

# MSMR

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## MEDICAL SURVEILLANCE MONTHLY REPORT

### 2009 ANNUAL SUMMARY ISSUE

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## Hospitalizations among members of active components, U.S. Armed Forces, 2008

This report documents frequencies, rates, and characteristics of hospitalizations of members of the active components of the U.S. Armed Forces during calendar year 2008. Summaries are based on standardized records of hospitalizations in U.S. military and non-military (reimbursed care) medical facilities worldwide. The primary reasons for hospitalizations are summarized based on the first three digits of the ICD-9-CM codes that were reported as primary (first-listed) discharge diagnoses. Hospitalizations not routinely documented with standardized, automated records (e.g., during deployments, field training exercises, shipboard) are not included in this summary. Of note, for the first time, hospitalizations of Coast Guard members are included in the annual summary.

### Frequencies, rates, and trends:

In 2008, there were 76,190 reports of hospitalizations of active component members of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard (Table 1) — approximately one-third (31%) of the hospitalizations were in non-military facilities (Figure 1). The hospitalization rate (all causes) was 53.7 per 1,000 service members per year. For the past ten years, hospitalization rates overall have been remarkably stable; however, rates of hospitalization of active component service members in U.S. military medical facilities have declined (Figure 1).

### Hospitalizations, by illness and injury categories:

As in recent prior years, in 2008, three diagnostic categories accounted for more than one-half (53.5%) of all hospitalizations of active component service members: pregnancy-related

conditions and childbirth (20.8%), mental disorders (19.1%), and injuries and poisonings (13.5%) (Table 1).

Between 2004 and 2008, numbers of hospitalizations increased in only one of the six major categories that accounted for the most hospitalizations overall; in 2008 compared to 2004, there were 41.1% (n, 2008-2004:+4,245) more hospitalizations for mental disorders (Table 1). During the same period, hospitalizations for injuries and poisonings and pregnancy-related conditions and childbirth declined by 17.9% (n, 2008-2004:-2,236) and 10.4% (n, 2008-2004:-1,846), respectively. (Table 1).

### Hospitalizations, by gender:

In 2008, the hospitalization rate (all causes) was 3.3-times higher among females than males (hospitalization rate, overall: females: 133.4 per 1,000 person-years [p-yrs]; males: 40.6 per 1,000 p-yrs). However, for conditions not related to pregnancy and childbirth (which accounted for 59.2% of all hospitalizations of females), the crude hospitalization rate among females (54.5 per 1,000 per year) was 34% higher than among males.

Hospitalization rates were higher among males than females for injuries and poisonings (male:female [m:f], rate ratio [RR]: 1.41; rate difference [RD]: 2.20 per 1,000 p-yrs), skin and subcutaneous tissue disorders (m:f, RR: 1.34; RD: 0.39 per 1,000 p-yrs), circulatory disorders (m:f, RR: 1.21; RD: 0.31 per 1,000 p-yrs), musculoskeletal/connective tissue disorders (m:f, RR: 1.11; RD: 0.48 per 1,000 p-yrs), and respiratory diseases (m:f, RR: 1.07; RD: 0.13 per 1,000 p-yrs). Hospitalization rates were higher among females

**Table 1.** Hospitalizations, ICD-9 diagnostic categories, U.S. Armed Forces, 2004, 2006, and 2008

Major diagnostic category (ICD-9-CM)	2004			2006			2008		
	No.	Rate*	Rank	No.	Rate*	Rank	No.	Rate*	Rank
Pregnancy and childbirth (630 - 679, relevant V codes)	17,719	12.19	(1)	16,424	11.72	(1)	15,873	11.18	(1)
Mental disorders (290 - 319)	10,340	7.11	(3)	11,267	8.04	(2)	14,585	10.27	(2)
Injury and poisoning (800 - 999)	12,518	8.61	(2)	10,552	7.53	(3)	10,282	7.24	(3)
Musculoskeletal system (710 - 739)	6,946	4.78	(5)	6,420	4.58	(5)	6,936	4.89	(4)
Digestive system (520 - 579)	7,336	5.05	(4)	6,658	4.75	(4)	6,845	4.82	(5)
Signs, symptoms and ill-defined conditions (780 - 799)	4,497	3.09	(6)	4,365	3.12	(6)	3,883	2.74	(6)
Respiratory system (460 - 519)	2,730	1.88	(8)	2,862	2.04	(7)	2,742	1.93	(7)
Circulatory system (390 - 459)	2,443	1.68	(9)	2,615	1.87	(8)	2,523	1.78	(8)
Genitourinary system (580 - 629)	3,009	2.07	(7)	2,610	1.86	(9)	2,405	1.69	(9)
Other (E81-E99 and V01-V82, except pregnancy-related)	1,357	0.93	(12)	1,574	1.12	(12)	2,190	1.54	(10)
Skin and subcutaneous tissue (680 - 709)	2,041	1.40	(10)	2,128	1.52	(11)	2,133	1.50	(11)
Neoplasms (140 - 239)	2,013	1.38	(11)	2,173	1.55	(10)	2,063	1.45	(12)
Nervous system (320 - 389)	1,173	0.81	(14)	1,128	0.81	(14)	1,341	0.94	(13)
Infectious and parasitic diseases (001 - 139)	1,293	0.89	(13)	1,245	0.89	(13)	1,152	0.81	(14)
Endocrine, nutrition, immunity (240 - 279)	793	0.55	(15)	900	0.64	(15)	665	0.47	(15)
Congenital anomalies (740 - 759)	378	0.26	(16)	329	0.23	(17)	321	0.23	(16)
Hematologic disorders (280 - 289)	375	0.26	(17)	488	0.35	(16)	251	0.18	(17)
<b>Totals</b>	<b>76,961</b>	<b>52.94</b>		<b>73,738</b>	<b>52.63</b>		<b>76,190</b>	<b>53.67</b>	

\*Rate per 1,000 person years

than males for all other major categories. The largest absolute differences in hospitalization rates between females and males were for genitourinary disorders (RD: 5.65 per 1,000 p-yrs) and mental disorders (RD: 3.30 per 1,000 p-yrs).

Hospitalization rates in relation to age significantly varied across diagnostic categories (**Figure 2**). For example, among both males and females, hospitalization rates for neoplasms and circulatory, genitourinary, and musculoskeletal/connective tissue disorders sharply increased with age; hospitalization rates for mental, respiratory, and skin/subcutaneous tissue disorders generally decreased with age (**Figure 2**).

#### Most frequent diagnoses:

In 2008, seven diagnoses (as specified by 3-digit codes of the ICD-9-CM) accounted for more than 1,000 hospitalizations each among males: adjustment reactions (n=3,538), affective psychoses (n=3,037), intervertebral disc disorders (n=1,952), acute appendicitis (n=1,605), alcohol dependence syndrome (1,419), symptoms involving the respiratory system and chest (n=1,376), and other cellulitis and abscess (n=1,355) (**Table 2**). These seven diagnoses accounted for nearly one-third (28.9%) of all hospitalizations of males during 2008.

As in the past, in 2008, conditions associated with pregnancy and childbirth caused the most hospitalizations by far among females (**Table 3**). Other than pregnancy and childbirth-related diagnoses, leading causes of hospitalizations of females were affective psychoses (n=918), adjustment reactions (n=727), uterine leiomyoma (n=461), intervertebral disc disorders (n=265), depressive disorder (n=240), and acute appendicitis (n=218) (**Table 3**). These six diagnoses accounted for approximately one-fourth (25.8%) of all hospitalizations of females (not related to pregnancy/childbirth).

#### Injuries and poisonings:

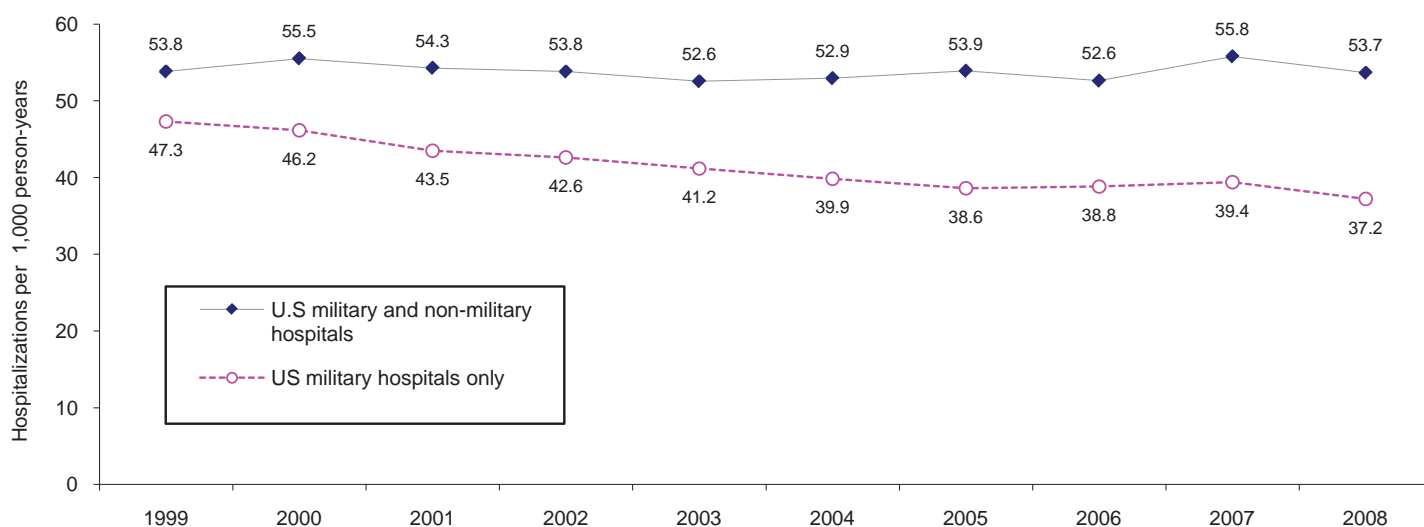
As in the past, in 2008, injuries and poisonings accounted for more hospitalizations of U.S. service members than any other category of diagnoses except pregnancy/childbirth-related conditions and mental disorders (**Table 1**). Of injury and poisoning-related hospitalizations with documented "causes," approximately one of seven (14.2%) were considered intentionally inflicted (e.g., enemy weapons; suicide gestures/attempts; fights, assaults, legal interventions); of those, 55% were reported as "battle casualties" (**Table 4**). As in the past, the most frequently reported causes of unintentional injuries/poisonings were "falls and miscellaneous," complications of medical/surgical care, and land transportation accidents (**Table 4**).

Among both males and females, "other complications of procedures, not elsewhere classified" caused more injury and poisoning-related hospitalizations than any other diagnoses (**Tables 2,3**). However, among males, the next most frequent causes of injury/poisoning-related hospitalizations were fractures of bones of the ankle, face, and leg; and concussions (**Table 2**). Among females, the next most frequent causes of injury/poisoning-related hospitalizations were poisonings (by analgesics, antipyretics, antirheumatics, and psychotropic agents), ankle fractures, complications affecting specified body systems, and complications of specified procedures (**Table 3**).

#### Durations of hospitalization:

As in previous years, in 2008, median durations of hospitalization varied across diagnostic categories – from one day (for "signs, symptoms, and ill-defined conditions") to five days (for mental disorders) (**Figure 3**). Median durations of hospitalization for all other categories of diagnoses were two or three days (**Figure 3**). In contrast to median durations of

**Figure 1.** Rate of hospitalization by calendar year, U.S. Armed Forces, 1999-2008



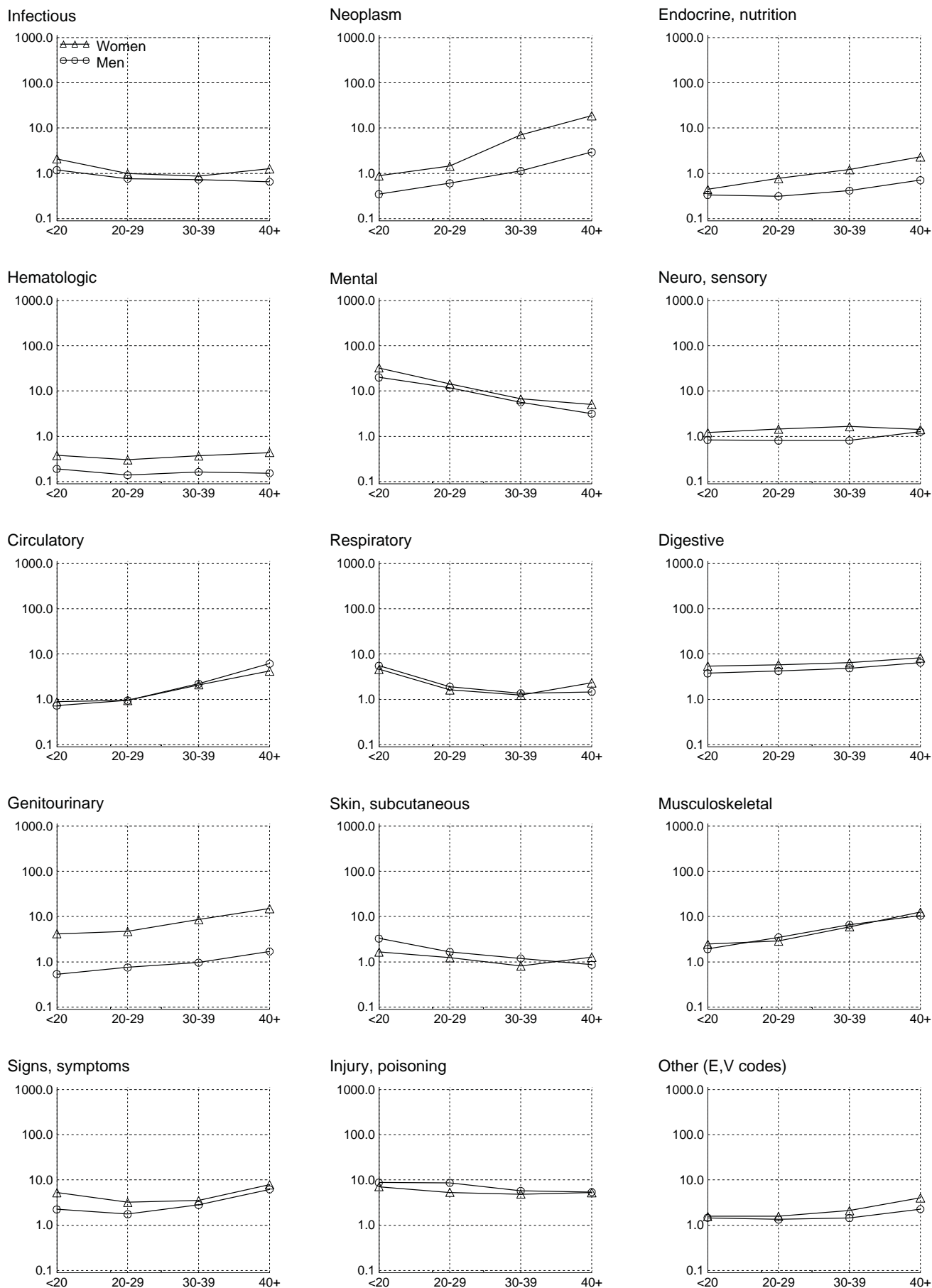
**Table 2.** Most frequent diagnoses during hospitalization, by major diagnostic category, males, U.S. Armed Forces, 2008

Diagnostic category (ICD-9-CM codes)	No.	% category
<b>Infectious and parasitic diseases (001 - 139)</b>	936	
Meningitis due to enterovirus	165	17.6
Intestinal infections due to other organisms	135	14.4
Viral & chlamydial infection	95	10.1
Septicemia	83	8.9
Ill-defined intestinal infections	55	5.9
<b>Neoplasms (140 - 239)</b>	1,191	
Cancer of thyroid gland	74	6.2
Cancer of prostate	71	6.0
Other cancer of lymphoid and histiocytic tissue	60	5.0
Cancer of testis	58	4.9
Secondary cancer of respiratory and digestive systems	43	3.6
<b>Endocrine, nutrition, immunity (240 - 279)</b>	466	
Diabetes mellitus	175	37.6
Disorders of fluid, electrolyte and acid-base balance	108	23.2
Nontoxic nodular goiter	37	7.9
Obesity and other hyperalimentation	35	7.5
Thyrotoxicosis with or without goiter	24	5.2
<b>Hematologic disorders (280 - 289)</b>	183	
Other diseases of blood and blood-forming organs	40	21.9
Purpura and other hemorrhagic conditions	35	19.1
Diseases of white blood cells	26	14.2
Other and unspecified anemias	23	12.6
Iron deficiency anemias	21	11.5
<b>Mental disorders (290 - 319)</b>	11,947	
Adjustment reaction	3,538	29.6
Affective psychoses	3,037	25.4
Alcohol dependence syndrome	1,419	11.9
Depressive disorder, nec	891	7.5
Neurotic disorders	713	6.0
<b>Nervous system (320 - 389)</b>	1,044	
Epilepsy	148	14.2
Migraine	137	13.1
Other conditions of brain	78	7.5
Other and unspecified disorders of the nervous system	49	4.7
Other paralytic syndromes	45	4.3
<b>Circulatory system (390 - 459)</b>	2,219	
Cardiac dysrhythmias	478	21.5
Other forms of chronic ischemic heart disease	214	9.6
Acute pulmonary heart disease	202	9.1
Acute myocardial infarction	181	8.2
Other venous embolism and thrombosis	117	5.3
<b>Respiratory system (460 - 519)</b>	2,375	
Pneumonia, organism unspecified	765	32.2
Pneumothorax	166	7.0
Deviated nasal septum	151	6.4
Other diseases of lung	142	6.0
Peritonsillar abscess	139	5.9

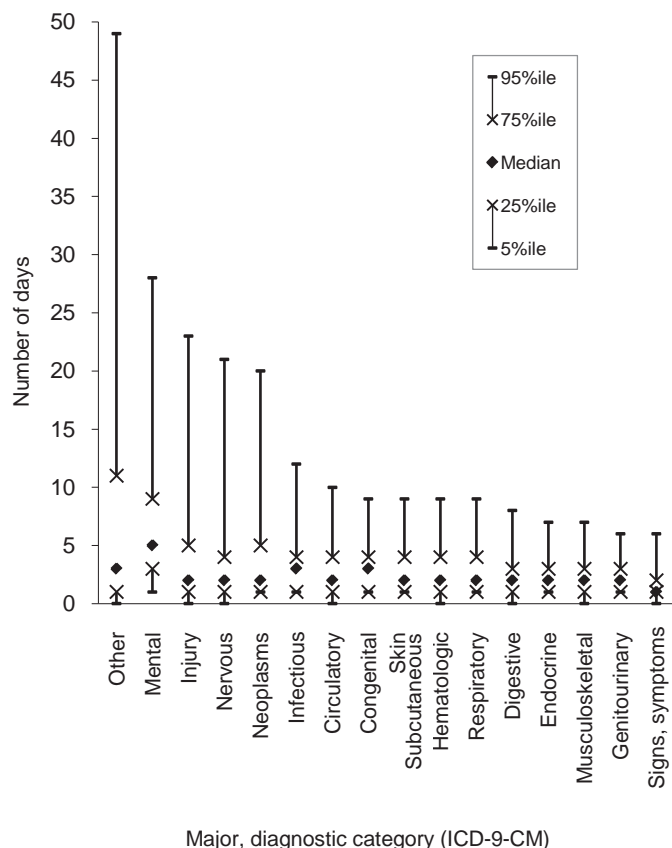
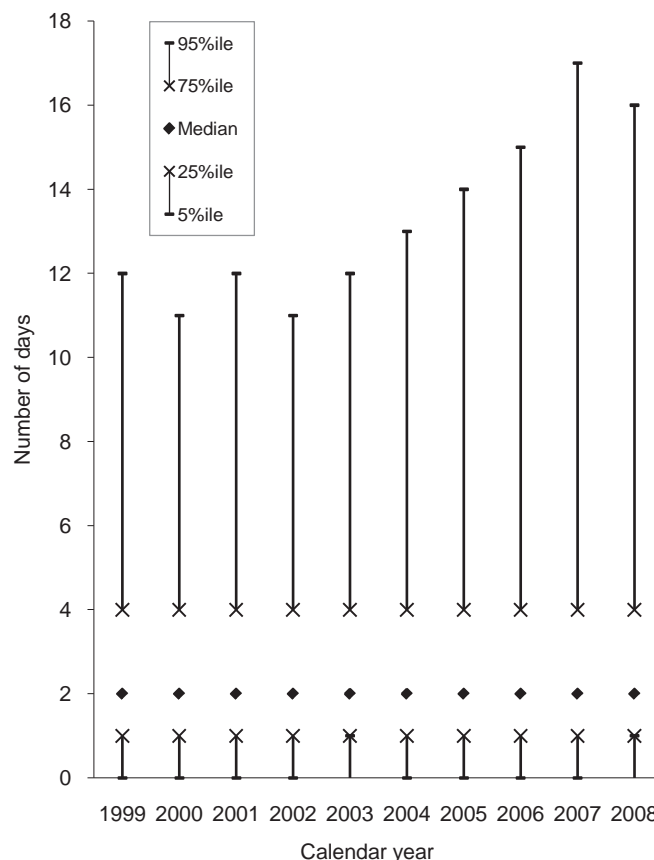
Diagnostic category (ICD-9-CM codes)	No.	% category
<b>Digestive system (520 - 579)</b>	5,605	
Acute appendicitis	1,605	28.6
Dentofacial anomalies, including malocclusion	351	6.3
Cholelithiasis	329	5.9
Other noninfective gastroenteritis and colitis	307	5.5
Diseases of esophagus	283	5.0
<b>Genitourinary system (580 - 629)</b>	1,090	
Calculus of kidney and ureter	351	32.2
Acute renal failure	145	13.3
Other disorders of male genital organs	104	9.5
Other disorders of kidney and ureter	88	8.1
Urethral stricture	70	6.4
<b>Skin and subcutaneous tissue (680 - 709)</b>	1,898	
Other cellulitis and abscess	1,355	71.4
Pilonidal cyst	154	8.1
Cellulitis and abscess of finger and toe	101	5.3
Other disorders of skin and subcutaneous tissue	64	3.4
Other hypertrophic and atrophic conditions of skin	40	2.1
<b>Musculoskeletal system (710 - 739)</b>	6,035	
Intervertebral disc disorders	1,952	32.3
Internal derangement of knee	559	9.3
Other derangement of joint	464	7.7
Disorders of muscle, ligament and fascia	404	6.7
Other disorders of bone and cartilage	389	6.4
<b>Congenital anomalies (740 - 759)</b>	270	
Other congenital musculoskeletal anomalies	59	21.9
Other congenital anomalies of circulatory system	35	13.0
Anomalies of bulbus cordis and cardiac septal closure	27	10.0
Certain congenital musculoskeletal deformities	23	8.5
Congenital anomalies of urinary system	22	8.1
<b>Signs, symptoms, ill-defined conditions (780 - 799)</b>	3,104	
Symptoms involving respiratory system, chest	1,376	44.3
General symptoms	814	26.2
Other symptoms involving abdomen and pelvis	391	12.6
Symptoms involving head and neck	133	4.3
Symptoms involving digestive system	88	2.8
<b>Injury and poisoning (800 - 999)</b>	9,201	
Other complications of procedures, nec	872	9.5
Fracture of ankle	493	5.4
Fracture of face bones	426	4.6
Fracture of tibia and fibula	374	4.1
Concussion	300	3.3
<b>Other (E81-E99 and V01-V82)</b>	1,801	
Other and unspecified aftercare	699	38.8
Care involving use of rehabilitation procedures	414	23.0
Other orthopedic aftercare	267	14.8
Observation & eval, suspected condition, not found	153	8.5
Attention to artificial openings	80	4.4

