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Post-deployment Mortality due to Illnesses and Non-battle Injuries, among Female Participants in Operation Enduring Freedom/Operation Iraqi Freedom, Active Component, U.S. Armed Forces

In recent years, women have increased their numbers and operational importance to the U.S. military. Women have accounted for approximately 10% of all U.S. military participants in Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF).

There are understandable concerns among combat service veterans regarding potential short- and long-term health effects of wartime exposures and experiences (e.g., Agent Orange, post-traumatic stress disorder, Gulf War illness). Also, some effects of wartime service may have different clinical expressions among female and male combat service veterans.¹

This analysis summarizes mortality due to illnesses and non-battle injuries among female active component service members within two years after they returned from OEF/OIF. To assess the potential effects of OEF/OIF on females who served in the combat theaters, the mortality experiences of female veterans of OEF/OIF were compared against the experiences of two referent cohorts: females who completed assignments in Korea and male veterans of OEF/OIF.

Methods:

The methods for this analysis are similar to those used to assess the postdeployment morbidity experiences of female

participants in OEF/OIF (described in detail in the October 2009 issue of the *MSMR*).

Briefly, the surveillance population included all members of the active component of the U.S. Armed Forces who began deployments to OIF/OEF or assignments to Korea between 1 January 2002 and 30 June 2007. The “exposed” cohort included all female members of the surveillance population who deployed to and returned from Operation Enduring Freedom (OEF) in Afghanistan or Operation Iraqi Freedom (OIF) any time during the surveillance period. The referent cohorts included all male service members who deployed to and returned from Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF) and all female service members who began and completed assignments in Korea between 1 January 2002 and 30 June 2007.

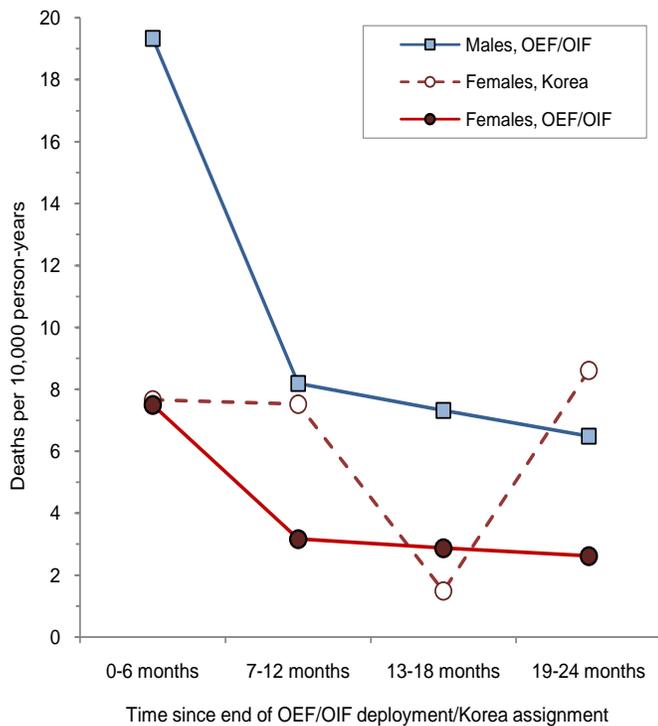
The endpoint for all analyses was death while in active military service. Each cohort member was considered “at risk” from the first day after completion of an OEF/OIF deployment or Korea assignment until the earliest of the following: death; termination of active military service; deployment to OEF/OIF or assignment to Korea; two continuous years of active military service; or the end of the surveillance period.

The dates and underlying causes of all deaths among exposed and referent cohort members were ascertained from records maintained in the Medical Mortality Registry of the

Table 1. Demographic and military characteristics, female veterans of OEF/OIF and members of two referent cohorts, among those who died from causes other than war-related injuries within two years after returning from overseas assignments

	Females, after OEF/OIF service				Females, after Korea service				Males, after OEF/OIF service			
	Deaths (within 2 years)		Cumulative mortality incidence (per 100,000)	Relative mortality incidence	Deaths (within 2 years)		Cumulative mortality incidence (per 100,000)	Relative mortality incidence	Deaths (within 2 years)		Cumulative mortality incidence (per 100,000)	Relative mortality incidence
	Number	% of deaths			Number	% of deaths			Number	% of deaths		
Total	88	100	6.2		19	100	8.8		1,947	100	15.3	
<i>Service</i>												
Army	48	54.5	8.6	1.91	15	78.9	10.4	1.78	979	50.3	19.3	2.10
Navy	16	18.2	4.5	1.01	0	0.0	0.0	0.00	315	16.2	11.5	1.25
Air Force	20	22.7	4.5	ref	4	21.1	5.9	ref	252	12.9	9.2	ref
Marine Corps	4	4.5	5.8	1.28	0	0.0	0.0	0.00	401	20.6	18.8	2.04
<i>Age group</i>												
<25	46	52.3	6.2	1.29	11	57.9	9.3	1.62	1,067	54.8	18.1	1.44
25-39	29	33.0	4.8	ref	5	26.3	5.7	ref	742	38.1	12.6	ref
40+	13	14.8	16.7	3.48	3	15.8	27.0	4.70	138	7.1	15.2	1.21
<i>Race/ethnicity</i>												
Black non-hispanic	26	29.5	6.1	1.01	11	57.9	12.9	5.50	312	16.0	15.7	1.00
White non-hispanic	42	47.7	6.1	ref	2	10.5	2.3	ref	1,311	67.3	15.7	ref
Others	20	22.7	6.5	1.08	6	31.6	13.2	5.64	324	16.6	13.5	0.86
<i>Military occupation</i>												
Combat	6	6.8	4.7	0.63	0	0.0	0.0	0.00	765	39.3	20.0	1.60
Health care	12	13.6	7.4	ref	4	21.1	14.7	ref	69	3.5	12.5	ref
Other	70	79.5	6.2	0.84	15	78.9	8.4	0.57	1,113	57.2	13.3	1.06

Figure 1. Crude mortality rate (all causes except war-related), by time since end of OEF/OIF deployment or Korea assignment



Armed Forces Medical Examiners System; the records are routinely provided to the Armed Forces Health Surveillance Center (AFHSC) for surveillance purposes.

For this analysis, mortality rates were calculated as deaths per 10,000 person-years of active service within two years after OEF/OIF deployment or Korea assignment. Cumulative mortality incidence was calculated as deaths per 10,000 cohort members.

The “expected” numbers of deaths, overall and by various causes, among female OEF/OIF veterans were estimated by multiplying the cause-specific mortality rates that affected each referent cohort by the total person-time at risk of female OEF/OIF veterans.

Results:

During the surveillance period, there were 88 deaths due to illnesses and non-battle injuries among 142,230 female service members within two years after they returned from OEF/OIF deployment. The cumulative mortality incidence was 6.2 per 10,000 female OEF/OIF veterans.

The crude mortality rate among female OEF/OIF veterans (4.4 per 10,000 person-years [p-yrs]) was more than 30% lower than among females recently assigned in Korea (6.4 per 10,000 p-yrs) and more than 60% lower than among male veterans of OEF/OIF (11.4 per 10,000 p-yrs). Among both female and male OEF/OIF deployers, mortality rates were more than twice as high during the first six months compared to the subsequent 18 months after returning from

OEF/OIF service. There was not a similar trend of mortality incidence among females after completing assignments in Korea (Figure 1).

Among female OEF/OIF veterans, the cumulative mortality incidence (unadjusted) was highest among those older than 40 years (16.7 per 10,000), in the Army (8.6 per 10,000) and in health care occupations (7.4 per 10,000); there was little variation in mortality incidence in relation to race-ethnicity. In contrast, among male OEF/OIF veterans, cumulative mortality incidence was highest among those younger than 25 (18.1 per 10,000), in the Army (19.3 per 10,000) or Marine Corps (18.8 per 10,000), and in combat occupations (20.0 per 10,000) (Table 1).

Of all deaths among female OEF/OIF veterans, three-fourths were due to transportation (28%) and “other” (8%) accidents, suicides (23%), or homicides (16%) (Table 2). The same causes were responsible for more than 80% of all deaths among male OEF/OIF veterans (transportation [49%] and “other” [10%] accidents, suicides [19%], and homicides [5%]). There were relatively few deaths among females recently assigned in Korea (n=19); still, there were notable findings regarding causes. For example, nearly one-third of all deaths were due to neoplasms (n=6), and none were due to suicide (Table 2).

Table 2. Deaths, by cause, among females and males within two years after returning from OEF/OIF and among females within two years after assignments in Korea, active component, U.S. Armed Forces

Cause of death category	Females, after OEF/OIF		Females, after Korea		Males, after OEF/OIF	
	Number of deaths	% of non-war related deaths	Number of deaths	% of non-war related deaths	Number of deaths	% of non-war related deaths
Transportation	25	28.4	7	36.8	959	49.3
Suicide	20	22.7	0	0.0	377	19.4
Homicide	14	15.9	2	10.5	95	4.9
Other accidents	7	8.0	2	10.5	202	10.4
Neoplasms	6	6.8	6	31.6	70	3.6
Other	6	6.8	1	5.3	29	1.5
Cardiovascular	5	5.7	0	0.0	123	6.3
Pregnancy, delivery	3	3.4	0	0.0	0	0.0
Falls	1	1.1	1	5.3	26	1.3
Infectious, parasitic	1	1.1	0	0.0	12	0.6
Missing UCOD	0	0.0	0	0.0	21	1.1
Poisoning	0	0.0	0	0.0	8	0.4
GI, pancreas, liver	0	0.0	0	0.0	7	0.4
Immun, endo, metab, nutrition	0	0.0	0	0.0	6	0.3
Blood	0	0.0	0	0.0	2	0.1
Respiratory	0	0.0	0	0.0	2	0.1
Act of nature	0	0.0	0	0.0	2	0.1
Compl of med/surgery	0	0.0	0	0.0	2	0.1
Nervous system	0	0.0	0	0.0	2	0.1
Congenital	0	0.0	0	0.0	2	0.1
Subtotal (excluding war-related)	88	100.0	19	100.0	1947	100.0

In each cohort, mortality due to transportation accidents clearly exceeded mortality from any other cause. Of note, however, transportation-related mortality among female OEF/OIF veterans was lower than among females recently assigned in Korea and much lower than among male OEF/OIF veterans (Figure 2).

