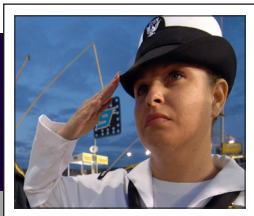




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Health of Women after Deployment in Support of Operation Enduring Freedom/ Operation Iraqi Freedom, Active Component, U.S. Armed Forces

In recent years, the operational importance of women to the U.S. military has increased. Women account for approximately one-seventh (14%) of the active component and approximately 10% of all U.S. military deployers to Afghanistan and Iraq.

There are significant threats to the health of all participants in military operations during wartime (e.g., battle injuries, post traumatic stress disorder (PTSD), traumatic brain injury (TBI), endemic infectious diseases, military equipment-related accidents). In addition, there may be unique threats to the health of women in combat environments.

The natures and relative importance of deployment-specific threats to the health of women are difficult to define. Several studies have illuminated factors that affect the health and performance of women in military service in general.¹ Studies of female veterans of wartime service have been informative regarding their health concerns during and after their deployments.²⁻⁴ Health concerns related to combat have been eloquently described by women who have served in various military occupations, during various operations, at various locations, and at various times. However, the experiences of individuals or selected groups of female combat service veterans may not be generalizable to female participants in combat operations in general or to OEF/OIF deployers specifically.

The objectives of this analysis were to identify and characterize the illnesses and injuries that occurred at higher than expected rates among all female participants in OEF/OIF within two years after they returned from deployment. To this end, "expected rates" were derived from the illness and injury experiences of three cohorts of U.S. service members that were considered comparable in many ways to female deployers to OEF/OIF. The three cohorts used as referents for this analysis were female deployers to OEF/OIF 7-12 months before they deployed; male service members after they returned from OEF/OIF; and female service members after they returned from assignments in Korea.

During comparable followup intervals, rates of illnesses and injuries among female OEF/OIF deployers were compared against rates (adjusted to control for confounding) among each of the referent cohorts. Illness and injury-specific rates that were much higher among female OEF/OIF deployers than in the referent cohorts (after adjustment) were considered potentially related to OEF/OIF service.

Methods:

The surveillance population included all members of the active component of the U.S. Armed Forces who began

deployments to OIF/OEF or assignments to Korea any time between 1 January 2002 and 30 June 2007.

"Exposed" cohort: For analysis purposes, the "exposed" cohort included all female members of the surveillance population who deployed to and returned from Operation Enduring Freedom (OEF) in Afghanistan or Operation Iraqi Freedom (OIF) any time during the surveillance period. The start and end dates of each OEF/OIF deployment were ascertained from records routinely provided to the Armed Forces Health Surveillance Center by the Defense Manpower Data Center.

Followup intervals: For each member of the exposed cohort, all medical encounters from one year prior to the start date to two years after the end date of each OEF/OIF deployment were ascertained from records of hospitalizations and ambulatory visits (in U.S. military medical facilities and from purchased care providers) routinely maintained in the Defense Medical Surveillance System (DMSS). Of these medical encounters, those with primary (first listed) diagnoses indicative of a current illness or injury (ICD-9-CM codes 001-999) that occurred prior to the individual's first ever OEF/OIF deployment or within 24 months after any OEF/OIF deployment were used for analyses.

For analysis purposes, predeployment and postdeployment followup periods were divided into six followup intervals of 6-months duration each.

Predeployment followup intervals:

- Interval 1: Seven to 12 months prior to the start of each deployer's first ever OEF/OIF deployment;
- Interval 2: One day to 6 months prior to the start of each deployer's first ever OEF/OIF deployment;

Postdeployment followup intervals:

- Interval 3: One day to 6 months after the end of each OEF/OIF deployment;
- Interval 4: Seven to 12 months after the end of each OEF/OIF deployment;
- Interval 5: Thirteen to 18 months after the end of each OEF/OIF deployment;
- Interval 6: Nineteen to 24 months after the end of each OEF/OIF deployment.

"Referent" cohorts: To detect specific illnesses and injuries most likely related to OEF/OIF deployment, the illness and injury experiences of female deployers after they returned from OEF/OIF were compared against the experiences of three referent cohorts. Referent experiences were documented by diagnoses reported during medical encounters of the following cohorts during the followup periods:

<i>Referent cohort</i>	<i>Followup periods</i>
Female deployers to OEF/OIF	Seven to 12 months prior to the start of each deployer's first ever OEF/OIF deployment
Females assigned to Korea	Post-assignment followup intervals (corresponding to the postdeployment followup intervals of the exposed cohort)
Male deployers to OEF/OIF	Same postdeployment followup intervals as the exposed cohort

“Observed” rates of incident medical encounters for specific illnesses and injuries, by followup interval: After each medical encounter of a military member, the illness or injury primarily responsible for the encounter is reported as the primary (first listed) diagnosis on the standardized medical record (in accordance with the ICD-9-CM). For this analysis, interval-specific incidence rates of medical encounters for each illness and injury (defined at the 3-digit level of the ICD-9-CM) were calculated by dividing the number of incident medical encounters for each illness and injury during the interval by the total active military service (in days) of all cohort members during the interval. If a cohort member had more than one medical encounter for a specific illness or injury during an interval, only the first was considered the incident medical encounter for rate calculations.

“Expected” rates of incident medical encounters for specific illnesses and injuries, by followup interval: To account for confounding differences between female OEF/OIF deployers and each referent cohort, “expected rates” were estimated by adjusting the rates of illnesses and injuries observed in each referent cohort during each followup interval. To this end, for each followup interval, rates of incident medical encounters for all illnesses and injuries among female OEF/OIF deployers were plotted against the corresponding rates in each referent cohort; in general, the rates were highly correlated (**Figure 1, Table 1**). The slopes of the regression lines that best summarized the relationships between illness and injury rates among female OEF/OIF deployers and those in each referent cohort during each followup interval were used as “adjustment factors” (to control for effects of differences between female OEF/OIF deployers and each referent cohort) (**Table 1**). Expected rates of incident medical encounters for each illness and injury during each followup interval were estimated by multiplying each illness and injury rate observed in each referent cohort during each followup interval by the corresponding adjustment factor.

Illnesses and injuries with the largest “excess incidence rates” among female OEF/OIF deployers: For each illness and injury during each followup interval, the differences between the observed rates among female OEF/OIF deployers and the corresponding expected rates (adjusted referent rates) were

calculated. Illnesses and injuries with the largest differences between the observed and expected rates (“excess incidence”) were considered conditions potentially associated with experiences or exposures of female OEF/OIF deployers. Conditions that are gender-specific (e.g., pregnancy-related conditions; disorders of prostate, testis, cervix, uterus, ovaries) were excluded from comparisons of rates among female and male OEF/OIF deployers.

All data used for analyses were derived from records routinely maintained in the Defense Medical Surveillance System (DMSS).

Results:

During the surveillance period, 108,669 female active component service members completed 142,054 deployments to OEF/OIF; these women provided 199,914 years of active military service within two years after returning from an OEF/OIF deployment (and prior to subsequent OEF/OIF deployment or Korea assignment). During the period, 869,778 male active component members completed 1,269,881 deployments to OEF/OIF, and 21,252 females completed 21,661 assignments to Korea. These referent cohorts provided 1,689,506 and 29,363 person-years, respectively, of post-OEF/OIF deployment/post-Korea assignment followup time.

Observed rates of incident medical encounters for illnesses/injuries, female deployers after returning from OEF/OIF compared to --

Female OEF/OIF deployers, 7-12 months before OEF/OIF deployment: Among female OEF/OIF deployers, rates of illnesses and injuries were generally lower during the first two years after returning from deployment compared to 7-12 months before deployment. In general, illness and injury rates were 6%, 11%, 14%, and 16% lower 0-6, 7-12, 13-18, and 19-24 months after returning from deployment, respectively, compared to 7-12 months before deployment (**Figure 1a, Table 1**).

Male OEF/OIF deployers, during corresponding postdeployment intervals: Among female compared to male OEF/OIF deployers, incidence rates of illnesses and injuries were generally higher throughout the first two years after returning from deployment. In general, incidence rates were 53%, 45%, 47%, and 44% higher among females than males 0-6, 7-12, 13-18, and 19-24 months after returning from deployment, respectively (**Figure 1c, Table 1**).

Females assigned to Korea, during comparable post-assignment intervals: Among females who served in OEF/OIF compared to those who served in Korea, incidence rates of illnesses and injuries were generally lower during the first two years after their respective overseas assignments. In general, incidence rates were 16%-18% lower among those who served in OEF/OIF than Korea throughout the first

two years after completing their overseas assignments (**Figure 1b, Table 1**).

Largest differences between observed and expected rates (“excess incidence”) among female OEF/OIF deployers (Table 2, Figure 2):

Female OEF/OIF deployers, 19-24 months after returning from deployment compared to 7-12 months before deployment: Among female deployers to OEF/OIF, the largest increases in rates of specific illnesses/injuries from pre- to post-deployment were for:

- Disorders of the back and neck, including ICD-9-CM 724 “other, unspecified disorders of the back,” rate difference (RD): 50.9 per 1000 person-years (p-yrs); ICD-9-CM 722 “intervertebral disc disorders,” RD: 24.0 per 1000 p-yrs; and ICD-9-CM 723 “other disorders of the cervical region,” RD: 22.5 per 1000 p-yrs;

- Mental disorders, including ICD-9-CM 309 “adjustment reaction,” RD: 33.6 per 1000 p-yrs; ICD-9-CM 300 “anxiety, dissociative, and somatoform disorders,” RD: 23.7 per 1000 p-yrs; ICD-9-CM 311 “depressive disorder not elsewhere classified,” RD: 23.1 per 1000 p-yrs; and ICD-9-CM 296 “episodic mood disorders,” RD: 22.2 per 1000 p-yrs;

- Migraine: ICD-9-CM 346 “migraine,” RD: 29.2 per 1000 p-yrs; and

- Conditions related to pregnancy, labor, delivery, and female infertility.

Female compared to male OEF/OIF deployers, 19-24 months after deployment: Among deployers to OEF/OIF, the illnesses and injuries that were most excessive among females compared to males 19-24 months after they returned from OEF/OIF were:

- Conditions identified during routine periodic preventive care, including ICD-9-CM 795 “nonspecific abnormal histological and immunological findings” (e.g., abnormal Papanicolaou smear of the cervix), RD: 78.8 per 1000 p-yrs; and ICD-9-CM 367 “disorders of refraction and accommodation” (imperfect vision), RD: 17.2 per 1000 p-yrs;

- Abdominal and digestive system conditions (without specific diagnoses), including ICD-9-CM 789 “other symptoms involving the abdomen and pelvis” (includes abdominal pain), RD: 50.4 per 1000 p-yrs; ICD-9-CM 787 “symptoms involving the digestive system” (includes diarrhea, nausea, and vomiting), RD: 23.4 per 1000 p-yrs; ICD-9-CM 558 “other and unspecified noninfectious gastroenteritis and colitis,” RD: 14.6 per 1000 p-yrs; ICD-9-CM 564 “functional digestive disorders, not elsewhere classified,” RD: 14.4 per 1000 p-yrs;

- Urinary system disorders, including ICD-9-CM 599 “other disorders of the urethra and urinary tract” (includes urinary tract infection), RD: 49.7 per 1000 p-yrs; ICD-9-CM 595 “cystitis,” RD: 22.8 per 1000 p-yrs; and ICD-9-CM 788 “symptoms involving the urinary system” (includes dysuria and urinary frequency), RD: 9.3 per 1000 p-yrs;

- Migraine: ICD-9-CM 346 “migraine,” RD: 45.4 per 1000 p-yrs;

- Mental disorders, including ICD-9-CM 311 “depressive disorder, not elsewhere classified,” RD: 21.4 per 1000 p-yrs; ICD-9-CM 296 “episodic mood disorders,” RD: 16.9 per 1000 p-yrs; and ICD-9-CM 300 “anxiety, dissociative, and somatoform disorders,” RD: 10.1 per 1000 p-yrs;

- Upper respiratory illnesses, including ICD-9-CM 465 “acute upper respiratory infections of multiple or unspecified sites,” RD: 36.0 per 1000 p-yrs; ICD-9-CM 477 “allergic rhinitis,” RD: 16.2 per 1000 p-yrs; ICD-9-CM 461 “acute sinusitis,” RD: 15.2 per 1000 p-yrs; ICD-9-CM 462 “acute pharyngitis,” RD: 14.2 per 1000 p-yrs; and ICD-9-CM 473 “chronic sinusitis,” RD: 10.5 per 1000 p-yrs;

- Head and neck conditions without specific diagnosis: ICD-9-CM 784 “symptoms involving the head and neck” (includes headache), RD: 49.7 per 1000 p-yrs;

Female OEF/OIF deployers compared to females assigned to Korea, 19-24 months after completing overseas assignments: Among females who deployed to OEF/OIF compared to those who served in Korea, the most excessive illnesses/injuries 19-24 months after returning from overseas assignments were for:

- Conditions identified during routine periodic/preventive care, including ICD-9-CM 367 “disorders of refraction/accommodation,” RD: 28.7 per 1000 p-yrs; ICD-9-CM 795 “nonspecific abnormal histological and immunological findings” (includes abnormal Papanicolaou smear of the cervix), RD: 11.1 per 1000 p-yrs; and ICD-9-CM 216 “benign neoplasm of skin,” RD: 4.5 per 1000 p-yrs;

- Conditions related to pregnancy, labor, delivery, and female infertility;

- Neurotic, personality, and other nonpsychotic mental disorders, including ICD-9-CM 309 “adjustment reaction,” RD: 10.8 per 1000 p-yrs; ICD-9-CM 300 “anxiety, dissociative, and somatoform disorders,” RD: 7.0 per 1000 p-yrs; and ICD-9-CM 307 “special symptoms or syndromes not elsewhere classified” (includes nonorganic sleep disorders and tension headache), RD: 4.3 per 1000 p-yrs;

- Non-specific conditions, including ICD-9-CM 799 “other ill-defined and unknown causes of morbidity and mortality,” RD: 9.5 per 1000 p-yrs;

- Acute upper respiratory infection: ICD-9-CM 465 “acute upper respiratory infections of multiple or unspecified sites,” RD: 9.1 per 1000 p-yrs;

- Migraine: ICD-9-CM 346 “migraine,” RD: 6.4 per 1000 p-yrs;

- Joint/back disorders, including ICD-9-CM 717 “internal derangement of the knee,” RD: 5.3 per 1000 p-yrs; and ICD-9-CM 723 “other disorders of the cervical region,” RD: 4.5 per 1000 p-yrs;

Conditions that were excessive among female OEF/OIF deployers (19 to 24 months after deployment) compared to

