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## *Annual Summary Issue*

- 
- PAGE 2**     *Medical Surveillance Monthly Report: The first 20 years*  
*John F. Brundage, MD, MPH; Mark V. Rubertone, MD, MPH*
- 
- PAGE 5**     Absolute and relative morbidity burdens attributable to various illnesses and injuries, U.S. Armed Forces, 2014
- 
- PAGE 11**    Hospitalizations among members of the active component, U.S. Armed Forces, 2014
- 
- PAGE 18**    Ambulatory visits among members of the active component, U.S. Armed Forces, 2014
- 
- PAGE 25**    Surveillance snapshot: Illness and injury burdens among reserve component service members, U.S. Armed Forces, 2014
- 
- PAGE 26**    Surveillance snapshot: Illness and injury burdens among U.S. military recruit trainees, 2014
- 
- PAGE 27**    Absolute and relative morbidity burdens attributable to various illnesses and injuries, non-service member beneficiaries of the Military Health System, 2014
- 
- SUMMARY TABLES AND FIGURES**
- 
- PAGE 35**    Deployment-related conditions of special surveillance interest

# Report Documentation Page

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## Medical Surveillance Monthly Report: The First 20 Years

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“To furnish the means of acquiring knowledge is ... the greatest benefit that can be conferred upon mankind.”

— John Quincy Adams (1846)

The early 1990s were years of major transitions for the U.S. military in general and the military medical departments specifically. Notably, the fall of the Berlin Wall in 1989 and the dissolution of the Soviet Union in 1991 marked the end of the Cold War and the beginning of a new era of national defense strategic vision, policies, and activities.<sup>1</sup>

Through the early 1990s, the military services and their medical departments were sharply downsized—even as major combat operations were conducted in Iraq and Kuwait (First Gulf War: August 1990–February 1991) and Somalia (Operation Restore Hope: December 1992–May 1993). The subsequent experiences of the military medical departments, particularly after the First Gulf War, highlighted significant deficiencies in the surveillance of the health of active and reserve component military members, especially after returning from overseas assignments in general and from active war zones in particular. Most notably, the military medical departments were unable to provide timely and authoritative answers when numerous Gulf War veterans

returned to the U.S. with diverse medical complaints (“Gulf War illnesses”) of uncertain causes and unknown prognoses.<sup>2</sup> Because of difficulties in determining who deployed, precisely when and where service members were located during war-related deployments, and the numbers and natures of illnesses and risk-related activities of war service veterans, it was not possible to reliably assess the natures, incidence rates, clinical importance of, and risk factors for post-war illnesses in a timely manner.<sup>2</sup>

Since 1952, the Centers for Disease Control and Prevention (CDC) has published the *Morbidity and Mortality Weekly Report (MMWR)*. The CDC describes the *MMWR* as its “primary vehicle for scientific publication of timely, reliable, authoritative, accurate, objective, and useful public health information and recommendations.” Until the mid-1990s, the “situational awareness” of military medical practitioners and policy makers regarding threats to the health, safety, and operational readiness of military members relied to a great extent on the experiences of non-military populations (such as reported in the *MMWR*).

However, in light of the numerous and important differences between U.S. civilian and military populations (e.g., sociodemographic characteristics, natures and intensities of health risk exposures), the public health experiences of the former are not particularly informative regarding the latter—particularly in relation to war-related exposures.

The first issue of the *Medical Surveillance Monthly Report (MSMR)* was published in April 1995. On the first page of that report, the objectives of the *MSMR* were explained: The *MSMR* will disseminate “medical surveillance information of broad interest. ... The ultimate goal ... is to provide ... information necessary to inform, motivate, and empower commanders, their surgeons, and medical staffs to design, implement, and resource programs that enhance health, fitness, and readiness.”<sup>3</sup> More succinctly, the *MSMR* aspired to be the *MMWR* of the U.S. military.

The *MSMR*'s objectives were audacious because, in 1995, the Army Medical Surveillance Activity (AMSA), the founding home of the *MSMR*, had no personnel or other resources dedicated exclusively to its production. In addition, comprehensive and reliable health surveillance-related data were not routinely transmitted to, stored in, or available in timely ways through a centralized electronic military medical database, such as the Army Medical Surveillance System (AMSS), which was operated by AMSA. In addition, there was no routine access to the Internet, and capabilities to securely transmit personnel or medical records electronically from proponent to client agencies were limited.

A critical military health surveillance function is documenting rates of conditions of interest during specified time periods in various military, demographic, and risk-associated populations. Health



surveillance of U.S. military members is particularly challenging because the military is a large, dynamic population of young adult men and women who enter service from diverse race/ethnicity, socio-cultural, and geographic backgrounds and are exposed to myriad natural and occupational health risks—some life threatening—during assignments worldwide. As such, access to complete, accurate, and timely rosters of all members of the military, in all Services and components, with up-to-date information regarding their military, occupational, and demographic characteristics as well as the natures and locations of their assignments, is essential. In 1995, AMSA was routinely receiving from the Defense Manpower Data Center (DMDC) monthly rosters (with demographic and military characteristics of each individual) of all members of the active component of the Army only. To enhance its capabilities to conduct health surveillance among U.S. military members overall, in 1996, AMSA requested and received monthly rosters of all members of all of the Services back to 1990. These data provided the denominators for calculations of rates of illnesses and injuries among various military and demographic subgroups during specified time periods since 1990.

For most *MSMR* reports, the numerators for rate calculations have been counts of medical events, including hospitalizations, ambulatory visits, positive screening tests, self-reported health concerns (e.g., pre- and post-deployment health assessments), immunizations, laboratory and other medical diagnostic procedures, and so on. However, in 1995, there was no centralized database with electronic records documenting all such events among all military members. Of note in this regard, each month beginning in 1994, AMSA received files (initially on reel-to-reel tapes) documenting hospitalizations of U.S. Army soldiers in fixed (e.g., not deployed) facilities of the Army Medical Department. By July 1995, hospitalization records back to 1989 had been added to the AMSS database; as a result, in August 1995, the *MSMR*, for the first time, was able to summarize multiple years of hospitalization experience—but only for active component Army members in “brick and mortar” (e.g., not deployed)

facilities of the Army Medical Department. Although 1995 was an auspicious beginning for the *MSMR*, at year’s end, it was still far from its goal of providing timely, reliable, comprehensive, authoritative, objective, and useful information regarding the health of *all* members of both the active and reserve components of *all* the Services.

By the time of the U.S. military intervention in Bosnia-Herzegovina in December 1995 (Operation Joint Endeavor [OJE]), monthly rosters of all U.S. participants, records of all in-theater hospitalizations, and summaries of all disease and non-battle injury (DNBI)-related medical encounters of deployed U.S. military members were provided to AMSA for deployment health surveillance purposes. As a result, from February 1996 through March 1997, each issue of the *MSMR* reported numbers and trends of DNBI-related medical encounters and hospitalizations of U.S. military participants in OJE.

In 1997, the AMSS transitioned to the Defense Medical Surveillance System (DMSS), and by the turn of the century, the DMSS was routinely receiving health surveillance-related data from sources throughout the Department of Defense (DoD) and the Military Health System (MHS). Data included monthly rosters of all individuals in active military service; rosters of all service members who deployed overseas for extended periods; records of all hospitalizations and ambulatory encounters in MHS-operated fixed military medical facilities; records of all contracted or otherwise reimbursed medical care in civilian facilities; and records of all deaths, notifiable medical events, immunizations, and routinely conducted screening tests for antibodies to HIV. Upon their receipt, these data were integrated into the DMSS health surveillance database managed by AMSA. The centralized, integrated, and comprehensive DMSS database was continuously accessible to authorized data analysts, including those preparing reports for the *MSMR*.<sup>4</sup>

In April 2001, for the first time, the *MSMR* reported numbers and rates, by diagnostic categories, of all hospitalizations and ambulatory visits of active component members of all the military services. Also in April 2001, the *MSMR* estimated the

“burdens” to the MHS (e.g., total medical encounters, hospital bed-days) and to affected military units (e.g., numbers of service members affected, lost duty days) that were due to various illnesses and injuries.<sup>5</sup> Reports of numbers, rates, and trends of hospitalizations, ambulatory visits, and morbidity burdens due to various illnesses and injuries among U.S. military members have been published in the *MSMR* each year since 2001. Thus, before post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI) were recognized as “signature wounds” of the wars in Afghanistan and Iraq, the *MSMR* was highlighting the importance of mental disorders (including mood disorders, adjustment reactions) and musculoskeletal injuries (including injuries of the head/neck) as major sources of morbidity, lost duty time, and healthcare usage among military members.<sup>5</sup>

By 2001, the unprecedented scope and capabilities of the DMSS enabled the *MSMR* to track and document the experiences of all U.S. military members from the first day of the wars in Afghanistan and Iraq. Throughout the wars, the *MSMR* focused on tracking frequencies, incidence rates, trends, and determinants of illnesses and injuries that affect Afghanistan/Iraq deployers, particularly after they return from war zone assignments.<sup>6–9</sup> In-depth reports have summarized the post-deployment experiences of war service veterans, particularly regarding illnesses and injuries potentially related to war service risk. The *MSMR* defined several such conditions as “conditions of special surveillance interest,” including PTSD, TBI, amputations and heterotopic ossifications (i.e., severe complications of traumatic limb amputations), deep vein thrombosis/pulmonary embolus, severe acute pneumonia, motor vehicle (particularly motorcycle)-related injuries and deaths, and leishmaniasis. For the duration of the wars, the *MSMR* routinely summarized numbers and trends of occurrences of these conditions among recently returned war service veterans. Other war-related reports examined post-deployment morbidity and mortality experiences in relation to the nature and timing of pre-deployment hospitalizations, responses to deployment-related health assessments, number of previous

war zone deployments, gender, military occupation, and other military and demographic factors.<sup>10-15</sup>

In 2008, the DoD established the Armed Forces Health Surveillance Center (AFHSC). The AFHSC integrated the missions, capabilities, and resources of three military health surveillance entities: the AMSA, the DoD Global Emerging Infectious Disease Surveillance and Response System (DoD-GEIS), and the Global Health Surveillance Activity (in the Office of the Assistant Secretary of Defense for Health Affairs). Since its formation in 2008, the AFHSC has been the home of the *MSMR*.<sup>16</sup>

In regard to the *MSMR*'s objectivity and openness in documenting war-related health threats, a *Time* magazine reporter opined that "sometimes, the doctors will tell you what the politicians won't." He observed that *MSMR* reports are "unheralded, and aren't rolled out with press briefings, or even press releases. Instead, they're written for military medical professionals and quietly issued to guide their efforts in patient care and research."<sup>17</sup> Of note in this regard, since 2011, *MSMR* reports have been archived in PubMed, the searchable database of peer-reviewed medical articles operated by the National Library of Medicine. Importantly, the adding of this archiving, search, and retrieval capability made the *MSMR* an attractive option for publication of military health surveillance-related reports by authors outside the AFHSC. Also, it should be noted that the full text of all issues of the *MSMR*, dating back to April 1995, are accessible on the AFHSC website at <https://www.afhsc.mil/msmr>.

Over the past 20 years, the *MSMR* has advanced a long way in pursuit of its goal

of serving as the military's *MMWR*. The *MSMR*'s progress was enabled by unprecedented support of military force health protection and health surveillance initiatives and unimaginable advances in telecommunications and information management/data warehousing technologies. To the extent that the U.S. military maintains its commitment to accountability for and transparency regarding force health protection, the *MSMR*'s role in producing and disseminating timely, comprehensive, and scientifically reliable health surveillance information will remain essential.

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# Absolute and Relative Morbidity Burdens Attributable to Various Illnesses and Injuries, U.S. Armed Forces, 2014

Perceptions of the relative “importance” of various health conditions in military populations often determine the natures, extents, and priorities for resources applied to primary, secondary, and tertiary prevention activities. However, perceptions of importance are inherently subjective; as such, they may be inconsistent with objective measures of the relationships between the conditions and their impacts on health, fitness, military operational effectiveness, healthcare costs, and so on.

Several classification systems and morbidity measures have been developed to quantify the “public health burdens” that are attributable to various illnesses and injuries in defined populations and settings.<sup>1</sup> Not surprisingly, different classification systems and morbidity measures lead to different rankings of illness- and injury-specific public health burdens.<sup>2</sup>

For example, in a given population and setting, the illnesses and injuries that account for the most hospitalizations are likely different from those that account for the most outpatient medical encounters, and the illnesses and injuries that account for the most medical encounters overall may differ from those that affect the most individuals, have the most debilitating or long-lasting effects, and so on.<sup>2</sup> Thus, in a given population and setting, the classification system or measure used to quantify condition-specific morbidity burdens determines to a large extent the conclusions that may be drawn regarding the relative “importance” of various conditions—and, in turn, the resources that may be indicated to prevent or minimize their impacts.

This annual summary uses a standard disease classification system (modified for use among U.S. military members) and several healthcare burden measures to quantify the impacts of various illnesses and injuries among members of the U.S. Armed Forces in 2014.

## METHODS

The surveillance period was 1 January through 31 December 2014. The surveillance population included all individuals who served in the active component of the U.S. Army, Navy, Air Force, Marine Corps, or Coast Guard anytime during the surveillance period. For this analysis, all inpatient and outpatient medical encounters of all active component members during 2014 were summarized according to the primary (first-listed) diagnosis (if reported with an International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] code between 001 and 999 or code V27.0).

For summary purposes, all illness- and injury-specific diagnoses (as defined by the ICD-9-CM) were grouped into 139 burden of disease-related conditions and 25 categories based on a modified version of the classification system developed for the Global Burden of Disease (GBD) Study.<sup>1</sup> In general, the GBD system groups diagnoses with common pathophysiologic or etiologic bases and/or significant international health policymaking importance. For this analysis, some diagnoses that are grouped into single categories in the GBD system (e.g., mental disorders) were disaggregated to increase the military relevance of the results. Also, injuries were categorized by affected anatomic site rather than by cause because external causes of injuries are incompletely reported in military outpatient records.

The “morbidity burdens” attributable to various “conditions” were estimated based on the total number of medical encounters attributable to each condition (i.e., total hospitalizations and ambulatory visits for the condition with a limit of one encounter per individual per condition per day), numbers of service members affected by each condition (i.e., individuals with at least one medical encounter for the condition during the

year), total bed days during hospitalizations for each condition, and total number of lost work days due to each condition. This fourth measure represents the days of work time lost due to hospitalizations plus one day for each “sick in quarters” disposition and one-half day for each “limited duty” disposition that resulted from ambulatory visits for the condition of interest.

## RESULTS

### Morbidity burden, by category

In 2014, more service members ( $n=578,351$ ) received medical care for injury/poisoning than any other morbidity-related category (**Figures 1a, 1b**). In addition, injury/poisoning accounted for more medical encounters ( $n=2,106,494$ ) than any other morbidity category and one-fifth (20.8%) of all medical encounters overall.

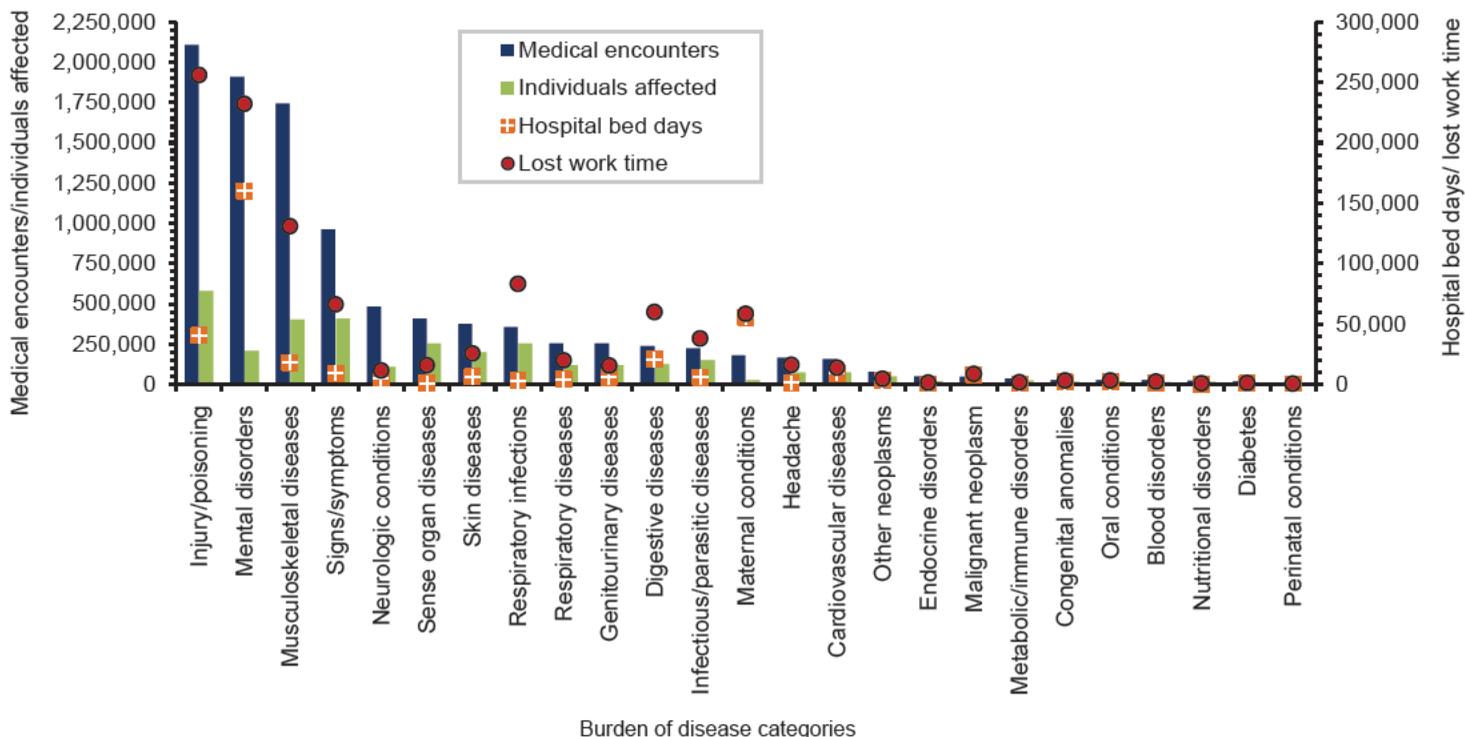
Mental disorders accounted for more hospital bed days ( $n=160,047$ ) than any other morbidity category and 44% of all hospital bed days overall (**Figures 1a, 1b**). Together, injury/poisoning and mental disorders accounted for more than half (55.0%) of all hospital bed days and almost two-fifths (39.6%) of all medical encounters. Injuries and poisonings accounted for the most lost work time ( $n=255,925$  lost work days; 23.9% of the total).

Of note, maternal conditions (including pregnancy complications and delivery) accounted for a relatively large proportion of all hospital bed days ( $n=55,570$ ; 15.3%), but a much smaller proportion of medical encounters overall ( $n=179,282$ ; 1.8%) (**Figures 1a, 1b**); routine prenatal visits are not included in this summary.

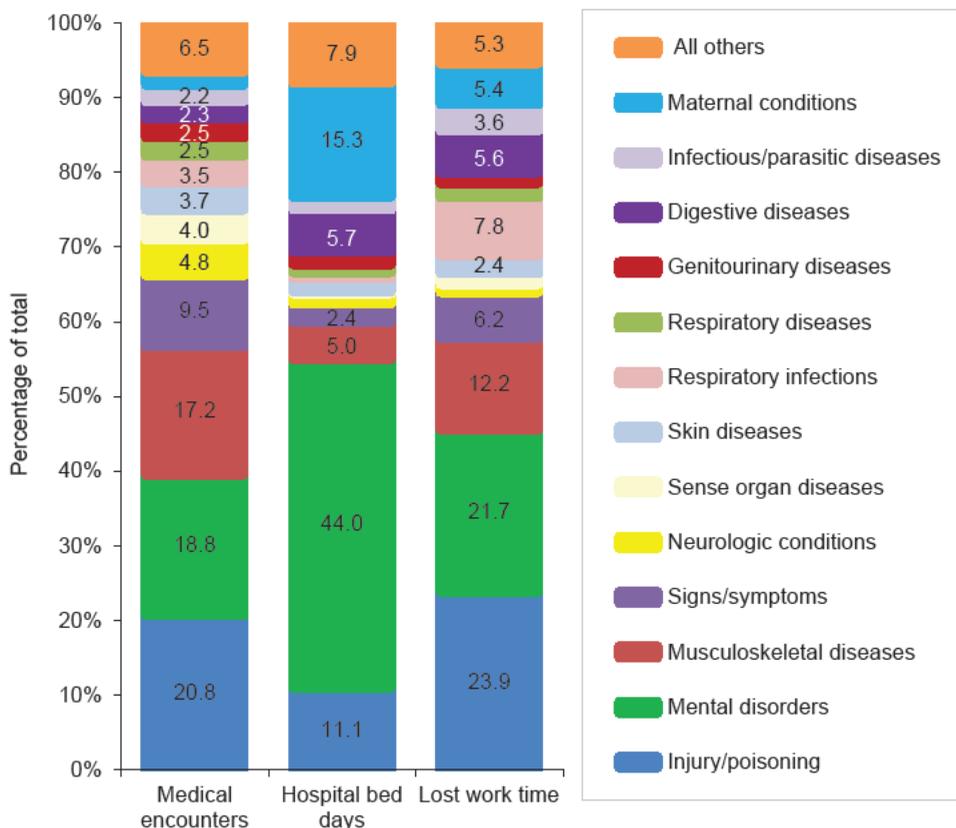
### Medical encounters, by condition

In 2014, the four burden of disease-related conditions that accounted for the

**FIGURE 1a.** Medical encounters,<sup>a</sup> individuals affected,<sup>b</sup> hospital bed days, and lost work time<sup>c</sup> by burden of disease category,<sup>d</sup> active component, U.S. Armed Forces, 2014



**FIGURE 1b.** Percentage of medical encounters,<sup>a</sup> hospital bed days, and lost work time<sup>c</sup> attributable to burden of disease categories,<sup>d</sup> active component, U.S. Armed Forces, 2014



<sup>a</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition (with no more than one encounter per individual per day per condition)

<sup>b</sup>Individuals with at least one hospitalization or ambulatory visit for the condition

<sup>c</sup>A measure of lost work time calculated in days due to bed days, convalescence, and one-half day for each ambulatory visit that resulted in limited duty

<sup>d</sup>Major categories and conditions defined in the Global Burden of Disease Study<sup>1</sup>

most medical encounters (i.e., other back problems, other musculoskeletal diseases, other signs and symptoms, and anxiety) accounted for more than one-fourth (27.9%) of all illness- and injury-related medical encounters overall (Figure 2). Moreover, the 10 conditions that accounted for more than half (52.7%) of all illness- and injury-related medical encounters overall. In general, the conditions that accounted for the most medical encounters were predominantly musculoskeletal disorders (e.g., back), injuries (e.g., arm/shoulder, knee, foot/ankle), and mental disorders (e.g., anxiety, adjustment, mood disorders) (Table 1, Figure 2).