Deaths that were observed among female veterans of OEF/OIF were compared against those that would have occurred ("expected") if the cause-specific rates that affected each referent cohort had occurred among female OEF/OIF veterans (Figure 3). Among female OEF/OIF veterans, there were 41 fewer deaths overall than would have occurred based on the experience of females recently assigned to Korea. Although female OEF/OIF veterans experienced 20 more deaths from suicide (there were no suicides in the Korea cohort) there were 35 and 23 fewer deaths from neoplasms and transportation accidents, respectively, than would have occurred based on the experience of females recently assigned in Korea (Figure 4).

Among female veterans of OEF/OIF, there were 144 fewer deaths overall than would have occurred based on the experience of male OEF/OIF veterans. Most notably, among female OEF/OIF veterans, there were 105 fewer deaths from transportation and other accidents and 24 fewer suicides than would have occurred based on the experience of male OEF/OIF veterans (Figure 4).

Data summaries provided by Stephen Taubman, PhD, Data and Analysis Division, Armed Forces Health Surveillance Center (AFHSC).

Editorial comment:

This report documents relatively low overall mortality among female service members within two years after returning from OEF/OIF. The overall mortality experienced by female OEF/OIF veterans is more than 60% lower than among their male OEF/OIF counterparts and more than 30% lower than among their female counterparts who were contemporaneously assigned in Korea.

The findings of this report should be interpreted cautiously. For example, the mortality rates presented here are unadjusted; that is, they do not account for the potentially confounding differences between the cohorts in such factors as military service, grade, age, or occupation. In addition, women who deploy to OEF/OIF may be "healthier" than those who are assigned to Korea. For example, medical services required for the management of potentially life-threatening chronic conditions (e.g., neoplasms) may be more accessible in Korea than in Afghanistan or Iraq; service members with such conditions may be assigned to Korea rather than a combat theater. Also, the analyses presented here document follow-up of individuals in active military service. Undoubtedly, some OEF/OIF veterans with life

threatening conditions left active service (and may have died) within two years after returning from OEF/OIF deployment. Finally, the results presented here are based on relatively small numbers of deaths, particularly in relation to specific causes. In turn, relationships between cause-specific mortality rates in various cohorts are statistically unstable.

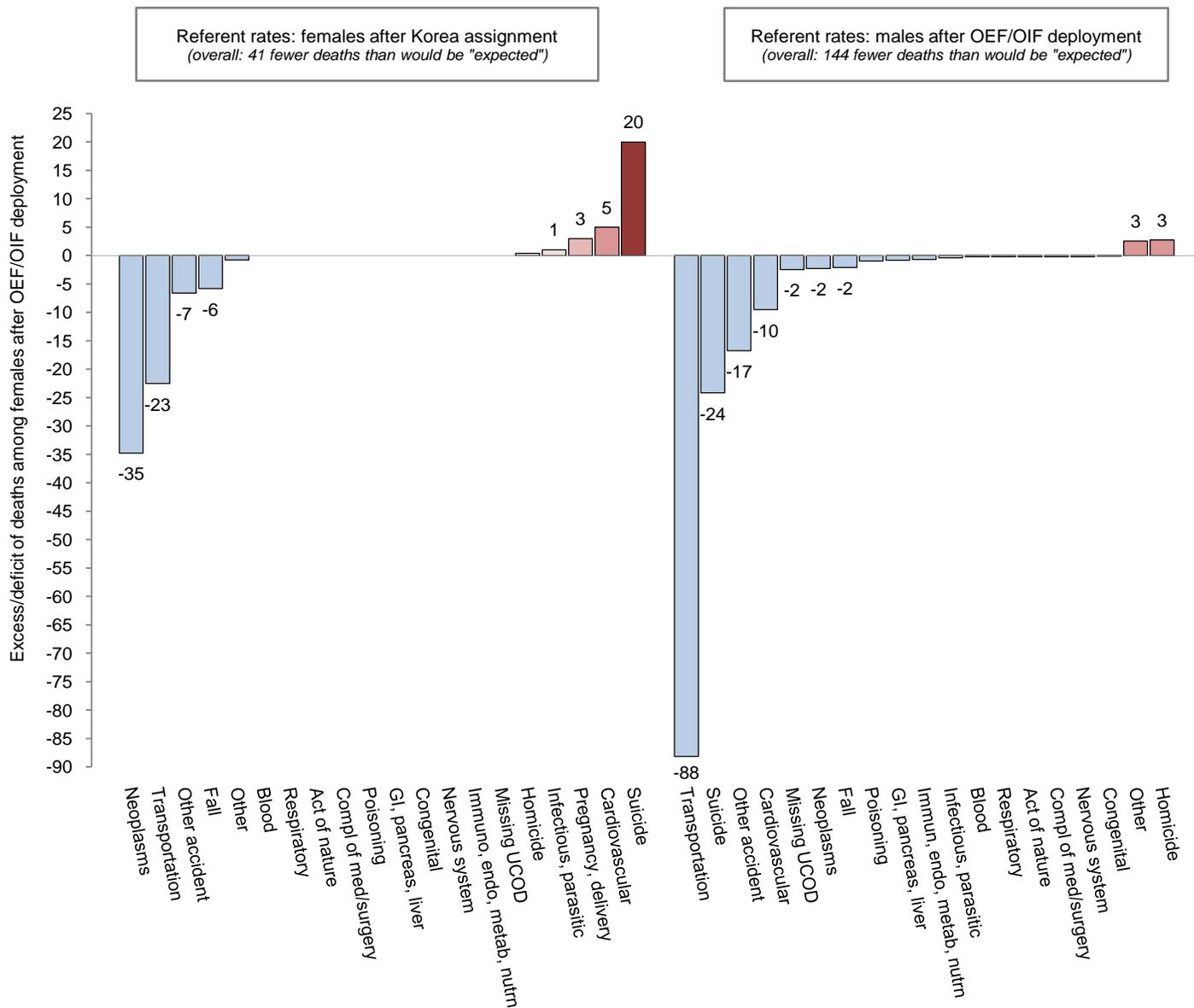
In this analysis, there were sharp contrasts between the mortality experiences of OEF/OIF veterans and their female Korea service counterparts. For example, among both female and male OEF/OIF veterans (but not females recently assigned in Korea), mortality was much higher within the first six months after returning from overseas compared to later. In addition, among OEF/OIF veterans (but not females recently assigned in Korea), there were not clear differences in mortality in relation to race-ethnicity. Also, neoplasms accounted for nearly one-third of all deaths of females recently assigned in Korea, but relatively few deaths among OEF/OIF veterans. Finally, suicide was the second leading cause of death among both female and male OEF/OIF veterans; however, there were no suicides among females who recently completed assignments in Korea.

There were also sharp differences between the mortality experiences of female and male OEF/OIF veterans. Most notably, within two years after returning from OEF/OIF, mortality incidence was 2-to-4-times higher among males than females, overall and in nearly every military and demographic subgroup; however, among OEF/OIF veterans older than 40 years, mortality incidence was slightly higher among females than males. The higher mortality overall among males than females within two years after returning from OEF/OIF was largely attributable to transportation and other accidents (male-to-female rate ratio [m:fRR]: 4.3), cardiovascular disease (m:fRR: 2.9), and suicide (m:fRR: 2.2).

Trends and patterns of mortality among OEF/OIF veterans generally reflect the mortality experiences of veterans of recent other wars. For example, after more than three decades of followup, overall mortality among female military members who served in Vietnam was similar to that among female veterans who served elsewhere; however, mortality among females who served during the Vietnam era (regardless of assignment locations) was lower than that among women in the general U.S. population.¹⁻³ Notably, however, mortality from "external causes" (e.g., accidents, homicides and suicides) was significantly higher among females who served in Vietnam than women in the general U.S. population; and mortality from motor vehicle accidents was more than twice as high among females who served in Vietnam than among those who served elsewhere.¹⁻³

Following the Persian Gulf War (PGW), mortality overall was significantly lower among women who served in the U.S. military during the war compared to those in the general U.S. population. However, within approximately two years after the PGW, mortality from "external causes" was higher

Figure 4. Differences between observed deaths among female veterans of OEF/OIF and those that would be “expected” based on experiences of two referent cohorts



among female service members who served in the PGW theater compared to those who were assigned elsewhere. Also, mortality from accidents — particularly motor vehicle accidents — was significantly higher among female PGW veterans compared to their non-war service counterparts.

