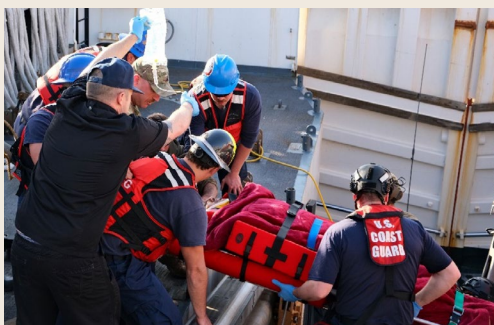


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Absolute and Relative Morbidity Burdens Attributable to Various Illnesses and Injuries Among Active Component Members of the U.S. Armed Forces, 2023

MSMR's annual burden of disease reports are designed to provide accurate estimations of the general health status of U.S. military personnel, for prioritization of effective interventions with measurable impacts on force readiness.¹ In these reports, diagnoses are grouped to inform our readership of the major factors and variables each year affecting health care provision within the Military Health System (MHS). Although burden of disease within a health care system can be classified into several categories, the majority of the disease burden globally comes from non-communicable diseases (NCDs), with communicable diseases the second-most prevalent, followed by maternal, neonatal and nutritional diseases, and subsequently injuries.²

To broadly describe the morbidity burden among active component service members (ACSMs), *MSMR* has used, since 2001, a classification system derived from the Global Burden of Disease (GBD) Study,^{3,4} a systematic, scientific effort that began 30 years ago to quantify the magnitude of all major diseases, their risk factors, and intermediate clinical outcomes in a highly standardized manner. This systematic classification enables comparisons between populations and health problems over time.⁵ *MSMR* utilizes the GBD classification system in combination with an International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) chapter-based system for categorization of hospitalizations and ambulatory visits among the MHS population.

To improve the usefulness of this information, these classification schemes are refined by *MSMR*'s editorial staff. The major classification system for diagnoses, ICD-10-CM, features over 68,000 separate codes.⁵ While the ICD-10-CM is organized in logical chapters, the groupings are not optimal for describing burdens of disease in a

military population. Consequently, some re-groupings of diagnoses are necessary 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 that of the general U.S. or global populations. 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 ACSMs may detect conditions potentially undetected in other populations. The numerous readiness-related outpatient visits required for each ACSM, the prescribed circumstances of military living, training requirements, and access to medical care without cost may contribute to different morbidity burden profiles compared to other population groups.

Individuals enlist or are commissioned into the active component typically between the ages of 17 and 25, with almost all members ending service by age 50. In 2022, the mean age of ACSMs in the U.S. Armed Forces was approximately 29, with 1.3% of the population over 50.³ By contrast, the median age of the U.S. population in 2022 was 38.9, with 36.1% over age 50.⁴ Women constituted 19.2% of the active component in 2023, compared to 51.0% in the general U.S. population.⁶

Within the military population and its specific environment, categories of illnesses and injuries requiring hospitalization have historically differed from those that result in the most outpatient visits. The added requirements for readiness are likely a major factor in outpatient health care provision, but rarely for hospitalization. The categories of medical conditions and readiness requirements that account for the most

What are the new findings?

In 2023, injuries, mental health disorders, and musculoskeletal diseases were the medical conditions associated with the most medical encounters, greatest numbers of service members affected, and highest numbers of hospital days. Major category conditions increased overall by about 17% compared to 2022, and medical encounters increased by 18%. COVID-19 accounted for no more than 0.3% of total member medical encounters and hospital bed days among active component service members in 2023.

What is the impact on readiness and force health protection?

The major condition categories in this report present health challenges among U.S. active component service members that can affect force readiness. Investigating morbidity and health care burdens enables prioritization of relevant health conditions, and their primary causes, for appropriate resource allocation and proactive management of potential health events through timely intervention, research, and resources. Development and consistent implementation of policies and safeguards is critical for reducing the burden of diseases that affect readiness.

medical encounters overall may differ from those that affect the most individuals or have the most debilitating or long-lasting effects.⁴

This annual summary uses several health care burden measures to quantify the impacts in 2023 of various illnesses and injuries 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. A consistent and comparative description of the burden of diseases and injuries, and subpopulations affected, is an important input to health decision-making and planning processes and can provide valuable information for where changes in policy or preventive emphasis may improve the medical readiness of the force.⁷

Methods

The population for this analysis includes all individuals who served in the active component of the Army, Navy, Air Force, Marine Corps, or Space Force at any time during the surveillance period of January 1, 2023 through December 31, 2023. 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 non-military hospitals and medical clinics (e.g., during deployments, field training exercises, or at sea) are excluded from this analysis.

DMSS data for all inpatient and outpatient medical encounters of ACSMs 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 25 burden of disease-related ‘categories’ and 153 ‘conditions’, which are described as major category conditions in this report, based on a modified version of the classification system developed for the GBD Study.⁴ This classification system was developed by the MSMR editorial staff in 2001 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.⁸

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 affected ACSMs (n=584,756) experienced medical encounters due to injury more than any other morbidity-related category in 2023 (**Figure 1a**). Ranking third in terms of hospital bed days, this major burden of disease category accounted for about one-fourth (23.2%) 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 98% of ambulatory encounters within the category (data not shown).

Mental health disorders accounted for more hospital bed days (n=213,905) than any other morbidity-related category, contributing over half (54.8%) of all hospital bed days, ranking fifth for individuals affected (**Figures 1a and 1b**). Together, injury and mental health disorders accounted for over two-thirds (64.8%) of all hospital bed days and 42.3% of all medical encounters.

Maternal conditions (e.g., pregnancy complications and delivery) accounted for a relatively large proportion of all hospital bed days (n=56,122; 14.4%) but a much smaller proportion of medical encounters overall (n=205,381; 1.5%) (**Figures 1a and 1b**). As women comprised only 19.2% of the active duty force in 2023, these summary statistics understate the impact of these

conditions among that group. Maternal conditions were the most frequent category among women in the active component.

Medical encounters, by condition

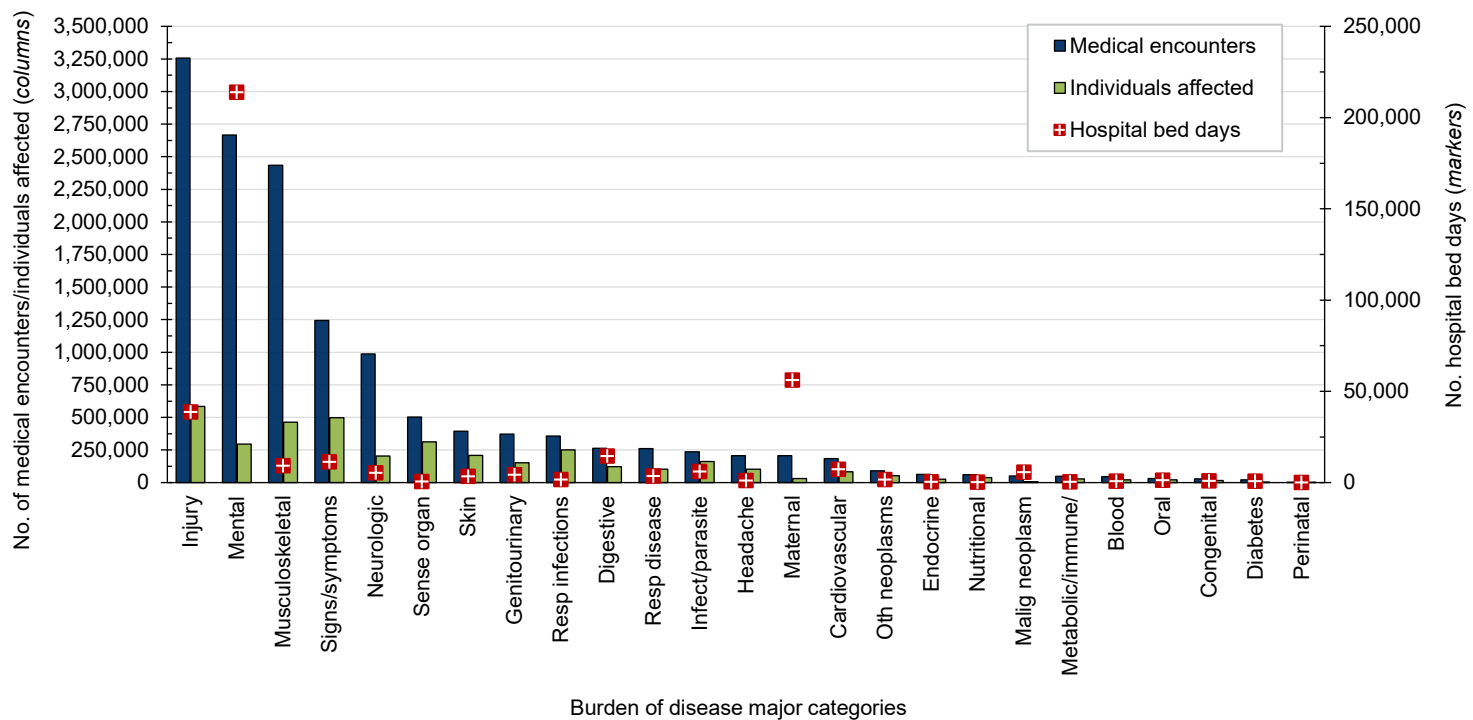
In 2023, 5 burden of disease-related conditions accounted for almost one-third (33.2%) of all illness- and injury-related medical encounters: other back problems (e.g., lower back pain, other dorsalgia), organic sleep disorders (e.g., insomnia, obstructive sleep apnea), all other signs and symptoms (e.g., 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 (56.6%) of all illness- and injury-related medical encounters.

The health conditions that accounted for the most medical encounters among ACSMs in 2023 were predominantly injuries, mental health disorders, and musculoskeletal diseases. Of reported injuries, knee (6.3%), arm/shoulder (6.0%), foot/ankle (3.8%), and leg (3.2%) resulted in the most medical encounters (**Figure 2 and Table**). Mental health disorder diagnoses resulted most frequently from anxiety (5.7%), adjustment (4.3%), mood (4.3%), and substance abuse disorders (2.8%). Other back problems (9.3%), all other musculoskeletal diseases (5.7%; e.g., pain in foot, pain in leg), and cervicgia (1.8%) generated the most medical encounters from musculoskeletal diseases. COVID-19 accounted for 0.3% of total medical encounters, ranking 44th in 2023, continuing the decrease to 1.4% of total encounters seen in 2022.

Individuals affected, by condition

In 2023, the 10 conditions that affected the most service members were signs, symptoms, and other ill-defined conditions (all other signs and symptoms and respiratory/chest); musculoskeletal diseases (other back problems and all other musculoskeletal diseases); respiratory infections (upper respiratory infections); neurological conditions (organic sleep disorders); respiratory and chest, sense organ diseases (refraction/accommodation); injuries (knee and arm/

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. Armed Forces, 2023^d



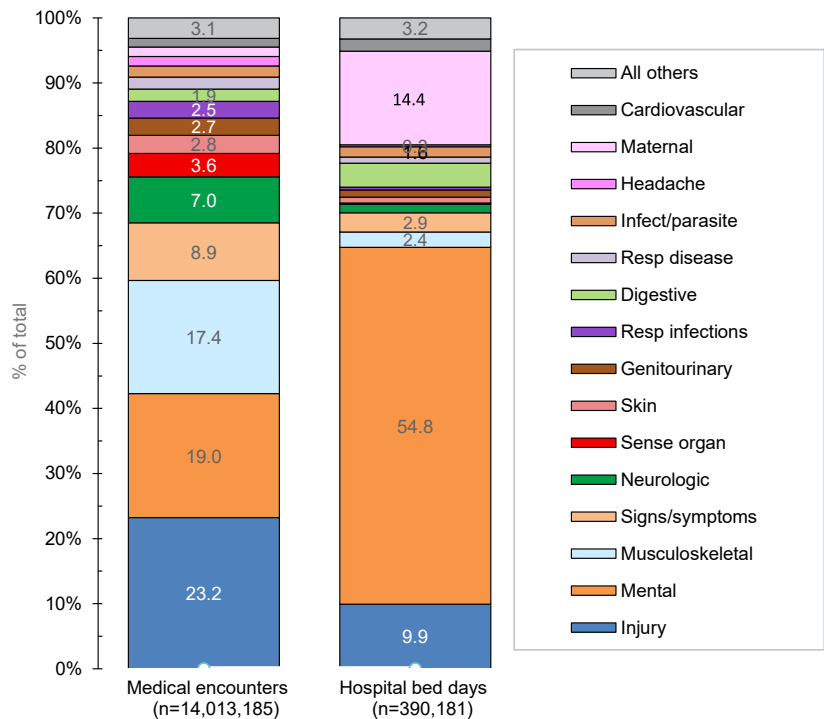
Abbreviation: No., number.

^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.^{3,4}

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, 2023



shoulder); and skin diseases (all other skin diseases). COVID-19 affected 32,508 service members and ranked thirty-fifth for numbers affected, a considerable decrease in rank from twelfth in 2022.

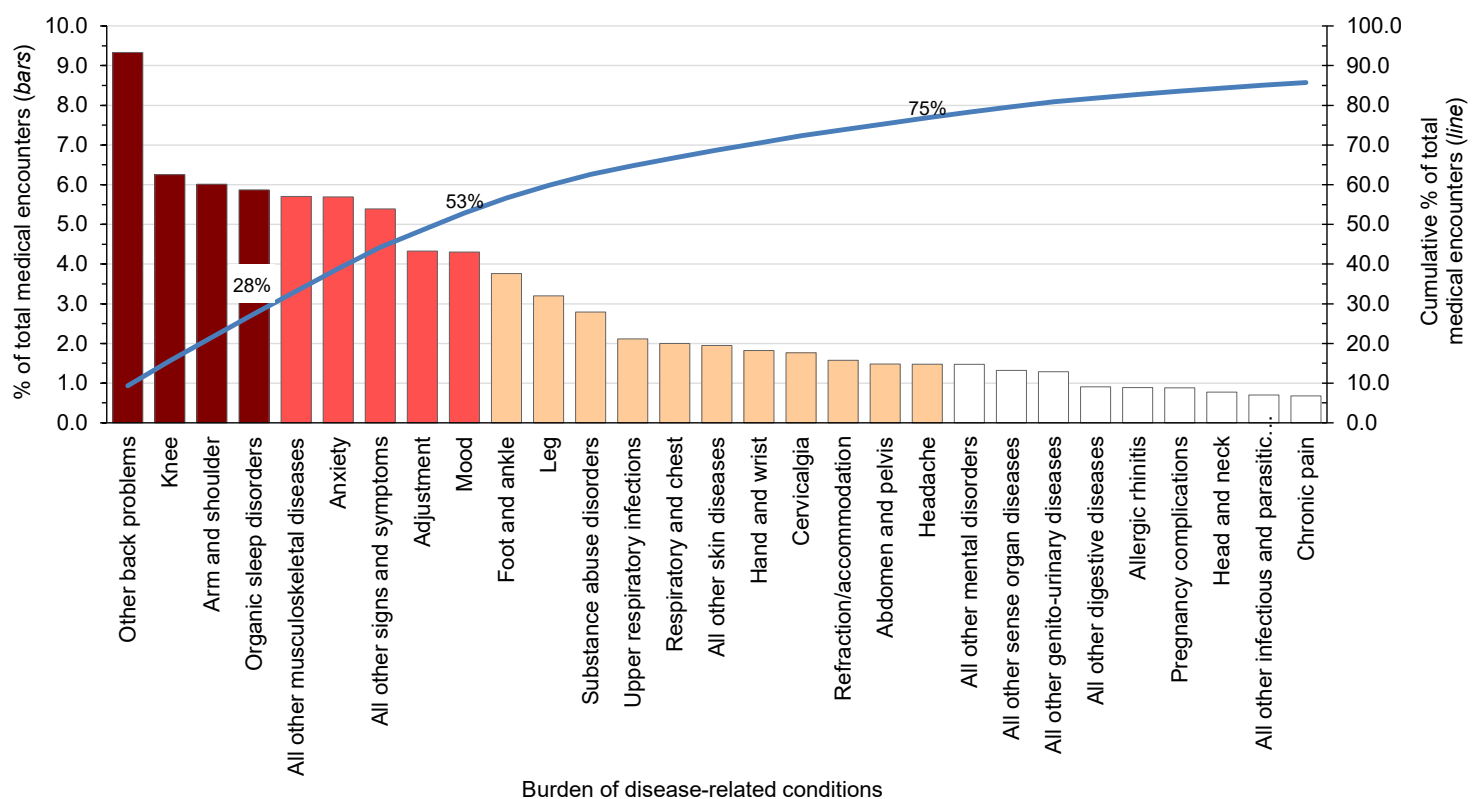
Hospital bed days, by condition

Mood and substance abuse disorders accounted for nearly one-third (32.9%) of all hospital bed days (**Figure 3**) in 2023. Four mental health disorders (mood, substance abuse, adjustment, anxiety) and 2 maternal conditions (pregnancy complications, delivery) together accounted for almost two-thirds (63.5%) of all hospital bed days (**Table** and **Figure 3**). About 10% of all hospital bed days were attributable to injuries and poisonings. COVID-19 accounted for

^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.^{3,4}

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, 2023



^aBurden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.^{3,4}

0.11% of total hospital bed days among ACSMs, down from 0.3% in 2022 (Table).

Relationships between health care burden indicators

There was a strong positive correlation between numbers of medical encounters attributable to various conditions and numbers 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), while weak-to-moderate positive relationships were detected for hospital bed days attributable to conditions and numbers of individuals affected ($r=0.22$) by, or medical encounters associated ($r=0.41$) with, those conditions. For example, substance abuse disorders and labor and delivery were among the top-ranking conditions, by proportion of total bed days, but these conditions affected relatively few ACSMs in 2023.

Discussion

This MSMR report provides the most recent data available for a major disease matrix comparable to previous reports. Compared to 2022, overall major category conditions reported in 2023 increased by 16.9%, medical encounters increased by 18%, as well as individuals affected (8.6%) and hospital bed days (5.7%). This result is consistent with the major findings of prior MSMR reports on morbidity and health care burdens among U.S. military members. Injuries, mental health disorders, and musculoskeletal disorders were the medical conditions in 2023 associated with the most medical encounters, highest numbers of affected service members, and greatest numbers of hospital days. Only 9 of the 153 burden of disease conditions comprising this report, or 5.8% of the listed conditions, accounted for slightly more than half of all illness- and injury-related medical

encounters: 2 anatomic site-defined injuries (knee and arm/shoulder), 3 mental health disorders (anxiety, adjustment, and mood disorders), organic sleep disorders, 2 musculoskeletal conditions (other back problems and all other musculoskeletal diseases), and all other signs and symptoms. Injuries were the single leading cause of death, disability, hospitalization, outpatient visits, and manpower loss among U.S. military service members in 2023.⁹ The 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. Injuries, mental health disorders, and musculoskeletal conditions are identified in the literature as the leading causes of morbidity and disability among service members throughout military history, affecting readiness and health care provision.⁹⁻¹¹

TABLE. Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Total	14,013,183				390,131	
Injury and poisoning	3,256,538				38,804	
Knee	876,325	2	174,885	6	1,315	33
Arm and shoulder	842,568	3	161,996	9	2,750	25
Foot and ankle	527,007	10	151,575	11	1,887	28
Leg	448,323	11	109,812	16	6,338	12
Hand and wrist	255,273	16	90,252	18	1,059	41
Head and neck	108,422	27	55,380	25	8,341	8
Back and abdomen	60,202	34	32,366	36	5,243	14
Other complications NOS	34,301	47	18,717	56	6,933	10
Unspecified injury	33,459	49	23,083	43	1,013	42
Other harm from external causes	29,058	51	18,231	57	467	58
Environmental	23,218	63	17,255	58	678	49
Poisoning, non-drug	5,663	104	4,300	92	269	73
Poisoning, drugs	4,406	109	1,670	107	2,407	27
All other injury	3,404	115	2,874	101	84	95
Other superficial injury	2,875	119	895	116	0	146
Other burns	1,982	122	1,260	111	20	125
Under-dosing	52	153	35	149	0	146
Mental health disorders	2,667,599				213,905	
Anxiety	797,775	6	131,309	12	30,773	5
Adjustment	606,459	8	123,984	14	40,298	3
Mood	603,069	9	81,931	20	69,881	1
Substance abuse disorders	391,221	12	32,883	33	58,642	2
All other mental disorders	206,544	21	65,027	23	4,410	16
Personality	23,337	61	4,473	91	2,881	24
Psychotic	18,197	70	1,790	106	6,415	11
Somatoform	11,765	83	3,674	95	598	50
Tobacco dependence	9,232	92	5,153	86	7	135
Musculoskeletal diseases	2,435,474				9,200	
Other back problems	1,307,669	1	262,406	2	3,857	18
All other musculoskeletal diseases	799,349	5	256,586	3	4,365	17
Cervicalgia	247,305	17	64,733	24	65	100
Osteoarthritis	45,513	41	21,300	47	482	57
Other knee disorders	16,875	72	7,351	71	393	66
Other shoulder disorders	14,711	76	6,666	76	21	123
Rheumatoid arthritis	4,052	112	1,412	109	17	128
Signs, symptoms and ill-defined conditions	1,243,239				11,408	
All other signs and symptoms	755,414	7	342,543	1	9,596	7
Respiratory and chest	280,180	14	167,654	8	571	54
Abdomen and pelvis	207,645	19	128,778	13	1,241	36
Neurologic conditions	987,668				5,307	
Organic sleep disorders	822,662	4	171,501	7	467	58
Chronic pain	95,075	29	29,887	38	151	84
All other neurologic conditions	48,314	40	19,045	54	3,753	19
Other mononeuritis, upper and lower limbs	13,129	80	6,587	77	81	97
Epilepsy	5,650	105	1,833	105	704	48
Multiple sclerosis	2,528	120	534	124	145	86
Parkinson's disease	310	141	54	143	6	138

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Sense organ diseases	502,266				653	
Refraction / accommodation	220,800	18	181,554	5	2	144
All other sense organ diseases	185,094	22	117,145	15	580	53
Hearing disorders	83,058	31	50,643	26	56	106
Glaucoma	11,534	84	7,022	72	7	135
Cataracts	1,780	123	945	114	8	133
Skin diseases	394,675				3,404	
All other skin diseases	273,044	15	154,704	10	3,333	22
Sebaceous gland diseases	72,647	33	41,140	29	19	127
Contact dermatitis	48,984	38	36,404	31	52	107
Infectious and parasitic diseases	235,726				6,075	
All other infectious and parasitic diseases	98,261	28	66,029	22	4,761	15
COVID-19	37,674	44	32,508	35	415	63
Unspecified viral infection	26,843	54	24,886	41	36	114
Tinea skin infections	26,659	55	21,096	48	1	145
Diarrheal diseases	18,825	69	16,245	59	549	55
STDs	17,200	71	12,401	66	99	92
Chlamydia	7,897	95	6,798	75	12	132
Hepatitis B and C	1,374	127	601	122	4	139
Tuberculosis	377	139	144	137	126	89
Intestinal nematode infection	291	142	257	132	0	146
Malaria	163	148	81	140	52	107
Bacterial meningitis	84	150	22	151	20	125
Tropical cluster	78	151	54	143	0	146
Respiratory infections	357,149				1,626	
Upper respiratory infections	296,346	13	220,640	4	404	64
Lower respiratory infections	31,935	50	21,892	45	1,158	39
Otitis media	28,868	52	22,984	44	64	102
Respiratory diseases	261,491				3,635	
Allergic rhinitis	124,460	25	43,220	27	14	129
All other respiratory diseases	56,981	35	33,671	32	2,899	23
Asthma	34,333	46	15,298	60	293	71
Chronic sinusitis	22,110	64	14,884	61	61	103
Deviated nasal septum	15,885	73	8,731	69	254	75
Chronic obstructive pulmonary disease	7,722	97	6,522	78	114	90
Genitourinary diseases	371,675				4,357	
All other genito-urinary diseases	180,463	23	87,746	19	1,543	30
Female genital pain	56,729	36	24,471	42	49	109
Menstrual disorders	34,265	48	21,392	46	353	67
UTI and cystitis	25,531	58	19,535	52	151	84
Other breast disorders	24,753	60	13,136	65	432	61
Vaginitis and vulvitis	19,158	68	14,336	63	0	146
Kidney stones	15,780	74	6,873	74	537	56
Nephritis and nephrosis	11,520	85	4,824	89	1,259	35
Benign prostatic hypertrophy	3,476	113	2,169	103	33	115
Digestive diseases	262,723				14,504	
All other digestive diseases	127,115	24	66,707	21	7,959	9
Esophagus disease	52,789	37	31,545	37	595	51
Other gastroenteritis and colitis	43,319	43	27,298	39	1,671	29
Constipation	20,215	67	14,247	64	80	98
Inguinal hernia	10,211	89	4,098	94	212	77
Appendicitis	6,842	100	2,895	100	3,443	21
Peptic ulcer disease	1,427	125	910	115	223	76
Cirrhosis of the liver	805	132	172	135	321	69

