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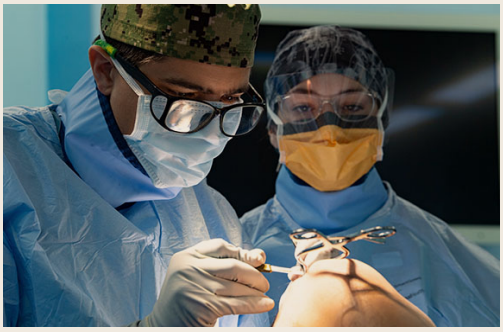

In this issue:

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Editorial Comment

Increased Missing Data Affects Burden Estimates

During the preparation of the *MSMR*'s annual burden of disease issue, Armed Forces Health Surveillance Division (AFHSD) epidemiologists and the *MSMR* staff noted data patterns that indicate incomplete transfer or capture of certain routinely reported elements. As the Military Health System (MHS) completes its transition to the new MHS GENESIS electronic health record (EHR), AFHSD is also in the process of completely transferring or mapping EHR data to the Defense Medical Surveillance System (DMSS). As a result, some data elements typically reported in the annual *MSMR* burden issues may not be completely mapped at this time, including duty disposition status and ambulatory appointment type (in-person vs. virtual).

In addition to these data mapping aspects, 2022 was the first year DMSS data were housed and analyzed from the new MHS Information Platform (MIP). During this transition to the MIP, the number of records transmitted from MHS GENESIS to DMSS are being continually reviewed for completeness of data capture. While both hospitalization and ambulatory records are routinely updated after the end of each calendar year, data transfer completeness has not yet been fully assessed during the MIP transition.

To bring our readership as much information as possible, and in a timely fashion, the *MSMR* staff has elected to mark much of the data in this issue as "provisional." The MSMR may publish revised figures later this year, after data completeness issues have been fully investigated. While the effect of these missing data is most pronounced on the absolute value comparisons year-to-year, e.g., total number of encounters in 2022 versus 2021, the relative values and rank order of the major diagnostic categories are likely unaffected. Notably, the largest decline in ambulatory encounters was observed for 'Z' codes (other factors influencing health status and contact with health services).

While the primary purpose of any EHR is to document care during inpatient and outpatient encounters, extracts of these data are critical to public health surveillance efforts. These extracts are utilized to continuously expand the DMSS as a central repository of medical surveillance data for the U.S. Armed Forces. The AFHSD will continue to monitor data capture from MHS GENESIS to DMSS for quality and completeness and collaborate with health informatics experts within MHS to resolve any remaining data issues.

The *MSMR* is pleased to announce newly updated Instructions for Authors, which provide more details on criteria for publication, types of articles, formatting requirements, and the process for submission. The new Instructions are published in the closing pages (36-39) of this issue. The requirements for the most-frequently published article types (full and brief reports) remain largely unchanged.

The editors encourage prospective authors to review requirements for less commonly submitted articles, including Outbreak Reports, Case Reports, and Surveillance Snapshots. Narrative manuscripts are also encouraged, which may be submitted as Historical Perspectives, Letters to the Editor, and Guest Editorials.

To read the newly updated Instructions to Authors including Information on Clearance and Consent, in addition to guidance on Ethics and Publication Malpractice, please visit our webpage at: https://www.health.mil/Military-Health-Topics/Health-Readiness/AFHSD/Reports-and-Publications/Medical-Surveillance-Monthly-Report/Instructions-for-Authors.

The *MSMR* Instructions for Authors webpage provides the email link for manuscript submissions, along with the Authorship Criteria and Submission Form for initial submissions.

Absolute and Relative Morbidity Burdens Attributable to Various Illnesses and Injuries Among Active Component Members, U.S. Armed Forces, 2022

Reducing preventable injury and illness enhances the readiness of the Armed Forces, as illnesses and injuries degrade service member readiness and can hinder mission accomplishment. Since 2012, the *MSMR* has used a classification system derived from the Global Burden of Disease (GBD) Study[1,2] , in combination with an International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) chapter-based system to broadly describe the morbidity burden among active component service members and categorize hospitalizations and ambulatory visits among this population. The *MSMR* editorial staff continues to refine these classification schemes to improve the usefulness of the information presented.

In these annual burden of disease reports, the *MSMR* groups diagnoses to inform our readership of the major drivers of health care utilization within the Military Health System (MHS) and where changes in policy or preventive emphasis may improve the medical readiness of the force. The major classification system for diagnoses, ICD-10-CM, features over 68,000 separate codes, a more than 5-fold increase from the 13,000 codes available in the previous version (ICD-9-CM).[2] While the ICD-10-CM is organized in logical chapters, the groupings are not optimized to describe burdens of disease in a military population. A delicate balance between "lumping" and "splitting" of diagnoses is required to achieve a meaningful portrayal of the burden in the military population.

The burden of disease in a young, healthy, predominantly male service member population will differ substantially from the general U.S. or global populations. The numerous readiness-related ambulatory visits required of each active duty service member, as well as military living circumstances, training requirements, and access to medical care without cost, may contribute to differing morbidity burden profiles in comparisons to other populations. Unique distributions in population demographics require, at a minimum, age and gender adjustment when comparing military rates to other populations. Typical adjustments are often insufficient to compensate for these unique factors, making comparisons challenging.

Demographic differences are particularly striking when comparing the active component to the general U.S. population. Service applicants are medically screened prior to military service to ensure fitness requirements for physically demanding jobs, and throughout their service mandatory periodic (typically annual) health assessments and screenings among active component members may detect conditions potentially undetected in other populations. People enlist or are commissioned into the active component, typically between 17 and 25 years of age, with the end of service for nearly all members by age 50. In 2022, the mean age of active component service members was approximately 29, with less than 1% of the population over 50.[3] By contrast, the median age of the U.S. population was 38.7, with 36.1% over age 50 in 2021.[4] Women constituted 17.5% of the active component in 2022, compared to 51.0% in the general U.S. population.[4]

Within the military population and its specific settings, categories of illnesses and injuries requiring hospitalization have historically differed from those resulting in the most ambulatory visits. The added requirements for readiness are likely a major factor in ambulatory health care utilization, but rarely for hospitalization. The categories of medical conditions and readiness requirements that account for the most medical encounters overall may differ from those that affect the most individuals or have the most debilitating or long-lasting effects.[1]

This annual summary uses several health care burden measures to quantify the impacts of various illnesses and injuries in 2022 among members of the active component of the U.S. Armed Forces. Health care burden metrics include the total number of medical encounters, individuals affected, and hospital bed days.

What are the new findings?

Provisional data from 2022 indicate injuries, musculoskeletal diseases, and mental health disorders constitute the categories of medical conditions associated with the most medical encounters, largest number of affected service members, and greatest number of hospital days, consistent with previous burden reports. COVID-19 accounted for 1.4% of total active component service member medical encounters in 2022, a slight increase from the 1.2% rate in 2021. Only 0.3% of total hospital bed days in active component service members were for COVID-19 in 2022, an 83% drop from the 1.8% rate in 2021.

What is the impact on readiness and force health protection?

As in previous years, this report documents relatively few illnesses and injury categories that account for a substantial proportion of morbidity and health care burdens affecting U.S. active component service members. Preventable illnesses and injuries proven as disproportionate contributors to morbidity and health care burdens should be high priorities for intervention, research, and resources. Certain conditions that may affect readiness (e.g., pregnancy and maternal conditions) require scheduled, sustained care for optimal health, while other conditions such as injuries resulting from rigorous training for readiness, necessitate proven policies and safeguards to reduce injury rates while maintaining requisite training standards approved by senior leaders and commanders.

Methods

The population for this analysis includes all individuals who served in the active component of the Army, Navy, Air Force, or Marine Corps at any time during the surveillance period of January 1, 2022 through December 31, 2022. Each service member contributed encounters and person-time only for the actual months served during the surveillance period. All data in this analysis were derived from records maintained in the Defense Medical Surveillance System (DMSS), which documents both ambulatory care encounters and hospitalizations

of active component members of the U.S. Armed Forces. DMSS contains all encounters in military medical and civilian treatment facilities when reimbursed through the MHS. Encounters not routinely and completely documented within fixed military and nonmilitary medical treatment facilities (e.g., during deployments, field training exercises, or at sea) are excluded from this analysis. This is the first year that DMSS data were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). Data quality assessments for completeness and timeliness are ongoing during the transition to MIP, and data presented in this report are considered provisional but current as of March 20, 2023.

DMSS data for all inpatient and outpatient medical encounters of active component service members during the surveillance period were summarized according to the primary (first-listed) diagnosis if reported with an ICD-10 code between A00 and T88, an ICD-10 code beginning with Z37 (outcome of delivery), or Department of Defense (DOD) unique personal history codes DOD0101–DOD0105 (personal history of traumatic brain injury). All illness- and injury-specific diagnoses, as defined by ICD-10 codes, were grouped into 153 burden of disease-related "conditions" and 25 "categories" based on a modified version of the classification system developed for the GBD Study.[1] This classification system was developed by the *MSMR* editorial staff in 2012 and is updated annually.

The GBD system groups diagnoses with common pathophysiologic or etiologic bases or significant DOD health policy importance. In this article, some diagnoses grouped into single categories in the GBD system (e.g., mental health disorders) were disaggregated to increase military relevance. In addition, injuries are classified by affected anatomic site rather than cause, as external causes of injuries using NATO Standardization Agreement (STANAG) 2050 codes are incompletely reported in military outpatient records.[5]

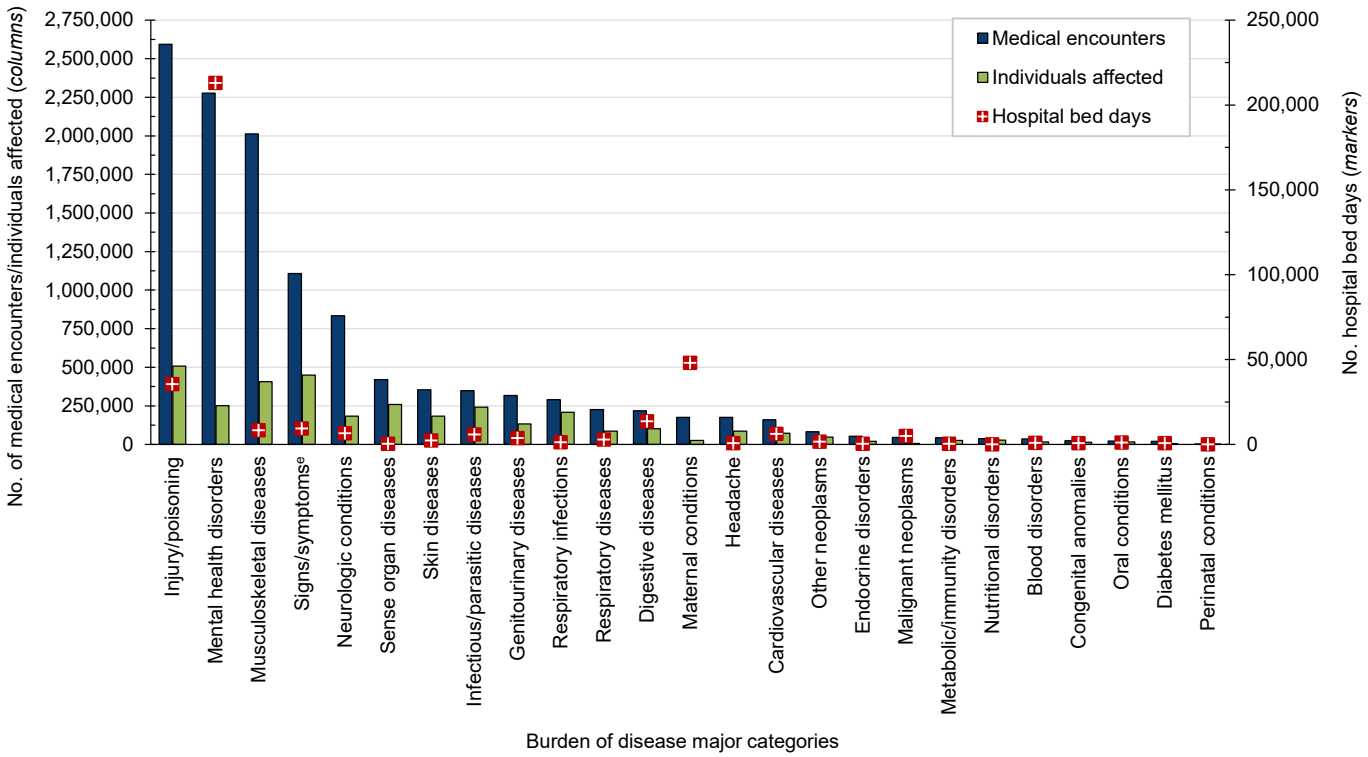
The morbidity burdens attributable to various conditions were estimated based on the total number of medical encounters associated with each condition, i.e., total hospitalizations and ambulatory visits for the condition with a limit of 1 encounter for an individual per condition each day; and numbers of service members affected by each condition, i.e., individuals with at least 1 medical encounter for the condition during the year; as well as total bed days during hospitalizations for each condition.

Results

Morbidity burden, by category

Provisional data indicate that in 2022 active component service members (individuals affected; n=508,355) experienced medical encounters due to injury more than any other morbidity-related category

FIGURE 1a. Medical Encounters,[a] Individuals Affected,[b] and Hospital Bed Days by Burden of Disease Major Category,[c] Active Component, U.S. Armed Forces, 2022[d]



Abbreviation: No., number.
[a]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[b]Individuals with at least 1 hospitalization or ambulatory visit for the condition.
[c]Burden of disease major categories based on a modified version of those defined in the Global Burden of Disease Study.[1]
[d]2022 is the first year for which data from the DMSS were warehoused and analyzed from the Military Health System (MHS) Information Platform (MIP). As part of this transition, data quality assessments for completeness and timeliness are underway. Thus, 2022 data presented in this report are considered provisional but current as of March 20, 2023.
[e]Includes ill-defined conditions.

(Figure 1a). Ranking third in terms of hospital bed days, this major burden of disease category accounted for over one-fifth (21.8%) of all medical encounters **(Figure 1b)**. The injury category combines ICD-10 S (injury) and T codes (burns and poisonings); however, injuries account for nearly 90% of ambulatory encounters within the category **(data not shown)**.[6]

Mental health disorders accounted for more hospital bed days (n=213,002) than any other morbidity-related category, contributing over half (57.7%) of all hospital bed days and ranking fifth for individuals affected **(Figures 1a, 1b)**. Together, injury and mental health disorders accounted for over two-thirds (67.3%) of all hospital bed days and 41.0% of all medical encounters.

Maternal conditions (e.g., pregnancy complications and delivery) accounted for a relatively large proportion of all hospital bed days (n=48,041; 13.0%) but a much smaller proportion of medical encounters overall (n=176,401; 1.5 %) **(Figures 1a, 1b)**. As women comprised only 17.5 % of the active duty force in 2022, these summary statistics understate the impact of these conditions among that group. Maternal conditions were the most frequent medical condition among active component women.

Medical encounters, by condition

In 2022, 5 burden of disease-related conditions accounted for almost one-third (32.0%) of all illness- and injury-related medical encounters: other back problems (e.g., low back pain, other dorsalgia); organic sleep disorders (e.g., insomnia, obstructive sleep apnea); all other signs and symptoms (e.g., fever, headache, general signs and symptoms not otherwise specified); knee injuries; and arm/shoulder injuries **(Figure 2)**. Moreover, the 10 conditions associated with the most medical encounters constituted more than half (55.4%) of all illness- and injury-related medical encounters.

The health conditions that accounted for the most medical encounters among active component service members in 2022 were predominantly injuries, mental health disorders, and musculoskeletal diseases. Of the injuries reported in 2022, knee (5.6%), arm/shoulder (5.6%), foot/ankle (3.8%), and leg (3.0%) resulted in the most medical encounters **(Figure 2, Table)**. The most frequent mental health disorder diagnoses resulted from anxiety (5.2%), adjustment (4.6%), mood (4.5%), and substance abuse disorders (3.0%). Other back problems (9.3%), all other musculoskeletal diseases (5.4%; e.g., pain in foot, pain in leg), and cervicalgia (1.7%) constituted the most medical encounters among musculoskeletal diseases. COVID-19 accounted for 1.4% of total medical encounters during 2022, a proportion nearly unchanged since 2021 (1.2%).

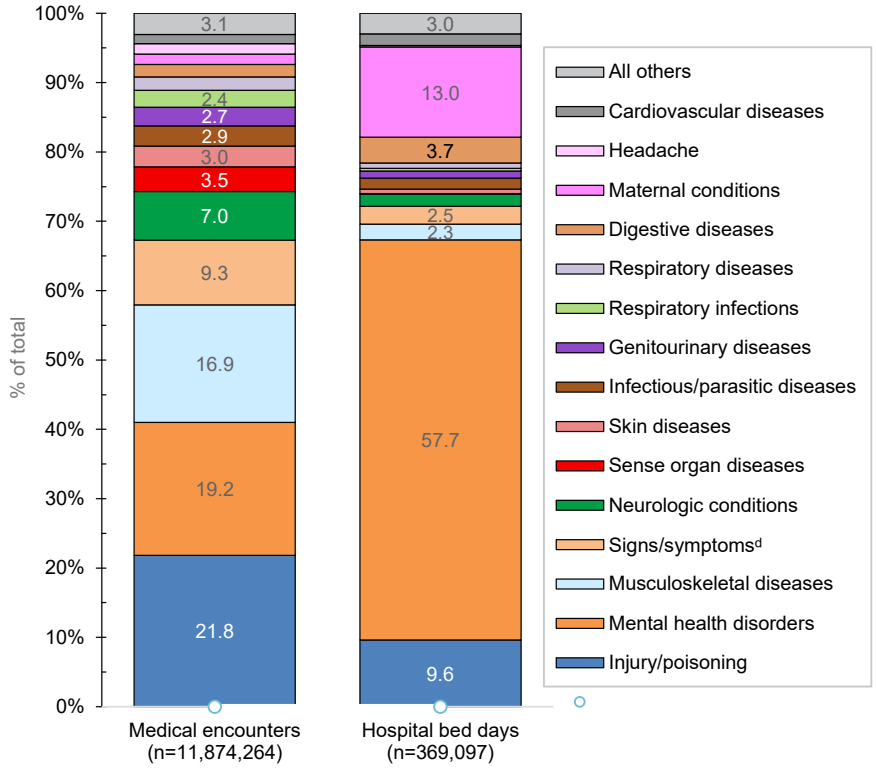
Individuals affected, by condition

In 2022, the 10 conditions that affected the most service members were all other signs and symptoms and respiratory/chest; other back problems and all other musculoskeletal diseases; knee and arm/shoulder injuries; upper respiratory infections; organic sleep disorders; refraction/accommodation disorders; and all other skin diseases. COVID-19 affected 129,923 service members, ranking 12th for number of service members affected in 2022, an increase in rank from 16th in 2021.

Hospital bed days, by condition

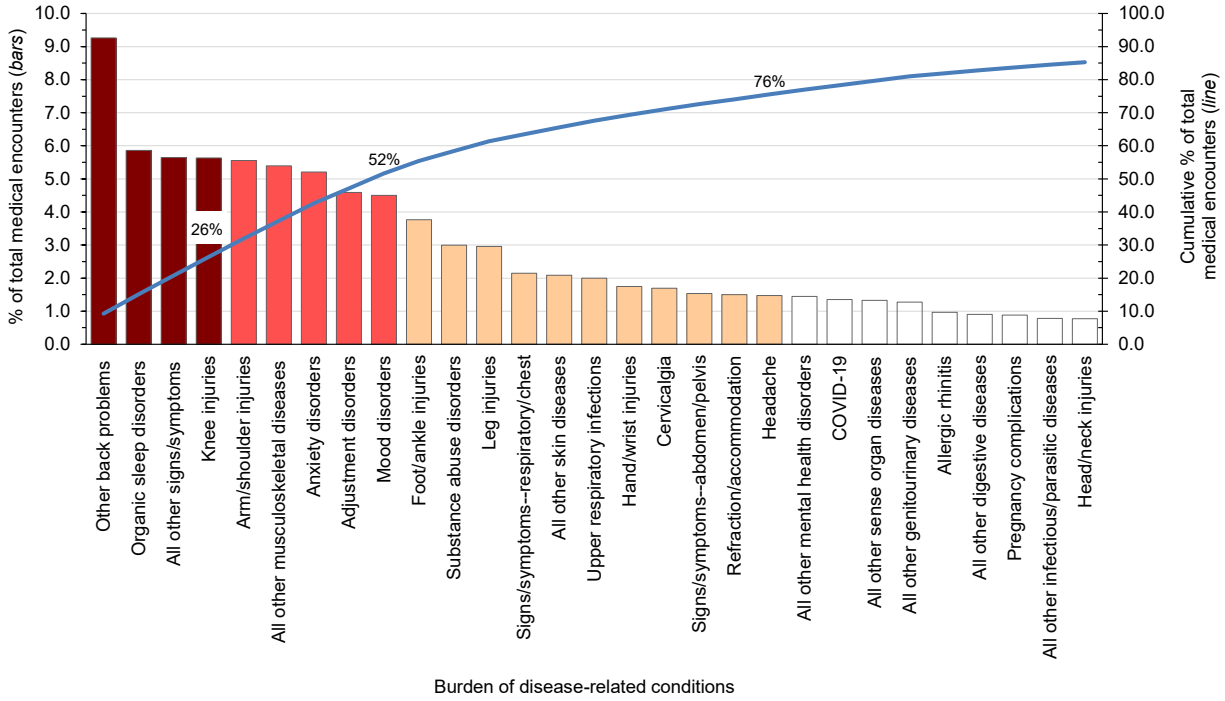
Mood and substance abuse disorders accounted for over one-third (34.1%) of all hospital bed days **(Figure 3)** experienced by active component members in 2022. Four mental health disorders (mood, substance abuse, adjustment, and anxiety) and 2 maternal conditions (pregnancy complications and delivery) combined accounted for almost two-thirds (65.5%) of all hospital bed days **(Table, Figure 3)**. About 10% of all hospital bed days in 2022 were attributable to injuries and poisonings. COVID-19 accounted for 0.3% of total hospital bed days in 2022 within the active component, down from 1.8% in 2021 **(Table)**.

