

DOD

HEALTH

OF THE

FORCE

2019



INTRODUCTION

The Department of Defense (DoD) Health of the Force report represents a coordinated effort by the Defense Health Agency and the Army, Navy, and Air Force public health centers to provide a snapshot of active component (AC) Service member health and well-being. It is meant to be a resource for military leaders and decision makers to help identify changes in the health status of AC Service members, emerging health problems, and gaps in prevention and treatment efforts. It may also be of interest to program planners, health practitioners, researchers, and others interested in the well-being of Service members.

The current report focuses on eight subject areas: injury, heat illness, behavioral health (BH), hazardous drinking, sexually transmitted infections (STIs), sleep disorders, acute respiratory illnesses, and obesity. It is based on data from calendar year 2019. Certainly, much has changed in the Military Health System (MHS) and in the world since the onset of coronavirus 2019 (COVID-19), a viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which became recognized as a global pandemic by the World Health Organization in March 2020. This report does not include any data related to COVID-19 because the surveillance period ended before the start of the COVID-19 pandemic; however, COVID-19-related data will be presented in future reports. The intent of the annual DoD Health of the Force report is to provide timely, concise, and useful information to generate ideas and drive progress toward enhancing the vitality and lethality of our fighting force.

ORGANIZATION OF THIS REPORT

This report is divided into two sections, Health Metrics and Service Profiles. The Health Metrics section provides health index measures for each of the eight subject areas; the Service Profiles section compares measures across Services.

Methodology is critical to understanding and using healthcare metrics, especially because of the growing number of sources of healthcare data. The appendices of this report present detailed information about the methods used to analyze data in each of the eight subject areas as well as specific limitations associated with the data analysis.

LIMITATIONS

There are many challenges associated with processing and interpreting healthcare data.^{1,2} Variability in the collection, collation, and processing of data; differences in study design and analytic methods; and the inherent intricacies of defining and measuring health itself contribute to complexity that cannot be fully resolved or explained in a summary report. Accordingly, this report is meant to be an adjunct to, rather than a substitute for, other reports related to Service member health, deployability, readiness, and total force fitness. Specific limitations include those associated with using electronic medical records for surveillance data (e.g., missing data, underrepresentation of conditions that do not come to the attention of the healthcare delivery system, miscoding) and failure to account for potentially important covariates such as age and sex when comparing Service populations.

This report is meant to evolve over time. It is anticipated that specific measures will change over time to account for data-related limitations and changing paradigms related to public health surveillance. Input related to improving this report is critical and welcomed.

HIGHLIGHTS

- There were 264 acute and 1,130 cumulative traumatic injuries per 1,000 active component (AC) Service members in 2019. Sprains and strains were the most common acute injuries, and the lower extremities were the most commonly affected body region. The rate of acute injuries decreased by 11.1% between 2016 and 2019, and the rate of cumulative traumatic injuries increased 2.9% between 2016 and 2019.
- A total of 2,716 AC Service members (0.2%) suffered from heat exhaustion in 2019, and 508 (0.04%) suffered from heat stroke. The percentage of AC Service members affected increased slightly from 2015 to 2019. Overall, heat illnesses were more common among younger Service members and those in the Marine Corps.
- In 2019, 8.4% of AC Service members had a behavioral health (BH) disorder. The prevalence of BH disorders remained stable between 2015 and 2019. Adjustment disorder was the most common BH disorder among both male and female AC Service members.
- Among AC Service members who completed a Periodic Health Assessment in 2019, 13.3% screened positive for hazardous drinking. Both male and female Service members under the age of 25 were more likely to screen positive compared to those aged 25 years or older.
- Approximately 28 per 1,000 AC Service members were diagnosed with or tested positive for a sexually transmitted infection (STI) (chlamydia, gonorrhea, or trichomoniasis) in 2019. Chlamydia was the most common STI (23.5 per 1,000), followed by gonorrhea (3.5 per 1,000), and trichomoniasis (0.7 per 1,000). The incidence of chlamydia and gonorrhea increased between 2015 and 2019. Younger Service members and females had higher rates compared to their respective counterparts.
- In 2019, 12.3% of AC Service members had a sleep disorder. The prevalence of sleep disorders remained stable between 2015 and 2019. The most common sleep disorder among male Service members was sleep apnea; the most common sleep disorder among female Service members was insomnia.
- The overall prevalence of obesity was 17.9% among AC Service members in 2019. The overall prevalence of obesity has increased steadily since 2015. Overall obesity prevalence was higher among males (18.8%) compared to females (14.3%) and in older compared to younger Service members.
- On average, 23 per 1,000 AC Service members were diagnosed with acute respiratory infections each month during 2019, with rates highest in January (31.2 per 1,000) and lowest in June (16.5 per 1,000). On average, females had higher monthly rates of acute respiratory infections and respiratory symptoms compared to males. Those in the youngest age group had the highest rates of acute respiratory infections, but those in the oldest age group had the highest rates of respiratory symptoms.

Acute and Cumulative Traumatic Injury

Injuries consistently rank among the top healthcare burdens in the DoD. In this report, non-battle injury was evaluated using two broad categories: acute injury (which includes musculoskeletal and other types of injury) and cumulative traumatic injury (musculoskeletal injury resulting from repeated microtrauma).

Acute injuries and *cumulative traumatic musculoskeletal injuries* were identified in inpatient and outpatient medical records using the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) injury codes described in the Army Public Health Center’s taxonomy of injuries for public health monitoring and reporting.³ The taxonomy defines body regions and nature-of-injury groups (i.e., the type of anatomic or physiologic disruption that occurred to the body region, such as a fracture, dislocation, open wound, burn, internal organ injury, or poisoning).

Both acute and cumulative traumatic injuries were described by body region and nature-of-injury groups (e.g., fracture, open wound, sprain, musculoskeletal tissue damage, etc).

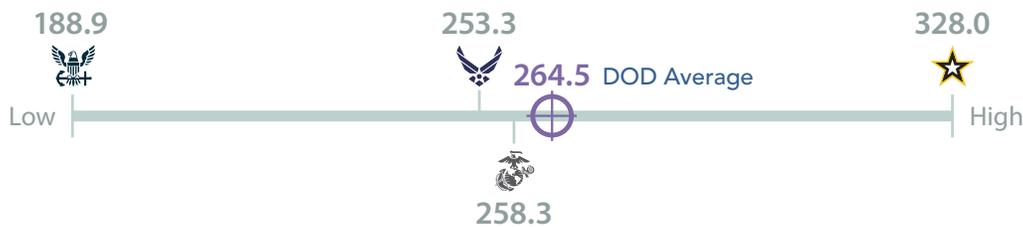
In 2019, there were 347,484 acute and 1,484,449 cumulative traumatic injuries among AC Service members, with rates of 264.5 per 1,000 persons and 1,129.8 per 1,000 persons, respectively. Injury rates were higher in females as compared to males in all Services and in both injury categories. Acute and

cumulative traumatic injury rates were highest in the oldest age group for both males and females. Cumulative traumatic injury rates were markedly higher among older Service members, especially males, where the rate among males aged 45 years or older was more than triple that of males less than 25 years.

