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## Medical Experiences Within 6-months of Redeployment in relation to Changes in Self-rated Health from Pre- to Post-deployment, Active Component, U.S. Armed Forces, January 2002-June 2006

Since the end of the cold war – and with heightened urgency in the wake of the first Gulf War – there has been increased interest in the health of U.S. servicemembers before and after overseas deployments, particularly in combat environments. Since the beginning of combat operations in Afghanistan and Iraq, U.S. servicemembers have completed standardized health assessments before and after deploying. Responses to questions on health assessments help health care providers determine if individuals are medically prepared for deployment and, on their return, to arrange for evaluations and follow-ups of illnesses, injuries, and potentially risky deployment-related exposures. In the past five years, more than one million pre- and post-deployment assessments have been completed by U.S. servicemembers.<sup>1</sup>

Several studies have investigated the meaning and determinants of self-rated health – in general and in military populations.<sup>2-4</sup> Recently, Trump investigated relationships between the self-rated health of U.S. servicemembers on post-deployment health assessments and their subsequent medical experiences. He found that, compared to their counterparts, those with lower self-assessed health and more health concerns at redeployment had more hospitalizations, ambulatory visits, and separations from service in the next 12 months.<sup>5</sup> Of note, Trump's studies predated ongoing combat operations in Afghanistan and Iraq.

For many reasons, individuals of similar health may self-rate their health differently; and individuals with relatively stable health may change their assessments over time. To control for individual differences in self assessments of overall health (by using each person's predeployment rating as his/her own baseline) and to isolate the effects of deployment on each person's self-rated health, we used changes in self-rated health from pre- to post-deployment for deployment health surveillance purposes.

For this analysis, we assessed the nature and magnitudes of changes in self-assessments of overall health from pre- to post-deployment of members of the active components of the U.S. Armed Forces who deployed to Southwest Asia/Middle East since January

2002. In addition, we investigated relationships between changes in self-rated health from pre- to post-deployment and the medical and military experiences of deployment veterans during the first six months after redeploying.

*Methods.* The surveillance period was 1 January 2002 to 30 June 2006. The surveillance population included all members of active components of the U.S. Armed Forces who completed at least one pre-deployment health assessment and one post-deployment health assessment during the surveillance period. If individuals completed multiple pre- and/or post-deployment assessments during the period, only one of each were used for analysis. Forms were paired by comparison of the date a pre-assessment was completed with the date of arrival in theater reported on the post-assessment.

Pre- and post-deployment health assessment questionnaires elicit self-ratings of "your health in general" using a five-level scale: "excellent," "very good," "good," "fair," "poor." Changes in self-ratings of general health from pre- to post-deployment were calculated on a linear scale that ranged from -4 (predeployment: "excellent"; postdeployment: "poor") to +4 (predeployment: "poor"; postdeployment: "excellent"). For analysis purposes, respondents were divided into three groups based on changes in self-rated health from pre- to post-deployment. For the "better" group, self-ratings increased by two or more levels from pre- to post-deployment. For the "same" group, self-ratings changed by one or no levels from pre- to post-deployment. For the "worse" group, self-ratings decreased by two or more levels from pre- to post-deployment.

During the first six months after redeployment, terminations of active military service and hospitalizations or ambulatory visits bearing primary diagnoses not previously found in an individual's medical record were ascertained for the surveillance population. To discount the effects of multiple medical encounters for the same illness or injury, only one hospitalization and one ambulatory visit per individual in each of the 16 major diagnostic categories of the ICD-9-CM (based on primary [first listed] diagnoses)

were maintained. All data were derived from the Defense Medical Surveillance System.<sup>6</sup>

Finally, excess incident diagnoses among those whose self-rated health significantly declined during deployment were estimated by comparing observed and expected numbers of incident diagnoses among them. Expected numbers were estimated by multiplying incidence rates in a referent group (those whose self-rated health was the same or improved during deployment) by the number of redeployers whose self-rated health significantly declined.

*Results.* During the 5.5-year surveillance period, 360,379 members of active components of the U.S. Armed Forces completed at least one pre- and one post-deployment health assessment. Most respondents were males, in their twenties, white non-Hispanic, enlisted, and in the Army or Air Force. Of all respondents, fewer than one of nine were in the Marine Corps or Navy, and approximately one-fourth had combat-specific military occupations (Table 1).

Most respondents (87.7%) had no significant change (“same”) in their self-rated health from pre- to post-deployment. Nearly 10% had a significant worsening (“worse”) and fewer than 3% had a significant improvement (“better”) in their self-rated health from pre- to post-deployment (Table 1).

Demographic and military characteristics of those with worse, the same, and better self-rated health from pre- to post-deployment were generally similar. Of note, however, compared to those with the same self-rated health from pre- to post-deployment, those with worse self-rated health were more likely to be in the Army, in combat-specific occupations, and Hispanic. Those with better self-rated health were more likely to be in the Air Force, female, Black non-Hispanic or other/unknown race/ethnicity, enlisted, and not in a combat or medical military occupation (Table 1).

Of interest, on the post-deployment health assessment, nearly two-thirds (62.6%) of those in the worse group reported that their health “stayed the same or got better” during the deployment. As expected, relatively few (6.4%) of those in the better group reported that their health “got worse” during the deployment (Table 2).

Prior to deploying, those in the better group were more than twice as likely as those in other groups to have “questions or concerns” about their health (better: 9.4%; same: 4.1%; worse: 2.9%). On post-

deployment assessments, those in the better group were the least likely to have “questions or concerns” about their health (better: 4.3%; same: 9.2%; worse: 21.0%) (Table 2).

On post-deployment assessments, there were sharp differences among the groups in the proportions with “concerns about possible exposures or events...that you feel may affect your health” (better: 5.4%; same: 11.5%; worse: 26.1%) and indications for referrals by healthcare providers (better: 13.6%; same: 18.8%; worse: 36.4%). Also, individuals in the worse group were more than twice as likely as those in other groups to report any (better: 10.5%; same: 14.4%; worse: 30.7%) and multiple post-traumatic stress-related symptoms (Table 2).

In general, those in the better and same groups had similar medical experiences during the first six months after returning from deployment. For example, the groups were nearly identical in regard to the cumulative incidence of hospitalization (better: 1.78%; same: 1.84%), the number of ambulatory visits per person (better: 5.2; same: 5.2), and the percentage with 3 or more outpatient visits (better: 59.6%; same: 59.1%). Compared to the same group, those in the better group had slightly more bed-days per hospitalization (an indicator of the severity of underlying conditions) (better: 6.9; same: 6.4) and hospital bed-days per 100 persons overall (better: 15.1; same: 13.9). Finally, slightly fewer of the better than same group terminated active military service within six months after returning from deployment (better: 17.7%; same: 19.9%). Because the medical experiences of the better and same groups were similar, they were combined into a single referent group for comparisons to the worse group.

Not surprisingly, those in the worse group varied significantly from those in the referent group in relation to each outcome measure. For example, compared to the referent group, those in the worse group were more than twice as likely to be hospitalized (% hospitalized: 3.8%), had more than one-third more bed-days per hospitalization (mean bed days per hospitalization: 9.2), and accounted for more than three times the hospital bed-days per 100 persons overall (bed-days per 100 persons: 45.6). Also, those in the worse group had approximately 50% more ambulatory visits per person (ambulatory visits per person: 7.8), a higher percentage with 3 or more ambulatory visits ( $\geq 3$  visits: 70.3%), and approximately one-fifth more terminations of active military service (terminated

service: 23.6%) during the first six months after redeployment.

Overall, the rate of incident diagnoses during hospitalizations was more than twice as high in the worse than the referent group. The largest absolute differences between rates in the worse and referent groups were for injuries and poisonings ("injuries") (rate difference [RD]: 5.70 per 1000), mental disorders (RD: 3.13 per 1000), and musculoskeletal and connective tissue disorders ("musculoskeletal") (RD: 2.63 per 1000) (Table 3).

If the illness and injury-specific hospitalization rates that affected the referent group had occurred in the worse group, there would have been 593 (8.6%)

fewer incident hospitalizations overall. Approximately two-thirds of all excess incident hospitalizations in the worse group were attributable to injuries of all causes (n=196; 33.1% of total excess), mental disorders of all types (n=108; 18.1% of total excess), and musculoskeletal disorders (n=91; 15.3% of total excess) (Figure 1). Battle injuries (worse group, total=139; excess=115) accounted for nearly 60% of the excess injury-related hospitalizations in the worse group; and acute reactions to stress (including PTSD) and adjustment reactions (worse group, total=89; excess=51) accounted for nearly half of the excess mental disorder-related hospitalizations in the worse group (data not shown).

**Table 1. Characteristics of individuals who completed pre- and post-deployment health assessments, by change in self-rated "overall health status" from pre- to post-deployment, active components, U.S. Armed Forces, January 2002-June 2006**

	Better		Same		Worse		Total	
	No.	%	No.	%	No.	%	No.	%
<i>Gender</i>								
Male	8,506	86.8	279,655	88.5	30,596	88.9	318,757	88.5
Female	1,299	13.2	36,505	11.5	3,818	11.1	41,622	11.5
<i>Age group</i>								
<20	670	6.8	20,475	6.5	2,550	7.4	23,695	6.6
20-24	4,228	43.1	127,275	40.3	14,821	43.1	146,324	40.6
25-29	2,148	21.9	71,459	22.6	7,711	22.4	81,318	22.6
30-34	1,281	13.1	44,390	14.0	4,383	12.7	50,054	13.9
35-39	871	8.9	32,496	10.3	3,175	9.2	36,542	10.1
>=40	607	6.2	20,065	6.3	1,774	5.2	22,446	6.2
<i>Race ethnic</i>								
Black not hispanic	2,250	22.9	57,800	18.3	6,573	19.1	66,623	18.5
White not hispanic	5,815	59.3	204,808	64.8	20,874	60.7	231,497	64.2
Hispanic	949	9.7	29,955	9.5	4,266	12.4	35,170	9.8
Other/unknown	791	8.1	23,597	7.5	2,701	7.8	27,089	7.5
<i>Service</i>								
Army	5,121	52.2	191,212	60.5	27,182	79.0	223,515	62.0
Navy	171	1.7	8,687	2.7	501	1.5	9,359	2.6
Air Force	4,040	41.2	91,057	28.8	4,070	11.8	99,167	27.5
Marine Corps	473	4.8	25,204	8.0	2,661	7.7	28,338	7.9
<i>Military status</i>								
Officer (incl. warrant)	643	6.6	44,005	13.9	4,067	11.8	48,715	13.5
Enlisted	9,162	93.4	272,155	86.1	30,347	88.2	311,664	86.5
<i>Military occ group</i>								
Combat	2,500	25.5	87,221	27.6	11,034	32.1	100,755	28.0
Medical	506	5.2	19,991	6.3	1,982	5.8	22,479	6.2
Other/unknown	6,799	69.3	208,948	66.1	21,398	62.2	237,145	65.8
<i>Total</i>	9,805	100.0	316,160	100.0	34,414	100.0	360,379	100.0

**Table 2. Responses to selected questions on deployment-related health assessments, by change in self-rated "overall health status" from pre- to post-deployment, active components, U.S. Armed Forces, January 2002-June 2006**