**Table 3.** Most frequent diagnoses during hospitalization, by major diagnostic category, females, U.S. Armed Forces, 2008

Diagnostic category (ICD-9-CM codes)	♀	No.	% category
<b>Infectious and parasitic diseases (001 - 139)</b>		216	
Meningitis due to enterovirus		42	19.4
Intestinal infections due to other organisms		40	18.5
Septicemia		27	12.5
Viral & chlamydial infection cond classed elsewhere/site		27	12.5
Herpes simplex		16	7.4
<b>Neoplasms (140 - 239)</b>		872	
Uterine leiomyoma		461	52.9
Cancer of thyroid gland		65	7.5
Benign neoplasm of ovary		50	5.7
Cancer of female breast		45	5.2
Cancer of brain		14	1.6
<b>Endocrine, nutrition, immunity (240 - 279)</b>		199	
Nontoxic nodular goiter		43	21.6
Obesity and other hyperalimentation		33	16.6
Disorders of fluid, electrolyte and acid-base balance		28	14.1
Thyrotoxicosis with or without goiter		25	12.6
Diabetes mellitus		19	9.5
<b>Hematologic disorders (280 - 289)</b>		68	
Iron deficiency anemias		24	35.3
Other and unspecified anemias		10	14.7
Other diseases of blood and blood-forming organs		10	14.7
Purpura and other hemorrhagic conditions		6	8.8
Diseases of white blood cells		6	8.8
<b>Mental disorders (290 - 319)</b>		2,638	
Affective psychoses		918	34.8
Adjustment reaction		727	27.6
Depressive disorder, nec		240	9.1
Alcohol dependence syndrome		182	6.9
Neurotic disorders		169	6.4
<b>Nervous system (320 - 389)</b>		297	
Migraine		83	27.9
Epilepsy		39	13.1
Other conditions of brain		17	5.7
Pain, not elsewhere classified		14	4.7
Other and unspecified disorders of the nervous system		11	3.7
<b>Circulatory system (390 - 459)</b>		304	
Cardiac dysrhythmias		60	19.7
Acute pulmonary heart disease		46	15.1
Other venous embolism and thrombosis		26	8.6
Occlusion of cerebral arteries		15	4.9
Hemorrhoids		13	4.3
<b>Respiratory system (460 - 519)</b>		367	
Pneumonia, organism unspecified		82	22.3
Asthma		48	13.1
Acute tonsillitis		29	7.9
Peritonsillar abscess		28	7.6
Acute upper respiratory infection of multiple or unspec		24	6.5
Diagnostic category (ICD-9-CM codes)	♀	No.	% category
<b>Digestive system (520 - 579)</b>		1,240	
Acute appendicitis		218	17.6
Cholelithiasis		174	14.0
Dentofacial anomalies, including malocclusion		142	11.5
Other noninfective gastroenteritis and colitis		90	7.3
Other hernia of abdominal cavity w/o obstruction or gang		58	4.7
<b>Genitourinary system (580 - 629)</b>		1,315	
Menstrual disorder, other abnormal bleeding		202	15.4
Noninflammatory disorder ovary, fallopian tube		165	12.5
Pain & other symptoms associated with genital org		157	11.9
Infections of kidney		143	10.9
Other disorders of breast		143	10.9
<b>Pregnancy complications (630- 679, relevant Vcodes)</b>		15,873	
Trauma to perineum and vulva during delivery		4,009	25.3
Other indications for care related to labor and delivery		1,382	8.7
Maternal abnormality of organs and soft tissues of pelv.		1,086	6.8
Other current conditions complicating pregnancy		1,047	6.6
Abnormality of forces of labor		1,014	6.4
<b>Skin and subcutaneous tissue (680 - 709)</b>		235	
Other cellulitis and abscess		147	62.6
Pilonidal cyst		21	8.9
Disorders of sweat glands		12	5.1
Other hypertrophic and atrophic conditions of skin		10	4.3
Other disorders of skin and subcutaneous tissue		10	4.3
<b>Musculoskeletal system (710 - 739)</b>		901	
Intervertebral disc disorders		265	29.4
Internal derangement of knee		72	8.0
Other derangement of joint		70	7.8
Other disorders of bone and cartilage		65	7.2
Other and unspecified disorders of back		63	7.0
<b>Signs, symptoms, ill-defined conditions (780 - 799)</b>		779	
General symptoms		211	27.1
Other symptoms involving abdomen and pelvis		211	27.1
Symptoms involving respiratory system, chest		208	26.7
Symptoms involving digestive system		41	5.3
Symptoms involving head and neck		33	4.2
<b>Injury and poisoning (800 - 999)</b>		1,081	
Other complications of procedures, nec		166	15.4
Poisoning by analgesics, antipyretics & antirheumatics		102	9.4
Fracture of ankle		70	6.5
Complications affecting specified body systems nec		61	5.6
Complications peculiar to certain specified procedures		59	5.5
<b>Other (E81-E99 and V01-V82, except pregnancy)</b>		389	
Other and unspecified aftercare		136	35.0
Observation & eval, suspected condition, not found		73	18.8
Care involving use of rehabilitation procedures		51	13.1
Other orthopedic aftercare		31	8.0
Procreative management		24	6.2

**Figure 2:** Rate of hospitalizations\*, by major diagnostic categories, by age and gender, U.S. Armed Forces, 2008

\*Rates expressed as hospitalizations per 1,000 person-years.

**Figure 3.** Length of hospital stay, by major diagnostic category, active component, U.S. Armed Forces, 2008**Figure 4.** Length of hospital stay, by year, active component, U.S. Armed Forces, 2008**Table 4.** Injury hospitalizations by causal agent,\* U.S. Armed Forces, 2008

Cause	No.	%
<b>Unintentional</b>	<b>6,106</b>	<b>59.4</b>
Fall and miscellaneous	1,884	18.3
Complications of medical/surgical	1,251	12.2
Land transport	815	7.9
Guns, explosives (includes accidents during war)	532	5.2
Poisons and fire	497	4.8
Athletics	479	4.7
Machinery, tools	252	2.5
Air transport	190	1.8
Environmental	181	1.8
Water transport	25	0.2
<b>Intentional</b>	<b>1,014</b>	<b>9.9</b>
Battle casualty	561	5.5
Self-inflicted	343	3.3
Non-battle, inflicted by other (e.g., assault)	110	1.1
<b>Missing/invalid code</b>	<b>3,162</b>	<b>30.8</b>

\*Causal agents were determined by codes IAW STANAG 2050.

hospitalization, ranges significantly varied across diagnostic categories (Figure 3). For example, in 2008, approximately 5% of hospitalizations for mental disorders were longer than 28 days, but fewer than 5% of hospitalizations for pregnancy/childbirth-related conditions exceeded 5 days. Finally, the median durations of hospitalizations of U.S. service members have been stable (2 days) for the last ten years. (Figure 4).

#### Hospitalizations by service:

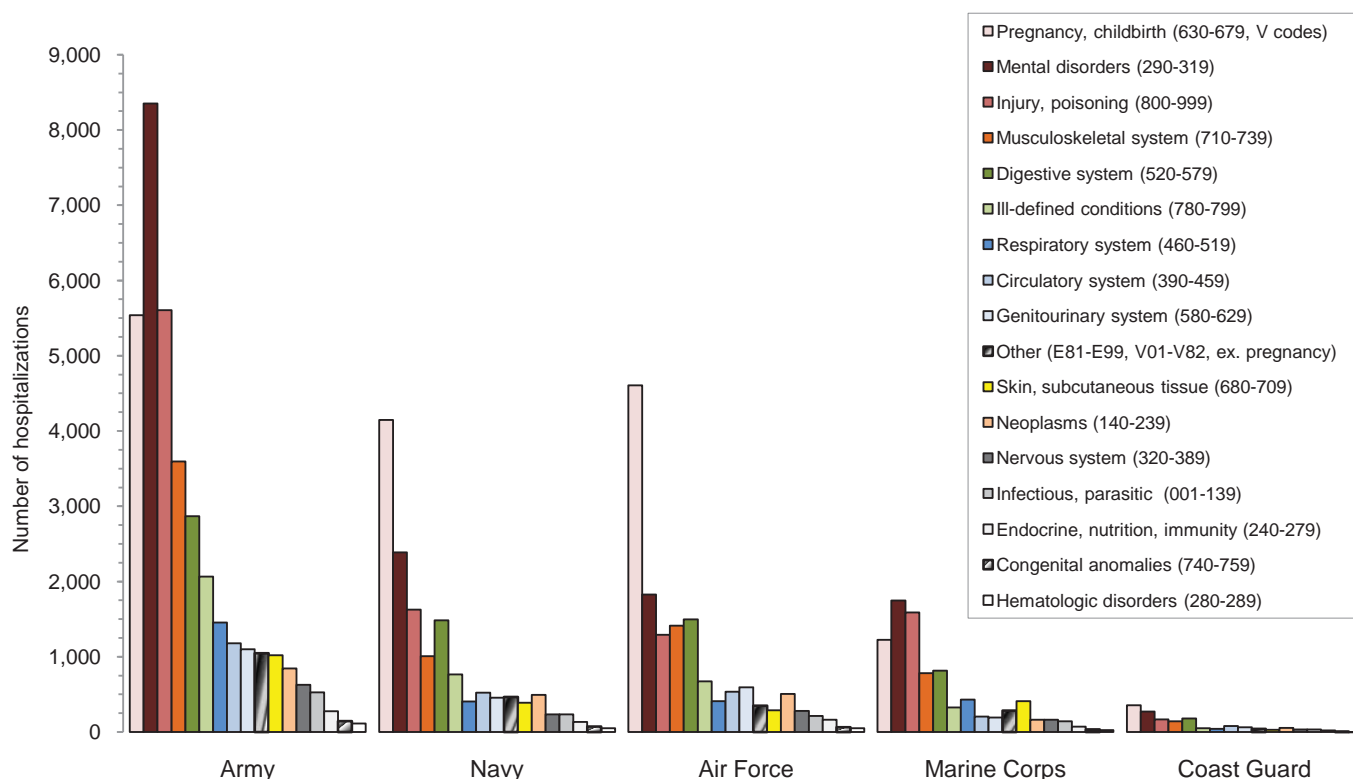
In the Navy, Air Force, and Coast Guard, pregnancy and childbirth accounted for more hospitalizations than any other category of illnesses or injuries. Still, there were more pregnancy/childbirth-related hospitalizations among members of the Army than any other Service (Table 5, Figure 5).

In the Army and Marine Corps, mental disorders and injuries/poisonings were the leading causes of hospitalizations. In the Army, the hospitalization rate for mental disorders was approximately two-thirds higher than in the Marine Corps and more than two-times higher than in the other Services. In the Army, the hospitalization rate for injuries/poisonings was approximately 30% higher than in the Marine Corps and more than two-times higher than in the other Services (Table 5, Figure 5).

**Table 5.** Hospitalizations, by Service and ICD-9 diagnostic category, U.S. Armed Forces, 2008

Major diagnostic category (ICD-9-CM)	Army		Navy		Air Force		Marine Corps		Coast Guard		Overall	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Pregnancy & childbirth (630-679, V codes)	5,538	10.4	4,146	12.7	4,607	14.2	1,225	6.3	357	8.6	15,873	11.2
Mental disorders (290 - 319)	8,354	15.7	2,388	7.3	1,825	5.6	1,746	9.0	272	6.6	14,585	10.3
Injury and poisoning (800-999)	5,607	10.5	1,626	5.0	1,293	4.0	1,587	8.2	169	4.1	10,282	7.2
Musculoskeletal system (710-739)	3,593	6.8	1,008	3.1	1,412	4.3	782	4.0	141	3.4	6,936	4.9
Digestive system (520-579)	2,869	5.4	1,485	4.5	1,498	4.6	814	4.2	179	4.3	6,845	4.8
Ill-defined conditions (780-799)	2,065	3.9	764	2.3	674	2.1	328	1.7	52	1.3	3,883	2.7
Respiratory system (460-519)	1,455	2.7	405	1.2	410	1.3	432	2.2	40	1.0	2,742	1.9
Circulatory system (390-459)	1,180	2.2	523	1.6	536	1.7	204	1.0	80	1.9	2,523	1.8
Genitourinary system (580-629)	1,100	2.1	457	1.4	594	1.8	193	1.0	61	1.5	2,405	1.7
Other (E81-E99 and V01-V82, ex. pregnancy)	1,047	2.0	466	1.4	350	1.1	285	1.5	42	1.0	2,190	1.5
Skin and subcutaneous tissue (680-709)	1,019	1.9	387	1.2	290	0.9	408	2.1	29	0.7	2,133	1.5
Neoplasms (140-239)	845	1.6	495	1.5	505	1.6	164	0.8	54	1.3	2,063	1.5
Nervous system (320-389)	628	1.2	236	0.7	282	0.9	163	0.8	32	0.8	1,341	0.9
Infectious and parasitic diseases (001-139)	527	1.0	236	0.7	212	0.7	142	0.7	35	0.8	1,152	0.8
Endocrine, nutrition, immunity (240-279)	276	0.5	133	0.4	164	0.5	73	0.4	19	0.5	665	0.5
Congenital anomalies (740-759)	145	0.3	73	0.2	64	0.2	35	0.2	4	0.1	321	0.2
Hematologic disorders (280-289)	114	0.2	54	0.2	54	0.2	27	0.1	2	0.0	251	0.2
<b>Totals</b>	<b>36,362</b>	<b>68.4</b>	<b>14,882</b>	<b>45.4</b>	<b>14,770</b>	<b>45.5</b>	<b>8,608</b>	<b>44.3</b>	<b>1,568</b>	<b>38.0</b>	<b>76,190</b>	<b>53.7</b>

\*Rate per 1,000 person-years

**Figure 5.** Number of hospitalizations, by diagnostic category, active component members, U.S. Armed Services, 2008

#### Editorial comment:

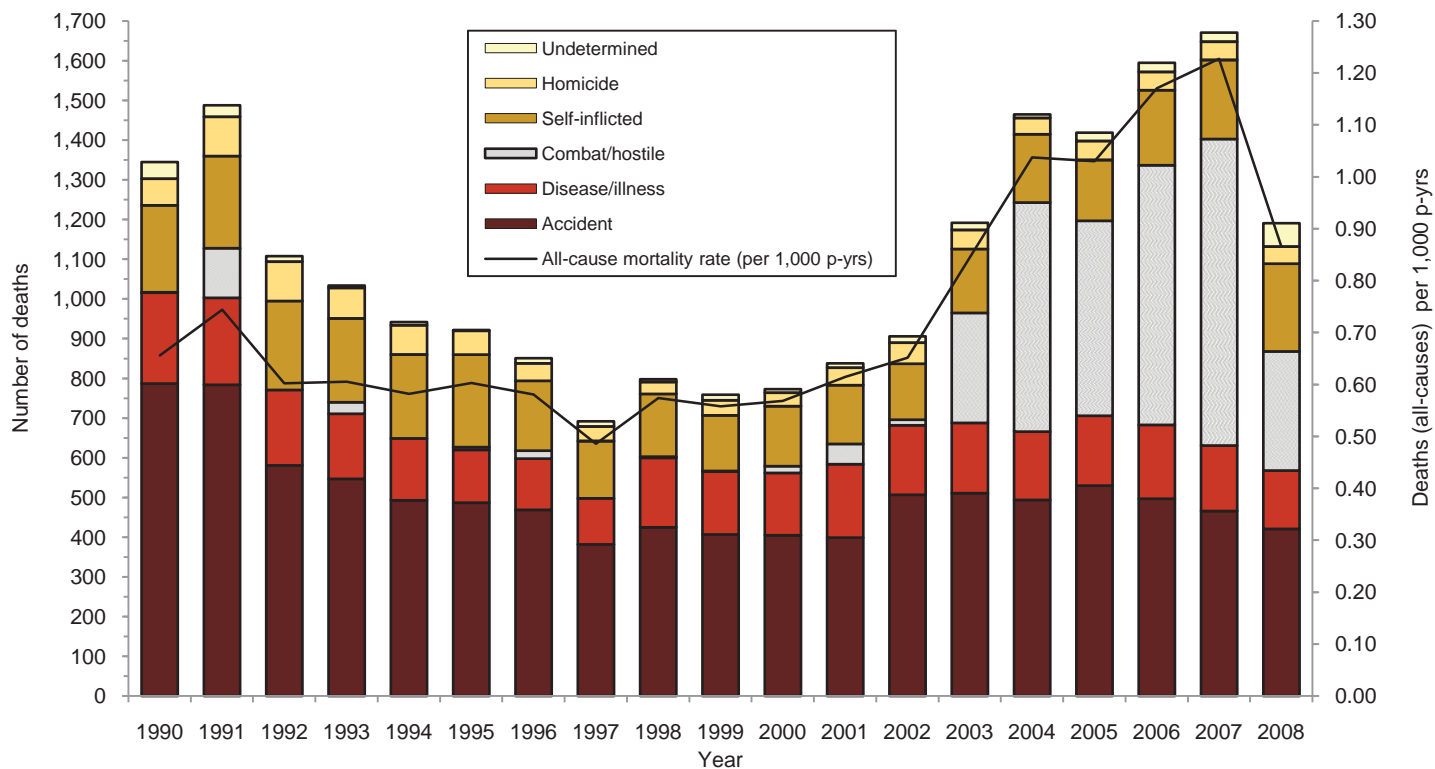
In 2008, on average, 5.3% of active component service members were hospitalized. Annual overall hospitalization rates have not significantly changed in the past decade.

As in the past, in 2008, pregnancy and childbirth, mental disorders, and injuries accounted for more than one-half of all hospitalizations of service members. Hospitalizations for mental disorders — but not pregnancy/childbirth or injuries — sharply increased in the past few years.