During 2019, 3,509 (1.3%) of the acute injury cases were hospitalized, and 1,968 (0.3%) of the cumulative traumatic cases were hospitalized. These hospitalizations resulted in 15,889 total bed days for acute injury and 6,375 total bed days for cumulative traumatic injury.

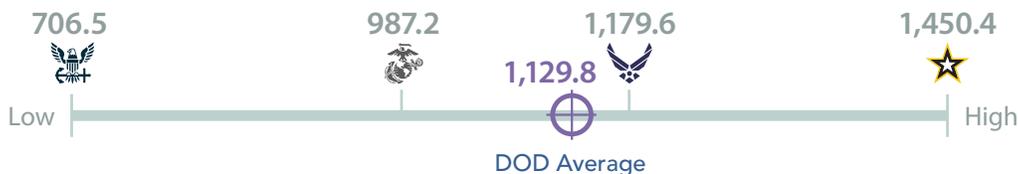
Among AC Service members who suffered **acute injuries**, the top five body regions and the top five nature-of-injury categories were similar for all Services and accounted for 96.7% and 80.9% of injuries, respectively. **The rate of acute injuries decreased by 11.1% between 2016 and 2019.**

Among AC Service members who suffered **cumulative traumatic injuries**, the most commonly injured body regions were the trunk (41.6%) and lower extremities (36.6%). Musculoskeletal tissue damage (including cervical disc disorders, pain in joints, tendonitis, bursitis, chondromalacia, etc.) was the most common nature-of-injury category, accounting for 89.1% of all cumulative traumatic injuries. **The rate of cumulative traumatic injuries increased slightly from 2016 through 2019, for an increase of 2.9%**



Overall, there were 264.5 acute injuries per 1,000 AC Service members in 2019.

Rates by service ranged from 189 to 328 per 1,000 AC Service members.



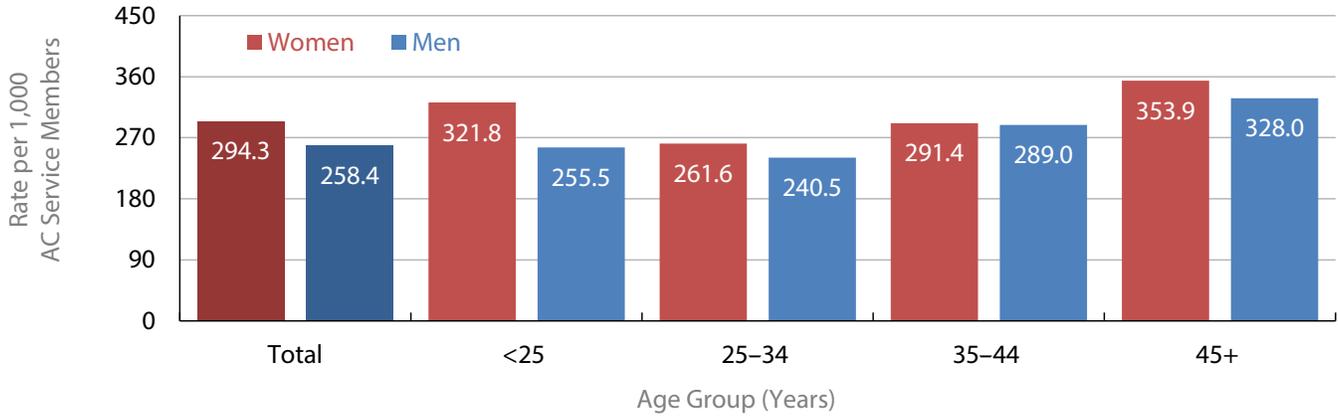
Overall, there were 1,129.8 cumulative traumatic injuries per 1,000 AC Service members in 2019.

Rates by service ranged from 707 to 1,450 per 1,000 AC Service members.



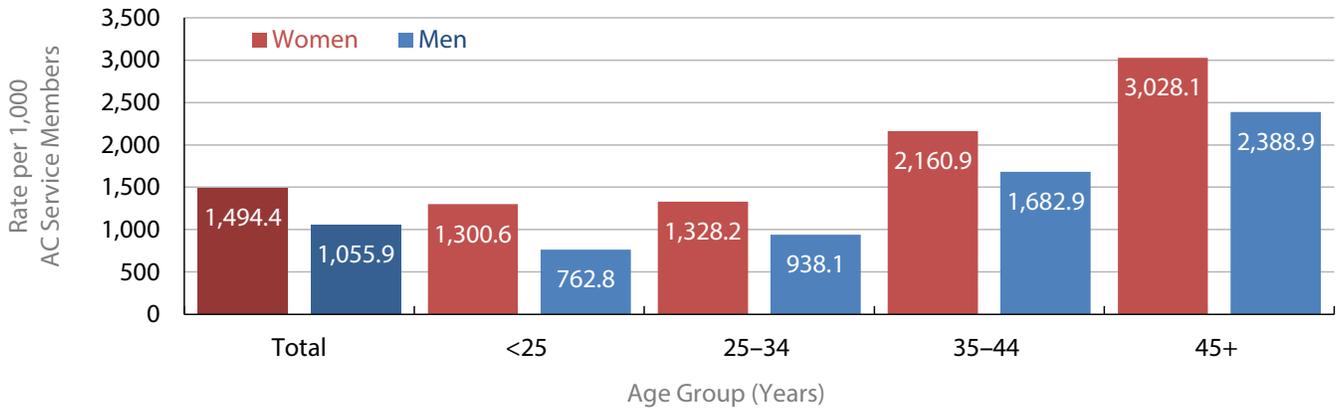
Incidence of Acute Injury by Sex and Age Group, AC Service Members, 2019

Overall, acute injury rates were higher for females (294.3 per 1,000) compared to males (258.4 per 1,000). Among both males and females, acute injury rates were highest in the oldest age group (45+ years).



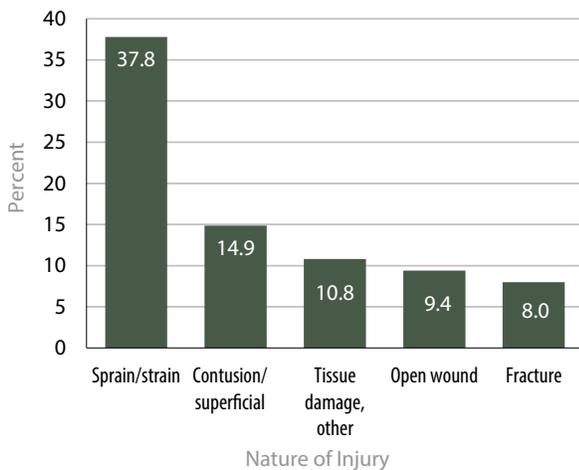
Incidence of Cumulative Traumatic Injury by Sex and Age Group, AC Service Members, 2019

Cumulative traumatic injury rates were higher for older compared to younger Service members and higher for females (1,494.4 per 1,000) compared to males (1,055.9 per 1,000).