Figure 1. Scatterplots and regression lines showing relationships between lines and injury-specific rates among female OEF/OIF deployers and comparable rates in referent cohorts, during various deployment-related followup intervals

Figure a. Females after versus before deployment to OEF/OIF

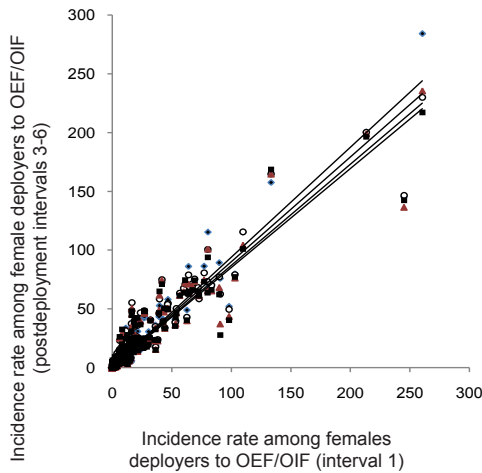


Figure b. Females after deployment to OEF/OIF versus females after assignments to Korea

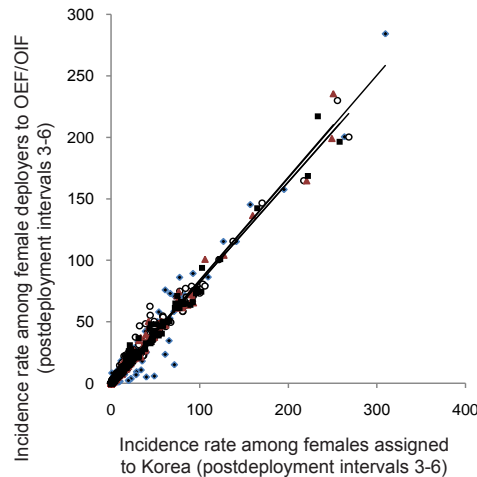


Figure c. Females after deployment to OEF/OIF versus males after deployment to OEF/OIF

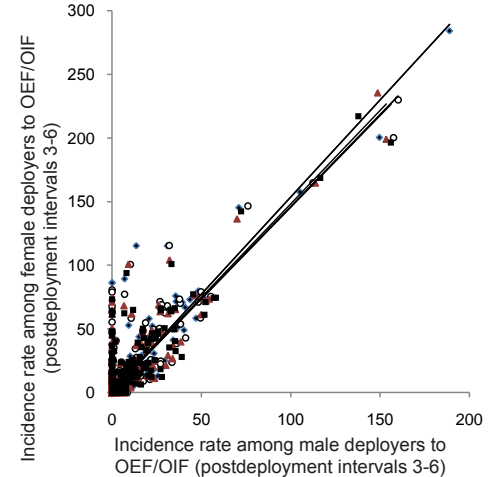


Table 1. Natures and strengths of correlations, illness and injury-specific rates among female OEF/OIF deployers versus various referent cohorts, during specified followup intervals

Correlation of illness and injury-specific rates among / during				Regression line characteristics	
"Exposed" cohort		Referent cohort		Slope ("adjustment factor")	Goodness of fit (R ²)
<i>Females</i>		<i>Females</i>			
OEF/OIF	Interval 3 vs	OEF/OIF	Interval 1	0.94	0.93
	Interval 4 vs		Interval 1	0.89	0.91
	Interval 5 vs		Interval 1	0.86	0.90
	Interval 6 vs		Interval 1	0.84	0.89
<i>Females</i>		<i>Females</i>			
OEF/OIF	Interval 3 vs	Korea	Interval 3	0.84	0.96
	Interval 4 vs		Interval 4	0.82	0.98
	Interval 5 vs		Interval 5	0.84	0.99
	Interval 6 vs		Interval 6	0.82	0.99
<i>Females</i>		<i>Males</i>			
OEF/OIF	Interval 3 vs	OEF/OIF	Interval 3	1.55	0.79
	Interval 4 vs		Interval 4	1.47	0.75
	Interval 5 vs		Interval 5	1.50	0.77
	Interval 6 vs		Interval 6	1.44	0.77

each of the referents: Several categories of illnesses/injuries were excessive among female OEF/OIF deployers compared to all of the referents; these conditions included migraine (particularly in relation to male deployers to OEF/OIF and themselves prior to deployment); mental disorders, e.g., depression, anxiety, mood disorder, and adjustment reaction (particularly relative to themselves prior to deployment); acute upper respiratory illnesses, including acute upper respiratory infection, acute and chronic sinusitis, and allergic rhinitis

(particularly relative to male OEF/OIF deployers); disorders of the neck and back, including cervical and intervertebral disc disorders (particularly relative to themselves prior to deployment) (Table 2, Figure 2).

Among female deployers to OEF/OIF, medical encounters for conditions related to pregnancy, labor, delivery, and fertility were much more frequent after compared to before their OEF/OIF deployments and in comparison to females who had been assigned in Korea. Finally, medical encounters for conditions identified during routine periodic preventive care (e.g., abnormal cervical Papanicolaou smear, disorders of refraction/accommodation) were much more frequent among female deployers to OEF/OIF compared to each of the referents (Table 2, Figure 2).

Data summaries conducted by Stephen B. Taubman, PhD, Data Analysis Group, AFHSC.

Editorial comment:

After each deployment of military forces in support of combat operations, there are concerns regarding the health effects of deployment-related exposures (e.g., Agent Orange, smoke from oil well fires, deployment-specific immunizations). In recent years in the U.S. military, women have increased their numbers and roles among deployed forces. Not surprisingly, concerns regarding the health effects of deployment in general are now intertwined with those that specifically or more seriously threaten the health of female deployers. This analysis is a preliminary attempt to define and characterize the natures and magnitudes of deployment-

related threats — particularly those that uniquely or more seriously threaten the health of women.

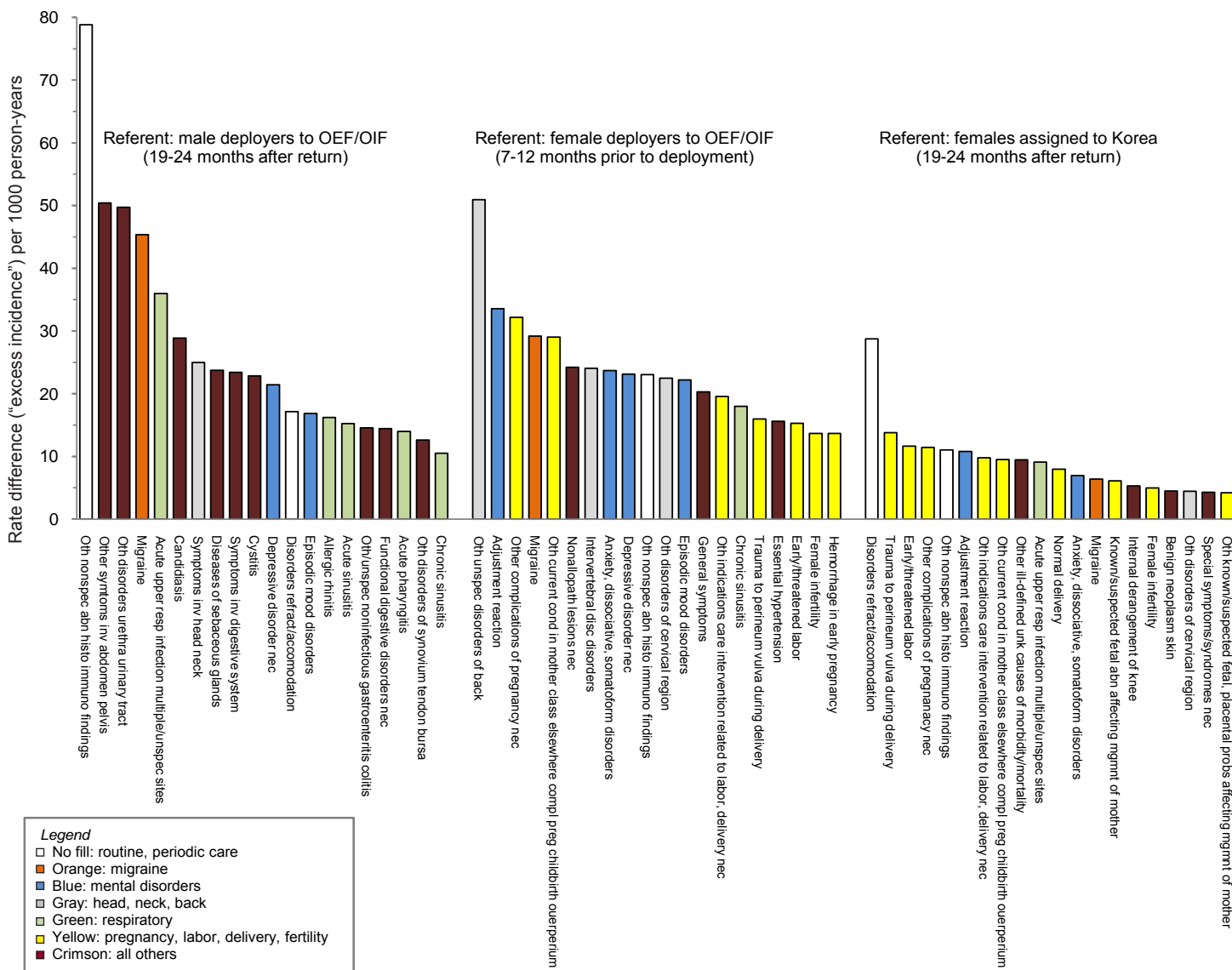
There are strengths to the analysis that was used for this report. For example, the analysis was comprehensive (e.g., it included all medical encounters within one year before and within two years after OEF/OIF deployment of all active component females who served in OEF/OIF during a long surveillance period) and systematic (e.g., it considered all illnesses and injuries as endpoints of analysis, rather than a few of particular interest or concern). Also, the analysis was designed to isolate and estimate the “excess incidence” of illnesses and injuries specifically related to OEF/OIF deployment (by accounting for the background of illnesses and injuries that affect female service members in general and are unrelated to OEF/OIF deployment).

From an epidemiologic standpoint, reliable estimates of deployment-specific threats to the health of women

require comparisons of the illness and injury experiences of deployment veterans to those of one or more referent groups, where the referent groups are identical to the deployed group in every way except for the exposure of interest — in this case, OEF/OIF service; and among all OEF/OIF deployers, comparisons of the illness and injury experiences of females and males with control of the effects of confounding differences between them. It is very difficult, however, to isolate the effects of OEF/OIF deployment (due to “healthy warrior” and other confounding effects)⁵, and to tease out those that affect women more than men, from the myriad of all other threats to the health of women in active military service.

Because there is not an ideal referent cohort for female deployers to OEF/OIF, three referent cohorts were used for this analysis. Rates observed in each referent cohort during each followup interval were adjusted to establish

Figure 2. Conditions with largest rate differences (“excess incidence”), among female OEF/OIF deployers, 19-24 months after returning from OEF/OIF, in comparison to adjusted referent rates



“expected rates” that could be used to reveal and estimate the magnitudes of health effects potentially related to OEF/OIF deployment. To this end, we assumed that overall differences in rates among female deployers and referent cohorts reflected both *general* effects of differences between the cohorts (e.g., age, race, gender, military occupation, prior health status, overseas deployment/combat experience, access to health care, care seeking behavior) and *specific* OEF/OIF-related effects. We also assumed that general effects had broad clinical manifestations while OEF/OIF-specific effects had more focal illness and injury manifestations. Given these assumptions, all illness and injury rates observed in each referent cohort during each followup interval were adjusted to control for the general effects of confounding — revealing the illnesses and injuries specifically related to OEF/OIF deployment.

The analyses documented illness and injury rates among female OEF/OIF deployers (19-24 months after return from OEF/OIF) that, in general, were approximately 15% lower than among themselves 7-12 months before deployment, approximately 15% lower than among female service members who had been assigned in Korea, and approximately 45% higher than among their male OEF/OIF counterparts. After adjusting for these cross-cutting differences in rates (i.e., accounting for the general effects of confounding differences between the cohorts), several categories of morbidity became identifiable as consistently excessive among female OEF/OIF deployers. These conditions included migraine; disorders of the neck and back; anxiety, depression, mood, and other mental disorders; upper respiratory illnesses; pregnancy, labor, delivery, and fertility-related conditions; and medical treatments related to routine, periodic care (e.g., abnormal Papanicolaou smear of the cervix, disorders of visual acuity).

Of conditions with the largest excess incidence among female OEF/OIF deployers, there were no particular surprises. It is likely, for example, that excess incidence of medical encounters for abnormal cervical smears, corrective lens prescriptions, pregnancy, labor, delivery, and female infertility reflect deferrals while deployed of well women and optometric care and of personal decisions regarding reproduction.

Anxiety, depression, and episodic mood disorders were excessive among female OEF/OIF deployers compared to themselves before deploying and to their counterparts who had been assigned in Korea. The finding is not surprising because these disorders are common manifestations of post-traumatic stress and are frequently reported by and diagnosed among military members after they return from Iraq or Afghanistan.⁶⁻⁸ However, in this analysis, rates of depression and mood disorder were notably higher among female compared to male OEF/OIF deployers. A recent MSMR report documented that, among OEF/OIF deployers, females were three to six times more likely than males to have medical encounters for anxiety, depression, and posttraumatic stress

disorder (PTSD) before deploying; and among all OEF/OIF deployers, those with anxiety, depression, or PTSD diagnoses before deploying were two to nine times more likely to have anxiety, depression, or PTSD-related medical encounters after deployment.⁹ Higher prevalences of mental disorders before deployment may account, at least in part, for increased risks of depression and mood disorders among females compared to males after OEF/OIF service. However, other factors (e.g., occupational activities, traumatic experiences, family separation) are likely associated with increased risk of mental disorders among female participants in combat operations; more detailed investigation is indicated.

The finding of excessive migraine among female veterans of OEF/OIF compared to all referent cohorts is not surprising. Among U.S. military members in general, migraine is relatively common, often disabling, and five to six times more common among females than males.¹⁰ Significant associations between migraine and mental disorders such as depression, anxiety, and PTSD have been documented in many settings.¹¹⁻¹⁴ Among U.S. military veterans of OIF, mild head trauma has been associated with the onset or worsening of headaches that are “migraine type.”¹⁵ The independent effects of and interactions between mild head trauma (e.g., concussion), depression, anxiety, PTSD, and other risk factors for migraine and other forms of headache, particularly among females who participate in or support combat operations, should be investigated further.