FIGURE 1b. Percentage of Medical Encounters[a] and Hospital Bed Days Attributable to Burden of Disease Major Categories,[b] Active Component, U.S. Armed Forces, 2022[c]



[a]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[b]Burden of disease major categories based on a modified version of those defined in the Global Burden of Disease Study.[1]
[c]2022 data are considered provisional but current as of March 20, 2023.
[d]Includes ill-defined conditions.

FIGURE 2. Percentage and Cumulative Percentage Distribution, Burden of Disease-related Conditions[a] that Accounted for the Most Medical Encounters, Active Component, U.S. Armed Forces, 2022[b]



[a]Burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[b]2022 data are considered provisional but current as of March 20, 2023.

Relationships between health care burden indicators

There was a strong positive correlation between the number of medical encounters attributable to various conditions and the number of individuals affected by those conditions (r=0.87) **(data not shown)**. The 3 leading causes of medical encounters were among the 5 conditions that affected the most individuals **(Table)**. Meanwhile, weak to moderate positive relationships were determined for hospital bed days attributable to conditions and either numbers of individuals affected (r=0.20) by, or medical encounters associated (r=0.43) with, the same conditions. For example, substance abuse disorders and labor and delivery were among the top-ranking conditions by proportion of total hospital bed days, but these conditions affected relatively few active component service members in 2022.

Discussion

This report is consistent with the major findings of prior annual reports on morbidity and health care burdens among U.S. military members. Mental health disorders (including substance abuse disorders), injuries, and musculoskeletal disorders of the back have been leading causes of morbidity and disability among service members throughout military history.[7-13] It is well-recognized that the prevention, treatment, and rehabilitation of back problems and joint injuries, and the detection, characterization, and management of mental health disorders—including substance abuse and deployment stress-related disorders (e.g., post-traumatic stress disorder)—should be the highest priorities for military medical research, public health, and force health protection programs.

In a given population and setting, the classification system or measure utilized to quantify condition-specific morbidity burdens determines conclusions about the relative importance of various conditions and, in turn, resources allocated for their treatment. The additional visits due to readiness requirements may be administrative or a consequence of a training or occupational injury. There is an interest among senior leaders and policymakers in the "cost of readiness," and an ideal burden of disease classification scheme for the military population would enable identification of readiness-related visits.

In 2022, consistent with previous reports, the burden of disease major categories of injury, musculoskeletal diseases, mental health disorders, and maternal conditions accounted for relatively large proportions of the morbidity and health care burdens that affected active component service members. Only 9 (5.9%) of the 153 burden of disease-related conditions accounted for slightly more than half of all illness- and injury-related medical encounters: These conditions included 2 musculoskeletal conditions (other back problems and all other musculoskeletal diseases), 2 anatomic site-defined injuries (knee and arm/shoulder), organic sleep disorders, all other signs and symptoms, and 3 mental health disorders (anxiety, adjustment, and mood disorders). This pattern of illness and injury among U.S. active component members is distinct from other population groups with different demographic distributions and occupational hazards, such as the general U.S. population and non-service member MHS beneficiaries; differing burdens of disease and injury for non-service member MHS beneficiaries will be described in the July 2023 *MSMR*.

TABLE. Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2022

Major category condition[a]	Medical encounters[b]		Individuals affected[c]		Hospital bed days	
	No.	Rank[d]	No.	Rank[d]	No.	Rank[d]
Total	11,874,264		1,108,975		369,097	
Injury and poisoning	**2,593,414**				**35,483**	
Knee injuries	668,899	(4)	147,641	(8)	876	(40)
Arm and shoulder injuries	659,700	(5)	136,891	(10)	2,220	(25)
Foot and ankle injuries	447,109	(10)	134,476	(11)	1,566	(29)
Leg injuries	351,201	(12)	92,433	(17)	4,699	(15)
Hand and wrist injuries	207,468	(16)	76,810	(19)	892	(39)
Head and neck injuries	91,807	(29)	48,592	(26)	9,685	(7)
Back and abdomen injuries	50,337	(35)	28,053	(36)	4,918	(12)
Other complications NOS	30,375	(46)	16,797	(53)	5,777	(11)
Unspecified injury	26,497	(50)	18,381	(44)	780	(42)
Other injury from external causes	25,853	(51)	15,509	(56)	316	(65)
Environmental	20,521	(58)	15,175	(57)	535	(51)
Poisoning, nondrug	4,634	(106)	3,246	(95)	317	(64)
Poisoning, drugs	3,748	(110)	1,794	(105)	2,721	(22)
All other injury	3,036	(115)	2,608	(99)	46	(104)
Other burns	1,484	(122)	883	(114)	135	(84)
Other superficial injury	734	(130)	531	(120)	0	(145)
Underdosing	11	(153)	11	(153)	0	(145)
Mental health disorders	**2,277,195**				**213,002**	
Anxiety disorders	618,332	(7)	100,784	(15)	31,072	(4)
Adjustment disorders	545,017	(8)	112,486	(13)	43,181	(3)
Mood disorders	534,537	(9)	67,589	(21)	68,640	(1)
Substance abuse disorders	355,773	(11)	30,264	(33)	57,201	(2)
All other mental health disorders	171,812	(21)	55,779	(25)	3,001	(20)
Personality disorders	20,232	(61)	4,002	(88)	2,159	(26)
Psychotic disorders	17,074	(66)	1,685	(106)	7,374	(10)
Somatoform disorders	8,986	(88)	2,972	(96)	363	(60)
Tobacco dependence	5,432	(100)	3,676	(93)	11	(126)
Musculoskeletal diseases	**2,012,315**				**8,433**	
Other back problems	1,099,806	(1)	232,887	(2)	3,961	(17)
All other musculoskeletal diseases	640,551	(6)	220,570	(3)	3,541	(18)
Cervicalgia	201,211	(17)	56,628	(23)	48	(103)
Osteoarthritis	40,377	(42)	19,097	(43)	520	(52)
Other knee disorders	14,732	(73)	6,407	(74)	271	(70)
Other shoulder disorders	11,890	(79)	5,431	(77)	68	(96)
Rheumatoid arthritis	3,748	(110)	1,338	(109)	24	(114)
Signs, symptoms and ill-defined conditions	**1,107,442**				**9,384**	
All other signs and symptoms	670,153	(3)	310,911	(1)	7,938	(8)
Respiratory and chest	255,011	(13)	151,665	(6)	695	(46)
Abdomen and pelvis	182,278	(18)	111,365	(14)	751	(44)
Neurologic conditions	**834,358**				**6,509**	
Organic sleep disorders	695,918	(2)	154,760	(5)	301	(67)
Chronic pain	75,518	(30)	25,174	(39)	275	(69)
All other neurologic conditions	42,541	(40)	15,835	(54)	4,909	(13)
Other mononeuritis–upper and lower limbs	11,994	(78)	6,079	(75)	45	(105)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2022

Major category condition[a]	Medical encounters[b]		Individuals affected[c]		Hospital bed days	
	No.	Rank[d]	No.	Rank[d]	No.	Rank[d]
Neurologic conditions (cont.)						
Epilepsy	5,424	(101)	1,682	(107)	608	(48)
Multiple sclerosis	2,727	(117)	484	(123)	371	(59)
Parkinson disease	236	(145)	60	(143)	0	(145)
Sense organ diseases	**419,843**				**354**	
Refraction/accommodation	178,180	(19)	148,788	(7)	3	(138)
All other sense organ diseases	157,678	(23)	99,176	(16)	327	(63)
Hearing disorders	71,430	(32)	44,047	(27)	12	(124)
Glaucoma	10,866	(80)	6,651	(72)	10	(129)
Cataracts	1,689	(120)	940	(113)	2	(142)
Skin diseases	**355,036**				**2,335**	
All other skin diseases	247,800	(14)	138,365	(9)	2,301	(24)
Sebaceous gland diseases	65,478	(34)	35,837	(30)	11	(126)
Contact dermatitis	41,758	(41)	30,749	(32)	23	(115)
Infectious and parasitic diseases	**348,329**				**5,863**	
COVID-19	160,598	(22)	129,923	(12)	1,020	(37)
All other infectious and parasitic diseases	92,888	(28)	64,497	(22)	3,988	(16)
Unspecified viral infection	27,884	(49)	25,542	(38)	34	(113)
Tinea skin infections	23,240	(53)	18,360	(45)	0	(145)
Diarrheal diseases	15,742	(69)	13,700	(58)	501	(53)
STDs (excluding chlamydia)	14,978	(72)	10,836	(65)	99	(89)
Chlamydia	10,472	(81)	8,849	(69)	0	(145)
Hepatitis B and C	1,321	(125)	566	(119)	1	(144)
Tuberculosis	407	(138)	195	(135)	72	(94)
Intestinal nematode infection	427	(137)	393	(129)	0	(145)
Malaria	159	(148)	59	(144)	70	(95)
Bacterial meningitis	121	(150)	21	(150)	78	(92)
Tropical cluster	92	(152)	53	(145)	0	(145)
Respiratory infections	**290,494**				**1,279**	
Upper respiratory infections	237,220	(15)	180,009	(4)	351	(61)
Lower respiratory infections	30,747	(45)	22,630	(40)	917	(38)
Otitis media	22,527	(55)	17,964	(47)	11	(126)
Respiratory diseases	**225,919**				**2,931**	
Allergic rhinitis	114,748	(25)	39,462	(28)	9	(130)
All other respiratory diseases	49,342	(36)	28,615	(35)	2,585	(23)
Asthma	28,520	(47)	12,696	(60)	154	(82)
Chronic sinusitis	15,004	(71)	9,539	(68)	38	(110)
Deviated nasal septum	13,598	(75)	7,566	(70)	127	(88)
Chronic obstructive pulmonary disease	4,707	(105)	3,977	(89)	18	(116)
Genitourinary diseases	**317,724**				**3,848**	
All other genitourinary diseases	151,370	(24)	76,101	(20)	1,538	(30)
Female genital pain	47,136	(37)	19,594	(42)	54	(102)
Menstrual disorders	28,085	(48)	17,505	(50)	181	(79)
Vaginitis and vulvitis	18,736	(65)	13,613	(59)	3	(138)
Other breast disorders	20,492	(59)	10,915	(64)	245	(72)
UTI and cystitis	22,910	(54)	17,356	(51)	138	(83)
Kidney stones	15,044	(70)	6,492	(73)	399	(58)
Nephritis and nephrosis	10,331	(82)	4,408	(86)	1,231	(32)
Benign prostatic hypertrophy	3,620	(113)	2,185	(102)	59	(100)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2022

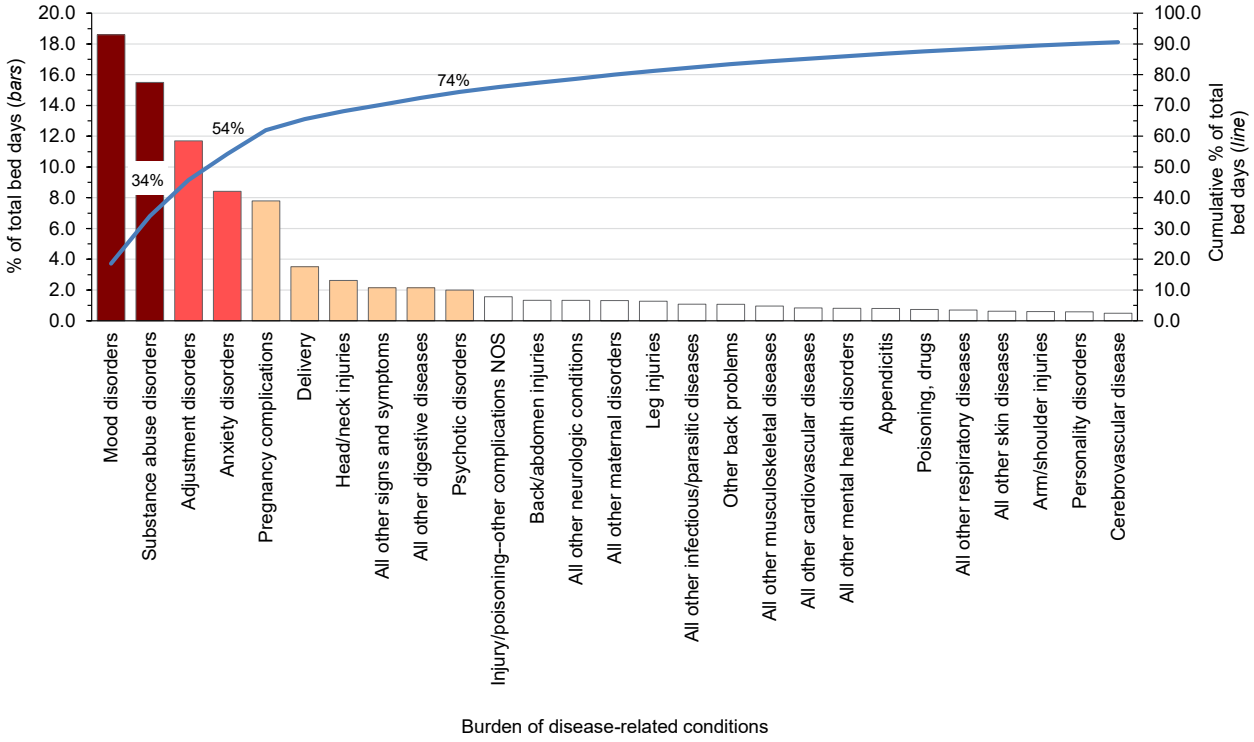
Major category condition[a]	Medical encounters[b]		Individuals affected[c]		Hospital bed days	
	No.	Rank[d]	No.	Rank[d]	No.	Rank[d]
Digestive diseases	**217,949**				**13,665**	
All other digestive diseases	107,329	(26)	56,250	(24)	7,932	(9)
Esophagus disease	44,737	(39)	26,945	(37)	489	(55)
Other gastroenteritis and colitis	32,089	(44)	17,620	(48)	1,670	(28)
Constipation	16,802	(68)	12,370	(62)	80	(91)
Inguinal hernia	9,350	(85)	3,916	(90)	155	(81)
Appendicitis	5,909	(99)	2,685	(98)	2,962	(21)
Peptic ulcer disease	1,262	(126)	791	(115)	249	(71)
Cirrhosis of the liver	471	(135)	134	(137)	128	(87)
Maternal conditions	**176,401**				**48,041**	
Pregnancy complications	104,784	(27)	22,575	(41)	28,772	(5)
All other maternal disorders	38,090	(43)	10,459	(66)	4,859	(14)
Delivery	19,125	(64)	10,218	(67)	12,980	(6)
Ectopic/miscarriage/abortion	8,484	(91)	3,778	(91)	305	(66)
Puerperium complications	5,918	(98)	3,288	(94)	1,125	(33)
Headache	**174,990**				**798**	
Headache	174,990	(20)	86,311	(18)	798	(41)
Cardiovascular diseases	**160,601**				**6,180**	
All other cardiovascular diseases	75,224	(31)	36,633	(29)	3,088	(19)
Essential hypertension	66,621	(33)	35,132	(31)	230	(74)
Cerebrovascular disease	8,298	(92)	2,016	(104)	1,816	(27)
Ischemic heart disease	7,341	(94)	2,919	(97)	771	(43)
Inflammatory	2,563	(118)	1,357	(108)	234	(73)
Rheumatic heart disease	554	(131)	486	(122)	41	(109)
Other neoplasms	**81,602**				**1,595**	
All other neoplasms	45,030	(38)	29,995	(34)	1,073	(35)
Benign skin neoplasm	22,186	(56)	17,508	(49)	4	(137)
Lipoma	9,200	(86)	5,470	(76)	42	(108)
Uterine leiomyoma	5,186	(103)	2,469	(100)	476	(56)
Endocrine disorders	**52,780**				**365**	
Hypothyroidism	14,382	(74)	6,839	(71)	13	(122)
Testicular hypofunction	13,335	(76)	5,127	(78)	0	(145)
Other thyroid disorders	12,204	(77)	4,631	(84)	182	(78)
All other endocrine disorders	9,011	(87)	4,642	(82)	164	(80)
Polycystic ovarian syndrome	3,848	(108)	2,214	(101)	6	(133)
Malignant neoplasms	**44,853**				**4,968**	
All other malignant neoplasms	6,420	(95)	1,081	(111)	1,125	(33)
Lymphoma and multiple myeloma	6,191	(96)	631	(116)	495	(54)
Leukemia	5,260	(102)	327	(131)	1,237	(31)
Melanoma and other skin cancers	4,743	(104)	2,067	(103)	13	(122)
Breast cancer	4,332	(107)	450	(126)	130	(86)
Testicular cancer	3,825	(109)	619	(117)	328	(62)
Colon and rectum cancers	3,662	(112)	312	(132)	536	(50)
Brain cancer	3,427	(114)	216	(134)	572	(49)
Thyroid cancer	1,633	(121)	410	(128)	75	(93)
Prostate cancer	1,409	(123)	259	(133)	60	(99)
Mouth and oropharynx cancers	1,127	(127)	134	(137)	43	(107)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2022

Major category condition[a]	Medical encounters[b]		Individuals affected[c]		Hospital bed days	
	No.	Rank[d]	No.	Rank[d]	No.	Rank[d]
Malignant neoplasms (cont.)						
Cervix uteri cancer	928	(128)	437	(127)	15	(121)
Trachea, bronchus, and lung cancers	385	(139)	69	(141)	61	(98)
Liver cancer	270	(141)	33	(148)	45	(105)
Stomach cancer	264	(142)	36	(147)	191	(77)
Bladder cancer	253	(143)	66	(142)	9	(130)
Ovary cancer	248	(144)	46	(146)	16	(117)
Pancreas cancer	186	(146)	28	(149)	8	(132)
Esophagus cancer	172	(147)	14	(152)	6	(133)
Corpus uteri cancer	118	(151)	20	(151)	3	(138)
Metabolic and immunity disorders	**43,360**				**371**	
Lipoid metabolism disorders	24,140	(52)	18,061	(46)	16	(117)
Other metabolic disorders	8,767	(90)	4,743	(81)	279	(68)
Gout	7,504	(93)	3,694	(92)	38	(110)
Immunity disorders	2,949	(116)	970	(112)	38	(110)
Nutritional disorders	**37,681**				**138**	
All other nutritional disorders	20,393	(60)	16,846	(52)	66	(97)
Overweight, obesity	16,945	(67)	12,123	(63)	16	(117)
Protein-energy malnutrition	343	(140)	83	(139)	56	(101)
Blood disorders	**35,068**				**872**	
All other blood disorders	10,113	(83)	4,968	(79)	400	(57)
Iron-deficiency anemia	9,371	(84)	4,082	(87)	224	(76)
Other non-deficiency anemias	8,786	(89)	4,824	(80)	226	(75)
Hereditary anemias	5,983	(97)	4,514	(85)	16	(117)
Other deficiency anemias	815	(129)	502	(121)	6	(133)
Oral conditions	**22,307**				**1,073**	
All other oral conditions	21,319	(57)	15,527	(55)	1,071	(36)
Periodontal disease	505	(133)	464	(125)	2	(142)
Dental caries	483	(134)	469	(124)	0	(145)
Congenital anomalies	**23,764**				**846**	
All other congenital anomalies	19,925	(62)	12,451	(61)	627	(47)
Congenital heart disease	2,458	(119)	1,087	(110)	134	(85)
Other circulatory anomalies	1,381	(124)	571	(118)	85	(90)
Diabetes mellitus	**19,696**				**744**	
Diabetes mellitus	19,696	(63)	4,642	(82)	744	(45)
Conditions arising during the perinatal period[e]	**1,143**				**20**	
All other perinatal anomalies	536	(132)	379	(130)	12	(124)
Low birth weight	457	(136)	183	(136)	5	(136)
Birth asphyxia and birth trauma	150	(149)	72	(140)	3	(138)

Abbreviations: No., number; NOS, not otherwise specified; UTI, urinary tract infection; STDs, sexually transmitted diseases.
[a]Burden of disease major categories and burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[b]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[c]Individuals with at least 1 hospitalization or ambulatory visit for the condition.
[d]Rank is based on the number of encounters, individuals affected, or hospital bed days in the respective columns within the listing of 153 burden-related disease conditions. For medical encounters, 1 pair of tied values (n=3,748) were given the same ranking (110). For individuals affected, 2 pairs of tied values (n=134; n=4,642) were given the same ranking (82; 137). For hospital bed days, there were 8 conditions with the rank of 145 (0); 12 other conditions had tied rankings.
[e]Conditions affecting newborns erroneously coded on service member medical records.

FIGURE 3. Percentage and Cumulative Percentage Distribution, Burden of Disease-related Conditions[a] that Accounted for the Most Hospital Bed Days, Active Component, U.S. Armed Forces, 2022[b]



Abbreviation: NOS, not otherwise specified.
[a]Burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[b]2022 data are considered provisional but current as of March 20, 2023.

As noted, the data presented in this report are considered provisional, and ongoing inquiries regarding data completeness in the MHS MIP may result in later updates to the patterns of morbidity and health care burden reported here.

Although 2022 was affected by the COVID-19 pandemic, COVID-19 accounted for relatively modest numbers of medical encounters and bed days compared to other conditions in this analysis, likely due to several factors, among them the fact that active component service members represent a relatively young and healthy population. The unique coding scheme for COVID-19 may also mask its true impact. COVID-19 encounters have a special purpose ICD-10 code (U07.1) not included with other infectious diseases. The number of ambulatory encounters for COVID-19 alone was nearly equal to the total ambulatory encounters for all infectious diseases (ICD codes A and B). It is possible some COVID-19 encounters were coded under either infectious diseases, acute respiratory infections (ICD-10 codes J00-J06), or other general symptoms and signs (ICD-10 code R68.89). ICD-10 code U07.1 may have been used as a secondary code, or not at all, for some COVID-19 encounters.

