



VOL. 15 • NO. 7
SEPTEMBER 2008

MISMR

A publication of the Armed Forces Health Surveillance Center



MEDICAL SURVEILLANCE MONTHLY REPORT

INSIDE THIS ISSUE:

Syncope after Immunization by Injection, U.S. Armed Forces, 1998-2007	2
Uses of Complementary and Alternative Medicine (CAM) Procedures, U.S. Armed Forces, Active Component, 2006-2007	6
Completeness and Timeliness of Reporting of Notifiable Medical Conditions Among Active Component Service Members, U.S. Armed Forces, 1998-2007	12
Update: Deployment health assessments, U.S. Armed Forces, August 2008	24

Summary tables and figures

Sentinel reportable medical events, active components, U.S. Armed Forces, cumulative numbers through August 2007 and August 2008	30
Acute respiratory disease, basic training centers, U.S. Army, August 2006-August 2008	35
Deployment-related conditions of special surveillance interest	36

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Syncope after Immunization by Injection, U.S. Armed Forces, 1998-2007

Syncope (“fainting”) is a temporary loss of consciousness due to sudden reduction of blood flow to the brain. In healthy individuals, syncope can occur from stimulation of the vagus nerve (“vasovagal syncope”) which slows the heart rate, dilates blood vessels, decreases blood pressure, and reduces cerebral blood flow. Vasovagal syncope is often associated with prolonged standing (e.g., during military formations), emotional extremes (e.g., weddings, funerals), the sight of blood or injury, and in response to pain.

Among adolescents and young adults, vasovagal syncope often complicates minor invasive medical procedures (e.g., blood donation, venipuncture, injections). Vasovagal syncope is not a serious medical condition; however, the effects of sudden loss of consciousness can be serious.¹⁻³

In the U.S. general population, syncope after immunizations is passively monitored from reports to the Vaccine Adverse Events Reporting System (VAERS).¹⁻³ In recent years, reports to VAERS of postvaccination syncope have been increasing, particularly among adolescent females; in addition, some serious postvaccination syncope-related injuries (including skull fracture, cerebral hemorrhage, and at least one death) have been reported.¹⁻³

Immunizations by injection are inherent to the force health protection efforts of the U.S. military. Because U.S. service members receive so many immunizations by injection, postvaccination syncope is a relevant safety concern. The objective of this analysis was to estimate frequencies, rates, trends, correlates of risk, and adverse medical effects of postvaccination syncope among U.S. service members during a recent 10-year period.

Methods:

The surveillance period was 1 January 1998 to 31 December 2007. The surveillance population included all individuals who served in the active or Reserve component of the U.S. Armed Forces and received at least one immunization by injection any time during the surveillance period.

For this analysis, immunizations given by injection were considered relevant exposures (hence, tuberculin skin tests and vaccines administered orally [e.g., adenovirus] or nasally [e.g., FluMist®] were not considered risky exposures).

Risk of postvaccination syncope was quantified in relation to “immunization episodes.” An “immunization episode” was defined as the receipt by a service member of one or more immunizations by injection on a given day. In turn, each service member was limited to one immunization episode per day, regardless of the number of immunizations received.

The case-defining endpoint of analyses was a hospitalization or ambulatory visit on the day of an immunization episode that included a diagnosis (in any position) of ICD-9-CM: 780.2 “syncope and collapse.”

Results:

During the 10-year surveillance period, there were 32,113,307 immunization episodes and 2,612 medical encounters for “syncope and collapse” on the days of immunization episodes. The crude overall risk of medical encounters for postvaccination syncope was 0.81 per 10,000 immunization episodes (**Table 1**).

The risk of postvaccination syncope increased in a nearly linear fashion during the period — the crude overall risk in 2007 (1.14 per 10,000 immunization episodes) was more than 2.5-times higher than in 1998 (0.44 per 10,000 immunization episodes) (**Table 1, Figure 1**).

The risk of postvaccination syncope was more than twice as high among males as females and sharply declined with increasing age (**Table 1, Figure 2**). Crude risks were higher among members of the Air Force, those in other than combat-specific and health care-related occupations, and among white non-Hispanic and enlisted service members compared to their respective counterparts (**Table 1**).

In the Air Force (26.2%) and Marine Corps (24.6%), approximately one-fourth of all postvaccination syncope cases occurred among individuals in their first two weeks of service; in the Army (10.4%) and Navy (14.9%), much smaller proportions of cases occurred within the first two weeks of service (data not shown).

In general, the risk of syncope sharply increased as the number of injections per immunization episode increased. Compared to episodes with only one injection, risks of syncope were approximately 2-times, 4-times, and more than 5-times higher during episodes with two, three, and four or more injections, respectively (**Figure 3**).

During the period, injuries diagnosed during the same medical encounters as postvaccination “syncope and collapse” included fractures of the skull (n=1) and other bones (n=4); intracranial injuries (n=4); concussions (n=11); open wounds of the scalp (n=26), jaw (n=12), forehead (n=6) and other sites (n=32); contusions of the scalp, face, and neck (n=29); other and unspecified injuries of the head, face, and neck (n=15); and sprains/strains of the neck and back (n=6) (data not shown).

Data summaries by Gi-Taik Oh, Data Analysis Group, Armed Forces Health Surveillance Center.

Table 1. Syncope after immunization, frequency and rate per 10,000 vaccination episodes, by year, U.S. Armed Forces, 1998-2007

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		Total		
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	Rate ratio (unadjusted)
Total	113	0.44	143	0.47	151	0.71	173	0.69	236	0.75	403	0.77	324	0.89	271	0.80	403	1.34	395	1.14	2,612	0.81	
<i>Component</i>																							
Active	100	0.48	129	0.53	125	0.74	138	0.73	195	0.80	281	0.76	241	0.96	206	0.84	323	1.48	318	1.25	2,056	0.86	1.26
Reserve	13	0.29	14	0.23	26	0.60	35	0.56	41	0.57	122	0.79	83	0.74	65	0.71	80	0.98	77	0.82	556	0.68	ref
<i>Gender</i>																							
Male	33	0.96	43	1.06	35	1.12	52	1.36	69	1.48	97	1.33	73	1.53	72	1.52	103	2.35	110	2.14	687	1.51	2.17
Female	80	0.36	100	0.38	116	0.64	121	0.57	167	0.62	306	0.68	251	0.80	199	0.69	300	1.17	285	0.96	1,925	0.70	ref
<i>Age</i>																							
<20	32	1.03	58	1.41	52	1.39	58	1.39	72	1.46	115	1.75	102	1.94	79	1.73	138	3.11	122	2.63	828	1.82	4.12
20-24	40	0.56	42	0.48	52	0.83	61	0.83	92	0.90	163	0.91	113	0.89	91	0.82	155	1.57	138	1.13	947	0.92	2.08
25-29	20	0.41	19	0.35	15	0.42	22	0.55	30	0.57	47	0.52	43	0.69	39	0.65	50	0.93	56	0.85	341	0.61	1.38
30-34	6	0.14	10	0.22	11	0.37	13	0.38	18	0.44	28	0.41	28	0.63	21	0.51	21	0.61	19	0.49	175	0.42	0.94
35-39	9	0.26	7	0.17	13	0.50	10	0.32	11	0.30	22	0.37	21	0.57	17	0.47	18	0.58	29	0.84	157	0.43	0.97
40+	6	0.23	7	0.21	8	0.37	9	0.30	13	0.37	28	0.45	17	0.42	24	0.56	21	0.56	31	0.76	164	0.44	ref
<i>Race/ethnicity</i>																							
White, non-Hispanic	85	0.47	109	0.51	115	0.78	134	0.76	198	0.89	327	0.88	256	0.99	213	0.88	322	1.48	314	1.23	2,073	0.91	1.65
Black, non-Hispanic	15	0.33	20	0.37	24	0.63	22	0.50	27	0.49	50	0.55	36	0.61	42	0.80	43	0.93	47	0.87	326	0.61	1.10
Other	13	0.46	14	0.38	12	0.45	17	0.55	11	0.28	26	0.41	32	0.71	16	0.39	38	1.06	34	0.86	213	0.55	ref
<i>Service</i>																							
Army	18	0.30	27	0.36	27	0.45	44	0.58	84	0.72	191	0.80	162	0.96	103	0.74	132	1.05	144	0.89	932	0.76	ref
Navy	17	0.30	24	0.37	19	0.46	26	0.60	32	0.60	42	0.46	40	0.60	27	0.43	45	0.71	56	0.90	328	0.54	0.71
Air Force	63	0.60	65	0.59	79	1.00	76	0.79	98	0.99	130	1.06	91	1.31	103	1.25	187	2.86	152	2.12	1,044	1.16	1.52
Marine Corps	15	0.45	27	0.51	26	0.86	26	0.78	21	0.47	35	0.54	30	0.57	30	0.66	29	0.75	25	0.56	264	0.60	0.79
Coast Guard	0	0.00	0	0.00	0	0.00	1	0.41	1	0.29	5	0.72	1	0.19	8	1.19	10	1.48	18	2.70	44	1.00	1.32
<i>Grade</i>																							
Enlisted	102	0.47	134	0.51	136	0.74	148	0.68	205	0.74	373	0.82	296	0.92	244	0.83	357	1.37	356	1.18	2,351	0.84	ref
Officer	11	0.30	9	0.21	15	0.53	25	0.76	31	0.76	30	0.45	28	0.65	27	0.61	46	1.16	39	0.87	261	0.62	0.74
<i>Military occupation</i>																							
Combat	12	0.26	16	0.28	15	0.37	22	0.47	35	0.54	54	0.49	45	0.56	61	0.73	78	0.94	67	0.80	405	0.58	ref
Health care	2	0.10	10	0.46	9	0.52	18	0.85	17	0.64	27	0.67	14	0.53	14	0.59	18	0.83	16	0.61	145	0.59	1.02
Other	99	0.53	117	0.52	127	0.82	133	0.73	184	0.82	322	0.86	265	1.04	196	0.86	307	1.57	312	1.31	2,062	0.91	1.57

* Rate per 10,000 immunization episodes, with no more than one immunization episode per individual per day

Figure 1. Risk of syncope after immunization by injection, U.S. Armed Forces, by year, 1998-2007

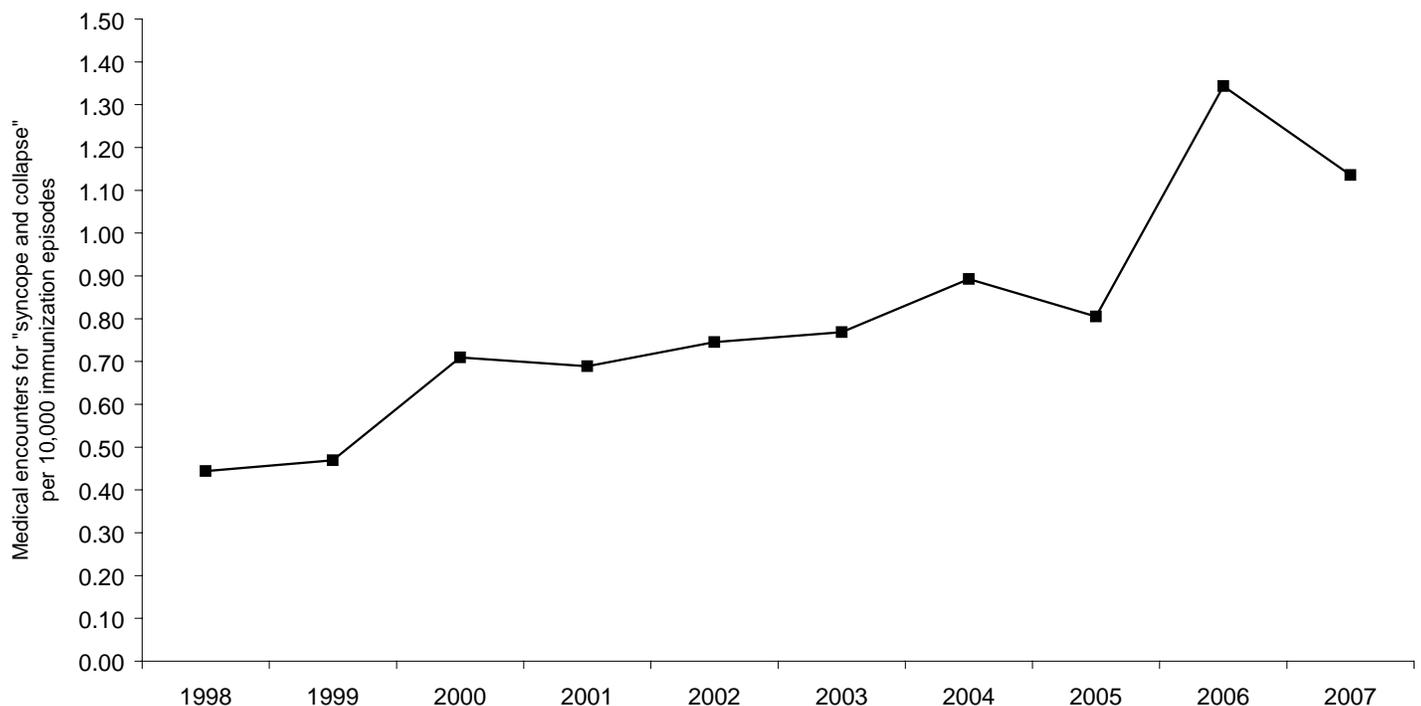


Figure 2. Risk of syncope after immunization by injection among males and females, by age group, U.S. Armed Forces, 1998-2007

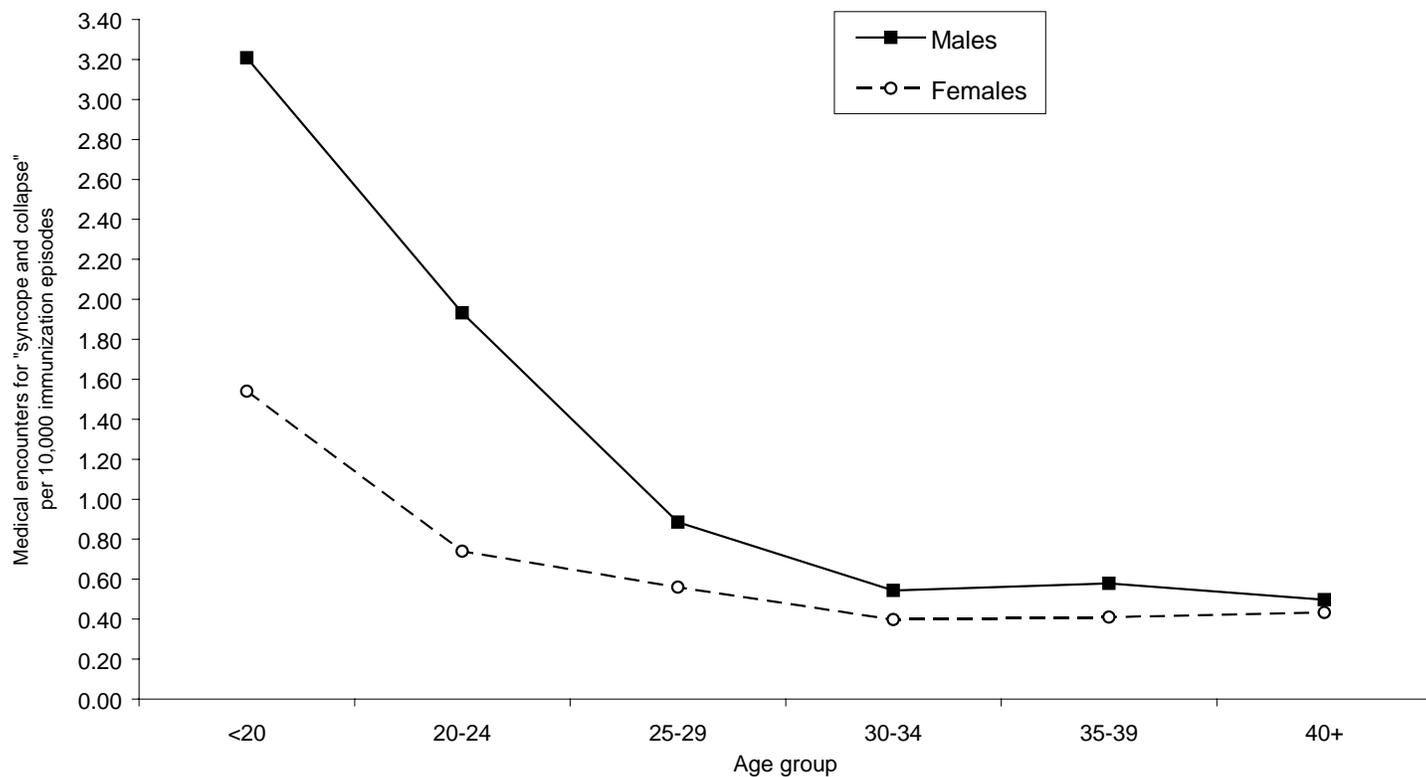
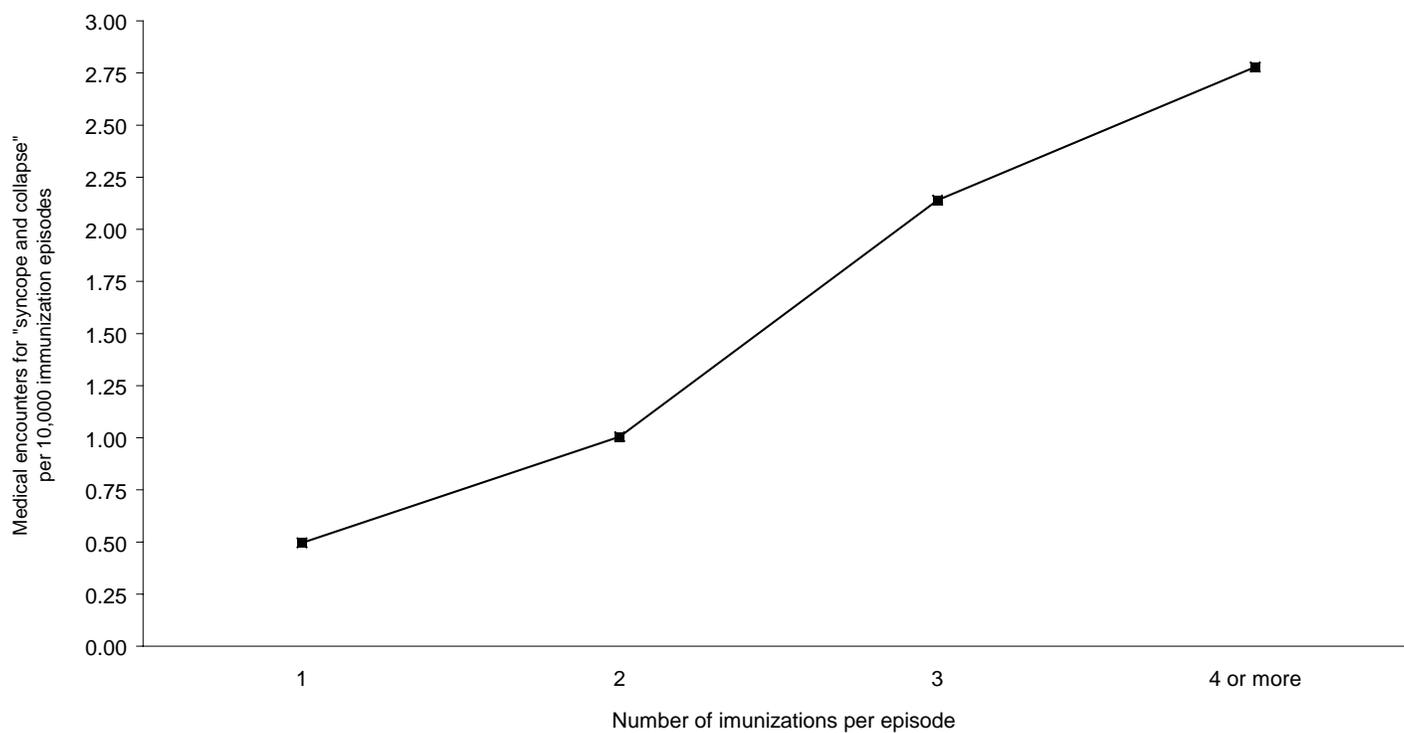


Figure 3. Risk of syncope after immunization episodes, by the number of injections during the episode, U.S. Armed Forces, 1998-2007



Editorial comment:

More than 230 years ago, General George Washington directed that all troops of the Continental Army “shall be inoculated” against smallpox.⁴ Since then, immunizations have been given to U.S. service members without their explicit consent. Because military immunizations are given to healthy individuals, health care workers have an extraordinary responsibility to minimize the risks associated with them.

Syncope is a well-known consequence of vaccination. In most cases, postvaccination syncope is managed at the site with no significant or long-lasting effects. However, syncope can be dangerous — particularly when collapse leads to forceful contact between the face or skull of the affected individual and a sharp or solid object nearby (e.g. furniture, equipment, wood/concrete flooring).

During the past ten years, there have been on average more than 3.2 million documented episodes of immunization by injection of U.S. service members annually — approximately one-fourth of all episodes have involved more than one injection. The risk of clinically significant syncope after receiving immunizations by injection is generally low (however, it does sharply increase when multiple injections are given). Because so many service members receive immunizations by injection, and since multiple injections are often given at the same time, hundreds of service members are treated for postvaccination syncope each year — occasionally, the clinical effects of postvaccination syncope are severe. This report documented more than 150 fractures, intracranial injuries, concussions, open wounds, contusions, sprains, strains, and other injuries of the head, face, neck, and back that were temporally related to syncope and collapse of service members after immunization.

The Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) recommends that vaccine providers “strongly consider observing patients for 15 minutes after they are vaccinated. If syncope develops, patients should be observed until symptoms resolve.”³ Before the start of recruit training, newly inducted service members receive multiple immunizations by injection; and in preparation for overseas deployments, members of military units often receive immunizations in large groups. The risk of serious complications of postvaccination syncope may be increased when immunizations are given to military groups outside of medical facilities — rather than to individuals in clinic settings. For example, in clinics, vaccinees can be seated during and after injections and monitored for syncope for reasonable periods; in addition, flooring, furniture, and equipment can be padded, shielded, or removed from immunization rooms and patient waiting areas. Such measures may be difficult to establish and maintain in areas where mass immunizations are given (e.g., theaters, gymnasiums). Nonetheless, every measure to ensure the safety of immunization recipients should be taken, regardless of the location, setting, or circumstances of administration.

References:

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2. Braun MM, Patriarca PA, Ellenberg SS. Syncope after immunization. *Arch Pediatr Adolesc Med.* 1997 Mar;151(3):255-9.
3. Advisory Committee on Immunization Practices (ACIP), Centers for Disease Control and Prevention. General recommendations on immunization. *MMWR* 2006;55(No. RR-15):19.
4. Filsinger AL, Dwek R. George Washington and the first mass military inoculation. Science reference services. John W. Kluge Center, Library of Congress. Washington, DC. Accessed on line on 16 Sep 2008: < <http://www.loc.gov/rr/scitech/inoculation.html> >.