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Maternal conditions	205,381				56,122	
Pregnancy complications	123,573	26	25,828	40	33,955	4
All other maternal disorders	44,052	42	12,086	67	6,008	13
Delivery	21,524	65	9,582	68	14,338	6
Ectopic/miscarriage/abortion	10,117	90	4,598	90	431	62
Puerperium complications	6,115	102	3,359	97	1,390	31
Headache	206,991				1,189	
Headache	206,991	20	102,239	17	1,189	38
Cardiovascular diseases	184,895				7,364	
All other cardiovascular diseases	87,003	30	42,158	28	3,570	20
Essential hypertension	76,957	32	40,894	30	163	82
Cerebrovascular disease	9,546	91	2,354	102	2,483	26
Ischemic heart disease	7,760	96	3,053	99	834	44
Inflammatory	2,973	118	1,430	108	307	70
Rheumatic heart disease	656	135	558	123	7	135
Other neoplasms	90,871				1,696	
All other neoplasms	48,481	39	32,640	34	1,229	37
Benign skin neoplasm	25,219	59	19,884	51	3	141
Lipoma	10,434	88	6,359	80	26	119
Uterine leiomyoma	6,737	101	3,141	98	438	60
Endocrine disorders	62,747				492	
Hypothyroidism	15,457	75	7,647	70	39	112
Other thyroid disorders	14,205	77	5,610	84	266	74
Testicular hypofunction	13,705	78	5,510	85	0	146
All other endocrine disorders	13,327	79	6,876	73	179	80
Polycystic ovarian syndrome	6,053	103	3,452	96	8	133
Malignant neoplasms	50,535				5,675	
All other malignant neoplasms	7,707	98	1,220	112	1,268	34
Lymphoma and multiple myeloma	7,648	99	655	121	723	47
Breast cancer	5,216	106	463	129	134	88
Melanoma and other skin cancers	5,208	107	2,165	104	59	104
Leukemia	4,686	108	336	131	770	46
Testicular cancer	4,332	110	664	119	107	91
Colon and rectum cancers	4,282	111	352	130	882	43
Brain	3,435	114	232	133	1,123	40
Thyroid	2,208	121	475	128	175	81
Prostate cancer	1,402	126	221	134	31	116
Mouth and oropharynx cancers	1,083	128	133	138	83	96
Cervix uteri cancer	1,030	129	524	125	27	118
Stomach cancer	601	136	51	145	91	93
Trachea, bronchus, and lung cancers	555	137	51	145	38	113
Liver cancer	290	143	39	148	40	111
Pancreas cancer	244	144	35	149	26	119
Ovary cancer	203	146	44	147	21	123
Bladder cancer	197	147	57	142	4	139
Esophagus cancer	132	149	9	153	14	129
Corpus uteri cancer	76	152	19	152	59	104
Metabolic and immunity disorders	47,638				488	
Lipoid metabolism disorders	25,584	57	18,865	55	65	100
Other metabolic disorders	11,079	87	5,711	83	328	68
Gout	7,974	94	4,150	93	23	122
Immunity disorders	3,001	116	955	113	72	99

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Armed Forces, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Nutritional disorders	61,588				265	
Overweight, obesity	35,561	45	21,039	49	41	110
All other nutritional disorders	25,818	56	19,486	53	137	87
Protein, energy malnutrition	209	145	81	140	87	94
Blood disorders	45,740				886	
Other non-deficiency anemias	12,865	81	6,475	79	287	72
All other blood disorders	12,520	82	6,093	81	400	65
Iron-deficiency anemia	11,372	86	4,897	88	155	83
Hereditary anemias	8,165	93	5,796	82	31	116
Other deficiency anemias	818	131	499	127	13	131
Oral conditions	30,189				1,327	
All other oral conditions	28,510	53	20,561	50	1,324	32
Dental caries	924	130	880	117	0	146
Periodontal disease	755	134	701	118	3	141
Congenital anomalies	27,974				977	
All other congenital anomalies	23,258	62	14,464	62	592	52
Congenital heart disease	2,974	117	1,262	110	198	78
Other circulatory anomalies	1,742	124	657	120	187	79
Diabetes mellitus	20,816				744	
Diabetes mellitus	20,816	66	5,025	87	794	45
Conditions arising during the perinatal period^e	1,595				28	
All other perinatal anomalies	762	133	507	126	25	121
Low birth weight	497	138	157	136	3	141
Birth asphyxia and birth trauma	336	140	129	139	0	146

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.^{3,4}

^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 individuals affected, 4 pairs of tied values (n=81; n=54; n=51; n=35) were given the same ranking (140; 143; 145; 149). For hospital bed days, there were 8 conditions with the rank of 146 (0); 26 other conditions had tied rankings.

^e Conditions affecting newborns erroneously coded on service member medical records.

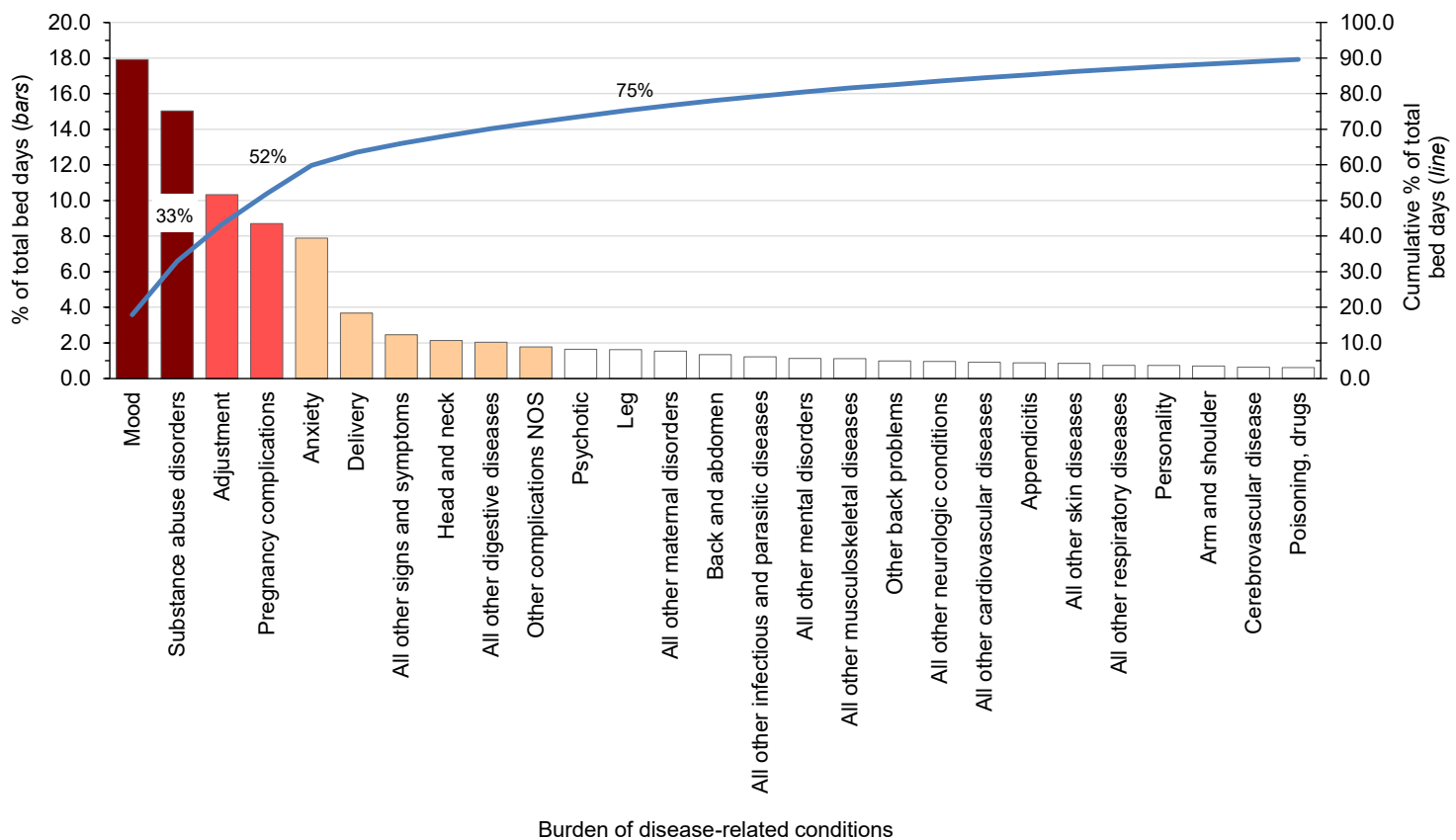
Due to lifestyles that can be influenced by operational conditions, multiple combat missions, separation from family, among other factors, a number of mental disorders including occupational stress, depression, and suicide are common among military personnel.¹⁰ Some studies have reported significant associations between major depressive disorder and deployment.¹¹ Exposure to intense physical demands in training and operational environments increases risk of musculoskeletal injury, which contributes to significant morbidity among military personnel.¹² With psychosocial factors shown to be implicated in increased risk of developing back pain, approaching this and related issues holistically, rather than divided among discrete

categories, would be beneficial.^{13,14} Holistic, integrated approaches to care that not only reflect the identified burden of conditions and associated risk factors, foremost the unique health challenges that result from the unique complexities of service experience and the nature of combat, but which also consider the interplay between military and civilian health care systems would better meet the health needs of military personnel and veterans.¹⁵

Because an understanding of the associations between preventive health care and disease occurrence is required for prevention of injury and disease among service members, a comprehensive medical surveillance system is necessary for routine injury and disease monitoring and

data-informed prioritization of research and successful prevention programs. These surveillance, analysis, and reporting efforts can culminate in effective partnerships between commanders, policy-makers, and service members for direct actions to prevent disease and injuries.^{8,11} Reporting on the burden of disease and injury includes reliable quantification of their physical and psychosocial health impacts, as well as risk factors, that can provide valuable information about the health status of a population, allowing optimal resource allocation for prevention and treatment. An accurate estimate of the health status of the armed forces can be used not only for determining expected health care use and costs and the prioritization of effective interventions,

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, 2023



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.^{3,4}

but evaluations of their impacts and cost-effectiveness.¹⁶ Recent and accurate information on the scale of health disorders among service members, groups noticeably at risk, and trends in their health statuses over time are critical data for policy-makers.

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Hospitalizations Among Active Component Members of the U.S. Armed Forces, 2023

This report documents the frequencies, rates, trends, and distributions of hospitalization among active component members of the U.S. Army, Navy, Air Force, Space Force, and Marine Corps during calendar year 2023. Summaries are based on standardized hospitalization records at U.S. military and non-military (reimbursed through the Military Health System) medical facilities worldwide that are routinely maintained in the Defense Medical Surveillance System (DMSS).

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

Frequencies, rates, and trends

In 2023, 62,806 hospitalizations were recorded for the active component members of the U.S. Army, Navy, Air Force, Space Force, and Marine Corps (**Table 1**); 45.3% of these hospitalizations were in non-military facilities (data not shown), compared to 46.4% in 2022.

Between 2014 and 2023, hospitalization rates manifested a general downward trend, but with annual fluctuations. Prior to 2020, the rates per 1,000 p-yrs fluctuated within a range, from a high of 55.7 in 2014 to a low of 52.7 in 2018, with an average annual percent change of less than

3% (-0.3% to +2.5%). In 2020, however, the hospitalization rate dropped sharply, below the typical range to 49.0, with a 9.4% decrease compared to 2019, the previous year. The rates in 2021 and 2022 then rebounded to their pre-pandemic range. As of April 2024, the crude annual hospitalization rate for 2023 was 48.8 per 1,000 p-yrs, approximately 9.0% lower than the rate in 2022 and comparable to the rate observed in 2020 (**Figure 1**).

Hospitalizations, by ICD-10 major diagnostic categories

In 2023, only 4 ICD-10 major diagnostic categories accounted for almost three-quarters (73.0%) of all active component hospitalizations: mental health disorders (31.1%), pregnancy- and delivery-related conditions (25.6%), injury and poisoning (8.7%), and digestive system disorders (7.6%) (**Table 1**). Consistent with the findings in 2019 and 2021, hospitalizations for mental health disorders in 2023 accounted for more than 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 less than 0.1% of total hospitalizations among active component service members (ACSMs) in 2023, a decline greater than 85% from the previous year, when 0.4% of hospitalizations were due to COVID-19, and represents a decline of nearly 96% from the 2021 figure of 1.5%.

The latest data indicate that, from 2019 through 2023, both the numbers and rates of hospitalizations decreased for all major diagnostic categories (**Table 1**). The 3 largest declines, by number and percent rate of hospitalization, were observed for musculoskeletal system and connective tissue (1,273 fewer hospitalizations; 24.2% rate

What are the new findings?

The hospitalization rate among U.S. active component service members in 2023 at both military and non-military medical facilities was 48.8 per 1,000 person-years, approximately 9% lower than the 2022 rate. As in prior years, over half (56.7%) of hospitalizations for active component members were associated with primary diagnoses in 2 categories: mental health disorders and pregnancy conditions. In 2023 COVID-19 accounted for less than 0.1% of total active component hospitalizations, a greater than 85% decline from 0.4% in 2022, and a nearly 96% decline from 1.5% in 2021.

What is the impact on readiness and force health protection?

As in prior years, mental health disorders, including substance abuse disorders, were associated with the longest median hospital stay, 6 days; 5% of hospitalizations for mental health disorders had durations greater than 30 days. Prolonged hospitalizations, after care, and early attrition due to these common disorders can diminish not merely individual but unit operational readiness.

decrease) conditions, injury and poisoning (-1,229; -16.6%), and 'other' (-1,123; -48.4%). COVID-19 ranked next in terms of decline in hospitalization numbers, at 980, but demonstrated the highest percent decline (-91.9%) in the hospitalization rate. Additional categories with substantially decreased hospital admission rates included respiratory system (-797; -35.0%), signs, symptoms and ill-defined conditions (-860; -25.8%), and skin and subcutaneous tissue (-338; -29.0%).

The relative proportion of hospitalizations by major diagnostic category was generally stable over the surveillance period (**Table 1**). COVID-19, which was included as a separate diagnostic category in 2020 and ranked thirteenth in total hospitalizations in 2021, dropped to the lowest ranking, eighteenth, in 2023.

TABLE 1. Numbers, Rates^a, and Ranks^b of Hospitalizations by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2019, 2021, and 2023

Major Diagnostic Category (ICD-10)	2019			2021			2023		
	No.	Rate	Rank	No.	Rate	Rank	No.	Rate	Rank
Mental disorders (F01-F99)	19,845	15.1	1	21,732	16.29	1	19,534	15.2	1
Pregnancy and delivery (O00-O9A, relevant Z codes) ^c	16,277	73.5	2	17,596	76.10	2	16,085	70.9	2
Injury and poisoning (S00-T88, DOD0101-DOD0105)	6,674	5.1	3	6,023	4.51	3	5,445	4.2	3
Digestive system (K00-K95)	5,627	4.3	4	5,427	4.07	4	4,798	3.7	4
Musculoskeletal system (M00-M99)	4,924	3.7	5	4,016	3.01	5	3,651	2.8	5
Signs, symptoms, and ill-defined conditions (R00-R99)	3,134	2.4	6	2,767	2.07	6	2,274	1.8	6
Circulatory system (I00-I99)	1,762	1.3	10	1,700	1.27	9	1,659	1.3	7
Genitourinary system (N00-N99)	1,989	1.5	9	1,780	1.33	7	1,477	1.1	8
Respiratory system (J00-J99, U07.0)	2,188	1.7	8	1,268	0.95	12	1,391	1.1	9
Nervous system and sense organs (G00-G99, H00-H95)	1,592	1.2	11	1,342	1.01	10	1,303	1.0	10
Other (Z00–Z99, except pregnancy-related) ^d	2,269	1.7	7	1,764	1.32	8	1,146	0.9	11
Neoplasms (C00-D49)	1,422	1.1	12	1,315	0.99	11	1,135	0.9	12
Infectious and parasitic diseases (A00-B99)	1,137	0.9	13	968	0.73	14	1,006	0.8	13
Skin and subcutaneous tissue (L00-L99)	1,107	0.8	14	743	0.56	15	769	0.6	14
Endocrine, nutrition, immunity (E00-E89)	554	0.4	15	569	0.43	16	540	0.4	15
Hematologic and immune disorders (D50-D89)	303	0.2	16	310	0.23	17	267	0.2	16
Congenital anomalies (Q00-Q99)	261	0.2	17	241	0.18	18	243	0.2	17
COVID-19 (U07.1, U09.9)	--	--	--	1,063	0.80	13	83	0.1	18
Total	71,065	54.0		70,624	52.93		62,806	48.8	

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; No., number; COVID-19, coronavirus disease 2019.

^a Rate per 1,000 person-years.

^b Rank of major diagnostic category based on number of hospitalizations.

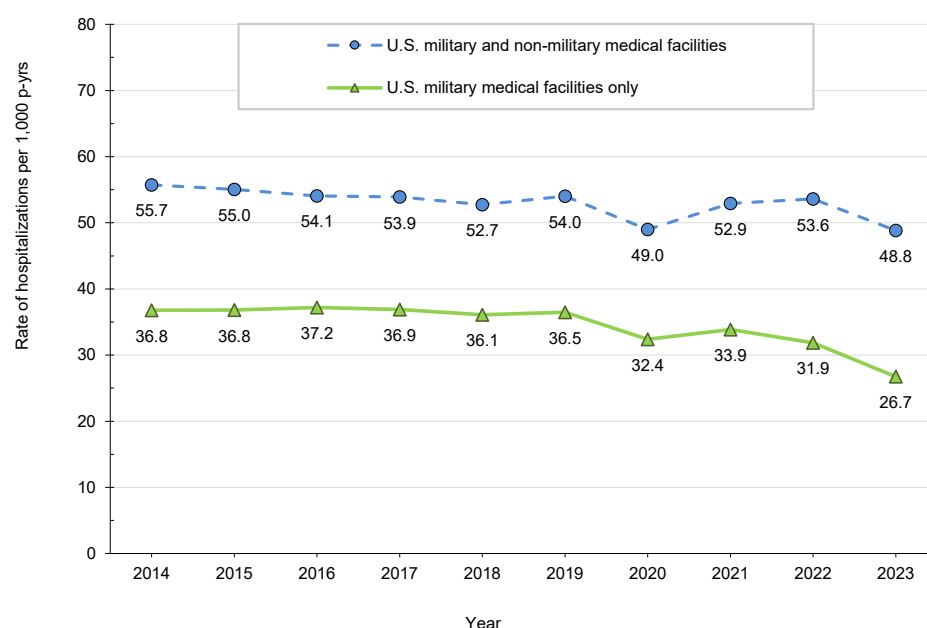
^c Rate of pregnancy and delivery-related hospitalizations among females only.

^d Other factors influencing health status and contact with health services (excluding pregnancy-related).

Hospitalizations, by sex

In 2023, the hospitalization rate (for all causes) among service women was more than 3 times that of service men (116.5 per 1,000 p-yrs and 34.3 per 1,000 p-yrs, respectively). These data are consistent with national hospitalization rate trends published in 2022 for women and men ages 18-44 years (95 per 1,000 p-yrs and 37 per 1,000 p-yrs respectively) in the general U.S. population.¹ Excluding pregnancy- and delivery-related conditions, the rate of hospitalizations among women (45.6 per 1,000 p-yrs) was 33.0% higher than among men (34.3 per 1,000 p-yrs) in 2023 (data not shown). This rate difference was primarily due to hospitalizations for mental health disorders (female:male rate difference [RD]: 6.1 per 1,000 p-yrs) and genitourinary disorders (RD: 2.6 per 1,000 p-yrs)

FIGURE 1. Rates of Hospitalization by Type of Medical Facility, Active Component, U.S. Armed Forces, 2014–2023



(data not shown). Excluding pregnancy- and delivery-related conditions, hospitalization rates were relatively similar among men and women for the remaining 16 major diagnostic categories (data not shown).

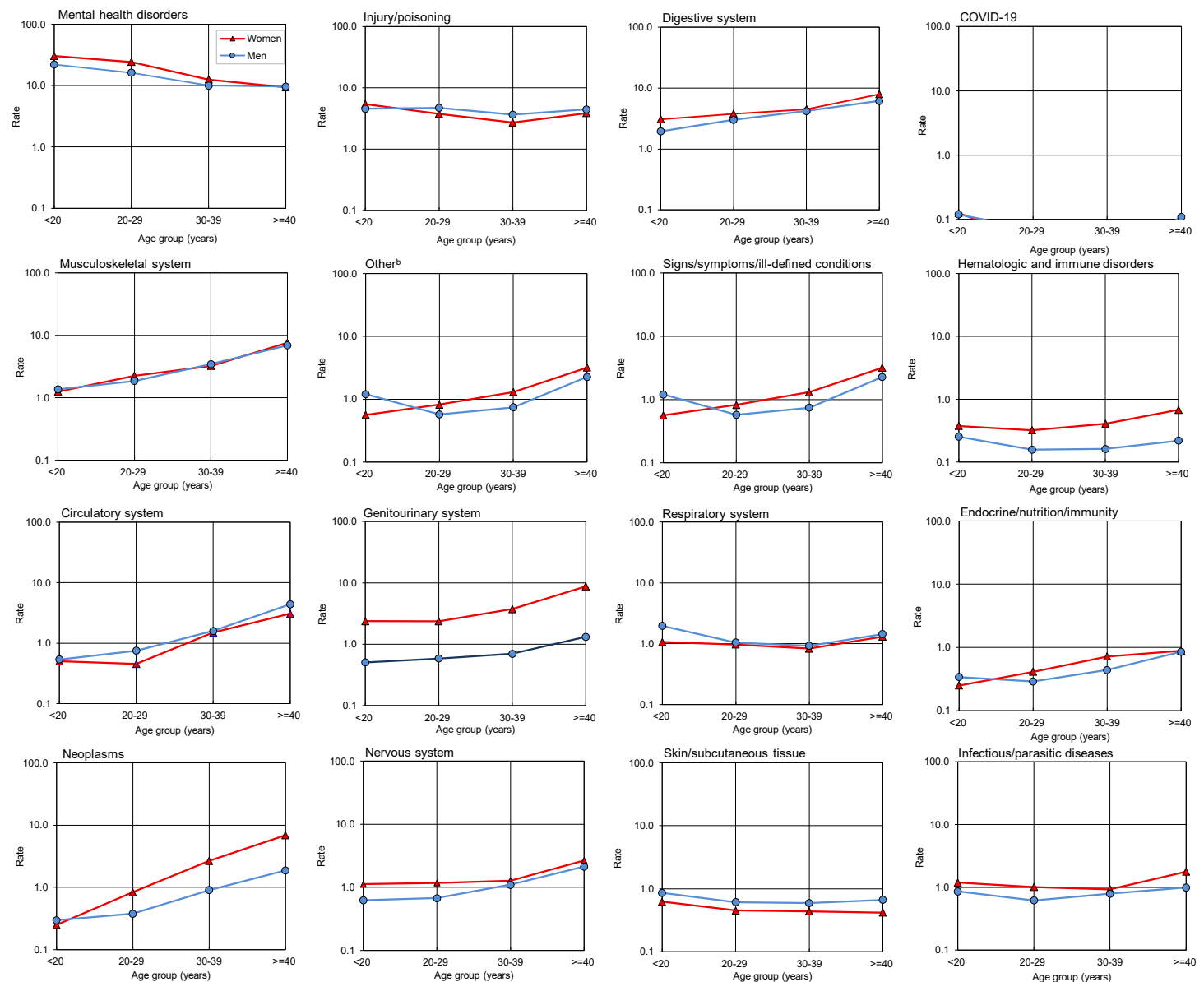
Relationships between age and hospitalization rates varied by major diagnostic category (**Figure 2**). Rates among women in all age groups were consistently higher for the genitourinary, nervous and digestive system, hematologic and immune disorder, and infectious and parasitic disease

categories. The gender gap was greatest for the genitourinary system category and widened with age, with the female-to-male ratio increasing from 4.0 in age categories under age 30 years to 6.6 in those older than 30. Similarly, hematologic and immune disorder rates were higher among women and with age increased from 1.5 to 3.1 times higher in women than men. Additionally, women had progressively higher (from 2.2 to 3.7 times) hospitalization rates within the neoplasms category, except for

the youngest age group. In contrast, rates among men were higher than women in all age groups for the skin and subcutaneous tissue as well as respiratory and circulatory system categories. Hospitalization rates of mental health disorders were more than twice as high among younger women, under the 30 years of age, and were comparable among older age groups.

