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Mortality among Members of Active Components, U.S. Armed Forces, 2004

Individuals in active military service are young adults who volunteer to serve in occupations that are physically rigorous and sometimes dangerous. In addition, all active servicemembers must pass medical examinations prior to entering service and periodically during service. Because of self and institutional selection factors such as these, members of the U.S. military tend to be healthier than the general population of young adults. In turn, morbidity and mortality from medical (particularly chronic and debilitating) conditions are likely to be lower in military than general U.S. populations.

Not surprisingly, injuries from accidental (e.g., vehicle/aircraft crashes; sports/other recreational, industrial, military training activities) and intentional (e.g., assaults/homicides, suicides, hostile actions, terrorism) traumas are leading causes of morbidity and mortality among military members.[1-5] Recent public health/force health protection initiatives have focused on reducing suicides and military training-related injuries and deaths.[3,6] Also, improvements in protective equipment and procedures and in battlefield casualty care, evacuation, and treatment have reduced deaths from severe traumatic injuries that occur during combat operations.[7,8]

In this report, we summarize deaths (and their general causes) among members of active components of the U.S. Armed Forces during calendar year 2004. In addition, we summarize demographic and military characteristics of servicemembers who died in active service and assess trends in mortality since 1995.

Methods: Records of deaths of U.S. servicemembers are routinely provided by the Medical Examiners Office of the Armed Forces Institute of Pathology to the Army Medical Surveillance Activity for integration in the Defense Medical Surveillance System (DMSS). For this analysis, records of the DMSS were searched to identify all deaths of members of active components of the U.S. Armed Forces from 1 January 1995 through 31 December 2004. Demographic and military characteristics of deceased servicemembers were based on contemporaneous personnel records maintained in the DMSS.

Results: In 2004, there were more deaths (n=1,482) of members of active components of the U.S. Armed Forces than in any other year since 1995. The crude mortality rate in 2004 was 104.8 per 100,000 person-years (p-yrs), approximately 69% higher than the overall crude rate during the combined other years of the period.

In the Army and Marine Corps, there were more deaths in 2004 than in any other year of the period (Figure 1). In contrast, in the Air Force and Navy, there were fewer deaths in 2004 than in any year since 2000 and 2001, respectively (Figure 1).

In 2004, approximately 40% of all deaths were due to "hostile action/terrorism"—nearly all (98%) among members of the Army and Marine Corps (Figure 1)—and approximately one-third were due to "accidents." Pending final dispositions of 32 deaths with "unknown/pending" causes, in 2004, the mortality rate due to illnesses was lower than in any year since 1997; and there were fewer deaths from "homicides" and "accidents" than in any year since 2000 and 2001, respectively (Figure 2).

During the 10-year surveillance period, the highest subgroup-specific mortality rates (all causes) were among servicemembers who were in combat occupations (101.6 per 100,000 p-yrs), Marines (96.1 per 100,000 p-yrs), single, never married (80.5 per 100,000 p-yrs), and 20-24 years old (79.4 per 100,000 p-yrs) (Table 1). During the period, the leading general cause of deaths by far was "accidents"; and the highest accident-related mortality rates were among servicemembers who were Marines, in combat occupations, younger than 25 years old, and single never married (Table 1).

Finally, relative to their respective counterparts, the highest mortality rates by specific cause were among servicemembers older than 39 years (due to illnesses), single, previously married (due to suicides), and Black, non-Hispanic (due to homicides) (Table 1).

Editorial comment: The relatively high overall mortality rate in 2004 was almost entirely attributable to combat-related deaths among soldiers and Marines. During the year, mortality rates among members of the Navy and Air Force were relatively low (Figure 2), and compared to recent years, there were relatively few deaths among U.S. servicemembers from accidents, illnesses, and homicides. Finally, the overall mortality in 2004 (104.8 per 100,000 p-yrs) was approximately 20% lower than the crude rate among similarly aged members of the general U.S. population (based on 2002 national data).[9]

Analysis by Jackson Gustave, MPH, Analysis Group, Army Medical Surveillance Activity.

References

1. Smith TA, Cashman TM. The incidence of injury in light infantry soldiers. *Mil Med.* 2002 Feb;167(2):104-8.
2. Bell NS, Amoroso PJ, Yore MM, Smith GS, Jones BH. Self-reported risk-taking behaviors and hospitalization for motor vehicle injury among active duty army personnel. *Am J Prev Med*. 2000 Apr;18(3 Suppl):85-95.
3. Jones BH, Knapik JJ. Physical training and exercise-related injuries. Surveillance, research and injury prevention in military populations. *Sports Med.* 1999 Feb;27(2):111-25.
4. Ritchie EC, Keppler WC, Rothberg JM. Suicidal admissions in the United States military. *Mil Med.* 2003 Mar;168(3):177-81.
5. Powell KE, Fingerhut LA, Branche CM, Perrotta DM. Deaths due to injury in the military. *Am J Prev Med.* 2000 Apr;18(3 Suppl):26-32.
6. Knox KL, Litts DA, Talcott GW, Feig JC, Caine ED. Risk of suicide and related adverse outcomes after exposure to a suicide prevention programme in the US Air Force: cohort study. *BMJ*. 2003 Dec 13;327(7428):1376.
7. Gawande A. Casualties of war—military care for the wounded from Iraq and Afghanistan. *N Engl J Med.* 2004 Dec 9;351(24):2471-5.
8. Peake JB. Beyond the purple heart—continuity of care for the wounded in Iraq. *N Engl J Med*. 2005 Jan 20;352(3):219-22.
9. Kochanek KD, Smith BL. Deaths: preliminary data for 2002. National Vital Statistics Report, 52:13(February 11), 2004, 7.

Figure 1. Deaths of members of active components, US Armed Forces, by cause, 1995-2004

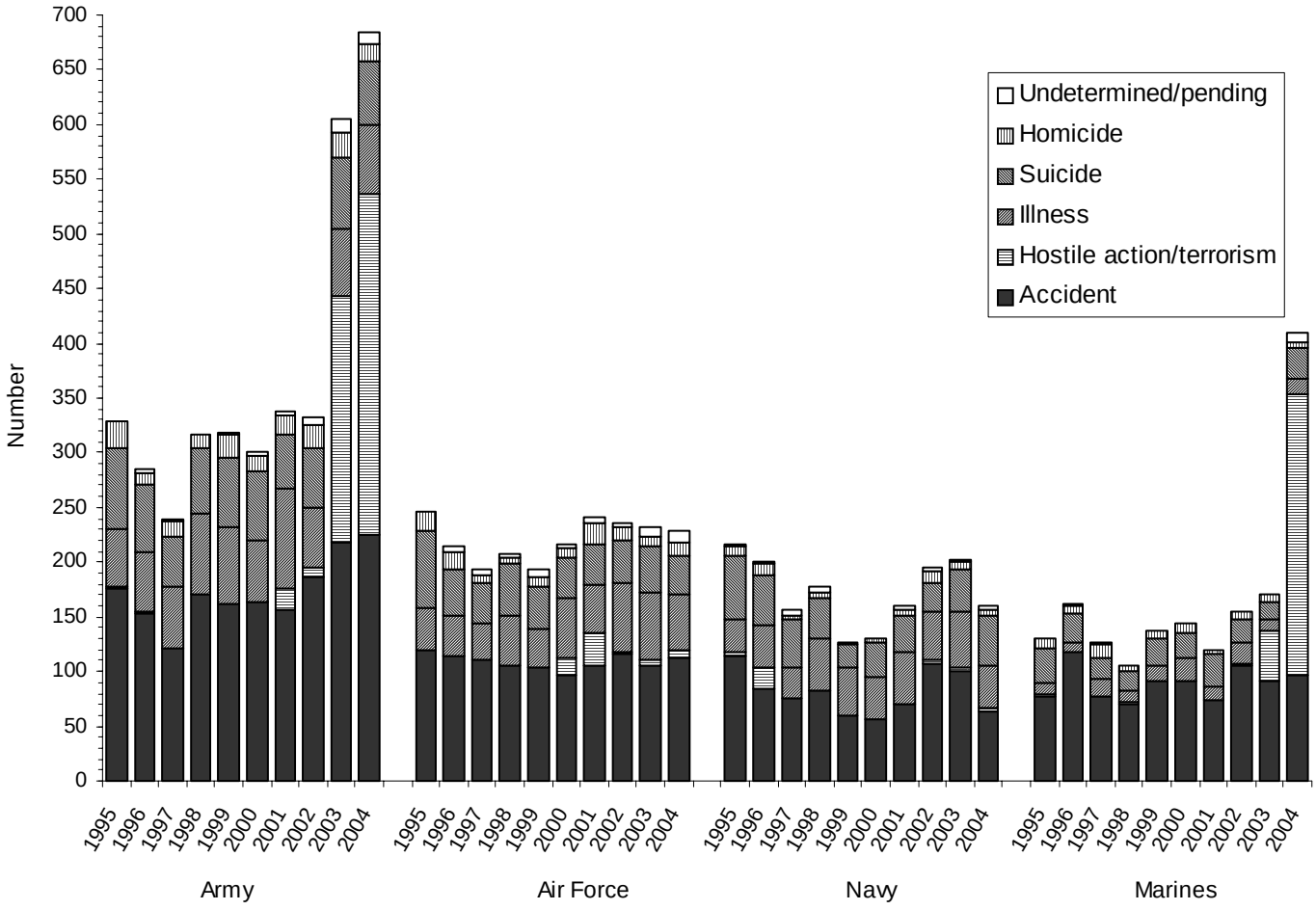
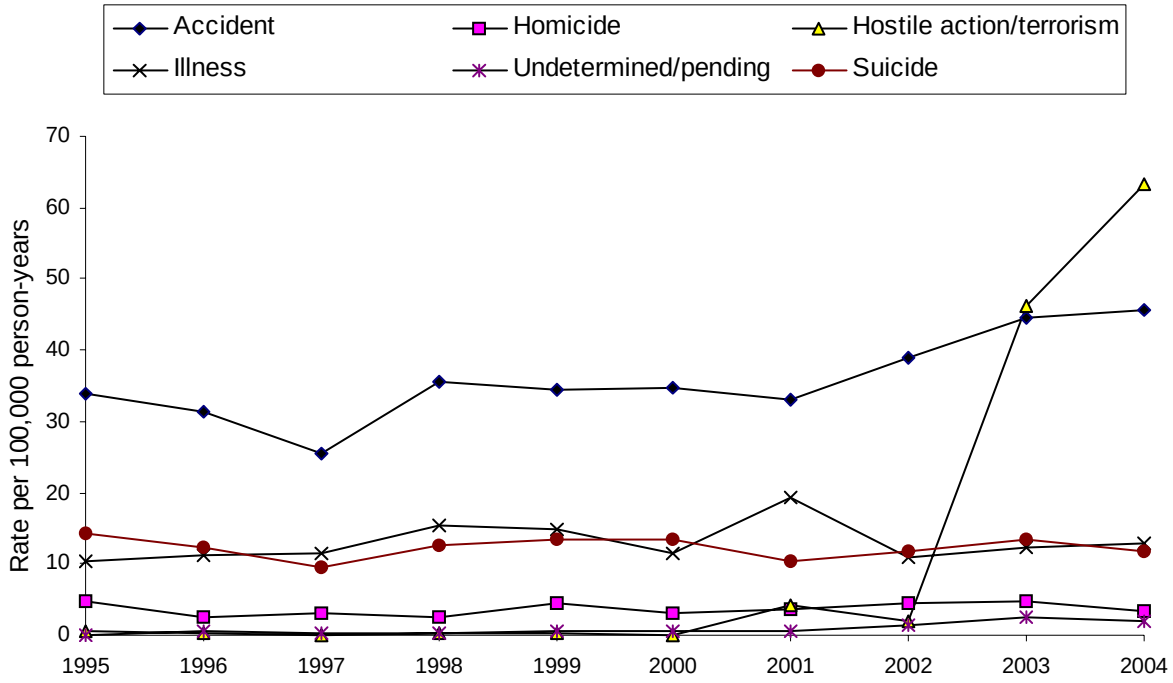


Figure 2. Mortality rate by cause, year and service, active duty military, 1995-2004.