Uses of Complementary and Alternative Medicine (CAM) Procedures, U.S. Armed Forces, Active Component, 2006-2007

Complementary and alternative medicine (CAM) is a term used to describe a wide variety of procedures, substances, and approaches to treating illnesses and injuries and promoting health. Some CAM procedures and substances have been rigorously tested; others have not.^{1,2} There is substantial demand for CAM among U.S. civilians: an estimated \$34 billion was paid for CAM in 2000.³ Preliminary data suggest similar trends among U.S. military members.

In a recent survey of U.S. Navy and Marine Corps members, over one-third of respondents reported CAM use in the prior year. Compared to non-CAM users, military CAM users were more likely to be officers and in technical support occupations; in addition, they reported more sick days, physical pain, and dissatisfaction with conventional medical care.¹ A recent prospective study of 1,446 members of the U.S. Navy and Marine Corps found that those who reported self-administering two or more CAM therapies were significantly less likely to be hospitalized for any cause compared to those who did not self-administer CAM.⁴

In the Military Health System, outpatient records use Current Procedural Terminology® (CPT) codes to document medical procedures rendered to service members and other beneficiaries. Currently, three forms of CAM are documented with CPT codes: acupuncture, osteopathic manipulation, and chiropractic.⁵ Prior studies of CAM use in military populations have relied on responses to questionnaires; to date, there have been no published analyses of systematically documented CAM use (e.g., medical claims) in U.S. military populations.

This report summarizes the number and nature of CAM procedures recorded during ambulatory visits by active component service members in 2006 and 2007. In addition, rates of hospitalization and missed duty days due to “convalescence in quarters” (CIQ) are compared among CAM users and non-CAM users.

Methods:

The surveillance period was 1 January 2006 through 31 December 2007. The surveillance cohort consisted of all individuals who were in the active component of the U.S. Armed Forces on 1 January 2007 (the midpoint of the surveillance period).

All ambulatory visits of surveillance cohort members that occurred during the surveillance period and included a procedure code were identified. For this analysis, only the primary (first-listed) procedure code (CPT1) for each ambulatory visit was included.

Rates of hospitalization and CIQ during the surveillance period were compared among CAM users and non-CAM users — overall; among those who had been hospitalized for any reason during the year (2005) prior to the surveillance period; and among those diagnosed with a musculoskeletal or connective tissue disorder (ICD-9-CM codes: 710-739) during the surveillance period.

Results:

During the two-year surveillance period, 4.2% (n=59,403) of all active component members had at least one outpatient visit that included a CAM procedure (Table 1). During the period, CAM procedures were the primary procedures during approximately 2.2% of all outpatient visits that included any procedure (Table 2).

Chiropractic (n=287,011 visits) accounted for approximately 90% of all CAM procedures. Chiropractic-related visits were more than 12- and 60-times more frequent than osteopathic manipulation (n=23,163 visits) and acupuncture (n=4,599 visits) visits, respectively (Table 2).

In general, members of the Air Force, women, officers, older service members, and those in health care occupations were more likely than their respective counterparts to have CAM procedure-related visits (Table 1).

During the two-year period, more than one-half (56.3%) of service members with any CAM procedure-related visits had three or more such visits. Older service members and Marines were more likely than their respective counterparts to have three or more visits during the period (data not shown).

The relative frequencies of CAM use varied in relation to the locations of medical facilities. For example, among clinics in the Midwest, ambulatory visits that included CAM procedures accounted for 3.6% of all visits with any procedure; in contrast, in the Northeast, visits with CAM procedures were only 1.4% of all visits with any procedures (data not shown).

Approximately two-thirds of all CAM-related visits had a primary (first-listed) diagnosis of “nonallopathic lesions, not elsewhere classified” (ICD-9 code 739) or “other and unspecified disorders of the back” (ICD-9 code 724). These were the most frequent diagnoses during visits that included chiropractic (ICD-9 739: 48%; ICD-9 code 724: 18%) and osteopathic manipulation (ICD-9 code 739: 34%; ICD-9 code 724: 24%) but not acupuncture. The most frequent primary diagnoses during acupuncture-associated visits

Table 1. Number and proportion of members of active component (as of 1 January 2007), U.S. Armed Forces, who had ambulatory visit(s) that included complementary or alternative medicine (CAM) procedure(s), 2006-2007.

	Number of service members	Acupuncture		Osteopathic manipulation		Chiropractic		Any CAM	
		No. of recipients	% of service members	No. of recipients	% of service members	No. of recipients	% of service members	No. of recipients	% of service members
<i>Gender</i>									
Female	201,937	594	0.29	4,184	2.07	10,579	5.24	14,573	7.22
Male	1,201,519	1,011	0.08	10,612	0.88	34,820	2.90	44,830	3.73
<i>Age group</i>									
17-24	572,146	252	0.04	3,827	0.67	10,311	1.80	13,934	2.44
25-34	510,288	547	0.11	5,968	1.17	17,146	3.36	22,787	4.47
35-44	272,888	594	0.22	4,088	1.50	15,009	5.50	18,824	6.90
45+	48,134	212	0.44	913	1.90	2,933	6.09	3,858	8.02
<i>Service</i>									
Army	504,806	691	0.14	4,803	0.95	16,299	3.23	20,930	4.15
Coast Guard	40,022	11	0.03	211	0.53	489	1.22	695	1.74
Air Force	340,290	510	0.15	6,524	1.92	12,801	3.76	18,908	5.56
Marine Corps	179,565	104	0.06	762	0.42	6,147	3.42	6,852	3.82
Navy	338,773	289	0.09	2,496	0.74	9,663	2.85	12,018	3.55
<i>Military status</i>									
Enlisted	1,173,095	1,117	0.10	11,654	0.99	35,491	3.03	46,510	3.96
Officer	230,361	488	0.21	3,142	1.36	9,908	4.30	12,893	5.60
<i>Military occupation</i>									
Combat	833,522	646	0.08	7,764	0.93	24,517	2.94	31,802	3.82
Health	115,626	475	0.41	2,538	2.20	5,917	5.12	8,390	7.26
Other	454,308	484	0.11	4,494	0.99	14,965	3.29	19,211	4.23
<i>Geographic region (home)</i>									
Midwest U.S.	198,976	195	0.10	1,428	0.72	6,208	3.12	7,539	3.79
Northeast U.S.	147,091	130	0.09	1,048	0.71	4,296	2.92	5,309	3.61
South U.S.	438,678	403	0.09	3,373	0.77	13,545	3.09	16,738	3.82
West U.S.	227,877	252	0.11	1,937	0.85	6,413	2.81	8,279	3.63
Unknown/other	390,834	625	0.16	7,010	1.79	14,937	3.82	21,538	5.51
Total	1,403,456	1,605	0.11	14,796	1.05	45,399	3.23	59,403	4.23

were “other and unspecified disorders of the back” (ICD-9 code 724: 24%) and “other (rheumatic, excluding the back) disorders of the soft tissue” (ICD-9 code 729: 17%) (Table 3).

During the surveillance period, among service members overall, the crude hospitalization rate was 1.78-times higher among CAM users than non-CAM users. However, among service members who had been hospitalized in the year (2005) prior to the surveillance period, CAM users were only 1.23-times more likely than non-CAM users to be hospitalized during the surveillance period. Finally, among service members who were diagnosed with a musculoskeletal or connective tissue disorder during the surveillance period, CAM users and non-CAM users had similar hospitalization rates (hospitalization rate ratio, 1.02) (Table 4).

Among service members overall, CAM users were more likely than non-CAM users to receive convalescence in quarters (CIQ) dispositions (rate ratio: 1.61). Similarly, among service members who received convalescence in quarters dispositions in the year (2005) prior to the surveillance period, CAM users were more likely than non-CAM users to receive a CIQ

disposition during the surveillance period (rate ratio: 1.74). However, among service members who were diagnosed with a musculoskeletal or connective tissue disorder during the surveillance period, CAM users and non-CAM users had similar CIQ disposition rates (rate ratio, 0.94) (Table 5).

Editorial comment:

This report provides an overview of CAM treatments used during ambulatory medical encounters among active component service members during a recent two-year period. Overall, CAM procedures were used by more than one of thirty service members; however, CAM procedures accounted for fewer than three percent of all primary procedures reported during outpatient encounters.

Compared to non-CAM users, CAM users had higher rates of hospitalization and convalescence in quarters dispositions in general as well as among those who had been hospitalized and/or received convalescence in quarters dispositions in the year preceding this surveillance. The

findings suggest that those who receive CAM treatments may have more persistent and/or disabling conditions than their counterparts; in turn, they may require more costly and/or more frequent medical care. Of note, in the subgroup of service members who were diagnosed with musculoskeletal and connective tissue disorders (the conditions for which CAM treatments were most often used), there were not significant differences in rates of hospitalization or convalescence in quarters dispositions between CAM users and non-CAM users. Thus, service members with roughly similar conditions have similar hospitalization and lost duty experiences with and without CAM treatments.

There are significant limitations that should be considered when interpreting the results of this analysis. For example, the results presented here substantially underestimate the numbers of CAM users and the instances and types of CAM treatments. Many CAM treatments are self-administered (e.g., herbal medicines, nutritional supplements) or accessed outside of conventional medical treatment facilities; hence, they are not documented in medical records.^{6,7} In addition, this analysis was limited to the only three CAM procedures that are currently documented with standardized procedure (CPT) codes.

Also, inherent differences between CAM users and non-CAM users make direct comparisons of their medical experiences very difficult to interpret. For example, CAM users, by definition, have conditions that are indications for treatment; many (perhaps most) non-CAM users have no such conditions. Also, among CAM users and non-users who access care for similar conditions (e.g., musculoskeletal/connective tissue disorders), there may be differences in the natures, severities, persistence, and/or associated disabilities of the conditions. Clearly, more rigorous studies are required to define the natures and magnitudes of the benefits, if any, that are associated with CAM treatments — in general and for conditions of various types and severities.

CAM treatments have received greater scientific and popular attention in the past decade.¹ Public and medical professional discussions of CAM have highlighted three issues. First, the term “Complementary and Alternative Medicine” is non-specific — depending on the context, CAM may include agents and activities as varied as herbal tea, exercise, acupuncture, and manipulation by licensed osteopathic physicians.³ Because CAM treatments are so varied and underreported, it is difficult to estimate their effects.^{1,8,9}

Second, even among health professionals, there is not a universally accepted definition of CAM. For example, the National Center for Complementary and Alternative Medicine defines CAM as “a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. Conventional medicine is medicine as practiced by holders

of M.D. (medical doctor) or D.O. (doctor of osteopathy) degrees and by their allied health professionals, such as physical therapists, psychologists, and registered nurses.”¹⁰ Yet, D.O.s and some M.D.s are trained to provide CAM and include it in their practices. In one study, approximately one-half of 375 osteopathic family physicians reported using osteopathic manipulative treatment (OMT) during 5-25% of all patient encounters.¹¹ Among M.D. credentialed providers, approximately 9% reported using homeopathy and 19% reported using chiropractic and massage therapy in their practices.¹² In 1998, the editors of the *New England Journal of Medicine* and *JAMA* agreed that the most important distinction between CAM and conventional medical treatments was whether they had scientific support, regardless of their historical origins or popularity in particular professional groups.^{2,13}

Third, and perhaps most important to the U.S. Military Health System, is the question of whether CAM treatments are regarded by users as additions to (complementary) or replacements for (alternatives) conventional health care. A nationwide survey of U.S. civilians found higher rates of conventional medical care use among CAM users than non-users — few respondents reported using CAM exclusively.¹⁴ In the Navy and Marine Corps, CAM users were more likely than their counterparts to report dissatisfaction with their physician providers.¹ Because active component service members have access to “free” medical care through the Military Health System, they would seem likely to use CAM in tandem with, rather than in place of, conventional care.

In this analysis, military medical facilities in the Midwest versus other regions of the U.S. reported relatively higher frequencies of CAM procedures, largely due to more common use of chiropractic. Nearly two-thirds (n=128; 62% of the total) of all accredited osteopathic treatment facilities in the U.S. are located in the Midwest.¹⁵ CAM treatments may be more readily accepted as part of mainstream medical care in that region.

In summary, the findings of this analysis document that CAM treatments are used frequently among active component U.S. service members — particularly in the midwest U.S. However, the effects of the treatments cannot be reliably estimated from these results. The findings indicate a need for studies that document the effects and cost effectiveness of CAM relative to conventional treatments of various conditions (with precisely defined clinical indications) that commonly affect military members. Results of such studies should be used to define the best uses of CAM in the Military Health System and the resources necessary to maximize the potential benefits of such uses.

Analysis and report by Joseph Woodring, DO, MTM&H, MPH, Walter Reed Army Institute of Research and Christopher B. Martin, MHS, Armed Forces Medical Surveillance Center.

Table 2. Number of CAM procedure-related visits, by type, and the percent of CAM-related visits among all ambulatory visits that included any procedures, active component, U.S. Armed Forces, 2006-2007.

	Acupuncture			Osteopathic manipulation		Chiropractic		Any CAM procedure	
	Visits w/ any procedure	No. of visits	% of visits w/ any procedure	No. of visits	% of visits w/ any procedure	No. of visits	% of visits w/ any procedure	No. of visits	% of visits w/ any procedure
<i>Gender</i>									
Female	3,358,480	1,906	0.06	7,318	0.22	76,317	2.27	85,541	2.55
Male	11,207,862	2,693	0.02	15,845	0.14	210,694	1.88	229,232	2.05
<i>Age group</i>									
17-24	5,310,578	531	0.01	5,649	0.11	51,550	0.97	57,730	1.09
25-34	5,269,848	1,487	0.03	9,160	0.17	101,954	1.93	112,601	2.14
35-44	3,285,539	1,810	0.06	6,809	0.21	110,080	3.35	118,699	3.61
45+	700,377	771	0.11	1,545	0.22	23,427	3.34	25,743	3.68
<i>Service</i>									
Army	6,406,219	1,832	0.03	7,377	0.12	95,764	1.49	104,973	1.64
Coast Guard	406,969	20	0.00	356	0.09	2,906	0.71	3,282	0.81
Air Force	3,430,358	1,567	0.05	10,742	0.31	101,603	2.96	113,912	3.32
Marine Corps	1,352,224	315	0.02	1,088	0.08	36,637	2.71	38,040	2.81
Navy	2,970,572	865	0.03	3,600	0.12	50,101	1.69	54,566	1.84
<i>Military status</i>									
Enlisted	12,355,221	3,053	0.02	17,879	0.14	218,610	1.77	239,542	1.94
Officer	2,211,121	1,546	0.07	5,284	0.24	68,401	3.09	75,231	3.40
<i>Military occupation</i>									
Combat	8,128,194	1,785	0.02	12,190	0.15	149,286	1.84	163,261	2.01
Health	1,586,511	1,320	0.08	4,109	0.26	38,442	2.42	43,871	2.77
Other	4,851,637	1,494	0.03	6,864	0.14	99,283	2.05	107,641	2.22
<i>Geographic region (home)</i>									
Midwest U.S.	2,087,434	576	0.03	2,161	0.10	37,566	1.80	40,303	1.93
Northeast U.S.	1,505,680	342	0.02	1,556	0.10	24,821	1.65	26,719	1.77
South U.S.	4,702,716	1,051	0.02	4,966	0.11	75,207	1.60	81,224	1.73
West U.S.	2,276,124	722	0.03	3,024	0.13	35,455	1.56	39,201	1.72
Unknown/other	3,994,388	1,908	0.05	11,456	0.29	113,962	2.85	127,326	3.19
Total	14,566,342	4,599	0.03	23,163	0.16	287,011	1.97	314,773	2.16

Table 3. Primary (first-listed) diagnoses during ambulatory visits that included CAM procedures, by type, active members, U.S. Armed Forces, 2006-2007

Primary (first-listed) diagnosis	Type of procedure		
	Chiropractic	Osteopathic	Acupuncture
	% of chiropractic visits	% of osteopathic visits	% of acupuncture visits
Nonallopathic lesion, not elsewhere classified	47.6	33.9	2.8
Other and unspecified disorder of back	18.0	24.1	24.1
Invertebral disc disorder	8.7	1.4	6.1
Other disorder of cervical region	5.8	4.4	7.8
Sprains, strains of other, unspecified parts of back	5.2	8.9	0.7
Follow-up examination	4.0	0.2	0.0
Care involving use of rehabilitation procedures	2.0	5.4	0.3
Other disorder of soft tissues	0.2	1.1	16.7
Other and unspecified disorder of joint	0.2	2.4	4.1
Other than above	8.3	18.2	37.4

Table 4. Hospitalizations for all causes, in relation to CAM use during the surveillance period, overall and in specified subgroups, active component members, U.S. Armed Forces, 2006-2007

	No CAM treatment in 2006-2007		CAM treatment in 2006-2007		Hosp rate ratio
	Hospitalizations	Hospitalization rate [#]	Hospitalizations	Hospitalization rate [#]	CAM vs no CAM
All active component service members	114,098	43.1	4,416	76.7	1.78 (1.73 - 1.83)
Hospitalized prior to the surveillance period (2005)	9,435	136.4	478	168.3	1.23 (1.13 - 1.35)
Musculoskeletal/connective tissue disorder during the surveillance period (2006-2007)	49,276	75.8	4,247	77.5	1.02 (0.99 - 1.05)

Rates expressed as hospitalizations per 1,000 person-years

Table 5. Incidence of lost duty days due to convalescence in quarters (CIQ) dispositions, in relation to CAM treatment during the surveillance period, overall and in specified subgroups, active component members, U.S. Armed Forces, 2006-2007

	No CAM treatment		CAM treatment(s)		Rate ratio
	CIQ dispositions	Rate [#] per 1000 person years	CIQ dispositions	Rate [#] per 1000 person years	CAM vs no CAM
All active component service members	360,886	150.4	12,405	241.9	1.61 (1.58 - 1.64)
Convalescence in quarters disposition prior to the surveillance period (2005)	59,402	281.1	3,481	487.8	1.74 (1.68 - 1.80)
Musculoskeletal/connective tissue disorder during the surveillance period (2006-7)	146,423	257.2	11,872	243.0	0.94 (0.93 - 0.96)

Rates expressed as convalescence in quarters dispositions per 1,000 person-years

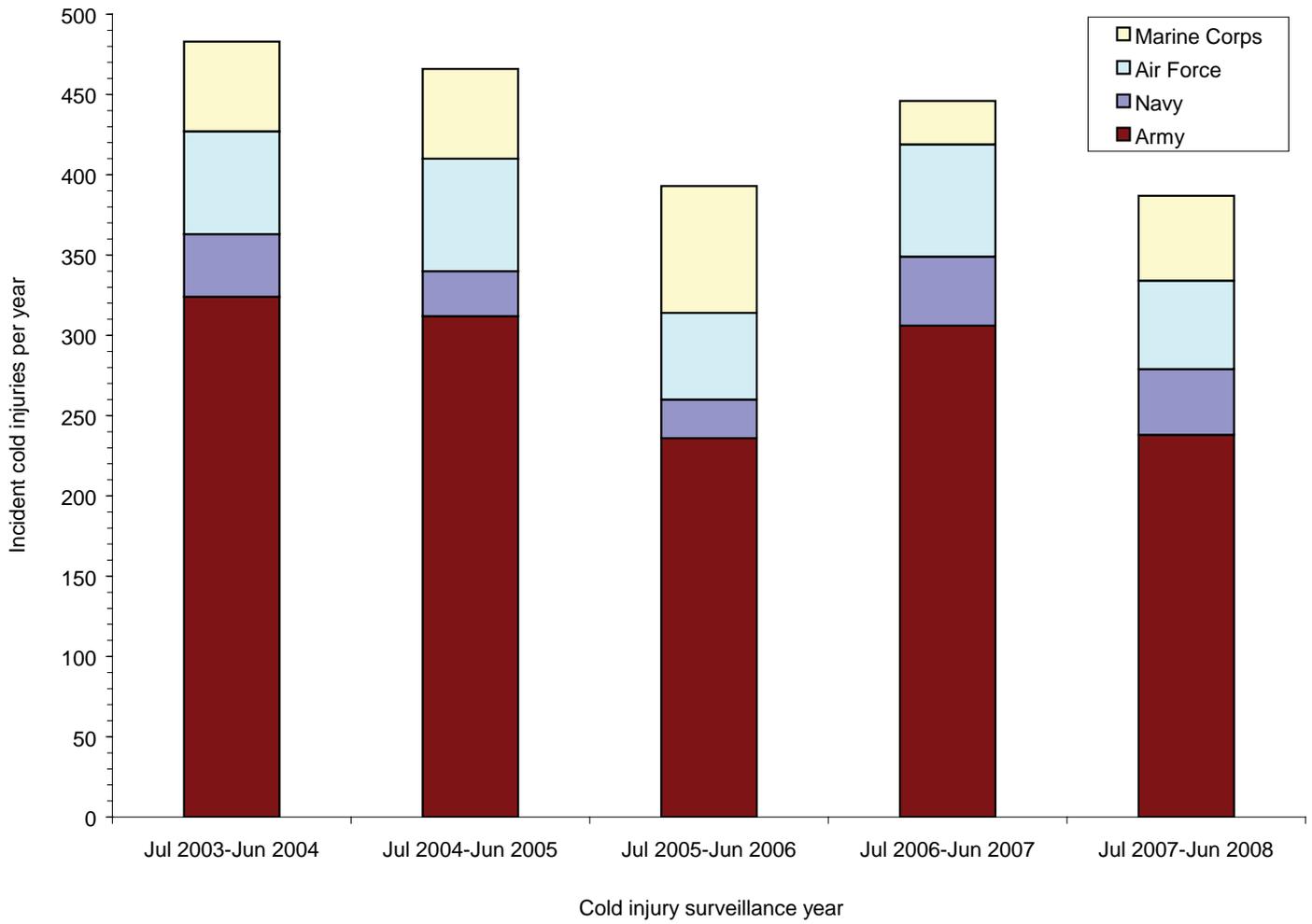
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IN THE NEXT MSMR

Cold Injuries, U.S. Armed Forces, July 2003-June 2008

Cold injuries among members of active component, U.S. Armed Forces, by Service and year, July 2003-June 2008



Completeness and Timeliness of Reporting of Notifiable Medical Conditions Among Active Component Service Members, U.S. Armed Forces, 1998–2007

Health officials of the Army, Navy, and Air Force medical departments are required to centrally report all occurrences of conditions with urgent or significant public health and/or military operational implications. Conditions considered notifiable are specified in the tri-service consensus list of reportable medical events.¹⁻³

Surveillance of notifiable events is an important part of the health surveillance programs of the Service medical departments.³ Each of the medical departments uses a different system for reporting and tracking reportable conditions at their supported installations.

