

Associations between Repeated Deployments to Iraq (OIF/OND) and Afghanistan (OEF) and Post-deployment Illnesses and Injuries, Active Component, U.S. Armed Forces, 2003-2010

Part II. Mental Disorders, by Gender, Age Group, Military Occupation, and “Dwell Times” Prior to Repeat (Second through Fifth) Deployments

Since 2001, 1,347,731 active component U.S. military members deployed in support of operations in Afghanistan and Iraq. This report documents the percentages of deployers who were diagnosed with selected mental disorders in relation to the number (first through fifth) and lengths of “dwell times” prior to such deployments. In general, larger percentages of deployers were diagnosed with PTSD and anxiety-related disorders after second/third than first deployments. After first and repeat deployments, relatively more medical than other occupational group members were diagnosed with PTSD. In general, larger percentages of deployers were diagnosed with alcohol/drug disorders and psychosocial problems after first than repeat deployments; and among deployers younger than 25 years, in combat-specific occupations, and females, every disorder (except PTSD and anxiety-related) affected larger percentages after first than repeat deployments. For most disorders, the longer the “dwell times” prior to deployments, the larger the percentages diagnosed with the conditions after the deployments. The findings should be interpreted with consideration of limitations of the analysis.

Since October 2001, the U.S. military has conducted combat operations in Afghanistan (Operation Enduring Freedom [OEF]) and Iraq (Operations Iraqi Freedom/New Dawn [OIF/OND]). During that time, many U.S. military members have deployed to OEF/OIF/OND multiple times; such a high operational tempo over such a long period is unprecedented for the U.S. military.

Military and political leaders, medical researchers and policy makers, health care providers, family members of deployment veterans, and many others have expressed concerns that increasing numbers of combat deployments and shorter “dwell times” between deployments may increase the rates, severities, and medical and social impacts of mental disorders.¹ Some studies of deployment veterans have documented higher rates of post-traumatic stress disorder (PTSD), depression, and other psychological problems (e.g., anxiety, acute stress) among repeat compared to first time deployers.^{2,3} Other studies have found little evidence of causal relationships between

repeat deployments and mental health effects (e.g., suicide).^{1,4} Interpretations of such findings should consider that service members who have clinically significant adverse psychological effects due to deployment experiences are less likely than their counterparts to deploy again; as a result, repeat deployers may be more psychologically “resilient” than their never or less frequently deployed counterparts.

In the first of this series of reports regarding associations between repeat deployments and illnesses and injuries in general, “adjustment reactions” (including post-traumatic stress disorder) and “anxiety-related disorders” were among the conditions much more frequently diagnosed among males after second and third compared to first combat deployments. Among females, no mental disorders were among the conditions much more frequently diagnosed after repeated compared to first deployments.⁵

This report documents the proportions of deployers who received diagnoses of selected mental disorders within one

year after returning from first through fifth OEF/OIF/OND deployments. The report summarizes the experiences of male and female deployers in relation to their ages, military occupations, and “dwell times” before repeat deployments (i.e., days from the end of prior to subsequent OEF/OIF/OND deployments).

METHODS

The surveillance period was 1 October 2001 to 31 December 2010. The surveillance population included all individuals who served in the active component of the U.S. Armed Forces and returned from an OEF/OIF/OND deployment anytime during the surveillance period.

Endpoints of analyses were mental disorders and psychosocial problems (as defined by numeric and “V” and “E” codes of the International Classification of Diseases, 9th Revision, Clinical Modifications [ICD-9-CM]) that were reported during hospitalizations and ambulatory visits in U.S. military and civilian (reimbursed care) medical treatment facilities within one year after service members’ first through fifth OEF/OIF/OND deployments. ICD-9-CM codes considered indicators of endpoints of analyses were: adjustment reaction: ICD-9-CM 309.0-.2; 309.21-.29; 309.3-.8; 309.8x (except 309.81 post-traumatic stress disorder [PTSD]); 309.9; post-traumatic stress disorder (PTSD): ICD-9-CM 309.81; alcohol, drug dependence/abuse (“alcohol/drug disorders”): ICD-9-CM 303.xx, 304.xx, 305.xx (except 305.1 tobacco use disorder); anxiety, phobic, obsessive-compulsive disorders (“anxiety-related disorders”): ICD-9-CM 300.0, 300.00-300.09; 300.2, 300.20-300.29; 300.3, 300.30-300.39; major depressive, episodic mood, dysthymic disorders (“depressive disorders”): ICD-9-CM 296.2, 296.20-.25, 296.3, 296.30-.35, 296.5,

296.50-.55, 296.9, 300.4, 311, 311.0; suicidal ideation/self-inflicted injury: ICD-9-CM v62.84, E950.0-E959.9; and counseling for mental, behavioral, psychosocial problems (“psychosocial problems”): ICD-9-CM v40, v40.2, .3, .9; v62, v62.0-.9 (except v62.6); v62.21, .22, .29; v62.81, .82, .89; 995.80-.85.

Indicator diagnoses were ascertained from the first two diagnoses reported on records of hospitalizations and ambulatory visits during relevant post-deployment periods. Regardless of the number of mental disorder-related encounters during each post-deployment period, each deployer was counted as a case of each disorder only once per post-deployment period.

Each post-deployment period was characterized by the number of OEF/OIF/OND deployments of each deployer, i.e., post-deployment periods 1 through 5 were defined as 0-12 months following the first through fifth OEF/OIF/OND deployments, respectively, of each deployer. Each post-deployment period was also characterized by the gender, age group, and military occupational group of each deployer and the “dwell time” prior to each repeat deployment. Dwell times were categorized by the number of days from the end of the preceding to the start of each second through fifth deployment. If “dwell times” between consecutive deployments were less than 30 days, the deployments were considered single deployments for analysis purposes.

