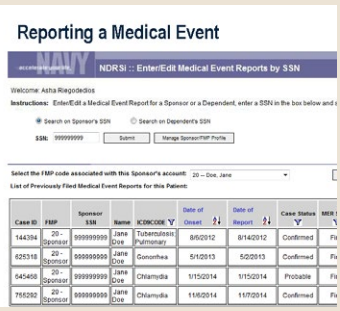
NOVEMBER 2015

Volume 22
Number 11

MSMR

MEDICAL SURVEILLANCE MONTHLY REPORT



Rates of Acute Respiratory Illnesses of Infectious and Allergic Etiologies After Permanent Changes of Duty Assignments, Active Component, U.S. Army, Air Force, and Marine Corps, January 2005–September 2015

John F. Brundage, MD, MPH; Stephen B. Taubman, PhD; Leslie L. Clark, PhD, MS

Throughout history, acute respiratory illnesses (ARIs) have disproportionately affected military populations, particularly those in recruit training camps. A similar dynamic can affect non-trainee military settings. When military members are reassigned, they often develop ARIs within the first weeks of their arrivals at their new assignments. To assess the natures and magnitudes of the risks associated with new assignments, this analysis compared the experiences of service members within their first full calendar months at new assignments and during the same months at the same locations 1 year later. The results do not support the hypothesis that ARIs of infectious etiologies consistently occur more frequently soon after arriving at new assignments compared to 1 year later at the same locations. In contrast, during two-thirds of the 117 months considered here, rates of ARIs of presumed allergic etiologies (e.g., allergic rhinitis, asthma) were higher during the first months of new assignments compared to 1 year later. The limitations of the study methodology as well as the possible implications of the findings are discussed.

Throughout history, acute respiratory illnesses (ARIs) have disproportionately affected military populations, particularly those in recruit training camps. To counter the persistent threat of debilitating outbreaks of ARIs among its members, the U.S. military immunizes all new recruit trainees against adenoviruses, types 4 and 7, and all active members annually against influenza viruses.[1-4] In addition, the military employs a variety of non-vaccine interventions against respiratory infections agents; these include personal protective measures (e.g., hand washing) and environmental controls (e.g., increased indoor ventilation, reduced crowding).[3-6] Such measures aim to reduce the transmission of respiratory pathogens from infected to immunologically susceptible hosts in crowded military settings.

Despite numerous and diverse countermeasures, however, ARIs from infectious and allergic causes continue to account for extremely large morbidity burdens among active military members. For example, in 2014, upper and lower respiratory infections, allergic rhinitis, and asthma together accounted for more than 459,000 medical encounters by active component members. Also, during the year, upper respiratory infections alone accounted for more lost duty time than all but two other illness/injury-related conditions and affected more military members (n=216,394) than all but three other conditions.[7]

Newly assembled recruit trainees are at high risk of ARIs because they come from diverse geographic and social backgrounds. By the time they enter military service, they have been exposed to and immunologically challenged by broad, diverse, and unique sets of respiratory infectious and airborne allergic agents. The numbers, natures, and timing of such exposures determine the ranges and diversity of their immunologic repertoires—which, in turn, define the natures of their susceptibilities to various infectious agents and allergens. Thus, when new recruits enter service, they vary in regard to the microbes that colonize their nasopharynges, the agents to which they are immune, and conversely, those to which they are immunologically susceptible.

When individuals from such diverse backgrounds are congregated into military units, the diverse microbes that colonize their nasopharynges, as well as the pathogenic agents infecting any actively sick individuals, may be seeded into the shared environments in which they sleep, shower, eat, train, worship, recreate, and so on. If agents with pathogenic potential are seeded into and efficiently transmitted in such settings, they can infect large numbers of immunologically susceptible hosts. In particular among recruits, if a large proportion of recruits are immunologically susceptible to an efficiently transmissible agent, the seeding of such an agent among them can result in outbreaks of ARIs that can significantly disrupt training. Most such outbreaks occur during the first few weeks of recruit training.[1-4]

A similar but much less discussed epidemiologic dynamic can affect non-trainee military settings. When military members are reassigned, they often develop ARIs within the first weeks of their arrivals at their new assignments. The phenomena are so predictable that, in some locations, ARIs among new arrivals are expected and unaffectionately linked to the locations ("Korea crud," "Bosnia flu").[8-9] Although the phenomenon is well described anecdotally, the natures and magnitudes of the

risks of ARIs among recently reassigned military members have not been rigorously assessed.

The objectives of this analysis are to characterize the ARI experiences of U.S. military members within their first full months after arriving at new permanent duty assignments. To assess the natures and magnitudes of the risks associated with new assignments, if any, the experiences of service members within their first full calendar months at new assignments and during the same months at the same locations 1 year later were compared. The method enables assessment of the risks associated with new assignments while controlling for the effects of season and for individual variability (e.g., immunologic susceptibility, healthcare-seeking behavior).

METHODS

The surveillance population included all individuals who served in the active component of the U.S. Army, Air Force, or Marine Corps any time between 1 January 2005 and 30 September 2014. Navy and Coast Guard members were excluded because, during the period of interest, many medical encounters for respiratory illnesses while onboard ships were not documented in records maintained in the Defense Medical Surveillance System (DMSS).

For each member of the surveillance population, each duty assignment between 1 January 2005 and 30 September 2014 that resulted in a change of duty location (defined as a different state within the U.S. or a different country overseas) of at least 1 year duration was identified.

For all surveillance population members, the first full calendar months immediately following each permanent change of duty assignment were considered index months. Each calendar month exactly 1 year after each index month was considered a referent month. Thus, for example, if a person began a new assignment in mid-June 2006, then July 2006 would be an index month, and July 2007 would be a referent month. The last pair of index-referent months included in the analysis were September 2014 and September 2015.

To enhance the comparability of comparisons of experiences during index and referent months, index and referent month pairs were excluded from analyses if the subject individuals were deployed overseas (e.g., Afghanistan, Iraq) anytime between the index and referent months, had permanent changes of duty assignments anytime between the index and referent months, or left active military service (for any period of time) between the index and referent months. Thus, because all subject individuals remained at the same assignment locations throughout the 1-year periods between the index and the referent months, the analysis database consisted of identical numbers of index and referent months.

For analysis purposes, each index and referent month pair was characterized in relation to gender, age group at the time of the new assignment, race/ethnicity, military service branch, military occupational group, and calendar month and year.

All diagnoses of ARIs of presumed infectious or allergic etiologies that were documented on records of hospitalizations or ambulatory visits (maintained in the DMSS) during index and referent months were ascertained. All incident episodes of ARIs during index and referent months were identified; incident episodes were defined as the first medical encounter of each individual during each index and referent month during which an ARI-specific diagnosis was recorded in the first or second diagnostic position of the electronic record of the encounter. For each index month and each referent month, each individual could have one incident episode of ARI of presumed infectious etiology and one incident episode of ARI of presumed allergic etiology. The ICD-9 codes that were considered indicative of clinical endpoints of interest are provided in **Table 1**.

For each index and referent month during the surveillance period, cumulative incidence rates were calculated by dividing the number of incident episodes that occurred during each index and referent month of interest by the total number of the respective months that occurred during the period.

TABLE 1. Clinical diagnosis codes (ICD-9) that were considered indicative of acute respiratory illnesses of infectious and allergic etiologies for surveillance purposes

Illnesses by etiology	ICD-9 code
Acute respiratory illnesses (infectious)	
Acute upper respiratory infections	460–465
Acute lower respiratory infections	466.x, 481–488, 997.31
Acute respiratory illnesses (allergic)	
Allergic rhinitis	477.x
Asthma	493.x

This table shows the ICD-9 codes that were used in this study to find cases of acute respiratory infections (upper and lower) and cases of acute respiratory illnesses associated with allergy and asthma.

RESULTS

From January 2005 through September 2014, there were 2,122,771 permanent changes of duty assignments of at least 12 months duration.

Acute respiratory illnesses (infectious)

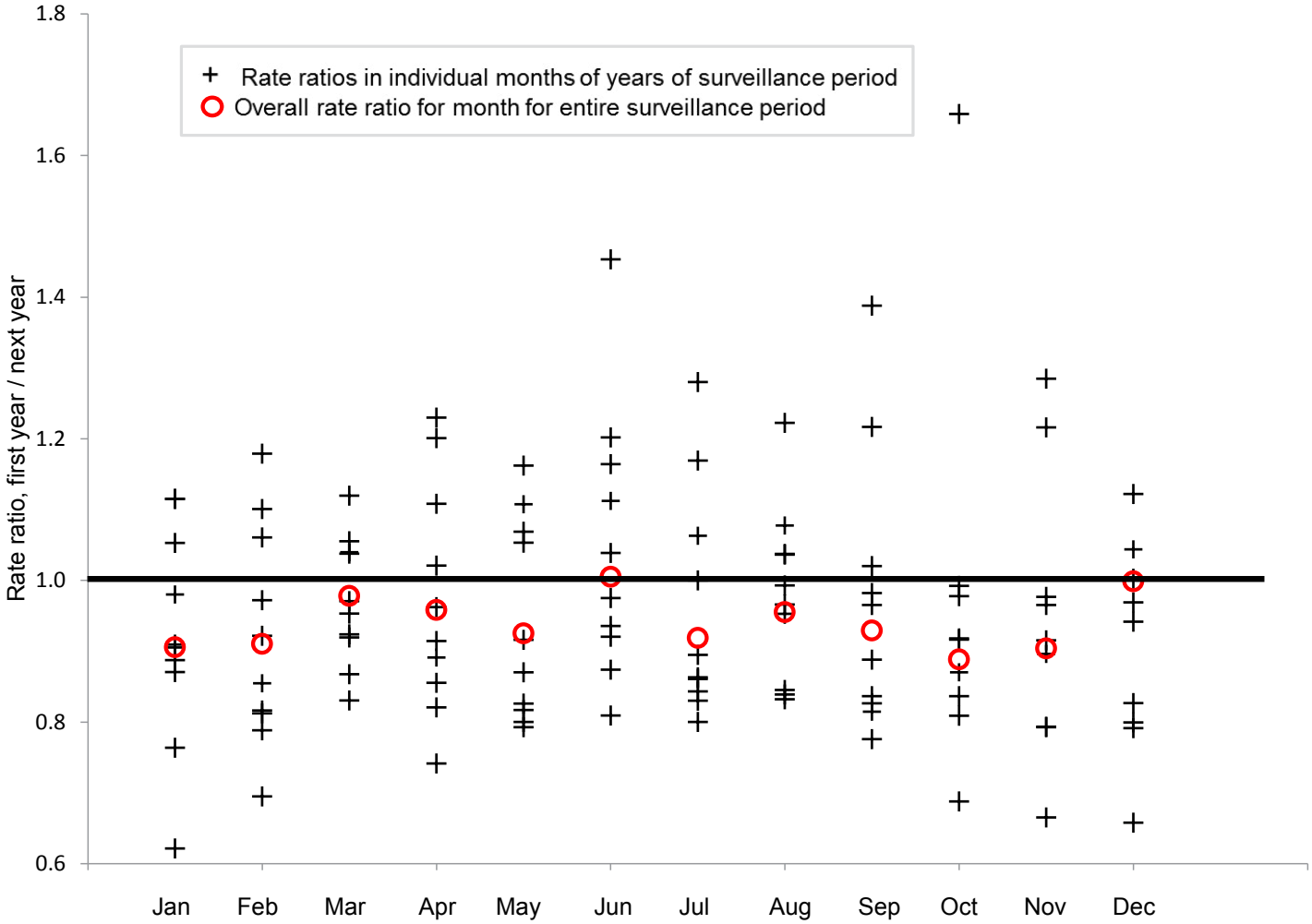
During the first full months of new assignments, there were 38,088 incident episodes of ARIs of presumed infectious etiologies (ARI [infectious]). Among the same service members during the same calendar months 1 year later, there were 40,414 incident episodes of ARI (infectious). During the period overall, cumulative incidence percentages of ARI (infectious) were slightly lower during the first full months of new assignments (1.79% per month) than during the same months 1 year later (1.90% per month) **(Table 2)**.