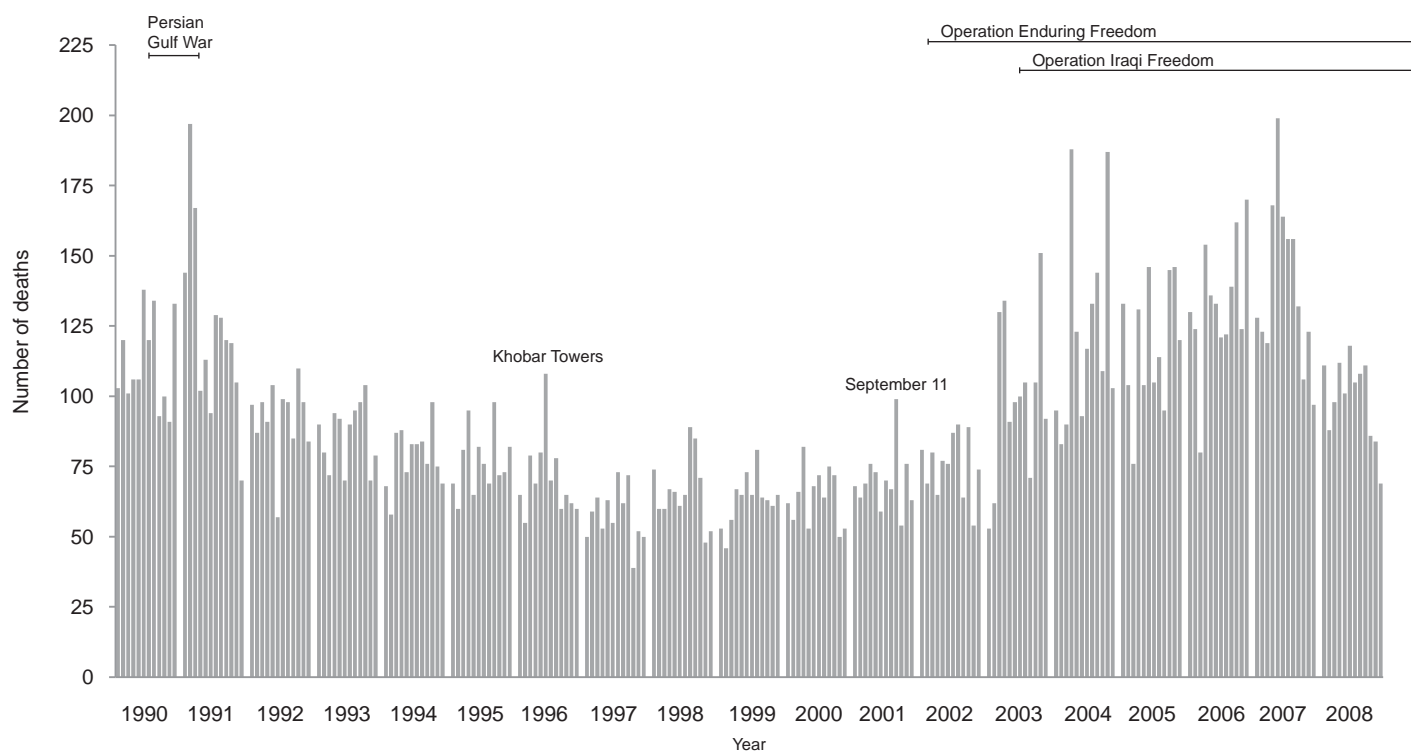
In 2008, adjustment reactions, affective psychosis, and intervertebral disc disorders were leading causes of hospitalizations of both male and female service members. In recent years, significant resources have been focused on detecting, diagnosing, and treating mental disorders — especially those related to combat stress — and decreasing barriers to care for such conditions. Increased resources are indicated to improve prevention, treatment, and rehabilitation of back injuries among service members.

## SURVEILLANCE SNAPSHOT: Deaths among active component service members, 1990-2008

Deaths, by year and manner of death, active component, U.S. Armed Forces, 1990-2008



Number of deaths by month, active component, U.S. Armed Forces, 1990-2008



## Ambulatory visits among members of active components, U.S. Armed Forces, 2008

This report documents frequencies, rates, and characteristics of ambulatory visits of active component members of the U.S. Armed Forces during calendar year 2008. Ambulatory visits of U.S. service members in fixed military and non-military (reimbursed through the Military Health System) medical treatment facilities are documented with standardized, automated records. These records are routinely archived for health surveillance purposes in the Defense Medical Surveillance System which is the source of data for this report. Records of ambulatory visits not documented with automated records (e.g., during deployments, field training exercises, shipboard) are not included.

For this report, all records of ambulatory visits of active component U.S. service members in 2008 were categorized based on the first three digits of the primary (first-listed) diagnosis code (International Classification of Diseases, 9th revision, clinical modifications [ICD-9-CM]). Of note, for the first time, ambulatory visits of Coast Guard members are included in the annual summary.

### Frequencies, rates, and trends:

During 2008, there were 14,496,946 reported ambulatory visits of active component service members (Table 1). The crude annual rate (all causes) was 10,211 visits per 1,000 service members; thus, on average, each service member had more than 10 clinic visits during the year (Figure 1). The rate

of documented ambulatory visits in 2008 was slightly higher (1.8%) than in 2007 – and more than 50% higher than in 1999 (Figure 1).

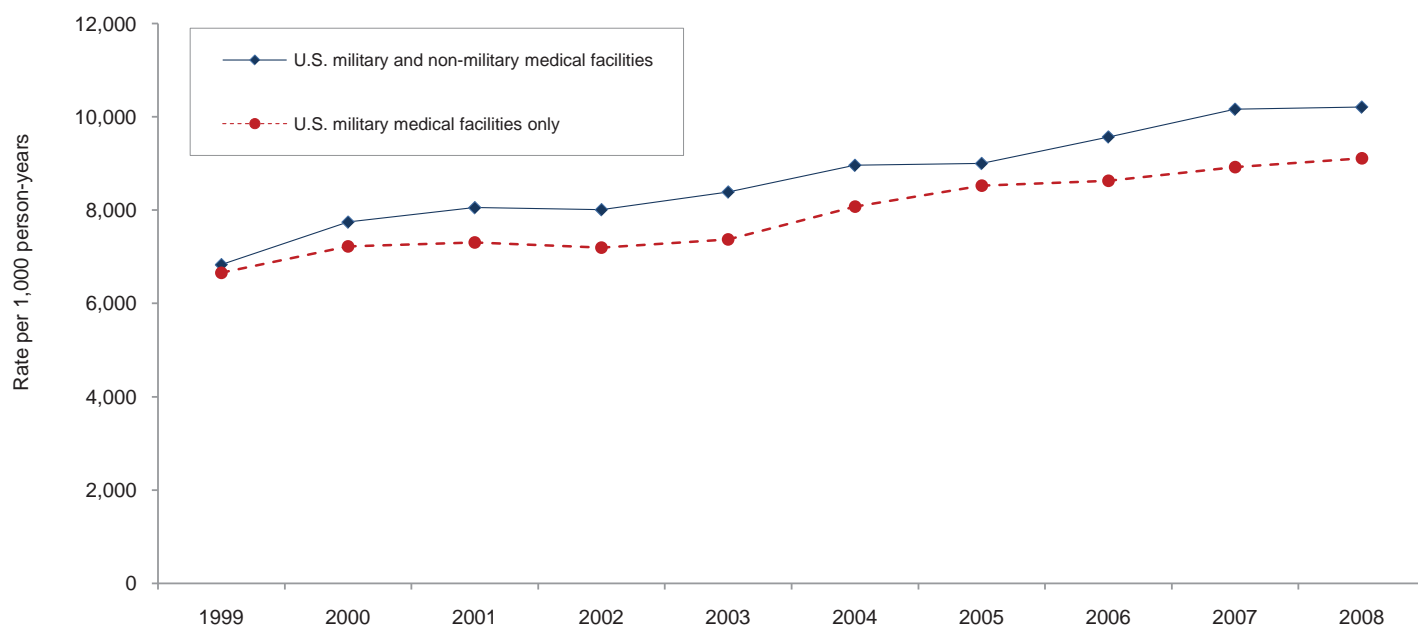
In 2008, nearly one-half (45.7%) of all ambulatory visits were for “other contact with health services.” This category (indicated by “V” codes of the ICD-9-CM) includes health care not related to a current illness or injury (e.g., counseling, immunization, deployment-related health assessment, routine and special medical examination, e.g., periodic, occupational, retirement) as well as ongoing treatment for illness or injury (e.g., physical therapy) (Tables 2,3). Three “V-coded” diagnoses accounted for the majority of the visits in this category: general health examination (31.7%), care involving use of rehabilitation procedures (15.8%), and special investigations and examinations (8.1%).

In 2008, there were 7,878,481 documented ambulatory visits for illnesses and injuries (ICD-9-CM: 001-999). The crude annual rate for illness and injury-related visits was 5.55 visits per person per year (p-yr). The rate of ambulatory visits for illnesses and injuries in 2008 was approximately 6.1% and 10.1% higher than in 2006 and 2004 respectively (Table 1).

### Distribution of visits, by diagnostic categories:

In 2008, the illness and injury-related categories that accounted for the most ambulatory visits were musculoskeletal and connective tissue disorders (24.1%), mental disorders (14.0%), injuries and poisonings (11.2%), “signs, symptoms

**Figure 1.** Rate of ambulatory visits by calendar year, U.S. Armed Forces, 1999-2008



and ill-defined conditions" (10.2%), and nervous system and sense organ disorders (8.9%) (Table 1). As in the past, nearly one-half (49.3%) of all illness and injury-related visits were due to musculoskeletal and connective tissue disorders, injuries and poisonings, and mental disorders (Table 1).

Over the past 5 years, the relative distributions of ambulatory visits by diagnostic categories remained fairly stable with a few notable exceptions. Between 2004 and 2008, the numbers of visits for mental disorders and musculoskeletal and connective tissue disorders increased by 68% and 15%, respectively; in the same period, the number of visits for infectious and parasitic diseases decreased by 20%. In relation to visits attributable to each of the 16 illness and injury-related diagnostic categories, between 2004 and 2008, mental disorders increased from seventh to the third, and infectious and parasitic diseases decreased from tenth to twelfth, in rank order. Since 2004, mental disorders is the only category that has changed by more than 2 ranks in regard to attributable visits (Table 1).

From 2006 to 2008, there were decreases in numbers of visits in 10 illness and injury-related categories and increases in six categories. The largest absolute increases in annual attributable visits from 2006 to 2008 were for mental disorders (difference, 2008 vs. 2004: +448,082) and musculoskeletal and connective tissue disorders (difference, 2008 vs. 2004: +259,582). The largest absolute decreases in attributable visits from 2006 to 2008 were for infectious and

parasitic diseases (difference, 2008 vs. 2004: -58,652) and diseases of the respiratory system (difference, 2008 vs. 2004: -46,090) (Table 1).

#### Ambulatory visits, by gender:


In 2008, males accounted for three-fourths (74.6%) of all illness and injury-related visits; however, the annual crude rate was approximately twice as high among females (9.96 visits/p-yr) than males (4.83 visits/p-yr). Excluding pregnancy-related visits (which accounted for 14.4% of all ambulatory visits among females), the ambulatory visit rate among females was 8.52 visits/p-yr. As in the past, rates were higher among females than males for every illness and injury-related category (Figure 2).


The same five illness and injury-specific diagnoses (at the 3-digit level of the ICD-9-CM) accounted for the most ambulatory visits among both males and females (Tables 2,3). For each of the most frequently reported diagnoses, the rate was higher among females than males: other/unspecified disorders of joints (rates [per 1,000 p-yrs], female: 556.4; male: 340.9; female:male rate ratio [RR]: 1.63); other/unspecified disorders of the back (rates, female: 411.2; male: 252.7; RR: 1.63); disorders of refraction and accommodation (rates, female: 247.6; male: 152.6; RR: 1.62); adjustment reactions (rates, female: 345.2; male: 232.1; RR: 1.49); and acute upper respiratory infections of multiple or unspecified

**Table 1.** Ambulatory visits, ICD-9 diagnostic categories, U.S. Armed Forces, 2004, 2006, and 2008

Major diagnostic category (ICD-9-CM)	2004			2006			2008		
	No	No. per person	Rank	No	No. per person	Rank	No	No. per person	Rank
Other (V01-V82, except pregnancy-related)	5,698,806	3.92	(1)	6,087,734	4.34	(1)	6,618,465	4.66	(1)
Musculoskeletal system (710 - 739)	1,642,153	1.13	(2)	1,653,676	1.18	(2)	1,901,735	1.34	(2)
Mental disorders (290 - 319)	657,144	0.45	(7)	780,893	0.56	(4)	1,105,196	0.78	(3)
Injury and poisoning (800 - 999)	897,451	0.62	(3)	885,035	0.63	(3)	879,441	0.62	(4)
Signs, symptoms and ill-defined conditions (780 - 799)	818,079	0.56	(4)	743,773	0.53	(5)	804,077	0.57	(5)
Nervous system and sense organs (320 - 389)	736,122	0.51	(5)	706,675	0.50	(6)	699,473	0.49	(6)
Respiratory system (460 - 519)	722,167	0.50	(6)	678,475	0.48	(7)	676,077	0.48	(7)
Dermatological diseases (680 - 709)	353,866	0.24	(8)	368,993	0.26	(8)	363,772	0.26	(8)
Pregnancy complications (630 - 679, relevant V codes)	298,572	0.21	(9)	301,746	0.22	(9)	288,297	0.20	(9)
Digestive system (520 - 579)	254,752	0.18	(11)	270,297	0.19	(10)	258,287	0.18	(10)
Genitourinary system (580 - 629)	253,439	0.17	(12)	246,032	0.18	(12)	238,423	0.17	(11)
Infectious and parasitic diseases (001 - 139)	289,623	0.20	(10)	255,171	0.18	(11)	230,971	0.16	(12)
Circulatory system (390 - 459)	149,017	0.10	(13)	162,970	0.12	(13)	158,128	0.11	(13)
Endocrine, nutrition, immunity (240 - 279)	125,778	0.09	(14)	126,342	0.09	(14)	124,375	0.09	(14)
Neoplasms (140 - 239)	91,319	0.06	(15)	99,877	0.07	(15)	105,664	0.07	(15)
Congenital anomalies (740 - 759)	22,757	0.02	(16)	25,225	0.02	(16)	25,948	0.02	(16)
Hematologic disorders (280 - 289)	17,288	0.01	(17)	18,106	0.01	(17)	18,617	0.01	(17)
Totals	13,028,333	8.96		13,411,020	9.57		14,496,946	10.21	

**Table 2.** Most frequent diagnoses during ambulatory visits by major diagnostic category, males, U.S. Armed Forces, 2008

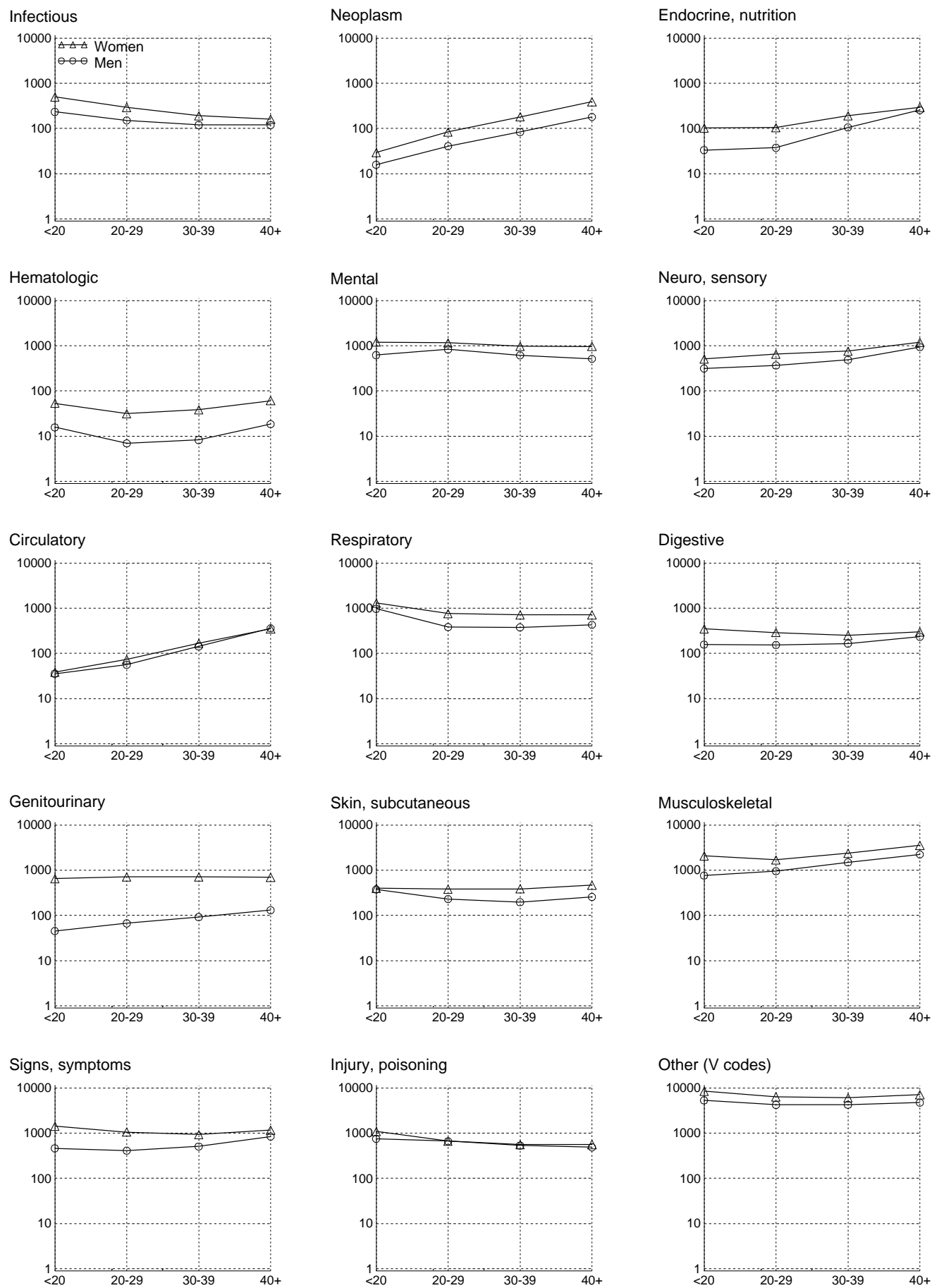
Diagnostic category (ICD-9-CM codes) 	No.	%
<b>Infectious and parasitic diseases (001 - 139)</b>	175,902	
Viral & chlamydial infection	38,494	21.9
Other diseases due to viruses and chlamydiae	35,958	20.4
Dermatophytosis	28,313	16.1
Intestinal infections due to other organisms	12,588	7.2
Streptococcal sore throat and scarlatina	8,782	5.0
<b>Neoplasms (140 - 239)</b>	79,416	
Benign neoplasm of skin	13,884	17.5
Neoplasm of uncertain behavior, other/unspec site	10,698	13.5
Lipoma	8,369	10.5
Neoplasm of unspecified nature	7,624	9.6
Cancer of testis	3,492	4.4
<b>Endocrine, nutrition, immunity (240 - 279)</b>	95,628	
Disorders of lipid metabolism	34,679	36.3
Diabetes mellitus	16,580	17.3
Obesity and other hyperalimentation	13,322	13.9
Disorders of fluid, electrolyte and acid-base balance	5,940	6.2
Acquired hypothyroidism	5,567	5.8
<b>Hematologic disorders (280 - 289)</b>	11,068	
Other and unspecified anemias	2,966	26.8
Hereditary hemolytic anemias	1,793	16.2
Purpura and other hemorrhagic conditions	1,432	12.9
Diseases of white blood cells	1,418	12.8
Other diseases of blood and blood-forming organs	1,266	11.4
<b>Mental disorders (290 - 319)</b>	882,575	
Adjustment reaction	282,137	32.0
Alcohol dependence syndrome	133,738	15.2
Nondependent abuse of drugs	117,736	13.3
Neurotic disorders	95,224	10.8
Affective psychoses	73,080	8.3
<b>Nervous system (320 - 389)</b>	554,998	
Disorders of refraction and accommodation	185,464	33.4
Organic sleep disorders	67,515	12.2
Disorders of conjunctiva	34,508	6.2
Hearing loss	34,053	6.1
Migraine	22,884	4.1
<b>Circulatory system (390 - 459)</b>	134,315	
Essential hypertension	66,105	49.2
Hemorrhoids	14,234	10.6
Cardiac dysrhythmias	10,972	8.2
Varicose veins of other sites	4,717	3.5
Other forms of chronic ischemic heart disease	3,965	3.0
<b>Respiratory system (460 - 519)</b>	518,478	
Acute upper respiratory infection, unspecified site	134,954	26.0
Allergic rhinitis	60,734	11.7
Acute pharyngitis	60,025	11.6
Acute nasopharyngitis (common cold)	46,380	8.9
Chronic sinusitis	30,433	5.9

Diagnostic category (ICD-9-CM codes) 	No.	%
<b>Digestive system (520 - 579)</b>	201,044	
Other noninfective gastroenteritis and colitis	54,730	27.2
Diseases of esophagus	29,551	14.7
Inguinal hernia	12,488	6.2
Gastrointestinal hemorrhage	11,567	5.8
Gastritis and duodenitis	11,048	5.5
<b>Genitourinary system (580 - 629)</b>	96,138	
Calculus of kidney and ureter	17,827	18.5
Other disorders of male genital organs	12,892	13.4
Other disorders of urethra and urinary tract	10,892	11.3
Orchitis and epididymitis	10,725	11.2
Infertility, male	6,627	6.9
<b>Dermatological diseases (680 - 709)</b>	285,312	
Other cellulitis and abscess	53,990	18.9
Contact dermatitis and other eczema	41,504	14.5
Diseases of hair and hair follicles	39,519	13.9
Diseases of sebaceous glands	34,273	12.0
Diseases of nail	15,775	5.5
<b>Musculoskeletal system (710 - 739)</b>	1,486,541	
Other and unspecified disorders of joint	414,506	27.9
Other and unspecified disorders of back	307,168	20.7
Peripheral enthesopathies and allied syndromes	103,625	7.0
Intervertebral disc disorders	97,019	6.5
Nonallopathic lesions, nec	89,184	6.0
<b>Congenital anomalies (740 - 759)</b>	19,153	
Certain congenital musculoskeletal deformities	5,743	30.0
Congenital anomalies of the integument	2,892	15.1
Other congenital musculoskeletal anomalies	2,884	15.1
Other congenital anomalies of limbs	2,015	10.5
Congenital anomalies of urinary system	809	4.2
<b>Ill-defined conditions (780 - 799)</b>	590,069	
General symptoms	137,408	23.3
Symptoms involving respiratory system, chest	112,360	19.0
Other symptoms involving abdomen and pelvis	66,736	11.3
Symptoms involving head and neck	55,959	9.5
Symptoms involving digestive system	51,499	8.7
<b>Injury and poisoning (800 - 999)</b>	746,266	
Sprains and strains of ankle and foot	79,985	10.7
Sprains and strains of knee and leg	76,924	10.3
Sprains and strains, other/unspec back	55,315	7.4
Sprains and strains of shoulder and upper arm	43,541	5.8
Injury, other and unspecified	33,928	4.5
<b>Other (E81-E99 and V01-V82)</b>	5,303,094	
General medical examination	1,784,033	33.6
Care involving use of rehabilitation procedures	846,196	16.0
Special investigations and examinations	370,103	7.0
Encounters for administrative purposes	359,390	6.8
Other well persons seeking care w/o sickness	298,240	5.6