The primary summary measure used for analyses was the “percent affected”; the percent affected was the number of service members in each post-deployment cohort who received a case-defining mental disorder diagnosis within one year after returning from a first through fifth OEF/OIF/OND deployment times 100 divided by the number of service members in the respective post-deployment cohort.

RESULTS

During the surveillance period, 1,190,354 male and 154,314 female active component members deployed at least once in support of OEF/OIF/OND. Of deployers overall, 42.2 percent, 12.9 percent, 3.7 percent, and 1.3 percent of males and 31.0 percent,

7.3 percent, 1.6 percent, and 0.5 percent of females deployed two to five times, respectively (**Table 1**).

GENDER

Among males, no mental disorders consistently increased in the percentages affected by them with each additional OEF/OIF/OND deployment. Larger percentages of males were diagnosed with PTSD after second through fourth deployments, and with adjustment reactions, anxiety-related disorders, and depressive disorders after second and third deployments, than after first deployments. Smaller percentages of males were diagnosed with alcohol/drug disorders, psychosocial problems, and suicide ideation/self-inflicted injuries after all repeat (second through fifth) than first deployments (**Table 1**).

As among males, among females, no mental disorders consistently increased in the percentages affected by them with each additional deployment; also as among males, relatively more females were diagnosed with PTSD after second through fourth than first deployments. In contrast to males, the percentages of females diagnosed with depressive disorders, alcohol/drug disorders, and suicide ideation/self-inflicted injuries consistently declined from first through fifth deployments; and the percentages diagnosed with adjustment reactions, anxiety-related disorders, and psychosocial problems declined fairly steadily (but not monotonically) from first through fifth deployments (**Table 1**).

AGE GROUP

Among deployers younger than 25 years, the percentages affected by all mental disorders of interest (except PTSD and anxiety-related) were larger after first than any repeat (second through fifth) deployments. Among these relatively young deployers, larger percentages were diagnosed with PTSD after second and third, and with anxiety-related disorders after second, than first deployments (**Table 1**).

Among deployers 25 to 29 years old, larger percentages were diagnosed with PTSD after second through fourth, and with adjustment reactions, anxiety-related

disorders, depressive disorders, and suicide ideation/self-inflicted injuries after second and third, than first deployments. Larger percentages of 25-29 year old deployers were diagnosed with alcohol/drug disorders and psychosocial problems after first than any repeat deployments (**Table 1**).

Among deployers 30 years and older, larger percentages were diagnosed with PTSD, adjustment reactions, anxiety-related disorders, and suicide ideation/self-inflicted injuries after second through fourth, with depressive disorders after second and third, and with alcohol/drug disorders after third, than first deployments. Of all conditions, only psychosocial problems were reported relatively more frequently after first than any repeat deployments (**Table 1**).

MILITARY OCCUPATION

Among deployers in combat-specific occupations (e.g., infantry, armor, artillery), larger percentages were diagnosed with PTSD and anxiety-related disorders after second and third than first deployments; for all other conditions, larger percentages were affected after first than any repeat deployments (**Table 1**).

Among deployers in health care occupations, larger percentages were diagnosed with PTSD after second through fourth, with anxiety-related disorders after second and third, and with adjustment reactions and depressive disorders after third, than first deployments. Relatively more medical workers were diagnosed with alcohol/drug disorders, psychosocial problems, and suicide ideation/self-inflicted injuries after first than any repeat deployments (**Table 1**).

Among deployers in non-combat-specific and non-medical (“other”) military occupations, larger percentages were diagnosed with PTSD after second through fifth, with anxiety-related disorders after second through fourth, with adjustment reactions after second and third, and with depressive disorders after third, than first deployments. Deployers in “other” occupations were relatively more frequently diagnosed with alcohol/drug disorders, psychosocial problems, and suicide ideation/self-inflicted injuries after first than any repeat deployments (**Table 1**).

TABLE 1. Number and percentage of deployers diagnosed with selected mental conditions within one year after first through fifth OEF, OIF, OND deployments, by gender and age of deployers, active component, U.S. Armed Forces, 2003-2010