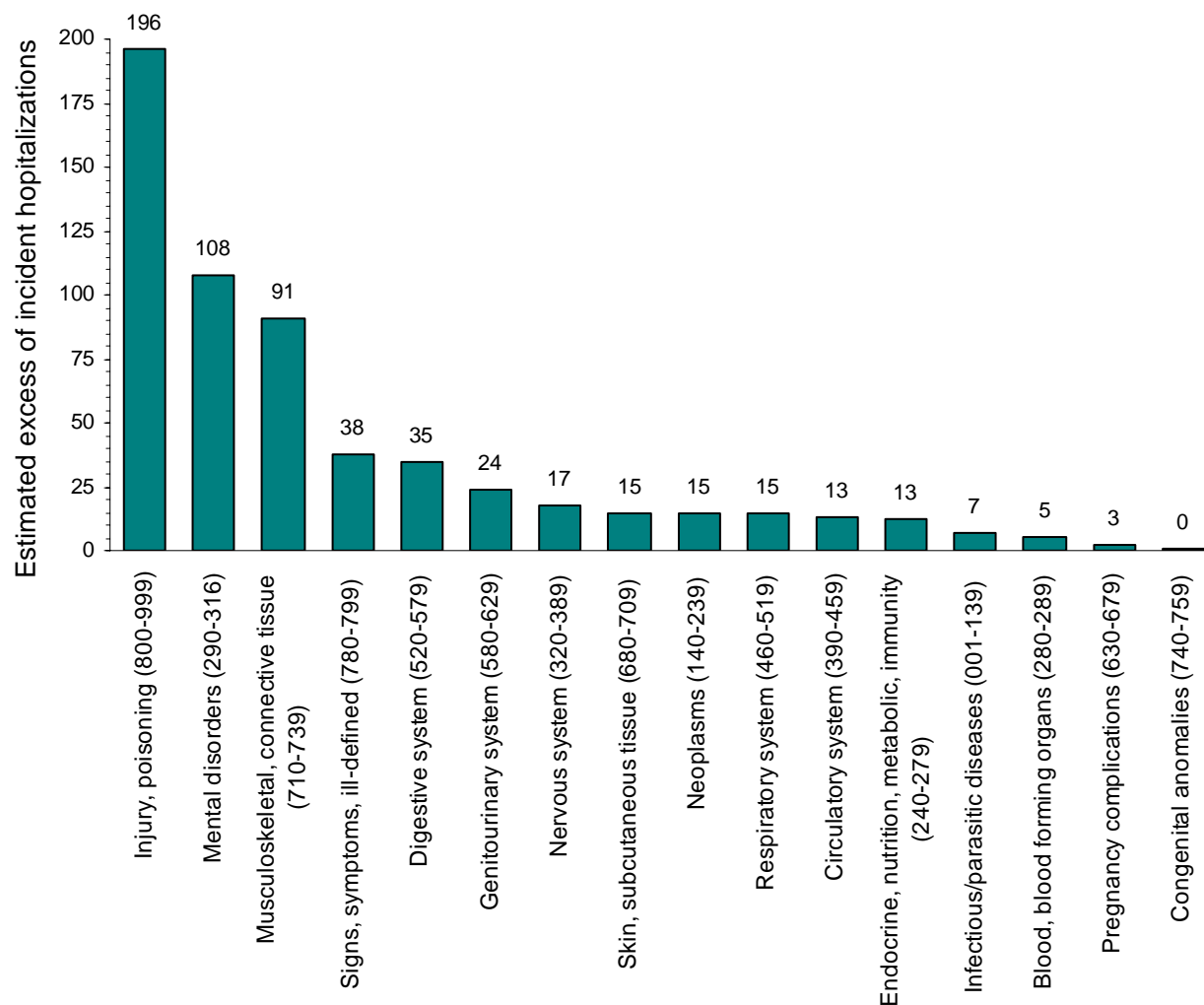
	Better		Same		Worse		Total	
	No.	%	No.	%	No.	%	No.	%
<i>Predeployment: Question 8. Do you currently have questions or concerns about your health?</i>								
"Yes"	921	9.4	12,884	4.1	996	2.9	14,801	4.1
"No"	8,884	90.6	303,276	95.9	33,418	97.1	345,578	95.9
<i>Postdeployment: Question 1. Did your health change during this deployment?</i>								
"... stayed about the same or got better"	9,181	93.6	280,030	88.6	21,549	62.6	310,760	86.2
"... got worse"	624	6.4	36,130	11.4	12,865	37.4	49,619	13.8
<i>Postdeployment: Question 12. Have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you ... (of 4 possibilities, total number of responses chosen)</i>								
None	8,773	89.5	270,517	85.6	23,850	69.3	303,140	84.1
One	488	5.0	22,810	7.2	4,266	12.4	27,564	7.6
Two	256	2.6	11,692	3.7	2,793	8.1	14,741	4.1
Three	175	1.8	6,445	2.0	1,891	5.5	8,511	2.4
Four	113	1.2	4,696	1.5	1,614	4.7	6,423	1.8
<i>Postdeployment: Interview, question 1. Would you say your health in general is: ...</i>								
"Excellent"	8,602	87.7	86,603	27.4			95,205	26.4
"Very good"	1,052	10.7	125,263	39.6			126,315	35.1
"Good"	151	1.5	92,667	29.3	22,956	66.7	115,774	32.1
"Fair"			11,313	3.6	10,023	29.1	21,336	5.9
"Poor"			314	0.1	1,435	4.2	1,749	0.5
<i>Postdeployment: Interview, question 5. Do you have concerns about possible exposures or events during this deployment that you feel may affect your health?</i>								
"Yes"	531	5.4	36,414	11.5	8,977	26.1	45,922	12.7
"No"	9,274	94.6	279,746	88.5	25,437	73.9	314,457	87.3
<i>Postdeployment: Interview, question 6. Do you currently have questions or concerns about your health?</i>								
"Yes"	426	4.3	29,092	9.2	7,214	21.0	36,732	10.2
"No"	9,379	95.7	287,068	90.8	27,200	79.0	323,647	89.8
<i>Postdeployment: Healthcare provider assessment. Referral indicated for:</i>								
"None"	8,470	86.4	256,693	81.2	21,887	63.6	287,050	79.7
Any	1,335	13.6	59,467	18.8	12,527	36.4	73,329	20.3
<i>Total</i>	9,805	100.0	316,160	100.0	34,414	100.0	360,379	100.0

Overall, the rate of incident diagnoses during ambulatory visits was approximately one-third higher in the worse than the referent group. The largest absolute differences between rates in the worse and referent groups were for mental disorders (RD: 29.6 per 1000); signs, symptoms, and ill-defined conditions (“ill-defined”) (RD: 15.7 per 1000); and musculoskeletal and connective tissue disorders (“musculoskeletal”) (RD: 15.2 per 1000) (Table 3).

If the illness and injury-specific ambulatory visit rates that affected the referent group had occurred in the worse group, there would have been 4,469

(3.0%) fewer incident diagnoses overall. Nearly half of all excess incident diagnoses during ambulatory visits in the worse group were attributable to mental disorders of all types (n=1,020; 22.8% of total excess); signs, symptoms, and ill-defined conditions (n=539; 12.1% of total excess); and musculoskeletal disorders (n=524; 11.7% of total excess) (Figure 2). Acute reactions to stress (including PTSD) and adjustment reactions (worse group, total=1,509; excess=825) accounted for nearly half of the excess incident mental disorder-related ambulatory visits in the worse group (data not shown).

**Figure 1. Estimated excess of incident hospitalizations, by major diagnostic category, among those with significant declines during deployment in self-rated “overall health status” (relative to all others), active components, U.S. Armed Forces, January 2002-June 2006**

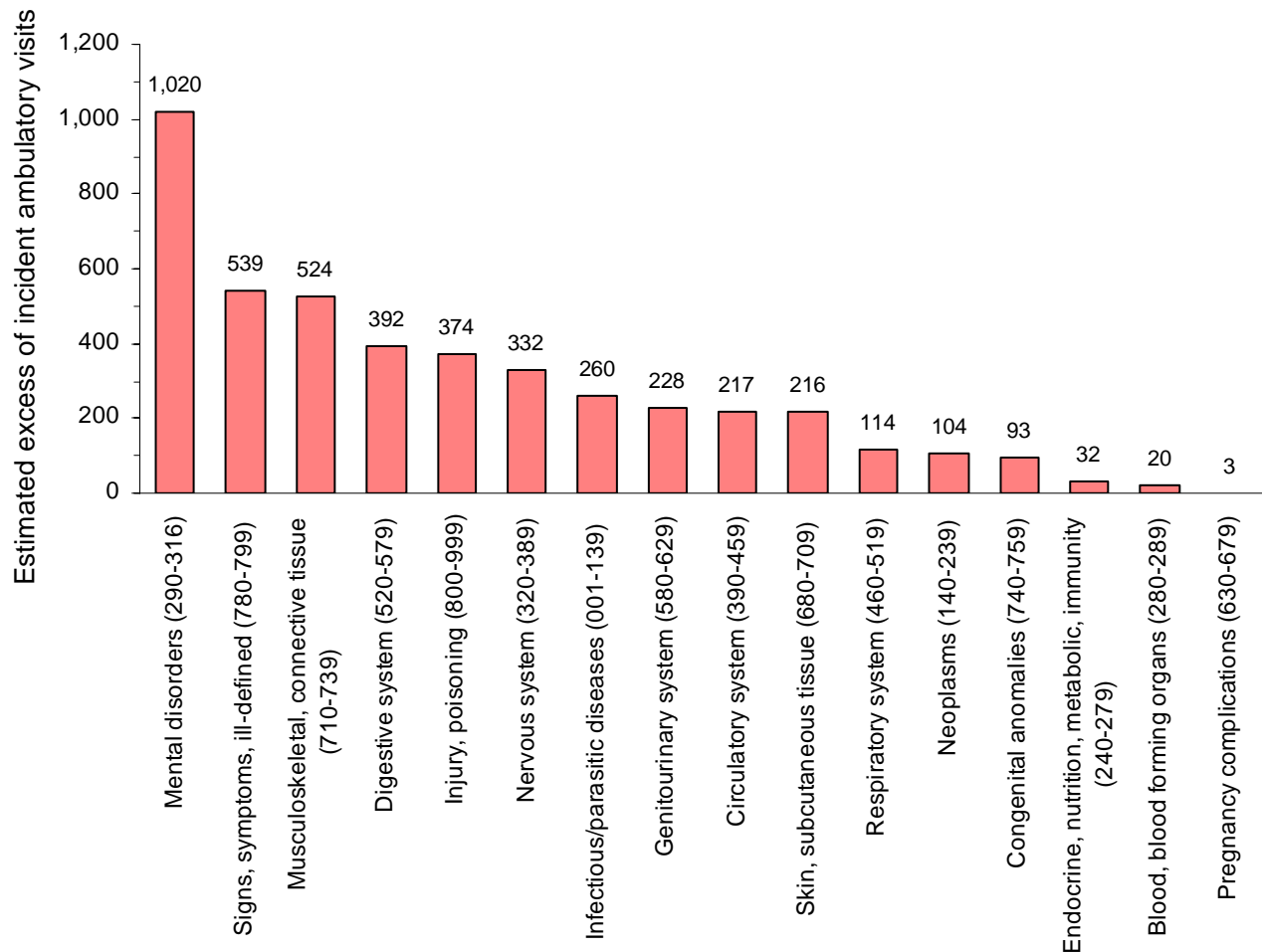


**Editorial comment:** This report documents that, compared to their counterparts, active service members whose self-rated health significantly declined from pre- to post-deployment had much higher rates of post-deployment hospitalizations and ambulatory visits – for all categories of illnesses and injuries – and were more likely to leave active military service within six months after redeploying. If the same rates of illnesses and injuries had occurred in those whose self-rated health significantly declined as in their counterparts, there would have been nearly 600 fewer diagnosis-specific incident hospitalizations and nearly 4,500 fewer diagnosis-specific incident ambulatory

visits. Still, the excess hospitalizations and ambulatory visits among those whose health significantly worsened during deployment accounted for relatively little of the total medical care provided to deployment veterans during their first six months after redeployment.

A significant proportion of the excess medical care provided to those whose self-rated health declined during deployment was directly attributable to combat-related physical and/or psychological traumas. For example, among those with significantly worse self-rated health after deployment, approximately one-third of all excess hospitalizations were directly related to battle injuries and adjustment reactions/acute reactions

**Figure 2. Estimated excess of incident ambulatory visits, by major diagnostic category, among those with significant declines during deployment in self-rated "overall health status" (relative to all others), active components, U.S. Armed Forces, January 2002-June 2006**



to stress (including post-traumatic stress disorder). Not surprisingly, servicemembers who are physical and/or psychological casualties of combat are likely to perceive their health as significantly worse after deployment than before. However, many others who are not clearly “combat casualties” report significant decrements in their overall health from pre- to post-deployment. Compared to their counterparts, these individuals utilize health care resources – for a variety of illnesses and injuries – at much higher rates within six months after redeploying. Perhaps, these individuals should be a focus of more detailed deployment health surveillance attention.

Surprisingly, approximately two-thirds of those whose self-rated health declined by at least two levels (on a 5-level scale) from pre- to post-deployment reported that their health “stayed about the same or got better” during deployment. This internally inconsistent finding suggests that some respondents misinterpreted and/or erroneously marked their responses to the general health question on the pre- and/or postdeployment questionnaire; considered self-rated health levels within two of each other as “about the same”; could not recall or changed their perceptions of their pre-deployment general health status; and/or considered factors other than health in responding to pre- (e.g., peer pressure) and/or post- (e.g., desire to expedite medical screening) deployment questions. Those whose self-reported health significantly declined from pre- to post-deployment and reported that their health “got worse” during

deployment may be a subgroup with higher than usual deployment-related health problems, concerns, and health care needs.