TABLE 2. Incident medical encounters and incidence rates for acute respiratory illnesses, during the first full months of new assignments and during the same months 1 year later, by demographic/military characteristics of active component members of U.S. Army, Air Force, and Marine Corps, January 2005–September 2015

		Acute respiratory illness, non-allergic			Acute respiratory illness, allergic		
	No. of months	Incident diagnoses, n	Incidence rate, cases/100 months	Incidence rate ratio	Incident diagnoses, n	Incidence rate, cases/100 months	Incidence rate ratio
Sex							
Female							
1st full calendar month	301,603	10,234	3.39	1.00	6,144	2.04	1.19
Same month 1 year later	301,603	10,269	3.40		5,169	1.71	
Male							
1st full calendar month	1,821,168	27,854	1.53	0.92	14,478	0.79	1.05
Same month 1 year later	1,821,168	30,145	1.66		13,827	0.76	
Age group							
<20 years							
1st full calendar month	165,071	3,266	1.98	0.95	747	0.45	0.91
Same month 1 year later	165,071	3,446	2.09		824	0.50	
20-25 years							
1st full calendar month	806,540	14,913	1.85	0.95	4,967	0.62	0.96
Same month 1 year later	806,540	15,641	1.94		5,187	0.64	
26-30 years							
1st full calendar month	444,197	8,524	1.92	0.95	4,619	1.04	1.13
Same month 1 year later	444,197	8,946	2.01		4,090	0.92	
31-40 years							
1st full calendar month	536,737	9,065	1.69	0.92	7,612	1.42	1.18
Same month 1 year later	536,737	9,811	1.83		6,463	1.20	
>40 years							
1st full calendar month	170,226	2,320	1.36	0.90	2,677	1.57	1.10
Same month 1 year later	170,226	2,570	1.51		2,432	1.43	
Race/ethnicity							
Black non-Hispanic							
1st full calendar month	343,809	6,608	1.92	0.97	4,626	1.35	1.08
Same month 1 year later	343,809	6,789	1.97		4,292	1.25	
Hispanic							
1st full calendar month	215,568	3,626	1.68	0.91	1,845	0.86	1.00
Same month 1 year later	215,568	4,005	1.86		1,849	0.86	
White non-Hispanic							
1st full calendar month	1,370,258	24,556	1.79	0.94	12,036	0.88	1.10
Same month 1 year later	1,370,258	26,121	1.91		10,970	0.80	
Other/unknown							
1st full calendar month	193,136	3,298	1.71	0.94	2,115	1.10	1.12
Same month 1 year later	193,136	3,499	1.81		1,885	0.98	
Service							
Army							
1st full calendar month	858,813	16,423	1.91	0.95	9,320	1.09	1.05
Same month 1 year later	858,813	17,236	2.01		8,874	1.03	
Air Force							
1st full calendar month	700,730	15,685	2.24	0.96	9,748	1.39	1.21
Same month 1 year later	700,730	16,395	2.34		8,082	1.15	
Marine Corps							
1st full calendar month	563,228	5,980	1.06	0.88	1,554	0.28	0.76
Same month 1 year later	563,228	6,783	1.20		2,040	0.36	
Rank							
Officer							
1st full calendar month	424,848	6,090	1.43	0.93	5,471	1.29	1.25
Same month 1 year later	424,848	6,579	1.55		4,367	1.03	
Enlisted							
1st full calendar month	1,697,923	31,998	1.88	0.95	15,151	0.89	1.04
Same month 1 year later	1,697,923	33,835	1.99		14,629	0.86	
Occupation							
Combat-specific							
1st full calendar month	435,432	5,344	1.23	0.96	2,630	0.60	1.09
Same month 1 year later	435,432	5,547	1.27		2,414	0.55	
Medical							
1st full calendar month	164,524	4,129	2.51	0.95	2,959	1.80	1.20
Same month 1 year later	164,524	4,345	2.64		2,474	1.50	
Others							
1st full calendar month	1,522,815	28,615	1.88	0.94	15,033	0.99	1.07
Same month 1 year later	1,522,815	30,522	2.00		14,108	0.93	
Overall							
1st full calendar month	2,122,771	38,088	1.79	0.94	20,622	0.97	1.09
Same month 1 year later	2,122,771	40,414	1.90		18,996	0.89	

This large table consists of numerous rows, each of which shows the numbers of diagnoses and the incidence rates of those diagnoses, for incident cases of acute respiratory illness (infectious) and for acute respiratory illness (allergic). Within each pair of adjacent rows, the top row displays such data for the first calendar month of new assignment and the bottom row shows similar data for the same month 1 year later. Separate pairs of rows are shown for each gender, five age groups, four categories of race/ethnicity, the three Services examined, officers and enlisted service members, and the occupational categories of combat-specific, medical, and others.

FIGURE 1. Incidence rate ratios, medical encounters for acute respiratory illnesses (infectious) during the first full months of new assignments versus during the same calendar months 1 year later, active component members, U.S. Army, Air Force, and Marine Corps, January 2005–September 2015



Of all military and demographic subgroups assessed for this report, the highest rates of ARI (infectious) during both the first full calendar months of new assignments and the same months 1 year later were among females (first month: 3.39% per month, 1 year later: 3.40% per month), medical workers (first month: 2.51% per month, 1 year later: 2.64% per month), and Air Force members (first month: 2.24% per month, 1 year later: 2.34% per month). There were no military/demographic subgroups for which the rate of ARI (infectious) was higher during the first months of assignments than the same months 1 year later **(Table 2)**.

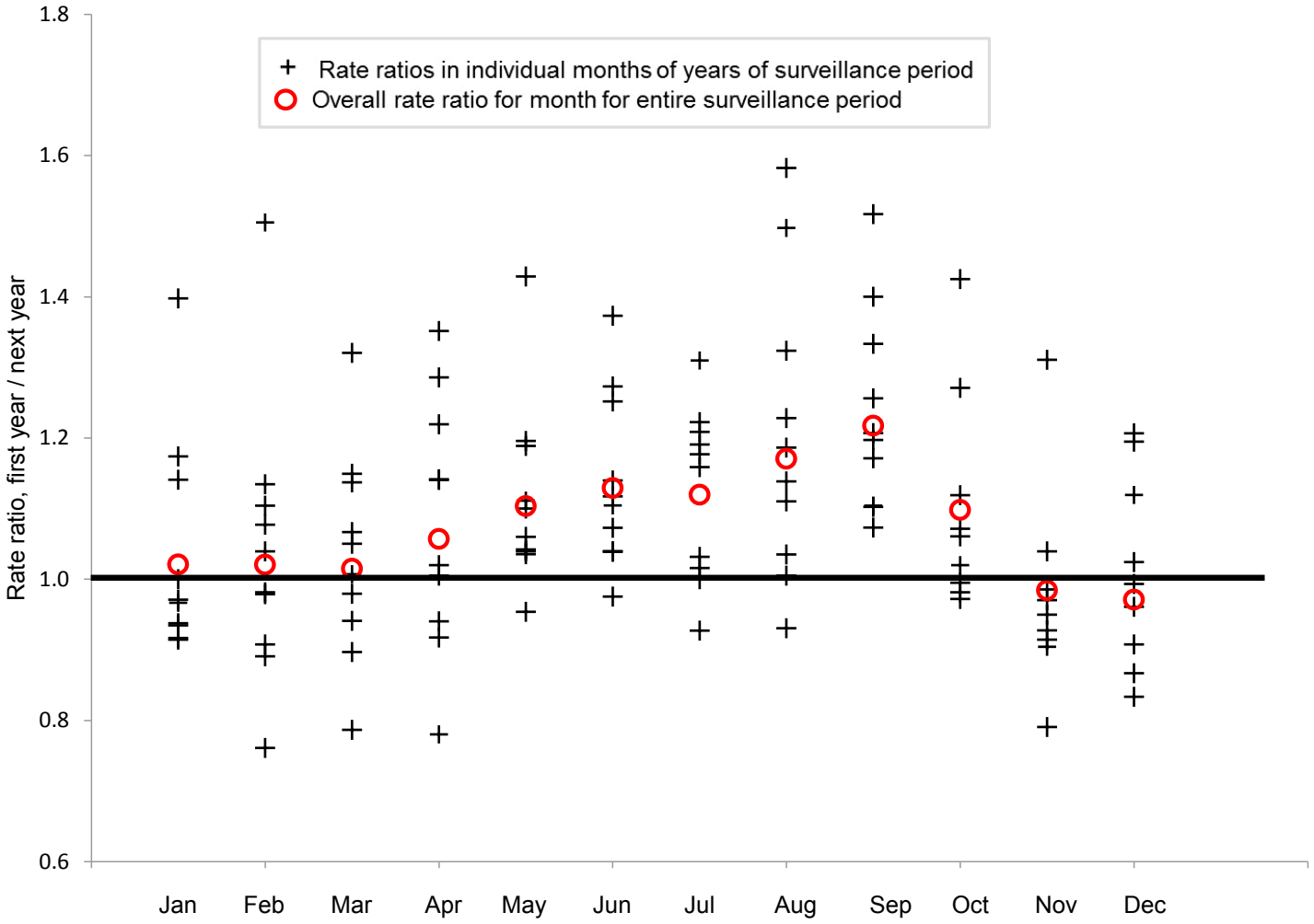
During one-third (n=39, 33.3%) of all months during the surveillance period, rates of ARI (infectious) were higher during the first months of assignments than the same calendar months 1 year later. In regard to calendar months overall, the highest ARI (infectious) rates, during both the first months of assignments and the same calendar months 1 year later, were during December (2.54%, 2.54% respectively), January (2.38%, 2.63% respectively), February (2.38%, 2.61% respectively), and March (2.46%, 2.51% respectively). Of the 12 calendar months during the surveillance period overall, only June had an aggregate ARI (infectious) rate that was higher (rate ratio of 1.005) during the first months of new assignments than the same months 1 year later **(Figure 1)**.

Acute respiratory illnesses (allergic)

During the first full months of new assignments, there were 20,622 incident episodes of ARIs of presumed allergic etiologies (ARI [allergic]). Among the same service members during the same calendar months 1 year later, there were 18,996 incident episodes of ARI (allergic). During the period overall, cumulative incidence rates of ARI (allergic) were higher during the first full months of new assignments (0.97% per month) than during the same calendar months 1 year later (0.89% per month) **(Table 2)**.

Of all military and demographic subgroups, the highest rates of ARI (allergic) during both the first months of new

FIGURE 2. Incidence rate ratios, medical encounters for acute respiratory illnesses (allergic) during the first full months of new assignments versus during the same calendar months 1 year later, active component members, U.S. Army, Air Force, and Marine Corps, January 2005–September 2015



assignments and the same months 1 year later affected females (first month: 2.04% per month, 1 year later: 1.71% per month), medical workers (first month: 1.80% per month, 1 year later: 1.50% per month), and service members older than 40 years (first month: 1.57% per month, 1 year later: 1.43% per month). The only military/demographic subgroups for which rates of ARI (allergic) were lower during the first months of assignments than the same months 1 year later were service members younger than 26 years and Marine Corps members **(Table 2)**.

During two-thirds (n=78, 66.7%) of the months of the surveillance period, rates of ARI (allergic) were higher during the first months of assignments than 1 year later. In regard to calendar months overall, the highest ARI (allergic) rates, during both the first full months of assignments and 1 year later, were during May (1.28%, 1.16% respectively) and April (1.23%, 1.16% respectively). Of the calendar months during the surveillance period overall, only November and December had ARI (allergic) rates that were lower during the first months of new assignments than the same months 1 year later **(Figure 2)**.

EDITORIAL COMMENT

There are numerous anecdotal reports of temporary increases in risks of acute respiratory illnesses among military members shortly after arriving at new assignments. The risks have been hypothesized to be related to exposures to respiratory infectious agents to which service members are immunologically susceptible; exposures to high concentrations of pollutants and allergens (e.g., dust, smoke in ambient air; mites, molds in temporary quarters); temporary immune dysfunction from psychological stress, sleep disruption ("jet lag"); and so on.[10–12]

This report summarizes rates of medically attended ARIs of infectious and allergic etiologies during the first full months of new assignments and during the same calendar months 1 year later among U.S. Army,

Air Force, and Marine Corps members. The results do not support the hypothesis that ARIs of infectious etiologies consistently occur more frequently soon after arriving at new assignments compared to 1 year later at the same assignments. In fact, rates of ARIs (infectious) were higher during the first months of new assignments compared to 1 year later during only one-third of the months considered here. Of note, the results did not significantly vary across seasons; overall during the period, only 1 month, June, had an aggregate rate of ARI (infectious) that was higher (barely)among new arrivals (rate: 1.362%) compared to the same individuals 1 year later (rate: 1.355%).

In contrast, during two-thirds of the 117 months considered here, rates of ARIs of presumed allergic etiologies (e.g., allergic rhinitis, asthma) were higher during the first months of new assignments compared to 1 year later. During the surveillance period overall, ARI (allergic) rates were relatively high among new arrivals during all calendar months except November and December. Of interest in this regard, relative risks were lowest during the coldest weather months (range of relative risks, by month, November–March: 0.97–1.02) and highest during the late summer–early fall months (relative risks: August: 1.17, September: 1.22). The finding suggests that relatively high rates among new arrivals may have been more related to outdoor (e.g., pollens, air pollutants) than indoor (e.g., mites, mold) allergen exposures.

The findings of this report should be interpreted with consideration of several shortcomings. For example, because the exact days of arrival at new assignments were not documented in available records, medical encounters for ARIs were not ascertained until the first full calendar months of new assignments. This approach was necessary to make times-at-risk comparable for rate calculations among new arrivals and the same individuals 1 year later. Because of the approach, however, medical encounters for ARIs that occurred prior to the first days of the first full calendar months of new assignments were not considered case-defining episodes. As such, if ARIs of infectious etiologies occurred at high rates within the first several days (during partial months) but not during the first full months of new assignments, such increases would not have been detected by the method used here.

In addition, case-defining endpoints were based on clinical diagnosis codes (ICD-9) indicative of ARIs that were recorded in administrative records of medical encounters. It is likely that most case-defining diagnoses of ARIs of presumed infectious and allergic etiologies were based on the clinical judgment of care providers without supporting microbiologic, serologic, or other relevant test results. As such, there were an unknown but possibly significant number of misclassifications of ARIs in relation to their presumed etiologies (i.e., infectious, allergic).

Also, the relatively high rates of ARIs of allergic etiologies among new arrivals likely reflect the chronic nature of some allergy-related illnesses, such as asthma. Such illnesses often require routine, periodic medical follow-up and long-term treatment. As such, some medical encounters for allergy-related ARIs among new arrivals at assignments may have been routine visits to establish new patient–provider relationships, update prescriptions for required medications, and enable continuity of long-term care.

Finally, it is important to note that this report summarizes the overall experiences of active component members of the U.S. Army, Air Force, and Marine Corps during assignments at installations worldwide. The finding of no increase in rates of ARIs of infectious etiologies soon after arriving at new assignments in general may not reflect the experiences at specific installations. It is likely that new arrivals at some installations consistently have relatively high rates of acute respiratory problems. Health officials at such installations should identify modifiable threats and implement countermeasures to mitigate the military operational and healthcare costs as well as the personal discomfort associated with "excess" but preventable ARIs.