**Table 3.** Most frequent diagnoses during ambulatory visits by major diagnostic category, females, U.S. Armed Forces, 2008

Diagnostic category (ICD-9-CM codes)	♀	No.	%
<b>Infectious and parasitic diseases (001 - 139)</b>		55,069	
Viral & chlamydial infection		14,331	26.0
Candidiasis		7,463	13.6
Other diseases due to viruses and chlamydiae		7,036	12.8
Dermatophytosis		4,695	8.5
Intestinal infections due to other organisms		4,016	7.3
<b>Neoplasms (140 - 239)</b>		26,248	
Benign neoplasm of skin		4,583	17.5
Uterine leiomyoma		3,918	14.9
Cancer of female breast		2,905	11.1
Neoplasm of uncertain behavior, oth & unspec site		2,670	10.2
Neoplasm of unspecified nature		1,839	7.0
<b>Endocrine, nutrition, immunity (240 - 279)</b>		28,747	
Obesity and other hyperalimentation		6,386	22.2
Acquired hypothyroidism		5,030	17.5
Disorders of lipid metabolism		2,473	8.6
Disorders of fluid, electrolyte and acid-base balance		2,346	8.2
Ovarian dysfunction		2,114	7.4
<b>Hematologic disorders (280 - 289)</b>		7,549	
Other and unspecified anemias		2,879	38.1
Iron deficiency anemias		2,155	28.5
Purpura and other hemorrhagic conditions		609	8.1
Hereditary hemolytic anemias		574	7.6
Other diseases of blood and blood-forming organs		489	6.5
<b>Mental disorders (290 - 319)</b>		222,621	
Adjustment reaction		69,382	31.2
Affective psychoses		35,966	16.2
Neurotic disorders		32,628	14.7
Depressive disorder, nec		26,390	11.9
Alcohol dependence syndrome		15,959	7.2
<b>Nervous system (320 - 389)</b>		144,475	
Disorders of refraction and accommodation		49,764	34.4
Migraine		21,413	14.8
Disorders of conjunctiva		9,508	6.6
Mononeuritis of upper limb and mononeuritis multiplex		5,507	3.8
Suppurative and unspecified otitis media		4,327	3.0
<b>Circulatory system (390 - 459)</b>		23,813	
Essential hypertension		8,757	36.8
Hemorrhoids		3,130	13.1
Cardiac dysrhythmias		2,241	9.4
Varicose veins of lower extremities		1,787	7.5
Diseases of capillaries		1,115	4.7
<b>Respiratory system (460 - 519)</b>		157,599	
Acute upper respiratory infection, unspecified site		41,072	26.1
Allergic rhinitis		22,827	14.5
Acute pharyngitis		20,106	12.8
Acute nasopharyngitis (common cold)		12,857	8.2
Chronic sinusitis		11,298	7.2

Diagnostic category (ICD-9-CM codes)	♀	No.	%
<b>Digestive system (520 - 579)</b>		57,243	
Other noninfective gastroenteritis and colitis		19,140	33.4
Functional digestive disorders, nec		7,601	13.3
Diseases of esophagus		5,721	10.0
Gastritis and duodenitis		4,122	7.2
Gastrointestinal hemorrhage		2,068	3.6
<b>Genitourinary system (580 - 629)</b>		142,285	
Pain & other symptoms, female genital organs		21,690	15.2
Menstrual disorder, other abnormal bleeding		18,683	13.1
Other disorders of urethra and urinary tract		17,918	12.6
Inflammatory disease of cervix, vagina and vulva		17,380	12.2
Noninflammatory disorders of cervix		11,668	8.2
<b>Pregnancy complications (630 - 679, V codes)</b>		288,297	
Normal pregnancy		126,208	43.8
Postpartum care and examination		24,676	8.6
Other current conditions complicating pregnancy		16,507	5.7
Other complications of pregnancy, nec		16,108	5.6
Supervision of high-risk pregnancy		10,372	3.6
<b>Dermatological diseases (680 - 709)</b>		78,460	
Diseases of sebaceous glands		15,887	20.2
Contact dermatitis and other eczema		12,441	15.9
Other cellulitis and abscess		9,511	12.1
Diseases of hair and hair follicles		6,533	8.3
Other disorders of skin and subcutaneous tissue		5,150	6.6
<b>Musculoskeletal system (710 - 739)</b>		415,194	
Other and unspecified disorders of joint		111,840	26.9
Other and unspecified disorders of back		82,667	19.9
Nonallopathic lesions, nec		33,343	8.0
Other disorders of soft tissues		31,952	7.7
Peripheral enthesopathies and allied syndromes		23,509	5.7
<b>Ill-defined conditions (780 - 799)</b>		214,008	
Other symptoms involving abdomen and pelvis		36,876	17.2
General symptoms		31,212	14.6
Symptoms involving respiratory system, chest		29,670	13.9
Nonspecif abnormal histological/immunological findings		26,010	12.2
Symptoms involving digestive system		23,979	11.2
<b>Injury and poisoning (800 - 999)</b>		133,175	
Sprains and strains of ankle and foot		17,088	12.8
Sprains and strains of knee and leg		17,035	12.8
Sprains and strains, other/unspec back		14,019	10.5
Contusion of lower limb and of other/unspec site		5,380	4.0
Certain adverse effects, nec		5,135	3.9
<b>Other (E81-E99 and V01-V82, ex. pregnancy)</b>		1,315,371	
General medical examination		316,085	24.0
Care involving use of rehabilitation procedures		202,557	15.4
Special investigations and examinations		171,316	13.0
Other well persons seeking care w/o sickness		99,581	7.6
Encounters for administrative purposes		88,869	6.8

**Figure 2.** Rate of ambulatory visits, by major diagnostic category, by age and gender, U.S. Armed Forces, 2008

sites (rates, female: 204.3; male: 111.0; RR: 1.84) (Tables 2,3).

Across diagnostic categories, relationships between age and ambulatory visit rates were generally similar among males and females (Figure 2). For example, among both males and females, ambulatory visit rates for neoplasms and circulatory disorders were more than 10-times higher among those older than 40 than younger than 20 years old; in contrast, clinic visit rates for injuries and poisonings, infectious and parasitic diseases, and mental disorders were generally lower among the oldest compared to younger service members. As in the past, clinic visit rates for genitourinary disorders were fairly stable across all age groups among females but sharply increased with age among males (Figure 2).

#### Dispositions after ambulatory visits:

Approximately two-thirds (63.5%) of all illness and injury-related visits resulted in “duty without limitations” dispositions (Figure 3). Fewer than one of 25 (4.0%) illness and injury-related visits resulted in “convalescence in quarters” dispositions (Figure 3). As in the past, the diagnostic categories with the highest proportions of “convalescence in quarters” or limited duty dispositions were injuries and poisonings (26.5%), diseases of the respiratory system (24.2%), diseases of the digestive system (22.9%) and musculoskeletal and connective tissue disorders (21.1%) (Figure 3). Musculoskeletal and connective tissue disorders and injuries and poisonings accounted for two-thirds (66.7%) of all “limited duty” dispositions (Figure 3). Diseases of the respiratory system

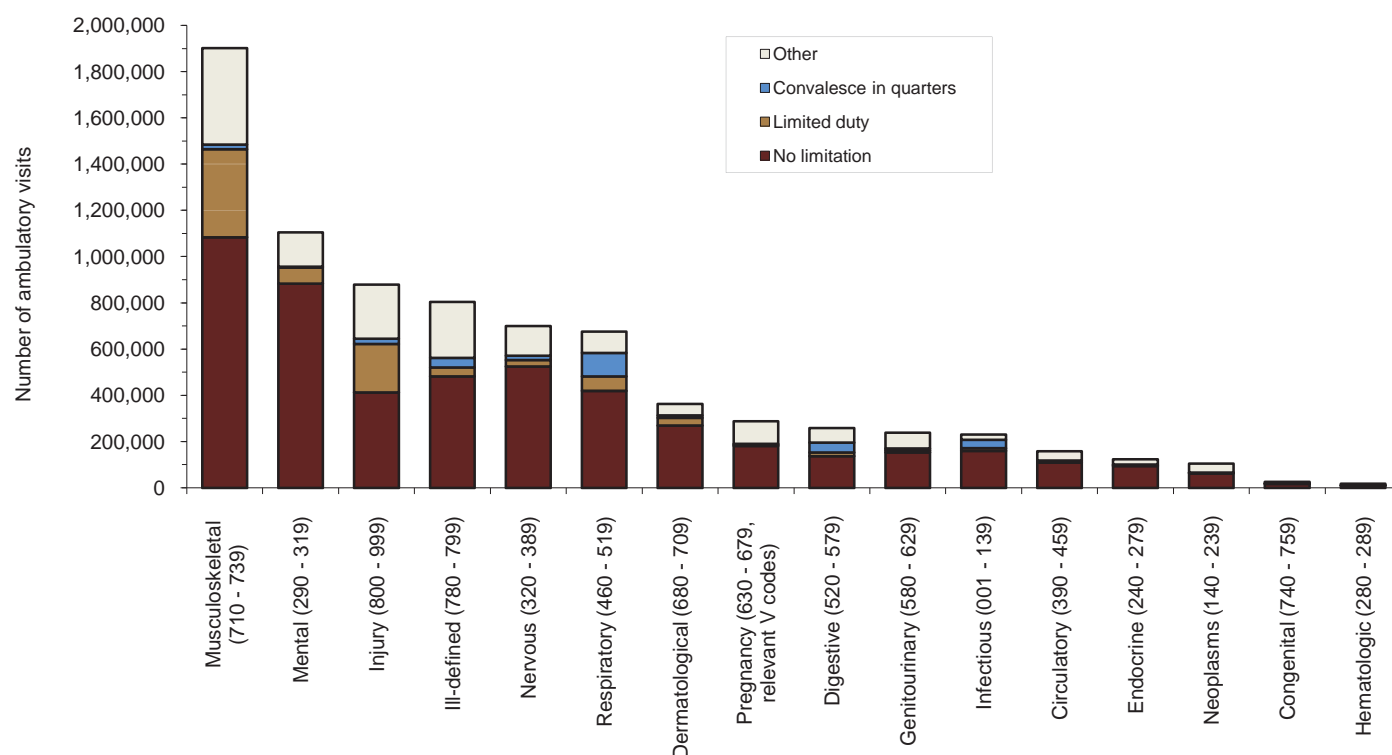
accounted for nearly one-third (32.3%) of all “convalescence in quarters” dispositions – more than twice as many (n=100,673) as any other disease category (Figure 3).

#### Editorial comment:

In the past five years, the distribution of illness and injury-related ambulatory visits in relation to their reported causes has remained fairly stable. Of note, however, from 2004 to 2008, documented visits for mental disorders increased by more than 68%. Thus, in 2008, musculoskeletal and connective tissue disorders, injuries and poisonings, and mental disorders accounted for nearly one-half of all illness and injury-related ambulatory visits and more than one-half of all “limited duty” dispositions among active component service members. Prevention and clinical care resources should be focused in these general areas. As in the past, in 2008, back pain/injuries accounted for extraordinarily large numbers of ambulatory visits and lost duty time; resources should be focused on preventing, treating, and rehabilitating back pain/injuries.

The findings of this report should be interpreted in light of the fact that ambulatory care that is delivered by unit medics and by deployed (including in Afghanistan, Iraq, and at sea) medical treatment facilities are not archived in the Defense Medical Surveillance System and are not included in this report. For many reasons, the natures and rates of illnesses and injuries among service members who are deployed likely vary from those of their counterparts.

**Figure 3.** Ambulatory visits in relation to reported dispositions, by diagnostic category, active components, U.S. Armed Forces, 2008



## Absolute and relative morbidity burdens attributable to various illnesses and injuries, U.S. Armed Forces, 2008

Perceptions of the relative importance of various conditions in military populations often determine the priorities for and the natures and magnitudes of resources for primary, secondary, and tertiary prevention activities. Because judgments regarding the importance of various threats to military members are not made in a systematic or objective manner, threats that have high priorities for prevention resources may have relatively low impacts on the health, fitness, and readiness of service members; the operational effectiveness of U.S. military units; or the U.S. Military Health System (e.g., costs associated with treatment). On the other hand, conditions that have relatively high impacts on the health, fitness, and effectiveness of service members and their units and have high direct costs associated with diagnosis, treatment, rehabilitation, and disability compensation may have few resources devoted to preventing them.

Several classification systems and morbidity measures have been developed to quantify the “public health burdens” that are attributable to various illnesses and injuries in various populations and settings worldwide.<sup>1</sup> Not surprisingly, different classification systems and morbidity measures lead to different rankings of illness and injury-specific public health burdens.<sup>2</sup> For example, in a given population and setting, the illnesses and injuries that account for the most hospitalizations are likely different from those that account for the most outpatient medical encounters; and the illnesses and injuries that account for the most medical encounters overall likely differ from those that affect the most individuals, have the most debilitating or long-lasting effects, and so on.<sup>2</sup> As a result, the classification system or measure that is used to quantify condition-specific morbidity burdens determines to a large extent the conclusions that are drawn regarding the relative “importance” of various conditions and, in turn, the resources that are indicated to minimize their impacts.

This annual summary uses several measures to estimate the health care burdens that were attributable to various illnesses and injuries among members of the U.S. Armed Forces in 2008.

### Methods:

For this summary, we defined illnesses and injuries by grouping related ICD-9-CM coded diagnoses (at the 3-digit level) based on a modified version of the classification system developed for the Global Burden of Disease (GBD) Study.<sup>1</sup> In general, the GBD system groups diagnoses with common pathophysiologic or etiologic bases and/or

significant international health policymaking importance. For our purposes, we broke out some diagnoses (e.g., mental disorders) that are grouped in the GBD system to increase the relevance of the results to the U.S. military and the U.S. Military Health System. We also categorized injuries by the affected anatomic sites rather than the causes because external causes of injuries are not routinely reported in military outpatient records.

For this analysis, we summarized all inpatient and outpatient medical encounters of all active component members of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard based on the primary (first-listed) diagnosis (if reported with an ICD-9-CM code between 001 and 999).

For this analysis, the “morbidity burdens” attributable to each “condition” were estimated based on the total medical encounters attributable to each condition; total service members affected by each condition (i.e., at least one medical encounter); and total bed-days during hospitalizations for each condition.

### Results:

#### Morbidity burden, by category of conditions:

In 2008, more than three-times as many service members ( $n=599,229$ ) received medical care for injuries than for any other category of conditions (**Figure 1**). As in the past, injuries and mental disorders accounted for more medical encounters and hospital bed-days by far than any other category of conditions (**Figure 1**).

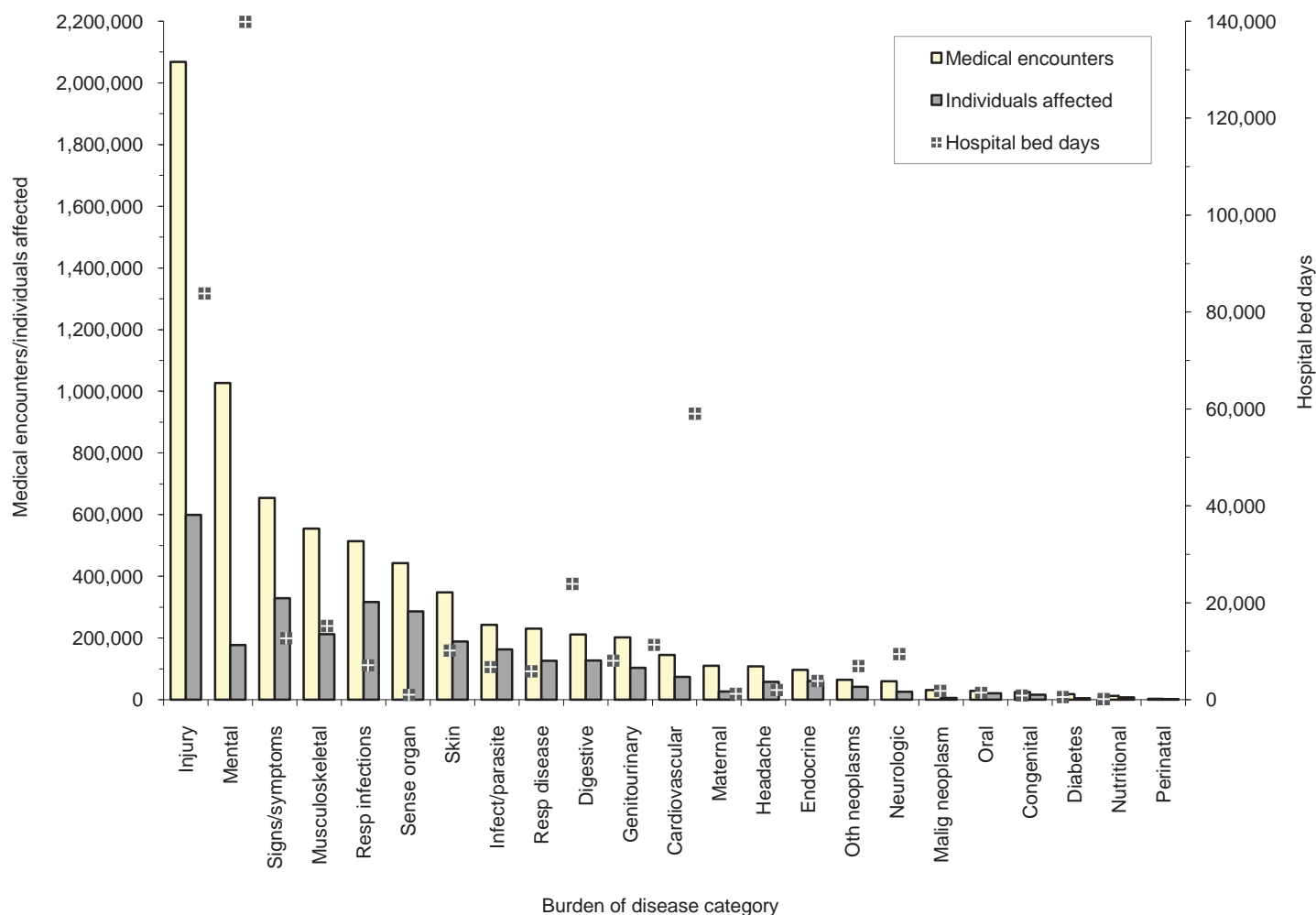
In 2008, mental disorders accounted for more than one-third (33.9%) of all hospital bed-days, while injuries accounted for more than one-fourth of all medical encounters overall (28.7%) (**Figure 1**). Together, injuries and mental disorders accounted for more than one-half (54.1%) of all hospital bed days and 43% of all medical encounters (**Figure 1**).

“Maternal” conditions (including pregnancy and childbirth) accounted for only 1.5% of all medical encounters but approximately one-seventh (14.3%) of all hospital bed-days (**Figure 1**).

#### Medical encounters, by condition:

As in the past, in 2008, four conditions accounted for nearly one-fourth – and 11 conditions accounted for more than one-half – of all illness and injury-related medical encounters (**Figure 2**). Specific conditions that accounted for the most medical encounters were injuries – of the back and abdomen, knee, arm and shoulder, and foot and ankle;

**Figure 1.** Medical encounters, individuals affected and hospital bed days, by burden of disease category, active component, U.S. Armed Forces, 2008



upper respiratory infections; substance abuse disorders; and disorders of refraction and accommodation (**Table 1, Figure 2**).

#### Individuals affected, by condition:

As in the past, in 2008, more service members received medical care for upper respiratory infections than any other condition (**Table 1**). Of the 16 conditions that affected the most service members, seven were injuries – of the back and abdomen, foot and ankle, knee, “unspecified,” arm and shoulder, head and neck, and hand and wrist (**Table 1**).

#### Hospital bed-days, by condition:

In 2008, mood disorders, substance abuse, and adjustment disorders accounted for more than one-fourth of all hospital days (**Table 1, Figure 3**). Eight conditions – four mental disorders (mood, substance abuse, adjustment, anxiety disorders); two associated with pregnancy and childbirth (delivery, pregnancy

complications); injuries of the head and neck; and “all other digestive diseases” – accounted for more than one-half (51.1%) of all hospital bed-days (**Table 1, Figure 3**).