In summary, servicemembers whose self-rated health status significantly declined from pre- to post-deployment utilized health care resources and terminated military service shortly after redeploying at higher rates than their counterparts. Large proportions – but not most – of the excess health care needs of these individuals were directly related to physical and/or psychological traumas during deployment. Finally, the excess health care needs of individuals with significant declines in self-rated health during deployment is a relatively small proportion of the total health care needs of recent redeployers.

#### References

1. Army Medical Surveillance Activity. *Medical Surveillance Monthly Report (MSMR)*.
2. Bosworth HB, Siegler IC, Brummett BH, et al. The association between self-rated health and mortality in a well-characterized sample of coronary artery disease patients. *Med Care*. 1999 Dec;37(12):1226-36.
3. Mackenbach JP, Simon JG, Looman CW, Joung IM. Self-assessed health and mortality: could psychosocial factors explain the association? *Int J Epidemiol*. 2002 Dec;31(6):1162-8.
4. Trump DH, Brady J, Olsen CH. Self-rated health and subsequent health care use among military personnel returning from international deployments. *Mil Med*. 2004 Feb;169(2):128-33.
5. Trump DH. Self-rated health and health care utilization after military deployments. *Mil Med*. 2006 Jul;171(7):662-8.
6. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense serum repository: glimpses of the future of public health surveillance. *Am J Public Health*. 2002 Dec;92(12):1900-4.

**Table 3. Incident diagnosis-specific hospitalizations and ambulatory visits, by major diagnostic category, by change in self-rated "overall health status" from pre- to post-deployment, active components, U.S. Armed Forces,**

Major diagnostic category (ICD-9-CM codes)	Referent <sup>1</sup>		Worse		Worse versus referent <sup>1</sup>	
	No.	Rate per 1,000	No.	Rate per 1,000	Rate ratio	Rate difference
<b>Hospitalizations</b>						
Injury, poisoning (800-999)	1,599	4.91	365	10.61	2.16	5.70
Mental disorders (290-316)	932	2.86	206	5.99	2.09	3.13
Musculoskeletal, connective tissue (710-739)	543	1.67	148	4.30	2.58	2.63
Signs, symptoms, ill-defined (780-799)	419	1.29	82	2.38	1.85	1.10
Digestive system (520-579)	639	1.96	102	2.96	1.51	1.00
Genitourinary system (580-629)	259	0.79	51	1.48	1.87	0.69
Nervous system (320-389)	90	0.28	27	0.78	2.84	0.51
Skin, subcutaneous tissue (680-709)	172	0.53	33	0.96	1.82	0.43
Neoplasms (140-239)	144	0.44	30	0.87	1.97	0.43
Respiratory system (460-519)	222	0.68	38	1.10	1.62	0.42
Circulatory system (390-459)	219	0.67	36	1.05	1.56	0.37
Endocrine, nutrition, metabolic, immunity (240-279)	52	0.16	18	0.52	3.28	0.36
Infectious/parasitic diseases (001-139)	131	0.40	21	0.61	1.52	0.21
Blood, blood forming organs (280-289)	18	0.06	7	0.20	3.68	0.15
Pregnancy complications (630-679)	241	0.74	28	0.81	1.10	0.07
Congenital anomalies (740-759)	24	0.07	3	0.09	1.18	0.01
<i>Total</i>	5,704		1,195			
<b>Ambulatory visits</b>						
Mental disorders (290-316)	12,654	38.8	2,356	68.5	1.76	29.6
Signs, symptoms, ill-defined (780-799)	14,745	45.2	2,096	60.9	1.35	15.7
Musculoskeletal, connective tissue (710-739)	14,388	44.1	2,043	59.4	1.34	15.2
Digestive system (520-579)	9,804	30.1	1,427	41.5	1.38	11.4
Injury, poisoning (800-999)	14,169	43.5	1,870	54.3	1.25	10.9
Nervous system (320-389)	12,495	38.3	1,651	48.0	1.25	9.6
Infectious/parasitic diseases (001-139)	10,669	32.7	1,386	40.3	1.23	7.5
Genitourinary system (580-629)	6,477	19.9	912	26.5	1.33	6.6
Circulatory system (390-459)	5,454	16.7	793	23.0	1.38	6.3
Skin, subcutaneous tissue (680-709)	10,667	32.7	1,342	39.0	1.19	6.3
Respiratory system (460-519)	8,067	24.7	966	28.1	1.13	3.3
Neoplasms (140-239)	3,767	11.6	502	14.6	1.26	3.0
Congenital anomalies (740-759)	1,578	4.8	260	7.6	1.56	2.7
Endocrine, nutrition, metabolic, immunity (240-279)	4,485	13.8	506	14.7	1.07	0.9
Blood, blood forming organs (280-289)	556	1.7	79	2.3	1.35	0.6
Pregnancy complications (630-679)	1,425	4.4	153	4.4	1.02	0.1
<i>Total</i>	131,400		20,732			

<sup>1</sup> Referent consists of servicemembers whose self-rated was the same or better after deployment compared to before

## First-time Episodes of Care after Referrals Indicated during Post-Deployment Health Reassessment

The Post-Deployment Health Reassessment (PDHRA) is a routine screening of deployment veterans three- to six-months after they return from operational deployments overseas. The PDHRA program was implemented throughout the U.S. Armed Forces in June 2005 to identify and treat the emerging health (especially mental health) concerns of U.S. servicemembers that may not be immediately apparent upon return from overseas deployments.<sup>1</sup> The PDHRA process includes assessments by health care providers of indications for and then referrals to specific clinics, programs, and services for further evaluations and follow-ups. For this report, we assessed the frequencies and rates of PDHRA-related referrals to various clinics in military medical treatment facilities. In addition, we assessed the number of first-time episodes of care of various types sought by servicemembers based on PDHRA-related referrals.

*Methods:* The surveillance period was 10 March 2005 through 10 September 2006. The surveillance population included all members of the U.S. Armed Forces who completed a Post-Deployment Health Assessment (PDHA) and a Post-Deployment Health Reassessment (PDHRA) while on active duty during the surveillance period. If an individual completed multiple PDHRAs after a PDHA, only the most recent was included in analyses.

For this report, PDHRAs were reviewed to identify those with provider-indicated referrals for further evaluations and follow-up in at least one of six referral categories listed on page 4 of the PDHRA (DD Form 2900): referrals to a “military treatment facility” (question 10, first listed response), for “immediate/urgent care” (question 6, response b), “primary care: family practice”/ “behavioral health” (responses c and/or e), “mental health specialty care” (response d) and “specialty care: other”(response f). These referral categories were chosen for analyses because of their good correlation with Medical Expense and Performance Reporting System (MEPRS) codes that indicate the clinic/service of each outpatient encounter at a military medical treatment facility.

Among all servicemembers referred to immediate, primary, and/or specialty care at a military treatment facility, all ambulatory visits from 180 days prior to 30 days following dates of relevant PDHRA referrals were identified. For summary purposes, “first-time recipients” of care were those servicemembers who received care within the 30 days following – but not the 180 days prior to – a referral on a PDHRA.

*Results:* During the surveillance period, 72,938 active duty members of the Army, Navy, Air Force, or Marine Corps completed PDHRAs. Of these, 4,239 (5.8%) were referred to primary care: family practice/behavioral health; 1,619 (2.2%) were referred to mental health specialty care; 1,245 (1.7%) were referred to other specialty care; and 68 (0.1%) were referred for immediate/urgent care.

More than 85% (n=3,644) of all servicemembers who were referred for primary care at a family practice/behavioral health clinic had received care in the 180 days prior to the referral. More than half (53.5%) received care in the 30 days following referral – and of these, 243 (5.7% of those referred) were first-time recipients of care. Thus, of every 301 servicemembers screened with a PDHRA, one became a first-time recipient of primary care in a family practice/behavioral health clinic after a PDHRA-related referral (rate: 33 new primary care clinic patients per 10,000 servicemembers screened).

Approximately 45% (n=720) of all servicemembers who were referred for mental health specialty care had received such care in the 180 days prior to the referral. Approximately 46% (n=738) received care in the 30 days following referral – and of these, 381 (24% of those referred) were first-time recipients of care. Thus, of every 192 servicemembers screened with a PDHRA, one became a first-time recipient of mental health specialty care after a PDHRA-related referral (rate: 52 new mental health specialty care patients per 10,000 servicemembers screened).

Nearly one-third (n=383) of all servicemembers who were referred for other specialty

care had received care in the 180 days prior to the referral. Slightly less than one-fourth (n=284) received care in the 30 days following referral – and of these, 152 (12% of those referred) were first-time recipients of care. Thus, of every 480 servicemembers screened with a PDHRA, one became a first-time recipient of non-mental health specialty care after a PDHRA-related referral (rate: 21 new non-mental health specialty care patients per 10,000 servicemembers screened).

Approximately one-fifth (n=13) of all servicemembers who were referred for immediate/urgent care had received care in the 180 days prior to the referral. Approximately one-ninth (n=8) received care in the 30 days following referral – and of these, 4 (6% of those referred) were first-time recipients of immediate/urgent care. Thus, of every 18,235 servicemembers screened with a PDHRA, one became a first-time recipient of immediate/urgent care after a PDHRA-related referral (rate: <1 new immediate/urgent care patient per 10,000 servicemembers screened).

***Editorial comment:*** In the memorandum announcing the establishment of the PDHRA program, the Assistant Secretary of Defense for Health Affairs stated that “health concerns, particularly those involving mental health, are more frequently identified several months following return from operational deployment. To better ensure early identification and treatment... I am directing an extension of our current program... with a specific emphasis on mental health.”<sup>1</sup> Thus, the PDHRA program was initiated under the assumption that additional screening would increase access to indicated medical evaluations and treatments.

The findings of this report suggest that most servicemembers who have indications for medical evaluations and follow-ups after PDHRAs already have established patterns of care with relevant clinical specialties. Perhaps in contrast to assumptions underlying the establishment and expectations regarding the yield of the PDHRA program, there seem to be relatively few active duty servicemembers who receive first-time mental health and other specialty care after PDHRA-related referrals. For example, based on the experience documented in this report, of every 10,000 post-deployment health reassessments that are completed, there are approximately 52 and 21 new (e.g., first time) appointments at mental health specialty and other specialty care clinics, respectively, throughout the Military Health System.

This analysis suggests that most servicemembers who receive referrals through the PDHRA program already have established contacts with the clinical services to which they are referred. It is possible that referrals generated as a result of the PDHRA program are, in fact, merely provider recommendations to continue previously established patterns of care. This may be particularly true for mental health specialty care, where relatively long-term treatment courses may be necessary.

Analyses such as that presented here may help to gauge the effectiveness and efficacy of the PDHRA program, particularly regarding its cost-effectiveness in improving access to mental health care services.

#### References

1. Assistant Secretary of Defense (Health Affairs). Memorandum for Assistant Secretaries of the Army, Navy, and Air Force (M&RA), subject: Post-deployment health reassessment, 10 March 2005.

## Physical health concerns and exposure concerns reported on the post-deployment health reassessment form, U.S. Armed Forces, September 2005-August 2006

The Post-Deployment Health Reassessment (PDHRA) program was launched in March 2005 to respond to servicemember health concerns that persist for, or emerge during, the first three to six months following operational overseas deployments. The October 2006 issue of the *MSMR* summarized servicemember and provider responses on PDHRA forms (DD2900) completed by nearly 120,000 redeployers over a 12-month period. The present summary examines these servicemembers' responses to 44 checklist items related to exposure concerns (question 7a, page 2) and health concerns or conditions other than wounds or injuries (question 6a, page 2).

*Methods:* The DMSS was searched to identify all PDHRA forms that were completed between 1 September 2005 and 31 August 2006 by members of the Active and Reserve components of the Army, Navy, Air Force and Marine Corps. If a servicemember had more than one PDHRA on record, only the most recent was used for analysis.