Since 1994, the U.S. Army medical department has conducted automated reporting of notifiable medical conditions through the Reportable Medical Events System (RMES). In 1998, the Navy and Air Force medical departments began automated reporting of notifiable medical conditions through the Navy Disease Reporting System (NDRS) and Air Force Reportable Events Surveillance System (AFRESS), respectively. Notifiable event case reports from all of the Services are forwarded to the Armed Forces Health Surveillance Center (AFHSC) for incorporation in the centralized Defense Medical Surveillance System (DMSS).

In the past, the MSMR has estimated the completeness and timeliness of reporting of notifiable conditions that were diagnosed during hospitalizations of active military members. This report estimates the completeness and timeliness of reporting of notifiable conditions that were diagnosed during hospitalizations and ambulatory visits of active military members in Army, Navy, and Air Force medical treatment facilities from 1998 through 2007.

Methods:

All reports from all of the Service medical departments are incorporated in the Defense Medical Surveillance System (DMSS). Completeness of reporting is estimated by matching hospitalizations and ambulatory visits for conditions that are presumably reportable with corresponding notifiable event reports. Timeliness of reporting is estimated by the time between dates of relevant hospital admissions, ambulatory visits, or reported illness onsets and dates of receipt of matching notifiable event reports in the DMSS.

Each hospitalization and ambulatory visit in a fixed (e.g., not deployed or at sea) U.S. military medical facility is documented with a standardized record that includes coded diagnoses (per the ICD-9-CM). ICD-9-CM codes that

specify notifiable conditions (“indicator codes”) were used to identify hospitalizations and ambulatory visits of active U.S. service members that were presumably notifiable events.

To increase the likelihood that medical encounters documented with indicator codes were true episodes of notifiable conditions (and not, for example, “rule-outs” of, screening for, immunizations against, or counseling regarding the conditions), for most conditions diagnosed in ambulatory settings, we restricted reportable cases to those in which the affected service member had at least two medical encounters with the same indicator diagnosis within 14 days. In addition, for conditions that inevitably require hospital care (e.g., smallpox, anthrax, rabies, hemorrhagic fever), we restricted notifiable cases to hospitalized cases only. Finally, in order that multiple encounters (e.g., clinical evaluations, therapy, follow-ups, recurrences) for single incident reportable events were not considered multiple reportable events, only one reportable episode per lifetime of some conditions (e.g., chickenpox) and only one episode per estimated time of acute illness plus convalescence — hence, not at risk for a new incident episode — for other conditions were considered “reportable” for estimation purposes.

Completeness of reporting, hospitalized cases

From 1998 to 2007, there were 4,936 hospitalizations of individuals in active U.S. military service with diagnoses indicative of reportable conditions. Of these, 2,145 (43.5%) were reported through Service-specific reporting systems and integrated in the Defense Medical Surveillance System (DMSS). The completeness of reporting of notifiable hospitalized cases overall remained relatively stable over the 10-year period (range, annual % reported: 39.1%-50.8%) (Table 1, Figure 1a).

Of reportable conditions diagnosed during hospitalizations in Army (n=2,933), Navy (n=1,500), and Air Force (n=503) medical facilities, 57.3%, 23.9%, and 21.1%, respectively, were reported through Service-specific systems and integrated in the DMSS (Table 1). Throughout the period, there were no strong or consistent trends in the completeness of reporting of hospitalized cases in the Services (Figure 1b-d).

Completeness of reporting, ambulatory cases

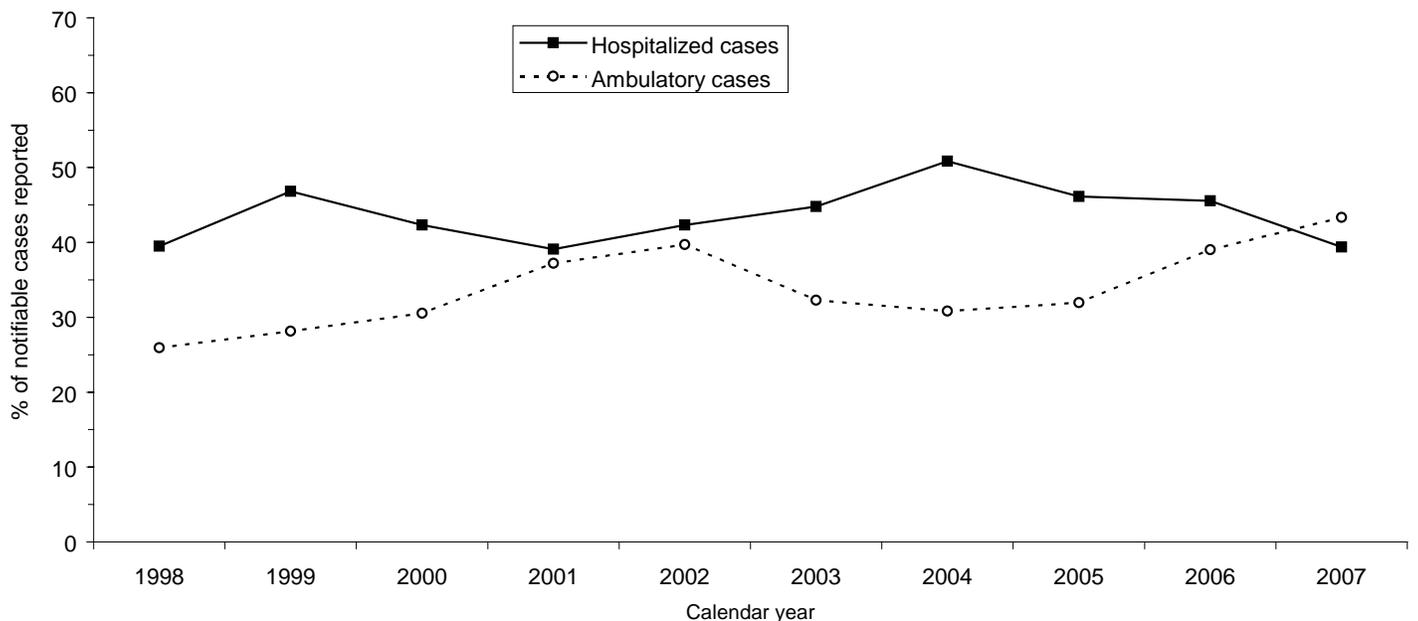
From 1998 to 2007, there were 91,289 ambulatory visits of U.S. service members that included diagnoses indicative of reportable conditions. Of presumably reportable ambulatory cases, 30,763 (33.7%) were reported through Service-specific

Table 1. Completeness of reporting of cases of notifiable medical conditions* among active component members, by clinical setting of diagnosis, U.S. Armed Forces, 1998-2007

	Reportable cases	# reported	% reported	Reportable cases	# reported	% reported	Reportable cases	# reported	% reported	Reportable cases	# reported	% reported
<i>Hospitalized cases</i>												
	Army hospitals			Navy hospitals			Air Force hospitals			Total, hospitalized cases		
1998	396	212	53.5	184	45	24.5	73	1	1.4	653	258	39.5
1999	332	193	58.1	149	56	37.6	104	25	24.0	585	274	46.8
2000	308	167	54.2	166	41	24.7	48	13	27.1	522	221	42.3
2001	336	184	54.8	170	23	13.5	54	12	22.2	560	219	39.1
2002	288	160	55.6	188	46	24.5	46	15	32.6	522	221	42.3
2003	306	175	57.2	201	61	30.3	58	17	29.3	565	253	44.8
2004	270	172	63.7	119	31	26.1	26	8	30.8	415	211	50.8
2005	243	154	63.4	123	27	22.0	35	4	11.4	401	185	46.1
2006	218	135	61.9	104	21	20.2	38	8	21.1	360	164	45.6
2007	236	128	54.2	96	8	8.3	21	3	14.3	353	139	39.4
Total	2,933	1,680	57.3	1,500	359	23.9	503	106	21.1	4,936	2,145	43.5
<i>Ambulatory cases</i>												
	Army clinics			Navy clinics			Air Force clinics			Total, ambulatory cases		
1998	3,827	1,371	35.8	3,391	689	20.3	950	58	6.1	8,168	2,118	25.9
1999	3,702	1,703	46.0	3,772	675	17.9	1,227	71	5.8	8,701	2,449	28.1
2000	4,871	2,328	47.8	3,074	480	15.6	2,885	498	17.3	10,830	3,306	30.5
2001	5,248	2,773	52.8	3,299	555	16.8	2,376	737	31.0	10,923	4,065	37.2
2002	5,069	2,751	54.3	3,369	627	18.6	2,003	768	38.3	10,441	4,146	39.7
2003	4,332	1,982	45.8	3,811	488	12.8	1,660	695	41.9	9,803	3,165	32.3
2004	4,935	2,185	44.3	4,010	543	13.5	1,376	455	33.1	10,321	3,183	30.8
2005	4,008	1,913	47.7	3,088	410	13.3	1,254	344	27.4	8,350	2,667	31.9
2006	3,399	1,946	57.3	2,257	377	16.7	1,195	351	29.4	6,851	2,674	39.0
2007	3,498	2,064	59.0	2,383	491	20.6	1,020	435	42.6	6,901	2,990	43.3
Total	42,889	21,016	49.0	32,454	5,335	16.4	15,946	4,412	27.7	91,289	30,763	33.7

* Tri-Service Reportable Events, May 2004. Events reported by 7 July 2008.

Figure 1a. Percent reported of cases of presumably notifiable medical conditions among active members, U.S. Armed Forces, by clinical setting at U.S. military medical facilities, by year, 1998-2007



systems and integrated in the DMSS. The completeness of reporting of ambulatory reportable cases increased from 1998 (25.9%) through 2002 (39.7%), slightly declined through 2004 (30.8%), and then increased through 2007 (43.3%) (**Table 1, Figure 1a**).

Of presumably reportable conditions diagnosed during ambulatory visits in Army (n=42,889), Navy (n=32,454), and Air Force (n=15,946) medical facilities, 49.0%, 16.4%, and 27.7%, respectively, were reported through the Services and integrated in the DMSS (**Table 1**). During the 10-year period, the completeness of reporting of ambulatory notifiable cases generally increased in Army and Air Force facilities and remained fairly stable in Navy facilities (**Figure 1b-d**).

Timeliness of reporting, hospitalized cases

Of all notifiable conditions diagnosed during hospitalizations and reported as notifiable events (n=2,145), more than one-fourth (27.6%) were reported within one week, nearly one-half within 2 weeks (45.7%), and nearly two-thirds (65.5%) within one month of the related hospital admission dates (**Table 2**). The timeliness of reporting of hospitalized notifiable conditions generally improved during the period (**Figure 2**). The timeliness of reporting of hospitalized cases from Army, Navy, and Air Force medical facilities is summarized in **Table 2**.

Timeliness of reporting, ambulatory cases

Of all notifiable conditions diagnosed during ambulatory visits and reported as notifiable events (n=30,763), more than one-fourth (27.1%) were reported within one week, nearly one-half within 2 weeks (44.5%), and nearly two-thirds (63.1%) within one month of the related clinical events (**Table 2**). The timeliness of reporting of ambulatory cases overall markedly improved during the period (**Figure 2**). The timeliness of reporting of ambulatory cases from Army, Navy, and Air Force medical facilities is summarized in (**Table 2**).

Completeness of reporting, by condition

From 1998-2007, the reportable conditions that resulted in the most hospitalizations of active military members were heat injuries (n=2,036), varicella (n=578), malaria (n=535), and influenza (n=395) (of note, in 2007, there were only nine hospitalizations of service members for varicella)—the completeness of reporting of these cases overall were 50.3%, 40.3%, 75.0%, and 25.6%, respectively (**Tables 3a-c**).

The diagnoses that accounted for the most ambulatory

notifiable cases from 1998-2007 were chlamydia (n=28,953), non-gonococcal urethritis (n=18,084), gonorrhea (n=15,303), and heat injuries (n=14,442)—the completeness of reporting of these conditions overall were 51.7%, 19.5%, 44.8%, and 24.3%, respectively. Of note, during the period, 85.1% of leishmaniasis (n=565) and 68.1% of malaria (n=385) cases were reported (**Tables 3a-c**).

Completeness of reporting, by location

From 2005 to 2007, there were 27 Army, 24 Navy, and 23 Air Force medical facilities with at least one hospitalization of a service member with a notifiable condition. Across the sites, there was significant variability in the numbers of notifiable hospitalized cases. For example, during the three-year period, there were two Army facilities with more than 100, two Navy facilities with more than 50, and one Air Force facility with more than 40 notifiable hospitalized cases; during the same period, there were 8 Army, 17 Navy, and 22 Air Force facilities with 10 or fewer notifiable hospitalized cases (**Tables 4a-c**). There was also significant variability across sites in the numbers and percentages of reports of hospitalized cases. For example, among Army facilities, one reported 87 (75.6%) of 115, another 79 (71.8%) of 110, and another 38 (84.4%) of 45 reportable hospitalized cases. A Navy facility reported 24 (41.4%) of 58 notifiable hospitalized cases. No Air Force facility reported more than four hospitalized cases (**Tables 4a-c**).

There was also variability across military medical facilities in the numbers of reportable ambulatory cases and the numbers and percentages of reports of such cases. For example, of 40 Army reporting sites, two reported more than 70% and three others more than 60% of all presumably notifiable ambulatory cases; of note, one site reported 1,678 (73.1%) of 2,294 reportable cases. Of 29 Navy sites, one reported 37.6% (32 of 85) of all reportable cases, and another reported 406 (27.6%) of 1,470 reportable cases. Of 75 Air Force sites, 13 reported at least 50% of their reportable ambulatory cases; of these sites, one reported 75% (51 of 68) of their notifiable cases, and another reported 40 (56.3% of 71) notifiable cases (**Tables 4a-c**).

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Table 2. Timeliness of reports of cases of notifiable conditions* among active members, by clinical setting of diagnosis, U.S. Armed Forces, 1998-2007

	Ambulatory cases							Hospitalized cases						
	Total reported cases	Reported within 1 week		Reported within 2 weeks		Reported within 1 month		Total reported cases	Reported within 1 week		Reported within 2 weeks		Reported within 1 month	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
<i>Army</i>														
1998	1,371	258	18.8	550	40.1	946	69.0	212	51	24.1	86	40.6	152	71.7
1999	1,703	348	20.4	784	46.0	1,341	78.7	193	48	24.9	91	47.2	137	71.0
2000	2,328	458	19.7	974	41.8	1,847	79.3	167	54	32.3	89	53.3	119	71.3
2001	2,773	876	31.6	1,538	55.5	2,309	83.3	184	61	33.2	98	53.3	132	71.7
2002	2,751	908	33.0	1,670	60.7	2,265	82.3	160	42	26.3	77	48.1	106	66.3
2003	1,982	713	36.0	1,184	59.7	1,547	78.1	175	48	27.4	83	47.4	125	71.4
2004	2,185	792	36.2	1,213	55.5	1,665	76.2	172	55	32.0	106	61.6	135	78.5
2005	1,913	772	40.4	1,115	58.3	1,506	78.7	154	66	42.9	107	69.5	137	89.0
2006	1,946	909	46.7	1,283	65.9	1,602	82.3	135	48	35.6	79	58.5	111	82.2
2007	2,064	822	39.8	1,275	61.8	1,662	80.5	128	55	43.0	73	57.0	92	71.9
<i>Navy</i>														
1998	689	163	23.7	167	24.2	171	24.8	45	3	6.7	4	8.9	4	8.9
1999	675	227	33.6	232	34.4	237	35.1	56	4	7.1	5	8.9	6	10.7
2000	480	35	7.3	40	8.3	41	8.5	41	1	2.4	1	2.4	1	2.4
2001	555	34	6.1	38	6.8	61	11.0	23	2	8.7	2	8.7	3	13.0
2002	627	84	13.4	93	14.8	164	26.2	46	1	2.2	2	4.3	9	19.6
2003	488	76	15.6	87	17.8	159	32.6	61	27	44.3	29	47.5	35	57.4
2004	543	83	15.3	96	17.7	206	37.9	31	13	41.9	16	51.6	25	80.6
2005	410	59	14.4	73	17.8	151	36.8	27	5	18.5	6	22.2	14	51.9
2006	377	54	14.3	71	18.8	125	33.2	21	0	0.0	1	4.8	7	33.3
2007	491	153	31.2	217	44.2	316	64.4	8	1	12.5	2	25.0	5	62.5
<i>Air Force</i>														
1998	58	0	0.0	4	6.9	5	8.6	1	0	0.0	1	100.0	1	100.0
1999	71	0	0.0	2	2.8	9	12.7	25	0	0.0	0	0.0	3	12.0
2000	498	14	2.8	21	4.2	46	9.2	13	0	0.0	0	0.0	1	7.7
2001	737	10	1.4	29	3.9	80	10.9	12	0	0.0	2	16.7	3	25.0
2002	768	71	9.2	168	21.9	387	50.4	15	2	13.3	4	26.7	10	66.7
2003	695	81	11.7	197	28.3	413	59.4	17	3	17.6	11	64.7	15	88.2
2004	455	87	19.1	150	33.0	263	57.8	8	0	0.0	1	12.5	5	62.5
2005	344	69	20.1	117	34.0	172	50.0	4	1	25.0	2	50.0	4	100.0
2006	351	54	15.4	106	30.2	153	43.6	8	1	12.5	3	37.5	6	75.0
2007	435	118	27.1	206	47.4	284	65.3	3	0	0.0	0	0.0	1	33.3
<i>Overall</i>														
1998	2,118	421	19.9	721	34.0	1,122	53.0	258	54	20.9	91	35.3	157	60.9
1999	2,449	575	23.5	1,018	41.6	1,587	64.8	274	52	19.0	96	35.0	146	53.3
2000	3,306	507	15.3	1,035	31.3	1,934	58.5	221	55	24.9	90	40.7	121	54.8
2001	4,065	920	22.6	1,605	39.5	2,450	60.3	219	63	28.8	102	46.6	138	63.0
2002	4,146	1,063	25.6	1,931	46.6	2,816	67.9	221	45	20.4	83	37.6	125	56.6
2003	3,165	870	27.5	1,468	46.4	2,119	67.0	253	78	30.8	123	48.6	175	69.2
2004	3,183	962	30.2	1,459	45.8	2,134	67.0	211	68	32.2	123	58.3	165	78.2
2005	2,667	900	33.7	1,305	48.9	1,829	68.6	185	72	38.9	115	62.2	155	83.8
2006	2,674	1,017	38.0	1,460	54.6	1,880	70.3	164	49	29.9	83	50.6	124	75.6
2007	2,990	1,093	36.6	1,698	56.8	2,262	75.7	139	56	40.3	75	54.0	98	70.5

* Tri-Service Reportable Events, May 2004

Figure 1b. Percent reported of cases of presumably notifiable medical conditions among active members, U.S. Armed Forces, by clinical setting at U.S. Army medical facilities, by year, 1998-2007

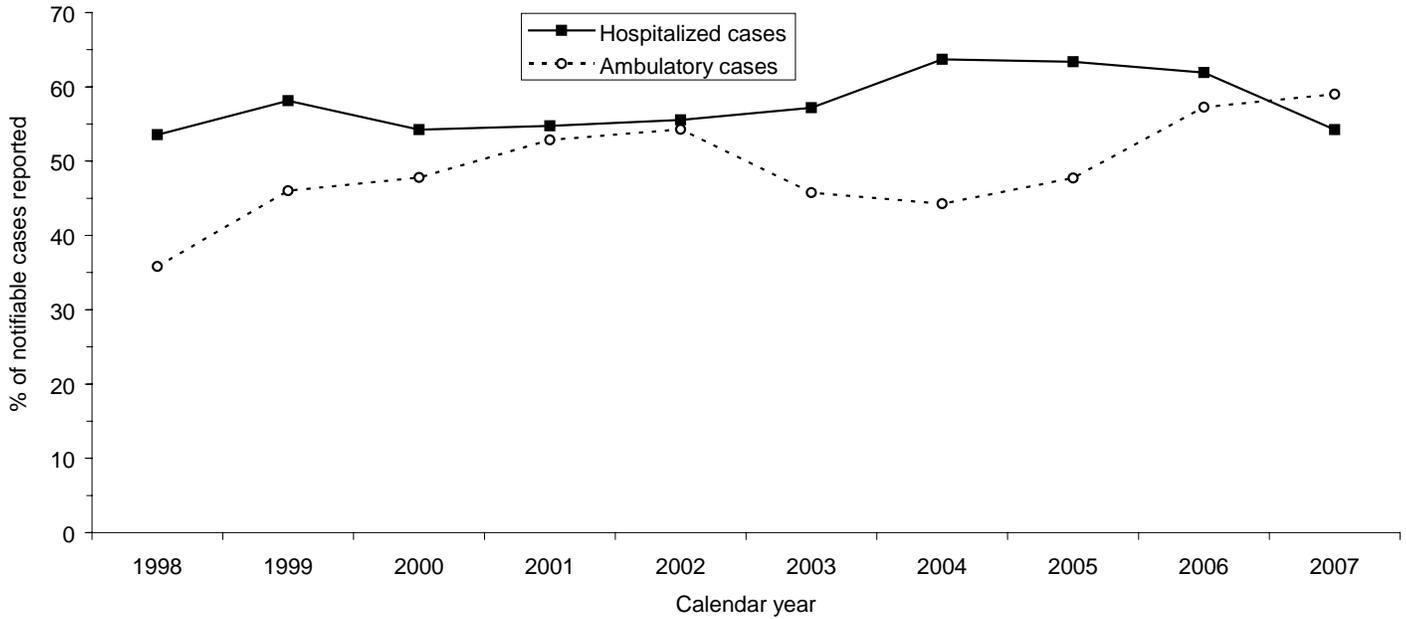


Figure 1c. Percent reported of cases of presumably notifiable medical conditions among active members, U.S. Armed Forces, by clinical setting at U.S. Navy medical facilities, by year, 1998-2007