REFERENCES

1. Russell KL. Ch 13, Respiratory Infections in military recruits. Recruit medicine. Office of the Surgeon General, United States Army. Falls Church, VA. Borden Institute, Walter Reed Army Medical Center, Washington, DC. 2006.
2. Gunzenhauser JD. Ch 9, Communicable disease control in basic training: programmatic aspects. Military preventive medicine: mobilization and deployment (vol I). Office of the Surgeon General, United States Army. Falls Church, VA. Borden Institute, Walter Reed Army Medical Center, Washington, DC 20006.
3. Sanchez JL, Cooper MJ, Myers CA, et al. Respiratory infections in the U.S. military: recent experience and control. *Clin Microbiol Rev.* 2015;28(3):743–800.
4. Brundage JF, Scott RM, Lednar WM, Smith DW, Miller RN. Building-associated risk of febrile acute respiratory diseases in Army trainees. *JAMA*. 1988;259(14):2108–2112.
5. Lee T, Jordan NN, Sanchez JL, Gaydos JC. Selected nonvaccine interventions to prevent infectious acute respiratory disease. *Am J Prev Med*. 2005;28(3):305–316.
6. White DW, Feigley CE, McKeown RE, Hout JJ, Hebert JR. Association between barracks type and acute respiratory infection in a gender integrated Army basic combat training population. *Mil Med*. 2011;176(8):909–914.
7. Armed Forces Health Surveillance Center. Absolute and relative morbidity burdens attributable to various illnesses and injuries, U.S. Armed Forces, 2014. *MSMR*. 2015;22(4):5–10.
8. Tokach WR. Coping with Bosnian Crud. The Talon. Operation Joint Guard, Bosnia-Herzegovina. 1997 Feb 28;3(9):10. http://www.dtic.mil/bosnia/talon/tal19970228.pdf. Accessed on 16 November 2015.
9. Norris J. Yellow dust season arrives in Korea. Stars and Stripes. 2009. 22 February. http://www.stripes.com/news/yellow-dust-season-arrives-in-korea-1.88335. Accessed on 16 November 2015.
10. Griffin DW. Atmospheric movement of microorganisms in clouds of desert dust and implications for human health. *Clin Microbiol Rev.* 2007;20(3):459–477.
11. Pedersen A, Zachariae R, Bovbjerg DH. Influence of psychological stress on upper respiratory infection—a meta-analysis of prospective studies. *Psychosom Med.* 2010;72(8):823–832.
12. Prather AA, Janicki-Deverts D, Hall MH, Cohen S. Behaviorally assessed sleep and susceptibility to the common cold. *Sleep*. 2015;38(9):1353–1359.

Completeness and Timeliness of Reporting of Notifiable Medical Conditions, Active Component, U.S. Armed Forces, 2008–2014

Lee Hurt, DrPH, MS; Saixia Ying, PhD

The complete and timely reporting of notifiable medical conditions occurring among U.S. military service members is important for the control of communicable and preventable diseases and injuries. The Defense Medical Surveillance System (DMSS) was used to identify all hospital and ambulatory care encounters among service members occurring during 2008–2014. Incident encounters with diagnoses of Department of Defense notifiable medical conditions were matched to reportable medical events entered through the Disease Reporting System Internet. Over this time period, the Services reported 47.6% of notifiable hospitalized cases and 57.2% of notifiable ambulatory care cases. Timeliness of reporting improved over the time period with 40.0% of notifiable hospitalized cases reported within 1 week in 2008 and 73.6% in 2014. For ambulatory care cases, 62.3% were reported within 1 week in 2008 and 81.3% in 2014.

Centralized reporting of preventable and communicable medical conditions is an important tool that facilitates quick dissemination of information regarding the occurrence of medical events that pose a public health threat. It also serves as a mechanism to provide more extensive information about a medical event than can be found within hospitalization and ambulatory care administrative data. Within the Department of Defense (DoD), the Services are required, via DoD Directive 6490.02E, to report notifiable medical conditions.[1] The guidelines and specific case definitions for all medical conditions that are required to be reported are described in the Armed Forces Reportable Medical Events Guidelines & Case Definitions.[2] Currently, all Services report notifiable medical conditions through a single electronic system, the Disease Reporting System Internet (DRSi), available at all military treatment facilities (MTFs).[3]

The usefulness of reportable medical events (RMEs) is highly dependent on the completeness and timeliness of these reports. For military leadership and public health officers to make optimally informed decisions about the location and extent of possible outbreaks, all cases of notifiable medical conditions need to be reported, including all required information, as quickly as possible. The Armed Forces Health Surveillance Branch of the Defense Health Agency produces weekly reports on communicable disease reportable events. Additionally, reports on preventable notifiable medical conditions such as heat and cold injuries are produced frequently to assist with the evaluation and potential modification of prevention strategies.

The most recent analysis of the completeness and timeliness of RMEs was published in the *MSMR* in September 2008.[4] The analysis found that, during 1998–2007, 43.5% of cases of notifiable hospitalized medical conditions were reported as RMEs. The completeness of hospitalized condition reporting was highest among Army MTFs at 57.3%, followed by Navy MTFs at 23.9%, and Air Force MTFs at 21.1%. The analysis also found that, during the same period, 33.7% of notifiable ambulatory care medical conditions were reported as RMEs. The completeness of ambulatory care condition reporting was highest at Army MTFs at 49.0%, followed by Air Force MTFs at 27.7%, and Navy MTFs at 16.4%. This report estimates the completeness and timeliness of RMEs during 2008–2014.

METHODS

The Defense Medical Surveillance System (DMSS) contains administrative records for all medical encounters of military service members who are hospitalized or receive ambulatory care at MTFs or through civilian purchased care. Records of healthcare encounters from both sources of care were included in this analysis. All inpatient or outpatient medical encounters for all active component service personnel (Army, Navy, Air Force, Marine Corps) occurring between 1 January 2008 and 31 December 2014 were searched for diagnoses of notifiable medical conditions in the primary diagnostic position using the ICD-9 codes shown in **Table 1**. Potentially notifiable cases were identified by the required number and type of encounters delineated in **Table 1** for specified conditions. For example, a potential case of amebiasis would require an ICD-9 code of 006.x in the primary diagnostic position in the record of an inpatient encounter or of two outpatient encounters within 2 weeks. Incident cases of the various conditions for individual service members were then identified by applying the incidence rule listed for each condition. For example, a service member who met the criteria to be a potentially notifiable case of amebiasis in February 2008 but had previously been diagnosed with amebiasis in December 2007 (within 120 days of the February 2008 diagnosis)

TABLE 1. Reportable Medical Events and associated ICD-9 codes, incidence rules, and required number and type of encounters

Notifiable medical condition	ICD-9 diagnosis code	Incidence rule	No. and type of encounter	Notes
Amebiasis	006.x	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Anthrax	022.x	once per 120 days	1 inpatient	
Botulism	005.1	once per 120 days	1 inpatient	
Brucellosis	023.x	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Campylobacter	008.43	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Chlamydia	099.41, 099.53, 099.54, 099.55	once per 120 days	1 inpatient, 1 outpatient	
Cholera	001.x	once per lifetime	1 inpatient	
Coccidioidomycosis	114.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Cold Injury	991.0-991.4, 991.6, 991.9	once per 120 days	1 inpatient, 1 outpatient	991.9 excluded after 2009
Cryptosporidiosis	007.4	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Cyclosporiasis	007.5	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Dengue Fever	061	once per 120 days	1 inpatient	
Diphtheria	032.x	once per lifetime	1 inpatient	
E coli 0157:H7	008.04	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Ehrlichiosis	082.4x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Encephalitis, Arboviral	062.x, 063.x, 066.41	once per lifetime	1 inpatient	
Filariasis	125.0–125.5, 125.9	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Giardiasis	007.1	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Gonorrhea	098.xx	once per 120 days	1 inpatient, 1 outpatient	
H. Influenzae, invasive	038.41, 041.5, 320.0, 464.0, 482.2, 711.0	once per 360 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Hantavirus infection	078.6, 079.81	once per lifetime	1 inpatient	
Heat Injury	992.x	once per 120 days	1 inpatient, 1 outpatient	
Hemorrhagic fever	065.x, 078.7	once per 120 days	1 inpatient	
Hepatitis A	070.0, 070.1	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Hepatitis B	070.2, 070.3	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Hepatitis C	070.41, 070.51	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Influenza	487.x	once per 360 days	1 inpatient	
Legionellosis	482.84	once per lifetime	1 inpatient, 1 outpatient	
Leishmaniasis	085.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Leprosy	030.x	once per lifetime	2 inpatient, 2 outpatient encounters within 2 weeks	
Leptospirosis	100.xx	once per lifetime	2 inpatient, 2 outpatient encounters within 2 weeks	
Listeriosis	027.0	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Lyme Disease	088.81	once per 360 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Malaria	084.0–084.6, 084.8, 084.9	once per 360 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Measles	055.xx	once per lifetime	1 inpatient	
Meningococcal disease	036.0-036.2	once per 360 days	1 inpatient	
Mumps	072.xx	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Norovirus	008.63	once per 120 days	1 inpatient	
Pertussis	033.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Plague	020.x	once per lifetime	1 inpatient	
Poliomyelitis	045.xx	once per lifetime	1 inpatient	
Q fever	083.0	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Rabies, human	071	once per lifetime	1 inpatient	
Relapsing fever	087.x	once per 360 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Rheumatic fever, acute	39x.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Rift Valley fever	066.3	once per lifetime	1 inpatient	
Rocky Mountain Spotted fever	082.0	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Rubella	056.xx	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Salmonella	003.xx	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Schistosomiasis	120.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Shigellosis	004.x	once per 120 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Streptococcus, group A, invasive	038.0, 320.2, 482.31	once per 360 days	1 inpatient	
Syphilis	091.xx–097.xx	once per 360 days	1 inpatient, 2 outpatient encounters within 2 weeks	
Tetanus	037	once per lifetime	1 inpatient	
Toxic shock syndrome	040.82	once per lifetime	1 inpatient	
Trichinosis	124	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Trypanosomiasis	086.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Tuberculosis	011.xx	once per 360 days	1 inpatient	
Tularemia	021.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Typhoid fever	002.0	once per 360 days	1 inpatient	
Typhus fever	080, 081.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Vaccine adverse event	323.5, 978.x, 979.x	once per 120 days	1 inpatient, 1 outpatient	not reportable after 2011
Varicella, active duty only	052.x	once per lifetime	1 inpatient, 2 outpatient encounters within 2 weeks	
Yellow fever	060.x	once per lifetime	1 inpatient	

This table lists, in alphabetical order, the names of the notifiable medical conditions in the Department of Defense. Alongside each condition's name are listed the ICD-9 diagnostic code(s) for the condition, the rules used to determine incident cases, and the criteria for identifying a case in administrative health care records.

would not be counted as a newly incident case in 2008 **(Table 1)**.

The DMSS also contains the records of RMEs entered into DRSi for all military service members. All RMEs for all active component service personnel (Army, Navy, Air Force, Marine Corps) occurring from January 2008 through 31 December 2014 were identified for the medical conditions listed in **Table 1**. Incident cases of notifiable medical events as defined by the criteria specified above were matched to any RME for that condition by the closest event date. Hospitalization and ambulatory care encounters were matched to RMEs independently. The total numbers of incident notifiable medical conditions and the percentage that had a corresponding RME were computed by medical condition, service, and reporting MTF. All MTFs on Marine Corps bases were counted as Navy facilities.

Timeliness of the reporting of notifiable medical conditions was estimated by computing the number of weeks between the medical encounter date and the entry date of the RME into DRSi. Among the incident notifiable medical conditions matched to an RME, the percentages that were reported within 1 week, 2 weeks, and 4 weeks were computed. All data were analyzed using SAS v9.4 (SAS Institute, Cary, NC).

RESULTS

Over the study period, 47.6% of incident notifiable hospitalized medical conditions among active component service members were reported as RMEs **(Table 2)**. The percentage reported rose from 38.9% in 2008, peaked in 2012 at 54.2%, and then declined to 46.7% in 2014. Army MTFs had the highest percentage of incident cases reported in 2014 at 61.0%, followed by Navy MTFs at 22.4%, and Air Force MTFs at 12.5% **(Figure 1)**.

Table 2 also shows the percentage of incident notifiable ambulatory care medical conditions that were reported as RMEs. Over the study period, the percentage of ambulatory care cases reported was higher than hospitalized cases (57.2% vs. 47.6%). In 2014, Army had the highest percentage of ambulatory conditions reported at 60.4%, followed by Air Force (50.3%) and Navy (43.4%) **(Figure 2)**.

The total numbers of incident cases for each type of notifiable medical condition, and the number and percentage reported, at Army MTFs are shown in **Table 3**. For hospitalized conditions occurring during 2008–2014, the largest numbers of incident cases were for heat injuries (1,126), influenza (252), and malaria (191). Of these cases, 60.2% of heat injuries, 54.0% of influenza cases, and 64.4% of malaria cases were reported as RMEs. The most frequent incident ambulatory care cases were for heat injury (10,554 cases, 34.7% reported), chlamydia (10,346 cases, 89.7% reported), and gonorrhea (5,159 cases, 76.9% reported).