Hospitalization rates among both sexes generally increased with age for most diagnostic categories except mental health,

FIGURE 2. Rates^a of Hospitalization by ICD-10 Major Diagnostic Category, Age Group, and Sex, Active Component, U.S. Armed Forces, 2023



Abbreviation: ICD-10, International Classification of Diseases, 10th Revision.

^a Rate per 1,000 person-years; rates are shown on a log scale.

^b Other factors influencing health status and contact with health services (Z00–Z99, excluding pregnancy-related).

injury and poisoning, skin and subcutaneous tissue, respiratory, and infectious and parasitic diseases. Rates decreased for both sexes with increasing age for mental health disorders and were relatively stable among all age groups for injury, infectious/parasitic diseases, respiratory system disorders, skin and subcutaneous tissue categories, as well as COVID-19.

Most frequent diagnoses

Mental health disorders represented a significant portion of hospital admissions among ACSMs. Adjustment disorders were the primary discharge diagnosis among both men (n=4,861) and women (n=1,321) (Tables 2 and 3) in 2023, accounting for nearly 10% of total hospitalizations. The next 4 most frequent diagnoses, for both sexes, were alcohol- and depression-related disorders, including recurrent major depressive disorder (severe without psychotic features), and post-traumatic stress disorder (PTSD). Mental health disorder diagnoses, collectively, accounted for over 40% of all hospitalizations among men and, excluding pregnancy- and delivery- related conditions, among women.

Pregnancy- and delivery-related conditions constituted the top major diagnostic category for women, accounting for over three-fifths (60.8%) of all female hospitalizations, although adjustment disorders represented the most frequent cause of hospitalization when examining ICD-10 diagnoses through the fourth character code (Table 3).

Other common causes of hospitalization, regardless of sex, included ‘other and unspecified acute appendicitis’, ‘sepsis, unspecified organism’, and ‘other symptoms and signs involving emotional state’, as well as ‘other specified disorders of muscle’ for men, and ‘abnormal uterine and vaginal bleeding’ for women.

Hospitalization durations

When graphically represented, hospitalization durations demonstrate a highly right-skewed (positive) distribution, with the lower limit equal to 1 day and a mode of 3 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. The median (IQR) duration of hospital stays (for all causes) has remained generally stable at 3 days, but increased to 4 (2-6) days in 2023 (Figure 3).

Medians and IQRs of hospitalization durations varied substantially by major diagnostic category. The shortest median durations of hospital stays, at 2 (2-6) days were observed for disorders of the musculoskeletal, genitourinary, and digestive systems, while the longest were for conditions in the ‘other’ and mental health diagnostic categories, where median (IQR) values were 5 (2-15) and 6 (4-11) days, respectively. Infectious and parasitic diseases had a median of 4 (2-6) days, and the remaining categories had a median of 3 (2-6) days).

Five percent of hospitalization stays exceeded 10 days for one half of ICD diagnostic categories: skin and subcutaneous tissue (11 days), circulatory system disorders (12 days), signs, symptoms and ill-defined conditions (19 days), nervous system/sense organ disorders (20 days), neoplasms (24 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

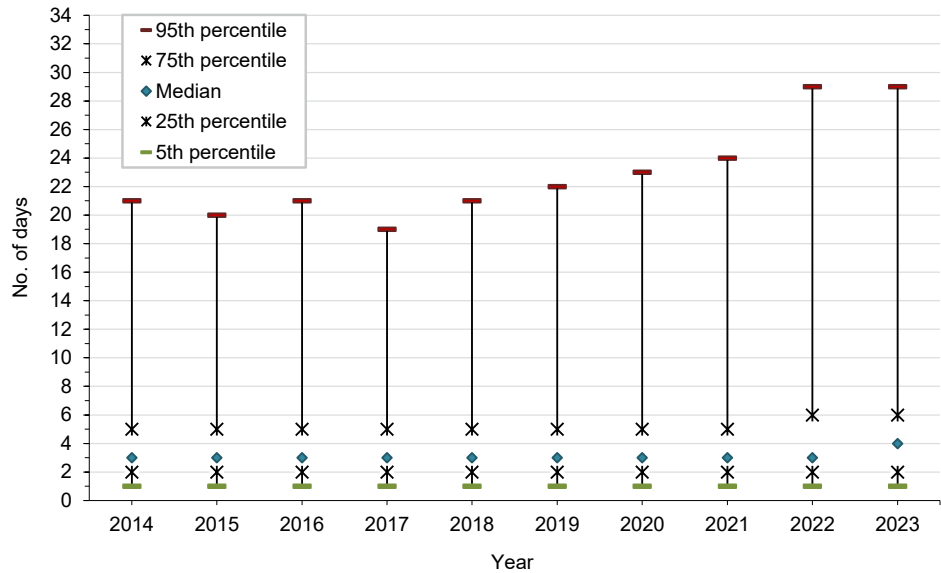
aftercare and rehabilitation following prior illness or injury) (41 days) (Figure 4).

Hospitalizations, by service

Among active component members of the Air Force and Space Force, 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 of hospitalization (Table 4). This pattern has been observed in recent years. Prior to 2020, pregnancy- and delivery-related conditions were ranked first for both Navy and Air Force active component members. Among all the services, the crude hospitalization rate for mental health disorders was highest among active component Army members (17.7 per 1,000 p-yrs).

Injury was the third leading hospitalization category for all services, except the Air Force, where it was ranked fourth. The hospitalization rate for injury was highest among Army (5.3 per 1,000 p-yrs) and Marine Corps members (4.9 per 1,000 p-yrs), and lowest among Air Force and Space Force members (2.7 and 2.2 per 1,000 p-yrs, respectively); this service-ranked distribution has been observed since 2010.

FIGURE 3. Length of Hospital Stay, Active Component, U.S. Armed Forces, 2014-2023



Abbreviation: No., number.

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, 2023

Diagnostic category (ICD-10 codes)	No.	% ^a	Diagnostic category (ICD-10 codes)	No.	% ^a
Mental health disorders (F01-F99)	14,949		Other (Z00–Z99, except pregnancy-related)^b	888	
Adjustment disorders	4,927	33.0	Encounter for antineoplastic chemotherapy and immunotherapy	161	18.1
Alcohol dependence	2,696	18.0	Aftercare following joint replacement surgery	108	12.2
Major depressive disorder, recurrent severe without psychotic features	1,480	9.9	Encounter for examination and observation for unspecified reason	99	11.1
Post-traumatic stress disorder (PTSD)	623	4.2	Encounter for other orthopedic aftercare	88	9.9
Alcohol abuse	522	3.5	Encounter for other specified postprocedural aftercare	68	7.7
Injury and poisoning (S00–T98, D0D0101–D0D0105)	4,629		Infectious and parasitic diseases (A00–B99)	765	
Infection following a procedure	203	4.4	Sepsis, unspecified organism	315	41.2
Concussion	176	3.8	Infectious gastroenteritis and colitis, unspecified	54	7.1
Other fractures of lower leg	139	3.0	Other specified sepsis	30	3.9
Fracture of shaft of tibia	132	2.9	Infectious mononucleosis, unspecified	25	3.3
Unspecified injury	114	2.5	Enterocolitis due to <i>Clostridioides difficile</i>	21	2.7
Digestive system (K00–K95)	3,828		Genitourinary system (N00–N99)	731	
Other and unspecified acute appendicitis	901	23.5	Acute kidney failure, unspecified	170	23.3
Acute appendicitis with localized peritonitis	252	6.6	Hydronephrosis with renal and ureteral calculous obstruction	82	11.2
Acute pancreatitis, unspecified	162	4.2	Calculus of kidney	43	5.9
Alcohol induced acute pancreatitis	139	3.6	Calculus of ureter	34	4.7
Other and unspecified intestinal obstruction	109	2.8	Urethral stricture, unspecified	33	4.5
Musculoskeletal system (M00–M99)	2,990		Neoplasms (C00–D49)	723	
Other specified disorders of muscle	510	17.1	Malignant neoplasm of brain, unspecified	38	5.3
Thoracic, thoracolumbar and lumbosacral intervertebral disc disorders with radiculopathy	239	8.0	Malignant neoplasm of thyroid gland	37	5.1
Spinal stenosis	202	6.8	Benign neoplasm of pituitary gland	22	3.0
Major anomalies of jaw size	137	4.6	Acute myeloblastic leukemia	21	2.9
Anomalies of dental arch relationship	124	4.1	Malignant neoplasm of frontal lobe	18	2.5
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	1,723		Skin and subcutaneous tissue (L00–L99)	665	
Other symptoms and signs involving emotional state	398	23.1	Cellulitis and acute lymphangitis of other parts of limb	286	43.0
Syncope and collapse	125	7.3	Cellulitis and acute lymphangitis of face and neck	45	6.8
Other symptoms and signs involving cognitive functions and awareness	119	6.9	Cellulitis and acute lymphangitis of finger and toe	34	5.1
Unspecified abdominal pain	100	5.8	Cutaneous abscess, furuncle and carbuncle of limb	33	5.0
Chest pain, unspecified	99	5.7	Cutaneous abscess, furuncle and carbuncle of trunk	26	3.9
Circulatory system (I00–I99)	1,439		Endocrine, nutrition, immunity (E00–E89)	420	
Pulmonary embolism without acute cor pulmonale	137	9.5	Type 2 diabetes mellitus with ketoacidosis	57	13.6
Non-ST elevation (NSTEMI) myocardial infarction	91	6.3	Type 2 diabetes mellitus with other specified complications	50	11.9
Paroxysmal atrial fibrillation	75	5.2	Type 1 diabetes mellitus with ketoacidosis	43	10.2
Unspecified atrial fibrillation and atrial flutter	42	2.9	Dehydration	34	8.1
Atherosclerotic heart disease of native coronary artery	40	2.8	Hypo-osmolality and hyponatremia	29	6.9
Respiratory system (J00–J99, U07.0)	1,172		Hematologic and immune disorders (D50–D89)	181	
Pneumonia, unspecified organism	134	11.4	Neutropenia, unspecified	26	14.4
Peritonsillar abscess	113	9.6	Acute posthemorrhagic anemia	19	10.5
Deviated nasal septum	92	7.8	Other specified aplastic anemias and other bone marrow failure syndromes	17	9.4
Other and unspecified asthma	63	5.4	Iron deficiency anemia, unspecified	16	8.8
Other pneumothorax and air leak	59	5.0	Immune thrombocytopenic purpura	13	7.2
Nervous system and sense organs (G00–G99, H00–H95)	1,003		Congenital anomalies (Q00–Q99)	151	
Sleep apnea	86	8.6	Atrial septal defect	19	12.6
Epilepsy, unspecified	54	5.4	Malformation of coronary vessels	14	9.3
Acute pain, not elsewhere classified	39	3.9	Other congenital deformities of hip	13	8.6
Brachial plexus disorders	36	3.6	Arteriovenous malformation of cerebral vessels	11	7.3
Migraine with aura	30	3.0	Meckel's diverticulum (displaced) (hypertrophic)	10	6.6
			COVID-19 (ICD-10: U07.1, U09.9)	68	
			COVID-19	67	98.5
			Post COVID-19 condition, unspecified	1	1.5

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number; NSTEMI, non-ST segment elevation myocardial infarction; NEC, not elsewhere classified.

^a Percentage of the total number of hospitalizations within the diagnostic category.

^b 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, 2023

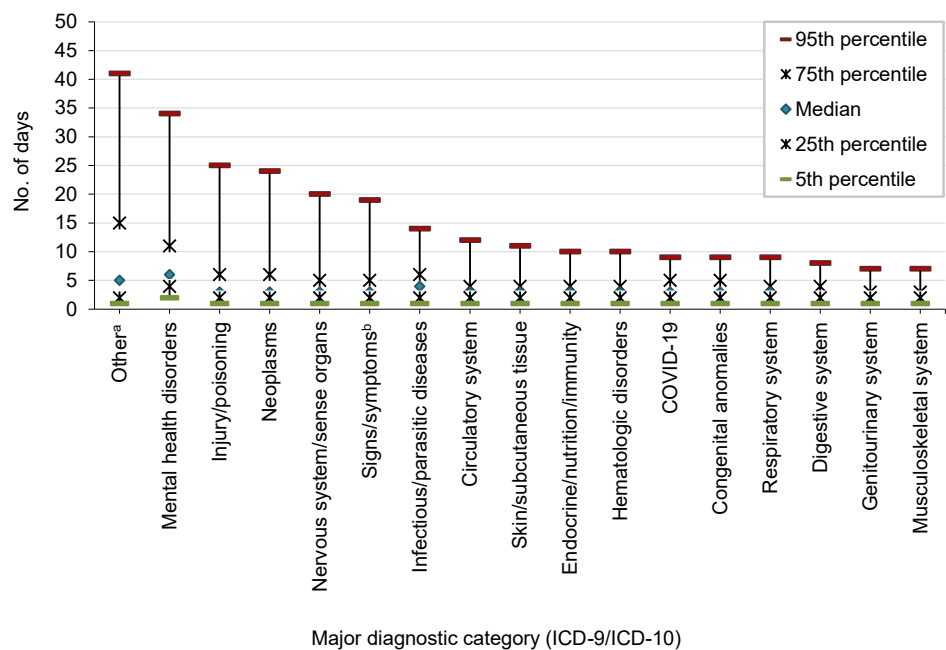
Diagnostic category (ICD-10-CM codes)	No.	% ^a	Diagnostic category (ICD-10-CM codes)	No.	% ^a
Pregnancy and delivery (O00–O99, relevant Z codes)	16,085		Other (Z00–Z99, except pregnancy-related)^b	258	
Post-term pregnancy	1,621	10.1	Encounter for examination and observation for unspecified reason	49	19.0
Abnormality in fetal heart rate and rhythm complicating labor and delivery	999	6.2	Aftercare following joint replacement surgery	35	13.6
Maternal care due to uterine scar from previous surgery	987	6.1	Encounter for other specified postprocedural aftercare	25	9.7
Premature rupture of membranes, onset of labor within 24 hours of rupture	860	5.3	Encounter for other orthopedic aftercare	24	9.3
Gestational [pregnancy-induced] hypertension without significant proteinuria, complicating childbirth	787	4.9	Encounter for prophylactic surgery for risk factors related to malignant neoplasms	19	7.4
Mental health disorders (F01–F99)	4,585		Infectious and parasitic diseases (A00–B99)	241	
Adjustment disorders	1,294	28.2	Sepsis, unspecified organism	111	46.1
Major depressive disorder, recurrent severe without psychotic features	561	12.2	Infectious gastroenteritis and colitis, unspecified	26	10.8
Post-traumatic stress disorder (PTSD)	495	10.8	Sepsis due to other Gram-negative organisms	11	4.6
Alcohol dependence	295	6.4	Other specified sepsis	9	3.7
Depression, unspecified	157	3.4	Viral intestinal infection, unspecified	8	3.3
Digestive system (K00–K95)	970		Circulatory system (I00–I99)	220	
Other and unspecified acute appendicitis	179	18.5	Pulmonary embolism without acute cor pulmonale	31	14.1
Calculus of gallbladder with acute cholecystitis	60	6.2	Supraventricular tachycardia	10	4.5
Noninfective gastroenteritis and colitis, unspecified	44	4.5	Cerebral aneurysm, nonruptured	10	4.5
Acute appendicitis with localized peritonitis	39	4.0	Non-ST elevation (NSTEMI) myocardial infarction	9	4.1
Calculus of gallbladder and bile duct with cholecystitis	31	3.2	Other arterial dissection	9	4.1
Injury and poisoning (S00–T98, D0D0101–D0D0105)	816		Respiratory system (J00–J99, U07.0)	219	
Poisoning by, adverse effect of and underdosing of 4-Aminophenol derivatives	47	5.8	Peritonsillar abscess	21	9.5
Poisoning by, adverse effect of and underdosing of other and unspecified antidepressants	43	5.3	Deviated nasal septum	18	8.2
Infection following a procedure	38	4.7	Chronic tonsillitis and adenoiditis	15	6.8
Unspecified injury	28	3.4	Other intraoperative and postprocedural complications and disorders of respiratory system, not elsewhere classified	14	6.4
Fracture of shaft of femur	20	2.5	Acute respiratory failure	12	5.5
Genitourinary system (N00–N99)	746		Endocrine, nutrition, immunity (E00–E89)	120	
Abnormal uterine and vaginal bleeding, unspecified	99	13.3	Thyrotoxicosis with diffuse goiter	18	15.0
Other and unspecified ovarian cysts	66	8.8	Thyrotoxicosis, unspecified	10	8.3
Hypertrophy of breast	52	7.0	Dehydration	10	8.3
Acute pyelonephritis	33	4.4	Type 2 diabetes mellitus with other specified complications	7	5.8
Excessive and frequent menstruation with regular cycle	33	4.4	Hypokalemia	6	5.0
Musculoskeletal system (M00–M99)	661		Skin and subcutaneous tissue (L00–L99)	104	
Major anomalies of jaw size	53	8.0	Cellulitis and acute lymphangitis of other parts of limb	25	24.0
Other specified disorders of muscle	48	7.3	Pilonidal cyst and sinus with abscess	13	12.5
Anomalies of dental arch relationship	44	6.7	Postprocedural hematoma and seroma of skin and subcutaneous tissue following a procedure	9	8.7
Pain in joint	34	5.1	Cutaneous abscess, furuncle and carbuncle of limb	8	7.7
Spinal stenosis	31	4.7	Cellulitis and acute lymphangitis of face and neck	8	7.7
Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	551		Congenital anomalies (Q00–Q99)	92	
Other symptoms and signs involving emotional state	120	21.8	Other congenital deformities of hip	53	57.6
Unspecified abdominal pain	53	9.6	Atrial septal defect	7	7.6
Syncope and collapse	46	8.3	Malformation of coronary vessels	4	4.3
Pain localized to other parts of lower abdomen	34	6.2	Partial anomalous pulmonary venous connection	2	2.2
Unspecified convulsions	29	5.3	Other malformations of cerebral vessels	2	2.2
Neoplasms (C00–D49)	412		Hematologic and immune disorders (D50–D89)	86	
Leiomyoma of uterus, unspecified	94	22.8	Anemia, unspecified	19	22.1
Intramural leiomyoma of uterus	46	11.2	Iron deficiency anemia, unspecified	14	16.3
Subserosal leiomyoma of uterus	36	8.7	Iron deficiency anemia secondary to blood loss (chronic)	10	11.6
Malignant neoplasm of thyroid gland	19	4.6	Other iron deficiency anemias	7	8.1
Malignant neoplasm of breast of unspecified site	15	3.6	Acute posthemorrhagic anemia	7	8.1
Nervous system and sense organs (G00–G99, H00–H95)	300		COVID-19 (U07.1, U09.9)	15	
Migraine with aura	20	6.7	COVID-19	15	100.00
Multiple sclerosis	18	6.0			
Acute pain, not elsewhere classified	16	5.3			
Brachial plexus disorders	15	5.0			
Epilepsy, unspecified	14	4.7			

Abbreviations: ICD, International Classification of Diseases, 10th Revision; No., number; NSTEMI, non-ST segment elevation myocardial infarction; NEC, not elsewhere classified.

^a Percentage of the total number of hospitalizations within the diagnostic category.

^b Other factors influencing health status and contact with health services (excluding pregnancy-related).

FIGURE 4. Length of Hospital Stay by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2023



Abbreviations: No., number; ICD-10, International Classification of Diseases, 10th Revision.
^a Other factors influencing health status and contact with health services (excluding pregnancy-related).
^b Includes ill-defined conditions.

Discussion

The crude annual hospitalization rate observed in 2023 marks the lowest recorded level from 2014 until 2023. Hospitalization rates demonstrated a general decreasing trend, with annual fluctuations, throughout the reporting period. In 2020 there was a significant decline, coincident with COVID-19-related changes in health care provision.

As in past years, in 2023 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 is attributed to a

TABLE 4. Numbers and Rates^a of Hospitalizations, by Service and ICD-10 Diagnostic Category, Active Component, U.S. Armed Forces, 2023

Major Diagnostic Category (ICD-10 codes)	Army		Navy		Air Force		Space Force		Marine Corps	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Mental disorders (F01-F99)	8,069	17.7	5,257	15.8	3,554	11.2	61	7.1	2,593	15.0
Pregnancy and delivery (O00-O9A, relevant Z codes) ^b	5,998	84.2	4,544	65.8	4,249	62.1	87	53.0	1,207	73.3
Injury and poisoning (S00-T88, DOD0101-DOD0105)	2,409	5.3	1,319	4.0	857	2.7	19	2.2	841	4.9
Digestive system (IK00-K95)	1,969	4.3	1,299	3.9	960	3.0	16	1.9	554	3.2
Musculoskeletal system (M00-M99)	1,745	3.8	781	2.3	665	2.1	14	1.6	446	2.6
Signs, symptoms, and ill-defined conditions (R00-R99)	1,141	2.5	527	1.6	428	1.3	8	0.9	170	1.0
Circulatory system (I00-I99)	685	1.5	468	1.4	353	1.1	8	0.9	145	0.8
Genitourinary system (N00-N99)	648	1.4	328	1.0	360	1.1	9	1.0	132	0.8
Respiratory system (J00-J99, U07.0)	622	1.4	309	0.9	234	0.7	4	0.5	222	1.3
Nervous system and sense organs (G00-G99, H00-H95)	575	1.3	326	1.0	276	0.9	5	0.6	121	0.7
Other (Z00–Z99, except pregnancy-related) ^c	451	1.0	249	0.7	266	0.8	6	0.7	174	1.0
Neoplasms (C00-D49)	437	1.0	338	1.0	254	0.8	8	0.9	98	0.6
Infectious and parasitic diseases (A00-B99)	361	0.8	272	0.8	237	0.7	4	0.5	132	0.8
Skin and subcutaneous tissue (L00-L99)	339	0.7	153	0.5	117	0.4	3	0.3	157	0.9
Endocrine, nutrition, immunity (E00-E89)	207	0.5	154	0.5	123	0.4	4	0.5	52	0.3
Hematologic and immune disorders (D50-D89)	116	0.3	54	0.2	48	0.2	3	0.3	46	0.3
Congenital anomalies (Q00-Q99)	103	0.2	64	0.2	47	0.1	1	0.1	28	0.2
COVID-19 (U07.1, U09.9)	44	0.1	15	0.0	13	0.0			11	0.1
Total	25,919	57.0	16,457	49.5	13,041	41.0	260	30.2	7,129	41.3

Abbreviations: ICD-10, International Classification of Diseases; No., number; COVID-19, coronavirus disease 2019.
^a Rates are based on 1,000 person-years.
^b Rates for pregnancy and delivery-related hospitalizations among females only (in parentheses)
^c Other factors influencing health status and contact with health services (excluding pregnancy-related).

generalized decline among the major diagnostic categories since 2019, with substantial declines in the musculoskeletal system, injury, and 'other' categories.