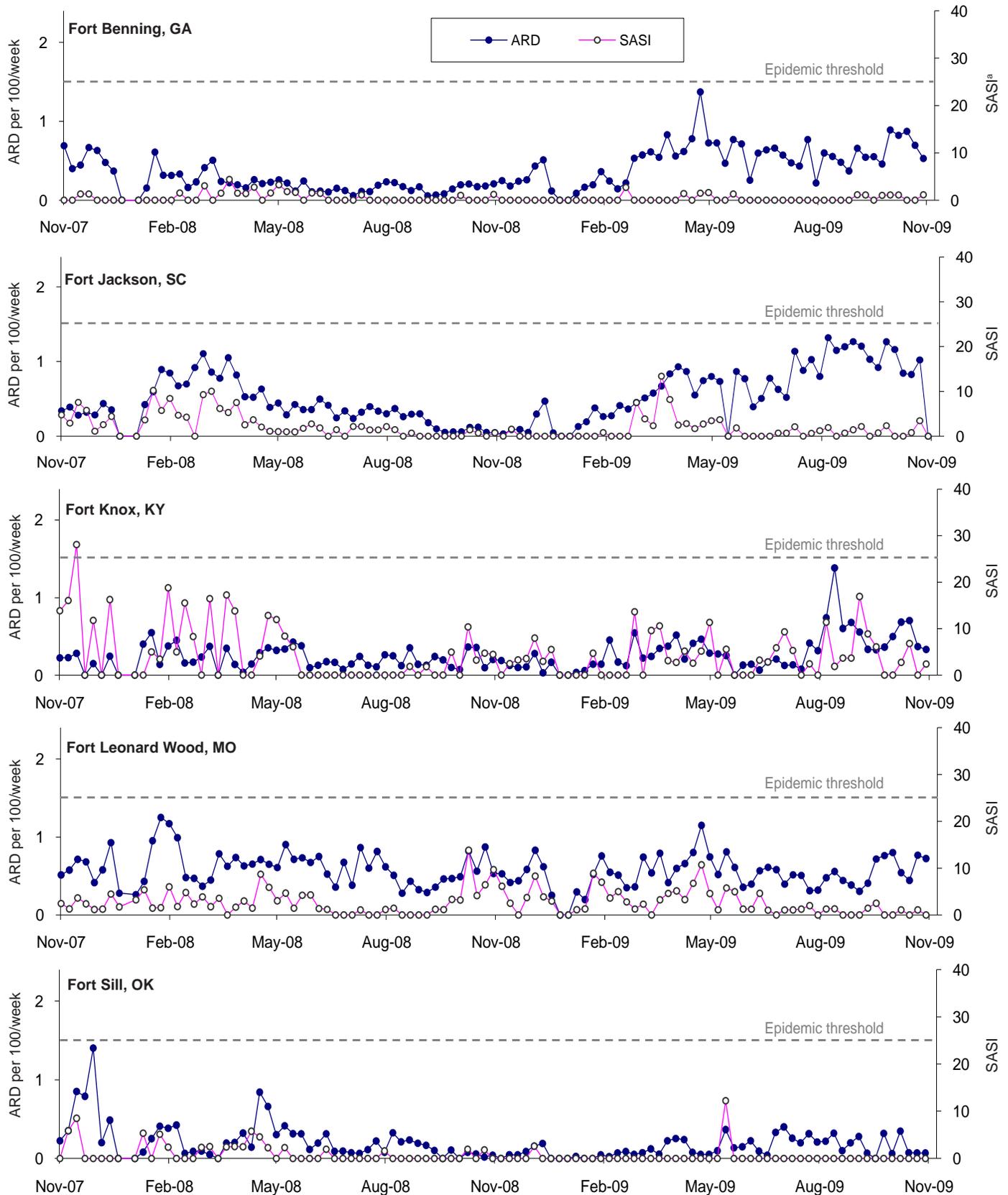
In summary, overall mortality among female service members within two years after returning from OEF/OIF service was relatively low compared to females who recently returned from Korea and to male OEF/OIF veterans. Among both male and female OEF/OIF veterans still in active service, mortality was relatively high during the first six months after returning from deployment. Similar to the experiences of veterans of recent U.S. wars, most deaths of females and males after returning from OEF/OIF and Korea are due to “external causes,” particularly motor vehicle accidents. The U.S. military should continue efforts⁵ to identify modifiable

risk factors associated with and countermeasures to prevent fatal motor vehicle accidents among service members who have recently returned from overseas (particularly in combat environments).

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



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

Preliminary Report: Investigation of and Response to Novel H1N1 Influenza among Soldiers of the Afghan National Army, Kabul, Afghanistan, 30 October - 14 November 2009

On 29 October 2009, the Afghan Ministry of Public Health (MoPH) reported 281 confirmed cases of H1N1 in Afghanistan; most confirmed cases were among military members of the North Atlantic Treaty Organization (NATO), however eight cases (one fatal) occurred among Afghans working closely with NATO. On 31 October, at the request of the Afghan National Army Surgeon General, the Combined Security Transition Command-Afghanistan (CSTC-A) Command Surgeon's office dispatched a Preventive Medicine Team (PMT) to investigate an outbreak of influenza-like illness (ILI) among Afghan soldiers at the Kabul Military Training Center (KMTC). The KMTC includes a basic training camp of the Afghan National Army (ANA). At the time of the outbreak, nearly 9,000 soldiers were assigned to the KMTC. Prior to the outbreak, the KMTC Troop Medical Clinic provided medical care to an average of 375 soldiers per day.

The PMT visited KMTC medical facilities, interviewed providers and patients, and made recommendations regarding ILI case management, prevention, and control. The team developed and distributed ILI evaluation and management guidelines to CSTC-A mentors throughout Afghanistan to help standardize procedures within the Afghan National Security Forces and encourage tracking and reporting of ILI cases. This report summarizes preliminary findings of the investigation, recommended countermeasures, and case management guidelines.

Key events and activities:

30 October: Three hundred fifty soldiers visited the Troop Medical Clinic (TMC). Of these, 30 (8.6%) were transferred to the National Military Hospital (NMH) and hospitalized with ILIs. Fifty-two soldiers were admitted to KMTC isolation facilities. Thus, on this day, 82 soldiers were removed from their units for treatment of ILIs (**Figure 1**). In general, patients admitted to isolation presented with relatively mild illnesses characterized by moderate fevers, cough or sore throat; these soldiers were discharged back to duty when asymptomatic for 24 hours without medication. ILI cases that were hospitalized for care generally had high fevers (up to 104°F), elevated pulses, and shaking chills.

31 October: The Preventive Medicine Team (PMT) visited the TMC and isolation facilities and interviewed care providers and patients. Recommendations to improve conditions at the isolation facilities included: ensure the availability of soap in all latrines; separate beds by at least

three feet and stagger them head-to-toe; improve general sanitation (e.g., clean floors, remove trash); and enforce entry control procedures (e.g., restrict access to support personnel with appropriate personal protective equipment). The recommendations were accepted and gradually implemented.

On this day, 399 soldiers presented for care at the TMC. Of these, 115 (28.8%) were admitted to the KMTC isolation facilities.

1 November: Due to increasing reports of H1N1 among civilians, the MoPH declared a nationwide public health emergency and ordered the closure of all education institutes for three weeks. The KMTC announced that no recruits would be matriculated during this period. The MoPH emphasized the importance to all Afghans of personal hygiene and social distancing as countermeasures against influenza.¹

On this day, 502 soldiers reported to the TMC. Of these, 21 (4.2%) were admitted to isolation, and six (1.2%) were transferred for evaluation and admitted to the NMH. The ANA Surgeon General issued billeting standards emphasizing adequate living space, head-to-toe sleeping configuration, and sanitation. The PMT visited the KMTC to monitor improvements.

2 November: Three patients who were admitted to the NMH on 30 October were confirmed to have been infected with novel H1N1 influenza (per real-time reverse transcription-polymerase chain reaction testing at the MoPH Central Laboratory). Of 420 new patients seen at the TMC, 97 (23.1%) were admitted to isolation facilities, and six (1.4%) were referred to the NMH. Also, on this day, 188 patients were discharged from the isolation facilities at the KMTC. Of note, the MoPH announced that H1N1 influenza could affect 5.5 million Afghans during the next two years².

3 November: There were 595 visits to the TMC - the most of any day of the outbreak period (**Figure 1**). Thirty-one soldiers (5.2%) were admitted to isolation and two (0.3%) to the NMH.

4 November-14 November: During this 11-day period, 4,078 soldiers sought care at the KMTC TMC (average, per day: 371). During the period, relatively few soldiers were admitted to isolation (n=3) or the NMH (n=17), while 128 soldiers were released from isolation.

In summary, between 30 October and 14 November, 6,344 soldiers were evaluated at the TMC (average, per day: 397). Of these, 5,954 (93.9%) were immediately

returned to duty, 319 (5.0%) were admitted to local isolation facilities (isolation time, mean: 2.2 days), and 61 (1.0%) were transferred to the military hospital for care. Of those transferred to the NMH, 58 (95.1%) were treated for severe ILI, acute respiratory disease symptoms, and/or pneumonia. Among all ILI cases, at least three provided samples that were positive for novel H1N1 influenza. By 14 November, seven soldiers remained hospitalized, and none were in isolation.