Table 4 displays the notifiable medical conditions at Navy MTFs. The most frequent hospitalized medical conditions were 397 cases of heat injury, of which 44.8% were reported as RMEs, 104 cases of

TABLE 2. Frequency of incident notifiable medical conditions with the number and percentage reported by service, active component, U.S. service members, 2008–2014

Hospitalizations

	Army			Navy			Air Force			DoD		
Year	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
2008	266	112	42.1	107	39	36.4	38	9	23.7	411	160	38.9
2009	407	235	57.7	165	58	35.2	73	31	42.5	645	324	50.2
2010	303	138	45.5	103	41	39.8	39	7	17.9	445	186	41.8
2011	327	179	54.7	140	59	42.1	53	21	39.6	520	259	49.8
2012	251	157	62.5	120	52	43.3	35	11	31.4	406	220	54.2
2013	272	154	56.6	85	30	35.3	33	11	33.3	390	195	50.0
2014	305	186	61.0	134	30	22.4	32	4	12.5	471	220	46.7
Total	2,131	1,161	54.5	854	309	36.2	303	94	31.0	3,288	1,564	47.6

Ambulatory care

	Army			Navy			Air Force			DoD		
Year	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
2008	4,157	2,438	58.6	2,814	1,462	52.0	925	500	54.1	7,896	4,400	55.7
2009	4,113	2,546	61.9	2,173	757	34.8	845	498	58.9	7,131	3,801	53.3
2010	3,293	1,797	54.6	1,487	545	36.7	449	265	59.0	5,229	2,607	49.9
2011	4,544	2,783	61.2	1,753	886	50.5	699	399	57.1	6,996	4,068	58.1
2012	4,558	3,111	68.3	1,545	804	52.0	672	409	60.9	6,775	4,324	63.8
2013	4,060	2,736	67.4	1,409	768	54.5	587	329	56.0	6,056	3,833	63.3
2014	3,737	2,259	60.4	1,491	647	43.4	441	222	50.3	5,669	3,128	55.2
Total	28,462	17,670	62.1	12,672	5,869	46.3	4,618	2,622	56.8	45,752	26,161	57.2

The table depicts, for the years 2008–2014, diagnoses of incident notifiable medical conditions recorded in records of hospitalizations and ambulatory care encounters. For each year, the numbers of cases of such conditions are shown, along with the number of such cases that were reported as a Reportable Medical Event, as well as the percentage of cases that were reported. Such data are presented separately for hospitalizations and ambulatory care encounters, for each of the three Services, and for all Services combined.

influenza (14.4% reported), and 58 cases of leptospirosis (5.2% reported). Among the ambulatory care conditions, the most frequent were chlamydia (5,304 cases, 64.6% reported), heat injury (4,618 cases, 29.1% reported), and gonorrhea (1,556 cases, 49.5% reported).

The incident cases of notifiable medical conditions at Air Force MTFs are shown in **Table 5**. The most frequent hospitalized medical conditions were influenza (64 cases, 29.7% reported), heat injury (59 cases, 25.4% reported), and malaria (23 cases, 78.3% reported). Focusing on ambulatory care conditions, the most frequent at Air Force MTFs were chlamydia (1,908 cases, 84.7% reported), heat injury (1,156 cases, 12.5% reported), and gonorrhea (888 cases, 63.7% reported).

Among all cases of notifiable ambulatory conditions identified for all the Services,

FIGURE 1. Percentage of incident notifiable hospitalization medical conditions reported by service, active component, U.S. Armed Forces, 2008–2014

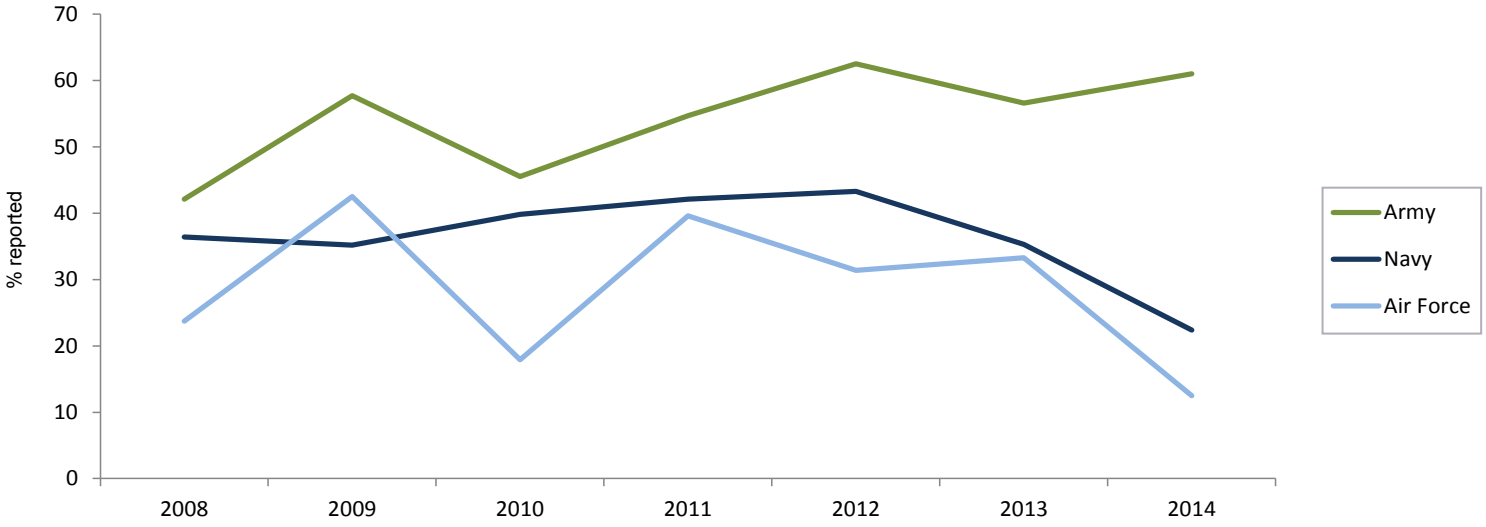


FIGURE 2. Percentage of incident notifiable ambulatory care medical conditions reported by service, active component, U.S. Armed Forces, 2008–2014

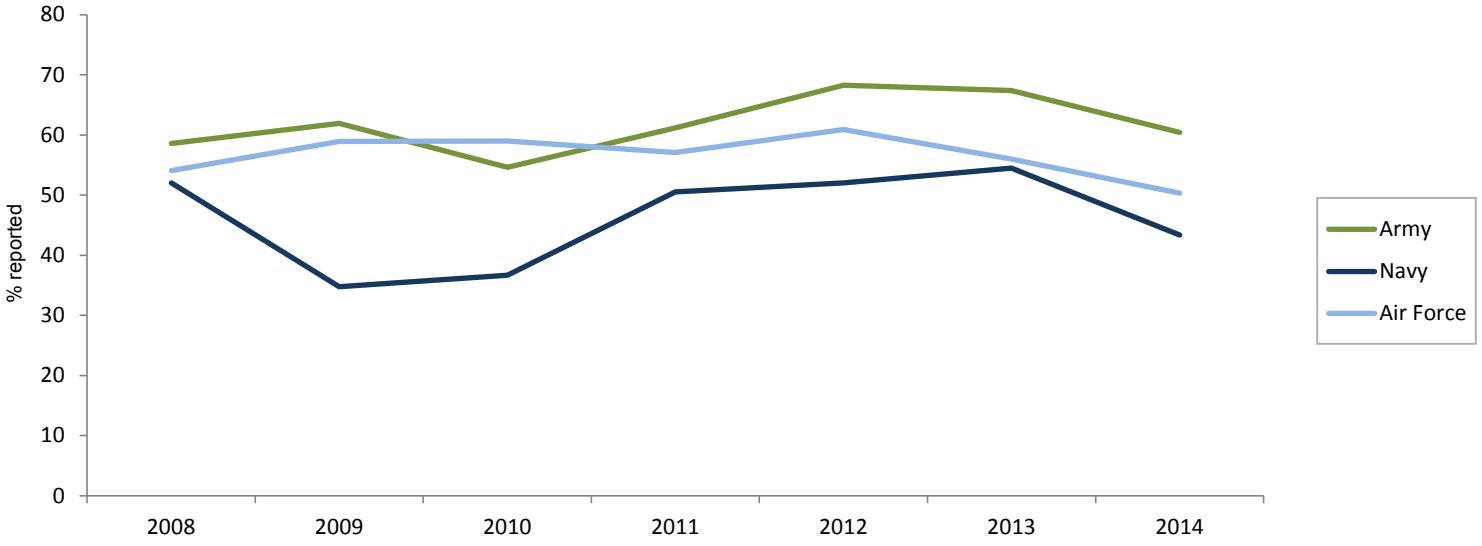


TABLE 3. Frequency of incident notifiable medical conditions with the number and percentage reported by condition at U.S. Army military treatment facilities, active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Reportable medical event type	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	1,826	975	53.4	305	186	61.0	24,725	15,411	62.3	3,737	2,259	60.4
Amebiasis	4	2	50.0	2	0	0.0	7	2	28.6	2	1	50.0
Brucellosis	2	0	0.0	0	0	*	3	0	0.0	0	0	*
Campylobacter	30	15	50.0	9	3	33.3	14	14	100.0	7	5	71.4
Chlamydia	11	5	45.5	1	1	100.0	9,118	8,188	89.8	1,228	1,095	89.2
Coccidioidomycosis	19	4	21.1	0	0	*	31	14	45.2	3	1	33.3
Cold Injury	39	14	35.9	7	6	85.7	1,006	198	19.7	229	52	22.7
Cryptosporidiosis	2	0	0.0	0	0	*	0	0	*	0	0	*
Dengue fever	17	2	11.8	2	1	50.0	NR	NR	NR	NR	NR	NR
E coli 0157:H7	1	0	0.0	0	0	*	0	0	*	0	0	*
Ehrlichiosis	8	1	12.5	1	0	0.0	11	0	0.0	1	0	0.0
Encephalitis, Arboviral	1	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Filariasis	0	0	*	0	0	*	2	0	0.0	0	0	*
Giardiasis	4	1	25.0	1	0	0.0	8	3	37.5	0	0	*
Gonorrhea	9	4	44.4	1	1	100.0	4,415	3,404	77.1	744	562	75.5
H. Influenzae, invasive	17	1	5.9	0	0	*	13	1	7.7	0	0	*
Hantavirus infection	2	1	50.0	0	0	*	NR	NR	NR	NR	NR	NR
Heat Injury	927	543	58.6	199	135	67.8	9,133	3,177	34.8	1,421	488	34.3
Hemorrhagic fever	1	1	100.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Hepatitis A	9	2	22.2	1	0	0.0	10	2	20.0	0	0	*
Hepatitis C	0	0	*	0	0	*	12	5	41.7	1	0	0.0
Influenza	225	126	56.0	27	10	37.0	NR	NR	NR	NR	NR	NR
Legionellosis	1	0	0.0	0	0	*	3	1	33.3	1	0	0.0
Leishmaniasis	9	4	44.4	1	0	0.0	59	20	33.9	1	0	0.0
Leprosy	0	0	*	0	0	*	6	4	66.7	0	0	*
Leptospirosis	8	6	75.0	3	3	100.0	8	6	75.0	2	2	100.0
Lyme disease	26	7	26.9	2	1	50.0	142	48	33.8	21	3	14.3
Malaria	172	109	63.4	19	14	73.7	175	124	70.9	17	14	82.4
Meningococcal disease	5	1	20.0	0	0	*	NR	NR	NR	NR	NR	NR
Mumps	3	2	66.7	0	0	*	17	2	11.8	3	1	33.3
Norovirus	66	40	60.6	1	0	0.0	NR	NR	NR	NR	NR	NR
Pertussis	2	1	50.0	0	0	*	6	2	33.3	0	0	*
Q fever	18	7	38.9	2	0	0.0	26	15	57.7	1	1	100.0
Rabies, human	1	1	100.0	0	0	*	NR	NR	NR	NR	NR	NR
Relapsing fever	1	0	0.0	0	0	*	4	0	0.0	0	0	*
Rheumatic fever, acute	4	0	0.0	0	0	*	8	0	0.0	2	0	0.0
Rocky Mountain spotted fever	7	4	57.1	0	0	*	21	7	33.3	3	0	0.0
Salmonellosis	36	21	58.3	9	5	55.6	23	18	78.3	8	5	62.5
Schistosomiasis	0	0	*	0	0	*	3	1	33.3	0	0	*
Shigellosis	3	1	33.3	2	2	100.0	2	1	50.0	1	1	100.0
Streptococcus, group A, invasive	28	3	10.7	6	0	0.0	NR	NR	NR	NR	NR	NR
Syphilis	27	17	63.0	4	3	75.0	192	136	70.8	34	28	82.4
Tetanus	1	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Toxic shock syndrome	4	0	0.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Trypanosomiasis	1	1	100.0	0	0	*	3	1	33.3	1	0	0.0
Tuberculosis	49	18	36.7	3	1	33.3	NR	NR	NR	NR	NR	NR
Tularemia	2	1	50.0	0	0	*	1	1	100.0	0	0	*
Typhoid fever	4	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Typhus fever	2	1	50.0	0	0	*	1	0	0.0	0	0	*
Vaccine, adverse event	1	0	0.0	NR	NR	NR	159	1	0.6	NR	NR	NR
Varicella, active duty only	17	8	47.1	0	0	*	83	15	18.1	6	0	0.0

NR=Not reportable

* No cases to report

This table displays data pertaining to notifiable medical conditions diagnosed at Army military treatment facilities among active component service members. Within each of the separate categories of hospitalizations and ambulatory care encounters, the table shows data for two time intervals: 2008–2013, and 2014 by itself. Within those categories and time intervals, for each of the notifiable medical conditions are shown the numbers of cases diagnosed, the numbers of those cases that were captured as Reportable Medical Events, and the percentage of cases that were reported. The same data presentation method is used in Tables 4 and 5.