Certain limitations should be considered when interpreting these results. 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. This could underestimate hospitalization rates for common conditions by dividing them among 2 or more subcategories.

This is the second year DMSS data were housed and analyzed from the Military Health System Information Platform (MIP). Additionally, nearly all military treatment facilities are using GENESIS software to electronically capture medical care. Data completeness issues with data transfers between GENESIS to the Medical Data Store (MDR) to DMSS have improved significantly since last year's report. Regardless of whatever electronic system is used to capture hospitalization information, every hospitalization record requires completion of a discharge summary before the event record is reported in the system. Consequently, timeliness of reporting can still be an issue that may lead

to underestimates of true counts and rates of hospitalizations for the most recent year of reporting. As a result, direct comparison between the 2023 data and data from prior years should be interpreted with caution.

Reference

1. National Center for Health Statistics, U.S. Centers for Disease Control and Prevention. Table: people with hospital stays in the past year, by selected characteristics—United States, selected years 1997–2019. National Hospital Care Survey. Accessed May 13, 2024. <https://www.cdc.gov/nchs/data/hs/2020-2021/HospStay.pdf>

Ambulatory Health Care Visits Among Active Component Members of the U.S. Armed Forces, 2023

This report documents the frequencies, rates, trends, and characteristics of ambulatory health care visits in 2023 of active component members of the U.S. Army, Navy, Air Force, Marine Corps, and Space Force. Ambulatory visits of U.S. service members in fixed military and non-military (reimbursed through the Military Health System) hospitals and clinics are documented by standardized records that are 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 hospitals and clinics (e.g., during deployments, field training exercises, or at sea) are not included in this analysis. Additionally, this is the second year in which DMSS data were housed and downloaded for analysis from the MHS (Military Health System) Information Platform (MIP). Although the transition to MIP is complete, data quality assessments of the ICD-10 Z codes for completeness and coding practices, comparing prior and current electronic medical reporting systems, are ongoing. Consequently, data on Z-codes presented in this report are considered provisional but current as of April 18, 2024.

As in prior *MSMR* reports, all records of ambulatory health care visits by active component service members (ACSMs) 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 person-years (p-yrs). Percent change in incidence was calculated using unrounded rates.

Frequencies, rates, and trends

In 2023, U.S. ACSMs completed 18,882,769 ambulatory visits for medical

care, resulting in a crude annual rate (for all causes) of 14,842.0 visits per 1,000 p-yrs or 14.8 visits per p-yr (**Table 1**). The observed rate was the lowest within the current reporting period, declining from its peak in 2021 (**Figure 1**). This decline was driven by a sharp reduction (3,823,905 fewer visits than in 2019, 47.9% rate decrease; 5,246,933 fewer visits than in 2021, 55.4% rate decrease) in the recorded number of administrative (ICD-10 Z code) visits. The 'Z code' used in the first diagnostic position identifies the care in the 'Other' major diagnostic category (i.e., other factors influencing health status and contact with health services, excluding pregnancy). In contrast to previous years, this year's reduction resulted in the 'Other' category dropping to the second rank among the categories for ambulatory visits in 2023, with musculoskeletal system disorders taking the leading position (**Table 1**).

Z-coded encounters are generally not billable to insurance and are normally used for administrative and other agency-specific requirements. The military uses these Z codes to document some of the burden in the health care system imposed by readiness requirements; examples include routine and special medical examinations, e.g., periodic, occupational, or retirement, along with immunizations, counseling, deployment-related health assessments, suspected exposure to infectious diseases, and screening. From 2019 to 2023, over half of visits (51.6%) attributed to this major diagnostic category included 3 ICD-10 Z codes: encounters for administrative examinations (Z02; n=10,284,975), immunization (Z23; n=4,418,526), and other special examinations without complaint, suspected, or reported diagnosis (Z01; n=3,516,579), which includes examinations for eyes and vision, ears and hearing, blood pressure, dental examination and

What are the new findings?

In 2023 the rate of ambulatory visits in U.S. military and non-military medical facilities was 14.8 visits per person-year, 9.9% lower than the 2022 rate. This decline was primarily driven by a decrease in administrative (ICD-10 Z code) visits. Excluding administrative visits, the crude annual rate of 11.8 visits per person-year for illnesses and injuries in 2023 was approximately 17% higher than the corresponding rates in 2021 and 2019. The numbers and rates of primary causes for ambulatory visits have increased in 14 out of 18 diagnostic categories from 2019 to 2023, except for respiratory system, infectious and parasitic diseases, 'Other', and COVID-19. Musculoskeletal, mental, and nervous system or sense organ disorders remain the leading causes of ambulatory visits, with substantial increases from 2019 to 2023. The absolute increase in the number of ambulatory visits for mental health disorders was the highest, with 648,730 total additional visits.

What is the impact on readiness and force health protection?

Disorders of the musculoskeletal, mental, and nervous system and sensory organ major diagnostic categories are already known to have significant impacts on the well-being of military personnel and operational readiness. Unaddressed musculoskeletal injuries and mental health disorders may lead to prolonged periods of unoccupied time, reduced ability to meet the physical and psychological demands of military service, and contribute to attrition.

cleanings, and gynecological exams (data not shown).

The 14,995,126 documented ambulatory visits in 2023 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 11.8 visits per p-yr, which is approximately 17% higher than the corresponding rates in 2021 (10.1 visits per p-yr) and 2019 (10.0 visits per p-yr).

TABLE 1. Numbers, Rates^a, and Ranks^b of Ambulatory Visits, by ICD-10 Major Diagnostic Category, Active Component, U.S. Armed Forces, 2019, 2021 and 2023

Major Diagnostic Category (ICD-10)	2019			2021			2023		
	No.	Rate	Rank	No.	Rate	Rank	No.	Rate	Rank
Musculoskeletal system (M00-M99)	4,693,803	3,569.3	2	4,476,003	3,354.4	2	5,192,025	4,080.9	1
Other (Z00–Z99, except pregnancy-related) ^c	7,711,548	5,864.1	1	9,134,576	6,845.7	1	3,887,643	3,055.7	2
Mental disorders (F01-F99)	2,101,124	1,597.8	3	2,419,888	1,813.5	3	2,749,854	2,161.4	3
Nervous system and sense organs (G00-G99, H00-H95)	1,483,388	1,128.0	4	1,554,969	1,165.3	4	1,777,326	1,396.9	4
Signs, symptoms, and ill-defined conditions (R00-R99)	1,314,084	999.3	5	1,471,785	1,102.9	5	1,498,649	1,177.9	5
Injury and poisoning (S00-T88, D0D0101-D0D0105)	846,667	643.8	6	784,027	587.6	6	859,792	675.8	6
Respiratory system (J00-J99, U07.0)	690,950	525.4	7	491,067	368.0	7	616,311	484.4	7
Skin and subcutaneous tissue (L00-L99)	406,876	309.4	8	414,320	310.5	9	431,295	339.0	8
Pregnancy and delivery (O00-O9A, relevant Z codes) ^d	380,998	1,720.5	9	419,198	1,813.3	8	389,880	1,737.8	9
Genitourinary system (N00-N99)	303,079	230.5	10	333,691	250.1	10	343,274	269.8	10
Digestive system (K00-K95)	252,836	192.3	11	274,849	205.9	11	312,837	245.9	11
Infectious and parasitic diseases (A00-B99)	232,145	176.5	12	216,476	162.2	12	195,013	153.3	12
Endocrine, nutrition, immunity (E00-E89)	145,931	110.9	13	162,298	121.6	13	191,502	150.5	13
Circulatory system (I00-I99)	140,517	106.9	14	159,288	119.4	14	170,999	134.4	14
Neoplasms (C00-D49)	127,436	96.9	15	137,065	102.7	16	148,925	117.1	15
Hematologic and immune disorders (D50-D89)	38,937	29.6	16	45,795	34.3	17	50,232	39.5	16
COVID-19 (U07.1, U09.9)	0	0	0	147,383	110.5	15	38,260	30.1	17
Congenital anomalies (Q00-Q99)	21,862	16.6	17	23,443	17.6	18	28,952	22.8	18
Total, illness and injury-specific ambulatory visits	13,180,633	10,023.0		13,531,545.0	10,140.9		14,995,126.0	11,786.2	
Total	20,892,181	15,887.1		22,666,121	16,986.6		18,882,769	14841.9	

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; No., number; COVID-19, coronavirus disease 2019.

^a Rate per 1,000 person-years.

^b Rank of major diagnostic category based on number of ambulatory visits.

^c Other factors influencing health status and contact with health services (excluding pregnancy-related).

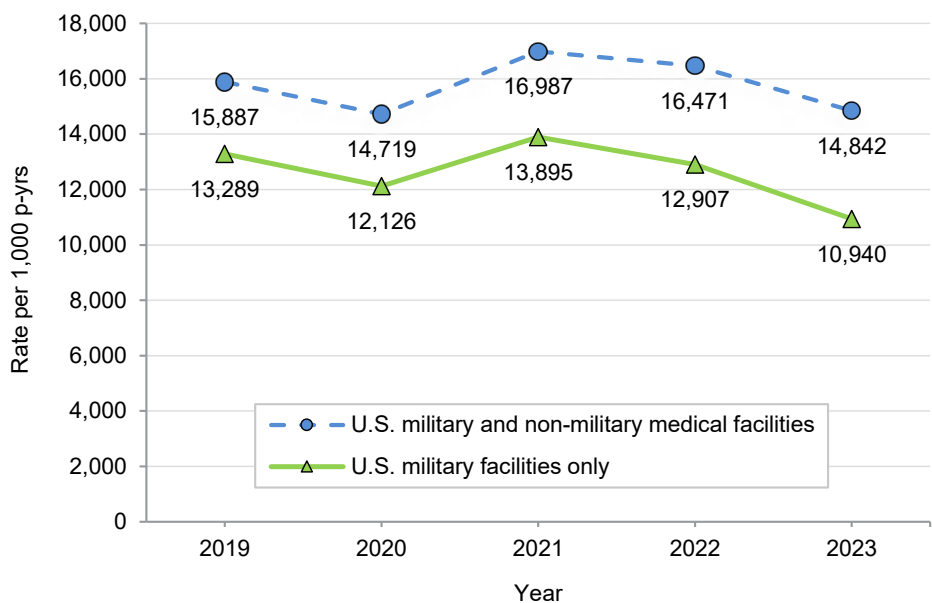
^d Rate of pregnancy and delivery-related hospitalizations among females only.

Ambulatory visits, by ICD-10 major diagnostic categories

Four major diagnostic categories accounted for almost three-quarters (74.8%) of all illness- and injury-related ambulatory visits among ACSMs (not including diagnoses classified as ‘Other’) in 2023: musculoskeletal system/connective tissue disorders (34.6%), mental health disorders (18.3%), disorders of the nervous system and sense organs (11.9%), and signs, symptoms and ill-defined conditions (10.0%) (Table 1). Among visits for illness and injury, COVID-19 encounters represented 0.3% of visits in 2023, a substantial decrease from 1.1% of visits 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). The numbers and rates of ambulatory visits increased

FIGURE 1. Rates of Ambulatory Visits by Year, Active Component, U.S. Armed Forces, 2019–2023



Abbreviation: P-yrs, person-years.

in 14 of 18 major diagnostic categories of illness and injury from 2019 to 2023, except for respiratory system, infectious and parasitic diseases, 'Other', and COVID-19. Neoplasms, disorders of the nervous system/sense organs, digestive, and circulatory systems had rate increases exceeding 20%. Rate increases surpassed 30% from 2019 to 2023 for major diagnostic categories such as hematologic/immune and mental health disorders, and endocrine, nutrition, and immunity-related conditions. Of note, the absolute increase in the number of ambulatory visits was highest for mental health conditions, totaling additional 648,730 visits (35.3% rate increase), followed by musculoskeletal disorders (498,222 more visits, 14.3% rate increase). Adjustment disorders accounted for the leading diagnosis in this major diagnostic category, for both men and women (**Tables 2 and 3**). Although the increase in the rate of encounters for congenital anomalies exceeded 30%, the absolute change in the frequency of encounters (7,090 more visits) remained the lowest of all major diagnostic categories. While congenital anomalies did not constitute a most frequent diagnosis for women, over a quarter (25.9%) of the congenital anomalies in men were attributed to congenital deformities of feet, including congenital *pes planus* (flat foot) and congenital *pes cavus* (high arch) (**Table 2**). Unspecified and iron deficiency types of anemia were among the leading diagnoses within hematologic and immune disorders major diagnostic category, accounting for 25.7% and 56.4% of diagnoses among service men and women, respectively (**Tables 2 and 3**).

The largest declines of illness and injury-specific major diagnostic categories were observed for COVID-19 (-72.8%), infectious and parasitic diseases (-13.2%), and disorders of the respiratory system (-7.8%). Unspecified viral infection and unspecified acute upper respiratory infection were the leading diagnoses in 2023 for infectious and parasitic diseases and disorders of the respiratory system, respectively (**Tables 2 and 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 2023, service men accounted for nearly three-fourths (71.4%) of all illness- and injury-related visits, but the annual crude rate among service women (19.1 visits per p-yr) was 87.5% higher than the rate among men (10.2 visits per p-yr) (data not shown). Excluding pregnancy- and delivery-related visits, which accounted for 9.1% of all non-Z-coded ambulatory visits among service women, the illness and injury ambulatory visit rate was 17.4 visits per p-yr, 70.5% 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, and injury (data not shown). Female rates were more than twice those of male rates for conditions in hematological, mental, genitourinary, and endocrine-, nutrition- and immunity-related disorder categories. Relationships between age group and ambulatory visit rates were broadly similar among men and women across diagnostic categories (**Figure 2**). Ambulatory rates for neoplasms, disorders in nervous, digestive, circulatory systems, and endocrine-, nutrition- and immunity-related conditions rose more steeply with advancing age than other categories of illness or injury (**Figure 2**).

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: 2,239.3; men: 1,514.1; female:male rate ratio [RR]: 1.5); lower back pain (women: 801.8; men: 556.3; RR: 1.4); adjustment disorders (women: 816.3; men: 347.0; RR: 2.4); and pain in the limb, hand, foot, fingers, or toes (female: 444.6; male: 289.4; RR: 1.5) (data not shown). Four other diagnoses were among the 10 most common diagnoses for both men and women: post-traumatic stress disorder (PTSD), cervicgia (neck pain), unspecified anxiety disorder, and sleep apnea. Sleep apnea was the second-most frequent illness- or injury-specific primary diagnosis during ambulatory visits for men but ranked ninth among women. The

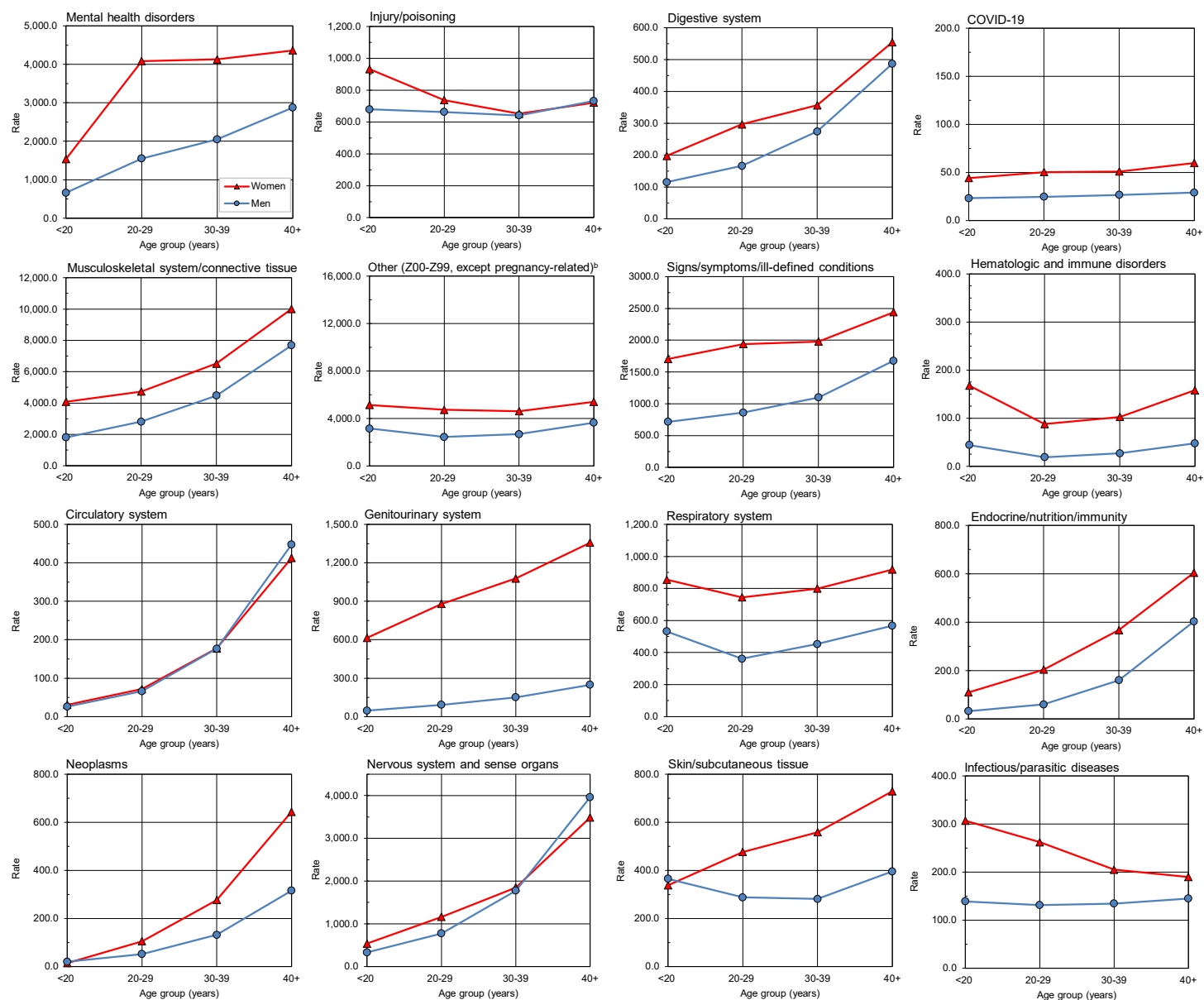
difference in the rate rank order of mental disorders is also worth noting. While alcohol dependence was the sixth most frequent diagnosis among men, it was not identified among the 10 leading causes of ambulatory visits for women (**Tables 2 and 3**). Generalized anxiety and major depressive disorders completed the list of 10 most common diagnoses among women.

Discussion

Ambulatory visits in 2023 among ACSMs declined to the lowest rate observed in the last 5 years. This decline was primarily driven by a decrease in the number and rate of administrative (ICD-10 Z code) ambulatory visits for the 'Other' diagnostic category that includes factors influencing health status and contact with health services. As indicated earlier, data quality assessments of Z codes for completeness and coding practices following DMSS data transition to the MIP are ongoing, and consequently Z-code data are provisional. When excluding visits documented by ICD-10 Z-codes, the rate of illness- and injury-specific ambulatory visits were elevated compared to 2019 and 2021. Notably, since 2019 the rate of ambulatory visits for mental health disorders increased by over 35%. The rate of encounters for COVID-19 decreased by nearly 73% from 2021 to 2023. The rate of encounters related to the infectious disease and respiratory system major diagnostic category continued to decline from 2019 to 2023.

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 ACSMs (19.1 vs. 10.2 visits per p-yr, respectively).¹ Furthermore, the crude annual rate of illness- and injury-related visits (11.8 visits per p-yr) among ACSMs far exceed the rate of ambulatory office visits among civilians aged 15-24 years (1.6 visits per p-yr) and 25-44 years (2.0 visits per p-yr).¹ Future analyses

FIGURE 2. Rates^a of Ambulatory Visits by ICD-10 Major Diagnostic Category, Age Group, and Sex, Active Component, U.S. Armed Forces, 2023



Abbreviation: ICD-10, International Classification of Diseases, 10th Revision.

^aRate per 1,000 person-years.

^bOther factors influencing health status and contact with health services (excluding pregnancy-related).

comparing the major diagnostic category rates to civilian counterparts may be useful to further explicate the costs of readiness.

Several limitations should be considered when interpreting these findings. Ambulatory care at the unit level by non-credentialed providers (e.g., medics, corpsmen) 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 ACSMs.

The transition to a new electronic health record for the Military Health System, MHS GENESIS, has introduced new limitations. In previous *MSMR* reports, dispositions following ambulatory visits described a proportion of encounters classified as limited duty, convalescence in quarters, or no limitation. These findings were not included in this as well as prior annual reports, due to a substantial increase in missing disposition data.

Disposition information may be included in future reports if data completeness issues can be 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.

This summary is based on primary (first-listed) diagnosis codes reported on ambulatory visit records, and the current

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, 2023

Diagnostic Category (ICD-10 codes)	No.	% ^a	Diagnostic Category (ICD-10 codes)	No.	% ^a
Infectious and parasitic diseases (A00–B99)	140,491		Digestive system (K00–K95)	239,103	
Viral infection, unspecified	19,257	13.7	Gastroesophageal reflux disease without esophagitis	30,672	12.8
Viral wart, unspecified	9,298	6.6	Noninfective gastroenteritis and colitis, unspecified	21,534	9.0
Tinea unguium	8,000	5.7	Constipation	9,814	4.1
Viral intestinal infection, unspecified	7,696	5.5	Hemorrhage of anus and rectum	9,418	3.9
Plantar wart	6,728	4.8	Melena	9,114	3.8
Neoplasms (C00–D49)	105,661		Genitourinary system (N00–N99)	128,471	
Neoplasm of uncertain behavior of skin	10,826	10.2	Other specified disorders of male genital organs	25,484	19.8
Melanocytic nevi, unspecified	8,006	7.6	Male erectile dysfunction, unspecified	14,559	11.3
Melanocytic nevi of trunk	4,386	4.2	Calculus of kidney	8,624	6.7
Benign lipomatous neoplasm, unspecified	3,609	3.4	Hypertrophy of breast	6,814	5.3
Malignant neoplasm of testis, unspecified whether descended or undescended	3,079	2.9	Male infertility, unspecified	4,875	3.8
Endocrine, nutrition, immunity (E00–E89)	129,255		Skin and subcutaneous tissue (L00–L99)	316,496	
Hyperlipidemia, unspecified	15,904	12.3	Pseudofolliculitis barbae	44,269	14.0
Testicular hypofunction	13,789	10.7	Acne vulgaris	23,085	7.3
Vitamin D deficiency, unspecified	12,377	9.6	Dermatitis, unspecified	21,153	6.7
Obesity, unspecified	12,118	9.4	Ingrowing nail	17,272	5.5
Type 2 diabetes mellitus without complications	10,101	7.8	Pilonidal cyst and sinus without abscess	9,189	2.9
Hematologic and immune disorders (D50–D89)	26,996		Musculoskeletal system and connective tissue (M00–M99)	3,926,429	
Anemia, unspecified	4,572	16.9	Pain in joint	1,586,638	40.4
Other specified disorders of white blood cells	3,082	11.4	Low back pain	582,899	14.8
Sickle-cell trait	2,570	9.5	Pain in limb, hand, foot, fingers, and toes	303,247	7.7
Iron deficiency anemia, unspecified	2,376	8.8	Cervicalgia	181,424	4.6
Glucose-6-phosphate dehydrogenase (G6PD)	1,769	6.6	Dorsalgia, unspecified	121,230	3.1
Mental health disorders (F01–F99)	1,865,164		Congenital anomalies (Q00–Q99)	20,820	
Adjustment disorders	363,609	19.5	Congenital pes planus	2,558	12.3
Alcohol dependence	251,997	13.5	Other specified congenital malformations of skin	2,197	10.6
Post-traumatic stress disorder (PTSD)	244,356	13.1	Congenital pes cavus	1,709	8.2
Anxiety disorder, unspecified	124,357	6.7	Other congenital deformities of feet	1,131	5.4
Generalized anxiety disorder	100,989	5.4	Atrial septal defect	1,043	5.0
Nervous system and sense organs (G00–G99, H00–H95)	1,438,567		Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	1,055,320	
Sleep apnea	640,137	44.5	Other symptoms and signs involving emotional state	69,932	6.6
Myopia	98,240	6.8	Headache, unspecified	54,936	5.2
Chronic pain, not elsewhere classified	60,391	4.2	Chest pain, unspecified	53,999	5.1
Insomnia	47,963	3.3	Other abnormalities of breathing	42,504	4.0
Astigmatism	34,275	2.4	Unspecified abdominal pain	37,493	3.6
Circulatory system (I00–I99)	142,371		Injury/poisoning (S00–T98, DOD0101–DOD0105)	696,955	
Essential (primary) hypertension	68,436	48.1	Sprain of ankle	40,985	5.9
Scrotal varices	4,774	3.4	Sprain of shoulder joint	29,489	4.2
Atherosclerotic heart disease of native coronary artery	3,084	2.2	Concussion	26,778	3.8
Acute embolism and thrombosis of deep veins of lower extremity	2,824	2.0	Sprain of cruciate ligament of knee	26,669	3.8
Pulmonary embolism without acute cor pulmonale	2,741	1.9	Tear of meniscus, current injury	17,077	2.5
Respiratory system (J00–J99)	440,823		Other (Z00–Z99, except pregnancy-related)^{b,c}	2,814,185	
Acute upper respiratory infection, unspecified	107,129	24.3	Encounter for immunization	304,634	10.8
Acute pharyngitis, unspecified	41,849	9.5	Encounter for other administrative examinations	299,303	10.6
Allergic rhinitis due to pollen	38,151	8.7	Encounter for administrative examinations, unspecified	273,263	9.7
Allergic rhinitis, unspecified	26,726	6.1	Other specified counseling	172,099	6.1
Acute nasopharyngitis [common cold]	22,958	5.2	Encounter for other specified special examinations	122,413	4.3

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; No., number; G6PD, glucose-6-phosphate dehydrogenase; NEC, not elsewhere classified.