Finally, the finding of relatively high rates of neck and back disorders among female OEF/OIF deployers is consistent with other reports. For example, Konitzer and colleagues documented substantial increases in back, neck, and upper extremity pain among U.S. soldiers in Iraq; approximately twice as many soldiers attributed the pain to wearing body armor than to job tasks or physical training.¹⁶ Hoge and colleagues documented strong associations between PTSD and numerous physical health complaints (including back pain) among Iraq war veterans.⁸

The findings of this report should be interpreted with consideration of its limitations. For example, the analyses used data routinely transmitted to and integrated in the Defense Medical Surveillance System. As such, medical care provided outside of fixed medical facilities (e.g., unit medics, aid stations, during field exercises, on-board ships) were not available. The reliability of diagnoses and the accuracy of diagnostic codes reported on administrative records of medical encounters are not known. Also, start and end dates of OEF/OIF deployments and Korea assignments were ascertained from administrative records; such records may not completely and accurately document all deployments and assignments of interest for this analysis. However, errors in records used for this analysis are likely not systematic and not significant determinants of the major findings or conclusions of the report.

Table 2. Conditions with largest incidence rate differences (“excess incidence”) among female OEF/OIF deployers based on comparisons with adjusted referent rates

ICD-9-CM code: illness/injury description	Incidence rate difference (per 1000 p-yrs), 19-24 months after return from OEF/OIF	ICD-9-CM code: illness/injury description	Incidence rate difference (per 1000 p-yrs), 19-24 months after return from OEF/OIF
Referent rates: female OEF/OIF deployers, 7-12 months before deployment		Referent rates: females assigned to Korea, 19-24 months after returning from Korea	
724 Other unspec disorders of back	50.9	367 Disorders refraction/accomodation	28.7
309 Adjustment reaction	33.6	664 Trauma to perineum vulva during delivery	13.8
646 Other complications of pregnancy nec	32.2	644 Early/threatened labor	11.7
346 Migraine	29.2	646 Other complications of pregnancy nec	11.5
648 Other current cond in mother compl preg/childbirth	29.0	795 Other nonspec abn histo immuno findings	11.1
739 Nonallopath lesions nec	24.2	309 Adjustment reaction	10.8
722 Intervertebral disc disorders	24.0	659 Other indications for care, labor/ delivery nec	9.8
300 Anxiety, dissociative, somatoform disorders	23.7	648 Other current cond in mother compl preg/childbirth	9.5
311 Depressive disorder nec	23.1	799 Other ill-defined unk causes morbidity/mortality	9.5
795 Other nonspec abn histo immuno findings	23.0	465 Acute upper resp infection multi/unspec sites	9.1
723 Other disorders of cervical region	22.5	650 Normal delivery	8.0
296 Episodic mood disorders	22.2	300 Anxiety, dissociative, somatoform disorders	7.0
780 General symptoms	20.3	346 Migraine	6.4
659 Other indications for care, labor/ delivery nec	19.6	655 Known/suspected fetal abn affecting mother	6.1
473 Chronic sinusitis	18.0	717 Internal derangement of knee	5.3
664 Trauma to perineum vulva during delivery	16.0	628 Female infertility	5.0
401 Essential hypertension	15.6	216 Benign neoplasm skin	4.5
644 Early/threatened labor	15.3	723 Other disorders of cervical region	4.5
628 Female infertility	13.7	307 Special symptoms/syndromes nec	4.3
640 Hemorrhage in early pregnancy	13.7	656 Other fetal/placental probs affecting mother	4.2
Referent rates: male deployers to OEF/OIF, 18-24 months after returning from OEF/OIF			
795 Other nonspec abn histo immuno findings	78.8		
789 Other symptoms inv abdomen pelvis	50.4		
599 Other disorders urethra urinary tract	49.7		
346 Migraine	45.4		
465 Acute upper resp infection multiple/unspec sites	36.0		
112 Candidiasis	28.9		
784 Symptoms inv head neck	25.0		
706 Diseases of sebaceous glands	23.7		
787 Symptoms inv digestive system	23.4		
595 Cystitis	22.8		
311 Depressive disorder nec	21.4		
367 Disorders refract/accomodation	17.2		
296 Episodic mood disorders	16.9		
477 Allergic rhinitis	16.2		
461 Acute sinusitis	15.2		
558 Other/unspec noninfectious gastroenteritis colitis	14.6		
564 Functional digestive disorders nec	14.4		
462 Acute pharyngitis	14.0		
727 Other disorders of synovium tendon bursa	12.6		
473 Chronic sinusitis	10.5		

To control for confounding differences between female OEF/OIF deployers and referent cohorts, adjustment factors (based on linear correlations between illness and injury rates in referent cohorts and those in female deployers during the same followup intervals) were applied across-the-board to illness and injury rates observed in referent cohorts to establish interval-specific “expected” rates. Obviously, the confounding differences between female OEF/OIF deployers and referent cohorts do not affect all illnesses and injuries identically. For future analyses, we plan to control the effects of specific confounding factors, when they are documented in available records and known to be associated with illness or injury risk (e.g., gender, age group, race-ethnicity; military service, occupation, grade).

This analysis relied on rate differences to detect and quantify the potential effects of OEF/OIF deployment on risks of illnesses and injuries among females after deployment. Such an approach is not particularly useful for detecting rare conditions that may be related to OEF/OIF. For example, if a condition rarely occurs among female service members in general, and if several cases occur among females after deployment to OEF/OIF, the “excess incidence” of the condition would not be notable in this analysis, even if the *relative* incidence rate was very high. Relative (rather

than absolute) increases in incidence rates among OEF/OIF deployers compared to various referents would be more informative regarding rare conditions that may be related to OEF/OIF deployment.

This preliminary analysis did not account for the effects, if any, of the number, location (e.g., Iraq, Afghanistan), timing, or duration of OEF/OIF deployments of individuals. Future analyses should attempt to discern the effects of these factors. In addition, this analysis considered each illness and injury (as defined by a unique 3-digit code of the ICD-9-CM) as endpoints of separate analyses. In some cases, such narrow definitions of endpoints may be so restrictive as to obscure important surveillance findings (e.g., missing the forest while examining each tree). Some closely related illnesses and injuries (e.g., acute respiratory infectious diseases, infectious gastroenteritis, "back pain") may be documented with multiple ICD-9-CM codes. Future analyses will consider using groups of related ICD-9-CM codes as endpoints of analyses.

Due to space limitations, this report summarized findings from the latest followup interval only (19-24 months after returning from deployment). As such, the findings are applicable only to female OEF/OIF deployers who remained in service and were not deployed to OEF/OIF or assigned to Korea for at least 18 months after they returned from OEF/OIF deployment. In turn, for example, OEF/OIF-related injuries and illnesses that precluded the continuation of active military service were not represented in the findings of this report. This explains, at least in part, why severe combat-related injuries (e.g., wounds to vital organs, traumatic amputations, severe brain injuries) were not identified as "excessive" among OEF/OIF deployers. Of note, however, the conditions identified as excessive 19-24 months after deployment were consistently excessive in earlier post-deployment (0-18 months) followup intervals (data not shown).

In summary, this report summarizes findings of a comprehensive and systematic analysis of medical encounters for illnesses and injuries among female veterans of OEF/OIF deployments. The analysis attempted to identify conditions that were consistently "excessive" in relation to the experiences of several referent cohorts. Conditions with consistently excessive incidence rates among female OEF/OIF deployers included migraine; disorders of the neck and back; anxiety, depression, mood, and other mental disorders; upper respiratory illnesses; pregnancy, labor, delivery, and

fertility-related conditions; and medical treatments related to routine care that was probably deferred during deployment. More detailed analyses are indicated to identify the natures, scopes, and effects of and potential countermeasures against deployment-related threats to the long term health of female service members.

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Medical Evacuation for Suspected Breast Cancer, Active and Reserve Components, U.S. Armed Forces, January 2002-June 2009

“Deployment health” activities enable the Armed Forces to deploy fit and healthy service members, to protect them from health threats while deployed, and to detect illnesses and injuries occurring during or after their deployment. Pre-deployment medical screening, physical examinations and health risk assessments are designed to assure a mission-ready force and to minimize the need for in-theater medical resources. Even among healthy deployers, however, nonbattle casualties are inevitable. When an illness or injury occurring in theater requires evaluation or care that will be either prolonged or beyond the capabilities of theater medical assets, the patient is expeditiously transported (evacuated) to a more appropriate location to receive such care. Since the beginning of operations in Iraq and Afghanistan, approximately 48,000 deployed U.S. service members have been medically evacuated for diseases and nonbattle injuries.

The Department of Defense tracks the movement of ill or injured service members within or outside the military theater using an automated system known as the Transportation Command Regulating and Command and Control Evacuation System or “TRAC2ES”. An evaluation of TRAC2ES records among deployers to Iraq and Afghanistan since January 2002 found that the most frequent diagnosis

(at the 3-digit level of the International Classification of Diseases, 9th revision [ICD-9-CM]) among females at the time of medical evacuation was ICD-9-CM: 611 “other disorders of breast”, which includes the diagnosis “lump or mass in breast”.

This report summarizes the demographic characteristics and medical experiences of more than 500 female service members medically evacuated from Iraq or Afghanistan since 2002 with a diagnosis of a breast lump, breast cancer or other breast disorders.

Methods:

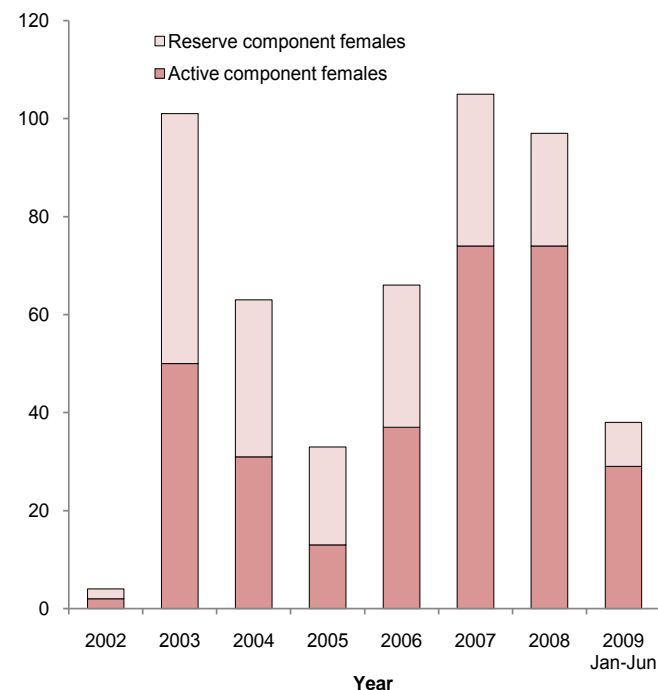
The surveillance period was January 2002 to June 2009. The surveillance population was composed of female service members with diagnoses of breast lump, breast cancer or other breast disorder recorded at the time of medical air transport from the U.S. Central Command (CENTCOM) theater of operations. Among service members with multiple breast-related medical evacuations, the first evacuation per individual was selected for analysis.

The Defense Medical Surveillance System (DMSS) was used to validate the military status of each individual and to obtain medical encounter data, deployment history and demographic and military characteristics. Service

Table 1. Diagnostic and procedure codes used in this analysis to identify medical evacuations for suspected breast cancer (row 1), subsequent diagnoses of breast cancer (row 2) and breast cancer treatment (row 3).

In-theater diagnosis at the time of medical evacuation (ICD-9-CM)	174.xx 198.81 217.xx 233 233.0 238.3 239.3 610.xx 611.xx	Malignant neoplasm of female breast Secondary malignant neoplasm, breast Benign neoplasm of breast Carcinoma in situ of breast and genitourinary system Carcinoma in situ of breast Neoplasm of uncertain behavior, breast Neoplasm of unspecified nature, breast Benign mammary dysplasias Other disorders of breast
Post-evacuation cancer diagnosis (ICD-9-CM)	174.xx 198.81 233.0	Malignant neoplasm of female breast Secondary malignant neoplasm, breast Carcinoma in situ of breast
Breast cancer treatment (Excludes: biopsy of breast, lumpectomy. Includes: mastectomy, radiation, chemotherapy, lymph node biopsy or excision)	ICD-9-CM procedure codes: 85.22, 85.23, 85.33, 85.34, 85.35, 85.36, 85.41, 85.42, 85.43, 85.44, 85.45, 85.46, 85.47, 85.48, 40.23, 40.29, 40.3x, 92.21-92.29, 99.25 CPT® (Current Procedural Terminology) codes: 11600-11606, 38525 19160, 19162, 19180, 19240, 19301, 19302, 19303, 19304, 19305, 19306, 19307, 19160, 19162, 19180, 19240, 96401, 96406, 96409, 96411, 96413, 96415, 96417, 96420, 96422, 96423, 96425, 96440, 96450, 96521, 96522, 96523, 96542, 96549, 96910, 96912, 96913, G0355, G0359, Q0083-Q0085, Q0163-Q0181, Q0511J9000, J9093-J9097, J9060, J9062, J9170, J9190, J9250, J9265, 57155, 77014, 772xx, 773xx, 774xx, 777xx, 19340, 19342, 19357, 19361, 19364, 19366, 19367, 19369	

Figure 1. Female deployers medically evacuated from Iraq/Afghanistan with a diagnosis of breast lump, breast cancer or other breast disorder, U.S. Armed Forces, January 2002-June 2009



members who received a primary (first-listed) diagnosis of breast cancer in an inpatient or outpatient setting within 90 days following medical evacuation were considered “possible” breast cancer cases. A “confirmed” case of breast cancer was defined as either of the following within 90 days of evacuation: a primary diagnosis of breast cancer from an oncology specialty clinic or a breast cancer treatment procedure (Table 1).

Results:

From January 2002 through June 2009, TRAC2ES medical air transport records documented medical evacuations of 523 female service members for breast disorders or suspected breast cancer. Of these individuals, 507 (97%) had demographic and military characteristics documented in the Defense Medical Surveillance System (DMSS) and were included in further analyses.

Of females evacuated for breast disorders, the most frequent diagnosis at the time of evacuation was “lump or mass in breast” (n=361, 71%). Twenty-five women (5%) were evacuated with diagnoses of “malignant neoplasm” or “carcinoma in situ”. Fifty-seven women (11%) had diagnoses of “benign dysplasia”, “benign neoplasm” or “neoplasm of unspecified nature”; nineteen of the deployers (4%) had diagnoses of other specified breast disorders (e.g., “pain in

breast”, “galactorrhea”); and 45 (9%) had nonspecific diagnoses of “other disorders of the breast” (data not shown).