TABLE 4. Frequency of incident notifiable medical conditions with the number and percentage reported by condition at U.S. Navy military treatment facilities, active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Reportable medical event type	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	720	279	38.8	134	30	22.4	11,181	5,222	46.7	1,491	647	43.4
Amebiasis	4	0	0.0	0	0	*	2	0	0.0	0	0	*
Brucellosis	2	0	0.0	0	0	*	1	0	0.0	0	0	*
Campylobacter	17	2	11.8	2	0	0.0	22	5	22.7	3	1	33.3
Chlamydia	2	2	100.0	1	1	100.0	4,879	3,085	63.2	425	344	80.9
Coccidioidomycosis	23	15	65.2	0	0	*	48	29	60.4	2	0	0.0
Cold Injury	11	4	36.4	4	0	0.0	438	57	13.0	161	8	5.0
Cryptosporidiosis	2	0	0.0	0	0	*	1	0	0.0	0	0	*
Dengue fever	17	7	41.2	7	0	0.0	NR	NR	NR	NR	NR	NR
Ehrlichiosis	0	0	*	0	0	*	1	1	100.0	1	0	0.0
Filariasis	0	0	*	0	0	*	2	0	0.0	0	0	*
Giardiasis	3	0	0.0	0	0	*	5	1	20.0	1	1	100.0
Gonorrhea	6	2	33.3	0	0	*	1,380	680	49.3	176	90	51.1
H. Influenzae, invasive	6	0	0.0	2	0	0.0	0	0	*	1	0	0.0
Heat Injury	361	165	45.7	36	13	36.1	3,986	1,168	29.3	632	178	28.2
Hepatitis A	6	0	0.0	0	0	*	4	0	0.0	0	0	*
Hepatitis C	3	0	0.0	1	0	0.0	6	2	33.3	1	0	0.0
Influenza	96	13	13.5	8	2	25.0	NR	NR	NR	NR	NR	NR
Legionellosis	6	1	16.7	0	0	*	7	3	42.9	1	1	100.0
Leishmaniasis	2	0	0.0	0	0	*	2	0	0.0	0	0	*
Leptospirosis	7	2	28.6	51	1	2.0	8	4	50.0	43	1	2.3
Listeriosis	1	1	100.0	0	0	*	1	1	100.0	0	0	*
Lyme disease	4	2	50.0	1	1	100.0	36	13	36.1	6	1	16.7
Malaria	43	30	69.8	9	8	88.9	37	27	73.0	10	9	90.0
Meningococcal Disease	10	8	80.0	1	1	100.0	NR	NR	NR	NR	NR	NR
Mumps	0	0	*	0	0	*	9	0	0.0	0	0	*
Norovirus	1	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Pertussis	1	0	0.0	0	0	*	10	2	20.0	0	0	*
Q fever	1	1	100.0	0	0	*	5	4	80.0	0	0	*
Relapsing fever	0	0	*	0	0	*	2	1	50.0	0	0	*
Rheumatic fever, acute	3	2	66.7	4	0	0.0	9	3	33.3	3	0	0.0
Rift Valley fever	1	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Rocky Mountain spotted fever	8	1	12.5	0	0	*	7	5	71.4	1	0	0.0
Rubella	1	0	0.0	0	0	*	0	0	*	0	0	*
Salmonellosis	19	11	57.9	3	2	66.7	25	17	68.0	2	1	50.0
Shigellosis	2	1	50.0	0	0	*	1	0	0.0	0	0	*
Streptococcus, group A, invasive	26	0	0.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Syphilis	6	3	50.0	1	0	0.0	120	89	74.2	18	12	66.7
Toxic shock syndrome	2	0	0.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Trypanosomiasis	0	0	*	0	0	*	0	0	*	2	0	0.0
Tuberculosis	7	4	57.1	1	1	100.0	NR	NR	NR	NR	NR	NR
Tularemia	1	1	100.0	0	0	*	1	1	100.0	0	0	*
Typhoid fever	3	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Typhus fever	2	0	0.0	0	0	*	0	0	*	0	0	*
Vaccine, adverse event	1	1	100.0	NR	NR	NR	68	2	2.9	NR	NR	NR
Varicella, active duty only	3	0	0.0	0	0	*	58	22	37.9	2	0	0.0

NR=Not reportable

* No cases to report

This table presents the same kind of data as in Table 3, but for Navy military treatment facilities only.

TABLE 5. Frequency of incident notifiable medical conditions with the number and percentage reported by condition at U.S. Air Force military treatment facilities, active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Reportable medical event type	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
All reportable events	271	90	33.2	32	4	12.5	4,177	2,400	57.5	441	222	50.3
Amebiasis	2	0	0.0	0	0	*	4	2	50.0	0	0	*
Campylobacter	15	6	40.0	5	0	0.0	10	10	100.0	1	1	100.0
Chlamydia	2	1	50.0	0	0	*	1,749	1,498	85.6	159	119	74.8
Coccidioidomycosis	14	8	57.1	0	0	*	17	12	70.6	1	0	0.0
Cold Injury	8	1	12.5	2	0	0.0	300	142	47.3	49	14	28.6
Cryptosporidiosis	0	0	*	1	0	0.0	1	1	100.0	0	0	*
Dengue fever	3	0	0.0	1	1	100.0	NR	NR	NR	NR	NR	NR
Ehrlichiosis	1	1	100.0	0	0	*	0	0	*	0	0	*
Giardiasis	1	0	0.0	0	0	*	6	5	83.3	1	0	0.0
Gonorrhea	5	0	0.0	1	0	0.0	767	501	65.3	121	65	53.7
H. Influenzae, invasive	4	1	25.0	0	0	*	0	0	*	1	1	100.0
Hantavirus infection	2	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Heat Injury	55	13	23.6	4	2	50.0	1,061	132	12.4	95	13	13.7
Hepatitis A	0	0	*	0	0	*	3	1	33.3	0	0	*
Hepatitis C	1	0	0.0	0	0	*	4	4	100.0	0	0	*
Influenza	60	18	30.0	4	1	25.0	NR	NR	NR	NR	NR	NR
Legionellosis	2	1	50.0	0	0	*	2	0	0.0	0	0	*
Leishmaniasis	0	0	*	0	0	*	2	1	50.0	0	0	*
Leprosy	2	1	50.0	0	0	*	0	0	*	0	0	*
Leptospirosis	1	0	0.0	1	0	0.0	0	0	*	0	0	*
Lyme disease	7	5	71.4	2	0	0.0	35	23	65.7	2	1	50.0
Malaria	23	18	78.3	0	0	*	15	10	66.7	1	1	100
Meningococcal Disease	1	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Mumps	1	0	0.0	0	0	*	11	4	36.4	0	0	*
Norovirus	3	1	33.3	0	0	*	NR	NR	NR	NR	NR	NR
Pertussis	1	0	0.0	0	0	*	5	4	80.0	0	0	*
Q fever	2	0	0.0	0	0	*	4	2	50	0	0	*
Relapsing fever	0	0	*	0	0	*	1	1	100	0	0	*
Rheumatic fever, acute	0	0	*	0	0	*	1	0	0.0	0	0	*
Rocky Mountain spotted fever	1	0	0.0	0	0	*	5	3	60.0	1	1	100.0
Salmonellosis	15	9	60.0	2	0	0.0	5	4	80	0	0	*
Schistosomiasis	0	0	*	0	0	*	1	0	0.0	0	0	*
Shigellosis	0	0	*	0	0	*	1	1	100	1	1	100
Streptococcus, group A, invasive	16	0	0.0	4	0	0.0	NR	NR	NR	NR	NR	NR
Syphilis	5	2	40.0	0	0	*	29	25	86.2	8	5	62.5
Tetanus	2	0	0.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Toxic shock syndrome	6	2	33.3	0	0	*	NR	NR	NR	NR	NR	NR
Trypanosomiasis	0	0	*	0	0	*	2	1	50.0	0	0	*
Tuberculosis	5	0	0.0	0	0	*	NR	NR	NR	NR	NR	NR
Typhoid fever	1	0	0.0	1	0	0.0	NR	NR	NR	NR	NR	NR
Typhus fever	1	0	0.0	0	0	*	0	0	*	0	0	*
Vaccine, adverse event	0	0	*	NR	NR	NR	122	7	5.7	NR	NR	NR
Varicella, Active Duty Only	3	2	66.7	3	0	0.0	14	6	42.9	0	0	*

NR=Not reportable

* No cases to report

This table presents the same kind of data as in Table 3, but for Air Force military treatment facilities only.

95.5% were associated with diagnoses of chlamydia, heat injury, gonorrhea, or cold injury **(Table 6)**. In turn, 96.5% of all RME reports were for those four diagnoses. Among those diagnoses, the proportions that could be linked to an RME report varied greatly from cold injury (21.6%) to chlamydia (81.6%) **(Table 6)**. The proportions for those four conditions also varied greatly by service, but interestingly, the average proportions of all other notifiable ambulatory conditions that resulted in RMEs ranged from a low of 43.3% for the Army to 45.5% for both the Navy and Air Force **(data not shown)**.

TABLE 6. Numbers and proportions of outpatient cases of notifiable conditions and of associated reportable medical event (RME) reports submitted by military treatment facilities, active component service members, 2008–2014

	All Services				
	Reportable outpatient cases identified		RME reports submitted		
Notifiable conditions	No. of cases	% of total no. of cases	No. of reports	% of all reports	% of cases linked to submitted reports
Chlamydia	17,558	38.4%	14,329	54.8%	81.6%
Heat injury	16,328	35.7%	5,156	19.7%	31.6%
Gonorrhea	7,603	16.6%	5,302	20.3%	69.7%
Cold injury	2,183	4.8%	471	1.8%	21.6%
All others	2,080	4.5%	903	3.5%	43.4%

This table focuses on the four most common notifiable conditions diagnosed in ambulatory care settings of military treatment facilities: chlamydia, heat injury, gonorrhea, and cold injury. For each of those conditions as well as for all other notifiable conditions considered as a fifth category, the table shows the number of cases diagnosed, that condition's proportion of all notifiable conditions diagnosed, the number of cases reported via the RME system, that condition's proportion of all such reports, and the proportion of all that condition's cases that were reported.

TABLE 7. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Army military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Army MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
A1	7	0	0.0	0	0	*	36	26	72.2	6	6	100.0
A2	0	0	*	0	0	*	16	7	43.8	2	2	100.0
A3	9	0	0.0	0	0	*	69	56	81.2	2	2	100.0
A4	1	0	0.0	0	0	*	1	1	100.0	1	1	100.0
A5	0	0	*	0	0	*	1	0	0.0	1	1	100.0
A6	0	0	*	0	0	*	4	0	0.0	1	1	100.0
A7	4	2	50.0	1	0	0.0	19	16	84.2	10	9	90.0
A8	10	5	50.0	0	0	*	249	153	61.4	24	21	87.5
A9	4	1	25.0	0	0	0.0	718	579	80.6	28	24	85.7
A10	1	0	0.0	0	0	*	55	28	50.9	7	6	85.7
A11	31	19	61.3	2	1	50.0	90	63	70.0	24	20	83.3
A12	10	4	40.0	4	3	75.0	45	32	71.1	6	5	83.3
A13	8	2	25.0	1	0	0.0	83	62	74.7	11	9	81.8
A14	1	0	0.0	0	0	*	31	14	45.2	10	8	80.0
A15	2	0	0.0	1	0	0.0	113	75	66.4	5	4	80.0
A16	7	0	0.0	0	0	*	39	18	46.2	9	7	77.8
A17	3	2	66.7	0	0	*	51	15	29.4	9	7	77.8
A18	288	159	55.2	30	14	46.7	5,484	4,285	78.1	949	720	75.9
A19	65	35	53.8	11	5	45.5	2,317	1,817	78.4	319	239	74.9
A20	45	19	42.2	3	1	33.3	79	59	74.7	18	13	72.2
A21	17	6	35.3	1	1	100.0	586	310	52.9	82	59	72.0
A22	1	0	0.0	0	0	*	126	88	69.8	28	20	71.4
A23	89	46	51.7	7	4	57.1	250	161	64.4	21	15	71.4
A24	6	2	33.3	1	0	0.0	49	34	69.4	7	5	71.4
A25	32	18	56.3	8	6	75.0	154	104	67.5	23	16	69.6
A26	80	63	78.8	9	6	66.7	615	391	63.6	132	88	66.7
A27	3	0	0.0	0	0	*	10	6	60.0	7	5	66.7
A28	1	0	0.0	1	0	0.0	32	16	50.0	3	2	66.7
A29	25	2	8.0	3	1	33.3	184	68	37.0	53	35	66.0
A30	66	45	68.2	10	6	60.0	293	136	46.4	68	43	63.2
A31	2	0	0.0	0	0	0.0	46	21	45.7	19	12	63.2
A32	30	10	33.3	5	3	60.0	495	321	64.8	120	75	62.5
A33	66	28	42.4	5	2	40.0	453	299	66.0	59	36	61.0
A34	22	8	36.4	3	2	66.7	1,112	839	75.4	162	96	59.3
A35	3	2	66.7	1	1	100.0	161	111	68.9	7	4	57.1
A36	105	57	54.3	16	15	93.8	944	396	41.9	209	119	56.9