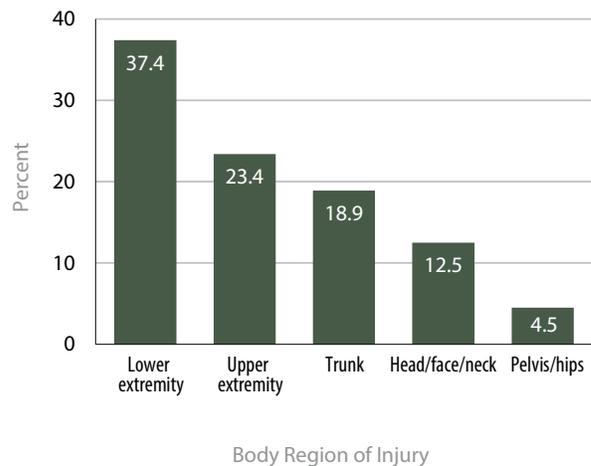
Nature of Acute Injury, Top 5 Categories, AC Service Members, 2019

Sprains and strains was the most common nature-of-injury category, accounting for 37.8% of all incident acute injuries.



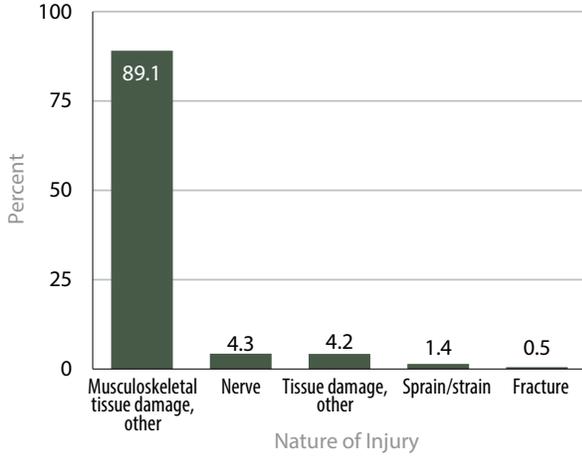
Body Region of Acute Injury, Top 5 Categories, AC Service Members, 2019

Lower extremity was the most common region affected by acute injury, accounting for 37.4% of all incident acute injuries.



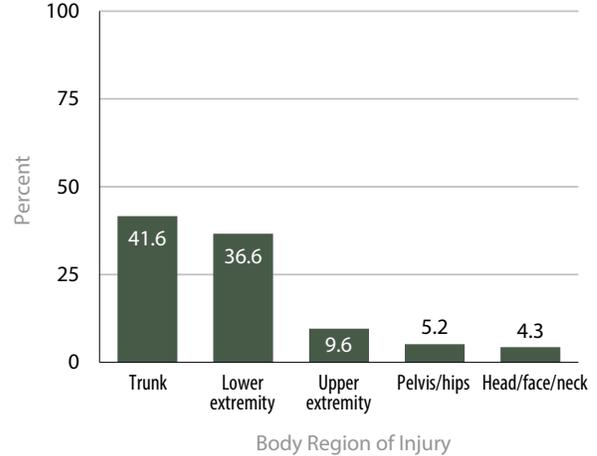
Nature of Cumulative Traumatic Injury, AC Service Members, 2019

Musculoskeletal tissue damage, other was the most common nature-of-injury category, accounting for 89.1% of all incident cumulative traumatic injuries.



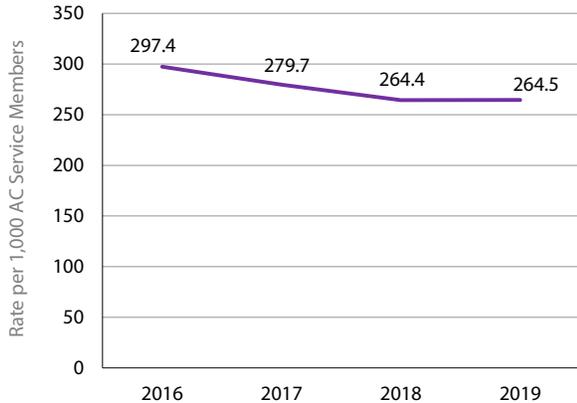
Body Region of Cumulative Traumatic Injury, Top 5 Categories, AC Service Members, 2019

The trunk (41.6%) and lower extremity (36.6%) were the most common regions affected by cumulative traumatic injury.



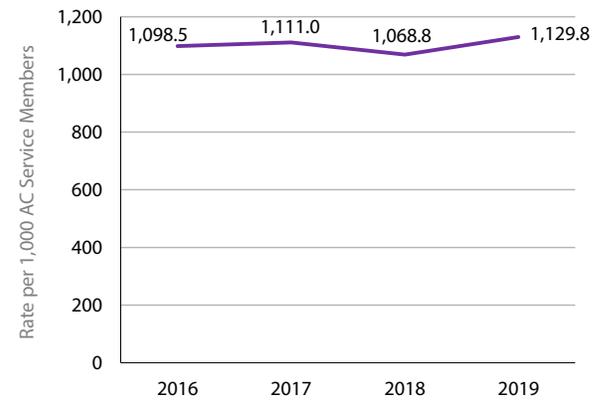
Incidence of Acute Injury, AC Service Members, 2016–2019

The rate of acute injuries decreased from 297.4 per 1,000 to 264.5 per 1,000 (11.1%) between 2016 and 2019.



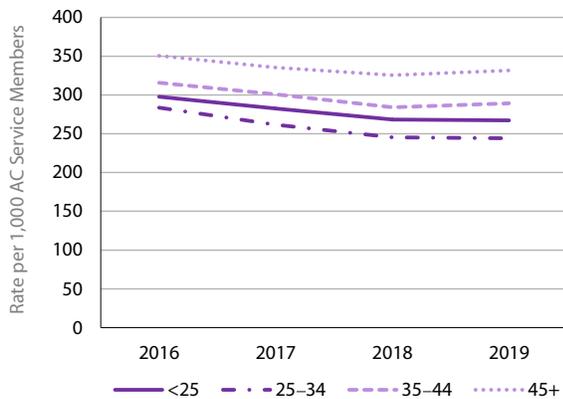
Incidence of Cumulative Traumatic Injury, AC Service Members, 2016–2019

The rate of cumulative traumatic injuries increased from 1098.5 per 1,000 to 1129.8 per 1,000 (2.9%) between 2016 and 2019.



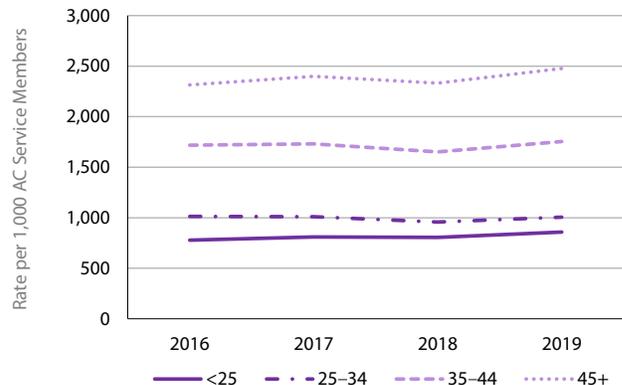
Incidence of Acute Injury by Age Group, AC Service Members, 2016–2019

The rate of acute injuries decreased among Service members in all age groups between 2016 and 2019.