**TABLE 1. Healthcare burdens attributable to various diseases and injuries, active component, U.S. Armed Forces, 2014**

Major category condition <sup>a</sup>	Medical encounters <sup>b</sup>		Individuals affected <sup>c</sup>		Bed days	
	No.	Rank	No.	Rank	No.	Rank
<b>Injury and poisoning</b>						
Arm and shoulder	520,475	(5)	156,325	(5)	2,963	(23)
Knee	485,556	(6)	151,543	(6)	1,412	(38)
Foot and ankle	369,052	(9)	146,970	(8)	2,746	(25)
Leg	197,032	(15)	77,830	(17)	4,459	(17)
Hand and wrist	134,324	(23)	68,553	(21)	1,773	(34)
Unspecified injury	124,344	(24)	81,012	(16)	937	(48)
Head and neck	93,207	(29)	56,471	(23)	6,273	(11)
Back and abdomen	76,733	(31)	46,614	(27)	3,902	(19)
Other complications	36,112	(41)	19,663	(45)	10,306	(8)
Environmental	26,247	(49)	20,469	(44)	1,234	(42)
Other injury, external	18,749	(61)	11,051	(62)	435	(68)
Other injury	16,351	(65)	11,080	(61)	801	(52)
Poisoning, nondrug	4,433	(94)	3,148	(80)	301	(78)
Poisoning, drugs	3,879	(97)	2,467	(87)	2,712	(26)
<b>Mental disorders</b>						
Anxiety	570,307	(4)	75,445	(18)	29,793	(4)
Mood	398,838	(7)	56,471	(24)	48,432	(1)
Adjustment	379,779	(8)	81,250	(15)	24,134	(5)
Substance abuse dis	355,686	(11)	28,685	(39)	46,059	(2)
Other mental dis	141,135	(21)	52,712	(25)	3,807	(20)
Tobacco dependence	21,957	(55)	13,261	(58)	6	(131)
Psychotic	19,127	(60)	2,525	(86)	5,953	(13)
Personality	12,251	(73)	2,770	(84)	1,459	(37)
Somatoform	9,320	(76)	2,326	(88)	404	(70)
<b>Musculoskeletal diseases</b>						
Other back problems	1,002,216	(1)	223,094	(3)	7,409	(10)
Other musculosk dis	672,350	(2)	245,428	(2)	8,197	(9)
Other knee disorders	32,838	(45)	13,868	(57)	1,474	(36)
Other shoulder dis	16,178	(66)	8,009	(65)	114	(98)
Osteoarthritis	14,762	(69)	8,088	(64)	932	(49)
Rheumatoid arthritis	3,416	(98)	1,124	(99)	14	(128)
<b>Signs and symptoms</b>						
Other signs/symptoms	581,953	(3)	273,163	(1)	4,495	(16)
Abdomen and pelvis	210,792	(14)	128,774	(10)	2,074	(29)
Respiratory and chest	169,881	(16)	101,641	(12)	2,311	(28)
<b>Neurologic conditions</b>						
Organic sleep disorders	359,171	(10)	73,754	(20)	480	(66)
Other neuro conditions	98,680	(28)	35,591	(33)	3,310	(21)
Other mononeuritis, limbs	15,350	(68)	7,972	(66)	141	(92)
Epilepsy	5,903	(88)	1,779	(94)	866	(51)
Multiple sclerosis	3,288	(99)	665	(106)	268	(81)
Parkinson disease	249	(129)	59	(130)	61	(107)
<b>Sense organ diseases</b>						
Refraction/accom	168,650	(17)	130,553	(9)	0	(139)
Other sense organ dis	167,872	(18)	106,221	(11)	663	(59)
Hearing disorders	57,951	(36)	36,276	(32)	45	(112)
Glaucoma	11,600	(74)	6,857	(69)	2	(135)
Cataracts	1,548	(111)	845	(103)	226	(83)
<b>Skin diseases</b>						
Other skin diseases	269,780	(13)	147,945	(7)	6,269	(12)
Contact dermatitis	56,143	(37)	40,822	(29)	79	(104)
Sebaceous gland dis	51,262	(38)	30,148	(38)	24	(123)
<b>Respiratory infections</b>						
Upper respiratory	280,173	(12)	216,394	(4)	572	(62)
Lower respiratory	46,134	(40)	31,745	(35)	2,334	(27)
Otitis media	27,271	(48)	21,285	(43)	48	(111)
<b>Respiratory diseases</b>						
Allergic rhinitis	99,067	(27)	42,859	(28)	12	(129)
Other respiratory dis	66,523	(32)	38,339	(31)	3,265	(22)
Asthma	33,354	(44)	14,978	(54)	372	(74)
Chronic sinusitis	31,845	(46)	23,629	(40)	125	(94)
Chron obstr pulm dis	21,614	(56)	17,896	(48)	118	(97)
<b>Genitourinary diseases</b>						
Other genitourinary dis	150,045	(20)	84,047	(14)	2,839	(24)
Female genital pain	27,570	(47)	15,928	(50)	287	(80)
Menstrual disorders	22,338	(54)	14,149	(56)	609	(61)
Other breast disorders	21,569	(57)	11,609	(60)	375	(73)
Kidney stones	20,067	(59)	7,796	(67)	795	(53)
Nephritis and nephrosis	7,866	(83)	2,185	(91)	1,086	(44)
Prostatic hypertrophy	2,830	(102)	1,878	(93)	71	(105)
<b>Digestive diseases</b>						
Other digestive dis	116,972	(25)	58,179	(22)	12,818	(7)
Gastroenteritis/colitis	63,073	(33)	52,288	(26)	967	(47)
Esophagus disease	35,456	(42)	22,684	(42)	868	(50)
Inguinal hernia	12,462	(71)	5,493	(72)	536	(63)
Appendicitis	6,093	(87)	3,098	(81)	4,875	(14)
Cirrhosis of the liver	1,972	(109)	1,404	(96)	91	(101)
Peptic ulcer disease	1,478	(112)	910	(101)	461	(67)
<b>Infectious and parasitic diseases</b>						
Other infectious/para-sitic dis	138,805	(22)	92,665	(13)	4,125	(18)
Unspecified viral infection	34,085	(43)	30,516	(37)	207	(84)
STDs	20,484	(58)	15,126	(52)	430	(69)
Diarrheal diseases	17,205	(64)	15,151	(51)	1,034	(46)
Chlamydia	8,020	(81)	6,839	(70)	11	(130)
Hepatitis B and C	2,068	(108)	874	(102)	26	(120)
Tuberculosis	850	(118)	470	(113)	39	(115)
Intestinal nematode	211	(133)	184	(123)	5	(133)
Malaria	209	(134)	66	(129)	135	(93)
Bacterial meningitis	144	(136)	47	(131)	80	(102)
Tropical cluster	78	(138)	42	(135)	1	(136)
<b>Maternal conditions</b>						
Pregnancy complications	108,924	(26)	22,958	(41)	19,979	(6)
Delivery	58,837	(35)	17,298	(49)	34,363	(3)
Ectopic/miscarriage/abortion	9,005	(77)	3,857	(79)	677	(57)
Puerperium complications	2,432	(104)	1,468	(95)	503	(65)
Other maternal disorders	84	(137)	46	(132)	48	(110)
<b>Headache</b>						
Headache	164,229	(19)	74,023	(19)	1,086	(45)

<sup>a</sup>Major categories and conditions defined in the Global Burden of Disease Study<sup>1</sup>

<sup>b</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition (with no more than one encounter per individual per day per condition)

<sup>c</sup>Individuals with at least one hospitalization or ambulatory visit for the condition

**TABLE 1. (cont.) Healthcare burdens attributable to various diseases and injuries, active component, U.S. Armed Forces, 2014**

Major category condition <sup>a</sup>	Medical encounters <sup>b</sup>		Individuals affected <sup>c</sup>		Bed days	
	No.	Rank	No.	Rank	No.	Rank
<b>Cardiovascular diseases</b>						
Other cardiovascular dis	79,454	(30)	39,694	(30)	4,782	(15)
Essential hypertension	59,441	(34)	33,824	(34)	376	(72)
Cerebrovascular disease	8,246	(80)	1,992	(92)	1,681	(35)
Ischemic heart disease	7,883	(82)	2,990	(83)	1,286	(40)
Inflammatory	1,291	(113)	508	(110)	675	(58)
Rheumatic heart disease	553	(123)	424	(114)	28	(119)
<b>Other neoplasms</b>						
Other neoplasms	46,391	(39)	31,182	(36)	1,934	(32)
Benign skin neoplasm	18,502	(62)	15,056	(53)	18	(126)
Lipoma	8,362	(79)	5,429	(73)	60	(109)
Uterine leiomyoma	4,630	(93)	2,187	(90)	1,120	(43)
<b>Endocrine disorders</b>						
Other endocrine disorders	22,762	(53)	9,112	(63)	201	(85)
Hypothyroidism	13,772	(70)	7,440	(68)	15	(127)
Other thyroid disorders	11,214	(75)	4,816	(74)	349	(76)
<b>Malignant neoplasms</b>						
Lymphoma/multiple myeloma	7,422	(85)	720	(105)	738	(56)
Other malignant neopl	6,294	(86)	1,147	(98)	1,868	(33)
Leukemia	5,284	(91)	256	(119)	2,030	(30)
Melanoma/skin	4,800	(92)	2,284	(89)	122	(95)
Breast cancer	4,396	(95)	481	(112)	172	(87)
Testicular cancer	4,234	(96)	786	(104)	301	(79)
Colon/rectum cancers	2,825	(103)	339	(116)	1,240	(41)
Brain	2,418	(105)	206	(121)	627	(60)
Thyroid	2,350	(106)	571	(107)	233	(82)
Prostate cancer	1,272	(114)	279	(118)	121	(96)
Mouth/oropharynx	1,181	(115)	162	(124)	79	(103)
Trachea, bronchus, lung	639	(120)	96	(126)	196	(86)
Pancreas cancer	580	(122)	41	(136)	143	(91)
Bladder cancer	385	(125)	97	(125)	18	(125)
Stomach cancer	335	(127)	43	(134)	97	(100)
Esophagus cancer	333	(128)	24	(138)	70	(106)
Cervix uteri cancer	243	(130)	43	(133)	32	(117)
<b>Liver cancer</b>						
	238	(131)	36	(137)	38	(116)
<b>Ovary cancer</b>						
	235	(132)	72	(127)	26	(121)
<b>Corpus uteri cancer</b>						
	50	(139)	15	(139)	3	(134)
<b>Metabolic and immunity disorders</b>						
Lipoid metabolism	24,124	(52)	18,899	(46)	25	(122)
Other metabolic dis	12,424	(72)	6,743	(71)	515	(64)
Immunity disorders	879	(117)	316	(117)	42	(113)
<b>Congenital anomalies</b>						
Other congenital anom	24,379	(51)	14,631	(55)	1,333	(39)
Congenital heart dis	2,143	(107)	1,028	(100)	307	(77)
Other circulatory anom	1,098	(116)	409	(115)	143	(90)
<b>Oral conditions</b>						
Other oral conditions	24,921	(50)	18,714	(47)	1,965	(31)
Dental caries	640	(119)	527	(109)	21	(124)
Periodontal disease	553	(124)	493	(111)	6	(132)
<b>Blood disorders</b>						
Other blood disorders	8,983	(78)	4,383	(76)	764	(54)
Other non-defic anemias	7,533	(84)	4,284	(77)	365	(75)
Iron-deficiency anemia	5,580	(90)	3,004	(82)	154	(88)
Hereditary anemias	3,156	(100)	2,735	(85)	28	(118)
Other deficiency anemias	378	(126)	214	(120)	0	(137)
<b>Nutritional disorders</b>						
Overweight, obesity	15,899	(67)	12,711	(59)	153	(89)
Other nutritional dis	5,662	(89)	4,074	(78)	60	(108)
Protein-energy	158	(135)	67	(128)	0	(138)
<b>Diabetes mellitus</b>						
Diabetes mellitus	18,004	(63)	4,779	(75)	739	(55)
<b>Conditions arising during the perinatal period<sup>d</sup></b>						
Low birth weight	2,907	(101)	551	(108)	102	(99)
Other perinatal anom	1,874	(110)	1,157	(97)	41	(114)
Birth asphyxia/birth trauma	598	(121)	199	(122)	395	(71)

<sup>a</sup>Major categories and conditions defined in the Global Burden of Disease Study<sup>1</sup>  
<sup>b</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition (with no more than one encounter per individual per day per condition)  
<sup>c</sup>Individuals with at least one hospitalization or ambulatory visit for the condition  
<sup>d</sup>Conditions affecting newborns erroneously coded on service member medical records

**Individuals affected, by condition**

In 2014, more service members received medical care for other signs and symptoms than for any other specific condition (Table 1). Of the 10 conditions that affected the most service members, two were musculoskeletal diseases (other musculoskeletal diseases and other back problems) and three were injuries (arm/shoulder, knee, and foot/ankle).

**Hospital bed days, by condition**

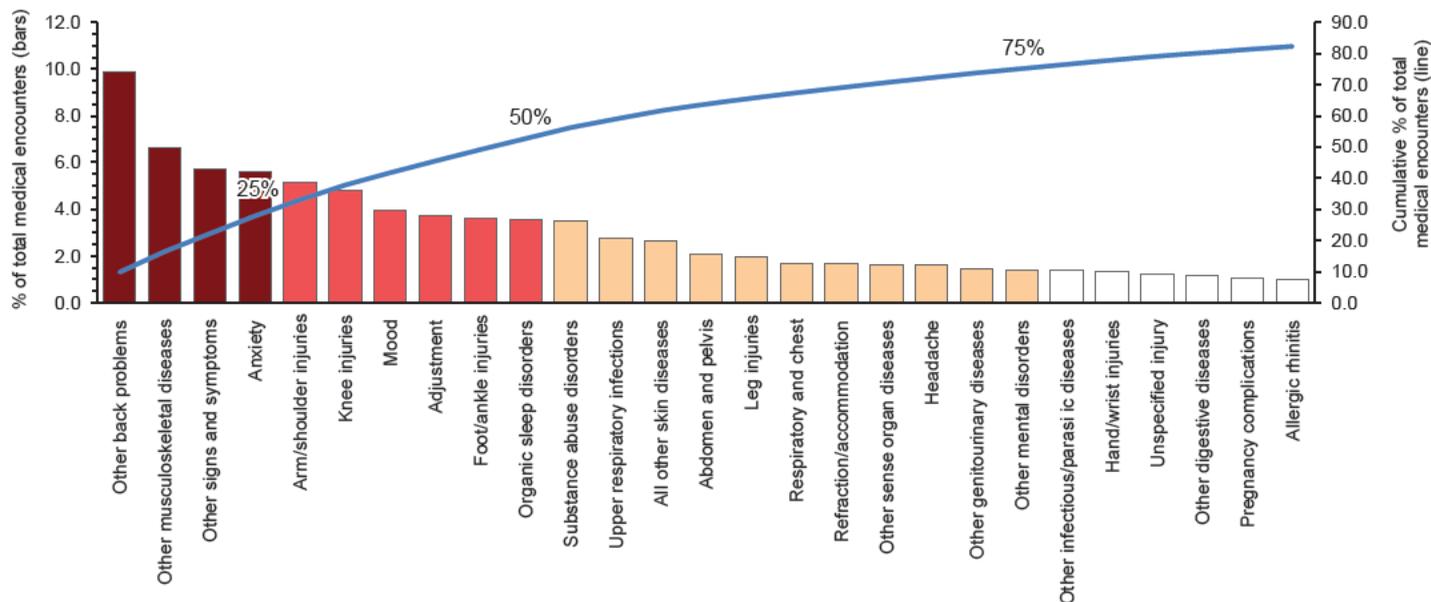
In 2014, mood disorders and substance abuse accounted for more than a quarter (26.0%) of all hospital days. Together, four mental disorders (mood, substance abuse, anxiety, and adjustment) and one maternal condition (delivery) accounted for half (50%) of all hospital bed days (Table 1, Figure 3). About one-ninth (11.1%) of all

hospital bed days were attributable to injuries and poisonings.

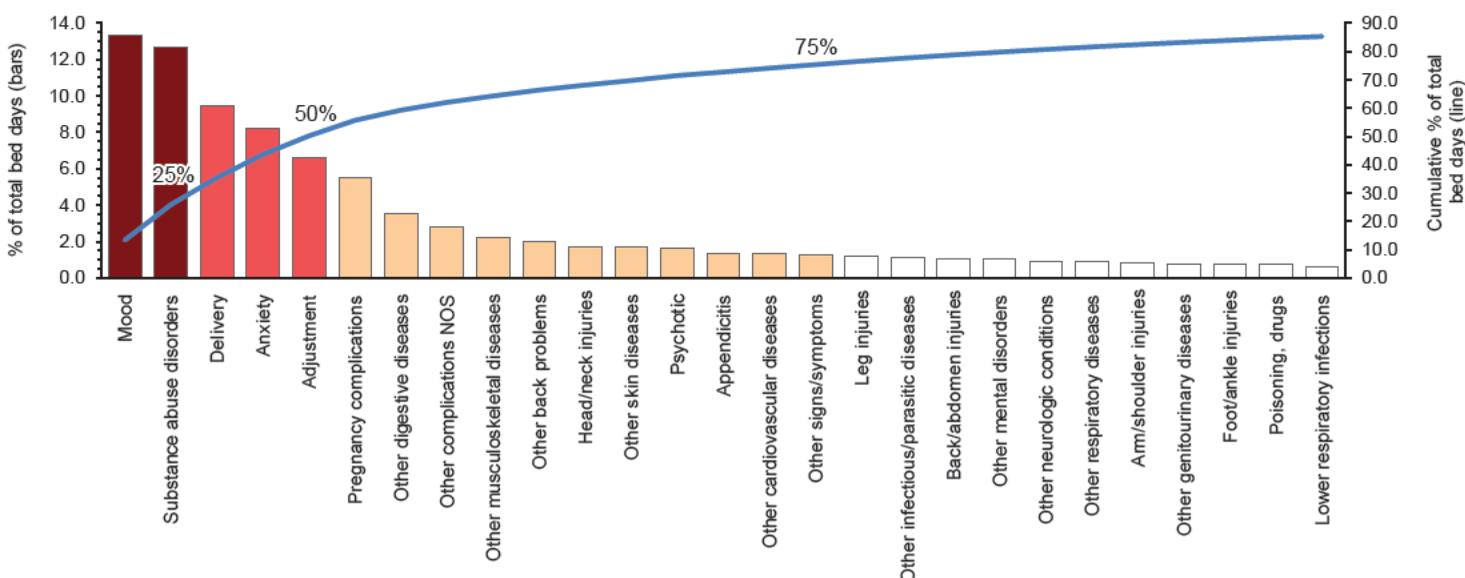
**Lost work time, by condition**

No single condition accounted for more than 7% of all lost work time (Figure 4). Together, the four conditions with the most lost work time (substance abuse disorders, other back problems, upper respiratory

**FIGURE 2.** Percentage and cumulative percentage distribution, burden “conditions” that accounted for the most medical encounters among U.S. service members, 2014



**FIGURE 3.** Percentage and cumulative percentage distribution, burden “conditions” that accounted for the most hospital bed days among U.S. service members, 2014



infections, and mood disorders) accounted for 24.8% all lost work time.

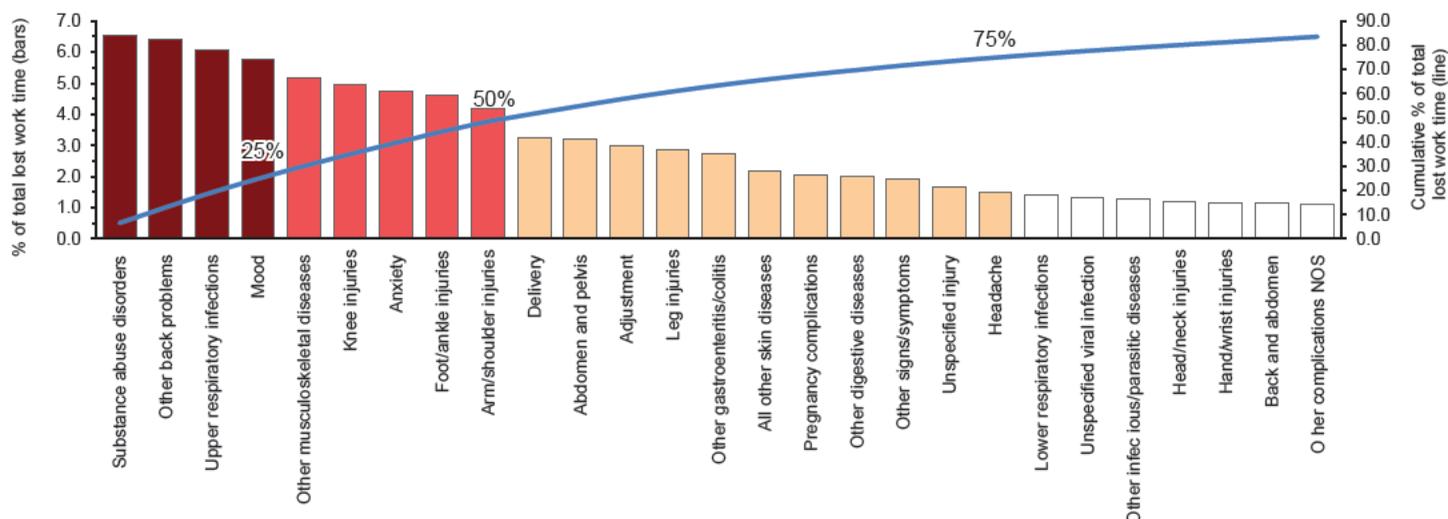
**Relationships between healthcare burden indicators**

There was a strong correlation between the number of medical encounters attributable to various conditions and the number of individuals affected by the conditions ( $r=0.75$ ) (data not shown). For example, the

three leading causes of medical encounters were among the three conditions that affected the most individuals (Table 1). There was also a strong relationship between lost work time attributable to conditions and medical encounters attributable to ( $r=0.71$ ) the same conditions. For example, of the 10 conditions that resulted in the most lost work time, seven were among the top 10 leading causes of medical encounters. In

contrast, there were not strong relationships between the hospital bed days attributable to conditions and either the numbers of individuals affected by ( $r=0.04$ ) or medical encounters attributable to ( $r=0.21$ ) the same conditions. For example, labor and delivery and substance abuse disorders were among the top four sources of hospital bed days; however, these conditions affected relatively few service members.

**FIGURE 4.** Percentage and cumulative percentage distribution, burden “conditions” that accounted for the most lost work time among U.S. service members, 2014



### EDITORIAL COMMENT

This report reiterates the major findings of prior annual reports regarding morbidity and healthcare burdens among U.S. military members. In particular, the report documents that a majority of the morbidity and healthcare burden that affects U.S. military members is attributable to remarkably few (i.e., less than 8%) of the 139 burden of disease-defining conditions considered in the analysis.