			Adjustment reaction			Post-traumatic stress disorder (PTSD)			Alcohol/drug dependence/abuse		
Deployment number	No. of deployers	No. with diagnosis	% with diagnosis	% affected relative to after first deployment	No. with diagnosis	% with diagnosis	% affected relative to after first deployment	No. with diagnosis	% with diagnosis	% affected relative to after first deployment	
Gender											
Female	First	154,314	10,610	6.88	Ref	2,585	1.68	Ref	2,752	1.78	Ref
	Second	47,832	2,935	6.14	0.89	901	1.88	1.12	624	1.30	0.73
	Third	11,215	699	6.23	0.91	246	2.19	1.31	101	0.90	0.50
	Fourth	2,489	144	5.79	0.84	47	1.89	1.13	17	0.68	0.38
	Fifth	720	23	3.19	0.46	10	1.39	0.83	2	0.28	0.16
Male	First	1,190,354	48,145	4.04	Ref	18,517	1.56	Ref	38,505	3.23	Ref
	Second	502,510	20,618	4.10	1.01	12,060	2.40	1.54	11,805	2.35	0.73
	Third	153,892	6,591	4.28	1.06	4,146	2.69	1.73	2,858	1.86	0.57
	Fourth	44,410	1,439	3.24	0.80	834	1.88	1.21	608	1.37	0.42
	Fifth	15,966	346	2.17	0.54	153	0.96	0.62	167	1.05	0.32
Age group											
<25	First	731,292	37,029	5.06	Ref	13,173	1.80	Ref	32,145	4.40	Ref
	Second	221,623	9,715	4.38	0.87	5,811	2.62	1.46	7,766	3.50	0.80
	Third	41,166	1,664	4.04	0.80	1,099	2.67	1.48	1,184	2.88	0.65
	Fourth	7,742	233	3.01	0.59	128	1.65	0.92	185	2.39	0.54
	Fifth	2,363	44	1.86	0.37	15	0.63	0.35	51	2.16	0.49
25-29	First	260,541	10,884	4.18	Ref	3,813	1.46	Ref	5,744	2.20	Ref
	Second	141,210	6,591	4.67	1.12	3,450	2.44	1.67	2,901	2.05	0.93
	Third	50,493	2,547	5.04	1.21	1,511	2.99	2.04	1,033	2.05	0.93
	Fourth	14,928	564	3.78	0.90	310	2.08	1.42	226	1.51	0.69
	Fifth	5,163	119	2.30	0.55	47	0.91	0.62	58	1.12	0.51
30+	First	352,835	10,842	3.07	Ref	4,116	1.17	Ref	3,368	0.95	Ref
	Second	187,509	7,247	3.86	1.26	3,700	1.97	1.69	1,762	0.94	0.98
	Third	73,448	3,079	4.19	1.36	1,782	2.43	2.08	742	1.01	1.06
	Fourth	24,229	786	3.24	1.06	443	1.83	1.57	214	0.88	0.93
	Fifth	9,160	206	2.25	0.73	101	1.10	0.95	60	0.66	0.69
Military occupation											
Combat	First	353,391	15,832	4.48	Ref	7,696	2.18	Ref	13,514	3.82	Ref
	Second	162,982	6,885	4.22	0.94	5,058	3.10	1.43	4,356	2.67	0.70
	Third	53,238	2,028	3.81	0.85	1,524	2.86	1.31	1,010	1.90	0.50
	Fourth	17,650	446	2.53	0.56	311	1.76	0.81	215	1.22	0.32
	Fifth	7,397	101	1.37	0.30	49	0.66	0.30	63	0.85	0.22
Health care	First	79,162	5,374	6.79	Ref	2,534	3.20	Ref	1,837	2.32	Ref
	Second	24,034	1,632	6.79	1.00	1,216	5.06	1.58	523	2.18	0.94
	Third	5,571	416	7.47	1.10	356	6.39	2.00	94	1.69	0.73
	Fourth	1,186	59	4.97	0.73	53	4.47	1.40	17	1.43	0.62
	Fifth	359	7	1.95	0.29	5	1.39	0.44	2	0.56	0.24
Other	First	912,115	37,549	4.12	Ref	10,872	1.19	Ref	25,906	2.84	Ref
	Second	363,326	15,036	4.14	1.01	6,687	1.84	1.54	7,550	2.08	0.73
	Third	106,298	4,846	4.56	1.11	2,512	2.36	1.98	1,855	1.75	0.61
	Fourth	28,063	1,078	3.84	0.93	517	1.84	1.55	393	1.40	0.49
	Fifth	8,930	261	2.92	0.71	109	1.22	1.02	104	1.16	0.41

TABLE 1. Number and percentage of deployers diagnosed with selected mental conditions within one year after first through fifth OEF, OIF, OND deployments, by gender and age of deployers, active component, U.S. Armed Forces, 2003-2010