Incidence of Cumulative Traumatic Injury by Age Group, AC Service Members, 2016–2019

The rate of cumulative traumatic injuries remained relatively stable among Service members in all age groups between 2016 and 2019, except for a slight increase among those in the youngest and oldest age groups.



Heat Illness

Heat illness refers to a group of disorders that occur when the elevation of core body temperature surpasses the compensatory limits of thermoregulation. The Armed Forces Health Surveillance Division (AFHSD) routinely perform surveillance for the most common of these disorders, namely heat exhaustion and heat stroke. Heat exhaustion is caused by the inability to maintain adequate cardiac output because of strenuous physical exertion and environmental heat stress and is often accompanied by acute dehydration. Heat stroke is a debilitating illness characterized clinically by severe hyperthermia (i.e., a core body temperature of 104°F/40°C or greater), profound central nervous system dysfunction (e.g., delirium, seizures, or coma), and additional organ and tissue damage. The onset of heat stroke requires aggressive clinical treatments including rapid cooling and supportive therapies such as fluid resuscitation to stabilize organ function and prevent multiorgan system failure, which is the ultimate cause of mortality due to heat stroke.

This summary identified cases of heat illness among AC Service members during the period from 2015 through 2019.

In 2019, A total of 2,176 AC Service members (0.2%) were diagnosed with heat exhaustion, and 508 (0.04%) were diagnosed with heat stroke. Overall, heat illnesses were more common among Service members under 25 years old, who accounted for 70% of all cases. Similar percentages of males (0.21%) and females (0.19%) were affected by heat illnesses. **The percentages of AC Service members affected by heat exhaustion rose slightly during the first four years of the period but leveled off in 2019.**

During 2019, 112 (22.1%) heat stroke cases were hospitalized and 32 (1.5%) heat exhaustion cases were hospitalized. These hospitalizations resulted in 321 total bed days for heat stroke and 70 total bed days for heat exhaustion.

Rates of heat illness have previously been found to be highest among recruit trainees and those serving in combat specific occupational fields.⁴ Efforts at preventing heat illnesses need to focus especially on these groups of Service members, who may engage in higher levels of demanding physical exertion during warm weather. In particular, trainees at basic training installations may not be acclimated to the heat or may not be physically fit.

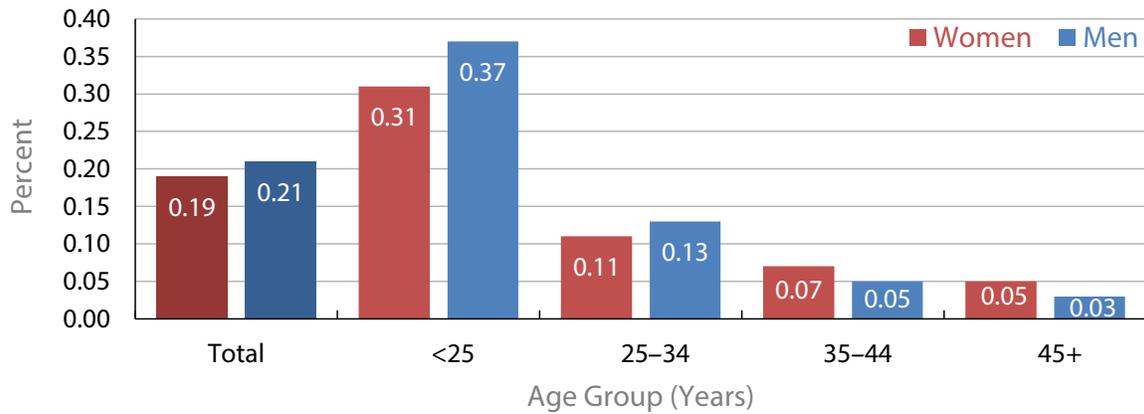


Overall, 0.2% of AC Service members had a heat illness in 2019.
Rates ranged from 0.05% to 0.4% across Services.



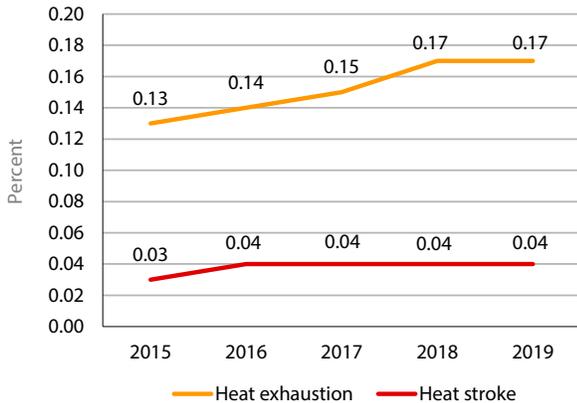
Incidence of Heat Illness by Sex and Age Group, AC Service Members, 2019

Younger Service members had the highest incidence of heat illness during the period from 2015 through 2019.



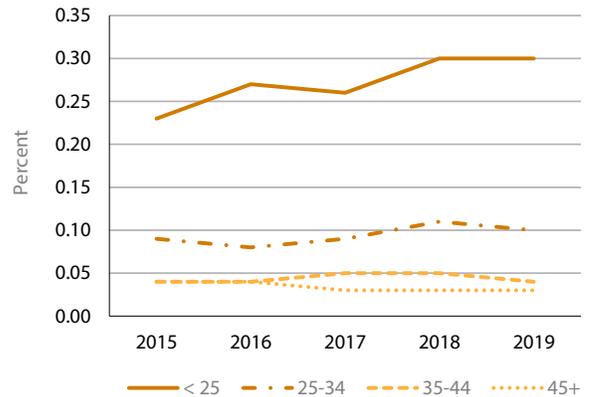
Incidence of Heat Stroke and Heat Exhaustion, AC Service Members, 2015–2019

The percentage of heat illnesses increased from 0.03% to 0.04% between 2015 and 2019. The percentages of AC Service members affected by heat exhaustion rose slightly during the first four years of the period but leveled off in 2019.



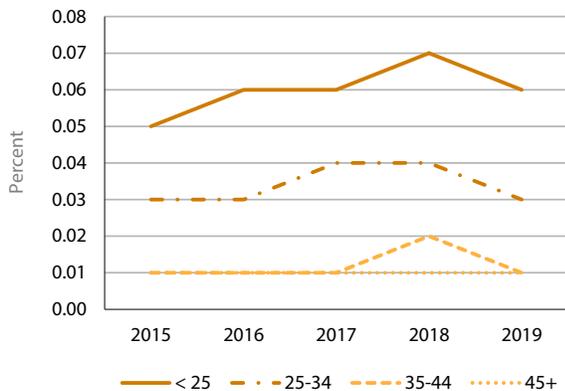
Incidence of Heat Exhaustion by Age Group, AC Service Members, 2015–2019

The percentage of Service members under 25 years old who experienced heat exhaustion increased between 2015 and 2019.



Incidence of Heat Stroke by Age Group, AC Service Members, 2015–2019

The percentage of Service members under 25 years old who experienced heat stroke increased between 2015 and 2019.