#### Relationships between health care burden indicators:

There was a strong correlation between the number of medical encounters attributable to various conditions and the number of individuals affected by the conditions ( $r=0.94$ ). For example, the eight conditions that affected the most individuals were all among the top ten causes of medical encounters (**Table 1**). There were not strong relationships between hospital bed-days attributable to conditions and either individuals affected by ( $r=0.30$ ) or medical encounters attributable to ( $r=0.46$ ) the same conditions. For example, childbirth and substance abuse disorders were among the top three sources of hospital bed-days but affected relatively few individuals. On the other hand, upper respiratory infections affected more individuals than any other condition and were

**Table 1.** Health care burdens attributable to various diseases and injuries, U.S. Armed Forces, 2008

Category*	Medical encounters <sup>†</sup>		Individuals affected <sup>‡</sup>		Hospital bed days	
	No.	Rank	No.	Rank	No.	Rank
<b>Injury &amp; poisoning</b>						
Back & abdomen	455,841	(1)	164,058	(5)	13,675	(9)
Knee	348,501	(5)	123,357	(8)	3,532	(30)
Arm & shoulder	308,118	(6)	107,747	(10)	6,403	(15)
Foot & ankle	299,502	(7)	136,495	(7)	6,089	(19)
Unspecified injury	197,547	(13)	120,892	(9)	4,285	(25)
Head & neck	168,895	(15)	83,393	(13)	17,289	(5)
Hand & wrist	120,226	(20)	65,959	(16)	2,814	(32)
Leg	97,870	(24)	40,969	(28)	9,974	(12)
Environmental	25,605	(49)	20,423	(44)	1,066	(51)
Other complications NOS	21,227	(53)	12,817	(56)	11,822	(10)
Other injury from external causes	9,481	(70)	7,149	(64)	320	(78)
All other injury	9,102	(71)	6,035	(68)	1,969	(37)
Poisoning, drugs	3,398	(86)	2,506	(77)	4,122	(27)
Poisoning, nondrug	3,214	(88)	2,475	(78)	463	(71)
<b>Mental disorders</b>						
Substance abuse disorders	258,433	(8)	32,199	(33)	37,993	(3)
Anxiety	221,284	(11)	45,072	(24)	13,760	(8)
Mood	200,939	(12)	48,003	(23)	50,246	(1)
Adjustment	188,539	(14)	60,017	(17)	20,501	(4)
All other mental disorders	101,323	(23)	43,801	(25)	6,389	(16)
Tobacco dependence	31,497	(46)	20,247	(45)	74	(103)
Psychotic	11,179	(66)	1,372	(88)	9,031	(13)
Personality	9,551	(69)	3,735	(74)	1,405	(42)
Somatoform	3,788	(84)	1,424	(85)	489	(66)
<b>Signs &amp; symptoms</b>						
All other signs & symptoms	450,015	(2)	251,304	(2)	6,329	(17)
Respiratory & chest	119,175	(21)	75,326	(14)	4,256	(26)
Abdomen & pelvis	84,850	(26)	53,022	(20)	2,113	(35)
<b>Musculoskeletal diseases</b>						
All other musculoskeletal	388,260	(4)	164,672	(4)	8,622	(14)
Other back problems	121,594	(19)	48,794	(22)	4,467	(24)
Other knee disorders	18,843	(56)	9,093	(59)	1,097	(49)
Osteoarthritis	12,012	(65)	7,245	(63)	784	(58)
Other shoulder disorders	10,918	(67)	6,510	(66)	202	(87)
Rheumatoid arthritis	2,894	(90)	943	(94)	41	(108)
<b>Respiratory infections</b>						
Upper respiratory infections	414,252	(3)	273,871	(1)	1,777	(40)
Lower respiratory infections	68,694	(30)	43,381	(26)	5,272	(22)
Otitis media	31,291	(47)	24,804	(39)	64	(104)
<b>Sense organ diseases</b>						
Refraction/accommodation	230,748	(10)	179,813	(3)	1	(126)
All other sense organ diseases	152,830	(16)	100,534	(11)	972	(54)
Hearing disorders	44,600	(37)	28,885	(36)	44	(107)
Glaucoma	13,510	(63)	8,400	(61)	0	(131)
Cataracts	1,383	(103)	803	(98)	7	(124)
<b>Skin diseases</b>						
All other skin diseases	248,315	(9)	137,120	(6)	10,074	(11)
Contact dermatitis	50,705	(33)	38,651	(31)	49	(106)
Sebaceous gland diseases	48,924	(34)	29,814	(35)	40	(109)

Category*	Medical encounters <sup>†</sup>		Individuals affected <sup>‡</sup>		Hospital bed days	
	No.	Rank	No.	Rank	No.	Rank
<b>Infectious &amp; parasitic diseases</b>						
All other infectious & parasitic	143,012	(17)	94,855	(12)	3,833	(29)
Unspecified viral infection	45,949	(36)	40,070	(29)	377	(76)
STDs	22,278	(51)	16,788	(49)	664	(61)
Diarrheal diseases	18,324	(57)	16,193	(52)	1,082	(50)
Chlamydia	8,419	(74)	7,398	(62)	15	(118)
Hepatitis B & C	2,801	(91)	1,025	(92)	115	(98)
Tuberculosis	672	(110)	419	(105)	160	(92)
Bacterial meningitis	485	(113)	203	(109)	285	(82)
Malaria	301	(116)	123	(115)	211	(86)
Tropical cluster	253	(117)	68	(117)	0	(128)
Intestinal nematode infection	194	(120)	175	(111)	9	(121)
Lower respiratory infections	25	(130)	24	(125)	0	(127)
<b>Respiratory diseases</b>						
Allergic rhinitis	79,929	(27)	43,207	(27)	14	(119)
All other respiratory diseases	47,840	(35)	28,276	(37)	4,840	(23)
Chronic sinusitis	39,891	(40)	31,534	(34)	200	(89)
Asthma	33,040	(44)	16,487	(50)	559	(65)
Chronic obstructive pulmonary	29,516	(48)	24,555	(40)	244	(84)
<b>Digestive diseases</b>						
All other digestive diseases	88,339	(25)	49,430	(21)	14,067	(7)
Other gastroenteritis & colitis	71,590	(29)	59,160	(18)	1,386	(43)
Esophagus disease	32,420	(45)	22,610	(42)	901	(56)
Inguinal hernia	12,309	(64)	5,659	(69)	719	(59)
Appendicitis	4,212	(82)	2,718	(76)	6,117	(18)
Cirrhosis of the liver	1,362	(104)	876	(96)	234	(85)
Peptic ulcer disease	1,267	(106)	846	(97)	482	(69)
<b>Genito-urinary diseases</b>						
All other genito-urinary diseases	123,880	(18)	74,106	(15)	4,032	(28)
Female genital pain	19,956	(54)	12,395	(57)	423	(73)
Kidney stones	18,028	(58)	7,111	(65)	1,364	(44)
Menstrual disorders	17,624	(60)	11,986	(58)	590	(64)
Other breast disorders	14,813	(62)	8,461	(60)	483	(68)
Nephritis & nephrosis	4,663	(80)	1,418	(86)	1,125	(48)
Benign prostatic hypertrophy	2,800	(92)	1,949	(81)	51	(105)
<b>Cardiovascular diseases</b>						
Essential hypertension	72,028	(28)	39,211	(30)	319	(79)
All other cardiovascular diseases	59,904	(32)	33,627	(32)	5,977	(20)
Ischemic heart disease	6,537	(76)	2,807	(75)	2,264	(34)
Cerebrovascular disease	4,071	(83)	1,384	(87)	2,095	(36)
Inflammatory	1,697	(102)	734	(99)	607	(63)
Rheumatic heart disease	576	(111)	441	(104)	78	(101)
<b>Headache</b>						
Headache	108,145	(22)	58,167	(19)	1,217	(47)
<b>Maternal conditions</b>						
Pregnancy complications	60,441	(31)	19,281	(47)	17,188	(6)
Delivery	39,738	(41)	16,323	(51)	40,186	(2)
Ectopic/miscarriage/abortion	7,943	(75)	3,944	(73)	961	(55)
Puerperium complications	1,819	(100)	1,215	(89)	675	(60)
All other maternal disorders	48	(128)	16	(128)	27	(115)

\*Categories defined in the Global Burden of Disease Study

†Medical encounters: total hospitalizations and ambulatory visits for the condition

‡Individuals affected: individuals with at least one hospitalization or ambulatory visit for the condition

**Table 1 continued.** Health care burdens attributable to various diseases and injuries, U.S. Armed Forces, 2008

Category*	Medical encounters <sup>†</sup>		Individuals affected <sup>‡</sup>		Hospital bed days	
	No.	Rank	No.	Rank	No.	Rank
<b>Endocrine disorders</b>						
All other endocrine disorders	41,882	(39)	20,970	(43)	1,804	(39)
Lipoid metabolism disorders	35,948	(42)	27,069	(38)	16	(117)
Obesity	19,176	(55)	15,137	(53)	183	(90)
<b>Neurologic conditions</b>						
All other neurologic conditions	42,690	(38)	19,871	(46)	5,533	(21)
Other mononeuritis - limbs	8,923	(72)	4,656	(72)	182	(91)
Epilepsy	5,684	(77)	1,998	(80)	983	(52)
Multiple sclerosis	2,500	(95)	558	(102)	245	(83)
Parkinson disease	117	(124)	42	(122)	8	(122)
Alzheimer & other dementias	1	(131)	1	(131)	0	(129)
<b>Other neoplasms</b>						
All other neoplasms	34,940	(43)	23,913	(41)	2,273	(33)
Benign skin neoplasm	17,086	(61)	13,616	(55)	8	(123)
Lipoma	8,719	(73)	5,565	(70)	75	(102)
Uterine leiomyoma	3,740	(85)	1,826	(82)	1,509	(41)
<b>Malignant neoplasms</b>						
Lymphoma & multiple myeloma	5,026	(78)	649	(100)	1,327	(45)
All other malignant neoplasms	4,684	(79)	907	(95)	2,901	(31)
Melanoma & other skin cancers	4,245	(81)	2,098	(79)	440	(72)
Testicular cancer	3,271	(87)	640	(101)	314	(80)
Breast cancer	2,740	(93)	358	(106)	201	(88)
Colon & rectum cancers	2,248	(96)	245	(108)	487	(67)
Leukemia	2,054	(98)	169	(114)	1,304	(46)
Thyroid	1,807	(101)	457	(103)	407	(74)
Brain	1,332	(105)	172	(112)	649	(62)
Prostate cancer	1,256	(107)	304	(107)	324	(77)

\*Categories defined in the Global Burden of Disease Study

<sup>†</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition<sup>‡</sup>Individuals affected: individuals with at least one hospitalization or ambulatory visit for the condition<sup>§</sup>Conditions affecting newborns erroneously coded on service member medical records

Category*	Medical encounters <sup>†</sup>		Individuals affected <sup>‡</sup>		Hospital bed days	
	No.	Rank	No.	Rank	No.	Rank
Mouth & oropharynx cancers	1,095	(109)	170	(113)	154	(93)
Trachea, bronchus, lung cancers	508	(112)	66	(118)	141	(95)
Stomach cancer	373	(115)	34	(124)	313	(81)
Ovary cancer	216	(118)	54	(120)	102	(99)
Bladder cancer	204	(119)	63	(119)	33	(113)
Cervix uteri cancer	188	(121)	38	(123)	38	(110)
Liver cancer	122	(123)	22	(126)	127	(96)
Pancreas cancer	98	(125)	22	(127)	118	(97)
Esophagus cancer	61	(127)	16	(129)	32	(114)
Corpus uteri cancer	46	(129)	14	(130)	11	(120)
<b>Oral conditions</b>						
All other oral conditions	25,017	(50)	19,119	(48)	1,825	(38)
Periodontal disease	2,737	(94)	1,570	(84)	0	(130)
Dental caries	1,096	(108)	963	(93)	19	(116)
<b>Diabetes mellitus</b>						
Diabetes mellitus	17,652	(59)	5,072	(71)	895	(57)
<b>Nutritional deficiencies</b>						
All other nutritional deficiencies	9,662	(68)	6,289	(67)	403	(75)
Iron-deficiency anemia	3,025	(89)	1,673	(83)	142	(94)
Protein-energy malnutrition	71	(126)	46	(121)	37	(112)
<b>Congenital anomalies</b>						
All other congenital anomalies	22,163	(52)	14,620	(54)	981	(53)
Congenital heart disease	2,132	(97)	1,110	(91)	463	(70)
<b>Conditions arising during the perinatal period<sup>§</sup></b>						
All other perinatal anomalies	1,842	(99)	1,208	(90)	37	(111)
Low birth weight	396	(114)	202	(110)	3	(125)
Birth asphyxia & birth trauma	159	(122)	105	(116)	92	(100)

a leading source of medical encounters overall; however, they accounted for relatively few hospital bed-days (**Table 1**).

Injuries of the back/abdomen was the only condition among the top 10 in relation to all burden measures (**Table 1**).

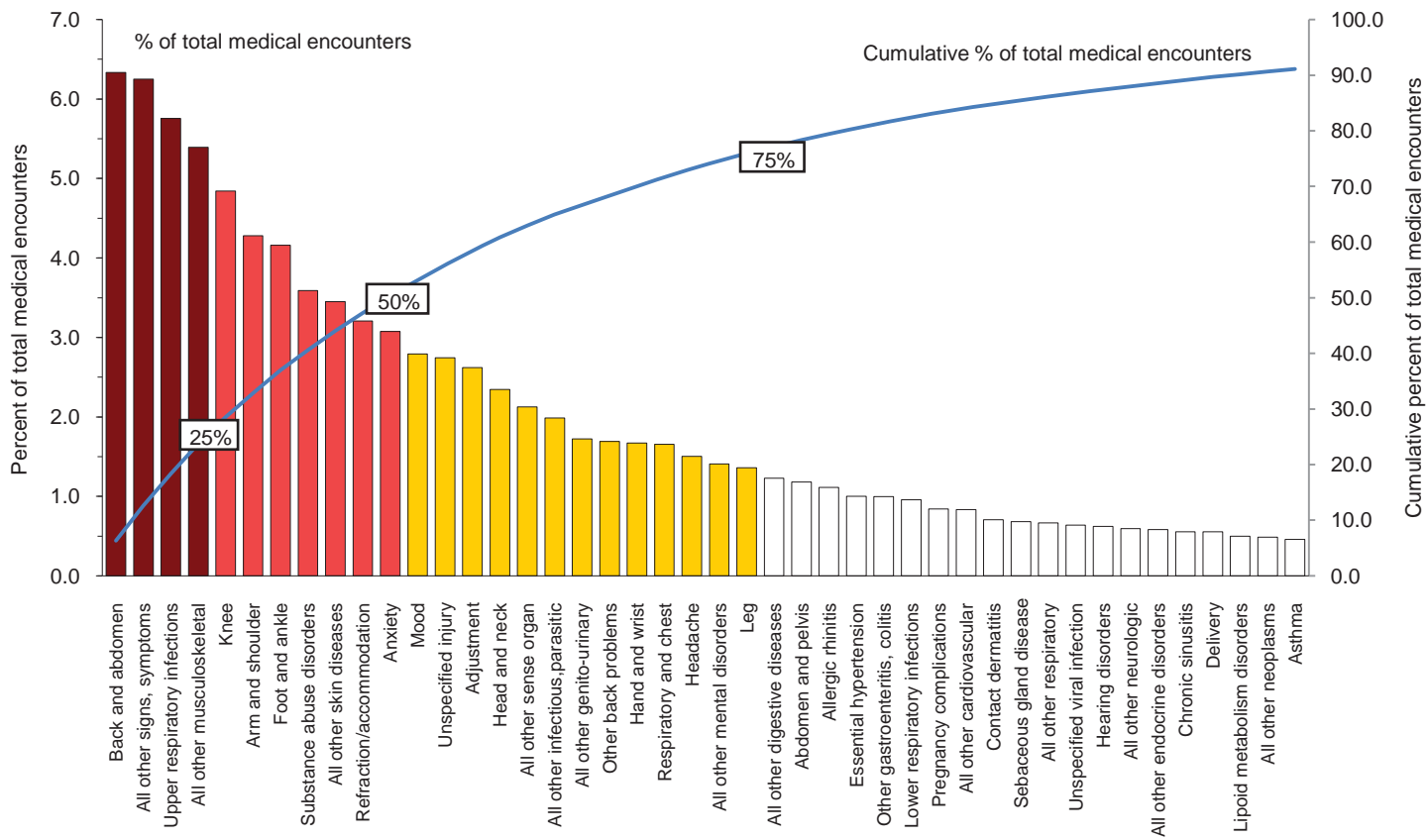
#### Editorial comment:

Illnesses and injuries are “burdens” to the U.S. Armed Forces to the extent that they degrade the health, fitness, morale, sense of well-being, and military operational effectiveness of service members. They also “burden” the U.S. Military Health System because they consume scarce health care resources for diagnosis, treatment, rehabilitation, and disability compensation. Decisions regarding prevention priorities, practices, research activities, and resources should consider the morbidity and health care burdens that are currently attributable to various illnesses, injuries, and associated risk factors.

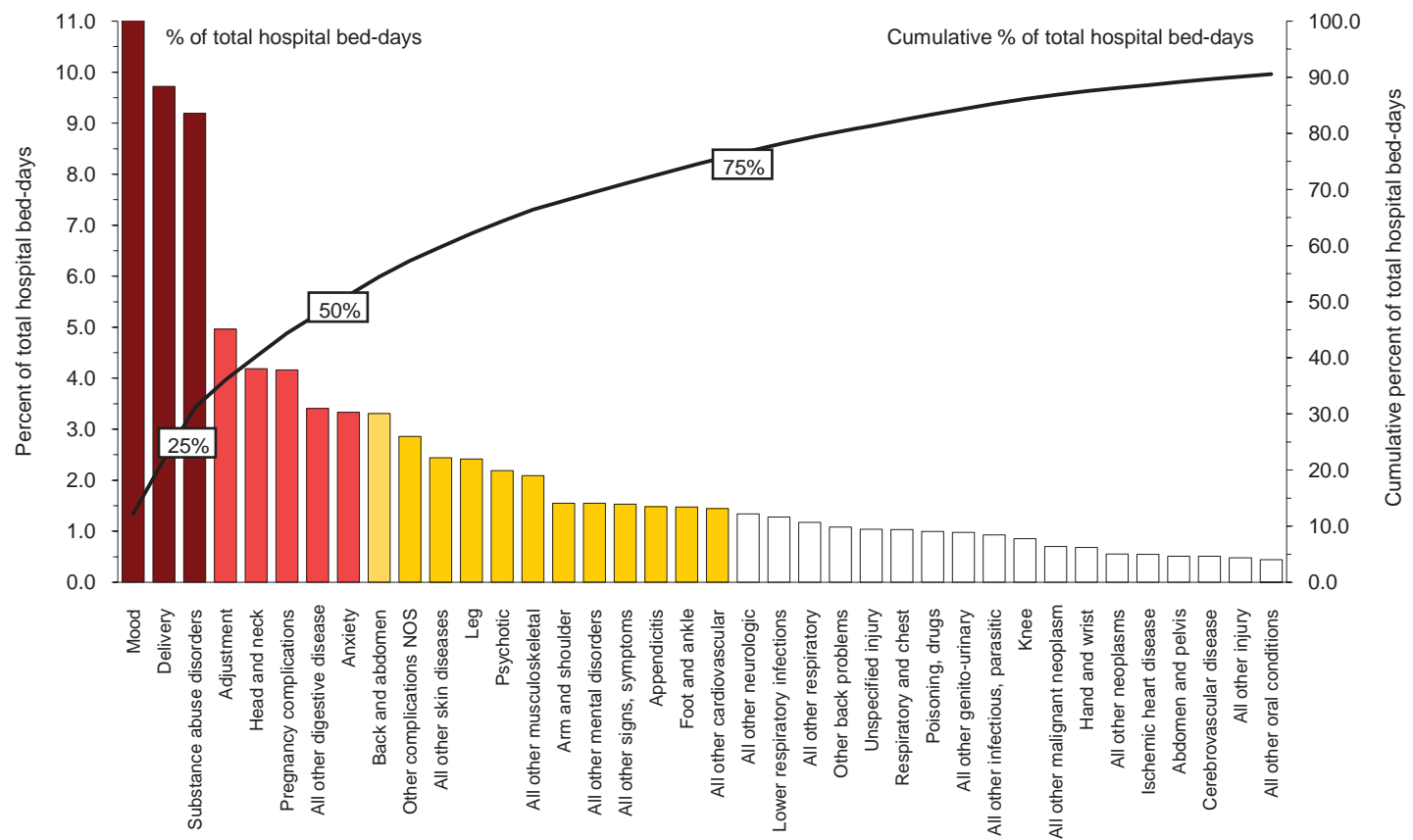
Not surprisingly, the ranks of conditions in relation to their attributable “morbidity burdens” sharply vary based on the morbidity burden measure. However, remarkably few conditions — in particular, back injuries, pregnancy-related conditions, and mental (including substance abuse) disorders — account for large proportions of morbidity burden, regardless of the metric. As in the past, in 2008, 11 (of 131) conditions accounted for more than one-half of all medical encounters, while just eight conditions accounted for more than one-half of all hospital bed-days.

Throughout military history, injuries, mental disorders (particularly related to combat), and substance abuse disorders have been leading causes of morbidity and lost duty time among service members.<sup>3-6</sup> In 2008, 14 conditions were among the top 25 in reference to all three burden measures. Of these, five were injuries — to the back and abdomen, arm and shoulder, foot and ankle, “unspecified,” and head and neck; and four were mental disorders (mood, anxiety, adjustment,

**Figure 2.** Percent and cumulative % distributions, burden categories that accounted for the most medical encounters among U.S. service members, 2008



**Figure 3.** Percent and cumulative % distributions, burden categories that accounted for the most hospital bed-days, U.S. service members, 2008



and “all other” disorders) (Table 1). As noted many times in the past, the prevention of injuries of all types – but, particularly, back injuries – and the detection, characterization, and management of mental disorders – including substance abuse and deployment stress-related disorders, e.g., PTSD – should be clear focuses of military public health and force health protection programs.