TABLE 7a. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Army military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Army MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
A37	0	0	*	0	0	*	93	40	43.0	9	5	55.6
A38	3	0	0.0	0	0	*	68	57	83.8	11	6	54.6
A39	42	27	64.3	3	1	50.0	993	721	72.6	96	52	54.2
A40	5	0	0.0	1	0	0.0	376	254	67.6	50	26	52.0
A41	31	20	64.5	10	8	80.0	479	157	32.8	66	33	50.0
A42	0	0	*	0	0	*	102	62	60.8	22	11	50.0
A43	26	10	38.5	2	1	50.0	475	296	62.3	16	8	50.0
A44	4	1	25.0	0	0	*	67	29	43.3	10	5	50.0
A45	0	0	*	0	0	*	111	82	73.9	6	3	50.0
A46	9	2	22.2	3	1	33.3	22	17	77.3	4	2	50.0
A47	0	0	*	0	0	*	7	4	57.1	2	1	50.0
A48	35	17	48.6	3	2	66.7	2,215	1,275	57.6	282	140	49.7
A49	126	81	64.3	3	0	0.0	383	221	57.7	80	36	45.0
A50	344	213	61.9	141	97	68.8	2,224	520	23.4	357	131	36.7
A51	0	0	*	0	0	*	18	3	16.7	3	1	33.3
A52	9	3	33.3	4	2	50.0	173	70	40.5	51	16	31.4
A53	26	13	50.0	6	2	33.3	610	360	59.0	109	34	31.2
A54	3	1	33.3	1	0	0.0	100	56	56.0	12	3	25.0
A55	0	0	*	0	0	*	38	25	65.8	4	1	25.0
A56	6	0	0.0	1	0	0.0	74	42	56.8	11	2	18.2
A57	2	0	0.0	0	0	*	60	37	61.7	8	1	12.5
A58	38	17	44.7	4	1	25.0	503	210	41.7	55	6	10.9
A59	0	0	*	0	0	*	40	4	10.0	11	1	9.1
A60	1	1	100.0	0	0	*	6	2	33.3	13	0	0.0
A61	0	0	*	0	0	*	14	5	35.7	3	0	0.0
A62	24	15	62.5	0	0	*	92	74	80.4	1	0	0.0
A63	0	0	*	0	0	*	0	0	*	1	0	0.0
A64	0	0	*	0	0	*	33	23	69.7	1	0	0.0
A65	0	0	*	0	0	*	6	1	16.7	0	0	*
A66	1	0	0.0	0	0	*	1	0	0.0	0	0	*
A67	0	0	*	0	0	*	6	0	0.0	0	0	*
A68	1	0	0.0	0	0	*	6	1	16.7	0	0	*
A69	0	0	*	0	0	*	4	1	25.0	0	0	*
A70	0	0	*	0	0	*	1	1	100.0	0	0	*
A71	0	0	*	0	0	*	7	2	28.6	0	0	*
A72	0	0	*	0	0	*	1	0	0.0	0	0	*
A73	0	0	*	0	0	*	5	0	0.0	0	0	*
A74	2	0	0.0	0	0	*	1	0	0.0	0	0	*
A75	0	0	*	0	0	*	3	0	0.0	0	0	*
A76	0	0	*	0	0	*	4	2	50.0	0	0	*
A77	0	0	*	0	0	*	5	1	20.0	0	0	*
A78	0	0	*	0	0	*	23	16	69.6	0	0	*
A79	0	0	*	0	0	*	5	3	60.0	0	0	*
A80	0	0	*	0	0	*	1	0	0.0	0	0	*
A81	0	0	*	0	0	*	4	2	50.0	0	0	*
A82	10	5	50.0	0	0	*	54	36	66.7	0	0	*
A83	0	0	*	0	0	*	11	8	72.7	0	0	*
A84	3	0	0.0	0	0	*	51	32	62.7	0	0	*
A85	0	0	*	0	0	*	1	1	100.0	0	0	*
A86	2	1	50.0	0	0	*	14	1	7.1	0	0	*
A87	0	0	*	0	0	*	2	0	0.0	0	0	*
A88	2	0	0.0	0	0	*	21	11	52.4	0	0	*
A89	0	0	*	0	0	*	8	5	62.5	0	0	*
A90	0	0	*	0	0	*	1	1	100.0	0	0	*
A91	0	0	*	0	0	*	1	1	100.0	0	0	*
A92	27	13	48.1	0	0	*	90	32	35.6	0	0	*
A93	0	0	*	0	0	*	1	0	0.0	0	0	*

* No cases to report

Table 7 (and its continuation Table 7a.) pertain to Army military treatment facilities (MTFs) only. The display is similar to Tables 3–5 for the categories of hospitalizations and ambulatory care encounters, for the two time intervals (2008–2013, and 2014), and for the presentation of numbers of notifiable cases, the numbers reported, and the percentage of cases that were reported. That type of data is provided for all notifiable conditions together for each of the 93 different Army MTFs. The same data presentation method is used in Tables 8 and 9.

TABLE 8. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Navy military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Navy MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
N1	0	0	*	0	0	*	11	6	54.5	4	4	100.0
N2	0	0	*	0	0	*	17	10	58.8	3	3	100.0
N3	0	0	*	0	0	*	23	6	26.1	2	2	100.0
N4	0	0	*	0	0	*	9	3	33.3	1	1	100.0
N5	0	0	*	0	0	*	6	2	33.3	1	1	100.0
N6	1	1	100.0	1	1	100.0	10	4	40.0	1	1	100.0
N7	0	0	*	0	0	*	5	2	40.0	1	1	100.0
N8	1	1	100.0	0	0	*	161	121	75.2	31	30	96.8
N9	2	1	50.0	0	0	*	123	94	76.4	20	17	85.0
N10	0	0	*	0	0	*	17	3	17.6	6	5	83.3
N11	1	0	0.0	0	0	*	53	15	28.3	9	7	77.8
N12	2	2	100.0	0	0	*	22	5	22.7	4	3	75.0
N13	0	0	*	0	0	*	64	38	59.4	4	3	75.0
N14	0	0	*	0	0	*	12	2	16.7	4	3	75.0
N15	0	0	*	0	0	*	2,109	1,500	71.1	95	68	71.6
N16	0	0	*	0	0	*	63	14	22.2	7	5	71.4
N17	0	0	*	0	0	*	121	69	57.0	9	6	66.7
N18	0	0	*	0	0	*	6	4	66.7	6	4	66.7
N19	0	0	*	0	0	*	12	9	75.0	3	2	66.7
N20	2	0	0.0	0	0	*	66	35	53.0	3	2	66.7
N21	5	2	40.0	1	1	100.0	50	21	42.0	8	5	62.5
N22	53	16	30.2	8	4	50.0	408	138	33.8	116	72	62.1
N23	0	0	*	0	0	*	80	34	42.5	10	6	60.0
N24	2	0	0.0	1	1	100.0	26	9	34.6	5	3	60.0
N25	2	0	0.0	0	0	*	73	36	49.3	12	7	58.3
N26	1	0	0.0	0	0	*	38	13	34.2	7	4	57.1
N27	4	3	75.0	1	0	0.0	30	15	50.0	7	4	57.1
N28	115	55	47.8	11	3	27.3	657	308	46.9	107	61	57.0
N29	37	5	13.5	10	5	50.0	264	48	18.2	35	19	54.3
N30	16	4	25.0	2	2	100.0	300	166	55.3	32	17	53.1
N31	6	2	33.3	0	0	*	158	108	68.4	33	17	51.5
N32	9	1	11.1	0	0	*	55	15	27.3	4	2	50.0
N33	0	0	*	0	0	*	10	2	20.0	2	1	50.0
N34	0	0	*	0	0	*	10	4	40.0	2	1	50.0
N35	1	0	0.0	0	0	*	24	9	37.5	2	1	50.0
N36	1	0	0.0	0	0	*	8	2	25.0	2	1	50.0
N37	1	0	0.0	0	0	*	9	3	33.3	2	1	50.0
N38	32	21	65.6	53	3	5.7	339	151	44.5	151	72	47.7
N39	13	3	23.1	1	0	0.0	52	15	28.8	9	4	44.4
N40	1	0	0.0	0	0	*	286	59	20.6	23	10	43.5
N41	9	2	22.2	1	0	0.0	193	89	46.1	26	11	42.3
N42	143	67	46.9	14	5	35.7	1,649	796	48.3	224	79	35.3
N43	3	0	0.0	0	0	*	40	5	12.5	6	2	33.3
N44	0	0	*	0	0	*	39	23	59.0	6	2	33.3
N45	0	0	*	0	0	*	13	1	7.7	3	1	33.3
N46	9	2	22.2	2	0	0.0	491	187	38.1	76	25	32.9

TABLE 8a. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Navy military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Navy MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
N47	106	47	44.3	11	5	45.5	591	184	31.1	126	34	27.0
N48	12	5	41.7	0	0	*	150	51	34.0	12	3	25.0
N49	1	0	0.0	0	0	*	52	16	30.8	8	2	25.0
N50	2	1	50	0	0	*	53	11	20.8	9	2	22.2
N51	3	2	66.7	1	0	0.0	69	21	30.4	5	1	20.0
N52	0	0	*	0	0	*	22	3	13.6	5	1	20.0
N53	3	2	66.7	0	0	*	45	26	57.8	5	1	20.0
N54	76	29	38.2	6	0	0.0	229	78	34.1	35	4	11.4
N55	1	0	0.0	0	0	*	1,416	519	36.7	133	3	2.3
N56	0	0	*	0	0	*	8	1	12.5	4	0	0.0
N57	1	0	0.0	0	0	*	14	6	42.9	4	0	0.0
N58	0	0	*	0	0	*	13	6	46.2	4	0	0.0
N59	4	0	0.0	0	0	*	22	12	54.5	2	0	0.0
N60	0	0	*	0	0	*	12	1	8.3	2	0	0.0
N61	0	0	*	0	0	*	11	1	9.1	2	0	0.0
N62	3	1	33.3	0	0	*	13	7	53.8	2	0	0.0
N63	0	0	*	0	0	*	19	7	36.8	2	0	0.0
N64	0	0	*	0	0	*	4	0	0.0	1	0	0.0
N65	1	0	0.0	0	0	*	12	3	25.0	1	0	0.0
N66	0	0	*	0	0	*	2	1	50.0	1	0	0.0
N67	1	0	0	0	0	*	7	2	28.6	1	0	0.0
N68	1	0	0.00	0	0	*	6	1	16.7	1	0	0.0
N69	0	0		1	0	0.0	36	19	52.8	1	0	0.0
N70	0	0	*	0	0	*	38	12	31.6	1	0	0.0
N71	0	0	*	0	0	*	10	3	30.0	0	0	*
N72	0	0	*	0	0	*	1	0	0.0	0	0	*
N73	0	0	*	0	0	*	1	1	100.0	0	0	*
N74	0	0	*	0	0	*	1	0	0.0	0	0	*
N75	0	0	*	0	0	*	2	0	0.0	0	0	*
N76	0	0	*	0	0	*	9	2	22.2	0	0	*
N77	1	0	0.0	0	0	*	7	1	14.3	0	0	*
N78	0	0	*	0	0	*	1	0	0.0	0	0	*
N79	1	0	0.0	0	0	*	0	0	*	0	0	*
N80	0	0	*	0	0	*	12	3	25.0	0	0	*
N81	0	0	*	0	0	*	2	0	0.0	0	0	*
N82	1	1	100.0	0	0	*	6	2	33.3	0	0	*
N83	0	0	*	0	0	*	2	1	50.0	0	0	*
N84	0	0	*	0	0	*	15	6	40.0	0	0	*
N85	1	0	0.0	0	0	*	17	6	35.3	0	0	*
N86	0	0	*	0	0	*	25	4	16.0	0	0	*
N87	0	0	*	0	0	*	1	0	0.0	0	0	*
N88	1	0	0.0	0	0	*	6	5	83.3	0	0	*
N89	0	0	*	0	0	*	6	1	16.7	0	0	*
N90	0	0	*	0	0	*	1	0	0.0	0	0	*

* No cases to report

These tables present the same kind of data as in Tables 7 and 7a. for the 90 Navy MTFs only.