a. Army



b. Navy

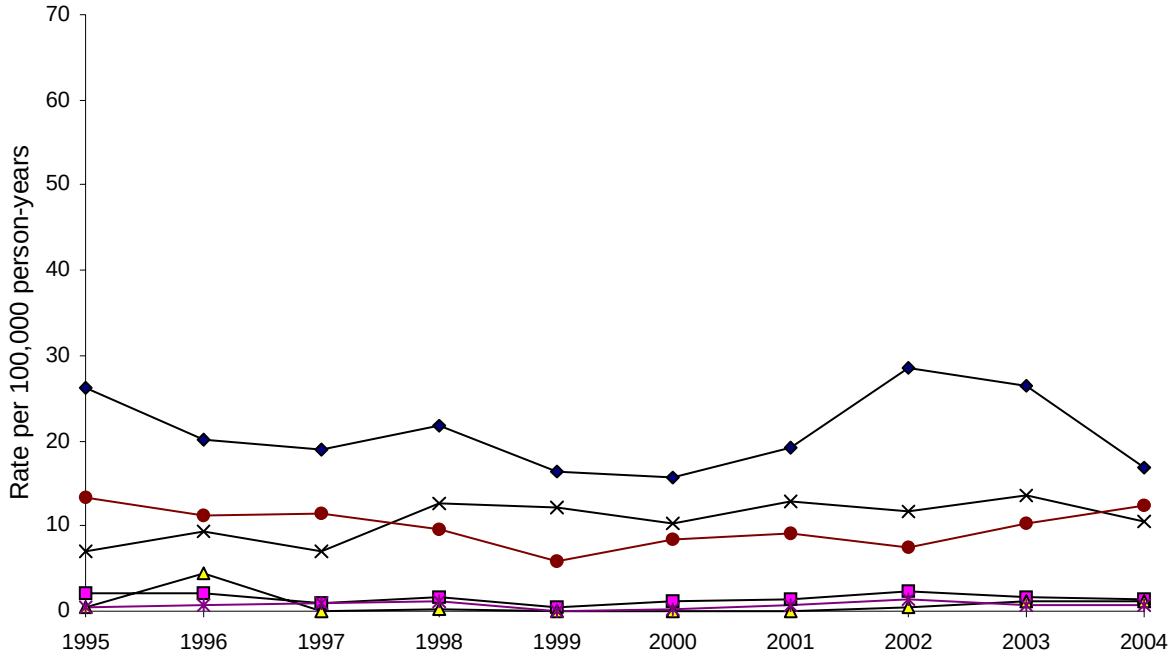
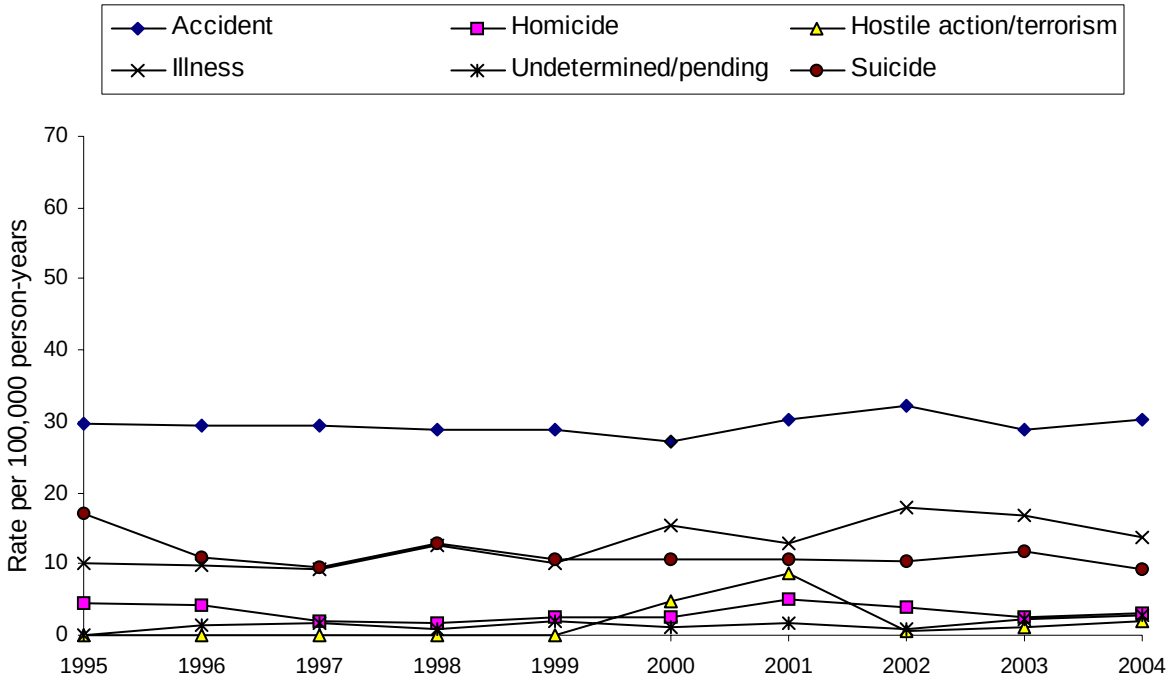
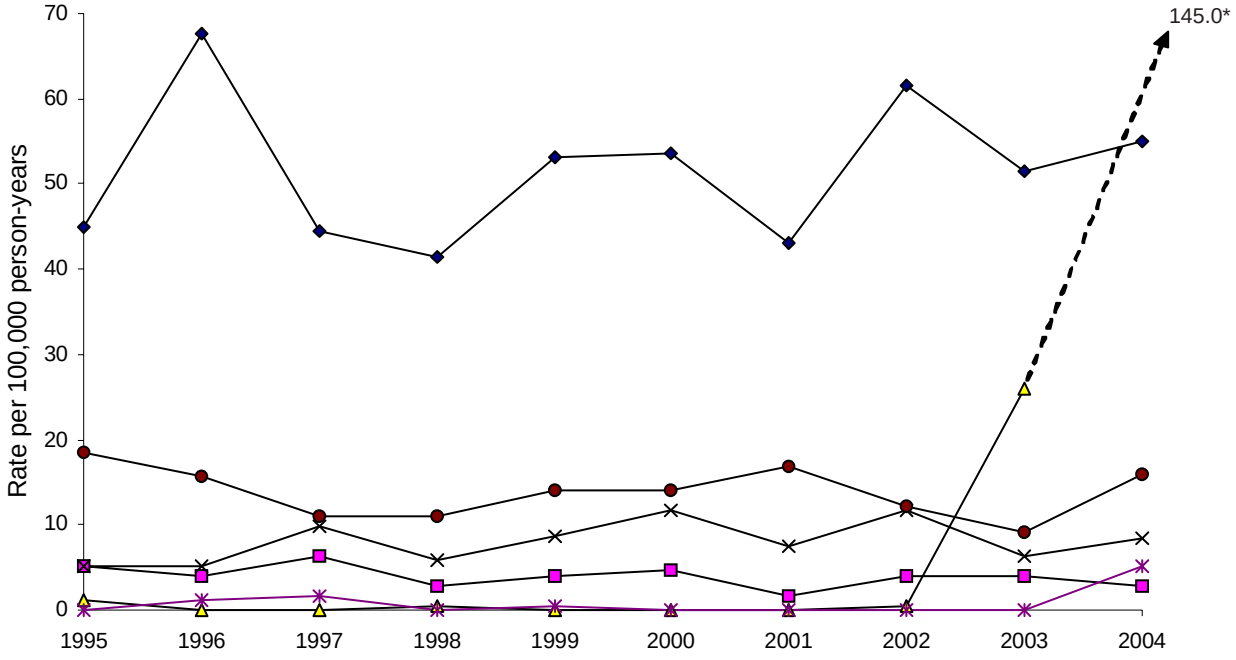


Figure 2 (continued). Mortality rate by cause, year and service, active duty military, 1995-2004.

c. Air Force



d. Marines*



* Note: The rate for hostile action/terrorism in 2004 is not shown to scale.

Table 1. Mortality among members of active components, U.S. Armed Forces, by demographic and military characteristics, by general cause and overall, 1995-2004

	Overall		Accident		Illness		Suicide		Homicide		Hostile action/ terrorism		Undetermined/ pending	
	#	Rate*	#	Rate*	#	Rate*	#	Rate*	#	Rate*	#	Rate*	#	Rate*
Total	9,346	66.2	4,527	32.1	1,648	11.7	1,642	11.6	422	3.0	970	6.9	137	1.0
Gender														
Male	8,679	71.7	4,235	35.0	1,474	12.2	1,565	12.9	343	2.8	939	7.8	123	1.0
Female	663	33.3	290	14.5	174	8.7	77	3.9	79	4.0	29	1.5	14	0.7
Age group														
< 20	848	73.7	511	44.4	65	5.6	145	12.6	45	3.9	74	6.4	8	0.7
20-24	3,577	79.4	2,037	45.2	248	5.5	571	12.7	195	4.3	467	10.4	59	1.3
25-29	1,687	58.3	862	19.1	183	6.3	343	11.9	81	2.8	197	6.8	21	0.7
30-34	1,134	50.6	521	18.0	188	8.4	239	10.7	48	2.1	120	5.4	18	0.8
35-39	1,077	54.9	386	17.2	359	18.3	211	10.8	33	1.7	69	3.5	19	1.0
40+	1,023	75.3	210	10.7	605	44.5	133	9.8	20	1.5	43	3.2	12	0.9
Race ethnic														
White non-Hisp	5,915	67.8	2,932	33.6	903	10.4	1,149	13.2	171	2.0	665	7.6	95	1.1
Black non-Hisp	1,787	65.7	795	29.2	464	17.0	218	8.0	182	6.7	108	4.0	20	0.7
Hispanic	1,050	70.6	541	36.4	172	11.6	164	11.0	46	3.1	112	7.5	15	1.0
Other	540	68.3	243	30.7	98	12.4	100	12.7	23	2.9	69	8.7	7	0.9
Marital status														
Never mar'd	4,627	80.5	2,565	44.6	469	8.2	748	13.0	224	3.9	538	9.4	83	1.4
Married	4,312	55.0	1,795	22.9	1,072	13.7	807	10.3	183	2.3	404	5.2	51	0.7
Previous mar'd	392	78.4	158	31.6	106	21.2	85	17.0	15	3.0	25	5.0	3	0.6
Service														
Army	3,747	77.4	1,731	35.7	629	13.0	597	12.3	176	3.6	572	11.8	42	0.9
Navy	2,209	57.4	1,087	28.2	471	12.2	421	10.9	118	3.1	60	1.6	52	1.4
Air Force	1,728	46.9	815	22.1	409	11.1	385	10.4	59	1.6	32	0.9	28	0.8
Marines	1,662	96.1	894	51.7	139	8.0	239	13.8	69	4.0	306	17.7	15	0.9
Military status														
Enlisted	8,126	68.5	3,912	33.0	1,342	11.3	1,497	12.6	401	3.4	848	7.2	126	1.1
Officer	1,220	54.2	615	27.3	306	13.6	145	6.4	21	0.9	122	5.4	11	0.5
Military occupation														
Combat	2,902	101.6	1,422	49.8	304	10.6	384	13.4	114	4.0	645	22.6	33	1.2
Healthcare	544	45.5	209	17.5	154	12.9	124	10.4	24	2.0	21	1.8	12	1.0
Other	5,900	58.67	2,896	28.8	1,190	11.8	1,134	11.3	284	2.8	304	3.0	92	0.9

* Rates expressed as deaths per 100,000 person-years

Vaccine Preventable Diseases, Active Components, US Armed Forces, 1998-2004

All enlisted accessions to the US military are immunized against influenza, measles, rubella, polio, tetanus, diphtheria, and meningococci (serogroups A, C, Y, and W135).[1] Since 1999 and 2002, respectively, vaccinations against varicella and hepatitis B have been required of all recruits who lack evidence of immunity.[2,3] (Of note, adenovirus, types 4 and 7, vaccines were routinely administered to Army, Navy, and Marine Corps recruits until production of the vaccines ceased in 1996 [remaining stocks of the vaccines were depleted in 1999]).[4]

During service, all servicemembers receive annual immunizations against influenza and periodic boosters to maintain immunity against tetanus.[1] In addition, in April 1995, the Department of Defense began a phased program to achieve immunity of all servicemembers against hepatitis A.[5,6] Finally, immunizations are given to servicemembers prior to anticipated high risk exposures (e.g., yellow fever, Japanese encephalitis).[1]

This report updates estimates of frequencies, incidence rates, and trends of 16 vaccine-preventable diseases among active component US military personnel from 1998 to 2004. In addition, it summarizes military and demographic characteristics of servicemembers who were diagnosed with selected vaccine preventable diseases during the surveillance period.