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Hospitalizations Among Active Component Members, U.S. Armed Forces, 2022

This report documents the frequencies, rates, trends, and distributions of hospitalization among active component members of the U.S. Army, Navy, Air Force, and Marine Corps during calendar year 2022. Summaries are based on standardized hospitalization records at U.S. military and non-military (reimbursed through the Military Health System [MHS]) medical facilities worldwide that are routinely maintained in the Defense Medical Surveillance System (DMSS).

This is the first year that DMSS data were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). Data quality assessments for completeness and timeliness are ongoing during the transition to MIP. Thus, data presented in this report are considered provisional but current as of March 28, 2023.

In this report, primary (first-listed) discharge diagnoses are considered indicative of the main reason for hospitalization. As in previous *MSMR* reports, summaries are based on the first 3 digits of the International Classification of Diseases, 10th Revision (ICD-10) of the primary discharge diagnoses. Hospitalizations not routinely documented by standardized, automated records, e.g., during field training exercises or while shipboard, are not available in a centralized location for health surveillance purposes and are excluded from this report. Incidence rates were calculated per 1,000 p-yrs. Percent change in incidence was calculated using unrounded rates.

Frequencies, rates, and trends

In 2022, 57,009 hospitalizations were recorded for the active component members of the U.S. Army, Navy, Air Force, and Marine Corps **(Table 1)**; 46.4% of these hospitalizations were in non-military facilities **(data not shown)**, compared to 37.7% in 2021. The crude annual hospitalization rate (all causes) in 2022 was 43.9 per 1,000 service member p-yrs **(Table 1)**, the lowest rate from 2013 through 2022, during which rates fell 23.8% **(Figure 1)**. Provisional data indicate that hospitalization rates have declined monotonically over the past 10 years, with the largest rate drop, 12%, within the current reporting period.

Hospitalizations by ICD-10 major diagnostic categories

In 2022, 4 ICD-10 major diagnostic categories accounted for almost three-quarters (73.7%) of all active component hospitalizations: mental health disorders (33.5%), pregnancy- and delivery-related conditions (24.0%), injury (8.7%), and digestive system disorders (7.5%) **(Table 1)**. Consistent with findings from 2018 and 2020, hospitalizations for mental health disorders in 2022 accounted for more than for any other major diagnostic category; 2009 was the last year in which another diagnostic category (pregnancy- and delivery-related conditions) surpassed hospitalizations for mental health disorders **(data not shown)**. COVID-19 accounted for 0.44% of total hospitalizations in active component service members in 2022, a 70% decline from 1.5% in 2021.

Provisional data indicate that numbers and rates of hospitalizations from 2018 to 2022 decreased for all major diagnostic categories except mental health disorders, which increased slightly (5.7% to 5.9%) **(Table 1)**. The largest decline in hospitalizations from 2018 to 2022 was in the musculoskeletal system and connective tissue diagnostic category (1,659 fewer hospitalizations; 34.1% decrease). The next largest drop in hospitalizations from 2018 to 2022 was in the injury category (1,570 fewer hospitalizations; 24.1% decrease). The largest hospitalization rate declines occurred in the categories of skin and subcutaneous tissue (44.0%), respiratory system (40.0%), other (39.4%), and genitourinary system (37.0%).

The relative proportion of hospitalizations by major diagnostic category was generally stable over the surveillance period **(Table 1)**. COVID-19 was included as a separate diagnostic category in 2020 and ranked 13th in total hospitalizations, but declined to 16th in total visits in 2022.

What are the new findings?

The provisional estimate of the hospitalization rate in U.S. military and non-military medical facilities in 2022 is 43.9 per 1,000 person-years (p-yrs), the lowest rate in 10 years. As in prior years, the majority (57.5%) of hospitalizations were associated with primary diagnoses in the categories of mental health disorders and pregnancy-related conditions. Less than 0.5% of total hospitalizations in active component service members in 2022 were attributed to COVID-19, a substantial decrease from 1.5% in 2021.

What is the impact on readiness and force health protection?

As in previous years, mental health disorders, including substance abuse disorders, were associated with the longest median hospital stay (6 days). Moreover, 5% of mental health disorder hospitalizations lasted longer than 30 days. Prolonged hospitalizations, aftercare, and early attrition due to these common disorders can diminish not only individual but unit operational readiness.

Hospitalizations, by sex

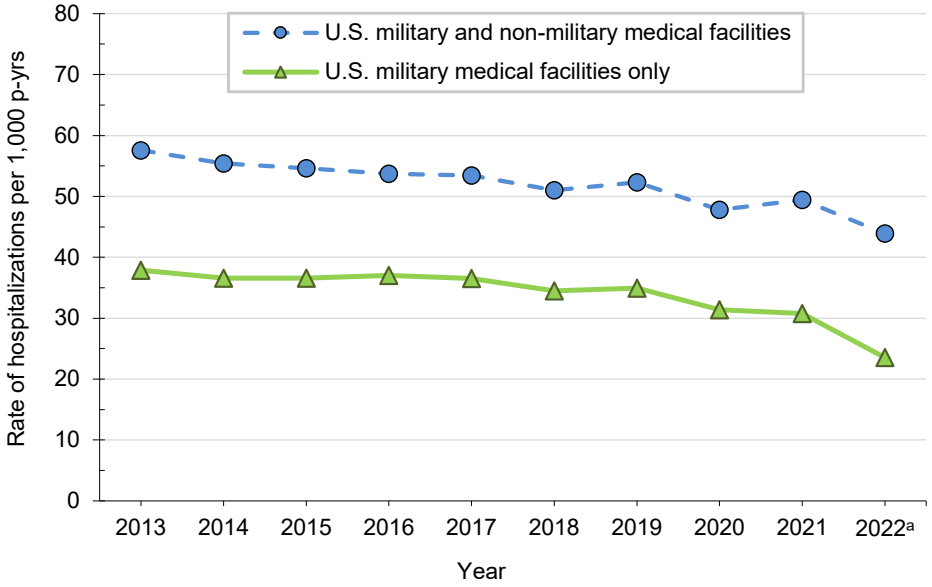
The hospitalization rate (all causes) among service women in 2022 was more than 3 times that of service men (101.9 per 1,000 p-yrs and 31.4 per 1,000 p-yrs, respectively). These data are consistent with general U.S. population hospitalization rate trends published in 2022 for women and men aged 18-44 (95 per 1,000 p-yrs and 37 per 1,000 p-yrs respectively).[1] Excluding pregnancy and delivery, the rate of hospitalizations among women (41.7 per 1,000 p-yrs) was 32.2% higher than among men (31.6 per 1,000 p-yrs) in 2022 **(data not shown)**. This rate difference was primarily due mental health disorder hospitalizations (female:male rate difference [RD]: 6.6 per

TABLE 1. Numbers, Rates,[a] and Ranks[b] of Hospitalizations by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2018, 2020, and 2022

	2018			2020			2022[c]		
Major diagnostic category (ICD-10)	No.	Rate[a]	Rank[b]	No.	Rate[a]	Rank[b]	No.	Rate[a]	Rank[b]
Mental disorders (F01-F99)	18,012	13.9	(1)	18,191	13.7	(1)	19,079	14.7	(1)
Pregnancy and delivery (O00-O9A, relevant Z codes)[d]	14,935	70.1	(2)	15,785	69.3	(2)	13,708	60.4	(2)
Injury and poisoning (S00-T88, DOD0101-DOD0105)	6,515	5.0	(3)	5,690	4.3	(3)	4,945	3.8	(3)
Digestive system (IK00-K95)	5,328	4.1	(4)	5,222	3.9	(4)	4,273	3.3	(4)
Musculoskeletal system (M00-M99)	4,861	3.7	(5)	3,988	3.0	(5)	3,202	2.5	(5)
Signs, symptoms, and ill-defined conditions (R00-R99)	3,057	2.4	(6)	2,440	1.8	(6)	2,144	1.7	(6)
Circulatory system (I00-I99)	1,651	1.3	(10)	1,510	1.1	(9)	1,361	1.0	(7)
Genitourinary system (N00-N99)	2,011	1.6	(8)	1,588	1.2	(8)	1,269	1.0	(8)
Other (Z00–Z99, except pregnancy-related)[e]	2,051	1.6	(7)	1,819	1.4	(7)	1,245	1.0	(9)
Nervous system and sense organs (G00-G99, H00-H95)	1,466	1.1	(11)	1,289	1.0	(11)	1,160	0.9	(10)
Respiratory system (J00-J99, U07.0)	1,807	1.4	(9)	1,492	1.1	(10)	1,086	0.8	(11)
Neoplasms (C00-D49)	1,358	1.0	(12)	1,224	0.9	(12)	1,031	0.8	(12)
Infectious and parasitic diseases (A00-B99)	1,001	0.8	(14)	881	0.7	(13)	807	0.6	(13)
Skin and subcutaneous tissue (L00-L99)	1,058	0.8	(13)	748	0.6	(14)	594	0.5	(14)
Endocrine, nutrition, immunity (E00-E89)	523	0.4	(15)	564	0.4	(15)	442	0.3	(15)
COVID-19 (U07.1, U09.9)	--	--	--	522	0.4	(16)	249	0.2	(16)
Hematologic and immune disorders (D50-D89)	277	0.2	(16)	293	0.2	(17)	228	0.2	(17)
Congenital anomalies (Q00-Q99)	217	0.2	(17)	207	0.2	(18)	186	0.1	(18)
Total	66,128	51.0		63,453	47.8		57,009	43.9	

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number.
[a]Rate per 1,000 person-years.
[b]Rank of major diagnostic category based on number of hospitalizations.
[c]2022 is the first year for which data from the DMSS were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). As part of this transition, data quality assessments for completeness and timeliness are underway, and 2022 data presented in this report are considered provisional but current as of March 28, 2023.
[d]Rate of pregnancy and delivery-related hospitalizations among females only.
[e]Other factors influencing health status and contact with health services (excluding pregnancy-related).

FIGURE 1. Rates of Hospitalization by Type of Medical Facility, Active Component, U.S. Armed Forces, 2013–2022

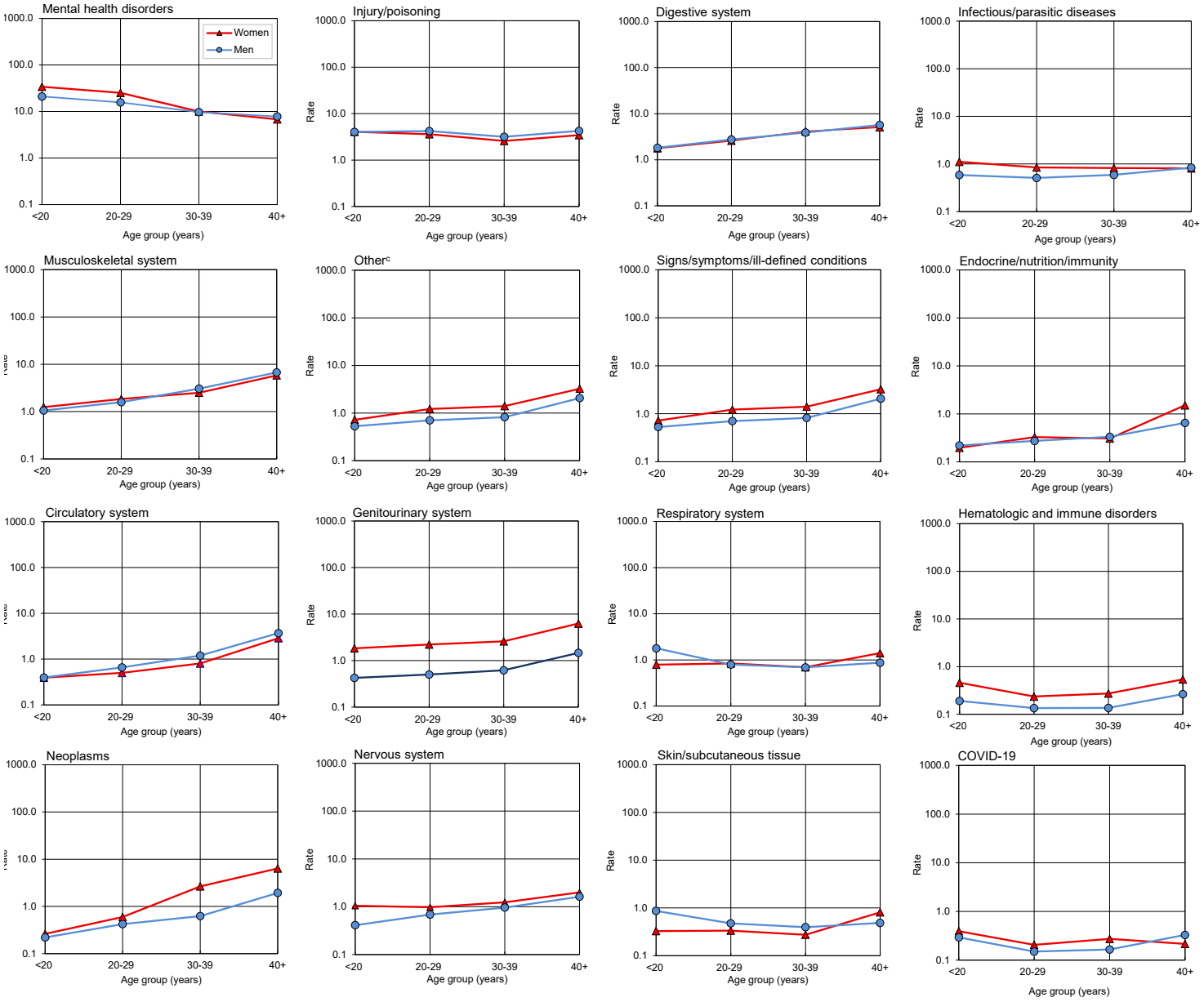


Abbreviation: P-yrs, person-years.
[a]2022 data are considered provisional but current as of March 28, 2023.

1,000 p-yrs) and genitourinary disorders (RD: 2.0 per 1,000 p-yrs) **(data not shown)**. Excluding pregnancy- and delivery-related conditions, hospitalization rates were relatively similar among men and women for the remaining 15 major diagnostic categories **(data not shown)**.

Relationships between age and hospitalization rates varied by major diagnostic category **(Figure 2)**. Rates among women in all age groups were consistently higher for several categories: other factors influencing health status and contact with health services; signs/symptoms and other ill-defined conditions; genitourinary system; neoplasms; nervous system; and hematologic and immune disorders. Except in the youngest age group, male rates were higher for the injury and circulatory system categories. Among both sexes, hospitalization rates generally increased with age for neoplasms, musculoskeletal system/connective tissue disorders, digestive system diseases,

FIGURE 2. Rates[a] of Hospitalization by ICD-10 Major Diagnostic Category, Age Group, and Sex, Active Component, U.S. Armed Forces, 2022[b]



Abbreviation: ICD-10, International Classification of Diseases, 10th Revision.
[a]Rate per 1,000 person-years; rates are shown on a log scale.
[b]2022 data are considered provisional but current as of March 28, 2023.
[c]Other factors influencing health status and contact with health services (Z00–Z99, excluding pregnancy-related).

genitourinary system diseases, circulatory system diseases, other factors influencing health status and contact with health services, and signs/symptoms and other ill-defined conditions. Rates decreased with increasing age for mental health disorders and were relatively stable across all age groups for injury, infectious/parasitic diseases, respiratory system disorders, skin and subcutaneous tissue, hematologic and immune disorders, as well as COVID-19.

Most frequent diagnoses

Adjustment disorders was the most frequent primary discharge diagnosis among both men (n=4,861) and women (n=1,321) **(Table 2)**, accounting for 10.8% of total hospitalizations in 2022. Alcohol dependence (n=2,525), recurrent major depressive disorder (severe without psychotic features) (n=1,490), other and unspecified acute appendicitis (n=802), post-traumatic stress disorder (PTSD) (n=697), and single episode major depressive disorder (unspecified) (n=530) were the next most frequent diagnoses in men **(Table 2)**. Mental health disorder diagnoses accounted for more than two-fifths (42.9 %) of all hospitalizations among men.

For women, pregnancy- and delivery-related conditions constituted the leading major diagnostic category, accounting for almost three-fifths (59.1%) of all female

TABLE 2. Numbers and Percentages of the Most Frequent Diagnoses During Hospitalization Among Men by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2022[a]

Diagnostic category (ICD-10 codes) ♂	No.	%[b]
Mental health disorders (F01-F99)	**14,511**	
Adjustment disorders	4,861	33.5
Alcohol dependence	2,525	17.4
Major depressive disorder, recurrent severe without psychotic features	1,490	10.3
Post-traumatic stress disorder (PTSD)	697	4.8
Major depressive disorder, single episode, unspecified	530	3.7
Injury and poisoning (S00–T98, DOD0101–DOD0105)	**4,186**	
Infection following a procedure	183	4.4
Concussion	181	4.3
Unspecified injury	115	2.7
Fracture of shaft of tibia	105	2.5
Other fractures of lower leg	101	2.4
Digestive system (K00–K95)	**3,558**	
Other and unspecified acute appendicitis	802	22.5
Acute appendicitis with localized peritonitis	214	6.0
Acute pancreatitis, unspecified	187	5.3
Alcohol induced acute pancreatitis	140	3.9
Other and unspecified intestinal obstruction	105	3.0
Musculoskeletal system (M00–M99)	**2,677**	
Other specified disorders of muscle	401	15.0
Thoracic, thoracolumbar and lumbosacral intervertebral disc disorders with radiculopathy	219	8.2
Spinal stenosis	195	7.3
Major anomalies of jaw size	132	4.9
Other spondylosis with radiculopathy	104	3.9
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	**1,696**	
Other symptoms and signs involving emotional state	461	27.2
Chest pain, unspecified	118	7.0
Syncope and collapse	116	6.8
Other chest pain	109	6.4
Other symptoms and signs involving cognitive functions and awareness	95	5.6
Circulatory system (I00–I99)	**1,186**	
Pulmonary embolism without acute cor pulmonale	116	9.8
Non-ST elevation (NSTEMI) myocardial infarction	82	6.9
Unspecified atrial fibrillation and atrial flutter	51	4.3
Acute embolism and thrombosis of deep veins of lower extremity	47	4.0
Paroxysmal atrial fibrillation	46	3.9
Other (Z00–Z99, except pregnancy-related)[c]	**927**	
Encounter for antineoplastic chemotherapy and immunotherapy	162	17.5
Encounter for examination and observation for unspecified reason	158	17.0
Aftercare following joint replacement surgery	92	9.9
Encounter for other orthopedic aftercare	92	9.9
Encounter for other specified postprocedural aftercare	80	8.6
Nervous system and sense organs (G00–G99, H00–H95)	**902**	
Sleep apnea	66	7.3
Epilepsy, unspecified	62	6.9
Acute pain, not elsewhere classified	40	4.4
Brachial plexus disorders	30	3.3
Transient cerebral ischemic attack, unspecified	27	3.0

Diagnostic category (ICD-10 codes) ♂	No.	%[b]
Respiratory system (J00-J99, U07.0)	**895**	
Peritonsillar abscess	104	11.6
Pneumonia, unspecified organism	77	8.6
Deviated nasal septum	55	6.1
Acute respiratory failure	51	5.7
Other pneumothorax and air leak	45	5.0
Genitourinary system (N00–N99)	**674**	
Acute kidney failure, unspecified	139	20.6
Hydronephrosis with renal and ureteral calculous obstruction	65	9.6
Calculus of kidney	44	6.5
Calculus of ureter	43	6.4
Torsion of testis	28	4.2
Neoplasms (C00–D49)	**666**	
Acute lymphoblastic leukemia [ALL]	27	4.1
Malignant neoplasm of testis, unspecified whether descended or undescended	22	3.3
Malignant neoplasm of prostate	21	3.2
Malignant neoplasm of thyroid gland	19	2.9
Malignant neoplasm of frontal lobe	18	2.7
Infectious and parasitic diseases (A00–B99)	**613**	
Sepsis, unspecified organism	228	37.2
Infectious gastroenteritis and colitis, unspecified	29	4.7
Other specified sepsis	26	4.2
Viral intestinal infection, unspecified	25	4.1
Infectious mononucleosis, unspecified	22	3.6
Skin and subcutaneous tissue (L00–L99)	**513**	
Cellulitis and acute lymphangitis of other parts of limb	203	39.6
Pilonidal cyst and sinus without abscess	30	5.8
Pilonidal cyst and sinus with abscess	27	5.3
Cellulitis and acute lymphangitis of finger and toe	25	4.9
Cutaneous abscess, furuncle and carbuncle of limb	24	4.7
Endocrine, nutrition, immunity (E00–E89)	**349**	
Type 2 diabetes mellitus with ketoacidosis	66	18.9
Type 1 diabetes mellitus with ketoacidosis	34	9.7
Hypo-osmolality and hyponatremia	22	6.3
Type 2 diabetes mellitus with other specified complications	21	6.0
Thyrotoxicosis with diffuse goiter	20	5.7
Hematologic and immune disorders (D50–D89)	**163**	
Neutropenia, unspecified	23	14.1
Iron deficiency anemia, unspecified	20	12.3
Immune thrombocytopenic purpura	20	12.3
Anemia, unspecified	15	9.2
Thrombocytopenia, unspecified	10	6.1
Congenital anomalies (Q00–Q99)	**123**	
Other congenital deformities of hip	14	11.4
Congenital insufficiency of aortic valve	9	7.3
Malformation of coronary vessels	8	6.5
Arteriovenous malformation of cerebral vessels	8	6.5
Atrial septal defect	7	5.7

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number; NSTEMI, non-ST segment elevation myocardial infarction; NEC, not elsewhere classified.
[a]2022 data are considered provisional but current as of March 28, 2023.
[b]Percentage of the total number of hospitalizations within the diagnostic category.
[c]Other factors influencing health status and contact with health services (excluding pregnancy-related).