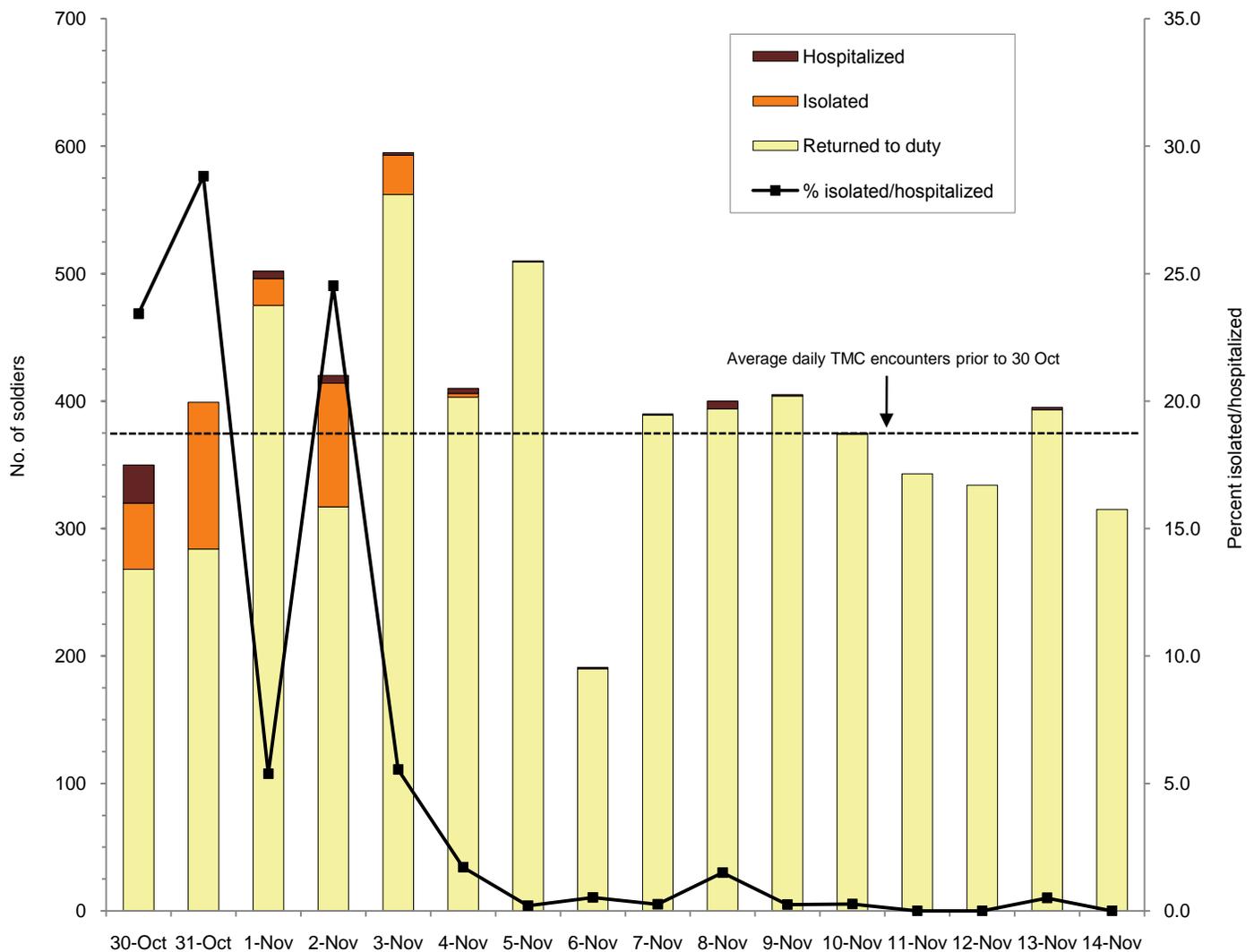
of the soldiers assigned to the camp sought medical care. Of these, only approximately 6% required treatment in an isolation ward or in the hospital.

During the outbreak period, the increase in clinic visits (peaking at 59% above the average) was relatively much larger than the increases in isolation ward or hospital admissions. On 29 October (just prior to the time of the Preventive Medicine Team consultation), the MoPH reported that 271 of the 281 confirmed cases of H1N1 influenza in Afghanistan were among members of North Atlantic Treaty Organization (NATO) forces and that an Afghan who worked closely with NATO forces had died of H1N1 influenza on 28 October. On 1 November, a national public health emergency was declared, all schools were closed, and Afghans were discouraged from gathering in public places. In addition, local private television stations advised wearing masks when around foreigners; also, at least

Editorial Comment:

Respiratory infections (e.g., influenza, adenovirus) can cause debilitating febrile respiratory illnesses among military trainees. In military recruit camps, they can cause large outbreaks that seriously disrupt training operations.^{3,4} This report documents that, during a two-week period at an Afghan National Army training camp, more than two-thirds

Figure 1. Dispositions of soldiers who presented for care of influenza-like illnesses at troop medical clinic (TMC), Afghan National Army, Kabul Military Training Center, 30 October-14 November 2009



one ANA regional commander outside of Kabul ordered his soldiers to wear surgical masks indoors at all times. In light of widespread cultural attitudes that regard pigs as profane, references to the novel H1N1 influenza as “swine flu” may have further inflamed fears. Given the concerning information that was disseminated throughout Afghanistan around the time of the outbreak, it is not surprising that clinic visits far exceeded cases that required isolation or hospitalization among military trainees.

During the outbreak summarized here, there was limited laboratory testing; however, the few specimens that were evaluated revealed that novel H1N1 influenza was present in the trainee population. Recently (as of 8 November 2009), the World Health Organization reported 772 laboratory-confirmed H1N1 influenza cases in Afghanistan; of the cases, 390 were Afghan military members, 313 were members of NATO forces, and 69 were Afghan civilians.⁵ Together, the findings suggest that the novel H1N1 influenza strain likely caused many (perhaps most) of the ILI cases during the KMTC outbreak.

As the outbreak evolved, ANA military commanders were generally effective at providing relevant information to their soldiers and implementing prevention and control measures (per recommendations of the PMT). The prompt responses of the military commanders constituted an aggressive and

appropriate attempt to control the spread, size, and impact of the epidemic on the military mission..

Reported by: Paul Y. Kim, Capt USAF; Darrell Mangham, HM1, USN; Francis Hall, CDR, USN; and Elizabeth Hofmeister CDR, USN

Acknowledgements: The authors acknowledge Maj Chrystal Henderson for sending daily status reports from the KMTC TMC and perfecting the tracking log, Dr Zabiullah Azizi for sending daily status reports from the NMH, and the members of the Afghan and Coalition medical community.

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Sentinel reportable events among service members and beneficiaries at U.S. Air Force medical facilities, cumulative numbers^a for calendar years through 31 October 2008 and 31 October 2009



Air Force

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Air Combat Cmd	1,296	1,196	5	5	21	13	5	2	5	2	31	4	1	2
Air Education & Training Cmd	675	1,334	2	4	13	21	6	6	3	3	3	9	.	.
Air Force Dist. of Washington	182	161	.	.	2	1	.	.	1	.	3	3	.	.
Air Force Materiel Cmd	518	482	2	2	7	13	10	.	2	1	1	7	.	.
Air Force Special Ops Cmd	175	154	.	1	4	10	.	.	.	.	3	.	.	.
Air Force Space Cmd	248	296	1	2	6	7	1	.	.	1	2	2	.	.
Air Mobility Cmd	706	643	1	4	10	7	2	3	.	1	7	3	1	1
Pacific Air Forces	619	453	9	2	6	5	.	.	3	.	10	5	.	1
U.S. Air Forces in Europe	466	496	2	4	8	5	.	.	.	.	4	4	1	1
U.S. Air Force Academy	40	58	1	1	.	3	.	.	.	.	.	.	.	.
Other	575	82	4	1	14	3	7	.	1	.	2	.	.	.
Total	5,500	5,355	27	26	91	88	31	11	15	8	66	37	3	5

^aEvents reported by Nov 7, 2009^bSixty-seven medical events/conditions specified by Tri-Service Reportable Events Guidelines and Case Definitions, June 2009.^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Air Combat Cmd	4	10	1	.	1,111	1,050	104	93	3	5	4	5	1	5	.	.	.	.
Air Education & Training Cmd	5	7	.	4	580	1,148	52	119	6	5	1	.	4	8	.	.	.	.
Air Force Dist. of Washington	3	5	.	.	151	142	21	10	1	.	.	.	.	.	.	.	.	.
Air Force Materiel Cmd	10	9	1	.	424	412	56	36	3	2	.	.	.	.	1	.	1	.
Air Force Special Ops Cmd	.	1	1	.	155	131	11	9	.	1	.	1	.	.	1	.	.	.
Air Force Space Cmd	1	.	.	.	221	267	15	14	.	1	.	.	1	1	.	.	.	1
Air Mobility Cmd	18	17	1	1	590	551	61	47	3	1	5	6	5	1	1	.	1	.
Pacific Air Forces	.	1	.	1	557	379	30	41	1	3	2	9	.	6	.	.	1	.
U.S. Air Forces in Europe	19	17	3	2	394	421	34	37	1	2	.	1	.	.	.	.	.	2
U.S. Air Force Academy	1	1	.	1	37	49	.	3	.	.	1	.	.	.	.	.	.	.
Other	6	.	1	5	501	40	29	7	2	.	.	1	5	23	3	1	.	1
Total	67	68	8	14	4,721	4,590	413	416	20	20	13	23	16	44	6	1	3	4

Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers^a for calendar years through 31 October 2008 and 31 October 2009