Behavioral Health

Like injury, behavioral health (BH) conditions are a leading cause of morbidity among AC Service members, accounting for 1.9 million (16.2%) outpatient encounters in 2019.⁵

To determine the proportion of AC Service members (including those who were deployed) with a BH diagnosis during a given 12-month period, the annual prevalence of BH conditions was calculated. A Service member was identified as having a BH disorder if they had at least two inpatient, outpatient, or in-theater encounters for a BH condition of any type within 365 days with at least one of the diagnoses occurring during 2019.⁶

Prevalence estimates of specific BH conditions (adjustment disorders, alcohol-related disorders, substance-related disorders, anxiety disorders, bipolar disorders, depressive disorders, psychoses, and posttraumatic stress disorder (PTSD) during 2019 were also calculated.⁷ To be considered a case, two encounters for the same BH condition within a 365-day period were required.

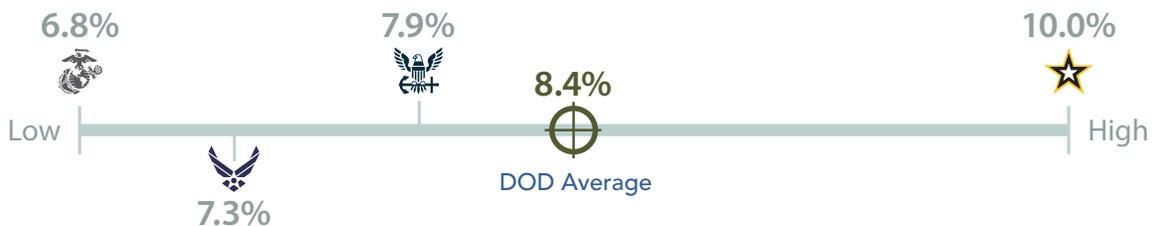
To determine the proportion of AC Service members that had ever been diagnosed with a BH condition, the “lifetime” prevalence of BH disorders was calculated. Service members on active duty during December 2019 were used for this analysis and were considered to have a lifetime history of a BH condition if they had two BH disorder diagnoses within 365 days at any time between 2002 and 2019.

Overall, 8.4% of AC Service members were diagnosed with a BH disorder in 2019. The annual prevalence of BH disorders remained relatively stable during 2015–2019, fluctuating between 8.1% and 8.4%. Women were more likely to be diagnosed with a BH disorder (13.3%) when compared to men (7.4%). Service members in the youngest age category (less than 25 years) had the highest prevalence of BH disorders among both males and females.

Slightly more than one-eighth (13.0%) of service members with any BH disorder were hospitalized, resulting in a total of 171,254 bed days in 2019. Cases of psychoses had the highest hospitalization rate (26.2%), followed by bipolar disorders (20.9%). However, cases of depressive disorders had the highest total number of bed days (52,784), followed by alcohol-related disorders (38,907).

Among both male and female AC Service members, adjustment disorder was the leading BH diagnosis in 2019 followed by depressive disorder and anxiety disorder.

Among AC Service members on active duty during December 2019, 25.4% of women and 15.7% of men (17.3% overall) had a history (lifetime prevalence) of a BH disorder. The lifetime prevalence of BH disorders ranged from 10.5% to 20.6% across Services.

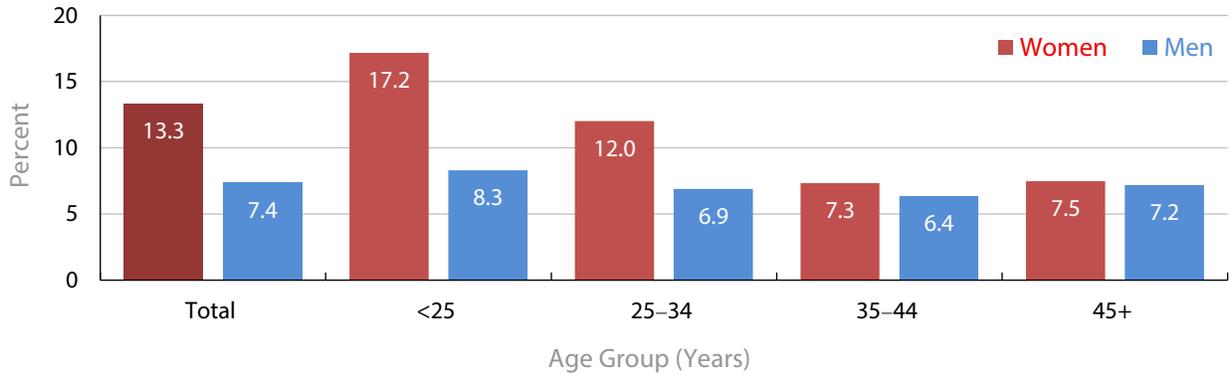


Overall, 8.4% of AC Service members had a BH disorder in 2019.
Rates ranged from 6.8% to 10.0% across Services.



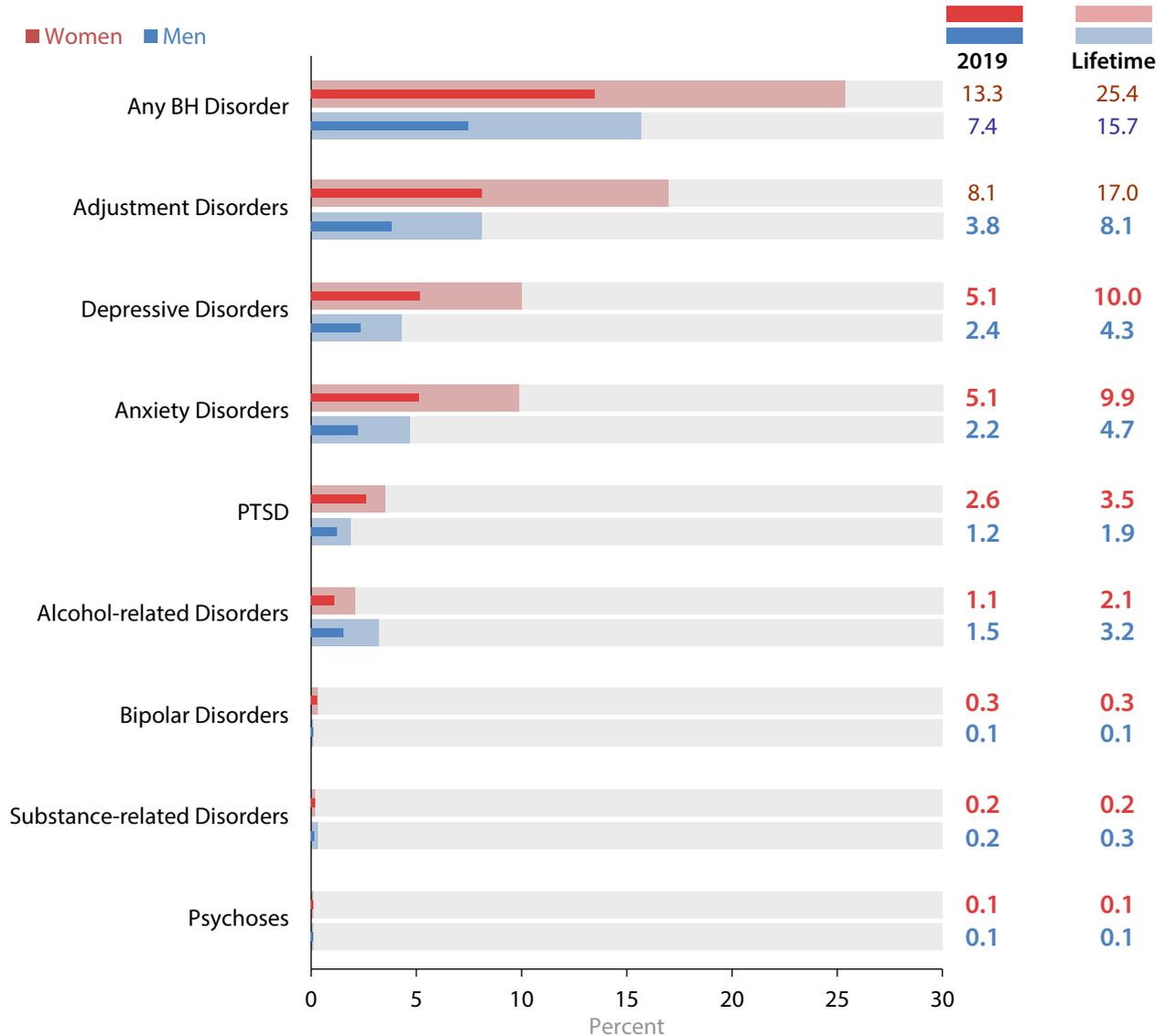
Prevalence of BH Disorders by Sex and Age Group, AC Service Members, 2019