TABLE 3. Numbers and Percentages of the Most Frequent Diagnoses During Hospitalization Among Women by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2022[a]

Diagnostic category (ICD-10-CM codes) ♀	No.	%[b]
Pregnancy and delivery (O00-O99, relevant Z codes)	**13,708**	
Post-term pregnancy	1,193	8.7
Abnormality in fetal heart rate and rhythm complicating labor and delivery	971	7.1
Maternal care due to uterine scar from previous surgery	834	6.1
Premature rupture of membranes, onset of labor within 24 hours of rupture	726	5.3
Gestational [pregnancy-induced] hypertension without significant proteinuria, complicating childbirth	718	5.2
Mental health disorders (F01-F99)	**4,568**	
Adjustment disorders	1,321	28.9
Major depressive disorder, recurrent severe without psychotic features	660	14.4
Post-traumatic stress disorder (PTSD)	492	10.8
Alcohol dependence	313	6.9
Major depressive disorder, single episode, unspecified	157	3.4
Injury and poisoning (S00–T98, DOD0101–DOD0105)	**759**	
Poisoning by, adverse effect of and underdosing of 4-Aminophenol derivatives	52	6.9
Poisoning by, adverse effect of and underdosing of other and unspecified antidepressants	52	6.9
Infection following a procedure	40	5.3
Unspecified injury	35	4.6
Concussion	24	3.2
Digestive system (K00–K95)	**715**	
Other and unspecified acute appendicitis	137	19.2
Acute cholecystitis	34	4.8
Calculus of gallbladder with acute cholecystitis	31	4.3
Biliary acute pancreatitis	24	3.4
Acute pancreatitis, unspecified	23	3.2
Genitourinary system (N00-N99)	**595**	
Abnormal uterine and vaginal bleeding, unspecified	52	8.7
Other and unspecified ovarian cysts	49	8.2
Hypertrophy of breast	36	6.1
Tubulo-interstitial nephritis, not specified as acute or chronic	34	5.7
Acute pyelonephritis	33	5.5
Musculoskeletal system (M00–M99)	**525**	
Other specified disorders of muscle	50	9.5
Thoracic, thoracolumbar and lumbosacral intervertebral disc disorders with radiculopathy	40	7.6
Major anomalies of jaw size	36	6.9
Anomalies of dental arch relationship	29	5.5
Spinal stenosis	27	5.1
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	**448**	
Other symptoms and signs involving emotional state	114	25.4
Syncope and collapse	34	7.6
Pain localized to other parts of lower abdomen	32	7.1
Unspecified abdominal pain	27	6.0
Unspecified convulsions	18	4.0
Neoplasms (C00–D49)	**365**	
Leiomyoma of uterus, unspecified	114	31.2
Intramural leiomyoma of uterus	36	9.9
Subserosal leiomyoma of uterus	25	6.8
Malignant neoplasm of breast of unspecified site	13	3.6
Submucous leiomyoma of uterus	13	3.6
Other (Z00–Z99, except pregnancy-related)[c]	**318**	
Encounter for examination and observation for unspecified reason	61	19.2
Encounter for other orthopedic aftercare	32	10.1
Encounter for antineoplastic chemotherapy and immunotherapy	29	9.1
Aftercare following joint replacement surgery	25	7.9
Encounter for other specified postprocedural aftercare	21	6.6
Nervous system and sense organs (G00–G99, H00–H95)	**258**	
Epilepsy, unspecified	17	6.6
Acute pain, not elsewhere classified	17	6.6
Multiple sclerosis	15	5.8
Brachial plexus disorders	15	5.8
Migraine with aura	14	5.4
Infectious and parasitic diseases (A00–B99)	**194**	
Sepsis, unspecified organism	84	43.3
Sepsis due to other Gram-negative organisms	15	7.7
Infectious gastroenteritis and colitis, unspecified	13	6.7
Other specified sepsis	11	5.7
Enterocolitis due to Clostridium difficile	10	5.2
Respiratory system (J00–J99, U07.0)	**191**	
Peritonsillar abscess	20	10.5
Pneumonia, unspecified organism	19	9.9
Other intraoperative and postprocedural complications and disorders of respiratory system, NEC	13	6.8
Chronic tonsillitis and adenoiditis	12	6.3
Other and unspecified asthma	8	4.2
Circulatory system (I00–I99)	**175**	
Pulmonary embolism without acute cor pulmonale	33	18.9
Acute embolism and thrombosis of deep veins of lower extremity	7	4.0
Orthostatic hypotension	7	4.0
Supraventricular tachycardia	6	3.4
Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries	6	3.4
Endocrine, nutrition, immunity (E00–E89)	**93**	
Thyrotoxicosis with diffuse goiter	14	15.1
Hypokalemia	9	9.7
Dehydration	6	6.5
Type 1 diabetes mellitus with ketoacidosis	5	5.4
Nontoxic multinodular goiter	4	4.3
Skin and subcutaneous tissue (L00–L99)	**81**	
Cellulitis and acute lymphangitis of other parts of limb	17	21.0
Cutaneous abscess, furuncle and carbuncle of limb	10	12.3
Pilonidal cyst and sinus with abscess	9	11.1
Cellulitis and acute lymphangitis of finger and toe	7	8.6
Cellulitis and acute lymphangitis of face and neck	4	4.9
Hematologic and immune disorders (D50-D89)	**65**	
Iron deficiency anemia, unspecified	15	23.1
Acute posthemorrhagic anemia	9	13.8
Iron deficiency anemia secondary to blood loss (chronic)	6	9.2
Neutropenia, unspecified	5	7.7
Other iron deficiency anemias	4	6.2

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number; NSTEMI, non-ST segment elevation myocardial infarction; NEC, not elsewhere classified.
[a]2022 data are considered provisional but current as of March 28, 2023.
[b]Percentage of the total number of hospitalizations within the diagnostic category.
[c]Other factors influencing health status and contact with health services (excluding pregnancy-related).

hospitalizations, although adjustment disorders were the most frequent cause when examining ICD-10 diagnoses through the fourth character **(Table 3)**. Other leading causes of hospitalization included recurrent major depressive disorder (severe without psychotic features) (n=660), PTSD (n=492), and alcohol dependence (n=313). Mental health disorder diagnoses accounted for about one-fifth (19.7 %) of all hospitalizations among women **(Table 3)**.

Durations of hospitalizations

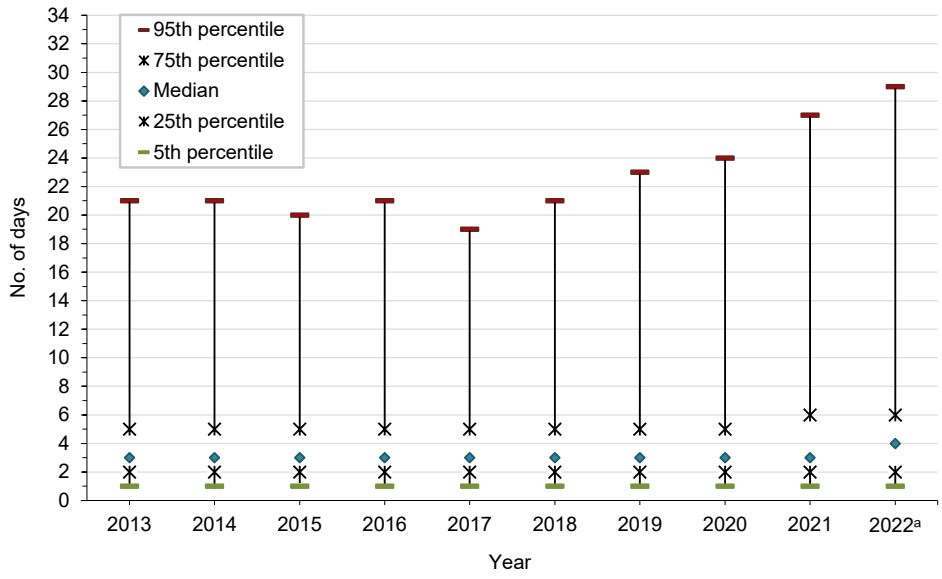
Hospitalization durations show a highly right-skewed (positive) distribution when charted, with the lower limit equal to 1 day and a mode of 2 days. Because length of hospital stay is not normally distributed, the median duration with interquartile range (IQR) was chosen as the best measure of central tendency. From 2013 to 2022, the median (IQR) duration of hospital stays (all causes) remained stable at 3 (2-5) days with an increase to 4 (2-6) days in 2022 **(Figure 3)**.

Medians and IQRs of hospitalization durations varied substantially by major diagnostic category. Median lengths of hospitalization varied from 2 (2-4) days (musculoskeletal system [2-3]; genitourinary system disorders [2-3]; digestive system; respiratory system [2-4]; signs, symptoms, and ill-defined conditions [1-4]) to 6 days for mental health disorders (4-12). For one half of ICD diagnostic categories, 5% of hospitalizations exceeded 10 days: circulatory system disorders (11 days), hematologic and immune disorders (12 days), signs, symptoms, and ill-defined conditions (14 days), COVID-19 (18 days), neoplasms (23 days), nervous system/sense organ disorders (25 days), injury/poisoning (25 days), mental health disorders (34 days), and other non-pregnancy-related factors influencing health status and contact with health services (primarily orthopedic aftercare and rehabilitation following prior illness or injury) (41 days) **(Figure 4)**.

Hospitalizations, by service

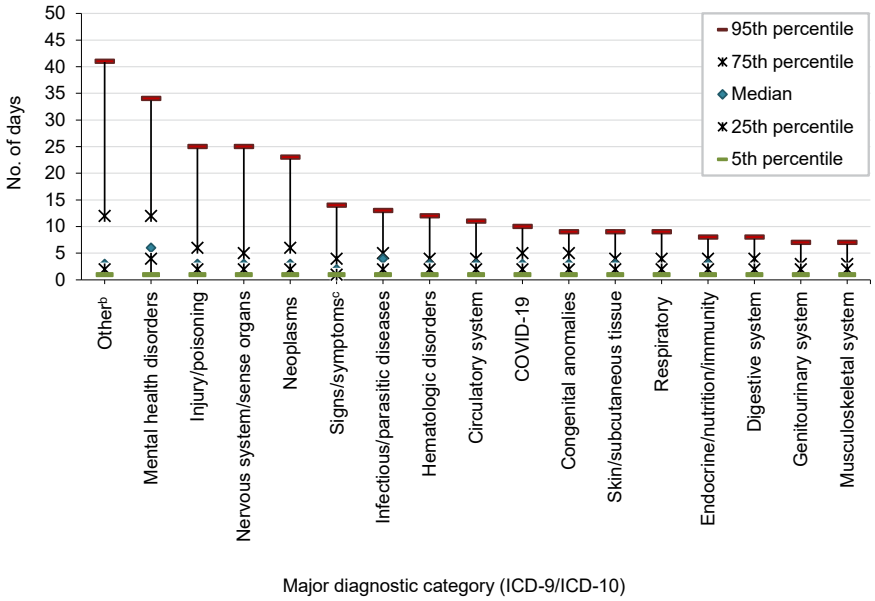
Among Air Force active component members, pregnancy- and delivery-related conditions accounted for more hospitalizations than any other illnesses or injury category, while among active component members of the Army, Navy, and Marine Corps, mental health disorders were the leading cause **(Table 4)**, a pattern observed in recent years. Prior to 2020, pregnancy- and delivery-related conditions were ranked first for both the Navy and Air Force. Among all services the crude hospitalization rate for mental health disorders was highest among active component Army members (16.5 per 1,000 p-yrs).

FIGURE 3. Length of Hospital Stay, Active Component, U.S. Armed Forces, 2013–2022



Abbreviation: No., number.
[a]2022 data are considered provisional but current as of March 28, 2023.

FIGURE 4. Length of Hospital Stay by ICD-9/ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2013–2022[a]



Abbreviations: No., number. ; ICD, International Classification of Diseases, 9th/10th Revisions.
[a]2022 data are considered provisional but current as of March 28, 2023.
[b]Other factors influencing health status and contact with health services (excluding pregnancy-related).
[c]Includes ill-defined conditions.

TABLE 4. Hospitalization Numbers and Rates, by Service and ICD-10 Diagnostic Category, Active Component, U.S. Armed Forces, 2022[a]

	Army		Navy		Air Force		Marine Corps	
Major diagnostic category (ICD-10 codes)	No.	Rate[b]	No.	Rate[b]	No.	Rate[b]	No.	Rate[b]
Mental disorders (F01-F99)	7,648	16.5	5,364	15.8	3,627	11.3	2,440	14.0
Pregnancy and delivery (O00-O9A, relevant Z codes)[c]	4,341	60.4	4,418	63.2	3,978	57.7	971	59.8
Injury and poisoning (S00-T88, DOD0101-DOD0105)	2,203	4.8	1,201	3.5	781	2.4	760	4.3
Digestive system (IK00-K95)	1,687	3.6	1,261	3.7	885	2.8	440	2.5
Musculoskeletal system (M00-M99)	1,461	3.2	718	2.1	660	2.1	363	2.1
Signs, symptoms, and ill-defined conditions (R00-R99)	1,162	2.5	445	1.3	359	1.1	178	1.0
Genitourinary system (N00-N99)	546	1.2	322	0.9	281	0.9	120	0.7
Circulatory system (I00-I99)	539	1.2	401	1.2	289	0.9	132	0.8
Nervous system and sense organs (G00-G99, H00-H95)	506	1.1	313	0.9	236	0.7	105	0.6
Respiratory system (J00-J99, U07.0)	492	1.1	258	0.8	169	0.5	167	1.0
Other (Z00–Z99, except pregnancy-related)[d]	482	1.0	278	0.8	321	1.0	164	0.9
Neoplasms (C00-D49)	400	0.9	311	0.9	233	0.7	87	0.5
Infectious and parasitic diseases (A00-B99)	321	0.7	219	0.6	185	0.6	82	0.5
Skin and subcutaneous tissue (L00-L99)	253	0.5	139	0.4	83	0.3	119	0.7
Endocrine, nutrition, immunity (E00-E89)	183	0.4	137	0.4	68	0.2	54	0.3
COVID-19 (U07.1, U09.9)	125	0.3	45	0.1	46	0.1	33	0.2
Hematologic and immune disorders (D50-D89)	105	0.2	47	0.1	51	0.2	25	0.1
Congenital anomalies (Q00-Q99)	83	0.2	33	0.1	45	0.1	25	0.1
Total	22,537	48.7	15,910	46.9	12,297	38.2	6,265	35.8

Abbreviations: ICD, International Classification of Diseases; No., number.
[a]2022 data are considered provisional but current as of March 28, 2023.
[b]Rates are based on 1,000 person-years.
[c]Rates for pregnancy and delivery-related hospitalizations among females only (in parentheses)
[d]Other factors influencing health status and contact with health services (excluding pregnancy-related).

Injury was the third leading hospitalization category in the Army and Marine Corps, and fourth in the Navy and Air Force. The hospitalization rate for injury was highest for Army (4.8 per 1,000 p-yrs) and Marine Corps members (4.3 per 1,000 p-yrs) and lowest in the Air Force (2.4 per 1,000 p-yrs), a service-ranked distribution observed since 2010.

Discussion

The total hospitalization rate for all causes in both military and non-military medical facilities among active component members in 2022 was the lowest in the past decade. As in past years, in 2022 mental health disorders, pregnancy- and delivery-related conditions, and injury accounted for more than half of all active component hospitalizations. Adjustment disorders, alcohol dependence, depressive disorders, and PTSD were among the leading primary discharge diagnoses for both men and women. The continued decline of hospitalization frequencies and rates in 2022 is attributed to a generalized decline for most major diagnostic categories since 2019, with substantial declines in the musculoskeletal system and injury categories.

Certain limitations should be considered when interpreting these results. The data presented in this report are considered provisional, as ongoing assessments of data completeness in the MHS MIP and any subsequent resolutions may result in changes in trends reported here. This summary is based on primary (first-listed) discharge diagnoses only, but in many hospitalized cases multiple conditions can be present; for example, joint pain (category: musculoskeletal) may be co-listed with an injury (category: injury). In such cases, only the first-listed discharge diagnosis would be accounted in this report, which could underestimate hospitalization rates for common conditions by dividing them among 2 or more subcategories.

Medical data from July 2017 to October 2019 at sites that had already transitioned to the new MHS electronic health record system, MHS GENESIS, are not available in the DMSS and thus not included in this report—these sites include Naval Hospital Oak Harbor, Naval Hospital Bremerton, Air Force Medical Services Fairchild, and Madigan Army Medical Center. These missing data reduce the true hospitalization rates for that period.

Reference

1. National Center for Health Statistics. National Health Interview Survey (NHIS). Health, United States, 2020-2021. Table HospStay. Accessed June 15, 2023. https://www.cdc.gov/nchs/data/hus/2020-2021/HospStay.pdf

Ambulatory Visits Among Active Component Members, U.S. Armed Forces, 2022

This report documents the frequencies, rates, trends, and characteristics of ambulatory health care visits in 2022 of active component members of the U.S. Army, Navy, Air Force, and Marine Corps. Ambulatory visits by U.S. service members in fixed military and non-military (reimbursed through the Military Health System [MHS]) medical treatment facilities are documented by standardized records routinely archived for health surveillance purposes in the Defense Medical Surveillance System (DMSS). Ambulatory visits not routinely and completely documented within fixed military and non-military medical treatment facilities (e.g., during deployments, field training exercises, or at sea) are not included in this analysis.

This year marks the first for which data from the DMSS were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). As part of the continuing transition to MIP, data quality assessments for completeness and timeliness are ongoing. Thus, data presented in this report are considered provisional but current as of March 27, 2023.

As in prior *MSMR* reports, all records of ambulatory visits of active component service members were categorized according to the International Classification of Diseases, 10th Revision (ICD-10) codes entered in the primary (first-listed) diagnostic position of the visit records. Incidence rates were calculated per 1,000 p-yrs. Percent change in incidence was calculated using unrounded rates.

Frequencies, rates, and trends

In 2022, active component service members made 17,861,941 ambulatory visits for health care, resulting in a crude annual rate (all causes) of 13,750.9 visits per 1,000 p-yrs or 13.8 visits per p-yr **(Table 1)**. Provisional data indicate that this rate was the lowest observed in the past 10 years, declining from its peak in 2021 **(Figure 1)**. This decline was driven by a reduction in administrative (ICD-10 Z code) visits.

The 12,472,615 documented ambulatory visits in 2022 for illnesses and injuries (ICD-10: A00–T88, including relevant pregnancy Z-codes) not including diagnoses classified as "Other" resulted in a crude annual rate of illness- and injury-related visits of approximately 9.6 per p-yr **(Table 1)**. The crude annual rate of ambulatory visits for illness and injury in 2022 was slightly higher than the rates in 2020 (8.6 visits per p-yr) and 2018 (9.3 visits per p-yr).

As in prior years, the "Other" major diagnostic category, i.e., other factors influencing health status and contact with health services, excluding pregnancy, accounted for the highest rank number of ambulatory visits **(Table 1)**. This care is identified by a "Z code" in the first diagnostic position, which is not generally billable to insurance and normally utilized for administrative and other agency-specific requirements. The military uses Z codes to document some of the health care system burden imposed by readiness requirements; examples include routine and special medical examinations, e.g., periodic, occupational, or retirement, along with immunizations, counseling, deployment-related assessments, suspected exposure to infectious diseases, and screening. From 2018 to 2022, over half of visits attributed to this major diagnostic category included 3 ICD-10 Z codes: encounters for administrative examinations (Z02; n=11,544,607), immunization (Z23; n=4,739,324), and other special examinations without complaint, suspected or reported diagnosis (Z01; n=3,814,985), which includes examinations for eyes and vision, ears and hearing, blood pressure, dental examination and cleanings, and gynecological exams **(data not shown)**.

Ambulatory visits, by ICD-10 major diagnostic categories

In 2022, 4 major diagnostic categories accounted for almost three-quarters (73.6%) of all illness- and injury-related ambulatory visits by active component service members (not including "Other" diagnoses): musculoskeletal system/connective tissue disorders (32.7%); mental health disorders (18.6%); disorders of the nervous system and sense organs (11.9%); and signs, symptoms, and ill-defined conditions (10.4%) **(Table 1)**. Among visits for illness and injury, COVID-19 caused 1.3% of visits in 2022, a minor increase from 1.1% in 2021 **(data not shown)**.

In general, the relative distributions of ambulatory visits by ICD-10 diagnostic categories remained stable throughout the surveillance period **(Table 1)**. Provisional data indicate that the rate of ambulatory visits increased in 9 major diagnostic categories of illness and injury from 2018 to 2022 **(Table 1)**. The rate of mental health conditions increased by 20.4% from 2018 to 2022, with adjustment disorders accounting for the leading diagnosis in this major diagnostic category **(Table 1;**

What are the new findings?

Provisional data indicate that the 2022 rate of ambulatory visits in U.S. military and non-military medical facilities was 14.6% lower than the rate observed in 2021.This decline was due to reduced administrative (ICD-10 Z code) visits. The ranked distribution of primary causes for ambulatory visits has remained stable, with disorders of the musculoskeletal system, mental disorders, and nervous system/sense organs accounting for the 3 most prevalent rates of illness- and injury-related major diagnostic groups.

What is the impact on readiness and force health protection?

The crude annual rate of 9.6 visits per person-year (p-yr) for ambulatory visits for illnesses and injuries in 2022 was slightly higher than the rates in 2020 (8.6 visits per p-yr) and 2018 (9.3 visits per p-yr). The ambulatory visit rate among active component service members far exceeds civilian health care encounters; future analyses comparing the major diagnostic category rates among these 2 groups may help better define cost of readiness.