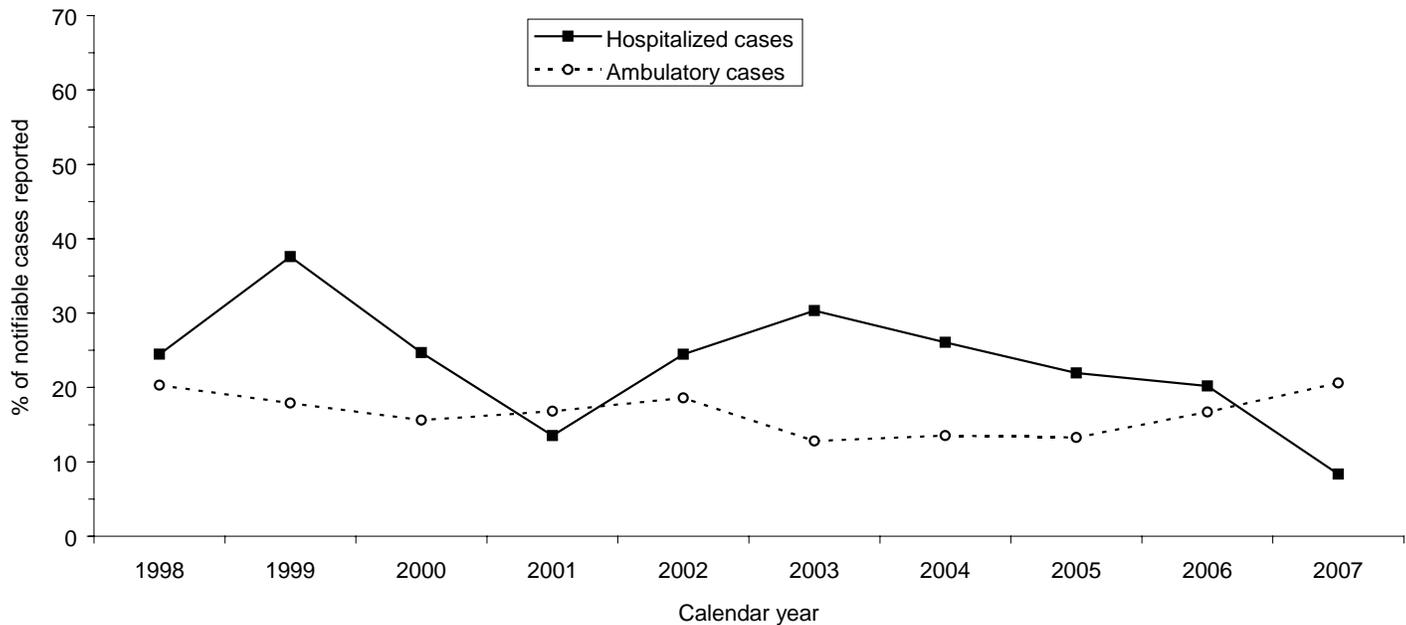


Figure 1d. Percent reported of cases of presumably notifiable medical conditions among active members, U.S. Armed Forces, by clinical setting at U.S. Air Force medical facilities, by year, 1998-2007

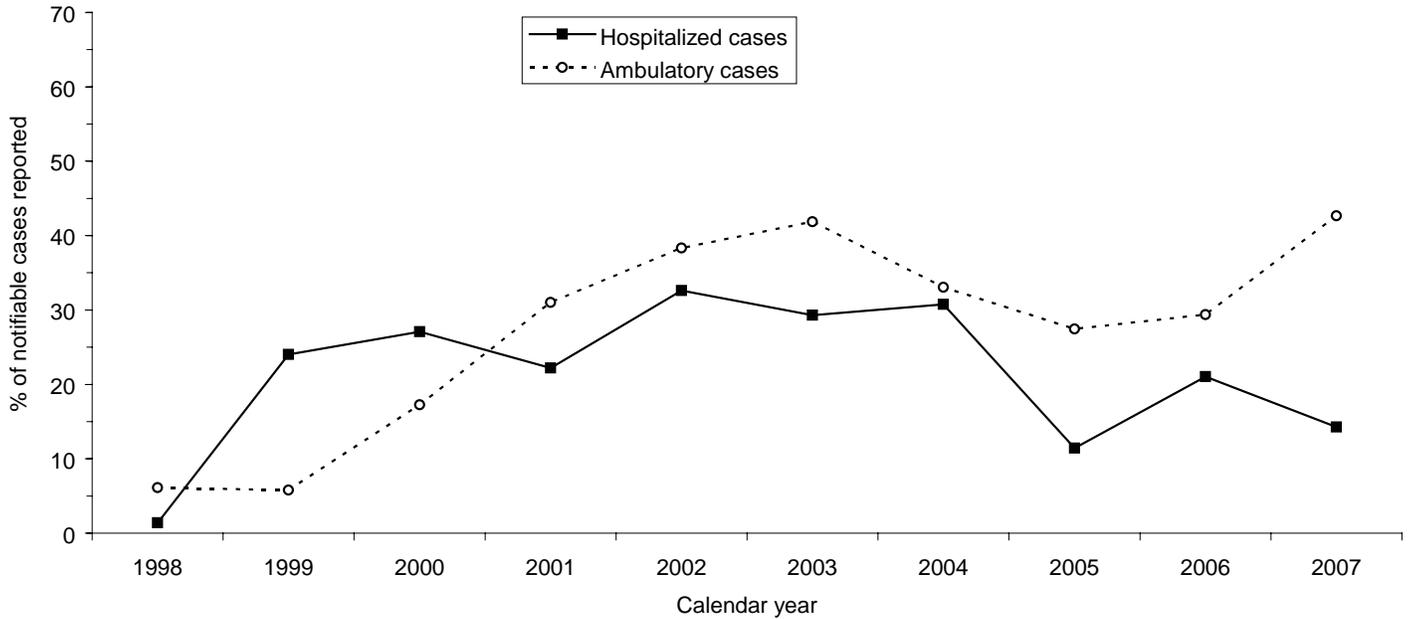


Figure 2. Percent reported of cases of presumably notifiable medical conditions among active members, U.S. Armed Forces, by clinical setting at U.S. Army medical facilities, by year, 1998-2007

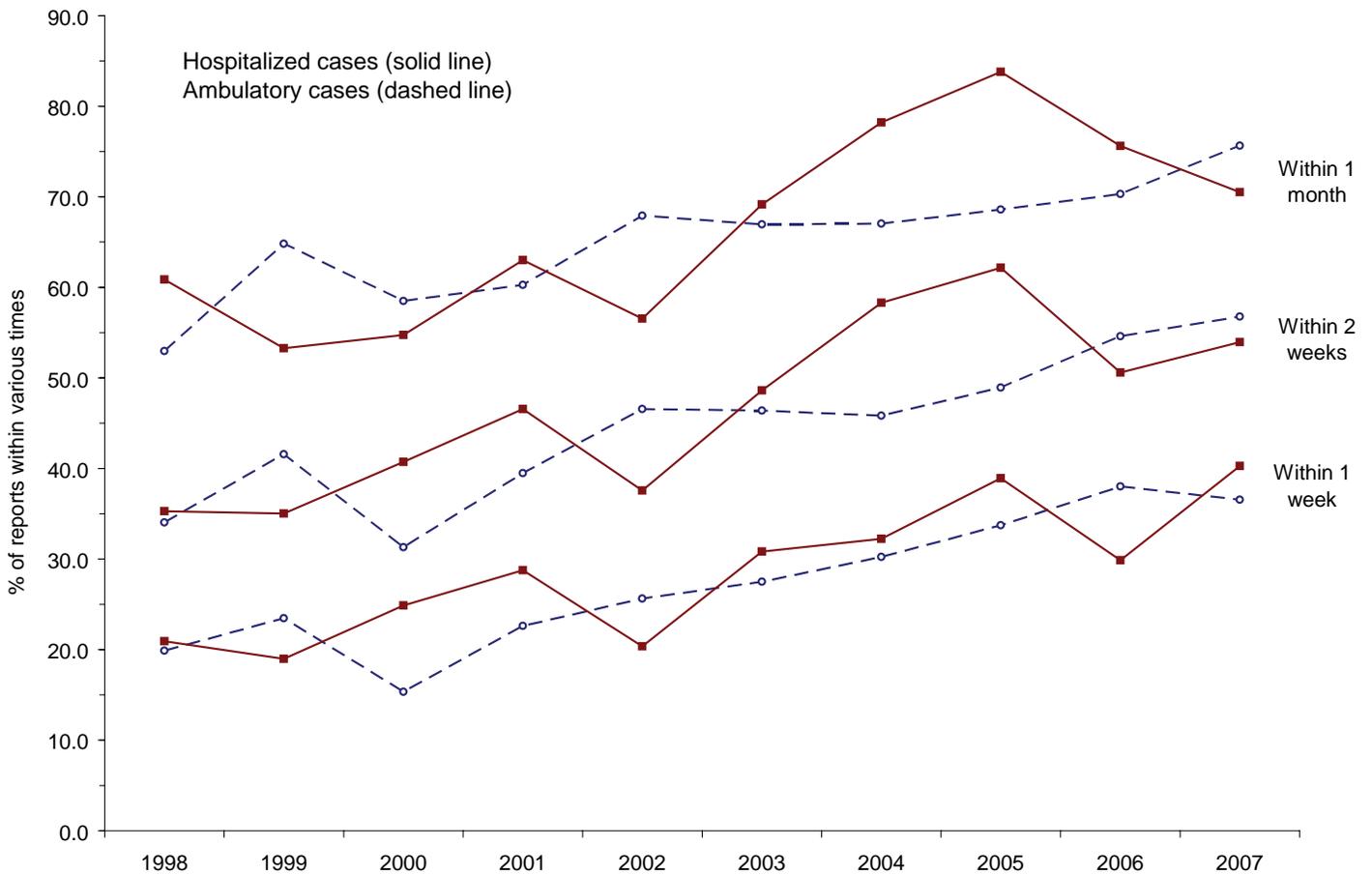


Table 3a. Completeness of reporting of hospitalized and ambulatory cases of notifiable conditions among active component members, by clinical setting, at U.S. Army medical facilities, 2007 and 1998-2006

	Hospitalizations						Ambulatory visits					
	2007			1998-2006			2007			1998-2006		
	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	236	128	54.2	2,697	1,552	57.5	3,498	2,064	59.0	39,391	18,952	48.1
Amebiasis	0	na	na	7	3	42.9	0	na	na	6	0	0.0
Brucellosis	2	1	50.0	3	3	100.0	1	0	0.0	3	2	66.7
Campylobacter	1	1	100.0	14	10	71.4	2	2	100.0	7	6	85.7
Carbon monoxide poisoning	4	0	0.0	29	6	20.7	23	0	0.0	209	13	6.2
Chemical agent exposure	14	0	0.0	9	0	0.0	0	na	na	0	na	na
Chlamydia	5	4	80.0	2	2	100.0	1,219	973	79.8	10,532	7,330	69.6
Coccidioidomycosis	3	2	66.7	30	11	36.7	3	1	33.3	29	5	17.2
Cold injury	5	3	60.0	39	21	53.8	261	50	19.2	2,766	480	17.4
Cryptosporidiosis	0	na	na	1	0	0.0	0	na	na	0	na	na
Dengue fever	0	na	na	12	4	33.3	0	na	na	0	na	na
Diphtheria	0	na	na	1	0	0.0	0	na	na	0	na	na
<i>E. coli</i> O157:H7	0	na	na	0	na	na	0	na	na	1	1	100.0
Ehrlichiosis	2	1	50.0	16	4	25.0	1	0	0.0	8	1	12.5
Filariasis	0	na	na	2	2	100.0	0	na	na	4	2	50.0
Giardiasis	0	na	na	4	1	25.0	1	0	0.0	11	5	45.5
Gonorrhea	1	0	0.0	44	22	50.0	728	507	69.6	7,306	4,741	64.9
<i>H. influenzae</i> , invasive	4	0	0.0	66	3	4.5	2	0	0.0	72	0	0.0
Hantavirus infection	0	na	na	10	8	80.0	0	na	na	0	na	na
Heat injury	96	55	57.3	1,209	819	67.7	739	351	47.5	6,935	2,533	36.5
Hemorrhagic fever	0	na	na	2	2	100.0	0	na	na	0	na	na
Hepatitis A	0	na	na	15	2	13.3	1	0	0.0	16	1	6.3
Hepatitis C	0	na	na	14	2	14.3	2	1	50.0	140	15	10.7
Influenza	29	17	58.6	173	49	28.3	63	13	20.6	849	70	8.2
Legionellosis	0	na	na	10	2	20.0	0	na	na	1	0	0.0
Leishmaniasis	2	2	100.0	11	9	81.8	7	5	71.4	542	466	86.0
Leprosy	0	na	na	3	2	66.7	1	0	0.0	4	3	75.0
Leptospirosis	2	2	100.0	19	14	73.7	2	2	100.0	28	8	28.6
Lyme disease	3	1	33.3	26	4	15.4	15	4	26.7	102	20	19.6
Malaria	31	22	71.0	344	285	82.8	41	33	80.5	241	173	71.8
Measles	0	na	na	1	0	0.0	0	na	na	0	na	na
Meningococcal disease	1	1	100.0	23	14	60.9	0	na	na	0	na	na
Mumps	0	na	na	4	1	25.0	2	0	0.0	19	1	5.3
Pertussis	1	0	0.0	1	1	100.0	0	na	na	11	3	27.3
Q fever	4	2	50.0	5	2	40.0	2	2	100.0	4	4	100.0
Relapsing fever	0	na	na	1	0	0.0	0	na	na	2	0	0.0
Rheumatic fever, acute	1	0	0.0	7	0	0.0	3	0	0.0	8	0	0.0
Rocky Mountain spotted fever	1	0	0.0	7	2	28.6	1	0	0.0	10	2	20.0
Salmonellosis	4	2	50.0	57	19	33.3	2	1	50.0	20	9	45.0
Schistosomiasis	0	na	na	2	0	0.0	0	na	na	2	0	0.0
Shigellosis	0	na	na	4	0	0.0	3	1	33.3	4	2	50.0
Streptococcus, grp A, invasive	2	2	100.0	27	5	18.5	0	na	na	0	na	na
Syphilis	5	3	60.0	24	13	54.2	7	6	85.7	122	46	37.7
Syphilis, congenital	1	0	0.0	0	na	na	0	na	na	0	na	na
Tetanus	0	na	na	1	1	100.0	0	na	na	0	na	na
Toxic shock syndrome	0	na	na	9	0	0.0	0	na	na	0	na	na
Trichinosis	0	na	na	0	na	na	0	na	na	1	0	0.0
Trypanosomiasis	0	na	na	0	na	na	1	0	0.0	1	1	100.0
Tuberculosis	5	3	60.0	69	26	37.7	0	na	na	0	na	na
Tularemia	0	na	na	0	na	na	0	na	na	1	0	0.0
Typhoid fever	1	1	100.0	5	1	20.0	0	na	na	0	na	na
Typhus fever	0	na	na	1	0	0.0	0	na	na	0	na	na
Urethritis, non-gonococcal	0	na	na	1	0	0.0	303	106	35.0	7,460	2,932	39.3
Vaccine, adverse event	0	na	na	8	1	12.5	35	0	0.0	1,442	7	0.5
Varicella, active duty only	5	3	60.0	325	176	54.2	27	6	22.2	472	70	14.8
Yellow fever	1	0	0.0	0	na	na	0	na	na	1	0	0.0

Table 3b. Completeness of reporting of hospitalized and ambulatory cases of notifiable conditions among active component members, by clinical setting, at U.S. Navy medical facilities, 2007 and 1998-2006

	Hospitalizations						Ambulatory visits					
	2007			1998-2006			2007			1998-2006		
	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	96	8	8.3	1,404	351	25.0	2,383	491	20.6	30,071	4,844	16.1
Amebiasis	0	na	na	4	0	0.0	1	0	0.0	9	1	11.1
Brucellosis	0	na	na	1	0	0.0	0	na	na	1	0	0.0
Campylobacter	1	0	0.0	8	0	0.0	0	na	na	4	0	0.0
Carbon monoxide poisoning	0	na	na	11	0	0.0	10	0	0.0	147	0	0.0
Chemical agent exposure	0	na	na	7	0	0.0	0	na	na	0	na	na
Chlamydia	0	na	na	3	0	0.0	970	328	33.8	10,641	2,843	26.7
Coccidioidomycosis	6	4	66.7	32	15	46.9	12	3	25.0	50	17	34.0
Cold injury	1	0	0.0	15	0	0.0	66	0	0.0	829	1	0.1
Cryptosporidiosis	0	na	na	1	0	0.0	0	na	na	1	0	0.0
Dengue fever	2	0	0.0	8	1	12.5	0	na	na	0	na	na
<i>E. coli</i> O157:H7	0	na	na	2	0	0.0	0	na	na	0	na	na
Ehrlichiosis	0	na	na	9	1	11.1	0	na	na	3	0	0.0
Encephalitis	0	na	na	5	0	0.0	0	na	na	0	na	na
Filariasis	0	na	na	0	na	na	0	na	na	2	0	0.0
Giardiasis	1	0	0.0	4	0	0.0	2	1	50.0	18	4	22.2
Gonorrhea	3	0	0.0	36	8	22.2	380	78	20.5	4,750	923	19.4
<i>H. influenzae</i> , invasive	0	na	na	44	1	2.3	0	na	na	56	0	0.0
Heat injury	42	1	2.4	621	143	23.0	537	65	12.1	4,652	512	11.0
Hemorrhagic fever	0	na	na	1	0	0.0	0	na	na	0	na	na
Hepatitis A	0	na	na	13	1	7.7	1	0	0.0	10	0	0.0
Hepatitis C	1	0	0.0	5	0	0.0	0	na	na	95	6	6.3
Influenza	4	0	0.0	57	2	3.5	32	1	3.1	643	4	0.6
Lead poisoning	0	na	na	0	na	na	0	na	na	1	0	0.0
Legionellosis	1	0	0.0	3	0	0.0	0	na	na	1	0	0.0
Leishmaniasis	0	na	na	1	1	100.0	2	1	50.0	11	9	81.8
Leprosy	0	na	na	0	na	na	0	na	na	1	0	0.0
Leptospirosis	1	0	0.0	12	4	33.3	3	1	33.3	28	3	10.7
Listeriosis	0	na	na	1	0	0.0	0	na	na	0	na	na
Lyme disease	6	1	16.7	6	1	16.7	13	4	30.8	87	5	5.7
Malaria	4	1	25.0	115	66	57.4	5	3	60.0	56	23	41.1
Meningococcal disease	2	0	0.0	19	12	63.2	0	na	na	0	na	na
Mumps	0	na	na	2	1	50.0	2	0	0.0	15	1	6.7
Pertussis	1	0	0.0	1	0	0.0	1	0	0.0	5	0	0.0
Q fever	0	na	na	0	na	na	0	na	na	2	0	0.0
Relapsing fever	0	na	na	0	na	na	1	0	0.0	2	0	0.0
Rheumatic fever, acute	0	na	na	8	1	12.5	0	na	na	13	1	7.7
Rocky Mountain spotted fever	0	na	na	5	0	0.0	1	0	0.0	9	1	11.1
Salmonellosis	3	1	33.3	18	6	33.3	4	2	50.0	18	3	16.7
Schistosomiasis	0	na	na	0	na	na	0	na	na	2	0	0.0
Shigellosis	0	na	na	7	2	28.6	0	na	na	3	0	0.0
Streptococcus, grp A, invasive	5	0	0.0	45	4	8.9	0	na	na	0	na	na
Syphilis	4	0	0.0	16	5	31.3	22	2	9.1	76	14	18.4
Toxic shock syndrome	3	0	0.0	5	0	0.0	0	na	na	0	na	na
Trichinosis	0	na	na	1	0	0.0	0	na	na	0	na	na
Tuberculosis	3	0	0.0	60	33	55.0	0	na	na	0	na	na
Tularemia	0	na	na	0	na	na	0	na	na	1	0	0.0
Typhoid fever	0	na	na	8	0	0.0	0	na	na	0	na	na
Typhus fever	0	na	na	2	0	0.0	1	0	0.0	7	3	42.9
Urethritis, non-gonococcal	0	na	na	0	na	na	276	0	0.0	6,995	445	6.4
Vaccine, adverse event	0	na	na	2	0	0.0	28	0	0.0	536	1	0.2
Varicella, active duty only	2	0	0.0	180	43	23.9	13	2	15.4	291	24	8.2

Table 3c. Completeness of reporting of hospitalized and ambulatory cases of notifiable conditions among active component members, by clinical setting at U.S. Air Force medical facilities, 2007 and 1998-2006

	Hospitalizations						Ambulatory visits					
	2007			1998-2006			2007			1998-2006		
	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	21	3	14.3	482	103	21.4	1,020	435	42.6	14,926	3,977	26.6
Amebiasis	0	na	na	4	0	0.0	0	na	na	12	2	16.7
Brucellosis	0	na	na	1	0	0.0	0	na	na	0	na	na
Campylobacter	1	0	0.0	1	0	0.0	1	0	0.0	0	na	na
Carbon monoxide poisoning	0	na	na	5	0	0.0	46	0	0.0	184	1	0.5
Chemical agent exposure	2	0	0.0	4	0	0.0	0	na	na	0	na	na
Chlamydia	0	na	na	2	1	50.0	440	332	75.5	5,151	3,177	61.7
Coccidioidomycosis	0	na	na	17	2	11.8	3	1	33.3	44	12	27.3
Cold injury	1	0	0.0	15	2	13.3	43	2	4.7	476	32	6.7
Dengue fever	0	na	na	1	1	100.0	0	na	na	0	na	na
<i>E. coli</i> O157:H7	0	na	na	1	0	0.0	0	na	na	1	0	0.0
Ehrlichiosis	0	na	na	4	0	0.0	0	na	na	3	1	33.3
Giardiasis	0	na	na	1	0	0.0	0	na	na	8	2	25.0
Gonorrhea	1	0	0.0	11	4	36.4	162	78	48.1	1,977	523	26.5
<i>H. influenzae</i> , invasive	0	na	na	6	0	0.0	0	na	na	48	0	0.0
Heat injury	3	1	33.3	65	6	9.2	116	8	6.9	1,463	46	3.1
Hepatitis A	0	na	na	4	0	0.0	1	0	0.0	8	1	12.5
Hepatitis C	0	na	na	1	0	0.0	0	na	na	48	10	20.8
Influenza	8	0	0.0	124	33	26.6	41	2	4.9	1,935	41	2.1
Legionellosis	0	na	na	3	2	66.7	0	na	na	0	na	na
Leishmaniasis	0	na	na	3	1	33.3	0	na	na	3	0	0.0
Leprosy	0	na	na	0	na	na	0	na	na	1	1	100.0
Leptospirosis	0	na	na	0	na	na	0	na	na	1	0	0.0
Lyme disease	0	na	na	10	1	10.0	3	2	66.7	51	9	17.6
Malaria	0	na	na	41	27	65.9	0	na	na	42	30	71.4
Meningococcal disease	0	na	na	6	2	33.3	0	na	na	0	na	na
Mumps	0	na	na	1	0	0.0	1	0	0.0	12	2	16.7
Pertussis	0	na	na	1	0	0.0	1	0	0.0	7	3	42.9
Q fever	0	na	na	0	na	na	1	1	100.0	1	0	0.0
Relapsing fever	0	na	na	2	0	0.0	0	na	na	1	0	0.0
Rheumatic fever, acute	0	na	na	5	1	20.0	0	na	na	9	2	22.2
Rocky Mountain spotted fever	1	0	0.0	8	1	12.5	1	0	0.0	2	1	50.0
Salmonellosis	2	1	50.0	15	4	26.7	1	1	100.0	5	1	20.0
Schistosomiasis	0	na	na	0	na	na	0	na	na	1	0	0.0
Shigellosis	0	na	na	4	1	25.0	0	na	na	2	1	50.0
Streptococcus, grp A, invasive	0	na	na	15	1	6.7	0	na	na	0	na	na
Syphilis	0	na	na	7	1	14.3	3	1	33.3	35	12	34.3
Syphilis, congenital	0	na	na	1	0	0.0	0	na	na	0	na	na
Tetanus	0	na	na	1	0	0.0	0	na	na	0	na	na
Toxic shock syndrome	0	na	na	2	0	0.0	0	na	na	0	na	na
Tuberculosis	0	na	na	21	2	9.5	0	na	na	0	na	na
Tularemia	0	na	na	1	0	0.0	0	na	na	0	na	na
Typhoid fever	0	na	na	1	0	0.0	0	na	na	0	na	na
Typhus fever	0	na	na	0	na	na	0	na	na	4	0	0.0
Urethritis, non-gonococcal	0	na	na	1	0	0.0	85	1	1.2	2,965	42	1.4
Vaccine, adverse event	0	na	na	2	0	0.0	59	3	5.1	203	3	1.5
Varicella, active duty only	2	1	50.0	64	10	15.6	12	3	25.0	223	22	9.9