Anxiety-related disorder			Depressive disorder			Psychosocial problems			Suicide ideation, self-inflicted injury		
No. with diagnosis	% with diagnosis	% affected relative to after first deployment	No. with diagnosis	% with diagnosis	% affected relative to after first deployment	Number with No.	% with diagnosis	% affected relative to after first deployment	No. with diagnosis	% with diagnosis	% affected relative to after first deployment
5,591	3.62	Ref	10,600	6.87	Ref	7,339	4.76	Ref	637	0.41	Ref
1,657	3.46	0.96	3,057	6.39	0.93	1,905	3.98	0.84	155	0.32	0.79
412	3.67	1.01	675	6.02	0.88	402	3.58	0.75	25	0.22	0.54
83	3.33	0.92	130	5.22	0.76	104	4.18	0.88	4	0.16	0.39
18	2.50	0.69	29	4.03	0.59	22	3.06	0.64	0	0.00	0.00
23,492	1.97	Ref	32,992	2.77	Ref	36,366	3.06	Ref	3,210	0.27	Ref
11,443	2.28	1.15	13,958	2.78	1.00	12,383	2.46	0.81	1,030	0.20	0.76
3,808	2.47	1.25	4,440	2.89	1.04	3,486	2.27	0.74	319	0.21	0.77
822	1.85	0.94	959	2.16	0.78	843	1.90	0.62	69	0.16	0.58
200	1.25	0.63	230	1.44	0.52	278	1.74	0.57	20	0.13	0.46
16,703	2.28	Ref	25,295	3.46	Ref	26,380	3.61	Ref	2,923	0.40	Ref
5,188	2.34	1.02	6,783	3.06	0.88	5,960	2.69	0.75	616	0.28	0.70
852	2.07	0.91	1,088	2.64	0.76	975	2.37	0.66	103	0.25	0.63
124	1.60	0.70	130	1.68	0.49	174	2.25	0.62	11	0.14	0.36
23	0.97	0.43	26	1.10	0.32	43	1.82	0.50	3	0.13	0.32
5,732	2.20	Ref	8,340	3.20	Ref	8,538	3.28	Ref	546	0.21	Ref
3,672	2.60	1.18	4,550	3.22	1.01	3,985	2.82	0.86	332	0.24	1.12
1,519	3.01	1.37	1,731	3.43	1.07	1,370	2.71	0.83	133	0.26	1.26
302	2.02	0.92	369	2.47	0.77	358	2.40	0.73	31	0.21	0.99
67	1.30	0.59	82	1.59	0.50	99	1.92	0.59	8	0.15	0.74
6,648	1.88	Ref	9,957	2.82	Ref	8,787	2.49	Ref	378	0.11	Ref
4,240	2.26	1.20	5,682	3.03	1.07	4,343	2.32	0.93	237	0.13	1.18
1,849	2.52	1.34	2,296	3.13	1.11	1,543	2.10	0.84	108	0.15	1.37
479	1.98	1.05	590	2.44	0.86	415	1.71	0.69	31	0.13	1.19
128	1.40	0.74	151	1.65	0.58	158	1.72	0.69	9	0.10	0.92
7,359	2.08	Ref	9,913	2.81	Ref	12,807	3.62	Ref	1,141	0.32	Ref
3,774	2.32	1.11	4,200	2.58	0.92	4,191	2.57	0.71	371	0.23	0.71
1,189	2.23	1.07	1,269	2.38	0.85	1,172	2.20	0.61	105	0.20	0.61
241	1.37	0.66	253	1.43	0.51	300	1.70	0.47	15	0.08	0.26
50	0.68	0.32	67	0.91	0.32	88	1.19	0.33	7	0.09	0.29
3,046	3.85	Ref	4,404	5.56	Ref	3,364	4.25	Ref	231	0.29	Ref
994	4.14	1.07	1,313	5.46	0.98	871	3.62	0.85	68	0.28	0.97
226	4.06	1.05	331	5.94	1.07	173	3.11	0.73	13	0.23	0.80
40	3.37	0.88	48	4.05	0.73	26	2.19	0.52	3	0.25	0.87
4	1.11	0.29	9	2.51	0.45	4	1.11	0.26	1	0.28	0.95
18,678	2.05	Ref	29,275	3.21	Ref	27,534	3.02	Ref	2,475	0.27	Ref
8,332	2.29	1.12	11,502	3.17	0.99	9,226	2.54	0.84	746	0.21	0.76
2,805	2.64	1.29	3,515	3.31	1.03	2,543	2.39	0.79	226	0.21	0.78
624	2.22	1.09	788	2.81	0.87	621	2.21	0.73	55	0.20	0.72
164	1.84	0.90	183	2.05	0.64	208	2.33	0.77	12	0.13	0.50

After first through third deployments, each mental disorder except alcohol/drug disorders and suicide ideation/self-inflicted injury was diagnosed more frequently among those in health care than combat-specific or “other” military occupations (Figure 1a-g). In general, relationships between percentages affected by various disorders and number of deployments were similar across occupational groups. For example, in each occupational group, for most conditions, the percentages affected by the conditions increased or were stable from first through third deployments and then declined; and in each occupational group, the percentages diagnosed with alcohol/drug disorders, psychosocial problems, and suicide ideation/self-inflicted injuries generally declined with increasing deployments (Figure 1a-g).

DWELL TIMES PRIOR TO REPEAT DEPLOYMENTS

In general, after repeat (second through fifth) deployments, the percentages of

deployers diagnosed with all of the mental disorders considered here (except alcohol/drug disorders and psychosocial problems) increased as dwell times preceding the deployments lengthened. The general relationships between percentages affected by various mental disorders after deployments and the lengths of dwell times prior to the deployments were similar among males and females (Table 2, Figure 1a-g).

EDITORIAL COMMENT

This report provides an overview of associations between the percentages of deployers who were diagnosed with various mental disorders within one year after returning from OEF/OIF/OND deployments, the number of such deployments, and the lengths of dwell times prior to the deployments. The report summarizes these associations in relation to the genders, ages, and military occupations of the deployers.

In every gender, age, and military occupational subgroup considered here, larger percentages of deployers were diagnosed with PTSD and anxiety-related disorders after second and/or third than first deployments; of note, the percentages diagnosed with PTSD were sharply lower after fourth and fifth than third deployments. Reger and colleagues reported an increase of positive screens for PTSD (but not other mental disorders) after second compared to first OIF deployments (based on responses to post-deployment mental health questionnaires).² Similarly, Ghaed and colleagues reported that PTSD was more prevalent among repeat than first time deployers (based on preliminary analysis of Theater Mental Health Encounter Data [TMHED]).³ In contrast, in their study of nearly 10,000 British soldiers, Fear and colleagues found no associations between the number of Iraq/Afghanistan deployments and prevalences of probable PTSD or any other mental disorders (based on

TABLE 2. Number and percentage of deployers diagnosed with selected mental disorders after second through fifth OEF/OIF/OND deployments, by “dwell times” between prior and specified repeat deployments, active component, U.S. Armed Forces, 2003-2010