TABLE 1. Numbers, Rates,[a] and Ranks[b] of Ambulatory Visits, by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2018, 2020, and 2022

	2018			2020			2022[c]		
Major diagnostic category (ICD-10)	No.	Rate[a]	Rank	No.	Rate[a]	Rank	No.	Rate[a]	Rank[b]
Other (Z00–Z99, except pregnancy-related)[d]	7,162,547	5,525.5	(1)	7,866,329	5,927.7	(1)	5,389,326	4,148.9	(1)
Musculoskeletal system (M00-M99)	4,247,576	3,276.7	(2)	3,593,576	2,707.9	(2)	4,076,462	3,138.2	(2)
Mental disorders (F01-F99)	1,918,704	1,480.2	(3)	2,082,421	1,569.2	(3)	2,315,154	1,782.3	(3)
Nervous system and sense organs (G00-G99, H00-H95)	1,331,899	1,027.5	(4)	1,324,703	998.2	(4)	1,484,178	1,142.6	(4)
Signs, symptoms, and ill-defined conditions (R00-R99)	1,168,850	901.7	(5)	1,223,556	922.0	(5)	1,300,121	1,000.9	(5)
Injury and poisoning (S00-T88, DOD0101-DOD0105)	800,670	617.7	(6)	673,997	507.9	(6)	713,286	549.1	(6)
Respiratory system (J00-J99, U07.0)	631,435	487.1	(7)	507,528	382.4	(7)	503,947	388.0	(7)
Skin and subcutaneous tissue (L00-L99)	381,255	294.1	(8)	345,103	260.1	(9)	374,142	288.0	(8)
Pregnancy and delivery (O00-O9A, relevant Z codes)[e]	342,972	1,609.1	(9)	360,999	1,584.9	(8)	338,652	1,492.3	(9)
Genitourinary system (N00-N99)	276,512	213.3	(10)	283,718	213.8	(10)	287,774	221.5	(10)
Digestive system (K00-K95)	233,405	180.1	(11)	227,025	171.1	(11)	253,218	194.9	(11)
Infectious and parasitic diseases (A00-B99)	226,262	174.5	(12)	210,253	158.4	(12)	179,373	138.1	(12)
COVID-19 (U07.1, U09.9)	--	--	--	84,367	63.6	(16)	160,618	123.7	(13)
Endocrine, nutrition, immunity (E00-E89)	136,982	105.7	(13)	136,933	103.2	(13)	147,974	113.9	(14)
Circulatory system (I00-I99)	129,357	99.8	(14)	128,295	96.7	(14)	146,118	112.5	(15)
Neoplasms (C00-D49)	119,902	92.5	(15)	114,776	86.5	(15)	128,766	99.1	(16)
Hematologic and immune disorders (D50-D89)	32,018	24.7	(16)	37,367	28.2	(17)	38,759	29.8	(17)
Congenital anomalies (Q00-Q99)	20,013	15.4	(17)	18,066	13.6	(18)	24,073	18.5	(18)
Total, Illness and Injury-Specific Ambulatory Visits	11,997,812	9,255.6	--	11,352,683	8,544.8	--	12,472,615	9,602.0	--
Total	19,160,359	14,781.0		19,219,012	14,482.5		17,861,941	13,750.9	

Abbreviations: ICD, International Classification of Diseases; No., number.
[a]Rate per 1,000 person-years.
[b]Rank of major diagnostic category based on number of ambulatory visits.
[c]2022 is the first year for which data from the DMSS were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). As part of this transition, data quality assessments for completeness and timeliness are underway, and 2022 data presented in this report are considered provisional but current as of March 27, 2023.
[d]Other factors influencing health status and contact with health services (excluding pregnancy-related).
[e]Rate of pregnancy and delivery-related hospitalizations among females only.

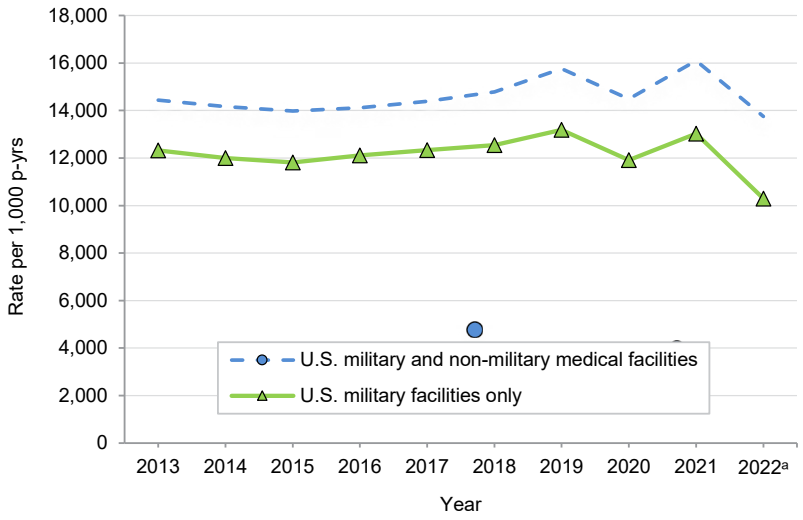
Table 2; Table 3). The encounter rate increase for congenital anomalies and hematologic and immune disorders from 2018 through 2022 also exceeded 20%, although the absolute change in the frequency of encounters for these conditions remained the lowest of all major diagnostic categories **(Table 1).** While congenital anomalies were not a most frequent diagnosis among women, almost 25% of the congenital anomaly conditions in men were diagnosed as congenital *pes planus* (flat foot) and congenital *pes cavus* (high arch) in 2022 **(Table 2).** Unspecified anemia represented the top diagnosis under hematologic and immune disorders for both men and women **(Table 2; Table 3).**

From 2018 through 2022, the largest declines of illness and injury-specific major diagnostic categories were observed for infectious and parasitic diseases (-20.9%), respiratory system disorders (-20.4%), and injury (-11.1%) **(Table 1).** While these data are considered provisional, ongoing investigations on data timeliness may indicate these declines are not as substantial. Unspecified viral infection and unspecified acute upper respiratory infection were the leading diagnoses in 2022 for infectious and parasitic diseases and disorders of the respiratory system, respectively **(Table 2; Table 3).** Consistent with prior years, diagnostic S codes (injury), as opposed to T codes (burns and poisonings), accounted for nearly 90% of all ambulatory encounters within this major diagnostic category **(data not shown).**

Ambulatory visits, by sex

In 2022, service men accounted for nearly three-fourths (72.7%) of all illness- and injury-related visits; however, the annual crude rate among service women (15.0 visits per p-yr) was 77.5% higher than the rate among men (8.5 visits per p-yr) **(data not shown).** Excluding pregnancy- and delivery-related visits (which accounted for 9.9% of all non-Z-coded ambulatory visits

FIGURE 1. Rates of Ambulatory Visits by Year, Active Component, U.S. Armed Forces, 2013–2022



Abbreviation: P-yrs, person-years.
[a]2022 data are considered provisional but current as of March 27, 2023.

by women), the illness and injury ambulatory visit rate among women, 13.5 per p-yr, was 60% higher than the rate among men.

The female rates of illness- and injury-specific diagnoses exceeded male rates by 50% in all major diagnostic categories, except for diagnoses relating to nervous system and sense organs, circulatory system, digestive system, musculoskeletal system/connective tissue, and injury **(data not shown)**. Relationships between age group and ambulatory visit rates were broadly similar among men and women across diagnostic categories **(Figure 2)**. Ambulatory rates for neoplasms, nervous system and sense organ disorders, circulatory system disorders, and endocrine, nutrition and immunity issues rose more steeply with advancing age than other categories of illness or injury **(Figure 2)**. Ambulatory visit rates for COVID-19 infection diagnoses were relatively stable with advancing age.

The 4 leading diagnoses among ambulatory visits were the same for both male and female service members, although the rates for women exceeded those among men: pain in joint (women: 1,565.8; men: 1,130.4; female: male rate ratio [RR]: 1.4); low back pain (women: 514.8; men: 394.1; RR: 1.1); adjustment disorders (women: 699.3; men: 306.2; RR: 2.3); and pain in the limb, hand, foot, fingers, or toes (female: 315.0; male: 223.6; RR: 1.4) **(data not shown)**. Five other diagnoses were among the 10 most common diagnoses for both men and women: post-traumatic stress disorder (PTSD); cervicalgia (neck pain); dorsalgia (back pain); unspecified anxiety disorder; and sleep apnea. Sleep apnea was the second-most frequent illness- or injury-specific primary diagnosis for men during ambulatory visits but ranked 10th for women. The difference in the rate rank order of mental disorders is also worth noting: While alcohol dependence was the sixth most frequent diagnosis among men, it was not identified among 10 leading causes of ambulatory visits for women **(Table 2, Table 3)**.

Discussion

Ambulatory visits among active component service members in 2022 declined to the lowest rate observed in the last 10 years; however, this overall decline was affected by a substantial change in the rate of ambulatory visits for "Other" factors influencing health status and health service contact. When excluding visits documented by ICD-10 Z-codes, the rate of illness- and injury-specific ambulatory visits was elevated compared to 2018 and 2020. The ranked distribution of primary causes of ambulatory visits remained stable, with musculoskeletal system, mental, and nervous system and sense organ disorders accounting for the 3 most prevalent rates among illness and injury-related major diagnostic groups.

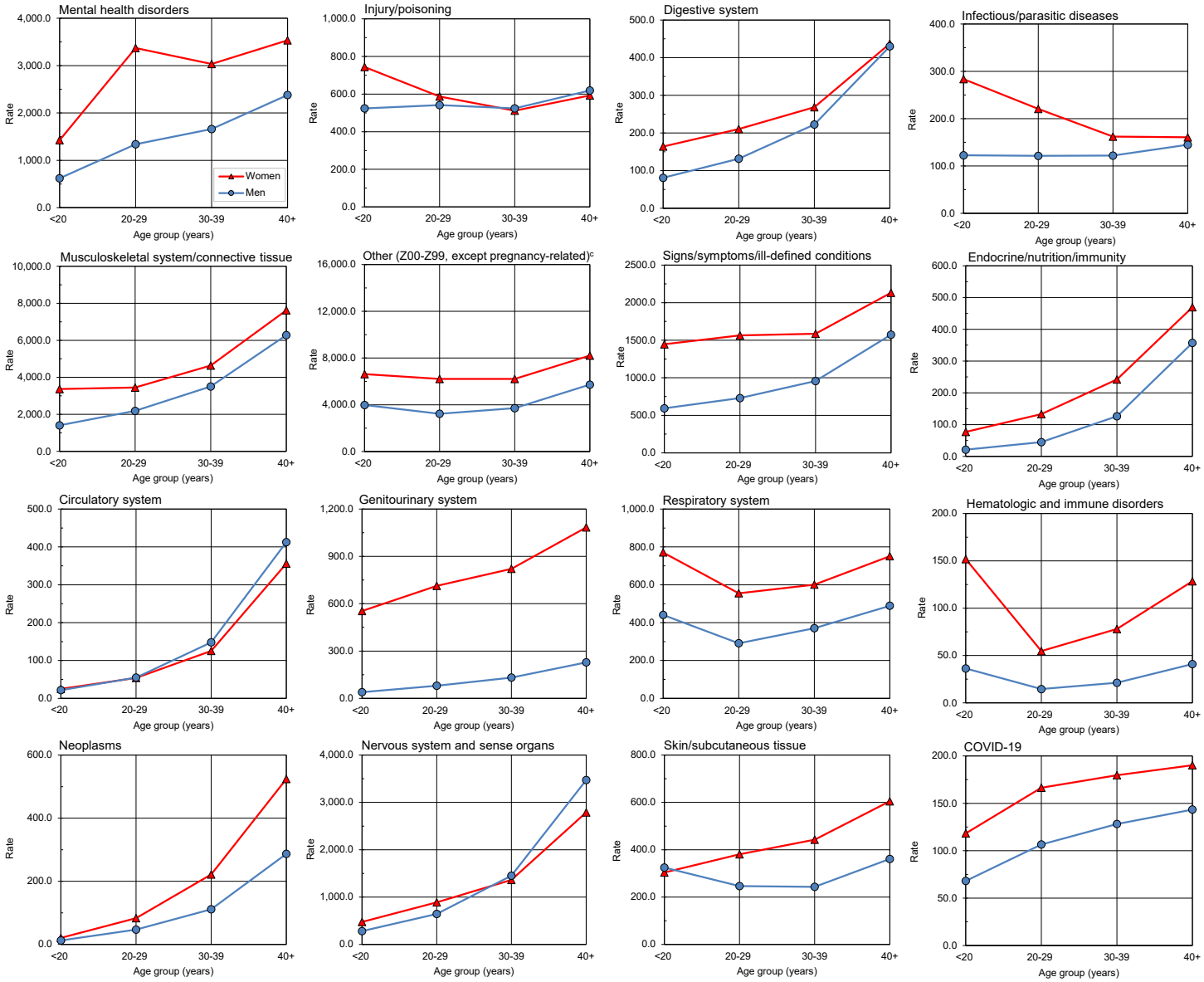
Notably, since 2018 the rate of ambulatory visits for mental health disorders increased by 20%. The rate of COVID-19 encounters also increased from 2020 to 2022, which partly reflects administrative coding procedures, as the ICD-10 code for COVID-19 was not available until April 2020. Conversely, encounter rate for the infectious disease and respiratory system major diagnostic categories declined by over 20% from 2018 to 2022. The data presented in this report are considered provisional, and ongoing investigations for data completeness in the MHS MIP may indicate a change in trends reported here.

While the National Ambulatory Medical Care Survey of 2019 indicates that civilian women use health care services more than men (3.7 vs. 2.7 visits per p-yr, respectively), the sex-specific rate ratio for illness and injury-specific ambulatory encounters indicates a larger disparity among active component service members (15.0 vs. 8.5 visits per p-yr, respectively).[1] Furthermore, the rate of ambulatory office visits among civilians 15-24 years of age (1.6 visits per p-yr) and 25-44 years of age (2.0 visits per p-yr) far exceed the crude annual rate of illness- and injury-related visits (9.6 visits per p-yr) among active duty service members.[1] Future analyses comparing the major diagnostic category rates to civilian counterparts may be useful to further define cost of readiness.

Several limitations should be considered when interpreting these findings. Ambulatory care at the unit level by non-credentialed providers and at deployed medical treatment facilities (including ships at sea) are not included. This summary does not reflect the fact that the nature and rates of illnesses and injuries may vary between deployed and non-deployed active component service members.

The transition to a new MHS electronic health record system, MHS GENESIS, has introduced new limitations. In prior *MSMR* reports, dispositions following ambulatory visits described a proportion of encounters classified as limited duty, convalescence in quarters, or no limitation. These findings

FIGURE 2. Rates[a] of Ambulatory Visits by ICD-10 Major Diagnostic Category, Age Group, and Sex, Active Component, U.S. Armed Forces, 2022[b]



Abbreviation: ICD, International Classification of Diseases, 10th Revision.
[a]Rate per 1,000 person-years.
[b]2022 data are considered provisional but current as of March 27, 2023.
[c]Other factors influencing health status and contact with health services (excluding pregnancy-related).

were not included in this report, due to a substantial increase in missing disposition data. Disposition information may be included in future reports if data completeness issues are resolved. Prior reports have described the number of virtual versus in-person ambulatory encounters; however, data quality issues have also been identified regarding the variable delineating this encounter type and is an area of active inquiry. Finally, medical data from sites using MHS GENESIS between July 2017 and October 2019 were not available in the DMSS—these sites include Naval Hospital Oak Harbor, Naval Hospital Bremerton, Air Force Medical Services Fairchild, and Madigan Army Medical Center. Medical encounter data for individuals seeking care at any of these facilities from July 2017 through October 2019 were not included in the 2018 comparison data.

This summary is based on primary (first-listed) diagnosis codes reported on ambulatory visit records, and the current summary discounts morbidity related to comorbid and complicating conditions that may have been documented in secondary diagnostic positions in health care records. The accuracy of reported diagnoses likely varies by medical condition, clinical setting, care provider, and treatment facility, as this information is not collected for health surveillance. Although specific diagnoses during individual encounters were potentially not definitive, final, or even correct, summaries of the frequencies, nature,

TABLE 2. Numbers and Percentages of the Most Frequent Diagnoses During Ambulatory Visits Among Men by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2022[a]

Diagnostic category (ICD-10 codes) ♂	No.	%[b]
Infectious and parasitic diseases (A00–B99)	**133,103**	
Viral infection, unspecified	20,583	15.5
Viral wart, unspecified	7,451	5.6
Tinea unguium	7,227	5.4
Plantar wart	6,167	4.6
Viral intestinal infection, unspecified	5,851	4.4
Neoplasms (C00–D49)	**94,120**	
Neoplasm of uncertain behavior of skin	11,029	11.7
Melanocytic nevi, unspecified	6,310	6.7
Melanocytic nevi of trunk	3,808	4.0
Neoplasm of unspecified behavior of bone, soft tissue, and skin	2,911	3.1
Benign lipomatous neoplasm, unspecified	2,759	2.9
Endocrine, nutrition, immunity (E00-E89)	**105,691**	
Hyperlipidemia, unspecified	14,807	14.0
Testicular hypofunction	13,332	12.6
Vitamin D deficiency, unspecified	9,935	9.4
Type 2 diabetes mellitus without complications	8,066	7.6
Obesity, unspecified	6,256	5.9
Hematologic and immune disorders (D50-D89)	**22,048**	
Anemia, unspecified	3,521	16.0
Other specified disorders of white blood cells	2,176	9.9
Sickle-cell trait	2,132	9.7
Iron deficiency anemia, unspecified	1,814	8.2
Thrombocytopenia, unspecified	1,060	4.8
Mental health disorders (F01-F99)	**1,598,014**	
Adjustment disorders	328,144	20.5
Alcohol dependence	227,170	14.2
Post-traumatic stress disorder (PTSD)	197,923	12.4
Anxiety disorder, unspecified	98,930	6.2
Major depressive disorder, recurrent severe without psychotic features	73,108	4.6
Nervous system and sense organs (G00-G99, H00-H95)	**1,224,245**	
Sleep apnea	524,609	42.9
Myopia	82,305	6.7
Insomnia	48,344	3.9
Chronic pain, not elsewhere classified	45,663	3.7
Astigmatism	40,639	3.3
Circulatory system (I00-I99)	**124,262**	
Essential (primary) hypertension	58,862	47.4
Scrotal varices	4,390	3.5
Atherosclerotic heart disease of native coronary artery	2,827	2.3
Acute embolism and thrombosis of deep veins of lower extremity	2,660	2.1
Paroxysmal atrial fibrillation	2,365	1.9
Respiratory system (J00-J99)	**368,229**	
Acute upper respiratory infection, unspecified	82,064	22.3
Allergic rhinitis due to pollen	34,442	9.4
Acute pharyngitis, unspecified	34,108	9.3
Acute nasopharyngitis [common cold]	24,149	6.6
Allergic rhinitis, unspecified	22,411	6.1
Digestive system (K00–K95)	**198,365**	
Gastroesophageal reflux disease without esophagitis	24,870	12.5
Noninfective gastroenteritis and colitis, unspecified	13,093	6.6
Hemorrhage of anus and rectum	9,113	4.6
Constipation	8,275	4.2
Unilateral inguinal hernia, without obstruction or gangrene	7,519	3.8
Genitourinary system (N00-N99)	**114,827**	
Other specified disorders of male genital organs	23,507	20.5
Male erectile dysfunction, unspecified	10,905	9.5
Calculus of kidney	7,902	6.9
Hypertrophy of breast	5,916	5.2
Male infertility, unspecified	4,973	4.3
Skin and subcutaneous tissue (L00-L99)	**280,970**	
Pseudofolliculitis barbae	41,157	14.6
Acne vulgaris	18,958	6.7
Dermatitis, unspecified	17,198	6.1
Ingrowing nail	15,253	5.4
Cellulitis and acute lymphangitis of other parts of limb	8,261	2.9
Musculoskeletal system and connective tissue (M00-M99)	**3,144,479**	
Pain in joint	1,211,811	38.5
Low back pain	422,438	13.4
Pain in limb, hand, foot, fingers and toes	239,736	7.6
Dorsalgia, unspecified	154,907	4.9
Cervicalgia	148,370	4.7
Congenital anomalies (Q00-Q99)	**18,018**	
Congenital pes planus	2,775	15.4
Congenital pes cavus	1,537	8.5
Other specified congenital malformations of skin	1,422	7.9
Other congenital deformities of feet	794	4.4
Atrial septal defect	748	4.2
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	**935,107**	
Other symptoms and signs involving emotional state	54,377	5.8
Chest pain, unspecified	49,837	5.3
Headache, unspecified	48,674	5.2
Other abnormalities of breathing	37,556	4.0
Dyspnea	37,263	4.0
Injury/poisoning (S00-T98, DOD0101-DOD0105)	**582,248**	
Sprain of ankle	32,145	5.5
Sprain of shoulder joint	24,546	4.2
Concussion	23,664	4.1
Sprain of cruciate ligament of knee	21,210	3.6
Tear of meniscus, current injury	15,480	2.7
Other (Z00–Z99, except pregnancy-related)c	**3,935,487**	
Encounter for other administrative examinations	687,314	17.5
Encounter for immunization	419,233	10.7
Encounter for administrative examinations, unspecified	315,728	8.0
Other specified counseling	266,968	6.8
Encounter for examination of ears and hearing	180,386	4.6

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number.
[a]2022 data are considered provisional but current as of March 27, 2023.
[b]Percentage of the total number of hospitalizations within the diagnostic category.
[c]Other factors influencing health status and contact with health services (excluding pregnancy-related).