Methods: The Defense Medical Surveillance System (DMSS) was searched to identify the first episode per U.S. servicemember of clinical diagnoses of selected vaccine preventable diseases between 1 January 1998 and 31 December 2004.

For this summary, we used different criteria to define cases of various diseases based on likelihoods that "true" cases would be hospitalized. Cases of meningococcal disease (ICD-9-CM: 036.0, 036.1, 036.2, 036.9), tetanus (ICD-9-CM: 037), poliomyelitis (ICD-9-CM: 045), diphtheria (ICD-9-CM: 032), yellow fever, and Japanese encephalitis were defined by primary (first listed) diagnoses from hospitalizations or reports of notifiable medical events with condition-specific ICD-9-CM codes. Cases of varicella (ICD-9-CM: 052), pertussis (ICD-9-CM: 033), measles (ICD-9-CM: 055), mumps (ICD-9-CM: 072), rubella (ICD-9-CM: 056), influenza (ICD-9-CM: 487), hepatitis B (ICD-9-CM: 070.2, 070.3), and hepatitis A (ICD-9-CM: 070.0, 070.1) were defined by primary (first listed) diagnoses during hospitalizations or ambulatory visits or reports of notifiable medical events. Demographic and military characteristics of cases at times of diagnoses were estimated from personnel records maintained in the DMSS.

Results: In 2004, the most common vaccine preventable diseases among U.S. servicemembers were influenza, varicella, and hepatitis B (Tables 1, 2). Of note, there were fewer diagnoses of each of these diseases in 2004 than in any other year of the surveillance period.

Findings related to specific vaccine preventable diseases include:

Influenza: During the period, annual diagnoses of influenza increased to a peak in 2000 and then declined to a lower, relatively unstable baseline. Of note, the peak in influenza in 2000 was largely attributable to a spike in diagnoses in the Air Force (Table 1). For the entire period, the highest subgroup-specific rates of influenza were among Marines, females, and teen-aged servicemembers (Table 3).

Varicella: During the period, annual diagnoses of varicella declined by approximately 75% in each service and overall (Table 1). During the period, the highest subgroup-specific rates of varicella were among Marines and Asians/Pacific Islanders (Table 3).

Hepatitis B: In general, there were significantly fewer diagnoses of hepatitis B during the last two years of the period compared to prior years (Table 1). Of note, during the period, diagnoses of hepatitis B sharply declined in the Army but increased in the other services (Table 1). For the entire period, the highest subgroup-specific rates of hepatitis B were among servicemembers who were Asians/

Pacific Islanders and "other" race/ethnicities (Table 3).

Pertussis: Overall, pertussis diagnoses increased more than 9-fold from the first to the last year of the period (Table 1). Diagnoses of pertussis tended to increase in each of the services with particularly sharp spike in diagnoses in the Air Force in 2004 (Table 1). For the entire period, the highest subgroup-specific rates of pertussis were among servicemembers who were Marines, younger than 20 years old, and "other" race/ethnicities (Table 3).

Hepatitis A: Overall, diagnoses of hepatitis A declined during the period (Table 1). However, in the Air Force and Marines, diagnoses sharply declined after 1998; in the Army, there was a sharp decline beginning in 2001; and in the Navy, there were no clear temporal trends (Table 1). For the entire period, the highest subgroup-specific rates of hepatitis A were among servicemembers who were Asians/Pacific Islanders (Table 3).

Mumps: Overall, diagnoses of mumps generally increased during the early years of the period and then declined in later years (Table 1). During the period, the highest subgroup-specific rates of mumps were among servicemembers older than 40 years (Table 3).

Measles, rubella: There were not more than 8 diagnoses in any year of measles or rubella (Table 1). There were no subgroups with particularly high rates and no clear temporal trends (Table 3).

Meningococcal disease: During the period, there were between four (in 2004) and 14 hospitalizations per year for meningococcal disease (Table 2). There were no subgroups with particularly high rates and no clear temporal trends.

Tetanus, yellow fever, diphtheria, poliomyelitis, Japanese encephalitis: During the period, there were sporadic hospitalizations for tetanus (n=3) and yellow fever (n=2), and no hospitalizations for diphtheria, poliomyelitis, or Japanese encephalitis (Table 2).

Editorial comment: For this report, cases of vaccine preventable diseases were ascertained from first-listed diagnoses during hospitalizations and, in some cases, ambulatory visits. In addition, cases were ascertained from reports of notifiable medical events.

Vaccine preventable illnesses that were not diagnosed etiologically (e.g., influenza) and/or were reported by their clinical manifestations rather than their infectious etiologies (e.g., pneumonia) were not ascertained and thus are not included in this summary. In addition, to increase the specificity of surveillance case definitions for some diseases, cases diagnosed exclusively in outpatient settings (if they were not also reported as notifiable medical events) were not included.

Because some vaccine preventable diseases were not ascertained, the numbers reported here may underestimate the actual numbers of vaccine-preventable illnesses that occurred among servicemembers during the period. On the other hand, some reports of vaccine preventable illnesses (particularly those documented on ambulatory visit records only) may reflect clinical assessments without laboratory confirmations. Also, in the past, immunizations against infectious diseases have occasionally been miscoded on ambulatory records as the diseases themselves. Thus, some cases included in this summary may represent "false positive" reports.

Finally, in recent years, the military health system has increased its capabilities to identify etiologies of influenza-like and other acute febrile illnesses.[7] In turn, trends in the numbers and rates of influenza and other vaccine preventable illnesses may reflect, at least in part, improvements in the characterization and reporting of such cases. Thus, assessments of temporal trends of specific conditions should consider potential changes in case ascertainment and reporting.

With these caveats in mind, several general findings from this summary are noteworthy:

First, in 2004, there were fewer cases of each of the most common vaccine preventable diseases among servicemembers – influenza, varicella, hepatitis B – than in any other year of the surveillance period.

Second, the relatively few cases of varicella in 2004 continued the persistent decline in varicella since 1999 (the year when mandatory vaccination of nonimmune recruits began).

Third, in recent years, diagnoses of pertussis among U.S. servicemembers generally increased; and in 2004, there were many more diagnoses of pertussis – particularly in the Air Force – than in any other year of the surveillance period. The finding is consistent with the increasing trend since the early 1990s of reported cases of pertussis in the U.S. overall.[7-11] Because immunity to pertussis wanes over

time, most servicemembers – regardless of their vaccination histories – are immunologically susceptible to pertussis when they enter military service. The recent licensures of acellular pertussis vaccines for use among adolescents and adults provide new opportunities to prevent pertussis among servicemembers and transmissions of *B. pertussis* from servicemembers to their infant children.[8-11]

Fourth, in 2004, there were fewer cases of meningococcal disease than in any other year of the surveillance period (Table 2). Of note, because all recruits are immunized against serogroups A, C, Y, and W135 of *N. meningitidis*, it is likely that most cases of meningococcal disease that occur among servicemembers are caused by serogroup B strains (and thus are not vaccine preventable).[12]

Fifth, trends of hepatitis A and hepatitis B varied among the services. For example, during the surveillance period, cases of hepatitis A and hepatitis B sharply declined in the Army; but were stable or slightly increased, respectively, in the Navy. The differences may be related, at least in part, to differences among the services in case ascertainment and/or centralized reporting.

Finally, for many years, infants and children in the United States have been immunized routinely against diphtheria, tetanus, poliomyelitis, measles, mumps, and rubella. Because of current high levels of immunity among U.S. residents and aggressive public health responses to imported cases, these diseases are no longer endemic in the U.S.[13,14] Not surprisingly, there continue to be few or no cases of these diseases among universally vaccinated U.S. servicemembers.

Analysis by Jenny C. Lay, MPH, Analysis Group, Army Medical Surveillance Activity.

References

1. AFJI 48-110, AR 40-562, BUMEDINST 6230.15, CG COMDTINST M6230.4E, subject: Immunizations and chemoprophylaxis. Secretaries of the Air Force, Army, Navy, and Transportation. 1 November 1995.

2. Memorandum, subject: Policy for the use of varicella (chickenpox) vaccine (HA policy: 99-034). Assistant Secretary of Defense, Washington DC, 22 November 1999.

3. Memorandum, subject: Vaccination of new recruits against hepatitis B (HA policy: 02-010). Assistant Secretary of Defense, Washington DC, 29 April 2002.

4. Committee on a strategy for minimizing the impact of naturally occurring infectious diseases of military importance: vaccine issues in the U.S. military. Urgent attention needed to restore lapsed adenovirus vaccine availability: a letter report. Medical Follow-up Agency, Institute of Medicine, Washington, DC. November 6, 2000.

5. Memorandum, subject: Recommendations regarding the use of the newly licensed hepatitis A vaccine in military personnel (HA policy: 95-004). Assistant Secretary of Defense, Washington DC, 19 April 1995.

6. Memorandum, subject: Policy for use of hepatitis A virus (HAV) vaccine and immunoglobulin (IG) (HA policy: 96-054). Assistant Secretary of Defense, Washington DC, 12 August 1996.

7. Centers for Disease Control and Prevention. Summary of notifiable diseases, United States-2002. MMWR 2004 Apr 30;51(53);55.

8. Scott PT, Clark JB, Miser WF. Pertussis: an update on primary prevention and outbreak control. Am Fam Physician. 1997 Sep 15;56(4):1121-8.

9. Orenstein WA. Pertussis in adults: epidemiology, signs, symptoms, and implications for vaccination. Clin Infect Dis. 1999 Jun;28 Suppl 2:S147-50.

10.Gardner P. Indications for acellular pertussis vaccines in adults: the case for selective, rather than universal, recommendations. Clin Infect Dis. 1999 Jun;28 Suppl 2:S131-5.

11. Keitel WA. Cellular and acellular pertussis vaccines in adults. Clin Infect Dis. 1999 Jun;28 Suppl 2:S118-23.

12. Brundage JF, Ryan MA, Feighner BH, Erdtmann FJ Meningococcal disease among United States military service members in relation to routine uses of vaccines with different serogroup-specific components, 1964-1998. *Clin Infect Dis* 2002 Dec1;35(11):1376-81.

13. Centers for Disease Control and Prevention. Measles, mumps, and rubella — vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep.* 1998 (May 22); 47(RR-8):1-57.

14. Centers for Disease Control and Prevention. Measles outbreak among internationally adopted children arriving in the United States, February—March 2001. *MMWR*. 2002 (December 13);51(49):1115-1116.