Females were more likely to be diagnosed with a BH disorder compared to males, and those in the youngest age category were more likely to be diagnosed compared to older Service members.



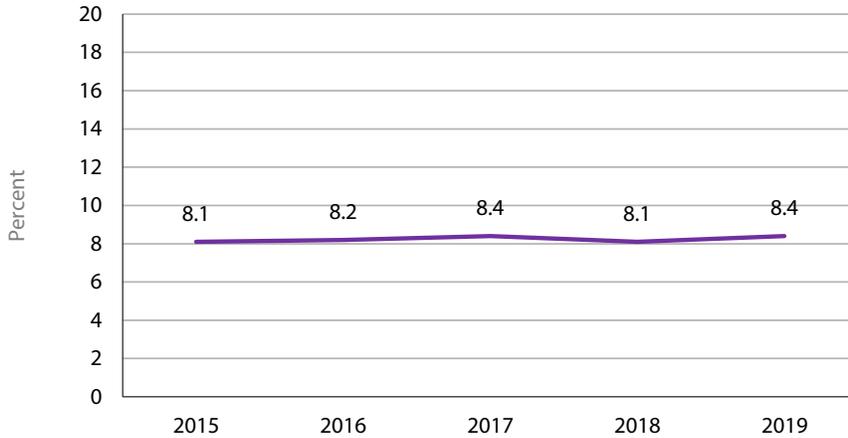
Annual and Lifetime Prevalence of BH Disorders by Sex and Condition, AC Service Members, 2019

Overall, 17.3% of Service members (25.4% of women and 15.7% of men) received a diagnosis of a BH disorder between 2002 and 2019. The percentage was higher for females compared to males for most BH disorders.



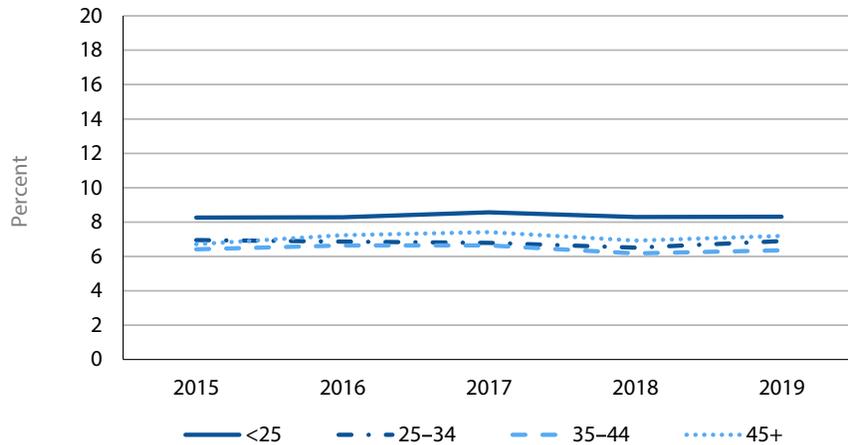
Prevalence of BH Disorders, AC Service Members, 2015–2019

The prevalence of BH disorders remained relatively stable between 2015 and 2019, with fluctuation from a low of 8.1% in 2015 and 2018 to a high of 8.4% in 2017 and 2019.



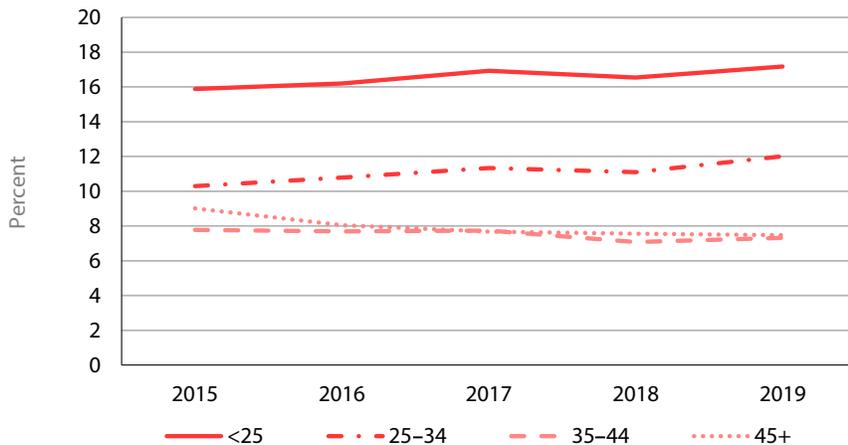
Prevalence of BH Disorders by Age Group, Male AC Service Members, 2015–2019

The prevalence of BH disorders remained relatively stable between 2015 and 2019 among males in all age groups.



Prevalence of BH Disorders by Age Group, Female AC Service Members, 2015–2019

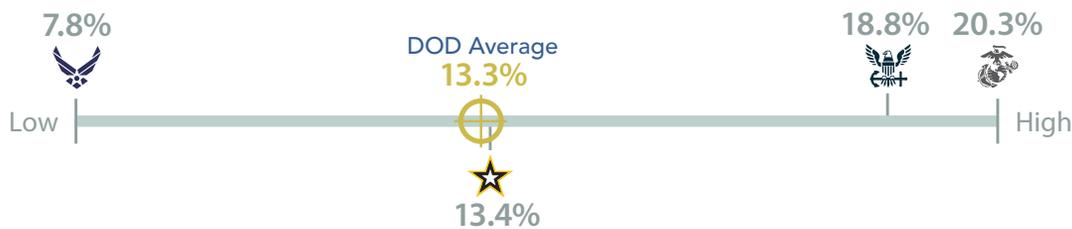
The prevalence of BH disorders increased slightly between 2015 and 2019 among females aged <25 years and 25–34 years, remained relatively stable for females aged 35–44 years, and decreased for those 45 years of age or older.