TABLE 3. Numbers and Percentages of the Most Frequent Diagnoses During Ambulatory Visits Among Women by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2022[a]

Diagnostic category (ICD-10 codes) ♀	No.	%[b]
Infectious and parasitic diseases (A00–B99)	**46,270**	
Viral infection, unspecified	7,291	15.8
Candidiasis of vulva and vagina	5,074	11.0
Viral intestinal infection, unspecified	2,123	4.6
Chlamydial infection, unspecified	1,840	4.0
Herpes viral infection, unspecified	1,820	3.9
Neoplasms (C00–D49)	**34,646**	
Leiomyoma of uterus, unspecified	4,098	11.8
Neoplasm of uncertain behavior of skin	3,048	8.8
Malignant neoplasm of breast of unspecified site	2,448	7.1
Melanocytic nevi, unspecified	2,025	5.8
Melanocytic nevi of trunk	1,042	3.0
Endocrine, nutrition, immunity (E00-E89)	**42,283**	
Vitamin D deficiency, unspecified	5,881	13.9
Hypothyroidism, unspecified	5,183	12.3
Polycystic ovarian syndrome	3,842	9.1
Obesity, unspecified	3,203	7.6
Iron deficiency	1,743	4.1
Hematologic and immune disorders (D50-D89)	**16,711**	
Iron deficiency anemia, unspecified	5,333	31.9
Anemia, unspecified	3,683	22.0
Iron deficiency anemia secondary to blood loss (chronic)	1,106	6.6
Sickle-cell trait	982	5.9
Other specified disorders of white blood cells	798	4.8
Mental health disorders (F01-F99)	**717,140**	
Adjustment disorders	158,693	22.1
Post-traumatic stress disorder (ptsd)	106,922	14.9
Anxiety disorder, unspecified	51,662	7.2
Generalized anxiety disorder	50,893	7.1
Major depressive disorder, recurrent, moderate	39,869	5.6
Nervous system and sense organs (G00-G99, H00-H95)	**259,933**	
Sleep apnea	42,676	16.4
Myopia	25,874	10.0
Chronic pain, not elsewhere classified	14,960	5.8
Insomnia	13,194	5.1
Astigmatism	10,037	3.9
Circulatory system (I00-I99)	**21,856**	
Essential (primary) hypertension	7,467	34.2
Varicose veins of lower extremities with other complications	903	4.1
Venous insufficiency (chronic) (peripheral)	830	3.8
Raynaud's syndrome	706	3.2
Lymphedema, not elsewhere classified	620	2.8
Respiratory system (J00-J99)	**135,718**	
Acute upper respiratory infection, unspecified	29,779	21.9
Acute pharyngitis, unspecified	15,367	11.3
Allergic rhinitis due to pollen	13,002	9.6
Acute nasopharyngitis [common cold]	10,376	7.6
Allergic rhinitis, unspecified	8,043	5.9
Digestive system (K00–K95)	**54,853**	
Constipation	8,681	15.8
Gastroesophageal reflux disease without esophagitis	5,683	10.4
Noninfective gastroenteritis and colitis, unspecified	4,062	7.4
Hemorrhage of anus and rectum	2,032	3.7
Unspecified hemorrhoids	1,828	3.3
Genitourinary system (N00-N99)	**172,947**	
Acute vaginitis	16,960	9.8
Urinary tract infection, site not specified	12,941	7.5
Stress incontinence (female) (male)	10,716	6.2
Abnormal uterine and vaginal bleeding, unspecified	9,486	5.5
Other specified noninflammatory disorders of vagina	9,317	5.4
Pregnancy and delivery (O00-O99, relevant Z codes)	**338,652**	
Encounter for care and examination of lactating mother	41,914	12.4
Encounter for supervision of normal first pregnancy	20,377	6.0
Pregnant state, incidental	19,943	5.9
Encounter for supervision of other normal pregnancy	17,946	5.3
Encounter for routine postpartum follow-up	14,564	4.3
Skin and subcutaneous tissue (L00-L99)	**93,172**	
Acne vulgaris	15,419	16.5
Dermatitis, unspecified	6,031	6.5
Urticaria, unspecified	2,990	3.2
Acne, unspecified	2,914	3.1
Ingrowing nail	2,841	3.0
Musculoskeletal system and connective tissue (M00-M99)	**931,983**	
Pain in joint	355,326	38.1
Low back pain	116,823	12.5
Pain in limb, hand, foot, fingers and toes	71,478	7.7
Cervicalgia	52,833	5.7
Dorsalgia, unspecified	49,747	5.3
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	**365,014**	
Pelvic and perineal pain	27,046	7.4
Headache, unspecified	23,058	6.3
Unspecified abdominal pain	18,718	5.1
Other symptoms and signs involving emotional state	17,967	4.9
Chest pain, unspecified	12,931	3.5
Injury/poisoning (S00-T98, DOD0101-DOD0105)	**131,038**	
Sprain of ankle	9,855	7.5
Concussion	5,727	4.4
Sprain of cruciate ligament of knee	5,289	4.0
Injury of muscle, fascia and tendon of abdomen, lower back and pelvis	3,020	2.3
Sprain of hip	2,479	1.9
Other (Z00–Z99, except pregnancy-related)[c]	**1,453,839**	
Encounter for other administrative examinations	262,694	18.1
Other specified counseling	119,902	8.2
Encounter for administrative examinations, unspecified	117,437	8.1
Encounter for immunization	100,228	6.9
Encounter for other specified special examinations	44,839	3.1

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number.
[a]2022 data are considered provisional but current as of March 27, 2023.
[b]Percentage of the total number of hospitalizations within the diagnostic category.
[c]Other factors influencing health status and contact with health services (excluding pregnancy-related).

and trends of ambulatory encounters among active component members provide descriptive evidence for further research and evaluation.

Rates and frequencies reported herein do not reflect unique individuals, but a rate of total ambulatory visits per p-year. This report documents all ambulatory health care visits but does not estimate incidence rates for the diagnoses described. These data provide descriptors for health care use, which elevate rates for disorders requiring increased numbers of ambulatory visits. In contrast to common, self-limited, and minor illnesses and injuries that require very little, if any, follow-up or continuing care, illnesses and injuries necessitating multiple ambulatory visits for evaluation, treatment, and rehabilitation are overrepresented in this summary.

Finally, the dataset is incomplete. Encounter data continues to be reported well after data are extracted from DMSS via the MHS MIP. The timing of data reporting varies annually, affecting direct comparisons to prior reports. While the relative rank order of utilization categories is most likely representative of the full data set, the absolute values are likely underestimated by 10-15%.

Reference

1. National Ambulatory Health Care Survey: 2019 National Summary. Accessed June 12, 2023. https://www.cdc.gov/nchs/data/ahcd/namcs_summary/2019-namcs-web-tables-508.pdf.

Absolute and Relative Morbidity Burdens Attributable to Various Illnesses and Injuries Among Active Component Members, U.S. Coast Guard, 2022

With approximately 40,000 active duty service members, the U.S. Coast Guard (USCG) is by far the smallest of the military branches and is the only branch outside the Department of Defense (DOD). Since 2016, missing data have precluded analysis of USCG health care data from the MSMR's annual burden reports.[1,2] A recent analysis demonstrated a USCG hospitalization rate 40% lower than DOD active component counterparts, indicating that concerns raised in 2016 about incomplete capture of USCG medical record data have not been completely addressed. Until these data issues can be resolved, a separate analysis of USCG burden is warranted.

The USCG operates primary care clinics in areas with sufficiently large Coast Guard populations. Although USCG personnel are eligible to use DOD health care facilities, many are not stationed near any DOD installation. A higher proportion of civilian hospitalizations among USCG members has been noted,[1] and this difference may extend to ambulatory care as well.

This summary uses the same disease classification system and health care burden measures as employed in the initial burden analysis to quantify the impacts of various illnesses and injuries among members of the active component of the USCG in 2022.

Methods

The population for this analysis includes all individuals who served in the active component of the USCG at any time during the surveillance period of January 1, 2022 through December 31, 2022. The methodology for summarizing absolute and relative USCG morbidity burdens in 2022 is identical to that described in pages 3-4 used in the absolute and relative burdens attributed to various illnesses and injuries among the active component of the U.S. Armed Forces. This is the first year that DMSS data were housed and analyzed from the Military Health System (MHS) Information Platform (MIP). Data quality assessments for completeness and timeliness are ongoing during the MIP transition, and data presented in this report are considered provisional but current as of March 21, 2023.

What are the new findings?

Among active component Coast Guard members in 2022, injuries, musculoskeletal diseases, and mental health disorders were the categories of medical conditions associated with the most medical encounters, the largest number of affected service members, and the greatest number of hospital days. COVID-19 accounted for 1.4% of total medical encounters and 0.7% of total hospital bed days.

What is the impact on readiness and force health protection?

Loss of duty availability because of illness and injury degrades personnel readiness. Coast Guard members have unique occupational exposures that may benefit from specific risk-reduction programs to mitigate these threats. Complete hospitalization data is critical to accurately estimate the medical burden among Coast Guard members. Efforts to ensure data completeness should be prioritized.

Results

In 2022, a total of 34,506 USCG service members experienced 390,665 total medical encounters. There were 8,717 bed-days reported, for a rate of 0.22 bed-days per USCG member who had at least 1 medical encounter (in- or out-patient). [3]

Morbidity burden, by category

In 2022, more active component USCG members (individuals affected; n=14,737) had medical encounters for injury than any other morbidity-related category **(Figure 1a)**. Ranking third in terms of hospital bed days, this morbidity category accounted for over one-fifth (22.0%) of all medical encounters **(Figure 1b)**.

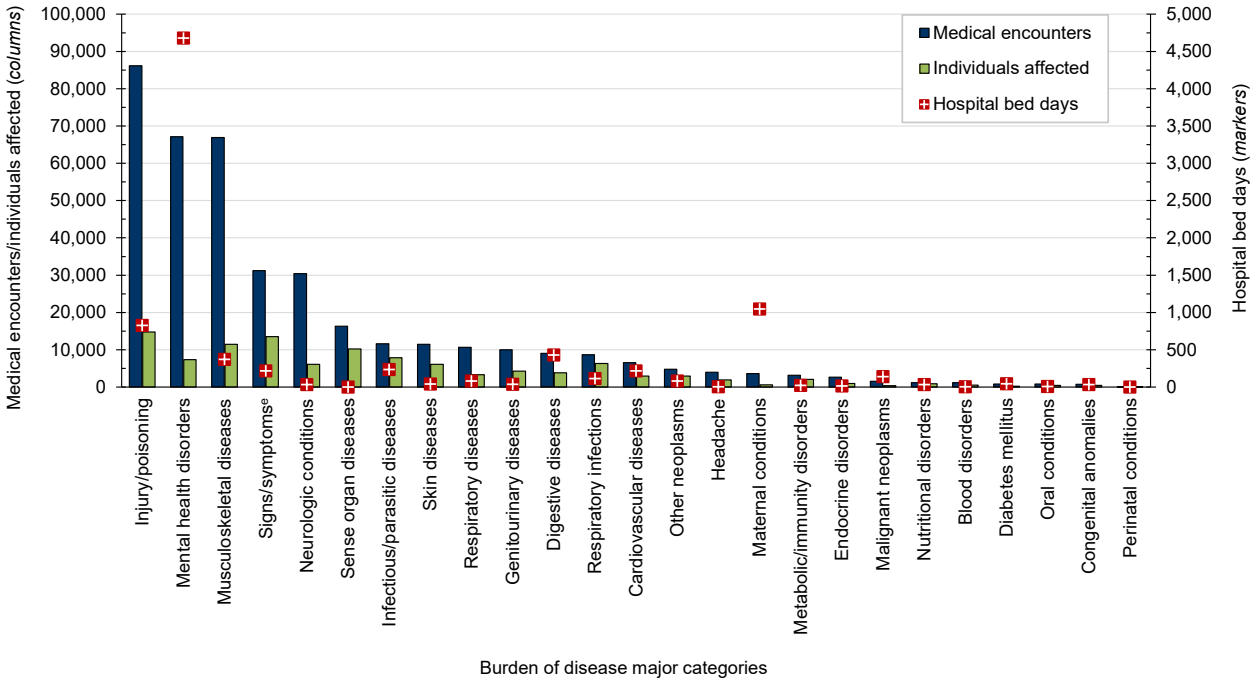
Mental health disorders accounted for more hospital bed days (n=4,680) than any other morbidity-related category, contributing over half (57.7%) of all hospital bed days and ranking sixth for number of individuals affected **(Figures 1a, 1b)**. Together, injury and mental health disorders accounted for over three-fifths (63.2%) of all hospital bed days and almost two-fifths (39.2%) of all medical encounters.

Maternal conditions, e.g., pregnancy complications and delivery, accounted for a relatively large proportion of all hospital bed days (n=1,047; 12.0%) but a much smaller proportion of total medical encounters (n=3,626; 0.9 %) **(Figures 1a, 1b)**. Maternal conditions were the most prevalent medical condition among active component female USCG members. Women comprised approximately one-sixth (16.0%) of the active duty USCG in 2022.[3]

Medical encounters, by condition

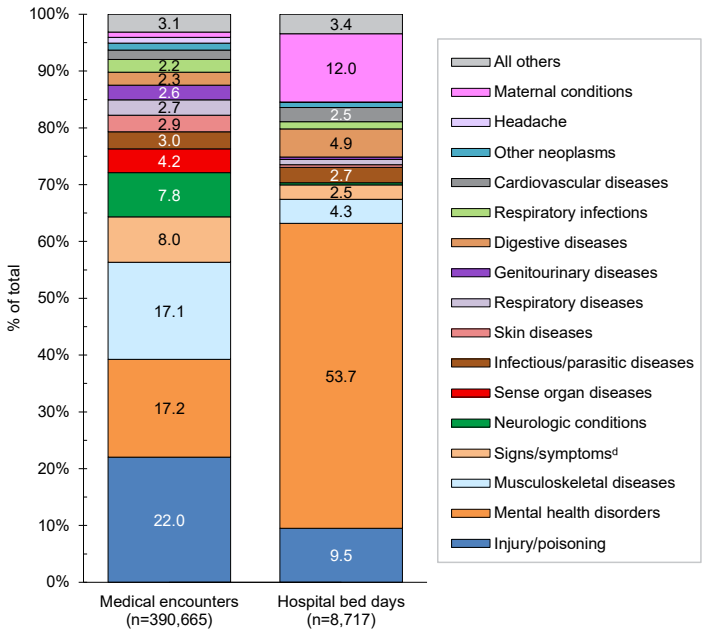
In 2022, 5 burden of disease-related conditions accounted for more than one-third (35.0%) of all illness- and injury-related medical encounters: other back problems e.g., low back pain, other dorsalgia; arm/shoulder injuries; organic sleep disorders (e.g., obstructive sleep apnea, insomnia); anxiety disorders; and knee injuries **(Figure 2)**. Moreover, the 10

FIGURE 1a. Numbers of Medical Encounters,[a] Individuals Affected,[b] and Hospital Bed Days by Burden of Disease Major Category,[c] Active Component, U.S. Coast Guard, 2022[d]



Abbreviation: No., number.
[a]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[b]Individuals with at least 1 hospitalization or ambulatory visit for the condition.
[c]Burden of disease major categories based on a modified version of those defined in the Global Burden of Disease Study.[1]
[d]2022 is the first year for which data from the DMSS were warehoused and analyzed from the Military Health System (MHS) Information Platform (MIP). As part of this transition, data quality assessments for completeness and timeliness are underway. Thus, 2022 data presented in this report are considered provisional but current as of March 21, 2023.
[e]Includes ill-defined conditions.

FIGURE 1b. Percentage of Medical Encounters[a] and Hospital Bed Days Attributable to Burden of Disease Major Categories,[b] Active Component, U.S. Coast Guard, 2022[c]

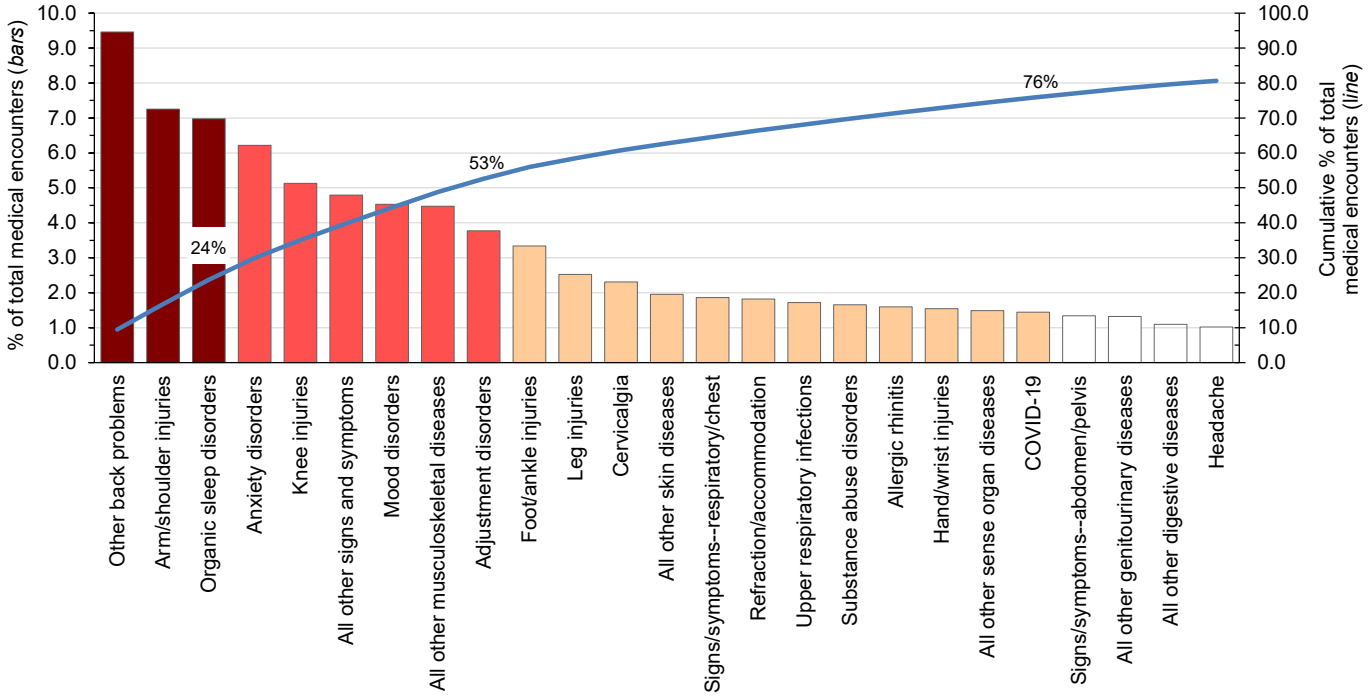


[a]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[b]Burden of disease major categories based on a modified version of those defined in the Global Burden of Disease Study.[1]
[c]2022 data are considered provisional but current as of March 21, 2023.
[d]Includes ill-defined conditions.

conditions associated with the most medical encounters constituted more than half (56.0%) of all illness- and injury-related medical encounters.

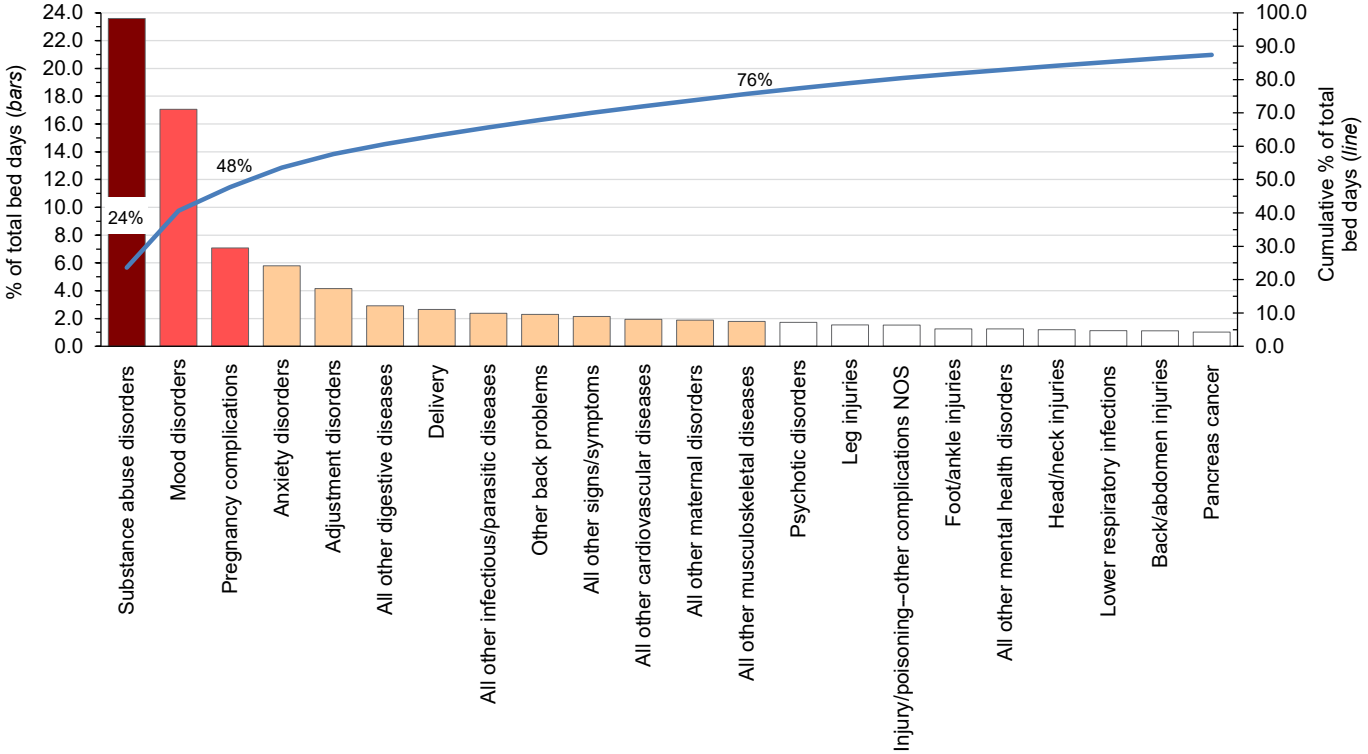
The conditions that accounted for the most medical encounters among active component USCG members in 2022 were predominantly injuries, mental health disorders, and musculoskeletal diseases. Among injuries, arm/shoulder (7.3%), knee (5.1%), foot/ankle (3.3%), and leg (2.5%) contributed the most medical encounters **(Figure 2, Table)**. Anxiety (6.2%), mood (4.5%), adjustment (3.8%), and alcohol/substance abuse disorders (1.7%) were the 4 most frequent mental health disorder diagnoses. Of the musculoskeletal diseases, other back problems (9.5%), all other musculoskeletal diseases (4.5%), e.g., muscle weakness, radiculopathy of the cervical region, pain in foot, and neck pain (2.3%) contributed the most medical encounters. COVID-19 accounted for 1.4% of total medical encounters during 2022.