In 2014, as in prior years, musculoskeletal disorders (particularly of the back), injuries (particularly of the arm/shoulder, knee, and foot/ankle), mental disorders (particularly substance abuse and disorders of mood, anxiety, and adjustment), and pregnancy- and delivery-related conditions accounted for relatively large proportions of the morbidity and healthcare burdens that affected U.S. military members. For example, in 2014, substance abuse, mood, anxiety, and adjustment disorders accounted for 214,948 lost work days (20% of the total) due to hospitalization, convalescence, and limited duty dispositions. More than 11% of all lost work time was attributable to other back problems (e.g., lumbago or low back pain) and other musculoskeletal diseases; together, these two musculoskeletal disorders accounted for more than 123,000 lost work days.

Also, in 2014, 10 burden of disease-defined conditions accounted for more than half of all illness- and injury-related medical encounters of active component members. The 10 conditions that accounted for the most medical encounters overall included three mental disorders (anxiety, adjustment, and mood disorders), three anatomic site-defined injuries (arm/shoulder, knee, and foot/ankle), two musculoskeletal disorders (back and disorders of “other” joints, muscles, tendons, soft tissues), and organic sleep disorders.

Throughout military history, mental disorders (including substance abuse disorders), injuries, and musculoskeletal disorders of the back have been leading causes of morbidity and lost work time among service members.<sup>3-7</sup> As noted many times in the past, the prevention, treatment, and rehabilitation of back problems and joint injuries, and the detection, characterization, and management of mental disorders—including substance abuse and deployment stress-related disorders (e.g., post-traumatic stress disorder)—should have the highest priorities for military medical research, public health, and force health protection programs.

In summary, this analysis, like those of recent years, documents that a relatively few illnesses and injuries account for most of the morbidity and healthcare burdens

that affect U.S. military members. Illnesses and injuries that disproportionately contribute to morbidity and healthcare burden should be high-priority targets for prevention research and resources.

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# Hospitalizations Among Members of the Active Component, U.S. Armed Forces, 2014

This report documents the frequencies, rates, trends, and distributions of hospitalizations of active component members of the U.S. Armed Forces during calendar year 2014. Summaries are based on standardized records of hospitalizations at U.S. military and non-military (reimbursed care) medical facilities worldwide. For this report, primary (first-listed) discharge diagnoses are considered indicative of the primary reasons for hospitalizations; summaries are based on the first three digits of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes used to report primary discharge diagnoses. Hospitalizations not routinely documented with standardized, automated records (e.g., during deployments, field training exercises, shipboard) are not centrally available for health surveillance purposes and thus are not included in this report.

## Frequencies, rates, and trends

In 2014, there were 72,574 records of hospitalizations of active component members of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard; 33% of the hospitalizations were in non-military facilities (Table 1, Figure 1). The hospitalization rate (all causes) was 52.7 per 1,000 service member person-years (p-yrs). The annual hospitalization rate (all causes) for 2014 was the lowest rate reported within the last 10 years covered in this report (Figure 1).

## Hospitalizations, by illness and injury categories

As in prior years, in 2014, three diagnostic categories accounted for more than half (53.7%) of all hospitalizations of active component members: mental disorders (21.9%), pregnancy- and delivery-related

conditions (21.7%), and injuries and poisonings (10.1%) (Table 1). Similar to 2010 and 2012, in 2014 there were more hospitalizations for mental disorders than for any other major diagnostic category (per the ICD-9-CM). The last year in which the number of hospitalizations for pregnancy- and delivery-related conditions exceeded the number for mental disorders was 2008 (data not shown).

Comparing 2014 to 2010, numbers of hospitalizations decreased in all major categories of illnesses and injuries (Table 1). The largest percentage decrease in hospitalizations during 2010–2014 was for injuries and poisonings (hosp diff, 2010–2014: -4,528; -38.2%).

## Hospitalizations, by gender

In 2014, the hospitalization rate (all causes) among females was more than

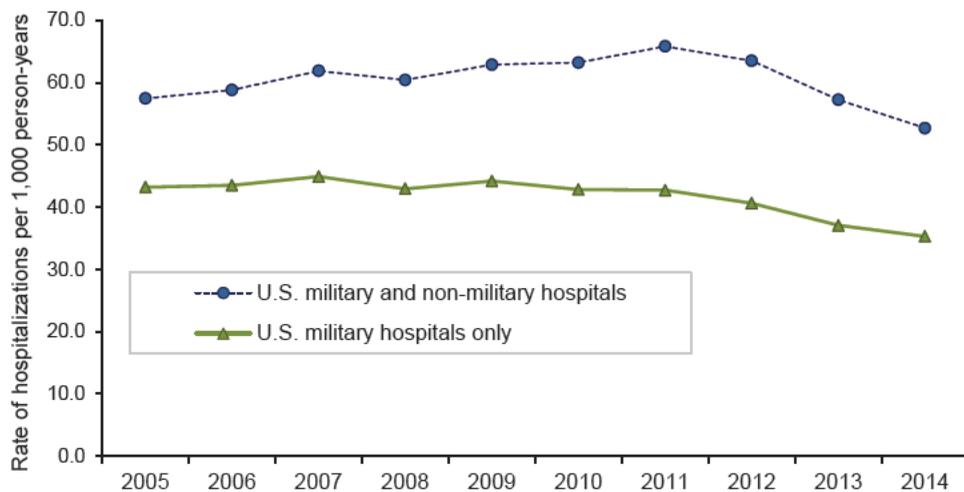
**TABLE 1.** Hospitalizations, ICD-9-CM diagnostic categories, active component, U.S. Armed Forces, 2010, 2012, and 2014

Major diagnostic category (ICD-9-CM)	2010			2012			2014		
	No.	Rate <sup>a</sup>	Rank	No.	Rate <sup>a</sup>	Rank	No.	Rate <sup>a</sup>	Rank
Mental disorders (290–319)	19,168	13.1	(1)	21,075	14.7	(1)	15,885	11.5	(1)
Pregnancy/delivery (630–679, relevant V-codes) <sup>b</sup>	18,514	12.7 (88.6)	(2)	17,726	12.3 (84.7)	(2)	15,754	11.4 (75.9)	(2)
Injury and poisoning (800–999)	11,855	8.1	(3)	10,842	7.6	(3)	7,327	5.3	(3)
Digestive system (520–579)	8,127	5.6	(4)	8,120	5.7	(4)	6,574	4.8	(4)
Musculoskeletal system/connective tissue (710–739)	7,747	5.3	(5)	7,407	5.2	(5)	6,199	4.5	(5)
Other (V01–V82), except pregnancy-related	3,588	2.5	(7)	3,850	2.7	(7)	3,570	2.6	(6)
Signs, symptoms, ill-defined conditions (780–799)	4,732	3.2	(6)	4,607	3.2	(6)	3,265	2.4	(7)
Circulatory system (390–459)	2,977	2.0	(8)	2,803	2.0	(8)	2,292	1.7	(8)
Genitourinary system (580–629)	2,762	1.9	(10)	2,687	1.9	(9)	2,225	1.6	(9)
Respiratory system (460–519)	2,832	1.9	(9)	2,566	1.8	(10)	1,858	1.3	(10)
Neoplasms (140–239)	2,219	1.5	(12)	2,160	1.5	(12)	1,779	1.3	(11)
Nervous system (320–389)	2,229	1.5	(11)	2,268	1.6	(11)	1,741	1.3	(12)
Skin and subcutaneous tissue (680–709)	2,162	1.5	(13)	1,834	1.3	(13)	1,460	1.1	(13)
Infectious and parasitic diseases (001–139)	1,463	1.0	(14)	1,454	1.0	(14)	1,247	0.9	(14)
Endocrine, nutrition, immunity (240–279)	921	0.6	(15)	913	0.6	(15)	742	0.5	(15)
Congenital anomalies (740–759)	482	0.3	(16)	436	0.3	(16)	353	0.3	(16)
Hematologic disorders (280–289)	389	0.3	(17)	389	0.3	(17)	303	0.2	(17)
Total	92,167	63.2		91,137	63.5		72,574	52.7	

<sup>a</sup>Rates are based on 1,000 person-years.

<sup>b</sup>Rates of pregnancy- and delivery-related hospitalizations among females only (in parentheses)

**FIGURE 1.** Rates of hospitalization by year, active component, U.S. Armed Forces, 2005–2014



three times that of males (hospitalization rate, overall: females: 130.4 per 1,000 p-yrs; males: 38.9 per 1,000 p-yrs). Excluding pregnancy and delivery, the rate of hospitalizations among females (54.6 per 1,000 p-yrs) was 40.3% higher than among males (data not shown).

Hospitalization rates were higher among males than females for injuries and poisonings (male:female [m:f], rate difference [RD]: 0.8 per 1,000 p-yrs, respectively). Hospitalization rates were higher among females than males for mental disorders (RD: 4.8 per 1,000 p-yrs); genitourinary disorders (RD: 4.7 per 1,000 p-yrs); neoplasms (RD: 2.8 per 1,000 p-yrs); digestive disorders (RD: 1.3 per 1,000 p-yrs); “other” V-coded conditions (RD: 1.3 per 1,000 p-yrs); and signs, symptoms, and ill-defined conditions (RD: 1.1 per 1,000 p-yrs). Hospitalization rates were similar among males and females for the remaining 10 major disease-specific categories (data not shown).

Relationships between age and hospitalization rates significantly varied across illness- and injury-specific categories. For example, among both males and females, hospitalization rates sharply increased with age for neoplasms, circulatory, genitourinary, and musculoskeletal system/connective tissue disorders; rates decreased with age for mental disorders; and rates were generally stable across age groups for

infectious and parasitic diseases and injuries and poisonings (Figure 2).

#### Most frequent diagnoses

In 2014, five diagnoses (at the three-digit level of the ICD-9-CM) each accounted for more than 1,400 hospitalizations among males: adjustment reactions (n=4,185), episodic mood disorders (n=2,641), intervertebral disc disorders (n=1,659), acute appendicitis (n=1,488), and alcohol dependence syndrome (n=1,437) (Table 2). These five diagnoses accounted for 25% of all hospitalizations of males in 2014.

In 2014, pregnancy- and delivery-related conditions accounted for 58% of all hospitalizations of females (Table 3). Other than pregnancy- and delivery-related diagnoses, leading causes of hospitalizations of females were adjustment reactions (n=1,207), episodic mood disorders (n=896), uterine leiomyoma (n=407), observation and evaluation for conditions not found (n=274), depressive disorders (n=258), disorders of menstruation/abnormal bleeding (n=256), and anxiety disorders (n=249). These seven diagnoses accounted for 31% of all hospitalizations (not related to pregnancy/delivery) of females.

#### Mental health conditions

In 2014, mental disorders accounted for more hospitalizations of U.S. service

members than any other major diagnostic category (Table 1). Adjustment reactions (including post-traumatic stress disorder) and episodic mood disorders were associated with more hospitalizations among active component members than any other specific condition (at the three-digit level); together, these two conditions accounted for 15% and 19% of all hospitalizations of males and females (excluding pregnancy/delivery), respectively (Tables 2, 3).

#### Injuries and poisonings

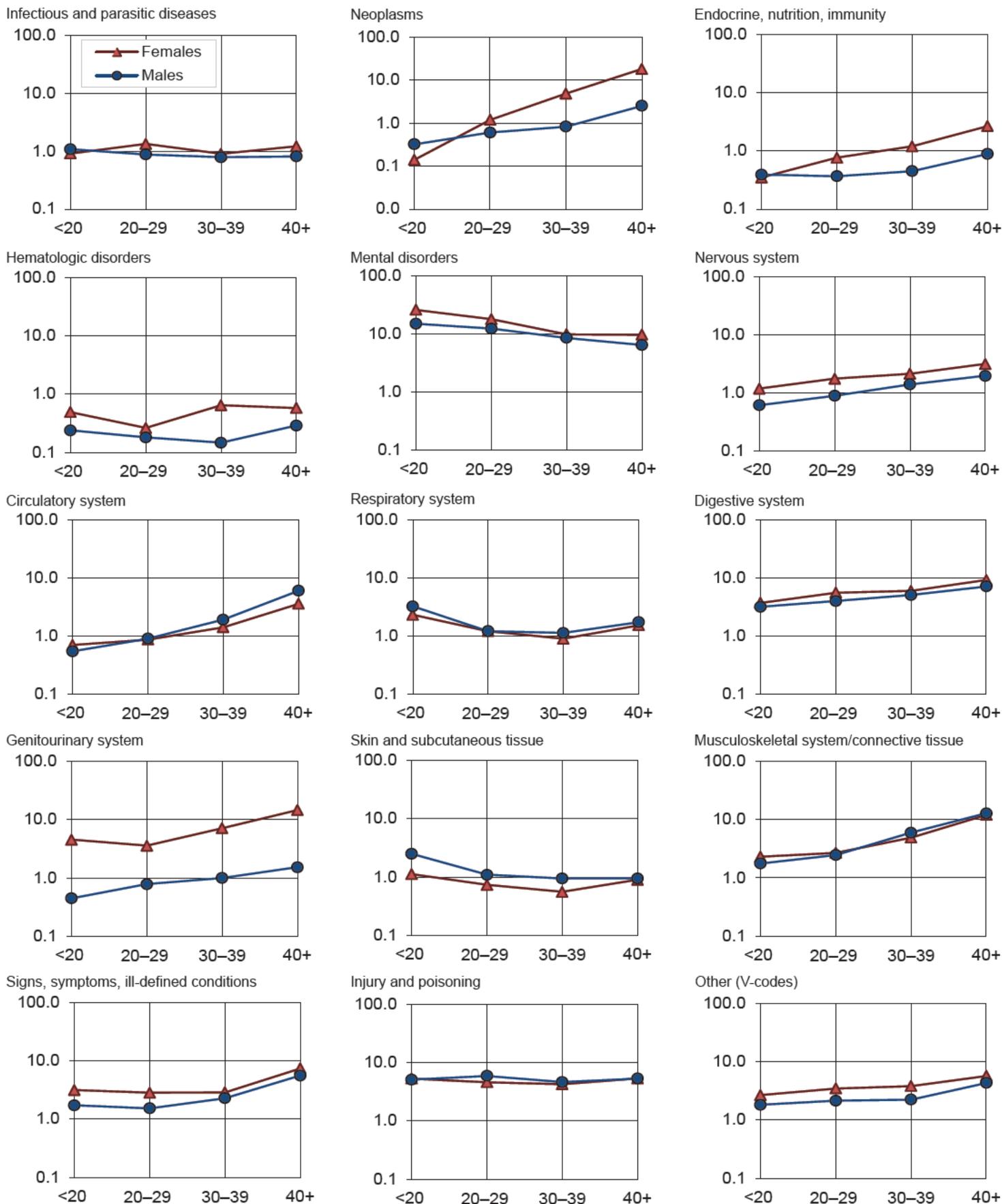
As in the past, in 2014, injuries and poisonings were the third leading cause of hospitalizations of U.S. military members (Table 1). Of all injuries and poisonings that resulted in hospitalizations in U.S. military medical facilities (n=4,614), approximately one in 19 (n=239; 5.2%) were reported as “intentionally inflicted” (e.g., enemy weapons; suicide gestures/attempts; fights, assaults, legal interventions). The majority of hospitalizations categorized as “intentionally inflicted” were reported as “self-inflicted” (n=154; 64.4%). Of all “unintentional” injuries and poisonings that resulted in hospitalizations in U.S. military facilities (n=2,582), approximately two-thirds (66.0%) were considered caused by falls and miscellaneous (n=658), complications of medical or surgical care (n=611), or land transport accidents (n=436) (Table 4).

Among males, injury- and poisoning-related hospitalizations were most often related to complications of medical and surgical procedures and fractures of ankle, leg, or face bones (Table 2). Among females, injury- and poisoning-related hospitalizations were most often related to complications of medical and surgical procedures and poisonings (e.g., psychotropic agents, analgesics, antipyretics, and antirheumatics) (Table 3).

#### Durations of hospitalizations

Since 2005, the median durations of hospitalizations (all causes) have been stable (3 days), but the durations of the longest hospitalizations have increased (Figure 3). In 2014, as in previous years, medians and ranges of durations of hospitalizations

**FIGURE 2.** Rates (per 1,000 person-years) of hospitalization by major diagnostic categories, by age and gender, active component, U.S. Armed Forces, 2014



**TABLE 2. Most frequent diagnoses during hospitalization, by major diagnostic category, males, active component, U.S. Armed Forces, 2014**

Diagnostic category (ICD-9-CM codes) ♂	No.	%	Diagnostic category (ICD-9-CM codes) ♂	No.	%
<b>Infectious and parasitic diseases (001–139)</b>	1,003		<b>Digestive system (520–579)</b>	5,360	
Septicemia	238	23.7	Acute appendicitis	1,488	27.8
Meningitis due to enterovirus	134	13.4	Dentofacial anomalies including malocclusion	395	7.4
Intestinal infections due to other organisms	116	11.6	Diseases of pancreas	361	6.7
Ill-defined intestinal infections	97	9.7	Other and unspecified noninfectious gastroenteritis and colitis	267	5.0
Viral and chlamydial infection <sup>a</sup>	57	5.7	Cholelithiasis	261	4.9
<b>Neoplasms (140–239)</b>	1,016		<b>Genitourinary system (580–629)</b>	1,060	
Malignant neoplasm of brain	68	6.7	Calculus of kidney and ureter	261	24.6
Malignant neoplasm of testis	65	6.4	Acute renal failure	233	22.0
Malignant neoplasm of thyroid gland	53	5.2	Other disorders of male genital organs	114	10.8
Malignant neoplasm of connective/soft tissue	43	4.2	Urethral stricture	74	7.0
Malignant neoplasm of prostate	41	4.0	Other disorders of kidney and ureter	66	6.2
<b>Endocrine, nutrition, immunity (240–279)</b>	528		<b>Skin and subcutaneous tissue (680–709)</b>	1,309	
Diabetes mellitus	175	33.1	Other cellulitis and abscess	941	71.9
Disorders of fluid electrolyte/acid-base balance	159	30.1	Pilonidal cyst	99	7.6
Overweight, obesity, and other hyperalimentation	29	5.5	Cellulitis and abscess of finger and toe	91	7.0
Thyrotoxicosis with or without goiter	26	4.9	Contact dermatitis and other eczema	25	1.9
Nontoxic nodular goiter	23	4.4	Other local infections of skin and subcutaneous tissue	22	1.7
<b>Hematologic disorders (280–289)</b>	218		<b>Musculoskeletal system (710–739)</b>	5,344	
Diseases of white blood cells	76	34.9	Intervertebral disc disorders	1,659	31.0
Purpura and other hemorrhagic conditions	45	20.6	Disorders of muscle ligament and fascia	544	10.2
Other diseases of blood and blood-forming organs	26	11.9	Spondylosis and allied disorders	462	8.6
Other and unspecified anemias	23	10.6	Osteoarthritis and allied disorders	424	7.9
Iron deficiency anemias	19	8.7	Other and unspecified disorders of back	380	7.1
<b>Mental disorders (290–319)</b>	12,643		<b>Congenital anomalies (740–759)</b>	285	
Adjustment reaction	4,185	33.1	Other congenital musculoskeletal anomalies	94	33.0
Episodic mood disorders	2,641	20.9	Other congenital anomalies of digestive system	28	9.8
Alcohol dependence syndrome	1,437	11.4	Other congenital anomalies of circulatory system	26	9.1
Anxiety, dissociative, and somatoform disorders	936	7.4	Congenital anomalies of urinary system	23	8.1
Depressive disorder not elsewhere classified	904	7.2	Bulbus cordis/cardiac septal closure anomalies	18	6.3
<b>Nervous system (320–389)</b>	1,337		<b>Signs, symptoms, ill-defined conditions (780–799)</b>	2,585	
Pain, not elsewhere classified	223	16.7	Symptoms involving respiratory system	932	36.1
Organic sleep disorders	203	15.2	General symptoms	801	31.0
Epilepsy	151	11.3	Other symptoms involving abdomen and pelvis	340	13.2
Migraine	138	10.3	Symptoms involving head and neck	121	4.7
Other conditions of brain	59	4.4	Symptoms involving digestive system	93	3.6
<b>Circulatory system (390–459)</b>	2,032		<b>Injury and poisoning (800–999)</b>	6,364	
Cardiac dysrhythmias	412	20.3	Other complications of procedures not elsewhere classified	702	11.0
Acute pulmonary heart disease	281	13.8	Fracture of ankle	316	5.0
Acute myocardial infarction	160	7.9	Complications peculiar to certain specified procedures	307	4.8
Hemorrhoids	95	4.7	Fracture of tibia and fibula	267	4.2
Other forms of chronic ischemic heart disease	92	4.5	Fracture of face bones	250	3.9
<b>Respiratory system (460–519)</b>	1,602		<b>Other (V01–V82, except pregnancy-related)</b>	2,801	
Pneumonia organism unspecified	408	25.5	Encounter for other/unspecified procedures/aftercare	613	21.9
Pneumothorax	138	8.6	Other psychosocial circumstances	448	16.0
Other diseases of lung	119	7.4	Convalescence and palliative care	434	15.5
Deviated nasal septum	106	6.6	Care involving use of rehabilitation procedures	392	14.0
Peritonsillar abscess	99	6.2	Observation/evaluation for suspected conditions not found	366	13.1

<sup>a</sup>ICD-9-CM code 079 is for "viral and chlamydial infection in conditions classified elsewhere and of unspecified site" and is to be used to identify the viral or chlamydial agent in diseases classifiable elsewhere and to classify virus or chlamydial infection of unspecified nature or site.