In summary, this analysis, like those of recent years, documents that a relatively few illnesses and injuries account for most of the total health care burden that affects U.S. service members. Illnesses and injuries that account for disproportionately large health care burdens (regardless of the metric used to measure it) should be targeted to determine their susceptibilities to primary, secondary, and tertiary prevention efforts and given high priorities for prevention resources.

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## Reportable medical events, active and reserve components, U.S. Armed Forces, 2008

In the U.S. Armed Forces, medical events of public health and/or military medical importance are reported through service-specific electronic reporting programs: the Army Reportable Medical Events System (RMES), the Air Force Reportable Event Surveillance System (AFRESS), and the Navy Reportable Disease System (NDRS). Army, Air Force, and Navy preventive medicine/public health activities at military installations worldwide collect and electronically transmit reports of notifiable events to their respective service surveillance centers. From these centers, reports are forwarded to the Armed Forces Health Surveillance Center (AFHSC). At the AFHSC, the data are integrated with personnel and other medical event data in the Defense Medical Surveillance System (DMSS).

Since 1998, 70 medical conditions<sup>1</sup> have been designated as “reportable” by the Department of Defense. The Army began electronic reporting of notifiable events in 1994 and in 2000, the medical surveillance centers of the Navy and Air Force began forwarding their reportable medical event case reports centrally for integration in the DMSS. The integration of data from all of the services enables summaries and analyses across the entire U.S. Armed Forces. This report summarizes frequencies, rates, and trends of notifiable medical events among both active and reserve component members, as reported from U.S. military medical treatment facilities, during calendar year 2008.

During 2008, there were 20,077 reports of notifiable medical events among members of the U.S. Armed Forces. During the year, there were an average of 31.0, 13.5 and 10.4 case reports per day from Army, Air Force, and Navy medical treatment facilities, respectively. In 2008 compared to 2007, there were more than twice as many notifiable medical event case reports from Navy installations, 24% more from Air Force installations, and 14% more from Army installations (Tables 1-4). The higher numbers of case reports in 2008 in general may reflect increasing awareness of and compliance with reporting requirements, broader access to diagnostic capabilities for some conditions, increasing numbers of service members who receive care in the Military Health System, and in some cases, actual increases in case incidence. Increases of reports of specific conditions in 2008 must be interpreted with consideration of the large increases of reports overall.

### Sexually-transmitted infections:

In 2008, as in recent prior years, sexually-transmitted infections (due to chlamydia, gonorrhea, syphilis, and nongonococcal urethritis) accounted for most (n=17,535; 87.4%) of the notifiable event reports overall; sexually-transmitted infections due to *Chlamydia trachomatis*

remained the most frequently reported specific notifiable condition (n=14,972; 74.6% of all reports) (Tables 1-4). There were more reports of sexually transmitted infections in 2008 than in previous years; however, there was not a clear trend. For example, compared to the respective means of annual reports during the previous three years, in 2008, there were approximately 10% fewer reports of non-gonococcal urethritis but 93% more of syphilis (Tables 1-4).

### Environmental:

In 2008, military medical facilities reported 597 heat- and 55 cold-related injuries among active and reserve component members. During the year, there were fewer reports of both heat and cold injuries than in any of the four prior years (Tables 1-4). However, the decrease in heat injury-related reports overall resulted from sharply fewer heat exhaustion reports; there were similar numbers of heat stroke reports in 2008 as in recent years (Figure 1).

### Vaccine preventable illnesses

Among military members in 2008, there were no reported cases of anthrax, diphtheria, measles, polio, tetanus, or rubella. In 2008 compared to recent prior years, there were similar numbers of reported cases of hepatitis A (n=4), pertussis (n=15) and mumps (n=4) among U.S. service members overall. However, more cases of hepatitis B were reported from Navy (n=33) medical facilities in 2008 than in any of the previous four years (Tables 3-4). Of note, the number of influenza cases reported in 2008 (n=1,055) was more than three-times the mean annual number of reports from 2005-2007 (Figure 1). In 2008, 40% of all case reports of influenza among U.S. service members were submitted from Air Force medical facilities (Tables 1,3).

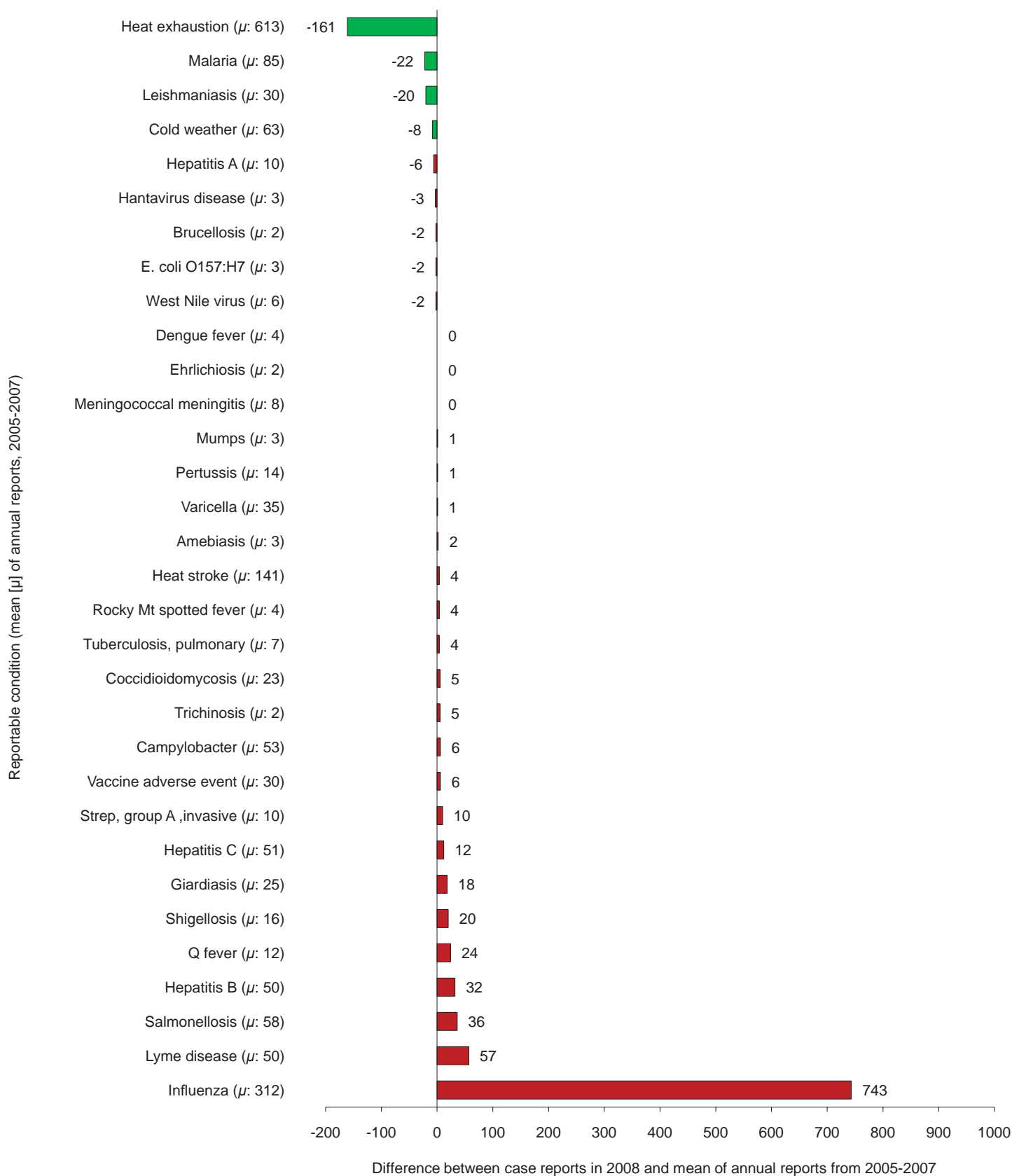
### Arthropod-transmitted diseases:

In general, in 2008 compared to recent prior years, there were similar numbers of reports of arthropod-transmitted infectious diseases among U.S. service members. However, in 2008, there was a sharp increase in reported cases of Lyme disease among service members overall (n=107). Of note, Lyme disease case reports increased from 2007 to 2008 at Navy and Air Force, but not Army, facilities (Tables 1, 3-4, Figure 1).

### Food/water-transmitted infections:

In 2008, the most frequently reported food/water transmitted infectious diseases among service members were

**Figure 1.** Numbers of notifiable medical events\* among active and reserve component members of the U.S. Armed Forces, as reported from U.S. military medical facilities, in 2008† (relative to the means of annual reports from 2005-2007)‡



\* Sexually transmitted diseases are excluded

† Events reported by April 7, 2009

‡ For diseases with three-year totals of at least six cases

**Table 1.** Notifiable medical events\* among active and reserve component members, U.S. Armed Forces, as reported from U.S. military medical treatment facilities, 2004-2008

Diagnosis†	2004	2005	2006	2007	2008
<b>All reportable events</b>	<b>16,020</b>	<b>14,178</b>	<b>13,289</b>	<b>15,630</b>	<b>20,077</b>
Amebiasis	1	6	2	1	5
Anthrax	0	0	0	0	0
Biological warfare agent exposure	1	0	0	1	0
Botulism	0	0	0	0	0
Brucellosis	1	2	2	3	0
Campylobacter	72	64	54	41	59
Carbon monoxide poisoning	0	1	3	1	8
Chemical agent exposure	0	0	0	1	6
Chlamydia	11,360	9,777	9,634	11,799	14,972
Cholera	0	0	2	0	0
Coccidioidomycosis	4	17	34	17	28
Cold weather, frostbite	97	46	38	39	41
Cold weather, hypothermia	1	2	5	13	5
Cold weather, immersion type	6	2	4	2	4
Cold weather, unspecified	13	17	10	10	5
Cryptosporidiosis	1	2	0	2	7
Cyclospora	1	1	0	0	0
Dengue fever	5	4	4	4	4
Diphtheria	0	0	0	0	0
E. coli O157:H7	3	3	2	5	1
Ehrlichiosis	0	2	2	3	2
Encephalitis	3	1	0	1	0
Filariasis	1	0	0	0	0
Giardiasis	37	35	16	23	43
Gonorrhea	1,977	1,821	1,818	1,872	2,126
H. influenzae, invasive	0	0	2	2	14
Hantavirus disease	0	6	2	0	0
Heat exhaustion	542	727	566	547	452
Heat stroke	196	163	128	133	145
Hemorrhagic fever	0	0	0	0	0
Hepatitis A	13	13	9	8	4
Hepatitis B	63	65	39	45	82
Hepatitis C	52	53	36	65	63
Influenza	176	497	191	248	1055
Lead poisoning	0	0	0	0	0
Legionellosis	1	0	0	2	1
Leishmaniasis, cutaneous	255	41	20	20	9
Leishmaniasis, mucocutaneous	0	0	0	0	0
Leishmaniasis, unspecified	2	2	3	2	1
Leishmaniasis, visceral	2	1	1	0	0
Leprosy	1	0	0	1	2
Leptospirosis	2	2	1	1	3
Listeriosis	0	0	0	0	0
Lyme disease	30	40	36	74	107
Malaria, falciparum	42	7	7	3	16
Malaria, malariae	0	0	3	0	0
Malaria, ovale	1	0	3	1	1
Malaria, unspecified	21	30	52	29	23
Malaria, vivax	29	38	48	33	23
Measles	0	1	0	0	0
Meningococcal meningitis	3	10	6	8	8
Meningococcal septicemia	0	0	0	0	2
Mumps	0	2	4	2	4
Pertussis	53	18	14	10	15
Plague	0	0	0	0	0
Poliomyelitis	0	0	0	0	0
Q fever	1	4	6	25	36
Rabies, human	0	1	0	0	0
Relapsing fever	0	1	0	0	1
Rheumatic fever, acute	1	0	1	1	1
Rift Valley fever	0	0	0	0	0
Rocky Mountain spotted fever	9	3	2	6	8
Rubella	0	0	0	0	0
Salmonellosis	54	55	59	61	94
Schistosomiasis	0	0	1	0	1
Shigellosis	20	20	6	21	36
Smallpox	0	1	0	0	0
Streptococcus, group A, invasive	6	6	10	13	20
Syphilis, congenital	10	1	1	1	3
Syphilis, latent	27	30	26	41	59
Syphilis, primary/secondary	78	49	51	63	107
Syphilis, tertiary	1	1	2	3	5
Tetanus	0	0	0	0	0
Toxic shock syndrome	1	1	0	0	1
Trichinosis	3	2	0	5	7
Trypanosomiasis	0	0	0	0	1
Tuberculosis, pulmonary	11	8	6	7	11
Tularemia	0	0	0	0	1
Typhoid fever	0	0	1	1	0
Typhus fever	0	0	0	0	0
Urethritis, non-gonococcal	667	418	253	216	263
Vaccine adverse event	29	32	19	40	36
Varicella	33	25	35	45	36
West Nile virus	1	1	9	9	4
Yellow fever	0	0	0	0	0

\*Events reported by April 7, 2009

†Tri-Service Reportable Events, Guidelines and Case Definitions, May 2004

**Table 2.** Notifiable medical events\* among active and reserve component members, U.S. Armed Forces, as reported from U.S. Army medical treatment facilities, 2004-2008

Diagnosis†	2004	2005	2006	2007	2008
<b>All reportable events</b>	<b>9,544</b>	<b>9,772</b>	<b>9,921</b>	<b>9,957</b>	<b>11,335</b>
Amebiasis	1	2	1	0	1
Anthrax	0	0	0	0	0
Biological warfare agent exposure	1	0	0	1	0
Botulism	0	0	0	0	0
Brucellosis	1	2	1	2	0
Campylobacter	41	50	47	32	37
Carbon monoxide poisoning	0	0	2	0	0
Chemical agent exposure	0	0	0	1	3
Chlamydia	6,138	6,337	6,954	7,084	8,192
Cholera	0	0	1	0	0
Coccidioidomycosis	3	6	4	4	4
Cold weather, frostbite	96	38	33	38	30
Cold weather, hypothermia	0	1	4	10	1
Cold weather, immersion type	6	2	4	2	2
Cold weather, unspecified	12	16	10	10	4
Cryptosporidiosis	1	2	0	0	5
Cyclospora	1	1	0	0	0
Dengue fever	1	2	2	3	0
Diphtheria	0	0	0	0	0
E. coli O157:H7	1	2	2	2	0
Ehrlichiosis	0	2	1	2	1
Encephalitis	0	0	0	0	0
Filariasis	1	0	0	0	0
Giardiasis	21	17	11	13	17
Gonorrhea	1,398	1,501	1,454	1,396	1,470
H. influenzae, invasive	0	0	1	2	13
Hantavirus disease	0	5	1	0	0
Heat exhaustion	385	536	482	438	227
Heat stroke	187	157	121	127	118
Hemorrhagic fever	0	0	0	0	0
Hepatitis A	8	11	7	1	1
Hepatitis B	27	40	22	15	23
Hepatitis C	30	41	29	38	23
Influenza	102	287	126	153	591
Lead poisoning	0	0	0	0	0
Legionellosis	1	0	0	2	1
Leishmaniasis, cutaneous	250	38	20	19	5
Leishmaniasis, mucocutaneous	0	0	0	0	0
Leishmaniasis, unspecified	0	1	2	2	0
Leishmaniasis, visceral	2	0	1	0	0
Leprosy	1	0	0	1	2
Leptospirosis	1	2	1	1	3

Diagnosis†	2004	2005	2006	2007	2008
Listeriosis	0	0	0	0	0
Lyme disease	21	27	29	51	49
Malaria, falciparum	8	4	4	2	8
Malaria, malariae	0	0	3	0	0
Malaria, ovale	1	0	1	0	1
Malaria, unspecified	16	28	51	28	15
Malaria, vivax	26	36	45	32	19
Measles	0	1	0	0	0
Meningococcal meningitis	1	5	5	7	2
Meningococcal septicemia	0	0	0	0	0
Mumps	0	2	3	0	0
Pertussis	36	12	9	5	1
Plague	0	0	0	0	0
Poliomyelitis	0	0	0	0	0
Q fever	1	3	4	22	30
Rabies, human	0	0	0	0	0
Relapsing fever	0	1	0	0	0
Rheumatic fever, acute	0	0	1	0	0
Rift Valley fever	0	0	0	0	0
Rocky Mountain spotted fever	7	2	1	1	5
Rubella	0	0	0	0	0
Salmonellosis	33	29	42	36	36
Schistosomiasis	0	0	1	0	0
Shigellosis	17	15	4	16	22
Smallpox	0	0	0	0	0
Streptococcus, group A, invasive	3	4	10	10	11
Syphilis, congenital	0	0	0	0	0
Syphilis, latent	14	24	23	29	37
Syphilis, primary/secondary	42	34	37	35	62
Syphilis, tertiary	0	1	2	3	5
Tetanus	0	0	0	0	0
Toxic shock syndrome	1	1	0	0	0
Trichinosis	1	1	0	5	1
Trypanosomiasis	0	0	0	0	0
Tuberculosis, pulmonary	5	3	4	7	9
Tularemia	0	0	0	0	0
Typhoid fever	0	0	1	1	0
Typhus fever	0	0	0	0	0
Urethritis, non-gonococcal	538	396	250	213	210
Vaccine adverse event	29	29	10	22	19
Varicella	26	15	28	26	18
West Nile virus	1	0	9	7	1
Yellow fever	0	0	0	0	0

\*Events reported by April 7, 2009

†Tri-Service Reportable Events, Guidelines and Case Definitions, May 2004

**Table 3.** Notifiable medical events\* among active and reserve component members, U.S. Armed Forces, as reported from U.S. Air Force medical treatment facilities, 2004-2008

Diagnosis†	2004	2005	2006	2007	2008
<b>All reportable events</b>	<b>4,694</b>	<b>2,971</b>	<b>1,992</b>	<b>3,958</b>	<b>4,924</b>
Amebiasis	0	2	1	1	4
Anthrax	0	0	0	0	0
Biological warfare agent exposure	0	0	0	0	0
Botulism	0	0	0	0	0
Brucellosis	0	0	0	0	0
Campylobacter	28	11	1	7	17
Carbon monoxide poisoning	0	1	1	1	7
Chemical agent exposure	0	0	0	0	3
Chlamydia	4,081	2,485	1,707	3,397	3,897
Cholera	0	0	1	0	0
Coccidioidomycosis	0	2	4	9	6
Cold weather, frostbite	1	8	5	1	11
Cold weather, hypothermia	0	0	0	3	3
Cold weather, immersion type	0	0	0	0	2
Cold weather, unspecified	1	1	0	0	1
Cryptosporidiosis	0	0	0	2	0
Cyclospora	0	0	0	0	0
Dengue fever	1	0	1	0	0
Diphtheria	0	0	0	0	0
E. coli O157:H7	2	1	0	2	1
Ehrlichiosis	0	0	1	1	0
Encephalitis	2	0	0	0	0
Filariasis	0	0	0	0	0
Giardiasis	8	15	3	6	20
Gonorrhea	354	164	157	276	291
H. influenzae, invasive	0	0	1	0	0
Hantavirus disease	0	0	1	0	0
Heat exhaustion	5	0	1	21	13
Heat stroke	2	0	0	1	2
Hemorrhagic fever	0	0	0	0	0
Hepatitis A	2	1	2	6	3
Hepatitis B	28	14	8	18	26
Hepatitis C	17	6	3	14	24
Influenza	73	192	55	87	420
Lead poisoning	0	0	0	0	0
Legionellosis	0	0	0	0	0
Leishmaniasis, cutaneous	2	3	0	1	3
Leishmaniasis, mucocutaneous	0	0	0	0	0
Leishmaniasis, unspecified	0	1	0	0	1
Leishmaniasis, visceral	0	0	0	0	0
Leprosy	0	0	0	0	0
Leptospirosis	0	0	0	0	0

Diagnosis†	2004	2005	2006	2007	2008
Listeriosis	0	0	0	0	0
Lyme disease	5	9	2	12	28
Malaria, falciparum	1	0	1	0	1
Malaria, malariae	0	0	0	0	0
Malaria, ovale	0	0	2	0	0
Malaria, unspecified	1	0	0	0	3
Malaria, vivax	3	1	3	1	2
Measles	0	0	0	0	0
Meningococcal meningitis	2	2	0	1	5
Meningococcal septicemia	0	0	0	0	1
Mumps	0	0	0	2	4
Pertussis	17	4	3	4	8
Plague	0	0	0	0	0
Poliomyelitis	0	0	0	0	0
Q fever	0	0	0	3	4
Rabies, human	0	0	0	0	0
Relapsing fever	0	0	0	0	0
Rheumatic fever, acute	1	0	0	1	0
Rift Valley fever	0	0	0	0	0
Rocky Mountain spotted fever	0	1	0	1	3
Rubella	0	0	0	0	0
Salmonellosis	16	11	5	19	37
Schistosomiasis	0	0	0	0	1
Shigellosis	2	5	1	4	6
Smallpox	0	1	0	0	0
Streptococcus, group A, invasive	1	2	0	2	7
Syphilis, congenital	3	1	0	1	3
Syphilis, latent	8	4	1	3	8
Syphilis, primary/secondary	19	6	7	17	13
Syphilis, tertiary	0	0	0	0	0
Tetanus	0	0	0	0	0
Toxic shock syndrome	0	0	0	0	1
Trichinosis	2	1	0	0	4
Trypanosomiasis	0	0	0	0	1
Tuberculosis, pulmonary	1	2	0	0	1
Tularemia	0	0	0	0	1
Typhoid fever	0	0	0	0	0
Typhus fever	0	0	0	0	0
Urethritis, non-gonococcal	2	1	0	3	3
Vaccine, adverse event	0	3	8	18	15
Varicella	3	9	6	10	7
West Nile virus	0	1	0	2	2
Yellow fever	0	0	0	0	0