Deployment number	Dwell time before deployment	No. of deployers	Adjustment reaction			Post-traumatic stress disorder (PTSD)			Alcohol dependence/abuse		
			No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time	No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time	No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time
Second											
	<6 months	82,294	2,715	3.30	Ref	1,213	1.47	Ref	1,918	2.33	Ref
	6-12 months	137,223	4,270	3.11	0.94	3,097	2.26	1.53	3,563	2.60	1.11
	12-18 months	125,330	6,276	5.01	1.52	3,348	2.67	1.81	3,127	2.50	1.07
	>18 months	205,495	10,292	5.01	1.52	5,303	2.58	1.75	3,821	1.86	0.80
Third											
	<6 months	34,055	869	2.55	Ref	461	1.35	Ref	521	1.53	Ref
	6-12 months	42,067	1,276	3.03	1.19	838	1.99	1.47	750	1.78	1.17
	12-18 months	38,590	2,391	6.20	2.43	1,387	3.59	2.66	825	2.14	1.40
	>18 months	50,395	2,754	5.46	2.14	1,706	3.39	2.50	863	1.71	1.12
Fourth											
	<6 months	15,374	322	2.09	Ref	175	1.14	Ref	190	1.24	Ref
	6-12 months	12,731	343	2.69	1.29	194	1.52	1.34	151	1.19	0.96
	12-18 months	9,639	477	4.95	2.36	271	2.81	2.47	155	1.61	1.30
	>18 months	9,155	441	4.82	2.30	241	2.63	2.31	129	1.41	1.14
Fifth											
	<6 months	7,411	123	1.66	Ref	48	0.65	Ref	71	0.96	Ref
	6-12 months	4,773	108	2.26	1.36	43	0.90	1.39	54	1.13	1.18
	12-18 months	2,366	75	3.17	1.91	38	1.61	2.48	26	1.10	1.15
	>18 months	2,136	63	2.95	1.78	34	1.59	2.46	18	0.84	0.88

questionnaire responses).⁴ Because the current report is based on records of medical encounters of all recently returned active component deployment veterans (rather than questionnaire responses of selected study subjects), the finding of higher percentages of diagnoses of PTSD in all gender, age, and military occupational subgroups after second and third than after first deployments is noteworthy.

In this analysis, higher percentages of deployers in health care than combat-specific or other military occupations were diagnosed with PTSD. The finding is not particularly surprising because health care workers may have better access to mental health services and may perceive less stigma from seeking and receiving mental health care than those in other military occupations. In addition, the percentages of deployers diagnosed with PTSD increased much more sharply from first through third deployments among health care than other occupational group members. In this

regard, deployers in combat-specific occupations (and some health care workers such as combat medics) may have multiple, intermittent, intensive exposures to personally life threatening experiences (e.g., snipers, rockets, mortars, ambushes, IEDs). In comparison, health care workers may be less frequently and intensively personally threatened while deployed; however, they may be nearly continuously exposed to the traumatic injuries, suffering, fear, grief, and death of others; and in many cases, their best efforts to intervene may be unsuccessful. Increasing risks of PTSD after second and third deployments suggest that repeated, intense, homotypic psychological traumas during multiple wartime deployments – particularly among combat troops (“battle fatigue”) and health care workers (“compassion fatigue”) – may have cumulative and persistent psychological effects.

Among deployers 25 years and older, most mental disorders examined for this report (except alcohol/drug disorders and

psychosocial problems) affected larger percentages after second and third than first deployments. The finding is consistent with those of the most recent Joint Mental Health Advisory Team (MHAT) survey of soldiers and Marines in Iraq and Afghanistan; the 2010 MHAT report documented significantly more psychological problems among those on third and fourth compared to first or second deployments;⁶ in general, soldiers and Marines on third and fourth deployments are older than their less frequently deployed counterparts.

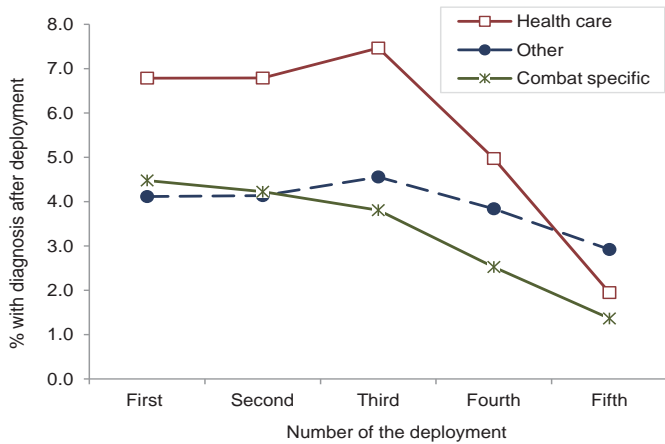
Among deployers who were younger than 25 years, in combat-specific occupations, and female, most disorders examined here (except PTSD and anxiety-related) were diagnosed relatively more frequently after first than repeat deployments. Compared to their respective counterparts, service members who are young, female, and in combat-specific occupations may leave military service at higher rates after their first wartime deployments—particularly

TABLE 2. Number and percentage of deployers diagnosed with selected mental disorders after second through fifth OEF/OIF/OND deployments, by “dwell times” between prior and specified repeat deployments, active component, U.S. Armed Forces, 2003-2010