Army

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NORTH ATLANTIC														
Washington, DC Area	204	208	2	1	1	.	1	.	1	.	3	5	6	1
Aberdeen, MD	25	45	.	.	.	.	.	.	.	1	.	.	.	.
FT Belvoir, VA	175	222	7	9	13	3	4	.	.	.	.	.	.	.
FT Bragg, NC	1,252	1,506	.	6	16	19	2	.	.	.	.	2	.	.
FT Drum, NY	201	52	.	.	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	227	215	1	.	2	3	.	.	.	.	.	.	1	.
FT Knox, KY	235	185	2	.	1	.	.	.	.	.	.	.	.	.
FT Lee, VA	249	513	.	1	.	.	.	.	.	.	4	.	1	.
FT Meade, MD	62	38	.	1	.	1	1	.	.	.	.	.	.	.
West Point, NY	62	96	.	1	.	.	.	.	.	.	1	1	.	.
GREAT PLAINS														
FT Sam Houston, TX	441	521	.	1	9	7	12	2	.	.	.	1	.	1
FT Bliss, TX	437	258	.	.	10	1	1	1	.	1	.	5	.	.
FT Carson, CO	576	597	3	5	3	3	.	.	1	1	1	.	.	.
FT Hood, TX	1,818	1,746	6	8	33	19	6	14	.	.	.	2	2	.
FT Huachuca, AZ	89	75	.	1	1	.	2	.	.	.	1	.	.	.
FT Leavenworth, KS	41	55	.	.	.	1	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	218	319	2	2	1	.	1	.	2	1	1	.	1	1
FT Polk, LA	157	541	1	.	1	1	1	3	.	.	.	.	1	.
FT Riley, KS	383	304	3	1	3	3	.	.	.	.	2	.	.	.
FT Sill, OK	114	598	.	.	3	.	.	4	.	.	1	.	.	.
SOUTHEAST														
FT Gordon, GA	561	607	1	3	14	15	16	3	.	.	1	3	2	1
FT Benning, GA	299	382	2	1	5	.	1	1	.	1	.	.	.	.
FT Campbell, KY	185	334	1	.	.	.	2	.	.	.	.	.	.	1
FT Jackson, SC	340	545	.	.	.	.	.	.	.	.	1	2	.	.
FT Rucker, AL	76	65	1	8	4	4	.	.	.	.	1	.	.	.
FT Stewart, GA	767	1,032	5	.	25	31	3	15	1	.	8	.	.	.
WESTERN														
FT Lewis, WA	998	946	11	5	3	7	2	1	.	.	.	.	.	.
FT Irwin, CA	58	107	.	.	2	1	1	1	.	.	.	.	.	.
FT Wainwright, AK	274	189	4	.	2	.	.	.	2	.	.	.	.	.
PACIFIC														
Hawaii	705	686	33	32	14	16	3	5	1	.	5	3	.	.
Japan	29	3	1	.	.	.	.	.	.	.	.	.	.	.
Korea	381	443	.	.	1	.	.	.	.	.	.	.	1	.
OTHER LOCATIONS														
Germany	919	1,262	9	19	24	14	5	1	1	2	3	1	2	1
Unknown	0	0	.	.	.	.	.	.	.	.	.	.	.	.
Total	12,558	14,695	95	105	191	149	64	51	9	7	33	25	17	6

^aEvents reported by Nov 7, 2008 and 2009

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

^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Army medical facilities, cumulative numbers^a for calendar years through 31 October 2008 and 31 October 2009



Army

Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NORTH ATLANTIC																		
Washington, DC Area	16	26	1	.	124	143	23	19	8	12	.	.	14	.	3	.	1	1
Aberdeen, MD	3	.	.	.	18	37	4	5	.	2	.	.	.	.	.	.	.	.
FT Belvoir, VA	.	.	.	.	140	192	11	18	.	.	.	.	.	.	.	.	.	.
FT Bragg, NC	1	.	10	.	897	1,151	186	222	1	4	.	1	137	101	.	.	2	.
FT Drum, NY	4	.	.	.	180	49	17	3	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	.	.	.	.	188	183	30	29	4	.	.	.	1	.	.	.	.	.
FT Knox, KY	2	1	.	.	187	161	38	23	2	.	.	.	2	.	1	.	.	.
FT Lee, VA	2	1	1	.	171	460	64	49	1	2	.	.	5	.	.	.	.	.
FT Meade, MD	1	1	.	.	55	35	5	.	.	.	.	.	.	.	.	.	.	.
West Point, NY	33	27	.	.	26	63	2	4	.	.	.	.	.	.	.	.	.	.
GREAT PLAINS																		
FT Sam Houston, TX	.	.	2	.	321	399	73	80	19	12	1	.	4	17	.	.	.	1
FT Bliss, TX	.	.	.	.	351	211	68	33	6	5	.	.	.	.	.	.	1	1
FT Carson, CO	.	.	.	.	517	533	50	55	.	.	.	.	.	.	1	.	.	.
FT Hood, TX	1	.	1	.	1,443	1,361	324	312	1	10	.	.	.	19	1	.	.	1
FT Huachuca, AZ	1	.	.	.	69	68	12	4	.	1	1	.	2	1	.	.	.	.
FT Leavenworth, KS	1	4	.	.	36	44	4	3	.	2	.	.	.	1	.	.	.	.
FT Leonard Wood, MO	.	.	.	.	177	277	20	28	1	.	3	1	7	8	.	.	2	1
FT Polk, LA	.	.	.	.	102	347	30	52	2	1	.	.	19	137	.	.	.	.
FT Riley, KS	6	.	1	1	318	254	40	40	1	1	1	1	8	3	.	.	.	.
FT Sill, OK	.	.	.	.	83	532	18	42	.	.	.	.	9	20	.	.	.	.
SOUTHEAST																		
FT Gordon, GA	.	.	.	.	433	491	93	83	.	.	.	.	1	8	.	.	.	.
FT Benning, GA	.	.	.	5	202	271	69	62	1	2	.	.	19	38	.	.	.	1
FT Campbell, KY	1	5	.	.	162	221	14	60	1	1	.	.	4	46	.	.	.	.
FT Jackson, SC	.	.	.	.	281	290	38	46	1	2	.	.	19	205	.	.	.	.
FT Rucker, AL	2	.	.	.	54	49	9	4	2	.	.	.	2	.	.	.	1	.
FT Stewart, GA	2	.	3	1	582	771	105	119	4	6	.	.	28	82	1	6	.	1
WESTERN																		
FT Lewis, WA	.	.	5	.	890	854	85	74	1	2	.	.	.	1	.	.	1	2
FT Irwin, CA	.	.	.	.	36	93	8	5	.	2	.	.	11	5	.	.	.	.
FT Wainwright, AK	1	.	.	.	224	169	28	16	1	.	10	1	1	1	.	1	1	1
PACIFIC																		
Hawaii	.	.	1	1	576	557	62	57	.	5	.	.	2	3	.	1	8	6
Japan	.	.	.	.	24	3	4	.	.	.	.	.	.	.	.	.	.	.
Korea	.	.	.	.	333	418	41	16	3	2	.	1	2	6	.	.	.	.
OTHER LOCATIONS																		
Germany	40	50	16	6	627	1,004	131	117	7	9	8	1	18	31	25	2	3	4
Unknown	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	117	115	41	14	9,827	11,691	1,706	1,680	67	83	24	6	315	733	32	10	20	20

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers^a for calendar years through 31 October 2008 and 31 October 2009



Navy

Reporting locations	Number of reports all events ^b		Food-borne						Vaccine preventable					
			Campylobacter		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella ^c	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NATIONAL CAPITOL AREA														
NNMC Bethesda, MD	220	154	4	3	15	2	.	.	.	3	6	5	.	.
NHC Annapolis, MD	30	6	1	.	1	.	.	.	.	.	.	.	.	.
NHC Patuxent River, MD	37	27	.	.	.	.	.	.	.	.	.	.	.	.
NHC Quantico, VA	192	102	.	1	.	1	.	3	.	.	2	.	.	.
NAVY MEDICINE EAST														
NH Beaufort, SC	172	347	.	.	1	.	1	.	.	1	.	3	.	.
NH Camp Lejeune, NC	917	507	2	1	26	13	.	1	.	.	.	.	.	.
NH Charleston, SC	35	3	.	.	1	.	1	.	.	.	.	.	.	.
NH Cherry Point, NC	138	3	.	.	8	.	.	.	.	.	.	.	.	.
NH Corpus Christi, TX	17	2	.	.	.	.	2	.	1	.	.	.	.	.
NHC Great Lakes, IL	573	392	.	.	.	1	.	.	.	1	7	12	2	.
NH Guantanamo Bay, Cuba	9	0	.	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	492	231	.	.	79	15	7	1	.	.	5	.	2	.
NH Naples, Italy	62	1	2	.	.	.	.	.	2	.	2	.	.	.
NHC New England, RI	34	0	1	.	1	.	.	.	.	.	.	.	1	.
NH Pensacola, FL	343	209	2	1	11	8	3	2	.	.	.	.	.	.
NMC Portsmouth, VA	522	176	.	.	.	.	2	.	.	.	5	1	.	.
NH Rota, Spain	26	0	5	.	3	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	50	1	.	.	.	.	.	.	.	.	.	.	1	1
NAVY MEDICINE WEST														
NH Bremerton, WA	64	6	1	.	1	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	174	6	2	.	3	.	1	.	.	.	.	.	.	.
NH Guam-Agana, Guam	140	31	.	.	.	3	.	.	.	.	.	.	6	.
NHC Hawaii, HI	139	18	.	.	1	.	.	.	.	.	1	.	.	.
NH Lemoore, CA	62	48	.	.	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	143	97	.	3	4	2	.	1	.	.	4	4	.	1
NH Okinawa, Japan	47	39	.	.	.	.	.	.	.	.	.	.	.	.
NMC San Diego, CA	1,147	741	1	8	6	12	2	1	1	.	44	52	2	1
NH Twentynine Palms, CA	9	1	.	.	.	.	.	.	.	.	.	.	.	.
NH Yokosuka, Japan	218	32	.	.	.	.	.	.	.	.	11	3	.	.
NAVAL SHIPS														
COMNAVAIRLANT/CINCLANTFLEET	53	22	.	.	.	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	120	67	.	.	4	.	.	.	.	.	.	.	.	.
OTHER LOCATIONS														
Unknown	3,287	3,215	16	14	28	23	7	5	.	1	17	11	8	2
Total	9,472	6,484	37	31	193	80	26	14	4	6	104	91	22	5

^aEvents reported by Nov 7, 2009

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

^cService member cases only.