\*Events reported by April 7, 2009

†Tri-Service Reportable Events, Guidelines and Case Definitions, May 2004

**Table 4.** Notifiable medical events\* among active and reserve component members, U.S. Armed Forces, as reported from U.S. Navy medical treatment facilities, 2004-2008

Diagnosis <sup>†</sup>	2004	2005	2006	2007	2008
<b>All reportable events</b>	<b>1,782</b>	<b>1,435</b>	<b>1,376</b>	<b>1,715</b>	<b>3,818</b>
Amebiasis	0	2	0	0	0
Anthrax	0	0	0	0	0
Biological warfare agent exposure	0	0	0	0	0
Botulism	0	0	0	0	0
Brucellosis	0	0	1	1	0
Campylobacter	3	3	6	2	5
Carbon monoxide poisoning	0	0	0	0	1
Chemical agent exposure	0	0	0	0	0
Chlamydia	1,141	955	973	1,318	2,883
Cholera	0	0	0	0	0
Coccidioidomycosis	1	9	26	4	18
Cold weather, frostbite	0	0	0	0	0
Cold weather, hypothermia	1	1	1	0	1
Cold weather, immersion type	0	0	0	0	0
Cold weather, unspecified	0	0	0	0	0
Cryptosporidiosis	0	0	0	0	2
Cyclospora	0	0	0	0	0
Dengue fever	3	2	1	1	4
Diphtheria	0	0	0	0	0
E. coli O157:H7	0	0	0	1	0
Ehrlichiosis	0	0	0	0	1
Encephalitis	1	1	0	1	0
Filariasis	0	0	0	0	0
Giardiasis	8	3	2	4	6
Gonorrhea	225	156	207	200	365
H. influenzae, invasive	0	0	0	0	1
Hantavirus disease	0	1	0	0	0
Heat exhaustion	152	191	83	88	212
Heat stroke	7	6	7	5	25
Hemorrhagic fever	0	0	0	0	0
Hepatitis A	3	1	0	1	0
Hepatitis B	8	11	9	12	33
Hepatitis C	5	6	4	13	16
Influenza	1	18	10	8	44
Lead poisoning	0	0	0	0	0
Legionellosis	0	0	0	0	0
Leishmaniasis, cutaneous	3	0	0	0	1
Leishmaniasis, mucocutaneous	0	0	0	0	0
Leishmaniasis, unspecified	2	0	1	0	0
Leishmaniasis, visceral	0	1	0	0	0
Leprosy	0	0	0	0	0
Leptospirosis	1	0	0	0	0

Diagnosis <sup>†</sup>	2004	2005	2006	2007	2008
Listeriosis	0	0	0	0	0
Lyme disease	4	4	5	11	30
Malaria, falciparum	33	3	2	1	7
Malaria, malariae	0	0	0	0	0
Malaria, ovale	0	0	0	1	0
Malaria, unspecified	4	2	1	1	5
Malaria, vivax	0	1	0	0	2
Measles	0	0	0	0	0
Meningococcal meningitis	0	3	1	0	1
Meningococcal septicemia	0	0	0	0	1
Mumps	0	0	1	0	0
Pertussis	0	2	2	1	6
Plague	0	0	0	0	0
Polio myelitis	0	0	0	0	0
Q fever	0	1	2	0	2
Rabies, human	0	1	0	0	0
Relapsing fever	0	0	0	0	1
Rheumatic fever, acute	0	0	0	0	1
Rift Valley fever	0	0	0	0	0
Rocky Mountain spotted fever	2	0	1	4	0
Rubella	0	0	0	0	0
Salmonellosis	5	15	12	6	21
Schistosomiasis	0	0	0	0	0
Shigellosis	1	0	1	1	8
Smallpox	0	0	0	0	0
Streptococcus, group A, invasive	2	0	0	1	2
Syphilis, congenital	7	0	1	0	0
Syphilis, latent	5	2	2	9	14
Syphilis, primary/secondary	17	9	7	11	32
Syphilis, tertiary	1	0	0	0	0
Tetanus	0	0	0	0	0
Toxic shock syndrome	0	0	0	0	0
Trichinosis	0	0	0	0	2
Trypanosomiasis	0	0	0	0	0
Tuberculosis, pulmonary	5	3	2	0	1
Tularemia	0	0	0	0	0
Typhoid fever	0	0	0	0	0
Typhus fever	0	0	0	0	0
Urethritis, non-gonococcal	127	21	3	0	50
Vaccine, adverse event	0	0	1	0	2
Varicella	4	1	1	9	11
West Nile virus	0	0	0	0	1
Yellow fever	0	0	0	0	0

\*Events reported by April 7, 2009

†Tri-Service Reportable Events, Guidelines and Case Definitions, May 2004

salmonellosis (n=94), campylobacter (n=59), giardiasis (n=43) and shigellosis (n=36). Over the past five years, numbers of reported cases of food/water-transmitted infectious diseases – overall and by specific causes – have been fairly stable (Tables 1-4). Of note, there continue to be very few reported cases of *E. coli* O157:H7, typhoid fever, amebiasis, and cholera (Tables 1-4).

Editorial comment:

Surveillance of reportable medical conditions provides military public health officials with unique, timely, and actionable information regarding ongoing and emerging threats to public health or military operational effectiveness. The integration of installation-specific reports at a central level enables the detection, characterization, and tracking of remote, widely disseminated, and/or spreading health threats. Consider, for example, that exposures to significant health threats while deployed may not be clinically expressed until affected service members have completed their deployment-related assignments (e.g., vivax malaria). By the time such diseases are clinically apparent, affected service members may be widely dispersed, in locations not endemic for the subject diseases, and far removed from the times and locations of the relevant exposures.

General summaries of reported medical conditions should be interpreted cautiously. For example, notifiable conditions are incompletely reported; and the completeness of reporting varies across Services, medical facilities, locations, settings, and conditions themselves. In addition, there are few or no reports of notifiable conditions among service members who are engaged in field training exercises or deployments — unless affected individuals receive care for the conditions at permanent military medical facilities or the cases are reported to military preventive medicine/public health officials at reporting sites. Thus, complete assessments of frequencies, rates, and trends of notifiable conditions require reviews of more than reported cases alone.

In regard to this report, there were nearly 30% more notifiable medical event reports overall in 2008 than 2007; of particular note, reports from Navy medical facilities more than doubled from 2007 to 2008. Increases in case reporting in general must be considered when interpreting recent sharp increases in case reports of specific conditions.

References:

1. Tri-Service consensus list of reportable medical events: Completeness and timeliness of reporting in the Army, January-June 1998. *MSMR*, 1998;4(8):2-11.

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

Since January 2003, peaks and troughs in the numbers of pre- and post-deployment health assessment forms transmitted to the Armed Forces Health Surveillance Center generally corresponded to times of departure and return of large numbers of deployers. Since April 2006, numbers of post-deployment health reassessments (PDHRA) transmitted per month have ranged from 17,000 to 36,000 (Table 1, Figure 1).

Proportions of deployers who rated their health as "fair" or "poor" on post-deployment health questionnaires generally increased from 7% in April 2008 to 11% in November 2008 and have since been stable at approximately 10%. On PDHRA questionnaires, the proportions who rated their health as "fair" or "poor" during the past 12 months ranged from 11 to 14 % (Figure 2).

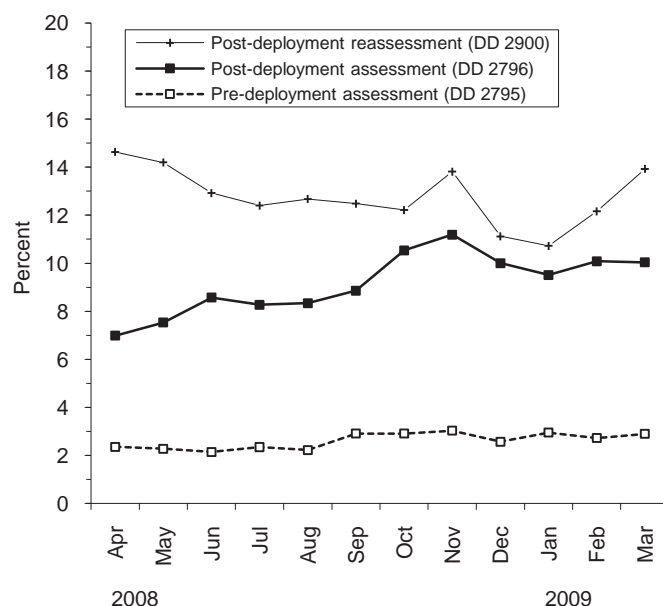
In general, on post-deployment assessments and reassessments, deployers in the Army and in reserve components were more likely than their respective counterparts to report health and exposure-related concerns (Table 2, Figure 2). Both active and reserve component members were more likely to report exposure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

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

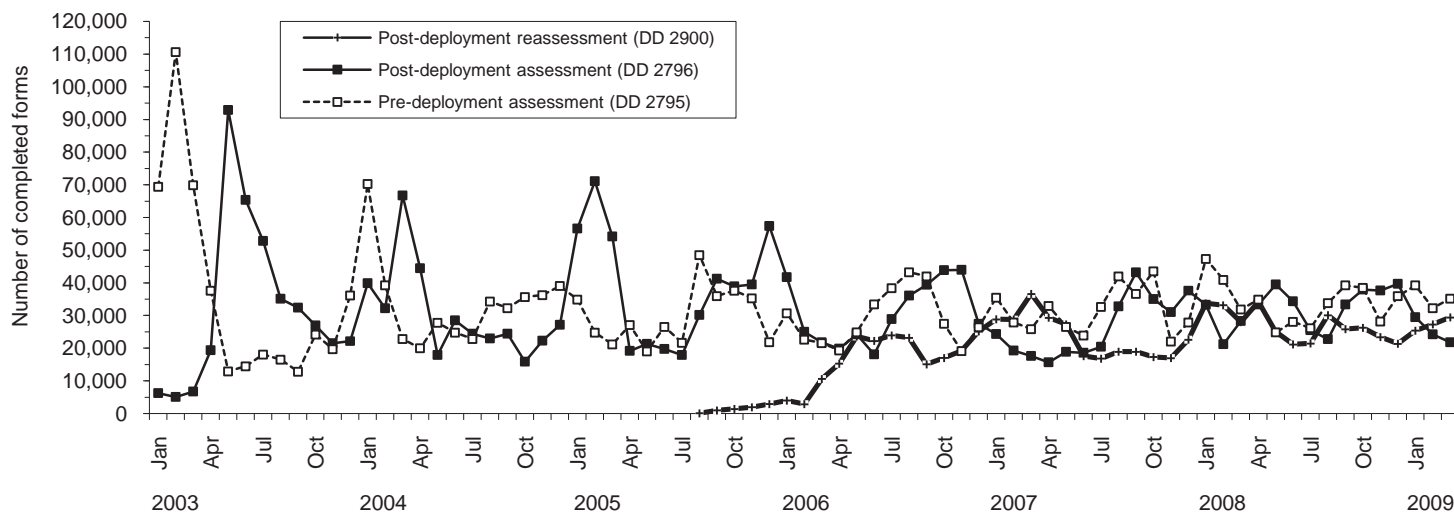
**Table 1.** Deployment-related health assessment forms, by month, U.S. Armed Forces, April 2008-March 2009

	Pre-deployment assessment DD2795		Post-deployment assessment DD2796		Post-deployment reassessment DD2900	
	No.	%	No.	%	No.	%
<b>Total</b>	<b>396,044</b>	<b>100</b>	<b>379,720</b>	<b>100</b>	<b>310,768</b>	<b>100</b>
<b>2008</b>						
April	34,884	8.8	33,363	8.8	34,182	11.0
May	24,803	6.3	39,541	10.4	25,042	8.1
June	28,104	7.1	34,351	9.0	21,147	6.8
July	26,111	6.6	25,463	6.7	21,427	6.9
August	33,784	8.5	22,727	6.0	30,077	9.7
September	39,194	9.9	33,360	8.8	25,830	8.3
October	38,499	9.7	37,961	10.0	26,251	8.4
November	28,173	7.1	37,677	9.9	23,376	7.5
December	35,890	9.1	39,732	10.5	21,359	6.9
<b>2009</b>						
January	39,212	9.9	29,517	7.8	25,392	8.2
February	32,256	8.1	24,220	6.4	27,270	8.8
March	35,134	8.9	21,808	5.7	29,415	9.5

**Figure 2.** Proportion of deployment health assessment forms with self-assessed health status as "fair" or "poor", U.S. Armed Forces, April 2008-March 2009



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



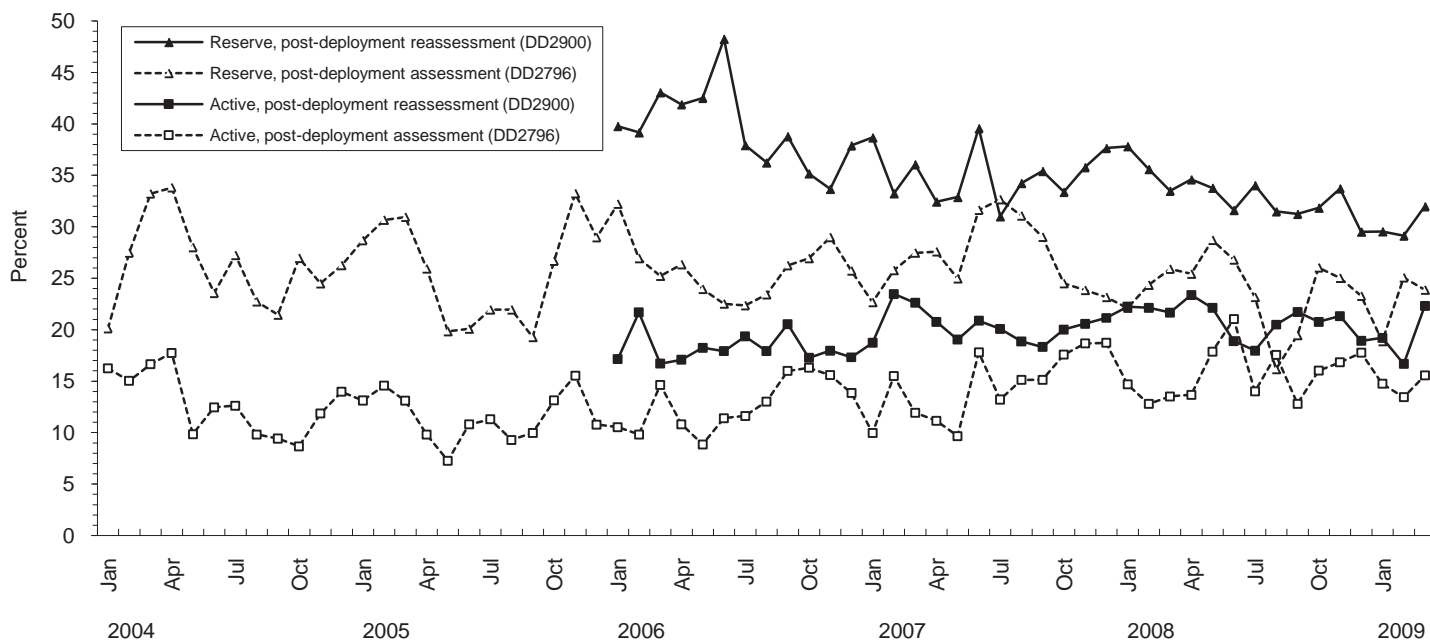
**Table 2.** Percentage of service members who endorsed selected questions/received referrals on health assessment forms, U.S. Armed Forces, April 2008-March 2009

	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n=147,539	n=129,520	n=114,103	n=11,409	n=15,670	n=14,984	n=57,646	n=52,187	n=51,203	n=17,422	n=32,975	n=35,396	n=234,016	n=230,352	n=215,686
Active component	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	4.1	10.9	15.8	1.4	4.7	6.2	0.5	3.7	4.4	1.6	6.1	9.1	2.9	8.2	11.4
Health concerns, not wound or injury	13.9	26.4	29.8	4.3	14.1	14.6	1.5	6.8	12.0	3.3	13.1	18.9	9.6	19.2	22.7
Health worse now than before deployed	na	4.3	27.9	na	0.1	13.9	na	0.9	9.3	na	0.1	18.4	na	2.6	20.9
Exposure concerns	na	18.4	23.8	na	15.3	15.7	na	10.8	15.5	na	11.1	18.5	na	15.4	20.4
PTSD symptoms (2 or more)	na	11.7	16.2	na	4.6	7.5	na	2.5	3.0	na	4.4	8.9	na	8.1	11.3
Depression symptoms (any)	na	5.8	36.9	na	0.1	25.4	na	1.0	15.3	na	0.3	31.5	na	3.6	30.1
Referral indicated by provider (any)	5.3	34.7	22.5	5.4	22.3	15.2	1.6	11.4	7.5	3.5	20.4	20.4	4.2	26.6	18.1
Mental health referral indicated*	1.2	8.6	6.6	0.6	3.9	5.8	0.5	1.2	2.1	0.3	2.4	4.5	0.9	5.7	5.2
Medical visit following referral†	97.3	98.0	97.1	90.9	77.7	90.8	76.6	95.5	96.8	68.4	69.9	73.7	92.1	92.3	92.1
Reserve component	Army			Navy			Air Force			Marine Corps			All service members		
	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900	Pre-deploy DD2795	Post-deploy DD2796	Reassess DD2900
	n=73,579	n=64,404	n=62,578	n=2,580	n=3,513	n=6,451	n=16,431	n=15,204	n=16,600	n=1,413	n=3,198	n=5,551	n=94,003	n=86,319	n=91,180
Reserve component	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
General health "fair" or "poor"	2.1	11.0	19.4	0.5	8.5	9.2	0.3	5.0	4.8	1.0	8.8	9.5	1.7	9.8	15.4
Health concerns, not wound or injury	13.6	38.0	49.6	2.6	27.7	30.1	0.7	10.1	13.4	3.7	29.8	34.4	10.9	32.3	40.7
Health worse now than before deployed	na	9.5	37.4	na	0.3	23.1	na	1.1	10.4	na	0.2	25.3	na	7.3	30.7
Exposure concerns	na	25.6	35.5	na	32.4	27.3	na	17.4	20.7	na	20.1	28.1	na	24.3	31.8
PTSD symptoms (2 or more)	na	10.9	24.8	na	5.6	10.6	na	2.0	2.7	na	5.0	12.8	na	8.9	19.0
Depression symptoms (any)	na	9.4	39.9	na	0.2	26.4	na	0.8	14.0	na	0.3	32.0	na	7.2	33.7
Referral indicated by provider (any)	4.2	34.9	34.8	3.4	30.3	18.5	0.7	13.9	5.5	6.4	32.5	31.0	3.6	30.9	28.1
Mental health referral indicated*	0.5	4.9	13.0	0.3	3.3	4.8	0.0	0.6	0.9	0.4	3.0	9.7	0.4	4.0	10.0
Medical visit following referral†	96.3	97.5	29.1	85.4	91.6	42.2	40.9	64.2	38.5	77.4	55.1	22.2	92.4	90.8	29.4

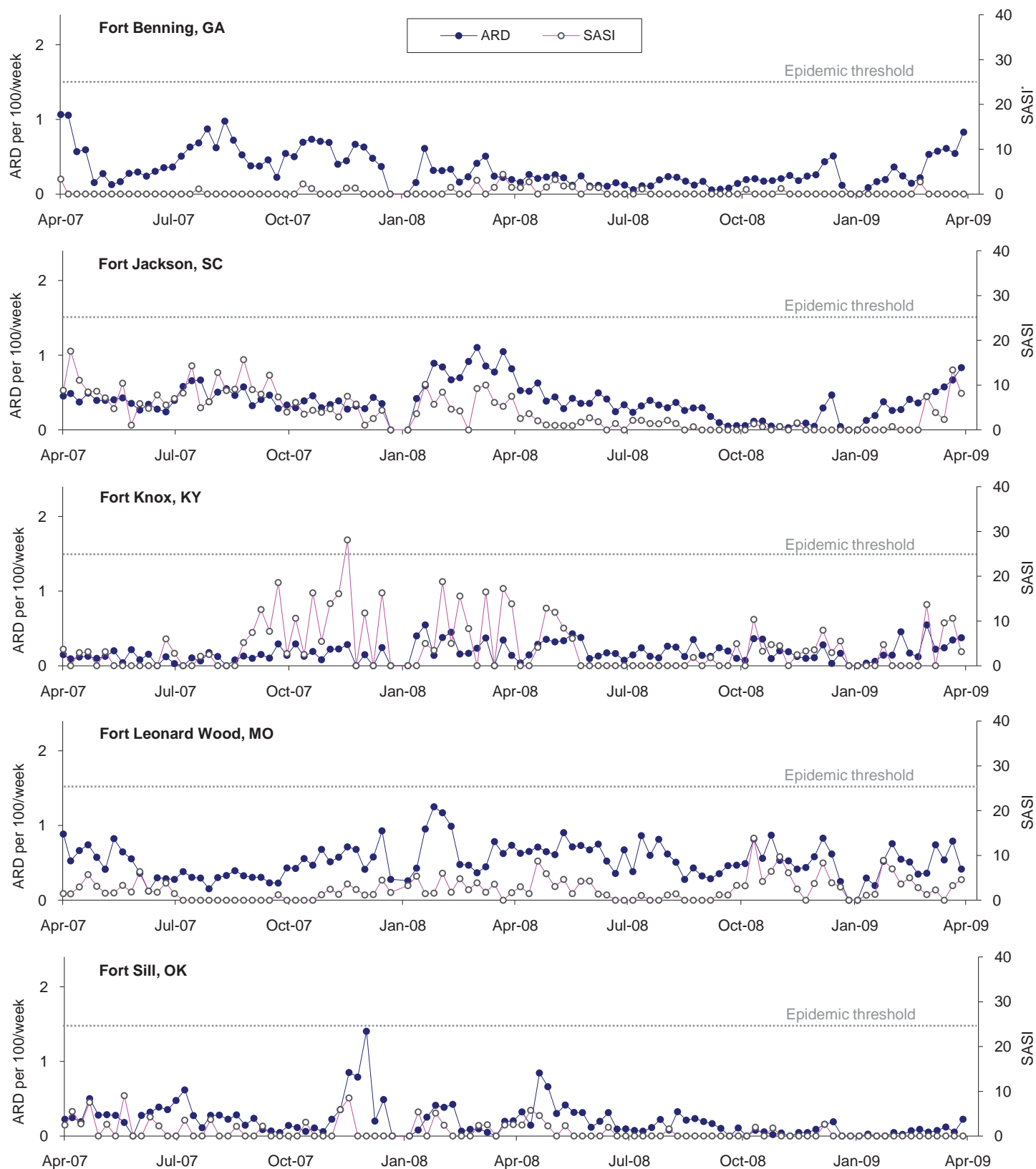
\*Includes behavioral health, combat stress and substance abuse referrals.