**TABLE 3. Most frequent diagnoses during hospitalization, by major diagnostic category, females, active component, U.S. Armed Forces, 2014**

Diagnostic category (ICD-9-CM codes)	♀	No.	%	Diagnostic category (ICD-9-CM codes)	♀	No.	%
<b>Infectious and parasitic diseases (001–139)</b>		244		<b>Digestive system (520–579)</b>		1,214	
Septicemia		83	34.0	Acute appendicitis		237	19.5
Intestinal infections due to other organisms		44	18.0	Dentofacial anomalies including malocclusion		156	12.9
Meningitis due to enterovirus		30	12.3	Cholelithiasis		118	9.7
Ill-defined intestinal infections		27	11.1	Other disorders of gallbladder		66	5.4
Viral and chlamydial infection <sup>a</sup>		10	4.1	Intestinal obstruction without mention of hernia		61	5.0
<b>Neoplasms (140–239)</b>		763		<b>Genitourinary system (580–629)</b>		1,165	
Uterine leiomyoma		407	53.3	Disorders of menstruation/abnormal bleeding		256	22.0
Malignant neoplasm of female breast		59	7.7	Infections of kidney		156	13.4
Benign neoplasm of ovary		35	4.6	Noninflammatory disorders of ovary fallopian tube/broad ligament		128	11.0
Malignant neoplasm of thyroid gland		26	3.4	Pain and other symptoms associated with female genital organs		114	9.8
Malignant neoplasm of brain		15	2.0	Other disorders of breast		78	6.7
<b>Endocrine, nutrition, immunity (240–279)</b>		214		<b>Pregnancy and delivery (630–679, relevant V-codes)</b>		15,754	
Disorders of fluid electrolyte and acid-base balance		43	20.1	Trauma to perineum and vulva during delivery		3,501	22.2
Diabetes mellitus		39	18.2	Late pregnancy		1,375	8.7
Nontoxic nodular goiter		35	16.4	Other conditions complicating pregnancy childbirth/puerperium		1,339	8.5
Thyrotoxicosis with or without goiter		32	15.0	Other indications for care/intervention related to labor/delivery		1,311	8.3
Overweight, obesity, and other hyperalimentation		22	10.3	Hypertension complicating pregnancy childbirth/puerperium		1,163	7.4
<b>Hematologic disorders (280–289)</b>		85		<b>Skin and subcutaneous tissue (680–709)</b>		151	
Iron deficiency anemias		33	38.8	Other cellulitis and abscess		82	54.3
Other and unspecified anemias		15	17.6	Pilonidal cyst		18	11.9
Diseases of white blood cells		15	17.6	Other hypertrophic and atrophic conditions of skin		13	8.6
Other diseases of blood and blood-forming organs		9	10.6	Other disorders of skin and subcutaneous tissue		9	6.0
Purpura and other hemorrhagic conditions		7	8.2	Cellulitis and abscess of finger and toe		5	3.3
<b>Mental disorders (290–319)</b>		3,242		<b>Musculoskeletal system (710–739)</b>		855	
Adjustment reaction		1,207	37.2	Intervertebral disc disorders		228	26.7
Episodic mood disorders		896	27.6	Spondylosis and allied disorders		85	9.9
Depressive disorder not elsewhere classified		258	8.0	Disorders of muscle ligament and fascia		84	9.8
Anxiety, dissociative, and somatoform disorders		249	7.7	Other disorders of bone and cartilage		64	7.5
Alcohol dependence syndrome		202	6.2	Other and unspecified disorders of joint		58	6.8
<b>Nervous system (320–389)</b>		404		<b>Signs, symptoms, ill-defined conditions (780–799)</b>		680	
Migraine		104	25.7	General symptoms		210	30.9
Pain, not elsewhere classified		71	17.6	Other symptoms involving abdomen and pelvis		179	26.3
Epilepsy		47	11.6	Symptoms involving respiratory system/		138	20.3
Other conditions of brain		26	6.4	Symptoms involving digestive system		40	5.9
Multiple sclerosis		14	3.5	Symptoms involving head and neck		37	5.4
<b>Circulatory system (390–459)</b>		260		<b>Injury and poisoning (800–999)</b>		963	
Acute pulmonary heart disease		48	18.5	Other complications of procedures not elsewhere classified		144	15.0
Cardiac dysrhythmias		35	13.5	Complications peculiar to certain specified procedures		66	6.9
Other venous embolism and thrombosis		24	9.2	Poisoning by analgesics, antipyretics and antirheumatics		58	6.0
Essential hypertension		17	6.5	Poisoning by psychotropic agents		58	6.0
Hemorrhoids		13	5.0	Fracture of ankle		54	5.6
<b>Respiratory system (460–519)</b>		256		<b>Other (V01–V82, except pregnancy-related)</b>		769	
Pneumonia organism unspecified		58	22.7	Observation/evaluation for suspected conditions not found		274	35.6
Other diseases of lung		22	8.6	Convalescence and palliative care		103	13.4
Asthma		21	8.2	Encounter for other/unspecified procedures/aftercare		97	12.6
Chronic disease of tonsils and adenoids		19	7.4	Other psychosocial circumstances		73	9.5
Pneumothorax		18	7.0	Encounters for administrative purposes		55	7.2

<sup>a</sup>ICD-9-CM code 079 is for “viral and chlamydial infection in conditions classified elsewhere and of unspecified site” and is to be used to identify the viral or chlamydial agent in diseases classifiable elsewhere and to classify virus or chlamydial infection of unspecified nature or site.

**TABLE 4. Injury hospitalizations<sup>a</sup> by causal agent,<sup>b</sup> active component, U.S. Armed Forces, 2014**

Cause	No.	%
Unintentional	2,582	56.0
Fall and miscellaneous	658	14.3
Complications of medical/surgical	611	13.2
Land transport	436	9.4
Poisons and fire	243	5.3
Athletics	189	4.1
Guns, explosives (includes accidents during war)	128	2.8
Machinery, tools	123	2.7
Air transport	100	2.2
Environmental	87	1.9
Water transport	7	0.2
Intentional	239	5.2
Self-inflicted	154	3.3
Battle casualty	51	1.1
Non-battle, inflicted by other (e.g., assault)	34	0.7
Missing/invalid code	1,793	38.9
Total	4,614	100.0

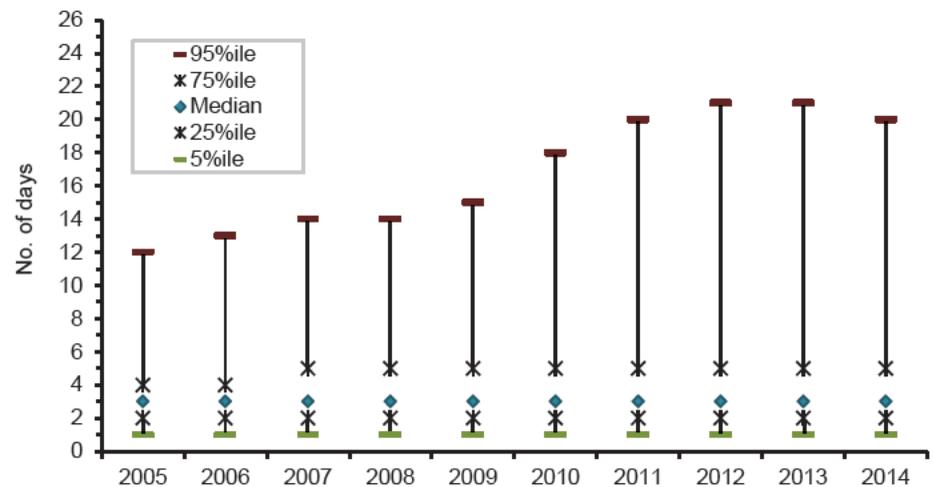
<sup>a</sup>Hospitalizations in U.S. military medical facilities only  
<sup>b</sup>Causal agents were determined by codes in accordance with STANAG 2050.

mental disorders were the leading cause of hospitalizations (Table 5). The crude hospitalization rate for mental disorders in the Army (16.1 per 1,000 p-yrs) was higher than all other Services and almost double that of the Navy, Air Force, and Coast Guard.

Injuries and poisonings were the third leading cause of hospitalizations

in the Navy, the Marine Corps, and the Army (Table 5). The hospitalization rate for injuries and poisonings was 27% higher among soldiers (7.3 per 1,000 p-yrs) than Marines (5.8 per 1,000 p-yrs) and almost twice as high among soldiers as among members of the three other Services.

**FIGURE 3. Length of hospital stay by year, active component, U.S. Armed Forces, 2005–2014**

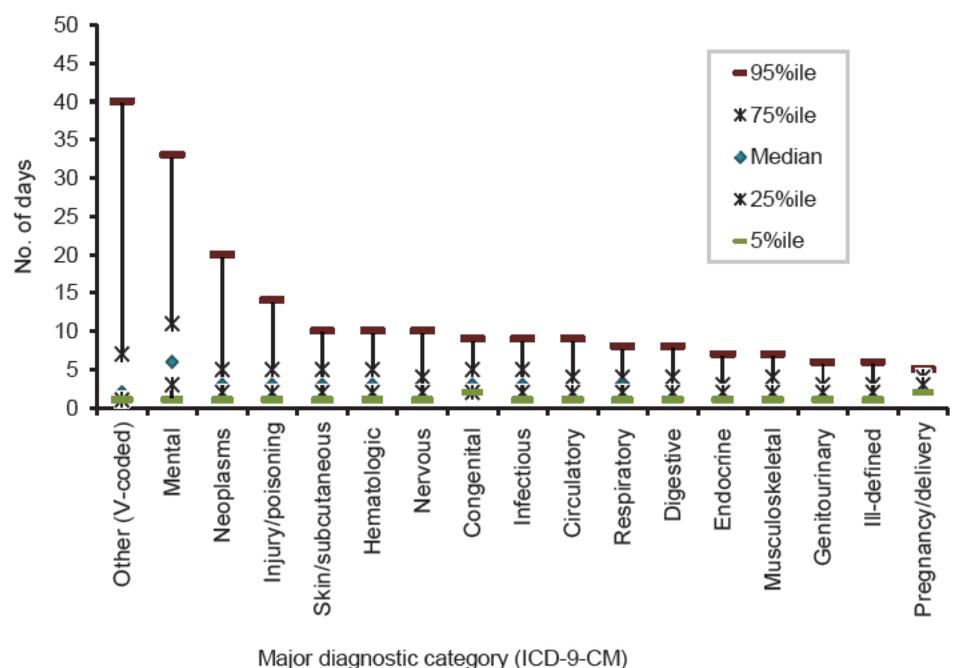


varied significantly across major diagnostic categories. For example, median lengths of hospitalizations varied from 2 days (e.g., musculoskeletal system/connective tissue disorders; signs, symptoms, and ill-defined conditions) to 6 days (i.e., mental disorders). For most diagnostic categories, less than 5% of hospitalizations exceeded 14 days, but for three categories, 5% of hospitalizations had longer durations: neoplasms (20 days); mental disorders (33 days); and “other” or V-coded hospitalizations (primarily orthopedic aftercare and rehabilitation following a previous illness or injury) (40 days) (Figure 4).

#### Hospitalizations by service

Among members of the Navy, Air Force, and Coast Guard, pregnancy- and delivery-related conditions accounted for more hospitalizations than any other category of illnesses or injuries; however, among members of the Army and Marine Corps,

**FIGURE 4. Length of hospital stay by diagnostic category, active component, U.S. Armed Forces, 2014**



**TABLE 5. Hospitalizations, by Service and ICD-9-CM diagnostic category, active component, U.S. Armed Forces, 2014**

Major diagnostic category (ICD-9-CM)	Army		Navy		Air Force		Marine Corps		Coast Guard	
	No.	Rate <sup>a</sup>	No.	Rate <sup>a</sup>	No.	Rate <sup>a</sup>	No.	Rate <sup>a</sup>	No.	Rate <sup>a</sup>
Mental disorders (290–319)	8,180	16.1	2,793	8.7	2,734	8.5	1,922	10.1	256	6.5
Pregnancy/delivery (630–679, relevant V-codes) <sup>b</sup>	5,773	11.4 (82.0)	4,037	12.6 (71.2)	4,323	13.5 (71.5)	1,229	6.5 (86.4)	392	9.9 (65.9)
Injury and poisoning (800–999)	3,710	7.3	1,343	4.2	1,080	3.4	1,092	5.8	102	2.6
Musculoskeletal system (710–739)	3,116	6.1	1,006	3.1	1,319	4.1	595	3.1	163	4.1
Digestive system (520–579)	3,093	6.1	1,328	4.1	1,298	4.1	711	3.8	144	3.6
Other (V01–V82, except pregnancy-related)	1,862	3.7	627	2.0	625	2.0	371	2.0	85	2.1
Signs, symptoms, ill-defined conditions (780–799)	1,810	3.6	583	1.8	562	1.8	275	1.5	35	0.9
Circulatory system (390–459)	1,163	2.3	414	1.3	491	1.5	178	0.9	46	1.2
Genitourinary system (580–629)	1,063	2.1	444	1.4	506	1.6	177	0.9	35	0.9
Respiratory system (460–519)	992	2.0	254	0.8	321	1.0	265	1.4	26	0.7
Nervous system (320–389)	874	1.7	296	0.9	363	1.1	178	0.9	30	0.8
Neoplasms (140–239)	819	1.6	337	1.1	473	1.5	113	0.6	37	0.9
Skin and subcutaneous tissue (680–709)	640	1.3	264	0.8	223	0.7	304	1.6	29	0.7
Infectious and parasitic diseases (001–139)	534	1.0	223	0.7	267	0.8	195	1.0	28	0.7
Endocrine, nutrition, immunity (240–279)	331	0.7	126	0.4	215	0.7	60	0.3	10	0.3
Congenital anomalies (740–759)	164	0.3	63	0.2	74	0.2	46	0.2	6	0.2
Hematologic disorders (280–289)	139	0.3	63	0.2	67	0.2	31	0.2	3	0.1
Total	34,263	67.4	14,201	44.4	14,941	44.4	7,742	40.9	1,427	36.1

<sup>a</sup>Rates are based on 1,000 person-years.

<sup>b</sup>Rates of pregnancy- and delivery-related hospitalizations among females only (in parentheses)

## EDITORIAL COMMENT

In 2014, for every 19 active component service members, there was one hospitalization for any cause; for every 24 members, there was one hospitalization for a condition not related to pregnancy and delivery. Hospitalization rates for all causes among active component members decreased in 2014 to the lowest rates in the past decade. As in the past, in 2014, mental disorders, pregnancy- and delivery-related conditions, and injuries and poisonings accounted for more than half of all hospitalizations of active component members. In 2014, adjustment reactions (including post-traumatic stress disorder) and mood disorders were among the leading causes of hospitalizations of both male and female service members. In recent years, attention at the highest levels of the U.S. military and significant resources have focused on detecting, diagnosing, and treating mental disorders—especially those related to long and repeated deployments and combat stress. Although annual numbers of hospitalizations for mental disorders had been rising each year since 2008, in 2014, the number fell to the lowest level since 2008.

The reasons for the 2014 downturn in the annual numbers of hospitalizations overall and for mental disorders in particular are not clear. It is conceivable that there has been a decline in the impact of combat and peacekeeping operations on overall morbidity among service members since the withdrawal of U.S. forces from Iraq, the steady decline in the size of the forces in Afghanistan, and the change in the extent of combat engagements there. It is also conceivable that the concerted efforts in recent years to decrease stigmas and to remove barriers and enhance access to mental health care may have forestalled the need to hospitalize many service members because of early interventions in the outpatient setting. Continued monitoring of hospitalizations and all other healthcare encounters over time may permit elucidation of the possible reasons for the recent trends in hospitalization.

This summary has certain limitations that should be considered when interpreting the results. For example, the scope of this report is limited to members of the active components of the Services. Many reserve component members were hospitalized for illnesses and injuries while serving

on active duty in 2014; these hospitalizations are not accounted for in this report. Also, many injury- and poisoning-related hospitalizations occur in non-military hospitals; in most cases, the “external causes” of such injuries and poisonings are not reported on standardized records. If there are significant differences between the causes of injuries and poisonings that resulted in hospitalizations in U.S. military and non-military hospitals, the summary of external causes of injuries requiring hospital treatment reported here (Table 4) could be misleading. Also, this summary is based on primary (first-listed) discharge diagnoses only; in many hospitalized cases, there are multiple underlying conditions. For example, military members who are wounded in combat or injured in motor vehicle accidents may have multiple injuries and complex medical and psychological complications. In such cases, only the first-listed discharge diagnosis would be accounted for in this report. Even with these and other limitations, this report provides useful and informative insights regarding the natures, rates, and distributions of the most serious illnesses and injuries that affect active component military members.

# Ambulatory Visits Among Members of the Active Component, U.S. Armed Forces, 2014

This report documents the frequencies, rates, trends, and characteristics of ambulatory healthcare visits of active component members of the U.S. Armed Forces during 2014. Ambulatory visits of U.S. service members in fixed military and non-military (reimbursed through the Military Health System [MHS]) medical treatment facilities are documented with standardized, automated records. These records are routinely archived for health surveillance purposes in the Defense Medical Surveillance System (DMSS), which is the source of data for this report. Ambulatory visits that are not routinely and completely documented with standardized electronic records (e.g., during deployments, field training exercises, at sea) are not included in this report.

For this report, all records of ambulatory visits of active component members of the

Army, Navy, Air Force, Marine Corps, and Coast Guard in 2014 were categorized according to the first three digits of the primary (first-listed) diagnosis code (per International Classification of Diseases, 9th Revision, Clinical Modification [ICD-9-CM]).

## Frequencies, rates, and trends

During 2014, there were 19,412,802 reported ambulatory visits of active component service members. The crude annual rate (all causes) was 14,091 visits per 1,000 person-years (p-yrs); thus, on average, each service member had 14 ambulatory encounters during the year (Table 1). The rate of documented ambulatory visits in 2014 was 1.7% lower than in 2012 and 48.5% higher than in 2005 (Figure 1).

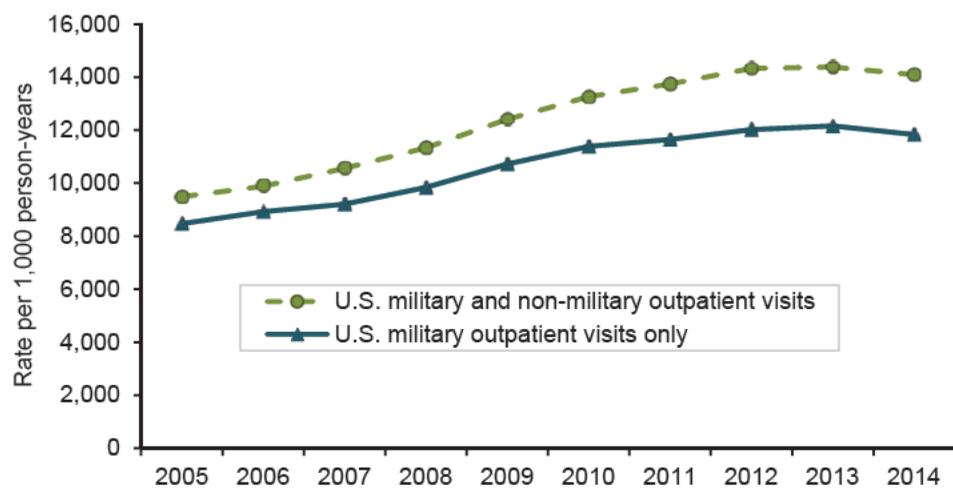
In 2014, nearly half (45.5%) of ambulatory visits were classified into the “other”

category (i.e., other contact with health services) (Table 1). This category (indicated by V-codes of the ICD-9-CM) includes health care not related to a current illness or injury. Such care includes counseling, immunizations, deployment-related health assessments, routine and special medical examinations (e.g., periodic, occupational, retirement), and therapeutic and rehabilitative treatments for previously diagnosed illnesses or injuries (e.g., physical therapy). In 2014, three V-coded diagnoses accounted for a majority of the visits in this category: general medical examination (including deployment health assessments) (31.1%), care involving use of rehabilitation procedures (16.4%), and encounters for administrative purposes (e.g. disability examinations, issuance of repeat prescriptions) (8.8%) (Tables 2, 3).

**TABLE 1.** Ambulatory visits, ICD-9-CM diagnostic categories, active component, U.S. Armed Forces, 2010, 2012, and 2014

Major diagnostic category (ICD-9-CM)	2010			2012			2014		
	No.	No. per person-year	Rank	No.	No. per person-year	Rank	No.	No. per person-year	Rank
Other (V01–V82, except pregnancy-related)	8,966,435	6.15	(1)	9,369,634	6.53	(1)	8,836,344	6.41	(1)
Musculoskeletal system (710–739)	2,639,037	1.81	(2)	3,108,516	2.17	(2)	3,088,415	2.24	(2)
Mental disorders (290–319)	1,700,563	1.17	(3)	2,130,244	1.48	(3)	1,943,178	1.41	(3)
Signs, symptoms, ill-defined conditions (780–799)	1,084,328	0.74	(4)	1,139,325	0.79	(4)	1,077,607	0.78	(4)
Nervous system (320–389)	963,158	0.66	(6)	1,043,296	0.73	(5)	1,075,382	0.78	(5)
Injury and poisoning (800–999)	1,045,730	0.72	(5)	970,377	0.68	(6)	843,417	0.61	(6)
Respiratory system (460–519)	739,139	0.51	(7)	642,308	0.45	(7)	585,150	0.42	(7)
Skin and subcutaneous tissue (680–709)	415,782	0.29	(8)	414,910	0.29	(8)	385,146	0.28	(8)
Pregnancy/delivery (630–679, relevant V-codes)	381,411	0.26	(9)	380,482	0.27	(9)	351,280	0.25	(9)
Genitourinary system (580–629)	300,901	0.21	(11)	301,136	0.21	(10)	277,181	0.20	(10)
Digestive system (520–579)	312,542	0.21	(10)	298,621	0.21	(11)	265,943	0.19	(11)
Infectious and parasitic diseases (001–139)	253,240	0.17	(12)	229,110	0.16	(12)	205,857	0.15	(12)
Circulatory system (390–459)	193,549	0.13	(13)	188,889	0.13	(13)	162,765	0.12	(13)
Endocrine, nutrition, immunity (240–279)	155,597	0.11	(14)	154,879	0.11	(14)	132,496	0.10	(14)
Neoplasms (140–239)	138,694	0.10	(15)	144,578	0.10	(15)	128,763	0.09	(15)
Congenital anomalies (740–759)	29,858	0.02	(16)	28,835	0.02	(17)	27,631	0.02	(16)
Hematologic disorders (280–289)	26,920	0.02	(17)	29,054	0.02	(16)	26,247	0.02	(17)
Total	19,346,884	13.27		20,574,194	14.33		19,412,802	14.09	

**FIGURE 1.** Rates of ambulatory visits by year, active component, U.S. Armed Forces, 2005–2014



In 2014, there were 10,576,458 documented ambulatory visits for illnesses and injuries (ICD-9-CM: 001–999, including relevant pregnancy V-codes) (Table 1). The crude annual rate of illness- and injury-related visits was 7.7 visits per person per year (p-yr). The rate of ambulatory visits for illnesses and injuries in 2014 was approximately the same as in 2012 (7.8 visits per person per year) and 2010 (7.1 visits per person per year).

#### Ambulatory visits, by diagnostic categories

In 2014, four major diagnostic categories accounted for two-thirds (67.9%) of all illness- and injury-related ambulatory visits among active component service members: musculoskeletal system/connective tissue disorders (29.2%), mental disorders (18.4%), “signs, symptoms, and ill-defined conditions” (10.2%), and disorders of the nervous system and sense organs (10.2%) (Table 1).

During 2010–2014, there were increases in numbers of visits in three major diagnostic categories and decreases in 14 major diagnostic categories (Table 1). The largest percentage increases during 2010–2014 were for musculoskeletal system/connective tissue (change in ambulatory visits, 2010–2014: +449,378; +17.0%), and mental disorders (change in ambulatory visits, 2009–2013: +242,615; +14.3%).

Diagnoses of disorders of the nervous system also rose by 11.7% during the interval. The largest percentage decreases during 2010–2014 were for respiratory system (change in ambulatory visits, 2010–2014: -153,989; -20.8%), injury and poisoning (change in ambulatory visits, 2010–2014: -202,313; -19.3%), and infectious and parasitic diseases (change in ambulatory visits, 2010–2014: -47,383; -18.7%).

Over the past 5 years, the relative distributions of ambulatory visits by diagnostic categories of the ICD-9-CM remained fairly stable with a few exceptions (Table 1). In relation to visits attributable to each of the 17 major diagnostic categories, between 2010 and 2014, two categories increased in rank order: nervous system (6th to 5th), and genitourinary system (11th to 10th) and correspondingly, two categories decreased in rank order: injury and poisoning (5th to 6th) and digestive system (10th to 11th).