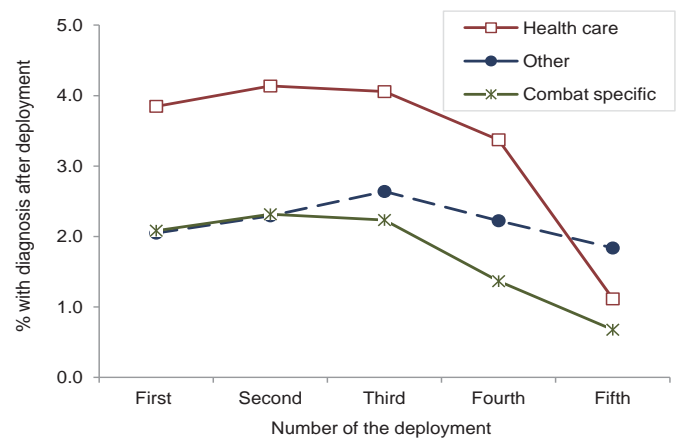
Anxiety-related disorder			Depressive disorder			Psychosocial problems			Suicide ideation, self-inflicted injury		
No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time	No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time	No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time	No. with diagnosis	% with diagnosis	% affected relative to shortest dwell time
1,290	1.57	Ref	2,071	2.52	Ref	2,511	3.05	Ref	104	0.13	Ref
2,625	1.91	1.22	3,598	2.62	1.04	2,870	2.09	0.69	246	0.18	1.42
3,454	2.76	1.76	4,199	3.35	1.33	3,602	2.87	0.94	336	0.27	2.12
5,731	2.79	1.78	7,147	3.48	1.38	5,305	2.58	0.85	499	0.24	1.92
495	1.45	Ref	625	1.84	Ref	607	1.78	Ref	35	0.10	Ref
782	1.86	1.28	971	2.31	1.26	757	1.80	1.01	81	0.19	1.87
1,319	3.42	2.35	1,570	4.07	2.22	1,128	2.92	1.64	102	0.26	2.57
1,624	3.22	2.22	1,949	3.87	2.11	1,396	2.77	1.55	126	0.25	2.43
166	1.08	Ref	211	1.37	Ref	254	1.65	Ref	15	0.10	Ref
192	1.51	1.40	240	1.89	1.37	215	1.69	1.02	18	0.14	1.45
276	2.86	2.65	348	3.61	2.63	256	2.66	1.61	20	0.21	2.13
271	2.96	2.74	290	3.17	2.31	222	2.42	1.47	20	0.22	2.24
82	1.11	Ref	84	1.13	Ref	105	1.42	Ref	1	0.01	Ref
59	1.24	1.12	74	1.55	1.37	93	1.95	1.38	9	0.19	13.97
38	1.61	1.45	56	2.37	2.09	62	2.62	1.85	4	0.17	12.53
39	1.83	1.65	45	2.11	1.86	40	1.87	1.32	6	0.28	20.82

FIGURE 1. Percentage of deployers who were diagnosed with selected mental disorders within one year after OEF/OIF/OND deployments, by deployment number and military occupational group, active component, U.S. Armed Forces, 2003-2010

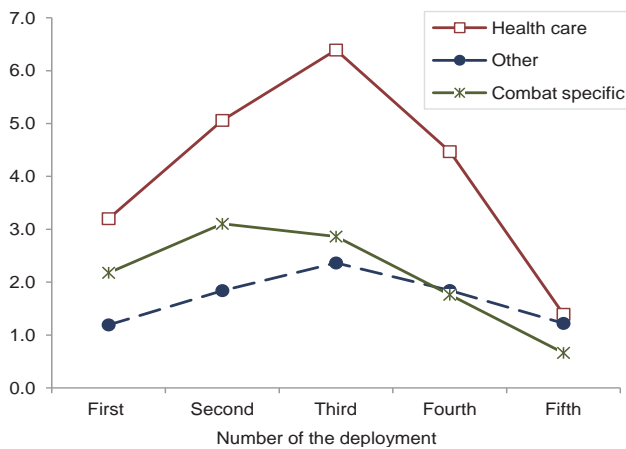
a. Adjustment reaction



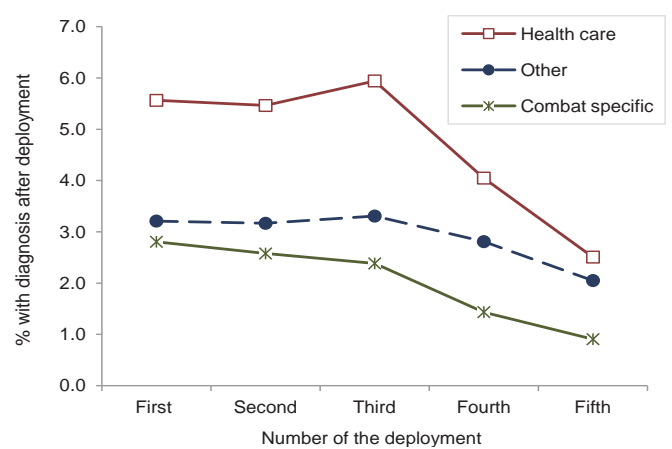
d. Anxiety-related disorder



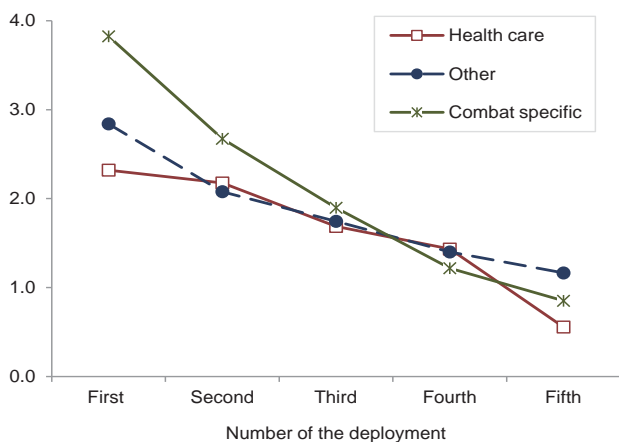
b. Post-traumatic stress disorder (PTSD)