Most females evacuated for breast disorders were in the Army (n=462, 91%); in administration, service or supply occupations (n=288, 57%); of race/ethnic groups other than “white, non-Hispanic” (n=277, 55%); and less than 35 years old (n=275, 54%) (Table 2). Nearly two-fifths were Reservists (n=197, 39%), and more than one-fourth were 40 years or older (n=144, 29%). Twenty-one service members were medically evacuated for breast-related problems more than once.

There was no apparent trend in the numbers of female deployers evacuated with breast problems during the period; however, there was significant variability from year to year (Figure 1, Table 1). For example, approximately 100 female service members were evacuated with breast-related diagnoses in 2003 (n=101), 2007 (n=105) and 2008 (n=97). In 2004 (n=63), 2005 (n=63) and 2006 (n=66), there were many fewer evacuations for breast disorders.

The median number of days between the start of deployment and medical evacuation was 148, and fewer than 5% (n=21) were evacuated during the first 30 days of deployment. However, more than one-quarter (n=119) were evacuated during the first 90 days, and two-thirds (n=297) were evacuated during the first 6 months of deployment (data not shown).

Table 2. Female deployers medically evacuated from Iraq/Afghanistan with a diagnosis of breast lump, breast cancer or other breast disorder, U.S. Armed Forces, January 2002 - June 2009

	Total Jan 2002- Jun 2009		2002		2003		2004		2005		2006		2007		2008		2009*	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total	507	100.0	4	100.0	101	100.0	63	100.0	33	100.0	66	100.0	105	100.0	97	100.0	38	100.0
<i>Component</i>																		
Active	310	61.1	2	50.0	50	49.5	31	49.2	13	39.4	37	56.1	74	70.5	74	76.3	29	76.3
Reserve	197	38.9	2	50.0	51	50.5	32	50.8	20	60.6	29	43.9	31	29.5	23	23.7	9	23.7
<i>Service</i>																		
Army	462	91.1	3	75.0	93	92.1	57	90.5	31	93.9	62	93.9	99	94.3	88	90.7	29	76.3
Navy	10	2.0	.	.	1	1.0	2	3.2	.	.	1	1.5	1	1.0	1	1.0	4	10.5
Air Force	29	5.7	1	25.0	7	6.9	4	6.3	1	3.0	2	3.0	3	2.9	6	6.2	5	13.2
Marine Corps	6	1.2	.	.	.	.	.	.	1	3.0	1	1.5	2	1.9	2	2.1	.	.
<i>Race/ethnicity</i>																		
White, non-Hispanic	230	45.4	3	75.0	53	52.5	27	42.9	14	42.4	33	50.0	44	41.9	40	41.2	16	42.1
Black, non-Hispanic	184	36.3	1	25.0	36	35.6	22	34.9	14	42.4	21	31.8	41	39.0	37	38.1	12	31.6
Other	93	18.3	.	.	12	11.9	14	22.2	5	15.2	12	18.2	20	19.0	20	20.6	10	26.3
<i>Age</i>																		
<20	10	2.0	1	25.0	1	1.0	2	3.2	1	3.0	1	1.5	1	1.0	3	3.1	.	.
20-24	107	21.1	1	25.0	29	28.7	11	17.5	6	18.2	8	12.1	21	20.0	26	26.8	5	13.2
25-29	91	17.9	.	.	14	13.9	13	20.6	6	18.2	15	22.7	16	15.2	20	20.6	7	18.4
30-34	67	13.2	1	25.0	17	16.8	8	12.7	2	6.1	9	13.6	15	14.3	10	10.3	5	13.2
35-39	87	17.2	.	.	19	18.8	13	20.6	6	18.2	9	13.6	19	18.1	15	15.5	6	15.8
40+	145	28.6	1	25.0	21	20.8	16	25.4	12	36.4	24	36.4	33	31.4	23	23.7	15	39.5
<i>Military occupation</i>																		
Combat	10	2.0	.	.	2	2.0	.	.	.	.	1	1.5	2	1.9	3	3.1	2	5.3
Health care	80	15.8	2	50.0	11	10.9	13	20.6	5	15.2	10	15.2	19	18.1	14	14.4	6	15.8
Admin, service, supply	288	56.8	2	50.0	69	68.3	33	52.4	22	66.7	31	47.0	54	51.4	53	54.6	24	63.2
Other	129	25.4	.	.	19	18.8	17	27.0	6	18.2	24	36.4	30	28.6	27	27.8	6	15.8

*Through 30 June

Table 3. Breast-related diagnoses within 90 days following medical air transport among female deployers evacuated from Iraq/Afghanistan for breast-related problems (n=507), U.S. Armed Forces, January 2002-June 2009

Primary diagnosis (dx1)	No. of active component females	No. of reserve component females
"Possible" breast cancer (ICD-9: 174, 233.0, 198.81)	19	16
Benign dysplasias, benign neoplasms, lumps (217, 238.3, 239.3, 610, 611.72)	219	137
Other breast disorders (611 except 611.72)	38	19
None of the above	34	25

Most females medically evacuated for breast disorders were treated at Landstuhl Regional Medical Center (n=479) or other Army hospitals in Germany (n=2). The others (n=26) had their first documented medical encounters after evacuation at military treatment facilities in the United States. Following initial medical encounters after evacuation, most women (n=474, 94%) received "return to duty" or "released without limitation" dispositions; relatively few women (n=33, 6.5%) received duty limitations or were referred/transferred for further care (data not shown.)

Within 90 days following breast-related medical evacuations, 35 (7%) women received at least one primary diagnosis of breast cancer (i.e., first-listed diagnosis on a hospitalization or clinic visit record). For surveillance purposes, these women were considered "possible" breast cancer cases. Among all other evacuees, approximately three-fourths (n=356) received diagnoses of "benign neoplasm of breast", "benign mammary dysplasias", or "lump or mass in breast" (Table 3).

Of the 35 women with at least one breast cancer diagnosis after evacuation, 30 had at least one primary diagnosis of breast cancer in an oncology specialty clinic and/or a breast cancer treatment procedure. For surveillance purposes, these women were considered "confirmed" breast cancer cases. Twenty-five of the 30 women with "confirmed" breast cancer were 35 years or older. Relative to their counterparts, female deployers with "confirmed breast cancer" were more often Reservists, white non-Hispanic, and 35 years or older (Table 4).

Data summaries conducted by Gi-Taik Oh, Data Analysis Group, AFHSC.

Editorial comment:

Since 2002, more female service deployers have been medically evacuated with the diagnosis of "other disorders of the breast" (which includes "lump or mass in breast") than for any other condition (at the three-digit level of the ICD-9-

Table 4. Demographic and military characteristics of female service members with and without breast cancer, among those evacuated from CENTCOM for suspected breast cancer, U.S. Armed Forces, January 2002-June 2009

	No. with "confirmed" breast cancer ¹		No. without "confirmed" breast cancer	
	No.	%	No.	%
Total	30	100.0	477	100.0
<i>Component</i>				
Active	17	56.7	293	61.4
Reserve	13	43.3	184	38.6
<i>Service</i>				
Army	25	83.3	437	91.6
Navy	1	3.3	9	1.9
Air Force	3	10.0	26	5.5
Marine Corps	1	3.3	5	1.0
<i>Race/ethnicity</i>				
White, non-Hispanic	18	60.0	212	44.4
Black, non-Hispanic	7	23.3	177	37.1
Other	5	16.7	88	18.4
<i>Age</i>				
<20	.	.	10	2.1
20-24	1	3.3	106	22.2
25-29	2	6.7	89	18.7
30-34	2	6.7	64	13.4
35-39	12	40.0	76	15.9
40+	13	43.3	132	27.7
<i>Military occupation</i>				
Combat	4	13.3	7	1.5
Health care	3	10.0	75	15.7
Admin, service, supply	15	50.0	270	56.6
Other	8	26.7	125	26.2

¹A breast cancer diagnosis from an outpatient oncology clinic or a breast cancer treatment procedure listed in Table 1

CM). The majority of service members evacuated for breast problems were younger than 35 years and other than white race; however, the majority of those with "confirmed" breast cancer were white and 35 or older.

Approximately one of 17 (n=30, 6%) of all women evacuated for breast disorders had "confirmation" of breast cancer (i.e., diagnosis in a specialty clinic or breast cancer treatment) within three months of medical evacuation. (Because more than 100,000 women have been deployed in support of operations in Iraq and Afghanistan, the results of this analysis should not be interpreted as suggesting a relationship between deployment and breast cancer risk).

In the Army, a pelvic examination is required within six months prior to deployment for all women except those over 30 who have no history of dysplasia and least three consecutive normal PAP smears—these women are required to have a pelvic exam within 24 months before deploying.¹ Presumably, breast examinations are performed during the same encounter. Female soldiers over 40 are required to have a mammogram within one year prior to deployment. Thus, it is likely that many soldiers between 30 and 40 do not undergo clinical breast examination during the year prior to deployment.

It is unclear whether pre-deployment breast examinations could prevent medical evacuation for benign or malignant breast disease. In this analysis, one-quarter of all women with breast-related diagnoses on administrative records of medevacs were evacuated within 90 days after their deployment start dates. In some of these cases, breast abnormalities may have been detectable by experienced examiners prior to deployment.

Pre-deployment medical record review could help identify women that need special pre-deployment screening for breast-related problems. Of the 310 active component women who were evacuated for breast disorders, nine (3%) had diagnoses of breast cancer, and 44 (14%) had diagnoses of lumps, benign dysplasia, or benign neoplasms, within the year before deployment (data not shown). In the Army, soldiers with a history of cancer who need periodic monitoring every six months or less are barred from deployment.²

The results of this analysis should be interpreted in light of several limitations. The study population was identified by diagnosis codes recorded on medical air transport records (TRAC2ES). The codes are recorded at the time of evacuation by available medical personnel and may not accurately match the diagnoses of the referring (evacuating) physicians. Diagnoses and therapeutic procedures received by evacuees within 90 days after evacuation include those routinely reported on standardized hospitalization and

ambulatory visit records of the U.S. Military Health System. Reserve component members are eligible to receive care through the Military Health System for six months following release from active duty. However, some may choose to access health care services at their homes; if so, there may be under-ascertainment of cancer diagnoses and treatment among Reserve component members following medical evacuations.

Finally, genetic testing for breast cancer has been suggested to improve early detection among young women. A recent study of cancer patients under 40 found that 25% of those genetically tested had a breast cancer gene mutation.³ Although the costs of mammography or other breast cancer detection technology in theater would likely be prohibitive, they should be weighed against the costs associated with military operational disruption and medical air transport of relatively large numbers of deployed service members.

References:

1. U.S. Army Office of the Surgeon General/MEDCOM Policy Memo 09-002 14 Jan 2009. Subject: Revised Guidelines: Women's Readiness Guidelines.
2. Army Regulation 40-501 Standards of Medical Fitness Issue Date: 10 September 2008.
3. Samphao S, Wheeler AJ, Rafferty E, Michaelson JS, Specht MC, Gadd MA, Hughes KS, Smith BL. Diagnosis of breast cancer in women age 40 and younger: delays in diagnosis result from underuse of genetic testing and breast imaging. *Am J Surg.* 2009 Oct;198(4):538-43.

Policy brief: Department of Defense Vaccine Guidance for Novel H1N1 Influenza

On 30 September 2009, the Office of the Assistant Secretary of Defense (Health Affairs) released a memorandum on the subject: Department of Defense Pandemic Vaccine Guidance for Novel Influenza A (H1N1). The memorandum describes how the Department of Defense (DoD) will receive and distribute the H1N1 vaccine as well as targeting, supply and distribution strategies. The following is a brief summary of the full memorandum, available at: <http://www.vaccines.mil>.

- A novel H1N1 influenza immunization program will begin upon receipt of vaccine.
- The vaccine will be mandatory for uniformed personnel and highly encouraged for all others.
- For operational requirements, DoD will acquire 2.7 million doses of novel H1N1 influenza vaccine; it may be allocated to active and Reserve component members, DoD civilians, and essential contractors.
- Beneficiaries not directly responsible for the overall DoD mission, such as family members and retirees, are included in the U.S. Department of Health and Human Services (HHS) vaccine allocation plan with the following target groups: pregnant women, household contacts of infants under 6 months of age, young people ages 6 months to 24 years, first responders and health care workers, and non-elderly adults (under age 65) with underlying risk conditions such as diabetes and chronic lung disease.
- The U.S. Coast Guard, unless operating under the U.S. Navy, is not part of the DoD allocation.
- If disease severity is mild, vaccine allocation should target groups at high risk for transmission. The following groups should receive the vaccine first: deployed forces, large scale training sites, ships afloat, and health care providers who are at high exposure risk.
- Immunization requires a single vaccine dose. The vaccine may be given concurrently with the seasonal influenza vaccination. Guidance regarding immunization requirements is posted on the DoD Pandemic Influenza Watchboard (<http://www.dod.millpandemicflu>).
- The Military Vaccine Agency (MILVAX) will issue immunization program implementation instructions to the Services.
- MILVAX will centralize electronic tracking and reporting of vaccine coverage (with the Services) and facilitate prompt reporting of potential vaccine related adverse events (with the Centers for Disease Control and Prevention [CDC] and the Food and Drug Administration [FDA]).
- The DoD Vaccine Healthcare Centers Network will be used for referral and case management of serious adverse events.
- AFHSC, in conjunction with FDA and CDC, will estimate vaccine effectiveness.
- The Air Force, as the Executive Agent for influenza laboratory surveillance, will coordinate and conduct the DoD-wide influenza laboratory surveillance program.
- Policy changes, if necessary, will be posted at <http://www.dod.mil/pandemicflu>.

SURVEILLANCE SNAPSHOT: Hospitalizations for hepatitis A

Trend of hospitalizations for hepatitis A, active component, U.S. Armed Forces, 1990-2008



Source: DMED, 2 Nov 2009

Update: Deployment Health Assessments, U.S. Armed Forces, September 2009

Since January 2003, peaks and troughs in the numbers of pre- and post-deployment health assessment forms transmitted to the Armed Forces Health Surveillance Center generally corresponded to times of departure and return of large numbers of deployers. Since April 2006, numbers of post-deployment health reassessments (PDHRA) transmitted per month have ranged from 17,000 to 43,000 (Table 1, Figure 1).

During the past 12 months, the proportions of returned deployers who rated their health as “fair” or “poor” were 8-11% on post-deployment health assessment questionnaires and 11-14% on PDHRA questionnaires (Figure 2).

In general, on post-deployment assessments and reassessments, deployers in the Army and in reserve components were more likely than their respective counterparts to report health and exposure-related concerns (Table 2, Figure 2). Both active and reserve component members were more likely to report exposure concerns three to six months after compared to the time of return from deployment (Figure 3).