Table 1. Cases of selected vaccine preventable diseases among members of active components, U.S. Armed Forces, by year, 1998-2004

	1998	1999	2000	2001	2002	2003	2004	Total
Army								
Pertussis	3	2	13	13	22	11	25	89
Varicella	569	432	376	241	158	209	133	2,118
Measles	4	1	4	4	1	1	0	15
Rubella	3	1	2	1	1	0	0	8
Mumps	4	9	13	10	17	11	11	75
Viral hepatitis A w/o mention of hepatic coma	55	60	43	70	10	19	16	273
Viral hepatitis B w/o mention of hepatic coma	322	289	144	151	120	87	110	1,223
Influenza	2,066	3,839	3,771	2,449	2,030	3,043	1,303	18,501
Navy								
Pertussis	1	1	5	8	5	13	9	42
Varicella	295	220	173	122	92	98	75	1,075
Measles	2	2	0	0	1	0	1	6
Rubella	1	0	0	3	0	0	0	4
Mumps	10	8	9	8	6	6	9	56
Viral hepatitis A w/o mention of hepatic coma	13	13	13	12	15	10	21	97
Viral hepatitis B w/o mention of hepatic coma	55	61	62	69	77	74	79	477
Influenza	1,559	1,045	1,083	983	1,085	1,575	566	7,896
Air Force								
Pertussis	3	3	16	17	13	10	35	97
Varicella	273	191	192	125	92	95	78	1,046
Measles	2	2	1	1	0	2	1	9
Rubella	4	2	0	0	0	7	0	13
Mumps	4	4	5	14	9	6	3	45
Viral hepatitis A w/o mention of hepatic coma	40	5	9	12	15	11	11	103
Viral hepatitis B w/o mention of hepatic coma	52	58	89	52	88	81	64	484
Influenza	1,634	4,536	8,816	3,294	1,451	2,191	999	22,921
Marines								
Pertussis	1	1	3	6	4	5	2	22
Varicella	103	75	82	62	27	39	23	411
Measles	0	1	1	0	3	0	0	5
Rubella	0	0	0	0	2	0	1	3
Mumps	3	3	2	3	3	1	1	16
Viral hepatitis A w/o mention of hepatic coma	20	1	6	3	6	5	2	43
Viral hepatitis B w/o mention of hepatic coma	24	28	24	142	134	49	34	435
Influenza	316	523	516	667	434	713	226	3,395
All services								
Pertussis	8	7	37	44	44	39	71	250
Varicella	1,240	918	823	550	369	441	309	4,650
Measles	8	6	6	5	5	3	2	35
Rubella	8	3	2	4	3	7	1	28
Mumps	21	24	29	35	35	24	24	192
Viral hepatitis A w/o mention of hepatic coma	128	79	71	97	46	45	50	516
Viral hepatitis B w/o mention of hepatic coma	453	436	319	414	419	291	287	2,619
Influenza	5,575	9,943	14,186	7,393	5,000	7,522	3,094	52,713

Table 2. Cases of selected vaccine preventable diseases among members of active components, U.S. Armed Forces, by year, 1998-2004

	1998	1999	2000	2001	2002	2003	2004	Total
Army								
Meningococcal disease	2	5	6	3	2	1	1	20
Yellow fever	0	0	2	0	0	0	0	2
Tetanus	1	0	0	0	0	0	0	1
Viral hepatitis A with hepatic coma	0	0	0	0	1	0	0	1
Viral hepatitis B with hepatic coma	0	1	0	0	0	0	0	1
Diphtheria	0	0	0	0	0	0	0	0
Acute poliomyelitis	0	0	0	0	0	0	0	0
Japanese encephalitis	0	0	0	0	0	0	0	0
Navy								
Meningococcal disease	3	3	6	2	6	3	1	24
Yellow fever	0	0	0	0	0	0	0	0
Tetanus	0	0	1	0	0	0	0	1
Viral hepatitis A with hepatic coma	0	0	0	0	0	0	0	0
Viral hepatitis B with hepatic coma	0	0	0	0	0	1	0	1
Diphtheria	0	0	0	0	0	0	0	0
Acute poliomyelitis	0	0	0	0	0	0	0	0
Japanese encephalitis	0	0	0	0	0	0	0	0
Air Force								
Meningococcal disease	1	1	1	1	1	0	2	7
Yellow fever	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0	1	1
Viral hepatitis A with hepatic coma	0	0	0	0	0	0	0	0
Viral hepatitis B with hepatic coma	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0
Acute poliomyelitis	0	0	0	0	0	0	0	0
Japanese encephalitis	0	0	0	0	0	0	0	0
Marines								
Meningococcal disease	1	0	1	0	1	2	0	5
Yellow fever	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0	0	0
Viral hepatitis A with hepatic coma	1	1	0	0	0	0	0	2
Viral hepatitis B with hepatic coma	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0
Acute poliomyelitis	0	0	0	0	0	0	0	0
Japanese encephalitis	0	0	0	0	0	0	0	0
All services								
Meningococcal disease	7	9	14	6	10	6	4	56
Yellow fever	0	0	2	0	0	0	0	2
Tetanus	1	0	1	0	0	0	1	3
Viral hepatitis A with hepatic coma	1	1	0	0	1	0	0	3
Viral hepatitis B with hepatic coma	0	1	0	0	0	1	0	2
Diphtheria	0	0	0	0	0	0	0	0
Acute poliomyelitis	0	0	0	0	0	0	0	0
Japanese encephalitis	0	0	0	0	0	0	0	0

Table 3. Frequencies and rates[1] of selected vaccine preventable diseases, by demographic and military characteristics, active components, U.S. Armed Forces, 2004

	Influenza		Varicella		Hep B w/o coma		Pertussis		Hep A w/o coma		Mumps		Measles		Rubella	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	3,094	218.7	309	21.8	287	20.3	71	5.0	50	3.5	24	1.7	2	0.1	1	0.1
Gender																
Female	769	365.0	57	27.1	46	21.8	15	7.1	7	3.3	7	3.3	0	0.0	0	0.0
Male	2,325	193.1	252	20.9	241	20.0	56	4.7	43	3.6	17	1.4	2	0.2	1	0.1
Age group																
<20	382	344.2	22	19.8	20	18.0	13	11.7	5	4.5	3	2.7	0	0.0	0	0.0
20-24	1,068	219.0	76	15.6	88	18.0	23	4.7	18	3.7	8	1.6	1	0.2	0	0.0
25-29	683	235.4	71	24.5	55	19.0	8	2.8	5	1.7	5	1.7	0	0.0	0	0.0
30-34	418	206.7	63	31.2	49	24.2	8	4.0	5	2.5	1	0.5	0	0.0	1	0.5
35-39	308	176.5	53	30.4	28	16.0	9	5.2	6	3.4	0	0.0	0	0.0	0	0.0
40+	235	157.6	24	16.1	47	31.5	10	6.7	11	7.4	7	4.7	1	0.7	0	0.0
Race/ethnicity																
Asian/Pacific	142	225.4	26	41.3	82	130.2	2	3.2	7	11.1	0	0.0	0	0.0	0	0.0
Black	561	217.2	57	22.1	93	36.0	7	2.7	13	5.0	4	1.5	0	0.0	0	0.0
Hispanic	306	234.1	34	26.0	16	12.2	5	3.8	3	2.3	2	1.5	0	0.0	0	0.0
Am Indn/Ak n	39	170.3	2	8.7	3	13.1	1	4.4	1	4.4	0	0.0	0	0.0	0	0.0
Other	5	92.2	0	0.0	4	73.8	2	36.9	0	0.0	0	0.0	0	0.0	0	0.0
White	1,972	221.5	179	20.1	84	9.4	53	6.0	26	2.9	17	1.9	2	0.2	1	0.1
Unknown	69	156.5	11	24.9	5	11.3	1	2.3	0	0.0	1	2.3	0	0.0	0	0.0
Service																
Army	1,303	264.6	133	27.0	110	22.3	25	5.1	16	3.2	11	2.2	0	0.0	0	0.0
Air Force	566	151.3	75	20.0	79	21.1	9	2.4	21	5.6	9	2.4	1	0.3	0	0.0
Marine Corps	999	565.8	78	44.2	64	36.2	35	19.8	11	6.2	3	1.7	1	0.6	0	0.0
Navy	226	60.9	23	6.2	34	9.2	2	0.5	2	0.5	1	0.3	0	0.0	1	0.3

[1] All rates are expressed as cases per 100,000 person-years.

Pre- and Post-deployment Health Assessments, US Armed Forces, January 2003-June 2005

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

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

The overall success of deployment force health protection efforts depends at least in part on the completeness and quality of pre- and post-deployment health assessments. This report summarizes information related to pre- and post-deployment forms that were completed between 1 January 2003 and 30 June 2005. The report summarizes characteristics of servicemembers who completed forms, responses to selected questions prior to and after deployment service, and changes in responses of individuals from pre-to post-deployment.

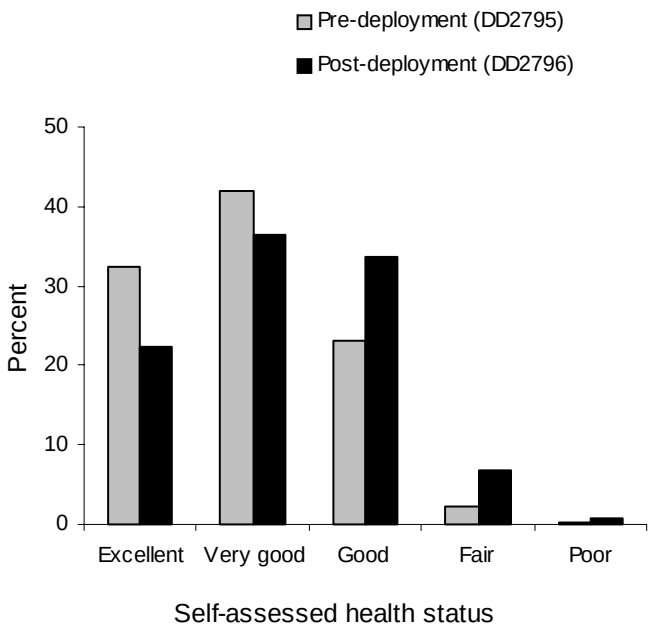
Methods. For this update, the period of interest was 1 January 2003 to 30 June 2005. The DMSS was searched to identify all pre-deployment (DD Form 2795) and post-deployment (DD Form 2796) health assessments that were completed during the period of interest.

Results. During the 30 month period, 973,084 pre-deployment health assessments and 953,124 post-deployment health assessments were completed at field sites, shipped to AMSA, and entered into the DMSS database (Table 1).

In general, respondents reported their overall health statuses as better on pre- than on post-deployment forms (Figure 1). On both sets of forms, the most frequent descriptor of overall health was "very good." However, relatively more pre- (32%) than post- (22%) deployment respondents assessed their overall health as "excellent," while relatively more post- (41%) than pre- (26%) deployment respondents assessed their overall health as "good," "fair," or "poor" (Figure 1).

Among servicemembers (n=474,686) who completed both pre- and post-deployment health assessments, nearly half (45%) chose the same

Figure 1. Percent distributions of self-assessed health status, pre- and post-deployment, US Armed Forces, January 2003- June 2005.



descriptor of their overall health before and after deploying (Figures 2, 3). Of those (n=196,833) who changed their assessments from pre- to post-deployment, approximately three-fourths (76%) changed by a single category (on a five category scale) (Figures 2,3). Of those who changed their assessments by more than one category, approximately 5-times more indicated a decrement (n=52,233; 11% of all respondents) than an improvement (n=10,445; 2% of all respondents) (Figure 3).

During post-deployment assessments, members of Reserve components were approximately twice as likely as active component members to report medical or dental problems that developed during deployment (Table 2). In general, medical/dental problems were more frequent among soldiers and Marines than members of the other Services (Table 2).

Approximately 4% and 6% of active and Reserve component members, respectively, sought or intended to seek counseling or care for mental health concerns. Mental health concerns were reported relatively more frequently among soldiers (active: 5%; Reserve: 6%) than members of the other Services (Table 2).

From 7% (active component, Navy) to 27% (active component, Army) of post-deployment forms documented that "referrals" were indicated (Table 2). More than 80% of servicemembers with indications for referrals had a hospitalization or ambulatory visit within six months of their post-deployment assessments (Table 2).

Approximately 12% of active and 23% of Reserve component members reported concerns about possible exposures or events during deployment that may affect their health (Table 2). Also, prevalences of exposure concerns increased monotonically with age—from 7.9% among <20 year olds to 22.3% among those 40 and older (Table 3). In each age group, exposure concerns were more prevalent among Reserve than active component members (Table 4). Soldiers and Marines were more likely to report concerns about deployment-related exposures than members of the other Services (Tables 2, 3). Females and officers were slightly more likely to report exposure concerns than their respective counterparts (Table 3). Finally, throughout the period, prevalences of exposure concerns were consistently higher among Reserve than active component redeployers (Figure 4).