Table 4a. Completeness of reporting of cases of notifiable conditions among U.S. service members, by clinical setting of diagnosis at U.S. Army medical facilities, by year, 2005-2007

Location	Hospitalizations									Ambulatory visits								
	2005			2006			2007			2005			2006			2007		
	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported
A01	6	5	83.3	3	0	0.0	3	3	100.0	184	125	67.9	227	163	71.8	205	136	66.3
A02	2	1	50.0	0	na	na	1	1	100.0	44	21	47.7	51	32	62.7	76	29	38.2
A03	2	0	0.0	6	4	66.7	6	5	83.3	149	93	62.4	128	78	60.9	105	59	56.2
A04	14	13	92.9	22	18	81.8	9	7	77.8	264	82	31.1	131	62	47.3	138	96	69.6
A05	35	20	57.1	49	39	79.6	26	20	76.9	729	491	67.4	788	583	74.0	777	604	77.7
A06	11	8	72.7	6	4	66.7	13	9	69.2	31	7	22.6	62	25	40.3	60	28	46.7
A07	10	7	70.0	4	2	50.0	16	11	68.8	55	13	23.6	55	19	34.5	82	48	58.5
A08	1	0	0.0	6	5	83.3	3	2	66.7	60	39	65.0	174	139	79.9	138	109	79.0
A09	7	3	42.9	6	3	50.0	15	10	66.7	53	21	39.6	45	20	44.4	37	15	40.5
A10	62	50	80.6	28	21	75.0	25	16	64.0	326	89	27.3	199	130	65.3	154	104	67.5
A11	13	12	92.3	15	12	80.0	8	5	62.5	127	66	52.0	134	82	61.2	101	61	60.4
A12	4	2	50.0	7	3	42.9	12	7	58.3	106	45	42.5	86	50	58.1	96	71	74.0
A13	5	2	40.0	8	4	50.0	16	9	56.3	346	220	63.6	298	165	55.4	297	185	62.3
A14	5	2	40.0	10	5	50.0	4	2	50.0	84	26	31.0	95	34	35.8	97	29	29.9
A15	9	8	88.9	5	4	80.0	5	2	40.0	90	28	31.1	37	8	21.6	53	28	52.8
A16	5	1	20.0	1	0	0.0	5	2	40.0	126	56	44.4	87	40	46.0	86	45	52.3
A17	0	na	na	4	0	0.0	6	2	33.3	30	5	16.7	32	15	46.9	42	21	50.0
A18	7	2	28.6	3	2	66.7	20	6	30.0	164	65	39.6	71	30	42.3	182	48	26.4
A19	1	0	0.0	2	0	0.0	7	2	28.6	23	11	47.8	81	20	24.7	87	53	60.9
A20	15	3	20.0	9	4	44.4	14	4	28.6	129	43	33.3	75	26	34.7	126	64	50.8
A21	4	3	75.0	7	1	14.3	6	1	16.7	266	129	48.5	112	52	46.4	83	29	34.9
A22	12	5	41.7	6	1	16.7	7	1	14.3	120	62	51.7	71	35	49.3	47	20	42.6
A23	3	2	66.7	4	2	50.0	8	1	12.5	47	24	51.1	48	22	45.8	66	21	31.8
A24	0	na	na	2	0	0.0	1	0	0.0	20	11	55.0	25	13	52.0	30	15	50.0
A25	5	3	60.0	1	0	0.0	0	na	na	35	15	42.9	40	21	52.5	29	13	44.8
A26	4	2	50.0	3	1	33.3	0	na	na	63	17	27.0	61	16	26.2	78	31	39.7
A27	1	0	0.0	1	0	0.0	0	na	na	14	5	35.7	11	0	0.0	6	1	16.7
A28										3	1	33.3	4	2	50.0	5	4	80.0
A29										41	18	43.9	36	18	50.0	67	49	73.1
A30										6	3	50.0	0	na	na	2	1	50.0
A31										19	7	36.8	12	7	58.3	9	4	44.4
A32										41	22	53.7	23	12	52.2	42	18	42.9
A33										3	0	0.0	5	0	0.0	3	1	33.3
A34										10	6	60.0	5	1	20.0	7	2	28.6
A35										123	27	22.0	51	9	17.6	33	9	27.3
A36										36	11	30.6	39	17	43.6	49	13	26.5
A37										4	0	0.0	0	na	na	3	0	0.0
A38										6	1	16.7	0	na	na	0	na	na
A39										18	1	5.6	0	0	0.0	0	na	na
A40										13	7	53.8	0	na	na	0	na	na

Table 4b. Completeness of reporting of cases of notifiable conditions among U.S. service members, by clinical setting of diagnosis at U.S. Navy medical facilities, by year, 2005-2007

Location	Hospitalizations									Ambulatory visits								
	2005			2006			2007			2005			2006			2007		
	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported
N01	1	1	100.0	1	0	0.0	1	1	100.0	21	3	14.3	36	10	27.8	28	19	67.9
N02	17	1	5.9	19	2	10.5	24	4	16.7	212	32	15.1	171	24	14.0	170	29	17.1
N03	10	1	10.0	12	0	0.0	7	1	14.3	683	67	9.8	403	59	14.6	332	43	13.0
N04	11	1	9.1	6	0	0.0	10	1	10.0	96	3	3.1	104	2	1.9	81	4	4.9
N05	21	9	42.9	24	14	58.3	13	1	7.7	623	119	19.1	468	197	42.1	379	90	23.7
N06	24	8	33.3	11	2	18.2	6	0	0.0	254	62	24.4	141	13	9.2	298	96	32.2
N07	3	0	0.0	2	0	0.0	2	0	0.0	132	28	21.2	86	4	4.7	112	26	23.2
N08	3	0	0.0	1	1	100.0	6	0	0.0	106	11	10.4	82	15	18.3	104	21	20.2
N09	4	1	25.0	5	2	40.0	6	0	0.0	57	5	8.8	39	4	10.3	35	6	17.1
N10	7	2	28.6	9	0	0.0	7	0	0.0	89	16	18.0	90	2	2.2	89	13	14.6
N11	1	1	100.0	1	0	0.0	1	0	0.0	78	12	15.4	92	5	5.4	72	10	13.9
N12	3	0	0.0	2	0	0.0	3	0	0.0	13	0	0.0	25	5	20.0	13	1	7.7
N13	0	na	na	1	0	0.0	1	0	0.0	17	3	17.6	23	1	4.3	29	1	3.4
N14	0	na	na	0	na	na	1	0	0.0	3	0	0.0	8	0	0.0	5	0	0.0
N15	3	0	0.0	4	0	0.0	3	0	0.0	56	1	1.8	61	0	0.0	38	0	0.0
N16	0	na	na	0	na	na	5	0	0.0	0	na	na	0	na	na	0	na	na
N17	4	0	0.0	1	0	0.0	0	na	na	154	7	4.5	101	11	10.9	311	117	37.6
N18	4	1	25.0	1	0	0.0	0	na	na	20	1	5.0	10	2	20.0	9	2	22.2
N19	2	0	0.0	0	na	na	0	na	na	28	1	3.6	8	1	12.5	11	2	18.2
N20	0	na	na	2	0	0.0	0	na	na	29	0	0.0	29	1	3.4	25	3	12.0
N21	2	1	50.0	0	na	na	0	na	na	64	7	10.9	46	2	4.3	35	2	5.7
N22	1	0	0.0	1	0	0.0	0	na	na	19	4	21.1	26	4	15.4	39	1	2.6
N23	1	0	0.0	0	na	na	0	na	na	26	0	0.0	17	0	0.0	26	0	0.0
N24	1	0	0.0	1	0	0.0	0	na	na	21	2	9.5	12	1	8.3	8	0	0.0
N25										12	1	8.3	16	2	12.5	0	na	na
N26										84	12	14.3	46	8	17.4	39	3	7.7
N27										22	2	9.1	9	1	11.1	16	1	6.3
N28										66	7	10.6	63	1	1.6	61	1	1.6
N29										18	1	5.6	8	2	25.0	3	0	0.0
N30										13	0	0.0	5	0	0.0	6	0	0.0

Table 4c. Completeness of reporting of cases of notifiable conditions among U.S. service members, by clinical setting of diagnosis at U.S. Air Force medical facilities, by year, 2005-2007

Location	Hospitalizations									Ambulatory visits								
	2005			2006			2007			2005			2006			2007		
	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported	Total cases	No. reported	% reported
F01	1	0	0.0	0	na	na	1	1	100.0	25	4	16.0	11	2	18.2	44	25	56.8
F02	0	na	na	5	1	20.0	2	1	50.0	31	4	12.9	24	9	37.5	27	4	14.8
F03	14	0	0.0	20	1	5.0	9	1	11.1	100	12	12.0	389	82	21.1	101	28	27.7
F04	2	1	50.0	1	0	0.0	0	na	na	18	10	55.6	17	12	70.6	33	29	87.9
F05	1	0	0.0	0	na	na	0	na	na	25	9	36.0	19	8	42.1	23	17	73.9
F06	3	0	0.0	0	na	na	0	na	na	8	4	50.0	5	3	60.0	6	4	66.7
F07	0	na	na	0	na	na	1	0	0.0	54	20	37.0	23	11	47.8	22	14	63.6
F08	1	0	0.0	1	0	0.0	1	0	0.0	21	13	61.9	16	3	18.8	20	12	60.0
F09	1	0	0.0	0	na	na	0	na	na	17	7	41.2	7	5	71.4	4	2	50.0
F10	0	na	na	1	0	0.0	0	na	na	7	1	14.3	5	0	0.0	8	4	50.0
F11	1	1	100.0	1	0	0.0	0	na	na	8	2	25.0	13	3	23.1	11	5	45.5
F12	0	na	na	1	0	0.0	0	na	na	1	0	0.0	5	2	40.0	14	6	42.9
F13	1	0	0.0	0	na	na	0	na	na	17	7	41.2	16	8	50.0	5	2	40.0
F14	3	1	33.3	1	0	0.0	0	na	na	61	10	16.4	57	20	35.1	35	13	37.1
F15	0	na	na	0	na	na	3	0	0.0	29	11	37.9	10	2	20.0	14	5	35.7
F16	0	na	na	0	na	na	1	0	0.0	17	7	41.2	10	3	30.0	27	7	25.9
F17	2	0	0.0	5	4	80.0	0	na	na	26	9	34.6	33	12	36.4	24	6	25.0
F18	1	0	0.0	0	na	na	2	0	0.0	17	3	17.6	19	9	47.4	13	3	23.1
F19	0	na	na	1	1	100.0	0	na	na	9	2	22.2	8	1	12.5	11	2	18.2
F20	2	1	50.0	0	na	na	0	na	na	27	5	18.5	19	3	15.8	60	9	15.0
F21	0	na	na	0	na	na	1	0	0.0	32	4	12.5	20	4	20.0	29	4	13.8
F22	2	0	0.0	0	na	na	0	na	na	22	7	31.8	18	13	72.2	4	0	0.0
F23	0	na	na	1	1	100.0	0	na	na	17	1	5.9	3	0	0.0	9	0	0.0
F24										5	0	0.0	2	1	50.0	3	3	100.0
F25										7	0	0.0	4	1	25.0	3	3	100.0
F26										22	6	27.3	15	3	20.0	16	13	81.3
F27										27	15	55.6	7	2	28.6	12	9	75.0
F28										4	0	0.0	5	3	60.0	4	3	75.0
F28										29	16	55.2	18	6	33.3	24	18	75.0
F29										13	2	15.4	8	2	25.0	11	8	72.7
F30										11	5	45.5	9	5	55.6	16	11	68.8
F31										5	0	0.0	0	na	na	6	4	66.7
F32										4	1	25.0	3	1	33.3	3	2	66.7
F33										14	6	42.9	8	2	25.0	12	8	66.7
F34										18	7	38.9	16	4	25.0	9	6	66.7
F35										1	1	100.0	0	na	na	3	2	66.7
F36										8	4	50.0	11	6	54.5	11	7	63.6
F37										13	4	30.8	6	1	16.7	5	3	60.0
F38										12	5	41.7	13	2	15.4	15	9	60.0
F39										25	3	12.0	17	2	11.8	17	10	58.8
F40										13	4	30.8	10	3	30.0	12	7	58.3
F41										8	4	50.0	9	3	33.3	11	6	54.5
F42										12	5	41.7	6	4	66.7	11	6	54.5
F43										18	2	11.1	11	1	9.1	14	7	50.0
F44										17	4	23.5	13	3	23.1	2	1	50.0
F45										16	2	12.5	12	4	33.3	14	7	50.0
F46										20	7	35.0	12	1	8.3	16	8	50.0
F47										8	3	37.5	9	4	44.4	4	2	50.0
F48										8	5	62.5	2	1	50.0	4	2	50.0
F49										32	8	25.0	16	7	43.8	14	7	50.0
F50										7	3	42.9	2	0	0.0	2	1	50.0
F51										2	2	100.0	12	5	41.7	8	4	50.0
F52										34	12	35.3	16	4	25.0	18	8	44.4
F53										19	2	10.5	15	1	6.7	18	7	38.9
F54										6	2	33.3	5	1	20.0	13	5	38.5
F55										17	2	11.8	13	3	23.1	13	5	38.5
F56										36	4	11.1	33	17	51.5	14	5	35.7
F57										17	5	29.4	3	0	0.0	9	3	33.3
F58										12	7	58.3	9	3	33.3	6	2	33.3
F59										7	5	71.4	9	6	66.7	3	1	33.3
F60										12	4	33.3	3	1	33.3	3	1	33.3
F61										11	2	18.2	12	2	16.7	12	4	33.3
F62										11	1	9.1	10	2	20.0	10	3	30.0
F63										17	1	5.9	8	2	25.0	11	3	27.3
F64										12	5	41.7	4	1	25.0	19	5	26.3
F65										5	1	20.0	4	2	50.0	11	2	18.2
F66										7	2	28.6	4	2	50.0	6	1	16.7
F67										5	0	0.0	8	2	25.0	9	1	11.1
F68										10	2	20.0	2	0	0.0	10	1	10.0
F69										17	4	23.5	6	2	33.3	3	0	0.0
F70										1	0	0.0	0	na	na	0	na	na
F71										13	3	23.1	7	2	28.6	2	0	0.0
F72										6	1	16.7	17	4	23.5	0	na	na
F73										11	3	27.3	4	2	50.0	3	0	0.0
F74										0	na	na	0	na	na	1	0	0.0

Update: Deployment Health Assessments, U.S. Armed Forces, August 2008

The health protection strategy of the U.S. Armed Forces is designed to deploy healthy, fit, and medically ready forces, to minimize illnesses and injuries during deployments, and to evaluate and treat physical and psychological problems (and deployment-related health concerns) following deployment.

In 1998, the Department of Defense initiated health assessments of all deployers prior to and after serving in major operations outside of the United States.¹ In March 2005, the Post-Deployment Health Reassessment (PDHRA) program was begun to identify and respond to health concerns that persisted for or emerged within three to six months after return from deployment.²

This report summarizes responses to selected questions on deployment health assessments completed since 2003. In addition, it documents the natures and frequencies of changes in responses from before to after deployments.

Methods:

Completed deployment health assessment forms are transmitted to the Armed Forces Health Surveillance Center (AFHSC) where they are incorporated into the Defense Medical Surveillance System (DMSS).³ In the DMSS, data recorded on health assessment forms are integrated with data that document demographic and military characteristics and medical encounters (e.g., hospitalizations, ambulatory visits) at fixed military and other (contracted care) medical facilities of the Military Health System. For this analysis, DMSS was searched to identify all pre (DD2795) and post (DD2796) deployment health assessment forms completed since 1 January

2003 and all post-deployment health reassessment (DD2900) forms completed since 1 August 2005.

Results:

During the 12-month period from September 2007 to August 2008, there were 395,016 pre-deployment health assessment forms, 367,494 post-deployment health assessment forms, and 290,417 post-deployment health reassessment forms were completed at field sites, transmitted to the AFHSC, and integrated into the DMSS (Figure 1). Throughout the period, there were intervals of approximately 2-4 months between peaks of pre-deployment and post-deployment health assessments (that were completed by different cohorts of deployers) (Figure 1). Post-deployment health reassessments rapidly increased between February and May 2006 (Figure 1). Since then, numbers of reassessment forms per month have been relatively stable (reassessment forms per month, September 2007-August 2008: mean: 24,201; range: 16,859-33,545) (Figure 1, Table 1).

Between September 2007 and August 2008, nearly three-fourths (72.9%) of deployers rated their "health in general" as "excellent" or "very good" during pre-deployment health assessments (Figure 2). During the same period, only 58.2% and 52.6% of redeployers rated their general health as "excellent" or "very good" during post-deployment assessments and post-deployment reassessments, respectively (Figure 2).

From pre-deployment to post-deployment to post-deployment reassessments, there were sharp increases in the proportions of deployers who rated their health as "fair" or

Figure 1. Total deployment health assessment and reassessment forms, by month, U.S. Armed Forces, January 2003-August 2008

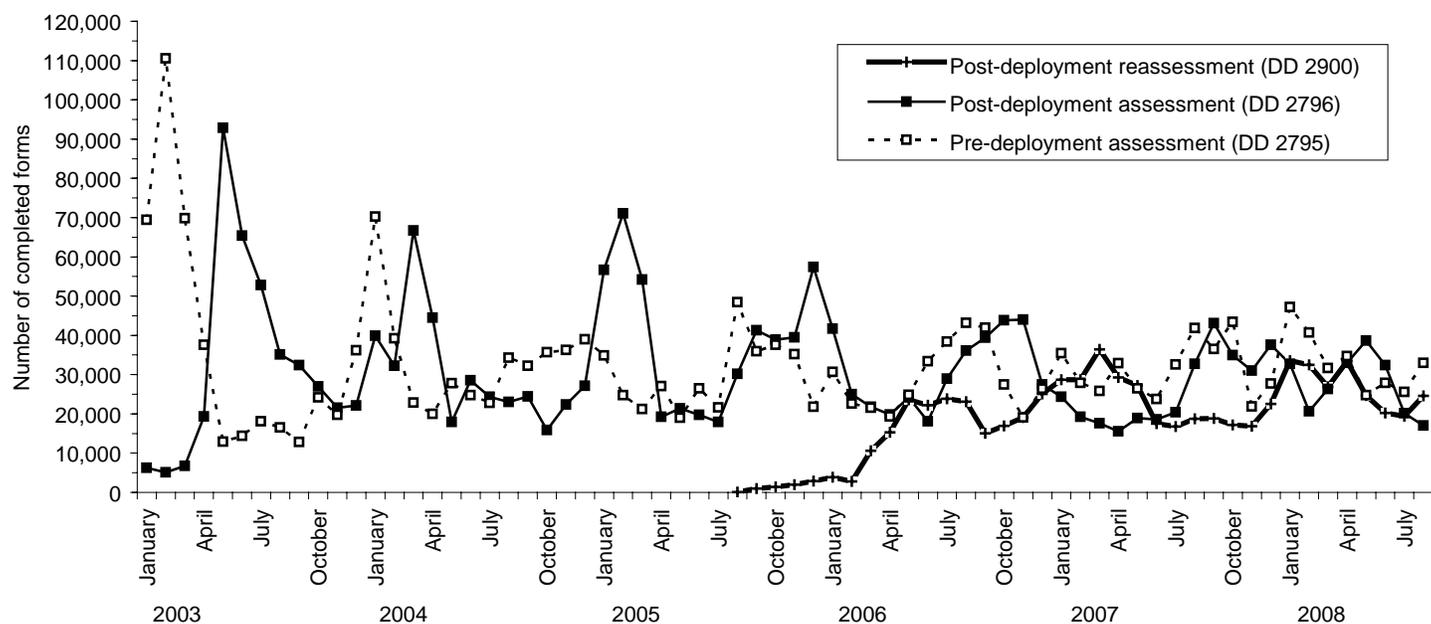


Table 1. Deployment-related health assessment forms, by month, U.S. Armed Forces, September 2007-August 2008

	Pre-deployment assessment DD2795		Post-deployment assessment DD2796		Post-deployment reassessment DD2900	
	No.	%	No.	%	No.	%
Total	395,016	100	367,494	100	290,417	100
2007						
September	36,539	9.3	43,121	11.7	18,794	6.5
October	43,454	11.0	34,951	9.5	17,163	5.9
November	21,889	5.5	31,029	8.4	16,859	5.8
December	27,751	7.0	37,550	10.2	22,499	7.7
2008						
January	47,188	11.9	32,733	8.9	33,545	11.6
February	40,735	10.3	20,629	5.6	32,461	11.2
March	31,643	8.0	26,295	7.2	26,868	9.3
April	34,713	8.8	32,990	9.0	33,430	11.5
May	24,760	6.3	38,623	10.5	24,653	8.5
June	27,844	7.0	32,379	8.8	20,196	7.0
July	25,544	6.5	20,178	5.5	19,397	6.7
August	32,956	8.3	17,016	4.6	24,552	8.5

(Figure 2). For example, prior to deployment, approximately one of 40 (2.7%) deployers rated their health as “fair” or “poor”; however, 3-6 months after returning from deployment (during post-deployment reassessments), approximately one of seven (13.9%) respondents rated their health as “fair” or “poor” (Figure 2).

During the past 12 months, the proportion of deployers who assessed their general health as “fair” or “poor” before deploying remained consistently low (% “fair” or “poor” “health in general,” pre-deployment health assessments, September 2007-August

2008, by month: mean: 2.6% [range: 1.8-3.3%]) (Figure 3). The proportion of redeployers who assessed their general health as “fair” or “poor” around times of return from deployment was consistently and clearly higher than before deploying (% “fair” or “poor” “health in general,” post-deployment health assessments, September 2007-August 2008, by month: mean: 7.3% [range: 5.7-8.3%]) (Figure 3). Finally, the proportion of deployers who assessed their general health as “fair” or “poor” 3-6 months after return from deployment was sharply higher than at return (% “fair” or “poor” “health in general,” post-deployment health reassessments, September 2007-August 2008, by month: mean: 13.6% [range: 12.8-14.7%]) (Figure 3).