FIGURE 2. Percentage and Cumulative Percentage Distribution, Burden of Disease-related Conditions[a] Accounting for the Most Medical Encounters, Active Component, U.S.Coast Guard, 2022[b]



[a]Burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[b]2022 data are considered provisional but current as of March 21, 2023.

FIGURE 3. Percentage and Cumulative Percentage Distribution, Burden of Disease-related Conditions[a] Accounting for the Most Hospital Bed Days, Active Component, U.S. Coast Guard, 2022[b]



Abbreviation: NOS, not otherwise specified.
[a]Burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[b]2022 data are considered provisional but current as of March 21, 2023.

TABLE. Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2022[a]

Major category condition[b]	Medical encounters[c]		Individuals affected[d]		Hospital bed days	
	No.	Rank[e]	No.	Rank[e]	No.	Rank[e]
Injury and poisoning	**86,125**				**828**	
Arm and shoulder injuries	28,337	(2)	4,455	(8)	79	(24)
Knee injuries	20,041	(5)	3,479	(14)	79	(24)
Foot and ankle injuries	13,038	(10)	3,523	(13)	109	(17)
Leg injuries	9,861	(11)	2,074	(22)	134	(15)
Hand and wrist injuries	6,030	(19)	2,358	(18)	14	(46)
Head and neck injuries	2,440	(31)	1,445	(32)	104	(19)
Back and abdomen injuries	2,219	(35)	973	(38)	97	(21)
Unspecified injury	1,091	(46)	696	(45)	16	(39)
Environmental	972	(52)	817	(40)	9	(54)
Other complications NOS	914	(53)	473	(56)	133	(16)
Other injury from external causes	695	(61)	560	(51)	5	(64)
Poisoning, nondrug	226	(95)	131	(90)	8	(58)
All other injury	122	(110)	103	(93)	8	(58)
Other superficial injury	79	(118)	11	(125)	0	(86)
Other burns	31	(128)	25	(118)	0	(86)
Poisoning, drugs	29	(130)	22	(120)	33	(32)
Mental health disorders	**67,148**				**4,680**	
Anxiety disorders	24,290	(4)	3,968	(11)	505	(4)
Mood disorders	17,699	(7)	2,209	(19)	1,487	(2)
Adjustment disorders	14,740	(9)	2,703	(16)	362	(5)
Substance abuse disorders	6,467	(17)	476	(55)	2,057	(1)
All other mental disorders	3,215	(28)	1,054	(37)	109	(17)
Somatoform disorders	240	(92)	82	(100)	0	(86)
Psychotic disorders	188	(99)	33	(111)	150	(14)
Tobacco dependence	157	(106)	123	(91)	0	(86)
Personality disorders	152	(107)	43	(107)	10	(52)
Musculoskeletal diseases	**66,899**				**371**	
Other back problems	36,962	(1)	6,543	(2)	200	(9)
All other musculoskeletal diseases	17,483	(8)	5,681	(4)	156	(13)
Cervicalgia	9,018	(12)	1,807	(24)	1	(80)
Osteoarthritis	1,860	(38)	897	(39)	14	(46)
Other shoulder disorders	660	(65)	251	(76)	0	(86)
Other knee disorders	649	(67)	237	(77)	0	(86)
Rheumatoid arthritis	267	(89)	77	(101)	0	(86)
Signs, symptoms and ill-defined conditions	**31,236**				**218**	
All other signs and symptoms	18,729	(6)	9,518	(1)	187	(10)
Respiratory and chest	7,271	(14)	4,453	(9)	19	(38)
Abdomen and pelvis	5,236	(22)	2,989	(15)	12	(51)
Neurologic conditions	**30,420**				**33**	
Organic sleep disorders	27,265	(3)	5,391	(5)	1	(80)
All other neurologic conditions	1,477	(43)	634	(47)	22	(35)
Chronic pain	885	(54)	329	(62)	0	(86)
Other mononeuritis - upper and lower limbs	343	(84)	162	(85)	0	(86)
Epilepsy	194	(98)	76	(102)	5	(64)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2022[a]

Major category condition[b]	Medical encounters[c]		Individuals affected[d]		Hospital bed days	
	No.	Rank[e]	No.	Rank[e]	No.	Rank[e]
Neurologic conditions (cont.)						
Multiple sclerosis	172	(100)	27	(116)	5	(64)
Parkinson disease	84	(117)	3	(136)	0	(86)
Sense organ diseases	**16,328**				**0**	
Refraction/accommodation	7,107	(15)	6,146	(3)	0	(86)
All other sense organ diseases	5,813	(20)	3,712	(12)	0	(86)
Hearing disorders	2,672	(29)	1,700	(25)	0	(86)
Glaucoma	669	(64)	412	(58)	0	(86)
Cataracts	67	(119)	50	(105)	0	(86)
Infectious and parasitic diseases	**11,606**				**237**	
COVID-19	5,639	(21)	4,546	(7)	6	(63)
All other infectious and parasitic diseases	3,228	(26)	2,120	(21)	207	(8)
Tinea skin infections	1,044	(47)	800	(41)	0	(86)
Unspecified viral infection	779	(59)	717	(44)	2	(77)
STDs	437	(74)	306	(65)	0	(86)
Diarrheal diseases	353	(82)	292	(67)	21	(36)
Chlamydia	101	(112)	88	(98)	0	(86)
Hepatitis B and C	18	(132)	8	(133)	0	(86)
Intestinal nematode infection	3	(142)	3	(136)	0	(86)
Bacterial meningitis	2	(144)	2	(139)	1	(80)
Tropical cluster	1	(145)	1	(143)	0	(86)
Tuberculosis	1	(145)	1	(143)	0	(86)
Skin diseases	**11,444**				**42**	
All other skin diseases	7,636	(13)	4,399	(10)	42	(30)
Sebaceous gland diseases	2,308	(33)	1,384	(33)	0	(86)
Contact dermatitis	1,500	(41)	1,158	(35)	0	(86)
Respiratory diseases	**10,683**				**82**	
Allergic rhinitis	6,234	(18)	1,535	(28)	0	(86)
All other respiratory diseases	1,846	(39)	1,109	(36)	80	(23)
Chronic sinusitis	1,109	(44)	621	(48)	0	(86)
Deviated nasal septum	692	(62)	395	(60)	0	(86)
Asthma	547	(72)	269	(70)	2	(77)
Chronic obstructive pulmonary disease	255	(91)	209	(81)	0	(86)
Genitourinary diseases	**9,990**				**36**	
All other genito-urinary diseases	5,159	(23)	2,615	(17)	14	(46)
Female genital pain	1,032	(48)	531	(53)	0	(86)
Menstrual disorders	1,025	(49)	617	(49)	1	(80)
UTI and cystitis	785	(57)	560	(51)	1	(80)
Other breast disorders	670	(63)	344	(61)	2	(77)
Kidney stones	632	(69)	267	(71)	13	(50)
Vaginitis and vulvitis	285	(87)	217	(78)	0	(86)
Nephritis and nephrosis	237	(93)	90	(97)	5	(64)
Benign prostatic hypertrophy	165	(103)	110	(92)	0	(86)
Digestive diseases	**9,030**				**430**	
All other digestive diseases	4,277	(24)	2,194	(20)	254	(6)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2022[a]

Major category condition[b]	Medical encounters[c]		Individuals affected[d]		Hospital bed days	
	No.	Rank[e]	No.	Rank[e]	No.	Rank[e]
Digestive diseases (cont.)						
Esophagus disease	2,178	(36)	1,244	(34)	16	(39)
Other gastroenteritis and colitis	1,479	(42)	665	(46)	69	(27)
Constipation	419	(76)	320	(64)	0	(86)
Inguinal hernia	379	(80)	145	(88)	5	(64)
Appendicitis	216	(96)	97	(94)	68	(28)
Cirrhosis of the liver	41	(122)	11	(125)	14	(46)
Peptic ulcer disease	41	(122)	28	(115)	4	(70)
Respiratory infections	**8,671**				**113**	
Upper respiratory infections	6,711	(16)	5,260	(6)	15	(41)
Lower respiratory infections	981	(50)	795	(42)	98	(20)
Otitis media	979	(51)	748	(43)	0	(86)
Cardiovascular diseases	**6,520**				**216**	
All other cardiovascular diseases	3,220	(27)	1,484	(30)	169	(11)
Essential hypertension	2,613	(30)	1,472	(31)	0	(86)
Ischemic heart disease	323	(85)	149	(87)	35	(31)
Cerebrovascular disease	281	(88)	96	(95)	8	(58)
Inflammatory	52	(120)	41	(108)	4	(70)
Rheumatic heart disease	31	(128)	29	(114)	0	(86)
Other neoplasms	**4,782**				**81**	
All other neoplasms	2,385	(32)	1,634	(26)	74	(26)
Benign skin neoplasm	1,908	(37)	1,526	(29)	0	(86)
Lipoma	346	(83)	211	(79)	0	(86)
Uterine leiomyoma	143	(109)	65	(103)	7	(61)
Headache	**3,982**				**3**	
Headache	3,982	(25)	1,919	(23)	3	(75)
Maternal conditions	**3,626**				**1,047**	
Pregnancy complications	1,816	(40)	497	(54)	617	(3)
All other maternal disorders	1,092	(45)	290	(68)	164	(12)
Delivery	388	(78)	255	(75)	231	(7)
Ectopic/miscarriage/abortion	228	(94)	88	(98)	15	(41)
Puerperium complications	102	(111)	56	(104)	20	(37)
Metabolic and immunity disorders	**3,198**				**21**	
Lipoid metabolism disorders	2,249	(34)	1,617	(27)	5	(64)
Other metabolic disorders	467	(73)	260	(72)	9	(54)
Gout	383	(79)	210	(80)	4	(70)
Immunity disorders	99	(113)	37	(110)	3	(75)
Endocrine disorders	**2,673**				**15**	
Testicular hypofunction	805	(56)	282	(69)	0	(86)
Hypothyroidism	651	(66)	303	(66)	0	(86)
Other thyroid disorders	640	(68)	258	(73)	0	(86)
All other endocrine disorders	417	(77)	207	(82)	15	(41)
Polycystic ovarian syndrome	160	(105)	91	(96)	0	(86)
Malignant neoplasms	**1,558**				**139**	
Melanoma and other skin cancers	359	(81)	168	(84)	0	(86)

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2022[a]

Major category condition[b]	Medical encounters[c]		Individuals affected[d]		Hospital bed days	
	No.	Rank[e]	No.	Rank[e]	No.	Rank[e]
Malignant neoplasms (cont.)						
Breast cancer	203	(97)	20	(121)	0	(86)
Lymphoma and multiple myeloma	166	(101)	27	(116)	0	(86)
Testicular cancer	166	(101)	31	(112)	0	(86)
Colon and rectum cancers	162	(104)	9	(131)	15	(41)
Leukemia	150	(108)	18	(122)	0	(86)
All other malignant neoplasms	96	(114)	31	(112)	15	(41)
Brain cancer	96	(114)	9	(131)	7	(61)
Pancreas cancer	41	(122)	2	(139)	89	(22)
Prostate cancer	39	(125)	16	(124)	0	(86)
Thyroid cancer	35	(126)	11	(125)	0	(86)
Trachea, bronchus, and lung cancers	14	(135)	4	(135)	4	(70)
Cervix uteri cancer	12	(136)	10	(130)	0	(86)
Stomach cancer	6	(137)	2	(139)	9	(54)
Ovary cancer	5	(140)	1	(143)	0	(86)
Bladder cancer	4	(141)	3	(136)	0	(86)
Esophagus cancer	3	(142)	1	(143)	0	(86)
Corpus uteri cancer	1	(145)	1	(143)	0	(86)
Nutritional disorders	**1,208**				**33**	
Overweight, obesity	785	(57)	610	(50)	0	(86)
All other nutritional disorders	422	(75)	327	(63)	33	(32)
Protein-energy malnutrition	1	(145)	1	(143)	0	(86)
Blood disorders	**1,182**				**5**	
All other blood disorders	553	(71)	258	(73)	1	(80)
Other non-deficiency anemias	290	(86)	158	(86)	4	(70)
Iron-deficiency anemia	256	(90)	137	(89)	0	(86)
Hereditary anemias	50	(121)	39	(109)	0	(86)
Other deficiency anemias	33	(127)	24	(119)	0	(86)
Diabetes mellitus	**822**				**45**	
Diabetes mellitus	822	(55)	207	(82)	45	(29)
Oral conditions	**786**				**9**	
All other oral conditions	762	(60)	430	(57)	9	(54)
Periodontal disease	18	(132)	17	(123)	0	(86)
Dental caries	6	(137)	6	(134)	0	(86)
Congenital anomalies	**727**				**33**	
All other congenital anomalies	605	(70)	412	(58)	10	(52)
Congenital heart disease	95	(116)	46	(106)	23	(34)
Other circulatory anomalies	27	(131)	11	(125)	0	(86)
Conditions arising during the perinatal period[f]	**21**				**0**	
All other perinatal anomalies	15	(134)	11	(125)	0	(86)
Birth asphyxia and birth trauma	6	(137)	2	(139)	0	(86)

Abbreviations: No., number; NOS, not otherwise specified; UTI, urinary tract infection; STDs, sexually transmitted diseases.
[a]2022 data are considered provisional but current as of March 21, 2023.
[b]Burden of disease major categories and burden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.[1]
[c]Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).
[d]Individuals with at least 1 hospitalization or ambulatory visit for the condition.
[e]Rank is based on the number of encounters, individuals affected, or hospital bed days in the respective columns within the listing of 153 burden-related disease conditions. For medical encounters, 22 conditions had tied rankings. For individuals affected, 34 conditions had tied rankings. For hospital bed days, there were 63 conditions with the rank of 86 (0); 49 other conditions had tied rankings.
[f]Conditions affecting newborns erroneously coded on service member medical records.

Individuals affected, by condition

The 10 conditions that affected the most USCG members in 2022 were all other signs and symptoms and respiratory/chest; other back problems and all other musculoskeletal diseases; refraction/accommodation disorders; organic sleep disorders; COVID-19 and upper respiratory infections; arm/shoulder injuries; and all other skin diseases. COVID-19 affected 4,546 USCG members and ranked seventh for the number of individuals affected.

Hospital bed days, by condition

In 2022, substance abuse and mood disorders accounted for about two-fifths (40.7%) of all hospital bed days **(Figure 3)**. Together, 4 mental health disorders (substance abuse, mood, anxiety, and adjustment) and 2 maternal conditions (pregnancy complications and delivery) accounted for three-fifths (60.3%) of all hospital bed days **(Table, Figure 3)**. About 10% of all hospital bed days were attributable to injuries and poisonings. COVID-19 accounted for 0.7% of total hospital bed days among active component USCG members **(Table)**.

Discussion

The USCG's health care use in 2022 is similar to the DOD when measured by total encounters/persons affected. The USGC rate was 11.3 encounters per person (390,665 / 34,506), compared to the DOD rate of 10.7 encounters per person (11,874,264 / 1,108,975). The USCG had a lower rate of hospital utilization, however, with only 0.25 bed-days per individual reporting a medical encounter; the DOD reported 0.33 bed-days per individual (369,097 / 1,108,975). This finding is consistent with prior reporting and raises concerns that the missing data issues discovered in 2016 have not yet been fully resolved.[4]

This report is consistent with the major findings of prior annual reports on morbidity and health care burdens among active component members . Injuries, musculoskeletal diseases, and mental health disorders are the categories of medical conditions associated with the most medical encounters, the largest number of affected service members, and the greatest number of hospital bed days. USCG and DOD service members shared many disease-related conditions when examining ICD codes to the fourth digit character: other back problems within the musculoskeletal disease major diagnostic category; arm/shoulder and knee in injuries within the injury major diagnostic category; anxiety disorders within the mental health disorder major diagnostic category; and organic sleep disorders within the neurologic condition major diagnostic category. The data presented in this report are considered provisional, as ongoing investigations for data completeness in the MHS MIP may result in later updates to the patterns of morbidity and health care burden reported here.

Although 2022 was affected by the COVID-19 pandemic, COVID-19 accounted for relatively modest numbers of medical encounters and bed days compared to other conditions included in this analysis, likely due to several factors. Besides the waning of the pandemic, active component service members represent a relatively young and healthy population less likely to experience severe consequences of COVID-19 infection. Notably, COVID-19 accounted for the most medical encounters but not bed-days within the infectious and parasitic disease major diagnostic category. This finding was consistent with DOD service members.

Consistent with past analyses, this report documents that relatively few illnesses and injuries account for a substantial proportion of morbidity and health care burdens that affect USCG active component service members. Preventable illnesses and injuries that disproportionately contribute to morbidity and health care burdens should be high-priority targets for intervention, research, and resources. Opportunities to address and resolve the missing data issues from USCG hospitalizations should be prioritized to ensure an accurate depiction of the true burden of disease among this population.

References

1. Pillai S, Chau M, Kamara I, Thomas D, Iskander J. Hospitalizations among active duty members of the U.S. Coast Guard, Fiscal Year 2021. *MSMR*. 2023; 30(2):3-5.
2. Armed Forces Health Surveillance Branch. Hospitalizations among members of the active component, U.S. Armed Forces, 2015. *MSMR*. 2016;23(4):8-16.
3. Defense Manpower Data Center. Self-service reports, Active duty by demographics, service branch. Accessed June 15, 2023. https://dmdcrs.dmdc.osd.mil/dmdcrs/public/

Reportable Medical Events, Military Health System Facilities, Week 18, Ending May 6, 2023

Reportable Medical Events (RMEs) are documented in the Disease Reporting System internet (DRSi) by health care providers and public health officials throughout the Military Health System (MHS). The DRSi collects reports on over 70 different RMEs, including infectious and non-infectious conditions, outbreak reports, STI risk surveys, and tuberculosis contact investigations. These reports are reviewed by each service's public health surveillance hub, which serves as an active primary prevention component to identify other service members at risk, assess need for post-exposure screening and prophylaxis, or inform other actions to protect and assure public health. Primary prevention (reducing disease occurrence) is the most effective method for preserving the medical readiness of the force.

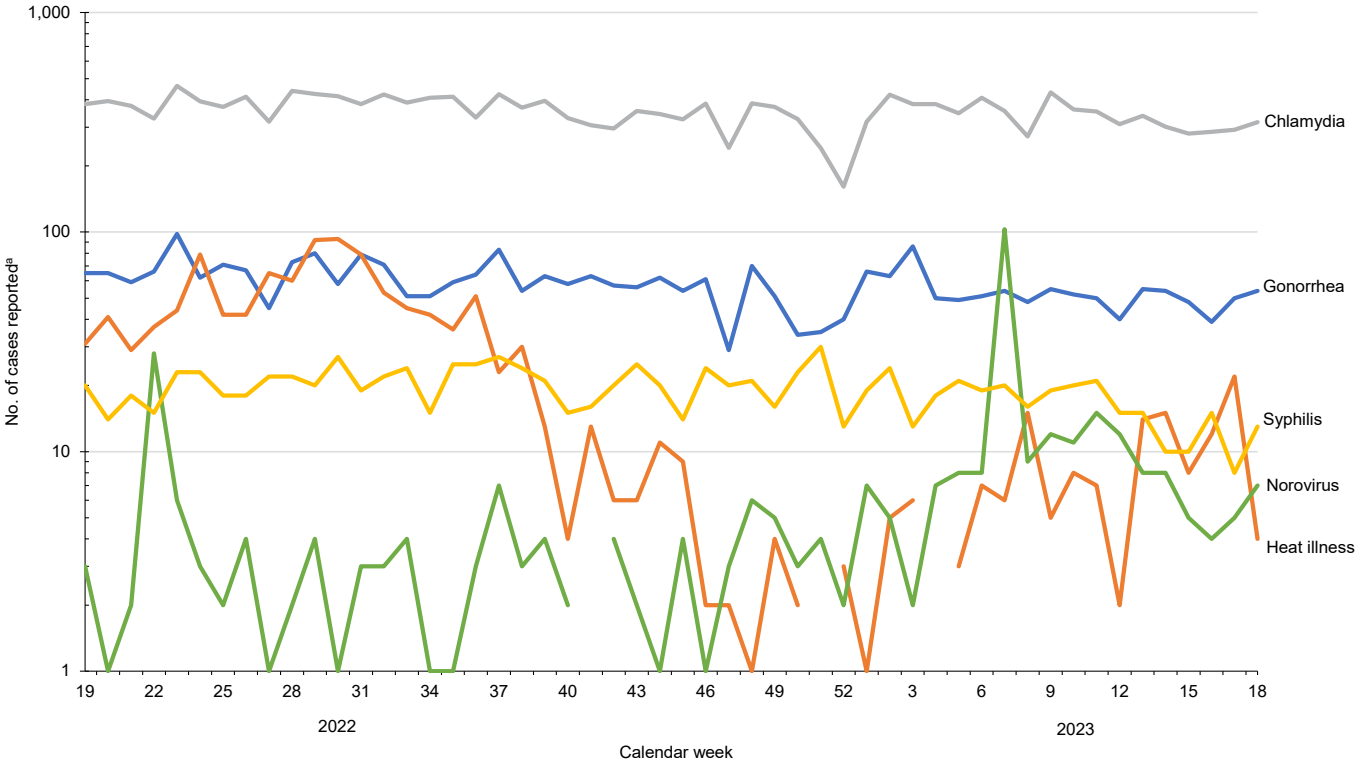
Routine monitoring, evaluation, and publication of RMEs provide an important data resource for both policymakers and commanders, to guide their efforts for controlling and preventing diseases with potential measurable impacts on public health and force readiness—strategic, operational, and tactical. RMEs were chosen by consensus and recommendations from each service, which evaluated lists of nationally-notifiable diseases from the Centers for Disease Control and Prevention, position statements from the Council of State and Territorial Epidemiologists, and other events identified as significant military health threats meriting added surveillance. A complete list of RMEs is available in the 2022 *Armed Forces Reportable Medical Events Guidelines and Case Definitions*.[1]

The data presented in the Table not only list the most recent case counts but reveal trends of incidence for the past 2 months, year-to-date, and over the preceding year. Data reported in the Table are considered provisional and do not represent conclusive evidence until case reports are fully validated.