^a Percentage of the total number of hospitalizations within the diagnostic category.

^b Other factors influencing health status and contact with health services (excluding pregnancy-related).

^c Z-code data are provisional but current as of April 18, 2024.

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, 2023

Diagnostic Category (ICD-10 codes)	No.	% ^a	Diagnostic Category (ICD-10 codes)	No.	% ^a
Infectious and parasitic diseases (A00–B99)	54,522		Digestive system (K00–K95)	73,734	
Viral infection, unspecified	7,961	14.6	Constipation	10,930	14.8
Candidiasis of vulva and vagina	5,286	9.7	Gastroesophageal reflux disease without esophagitis	8,069	10.9
Viral intestinal infection, unspecified	2,746	5.0	Noninfective gastroenteritis and colitis, unspecified	7,543	10.2
Herpes viral infection, unspecified	2,541	4.7	Unspecified hemorrhoids	2,389	3.2
Other viral agents as the cause of disease classified elsewhere	2,451	4.5	Hemorrhage of anus and rectum	2,278	3.1
Neoplasms (C00–D49)	43,264		Genitourinary system (N00–N99)	214,803	
Leiomyoma of uterus, unspecified	5,445	12.6	Acute vaginitis	18,170	8.5
Malignant neoplasm of breast of unspecified site	3,799	8.8	Urinary tract infection, site not specified	16,261	7.6
Neoplasm of uncertain behavior of skin	3,279	7.6	Stress incontinence (female) (male)	15,597	7.3
Melanocytic nevi, unspecified	2,982	6.9	Abnormal uterine and vaginal bleeding, unspecified	14,313	6.7
Benign neoplasm of pituitary gland	1,338	3.1	Other specified noninflammatory disorders of vagina	12,291	5.7
Endocrine, nutrition, immunity (E00–E89)	62,247		Pregnancy and delivery (O00–O99, relevant Z codes)	389,880	
Obesity, unspecified	9,052	14.5	Encounter for care and examination of lactating mother	47,869	12.3
Vitamin D deficiency, unspecified	6,762	10.9	Pregnant state, incidental	31,985	8.2
Polycystic ovarian syndrome	6,142	9.9	Encounter for supervision of normal first pregnancy	20,205	5.2
Hypothyroidism, unspecified	6,110	9.8	Encounter for supervision of other normal pregnancy	17,491	4.5
Overweight	3,000	4.8	Encounter for routine postpartum follow-up	15,162	3.9
Hematologic and immune disorders (D50–D89)	23,236		Skin and subcutaneous tissue (L00–L99)	114,799	
Iron deficiency anemia, unspecified	6,822	29.4	Acne vulgaris	19,289	16.8
Anemia, unspecified	6,272	27.0	Dermatitis, unspecified	8,654	7.5
Sickle cell trait	1,413	6.1	Urticaria, unspecified	3,861	3.4
Iron deficiency anemia secondary to blood loss (chronic)	1,178	5.1	Ingrowing nail	3,342	2.9
Other specified disorders of white blood cells	990	4.3	Nonscarring hair loss, unspecified	3,048	2.7
Mental health disorders (F01–F99)	884,690		Musculoskeletal system and connective tissue (M00–M99)	1,265,596	
Adjustment disorders	183,137	20.7	Pain in joint	502,378	39.7
Post-traumatic stress disorder (PTSD)	137,021	15.5	Low back pain	179,874	14.2
Anxiety disorder, unspecified	74,244	8.4	Pain in limb, hand, foot, fingers, and toes	99,750	7.9
Generalized anxiety disorder	72,271	8.2	Cervicalgia	72,192	5.7
Major depressive disorder, recurrent, moderate	49,478	5.6	Dorsalgia, unspecified	41,463	3.3
Nervous system and sense organs (G00–G99, H00–H95)	338,759		Symptoms, signs and abnormal clinical and laboratory findings, NEC (R00–R99)	443,329	
Sleep apnea	55,667	16.4	Pelvic and perineal pain	30,711	6.9
Myopia	37,234	11.0	Headache, unspecified	28,448	6.4
Chronic pain, not elsewhere classified	22,712	6.7	Unspecified abdominal pain	24,839	5.6
Migraine, unspecified	18,470	5.5	Other symptoms and signs involving emotional state	24,290	5.5
Insomnia	15,061	4.4	Chest pain, unspecified	14,911	3.4
Circulatory system (I00–I99)	28,628		Injury/poisoning (S00–T98, D0D0101–D0D0105)	162,837	
Essential (primary) hypertension	10,601	37.0	Sprain of ankle	12,900	7.9
Varicose veins of lower extremities with other complications	1,067	3.7	Concussion	7,343	4.5
Supraventricular tachycardia	926	3.2	Sprain of cruciate ligament of knee	6,841	4.2
Venous insufficiency (chronic) (peripheral)	870	3.0	Unspecified injury of ankle and foot	4,209	2.6
Raynaud's syndrome	843	2.9	Injury of muscle, fascia and tendon of abdomen, lower back and pelvis	3,710	2.3
Respiratory system (J00–J99)	175,488		Other (Z00–Z99, except pregnancy-related)^{b,c}	1,073,458	
Acute upper respiratory infection, unspecified	45,547	26.0	Encounter for other administrative examinations	103,127	9.6
Acute pharyngitis, unspecified	19,291	11.0	Encounter for administrative examinations, unspecified	86,826	8.1
Allergic rhinitis due to pollen	15,320	8.7	Other specified counseling	73,235	6.8
Allergic rhinitis, unspecified	11,032	6.3	Encounter for immunization	72,721	6.8
Acute nasopharyngitis [common cold]	10,019	5.7	Encounter for other specified special examinations	35,352	3.3

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; No., number; NEC, not elsewhere classified.

^a Percentage of the total number of hospitalizations within the diagnostic category.

^b Other factors influencing health status and contact with health services (excluding pregnancy-related).

^c Z-code data are provisional but current as of April 18, 2024.

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 according to medical condition, clinical setting, care provider, and treatment facility, as the information is collected for non-surveillance purposes. Although specific diagnoses during individual encounters were potentially not definitive, final, or even correct, summaries of the frequencies, nature, and trends of ambulatory encounters among ACSMs

provide descriptive evidence to inform further research and evaluation.

Rates and frequencies reported herein do not reflect unique individuals, but a rate of total ambulatory visits per person-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 provision, 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 over-represented in this summary.

Reference

1. National Center for Health Statistics, U.S. Centers for Disease Control and Prevention. 2019 national summary tables. National Ambulatory Medical Care Survey. Accessed May 13, 2024. 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 of the U.S. Coast Guard, 2023

The U.S. Coast Guard (USCG) is the second smallest service of the U.S. Armed Forces, comprised of approximately 40,000 active component service members, and the only military service operating outside the authority of the Department of Defense (DOD). Between 2016 and 2021, USCG health care data were excluded from *MSMR*'s annual morbidity burden reports due to missing data.^{1,2} USCG personnel are eligible to use DOD health care facilities, but as many service members are not stationed near a DOD installation, the USCG operates primary care clinics in areas with sufficiently large Coast Guard populations. A higher proportion of civilian hospitalizations among USCG members has been noted,¹ and this difference may extend to ambulatory care as well.

To quantify the impacts of various illnesses and injuries among members of the active component of the USCG in 2023, this summary employs the same disease classification system and morbidity burden measures used in the general active component burden analysis.

Methods

The population for this analysis included all individuals who served in the active component of the USCG at any time during the surveillance period of January 1, 2023 through December 31, 2023. The methodology for summarizing absolute and relative USCG morbidity burdens in 2023 is identical to the methodology described on page 3 of this issue that was used to determine the absolute and relative burdens attributed to various illnesses and injuries among the active component of the U.S. Armed Forces.

Results

In 2023 a total of 37,438 USCG service members had 442,798 total medical encounters, which included 8,917 bed days reported, for a rate of 0.24 bed days per USCG member who experienced at least 1 medical encounter (either ambulatory or hospitalization).

Morbidity burden, by category

In 2023, more active component USCG members (n=16,210 individuals affected) experienced 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 (22.4%) of all medical encounters (**Figure 1b**).

Mental health disorders accounted for more hospital bed days (n=4,903) than any other morbidity-related category, comprising over half (55.0%) of all hospital bed days and ranking fifth in terms of numbers of individuals affected (**Figures 1a and 1b**). Injury and mental health disorders combined accounted for over three-fifths (66.9%) of all hospital bed days and almost two-fifths (40.8%) of all medical encounters.

Maternal conditions, e.g., pregnancy complications and delivery, accounted for a relatively large proportion of all hospital bed days (n=1,202; 13.5%) but a much smaller proportion of total medical encounters (n=3,884; 0.9%) (**Figures 1a and 1b**). Maternal conditions were the most prevalent medical condition among female active component USCG members. Women comprised approximately one-sixth (16.0%) of the active duty USCG in 2023.

What are the new findings?

In 2023, injuries, mental health disorders, and musculoskeletal diseases constituted the categories of medical conditions associated with the most medical encounters, greatest numbers of members affected, as well as largest numbers of hospital days among active duty Coast Guard members, similar to DOD active component service members. Medical encounters increased by 13.3% when compared to last year, and major category conditions increased by 12.7% overall. In 2023 COVID-19 accounted for 0.4% of total medical encounters, a decrease from 1.4% in 2022, with no hospital bed days reported in 2023.

What is the impact on readiness and force health protection?

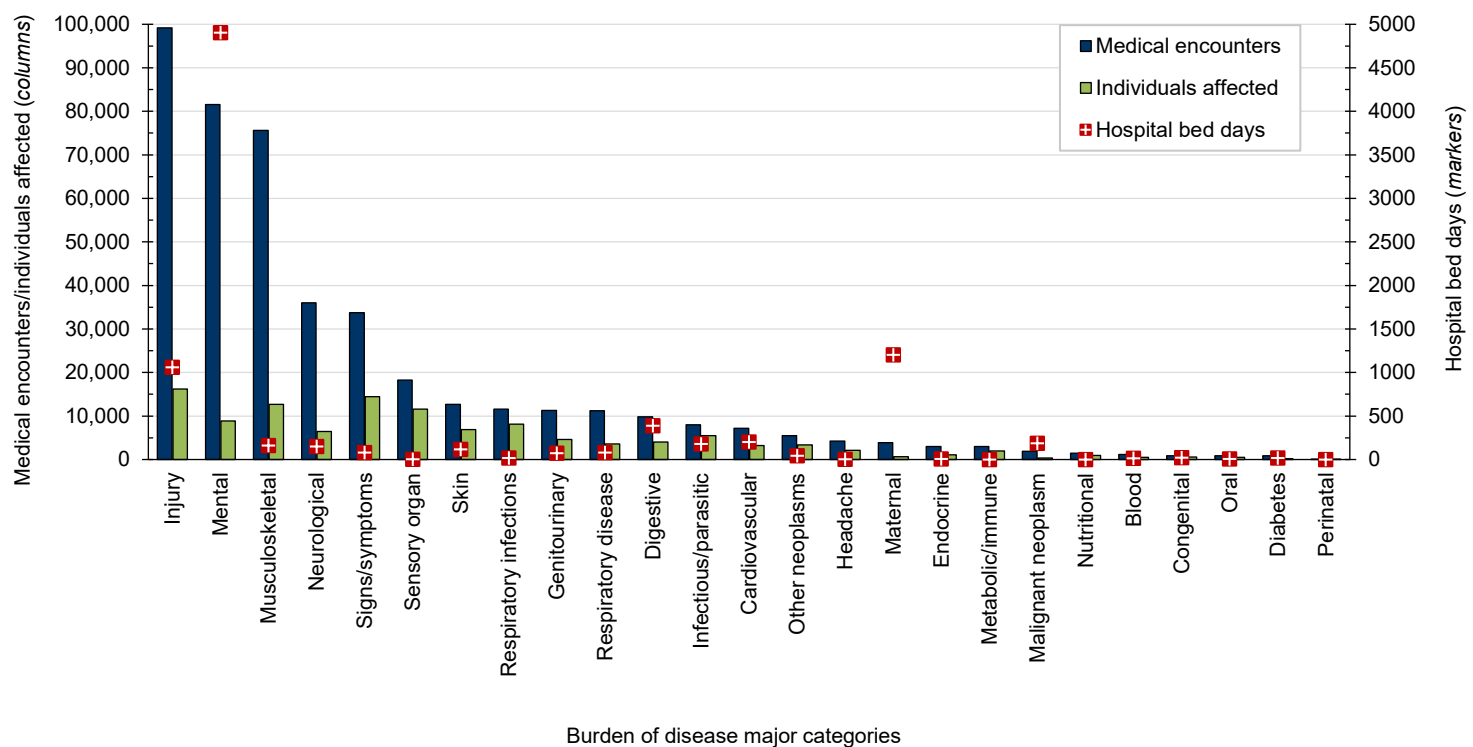
The major condition categories in this report present health challenges for members of the U.S. Coast Guard and affect their service readiness. Loss of duty availability related to illness and injury reduces Coast Guard personnel readiness. Coast Guard members have unique occupational exposures that may benefit from specific risk reduction programs to mitigate these threats.

Medical encounters, by condition

In 2023, 5 disease-related conditions accounted for more than one-third (36.9%) of all illness- and injury-related medical encounters among active component USCG members: other back problems (includes lower back pain and other dorsalgia), arm/shoulder injuries, anxiety disorders, organic sleep disorders (e.g., obstructive sleep apnea, insomnia), and knee injuries (**Figure 2**). Moreover, the 10 conditions associated with the most medical encounters constituted more than half (58.0%) of all illness- and injury-related medical encounters.

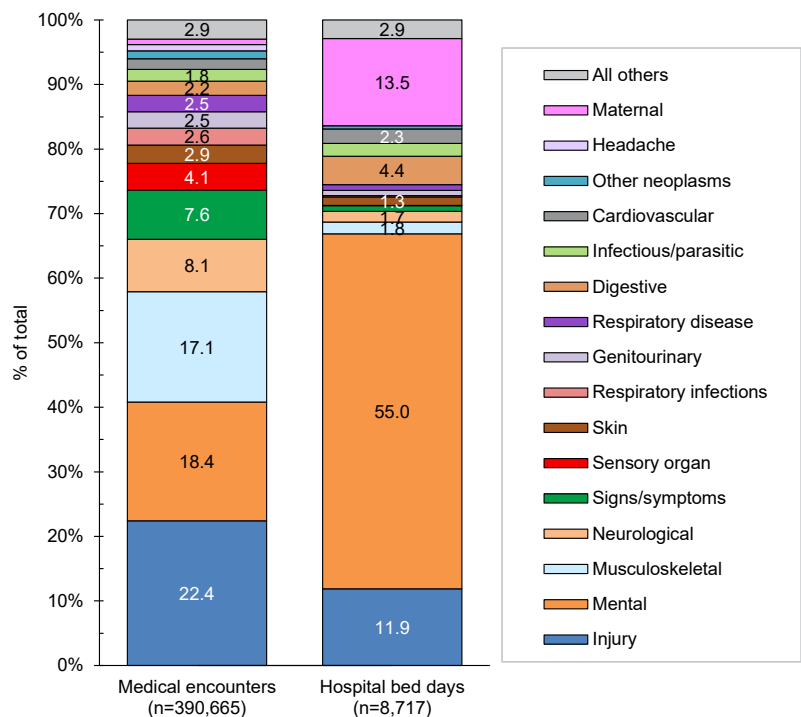
The conditions in 2023 that accounted predominantly for medical encounters among active component USCG members

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, 2023



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.^{5,6}

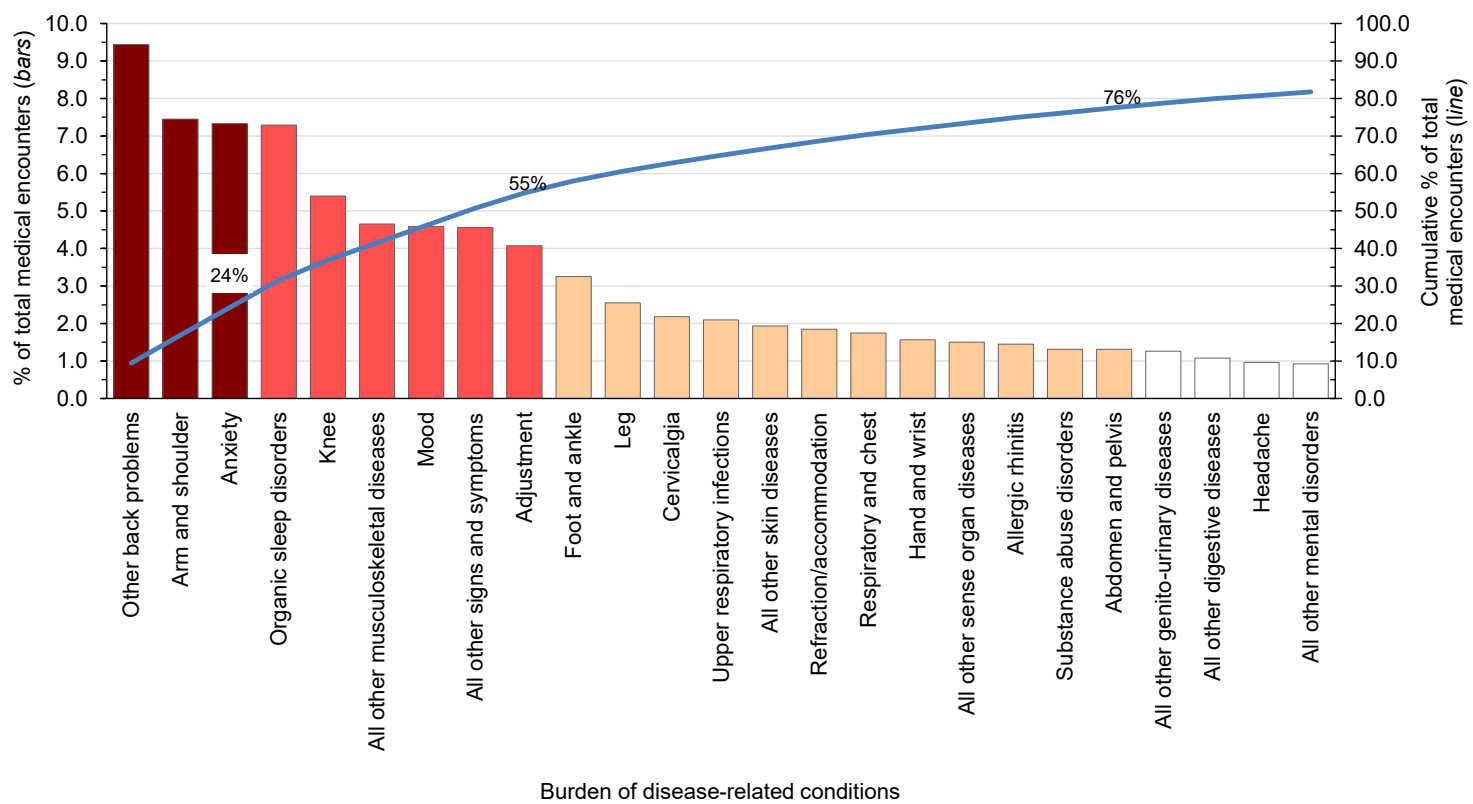
FIGURE 1b. Percentage of Medical Encounters^a and Hospital Bed Days Attributable to Burden of Disease Major Categories^b, Active Component, U.S. Coast Guard, 2023



were injuries, mental health disorders, and musculoskeletal diseases. Arm / shoulder (7.5%), knee (5.4%), foot / ankle (3.3%), and leg (2.6%) injuries contributed the most medical encounters (**Figure 2** and **Table**). Anxiety (7.3%), mood (4.6%), adjustment (4.1%), and alcohol / substance abuse disorders (1.3%) were the 4 most frequent mental health disorder diagnoses. Other back problems (9.4%), all other musculoskeletal diseases (4.7%), and cervicgia (2.2%) constituted the most medical encounters among musculoskeletal disorders. COVID-19 accounted for 0.4% of total medical encounters during 2023.

^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.^{5,6}

FIGURE 2. Percentage and Cumulative Percentage Distribution, Burden of Disease-related Conditions^a that Accounted for the Most Medical Encounters, Active Component, U.S. Coast Guard, 2023



^aBurden of disease-related conditions based on a modified version of those defined in the Global Burden of Disease Study.^{5,6}

Individuals affected, by condition

The 10 categories of conditions that affected the most USCG members in 2023 were all other signs and symptoms, refraction / accommodation, other back problems, upper respiratory infections, all other musculoskeletal diseases, organic sleep disorders, anxiety, all other skin diseases, arm and shoulder conditions, and respiratory and chest issues. COVID-19 affected 1,380 USCG members and ranked thirty-third for the number of individuals affected, a considerable decrease in rank from seventh in 2022.

Hospital bed days, by condition

In 2023, substance abuse and mood disorders accounted for about two-fifths (41.3%) of all hospital bed days (Figure 3). Four mental health disorders (substance abuse, mood, anxiety, adjustment) and 2 maternal conditions (pregnancy complications and delivery) combined accounted for

more than three-fifths (62.5%) of all hospital bed days (Table and Figure 3). About 12% of all hospital bed days were attributable to injuries and poisonings. There were no hospitalizations due to COVID-19 among active component USCG members in 2023 (Table).