More than half of service members who rated their overall health before deployment chose a different descriptor after deploying, but usually by a single category (on a five-category scale). The proportions of deployers whose self-rated health improved by more than one category from pre-deployment to reassessment remained relatively stable between September 2007 and August 2008 (mean: 1.4%, range:1.0-1.7%) (Figure 4). The proportions of service members whose self-assessed health declined by more than one category was relatively stable between May and September 2007 and has generally increased since September 2007 (mean: 16.3, range 13.6-17.9%) (Figure 4).

In general, on post-deployment assessments and reassessments, members of Reserve components and members of the Army were much more likely than their respective counterparts to report mental health-related symptoms and health and exposure-related concerns – and in turn, to have indications for medical and mental health follow-ups (“referrals”) (Table 2).

Among Reserve versus active component members, relative excesses of health-related concerns and provider-indicated

Figure 2. Percent distributions of self-assessed health status as reported on deployment health assessment forms, U.S. Armed Forces, September 2007-August 2008

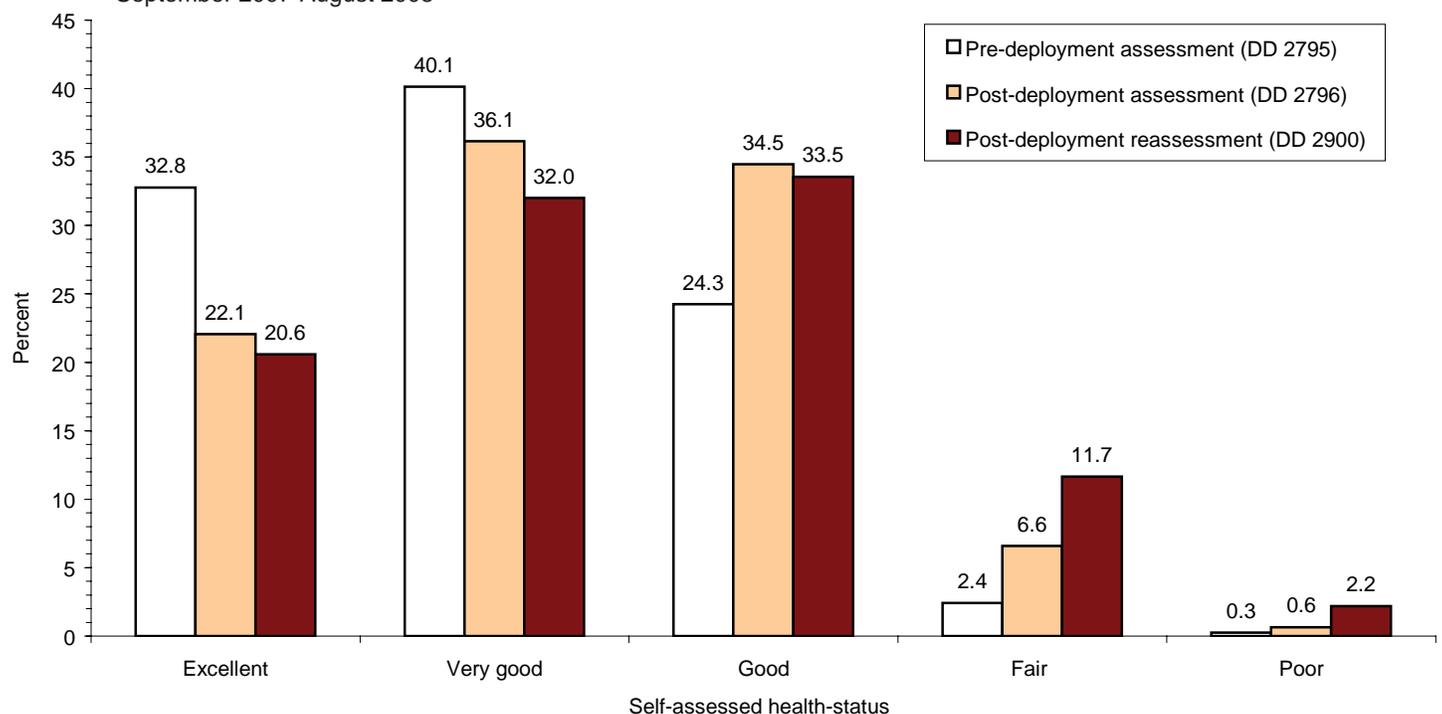
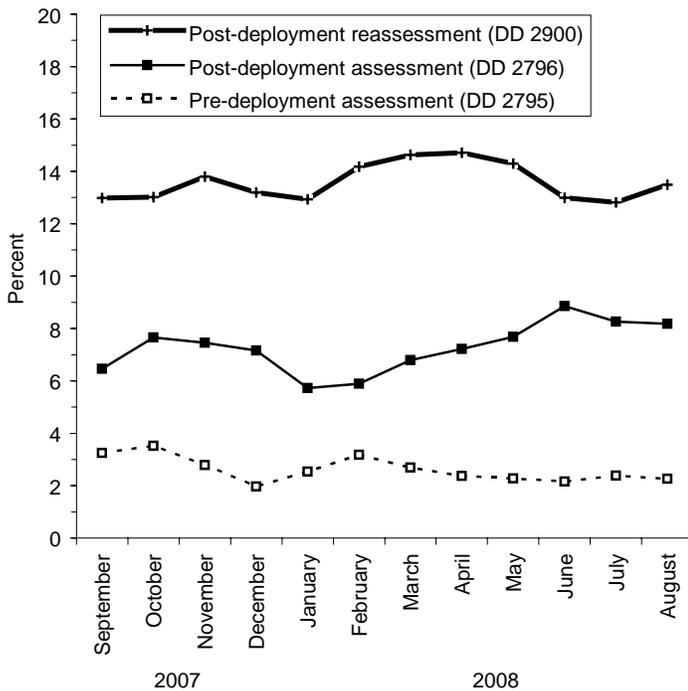


Figure 3. Proportion of deployment health assessment forms with self-assessed health status as “fair” or “poor”, U.S. Armed Forces, September 2007-August 2008



referrals were much greater 3-6 months after return from deployment (DD2900) than either before deploying (DD2795) or upon returning (DD2796) (Table 2, Figures 5,6). For example, among both active and Reserve component members of all Services, mental or behavioral health referrals were more common after deployment than before (Figure 5). However, from the time of return from deployment to 3-6 months later, mental health referrals sharply increased among Reserve component members of the Army, Navy, and Marine Corps (but not Air Force) (Table 2, Figure 5). Of note in this regard, the largest absolute increase in mental health referrals from return to 3-6 months later was for Reserve component members of the Army (post-deployment: 4.1%; reassessment: 11.4%) (Table 2, Figure 5).

Finally, over the past three years, Reserve component members have been approximately twice as likely as active to report “exposure concerns” on post-deployment health assessments (DD2796) (“exposure concerns,” post-deployment assessments, by month, June 2007-May 2008: Reserve: mean: 23.9%, range: 21.9-29.0%; active: mean: 16.2%; range: 12.1-21.6%) (Table 2, Figures 6,7). Sharply higher proportions of both Reserve and active component members endorsed exposure concerns 3-6 months after (DD2900) compared to around times (DD2796) of return from deployment (% “exposure concerns,” post-deployment reassessments, by month, June 2007-May 2008: Reserve: mean: 34.6%, range: 31.6-37.8%; active: mean: 20.8%; range: 18.2-23.4%) (Figure 7).

Editorial comment:

In general, since 2003, proportions of U.S. deployers to Iraq and Afghanistan who report medical or mental health-related symptoms (or have indications for medical or mental health referrals) on deployment-related health assessments increased from pre-deployment to post-deployment to 3-6 months post-deployment, are higher among members of the Army than the other Services, and are higher among Reserve than the active component members.

Regardless of the Service or component, deployers often rate their general health worse when they return compared to before deploying. This is not surprising because deployments are inherently physically and psychologically demanding. Clearly, there are many more – and more significant – threats to the physical and mental health of service members when they are conducting or supporting combat operations away from their families in hostile environments compared to when serving at their permanent duty stations (active component) or when living in their civilian communities (Reserve component).

However, many returned service members rate their general health worse 3-6 months after returning from deployment compared to earlier. This finding may be less intuitively understandable. Symptoms of post-traumatic stress disorder (PTSD) may emerge or worsen within several months after a life threatening experience (such as military service in a war zone). PTSD among U.S. veterans of combat duty in Iraq has been associated with higher rates of physical health problems after redeployment.⁴ The post-deployment health reassessment at 3-6 months post-deployment is designed to detect service members with symptoms not only of PTSD but also persistent or emerging deployment-related medical and mental health problems.

Among British veterans of the Iraq war, Reservists reported more “ill health” than their active counterparts.⁵ Roles, traumatic experiences, and unit cohesion while deployed were associated with medical outcomes after redeployment; however, PTSD symptoms were more associated with problems at home (e.g., reintegration into family, work, and other aspects of civilian life) than with events in Iraq.⁵ The finding may explain, at least in part, the differences in prevalences of mental health symptoms, medical complaints, and provider-indicated mental health referrals among Reserve compared to active members — 3-6 months after returning from deployment compared to earlier.

Post-deployment health assessments may be more reliable several months after return compared to earlier. Commanders, supervisors, family members, peers, and providers of health care to redeployed service members should be alert to emerging or worsening symptoms of physical and psychological problems for several months, at least, after returning from deployment.

Figure 4. Proportion of service members whose self-assessed health status improved (“better”) or declined (“worse”) (by 2 or more categories on 5-category scale) from pre-deployment to reassessment, by month, U.S. Armed Forces, September 2007-August 2008

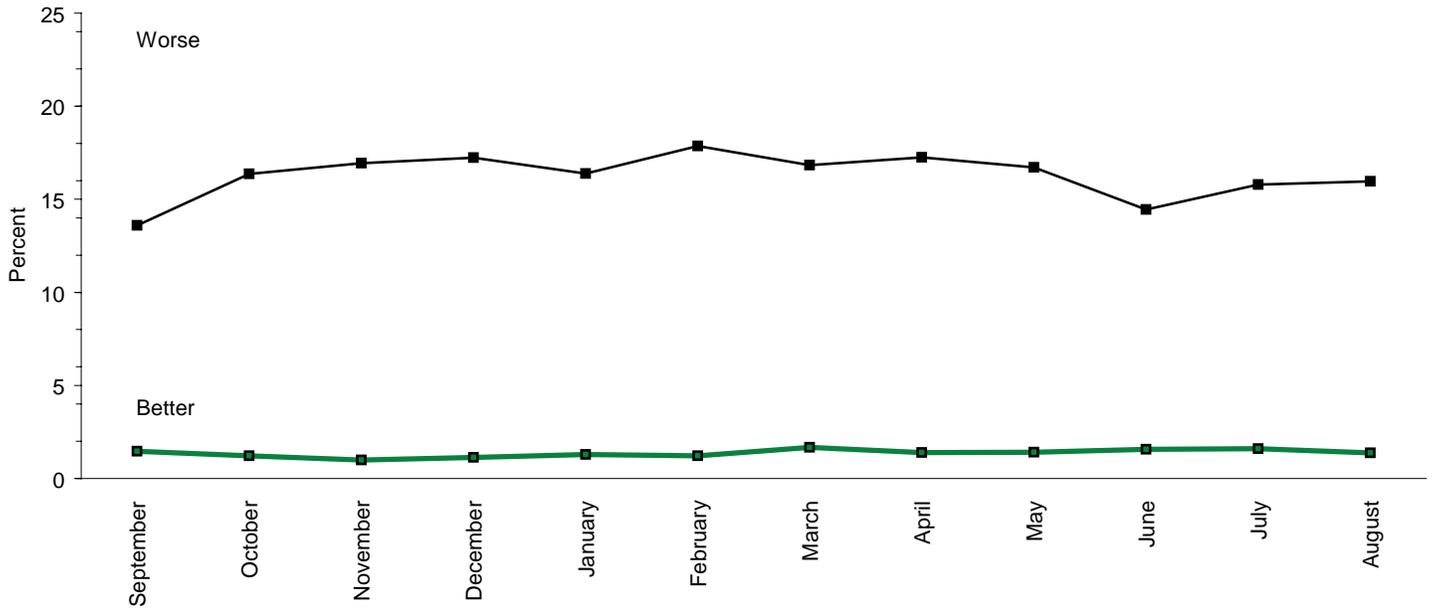


Figure 5. Percent of deployers with mental or behavioral health referrals, by Service and component, by timing of health assessment, U.S. Armed Forces, September 2007-August 2008

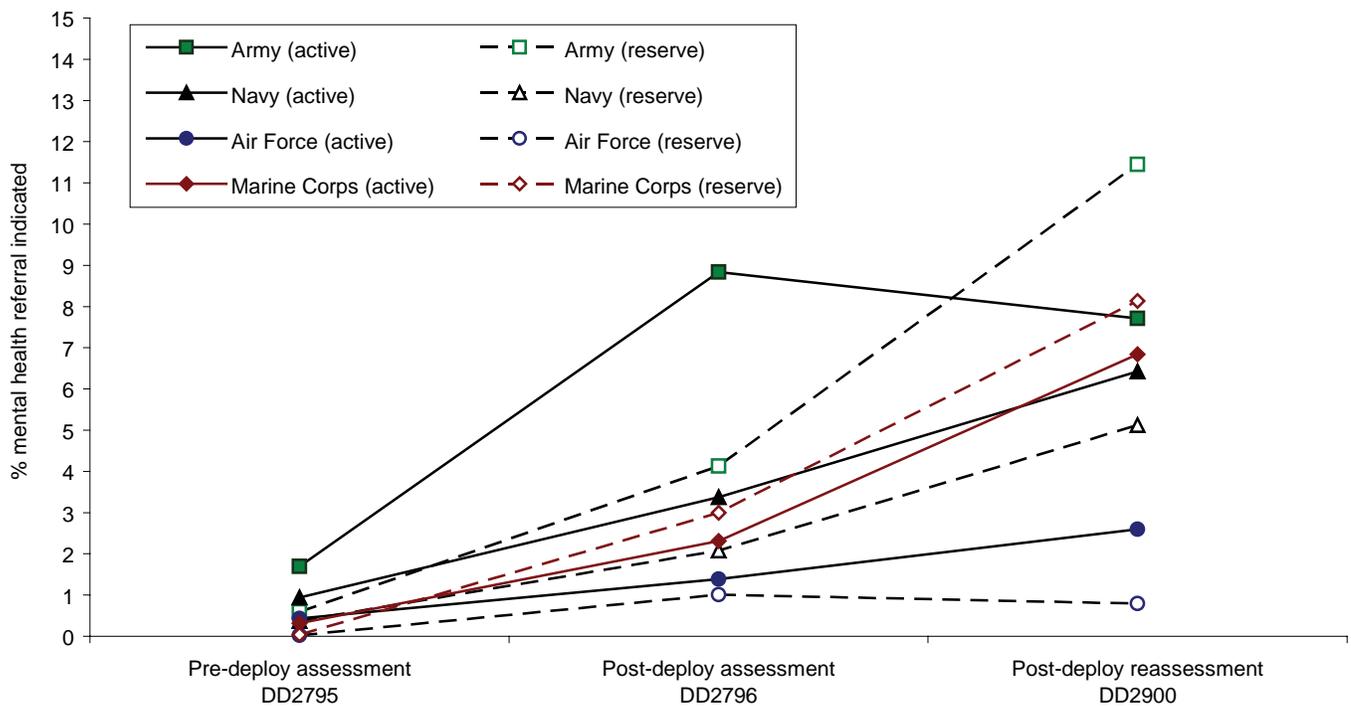


Table 2. Percentage of service members who endorsed selected questions/received referrals on health assessment forms, U.S. Armed Forces, September 2007-August 2008

	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassessmt DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassessmt DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassessmt DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassessmt DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassessmt DD2900
Active component	n=135,535 %	n=130,328 %	n=89,251 %	n=16,331 %	n=12,212 %	n=8,002 %	n=58,016 %	n=52,962 %	n=51,993 %	n=35,496 %	n=29,009 %	n=40,687 %	n=245,378 %	n=224,511 %	n=189,933 %
General health "fair" or "poor"	4.3	8.5	17.5	1.6	4.0	7.1	0.5	2.7	4.6	2.0	2.8	10.3	2.9	6.2	12.0
Health concerns, not wound or injury	12.1	28.9	38.4	5.2	9.7	21.6	3.1	11.7	15.5	4.2	7.6	28.1	8.4	21.0	29.2
Health worse now than before deployed	na	18.1	29.4	na	5.5	14.9	na	5.7	9.7	na	6.3	20.5	0.0	12.9	21.5
Exposure concerns	na	22.3	24.7	na	9.6	16.3	na	8.2	15.0	na	6.3	22.1	0.0	16.2	21.2
PTSD symptoms (2 or more)	na	15.8	19.1	na	3.5	9.6	na	2.9	3.4	na	3.6	11.7	0.0	10.5	12.8
Depression symptoms (any)	na	25.7	37.7	na	9.6	27.4	na	6.4	15.4	na	13.6	34.1	0.0	18.7	30.4
Referral indicated by provider (any)	6.5	32.9	24.6	6.0	18.3	22.2	1.7	11.5	9.8	5.1	12.4	29.0	5.1	24.5	21.4
Mental health referral indicated*	1.7	8.8	7.7	0.9	3.4	6.4	0.4	1.4	2.6	0.3	2.3	6.8	1.1	5.9	6.1
Medical visit following referral†	97.8	98.9	98.2	87.5	90.3	93.1	76.8	94.8	96.4	69.1	69.6	73.0	90.7	95.8	87.4
Reserve component	n=63,978 %	n=54,186 %	n=75,180 %	n=4,041 %	n=4,179 %	n=4,763 %	n=14,984 %	n=13,842 %	n=13,785 %	n=2,840 %	n=2,967 %	n=3,158 %	n=85,843 %	n=75,174 %	n=96,886 %
General health "fair" or "poor"	2.2	9.9	19.5	0.5	4.0	9.5	0.4	2.9	4.8	1.2	5.1	10.4	1.8	8.1	16.6
Health concerns, not wound or injury	12.7	40.2	54.8	3.4	18.2	35.4	1.6	17.3	16.4	4.8	24.4	41.5	10.1	34.1	47.9
Health worse now than before deployed	na	24.4	38.1	na	11.5	23.6	na	7.9	10.5	na	7.3	25.9	0.0	20.0	33.0
Exposure concerns	na	28.7	38.1	na	24.1	29.2	na	12.3	19.8	na	15.6	30.2	0.0	24.9	34.8
PTSD symptoms (2 or more)	na	12.9	24.8	na	3.7	13.0	na	1.9	3.0	na	3.0	17.5	0.0	9.9	20.9
Depression symptoms (any)	na	23.8	40.0	na	10.8	27.0	na	5.2	14.1	na	11.3	32.0	0.0	19.2	35.4
Referral indicated by provider (any)	5.2	28.0	35.5	4.1	17.0	19.5	0.5	13.1	7.2	5.7	28.8	31.6	4.4	24.7	30.6
Mental health referral indicated*	0.6	4.1	11.4	0.4	2.1	5.1	0.0	1.0	0.8	0.0	3.0	8.1	0.5	3.4	9.5
Medical visit following referral†	93.5	96.5	31.0	83.5	76.9	32.6	53.8	61.9	29.3	80.4	61.7	28.8	91.0	89.9	30.9

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

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

References:

1. Undersecretary of Defense for Personnel and Readiness. Department of Defense Instruction (DODI) Number 6490.3. Subject: Deployment health, dated 11 August 2006. Accessed on 19 March 2007 at: <http://www.dtic.mil/whs/directives/corres/pdf/649003p.pdf>.
 2. Assistant Secretary of Defense (Health Affairs). Memorandum for the Assistant Secretaries of the Army (M&RA), Navy (M&RA), and Air Force (M&RA), subject: Post-deployment health reassessment (HA policy: 05-011), dated 10 March 2005. Washington, DC. <http://www.ha.osd.mil/policies/2005/05-011.pdf>. Accessed 18 October 2006.

3. Rubertone MV, Brundage JG. 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):1900-04.
 4. Hoge CW, Terhakopian A, Castro CA, Messer SC, Engel CC. Association of posttraumatic stress disorder with somatic symptoms, health care visits, and absenteeism among Iraq war veterans. *Am J Psychiatry*. 2007 Jan;164(1):150-3.
 5. Browne T, Hull L, Horn O, et al. Explanations for the increase in mental health problems in UK reserve forces who have served in Iraq. *Br J Psychiatry*. 2007 Jun;190:484-489.