At the time of return from deployment, soldiers serving in the active component were the most likely of all deployers to receive mental health referrals; however, three to six months after returning, active component soldiers were less likely than Army and Marine Corps Reservists to receive mental health referrals (Table 2).

Finally, during the past three years, reserve component members have been more likely than active to report “exposure concerns” on post-deployment assessments and reassessments (Figure 3).

Table 1. Deployment-related health assessment forms, by month, U.S. Armed Forces, October 2008-September 2009

	Pre-deployment assessment DD2795		Post-deployment assessment DD2796		Post-deployment reassessment DD2900	
	No.	%	No.	%	No.	%
Total	436,924	100	379,766	100	309,056	100
<i>2008</i>						
October	38,705	8.9	38,076	10.0	26,504	8.6
November	28,445	6.5	37,841	10.0	23,512	7.6
December	36,805	8.4	40,381	10.6	21,665	7.0
<i>2009</i>						
January	42,995	9.8	31,762	8.4	26,042	8.4
February	36,438	8.3	28,330	7.5	28,395	9.2
March	38,000	8.7	23,711	6.2	32,041	10.4
April	41,311	9.5	18,513	4.9	31,233	10.1
May	34,572	7.9	28,080	7.4	24,878	8.0
June	41,134	9.4	28,249	7.4	26,761	8.7
July	37,016	8.5	25,676	6.8	22,412	7.3
August	34,619	7.9	43,588	11.5	20,910	6.8
September	26,884	6.2	35,559	9.4	24,703	8.0

Figure 2. Proportion of deployment health assessment forms with self-assessed health status as “fair” or “poor”, U.S. Armed Forces, October 2008-September 2009

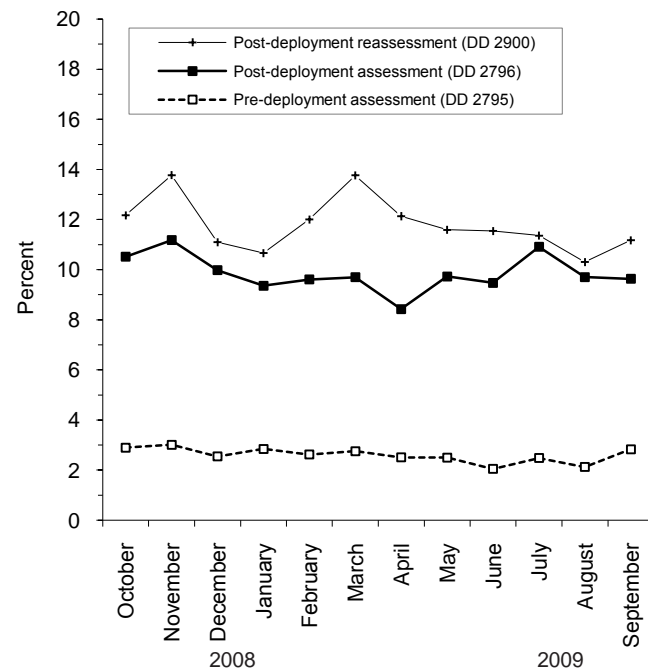


Figure 1. Total deployment health assessment and reassessment forms, by month, U.S. Armed Forces, January 2003-September 2009

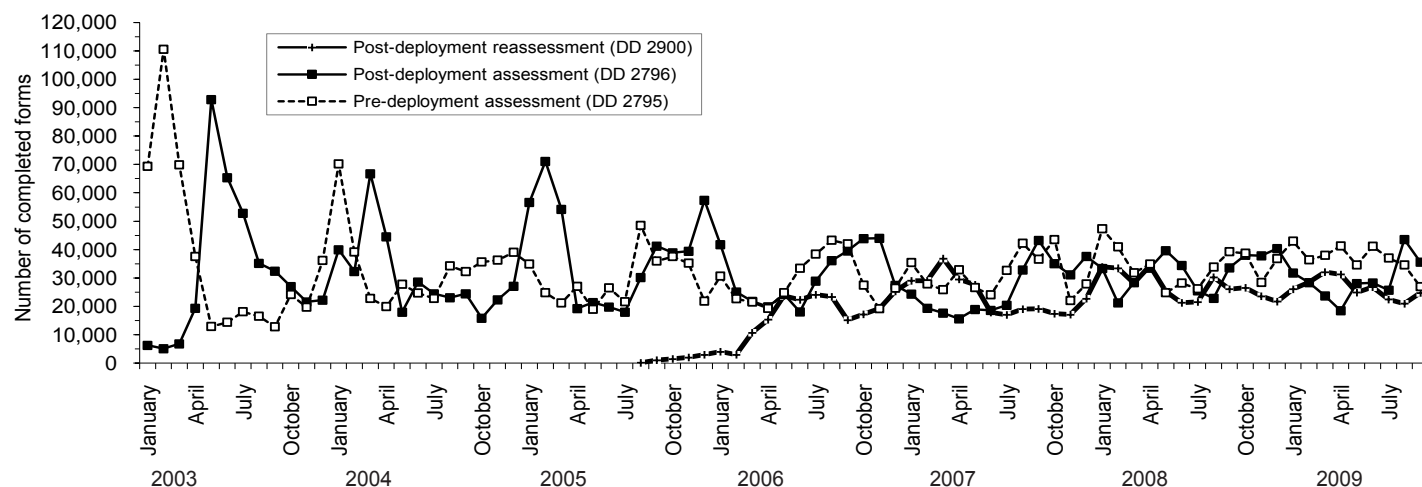


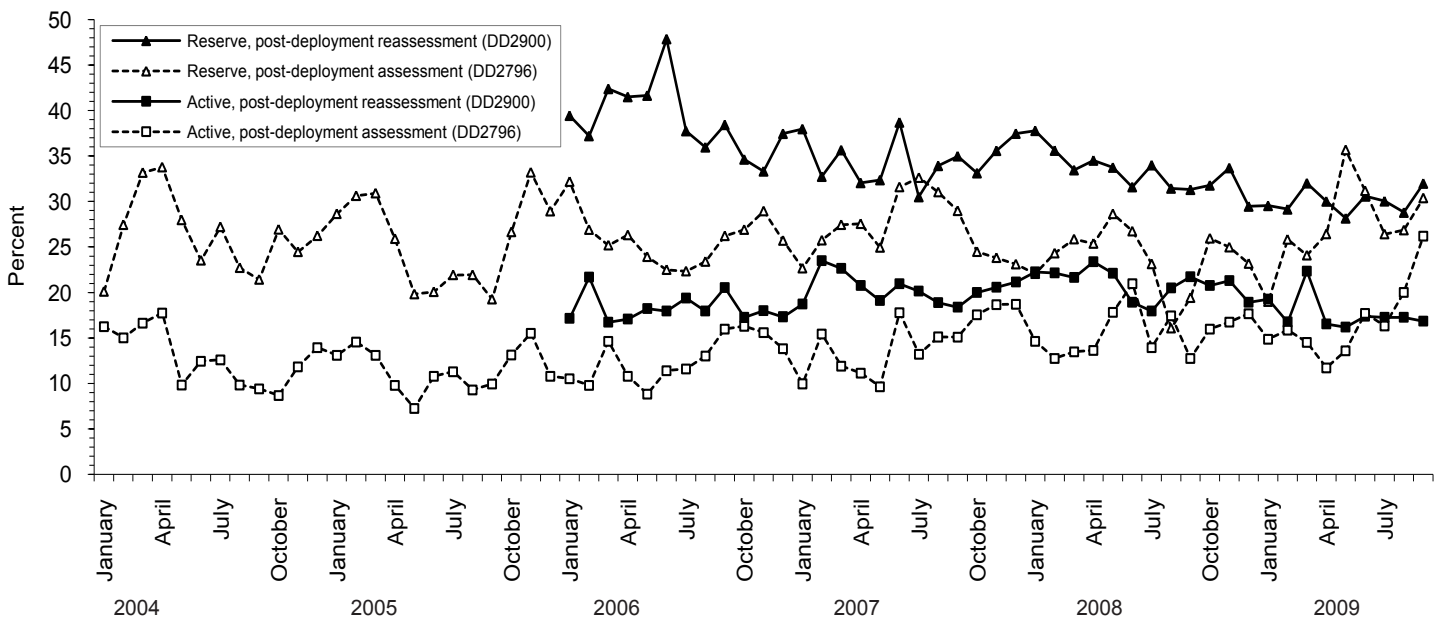
Table 2. Percentage of service members who endorsed selected questions/received referrals on health assessment forms, U.S. Armed Forces, October 2008-September 2009

	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %	n= %
Active component	153,748	142,517	117,740	11,782	10,125	17,013	57,929	51,621	51,896	22,194	16,825	34,340	245,653	221,088	220,989
General health "fair" or "poor"	4.0	11.0	14.6	1.2	4.0	6.0	0.5	3.8	4.2	1.7	6.5	9.4	2.9	8.6	10.7
Health concerns, not wound or injury	19.1	25.8	24.3	3.9	13.1	13.4	1.4	5.9	10.6	3.1	14.8	17.6	12.7	19.7	19.2
Health worse now than before deployed	na	24.3	26.1	na	11.6	13.5	na	8.9	8.9	na	14.4	18.4	na	19.4	19.9
Exposure concerns	na	17.8	19.7	na	18.6	16.6	na	11.5	14.8	na	16.9	20.4	na	16.3	18.4
PTSD symptoms (2 or more)	na	9.6	13.0	na	4.1	6.5	na	2.2	2.4	na	4.7	8.5	na	7.2	9.3
Depression symptoms (any)	na	33.1	33.4	na	19.8	23.1	na	13.4	13.9	na	26.2	29.8	na	27.4	27.5
Referral indicated by provider (any)	4.9	33.7	20.2	5.5	22.9	15.3	1.6	10.6	6.6	4.0	23.6	23.2	4.0	27.1	17.1
Mental health referral indicated*	0.9	7.1	6.3	0.6	3.9	5.8	0.5	1.2	1.8	0.3	2.7	4.8	0.7	5.3	5.0
Medical visit following referral†	93.4	99.5	95.1	90.3	86.1	91.1	81.2	96.3	98.2	64.6	74.4	85.5	89.8	95.7	93.4
Reserve component	85,493	70,278	53,362	3,165	2,530	6,806	15,947	14,851	18,054	2,515	914	6,069	107,120	88,573	84,291
General health "fair" or "poor"	1.7	11.9	18.2	0.5	8.3	7.8	0.3	5.2	4.7	1.5	10.0	10.0	1.5	10.6	13.9
Health concerns, not wound or injury	14.6	34.4	45.8	2.3	32.2	28.8	0.6	9.3	14.6	3.7	24.1	34.2	11.9	30.0	36.9
Health worse now than before deployed	na	26.5	34.8	na	20.9	21.5	na	13.7	11.0	na	22.8	26.4	na	24.1	28.0
Exposure concerns	na	27.3	33.8	na	34.6	29.0	na	21.4	22.2	na	23.9	29.0	na	26.5	30.6
PTSD symptoms (2 or more)	na	9.1	21.8	na	5.7	9.9	na	2.3	2.9	na	6.3	13.4	na	7.8	16.2
Depression symptoms (any)	na	32.3	37.3	na	25.6	24.0	na	13.9	14.1	na	32.2	28.8	na	29.1	30.7
Referral indicated by provider (any)	3.6	38.4	33.4	4.0	29.7	17.5	0.4	13.4	5.4	3.6	32.3	27.7	3.1	33.9	25.7
Mental health referral indicated*	0.4	5.0	12.5	0.4	3.3	4.5	0.0	0.7	0.9	0.4	3.2	8.7	0.4	4.2	9.1
Medical visit following referral†	94.5	96.9	34.0	90.4	91.6	37.5	33.3	64.8	42.3	28.9	68.0	27.6	91.4	94.1	34.1

*Includes behavioral health, combat stress and substance abuse referrals.

†Record of inpatient or outpatient visit within 6 months after referral.

Figure 3. Proportion of service members who endorsed exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2004-September 2009



Sentinel reportable events for service members and beneficiaries at U.S. Army medical facilities, cumulative numbers^a for calendar years through 30 September 2008 and 30 September 2009



Army

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NORTH ATLANTIC														
Washington, DC Area	187	185	2	1	1	.	1	.	1	.	2	5	6	1
Aberdeen, MD	22	34	.	.	.	.	.	.	.	1	.	.	.	.
FT Belvoir, VA	155	201	7	9	12	3	3	.	.	.	.	.	.	.
FT Bragg, NC	1,105	1,389	.	6	14	17	.	.	.	.	.	2	.	.
FT Drum, NY	178	49	.	.	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	198	192	1	.	1	3	.	.	.	.	.	.	1	.
FT Knox, KY	211	158	2	.	1	.	.	.	.	.	.	.	.	.
FT Lee, VA	245	466	.	.	.	.	.	.	.	.	4	.	1	.
FT Meade, MD	51	38	.	1	.	1	1	.	.	.	.	.	.	.
West Point, NY	56	91	.	1	.	.	.	.	.	.	1	1	.	.
GREAT PLAINS														
FT Sam Houston, TX	387	470	.	1	8	6	12	2	.	.	.	1	.	1
FT Bliss, TX	375	256	.	.	10	1	.	1	.	1	.	5	.	.
FT Carson, CO	531	586	3	5	3	3	.	.	1	1	1	.	.	.
FT Hood, TX	1,617	1,595	6	8	30	17	5	12	.	.	.	2	2	.
FT Huachuca, AZ	79	65	.	.	1	.	2	.	.	.	1	.	.	.
FT Leavenworth, KS	40	51	.	.	.	1	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	188	294	2	2	1	.	1	.	2	1	1	.	1	1
FT Polk, LA	147	486	1	.	.	1	1	3	.	.	.	.	1	.
FT Riley, KS	318	283	3	1	2	3	.	.	.	.	2	.	.	.
FT Sill, OK	83	566	.	.	.	.	.	4	.	.	.	.	.	.
SOUTHEAST														
FT Gordon, GA	507	546	1	1	13	13	14	3	.	.	1	2	2	1
FT Benning, GA	299	272	2	1	5	.	1	1	.	1	.	.	.	.
FT Campbell, KY	161	334	1	.	.	.	2	.	.	.	.	.	.	1
FT Jackson, SC	270	498	.	.	.	.	.	.	.	.	1	2	.	.
FT Rucker, AL	64	65	1	8	4	4	.	.	.	.	.	.	.	.
FT Stewart, GA	661	914	3	.	22	27	1	14	1	.	8	.	.	.
WESTERN														
FT Lewis, WA	871	876	9	3	3	7	2	1	.	.	.	.	.	.
FT Irwin, CA	52	102	.	.	2	1	1	1	.	.	.	.	.	.
FT Wainwright, AK	258	158	4	.	1	.	.	.	2	.	.	.	.	.
PACIFIC														
Hawaii	628	629	31	30	14	13	3	4	1	.	4	3	.	.
Japan	27	3	1	.	.	.	.	.	.	.	.	.	.	.
Korea	353	350	.	.	1	.	.	.	.	.	.	.	1	.
OTHER LOCATIONS														
Germany	782	1,179	8	17	20	12	5	1	1	1	3	1	2	1
Unknown	0	0	.	.	.	.	.	.	.	.	.	.	.	.
Total	11,106	13,381	88	95	169	133	55	47	9	6	29	24	17	6

^aEvents reported by Oct 7, 2008 and 2009

^bSixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.