Discussion

Health care utilization within the USCG was similar to the DOD when measured by total encounters and persons affected in 2023. The USCG rate was 11.8 encounters per person (442,798/37,438), compared to the DOD rate of 11.6 encounters per person (14,013,185/1,204,509). The USCG had a lower rate of hospitalization, however, with only 0.24 bed days per individual; the DOD reported 0.32 bed days per individual (390,181/1,204,509). Compared to 2022, USCG medical encounters increased by 13.3%, with major

category conditions reported increasing by 12.7% overall, and individuals affected and hospital bed days (8.5% and 2.3%, respectively) both rising as well. Mental health disorders resulted in more hospital stays than any other morbidity-related category, and mental health-related medical encounters increased by 21.5% compared to the previous year. These reported increases may be overestimates, as 2022 was the first year DMSS data were archived and analyzed in the Military Health System (MHS) Information Platform (MIP), and during last year’s morbidity burden analysis completeness issues were identified for MHS GENESIS data being transferred to DMSS. Opportunities to address and resolve missing data issues that result from USCG hospitalizations in civilian facilities should be prioritized to accurately depict the true burden of disease in this population. This report is consistent with the major findings of prior annual reports on morbidity burdens among active component

TABLE. Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Injury and poisoning	99,167		23,348		1,060	
Arm and shoulder	32,993	2	4,926	9	38	29
Knee	23,908	5	3,833	13	39	27
Foot and ankle	14,394	10	3,891	12	73	21
Leg	11,293	11	2,391	21	223	8
Hand and wrist	6,931	17	2,668	17	18	45
Head and neck	2,607	31	1,473	31	195	10
Back and abdomen	2,567	32	1,092	37	94	20
Unspecified injury	1,232	45	803	44	0	88
Environmental	997	52	798	45	3	73
Other complications NOS	927	55	498	56	316	6
Other harm from external causes	813	59	609	50	17	46
Poisoning, non-drug	244	93	184	85	6	63
All other injury	118	113	101	97	3	73
Other burns	68	119	43	109	0	88
Poisoning, drugs	62	123	31	115	35	31
Other superficial injury	13	135	7	134	0	88
Mental health disorders	81,591		12,888		4,903	
Anxiety	32,465	3	5,073	7	483	4
Mood	20,320	7	2,564	18	1,662	2
Adjustment	18,045	9	3,297	15	417	5
Substance abuse	5,810	20	548	54	2,020	1
All other mental disorders	4,090	25	1,090	38	151	14
Psychotic	301	88	37	112	161	12
Tobacco dependence	219	96	145	89	0	88
Personality	193	103	44	107	9	52
Somatoform	148	109	90	99	0	88
Musculoskeletal diseases	75,597		17,036		161	
Other back problems	41,803	1	7,111	3	108	17
All other musculoskeletal diseases	20,604	6	6,376	5	40	26
Cervicalgia	9,665	12	1,923	23	0	88
Osteoarthritis	1,931	38	986	39	6	63
Other knee disorders	727	66	269	75	7	56
Other shoulder disorders	695	68	302	70	0	88
Rheumatoid arthritis	172	105	69	105	0	88
Signs, symptoms, and ill-defined conditions	33,733		18,215		80	
All other signs and symptoms	20,196	8	10,149	1	60	24
Respiratory and chest	7,733	16	4,740	10	11	50
Abdomen and pelvis	5,804	21	3,326	14	9	52
Neurologic conditions	36,038		6,980		149	
Organic sleep disorders	32,284	4	5,601	6	2	79
All other neurologic conditions	1,924	39	652	49	117	15
Chronic pain	940	54	398	62	27	34
Other mononeuritis, upper and lower limbs	510	72	227	81	0	88
Epilepsy	216	97	80	102	3	73
Multiple sclerosis	127	112	18	123	0	88
Parkinson's disease	37	128	4	136	0	88
Sense organ diseases	18,246		13,552		4	
Refraction/accommodation	8,178	15	7,133	2	0	88
All other sense organ diseases	6,651	18	4,248	11	4	69
Hearing disorders	2,637	30	1,676	26	0	88
Glaucoma	677	69	434	59	0	88
Cataracts	103	115	61	106	0	88

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Infectious and parasitic diseases	8,018		6,051		178	
All other infectious and parasitic diseases	3,766	26	2,461	19	157	13
COVID-19	1,578	43	1,380	33	0	88
Tinea skin infections	1,206	48	920	40	0	88
Unspecified viral infection	611	71	569	53	0	88
STDs	380	83	303	69	0	88
Diarrheal diseases	352	85	311	67	21	39
Chlamydia	85	116	78	103	0	88
Intestinal nematode infection	14	134	11	129	0	88
Hepatitis B and C	11	137	7	134	0	88
Tropical cluster	7	140	4	136	0	88
Tuberculosis	5	142	4	136	0	88
Malaria	2	144	2	143	0	88
Bacterial meningitis	1	146	1	146	0	88
Skin diseases	12,666		7,773		115	
All other skin diseases	8,563	14	5,067	8	114	16
Sebaceous gland diseases	2,450	33	1,459	32	1	83
Contact dermatitis	1,653	42	1,247	34	0	88
Respiratory diseases	11,221		4,421		80	
Allergic rhinitis	6,415	19	1,484	30	0	88
All other respiratory diseases	1,833	40	1,128	36	73	21
Chronic sinusitis	1,207	47	740	46	3	73
Deviated nasal septum	715	67	411	61	0	88
Asthma	626	70	309	68	4	69
Chronic obstructive pulmonary disease	425	79	349	63	0	88
Genitourinary diseases	11,279		5,807		73	
All other genito-urinary diseases	5,583	22	2,730	16	19	41
Female genital pain	1,355	44	599	51	0	88
Menstrual disorders	1,211	46	695	47	7	56
UTI and cystitis	810	60	597	52	6	63
Kidney stones	764	61	279	74	28	33
Other breast disorders	752	63	431	60	1	83
Nephritis and nephrosis	306	87	121	91	12	49
Vaginitis and vulvitis	295	89	234	79	0	88
Benign prostatic hypertrophy	203	102	121	91	0	88
Digestive diseases	9,797		5,042		390	
All other digestive diseases	4,772	23	2,404	20	203	9
Esophagus disease	2,115	36	1,228	35	7	56
Other gastroenteritis and colitis	1,733	41	837	43	59	25
Constipation	430	78	295	72	5	67
Inguinal hernia	414	81	134	90	3	73
Appendicitis	225	95	97	98	95	19
Peptic ulcer disease	60	124	39	110	7	56
Cirrhosis of liver	48	125	8	133	11	50
Respiratory infections	11,567		8,671		18	
Upper respiratory	9,278	13	6,939	4	4	69
Otitis media	1,191	49	872	41	1	83
Lower respiratory	1,098	51	860	42	13	48
Cardiovascular diseases	7,206		3,554		201	
All other cardiovascular diseases	3,496	27	1,665	27	107	18
Essential hypertension	2,915	28	1,567	28	1	83
Ischemic heart disease	439	75	158	86	61	23
Cerebrovascular disease	245	92	102	95	25	36
Inflammatory	75	117	31	115	7	56
Rheumatic heart disease	36	129	31	115	0	88

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Other neoplasms	5,493		3,952		44	
All other neoplasms	2,748	29	1,894	24	27	34
Benign skin neoplasm	2,163	34	1,724	25	0	88
Lipoma	406	82	251	77	0	88
Uterine leiomyoma	176	104	83	101	17	46
Headache	4,255		2,142		2	
Headache	4,255	24	2,142	22	2	79
Maternal conditions	3,884		1,237		1,202	
Pregnancy complications	1,956	37	509	55	730	3
All other maternal disorders	1,104	50	314	66	182	11
Delivery	475	74	256	76	265	7
Ectopic/miscarriage/abortion	216	97	85	100	3	73
Puerperium complications	133	111	73	104	22	38
Metabolic and immunity disorders	2,970		2,033		0	
Lipoid metabolism disorders	2,153	35	1,563	29	0	88
Other metabolic disorders	422	80	239	78	0	88
Gout	320	86	187	84	0	88
Immunity disorders	75	118	44	107	0	88
Endocrine disorders	3,027		1,249		8	
Testicular hypofunction	909	56	297	71	0	88
Hypothyroidism	739	64	332	65	0	88
Other thyroid disorders	732	65	289	73	2	79
All other endocrine disorders	432	77	221	82	6	63
Polycystic ovarian syndrome	215	99	110	94	0	88
Malignant neoplasms	1,875		371		185	
Melanoma and other skin cancers	360	84	154	87	29	32
Colon and rectal cancers	264	90	19	122	20	40
Lymphoma and multiple myeloma	232	94	28	118	39	27
Brain	204	101	11	129	19	41
Breast cancer	159	106	26	119	2	79
Testicular cancer	155	107	34	113	5	67
All other malignant neoplasms	153	108	32	114	9	52
Leukemia	113	114	18	123	36	30
Liver cancer	68	119	2	143	25	36
Prostate cancer	65	122	9	132	0	88
Thyroid	43	127	12	127	1	83
Cervix uteri cancer	24	132	14	126	0	88
Trachea, bronchus, and lung cancers	19	133	4	136	0	88
Bladder cancer	8	139	4	136	0	88
Mouth and oropharynx cancers	7	140	3	141	0	88
Corpus uteri cancer	1	146	1	146	0	88
Nutritional disorders	1,419		996		0	
Overweight, obesity	982	53	657	48	0	88
All other nutritional disorders	436	76	338	64	0	88
Protein, energy malnutrition	1	146	1	146	0	88
Blood disorders	1,128		593		15	
All other blood disorders	490	73	217	83	8	55
Iron deficiency anemia	259	91	111	93	0	88
Other non-deficiency anemias	214	100	146	88	7	56
Hereditary anemias	140	110	102	95	0	88
Other deficiency anemias	25	131	17	125	0	88
Diabetes mellitus	853		231		19	
Diabetes mellitus	853	57	231	80	19	41

TABLE (cont). Health Care Burdens Attributable to Various Diseases and Injuries, Active Component, U.S. Coast Guard, 2023

Major Category Condition ^a	Medical Encounters ^b		Individuals Affected ^c		Hospital Bed Days	
	No.	Rank ^d	No.	Rank ^d	No.	Rank ^d
Oral conditions	858		515		7	
All other oral conditions	835	58	492	57	7	56
Dental caries	12	136	12	127	0	88
Periodontal disease	11	137	11	129	0	88
Congenital anomalies	867		547		23	
All other congenital anomalies	753	62	485	58	19	41
Congenital heart disease	67	121	38	111	0	88
Other circulatory anomalies	47	126	24	120	4	69
Conditions arising during the perinatal period^e	43		25		0	
All other perinatal anomalies	36	129	20	121	0	88
Low birth weight	5	142	3	141	0	88
Birth asphyxia and birth trauma	2	144	2	143	0	88

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.^{5,6}

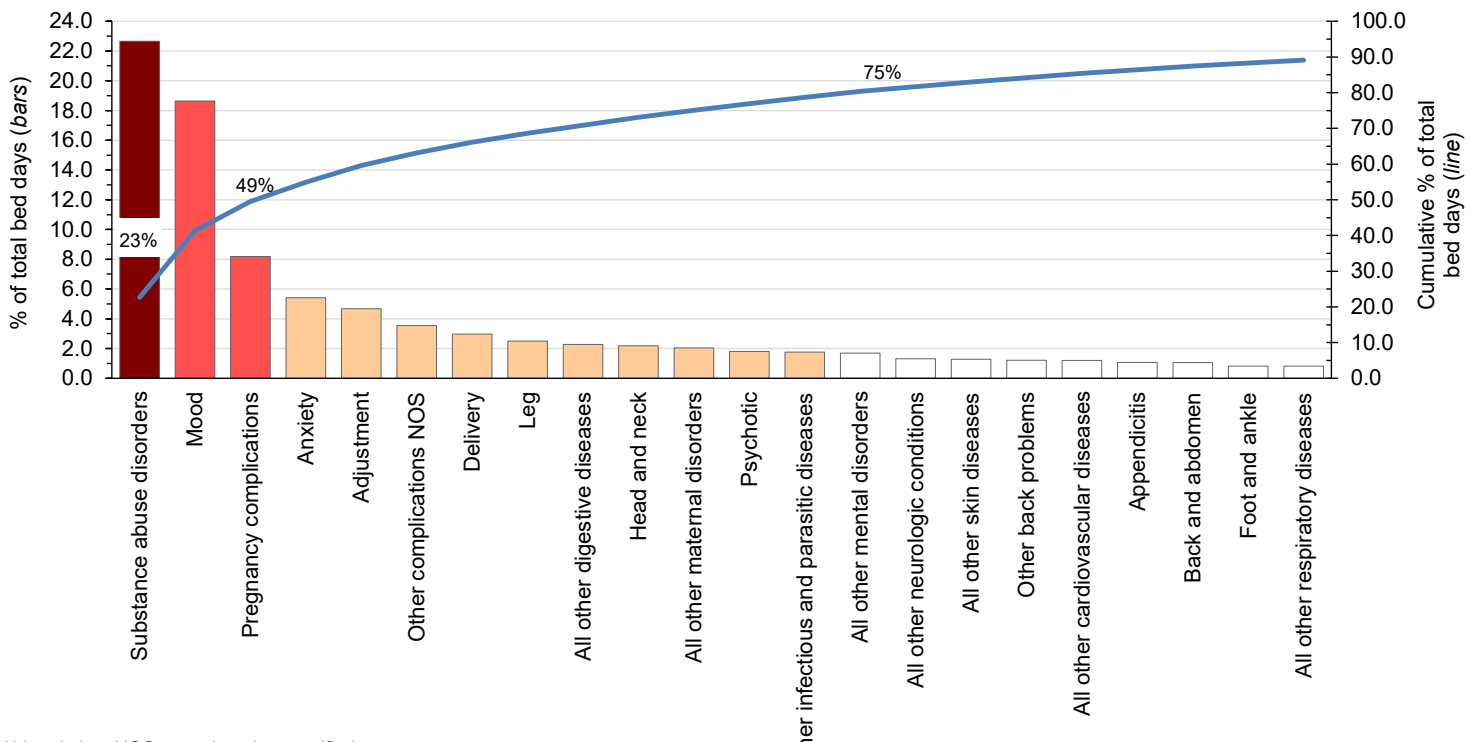
^b Medical encounters include total hospitalizations and ambulatory visits for the condition (with no more than 1 encounter per individual per day per condition).

^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 154 burden-related disease conditions. For individuals affected, 3 pairs of tied values (n=81; n=51; n=35) were given the same ranking (140; 145; 149). For hospital bed days, there were 9 conditions with the rank of 146 (0); 14 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. Coast Guard, 2023



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.^{5,6}

U.S. service members. Injuries, mental health disorders, and musculoskeletal diseases were the categories of medical conditions associated with the most medical encounters, the largest numbers of affected service members, and the greatest numbers of hospital bed days. When examining ICD codes to the fourth digit character, USCG and DOD service members shared many disease-related conditions: other back problems within the musculoskeletal disease major diagnostic category; arm/shoulder and knee injuries within the injury major diagnostic category; anxiety disorders in the mental health disorder major diagnostic category; and organic sleep disorders within the neurologic condition major diagnostic category.

COVID-19 did not account significantly for medical encounters and bed days in 2023 compared to 2022. 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.

Preventable illnesses and injuries, which contribute disproportionately to morbidity and health care burdens, should be high priority targets for intervention, research, and resources. In a 2018 survey, USCG members reported several mental health issues including serious psychological distress, failure to receive mental health services despite need, and other preventable risky health behaviors.³ Providing a matrix of major diseases each year enables the identification, in comparison with previous reports, of potentially avoidable health conditions among military personnel, and their proximate causes. Morbidity burden report findings can aid prioritization of effective interventions, provision of necessary care, and evaluation of their impacts and cost-effectiveness.⁴

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Sexually Transmitted Infections Among Active Component Members of the U.S. Armed Forces, 2015–2023

This report summarizes incidence rates and trends of sexually transmitted infections (STIs) from 2015 through 2023 among active component service members of the U.S. Armed Forces. The data compiled for this report are derived from the medical surveillance of chlamydia, gonorrhea, and syphilis as nationally notifiable diseases. Case data for 2 additional STIs, human papilloma virus (HPV) and genital herpes simplex virus (HSV), are also presented. The crude total case rates of chlamydia and gonorrhea initially rose by an average of 6.7% and 9.8% per year, respectively, until 2019. From 2020 onwards, rates steadily declined. By 2023, chlamydia rates had dropped by approximately 39%, while gonorrhea rates had fallen by more than 40% for female, and 19% for male, service members. Initially syphilis increased, on average, 10% annually from 2015 to 2019, then declined in 2020, but resumed its upward trend through 2023, nearly doubling the 2015 rate in 2023. The total crude annual incidence rates of genital HPV and HSV exhibited downward trends in general over the surveillance period, decreasing by 30.7% and 24.7%, respectively. Age- and gender-adjusted case rates for chlamydia, gonorrhea, and syphilis remain elevated within the U.S. Armed Forces compared to the general U.S. population, which may be due to factors that include mandatory STI screening, more complete reporting, incomplete adjustment for age distribution, and inequitable comparisons between the military active duty and general U.S. populations. Social restrictions enacted during the COVID-19 pandemic may have contributed to declines in true case rates and screening coverage.

In 2022, sexually transmitted infections (STIs) represented one of the highest health care burdens attributable to infectious diseases (other than COVID-19) among active component service members (ACSMs) of the U.S. Armed Forces.¹ A National Academies of Sciences, Engineering and Medicine committee convened to provide recommendations for prevention and control of STIs in the U.S. concluded that military recruits and active duty service members require focused consideration.² While multiple and interrelated factors influence STI risk within military populations,³

the strongest risk factors are age and sex. The military population is young (mean age 26) and predominantly male (85%), so its rates are not directly comparable to the general U.S. population unless adjusted for these demographics.

The Centers for Disease Control and Prevention (CDC) publishes annual summaries of national surveillance data for notifiable diseases including *Chlamydia trachomatis* (chlamydia), *Neisseria gonorrhoeae* (gonorrhea), and *Treponema pallidum* (syphilis) covered under federally-funded control programs.⁴ Although these 3

What are the new findings?

The rates of bacterial STIs have declined since 2020, with the exception of syphilis, which has nearly doubled, increasing by 98% over the 9-year surveillance period. Viral STI rates also declined during the surveillance period. These trends could be influenced partially by changes in screening coverage or behavior associated with the COVID-19 pandemic. Future analyses of screening rates are warranted to assess a true decline in incidence and examine the ongoing rise in syphilis reports.

What is the impact on readiness and force health protection?

To assist service leaders and medical corps in planning and assessing STI prevention and control measures for operational readiness, this report provides an updated epidemiologic profile of the most commonly reported STIs. STIs can adversely affect service members' ability and availability to perform their duties and can result in serious medical sequelae if left untreated. Continued behavioral and educational interventions, focused particularly on those under 25 years of age, are needed to mitigate the risk of STIs among military service members.

relatively common bacterial STIs are curable with antibiotics, there is continued concern about the threat of multidrug resistance.^{5–7}

Common viral STIs in the U.S. also include infections caused by human papillomavirus (HPV) and genital herpes simplex virus (HSV). Studies assessing the National Health and Nutrition Examination Survey (NHANES) data provide prevalence estimates for adolescents and young adults ages 15–24, estimating 1.3 million HSV-2 infections and 9.0 million infected with at least 1 disease-associated HPV type during 2018.^{8,9} Neither HPV nor HSV

viral infections are curable with antibiotics; however, suppression of recurrent herpes is attainable using antiviral medication, and a vaccine prevents infection from 4 of the most common HPV serotypes as well as 5 additional cancerous types.⁹

This report presents an epidemiological profile for STIs among U.S. ACSMs from 2015 to 2023, updating previous *MSMR* articles.^{10,11} Data are presented for 5 common STIs: chlamydia, gonorrhea, syphilis, HPV, and HSV.

Methods

The surveillance population for this report comprised all ACSMs of the U.S. Army, Navy, Air Force, or Marine Corps who served at any time during the surveillance period of January 1, 2015 to December 31, 2023. Diagnoses of STIs were ascertained from medical administrative data as well as reports of notifiable medical events routinely provided to the Armed Forces Health Surveillance Division and maintained in the Defense Medical Surveillance System (DMSS) for health surveillance. STI cases were also derived from positive laboratory test results recorded in the Health Level 7 (HL7) chemistry and microbiology databases compiled by the Defense Centers for Public Health–Portsmouth (DCPH-P).

For each service member, the number of days in active service was ascertained and then aggregated to a total for all service members for each calendar year. The resultant annual totals were expressed as person-years (p-yrs) of service and used as the denominators for calculating annual incidence rates. Person-time not considered time at risk for each STI—such as the 30 days following each incident chlamydia or gonorrhea infection and all person-time following the first diagnosis, medical event report, or positive laboratory test of HSV, HPV, or syphilis—was excluded. Incidence rates were calculated as incident cases of a given STI per 100,000 p-yrs of active component service, with percent changes in incidence calculated by unrounded rates.

An incident case of chlamydia was defined by either 1) a case-defining

diagnosis (**Table 1**) in the first or second diagnostic position of a record of an outpatient or in-theater medical encounter, 2) a confirmed notifiable disease report, or 3) a positive laboratory test (for any specimen source or test type). An incident case of gonorrhea was similarly defined by 1) a case-defining diagnosis in the first or second diagnostic position of an inpatient, outpatient, or in-theater encounter record, 2) a confirmed notifiable disease report, or 3) a positive laboratory test (any specimen source or test type). For both chlamydia and gonorrhea, an individual could be counted as having a subsequent case only if more than 30 days occurred between the dates recorded for each case-defining diagnosis.

An incident case of syphilis was defined by either 1) a qualifying ICD-9 or ICD-10 code in the first, second, or third diagnostic position of a hospitalization, 2) at least 2 outpatient or in-theater encounters within 30 days with a qualifying ICD-9 or ICD-10 code in the first or second position, 3) a confirmed notifiable disease report for any type of syphilis, or 4) a record of a positive polymerase chain reaction or treponemal laboratory test. Stages of syphilis (primary, secondary, late, latent) could not be distinguished because HL7 laboratory data do not allow for stage differentiation, and because a high degree of misclassification is associated with the use of ICD diagnosis codes for stage determination.^{12,13} An individual could be considered an

incident case of syphilis only once during the surveillance period; those with evidence of prior syphilis infection were excluded.

Incident cases of genital HSV were identified by either 1) the presence of the requisite ICD-9 or ICD-10 codes in either the first or second diagnostic positions of an outpatient or in-theater encounter record, or 2) a positive laboratory test from a genital specimen source. Antibody tests were excluded because they do not allow distinction between genital and oral infections. Incident cases of genital HPV were similarly identified by either 1) the presence of the requisite ICD-9 or ICD-10 codes in either the first or second diagnostic positions of an outpatient or in-theater encounter record or 2) a positive laboratory test from any specimen source or test type. Outpatient encounters for HPV with evidence of HPV immunization within 7 days before or after the encounter date were excluded, as were outpatient encounters with a procedural or Current Procedural Terminology (CPT) code indicating HPV vaccination, as such encounters were potentially related to vaccination administration. An individual could be counted as an incident case of HSV or HPV only once during the surveillance period. Individuals with diagnoses of HSV or HPV infection before the surveillance period were excluded.

TABLE 1. ICD-9 and ICD-10 Diagnostic Codes Used to Identify STI Cases in Electronic Health Care Records

STI	ICD-9 ^a	ICD-10 ^a
HPV	078.11, 079.4, 795.05, 795.09, 795.15, 795.19, 796.75, 796.79	A63.0, R85.81, R85.82, R87.81, R87.810, R87.811, R87.82, R87.820, R87.821, B97.7
Chlamydia	099.41, 099.5*	A56.*
Genital HSV	054.1*	A60.*
Gonorrhea	098.*	A54.*
Syphilis	091.*, 092.*, 093.*–096.*, 097.0, 097.1, 097.9	A51.* (excluding A51.31), A52.*, A53.0, A53.9

Abbreviations: ICD-9, International Classification of Diseases, 9th Revision; ICD-10, International Classification of Diseases, 10th Revision; STI, sexually transmitted infection; HPV, Human papillomavirus; HSV, herpes simplex virus.