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

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



## Acute respiratory disease (ARD) and streptococcal pharyngitis rates (SASI\*), basic combat training centers, U.S. Army, by week, April 2007-April 2009



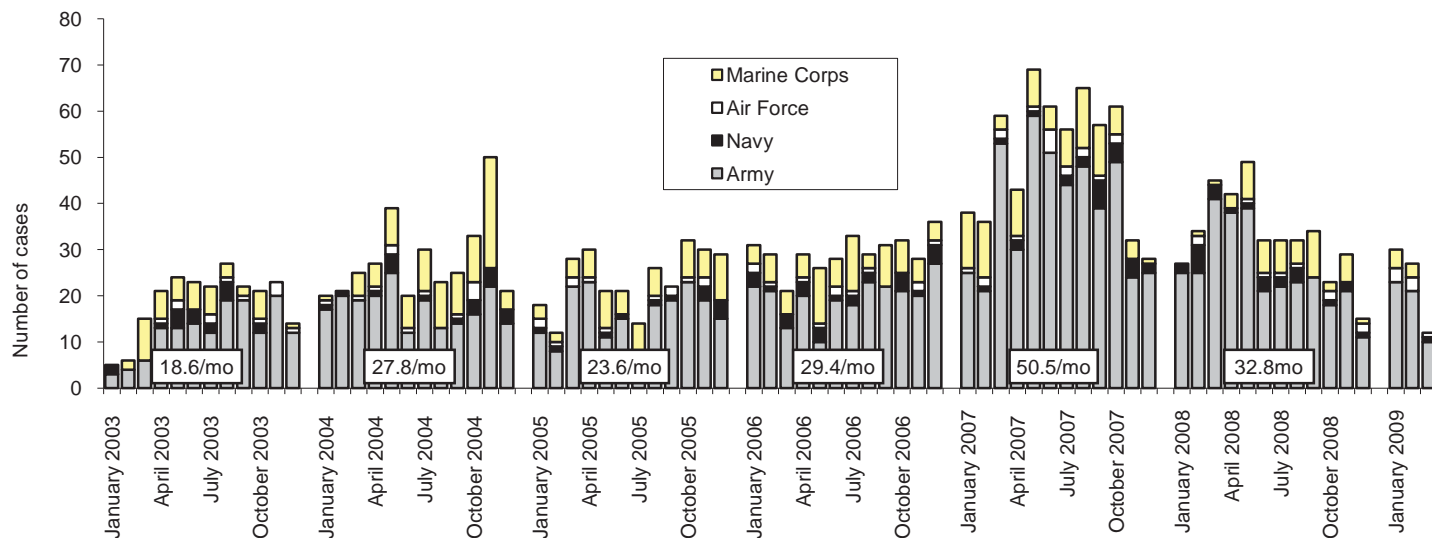
\*Streptococcal-ARD surveillance index (SASI) = ARD rate x % positive culture for group A streptococcus

ARD rate = cases per 100 trainees per week

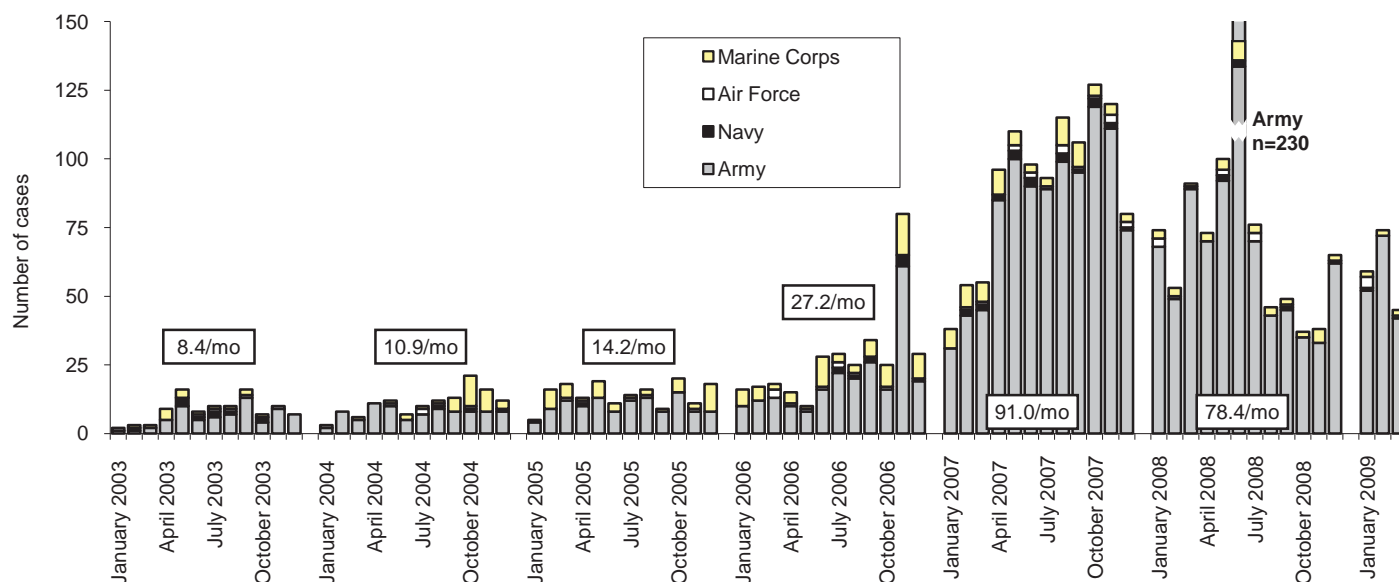
ARD rate  $\geq 1.5$  or SASI  $\geq 25.0$  for 2 consecutive weeks are surveillance indicators of epidemics

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

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



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



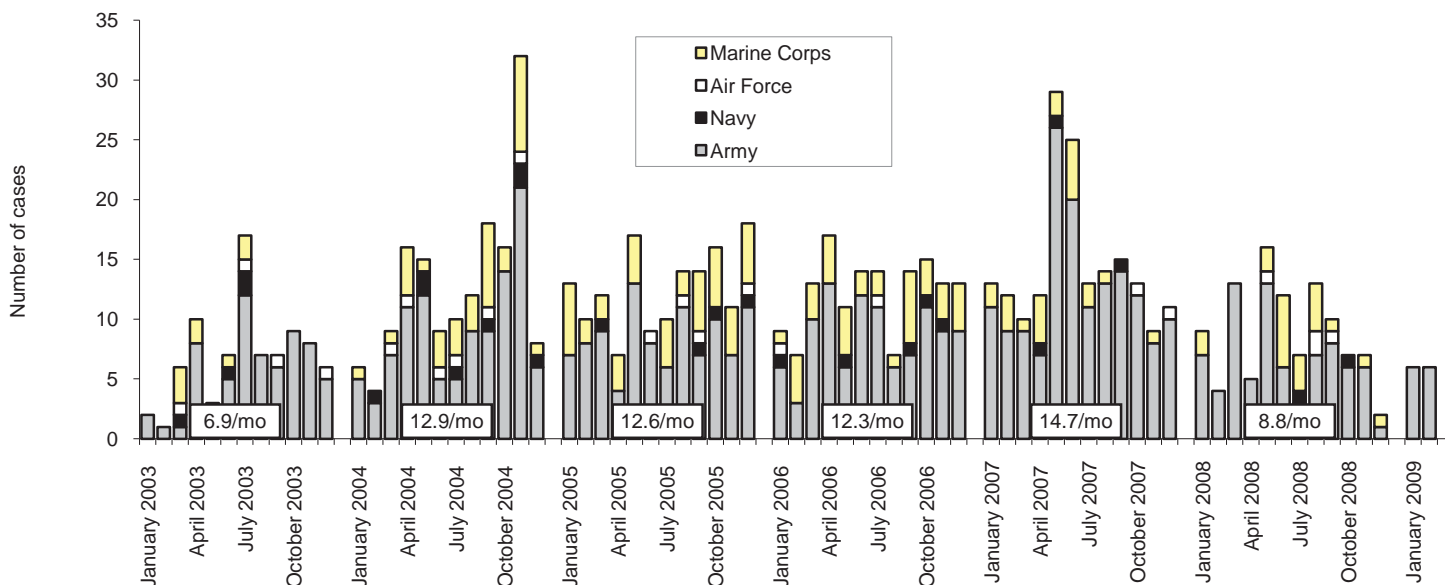
Reference: Armed Forces Health Surveillance Center. Frequencies, rates and trends of use of diagnostic codes indicative of traumatic brain injury (TBI), July 1999-June 2008. *MSMR*. Dec 2008; 15(10):2-9.

\*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 (one case per individual) while deployed to/within 30 days of returning from OEF/OIF.

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

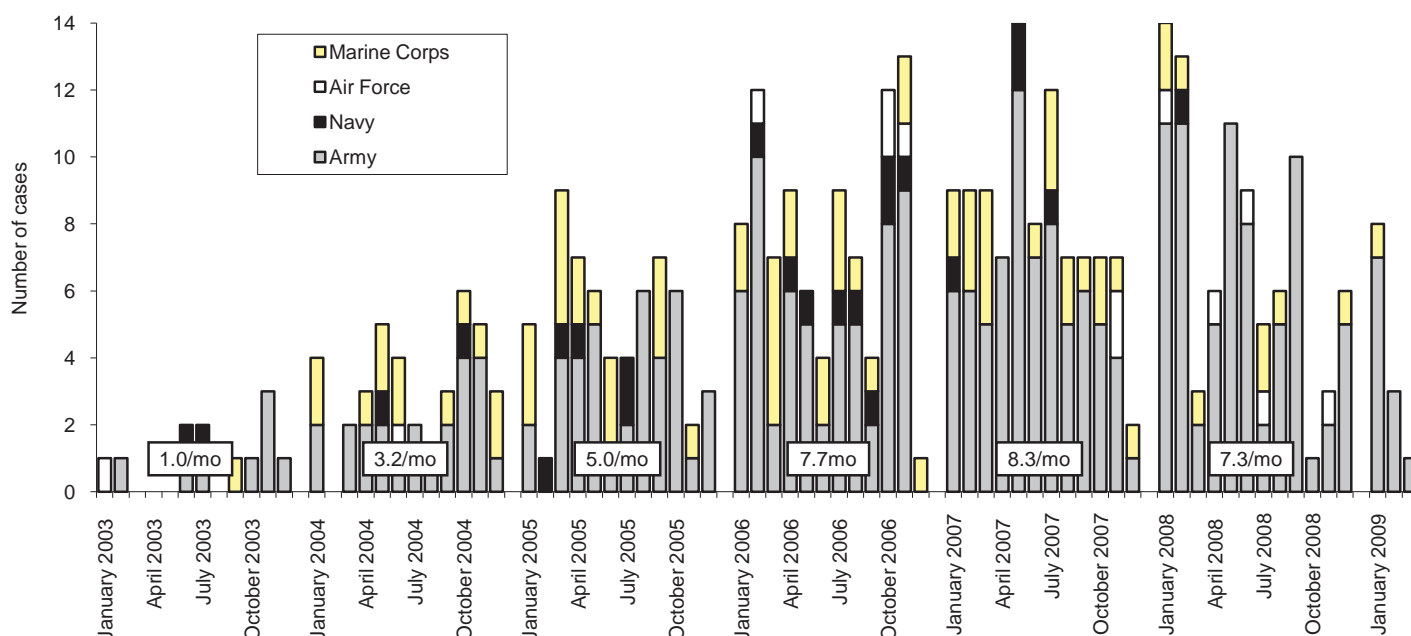
Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)\*



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

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

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

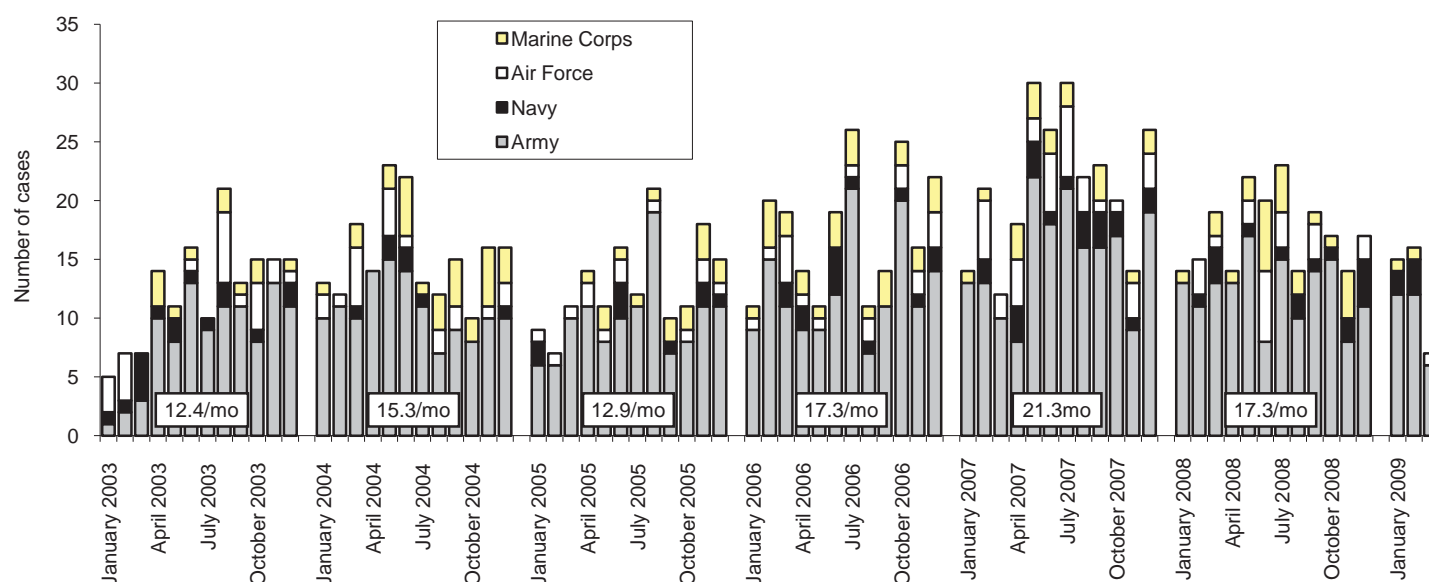


Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. *MSMR*. Aug 2007; 14(5):7-9.

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

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

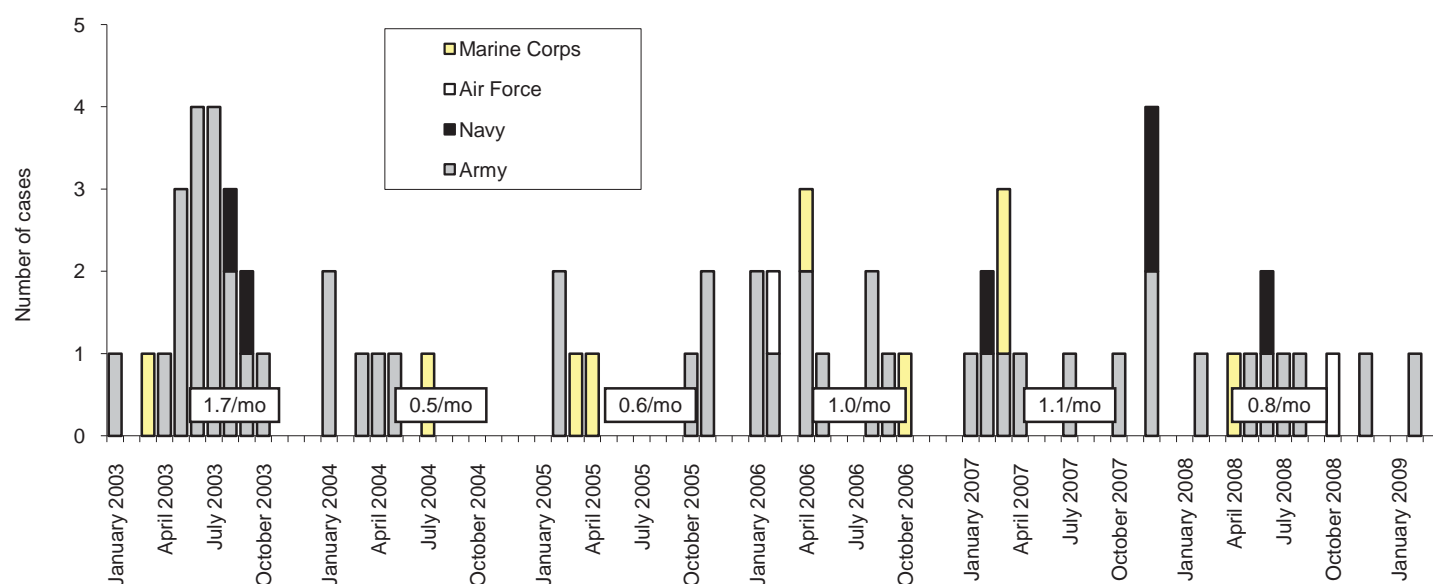
Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 - 453.42 and 453.8)\*



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.

\*One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from OEF/OIF.

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

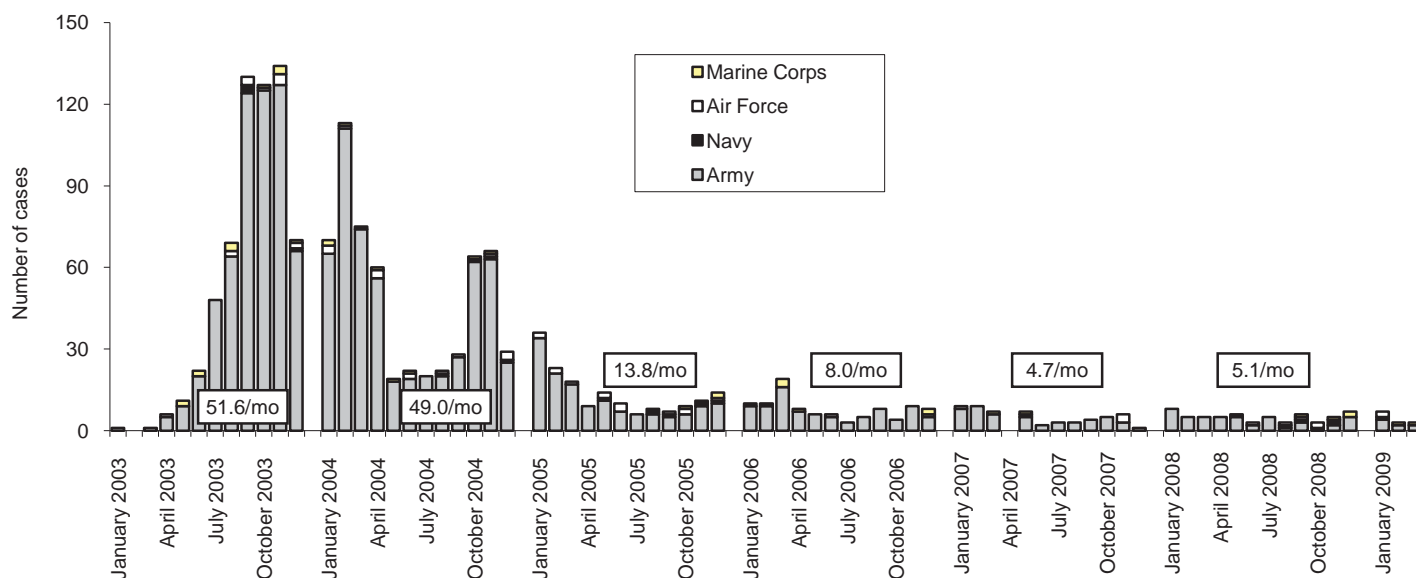


Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom, 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 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 - March 2009 (data as of 27 April 2009)

Leishmaniasis (ICD-9: 085.0 to 085.9)\*



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

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

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