Note: Completeness and timeliness of reporting vary by facility.

Sentinel reportable events among service members and beneficiaries at U.S. Navy medical facilities, cumulative numbers^a for calendar years through 31 October 2008 and 31 October 2009

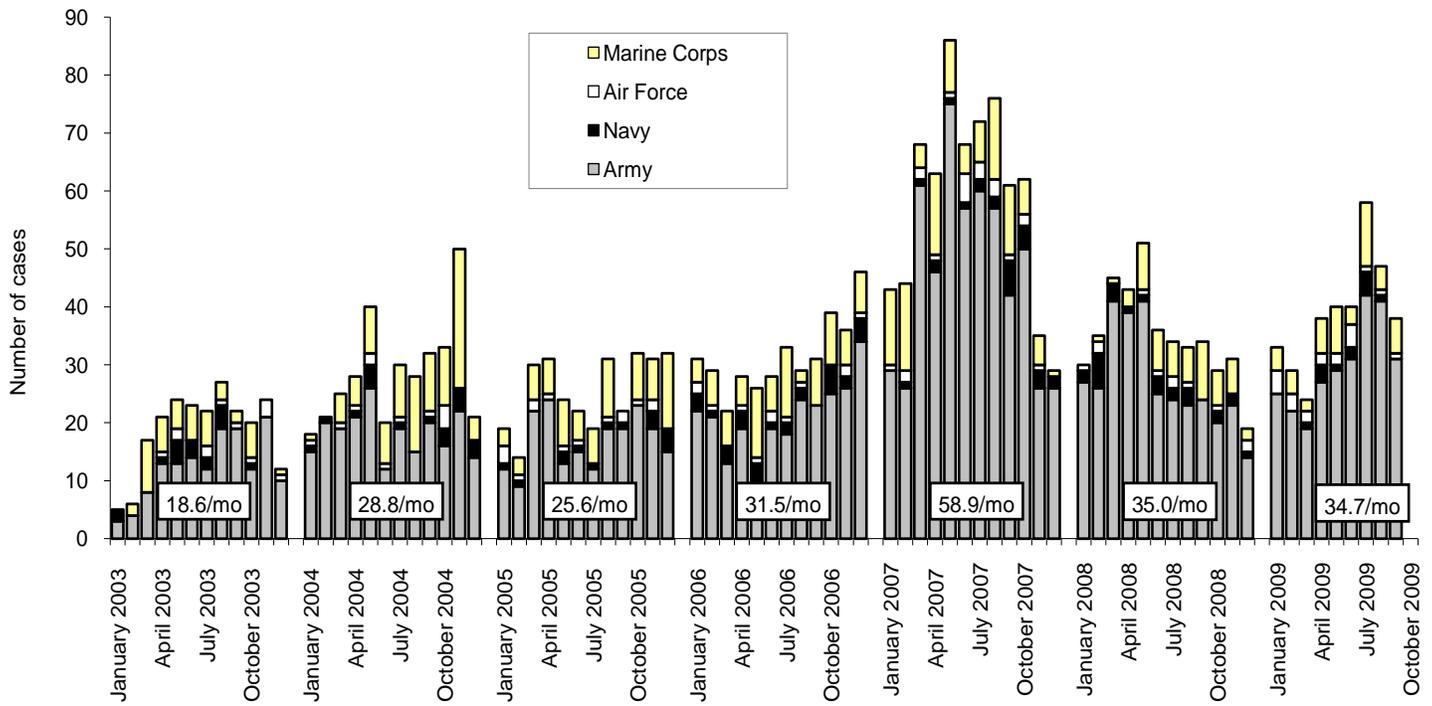


Navy

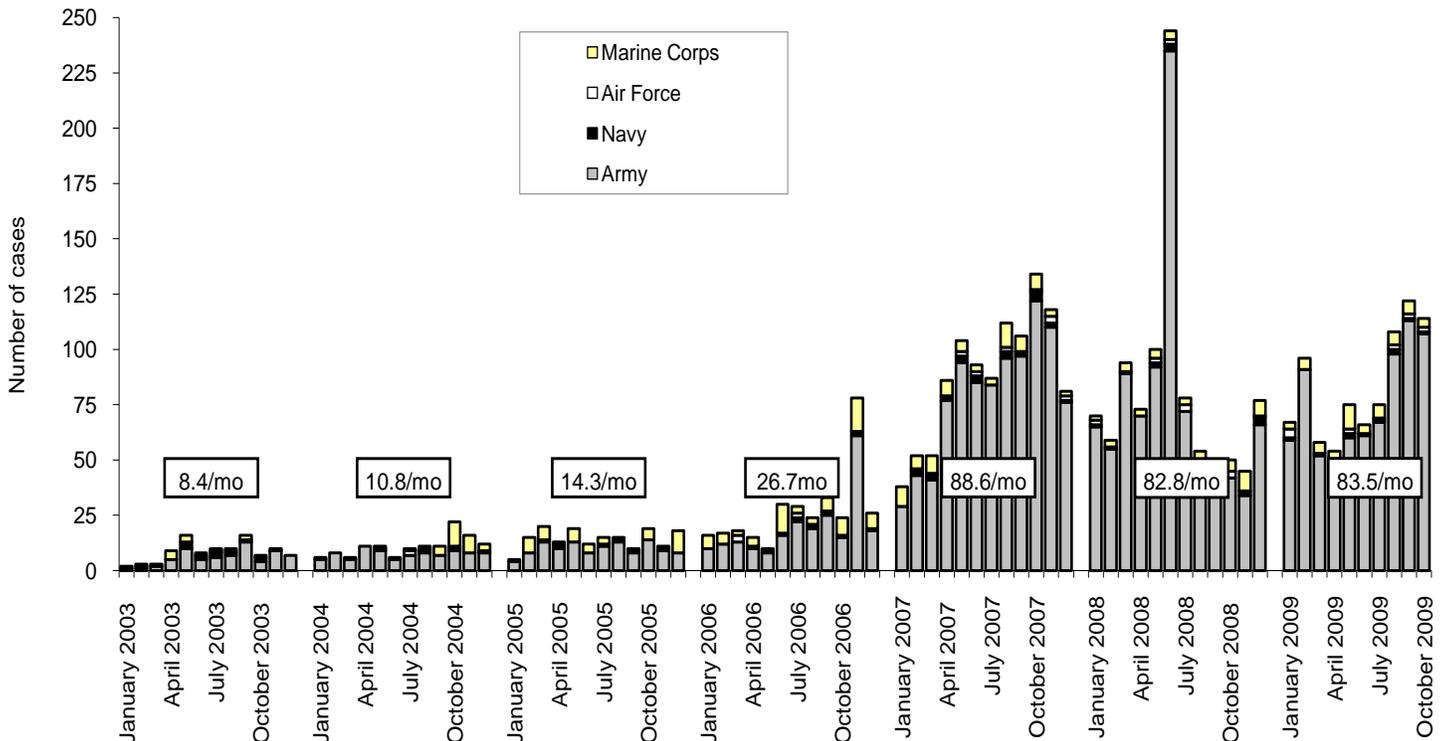
Reporting location	Arthropod-borne				Sexually transmitted						Environmental				Travel associated			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis		Cold ^c		Heat ^c		Q Fever		Tuberculosis	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
NATIONAL CAPITOL AREA																		
NNMC Bethesda, MD	20	12	5	.	152	119	13	9	3	1	.	.	.	.	.	.	2	.
NHC Annapolis, MD	6	.	.	.	19	5	1	.	1	1	.	.	1	.	.	.	.	.
NHC Patuxent River, MD	6	6	.	.	29	18	2	2	.	1	.	.	.	.	.	.	.	.
NHC Quantico, VA	4	1	2	.	121	76	19	10	.	.	.	.	44	10	.	.	.	.
NAVY MEDICINE EAST																		
NH Beaufort, SC	1	.	.	.	68	326	5	16	2	1	.	.	94	.	.	.	.	.
NH Camp Lejeune, NC	3	3	.	2	614	344	140	78	1	.	.	1	130	62	1	1	.	1
NH Charleston, SC	1	.	.	.	26	2	3	1	2	.	.	.	1	.	.	.	.	.
NH Cherry Point, NC	1	.	.	.	106	3	20	.	.	.	.	.	3	.	.	.	.	.
NH Corpus Christi, TX	1	.	.	.	6	2	7	.	.	.	.	.	.	.	.	.	.	.
NHC Great Lakes, IL	.	1	.	.	521	351	40	22	3	.	.	.	.	3	.	.	.	1
NH Guantanamo Bay, Cuba	.	.	.	.	8	.	1	.	.	.	.	.	.	.	.	.	.	.
NH Jacksonville, FL	.	1	.	1	361	194	34	19	4	.	.	.	.	.	.	.	.	.
NH Naples, Italy	.	.	.	.	52	1	4	.	.	.	.	.	.	.	.	.	.	.
NHC New England, RI	7	.	.	.	21	.	3	.	.	.	.	.	.	.	.	.	.	.
NH Pensacola, FL	3	.	.	.	243	158	31	22	7	1	.	.	42	14	.	2	1	1
NMC Portsmouth, VA	2	.	1	3	413	138	94	28	4	4	.	.	.	.	1	.	.	2
NH Rota, Spain	.	.	.	.	17	.	1	.	.	.	.	.	.	.	.	.	.	.
NH Sigonella, Italy	.	.	1	.	38	.	5	.	1	.	.	.	4	.	.	.	.	.
NAVY MEDICINE WEST																		
NH Bremerton, WA	.	.	1	.	57	6	4	.	.	.	.	.	.	.	.	.	.	.
NH Camp Pendleton, CA	.	.	.	.	147	6	19	.	.	.	.	.	.	.	1	.	1	.
NH Guam-Agana, Guam	.	.	6	.	101	24	27	3	.	.	.	.	.	.	.	.	.	1
NHC Hawaii, HI	.	.	.	.	128	17	8	1	1	.	.	.	.	.	.	.	.	.
NH Lemoore, CA	4	1	.	.	57	42	1	5	.	.	.	.	.	.	.	.	.	.
NH Oak Harbor, WA	.	1	.	.	123	84	9	1	3	.	.	.	.	.	.	.	.	.
NH Okinawa, Japan	.	.	1	.	33	39	8	.	.	.	.	.	5	.	.	.	.	.
NMC San Diego, CA	10	3	2	3	964	533	96	84	15	18	.	.	2	20	1	2	1	4
NH Twentynine Palms, CA	.	.	.	.	6	.	.	.	.	1	.	.	3	.	.	.	.	.
NH Yokosuka, Japan	.	1	.	.	177	28	27	.	1	.	.	.	.	.	.	.	2	.
NAVAL SHIPS																		
COMNAVAIRLANT/CINCLANTFLEET	.	.	.	1	42	21	10	.	1	.	.	.	.	.	.	.	.	.
COMNAVSURFPAC/CINCPACFLEET	.	.	.	.	92	59	24	7	.	1	.	.	.	.	.	.	.	.
OTHER LOCATIONS																		
Other	72	28	5	7	2,700	2,623	309	330	17	9	.	9	106	148	1	.	1	5
Total	141	58	24	17	7,442	5,219	965	638	66	38	0	10	435	257	5	5	8	15