^aAn asterisk (*) indicates that any subsequent digit or character is included.

TABLE 2. Incident Counts and Incidence Rates of STIs, Active Component, U.S. Armed Forces, 2015–2023

	Chlamydia		Gonorrhea		Syphilis		Genital HSV		Genital HPV	
	No.	Rate ^a	No.	Rate ^a	No.	Rate ^a	No.	Rate ^a	No.	Rate ^a
Total	234,162	2,001.6	39,082	333.6	7,068	60.4	26,500	229.5	51,994	459.7
Sex										
Male	146,952	1,507.2	30,994	317.6	6,136	63.0	14,175	146.7	17,249	180.0
Female	87,210	4,475.8	8,088	413.7	932	47.7	12,325	654.8	34,745	2,009.9
Age group, y										
< 20	32,246	3,867.5	4,062	485.9	755	90.3	1,904	228.0	671	80.3
20–24	136,357	3,667.5	20,602	552.7	2,704	72.6	11,137	300.8	18,447	499.7
25–29	45,209	1,659.6	8,799	322.6	1,789	65.7	6,919	257.2	13,762	520.2
30–34	13,543	719.5	3,488	185.2	1,002	53.3	3,521	190.9	11,326	640.4
35–39	4,852	351.0	1,426	103.1	481	34.9	1,866	138.9	4,854	380.3
≥ 40	1,955	168.8	705	60.9	337	29.2	1,153	102.2	2,934	268.5
Race and ethnicity										
White, non-Hispanic	87,605	1,352.0	10,158	156.6	2,178	33.6	11,385	177.6	23,970	381.4
Black, non-Hispanic	77,034	4,098.2	19,796	1,050.5	2,535	135.0	8,009	436.6	11,664	648.3
Hispanic	46,278	2,369.0	5,697	291.1	1,549	79.3	4,638	240.2	9,548	505.1
Other/unknown	23,245	1,677.5	3,431	247.3	806	58.2	2,468	180.1	6,812	509.6
Education level										
High school or less	202,817	2,738.1	32,721	440.9	5,197	70.1	18,707	254.8	30,827	424.4
Some college	14,372	1,010.8	2,777	195.2	733	51.6	3,179	229.7	7,506	566.8
Bachelor's or advanced degree	14,582	557.8	3,173	121.3	1,020	39.1	4,205	163.9	12,378	500.0
Other/unknown	2,391	936.0	411	160.8	118	46.2	409	161.9	1,283	518.2
Marital status										
Single, never married	165,463	3,248.3	26,605	521.1	4,533	88.9	14,104	278.5	25,101	501.0
Married	54,664	904.6	10,205	168.8	2,104	34.9	9,686	163.0	20,788	358.6
Other/unknown	14,035	2,498.5	2,272	403.8	431	76.8	2,710	503.6	6,105	1,211.4
Service										
Army	96,752	2,290.6	18,946	447.9	2,580	61.1	11,309	271.6	18,004	439.7
Navy	56,215	1,896.8	9,671	325.9	2,641	89.2	6,392	218.6	15,222	532.4
Air Force	45,876	1,591.0	5,892	204.1	1,194	41.4	5,931	208.8	14,044	509.8
Marine Corps	35,319	2,170.3	4,573	280.6	653	40.1	2,868	177.5	4,724	294.8
Rank/grade										
Junior enlisted (E1–E4)	174,629	3,487.4	27,080	539.5	4,487	89.5	14,242	285.4	23,599	474.9
Senior enlisted (E5–E9)	49,930	1,084.2	10,081	218.7	2,029	44.1	9,257	205.6	19,441	447.0
Junior officer (O1–O3)	8,186	700.8	1,457	124.7	374	32.0	2,118	183.4	6,486	574.7
Senior officer (O4–O10)	842	112.4	326	43.5	133	17.8	628	85.5	1,984	280.8
Warrant officer (W01–W05)	575	341.7	138	82.0	45	26.8	255	156.4	484	307.7
Military occupation										
Combat-specific ^b	27,528	1,712.4	4,821	299.5	606	37.7	2,702	169.4	3,669	232.2
Motor transport	11,230	3,262.4	2,148	622.7	416	120.8	994	291.8	1,969	585.4
Pilot/air crew	2,348	554.0	316	74.5	91	21.5	504	120.5	1,227	300.3
Repair/engineering	65,690	1,907.4	10,645	308.7	1,628	47.3	6,917	203.1	12,398	369.6
Communications/intelligence	57,917	2,306.1	10,725	426.4	1,627	64.8	7,229	293.6	14,708	615.9
Health care	17,551	1,733.5	2,909	287.0	594	58.7	2,925	294.5	7,907	830.1
Other	51,898	2,203.8	7,518	318.8	2,106	8.9	5,229	224.4	10,116	441.7

Abbreviations: STIs, sexually transmitted infections; HSV, herpes simplex virus; HPV, human papillomavirus; No., number; y, years.

^a Incidence rate per 100,000 person-years.^b Infantry/artillery/combat engineering/armor.

Results

Between 2015 and 2023, chlamydia was the most commonly detected STI among ACSMs. The number of incident cases of chlamydia exceeded the combined incidence number of the other 4 STIs nearly 2-fold and was 4.5 times the total number of genital HPV infections—the next most frequently identified STI during this period (Table 2). The highest rates of chlamydia were observed in the Army (2,290.6 per 100,000 p-yrs) and Marine Corps (2,170.3 per 100,000 p-yrs), while the Navy and Air Force had the highest rates of genital HPV (532.4 and 509.8 per 100,000 p-yrs, respectively).

The total incidence rates of all STIs, excluding syphilis, were higher among female service members, ranging from 1.3 times higher for gonorrhea to 11.2 times higher for genital HPV.

The highest incidence rates for bacterial STIs and genital HSV were concentrated among service members under 25 years of age, while for genital HPV rates were highest among those over 25 years of age. For all STIs, non-Hispanic Black

service members, those with a high school education or less, never married, and junior enlisted members had the highest incidence rates.

Patterns of incidence rates over time for each specific STI are described in subsequent subsections.

Chlamydia

Annual total chlamydia rates among all ACSMs steadily increased, by an average of 6.7% annually between 2015 and 2019, with rates among both women and men peaking in 2019, at 5,464.3 and 1,886.9 per 100,000 p-yrs, respectively (Figure 1). Total chlamydia rates began to decline annually thereafter, with the most pronounced decrease (approximately 21%) observed in 2020. The annual rate of decline in subsequent years averaged approximately 11%.

The younger (under 30 years old) age categories of service members constituted the majority of the overall decline in chlamydia, for both men and women and among all races and ethnicities. The most consistent and largest rate decrease (42.1%) for chlamydia in women was observed among non-Hispanic White service

members under age 25, declining from a peak of 8,581.5 cases per 100,000 p-yrs in 2019 to 4,972.4 cases per 100,000 p-yrs in 2023 (Figure 2). Among male service members under 25 years of age, the range of declines in incidence rates was between 22% and 44%.

Throughout the 9-year surveillance period, female service members were 3 times more likely to be diagnosed with chlamydia than their male counterparts. The female-to-male ratio of chlamydia infection was highest, at 7 to 9, among those under 20 years of age.

Gonorrhea

From 2015 to 2019, annual total gonorrhea rates increased by an average of 9.8% per year among all ACSMs, from a low of 264.7 cases per 100,000 p-yrs to the highest recorded rates of 370.60 cases (Figure 3). Thereafter, total gonorrhea rates declined on average by 9.3% annually. More substantial declines were observed among women, from a peak of 490.9 cases per 100,000 p-yrs in 2018 to 279.5 in 2023, while rates among men fell from 347.1 per 100,000 p-yrs in 2019 to 280.5 in 2023.

FIGURE 1. Incidence Rates^a of *Chlamydia Trachomatis* Infection Among Women and Men by Age Group, Active Component, U.S. Armed Forces, 2015–2023

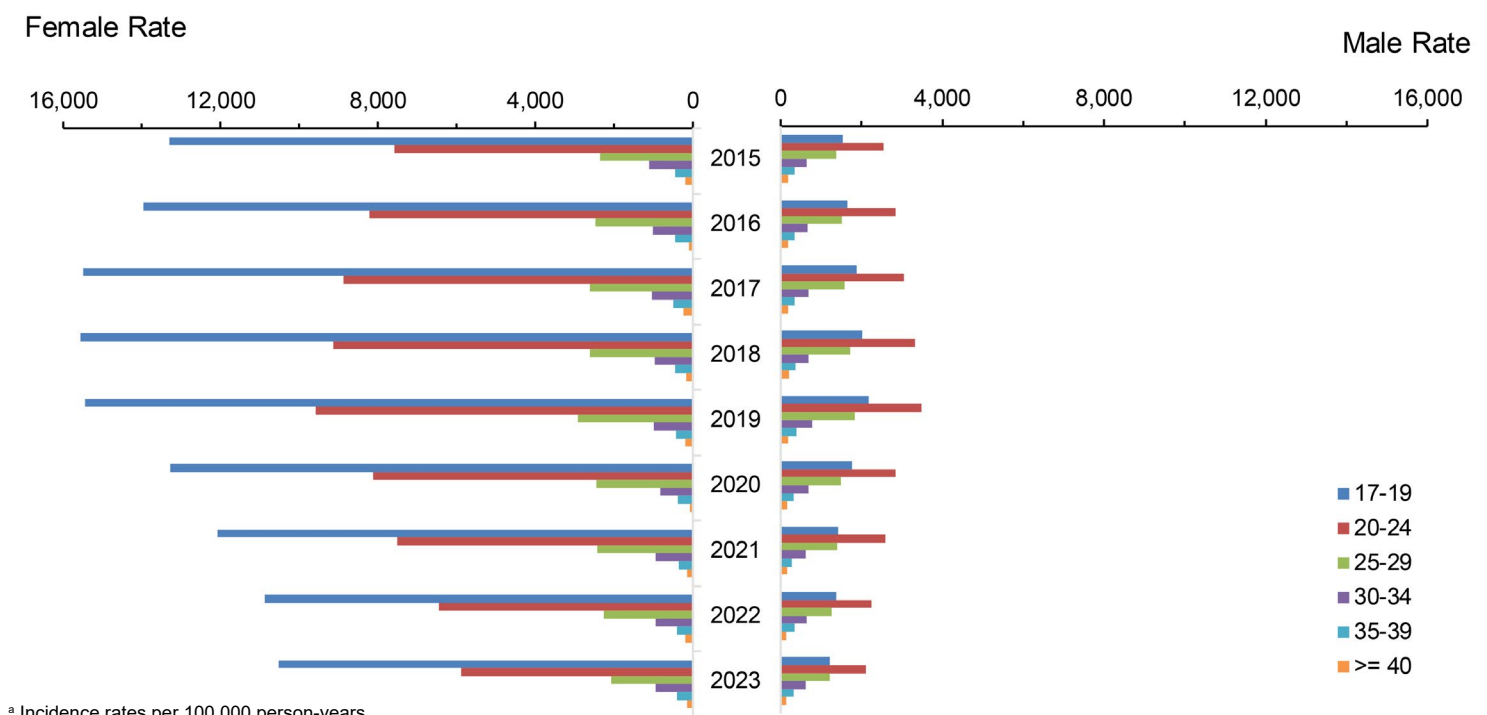


FIGURE 2. Incidence Rates of *Chlamydia Trachomatis* Infection Among Women and Men, by Age and Racial and Ethnic Groups, Active Component, U. S. Armed Forces, 2015–2023

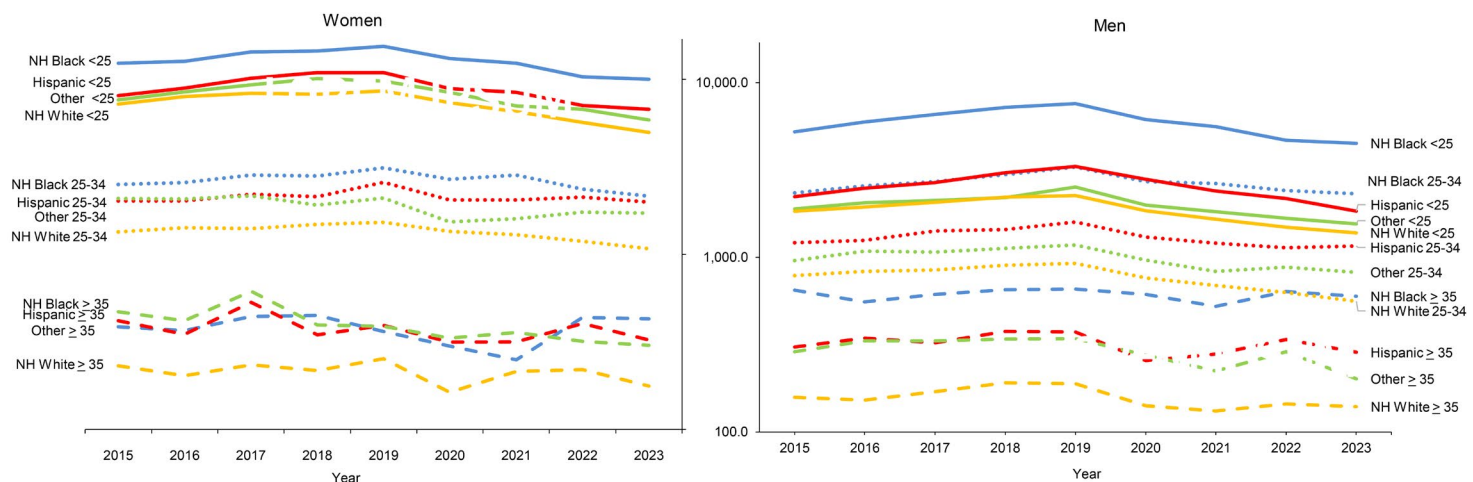
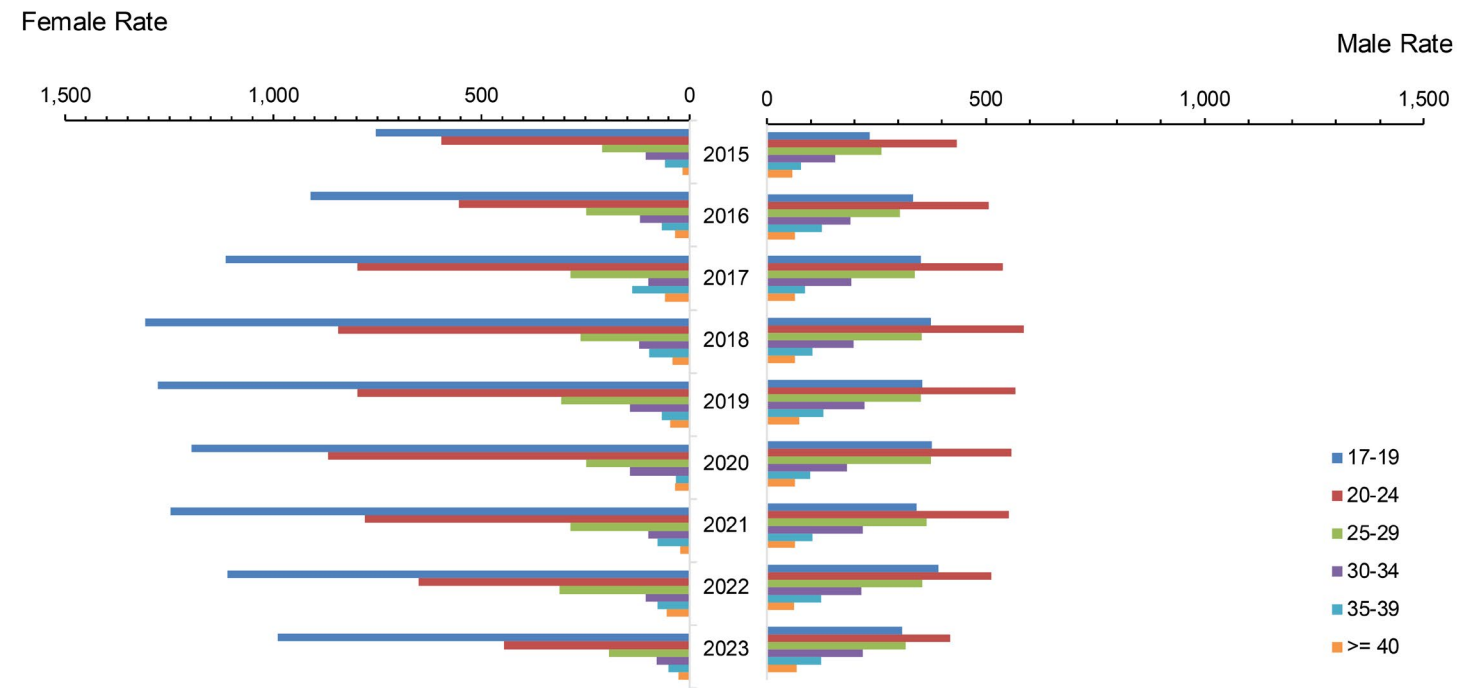


FIGURE 3. Incidence Rates^a of Gonorrhea Infection Among Women and Men by Age Group, Active Component, U.S. Armed Forces, 2015–2023



^a Incidence rates per 100,000 person-years.

The recent decline in female gonorrhea incidence was primarily driven by rates among service members under age 25 years, although the rate among the youngest female age group, under 20 years, remained elevated in 2023, at 988.7 cases per 100,000 p-yrs, compared to the low of 753.5 from 2015. Among men, the rate decline was

most pronounced among those aged 20-24 years, the age group that also had the highest incidence rates. Rates remained relatively stable for age groups over 30, among both women and men. Throughout the 9-year surveillance period, total incidence rates of gonorrhea in female and male service members were

comparable. When disaggregated by age, however, female service members in the youngest age category (under 20 years), were 2.7 to 3.6 times more likely to be diagnosed with gonorrhea than men in the same age range. Among ACSMs older than 25 years, however, women were 10-70% less likely (female-to-male ratio: 0.3-0.9)

to be diagnosed with gonorrhea than males. Throughout the surveillance period, gonorrhea rates remained highest among non-Hispanic Black service members, peaking at 1,238.9 per 100,000 p-yrs in 2020, then declining to 833.0 per 100,000 p-yrs in 2023 (data not shown).

Syphilis

Syphilis rates steadily rose until 2020, when they declined by 13.2% from the previous year. In 2021, however, syphilis rates resumed their upward trend and in 2023 surpassed all prior year rates from the surveillance period. The crude incidence rate for total cases of syphilis in 2023 (83.3 per 100,000 p-yrs) was almost double the rate observed in 2015 (42.1 per 100,000 p-yrs).

Female syphilis rates increased by 168.1%, from 30.0 in 2015 to 80.4 per 100,000 p-yrs in 2023, far exceeding—by nearly twice as much—the 89.1% increase in male syphilis rates from 44.3 in 2015 to 83.9 per 100,000 p-yrs in 2023 (**Figure 4**). This notable difference was primarily driven by female service members in the youngest age group, 17-19 years. Syphilis

rates among ACSMs ages 17-19 peaked at 209.2 per 100,000 p-yrs in 2022, then decreased by 7.8% to 192.8 cases in 2023, but remained elevated compared to pre-2020 levels. Men ages 17-19 years registered the second highest rate of syphilis, peaking in 2022 at 121.5 cases per 100,000 p-yrs, then declined by 4.5% in 2023, but still elevated more than 2.0 times their lowest levels, in 2015, at 52.6 cases per 100,000 p-yrs.

Syphilis case rates among women in older age groups tended to be lower than the rates among men of corresponding age ranges. Non-Hispanic Black service members consistently accounted for the highest rates of syphilis throughout the surveillance period, with peak rates among women and men under age 25 at 196.7 and 275.0 per 100,000 p-yrs, respectively, and for men ages 25-34 at 260.2 per 100,000 p-yrs in 2023 (data not shown).

Genital HPV

The crude annual incidence rates of genital HPV infections among all ACSMs decreased by 30.7% from the start of the

surveillance period until its end, but with a more marked absolute decrease among men. The incidence rates of genital HPV infections among male service members decreased from a high of 264.7 cases per 100,000 p-yrs in 2015 to a low of 133.4 in 2023, representing a 49.6% reduction (**Figure 5**). Among female service members, the downward trend continued until 2022, culminating in a 40.0% decline to 1,599.5 cases per 100,000 p-yrs from a high of 2,641.6 in 2015, before increasing in 2023 by 18.6%, to 1,896.8 cases per 100,000 p-yrs. The increased rate in 2023 among women is 28.2% lower than the 2015 peak.

Throughout the surveillance period genital HPV incidence rates displayed marked differences among both sex and age groups. Women ages 30-34 years had the highest rates of genital HPV, as much as 19 times greater than the corresponding rates among men, while women ages 17-19 years had the lowest rates. The HPV rates among the youngest group of women were markedly lower, up to 20 times, than the rates among women in the 30-34 age group.