TABLE 9. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Air Force military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Air Force MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
AF1	0	0	*	0	0	*	39	27	69.2	4	4	100.0
AF2	2	0	0.0	0	0	*	20	15	75.0	3	3	100.0
AF3	2	0	0.0	0	0	*	41	34	82.9	3	3	100.0
AF4	2	0	0.0	0	0	*	6	3	50.0	3	3	100.0
AF5	1	0	0.0	0	0	*	34	16	47.1	3	3	100.0
AF6	1	1	100.0	0	0	*	8	6	75.0	2	2	100.0
AF7	0	0	*	0	0	*	7	4	57.1	2	2	100.0
AF8	0	0	*	0	0	*	3	2	66.7	2	2	100.0
AF9	1	1	100.0	1	0	0.0	13	7	53.8	2	2	100.0
AF10	2	2	100.0	1	0	0.0	29	21	72.4	2	2	100.0
AF11	1	0	0.0	0	0	*	34	21	61.8	2	2	100.0
AF12	1	1	100.0	0	0	*	8	7	87.5	1	1	100.0
AF13	1	1	100.0	0	0	*	23	15	65.2	1	1	100.0
AF14	2	1	50.0	0	0	*	117	94	80.3	1	1	100.0
AF15	0	0	*	0	0	*	14	12	85.7	1	1	100.0
AF16	3	1	33.3	2	0	0.0	49	37	75.5	1	1	100.0
AF17	4	1	25.0	1	0	0.0	20	14	70.0	1	1	100.0
AF18	3	1	33.3	0	0	*	115	96	83.5	10	9	90.0
AF19	1	0	0.0	0	0	*	30	14	46.7	6	5	83.3
AF20	5	1	20.0	0	0	*	79	68	86.1	10	8	80.0
AF21	1	0	0.0	0	0	*	41	30	73.2	10	8	80.0
AF22	1	0	0.0	0	0	*	24	14	58.3	4	3	75.0
AF23	1	0	0.0	0	0	*	40	13	32.5	4	3	75.0
AF24	1	0	0.0	0	0	*	44	39	88.6	7	5	71.4
AF25	9	3	33.3	0	0	*	122	65	53.3	10	7	70.0
AF26	4	0	0.0	1	0	0.0	67	33	49.3	12	8	66.7
AF27	2	0	0.0	0	0	*	48	30	62.5	6	4	66.7
AF28	10	2	20.0	1	0	0.0	96	81	84.4	6	4	66.7
AF29	5	1	20.0	0	0	*	42	24	57.1	3	2	66.7
AF30	1	0	0.0	0	0	*	32	18	56.3	3	2	66.7
AF31	4	1	25.0	0	0	*	52	35	67.3	10	6	60.0
AF32	2	1	50.0	0	0	*	65	49	75.4	5	3	60.0
AF33	0	0	*	0	0	*	42	34	81.0	5	3	60.0
AF34	16	9	56.3	0	0	*	143	68	47.6	12	7	58.3
AF35	3	0	0.0	0	0	*	84	60	71.4	14	8	57.1
AF36	1	0	0.0	0	0	*	48	25	52.1	9	5	55.6
AF37	1	0	0.0	0	0	*	76	60	78.9	8	4	50.0
AF38	0	0	*	0	0	*	54	33	61.1	8	4	50.0
AF39	1	1	100.0	0	0	*	73	49	67.1	6	3	50.0
AF40	3	1	33.3	1	0	0.0	22	17	77.3	4	2	50.0
AF41	3	1	33.3	1	0	0.0	25	10	40.0	4	2	50.0
AF42	0	0	*	0	0	*	15	12	80.0	2	1	50.0
AF43	0	0	*	0	0	*	8	6	75.0	2	1	50.0
AF44	0	0	*	0	0	*	40	26	65.0	2	1	50.0
AF45	3	0	0.0	1	0	0.0	130	80	61.5	13	6	46.2
AF46	5	4	80.0	0	0	*	66	45	68.2	7	3	42.9
AF47	39	8	20.5	0	0	*	509	242	47.5	32	13	40.6
AF48	9	7	77.8	3	0	0.0	78	32	41.0	10	4	40.0
AF49	2	1	50.0	0	0	*	39	22	56.4	5	2	40.0
AF50	13	9	69.2	3	0	0.0	125	78	62.4	13	5	38.5
AF51	6	3	50.0	1	0	0.0	57	36	63.2	8	3	37.5
AF52	0	0	*	0	0	*	21	16	76.2	9	3	33.3
AF53	1	1	100.0	1	0	0.0	22	13	59.1	9	3	33.3
AF54	3	1	33.3	1	0	0.0	44	25	56.8	6	2	33.3

TABLE 9a. Frequency of incident notifiable medical conditions with the number and percentage reported by U.S. Air Force military treatment facilities (MTFs), active component, U.S. service members, 2008–2014

	Hospitalizations						Ambulatory care					
	2008–2013			2014			2008–2013			2014		
Air Force MTF	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported	No. of cases	No. reported	% reported
AF55	8	5	62.5	3	1	33.3	36	23	63.9	3	1	33.3
AF56	10	4	40.0	2	2	100.0	129	47	36.4	10	3	30.0
AF57	18	4	22.2	0	0	*	227	63	27.8	28	8	28.6
AF58	6	3	50.0	1	1	100.0	195	49	25.1	25	7	28.0
AF59	1	0	0.0	0	0	*	43	33	76.7	4	1	25.0
AF60	21	4	19.0	3	0	0.0	22	18	81.8	4	1	25.0
AF61	7	3	42.9	0	0	*	43	17	39.5	5	1	20.0
AF62	7	2	28.6	2	0	0.0	85	26	30.6	5	1	20.0
AF63	1	0	0.0	0	0	*	49	16	32.7	11	2	18.2
AF64	4	0	0.0	1	0	0.0	41	23	56.1	7	1	14.3
AF65	0	0	*	0	0	*	26	17	65.4	2	0	0.0
AF66	0	0	*	0	0	*	26	17	65.4	2	0	0.0
AF67	1	0	0.0	1	0	0.0	28	19	67.9	2	0	0.0
AF68	0	0	*	0	0	*	29	24	82.8	2	0	0.0
AF69	4	0	0.0	0	0	*	8	7	87.5	1	0	0.0
AF70	0	0	*	0	0	*	12	11	91.7	1	0	0.0
AF71	0	0	*	0	0	*	1	1	100.0	1	0	0.0
AF72	0	0	*	0	0	*	30	18	60.0	0	0	*
AF73	0	0	*	0	0	*	17	6	35.3	0	0	*
AF74	1	0	0.0	0	0	*	22	18	81.8	0	0	*
AF75	0	0	*	0	0	*	1	1	100.0	0	0	*
AF76	0	0	*	0	0	*	6	4	66.7	0	0	*
AF77	0	0	*	0	0	*	4	4	100.0	0	0	*
AF78	0	0	*	0	0	*	2	0	0.0	0	0	*
AF79	0	0	*	0	0	*	12	5	41.7	0	0	*

* No cases to report

These tables present the same kind of data as in Tables 7 and 7a. for the 79 Air Force MTFs only.

TABLE 10. Timeliness of reporting of incident notifiable medical conditions by service, active component, U.S. service members, 2008–2014

Hospitalizations

	Army				Navy				Air Force				DoD			
Year	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month
2008	112	42.0	59.8	80.4	39	23.1	30.8	59.0	9	88.9	100.0	100.0	160	40.0	55.0	76.3
2009	235	66.4	73.6	84.3	58	79.3	87.9	91.4	31	100.0	100.0	100.0	324	71.9	78.7	87.0
2010	138	47.1	64.5	82.6	41	53.7	65.9	75.6	7	71.4	71.4	85.7	186	49.5	65.1	81.2
2011	179	62.6	81.0	92.2	59	55.9	72.9	84.7	21	100.0	100.0	100.0	259	64.1	80.7	91.1
2012	157	68.8	90.4	95.5	52	76.9	78.8	88.5	11	100.0	100.0	100.0	220	72.3	88.2	94.1
2013	154	80.5	92.9	95.5	30	70.0	70.0	80.0	11	72.7	90.9	90.9	195	78.5	89.2	92.8
2014	186	75.8	87.1	95.7	30	63.3	80.0	83.3	4	50.0	50.0	100.0	220	73.6	85.5	94.1

Ambulatory care

	Army				Navy				Air Force				DoD			
Year	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month	Total reported cases	% reported within 1 week	% reported within 2 weeks	% reported within 1 month
2008	2,438	62.5	75.9	89.4	1,462	49.9	57.9	68.4	500	98.2	98.2	98.2	4,400	62.3	72.5	83.4
2009	2,546	76.9	86.5	92.5	757	65.1	70.5	78.1	498	98.2	98.8	98.8	3,801	77.3	84.9	90.5
2010	1,797	66.5	76.6	85.6	545	47.2	62.8	71.2	265	97.4	97.7	98.9	2,607	65.6	75.9	83.9
2011	2,783	70.0	79.3	88.1	886	58.2	70.3	85.3	399	98.2	99.2	99.2	4,068	70.2	79.3	88.6
2012	3,111	81.7	92.1	96.0	804	61.6	74.6	86.2	409	98.0	98.8	99.0	4,324	79.5	89.5	94.5
2013	2,736	84.9	92.7	97.2	768	65.9	75.0	85.2	329	85.7	91.2	94.5	3,833	81.1	89.0	94.6
2014	2,259	84.5	92.0	95.9	647	71.6	81.3	91.0	222	76.6	87.4	95.5	3,128	81.3	89.5	94.9

This table describes the timeliness of reporting, via the Reportable Medical Events system, of the notifiable conditions of interest. Reports based on hospitalized cases are presented separately from reports based on ambulatory care cases. Data are presented for each of the Services separately as well as for all DoD Services combined. For each year in the interval 2008–2014, the table displays the number of reported cases, and the percentages of those cases that were reported within 1 week, 2 weeks, and 1 month.

The numbers of incident notifiable medical conditions and the percentage reported as RMEs by de-identified MTF are reported in **Tables 7–9** for Army, Navy, and Air Force, respectively. Ten of 99 Army MTFs with at least one notifiable medical condition reported more than three-quarters of the cases that they diagnosed. Fifty-seven of 99 Army MTFs reported at least 50% of their notifiable conditions. Among Navy MTFs, three of 90 MTFs reported more than three-quarters of the cases that they received, while 21 MTFs reported at least 50% of their notifiable conditions. For the Air Force, 18 of 85 MTFs reported at least 75% of their notifiable conditions, while 62 reported at least 50% of their incident cases.

The timeliness of reporting of incident notifiable medical conditions increased over the years between 2008 and 2014 **(Table 10)**. DoD-wide, among reported hospitalized cases, 40.0% were reported within 1 week in 2008 and 73.6% were reported within 1 week in 2014. Similarly, 76.3% were reported within 1 month in 2008 and this increased to 94.1% reported within 1 month in 2014. In 2014, the Army MTFs had the quickest reporting of hospitalized cases, with 75.8% of RMEs reported within 1 week, compared with 63.3% for Navy, and 50.0% for Air Force.

Timeliness of reporting ambulatory care cases also improved over the years and was slightly better than hospitalized case reporting **(Table 10)**. DoD-wide, reporting within 1 week increased from 62.3% in 2008 to 81.3% in 2014. By service, Army MTFs had the highest percentage of reported cases within 1 week, 84.5%, compared with Air Force (76.6%) and Navy (71.6%).

EDITORIAL COMMENT

The results of this analysis indicate that, in recent years, only about half of incident notifiable medical conditions have been reported as RMEs through the DRSi reporting system. In 2014, 46.7% of hospitalized cases were reported by the Services and 55.2% of ambulatory care cases were reported **(Table 2)**. These findings can be compared to those of a prior analysis published in the *MSMR* in 2008, which indicated that 39.4% of hospitalized cases were reported and 43.3% of ambulatory care cases were reported in 2007.[4] There was considerable variation in reporting among the Services. During 2008–2014, the percentages of hospitalized cases reported ranged from 54.5% for Army MTFs to 36.2% for Navy MTFs and 31.0% for Air Force MTFs. The percentages of ambulatory care cases reported during the same period ranged from 62.1% for Army, 56.8% for Air Force, and 46.3% for Navy.

The timeliness of reporting improved during the study period, from 40.0% of total hospitalized cases in 2008 reported within 1 week to 73.6% reported within 1 week in 2014 **(Table 10)**. Similarly, the percentage of ambulatory care cases reported within 1 week increased from 62.3% in 2008 to 81.3% in 2014. (Note that comparisons with the previous timeliness analysis published in the *MSMR* in 2008 should not be done because of changes in the methods used in the computation.)

Interpretation of the findings of this analysis should be done cautiously in view of the methodological limitations. First, the use of administrative data from health records to identify cases deserving of submission of RME reports likely overestimates the number of true cases of the conditions of interest. This possibility is especially true for preliminary outpatient diagnoses for which laboratory test results were inconclusive or negative so the diagnoses did not meet the criteria for RME reports of confirmed cases. This scenario seems most pertinent for the diagnoses of chlamydia and gonorrhea that accounted for more than 50% of the notifiable outpatient cases identified in DMSS, particularly because the ascertainment of such cases required only a single outpatient encounter with the diagnosis of interest.

On the other hand, the other two most common diagnoses (heat injury and cold injury) are diagnosed on the basis of clinical findings alone and a single outpatient encounter and do not require laboratory confirmation. Those diagnoses were the subject of RME reports for only 31.6% and 21.6% of outpatient cases identified. The data available for this analysis do not permit any insight into the reasons that underlie instances when preliminary diagnoses of such conditions are subsequently ruled out when considering the submission of an RME report.

Many of the other reportable conditions are so infrequently encountered that a clinical suspicion of such a diagnosis, which may be of critical importance for rapid public health response, may result in the documentation of the diagnosis before confirmation can be obtained. Against that backdrop of heightened vigilance for such conditions, it would not be surprising that many, if not most, of such tentative diagnoses would fail to meet the criteria for submission of an RME report.

It is also possible that the low percentage of notifiable medical conditions that are reported may also reflect ambiguity in the Reportable Medical Events guidelines, especially in the descriptions of which laboratory tests reflect laboratory confirmation of a condition. Because this analysis included encounters from both MTFs and civilian purchased care, some outsourced care encounters for notifiable medical conditions may be missed by the referring MTFs due to lack of follow-up, resulting in a missed reporting opportunity. Lastly, the personnel resources available to carry out the mission of public health surveillance and reporting may vary widely from one MTF to another.