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - October 2009 (data as of 25 November 2009)

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



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



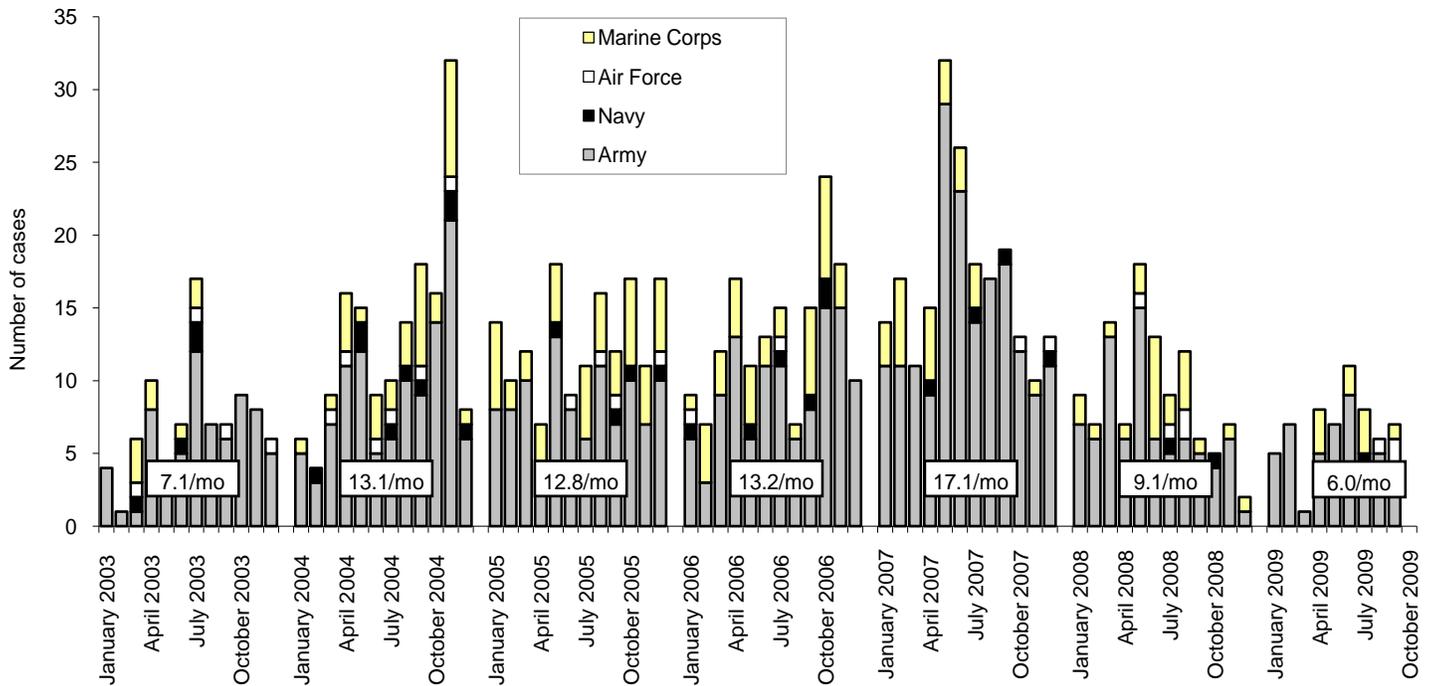
Reference: Armed Forces Health Surveillance Center. Frequencies, rates and trends of use of diagnostic codes indicative of traumatic brain injury (TBI), July 1999-June 2008. MSMR. Dec 2008; 15(10):2-9.

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

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

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - October 2009 (data as of 25 November 2009)

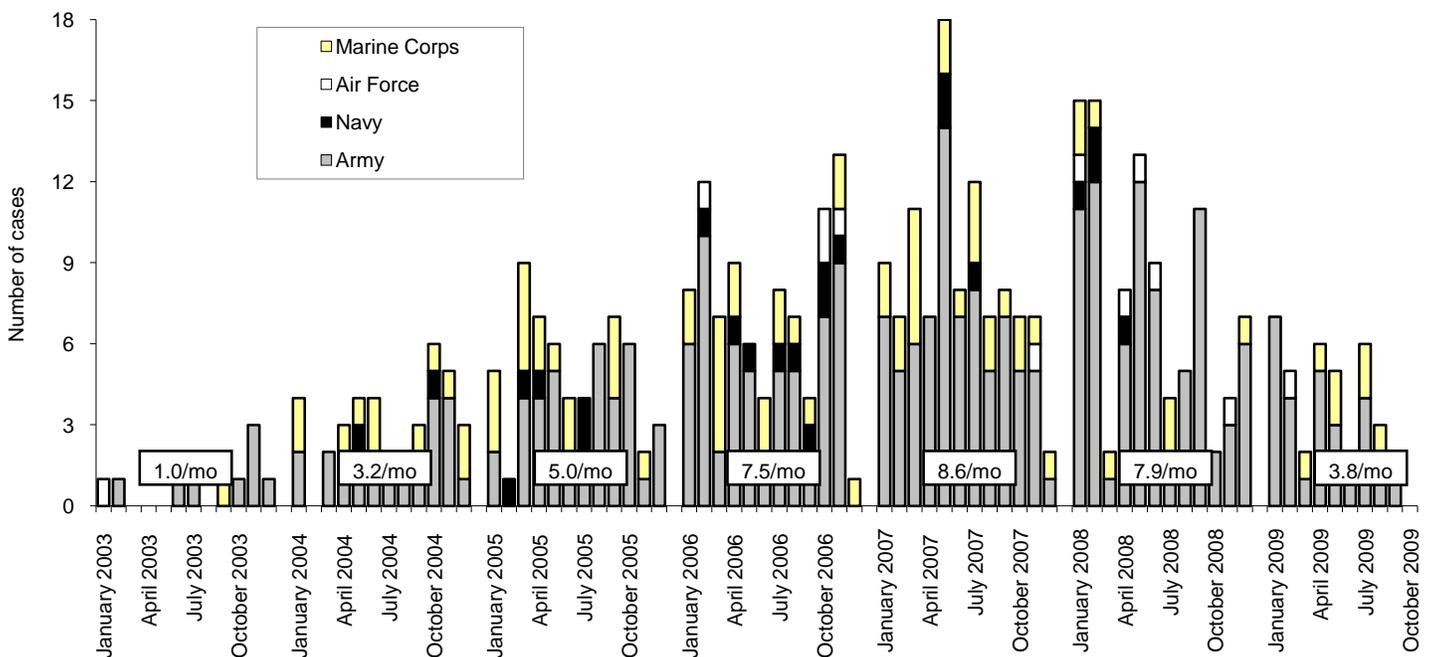
Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)^a