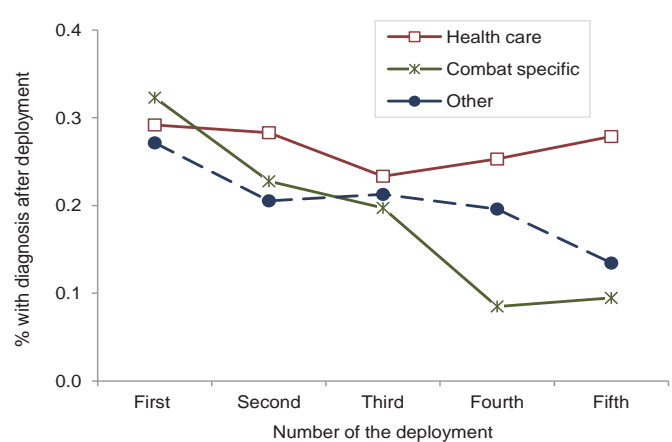
e. Depressive disorder



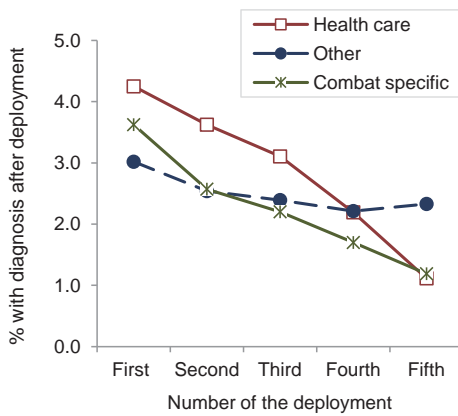
c. Alcohol dependence/abuse



f. Suicide ideation, self-inflicted injury



g. Psychosocial problems



if they were psychologically traumatized during, and/or disabled by a mental disorder after returning from, their first deployments.

Also, in nearly every demographic and military occupational subgroup examined here, larger percentages of deployers were diagnosed with alcohol/drug disorders and psychosocial problems after first than repeat deployments. Alcohol/drug disorders and psychosocial problems may be indicators of psychological effects of wartime service; service members affected by such conditions may be more likely than their counterparts to leave active service before they deploy again. Thus, as a group, service members who have deployed multiple times may be more psychologically resilient to deployment stress-related symptoms than their never or less frequently deployed counterparts. The findings of this report in relation to the relatively high risks of mental disorders after first deployments reiterate the importance of providing mental health-related interventions during and closely following the first wartime deployments of service members.

Perhaps, the most unexpected finding of this analysis was the consistency of the relationships between the percentages of deployers who were diagnosed with various mental disorders (except alcohol/drug disorders and psychosocial problems) after second through fifth deployments and the lengths of dwell times prior to such deployments. For most conditions, the longer the dwell times prior to repeat

deployments, the larger the percentages diagnosed with the conditions after the deployments. In considering the implications of this finding, it may be useful to think of dwell times in relation to the transition/readjustment periods that inevitably follow combat deployments.⁷ Based on extensive clinical and research experiences, Hoge has observed that “warriors and their family members are often surprised at how difficult the transition period is after coming back from a combat deployment.”⁷ (p. xviii) Depending on factors such as personal circumstances (e.g., marital status, number and ages of children) and wartime experiences, post-deployment transition/readjustment periods can markedly vary in regard to the natures, magnitudes, durations, and effects of transition/readjustment-related stresses. With long dwell times between repeat deployments, deployers may complete the work of transition/readjustment from deployed to non-deployed status before deploying again – and then transitioning/readjusting again from non-deployed to “warrior” status. For some service members, short dwell times that interrupt transitions/readjustments from deployed to non-deployed status between repeat deployments may be less psychologically traumatic.

Also, some service members are temporarily unable to redeploy while being treated for or recuperating from medical conditions (including mental disorders) that are associated with recent deployments. Such individuals may have relatively long dwell times before deploying again; in addition, they may be at higher risk of exacerbations or recurrences of their conditions during and following subsequent deployments.⁸ In a special case of such a circumstance, some female service members experience pregnancy, childbirth, and maternity leave during dwell times between deployments. In such situations, dwell times prior to repeat deployments may be relatively long, and risks of mental disorders during and following such deployments may be increased. In a recent *MSMR* report, Danielson documented that 6.1 percent of 8,524 women who deployed after the births of their first children received at least one mental health diagnosis within

six months after returning from deployment; their most frequent post-deployment mental disorder diagnoses were adjustment reactions and depressive and anxiety disorders.⁹ In the current report, these conditions were diagnosed particularly frequently among females after deployments preceded by relatively long dwell times. Clearly, the effects of dwell times in relation to repeat wartime deployments require much more investigation.

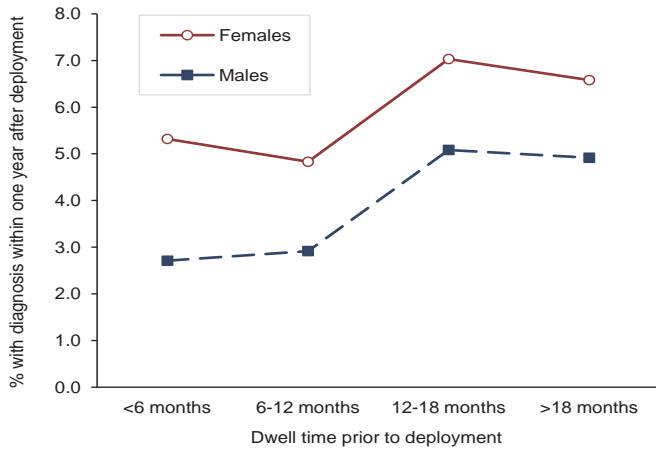
There are significant limitations to this report that should be considered when interpreting the results. For example, the demographic and military characteristics of initial and repeat deployers are markedly different; in addition, there are differences in the demographic and military characteristics of deployers in relation to lengths of dwell times between deployments. The results reported here do not account for the effects of these differences; such effects could alter some of the findings of this report. More detailed analyses of the effects of multiple deployments and lengths of dwell times between deployments are indicated to isolate the effects of these factors from the effects of multiple confounding factors.