Hazardous Drinking

Excessive alcohol use is a threat to the health of military members and to military readiness. Screening for alcohol misuse on a periodic basis provides an opportunity for early identification of hazardous drinking behavior and for referral for further assessment and/or treatment, if needed. Screening for alcohol misuse is implemented in the Periodic Health Assessment (PHA) through the use of a three-item tool, the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C).⁸ The AUDIT-C questions ask about the frequency and amount of alcohol consumption and their combined score has been validated as a reliable scale for detecting hazardous drinking behavior.⁸ The overall prevalence of positive AUDIT-C screens among AC Service members who completed a PHA in 2019 are reported here.

In 2019, a total of 116,234 (13.3%) AC Service members screened positive on the AUDIT-C. This is compared to 19,109 (1.5%) AC Service members who were diagnosed with an alcohol-related disorder in 2019, of whom 11.8% were hospitalized, resulting in a total of 38,907 bed days. Proportions were similar for males and females overall (13.3% and 13.2%, respectively). **Both male and female Service members under the age of 25 had a higher proportion of positive AUDIT-C screens compared to their counterparts aged 25 years or older.** A greater percentage of male Service members screened positive on the AUDIT-C compared to similarly aged females in every age group except for those aged 25–34 years (12.2% and 13.0%, respectively).

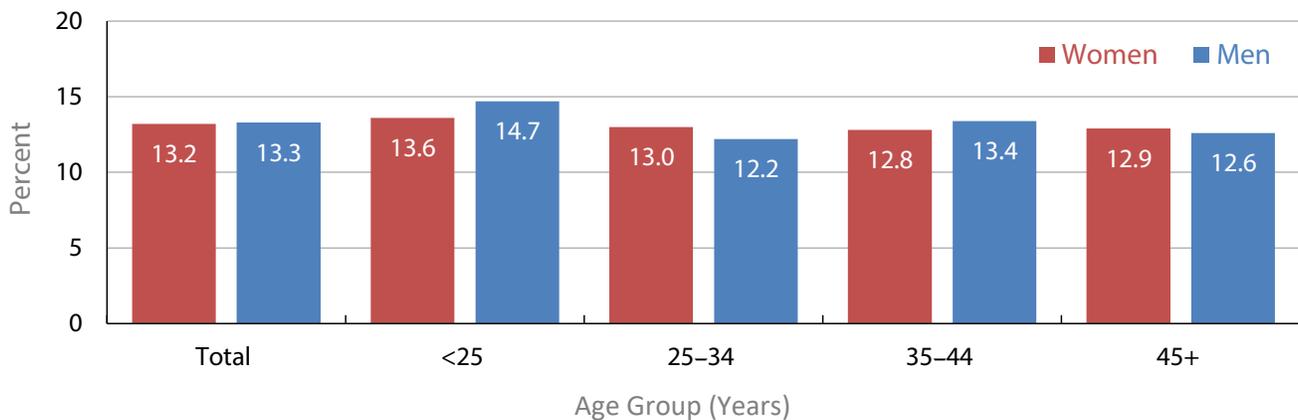


Overall, 13.3% of AC Service members had a positive AUDIT-C screen in 2019.
Rates ranged from 7.8% to 20.3% across Services.



Prevalence of Positive AUDIT-C Screens by Sex and Age Group, AC Service Members, 2019

Rates of positive AUDIT-C screens were slightly higher among males (13.3) than females (13.2). The prevalence of positive AUDIT-C screens was higher in Service members less than 25 years of age as compared to their counterparts aged 25 years or older.



Sexually Transmitted Infections

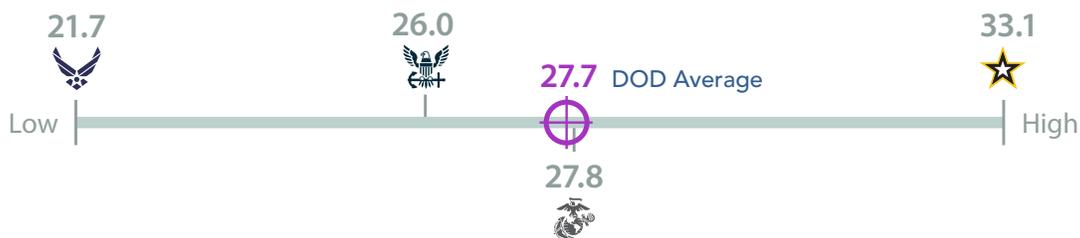
Sexually transmitted infections (STIs) are relevant to Service members because of their relatively high incidence, adverse impact on individual readiness, and potential for serious medical sequelae if left untreated.⁹ Two of the most common bacterial STIs are caused by *Chlamydia trachomatis* (chlamydia) and *Neisseria gonorrhoeae* (gonorrhea). Trichomoniasis, caused by the parasite *Trichomonas vaginalis*, is another common STI.

The overall incidence and time trends related to these three STIs (chlamydia, gonorrhea, and trichomoniasis) among AC Service members in 2019 are reported here.

In 2019, 27.7 per 1,000 AC Service members were diagnosed with or tested positive for one of the 3 STIs. Women had higher rates of STIs compared to men, particularly among the younger age groups. **Chlamydia was most common (23.5 per 1,000), followed by gonorrhea (3.5 per 1,000) and trichomoniasis (0.7 per 1,000).** Among both men and women,

STIs were most common in the youngest age groups. AC Service members less than 25 years of age were almost three times more likely to have an STI compared to those aged 25–34 years.

The annual incidence rates of chlamydia and gonorrhea among AC Service members increased during 2015–2019. This was primarily attributed to increases among those less than 25 years of age. However, rates of trichomoniasis decreased between 2015 and 2017 and remained steady between 2017 and 2019. Previous studies have demonstrated increases in the incidence rates of chlamydia and gonorrhea among AC Service members in the past 5 years,⁹ with consistently higher rates among women. Higher rates of most STIs among women compared to men can likely be attributed to implementation of the Services’ screening programs. Continued behavioral risk reduction interventions are needed to counter the increasing incidence of some STIs and maintain any decreases.



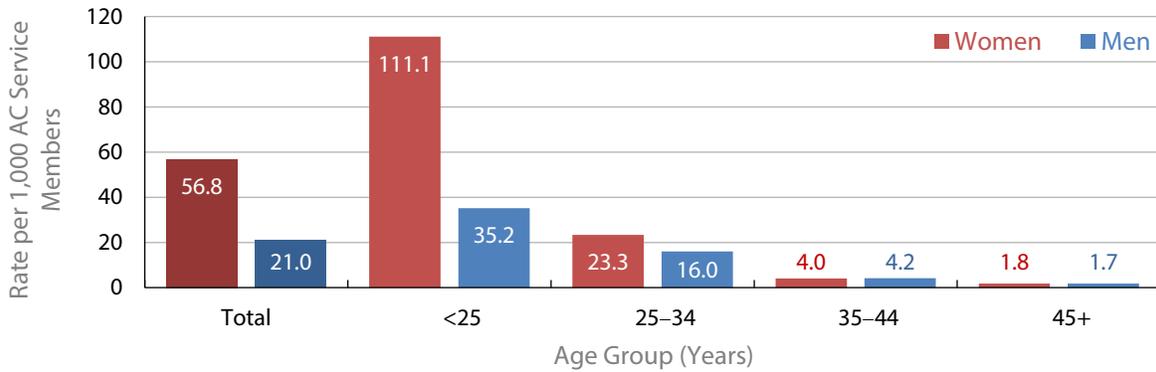
Overall, there were 27.7 cases of chlamydia, gonorrhea, or trichomoniasis per 1,000 AC Service members in 2019.