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

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

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

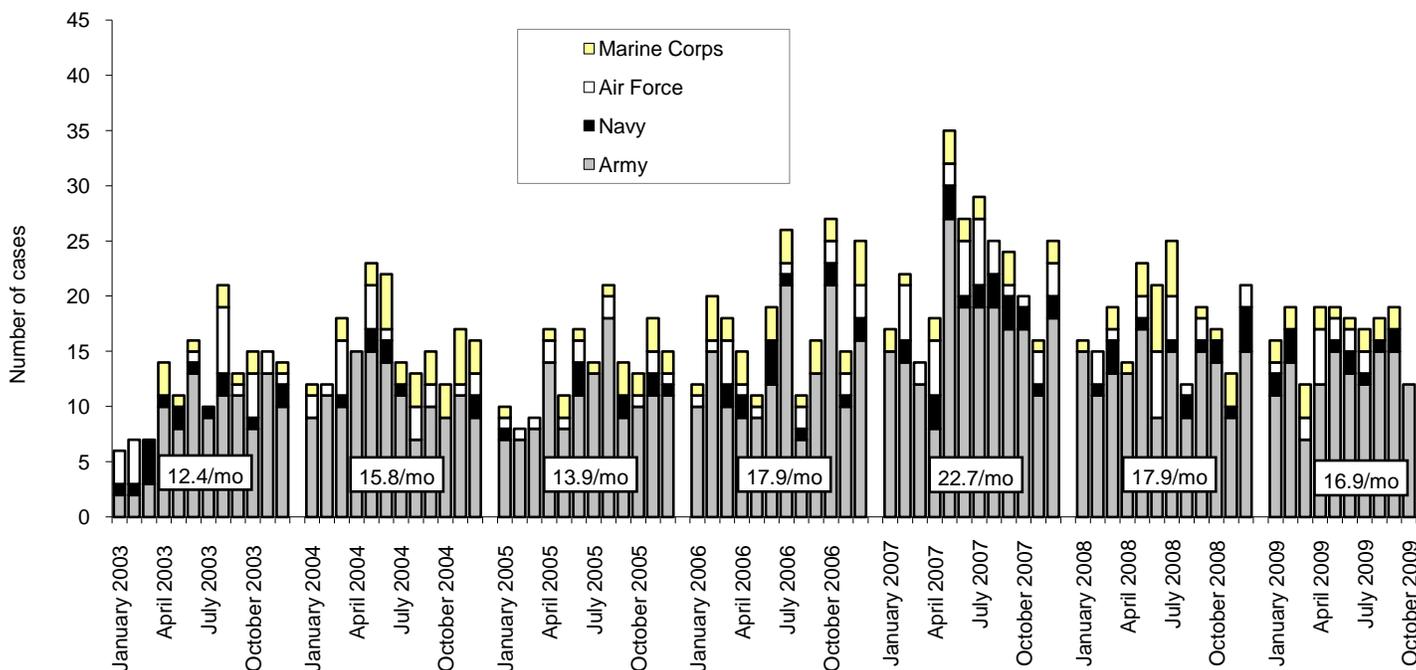


Reference: Army Medical Surveillance Activity. Heterotopic ossification, active components, U.S. Armed Forces, 2002-2007. MSMR. Aug 2007; 14(5):7-9.

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

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - October 2009 (data as of 25 November 2009)

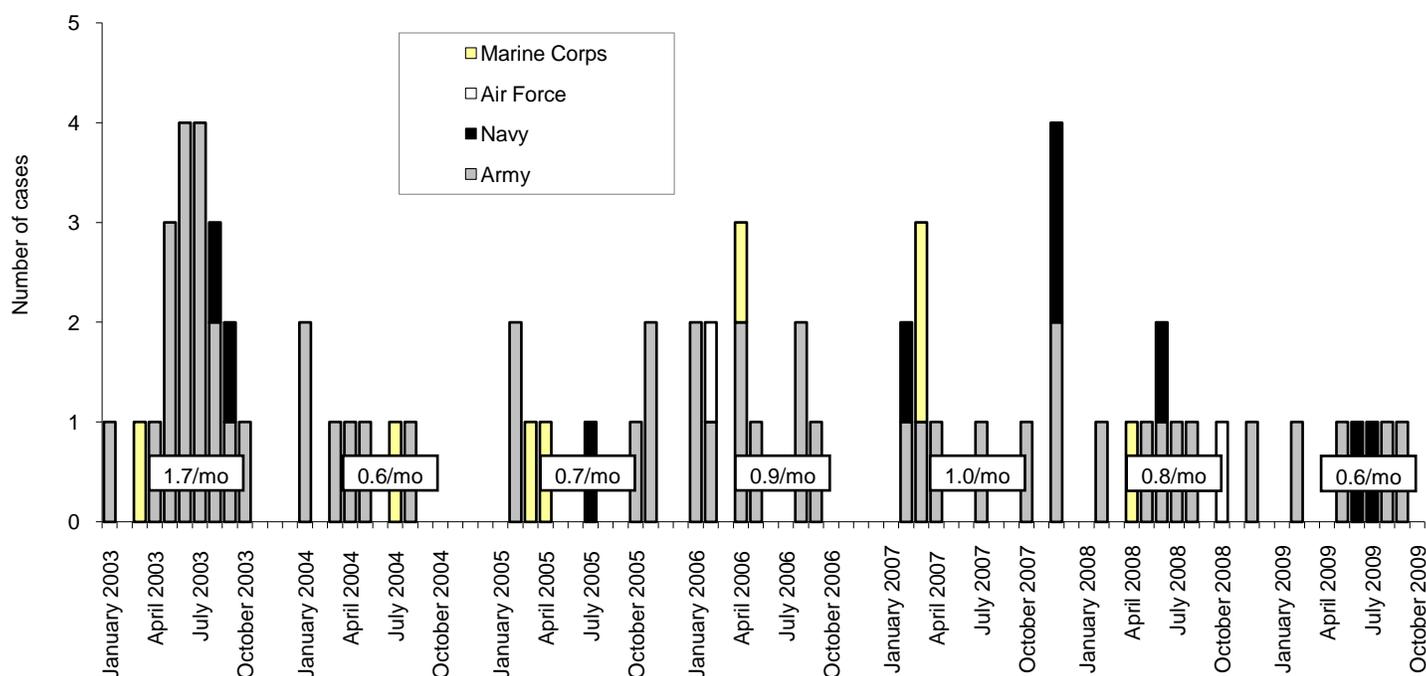
Deep vein thrombophlebitis/pulmonary embolus (ICD-9: 415.1, 451.1, 451.81, 451.83, 451.89, 453.2, 453.40 - 453.42 and 453.8)^a



Reference: Isenbarger DW, Atwood JE, Scott PT, et al. Venous thromboembolism among United States soldiers deployed to Southwest Asia. *Thromb Res.* 2006;117(4):379-83.

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

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

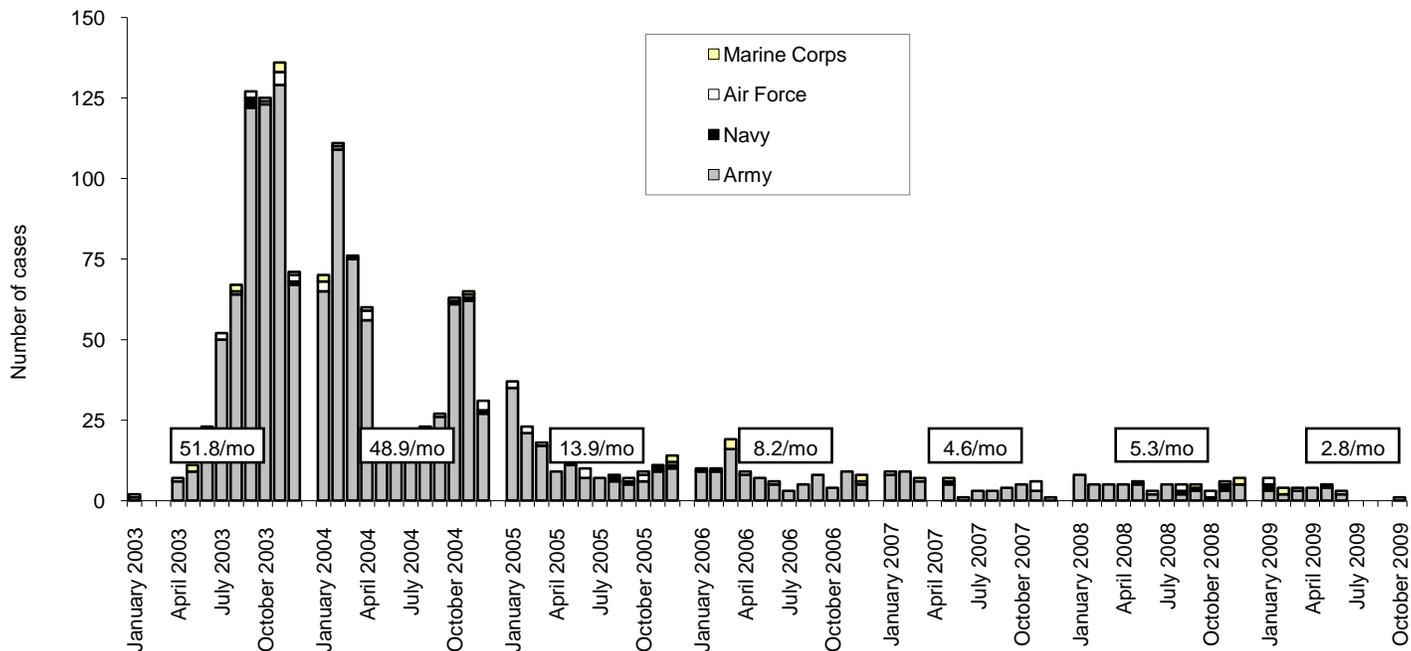


Reference: Army Medical Surveillance Activity. Deployment-related condition of special surveillance interest: severe acute pneumonia. Hospitalizations for acute respiratory failure (ARF)/acute respiratory distress syndrome (ARDS) among participants in Operation Enduring Freedom/Operation Iraqi Freedom,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

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

Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - October 2009 (data as of 25 November 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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