^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events for service members and beneficiaries at U.S. Army medical facilities, cumulative numbers^a for calendar years through 30 September 2008 and 30 September 2009



Army

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NORTH ATLANTIC																		
Washington, DC Area	16	22	1	.	111	124	22	19	7	12	.	.	14	.	3	.	.	1
Aberdeen, MD	3	.	.	.	15	27	4	4	.	2	.	.	.	.	.	.	.	.
FT Belvoir, VA	.	.	.	.	123	172	10	17	.	.	.	.	.	.	.	.	.	.
FT Bragg, NC	1	.	9	.	791	1,056	167	203	1	3	.	1	121	101	.	.	1	.
FT Drum, NY	3	.	.	.	161	46	14	3	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	.	.	.	.	164	162	26	27	4	.	.	.	1	.	.	.	.	.
FT Knox, KY	2	1	.	.	165	135	36	22	2	.	.	.	2	.	1	.	.	.
FT Lee, VA	2	1	1	.	169	419	62	44	1	2	.	.	5	.	.	.	.	.
FT Meade, MD	1	1	.	.	45	35	4	.	.	.	.	.	.	.	.	.	.	.
West Point, NY	31	26	.	.	24	60	.	3	.	.	.	.	.	.	.	.	.	.
GREAT PLAINS																		
FT Sam Houston, TX	.	.	2	.	274	359	68	72	18	11	1	.	4	16	.	.	.	1
FT Bliss, TX	.	.	.	.	298	209	60	33	6	5	.	.	.	.	.	.	1	1
FT Carson, CO	.	.	.	.	475	524	47	53	.	.	.	.	.	.	1	.	.	.
FT Hood, TX	1	.	1	.	1,287	1,243	283	284	1	9	.	.	.	19	1	.	.	1
FT Huachuca, AZ	1	.	.	.	61	60	10	3	.	1	1	.	2	1	.	.	.	.
FT Leavenworth, KS	1	4	.	.	35	41	4	3	.	1	.	.	.	1	.	.	.	.
FT Leonard Wood, MO	.	.	.	.	150	254	17	27	1	.	3	1	7	7	.	.	2	1
FT Polk, LA	.	.	.	.	93	303	30	44	2	1	.	.	19	134	.	.	.	.
FT Riley, KS	4	.	1	1	266	235	30	38	1	1	1	1	8	3	.	.	.	.
FT Sill, OK	.	.	.	.	62	497	12	43	.	.	.	.	9	22	.	.	.	.
SOUTHEAST																		
FT Gordon, GA	.	.	.	.	387	445	88	73	.	.	.	.	1	8	.	.	.	.
FT Benning, GA	.	.	.	5	202	208	69	52	1	2	.	.	19	1	.	.	.	1
FT Campbell, KY	1	5	.	.	141	221	11	60	1	1	.	.	4	46	.	.	.	.
FT Jackson, SC	.	.	.	.	215	252	34	42	1	2	.	.	19	200	.	.	.	.
FT Rucker, AL	2	.	.	.	44	49	8	4	2	.	.	.	2	.	.	.	1	.
FT Stewart, GA	2	.	2	.	496	680	95	103	2	5	.	.	28	78	1	6	.	1
WESTERN																		
FT Lewis, WA	.	.	5	.	770	789	80	72	1	2	.	.	.	1	.	.	1	1
FT Irwin, CA	.	.	.	.	31	88	7	5	.	2	.	.	11	5	.	.	.	.
FT Wainwright, AK	1	.	.	.	210	141	27	13	1	.	10	1	1	1	.	1	1	1
PACIFIC																		
Hawaii	.	.	1	1	507	511	57	53	.	5	.	.	2	3	.	1	8	5
Japan	.	.	.	.	23	3	3	.	.	.	.	.	.	.	.	.	.	.
Korea	.	.	.	.	305	332	41	11	3	2	.	1	2	4	.	.	.	.
OTHER LOCATIONS																		
Germany	28	42	12	5	524	945	118	110	7	9	8	1	18	30	25	1	3	3
Unknown	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	100	102	35	12	8,624	10,625	1,544	1,540	63	78	24	6	299	681	32	9	18	17

Sentinel reportable events for service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers^a for calendar years through 30 September 2008 and 30 September 2009



Navy

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NATIONAL CAPITOL AREA														
NNMC Bethesda, MD	204	140	4	3	15	2	.	.	.	3	5	5	.	.
NHC Annapolis, MD	27	2	1	.	1	.	.	.	.	.	.	.	.	.
NHC Patuxent River, MD	21	27	.	.	.	.	.	.	.	.	.	.	.	.
NHC Quantico, VA	176	92	.	1	.	1	.	3	.	.	1	.	.	.
NAVY MEDICINE EAST														
NH Beaufort, SC	171	333	.	.	1	.	1	.	.	1	.	2	.	.
NH Camp Lejeune, NC	822	471	2	1	22	11	.	1	.	.	.	.	.	.
NH Charleston, SC	33	3	.	.	1	.	1	.	.	.	.	.	.	.
NH Cherry Point, NC	131	3	.	.	7	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	16	2	.	.	.	.	2	.	1	.	.	.	.	.
NHC Great Lakes, IL	535	326	.	.	.	.	.	.	.	1	7	12	1	.
NH Guantanamo Bay, Cuba	7	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	445	208	.	.	76	14	7	1	.	.	5	.	2	.
NH Naples, Italy	58	1	2	.	.	.	.	.	2	.	2	.	.	.
NHC New England, RI	31	0	1	.	1	.	.	.	.	.	.	.	1	.
NH Pensacola, FL	307	188	2	1	8	7	3	2	.	.	.	.	.	.
NMC Portsmouth, VA	472	144	.	.	.	.	2	.	.	.	5	1	.	.
NH Rota, Spain	22	0	4	.	3	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	47	1	.	.	.	.	.	.	.	.	.	.	1	1
NAVY MEDICINE WEST														
NH Bremerton, WA	49	5	.	.	1	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	173	6	2	.	3	.	1	.	.	.	.	.	.	.
NH Guam-Agana, Guam	127	31	.	.	.	3	.	.	.	.	.	.	4	.
NHC Hawaii, HI	108	18	.	.	.	.	.	.	.	.	.	.	.	.
NH Lemoore, CA	55	47	.	.	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	135	84	.	3	4	2	.	.	.	.	4	3	.	1
NH Okinawa, Japan	47	39	.	.	.	.	.	.	.	.	.	.	.	.
NMC San Diego, CA	1,033	674	1	6	6	11	2	1	1	.	37	49	2	1
NH Twentynine Palms, CA	9	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	200	31	.	.	.	.	.	.	.	.	9	3	.	.
NAVAL SHIPS														
COMNAVAIRLANT/CINCLANTFLEET	47	20	.	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	109	67	.	.	4	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS														
Unknown	2,840	2,990	12	13	23	19	6	5	.	1	16	10	7	2
Total	8,457	5,954	31	28	176	70	25	13	4	6	91	85	18	5

^aEvents reported by Oct 7, 2009

^bSixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.

^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events for service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers^a for calendar years through 30 September 2008 and 30 September 2009



Navy

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NATIONAL CAPITOL AREA																		
NNMC Bethesda, MD	19	9	5	.	139	109	13	8	2	1	.	.	.	.	.	.	2	.
NHC Annapolis, MD	6	.	.	.	16	2	1	.	1	.	.	.	1	.	.	.	.	.
NHC Patuxent River, MD	6	6	.	.	14	18	1	2	.	1	.	.	.	.	.	.	.	.
NHC Quantico, VA	4	1	2	.	110	67	17	9	.	.	.	.	42	10	.	.	.	.
NAVY MEDICINE EAST																		
NH Beaufort, SC	1	.	.	.	68	315	5	14	1	1	.	.	94	.	.	.	.	.
NH Camp Lejeune, NC	2	3	.	1	537	316	131	75	1	.	.	1	126	61	1	1	.	.
NH Charleston, SC	1	.	.	.	25	2	3	1	1	.	.	.	1	.	.	.	.	.
NH Cherry Point, NC	1	.	.	.	101	3	19	.	.	.	.	.	3	.	.	.	.	.
NH Corpus Christi, TX	1	.	.	.	6	2	6	.	.	.	.	.	.	.	.	.	.	.
NHC Great Lakes, IL	.	1	.	.	485	288	39	20	3	.	.	.	.	3	.	.	.	1
NH Guantanamo Bay, Cuba	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	.	.	.	1	321	174	30	18	4	.	.	.	.	.	.	.	.	.
NH Naples, Italy	.	.	.	.	48	1	4	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	6	.	.	.	19	.	3	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	3	.	.	.	225	141	29	19	5	1	.	.	31	14	.	2	1	1
NMC Portsmouth, VA	2	.	1	2	372	115	86	22	3	2	.	.	.	.	1	.	.	2
NH Rota, Spain	.	.	.	.	14	.	1	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	.	.	1	.	36	.	4	.	1	.	.	.	4	.	.	.	.	.
NAVY MEDICINE WEST																		
NH Bremerton, WA	.	.	1	.	46	5	1	.	.	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	.	.	.	.	146	6	19	.	.	.	.	.	.	.	1	.	1	.
NH Guam-Agana, Guam	.	.	6	.	91	24	26	3	.	.	.	.	.	.	.	.	.	1
NHC Hawaii, HI	.	.	.	.	102	17	5	1	1	.	.	.	.	.	.	.	.	.
NH Lemoore, CA	4	.	.	.	50	42	1	5	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	.	1	.	.	115	73	9	1	3	.	.	.	.	.	.	.	.	.
NH Okinawa, Japan	.	.	1	.	33	39	8	.	.	.	.	.	5	.	.	.	.	.
NMC San Diego, CA	9	1	2	3	871	483	87	76	13	17	.	.	2	20	.	2	.	4
NH Twentynine Palms, CA	.	.	.	.	6	.	.	.	.	1	.	.	3	.	.	.	.	.
NH Yokosuka, Japan	.	1	.	.	163	27	25	.	1	.	.	.	.	.	.	.	2	.
NAVAL SHIPS																		
COMNAVAIRLANT/CINCLANTFLEET	.	.	.	1	37	19	10	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	.	.	.	.	83	59	22	7	.	1	.	.	.	.	.	.	.	.
OTHER LOCATIONS																		
Other	65	25	5	7	2,311	2,443	277	298	13	9	.	9	103	144	1	.	1	5
Total	130	48	24	15	6,597	4,790	882	579	53	34	0	10	415	252	4	5	7	14

Sentinel reportable events for service members and beneficiaries at U.S. Air Force medical facilities, cumulative numbers^a for calendar years through 30 September 2008 and 30 September 2009



Air Force

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Air Combat Cmd	1,145	1,119	3	4	15	13	4	2	5	2	31	4	1	2
Air Education & Training Cmd	558	1,213	1	3	11	16	3	3	3	3	3	8	.	.
Air Force Dist. of Washington	158	147	.	.	2	1	.	.	1	.	2	3	.	.
Air Force Materiel Cmd	464	424	2	.	7	8	8	.	2	.	.	4	.	.
Air Force Special Ops Cmd	159	143	.	1	4	6	.	.	.	.	3	.	.	.
Air Force Space Cmd	220	226	1	2	6	7	1	.	.	1	2	2	.	.
Air Mobility Cmd	625	607	1	4	9	7	2	3	.	1	6	3	1	1
Pacific Air Forces	586	397	8	2	5	5	.	.	3	.	10	4	.	1
U.S. Air Forces in Europe	430	457	1	4	7	5	.	.	.	.	4	4	1	1
U.S. Air Force Academy	33	46	1	1	.	2	.	.	.	.	.	.	.	.
Other	563	82	4	1	13	3	7	.	1	.	1	.	.	.
Total	4,941	4,861	22	22	79	73	25	8	15	7	62	32	3	5

^aEvents reported by Oct 7, 2009

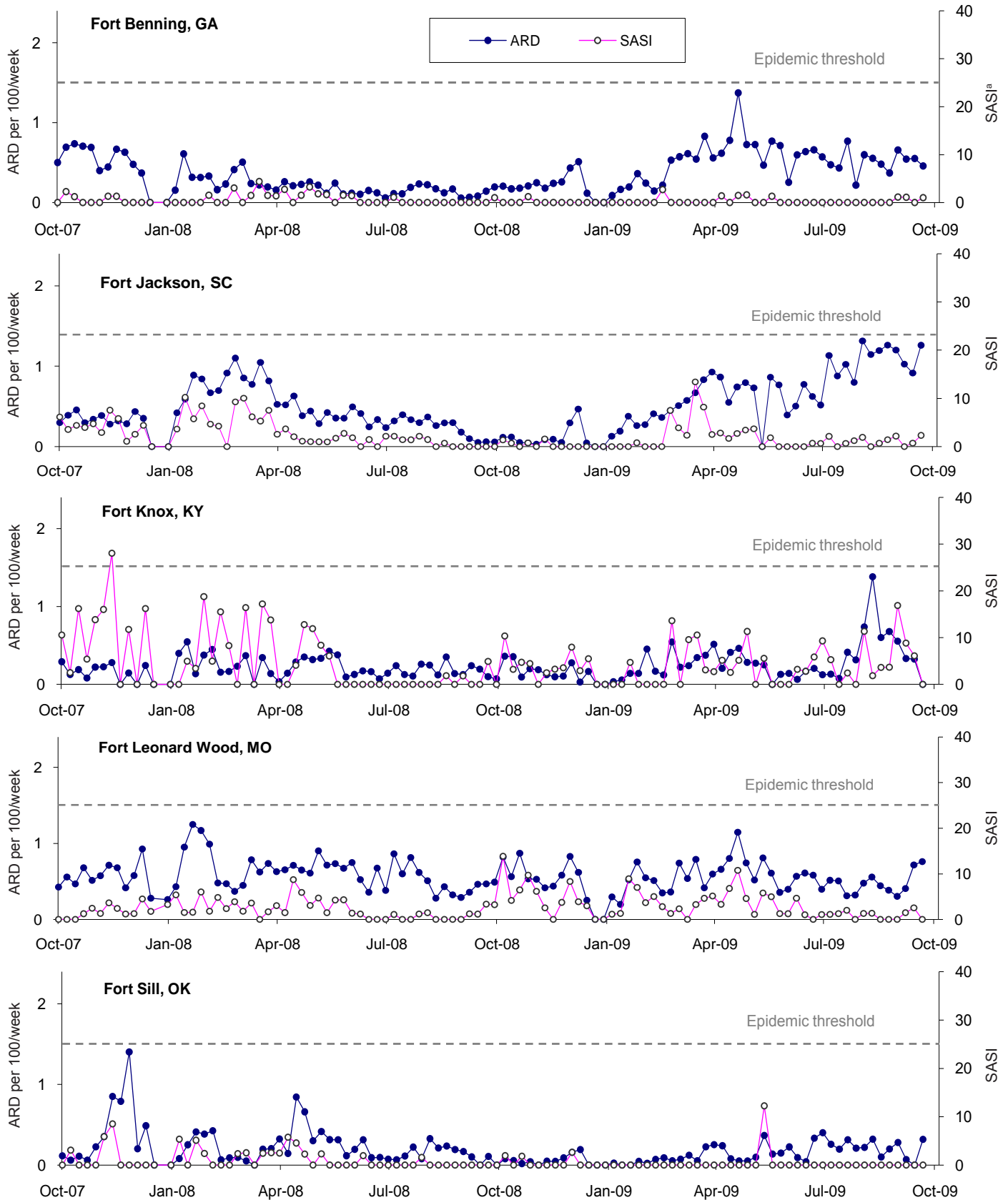
^bSixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.