*Results:* During the 12-month surveillance period, electronic PDHRA forms were completed by 118,715 U.S. military members. More than three-quarters of all forms were completed by members of the active components of the Services, and more than 90% were completed by members of the Army (66%) or Air Force (27%). Most respondents were men (89.5%), between the ages of 20 and 39 (87.5%), white nonhispanic (67.7%), and enlisted (87.7%). Nearly one-third of respondents were in combat-specific military occupations. Compared to active component respondents, Reservists were more likely to be older than 40, male, white nonhispanic, and in combat-specific military occupations. Across the Services, the Marine Corps and Air Force had the highest relative numbers of males (98.6%) and females (16.2%), respectively. Of note, nearly two-thirds of Marines were 20-24 years old, more than 60% were in combat-specific occupations, and only 5.5% were officers — all sharply different from the other services. Finally, nearly one-fifth of all Navy respondents were in medical military occupations (data not shown).

### Exposure concerns

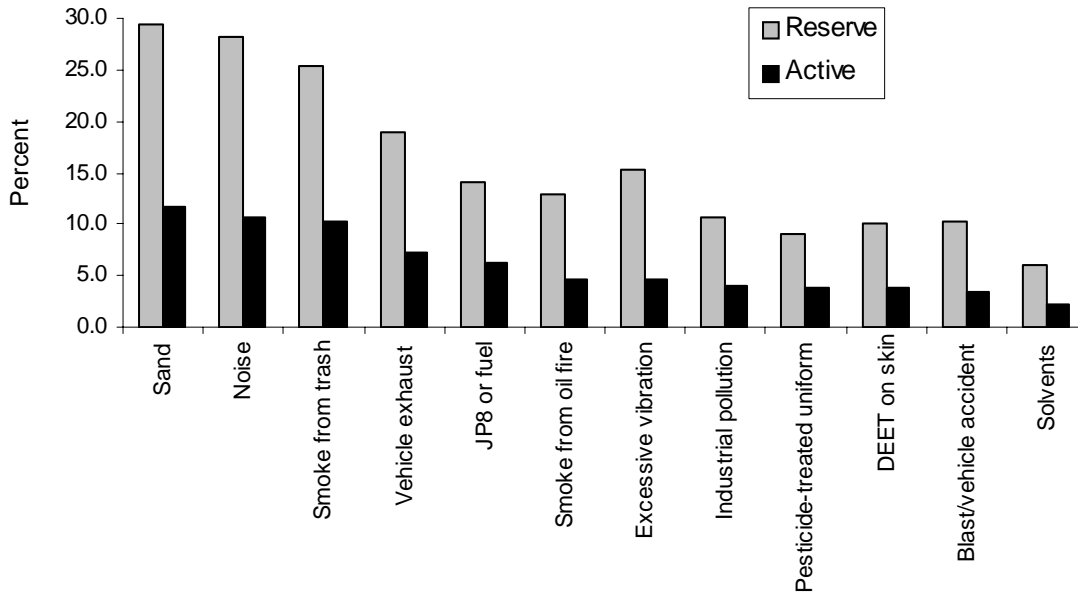
In general, “persistent major concerns” regarding the health effects of deployment-related exposures queried on the PDHRA were much more frequently reported by members of the Army and Marine Corps compared to the other services (Figure 1) and by members of the Reserve compared to the active component (Figure 2). The top five exposure concerns were the same for each of the services and components: sand, loud noises, smoke from burning trash or feces, vehicle exhaust, and JP8 or other fuels. The majority of exposure concerns were endorsed two and a half to three times more frequently by reserve than by active component servicemembers.

Of the 22 potentially harmful agents or situations listed in question 7a, nine (41%) elicited major concerns regarding health effects by more than 5% of all servicemembers combined. The twelve most frequently cited exposure concerns are shown by service and by component in Figures 1 and 2, respectively.

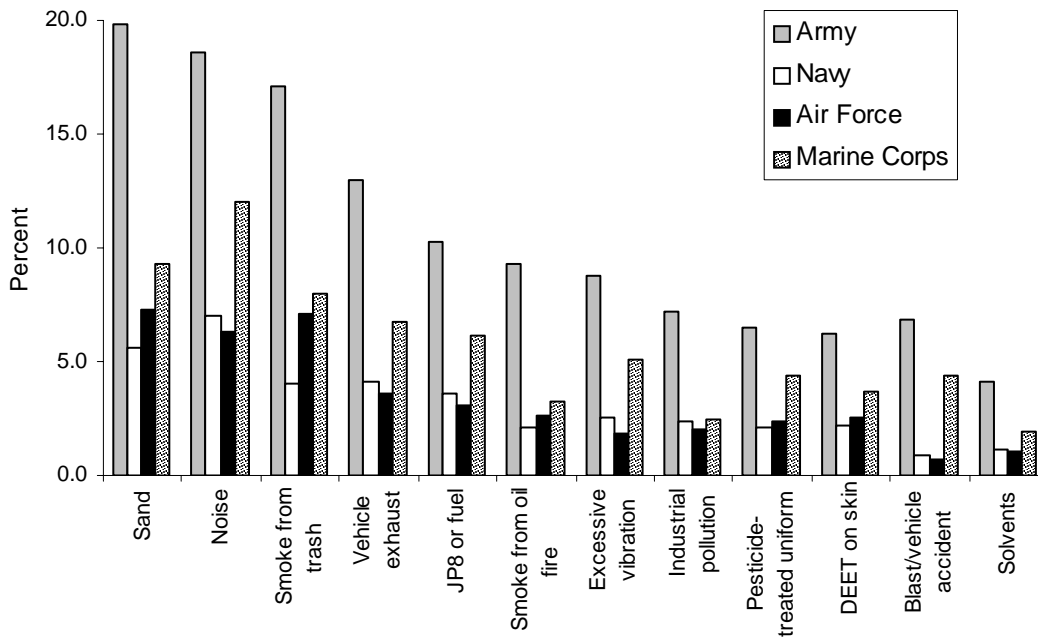
### Health concerns

As with exposure concerns, specific physical health concerns or conditions (other than wounds or injuries) were much more frequently endorsed by members of the Army and Marine Corps compared to the other services (Figure 3) and by members of the Reserve compared to the active component (Figure 4). In general, Reservists endorsed each of the specific health problems or concerns listed on the PDHRA about twice as frequently as active component members. Four health concerns were among the five most frequently endorsed by members of each service and by members of the active and reserve components: back pain; problems sleeping or still feeling tired after sleeping; increased irritability; and swollen, stiff or painful joints. In addition, “ringing of the ears” was among the five most frequently reported concerns of members of the Army, Navy, and Marine Corps and among Reservists. Finally, “headaches” was the fifth most frequently reported health concern of Air Force members and of active component servicemembers.

**Figure 1. Frequency of servicemember exposure concerns reported on the post-deployment health reassessment, September 2005-August 2006**



**Figure 2. Frequency of servicemember exposure concerns reported on the post-deployment health reassessment (DD2900), September 2005-August 2006**

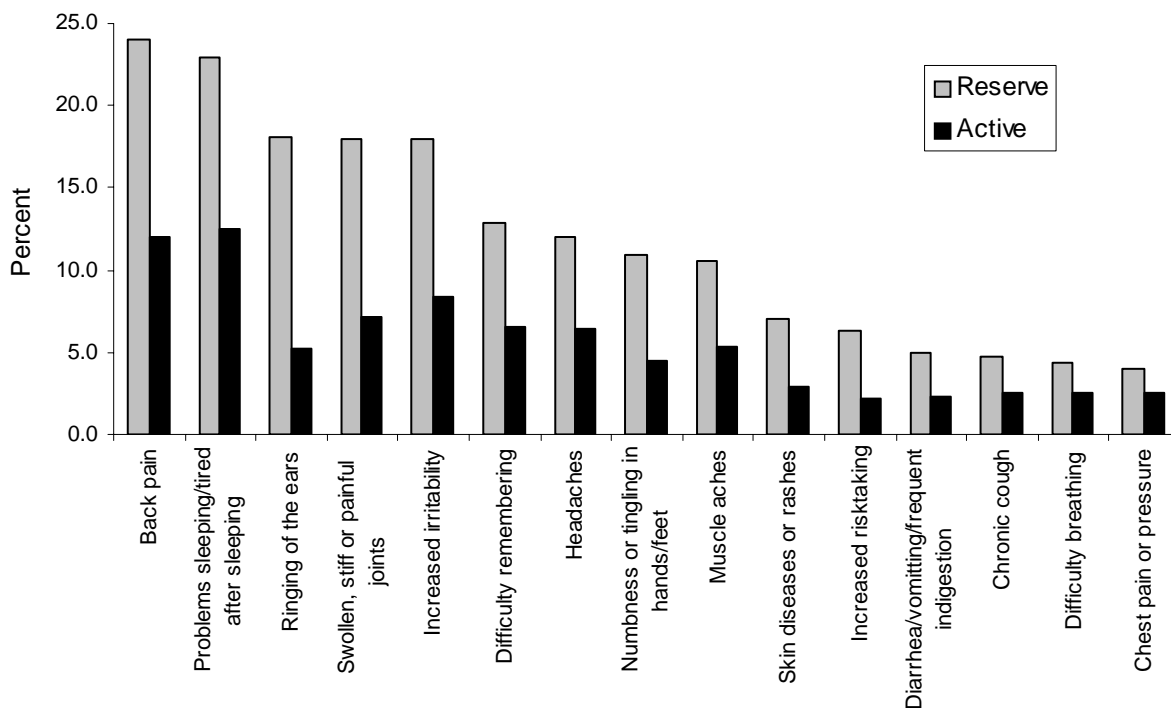


Of the 22 deployment-related health concerns/conditions listed in Question 6a of the PDHRA, 9 (41%) were endorsed by more than 4% of all respondents combined. Fifteen of the most frequently cited health concerns are shown in Figures 3 and 4.

**Editorial comment:** This report documents that members of the Army and Marine Corps are more likely than those of the Air Force and Navy to report concerns regarding the health effects of deployment-related exposures. Also, members of the Army and Marine Corps are much more likely than their counterparts to report current physical health concerns/conditions at the time of post-deployment health reassessments. The findings are not surprising because they do not account for differences in the demographic characteristics, military occupations, or the natures of the activities of the respondents while deployed. If the effects of such factors were accounted for, it is likely that the differences across the Services would be much less.

Of interest, members of the reserve versus active component are much more likely to report concerns regarding the health effects of deployment-related exposures and current health concerns/conditions three to six months after deployment. It seems unlikely that reserve compared to active component members would actually have more or more intense exposures while deployed to virtually every nominally high-risk agent queried on the PDHRA – or that they would have higher rates of virtually every symptom queried three to six months after returning from deployment. It seems more likely that reserve component members, in general, have lower thresholds for endorsing exposure and health concerns potentially related to operational deployments. If so, there are several potential reasons for this increased willingness to report concerns. For example, there are strong personal incentives for reservists to have all of their deployment-related health problems/concerns evaluated — and documented — during the

**Figure 3. Frequency of servicemember health concerns reported on the post-deployment reassessment (DD 2900), by component, September 2005-August 2006**



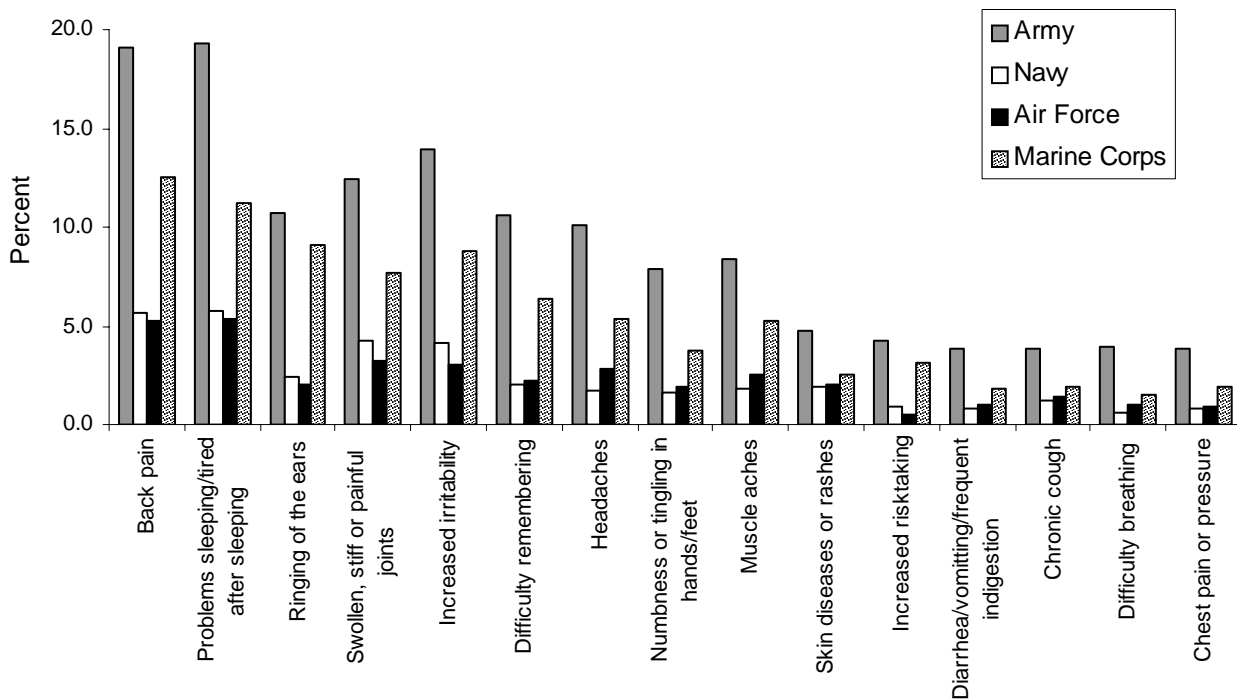
limited time after deployment when they have access to military health care. Also, in general, Reservists are older than their active component counterparts, and older servicemembers have more and greater risks of many health problems. Finally, because active component members are in military service full-time, the stresses associated with long overseas deployments – especially in combat environments – may make

reservists more sensitive to deployment-related exposures and experiences with potentially harmful long-term health effects.