#### Ambulatory visits, by gender

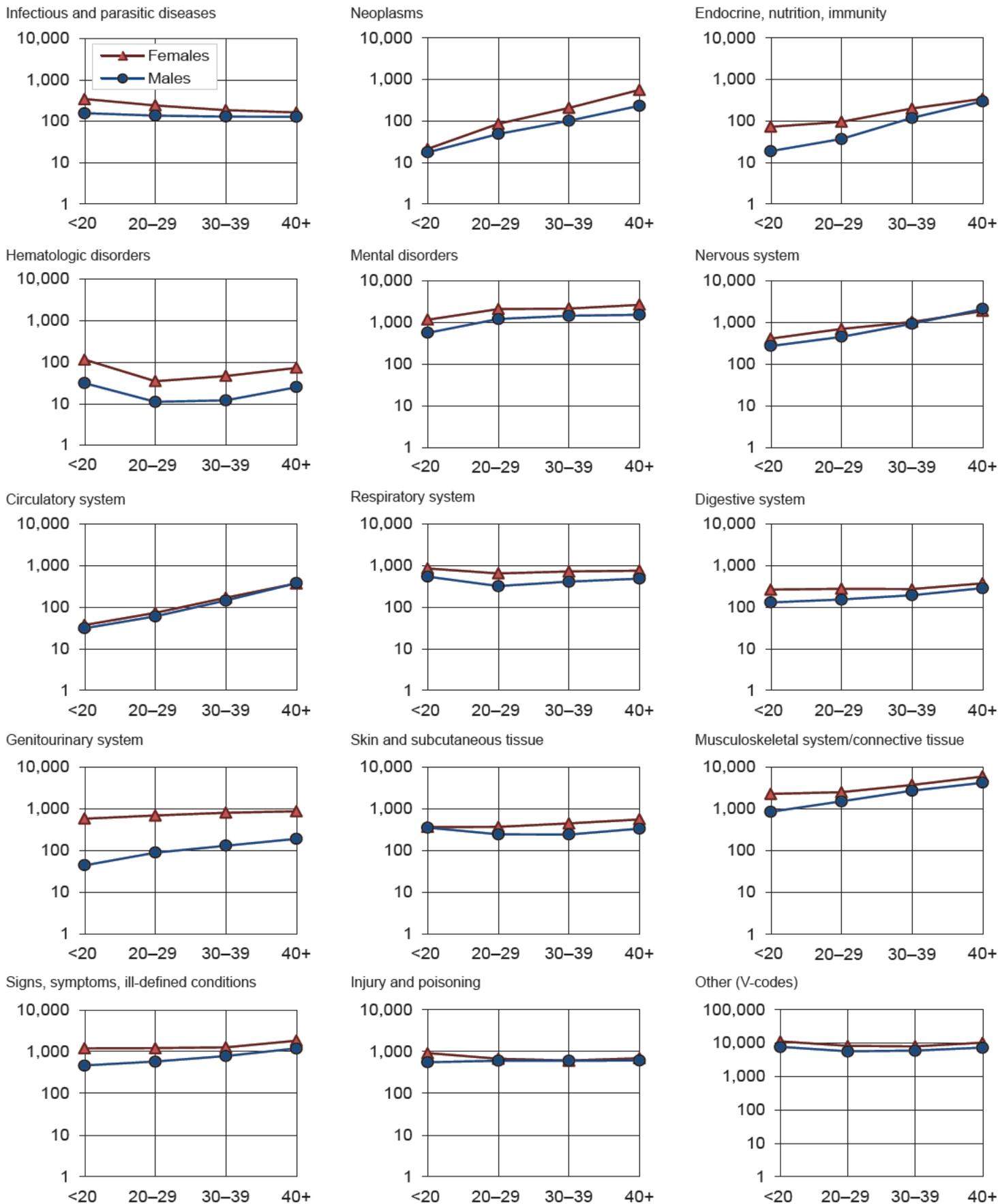
In 2014, males accounted for three-fourths (75.3%) of all illness- and injury-related visits; however, the annual crude rate among females (12.6 visits/p-yr) was 84.9% higher than that of males (6.8 visits/p-yr) (data not shown). Excluding pregnancy and delivery-related visits (which accounted for 13.4% of all non-V-coded ambulatory visits

among females), the non-V-coded ambulatory visit rate among females was 10.9 visits/p-yr. As in the past, rates were higher among females than males for every illness- and injury-related category (Figure 2).

The same three illness- and injury-specific diagnoses (at the three-digit level of the ICD-9-CM) accounted for the largest numbers of ambulatory visits among males and females (Tables 2, 3). For each of the three most frequently reported illness- or injury-specific diagnoses, the crude rate was at least 39% higher among females than males: other/unspecified disorders of joints (rates [per 1,000 p-yrs], female: 963.3; male: 655.9; female:male rate ratio [RR]: 1.47); adjustment reaction (rates, female: 823.9; male: 469.8; RR: 1.75); and other/unspecified disorders of the back (rates, female: 763.2; male: 550.0; RR: 1.39) (data not shown). Anxiety disorders, general symptoms, other disorders of soft tissues, and episodic mood disorders also ranked in the top 10 diagnoses for both males and females. Four mental disorders among males (adjustment reaction, anxiety disorders, alcohol dependence syndrome, and episodic mood disorders) and four mental disorders among females (adjustment reaction, anxiety disorders, episodic mood disorders, and depressive disorder) were among the 10 most frequently reported illness- or injury-specific diagnoses during ambulatory encounters (Tables 2, 3). Of note, “organic sleep disorders” was the fourth most frequent illness- or injury-specific primary diagnosis during ambulatory visits of males (Table 2).

Across diagnostic categories, relationships between age and ambulatory visit rates were generally similar among males and females (Figure 2). For example, among both males and females, ambulatory visit rates for neoplasms and circulatory disorders among those aged 40 years or older were 10 or more times the rates among those younger than 20 years old; in contrast, clinic visit rates for respiratory disorders and infectious and parasitic diseases were lower among the oldest compared to the youngest service members. As in the past, clinic visit rates for disorders of the endocrine system, nutrition, and immunity, of the nervous system, and of the musculoskeletal system were found to rise more

**FIGURE 2.** Rates (per 1,000 p-yrs) of ambulatory visits by major diagnostic categories, by age and gender, active component, U.S. Armed Forces, 2014



**TABLE 2. Most frequent diagnoses during ambulatory visits by major diagnostic category, males, active component, U.S. Armed Forces, 2014**

Diagnostic category (ICD-9-CM codes)	No.	%	Diagnostic category (ICD-9-CM codes)	No.	%
<b>Infectious and parasitic diseases (001–139)</b>	158,726		<b>Digestive system (520–579)</b>	207,235	
Other diseases due to viruses and chlamydiae <sup>a</sup>	33,896	21.4	Other/unspecified noninfectious gastroenteritis/colitis	47,191	22.8
Viral and chlamydial infection <sup>b</sup>	27,733	17.5	Diseases of esophagus	30,407	14.7
Dermatophytosis	24,695	15.6	Inguinal hernia	12,454	6.0
Intestinal infections due to other organisms	10,823	6.8	Gastrointestinal hemorrhage	11,404	5.5
Streptococcal sore throat and scarlet fever	10,469	6.6	Functional digestive disorders not elsewhere classified	10,447	5.0
<b>Neoplasms (140–239)</b>	96,211		<b>Genitourinary system (580–629)</b>	126,964	
Benign neoplasm of skin	15,343	15.9	Other disorders of male genital organs	27,505	21.7
Neoplasm of uncertain behavior, unspecified sites	12,866	13.4	Calculus of kidney and ureter	18,474	14.6
Neoplasms of unspecified nature	10,781	11.2	Other disorders of urethra and urinary tract	12,516	9.9
Lipoma	7,996	8.3	Disorders of penis	11,884	9.4
Malignant neoplasm of testis	4,224	4.4	Other disorders of breast	9,368	7.4
<b>Endocrine, nutrition, immunity (240–279)</b>	102,429		<b>Skin and subcutaneous tissue (680–709)</b>	301,566	
Disorders of lipid metabolism	22,781	22.2	Diseases of hair and hair follicles	51,897	17.2
Diabetes mellitus	16,334	15.9	Contact dermatitis and other eczema	45,036	14.9
Testicular dysfunction	15,390	15.0	Other cellulitis and abscess	41,951	13.9
Overweight, obesity, and other hyperalimentation	10,968	10.7	Diseases of sebaceous glands	33,687	11.2
Acquired hypothyroidism	7,844	7.7	Other disorders of skin and subcutaneous tissue	19,275	6.4
<b>Hematologic disorders (280–289)</b>	16,507		<b>Musculoskeletal system (710–739)</b>	2,444,270	
Other and unspecified anemias	3,937	23.9	Other and unspecified disorders of joint	767,358	31.4
Diseases of white blood cells	2,953	17.9	Other and unspecified disorders of back	643,472	26.3
Hereditary hemolytic anemias	2,449	14.8	Other disorders of soft tissues	156,205	6.4
Purpura and other hemorrhagic conditions	1,974	12.0	Peripheral enthesopathies and allied syndromes	141,889	5.8
Iron deficiency anemias	1,963	11.9	Intervertebral disc disorders	140,951	5.8
<b>Mental disorders (290–319)</b>	1,501,299		<b>Congenital anomalies (740–759)</b>	20,974	
Adjustment reaction	549,591	36.6	Certain congenital musculoskeletal deformities	5,571	26.6
Anxiety, dissociative, and somatoform disorders	218,616	14.6	Other congenital musculoskeletal anomalies	4,662	22.2
Alcohol dependence syndrome	198,865	13.2	Congenital anomalies of the integument	2,328	11.1
Episodic mood disorders	158,418	10.6	Other congenital anomalies of limbs	1,987	9.5
Nondependent abuse of drugs	103,949	6.9	Other congenital anomalies of heart	979	4.7
<b>Nervous system (320–389)</b>	892,574		<b>Signs, symptoms, ill-defined conditions (780–799)</b>	812,351	
Organic sleep disorders	340,578	38.2	General symptoms	203,347	25.0
Disorders of refraction and accommodation	134,027	15.0	Symptoms involving respiratory system	146,212	18.0
Pain, not elsewhere classified	60,959	6.8	Other symptoms involving abdomen and pelvis	91,191	11.2
Hearing loss	40,115	4.5	Symptoms involving digestive system	73,940	9.1
Other headache syndromes	36,364	4.1	Other ill-defined/unknown	66,026	8.1
<b>Circulatory system (390–459)</b>	137,185		<b>Injury and poisoning (800–999)</b>	703,399	
Essential hypertension	52,443	38.2	Sprains and strains of ankle and foot	67,481	9.6
Hemorrhoids	16,733	12.2	Sprains and strains of knee and leg	64,968	9.2
Cardiac dysrhythmias	13,779	10.0	Sprains and strains of shoulder and upper arm	53,845	7.7
Varicose veins of other sites	5,474	4.0	Injury other and unspecified	47,201	6.7
Other forms of chronic ischemic heart disease	4,176	3.0	Sprains/strains of other and unspecified parts of back	43,030	6.1
<b>Respiratory system (460–519)</b>	441,340		<b>Other (V01–V82, except pregnancy-related)</b>	7,052,408	
Acute upper respiratory infections	104,658	23.7	General medical examination	2,314,866	32.8
Allergic rhinitis	73,315	16.6	Care involving use of rehabilitation procedures	1,157,680	16.4
Acute pharyngitis	51,954	11.8	Encounters for administrative purposes	606,986	8.6
Asthma	24,543	5.6	Special investigations and examinations	445,150	6.3
Chronic sinusitis	23,938	5.4	Other persons seeking consultation	337,102	4.8

<sup>a</sup>ICD-9-CM code 078 encompasses a broad variety of conditions including molluscum contagiosum, viral warts, sweating fever, cat-scratch disease, foot and mouth disease, cytomegaloviral disease, hemorrhagic nephrosonephritis, arenaviral hemorrhagic fever, and other disorders such as epidemic vomiting syndrome and Marburg disease.  
<sup>b</sup>ICD-9-CM code 079 is for "viral and chlamydial infection in conditions classified elsewhere and of unspecified site" and is to be used to identify the viral or chlamydial agent in diseases classifiable elsewhere and to classify virus or chlamydial infection of unspecified nature or site.

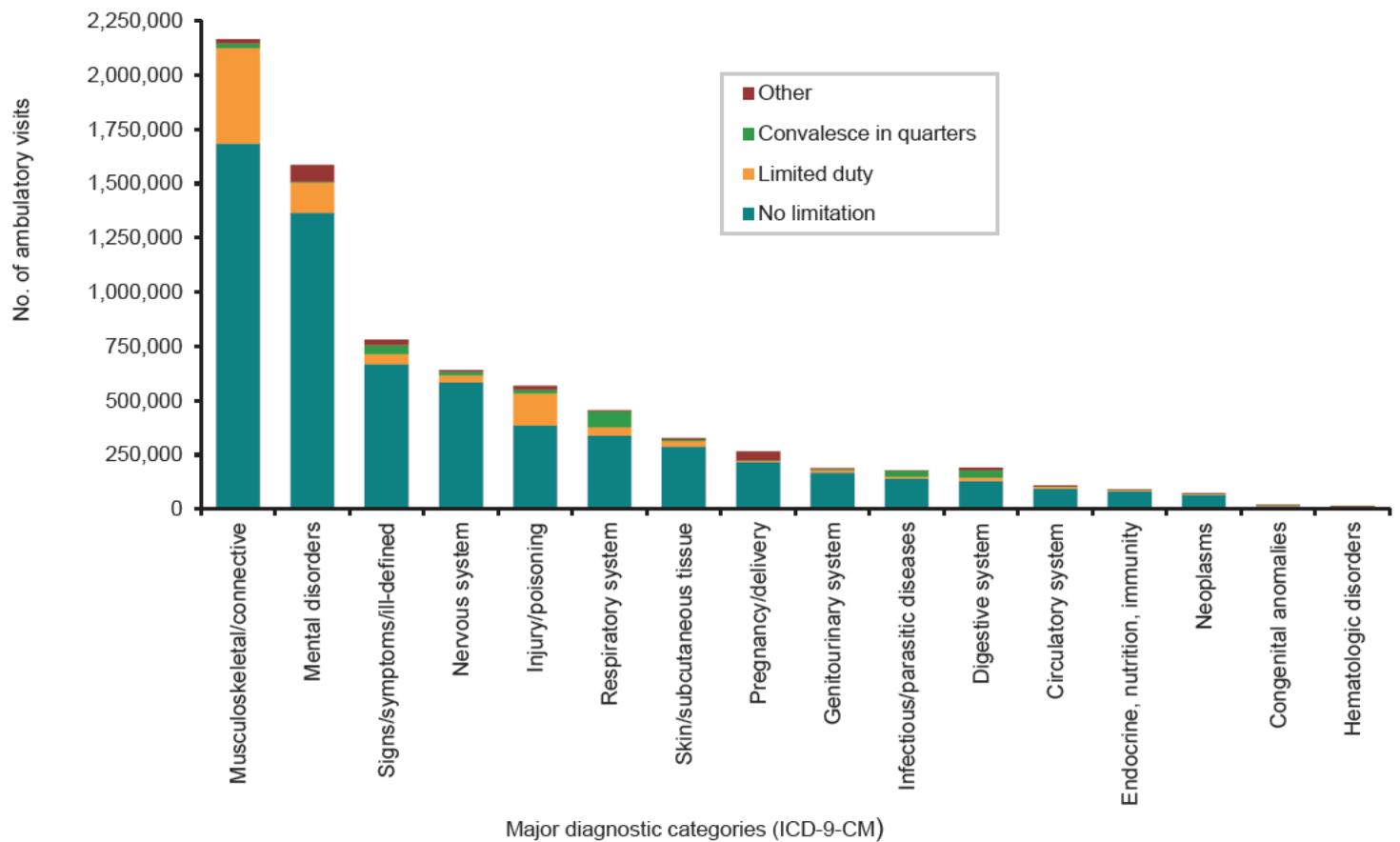
**TABLE 3. Most frequent diagnoses during ambulatory visits by major diagnostic category, females, active component, U.S. Armed Forces, 2014**

Diagnostic category (ICD-9-CM codes)	♀	No.	%	Diagnostic category (ICD-9-CM codes)	♀	No.	%
<b>Infectious and parasitic diseases (001–139)</b>		47,131		<b>Digestive system (520–579)</b>		58,708	
Viral and chlamydial infection <sup>a</sup>		11,008	23.4	Other/unspecified noninfectious gastroenteritis and colitis		15,726	26.8
Candidiasis		6,098	12.9	Functional digestive disorders not elsewhere classified		8,652	14.7
Other diseases due to viruses and chlamydiae <sup>b</sup>		5,019	10.6	Diseases of esophagus		6,135	10.5
Dermatophytosis		4,163	8.8	Gastritis and duodenitis		3,925	6.7
Intestinal infections due to other organisms		3,670	7.8	Gastrointestinal hemorrhage		2,263	3.9
<b>Neoplasms (140–239)</b>		32,552		<b>Genitourinary system (580–629)</b>		150,217	
Uterine leiomyoma		4,656	14.3	Pain/other symptoms associated, female genital organs		27,698	18.4
Benign neoplasm of skin		4,556	14.0	Disorders of menstruation/other abnormal bleeding		22,577	15.0
Malignant neoplasm of female breast		4,541	13.9	Other disorders of urethra and urinary tract		19,240	12.8
Neoplasm of uncertain behavior, unspecified sites		3,200	9.8	Inflammatory disease of cervix vagina and vulva		14,730	9.8
Neoplasms of unspecified nature		2,776	8.5	Other disorders of breast		11,613	7.7
<b>Endocrine, nutrition, immunity (240–279)</b>		30,067		<b>Pregnancy/delivery (630–679, relevant V-codes)</b>		351,280	
Acquired hypothyroidism		5,958	19.8	Normal pregnancy		102,272	29.1
Overweight, obesity, and other hyperalimentation		5,023	16.7	Other complications of pregnancy not elsewhere classified		36,224	10.3
Ovarian dysfunction		2,654	8.8	Other conditions complicating pregnancy childbirth/puerperium		36,009	10.3
Nontoxic nodular goiter		2,244	7.5	Postpartum care and examination		24,733	7.0
Diabetes mellitus		2,043	6.8	Other indications for care/intervention related to labor/delivery		16,832	4.8
<b>Hematologic disorders (280–289)</b>		9,740		<b>Skin and subcutaneous tissue (680–709)</b>		83,580	
Iron deficiency anemias		3,630	37.3	Diseases of sebaceous glands		17,597	21.1
Other and unspecified anemias		2,868	29.4	Contact dermatitis and other eczema		12,802	15.3
Purpura and other hemorrhagic conditions		788	8.1	Other cellulitis and abscess		7,719	9.2
Diseases of white blood cells		766	7.9	Diseases of hair and hair follicles		7,484	9.0
Hereditary hemolytic anemias		730	7.5	Other disorders of skin and subcutaneous tissue		7,077	8.5
<b>Mental disorders (290–319)</b>		441,879		<b>Musculoskeletal system (710–739)</b>		644,145	
Adjustment reaction		171,108	38.7	Other and unspecified disorders of joint		200,063	31.1
Anxiety, dissociative, and somatoform disorders		80,105	18.1	Other and unspecified disorders of back		158,509	24.6
Episodic mood disorders		70,764	16.0	Other disorders of soft tissues		52,749	8.2
Depressive disorder not elsewhere classified		41,419	9.4	Other disorders of cervical region		39,042	6.1
Alcohol dependence syndrome		24,053	5.4	Peripheral enthesopathies and allied syndromes		30,885	4.8
<b>Nervous system (320–389)</b>		182,808		<b>Signs, symptoms, ill-defined conditions (780–799)</b>		265,256	
Disorders of refraction and accommodation		35,429	19.4	General symptoms		48,182	18.2
Migraine		27,375	15.0	Other symptoms involving abdomen and pelvis		47,400	17.9
Organic sleep disorders		19,097	10.4	Symptoms involving respiratory system		36,396	13.7
Pain, not elsewhere classified		17,136	9.4	Symptoms involving digestive system		29,814	11.2
Other headache syndromes		10,359	5.7	Symptoms involving head and neck		22,843	8.6
<b>Circulatory system (390–459)</b>		25,580		<b>Injury and poisoning (800–999)</b>		140,018	
Essential hypertension		7,124	27.8	Sprains and strains of ankle and foot		15,054	10.8
Hemorrhoids		3,883	15.2	Sprains and strains of knee and leg		14,191	10.1
Cardiac dysrhythmias		2,885	11.3	Sprains and strains of other and unspecified parts of back		10,951	7.8
Varicose veins of lower extremities		1,782	7.0	Certain adverse effects not elsewhere classified		8,643	6.2
Other disorders of circulatory system		1,042	4.1	Injury other and unspecified		8,295	5.9
<b>Respiratory system (460–519)</b>		143,810		<b>Other (V01–V82, except pregnancy-related)</b>		1,783,936	
Acute upper respiratory infections		34,857	24.2	General medical examination		431,893	24.2
Allergic rhinitis		26,117	18.2	Care involving use of rehabilitation procedures		294,152	16.5
Acute pharyngitis		18,369	12.8	Encounters for administrative purposes		169,577	9.5
Asthma		9,470	6.6	Special investigations and examinations		152,261	8.5
Acute nasopharyngitis (common cold)		8,583	6.0	Other persons seeking consultation		123,228	6.9

<sup>a</sup>ICD-9-CM code 079 is for "viral and chlamydial infection in conditions classified elsewhere and of unspecified site" and is to be used to identify the viral or chlamydial agent in diseases classifiable elsewhere and to classify virus or chlamydial infection of unspecified nature or site.

<sup>b</sup>ICD-9-CM code 078 encompasses a broad variety of conditions including molluscum contagiosum, viral warts, sweating fever, cat-scratch disease, foot and mouth disease, cytomegaloviral disease, hemorrhagic nephrosonephritis, arenaviral hemorrhagic fever, and other disorders such as epidemic vomiting syndrome and Marburg disease.

**FIGURE 3.** Ambulatory visits in relation to reported dispositions, by diagnostic category, active component, U.S. Armed Forces, 2014



steeply with advancing age than most other categories of illness or injury, for which rates were relatively stable or only modestly increased.

#### Dispositions after ambulatory visits

Because disposition codes are only assigned to ambulatory medical encounters that occur at military treatment facilities (MTFs), the following metrics do not include outsourced care. Approximately 81.6% of all illness- and injury-related visits resulted in “no limitation” (i.e., duty without limitations) dispositions (**Figure 3**). Approximately one in 29 (3.4%) illness- and injury-related visits resulted in “convalescence in quarters” dispositions. The illness- and injury-related diagnostic categories with the highest proportions of “convalescence in quarters” or “limited duty” dispositions were injuries and poisonings (28.7%), diseases of the respiratory

system (24.7%), diseases of the digestive system (24.7%), infectious and parasitic diseases (20.0%), and musculoskeletal system/connective tissue disorders (21.4%). Musculoskeletal system/connective tissue disorders (47.7%) accounted for nearly half of all “limited duty” dispositions, and injuries and poisonings (16.5%) and mental disorders (14.3%) accounted for nearly one-third. Diseases of the respiratory system accounted for 28.7% of all “convalescence in quarters” dispositions—more than twice as many (n=74,365) as any other disease category, except signs, symptoms, and ill-defined conditions (15.8%) (**Figure 3**).