FIGURE 4. Incidence Rates^a of Syphilis Infection Among Women and Men by Age Group, Active Component, U.S. Armed Forces, 2015–2023

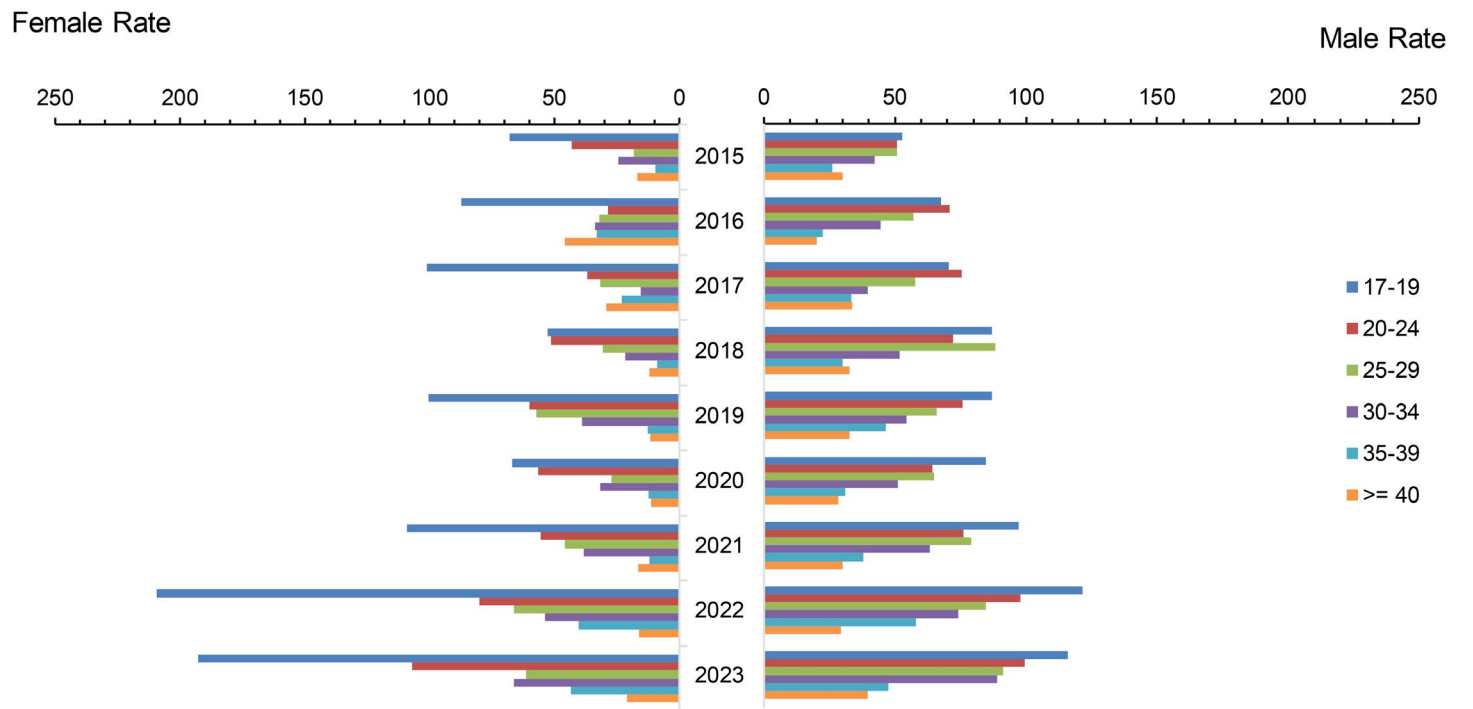
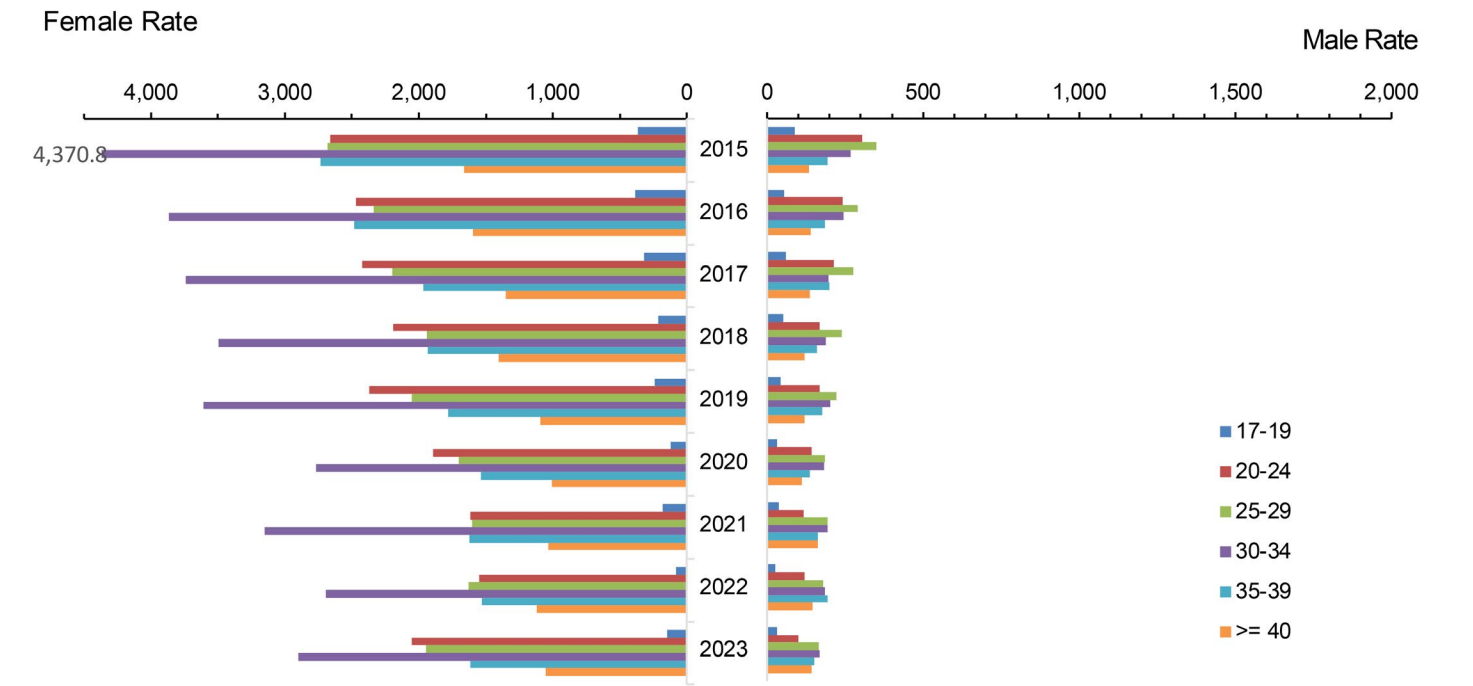


FIGURE 5. Incidence Rates^a of Genital HPV Infection Among Women and Men by Age Group, Active Component, U.S. Armed Forces, 2015–2023



Genital HSV

From 2020 to 2023 the HSV incidence rate decreased by 24.7% to an average of 194.3 (range: 188.5-199.9) cases per 100,000 p-yrs, after incidence rates fluctuated from 2015 through 2019, with an average of rate at 258.1 (range 236.0–277.4) cases per 100,000 p-yrs. Stratified by sex, HSV rates among female service members declined from a high in 2016 of 786.6 per 100,000 p-yrs to a low of 512.6 per 100,000 p-yrs in 2023 (Figure 6). HSV rates for male service members were also highest in 2016 (184.5 per 100,000 p-yrs), then hit their lowest point in 2020 (115.1 per 100,000 p-yrs; 37.7% reduction) before increasing by 5.1% to 121.0 in 2023. On average, female rates were 4 to 5 times higher than corresponding rates among males.

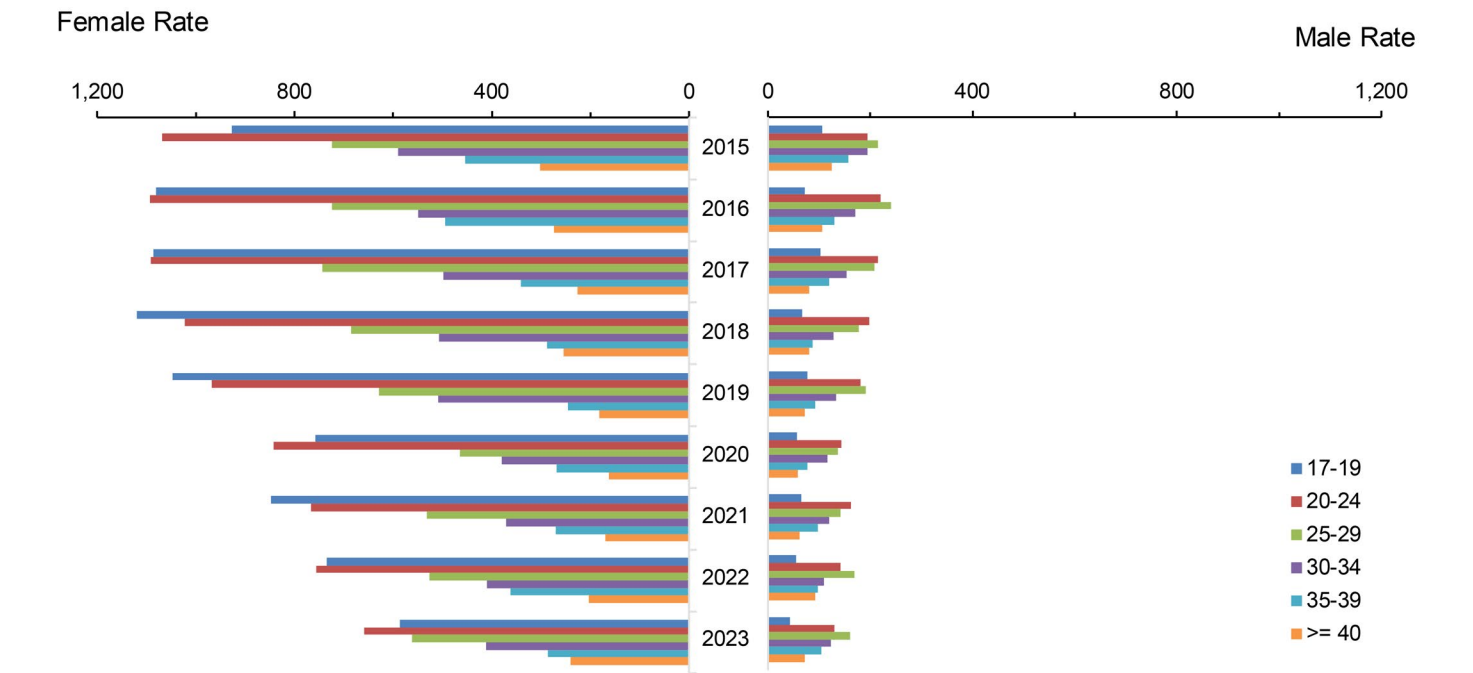
Discussion

This report provides a surveillance update on 3 nationally notifiable bacterial STIs: chlamydia, gonorrhea, and syphilis; as well as 2 viral STIs: genital HSV and HPV. Chlamydia was the most frequently reported

STI, with average incidence rates exceeding those of HPV, the second-most common STI by approximately 2 times. Genital herpes was the third-most detected STI, followed by gonorrhea and syphilis. Although chlamydia rates were more than 10-fold higher than the rates of gonorrhea, temporal trends in incidence rates for both infections followed a similar pattern. During the initial 5 years of the surveillance period, both chlamydia and gonorrhea showed an upward trend, peaking in 2019, before declining in 2020. Those declines persisted through 2023. An assessment of screening rates may clarify whether this finding constitutes a true decline in incidence, as overall chlamydia and gonorrhea rates in the civilian population continued to increase during this period. The latest CDC report shows that, over the decade spanning 2013 to 2022, chlamydia rates among civilian men increased by nearly 40%, while those among women showed negligible change.^{14,15} Overall rates of gonorrhea more than doubled during the same period, surging by 117% among men and nearly 50% among women.¹⁶ In absolute terms, the total case rates of chlamydia and gonorrhea among service members were higher than in the general population, for both men and

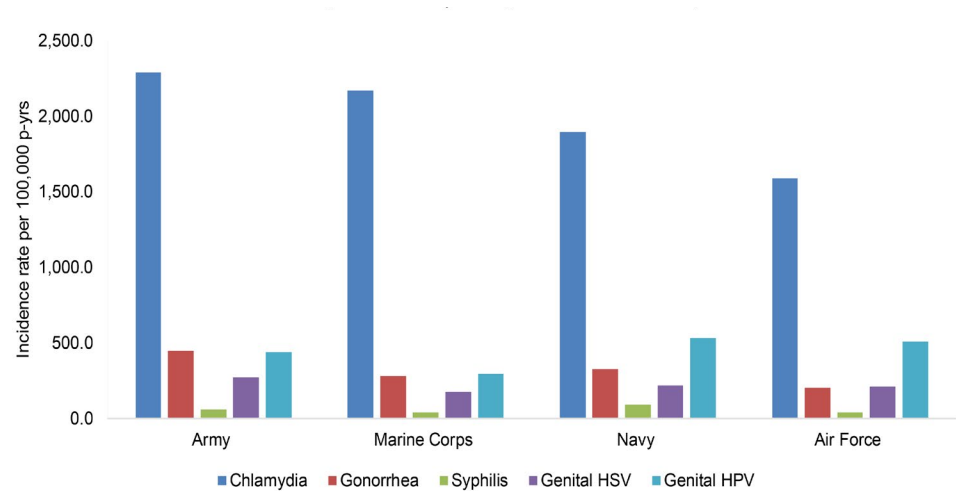
women. In 2022, the chlamydia rates in male and female service members were approximately 3.4 and 5.9 times higher, respectively, than comparable civilian counterpart rates, while the same rates for gonorrhea were 1.5 to 2.6 times higher. These rate comparisons should, however, be interpreted with an understanding of the unique surveillance methods for each population, as well as their differences in screening access and use. The U.S. military represents a ‘healthy worker’ population with no-cost access to complete preventive and primary care, for maintaining a military ready force.¹⁷ The electronic health records generated by the Military Health System (MHS) also enable more complete disease burden capture for notifiable disease reporting. Laboratory and medical encounter data from service members in 2022 supplemented chlamydia case rates, as those cases had no medical event report and would have been unidentifiable without supplemental electronic health record data. Routine surveillance reports do not assess anatomic sites from gonorrhea case reports and laboratory records, which could provide more comprehensive understanding of extragenital infections in high-risk populations.

FIGURE 6. Incidence Rates^a of Genital HSV Infection Among Women and Men by Age Group, Active Component, U.S. Armed Forces, 2015–2023



^a Incidence rates per 100,000 person-years.

FIGURE 7. Incident Rates^a of STIs, Active Component, U.S. Armed Forces, 2015–2023



Abbreviations: STIs, sexually transmitted infections; HSV, herpes simplex virus; HPV, human papillomavirus.
^a Incidence rates per 100,000 person-years.

National guidelines recommend gonorrhea screening, including pharyngeal or rectal testing at least annually for both MSM and HIV-positive patients. Extragenital gonorrhea screening may be considered for women on the basis of reported sexual behaviors and exposure.¹⁸ Despite these recommendations, extragenital screening for

high-risk civilian and military populations is under-utilized.^{19,20} A recent assessment of extragenital STI screening by primary care physicians for HIV-positive Airmen found that approximately one-third of patients had undetected STIs, the majority due to extragenital infections of the rectum and pharynx.²⁰

The trend in syphilis rates reveals a pattern that differs from the other 2 bacterial STIs, reflecting differing epidemiological factors and clinical dynamics. Despite a brief decline in 2020, syphilis rates essentially doubled (98%) over the 9-year period, peaking in 2023. This syphilis surge among the military population exceeds the 80% increase in cases in the U.S. general population from 2018 to 2022, at the highest levels since the 1950s, according to the CDC.⁴

A male-to-female syphilis rate ratio greater than 1.0 persisted, except among women ages 17 to 19 years, throughout the surveillance period. This relative increase in syphilis rates for female service members in the youngest age group could indicate either improved accession screening or a true increase in rates. This finding is reflected in national surveillance reports.

Although civilian rates of primary and secondary syphilis are lower among women, their incidence rates more than doubled from 2016 to 2020.²¹ This evidence reinforces U.S. Preventive Services Task Force recommendations for early syphilis infection screening in all pregnant women.²² This recommendation may be particularly relevant for female service members, as the majority of them are largely of childbearing age.

In 2020 all STI rates notably decreased. As noted in CDC national surveillance reports, the COVID-19 pandemic likely contributed to changes in STI screening coverage; thus, incidence rates for that period should be interpreted with caution.¹⁴ Future analyses of ACSM STI screening practices may help reveal true incidence rate declines, particularly for STIs more commonly associated with asymptomatic infection.

No sexual risk behavior data were available, but prior surveys of military personnel indicate increased behaviors of possible concern. The 2018 Department of Defense Health Related Behaviors Survey (HRBS) documented 19.3% of active component respondents reporting 2 or more sexual partners within the past year, with 34.9% reporting sex without condom use with a new partner in the past year—percentages almost double those in the 2011 survey.²³

This report has several limitations that should be considered. First, STI diagnoses can be incorrectly coded. For example, STI-specific “rule out” diagnoses or vaccinations (e.g., HPV vaccination) may be reported with STI-specific diagnostic codes, which would result in STI incidence overestimation. Cases of syphilis, genital HSV, and genital HPV infections based solely upon laboratory test results are considered “suspect” because laboratory results cannot distinguish between active and chronic infections. Because incident cases of those 3 STIs were identified based upon a first qualifying encounter or laboratory result, it is likely most cases were acute and not chronic.

STI cases coded in the medical record using symptom codes (e.g., urethritis) rather than STI-specific codes may not be captured. In addition, the counts of STI diagnoses reported here may underestimate actual diagnoses because some service members may have been diagnosed and treated by non-reimbursed, non-military care providers (e.g., county health departments, family planning centers) or in deployed settings (e.g., overseas training exercises, combat operations, aboard ships). Laboratory tests in the private sector care or in a shipboard facility, battalion aid station, or in-theater facility were not captured in this analysis.

For some STIs, detection of prevalent infection may occur long after initial infection. Changes in incidence rates may reflect, at least in part, temporal changes in case

detection, including more aggressive screening. The lack of standard service and installation practices for STI screening, testing, treatment, and reporting complicates interpretations of detected differences between services, military and demographic subgroups, as well as locations. Standard STI screening, testing, treatment, and reporting throughout the services, and consistent adherence, can improve detection and characterization of STI-related health threats. Continued behavioral risk-reduction interventions are still required to counter STIs among military service members.

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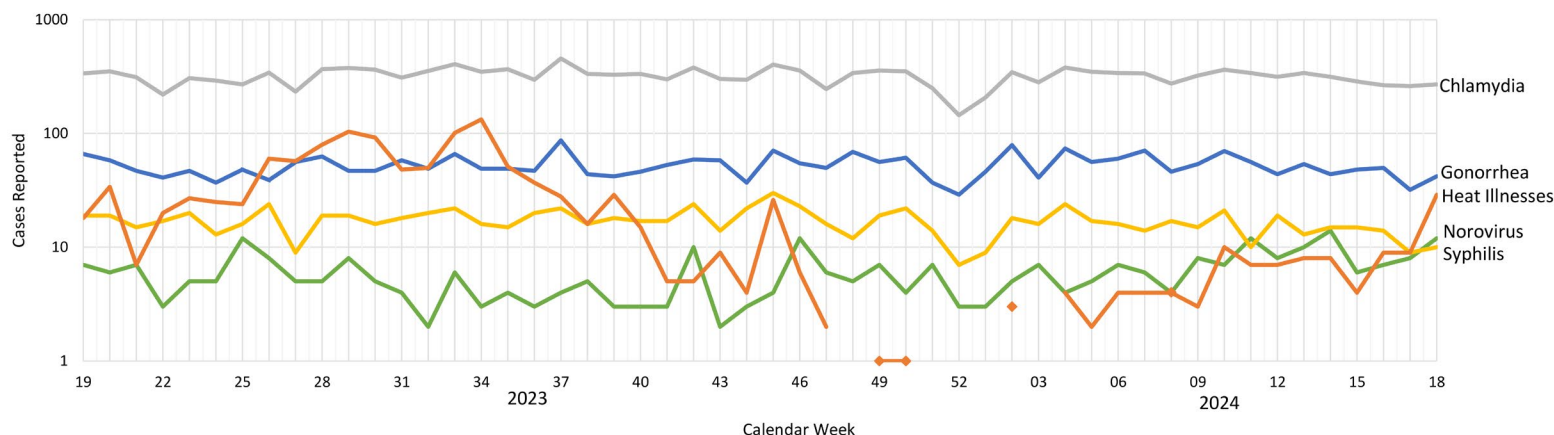
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Reportable Medical Events at Military Health System Facilities Through Week 18, Ending May 4, 2024

Matthew W. R. Allman, MPH; Anthony R. Marquez, MPH; Katherine S. Kotas, MPH

TOP 5 REPORTABLE MEDICAL EVENTS BY CALENDAR WEEK, ACTIVE COMPONENT (MAY 13, 2023 - MAY 4, 2024)



Cases are shown on a logarithmic scale.

Note: There were 0 heat illness cases in the following weeks in 2023: 48, 51-52, and weeks 1 and 3 in 2024. Markers added to represent instances of heat illnesses that were not visible on the logarithmic scale graph.

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) for monitoring, controlling, and preventing the occurrence and spread of diseases of public health interest or readiness importance. These reports are reviewed by each service's public health surveillance hub. The DRSi collects reports on over 70 different RMEs, including infectious and non-infectious conditions, outbreak reports, STI risk surveys, and tuberculosis contact investigation reports. A complete list of RMEs is available in the *2022 Armed Forces Reportable Medical Events Guidelines and Case Definitions*.¹ Data reported in these tables are considered provisional and do not represent conclusive evidence until case reports are fully validated.

Total active component cases reported per week are displayed for the top 5 RMEs for the previous year. Each month, the graph is updated with the top 5 RMEs, and is presented with the current month's (April 2024) top 5 RMEs, which may differ from previous months. COVID-19 is excluded from these graphs due to changes in reporting and case definition updates in 2023.

For questions about this report, please contact the Disease Epidemiology Branch at the Defense Centers for Public Health–Aberdeen. Email: dha.apg.pub-health-a.mbx.disease-epidemiologyprogram13@health.mil

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TABLE. Reportable Medical Events, Military Health System Facilities, Week Ending May 4, 2024 (Week 18)^a

Reportable Medical Event ^b	Active Component ^c			MHS Beneficiaries ^d		
	March 2024	April 2024	YTD 2024	YTD 2023	Total, 2023	April 2024
	No.	No.	No.	No.	No.	No.
Amebiasis	4	0	5	5	15	0
Arboviral diseases, neuroinvasive and non-neuroinvasive	0	0	0	0	2	0
COVID-19-associated hospitalization and death ^e	0	2	16	60	113	9
Campylobacteriosis	19	24	68	80	268	17
Chikungunya virus disease	0	0	0	1	2	0
<i>Chlamydia trachomatis</i>	1,430	1,213	5,412	6,074	17,498	198
Cholera	1	0	1	1	4	0
Coccidioidomycosis	6	2	23	9	36	0
Cold weather injury ^f	8	7	123	92	151	N/A
Cryptosporidiosis	3	4	26	22	67	2
Cyclosporiasis	0	0	0	0	15	0
Dengue virus infection	1	2	4	1	7	1
<i>E coli</i> , Shiga toxin-producing	2	10	17	7	70	2
Ehrlichiosis/Anaplasmosis	0	0	0	0	28	0
Giardiasis	10	8	35	21	79	6
Gonorrhea	236	191	944	931	2,761	34
Haemophilus influenza ^g , invasive	0	1	2	0	1	1
Hantavirus disease	0	0	0	0	2	0
Heat illness ^f	33	37	93	138	1,258	N/A
Hepatitis A	0	1	2	4	8	0
Hepatitis B, acute and chronic	5	8	37	54	154	7
Hepatitis C, acute and chronic	2	1	13	24	52	2
Influenza-associated hospitalization ^g	4	1	32	5	29	10
Lead poisoning, pediatric ^h	N/A	N/A	N/A	N/A	N/A	4
Legionellosis	0	0	3	2	5	0
Leishmaniasis	0	0	0	1	1	0
Leprosy	0	0	0	0	2	0
Leptospirosis	0	0	0	2	4	0
Lyme disease	4	9	22	20	70	8
Malaria	1	0	3	6	28	1
Meningococcal disease	0	0	0	2	4	0
Mpox	0	0	0	0	4	0
Norovirus	41	37	124	231	419	64
Pertussis	2	1	6	2	15	4
Post-exposure prophylaxis against Rabies	39	46	174	181	598	22
Q fever	0	0	0	1	2	0
Rubella	0	0	0	2	2	0
Salmonellosis	6	6	26	21	129	10
Shigellosis	3	4	14	18	59	2
Spotted Fever Rickettsiosis	0	2	2	14	31	1
Syphilis (all)	66	57	266	318	945	12
Toxic shock syndrome	1	0	2	1	2	1
Trypanosomiasis	0	0	1	1	1	0
Tuberculosis	0	0	1	2	11	4
Tularemia	0	0	1	1	1	0
Typhoid fever	0	0	0	0	2	0
Typhus fever	0	0	1	1	3	0
Varicella	0	0	4	3	12	10
Zika virus infection	0	0	1	0	0	0
Total case counts	1,927	1,674	7,504	8,359	24,970	432

Abbreviations: MHS, Military Health System; YTD, year-to-date; No., number; E, Escherichia; N/A, not applicable.

^a RMEs reported through the DRSi as of May 31, 2024 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 Mar. 1, 2024–March 31, 2024 and Apr. 1, 2024–Apr. 30, 2024. YTD comparison is displayed for the period of Jan. 1, 2024–Apr. 30, 2024 for MHS facilities. Previous year counts are provided as the following: previous YTD, Jan. 1, 2023–Apr. 30, 2023; total 2023, Jan. 1, 2023–Dec. 31, 2023.

^b RME categories with 0 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 the Army, Navy, Air Force, Marine Corps, Coast Guard, and Space Force, including personnel classified as FMP 20 with duty status of Active Duty, 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 cases reported after case definition update on May 4, 2023. Includes only cases resulting in hospitalization or death. Does not include cases of hospitalization or death reported under the previous COVID-19 case definition.

^f Only reportable for service members.

^g Influenza-associated hospitalization is reportable only for individuals under 65 years of age.

^h Pediatric lead poisoning is reportable only for children aged 6 years or younger.

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