References

1. Post-deployment health reassessment (PDHRA) program U.S.Armed Forces: responses by service and component, September 2005-August 2006. *MSMR* Oct; 12(7): 2-13.

**Figure 4. Frequency of servicemember health concerns reported on the post-deployment health reassessment (DD2900), by service, September 2005-August 2006**



## Update: Pre- and Post-deployment Health Assessments, U.S. Armed Forces, January 2003-October 2006

The June 2003 issue of the *MSMR* summarized the background, rationale, policies, and guidelines related to pre-deployment and post-deployment health assessments of servicemembers.<sup>1-10</sup> Briefly, prior to deploying, the health of each servicemember is assessed to ensure his/her medical fitness and readiness for deployment. At the time of redeployment, the health of each servicemember is again assessed to identify medical conditions and/or exposures of concern to ensure timely and comprehensive evaluation and treatment.

Completed pre- and post-deployment health assessment forms are routinely sent (in hard copy or electronic form) to the Army Medical Surveillance Activity (AMSA) where they are archived in the Defense Medical Surveillance System (DMSS).<sup>11</sup> In the DMSS, data recorded on pre- and post-deployment health assessments are integrated with data that document demographic characteristics, military experiences, and medical encounters of all servicemembers (e.g., hospitalizations, ambulatory visits, immunizations).<sup>11</sup> The continuously expanding DMSS database can be used to monitor the health of servicemembers who participated in major overseas deployments.<sup>11-13</sup>

The overall success of deployment force health protection efforts depends at least in part on the completeness and quality of pre- and post-deployment health assessments. This report summarizes characteristics of servicemembers who completed pre- and post-deployment forms since 1 January 2003, responses to selected questions on pre- and post-deployment forms, and changes in responses of individuals from pre-deployment to post-deployment.

**Methods:** For this update, the DMSS was searched to identify all pre- and post-deployment health assessments (DD Form 2795 and DD Form 2796, respectively) that were completed after 1 January 2003.

**Results:** From 1 January 2003 to 31 October 2006, 1,475,683 pre-deployment health assessments and 1,478,952 post-deployment health assessments were

completed at field sites, shipped to AMSA, and integrated in the DMSS database (Table 1).

In general, the distributions of self-assessments of “overall health” were similar among pre- and post-deployment form respondents (Figure 1). For example, both prior to and after deployment, the most frequent descriptor of “overall health” was “very good.” Of note, however, relatively more pre- (34%) than post- (24%) deployment respondents assessed their overall health as “excellent”; while more post- (41%) than pre- (25%) deployment respondents assessed their overall health as “good,” “fair,” or “poor” (Figure 1).

Among servicemembers (n=751,335) who completed both a pre- and a post-deployment health assessment, fewer than half (44%) chose the same descriptor of their overall health before and after deploying (Figures 2, 3). Of those (n=417,031) who changed their assessments from pre- to post-deployment, three-fourths (75%) changed by a single category (on a five category scale) (Figure 3); and of those who changed by more than one category, nearly 5-times as many indicated a decrement in overall health (n=85697; 11.4% of all respondents) as an improvement (n=18,163; 2.4% of all respondents) (Figure 3).

On post-deployment forms, 22% of active and 40% of Reserve component respondents reported “medical/dental problems” during deployment (Table 2). Among active component respondents, “medical/dental problems” were more frequently reported by soldiers and Marines than by members of the other Services. Among Reservists, members of the Air Force reported “medical/dental problems” much less often than members of the other Services (Table 2).

Approximately 5% and 6% of active and Reserve component respondents, respectively, reported “mental health concerns.” “Mental health concerns” were reported relatively more frequently among soldiers (active: 7%; Reserve: 8%) than members of the other Services (Table 2). Post-deployment forms from approximately one-fifth (18%) of active component and one-fourth (24%) of Reserve component members documented that

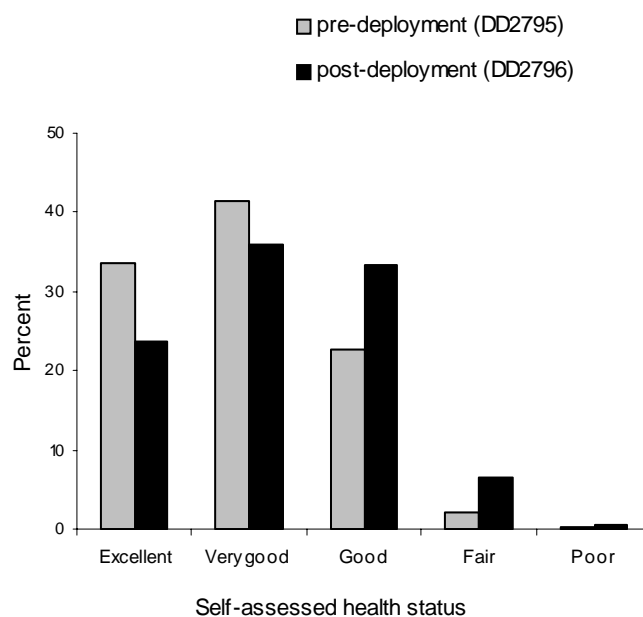
**Table 1. Total pre-deployment and post-deployment health assessments, by month and year, U.S. Armed Forces, January 2003-October 2006**

	Pre-deployment		Post-deployment	
	No.	%	No.	%
<b>Total</b>	<b>1,475,683</b>	<b>100.0</b>	<b>1,478,952</b>	<b>100.0</b>
<b>2003</b>				
January	69,390	4.7	6,221	0.4
February	110,571	7.5	5,077	0.3
March	69,855	4.7	6,755	0.5
April	37,599	2.5	19,350	1.3
May	12,885	0.9	92,882	6.3
June	14,417	1.0	65,381	4.4
July	18,062	1.2	52,902	3.6
August	16,513	1.1	35,154	2.4
September	12,800	0.9	32,447	2.2
October	24,170	1.6	27,047	1.8
November	19,703	1.3	21,542	1.5
December	36,157	2.5	22,242	1.5
<b>2004</b>				
January	70,229	4.8	39,999	2.7
February	39,203	2.7	32,286	2.2
March	22,843	1.5	66,655	4.5
April	19,947	1.4	44,506	3.0
May	27,798	1.9	17,911	1.2
June	24,666	1.7	28,404	1.9
July	22,805	1.5	24,342	1.6
August	34,302	2.3	23,013	1.6
September	32,207	2.2	24,396	1.6
October	35,657	2.4	15,865	1.1
November	36,239	2.5	22,085	1.5
December	38,613	2.6	27,069	1.8
<b>2005</b>				
January	34,691	2.4	56,090	3.8
February	24,766	1.7	70,037	4.7
March	20,887	1.4	53,549	3.6
April	26,992	1.8	19,123	1.3
May	18,783	1.3	21,095	1.4
June	25,597	1.7	19,384	1.3
July	21,630	1.5	17,748	1.2
August	47,318	3.2	29,695	2.0
September	34,499	2.3	40,210	2.7
October	37,201	2.5	37,659	2.5
November	35,216	2.4	38,805	2.6
December	21,238	1.4	56,841	3.8
<b>2006</b>				
January	29,834	2.0	39,253	2.7
February	22,206	1.5	19,522	1.3
March	20,705	1.4	21,031	1.4
April	18,577	1.3	18,477	1.2
May	23,915	1.6	23,529	1.6
June	30,485	2.1	16,819	1.1
July	33,996	2.3	22,381	1.5
August	38,748	2.6	30,379	2.1
September	37,200	2.5	33,089	2.2
October	24,568	1.7	40,705	2.8

“referrals” were indicated (Table 2); and 85% of all active and Reserve component respondents had hospitalizations and/or medical encounters within 6 months after documented post-deployment referrals (Table 2).

During interviews by health care providers, approximately 16% of respondents expressed concerns about possible exposures or events during the deployment that they felt may affect their health (“exposure concerns”) (Table 3). The proportion of respondents who reported exposure concerns has varied from month to month. However, in the active components, rates of exposure concerns increased through calendar year 2003 but have been relatively stable (5-15%) since the spring of 2004 (Figure 4). In the Reserve components, rates of exposure concerns increased through the spring of 2004 and have been relatively high (15-30%) since then (Figure 4). Reports of exposure concerns have been generally higher in the Army than the other services and in the Reserve compared to the active component (Table 3). Finally, prevalences of exposure concerns increase with age (Tables 3, 4).

**Figure 1. Percent distributions of self-assessed health status, pre- and post-deployment, U.S. Armed Forces, January 2003- October 2006**



**Editorial comment:** Since January 2003, approximately 75% of U.S. servicemembers have assessed their overall health as “very good” or “excellent” when they are mobilized and/or prior to deploying overseas; and approximately 60% have assessed their overall health as “very good” or “excellent” at the end of their deployments. Most of the changes in assessments of overall health from pre- to post-deployment have been relatively minor (i.e., one category on a 5-category scale). Still, however, approximately one of nine post-deployers have indicated relatively significant declines (i.e., two or more categories) in their overall health from pre- to post-deployment. The findings are attributable at least in part to the extreme physical and psychological stresses associated with mobilization, overseas deployment, and harsh and dangerous living and working conditions.<sup>14,15</sup>

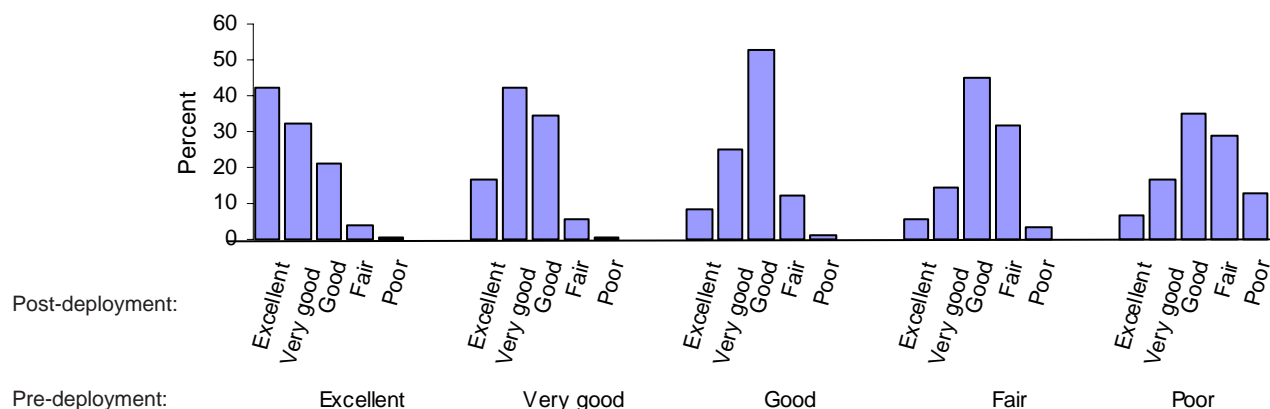
The deployment health assessment process is specifically designed to identify, assess, and follow-up as necessary all servicemembers with concerns regarding their health and/or deployment-related exposures. Overall, for example, approximately one-fifth of all returning soldiers had “referral indications” documented on post-deployment health assessments; and of those, most had documented outpatient visits and/or hospitalizations within 6 months after they returned.

