilization characteristics

Higher odds of linking:

- Men in 2009-10 cohorts
- Women in Midwest
- Men with probable serious injury during index deployment, 12 months post-PDHRA

Lower odds of linking:

- Most higher ranks
- Men with more deployments prior to index deployment
- Women with probable serious injury during index deployment, 6 months post-PDHRA
- Repeat deployment in the post-index year

	Women 6 months post- PDHRA	Women 12 months post-PDHRA	Men 6 months post-PDHRA	Men 12 months post-PDHRA
	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Deployment and demobilization characteristics				
Rank (Junior enlisted as reference)				
Senior enlisted	.63 (.50, .81)	.62 (.49, .77)	.83 (.74, .92)	.75 (.68, .82)
Junior officer	.63 (.45, .89)	.60 (.44, .83)	.63 (.54, .75)	.53 (.46, .62)
Senior officer	.51 (.32, .81)	.46 (.29, .70)	.72 (.60, .87)	.61 (.52, .73)
Warrant officer	.38 (.17, .88)	.40 (.18, .86)	.91 (.67, 1.22)	.82 (.62, 1.08)
Number of deployments prior to index deployment	.91 (.77, 1.07)	.89 (.76, 1.04)	.89 (.84, .95)	.91 (.85, .96)
Probable serious injury during index deployment	.55 (.31, .96)	.67 (.40, 1.13)	1.11 (.87, 1.41)	1.26 (1.004, 1.59)
Cohort (2008 as reference)				
2009	1.21 (.91, 1.59)	1.19 (.92, 1.54)	1.31 (1.15, 1.48)	1.29 (1.15, 1.45)
2010	1.20 (.92, 1.56)	1.20 (.94, 1.54)	1.25 (1.11, 1.41)	1.17 (1.05, 1.31)
2011	.95 (.72, 1.27)	.99 (.75, 1.29)	1.08 (.95, 1.23)	1.06 (.94, 1.19)
Repeat deployment in the post-index year	.50 (.25, .99)	.45 (.24, .84)	.36 (.26, .50)	.42 (.32, .55)
Residence region at end of index deployment (West as reference)				
South	1.18 (.87, 1.61)	.96 (.71, 1.28)	1.08 (.89, 1.29)	1.01 (.85, 1.20)
Midwest	1.45 (1.04, 2.02)	1.15 (.84, 1.58)	1.27 (1.05, 1.55)	1.20 (1.005, 1.44)
Northeast	1.14 (.79, 1.65)	1.02 (.72, 1.45)	1.19 (.96, 1.46)	1.19 (.98, 1.45)
Length (in months) of index deployment	1.03 (.99, 1.07)	1.04 (1.002, 1.08)	1.01 (.99, 1.03)	1.01 (.99, 1.03)

Medications

AUD	Major depressive disorder		PTSD	
Disulfiram Naltrexone oral Extended-release Naltrexone injection (Vivitrol) Acamprosate Topiramate	First line: Citalopram Escitalopram Fluoxetine Paroxetine Sertraline Duloxetine Venlafaxine Bupropion Mirtazapine	All-inclusive: Citalopram Escitalopram Fluoxetine Paroxetine Sertraline Duloxetine Venlafaxine Bupropion Mirtazapine Amitriptyline Doxepin Imipramine Trimipramine Desipramine Nortriptyline Protriptyline Amoxapine Maprotiline Isocarboxazid Phenelzine Selegiline Tranylcypromine Trazodone Nefazodone Desvenlafaxine	Primary: Fluoxetine Paroxetine Sertraline Fluvoxamine Citalopram Escitalopram Venlafaxine Mirtazapine Nefazodone Imipramine Amitriptyline Desipramine Nortriptyline Protriptyline Clomipramine Phenelzine Tranylcypromine	All-inclusive (add the following to list of primary med): Prazosin Duloxetine