#### EDITORIAL COMMENT

In the past 5 years, the distribution of illness- and injury-related ambulatory visits in relation to their reported primary causes has remained fairly stable. However, during

2010–2014, the numbers of visits that were documented with diagnostic codes referring to mental disorders or the musculoskeletal system increased by 14.3% and 17.9%, respectively. In 2014, musculoskeletal system and mental disorders accounted for nearly one-half (47.6%) of all illness- and injury-related diagnoses documented on standardized records of ambulatory encounters. It should be noted, however, that the annual numbers of visits for these two major categories peaked in 2012 and have declined slightly since then.<sup>1</sup> In fact, with one exception, the annual numbers of visits for all of the major diagnostic categories of illness and injury peaked in 2012 or earlier and have subsequently declined. This downward trend is likely due, in part, to the ongoing drawdown of military forces; for example, at the end of 2014, there were almost 50,000 fewer military personnel than at the same time in 2013.<sup>2</sup> The exception to the downward trend is the category

of nervous system disorders, which steadily rose by 112,224 visits (11.7%) from 963,158 in 2010 to a high of 1,075,382 visits in 2014.

During 2010–2014, the relative ranking of injuries and poisonings as primary causes of ambulatory visits declined. However, the military operational impacts of various conditions cannot be assessed by numbers of attributable ambulatory visits alone. For example, in 2014, injuries and poisonings accounted for approximately one of every 23 ambulatory visits overall, but, of ambulatory visits occurring at MTFs, 16% (more than 1 in 10) had limited duty dispositions. Of particular note in relation to injuries and musculoskeletal conditions, in 2014 as in the past, joint and back injuries/back pain accounted for extraordinarily large numbers of ambulatory visits and lost duty time; resources should be focused on preventing, treating, and rehabilitating back pain/injuries among active component members.

It should be noted that the summary data presented here using the major diagnostic categories of the ICD-9-CM system deserve more detailed examination, as presented in Tables 2 and 3. For example, the general category identified as “nervous system” encompasses diseases of the nervous system and the sense organs (eyes and ears). Tables 2 and 3 indicate that the more common diagnoses in this category refer to sleep disorders, disorders of refraction and accommodation, pain disorders, headaches and migraine, and hearing loss.

Closer scrutiny discloses that the overall increase in annual visits for this category from 2010 to 2014 (described above) can be attributed entirely to a rise in diagnoses of organic sleep disorders from 188,123 in 2010 to 359,675 in 2014.<sup>3</sup>

Several limitations should be considered when interpreting the findings of this report. For example, ambulatory care that is delivered by unit medics and at deployed medical treatment facilities (such as in Afghanistan, Iraq, or at sea) may not be documented on standardized, automated records and thus not archived in the DMSS (the source of data for this report). In turn, this summary does not reflect the experience of active component military members overall to the extent that the natures and rates of illnesses and injuries vary among those who are deployed and not deployed.

Also, this summary is based on primary (first-listed) diagnosis codes reported on ambulatory visit records. As a result, the summary discounts morbidity related to comorbid and complicating conditions that may have been documented in secondary diagnostic positions of the healthcare records. Furthermore, the accuracy of reported diagnoses likely varies across conditions, care providers, treatment facilities, and clinical settings. Although some specific diagnoses made during individual encounters may not be definitive, final, or even correct, summaries of the frequencies, natures, and

trends of ambulatory encounters among active component members are informative and potentially useful. For example, the relatively large and sharply increasing numbers of ambulatory visits for mental disorders in general, and the large numbers of visits for organic sleep disorders among males, reflect patterns of responses by the MHS to the effects of combat- and deployment-related stresses on active component service members.

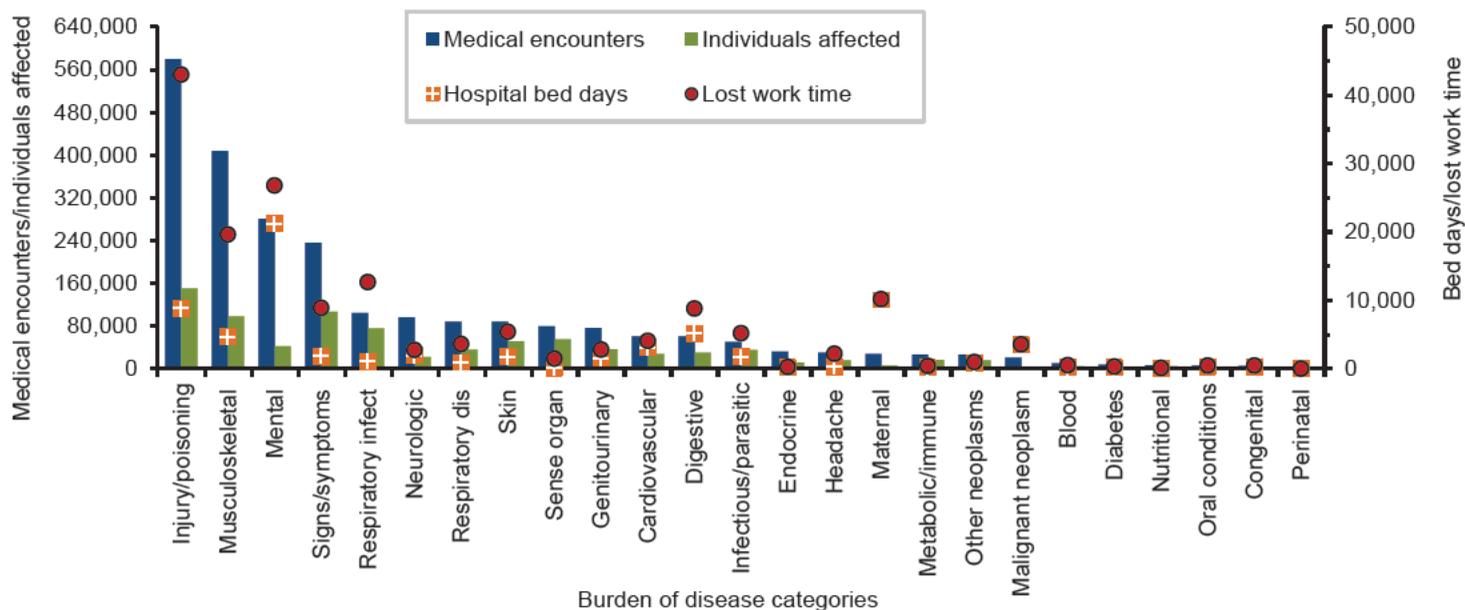
Lastly, this report documents all ambulatory healthcare visits but does not provide estimates of the incidence rates of the diagnoses described. Illnesses and injuries that necessitate multiple ambulatory visits for evaluation, treatment, and rehabilitation are over-represented in this summary of the ambulatory burden of health care, in contrast to common, self-limited, and minor illnesses and injuries that require very little, if any, follow-up or continuing care.

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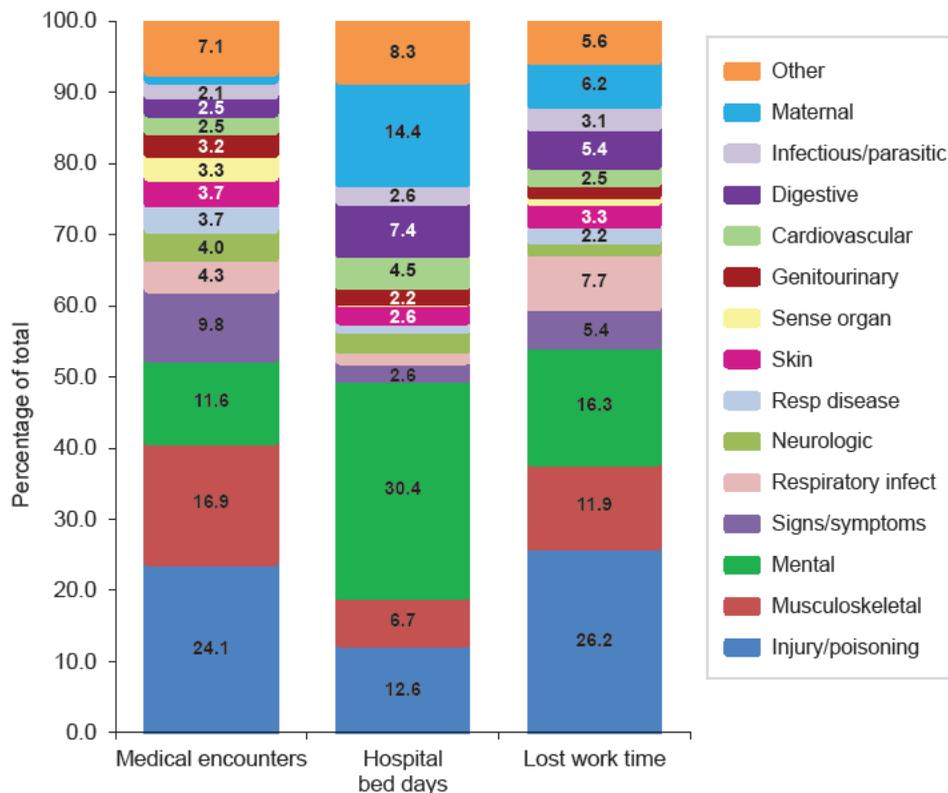
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# Surveillance Snapshot: Illness and Injury Burdens Among Reserve Component Service Members, U.S. Armed Forces, 2014

**FIGURE 1.** Medical encounters,<sup>a</sup> individuals affected,<sup>b</sup> hospital bed days, and lost work time<sup>c</sup> by burden of disease category<sup>d</sup> among reserve component service members,<sup>e</sup> U.S. Armed Forces, 2014



**FIGURE 2.** Percentages of medical encounters,<sup>a</sup> hospital bed days, and lost work time<sup>c</sup> by burdens of disease category<sup>d</sup> among reserve component service members,<sup>e</sup> U.S. Armed Forces, 2014



<sup>a</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition (with no more than one encounter per individual per day per condition)

<sup>b</sup>Individuals with at least one hospitalization or ambulatory visit for the condition

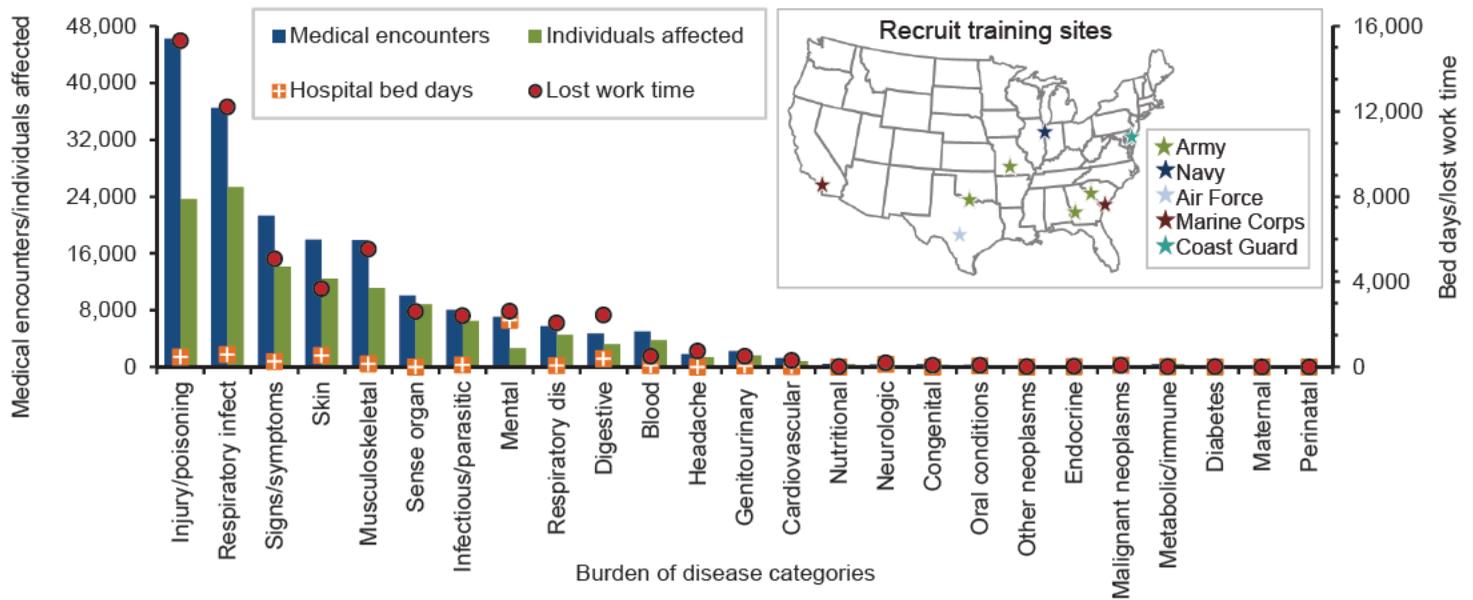
<sup>c</sup>A measure of lost work time calculated in days due to bed days, convalescence, and one-half day for each ambulatory visit that resulted in limited duty

<sup>d</sup>Burden of disease categories are the same as those used for analyses of morbidity burdens in the active component overall (see pp. 5–10).

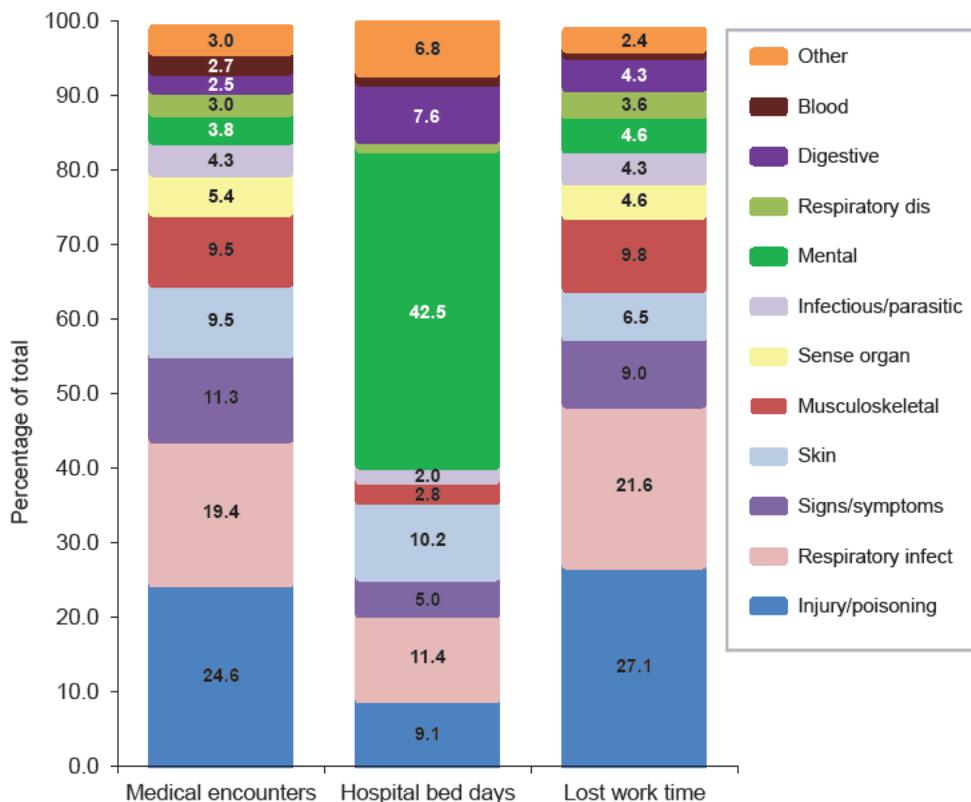
<sup>e</sup>The reserve component is made up of Reserve and Guard members of each Service.

# Surveillance Snapshot: Illness and Injury Burdens Among U.S. Military Recruit Trainees, 2014

**FIGURE 1.** Medical encounters,<sup>a</sup> individuals affected,<sup>b</sup> hospital bed days, and lost work time,<sup>c</sup> by burden of disease category,<sup>d</sup> among recruit trainees,<sup>e</sup> active component, U.S. Armed Forces, 2014



**FIGURE 2.** Percentages of medical encounters,<sup>a</sup> hospital bed days, and lost work time,<sup>c</sup> by burden of disease category<sup>d</sup> among recruit trainees,<sup>e</sup> active component, U.S. Armed Forces, 2014



<sup>a</sup>Medical encounters: total hospitalizations and ambulatory visits for the condition (with no more than one encounter per individual per day per condition)

<sup>b</sup>Individuals with at least one hospitalization or ambulatory visit for the condition

<sup>c</sup>A measure of lost work time calculated in days due to bed days, convalescence, and one-half day for each ambulatory visit that resulted in limited duty

<sup>d</sup>Burden of disease categories are the same as those used for analyses of morbidity burdens in the active component overall (see pp. 5–10).

<sup>e</sup>Recruit trainees are defined as active component members of the Army, Navy, Air Force, or Marine Corps with a rank of E1–E4 who served at one of nine basic training locations (inset) during a service-specific training period following a first-ever personnel record. The data shown here are a subset of the active component data found on pages 5–10.

# Absolute and Relative Morbidity Burdens Attributable to Various Illnesses and Injuries, Non-Service Member Beneficiaries of the Military Health System, 2014

Individuals who are eligible for care through the Military Health System (MHS) (“beneficiaries”) include family members of active component service members, family members of National Guard and Reserve service members, and retirees and eligible family members of retirees. In 2014, there were approximately 1.91 million active component family members, 520,000 Guard/Reserve family members, and 5.37 million retirees and their family members eligible for medical care from the MHS.<sup>1</sup> Some beneficiaries of MHS care do not enroll in the healthcare plans provided by the MHS (e.g., if they use insurance through their own employment); also, some of those who are enrolled do not seek care through the MHS.

MHS beneficiaries may receive care from resources provided directly by the Uniformed Services (i.e., military medical treatment facilities [MTFs]) or from civilian healthcare resources (i.e., outsourced [purchased] care) that supplement direct military medical care.<sup>1</sup> In 2014, approximately 6.6 million individuals utilized inpatient or outpatient services provided by the MHS (data source: the Defense Medical Surveillance System). In the population of MHS care recipients in 2014, there were more females (58%) than males (42%) and more infants, children, and adolescents (<20 years: n=1.9 million; 28.5%) and more seniors (65 years or older: n=1.8 million; 27.0%) than younger (20–44 years: n=1.3 million; 19.9%) or older (45–64 years: n=1.6 million; 24.6%) adults.

Since 1998, the *MSMR* has published annual summaries of the numbers and rates of hospitalizations and outpatient medical encounters to assess the healthcare “burdens” of 16 categories of illnesses and injuries among active component military members. Last year, for the first time and using similar methodology, the *MSMR* published a report that quantified the health care for illnesses and injuries among non-service members in 2013.<sup>2</sup> This report is an

update to provide a summary of care provided to non-service members in the MHS during calendar year 2014. Healthcare burden estimates are stratified by direct versus outsourced care and across four age groups of healthcare recipients.

## METHODS

The surveillance period was 1 January through 31 December 2014. The surveillance population included all non-service member beneficiaries of the MHS who had at least one hospitalization or outpatient medical encounter during 2014 either through a military medical facility/provider or a civilian facility/provider (if paid for by the MHS). For this analysis, all inpatient and outpatient medical encounters were summarized according to the primary (first-listed) diagnoses documented on administrative records of the encounters if the diagnoses were reported with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes that indicate the natures of illnesses or injuries (i.e., ICD-9-CM codes 001–999). Nearly all records of encounters with first-listed diagnoses that were “V-codes” (care other than for a current illness or injury, e.g., general medical examinations, after care, vaccinations) or “E-codes” (indicators of the external causes but not the natures of injuries) were excluded from analyses; however, encounters with primary diagnoses of V27.0 “outcome of delivery, single liveborn” were maintained.

For summary purposes, all illness- and injury-specific diagnoses (as defined by the ICD-9-CM) were grouped into 139 burden of disease-related conditions and 25 categories based on a modified version of the classification system developed for the Global Burden of Disease (GBD) Study.<sup>3</sup> The methodology for summarizing absolute and relative morbidity burdens is described on page 5 of this issue of the *MSMR*.

## RESULTS

In 2014, a total of 6,657,025 non-service member beneficiaries of the MHS had 80,453,596 medical encounters (**Table 1**). Thus, on average, each individual who accessed care from the MHS had 12.1 medical encounters over the course of the year. The top three morbidity-related categories, which accounted for approximately one-third of all medical encounters, were “signs, symptoms, and ill-defined conditions” (12.2%); musculoskeletal diseases (11.8%); and injuries and poisonings (9.9%) (**Figures 1a, 1b**). Signs, symptoms, and ill-defined conditions, injuries and poisonings, and disorders of the sense organs were the illness/injury categories that affected the most individuals (44.8%, 32.0%, and 29.6% of all beneficiaries who received any care, respectively).

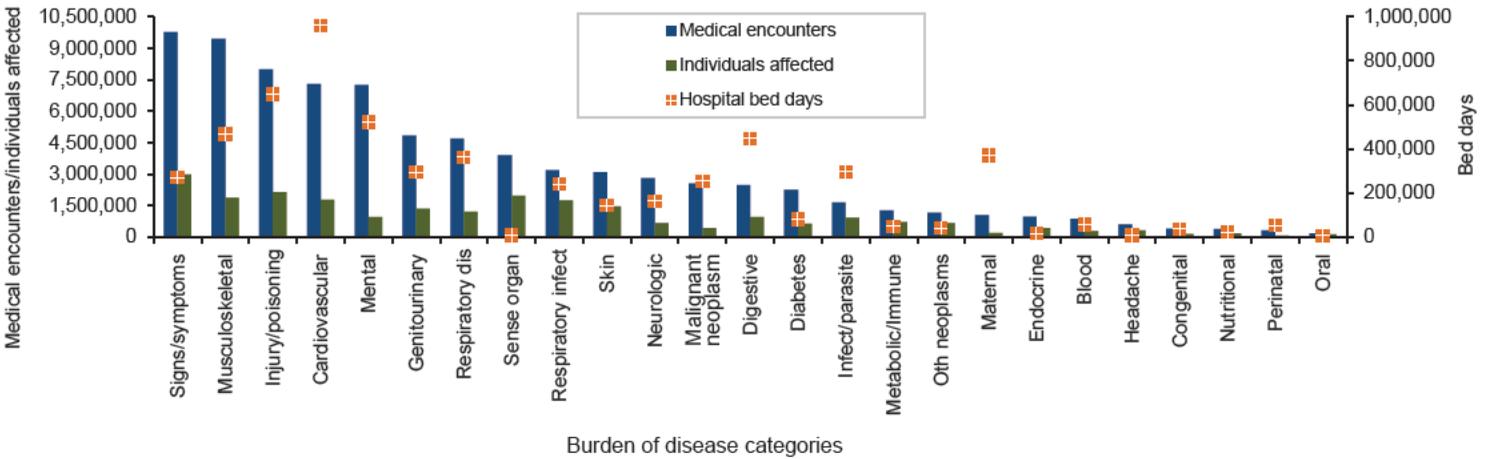
Cardiovascular diseases accounted for more hospital bed days (n=960,598) than any other illness/injury category and 16.5% of all hospital bed days overall (**Figures 1a, 1b**). An additional 35.9% of all bed days were attributable to injuries and poisonings (11.2%), mental disorders (9.0%), musculoskeletal diseases (8.1%), and digestive diseases (7.7%).