Figure 6. Ratio of percents of deployers who endorse selected questions, Reserve versus active component, on pre-deployment health assessments (DD2795) and post-deployment health reassessments (DD2900), U.S. Armed Forces, September 2007-August 2008

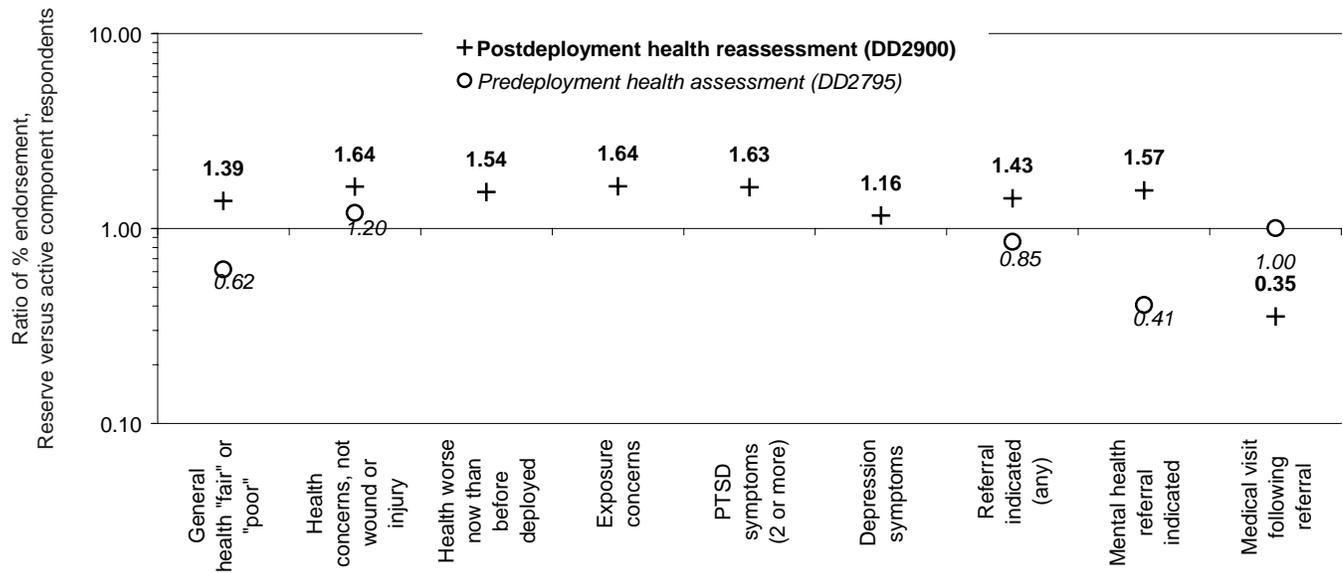
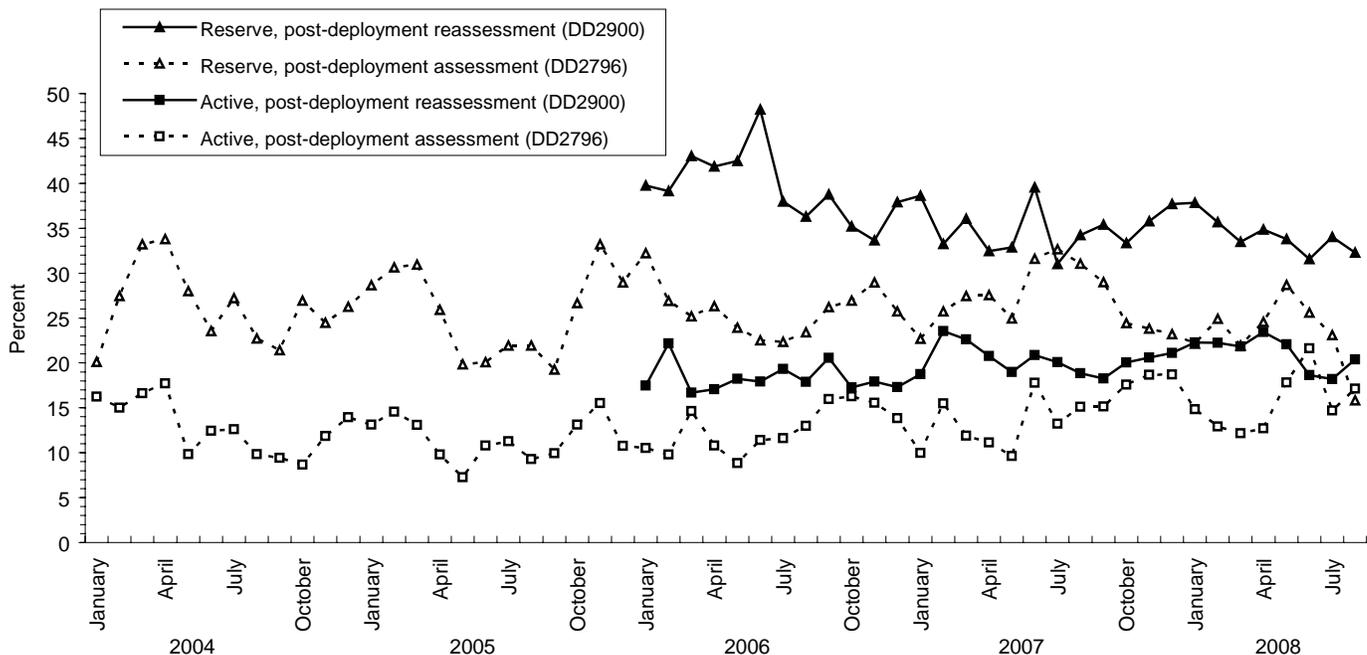


Figure 7. Proportion of service members who endorse exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2004-August 2008



Sentinel reportable events for service members and beneficiaries at U.S. Army medical facilities, cumulative numbers* for calendar years through 31 August 2007 and 31 August 2008



Reporting locations	Number of reports all events†		Food-borne								Vaccine preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
NORTH ATLANTIC																
Washington, DC Area	199	247	.	1	3	4	4	1	.	1	.	.	5	2	1	6
Aberdeen, MD	19	42	.	.	1	.	.	1	.	.	.	.	.	.	.	.
FT Belvoir, VA	179	192	8	5	2	.	4	9	3	3	.	.	.	.	1	.
FT Bragg, NC	918	1,051	2	1	.	.	17	10	2	.	.	.	.	.	.	.
FT Drum, NY	147	202	.	.	.	.	.	.	.	.	.	.	2	.	.	.
FT Eustis, VA	138	449	.	1	.	.	.	1	.	.	.	.	.	.	.	1
FT Knox, KY	188	421	2	2	.	.	2	.	1	.	.	.	2	.	.	.
FT Lee, VA	282	227	.	.	1	.	1	.	1	.	.	.	2	4	1	1
FT Meade, MD	55	199	.	.	.	1	.	.	.	1	.	.	.	.	.	.
West Point, NY	31	82	.	.	.	.	.	.	.	.	.	.	3	1	.	.
GREAT PLAINS																
FT Sam Houston, TX	416	531	.	.	1	.	2	7	.	11	.	.	3	.	6	.
FT Bliss, TX	109	373	.	.	.	.	.	8	.	.	.	.	.	.	.	.
FT Carson, CO	453	584	3	2	2	3	.	2	.	.	.	.	1	.	.	.
FT Hood, TX	1,387	1,501	5	5	3	2	8	22	9	5	.	.	.	.	1	2
FT Huachuca, AZ	78	68	.	.	.	.	5	1	.	2	.	.	.	1	.	.
FT Leavenworth, KS	41	34	1	.	.	.	.	.	2	.	.	.	.	.	.	.
FT Leonard Wood, MO	284	388	.	2	.	2	1	1	1	1	.	.	.	1	10	1
FT Polk, LA	173	137	.	1	3	.	3	.	.	1	.	.	.	.	1	1
FT Riley, KS	230	406	2	.	.	1	5	1	.	.	.	.	2	2	.	.
FT Sill, OK	131	175	.	.	.	.	1	.	.	.	.	.	.	.	1	.
SOUTHEAST																
FT Gordon, GA	509	658	.	1	.	.	3	9	.	13	.	.	1	1	.	2
FT Benning, GA	286	282	1	2	1	1	3	5	1	1	.	.	1	.	1	.
FT Campbell, KY	514	223	1	1	.	.	.	.	2	2	.	.	.	.	.	.
FT Jackson, SC	255	205	.	.	.	.	.	.	.	.	.	.	1	1	.	.
FT Rucker, AL	63	62	.	1	.	2	1	4	11	.	.	.	1	.	.	.
FT Stewart, GA	744	554	2	3	.	1	14	12	9	1	.	.	2	7	2	.
WESTERN																
FT Lewis, WA	510	810	1	6	4	.	1	2	1	2	.	.	.	.	1	.
FT Irwin, CA	65	42	1	.	.	.	2	1	1	1	.	.	.	.	.	.
FT Wainwright, AK	171	273	.	4	.	.	1	1	.	.	.	.	.	.	.	.
OTHER LOCATIONS																
Hawaii	527	599	21	28	1	2	10	12	.	3	.	.	1	4	.	.
Germany	572	941	6	9	1	2	6	17	7	5	.	.	.	5	1	.
Korea	452	514	.	.	.	.	.	1	.	.	.	.	.	.	2	1
Other	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	10,126	12,472	56	75	23	21	94	128	51	53	0	0	24	30	31	15

*Events reported by September 7, 2007 and 2008

†Seventy medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, May 2004.

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* for calendar years through 31 August 2007 and 31 August 2008



Reporting location	Arthropod-borne				Sexually transmitted								Environmental			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis [‡]		Urethritis [§]		Cold		Heat	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
NORTH ATLANTIC																
Washington, DC Area	5	12	3	1	115	100	18	19	4	5	.	.	.	.	.	15
Aberdeen, MD	.	6	.	.	10	17	3	1	.	.	.	.	.	.	.	.
FT Belvoir, VA	1	.	1	.	123	112	19	8	2	.	.	.	.	.	.	.
FT Bragg, NC	.	1	2	8	623	683	104	150	.	1	56	50	1	.	107	55
FT Drum, NY	2	3	2	.	93	144	17	14	.	.	.	.	.	.	.	.
FT Eustis, VA	1	.	.	.	112	137	7	21	.	3	.	.	.	.	9	1
FT Knox, KY	1	1	1	.	149	130	22	30	.	1	.	.	.	.	2	2
FT Lee, VA	2	2	.	1	217	148	28	55	2	1	.	.	1	.	12	5
FT Meade, MD	1	1	.	.	43	34	8	2	1	.	1	.	1	.	.	.
West Point, NY	14	30	.	.	11	23	.	.	.	.	.	.	.	.	.	.
GREAT PLAINS																
FT Sam Houston, TX	1	.	.	.	216	213	47	56	2	17	.	.	.	1	4	4
FT Bliss, TX	.	.	.	.	89	256	14	51	1	5	.	.	.	.	.	.
FT Carson, CO	.	.	.	.	305	410	48	41	1	.	7	13	1	.	.	.
FT Hood, TX	.	.	3	.	1,017	1,071	173	219	2	.	71	53	.	.	19	.
FT Huachuca, AZ	.	1	.	.	60	49	13	9	.	.	.	.	.	.	.	3
FT Leavenworth, KS	1	1	.	.	33	29	4	4	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	.	.	.	.	187	132	30	14	1	.	.	.	2	3	19	7
FT Polk, LA	.	.	15	.	82	87	26	26	1	1	.	.	.	.	41	19
FT Riley, KS	.	4	.	1	167	244	10	23	.	1	.	1	.	1	10	8
FT Sill, OK	.	.	1	.	69	60	17	12	1	.	.	.	1	.	32	9
SOUTHEAST																
FT Gordon, GA	1	.	.	.	364	344	68	79	4	.	.	.	.	.	6	1
FT Benning, GA	.	.	2	.	172	172	56	53	.	1	.	.	1	.	31	20
FT Campbell, KY	.	.	.	.	379	118	55	5	.	1	.	.	.	.	14	6
FT Jackson, SC	.	.	.	.	128	158	35	24	2	.	.	1	.	.	87	20
FT Rucker, AL	.	2	.	.	42	40	2	8	.	2	.	.	.	.	5	2
FT Stewart, GA	.	.	.	2	505	406	100	72	3	2	1	.	.	.	62	28
WESTERN																
FT Lewis, WA	.	.	3	5	440	651	46	64	.	1	8	12	.	.	.	.
FT Irwin, CA	1	.	1	.	34	24	4	5	.	.	.	.	.	.	18	11
FT Wainwright, AK	.	1	.	.	136	189	9	24	.	1	.	.	10	12	.	1
OTHER LOCATIONS																
Hawaii	1	.	.	1	390	434	44	56	.	.	.	1	.	.	3	.
Germany	15	27	5	12	341	539	107	114	2	7	3	.	.	8	30	18
Korea	.	.	11	.	371	443	45	52	1	4	1	.	20	.	1	3
Other	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	47	92	50	31	7,023	7,597	1,179	1,311	30	54	148	131	38	25	512	238

‡Primary and secondary.

§Urethritis, non-gonococcal (NGU).

Sentinel reportable events for service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers* for calendar years through 31 August 2007 and 31 August 2008



Reporting locations	Number of reports all events [†]		Food-borne								Vaccine preventable						
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella		
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	
NATIONAL CAPITOL AREA																	
Annapolis, MD	0	25	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.
Bethesda, MD	35	48	1	2	.	1	2	4	.	.	.	1	1	.	.	.	.
Patuxent River, MD	0	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NAVY MEDICINE EAST																	
Albany, GA	0	3	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.
Atlanta, GA	3	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Beaufort, SC	248	50	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.
Camp Lejeune, NC	277	144	.	.	.	.	4	2	.	.	.	.	.	.	.	.	.
Cherry Point, NC	121	94	.	.	.	.	2	1	.	.	.	.	.	.	3	.	.
Great Lakes, IL	170	102	.	.	1	.	3	.	.	.	.	.	2	.	.	1	.
Jacksonville, FL	165	57	1	.	.	.	5	10	2	1	.	.	.	.	.	.	2
Mayport, FL	24	34	1	.	.	.	4	6	.	2	.	.	.	.	.	.	.
NABLC Norfolk, VA	58	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NBMC Norfolk, VA	330	198	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
NEHC Norfolk, VA	4	0	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.
North Charleston, SC	3	25	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.
Pensacola, FL	83	55	.	1	2	.	5	3	3	1	.	.	.	.	5	.	.
Portsmouth, VA	0	5	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Washington, DC	6	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guantanamo Bay, Cuba	2	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Europe	22	30	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.
NAVY MEDICINE WEST																	
Camp Pendleton, CA	13	87	.	.	.	1	1	3	.	1	.	.	.	.	.	.	.
Corpus Christi, TX	4	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fallon, NV	0	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ingleside, TX	3	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lemoore, CA	1	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pearl Harbor, HI	0	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
San Diego, CA	313	141	3	.	2	.	3	1	2	1	.	.	28	5	.	1	.
Guam	31	17	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2
Japan	59	40	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.
NAVAL SHIPS																	
COMNAVAIRLANT/CINCLANTFLEET	10	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	25	13	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
OTHER LOCATIONS																	
Other	24	205	.	.	.	.	4	2	.	.	.	.	.	.	.	.	2
Total	2,034	1,448	6	4	5	2	34	37	8	7	0	0	29	13	12	8	

*Events reported by September 7, 2008

†Seventy medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, May 2004..

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* for calendar years through 31 August 2007 and 31 August 2008



Reporting location	Arthropod-borne				Sexually transmitted								Environmental			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis [‡]		Urethritis [§]		Cold		Heat	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
NATIONAL CAPITOL AREA																
Annapolis, MD	.	5	.	.	.	12	1
Bethesda, MD	4	2	.	2	20	25	2	1	1	1	.	.	.	.	.
Patuxent River, MD	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
NAVY MEDICINE EAST																
Albany, GA	1	.	.	.	.	.	.	.	.	.
Atlanta, GA	1	2	1	.	1	.	.	.	.	.	.
Beaufort, SC	169	4	18	.	2	.	.	.	.	52	44	
Camp Lejeune, NC	12	.	1	.	214	63	27	22	.	.	16	.	.	17	40	
Cherry Point, NC	.	1	.	.	98	64	7	10	1	.	.	.	.	3	3
Great Lakes, IL	143	94	16	4	.	.	.	.	.	.	.
Jacksonville, FL	118	25	18	2	2	1	.	.	.	8	.	
Mayport, FL	16	16	.	2	1	.	.	.	.	.	.
NABLC Norfolk, VA	52	14	6	1	.	.	.	.	.	.	.
NBMC Norfolk, VA	272	161	56	29	.	1	.	.	.	.	.
NEHC Norfolk, VA	2	.	.	.	.	.	.	.	.	.	.
North Charleston, SC	.	1	.	.	3	14	.	3	.	1	.	.	.	.	1
Pensacola, FL	47	41	5	3	.	.	.	.	.	12	.	
Portsmouth, VA	3	.	1	.	.	.	.	.	.	.
Washington, DC	.	1	.	.	5	7	.	.	1	.	.	.	.	.	.
Guantanamo Bay, Cuba	2	5	.	.	.	.	.	.	.	.	.
Europe	.	.	.	1	21	24	1	2	.	.	.	.	.	.	.
NAVY MEDICINE WEST																
Camp Pendleton, CA	10	72	1	8	1	.	.	.	.	.	.
Corpus Christi, TX	3	.	1	2	.	.	.	.	.	.	.
Fallon, NV	3	.	.	.	.	.	.	.	.	.
Ingleside, TX	3	2	.	.	.	.	.	.	.	.	.
Lemoore, CA	7	.	.	.	.	.	.	.	.	.
Pearl Harbor, HI	20	.	.	.	1	.	.	.	.	.
San Diego, CA	1	1	.	1	197	108	35	12	5	2	.	.	.	.	.
Guam	.	.	.	2	25	8	4	3	.	.	.	.	.	.	.
Japan	.	.	.	1	42	28	10	4	.	.	.	.	.	4	2
NAVAL SHIPS																
COMNAVAIRLANT/CINCLANTFLEET	8	.	2	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	17	9	6	2	.	.	2	.	.	1	.	
OTHER LOCATIONS																
Other	1	9	1	1	13	142	5	15	.	1	.	.	1	.	15	
Total	18	22	2	8	1,501	974	221	126	15	8	0	18	0	1	97	106

‡Primary and secondary.

§Urethritis, non-gonococcal (NGU).

Sentinel reportable events for service members and beneficiaries at U.S. Air Force medical facilities, cumulative numbers* for calendar years through 31 August 2007 and 31 August 2008



Air Force

Reporting locations	Number of reports all events [†]		Food-borne								Vaccine preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Air Combat Cmd	1,137	1,165	2	2	1	3	5	12	.	4	.	.	6	28	6	3
Air Education & Training Cmd	513	655	1	1	.	3	11	8	5	1	.	.	4	1	5	4
Lackland, TX	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.
USAF Academy, CO	37	16	.	1	.	.	2	.	.	.	.	.	.	.	.	.
Air Force Dist. of Washington	21	20	.	.	.	.	.	.	1	.	.	.	.	.	.	.
Air Force Materiel Cmd	382	475	.	2	1	1	15	4	1	4	.	.	.	.	1	.
Air Force Special Ops Cmd	121	170	.	.	.	.	.	1	1	.	.	.	.	2	.	.
Air Force Space Cmd	254	315	2	1	2	2	6	5	1	1	.	.	2	2	1	1
Air Mobility Cmd	531	717	1	1	1	2	8	7	2	2	.	.	4	3	2	8
Pacific Air Forces	394	386	1	6	2	4	4	3	1	.	.	.	4	7	10	3
PACAF Korea	106	154	.	.	.	.	.	.	.	.	.	.	6	1	1	.
U.S. Air Forces in Europe	200	286	3	1	.	.	.	1	1	.	.	.	1	3	.	1
Other	560	620	3	4	1	5	9	11	.	8	.	.	2	1	1	1
Total	4,256	4,979	13	19	8	20	60	52	13	20	0	0	29	48	27	21

*Events reported by September 7, 2008

†Seventy medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, May 2004.

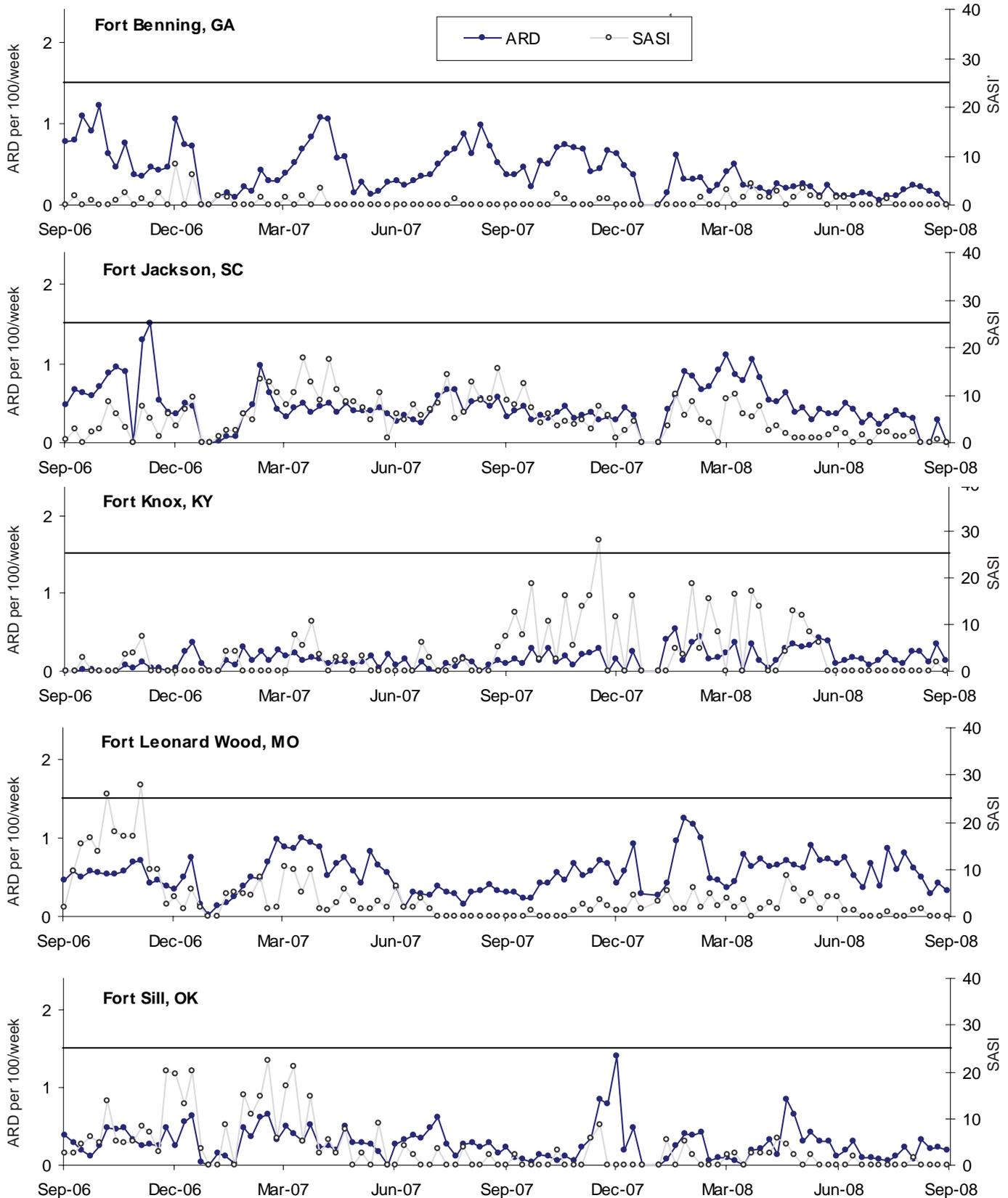
Note: Completeness and timeliness of reporting vary by facility

Reporting location	Arthropod-borne				Sexually transmitted								Environmental			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis [‡]		Urethritis [§]		Cold		Heat	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Air Combat Cmd	9	3	.	.	731	670	61	59	2	2	2	2	.	3	6	.
Air Education & Training Cmd	2	4	.	.	399	388	50	37	.	4	.	.	1	.	1	1
Lackland, TX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
USAF Academy, CO	.	.	.	.	31	14	2	.	.	.	.	.	1	.	.	.
Air Force Dist. of Washington	.	1	.	.	19	12	1	1	.	.	.	.	.	.	.	.
Air Force Materiel Cmd	7	7	1	1	302	279	39	44	.	3	.	.	.	.	.	.
Air Force Special Ops Cmd	.	1	.	1	95	129	13	25	.	1	.	.	.	.	12	.
Air Force Space Cmd	1	3	.	.	216	217	17	10	.	.	.	.	.	.	.	.
Air Mobility Cmd	6	7	.	.	444	481	32	54	3	3	.	.	.	2	3	5
Pacific Air Forces	1	.	.	.	327	316	21	19	.	1	.	.	1	1	.	.
PACAF Korea	.	.	.	.	76	126	4	4	3	.	.	.	2	.	1	.
U.S. Air Forces in Europe	2	6	.	2	153	221	12	19	.	.	.	.	.	.	.	.
Other	1	2	.	.	492	468	30	33	2	1	.	.	.	.	.	6
Total	29	34	1	4	3,285	3,321	282	305	10	15	2	2	4	7	23	12

‡Primary and secondary.