Of interest, “exposure concerns” among post-deploying respondents significantly vary from month to month. Since the beginning of 2004, exposure concerns have been much more common among Reserve compared to active component members. Among both active and Reserve component members, exposure concerns significantly increase with age, and in both components, servicemembers older than 40 are approximately twice as likely as those younger than 20 to report exposure concerns.

#### References

1. Medical readiness division, J-4, JCS. Capstone document: force health protection. Washington, DC. Available at: < <http://www.dtic.mil/jcs/j4/organization/hssd/fhpcapstone.pdf> >.
2. Brundage JF. Military preventive medicine and medical surveillance in the post-cold war era. *Mil Med.* 1998 May;163(5):272-7.
3. Trump DH, Mazzuchi JF, Riddle J, Hyams KC, Balough B. Force health protection: 10 years of lessons learned by the Department of Defense. *Mil Med.* 2002 Mar;167(3):179-85.
4. Hyams KC, Riddle J, Trump DH, Wallace MR. Protecting the health of United States military forces in Afghanistan: applying lessons learned since the Gulf War. *Clin Infect Dis.* 2002 Jun 15;34(Suppl 5):S208-14.
5. DoD instruction 6490.3, subject: Implementation and application of joint medical surveillance for deployments. 7 Aug 1997.
6. 10 USC 1074f, subject: Medical tracking system for members deployed overseas. 18 Nov 1997.
7. ASD (Health Affairs) memorandum, subject: Policy for pre- and post-deployment health assessments and blood samples (HA policy: 99-002). 6 Oct 1998.
8. ASD (Health Affairs) memorandum, subject: Updated policy for pre- and post-deployment health assessments and blood samples (HA policy: 01-017). 25 Oct 2001.
9. JCS memorandum, subject: Updated procedures for deployment health surveillance and readiness (MCM-0006-02). 1 Feb 2002.
10. USD (Personnel and Readiness) memorandum, subject: Enhanced post-deployment health assessments. 22 Apr 2003.
11. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense Serum Repository: glimpses of the future of comprehensive public health surveillance. *Am J Pub Hlth.* 2002 Dec;92(12):1900-4.
12. Brundage JF, Kohlhase KF, Gambel JM. Hospitalization experiences of U.S. servicemembers before, during, and after participation in peacekeeping operations in Bosnia-Herzegovina. *Am J Ind Med.* 2002 Apr;41(4):279-84.
13. Brundage JF, Kohlhase KF, Rubertone MV. Hospitalizations for all causes of U.S. military service members in relation to participation in Operations Joint Endeavor and Joint Guard, Bosnia-Herzegovina, January 1995 to December 1997. *Mil Med.* 2000 Jul;165(7):505-11.
14. Trump DH. Self-rated health and health care utilization after military deployments. *Mil Med.* 2006 Jul;171(7):662-8.
15. Hyams KC, Wignall FS, Roswell R. War syndromes and their evaluation: from the U.S. Civil War to the Persian Gulf War. *Ann Intern Med.* 1996 Sep 1;125(5):398-405.
16. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med.* 2004 Jul 1;351(1):13-22.
17. Hoge CW, Auchterlonie JL, Milliken CS. Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA.* 2006 Mar 1;295(9):1023-32.

**Figure 2. Self-assessed health status on post-deployment form, in relation to self-assessed health status on pre-deployment form, U.S. Armed Forces, January 2003- October 2006**



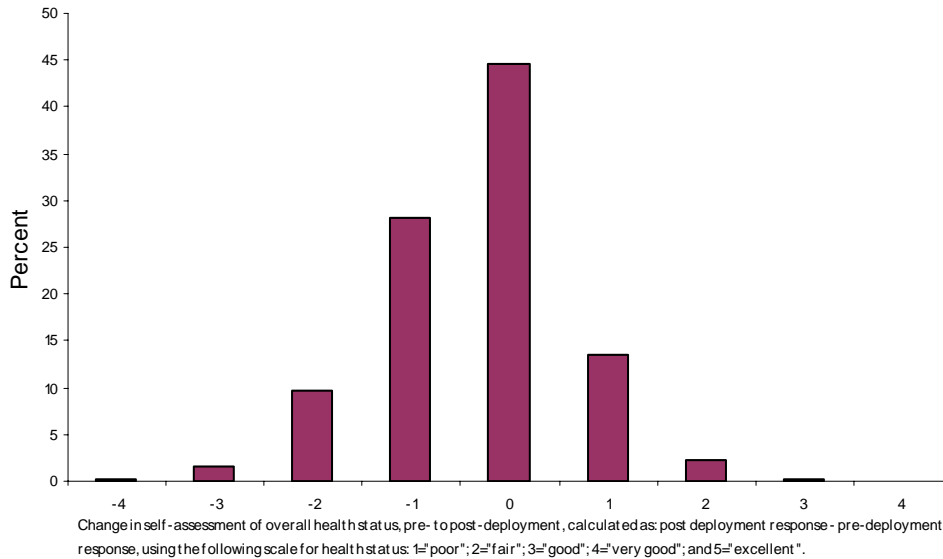
**Table 2. Responses to selected questions from post-deployment forms (DD2796) by service and component, US Armed Forces, January 2003-October 2006**

	Army	Navy	Air Force	Marine Corps	Total
<b>Active component</b>					
<b>SMs with DD 2796 in DMSS</b>	<b>326,217</b>	<b>103,972</b>	<b>130,891</b>	<b>91,001</b>	<b>652,081</b>
Electronic version	82%	7%	75%	14%	60%
General health ("fair" or "poor")	9%	5%	2%	6%	6%
Medical/dental problems during deploy	30%	12%	12%	20%	22%
Currently on profile	11%	2%	2%	3%	7%
Mental health concerns	7%	3%	1%	2%	5%
Exposure concerns	17%	5%	4%	10%	11%
Health concerns	13%	6%	6%	9%	10%
Referral indicated	27%	7%	10%	13%	18%
Med. visit following referral <sup>1</sup>	88%	72%	89%	65%	85%
Post deployment serum <sup>2</sup>	86%	82%	90%	89%	86%
<b>Reserve component</b>					
<b>SMs with DD 2796 in DMSS</b>	<b>288,192</b>	<b>16,937</b>	<b>47,573</b>	<b>19,779</b>	<b>372,481</b>
Electronic version	74%	15%	66%	17%	67%
General health ("fair" or "poor")	11%	6%	2%	8%	10%
Medical/dental problems during deploy	45%	36%	15%	35%	40%
Currently on profile	14%	4%	2%	3%	12%
Mental health concerns	8%	3%	1%	3%	6%
Exposure concerns	25%	20%	8%	25%	23%
Health concerns	22%	21%	11%	22%	21%
Referral indicated	27%	19%	11%	23%	24%
Med. visit following referral <sup>1</sup>	89%	79%	58%	56%	85%
Post deployment serum <sup>2</sup>	93%	91%	70%	89%	90%

<sup>1</sup> Inpatient or outpatient visit within 6 months after referral.

<sup>2</sup> Only calculated for DD 2796 completed since 1 June 2003.

**Figure 3. Distribution of changes in self-assessed health status as reported on pre- and post-deployment forms, U.S. Armed Forces, January 2003-October 2006**

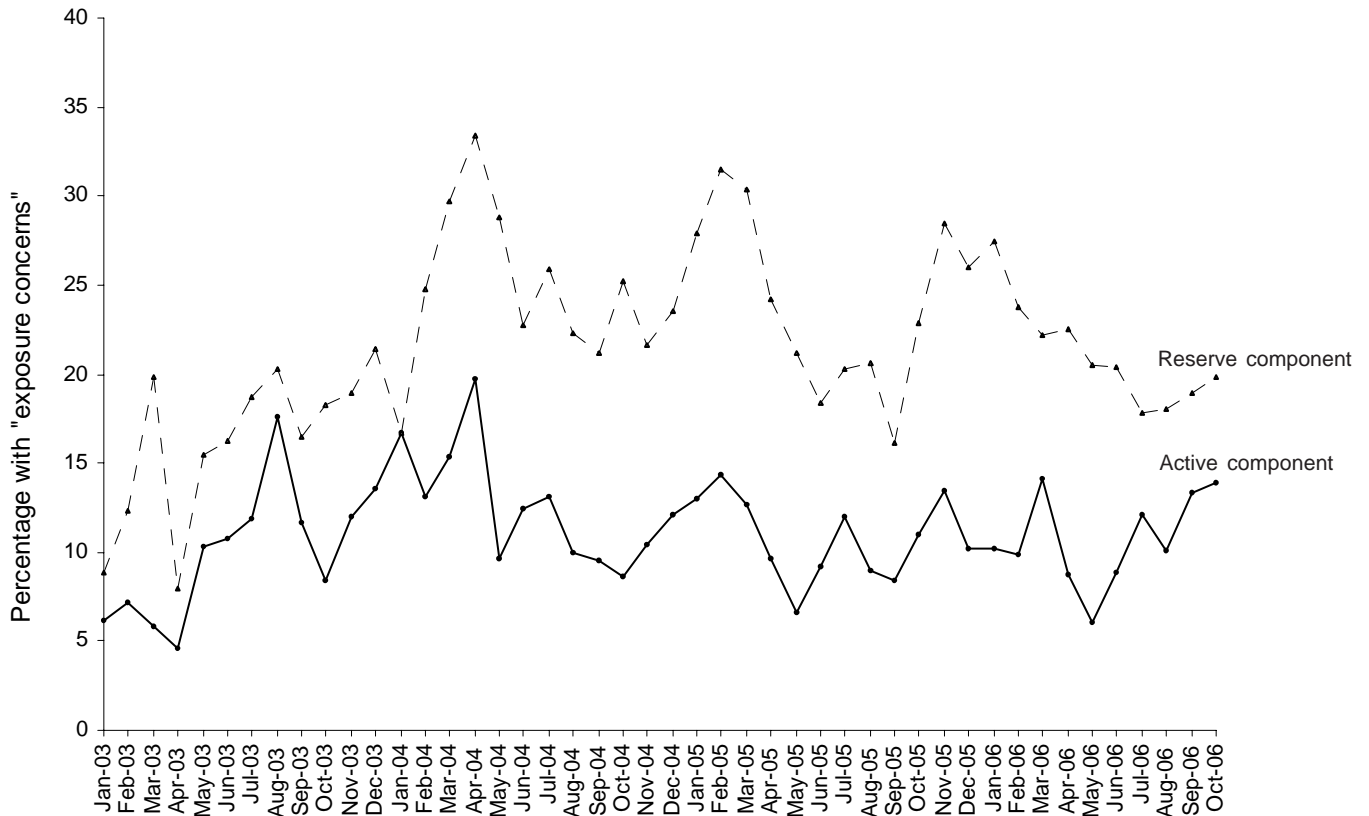


**Table 3. Reports of exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2003-October 2006**

	Total <sup>1</sup>	Exposure concerns	% with exposure concerns
<b>Total</b>	<b>1,019,066</b>	<b>159,916</b>	<b>15.7</b>
<b>Component</b>			
Active	648,728	74,742	11.5
Reserve	370,338	85,174	23.0
<b>Service</b>			
Army	612,048	127,834	20.9
Navy	119,302	8,154	6.8
Air Force	177,885	9,489	5.3
Marine Corps	109,831	14,439	13.1
<b>Age (years)</b>			
<20	24,510	1,948	7.9
20-29	542,824	70,399	13.0
30-39	281,423	48,983	17.4
>39	170,287	38,586	22.7
<b>Gender</b>			
Men	903,535	139,891	15.5
Women	115,530	20,025	17.3
<b>Race/ethnicity</b>			
Black	174,549	29,780	17.1
Hispanic	100,651	17,185	17.1
Other	2,499	247	9.9
White	669,830	101,513	15.2
<b>Grade</b>			
Enlisted	886,057	137,619	15.5
Officer	132,939	22,296	16.8

<sup>1</sup>Totals do not include non-responses/missing data.