Also, the summary measure used for comparisons in this report was the percent of deployers diagnosed with various mental disorders within one year after returning from deployment. As such, deployers who left active service within the year after returning from a deployment had shorter post-deployment follow-up times than others. It is unlikely, however, that the overall results would be significantly changed by accounting for the shorter lengths of some post-deployment follow-ups. For example, in a separate analysis (data not shown), relationships between number of deployments and percentages affected by PTSD (which do not account for follow-up times) and rates of PTSD (which do account for follow-up times) were very similar.

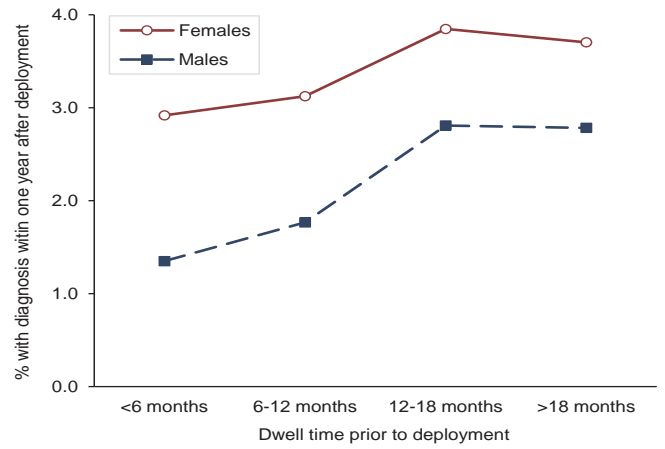
Also, case-defining diagnoses for this report were ascertained from ICD-9-CM diagnostic codes that were reported on administrative records of hospitalizations and ambulatory visits in fixed (e.g., not deployed, at sea) medical treatment facilities. The mental disorders of interest

FIGURE 2. Percentage of repeat (second through fifth time) OEF/OIF/OND deployers diagnosed with selected mental disorders after deployment, by “dwell times” prior to deployments, by gender, active component, U.S. Armed Forces, 2003-2010

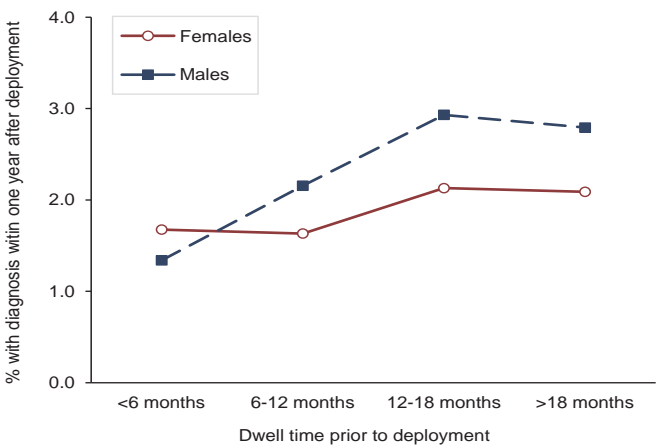
a. Adjustment reaction



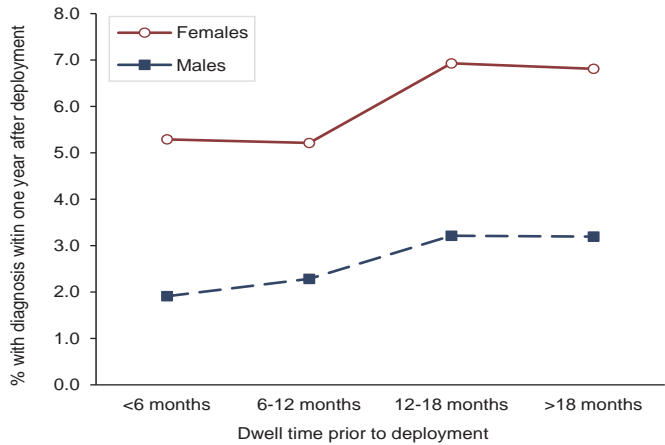
d Anxiety-related disorder



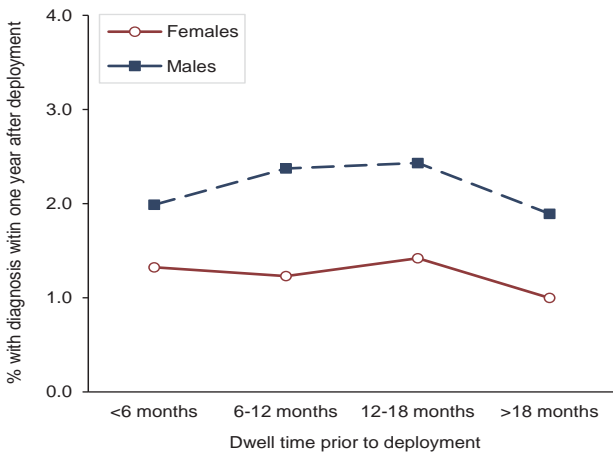
b. Post-traumatic stress disorder (PTSD)



e. Depressive disorder



c. Alcohol/substance disorder



f. Suicide ideation/self-inflicted injury