Editorial comment. During the two and a half year period from January 2003 through June 2005, approximately three-fourths of U.S. servicemembers assessed their overall health as "very good" or "excellent" at the time they were mobilized and/or prior to deploying overseas. Relatively fewer (59%) servicemembers assessed their overall health as "very good" or "excellent" at the end of their overseas

Table 1. Total pre-deployment and post-deployment health assessments, by month and year, US Armed Forces, January 2003-June 2005

	Pre-deployment		Post-deployment	
	No.	%	No.	%
Total	**973,084**	**100.0**	**953,124**	**100.0**
2003				
January	69,060	7.1	5,970	0.6
February	109,840	11.3	4,708	0.5
March	69,708	7.2	6,319	0.7
April	37,440	3.8	19,217	2.0
May	12,814	1.3	90,327	9.5
June	14,387	1.5	65,103	6.8
July	17,900	1.8	52,063	5.5
August	16,154	1.7	34,843	3.7
September	12,571	1.3	32,054	3.4
October	23,951	2.5	26,252	2.8
November	19,404	2.0	20,345	2.1
December	35,710	3.7	21,027	2.2
2004				
January	67,324	6.9	39,011	4.1
February	39,033	4.0	32,033	3.4
March	22,705	2.3	65,871	6.9
April	19,644	2.0	43,772	4.6
May	27,517	2.8	17,601	1.8
June	24,285	2.5	27,898	2.9
July	22,428	2.3	24,012	2.5
August	33,862	3.5	22,519	2.4
September	31,527	3.2	23,811	2.5
October	34,834	3.6	15,437	1.6
November	33,758	3.5	21,395	2.2
December	36,853	3.8	26,535	2.8
2005				
January	33,004	3.4	50,049	5.3
February	22,812	2.3	64,939	6.8
March	19,737	2.0	50,374	5.3
April	25,959	2.7	18,003	1.9
May	16,976	1.7	17,257	1.8
June	21,887	2.2	14,379	1.5

Figure 2. Self-assessed health status on post-deployment form, in relation to self-assessed health status on pre-deployment form, US Armed Forces, January 2003- June 2005.

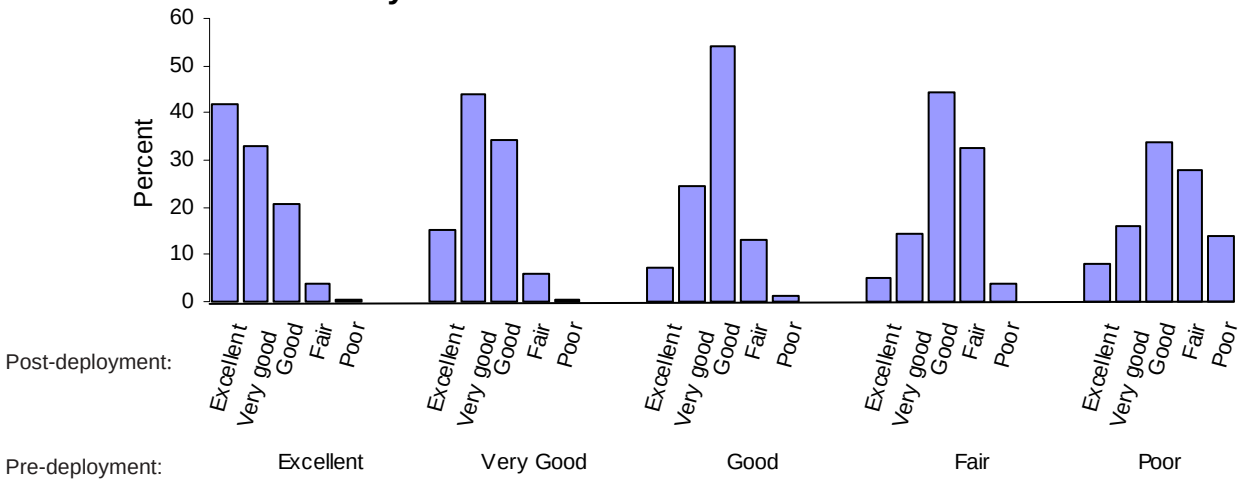


Table 2. Responses to selected questions from post-deployment forms (DD2796) by service and component, US Armed Forces, January 2003-June 2005

	Army	Navy	Air Force	Marines	Total
Active component					
SMs with DD 2796 at AMSA	**226,856**	**83,202**	**86,701**	**70,158**	**466,917**
Electronic version	69%	3%	58%	8%	48%
General health ("fair" or "poor")	9%	5%	2%	6%	6%
Medical/dental problems during deploy	29%	12%	11%	20%	21%
Currently on profile	10%	2%	2%	3%	6%
Mental health concerns	6%	2%	1%	2%	4%
Exposure concerns	18%	5%	5%	11%	12%
Health concerns	13%	6%	5%	8%	10%
Referral indicated	27%	7%	10%	14%	18%
Med. visit following referral[1]	97%	69%	89%	63%	85%
Post deployment serum[2]	94%	80%	78%	86%	88%
Reserve component					
SMs with DD 2796 at AMSA	**200,613**	**12,857**	**30,138**	**15,101**	**258,709**
Electronic version	65%	16%	39%	9%	57%
General health ("fair" or "poor")	11%	6%	2%	9%	10%
Medical/dental problems during deploy	44%	36%	16%	35%	39%
Currently on profile	15%	4%	2%	3%	12%
Mental health concerns	7%	3%	1%	3%	6%
Exposure concerns	25%	18%	9%	27%	23%
Health concerns	21%	21%	8%	23%	20%
Referral indicated	25%	19%	12%	25%	23%
Med. visit following referral[1]	87%	82%	59%	55%	82%
Post deployment serum[2]	93%	89%	63%	84%	89%

[1] Inpatient or outpatient visit within 6 months after referral.

[2] Only calculated for DD 2796 completed since 1 June 2003.

deployments. Most changes in assessments of overall health from pre- to post-deployment were relatively small (i.e., one category on a 5-category scale). However, more than 10% of all post-deployers indicated relatively significant declines (i.e., two or more categories) in assessments of their overall health from pre- to post-deployment.

The findings are not surprising considering the extreme physical and psychological stresses associated with mobilization, overseas deployment, and harsh and dangerous living and working conditions.[14,15] The deployment health assessment process is specifically designed to identify, assess, and follow-up as necessary all servicemembers with concerns regarding their health and/or deployment-related exposures. Overall, for example, approximately one-fifth of all post-deployers had "referral indications" documented on post-deployment health assessments; and of those with referral indications, most (range, by service and component: 55%-97%) had documented outpatient visits and/or hospitalizations within 6 months after they returned.

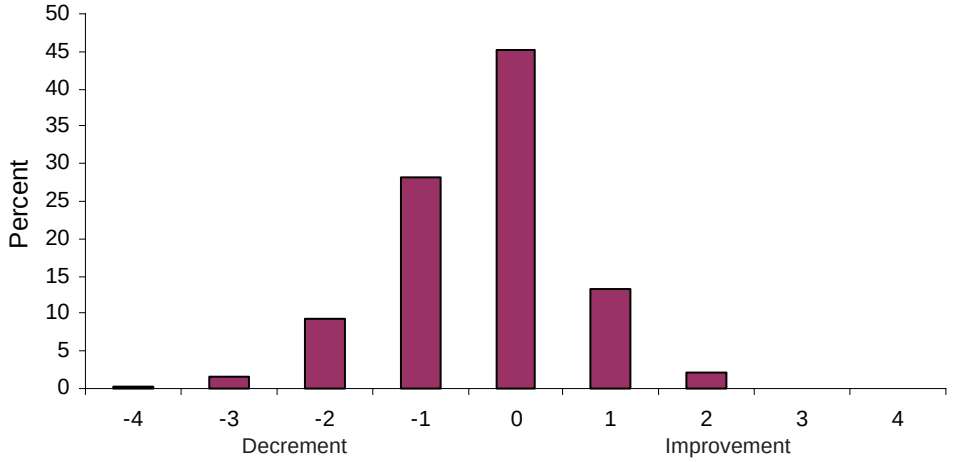
Overall, nearly one of every 6 servicemembers who completed post-deployment health assessments reported concerns about exposures or events during deployment that might have health effects. Of demographic factors, the strongest correlate of reporting an exposure concern was older age (Table 3). The higher crude prevalence of exposure concerns among officers versus enlisted may be related at least in part to differences in ages. Trends in the numbers and natures of deployment-related exposure concerns will be monitored as more servicemembers return from overseas assignments and/or demobilize.

Analysis by Jamease Kowalczyk, MPH, Analysis Group, Army Medical Surveillance Activity.

References

1. Medical readiness division, J-4, JCS. Capstone document: force health protection. Washington, DC. Available at: < http://www.dtic.mil/jcs/j4/organization/hssd/fhpcapstone.pdf >.
2. Brundage JF. Military preventive medicine and medical surveillance in the post-cold war era. *Mil Med*. 1998 May;163(5):272-7.
3. Trump DH, Mazzuchi JF, Riddle J, Hyams KC, Balough B. Force health protection: 10 years of lessons learned by the Department of Defense. *Mil Med.* 2002 Mar;167(3):179-85.
4. Hyams KC, Riddle J, Trump DH, Wallace MR. Protecting the health of United States military forces in Afghanistan: applying lessons learned since the Gulf War. *Clin Infect Dis.* 2002 Jun 15;34(Suppl 5):S208-14.
5. DoD instruction 6490.3, subject: Implementation and application of joint medical surveillance for deployments. 7 Aug 1997.
6. 10 USC 1074f, subject: Medical tracking system for members deployed overseas. 18 Nov 1997.
7. ASD (Health Affairs) memorandum, subject: Policy for pre- and post-deployment health assessments and blood samples (HA policy: 99-002). 6 Oct 1998.
8. ASD (Health Affairs) memorandum, subject: Updated policy for pre- and post-deployment health assessments and blood samples (HA policy: 01-017). 25 Oct 2001.

Figure 3. Distribution of changes in self-assessed health statuses as reported on pre- and post-deployment forms, US Armed Forces, January 2003-June 2005.



Change in self-assessment of overall health status, pre- to post-deployment, calculated as: post deployment response - pre-deployment response, using the following scale for health status: 1="poor"; 2="fair"; 3="good"; 4="very good"; and 5="excellent".

9. JCS memorandum, subject: Updated procedures for deployment health surveillance and readiness (MCM-0006-02). 1 Feb 2002.
10. USD (Personnel and Readiness) memorandum, subject: Enhanced post-deployment health assessments. 22 Apr 2003.
11. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense Serum Repository: glimpses of the future of comprehensive public health surveillance. *Am J Pub Hlth.* 2002 Dec;92(12):1900-4.
12. Brundage JF, Kohlhase KF, Gambel JM. Hospitalization experiences of U.S. servicemembers before, during, and after participation in peacekeeping operations in Bosnia-Herzegovina. *Am J Ind Med.* 2002 Apr;41(4):279-84.

Table 3. Reports of exposure concerns on post-deployment health assessments, US Armed Forces, January 2003-June 2005

	Total[1]	Exposure concerns	% with exposure concerns
Total	**725,626**	**114,510**	**15.8**
Component			
Active	466,917	56,128	13.7
Reserve	258,709	58,382	29.1
Service			
Army	427,469	89,466	20.9
Navy	96,059	6,227	6.5
Air Force	116,839	6,929	5.9
Marine Corps	85,259	11,888	13.9
Age (years)			
<20	22,069	1,738	7.9
20-29	385,732	51,258	13.3
30-39	201,299	35,517	17.6
>39	116,510	25,996	22.3
Gender			
Men	644,434	100,262	15.6
Women	81,189	14,248	17.5
Race/ethnicity			
Black	128,749	21,953	17.1
Hispanic	72,137	12,212	16.9
Other	1,628	186	11.4
White	473,348	72,706	15.4
Grade			
Enlisted	633,040	98,833	15.6
Officer	92,534	15,677	16.9

[1]Totals do not include non-responses/missing data.

Figure 4. Proportion of post-deployment forms that include reports of exposure concerns, by month, US Armed Forces, January 2004-June 2005.