**Figure 4. Proportion of post-deployment forms that include reports of exposure concerns, by month, U.S. Armed Forces, January 2003-October 2006**

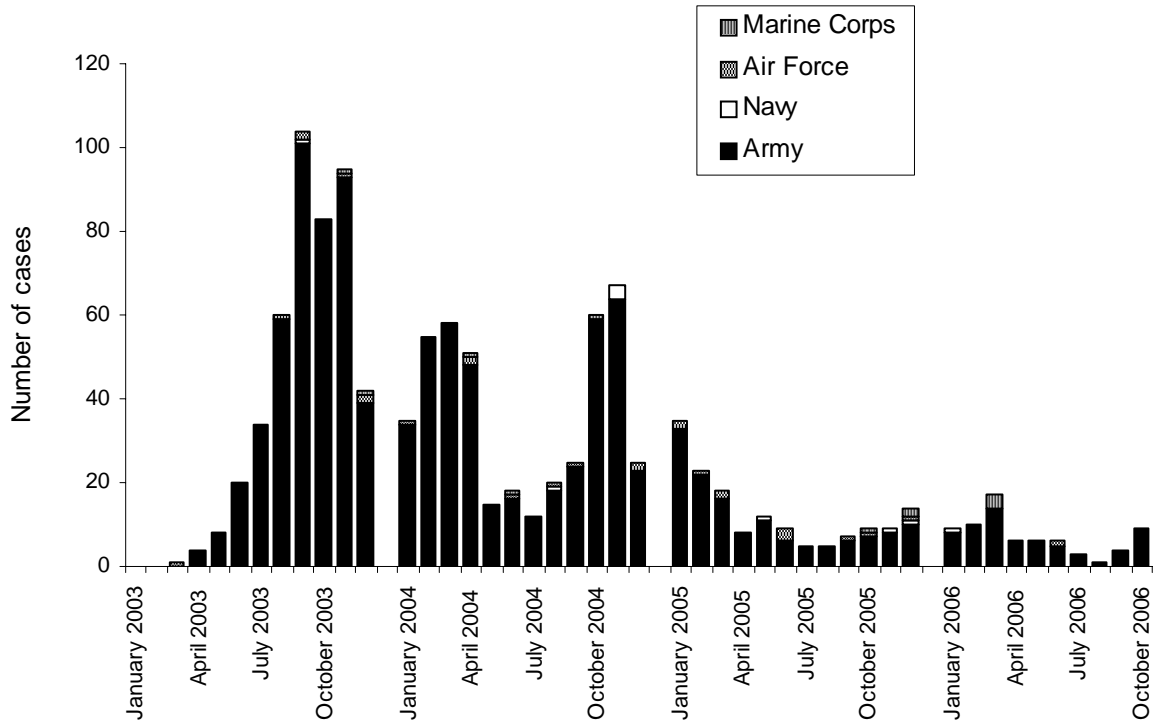


**Table 4. Proportion of post-deployment forms that include reports of exposure concerns, by age group and component, U.S. Armed Forces, January 2003-October 2006**

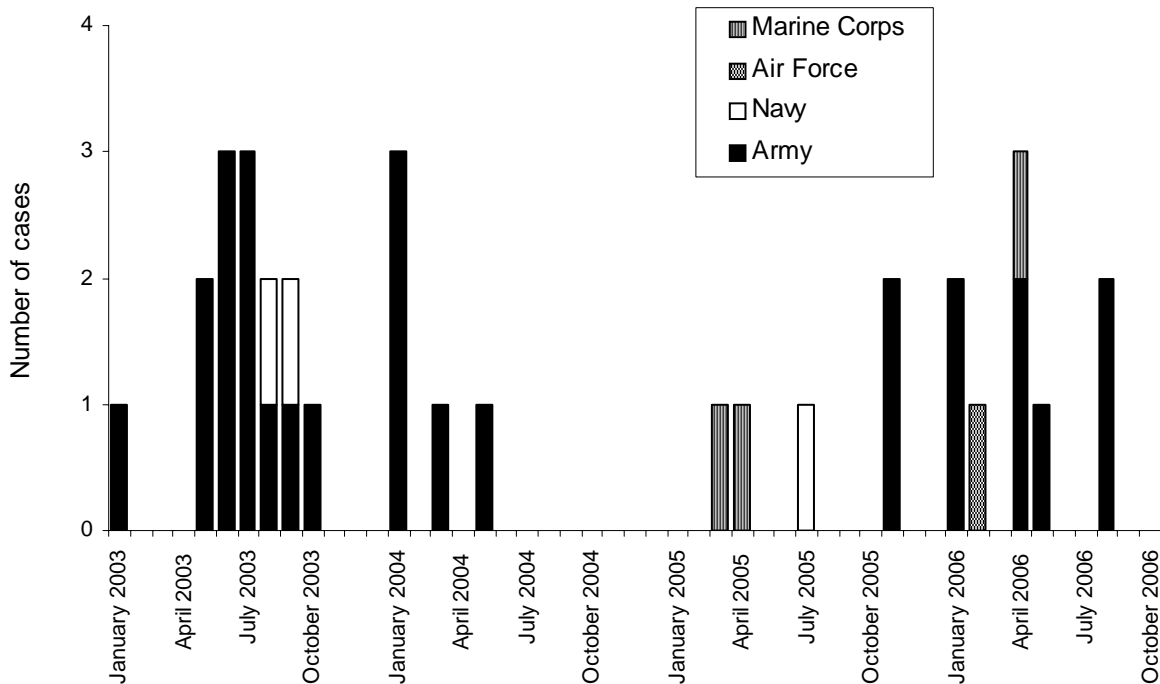
Age group	Active	Reserve
<20	6.4	13.9
20-29	10.4	20.3
30-39	13.1	23.8
>39	16.2	26.0

### Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-October 2006

#### Leishmaniasis (ICD-9-CM: 085.0-85.5)<sup>1</sup>



#### Acute respiratory failure/ARDS (ICD-9-CM:518.81, 518.82)<sup>2</sup>

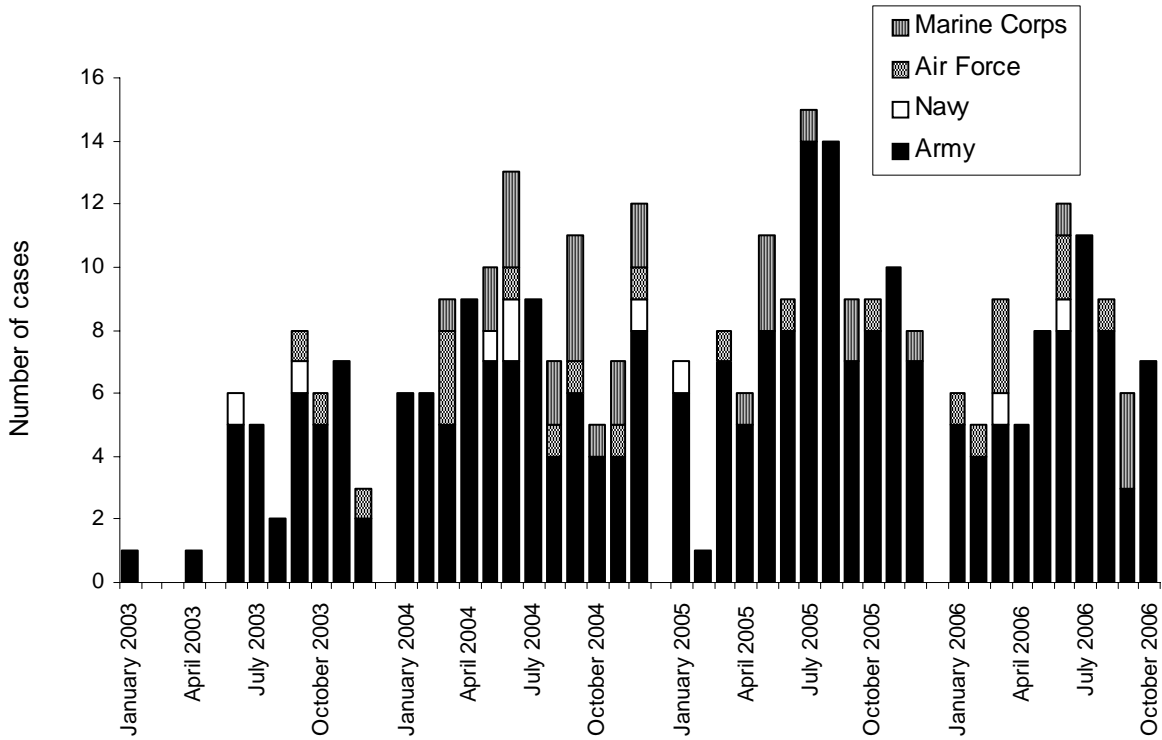


Footnotes:

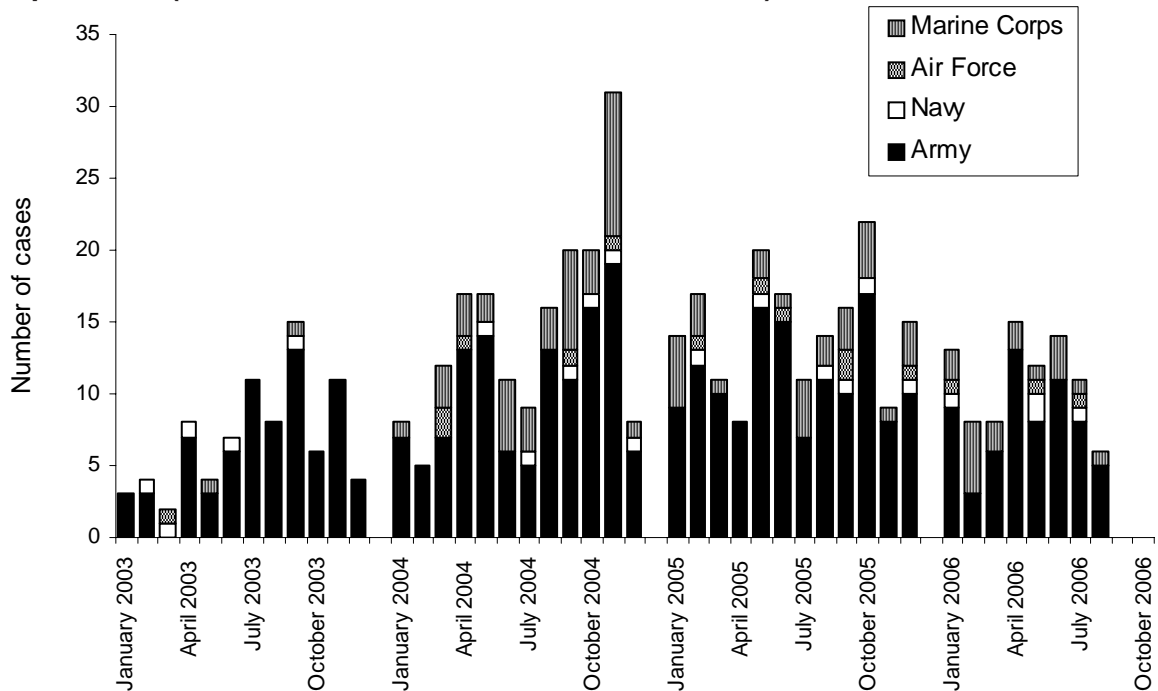
<sup>1</sup> Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.

<sup>2</sup> Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

**Deep vein phlebitis/thromboembophlebitis and/or pulmonary embolism/infarction (ICD-9-CM: 541.1, 451.81, 415.1)<sup>3</sup>**



**Amputations (ICD-9-CM: 84.0, 84.1, 887, 896, V49.6, V49.7)<sup>4</sup>**



Footnotes:

<sup>3</sup> Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF.

<sup>4</sup> Indicator diagnosis (one per individual) during a hospitalization of a servicemember during/after service in OEF/OIF.