Of note, maternal conditions (including pregnancy complications and delivery) accounted for relatively more hospital bed days (n=370,286; 5.5%) than individuals affected (n=190,014; 2.9% of all beneficiaries) (**Figure 1a**).

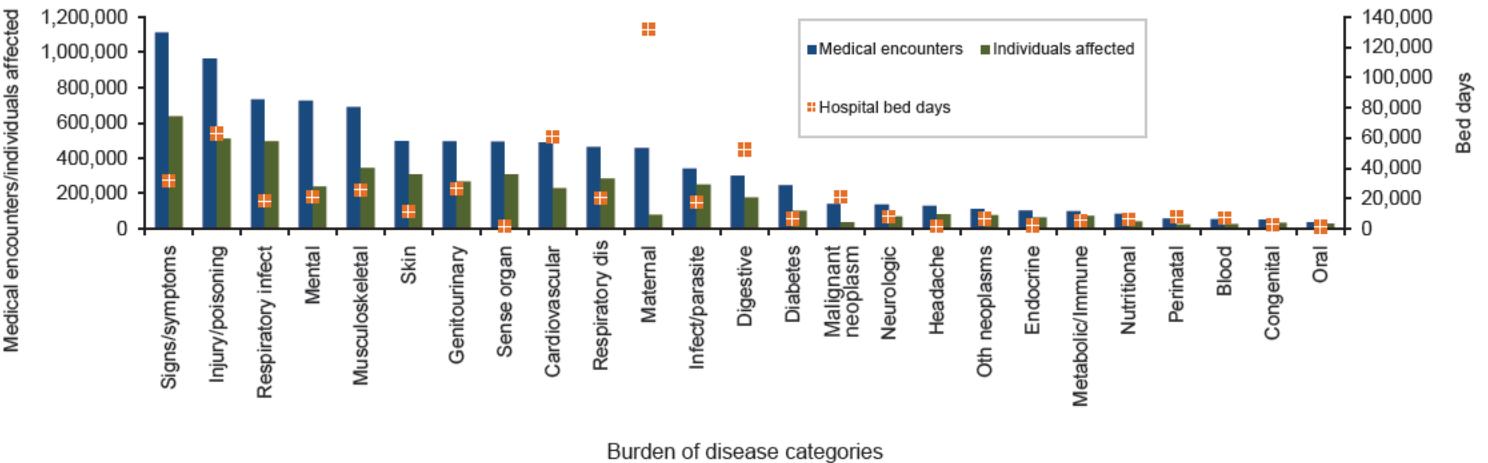
### Direct care vs. outsourced care

In 2014, among non-service member beneficiaries, most medical encounters (88.8%) were in non-military medical facilities (“outsourced care”) (**Table 1**). Of all beneficiaries with any illness or injury-related encounters during the year, many more received exclusively outsourced care (n=4,566,448; 68.6%) than either military medical (direct) care only (n=906,452;

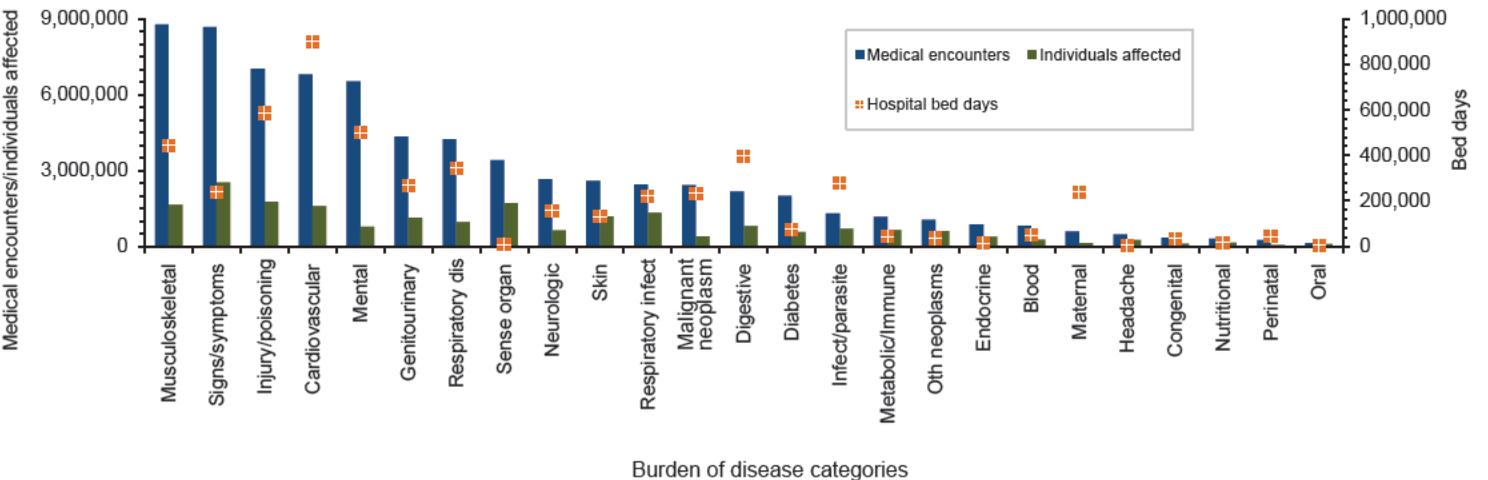
**FIGURE 1a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, 2014



**FIGURE 2a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, direct care only, 2014



**FIGURE 3a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, outsourced care only, 2014



**TABLE 1.** Medical encounters, individuals affected, and hospital bed days, by source and age group, non-service member beneficiaries, 2014

	Medical encounters		Individuals affected		Hospital bed days		Medical encounters per individual affected
	No.	% total	No.	% total	No.	% total	
All non-service member beneficiaries	80,453,596	—	6,657,025	—	5,808,794	—	12.1
<b>Source</b>							
Direct care only	9,020,356	11.2	906,452	13.6	558,332	9.6	n/a
Outsourced care only	71,433,240	88.8	4,566,448	68.6	5,250,462	90.4	n/a
Direct and outsourced	n/a	n/a	1,184,125	17.8	n/a	n/a	n/a
<b>Age group (years)</b>							
0–17	11,803,908	14.7	1,672,412	25.1	456,198	7.9	7.1
18–44	12,199,184	15.2	1,510,013	22.7	770,483	13.3	8.1
45–64	19,329,796	24.0	1,588,021	23.9	1,042,698	18.0	12.2
65+	37,120,704	46.1	1,886,579	28.3	3,539,415	60.9	19.7

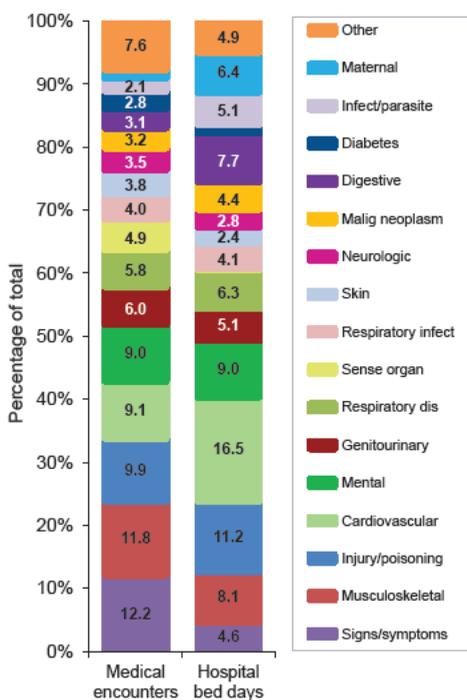
13.6%) or both outsourced and direct care (n=1,184,125; 17.8%). By far, most inpatient care (90.4% of all bed days) was received in non-military facilities (outsourced).

The proportions of medical encounters by morbidity-related categories were

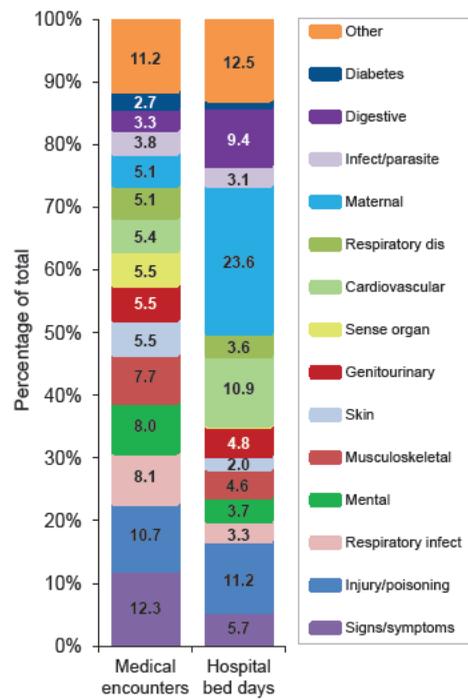
generally similar for direct and outsourced care (Figures 2a, 2b, 3a, 3b). However, encounters for respiratory infections and skin and subcutaneous tissue were relatively more common during direct (8.1% and 5.5%, respectively) than outsourced

(3.4% and 3.6%, respectively) care encounters. Musculoskeletal diseases, cardiovascular diseases, neurologic disorders, and malignant neoplasms were relatively more common during outsourced (12.3%, 9.5%, 3.7%, and 3.4%, respectively) than direct

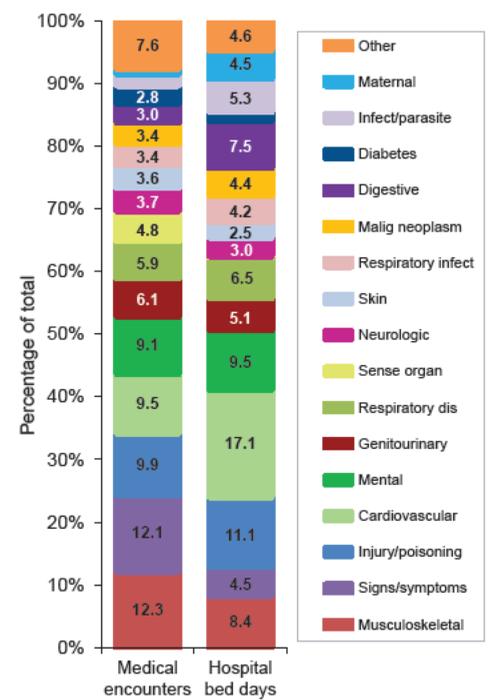
**FIGURE 1b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, 2014



**FIGURE 2b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, direct care only, 2014



**FIGURE 3b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, outsourced care only, 2014



(7.7%, 5.4%, 1.5%, and 1.5%, respectively) care encounters.

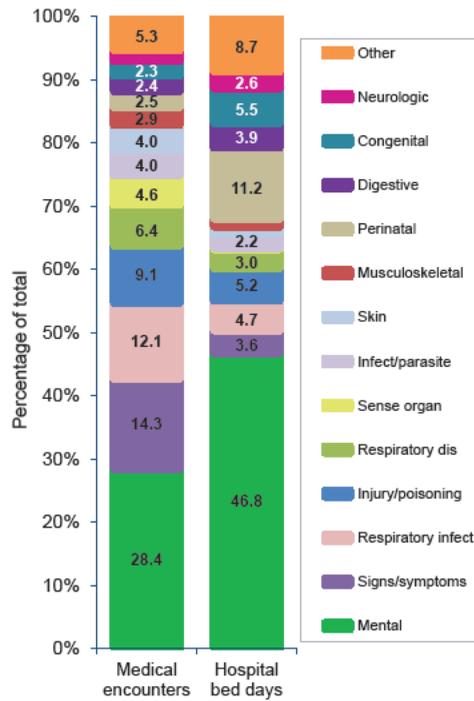
Maternal conditions accounted for 23.6% of all direct care bed days but only 4.5% of all outsourced care bed days (Figures 2a, 2b, 3a, 3b). On the other hand, cardiovascular disorders, mental disorders, and musculoskeletal diseases accounted for relatively more of all outsourced than direct care bed days (% of outsourced vs. % of direct care bed days: cardiovascular, 17.1% vs. 10.9%; mental, 9.5% vs. 3.7%; musculoskeletal, 8.4% vs. 4.6%).

### Pediatric beneficiaries (aged 0–17 years)

In 2014, pediatric beneficiaries accounted for 14.7% of all medical encounters, 25.1% of all individuals affected, and 7.9% of all hospital bed days (Table 1). On average, each affected individual had 7.1 medical encounters during the year.

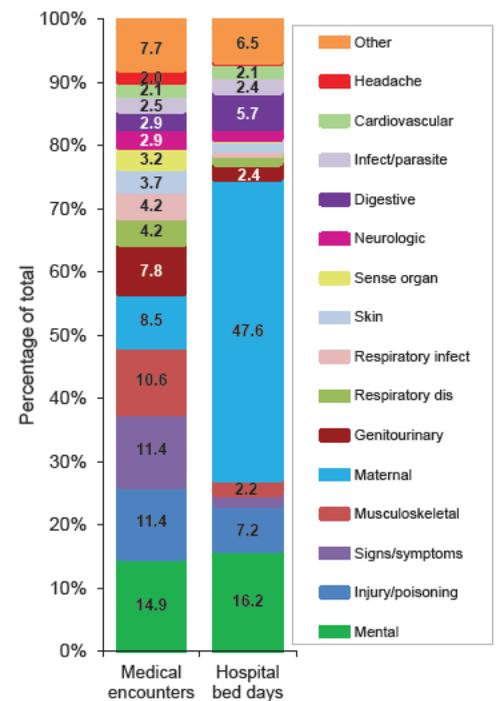
Mental disorders accounted for one-quarter (n=3,354,633; 28.4%) of all medical encounters and 46.8% of all hospital bed days (n=213,374) among pediatric beneficiaries (Figures 4a, 4b). On average, each pediatric beneficiary who was affected by a mental disorder had 12.2 mental disorder-related encounters during the year. Three-fifths (61.7%) of all medical encounters for mental disorders among pediatric beneficiaries were for autistic

**FIGURE 4b.** Percentages of medical encounters and hospital bed days by burden of disease category, pediatric non-service member beneficiaries, aged 0–17 years, 2014

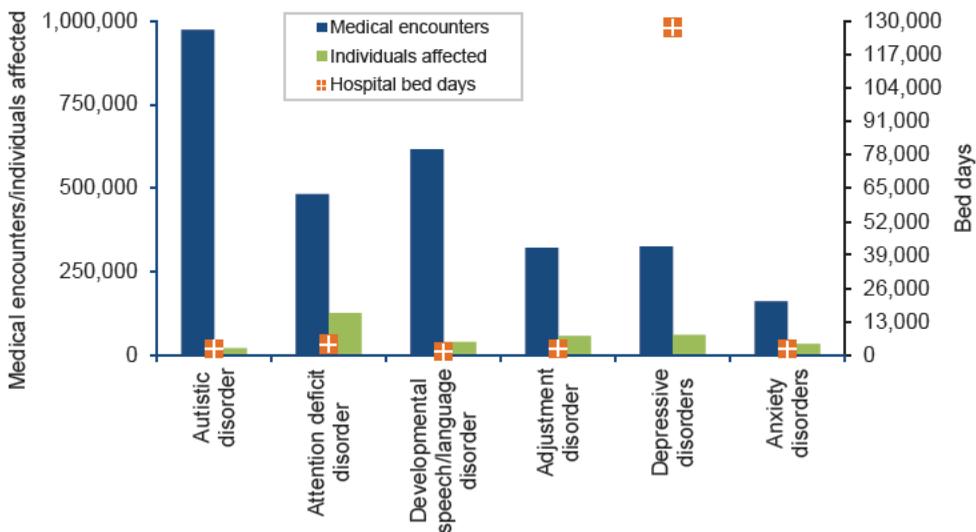


disorders (29.0%), developmental speech/language disorders (18.4%), or attention deficit disorders (14.3%) (Figures 4c, 4d). On average, there were 44.5 autism-related encounters per individual affected with

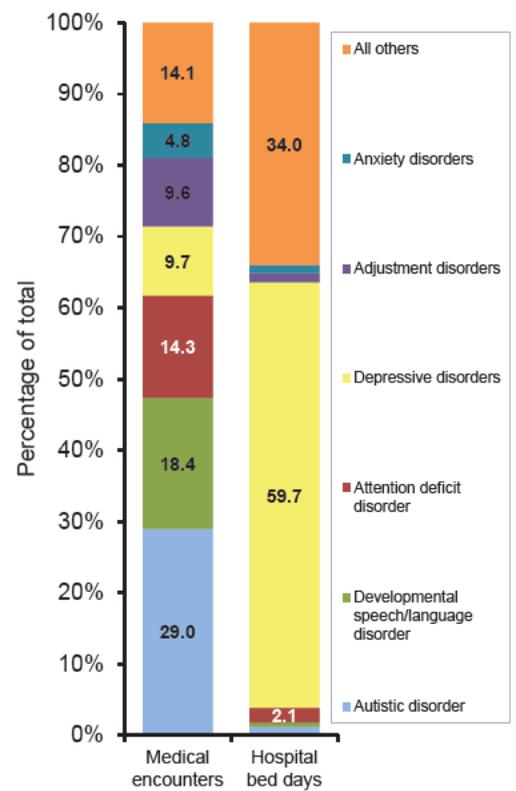
**FIGURE 5b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, aged 18–44 years, 2014



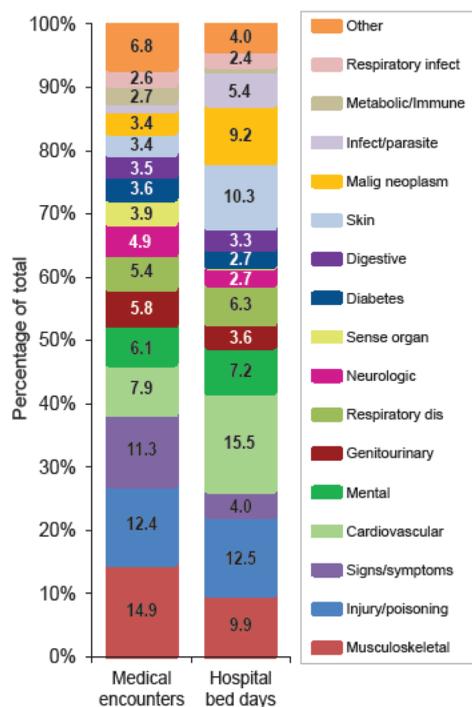
**FIGURE 4c.** Medical encounters, individuals affected, and hospital bed days by the mental disorders accounting for the most morbidity burden, pediatric non-service member beneficiaries, aged 0–17 years, 2014



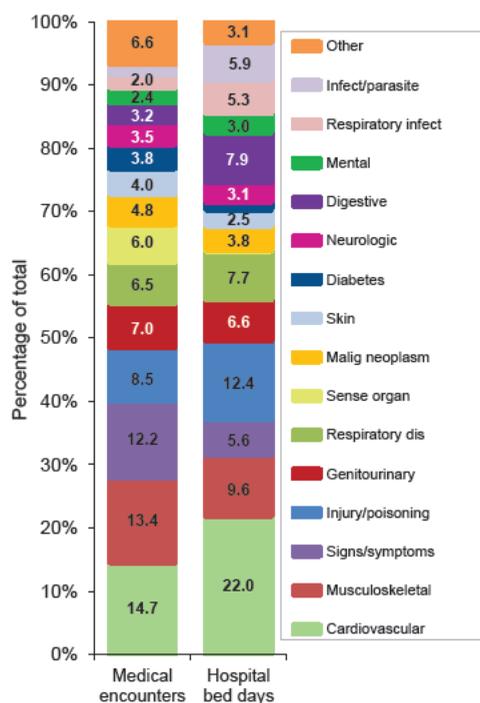
**FIGURE 4d.** Percentage of total mental disorders, pediatric non-service member beneficiaries, aged 0–17 years, 2014



**FIGURE 6b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, aged 45–64 years, 2014



**FIGURE 7b.** Percentages of medical encounters and hospital bed days by burden of disease category, non-service member beneficiaries, aged 65 years and older, 2014



an autistic disorder and 15.0 encounters for developmental speech/language disorder per individual affected with those specific disorders. Despite the high numbers of encounters overall associated with these three categories of mental disorders, a majority of mental disorder-related bed days were attributable to depressive disorders (59.7%), and 43.5% of all depression-related bed days were attributable to “affective psychosis, unspecified” (data not shown).

Among pediatric beneficiaries overall, “conditions arising during the perinatal period” (i.e., perinatal category) accounted for the second most bed days (n=51,241, 11.2%) (Figures 4a, 4b). Of note, among pediatric beneficiaries with at least one illness or injury-related diagnosis, those with malignant neoplasms had the most category-specific encounters per affected individual (12.5). The highest numbers of malignant neoplasm-related encounters and bed days were attributable to leukemias, “all other malignant neoplasms,” and brain neoplasms (data not shown).

Finally, respiratory infections (including upper and lower respiratory infections and otitis media) accounted for relatively more medical encounters and bed days among pediatric beneficiaries (12.1% and 4.7%, respectively), compared to any older age group of beneficiaries (with the exception of beneficiaries aged 65 years or older in whom respiratory infections accounted for 5.3% of total bed days) (data not shown).

#### Beneficiaries (aged 18–44 years)

In 2014, non-service member beneficiaries aged 18–44 years accounted for 15.2% of all medical encounters, 22.7% of all individuals affected, and 13.3% of hospital bed days (Table 1). On average, each individual affected with an illness or injury (any cause) had 8.1 medical encounters during the year.

Among beneficiaries aged 18–44 years, the morbidity-related category that accounted for the most medical encounters was mental disorders (n=1,820,702; 14.9% of all encounters) (Figures 5a, 5b). Among these adult beneficiaries, mental

disorders accounted for 16.2% of all bed days, and on average, each adult affected by a mental disorder had 6.1 mental disorder-related encounters during the year. Mood disorders (39.0%), anxiety disorders (24.6%), and adjustment disorders (15.8%) accounted for nearly four-fifths (79.4%) of all mental disorders medical encounters among beneficiaries aged 18–44 years (data not shown).

Among adults aged 18–44 years, maternal conditions accounted for nearly half (47.6%) of all bed days and, on average, 5.6 medical encounters per affected individual (Figures 5a, 5b). Normal deliveries accounted for 36.9% of maternal condition-related medical encounters (data not shown). Adults aged 18–44 years accounted for nearly all (99.1%) maternal condition-related bed days among beneficiaries not in military service. If morbidity burdens associated with maternal conditions were excluded from the overall analysis, beneficiaries aged 18–44 years would account for fewer medical encounters (14.1%) and bed days (7.4%) than any other age group of beneficiaries (data not shown).