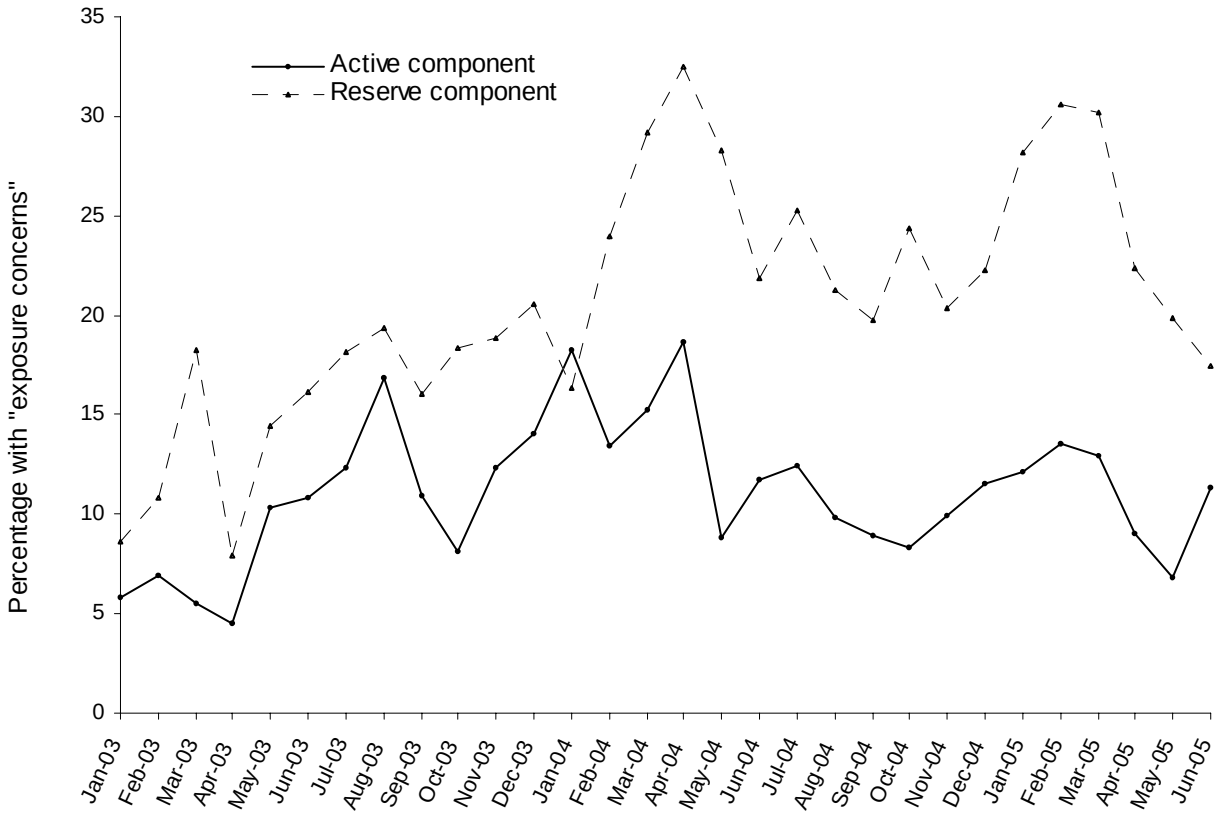


Table 4. Proportion of post-deployment forms that include reports of exposure concerns, by age group and component, US Armed Forces, January 2003-June 2005

Age group	Active	Reserve
<20	6.7	13.1
20-29	11.0	20.3
30-39	13.9	23.1
>39	16.4	25.3

Note: 1 person missing due to unknown age group.

Case report: Multi-drug Resistant Tuberculosis (MDR-TB), Wife of a U.S. Servicemember, 2004

A U.S. servicemember and his Korean-born wife lived in Korea and the United States before returning to Korea in 2004. In July 2004, she developed fevers, night sweats, cough, and difficulty breathing. Approximately nine years previously, she had been diagnosed with active tuberculosis (TB) and treated for two years with a four-drug regimen. She was evaluated with a chest radiograph that was questionable for TB. A CT scan revealed a left upper lobe mass that was 4 centimeters in diameter and had spiculated borders—the appearance was consistent with a diagnosis of tuberculoma.

Between July and October 2004, the servicemember's wife saw Korean physicians who may have treated her empirically for TB. In early October, a culture of sputum that had been collected in July grew out acid-fast bacilli. At the time, she denied cough, fever, night sweats, dyspnea, fevers, or chills. She was started on a 4-drug regimen—isoniazid 300 mg daily, rifampicin 300 mg twice daily, pyrazinamide 750 mg daily, and ethambutol 100 mg three times daily—using directly observed therapy three times per week.

In early November, the patient flew from Korea to the United States with her 3-year-old daughter. She was permitted to fly because she was considered not contagious: she had no active TB symptoms and had been under directly observed therapy for one month. In mid-November, her medications were refilled with increased dosages of pyrazinamide (to 1500 mg daily) and ethambutol (to 1200 mg daily) consistent with her body weight.

In mid-November, drug sensitivity for the culture obtained in July revealed resistance to isoniazid, rifampicin, ethambutol, kanamycin, and ofloxacin. The state health department was notified of the patient's multi-drug resistant TB (MDR-TB). The state's TB program tested household contacts of the patient. No skin test conversions were documented. The CDC's Division of Global Migration and Quarantine was notified of an active TB case on an international flight into the United States.

During follow-up, the patient reported significant worsening of her symptoms including persistent and profound fatigue since leaving Korea. She also reported a 15 pound weight loss in the preceding two months, a productive cough, and hemoptysis that spontaneously cleared.

On 30 November, another sputum was collected for repeat cultures and sensitivity testing. The results returned in January 2005, revealing resistance to each of the drugs included in the patient's current regimen: isoniazid, ethambutol, rifampicin, and pyrazinamide.

The patient was initially admitted to a civilian hospital to minimize the potential for infection transmission during treatment. As a military beneficiary, she was transferred to an Army community hospital. Prior to her arrival, a negative pressure isolation room was tested; selected staff were fitted with N95 masks; purified protein derivative (PPD) skin tests were placed on employees who had not been screened for TB within 6 months; and the pharmacy procured all required medications. Based on the documented resistance of the infecting mycobacteria, a new 4-drug regimen—pyrazinamide 1500 mg per day, streptomycin 1.5 grams 3 times weekly, ethionamide 500 mg twice daily, and cycloserine 500 mg each morning and 250 mg each evening was begun.

During hospitalization, the patient had decreased cough and fatigue and improved energy. Despite her symptomatic improvement, she continued to have acid fast bacilli in her sputum. After nearly six weeks of inpatient care, she was transferred to a regional Army medical center that had infectious disease and pulmonary specialists on staff and a clinical laboratory with in-house TB diagnostic capabilities.

Editorial comment: For centuries, tuberculosis has been one of the most common and deadly diseases of man. Currently, TB causes an estimated two million deaths worldwide,[1,2] and approximately one-third of the world's population are currently infected with *M. tuberculosis*.[1,2]

Multidrug-resistant TB is characterized by resistance of infecting mycobacteria to at least isoniazid and rifampicin.[3] MDR-TB threatens TB control efforts throughout the world—but particularly

in populations and settings where MDR-TB rates are high, e.g., former Soviet Union.[4,5]

Drug resistant *M. tuberculosis* can emerge when treatment regimens are inappropriate and/or when patients take prescribed medications inconsistently or for insufficient durations.[5-7] When patients are prescribed inappropriate treatment regimens or fail to complete appropriate regimens, they can remain infectious with mycobacteria that are resistant to standard TB medications.[5-7] In turn, they can transmit drug-resistant strains of mycobacteria to others. While drug-resistant TB is generally treatable, it requires a therapeutic course that is longer (up to two years of treatment), more expensive (often more than 100 times more expensive than treatment of drug-susceptible TB), and more toxic than standard courses.[6] From a public health perspective, poorly supervised or incomplete treatment of TB can be worse than no treatment at all.[1]

Since the subject of this report had prior treatment for TB, it was unclear whether her recent illness represented reactivation of the same strain or re-infection with a new strain. In countries with low rates of tuberculosis, recurrences are rarely due to re-infections with new strains.[8] In contrast, in high-burden countries (i.e., >200 cases per 100,000 persons per year), recurrences due to re-infections are relatively common.[9]

In the past 50 years in the U.S., TB case rates have declined more than tenfold (from 53 per 100,000 in 1953 to 4.9 per 100,000 in 2004).[3] Currently, the TB case rate is more than eight times higher among foreign- compared to U.S.-born persons.[3] In recent years, TB rates have declined among both U.S.- and foreign-born persons; however, the decrease has been much greater among U.S.-born persons.[3] In 2004 for the third consecutive year, foreign-born persons accounted for a majority (53%) of all TB cases in the U.S.[3] From 1999-2003, Korea (n=193) was the 7th most common country of origin among foreign-born persons with TB in the U.S.[10]

In 2004 in the U.S., approximately one percent (n=114) of all TB cases with known drug-susceptibilities were multi-drug resistant.[3] In 2003, there were 86 and 28 cases of MDR-TB among foreign-born and U.S.-born persons in the U.S., respectively.[3] Recently, there have been declines in the numbers and proportions of primary MDR-TB cases among both foreign- and U.S.-born individuals; however, declines have been much greater among U.S.-born individuals.[3] Declines in MDR-TB are likely related to increases in the proportions of patients who receive initial four-drug regimens, are treated with directly observed therapy (DOT), and complete treatments within 1 year.

This case highlights the importance of comprehensive hospital-based infection control procedures to prevent nosocomial transmissions of TB. Procedures include the use of negative pressure isolation rooms, periodic screening of all hospital staff with PPD skin tests, and fit testing and proper wear of N95 masks. The case also illuminates the significant public health responsibilities associated with TB control, including identifying, interviewing, and testing known and potential contacts of active cases.[11] In this case, for example, the state and CDC were notified of the possibility of MDR-TB exposures of passengers and crews during domestic and international travel. Finally, the case illustrates the importance of coordination and cooperation among care providers, hospitals, laboratories, pharmacies, and public health staffs in military, state, national, and international jurisdictions.

Report and comments provided by Eric E. Shuping, LTC, MC, US Army, Ireland Army Community Hospital, Fort Knox, Kentucky.

References

1. World Health Organization. Tuberculosis. Accessed at: www.who.int/mediacentre/factsheets/fs104/en/, on 13 April 2005.

2. Dye C, Scheele S, Dolin P, Pathania V, Raviglione MC. Consensus statement. Global burden of tuberculosis: estimated incidence, prevalence, and mortality by country. WHO Global Surveillance and Monitoring Project. *JAMA*. 1999 Aug 18;282(7):677-86.

3. Centers for Disease Control and Prevention. Trends in tuberculosis – United States, 2004. *MMWR*. 2005 Mar 18;54(10);245-9.

4. Cox HS, Orozco JD, Male R, et al. Multidrug-resistant tuberculosis in central Asia. *Emerg Infect Dis*. 2004 May;10(5):865-72.

5. Pablos-Mendez A, Raviglione MC, Laszlo A, et al. Global surveillance for antituberculosis-drug resistance, 1994-1997. World Health Organization-International Union against Tuberculosis and Lung Disease Working Group on Anti-Tuberculosis Drug Resistance Surveillance. *N Engl J Med*. 1998 Jun 4;338(23):1641-9.

6. Mahmoudi A, Iseman MD. Pitfalls in the care of patients with tuberculosis. Common errors and their association with the acquisition of drug resistance. *JAMA*. 1993 Jul 7;270(1):65-8.

7. Kritski AL, Rodrigues de Jesus LS, Andrade MK, et al. Retreatment tuberculosis cases. Factors associated with drug resistance and adverse outcomes. *Chest*. 1997 May;111(5):1162-7.
8. Jasmer RM, Bozeman L, Schwartzman K, et al. Recurrent tuberculosis in the United States and Canada: relapse or reinfection? *Am J Respir Crit Care Med*. 2004 Dec 15;170(12):1360-6. Epub 2004 Oct 11.
9. van Rie A, Warren R, Richardson M, et al. Exogenous reinfection as a cause of recurrent tuberculosis after curative treatment. *N Engl J Med*. 1999 Oct 14;341(16):1174-9.
10. CDC. Reported Tuberculosis in the United States, 2003. Atlanta, GA: U.S. Department of Health and Human Services, CDC, September 2004, 19.
11. Reichler MR, Reves R, Bur S, et al. Evaluation of investigations conducted to detect and prevent transmission of tuberculosis. *JAMA*. 2002 Feb 27;287(8):991-5.