**Sentinel reportable events for all beneficiaries<sup>1</sup> at U.S. Army medical facilities,  
cumulative numbers<sup>2</sup> for calendar years through October 31, 2005 and 2006**

Reporting location	Number of reports all events <sup>3</sup>		Food-borne								Vaccine Preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
<b>NORTH ATLANTIC</b>																
Washington, DC Area	376	248	4	4	9	4	5	3	5	.	.	.	3	1	2	.
Aberdeen, MD	69	11	.	.	.	.	.	.	1	.	.	.	.	.	.	.
FT Belvoir, VA	332	304	8	11	.	1	8	9	1	2	.	.	1	.	.	5
FT Bragg, NC	1,418	1,523	6	11	.	.	23	29	3	.	.	.	.	.	.	.
FT Drum, NY	209	180	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	262	215	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Knox, KY	252	259	4	.	.	2	4	.	.	1	.	.	.	.	.	.
FT Lee, VA	177	314	.	.	.	.	.	.	.	.	.	.	.	.	.	5
FT Meade, MD	112	108	.	.	.	.	1	2	.	.	.	.	.	1	1	.
West Point, NY	45	54	.	.	.	.	.	1	.	.	.	.	.	3	.	.
<b>GREAT PLAINS</b>																
FT Sam Houston, TX	445	314	.	.	.	1	5	1	2	.	.	2	9	4	.	.
FT Bliss, TX	361	473	1	.	4	2	3	10	6	2	.	3	.	2	.	1
FT Carson, CO	680	727	5	1	3	3	4	4	.	.	1	2	.	.	.	.
FT Hood, TX	2,168	1,470	6	5	1	2	10	12	4	13	.	.	.	.	.	1
FT Huachuca, AZ	66	86	1	.	.	.	.	11	.	.	.	.	.	.	.	.
FT Leavenworth, KS	48	48	.	.	.	4	1	.	1	.	.	.	.	.	.	.
FT Leonard Wood, MO	329	285	1	.	1	5	1	2	.	.	.	.	.	.	2	6
FT Polk, LA	233	217	1	2	1	1	4	1	.	.	.	2	1	.	.	.
FT Riley, KS	252	254	.	2	2	.	2	.	.	.	.	.	.	.	.	.
FT Sill, OK	146	215	.	.	1	.	.	1	1	.	.	.	.	.	.	2
<b>SOUTHEAST</b>																
FT Gordon, GA	371	408	.	.	.	.	.	.	.	.	.	.	7	11	2	1
FT Benning, GA	304	423	2	2	1	1	9	12	2	2	.	.	.	.	.	.
FT Campbell, KY	786	551	3	1	1	.	9	1	4	.	.	.	.	.	1	.
FT Jackson, SC	193	245	.	.	.	.	.	.	.	.	2	.	.	1	.	1
FT Rucker, AL	31	74	.	1	.	.	.	3	.	.	.	.	.	.	.	.
FT Stewart, GA	503	735	.	.	2	.	15	7	27	5	8	3	30	8	1	3
<b>WESTERN</b>																
FT Lewis, WA	470	527	4	.	.	.	1	5	.	.	.	.	.	1	.	1
FT Irwin, CA	67	99	.	1	.	.	.	.	.	1	.	.	1	.	.	.
FT Wainwright, AK	133	174	3	.	.	.	2	3	.	.	.	.	.	.	1	1
<b>OTHER LOCATIONS</b>																
Hawaii	733	845	32	36	6	1	12	11	4	2	1	1	1	.	1	2
Europe	1,395	793	14	12	1	2	24	23	1	.	3	2	6	2	3	1
Korea	463	545	.	.	.	.	.	.	.	.	1	.	1	3	.	5
<b>Total</b>	<b>13,429</b>	<b>12,724</b>	<b>95</b>	<b>89</b>	<b>33</b>	<b>29</b>	<b>144</b>	<b>151</b>	<b>62</b>	<b>28</b>	<b>16</b>	<b>15</b>	<b>60</b>	<b>37</b>	<b>14</b>	<b>35</b>

<sup>1</sup> Includes active duty servicemembers, dependents, and retirees.

<sup>2</sup> Events reported by Nov 7, 2005 and 2006.

<sup>3</sup> Seventy events specified by Tri-Service Reportable Events, Version 1.0, July 2000.

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

**Sentinel reportable events for all beneficiaries<sup>1</sup> at U.S. Army medical facilities,  
cumulative numbers<sup>2</sup> for calendar years through October 31, 2005 and 2006**

Reporting location	Arthropod-borne				Sexually Transmitted								Environmental				
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis <sup>4</sup>		Urethritis <sup>5</sup>		Cold		Heat		
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	
<b>NORTH ATLANTIC</b>																	
Washington, DC Area	1	3	3	3	156	141	23	23	8	3	.	1	1	.	2	.	
Aberdeen, MD	4	.	.	.	28	8	3	1	2	.	.	.	.	.	.	.	
FT Belvoir, VA	1	2	.	.	193	167	37	39	.	.	.	.	.	.	.	.	
FT Bragg, NC	.	2	.	21	970	1,041	191	155	2	4	90	115	1	2	112	135	
FT Drum, NY	.	.	.	.	149	161	11	19	.	.	.	.	2	.	1	.	
FT Eustis, VA	.	.	.	.	142	143	32	44	.	.	.	.	2	.	39	19	
FT Knox, KY	1	6	1	.	156	180	25	43	.	2	.	.	4	3	20	11	
FT Lee, VA	1	.	.	.	142	239	28	40	.	.	.	.	1	.	5	3	
FT Meade, MD	.	.	.	.	100	90	10	13	.	.	.	1	.	.	.	.	
West Point, NY	6	16	.	.	26	24	2	.	.	.	.	.	1	1	3	2	
<b>GREAT PLAINS</b>																	
FT Sam Houston, TX	.	.	.	.	269	229	82	62	7	6	.	.	.	.	11	1	
FT Bliss, TX	.	.	1	1	160	268	36	48	4	4	.	.	.	.	14	9	
FT Carson, CO	.	.	4	.	478	520	62	86	.	.	22	36	1	.	.	.	
FT Hood, TX	.	.	1	1	1,303	977	433	229	1	.	192	36	.	.	139	32	
FT Huachuca, AZ	.	.	.	.	48	66	14	8	.	.	.	.	.	1	2	.	
FT Leavenworth, KS	.	.	.	.	38	39	5	5	.	.	.	.	1	.	2	.	
FT Leonard Wood, MO	.	.	1	.	199	196	47	19	2	.	1	.	4	.	19	15	
FT Polk, LA	.	.	1	1	136	117	34	33	1	2	.	.	.	.	48	58	
FT Riley, KS	.	1	.	.	148	207	49	25	.	.	.	.	5	.	11	10	
FT Sill, OK	.	.	.	.	54	65	31	24	1	2	.	.	.	.	31	58	
<b>SOUTHEAST</b>																	
FT Gordon, GA	.	.	2	.	227	293	26	65	1	.	.	3	.	.	53	4	
FT Benning, GA	.	.	2	1	149	247	50	73	1	.	.	.	1	.	84	76	
FT Campbell, KY	2	.	1	.	530	386	92	53	.	.	.	.	1	.	68	33	
FT Jackson, SC	.	.	.	.	151	203	25	36	.	.	1	.	.	.	6	.	
FT Rucker, AL	.	.	.	.	21	53	9	5	.	1	.	.	.	.	.	10	
FT Stewart, GA	3	3	.	3	227	446	93	130	1	2	13	18	1	1	40	87	
<b>WESTERN</b>																	
FT Lewis, WA	1	.	5	9	318	408	51	66	.	1	67	25	.	.	2	.	
FT Irwin, CA	.	.	.	.	46	72	15	11	.	3	.	.	.	.	4	10	
FT Wainwright, AK	.	.	1	17	94	113	9	14	1	.	.	.	14	16	.	.	
<b>OTHER LOCATIONS</b>																	
Hawaii	.	.	13	6	493	599	72	76	.	.	.	.	.	.	14	34	
Europe	41	30	5	14	906	504	231	149	2	4	1	1	5	.	4	5	
Korea	.	.	9	13	369	429	60	70	2	3	.	.	3	2	13	12	
<b>Total</b>	<b>61</b>	<b>63</b>	<b>50</b>	<b>90</b>	<b>8,426</b>	<b>8,631</b>	<b>1,888</b>	<b>1,664</b>	<b>36</b>	<b>37</b>	<b>387</b>	<b>236</b>	<b>48</b>	<b>26</b>	<b>747</b>	<b>624</b>	

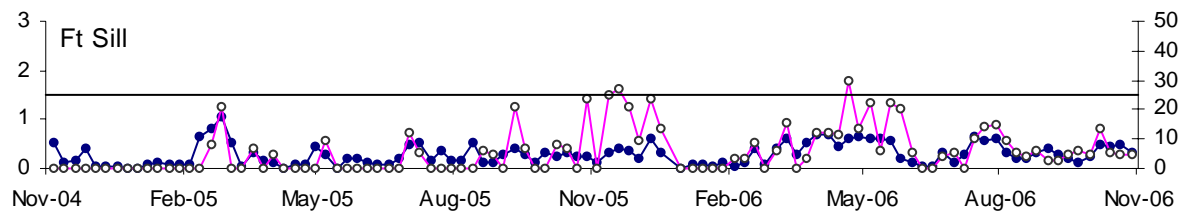
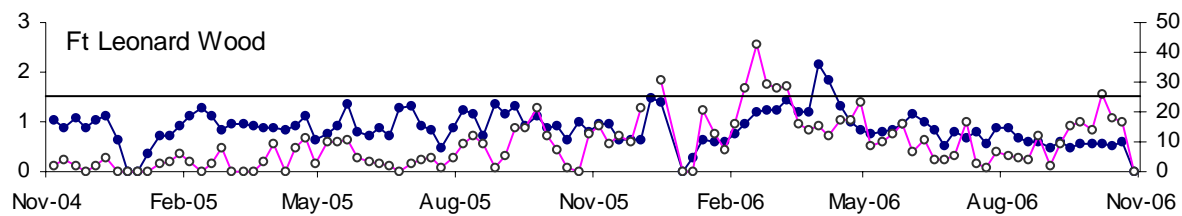
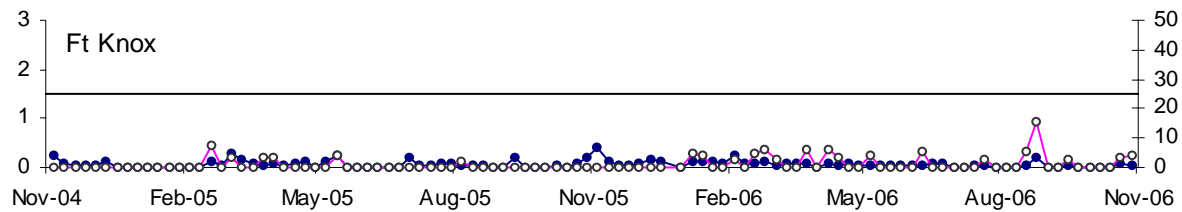
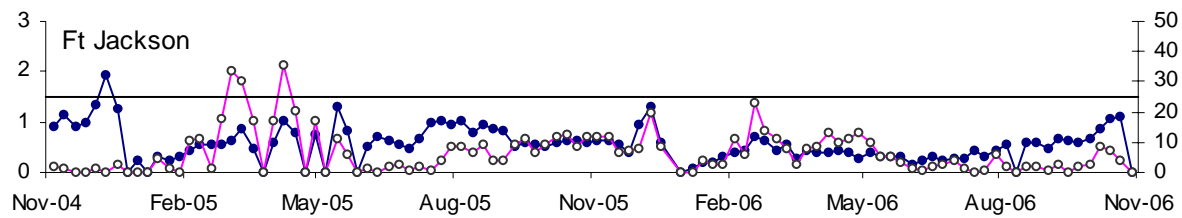
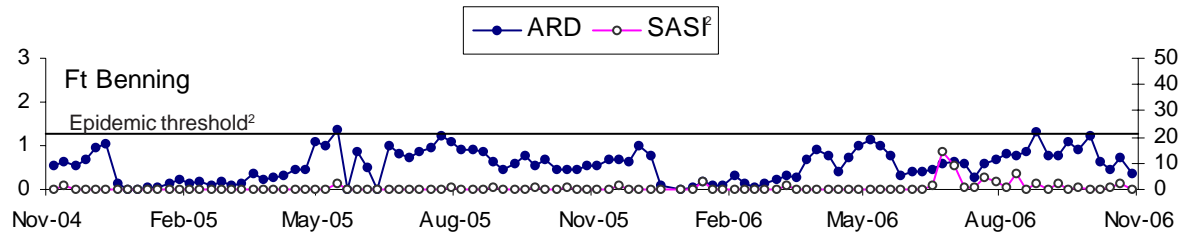
<sup>1</sup> Primary and secondary.

<sup>4</sup> Urethritis, non-gonococcal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

### Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army basic training centers, by week through October 31, 2006



<sup>1</sup> ARD rate = cases per 100 trainees per week

<sup>2</sup> SASI (Strep ARD surveillance index) = (ARD rate)x(rate of Group A beta-hemolytic strep)

<sup>3</sup> ARD rate  $\geq 1.5$  or SASI  $\geq 25.0$  for 2 consecutive weeks indicates an "epidemic"

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