^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Air Combat Cmd	4	9	.	.	978	987	96	82	3	4	4	5	1	5	.	.	.	.
Air Education & Training Cmd	5	7	.	3	476	1,045	46	112	5	5	1	.	4	8	.	.	.	.
Air Force Dist. of Washington	3	5	.	.	131	130	18	8	1	.	.	.	.	.	.	.	.	.
Air Force Materiel Cmd	10	9	1	.	376	366	53	35	3	2	.	.	.	.	1	.	1	.
Air Force Special Ops Cmd	.	1	1	.	141	125	9	8	.	1	.	1	.	.	1	.	.	.
Air Force Space Cmd	1	.	.	.	196	200	13	12	.	.	.	.	.	1	.	.	.	1
Air Mobility Cmd	15	16	.	1	524	516	53	47	3	1	5	6	4	1	1	.	1	.
Pacific Air Forces	.	.	.	1	528	332	28	35	1	3	2	8	.	6	.	.	1	.
U.S. Air Forces in Europe	17	14	3	1	365	389	32	34	.	2	.	1	.	.	.	.	.	2
U.S. Air Force Academy	1	1	.	1	30	40	.	1	.	.	1	.	.	.	.	.	.	.
Other	6	.	.	5	493	40	29	7	1	.	.	1	5	23	3	1	.	1
Total	62	62	5	12	4,238	4,170	377	381	17	18	13	22	14	44	6	1	3	4

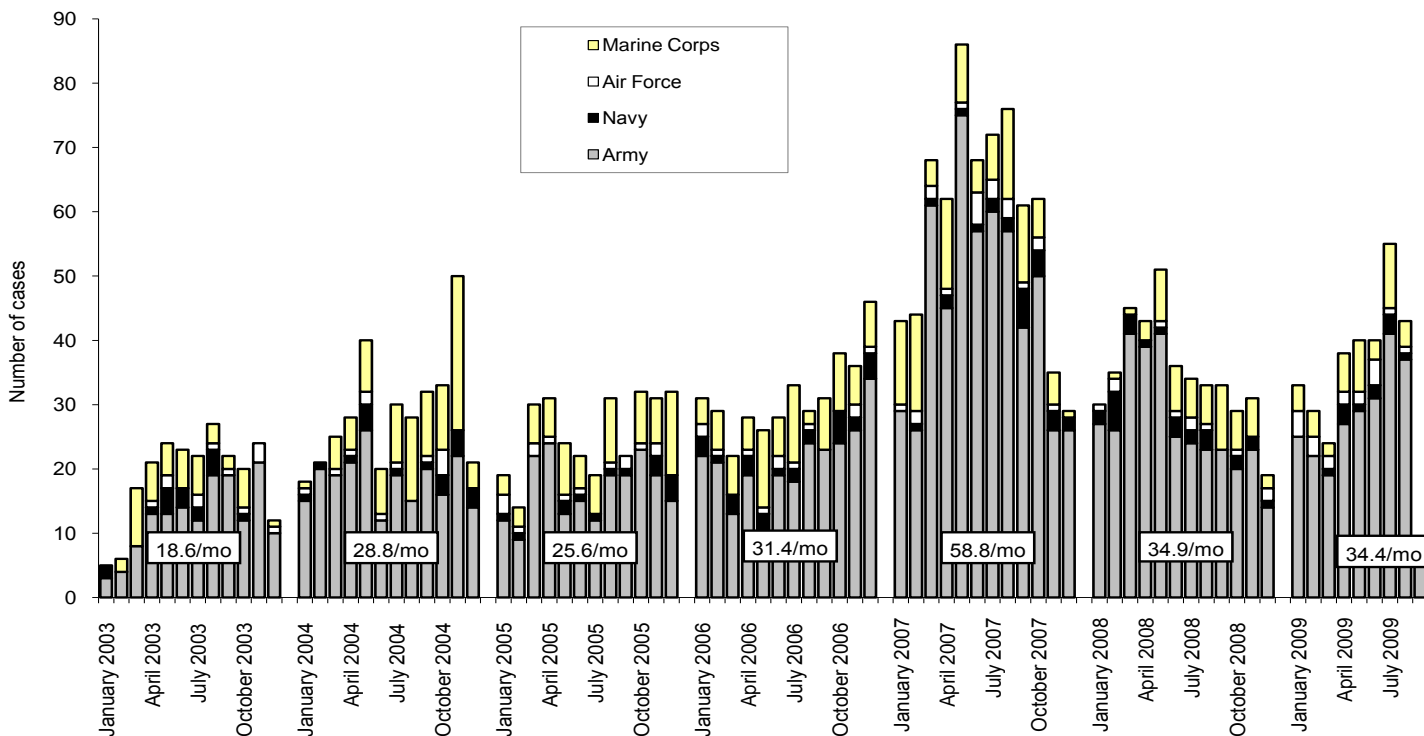
Acute respiratory disease (ARD) and streptococcal pharyngitis rates (SASI^a), basic combat training centers, U.S. Army, by week, October 2007-October 2009



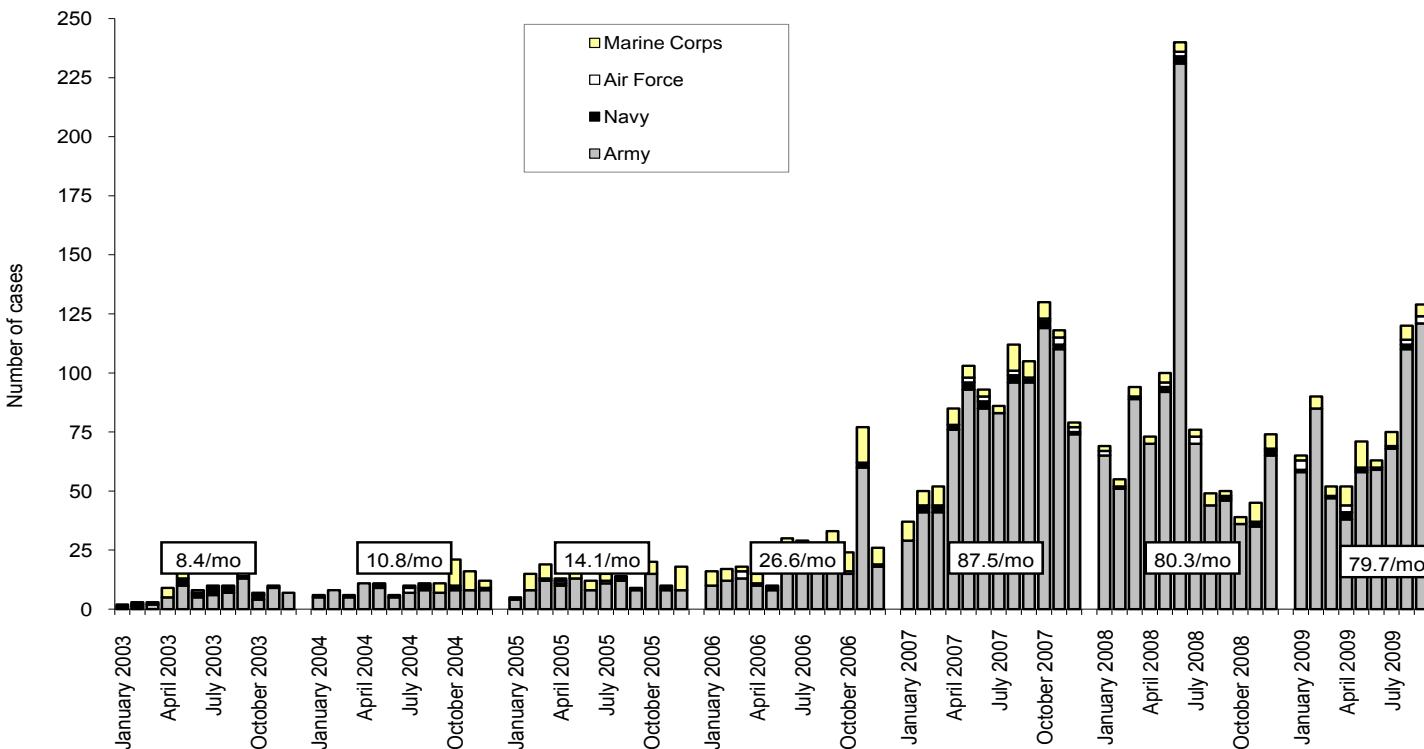
^aStreptococcal-ARD surveillance index (SASI) = ARD rate x % positive culture for group A streptococcus
 ARD rate = cases per 100 trainees per week
 ARD rate > 1.5 or SASI ≥ 25.0 for 2 consecutive weeks are surveillance indicators of epidemics

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - September 2009 (data as of 27 October 2009)

Traumatic brain injury, hospitalizations (ICD-9: 310.2, 800-801, 803-804, 850-854, 950.1-950.3, 959.01, V15.5_1-9, V15.5_A-F)^a



Traumatic brain injury, multiple ambulatory visits (without hospitalization), (ICD-9: 310.2, 800-801, 803-804, 850-854, 950.1-950.3, 959.01, V15.5_1-9, V15.5_A-F)^b



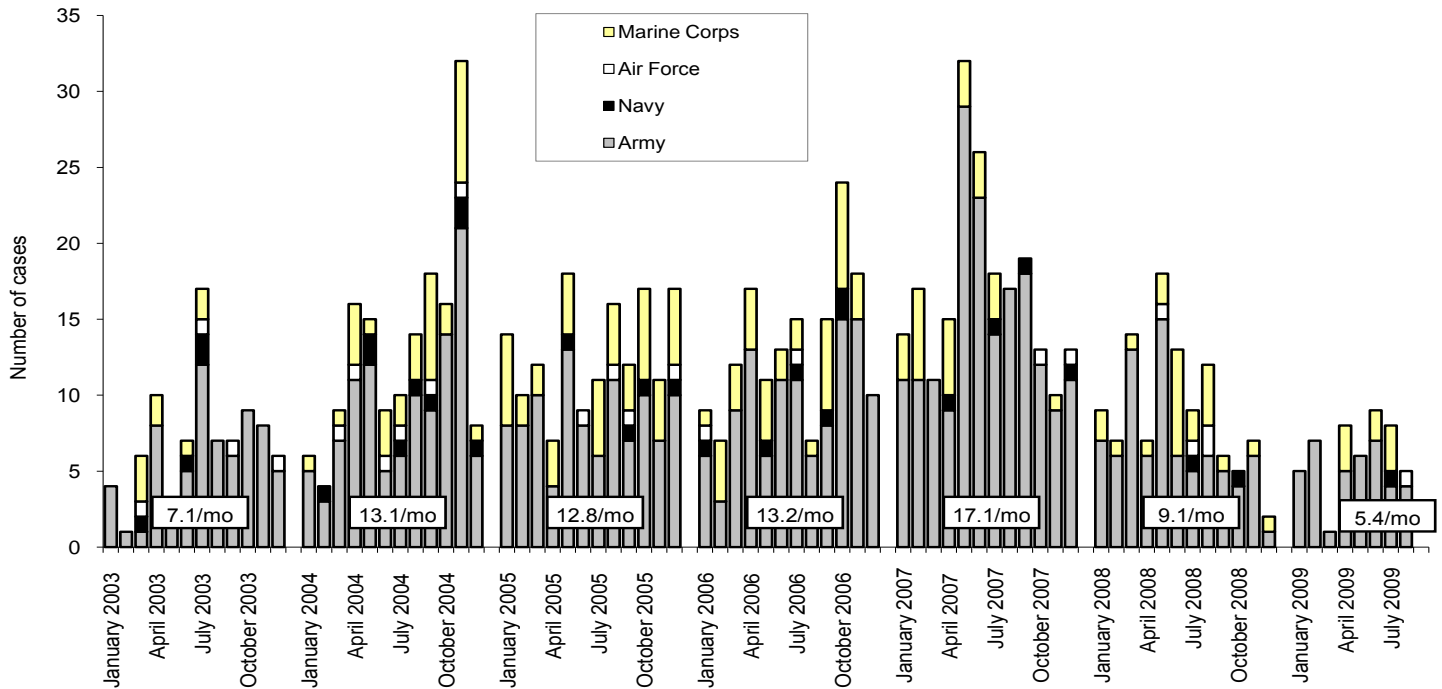
Reference: Armed Forces Health Surveillance Center. Frequencies, rates and trends of use of diagnostic codes indicative of traumatic brain injury (TBI), July 1999-June 2008. MSMR. Dec 2008; 15(10):2-9.

^aIndicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

^bTwo or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 30 days of returning from OEF/OIF.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - September 2009 (data as of 27 October 2009)

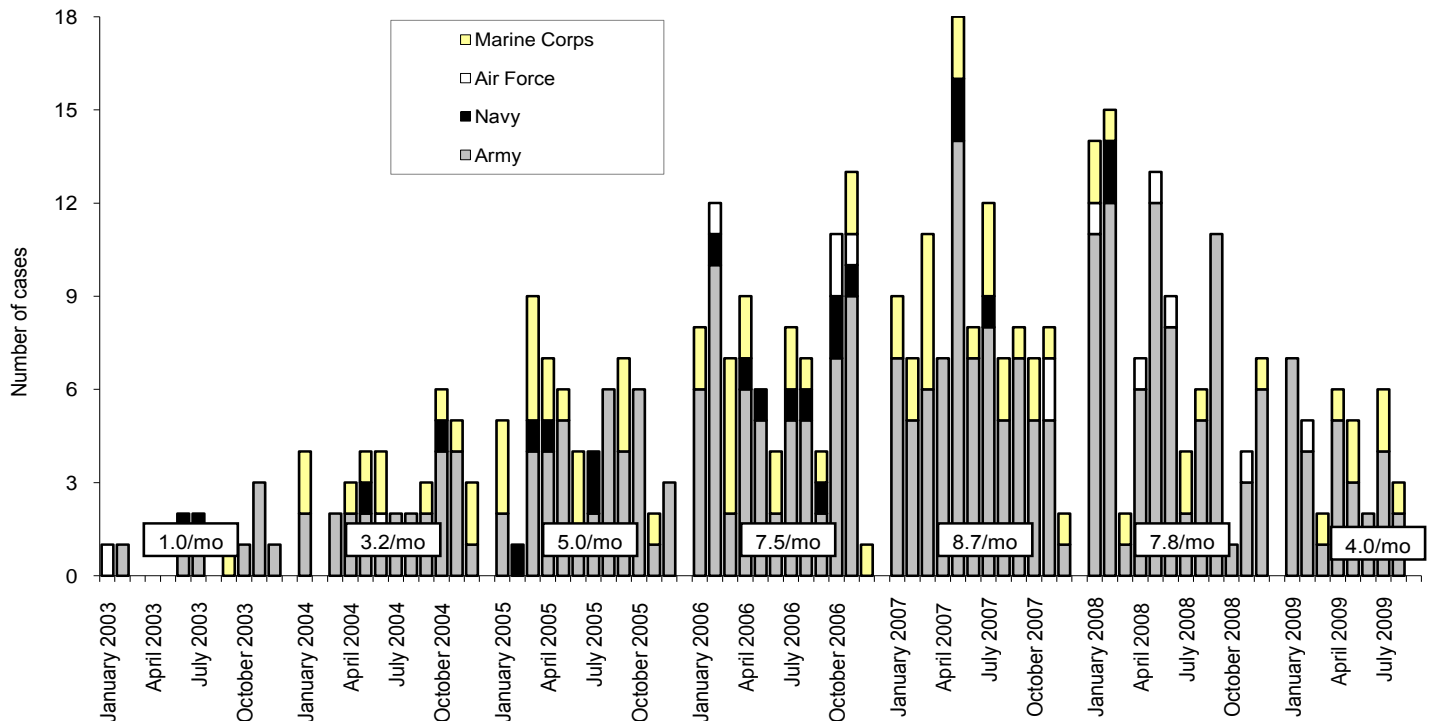
Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)^a



Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: amputations. Amputations of lower and upper extremities, U.S. Armed Forces, 1990-2004. MSMR. Jan 2005;11(1):2-6.

^aIndicator diagnosis (one per individual) during a hospitalization while deployed to/within 365 days of returning from OEF/OIF.

Heterotopic ossification (ICD-9: 728.12, 728.13, 728.19)^b

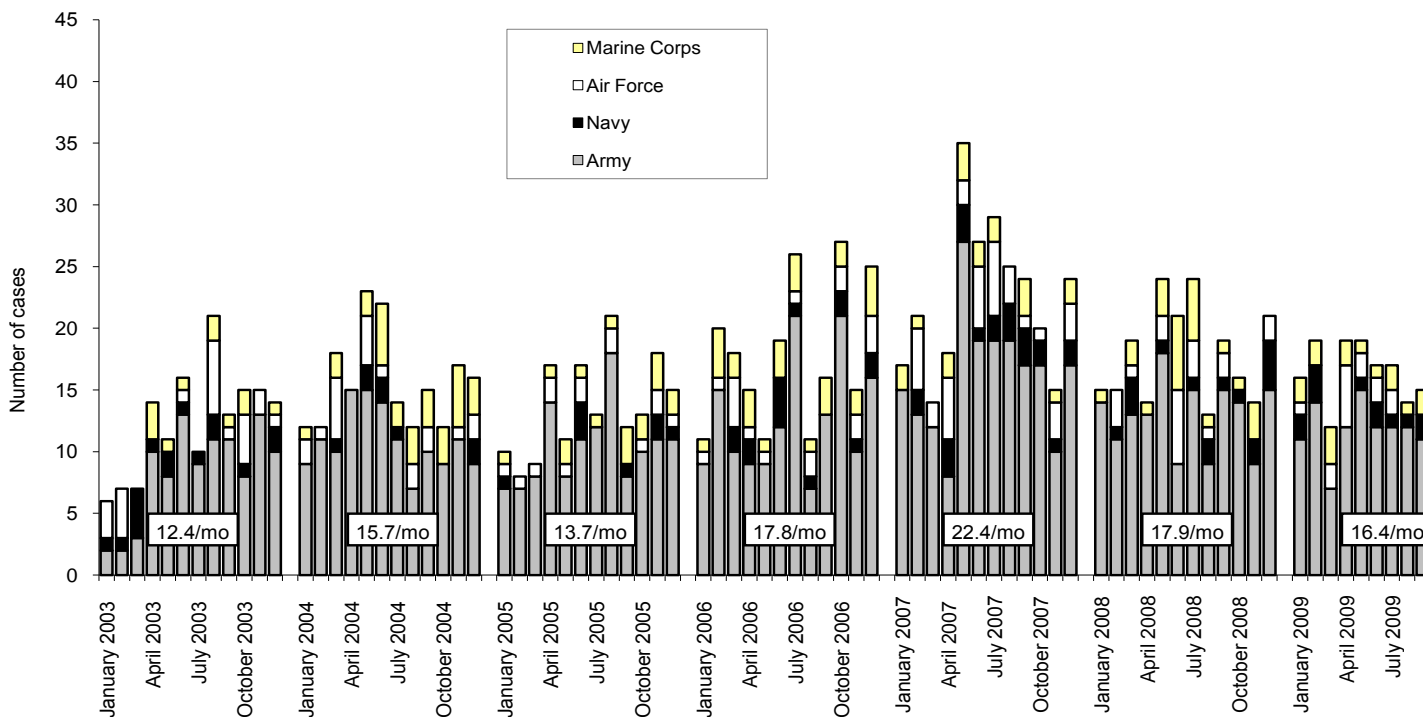


Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. MSMR. Aug 2007; 14(5):7-9.

^bOne diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 365 days of returning from OEF/OIF.

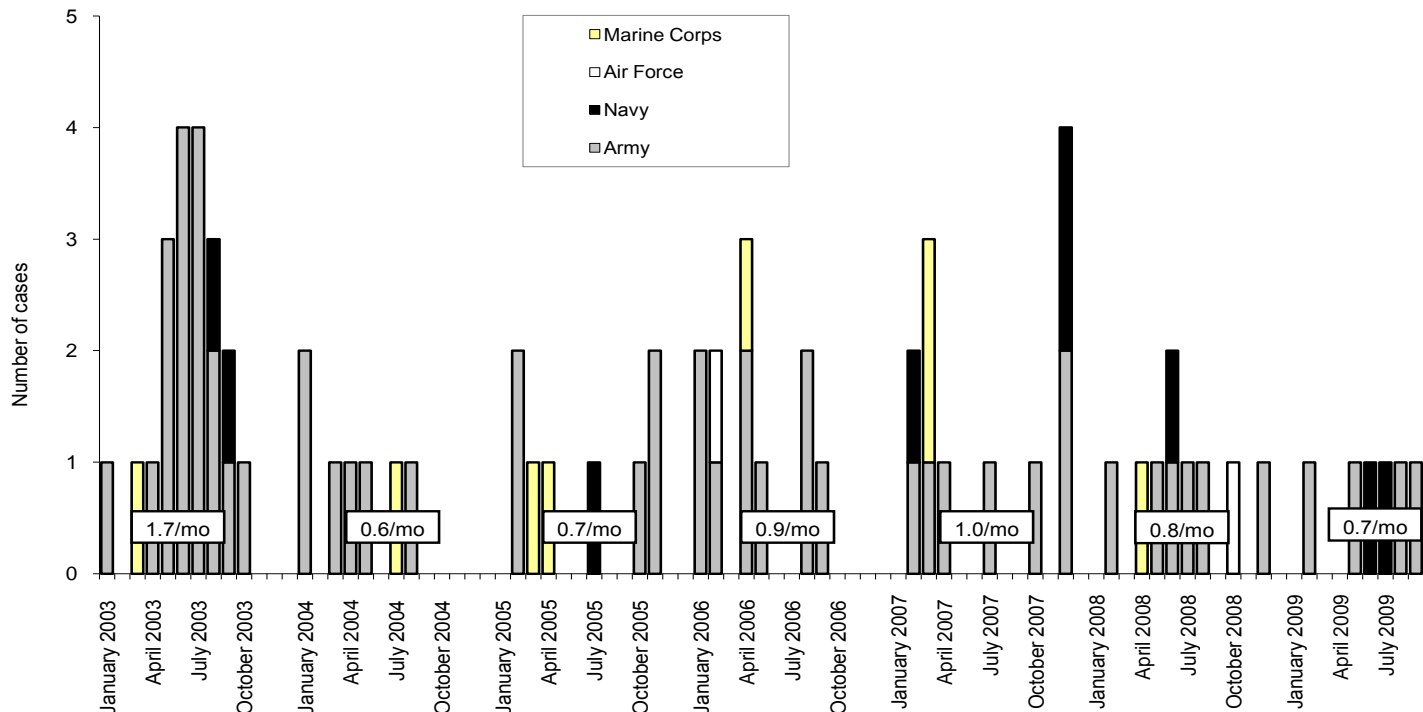
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - September 2009 (data as of 27 October 2009)

Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 - 453.42 and 453.8)^a



Reference: Isenbarger DW, Atwood JE, Scott PT, et al. Venous thromboembolism among United States soldiers deployed to Southwest Asia. *Thromb Res.* 2006;117(4):379-83.
^aOne diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from OEF/OIF.

Severe acute pneumonia (ICD-9: 518.81, 518.82, 480-487, 786.09)^b

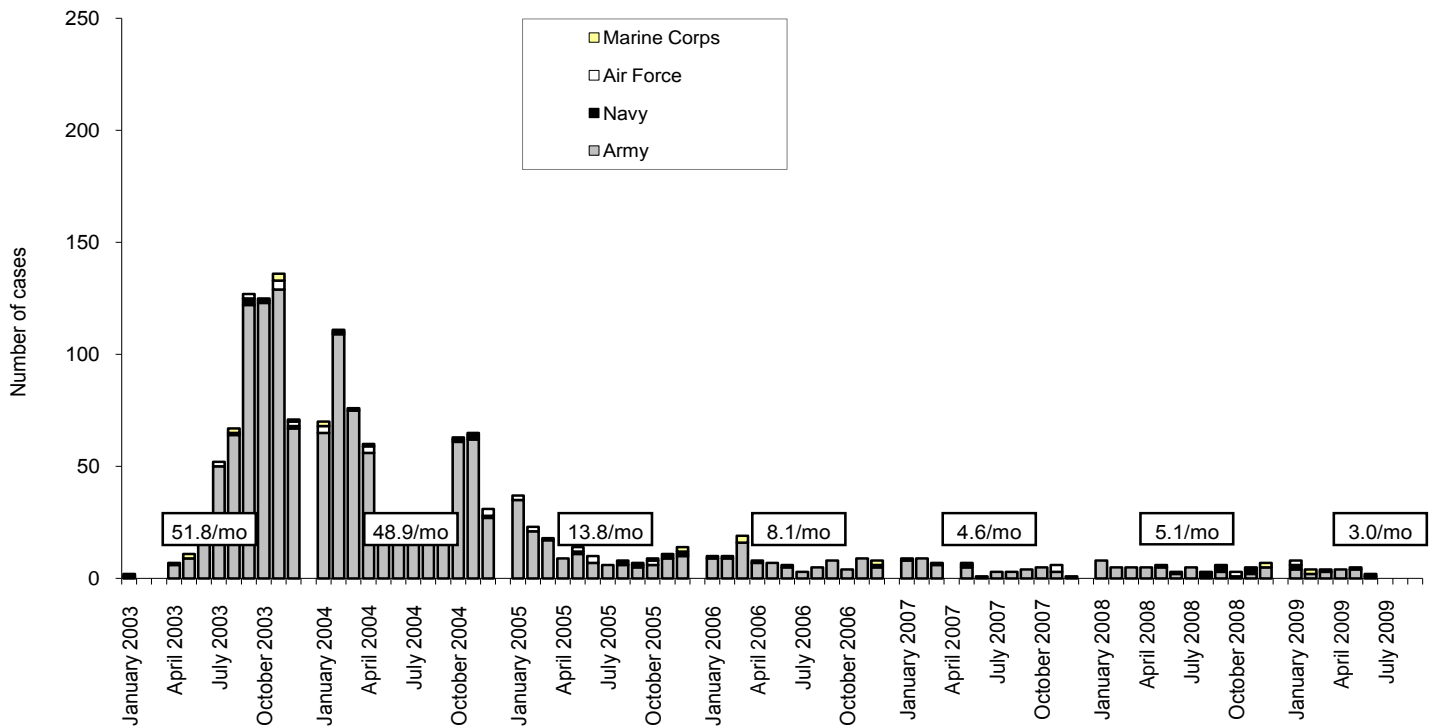


Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom, active components, U.S. Armed Forces, January 2003-November 2004. *MSMR.* Nov/Dec 2004;10(6):6-7.

^bIndicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - September 2009 (data as of 27 October 2009)

Leishmaniasis (ICD-9: 085.0 to 085.9)*



Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: leishmaniasis. Leishmaniasis among U.S. Armed Forces, January 2003-November 2004. MSMR. Nov/Dec 2004;10(6):2-4.

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

Commander
U.S. Army Center for Health Promotion
and Preventive Medicine
ATTN: MCHB-TS-EDM
5158 Blackhawk Road
Aberdeen Proving Ground, MD 21010-5422

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Inquiries regarding content or material to be considered for publication should be directed to: Editor, Armed Forces Health Surveillance Center, 2900 Linden Lane, Suite 200 (Attn: MCHB-TS-EDM), Silver Spring, MD 20910. E-mail: msmr.afhsc@amedd.army.mil

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