The most recent data on the 5 most frequent RMEs among total active component cases, as reported per week during the preceding year, are depicted in the Top 5 RME Trends by Calendar Week graph. COVID-19 is excluded from the graph due to 2023 changes in reporting and case definitions.

TOP 5 REPORTABLE MEDICAL EVENTS BY CALENDAR WEEK, ACTIVE COMPONENT

(APRIL 30, 2022 - MAY 6, 2023)



Abbreviation: No., number.
[a]Cases are shown on a log scale.
Note: There were 0 heat illness cases in week 51 of 2022 and week 4 of 2023. There were 0 norovirus cases in week 41 of 2022.

TABLE. Reportable Medical Events, Military Health System Facilities, Week Ending May 6, 2023 (Week 18)[a]

Reportable Medical Event[b]	Active component[c]				MHS beneficiaries[d]	
	Mar	Apr	YTD 2023	YTD 2022	Total, 2022	Apr
	no.	no.	no.	no.	no.	no.
Amebiasis	1	2	5	4	13	0
Arboviral Diseases, Neuroinvasive and Non-neuroinvasive	0	0	0	1	1	0
Brucellosis	0	0	0	0	2	0
COVID-19[f]	3,124	1,918	16,347	124,164	209,957	798
Campylobacteriosis	25	19	77	68	229	10
Chikungunya Virus Disease	0	0	0	1	1	0
Chlamydia trachomatis	1,611	1,185	5,862	6,711	19,397	175
Cholera	1	0	1	0	2	0
Coccidioidomycosis	1	1	8	4	15	0
Cold Weather Injuries[e]	25	4	91	109	151	-
Cryptosporidiosis	8	4	22	13	46	1
Cyclosporiasis	0	0	0	0	10	0
Dengue Virus Infection	1	0	1	0	1	0
E. coli, Shiga Toxin-Producing	2	3	7	7	67	4
Ehrlichiosis/Anaplasmosis	0	0	0	0	3	0
Giardiasis	4	6	21	23	71	0
Gonorrhea	223	196	910	1,195	3,302	23
Haemophilus influenzae, invasive	0	0	0	1	1	1
Hantavirus Disease	0	0	0	0	1	0
Heat Illness[e]	36	57	136	96	1,213	-
Hepatitis A	0	2	4	5	16	0
Hepatitis B	18	6	51	42	118	15
Hepatitis C	7	3	24	11	57	8
Influenza-Associated Hospitalization[g]	0	0	5	11	148	3
Lead Poisoning, Pediatric[h]	-	-	-	-	-	5
Legionellosis	0	1	2	1	4	0
Leishmaniasis	0	0	1	1	1	0
Leptospirosis	0	0	2	0	1	0
Lyme Disease	3	5	19	17	65	3
Malaria	0	0	6	2	26	0
Meningococcal Disease	1	1	2	0	2	0
Mpox	0	0	0	0	93	0
Mumps	0	0	0	0	0	0
Norovirus	49	22	229	93	219	50
Pertussis	0	1	2	3	10	3
Post-Exposure Prophylaxis against Rabies	45	34	162	139	507	32
Q Fever	0	0	1	2	3	0
Rubella	2	0	2	2	3	0
Salmonellosis	9	7	21	26	122	12
Schistosomiasis	0	0	0	0	1	0
Severe Acute Respiratory Syndrome (SARS)	0	0	0	1	1	0
Shigellosis	4	5	18	6	33	7
Spotted Fever Rickettsiosis	4	2	14	6	70	0
Syphilis (All)	81	45	284	327	1,041	13
Toxic Shock Syndrome	0	0	1	0	0	0
Trypanosomiasis	0	0	1	0	1	0
Tuberculosis	2	0	2	3	10	3
Tularemia	0	1	1	0	0	0
Typhus Fever	1	0	1	1	1	0
Varicella	0	2	3	2	16	3
Total case counts	5,288	3,532	24,346	133,098	237,052	1,169

Abbreviations: RME, reportable medical event; MHS, Military Health System; YTD, year to date; no., number.

[a] RMEs reported through the DRSi as of May 31, 2023 are included in this report. RMEs were classified by date of diagnosis, or where unavailable, date of onset. Monthly comparisons are displayed for the period of March 1, 2023-March 31, 2023 and April 1, 2023-April 30, 2023. Year-to-date comparison is displayed for the period of January 1, 2023-April 30, 2023 for Military Health System facilities. Previous year counts are provided as the following: previous year YTD - January 1, 2022-April 30, 2022; total 2022 - January 1, 2022-December 31, 2022.

[b] RME categories with zero reported cases among active component service members and MHS beneficiaries for the time periods covered were not included in this report.

[c] Services included in this report include Air Force, Army, Coast Guard, Navy, Marine Corps, and Space Force, including personnel classified as FMP 20 with Duty Status of AD, Recruit, or Cadet in DRSi.

[d] Beneficiaries included the following: individuals classified as FMP 20 with Duty Status of Retired and individuals with all other FMPs except 98 and 99. Civilians, contractors, and foreign nationals were excluded from these counts.

[e] Only reportable for active component service members.

[f] Only cases resulting in hospitalization or death after case definition update on May 4, 2023.

[g] Influenza-Associated Hospitalization is reportable only for individuals aged 65 years or younger.

[h] Pediatric Lead Poisoning is reportable only for children aged 6 years or younger.

Updated Instructions for MSMR Authors

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Reports must be based on analyses that use standardized, validated, or accepted scientific methods and should include sufficient data samples to adequately address the aim of the report. Results should yield actionable public health information or recommendations. Recommendations presented in the Discussion should reflect the quality and nature of the study design. Any major limitations resulting from data quality should be included for transparency. Reports primarily descriptive in nature, i.e., not testing a proposed hypothesis, should have a limited Discussion section. Use of active voice, in addition to succinct language, are strongly encouraged for clarity and reports should be logically organized for ready comprehension by *MSMR* readers

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Full Reports

Full Reports present the verified results of a completed epidemiologic investigation or study that answers a question of military health importance. All Full Reports are submitted to 2 voluntary, independent reviewers for peer review.

The Introduction, Methods, Results, and Discussion sections of a Full Report should not exceed 2,000 words. Full Reports exceeding 2,000 words may be considered if a supported justification is presented to the editor. Cited references in a Full Report are limited to 25, and data tables and figures should complement the text succinctly and logically.

Recommendations presented in the Discussion of a Full Report should reflect the quality and nature of the study design.

TYPES OF REPORTS

Type of Report	Word Limit	Table/Figure Limit	Reference Limit	Peer Review
Full Report	2,000	Minimum necessary to support succinct data presentation.	25	Yes
Brief Report	1,000	2	10	Yes
Outbreak Report	2,000	Minimum necessary to support succinct data presentation.	25	Yes
Case Report	1,000	Minimum necessary to support succinct data presentation.	10	Yes
Surveillance Snapshot	500	1	10	No
Letter to the Editor	1,000	Typically not applicable.	5	Reviewed by MSMR editors
Historical Perspective	2,000	Typically 2; additional may be considered upon request.	25	Yes
Notice to Readers	500	Typically not applicable.	-	No
Images in Health Surveillance	500	As required to support aim of submission.	5	No
Guest Editorial	2,000	Typically 2; additional may be considered upon request.	25	Discretion of editors

Full Reports, cont'd.

Full Report submissions comprise 10 elements or sections, in the following order:

1. *Title:* Brief and descriptive, indicating major result(s) in as few words as possible.
2. *Authorship and Affiliations:* List all authors and affiliations immediately after title, according to *MSMR* authorship guidelines (see Submission Formats). *MSMR* policy requires *all* authors satisfy *all* International Committee of Medical Journal Editors (ICMJE) authorship criteria:
   - Substantial contributions to the conception or design, or acquisition, analysis or interpretation of data
   - Drafting and critical revision of important intellectual content
   - Final approval published version
   - Agreement to accountability for all aspects to ensure accuracy or integrity questions are appropriately investigated and resolved.
3. *Military Relevance:* In 100 words maximum, convey succinctly what is novel about the findings and describe how they can inform decisions and actions supporting readiness and force health protection: *MSMR* aims to disseminate actionable medical surveillance information to military medical and public health professionals to enhance health, fitness, and readiness. This information is presented in a text box with 2 key questions: *What are the new findings?* and *What is the impact on readiness and force health protection?*
   - For the new findings statement, in 50 words or less describe, in plain English, the findings of the analysis or report that either are new or provide confirmation of earlier reports.
   - For the impact on readiness and force health protection statement, in 50 words or less describe, in plain English, how the findings can be applied to decisions or actions for military operational readiness or force health protection. (See *MSMR* November 2018 vol. 25 issue 11.)
4. *Structured Abstract:* In 175 words maximum, summarize the report, with a focus on the main findings, in sections labeled Introduction, Methods, Results, and Discussion.
5. *Background:* Include contextual information (e.g., brief, relevant literature review) and relevance to U.S. military populations or operations. Conclude with objective or specific question(s).
6. *Methods:* Specify, as appropriate, target population, time period, definitions, exposures, outcomes or endpoints, other characteristics of interest, sources and methods of data collection, and data summary and statistical analysis methods. The Methods must have sufficient detail to allow study reproduction or verification. If analysis involved databases or methods already published, limited text should be devoted to information available elsewhere, referenced. For descriptive studies, the Methods must describe how data were obtained, including source(s), case and covariate definitions, and most recent date(s) data sources were refreshed.
7. *Results:* Communicate, logically and concisely, findings and analysis results. Excepting emphasis on important or significant observations, do not repeat numerical data in tables and graphs; limit tables and figures to those required to explain and support the argument and report key outcomes identified. Descriptive studies should limit analyses to those appropriate for hypothesis-generating submissions.
8. *Discussion:* Provide interpretive comments that address the importance of the study findings. Contextualize the main findings within broader military or general public health conditions or concerns, including previously published comparative studies, as applicable. Articulate both study strengths and limitations, including likely impacts of the limitations (e.g., shortcomings of data sources, sources of bias). Propose specific strategies for future studies or changes in practice. Descriptive (hypothesis-generating) studies should limit their discussions to new or noteworthy trends, strengths and limitations, and suggestions for future work. Analytic (hypothesis-testing) studies should include comparisons to published literature (if any) and whether the new findings confirm or refute those studies.

Acknowledgements (optional): Recognize contributors who do not qualify as authors. *Disclaimers (optional):* Disclose any necessary legal, service-specific, or DOD disclaimers. Submissions from within any DOD Service or Agency must have legal and public affairs review.

9. *References:* Cite a maximum of 25, directly related to the topic. All references must be cited in the text, in superscript. List references in AMA style. (See Submission Formats.)
10. *Tables and figures:* Submit in a separate Excel file. The number of tables and figures should complement the text succinctly and logically. (See Submission Formats.)

Brief Reports

Brief Reports condense 8 of the 10 elements of a Full Report—Military Relevance and Structured Abstract are not required—to 1,000 words maximum. Brief Reports are generally more descriptive and suitable for most descriptive (hypothesis-generating) studies, due to their simplified and limited Methods and Discussion sections. All Brief Reports are peer-reviewed. Brief reports are generally limited to 1 or 2 tables and figures, to focus the scope of the report, with a maximum of 10 references.

***TIP*:** Simplicity expedites the review of a Brief Report, which only summarizes an analysis of data or prior reporting.

Outbreak Reports

Outbreak Reports detail the chronology of an epidemiologic investigation with a surveillance period of 12 months preceding report submission. Outbreak Reports include all 10 elements of Full Reports and should not exceed 2,000 words. The Methods should summarize the full investigation with case definitions, case-defining activities, and epidemiologic study design. The Results should describe case characteristics (e.g., clinical characteristics) as well as person, place, and time measurements. The Discussion may include a brief summary of public health interventions, interpretation of results, implications for public

health practice, and recommendations for future prevention and control. All Outbreak Reports are peer-reviewed.

TIP: This type of report may include clusters of disease where no specific etiology was discovered after a thorough investigation.

Case Reports

Case Reports, limited to 1,000 words, describe a disease occurrence to share timely, pertinent, and potentially actionable information for medical, scientific, or educational purposes. Case Reports should clearly establish a relevance to matters of public health importance. Case Reports should include a Summary of each case(s) followed by a Discussion, and may contain images, as appropriate. Specific section headers may be proposed by authors. Acknowledgements, Disclaimers, and References should be included, when applicable. All Case Reports are peer-reviewed.

Surveillance Snapshots

Surveillance Snapshots depict the incidence or distribution of disease within a single chart and can include 1 or 2 paragraphs of text (with no section heading), limited to 500 words. Surveillance Snapshots are not peer-reviewed but are subject to editorial review that may include consultation with other AFHSD staff. Acknowledgements, Disclaimers, and References should be included, as applicable.

Letters to the Editor

Letters to the Editor offer timely and concise opinions or interpretations of articles published in *MSMR*. Letters should not include unpublished data and should be submitted within 1 year of publication of the referenced article. They are not peer-reviewed, but it is customary for the editorial team to send each letter to the author(s) of the original work for an opportunity to reply; the authors' response is generally published as a companion to the letter. Text for a letter to the editor is limited to 1,000 words, with references limited to 5. Tables and figures are discouraged but may be considered on an individual basis. Acknowledgements, disclaimers, and references should be included, as applicable. Letters are subject to abridgement and editing for style and content.

Historical Perspectives

Historical Perspectives discuss the historical impact(s) of a disease or condition on a specific military operation or the military overall, limited to 2,000 words and 1 or 2 images. Section headers can be proposed by the authors; Acknowledgements, Disclaimers, and References should be included, as applicable. Historical Perspectives may be peer-reviewed by historians or relevant subject matter experts.

Notices to Readers

Notices to Readers announce changes in recommended public health practices (e.g., vaccine recommendations) or the availability of clinical or surveillance resources (e.g., laboratory testing), in 500 words or less. Notices to Readers are not peer-reviewed. The *MSMR* does not publish meeting announcements or summaries of past meetings.

Images in Health Surveillance

Images in Health Surveillance illustrate militarily relevant public health information with photographs, drawings or other images, with accompanying text limited to 500 words, with no section headers. Acknowledgements, Disclaimers, and References should be included, as applicable.

Guest Editorials

Editorials are usually invited but may be proposed. An editorial may serve as an opinion piece, or a comprehensive narrative relevant to public health professionals serving MHS beneficiaries. This may include a narrative review of literature or knowledge base, an update on the current understanding and state-of-the art of the topic, theory, and practice of epidemiology and/or military public health sciences. Editorials are generally limited to 2,000 words and may contain up to 2 tables or figures. The section headers of this report may be proposed by the authors. Acknowledgements, disclaimers, and references should be included, as applicable.

Other article types

May be proposed to the editor.

Submission Formats

The *MSMR* follows the *American Medical Association Manual of Style, 11th edition* as well as the MHS Editorial Style Guide. Please refer to the AMA Manual if you have questions about formatting or structure not addressed in these instructions. Submissions should be sent to the *MSMR* editor at dha.ncr.health-surv.mbx.msmr@health.mil.

Required for submission:

- a Microsoft Word document of the manuscript text of the proposed article
- a complete Authorship Submission Form, downloaded at https://www.health.mil/Military-Health-Topics/Health-Readiness/AFHSD/Reports-and-Publications/Medical-Surveillance-Monthly-Report/Instructions-for-Authors
- a Microsoft Excel file containing any associated tables and figures, or associated images, as applicable.

Manuscript Text

All manuscript text should be submitted in 1 Microsoft Word file, using the structure and section headers (applicable) noted for each Type of Report. Please submit all Word documents in 12-point Times New Roman font, with text double-spaced, and leave right margins unjustified (ragged). Do not embed tables or charts in the Word document (see Tables and Figures). A title page is not required.

Word limits only apply to the body of the text, which include 2,000 words for Full Reports, Outbreak Reports, Topical Reviews, and Historical Perspectives; 1,000 words for Brief Reports and Case Reports; and 500 words of text may accompany Surveillance Snapshots, Images in Health Surveillance, and Notices to Readers.

Submissions longer than these suggested word counts will be considered individually and must be justified by the authors in their submission e-mails.

References

References should be listed in accordance with AMA style.

- List authors by last name and initials with no punctuation other than commas separating authors. When listing more than 6 authors, list only the first 3 followed by "et al."
- Only proper nouns are capitalized for article or chapter titles.
- Use journal title abbreviations as listed in PubMed and *italicize* journal title abbreviations and book titles.
- Journal issue citations should include no spaces after year of publication, followed by a semicolon; then the volume number with issue number in parentheses, then a colon with page number(s) immediatelay following.
- Online updates and dates of access should precede the URL.
- Do not include URLs for references indexed in PubMed.

Example references:

1. Stahlman S, Oetting AA. Mental health disorders and mental health problems, active component, U.S. Armed Forces, 2007–2016. *MSMR*. 2018;25(3):2-11.
2. Armed Forces Health Surveillance Division. Armed Forces Reportable Medical Events Guidelines and Case Definitions. October 2022. Accessed April 6, 2023. https://www.health.mil/Reference-Center/Publications/2022/11/01/Armed-Forces-Reportable-Medical-Events-Guidelines
3. O'Connor FG, Sawka MN, Deuster P. Disorders due to heat and cold. In: Goldman L, Schafer AI, eds. *Goldman-Cecil Medicine*. 25th ed. Philadelphia, PA: Elsevier Saunders; 2016:692-693.

Authorship and Affiliations

The Microsoft Word file submission must include a list of all authors and affiliations, immediately below the title. For each author list first name, middle initial, last name, highest academic degree(s). Examples: John Snow, MD, MPH; Mary L. Archer, MD. If an author holds 2 doctoral degrees (e.g., MD and PhD), either or both may be used, in the author's preferred order. List academic degrees below the highest degree only when representative of a specialized field or other than highest degree (e.g., MPH, BSN). List each author's current assignment and/or affiliation. Examples: U.S. Naval Medical Research Unit 3, Cairo, Egypt (Dr. Archer); Department of Surgery, University of Chicago, Chicago, Illinois (Dr. Snow, Dr. Smith, Dr. Jones).

Only authors with substantive contributions qualifying for authorship credit according to ICMJE guidelines may be listed; listing authors who do not meet ICMJE authorship criteria is considered a serious breach of scientific ethics. The primary author is solely responsible for verifying the academic contributions of each co-author. Each co-author must approve the final version of the article prior to publication. An author must satisfy *all* of the following criteria:

1. *Substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data.* For contributions to be substantial, the work could not have proceeded without that author's contributions. Granting authorship to a senior individual solely by virtue of position, e.g., department head, commander, is prohibited. *MSMR* may request additional information to verify contributions.
2. *Drafting and critical revision for important intellectual content:* Each author should provide substantive comments during reviews—authors should record comments during reviews so each author's contributions to the final product can be verified.
3. *Final approval of the version published.*
4. *Agreement to accountability for all aspects of the work, ensuring that questions of accuracy or integrity for any part are appropriately investigated and resolved:* Scientific misconduct, e.g., falsifying or intentionally presenting misleading data is a serious offense. All authors are expected to fully cooperate in any investigation where scientific misconduct is alleged.
5. *The primary author must be able to identify which co-authors are responsible for specific parts of the work.* This information should be included in the initial submission packet.

Tables and Figures

Tables and figures should adhere to AMA style and must be submitted as a Microsoft Excel file, i.e., **not** embedded in the text. Microsoft Excel is the preferred software for generating tables and figures. Figures generated with other software (e.g., SAS, SPSS) will be considered individuallly.

Each table or figure should constitute 1 worksheet tab. The data used to create a figure in Excel must be included in tabular form and link to the figure. Number each table and figure, with a descriptive title.

Every table and figure should be cited in the text. Verify that data are consistently reported within all text, tables, and figures.

Place legends within the figure—line labels for graphs are preferred—and titles above the figure. Do not use pie charts or 3-D graphs. Format all tables and figures with Arial font 8 point. Use lowercase superscripted letters (e.g., a,b,c) for footnotes in tables and figures.

TIP: Authors should study tables in the example and previously published reports for specific style guidance.

Photographs that illustrate a prevention intervention, risk factor, or outbreak setting are encouraged. Only submit photographs within the public domain; if a photo credit is required, submit the name.

Submission and Acceptance

Submit via email at dha.ncr.health-surv.mbx.msmr@health.mil. Consult the Submission Formats section for all formatting requirements and instructions. Submit the Microsoft Word report document, Excel tables/figure file (or photographs, if applicable), and authorship submission form as separate attachments.

Publication Timeline

Accepted reports are typically published within 60 days of acceptance.

Information on Clearance and Consent, as well as Ethics and Publication Malpractice should be reviewed at https://www.health.mil/Military-Health-Topics/Health-Readiness/AFHSD/Reports-and-Publications/Medical-Surveillance-Monthly-Report/Instructions-for-Authors.

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- *Editorial Inquiries*: Call (301) 319-3240 or email dha.ncr.health-surv.mbx.msmr@health.mil.
- *Instructions for Authors:* Information about article submissions is provided at www.health.mil/MSMRInstructions.

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Armed Forces Health Surveillance Division
11800 Tech Road, Suite 220
Silver Spring, MD 20904