§Urethritis, non-gonococcal (NGU).

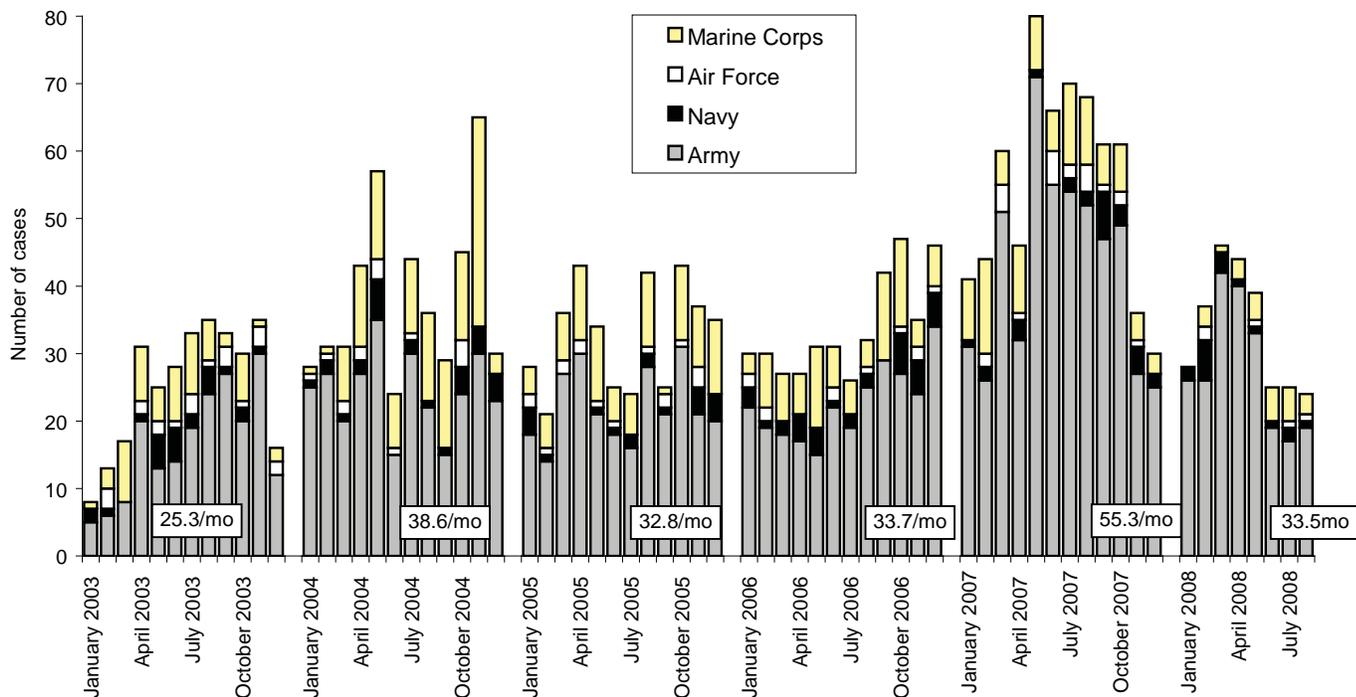
Acute respiratory disease (ARD) and streptococcal pharyngitis rates (SASI*), basic combat training centers, U.S. Army, by week, September 2006-September 2008



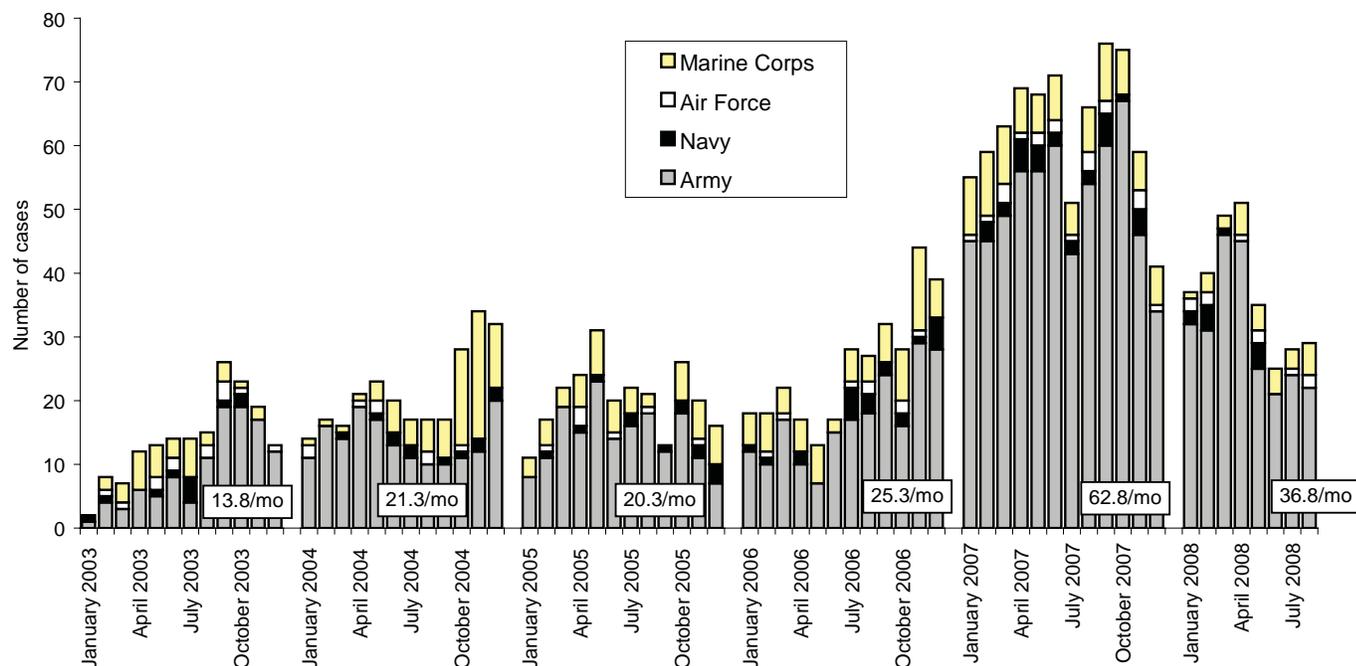
* Streptococcal-ARD surveillance index (SASI) = ARD rate x % positive culture for group A streptococcus
 ARD rate = cases per 100 trainees per week
 ARD rate ≥ 1.5 or SASI ≥ 25.0 for 2 consecutive weeks are surveillance indicators of epidemics

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - August 2008

Traumatic brain injury, hospitalizations (ICD-9: 800-804, 850-854, 959.01)*



Traumatic brain injury, multiple ambulatory visits (without hospitalization), (ICD-9: 800-804, 850-854, 959.01)†



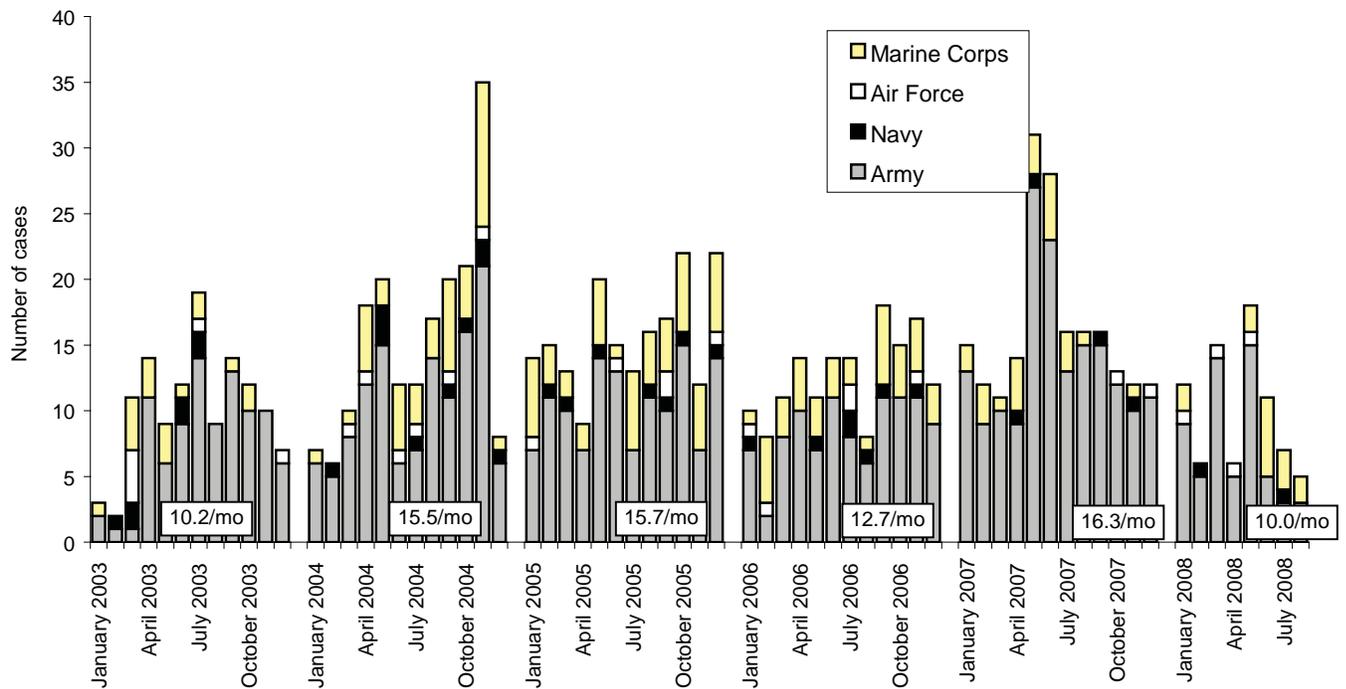
Reference: Army Medical Surveillance Activity. Traumatic brain injury among members of active components, U.S. Armed Forces, 2002-2007. *MSMR*. Aug 2007; 14(5):2-6.

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

†Two or more ambulatory visits at least 7 days apart while deployed to/within 365 days of returning from OEF/OIF.

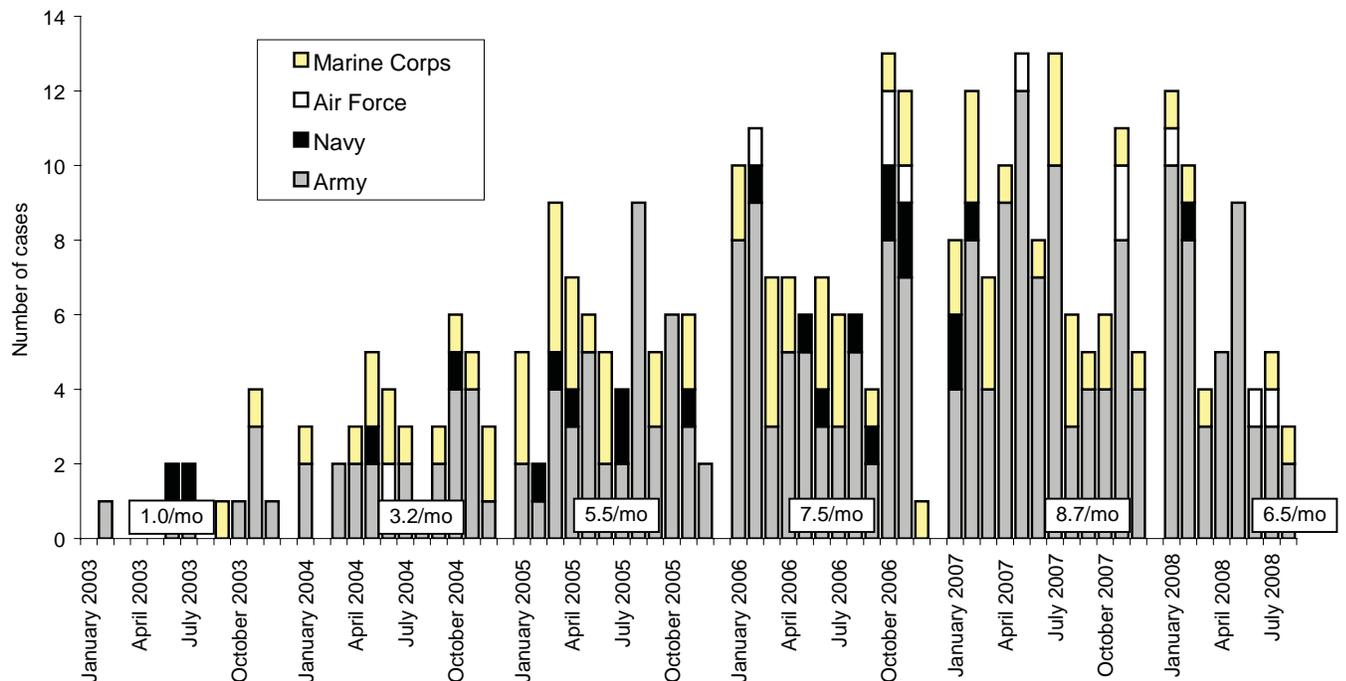
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - August 2008

Amputations (ICD-9: 887, 896, 897, V49.6 to V49.7, PR 84.0 to PR 84.1)*



Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. *MSMR*. Aug 2007; 14(5):7-9.
 *One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart while deployed to/within 365 days of returning from OEF/OIF.

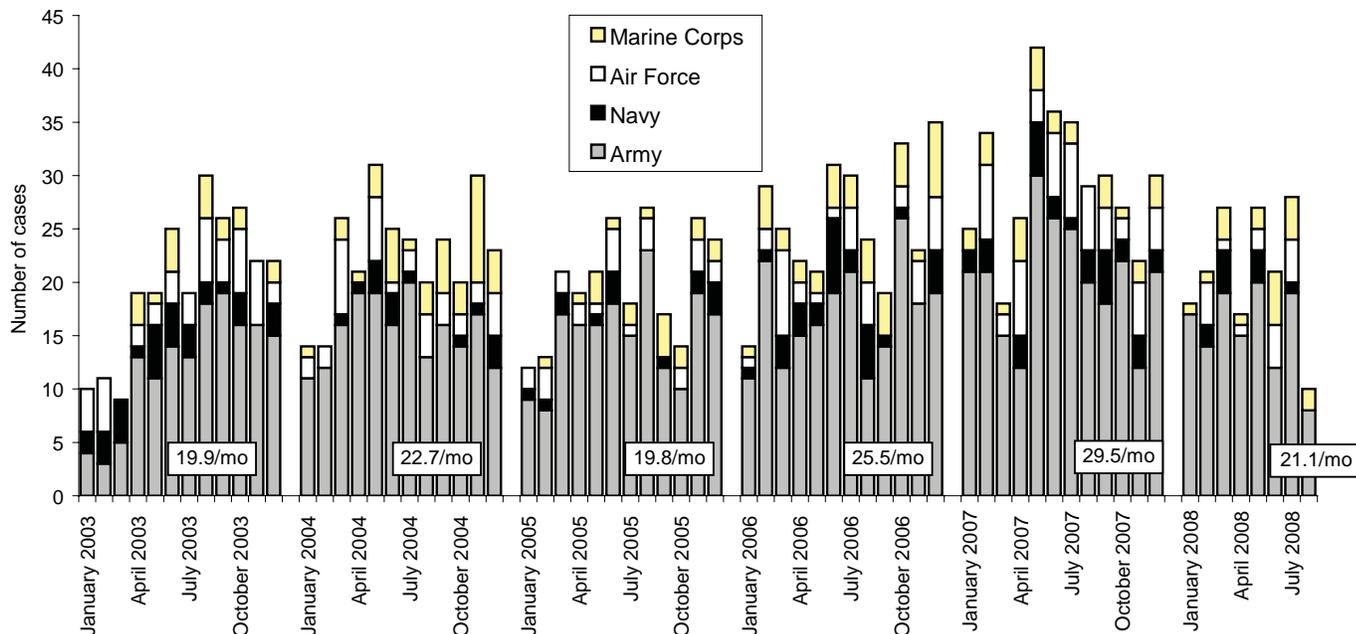
Heterotopic ossification (ICD-9: 728.12, 728.13, 728.19)†



Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. *MSMR*. Aug 2007; 14(5):7-9.
 †One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart 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 - August 2008

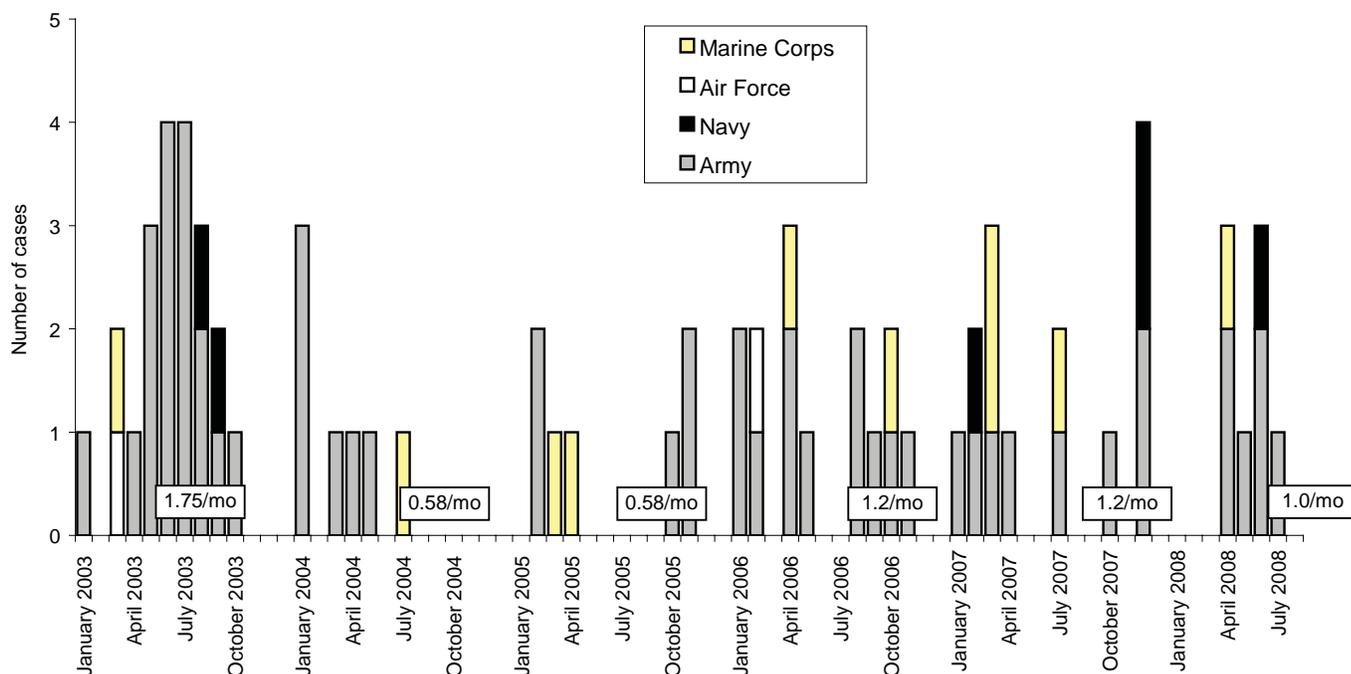
Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 to 453.42 and 453.8)*



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.

*Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 90 days of returning from OEF/OIF.

Severe acute pneumonia (ICD-9: 518.81, 518.82, 518.3, 480-487, 786.09)†

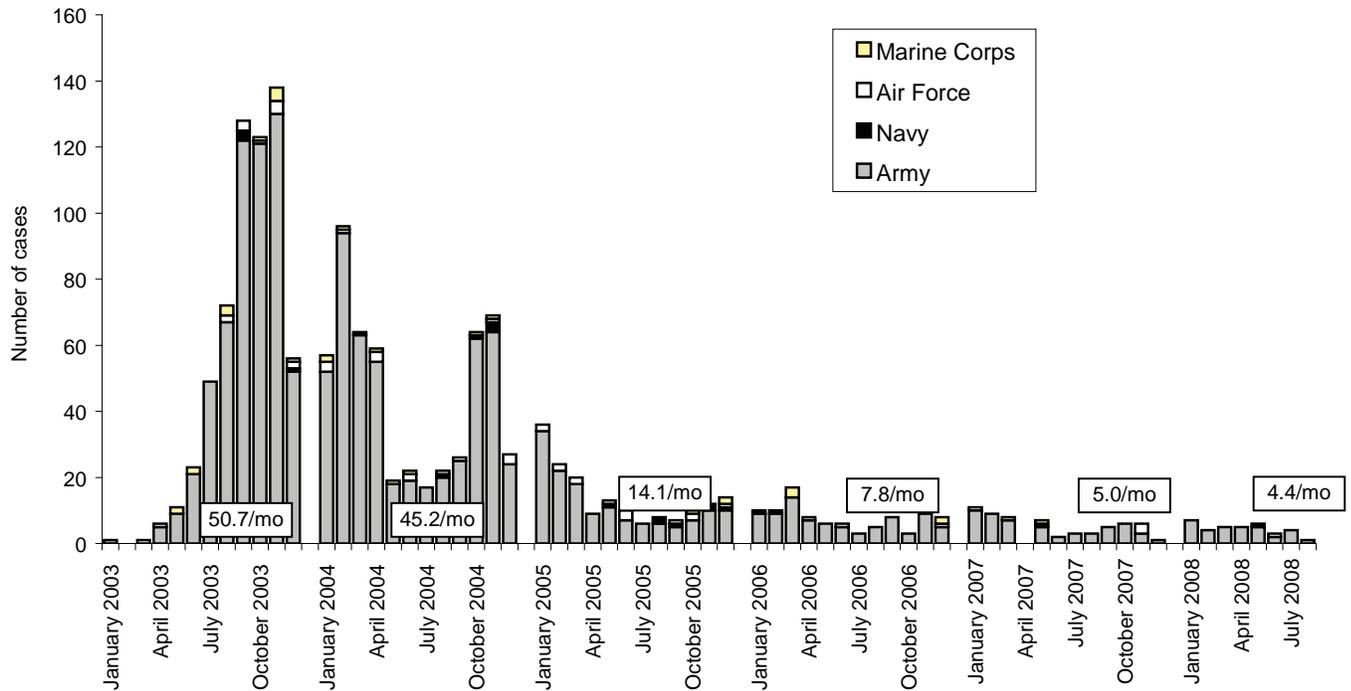


Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom,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

†Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit 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 - August 2008

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.

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The *Medical Surveillance Monthly Report* (MSMR) is prepared by the Armed Forces Health Surveillance Center (AFHSC), US Army Center for Health Promotion and Preventive Medicine (USACHPPM).

Data in the MSMR are provisional, based on reports and other sources of data available to AFHSC.

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