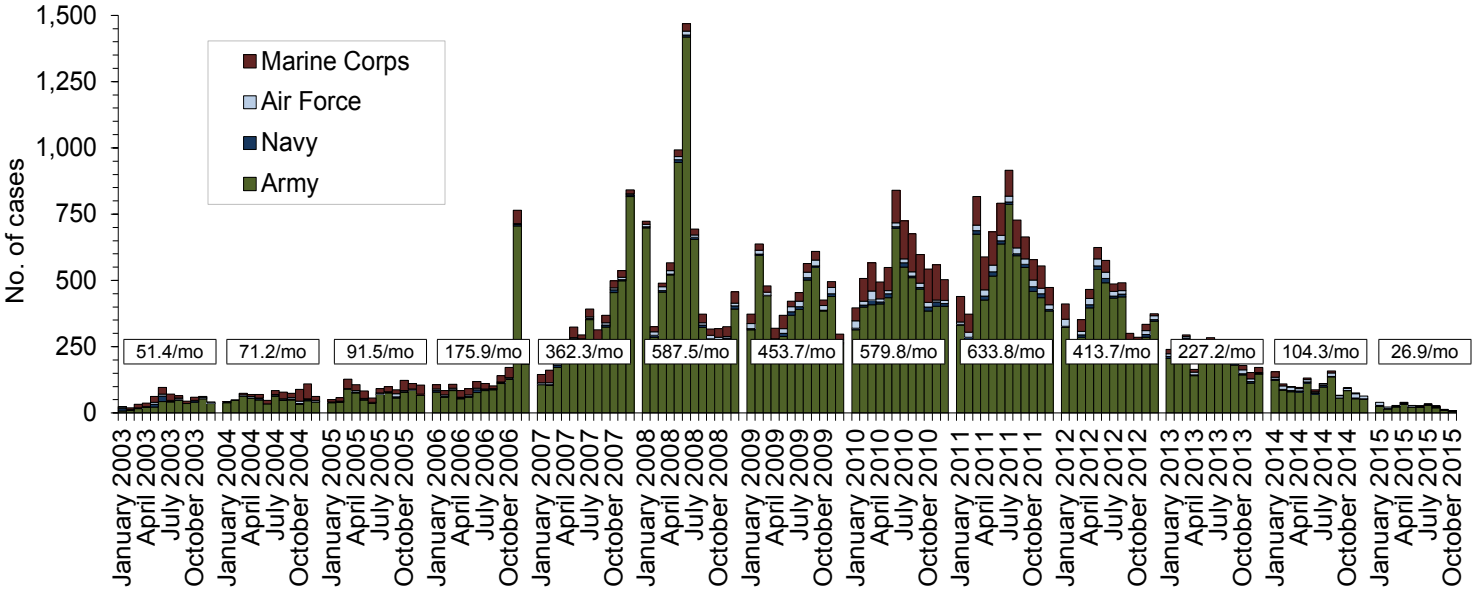
Author affiliation: Armed Forces Health Surveillance Branch, Silver Spring, MD

REFERENCES

1. Department of Defense. DODD 6490.02e, Comprehensive Health Surveillance. http://www.dtic.mil/whs/directives/corres/pdf/649002e.pdf. Accessed on 19 November 2015.
2. Armed Forces Health Surveillance Center. Armed Forces Reportable Medical Events Guidelines & Case Definitions. https://www.afhsc.mil/documents/pubs/documents/TriService_CaseDefDocs/ArmedForcesGuidlinesFinal14Mar12.pdf. Accessed on 19 November 2015.
3. Navy and Marine Corps Public Health Center. DRSi: Disease Reporting System Internet. http://www.med.navy.mil/sites/nmcphc/program-and-policy-support/drsi/Pages/default.aspx. Accessed on 19 November 2015.
4. Armed Forces Health Surveillance Center. Completeness and timeliness of notifiable medical conditions among active component service members, U.S. Armed Forces, 1998–2007. *MSMR*. 2008;15(7):12–23.

Deployment-Related Conditions of Special Surveillance Interest, U.S. Armed Forces, by Month and Service, January 2003–October 2015 (data as of 24 November 2015)

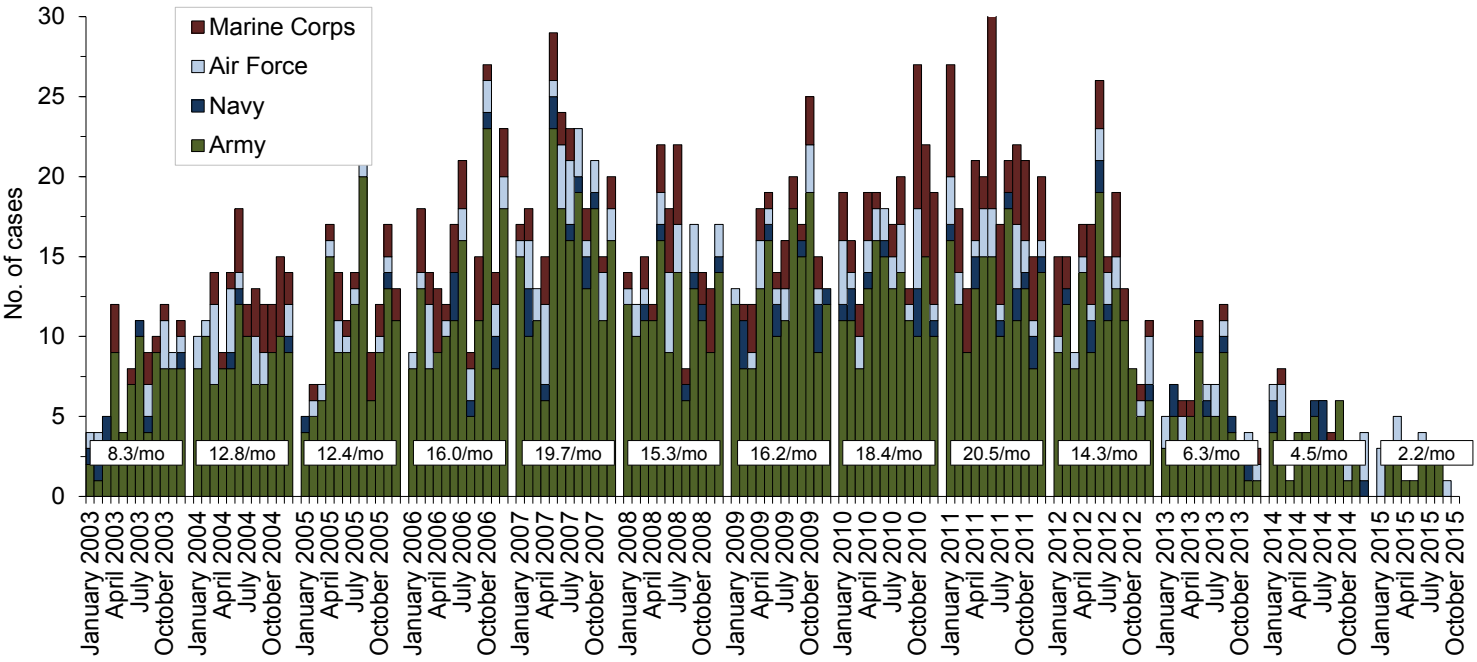
Traumatic brain injury (TBI) (ICD-9: 310.2, 800–801, 803-804, 850–854, 907.0, 950.1–950.3, 959.01, V15.5_1–9, V15.5_A–F, V15.52_0–9, V15.52_A–F, V15.59_1–9, V15.59_A–F)[a]



Reference: Armed Forces Health Surveillance Center. Deriving case counts from medical encounter data: considerations when interpreting health surveillance reports. *MSMR*. 2009;16(12):2–8.

[a]Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from deployment (includes in-theater medical encounters from the Theater Medical Data Store [TMDS] and excludes 4,637 deployers who had at least one TBI-related medical encounter any time prior to deployment).

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)[b]

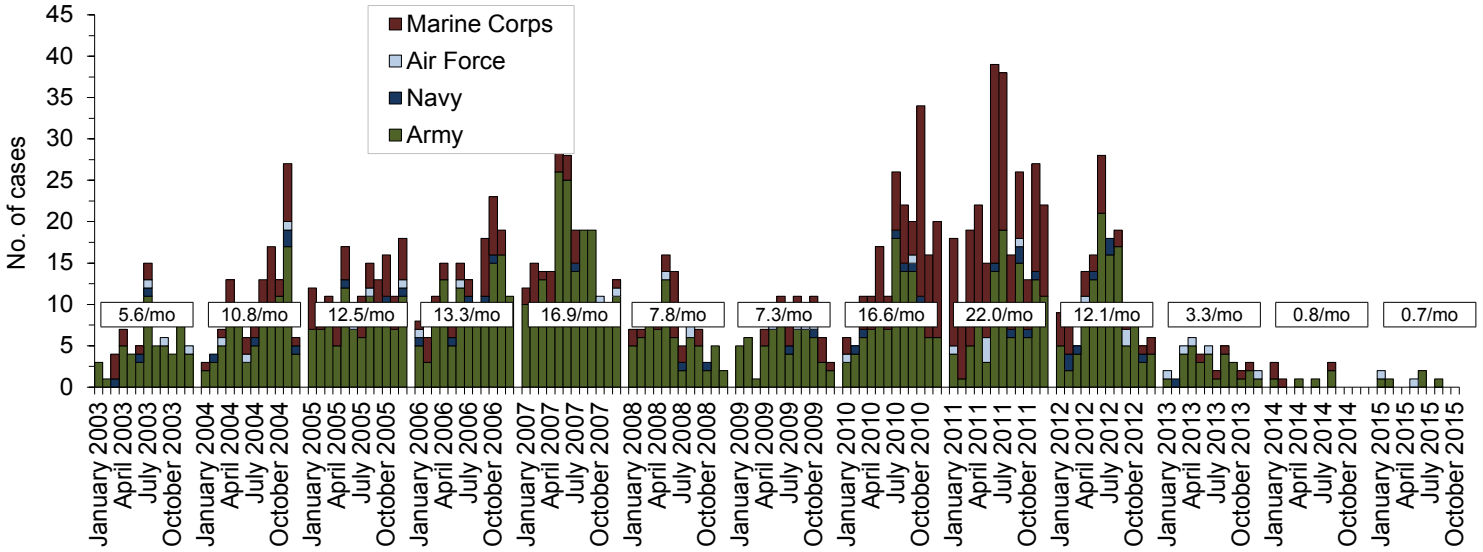


Reference: Isenbarger DW, Atwood JE, Scott PT, et al. Venous thromboembolism among United States soldiers deployed to Southwest Asia. *Thromb Res*. 2006;117(4):379–383.

[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from deployment.

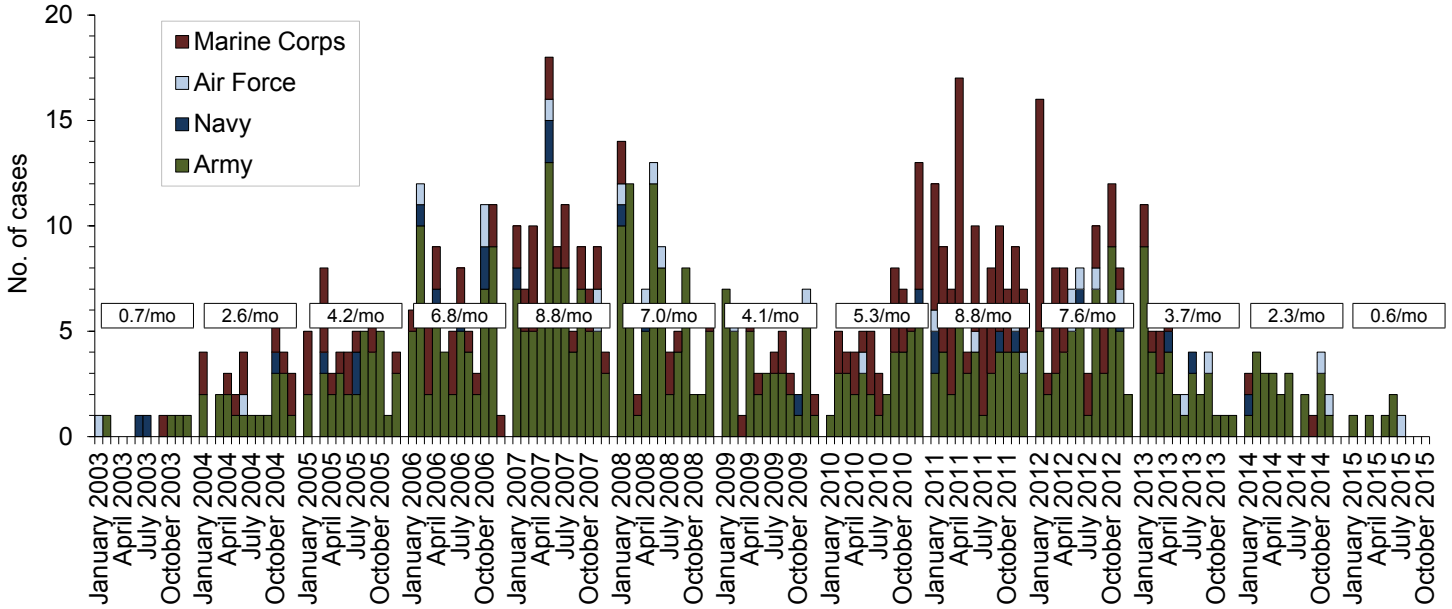
Deployment-Related Conditions of Special Surveillance Interest, U.S. Armed Forces, by Month and Service, January 2003–October 2015 (data as of 24 November 2015)

Amputations (ICD-9-CM: 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*. 2005;11(1):2–6.
[a]Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 365 days of returning from deployment

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*. 2007;14(5):7–9.
[b]One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 365 days of returning from deployment

Medical Surveillance Monthly Report (MSMR)
Armed Forces Health Surveillance Branch
11800 Tech Road, Suite 220 (MCAF-CS)
Silver Spring, MD 20904

MEDICAL SURVEILLANCE MONTHLY REPORT (MSMR), in continuous publication since 1995, is produced by the Armed Forces Health Surveillance Branch (AFHSB). The *MSMR* provides evidence-based estimates of the incidence, distribution, impact and trends of illness and injuries among United States military members and associated populations. Most reports in the *MSMR* are based on summaries of medical administrative data that are routinely provided to the AFHSB and integrated into the Defense Medical Surveillance System for health surveillance purposes.

All previous issues of the *MSMR* are available online at www.afhsc.mil. Subscriptions (electronic and hard copy) may be requested online at www.afhsc.mil/Contact/MsmrSubscribe or by contacting AFHSB by phone: (301) 319-3240 or email: dha.ncr.health-surv.mbx.afhs-msmr@mail.mil.

Submissions: Instructions for authors are available at www.afhsc.mil/msmr/Instructions.

Follow us:

www.facebook.com/AFHSCPAGE

http://twitter.com/AFHSCPAGE

ISSN 2158-0111 (print)
ISSN 2152-8217 (online)