Correction

Table 4 ("Injury hospitalizations by causal agent, US Armed Forces, 2004") on page 9 of the April 2005 *MSMR* was incorrect. The corrected table is below (the on-line version of the April 2005 MSMR has been corrected):

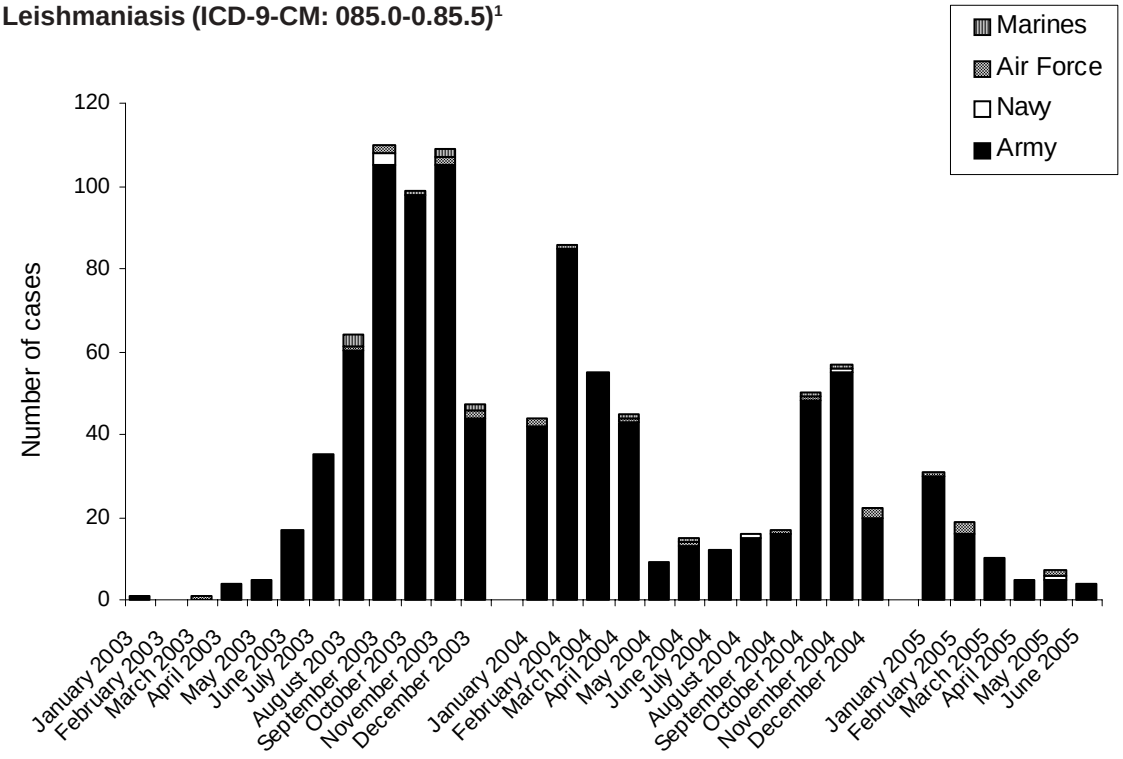
Table 4. Injury hospitalizations by causal agent,* US Armed Forces, 2004

Cause	Number	Percent
Unintentional		
Falls and miscellaneous	1,988	17.6
Land transport	1,363	12.1
Complications of medical/surgical	1,311	11.6
Guns, explosives (includes accidents during war)	1,043	9.2
Athletics	733	6.5
Poisons and fire	360	3.2
Machinery, tools	359	3.2
Environmental	267	2.4
Air transport	263	2.3
Water transport	33	0.3
Intentional		
Battle casualty	1,138	10.1
Self-inflicted	314	2.8
Non-battle, inflicted by other (e.g., assault)	414	3.7
Missing/invalid code	1,714	15.2

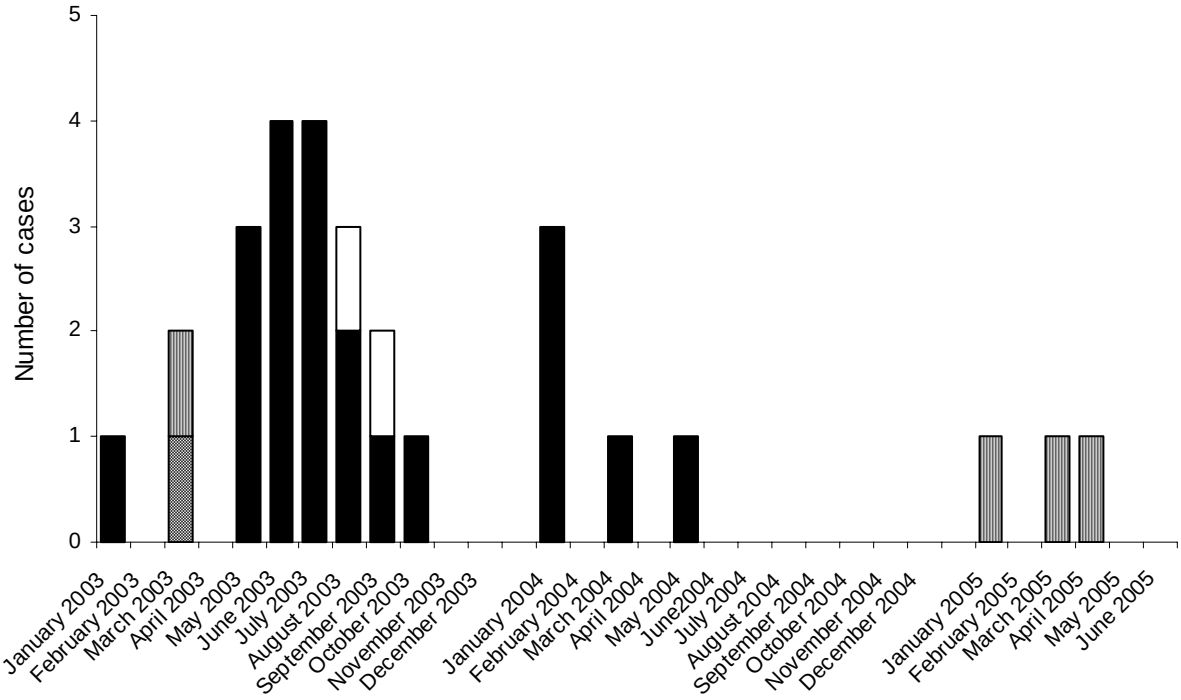
* Causal agents were determined by general class of trauma and specific causative agent codes, NATO Standardization Agreement (STANAG) 2050.

Deployment-related conditions of special surveillance interest, US Armed Forces, by month and service, January 2003-June 2005

Leishmaniasis (ICD-9-CM: 085.0-0.85.5)[1]



Acute respiratory failure/ARDS (ICD-9-CM:518.81, 518.82)[2]



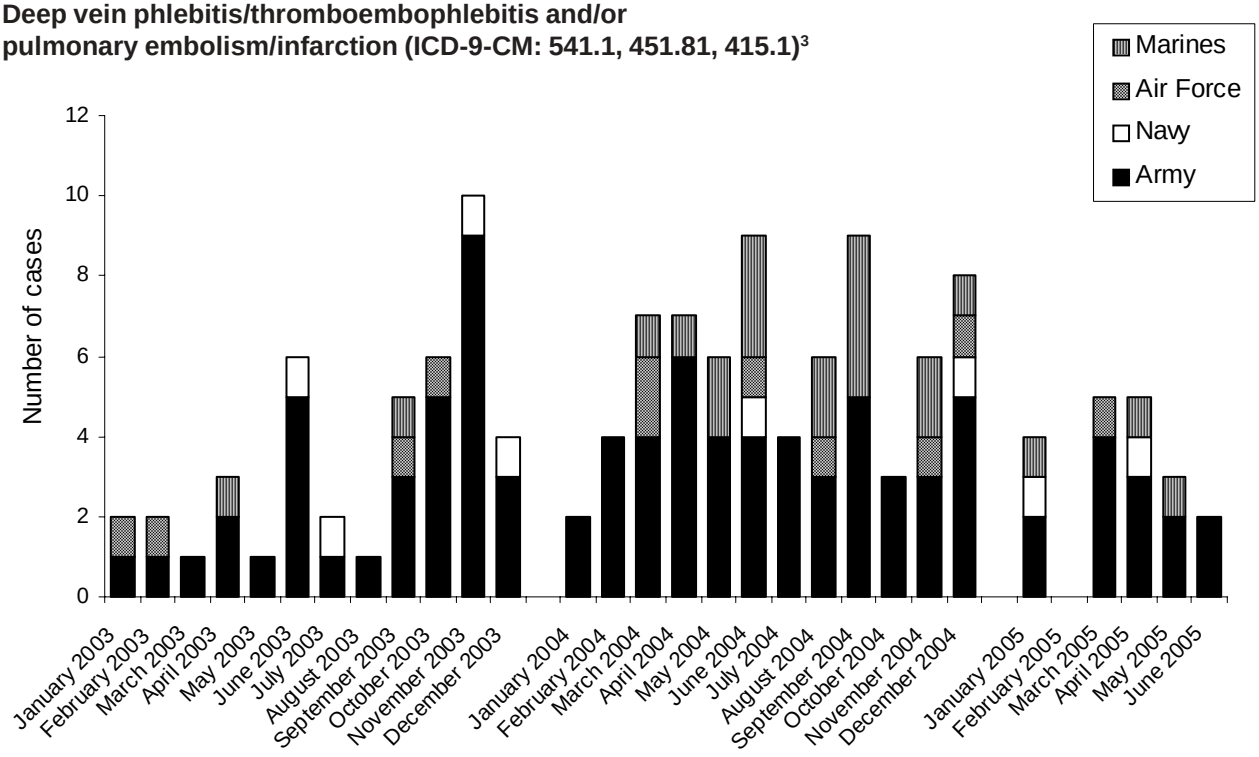
Footnotes:

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

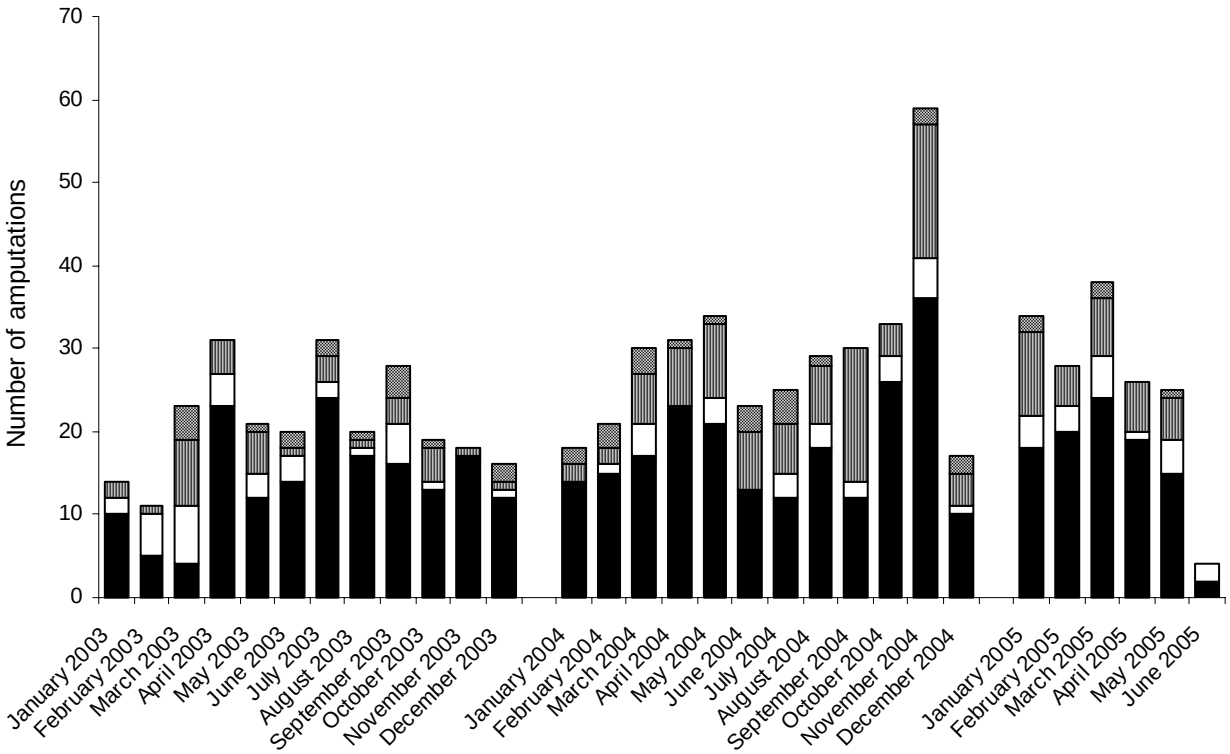
[2] Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

(Cont.) Deployment-related conditions of special surveillance interest, US Armed Forces, by month and service, January 2003-June 2005

Deep vein phlebitis/thromboembophlebitis and/or pulmonary embolism/infarction (ICD-9-CM: 541.1, 451.81, 415.1)[3]



Amputations (ICD-9-CM: 84.0, 84.1, 887, 896, 897, V49.6, V49.7)[4]



Footnotes:

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

[4] Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF.