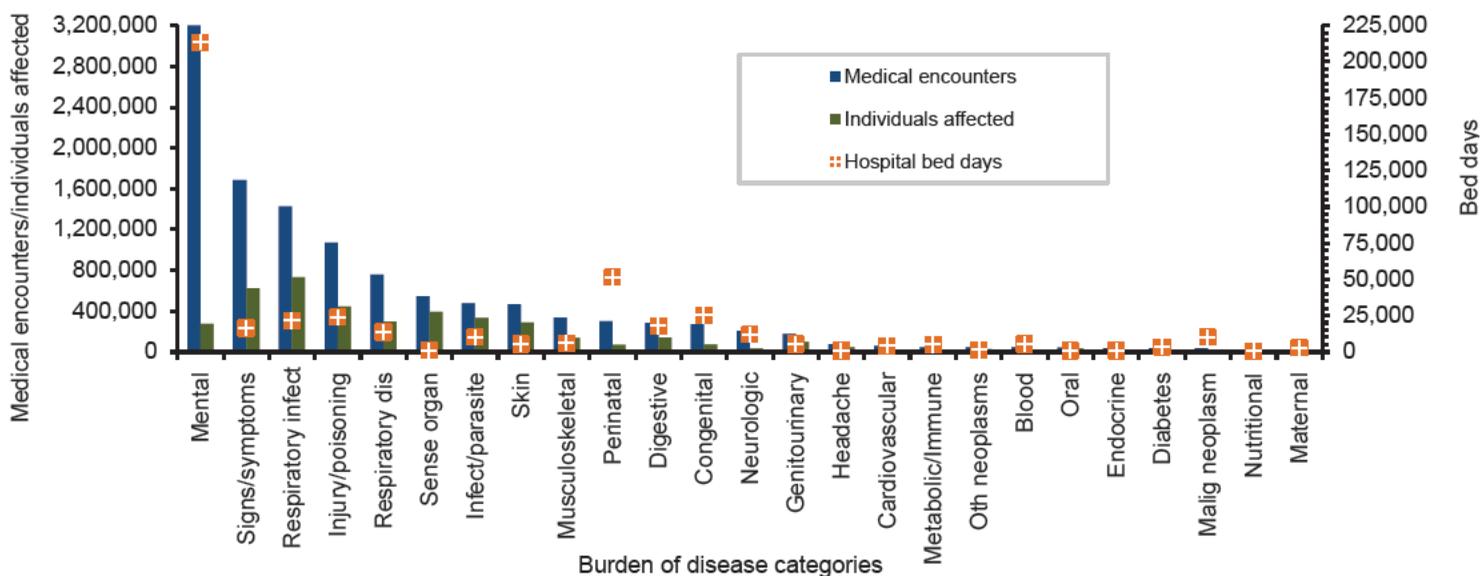
Among beneficiaries aged 18–44 years with at least one illness or injury-related diagnosis, those with malignant neoplasms had the most category-specific encounters per affected individual (6.6). Of all malignant neoplasms, breast cancer accounted for the most malignant neoplasm-related encounters (27.9% of the total) (data not shown).

#### Beneficiaries (aged 45–64 years)

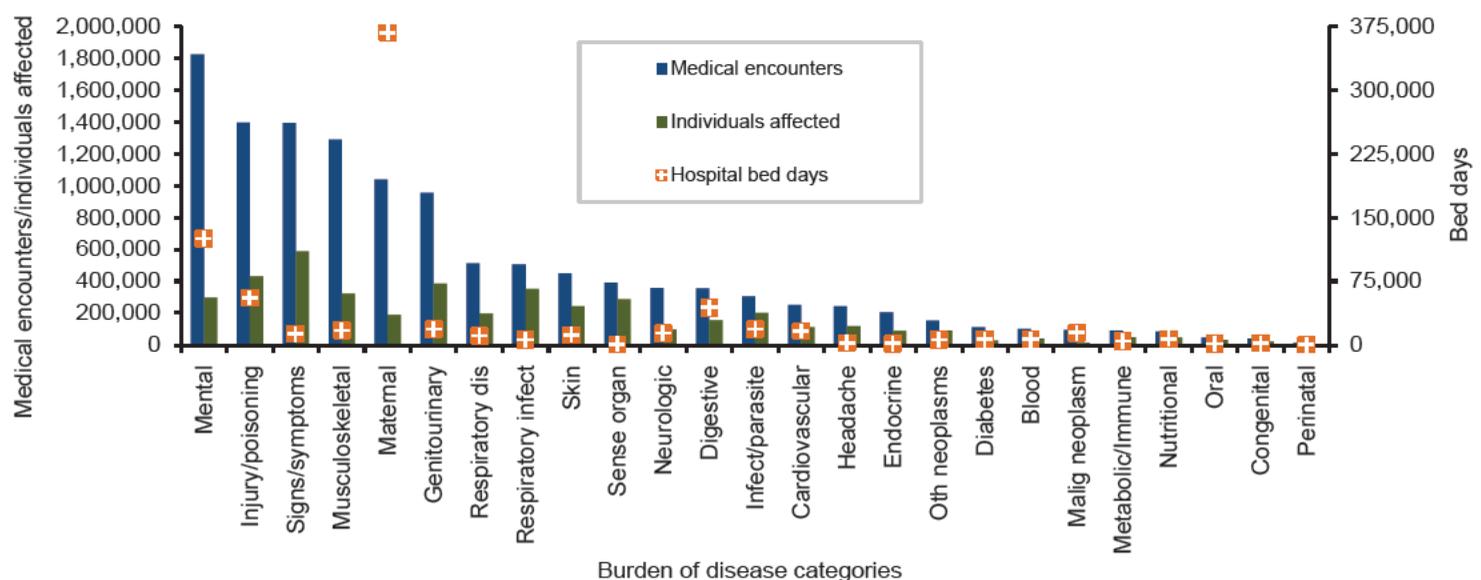
In 2014, non-service member beneficiaries aged 45–64 years accounted for 24.0% of all medical encounters, 23.9% of all individuals affected, and 18.0% of hospital bed days (Table 1). On average, each affected individual had 12.2 medical encounters during the year.

Of all morbidity-related categories, musculoskeletal diseases accounted for the most medical encounters (n=2,871,606; 14.9%) among older adult beneficiaries (Figures 6a, 6b). In addition, in this age group, back problems accounted for 42.3% of all musculoskeletal disease-related encounters (data not shown). Cardiovascular diseases accounted for more hospital bed days

**FIGURE 4a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, pediatric non-service member beneficiaries, aged 0–17 years, 2014



**FIGURE 5a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, non-service member beneficiaries, aged 18–44 years, 2014



(15.5% of the total) than any other category of illnesses or injuries; and cerebrovascular disease and ischemic heart disease accounted for 25.3% and 20.6%, respectively, of all cardiovascular disease-related bed days (data not shown).

The most medical encounters per affected individual were associated with malignant neoplasms (6.5), mental disorders (6.0), musculoskeletal diseases (4.9), and injury/poisoning (4.3) (Figures 6a, 6b). Malignant neoplasms (9.2%) accounted

for a larger proportion of total bed days among beneficiaries aged 45–64 years than the other age groups of beneficiaries. Breast cancer accounted for nearly one-fourth (23.3%) of all malignant neoplasm-related encounters among older adult beneficiaries (data not shown).

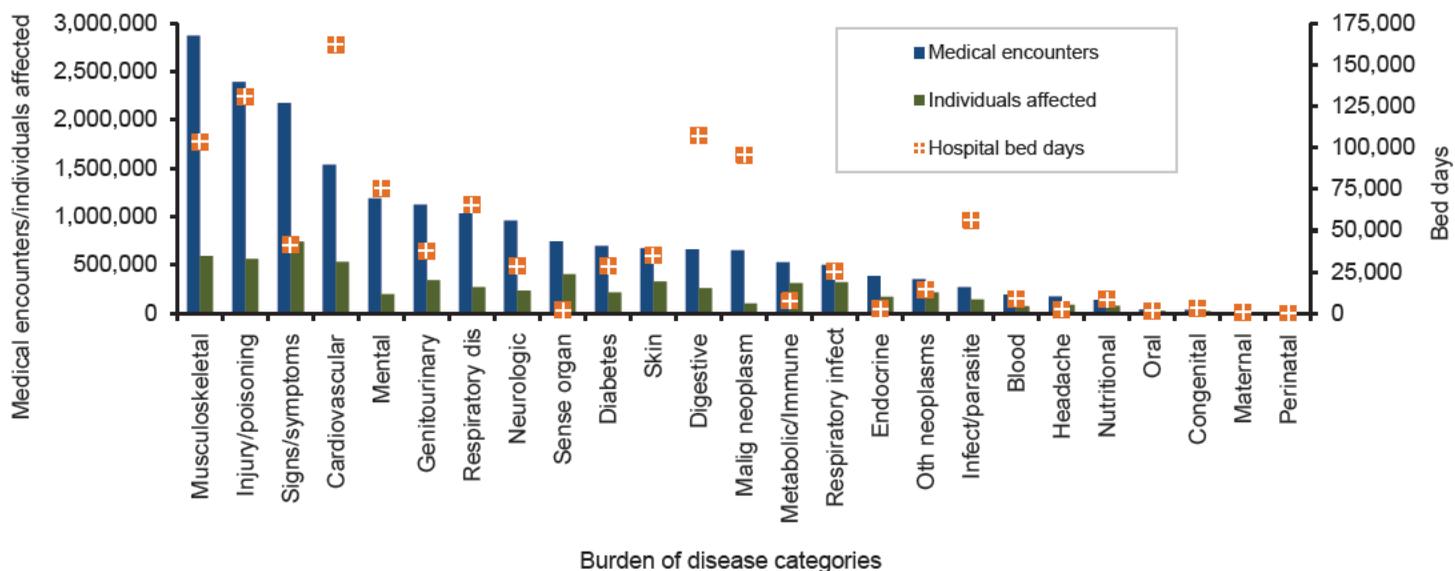
#### Beneficiaries (aged 65 years or older)

In 2014, non-service member beneficiaries aged 65 years or older accounted for

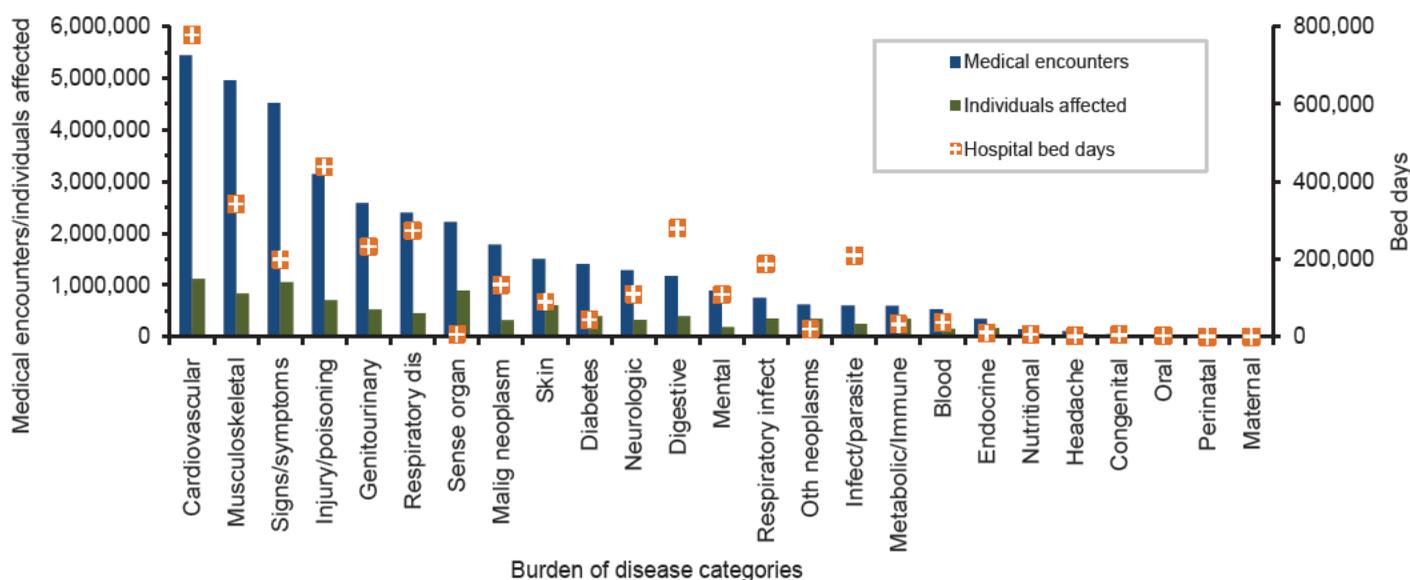
46.1% of all medical encounters, 28.3% of all individuals affected, and 60.9% of hospital bed days (Table 1). On average, each affected individual had 19.7 medical encounters during the year.

Of all morbidity-related categories, cardiovascular diseases accounted for the most medical encounters (n=5,446,924; 14.7%) and bed days (n=778,348; 22.0%) (Figures 7a, 7b). Essential hypertension (25.3%), ischemic heart disease (15.8%), and cerebrovascular disease (10.0%)

**FIGURE 6a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, non-service member beneficiaries, aged 45–64 years, 2014



**FIGURE 7a.** Medical encounters, individuals affected, and hospital bed days by burden of disease category among non-service member beneficiaries, non-service member beneficiaries, aged 65 years and older, 2014



accounted for more than half (51.2%) of all cardiovascular disease-related medical encounters; and cerebrovascular disease accounted for more than one-fourth (26.7%) of all cardiovascular disease-related bed days (data not shown).

Among the oldest age group of beneficiaries, the most medical encounters per affected individual were associated with musculoskeletal diseases (5.9), malignant neoplasms (5.6), respiratory diseases (5.3), and cardiovascular diseases (4.9).

In this age group, back problems (32.1%) accounted for nearly one-third of all musculoskeletal disease-related encounters. Together, melanomas and other skin cancers (17.2%), prostate cancer (14.6%), breast cancer (12.6%), and “trachea, bronchus, and lung” cancers (12.0%) accounted for more than half (56.3%) of all malignant neoplasm-related encounters (data not shown). Chronic obstructive pulmonary disease (COPD) accounted for more than 40% of all medical encounters

(44.8%) and bed days (40.6%) attributable to respiratory diseases.

Digestive diseases (7.9%) and infectious and parasitic diseases (5.9%) accounted for larger proportions of total bed days among the oldest compared to the other age groups of beneficiaries (Figures 7a, 7b). In contrast, mental disorders accounted for smaller percentages of medical encounters (2.4%) and bed days (3.0%) among the oldest compared to the younger age groups.

This report describes the second estimate of overall morbidity burdens among non-service member beneficiaries of the MHS. The report notes that a large majority of the healthcare services for current illness and injury (excluding encounters with diagnoses identified by V-codes) that are provided through the MHS to non-service member beneficiaries are delivered in non-military medical facilities (i.e., outsourced [purchased] care). The report also documents that the types of morbidity and the natures of the care provided for evaluation and treatment sharply differ across age groups of beneficiaries. Of particular note, individuals aged 65 years or older account for nearly half of all medical encounters (46.1%) and a majority (60.9%) of all hospital bed days delivered to beneficiaries not currently in military service.

In 2014, mental disorders accounted for the largest proportions of the morbidity and healthcare burdens that affected the pediatric (0–17 years) and young adult (18–44 years) beneficiary age groups. Among pediatric beneficiaries, 61.7% of medical encounters for mental disorders were attributable to autistic disorders, attention deficit disorders, and developmental speech/language disorders. Of particular note, children affected by autistic disorders had, on average, 44.5

autism-related encounters each during the 1-year surveillance period.

As among pediatric beneficiaries, among young adults (18–44 years), mental disorders accounted for more medical encounters than any other major category of illnesses or injuries. However, the proportion of all encounters attributable to mental disorders was markedly less among adults (18–44 years) (14.9%) compared to pediatric (28.4%) beneficiaries. Also, the mental disorders that accounted for the largest healthcare burdens among adults (18–44 years)—mood, anxiety, and adjustment disorders—differed from those that most affected the pediatric age group.

It is not surprising that the highest numbers and proportion of hospital bed days among 18- to 44-year-olds were for maternal conditions because this age group encompasses nearly all women of child-bearing age.

Among older adults (aged 44–64 years), musculoskeletal diseases were the greatest contributors to morbidity and healthcare burdens; and among adults aged 65 years or older, cardiovascular diseases were the major morbidity and healthcare burdens.

Of musculoskeletal diseases, back problems were the major source of healthcare burden; and of cardiovascular diseases, essential hypertension, cerebrovascular disease, and ischemic heart disease accounted for the largest healthcare burdens. The findings are not surprising and reflect the

inevitable effects of aging on the health and healthcare needs of the older segment of the MHS beneficiary population.

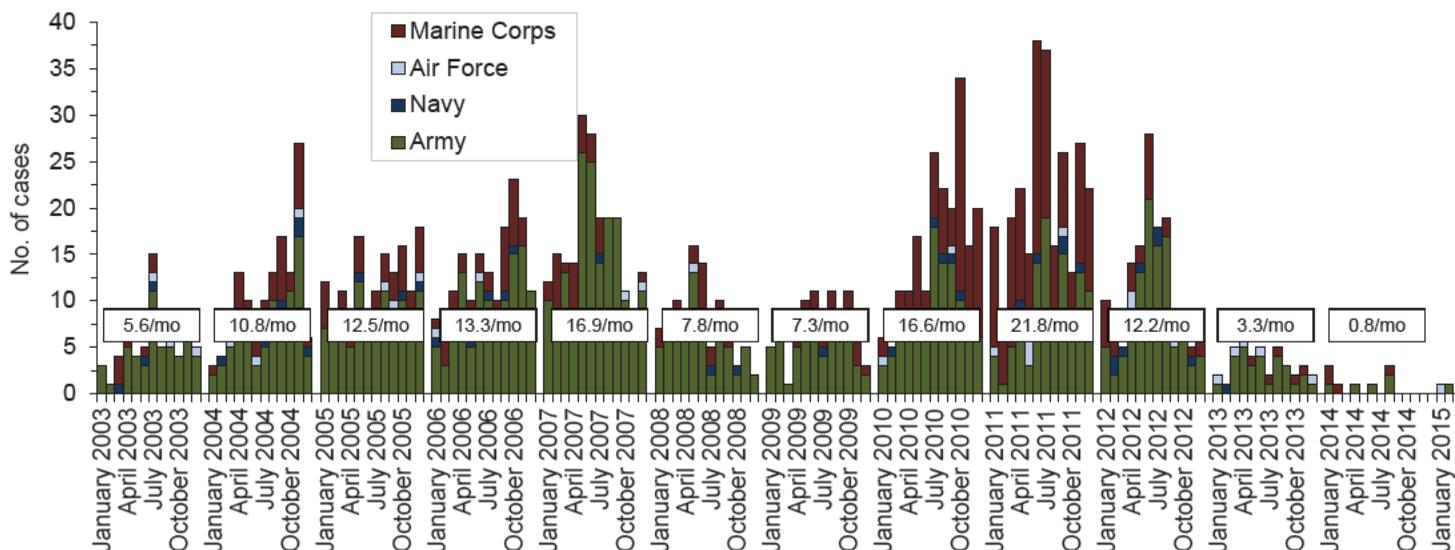
However, many of the health conditions associated with the largest morbidity and healthcare burdens in older age groups of beneficiaries are also associated with unhealthy life styles (e.g., unhealthy diet, inadequate exercise, tobacco use). As such, to varying extents, the most costly health conditions may be preventable and their disabling or life-threatening long-term consequences may be avoidable. Illnesses and injuries that disproportionately contribute to morbidity and healthcare burdens in various age groups of MHS beneficiaries should be targeted for early detection and treatment and by comprehensive prevention and research programs.

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3. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Murray, CJ and Lopez, AD, eds. Harvard School of Public Health (on behalf of the World Health Organization and The World Bank), 1996:120–122.

# Deployment-related Conditions of Special Surveillance Interest, U.S. Armed Forces, by Month and Service, January 2003–March 2015 (data as of 22 April 2015)

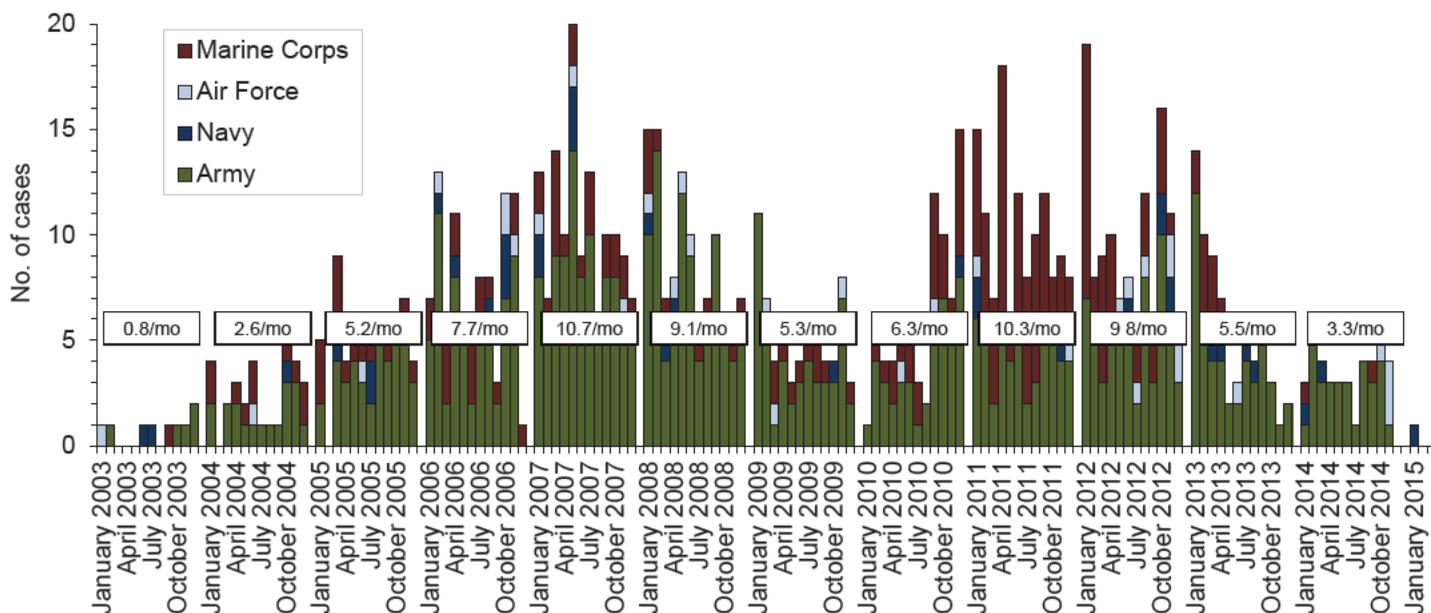
Amputations (ICD-9-CM: 887, 896, 897, V49.6 except V49.61–V49.62, V49.7 except V49.71–V49.72, PR 84.0–PR 84.1, except PR 84.01–PR 84.02 and PR 84.11)<sup>a</sup>



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.

<sup>a</sup>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)<sup>b</sup>



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

<sup>b</sup>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

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