Sentinel reportable events for all beneficiaries[1] at US Army medical facilities, cumulative numbers[2] for calendar years through June 30, 2004 and 2005

Reporting location	Number of reports all events[3]		Food-borne								Vaccine Preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
NORTH ATLANTIC																
Washington, DC Area	123	262	.	2	.	4	1	2	1	2	.	.	.	2	3	1
Aberdeen, MD	26	54	.	.	.	.	.	.	.	1	.	.	.	.	.	.
FT Belvoir, VA	122	220	5	5	1	.	2	3	1	.	1	.	.	.	1	.
FT Bragg, NC	948	890	4	5	.	.	17	5	1	1	.	.	.	.	.	.
FT Drum, NY	57	98	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Eustis, VA	120	165	.	.	.	.	.	1	.	.	.	.	.	.	.	.
FT Knox, KY	110	149	1	1	3	.	1	2	.	.	.	.	1	.	.	.
FT Lee, VA	92	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Meade, MD	95	59	.	.	1	.	.	.	.	.	.	.	.	.	.	1
West Point, NY	27	25	1	.	.	.	.	.	.	.	.	.	1	.	.	.
GREAT PLAINS																
FT Sam Houston, TX	155	232	.	.	1	.	3	2	.	1	.	.	.	1	2	.
FT Bliss, TX	166	230	1	1	2	4	3	2	4	4	.	.	.	.	.	.
FT Carson, CO	278	432	1	2	.	2	1	1	1	.	.	.	.	.	.	.
FT Hood, TX	587	1,053	6	2	.	.	5	.	30	3	.	.	1	.	.	.
FT Huachuca, AZ	60	34	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Leavenworth, KS	20	17	1	.	2	.	1	1	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	136	196	1	1	.	.	1	1	.	.	.	.	.	.	.	2
FT Polk, LA	89	115	.	.	.	1	4	1	.	.	.	.	.	1	.	.
FT Riley, KS	127	139	1	.	1	1	.	.	.	.	1	.	.	.	.	.
FT Sill, OK	81	94	.	.	.	.	3	.	3	1	.	.	.	.	.	.
SOUTHEAST																
FT Gordon, GA	70	186	1	.	.	.	1	.	.	.	.	.	1	4	.	.
FT Benning, GA	199	153	.	1	4	1	4	3	1	2	.	.	.	.	.	.
FT Campbell, KY	413	587	2	.	1	.	3	3	1	4	.	.	.	.	3	1
FT Jackson, SC	161	74	.	.	.	.	.	.	.	.	.	2	.	.	3	.
FT Rucker, AL	33	18	.	.	1	.	1	.	.	.	.	.	.	.	1	.
FT Stewart, GA	213	284	2	.	1	.	2	5	3	.	.	.	.	.	.	.
WESTERN																
FT Lewis, WA	281	323	2	3	1	.	3	1	2	.	.	.	1	.	.	.
FT Irwin, CA	39	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Wainwright, AK	123	82	.	2	.	.	1	.	.	.	1	.	1	.	.	.
OTHER LOCATIONS																
Hawaii	460	409	10	20	7	4	9	5	.	.	.	.	1	.	2	.
Europe	664	775	9	11	1	.	7	6	.	.	.	3	.	2	3	2
Korea	223	219	1	.	.	.	1	.	.	.	.	.	.	1	2	.
Total	**6,298**	**7,706**	**49**	**56**	**27**	**17**	**75**	**44**	**48**	**19**	**3**	**5**	**7**	**11**	**20**	**7**

[1] Includes active duty servicemembers, dependents, and retirees.

[2] Events reported by July 7, 2004 and 2005.

[3] Seventy events specified by Tri-Service Reportable Events, Version 1.0, July 2000.

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

(Cont'd) Sentinel reportable events for all beneficiaries[1] at US Army medical facilities, cumulative numbers[2] for calendar years through June 30, 2004 and 2005

Reporting location	Arthropod-borne				Sexually Transmitted								Environmental			
	Lyme Disease		Malaria		Chlamydia		Gonorrhea		Syphilis[3]		Urethritis[4]		Cold		Heat	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
NORTH ATLANTIC																
Washington, DC Area	1	.	.	2	60	91	6	15	2	6	.	.	29	1	1	2
Aberdeen, MD	.	.	.	.	25	18	.	3	.	1	.	.	.	.	.	.
FT Belvoir, VA	.	.	.	.	98	103	10	30	3	.	.	.	.	.	.	.
FT Bragg, NC	.	.	8	.	654	635	148	132	1	2	61	61	3	1	45	31
FT Drum, NY	.	.	4	.	45	45	3	4	.	.	.	.	1	2	.	1
FT Eustis, VA	2	.	.	.	92	92	13	22	.	.	.	.	.	2	2	2
FT Knox, KY	.	1	.	.	96	88	6	10	.	.	.	.	.	1	2	11
FT Lee, VA	.	1	.	.	76	83	14	13	.	.	.	.	.	1	1	1
FT Meade, MD	.	.	.	.	77	53	16	5	.	.	.	.	.	.	.	.
West Point, NY	5	3	.	.	16	16	.	.	.	.	.	.	1	1	3	.
GREAT PLAINS																
FT Sam Houston, TX	.	.	.	.	117	151	18	41	1	3	.	.	.	.	.	.
FT Bliss, TX	1	.	.	1	115	86	22	9	1	2	.	.	.	.	.	6
FT Carson, CO	.	.	.	1	227	277	18	33	1	.	26	15	.	1	.	.
FT Hood, TX	.	.	2	1	343	584	94	213	.	.	89	132	.	.	2	46
FT Huachuca, AZ	.	.	.	.	56	23	4	9	.	.	.	.	.	.	.	1
FT Leavenworth, KS	.	.	.	.	12	14	4	1	.	.	.	.	.	1	.	.
FT Leonard Wood, MO	.	.	1	.	99	107	26	25	.	.	.	1	1	4	3	5
FT Polk, LA	.	.	.	.	71	82	13	22	1	1	.	.	.	.	.	2
FT Riley, KS	.	.	.	.	91	73	16	27	.	.	.	.	5	5	11	1
FT Sill, OK	.	.	.	.	63	36	6	18	1	.	.	.	2	.	1	15
SOUTHEAST																
FT Gordon, GA	.	.	.	.	48	127	16	9	.	1	.	.	.	.	.	2
FT Benning, GA	.	.	2	1	122	94	66	26	.	.	.	.	.	1	.	22
FT Campbell, KY	.	1	.	1	284	417	51	76	1	.	.	.	.	1	42	11
FT Jackson, SC	.	.	.	.	112	58	16	11	1	.	.	.	6	.	20	.
FT Rucker, AL	.	.	.	.	27	10	3	8	.	.	.	.	.	.	.	.
FT Stewart, GA	.	1	.	.	125	143	63	63	2	.	4	8	.	1	2	11
WESTERN																
FT Lewis, WA	1	.	.	3	187	228	26	32	.	.	46	41	1	.	2	.
FT Irwin, CA	.	.	.	.	33	22	5	7	.	.	.	.	.	.	1	4
FT Wainwright, AK	.	.	.	1	54	54	11	8	.	1	.	.	54	13	.	.
OTHER LOCATIONS																
Hawaii	.	.	1	6	324	270	77	31	.	.	.	.	.	.	6	.
Europe	.	6	2	.	492	484	108	120	2	2	.	1	1	5	1	.
Korea	.	.	1	.	182	184	25	27	3	1	.	.	6	3	1	1
Total	**10**	**13**	**21**	**17**	**4,423**	**4,748**	**904**	**1,050**	**20**	**20**	**226**	**259**	**110**	**44**	**146**	**175**

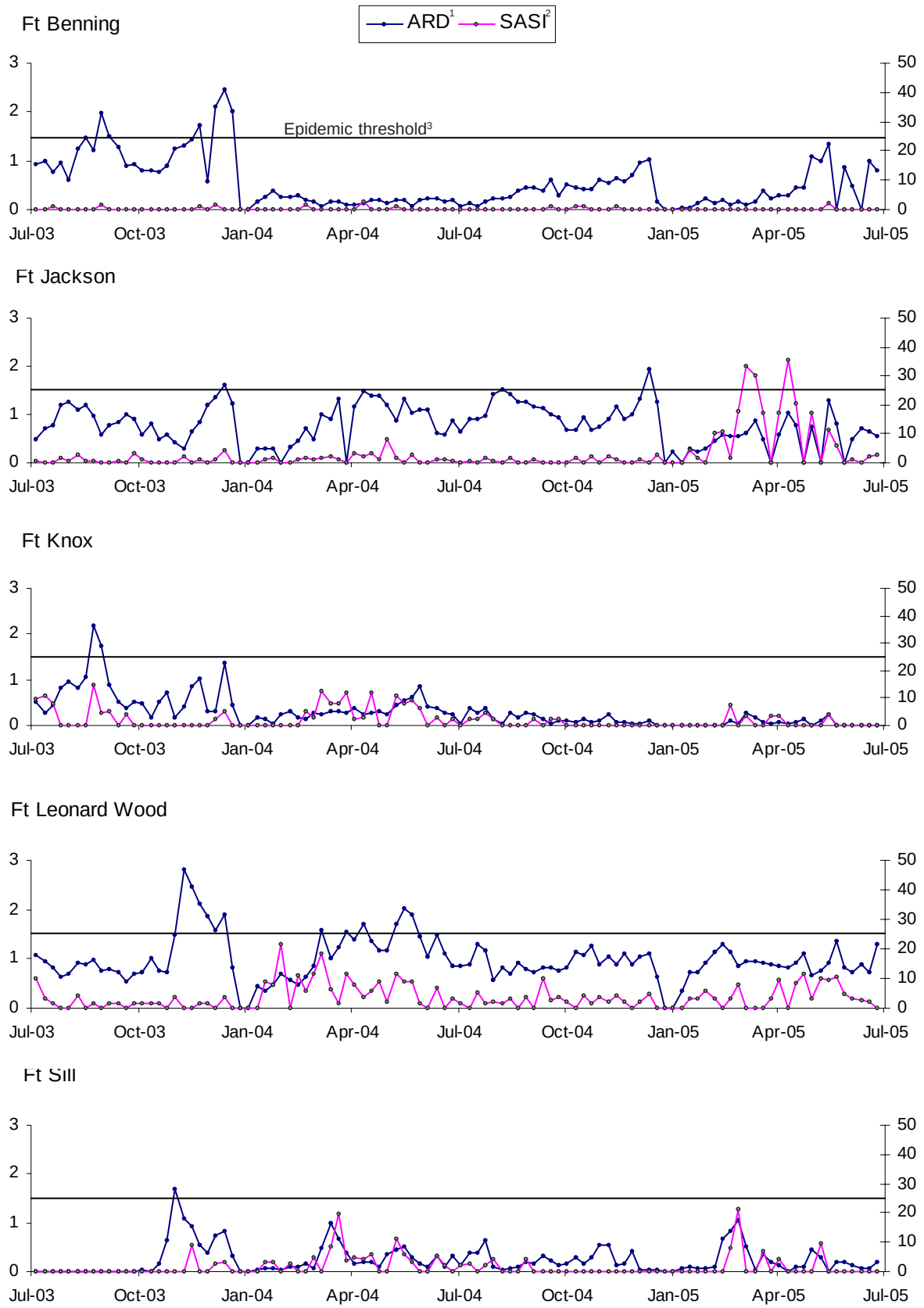
[3] Primary and secondary.

[4] Urethritis, non-gonoccal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army basic training centers, by week through June 30, 2005



[1] ARD rate = cases per 100 trainees per week
[2] SASI (Strep ARD surveillance index) = (ARD rate)x(rate of Group A beta-hemolytic strep)
[3] ARD rate >=1.5 or SASI>=25.0 for 2 consecutive weeks indicates an “epidemic”

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