Rates ranged from 21.7 per 1,000 to 33.1 per 1,000 across Services.



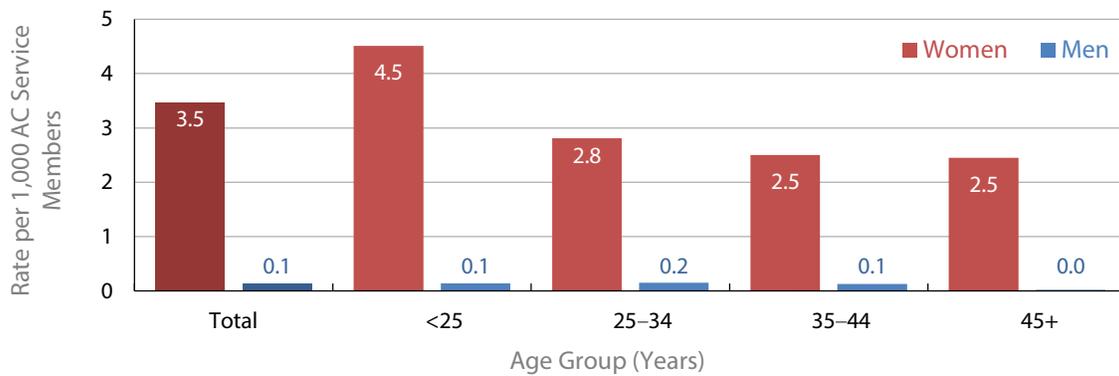
Incidence of Chlamydia and Gonorrhea by Sex and Age Group, AC Service Members, 2019

Women had higher rates of chlamydia and gonorrhea compared to men, particularly among those in the younger age groups.



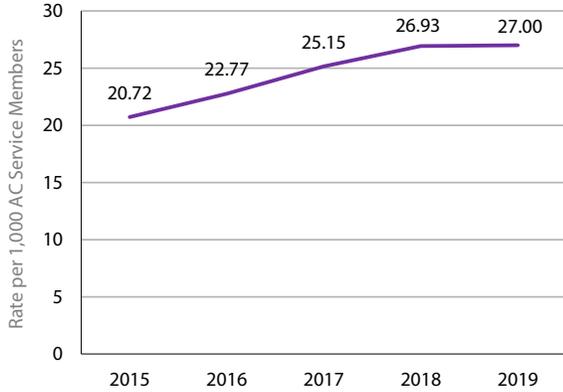
Incidence of Trichomoniasis by Sex and Age Group, AC Service Members, 2019

Overall, women had a higher rates of trichomoniasis compared to men.



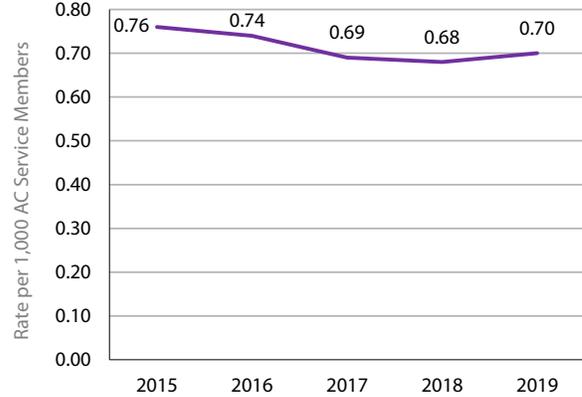
Incidence of Chlamydia and Gonorrhea, AC Service Members, 2015–2019

The incidence of chlamydia and gonorrhea increased from 2015 to 2018, and remained steady between 2018 and 2019.



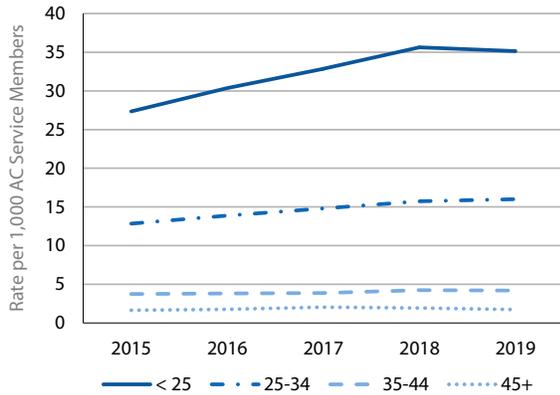
Incidence of Trichomoniasis, AC Service Members, 2015–2019

The incidence of trichomoniasis decreased between 2015 and 2017, and remained steady between 2017 and 2019.



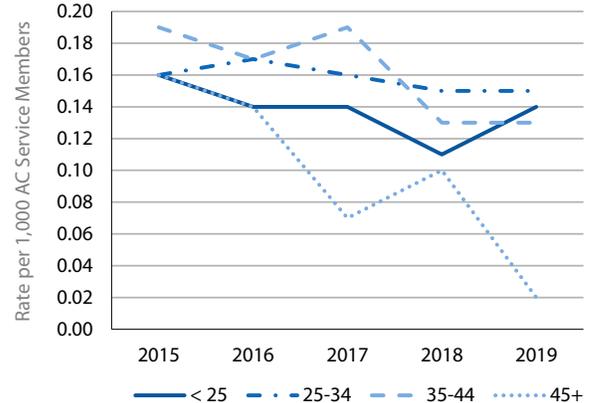
Incidence of Chlamydia and Gonorrhea by Age Group and Sex, AC Male Service Members, 2015–2019

The incidence of chlamydia and gonorrhea increased between 2015 and 2019 among service men in the youngest age groups.



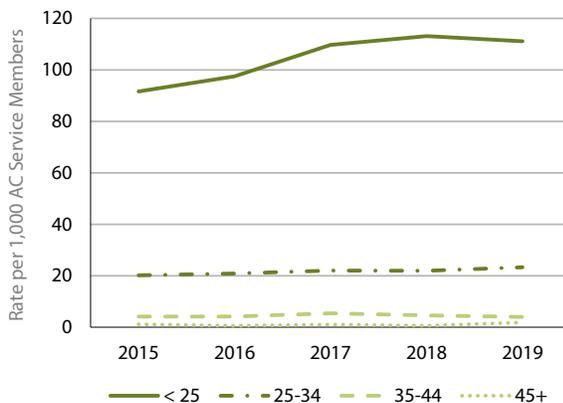
Incidence of Trichomoniasis by Age Group, AC Male Service Members, 2016–2019

The incidence of trichomoniasis decreased between 2015 and 2019 among male service members less than 25 years of age.



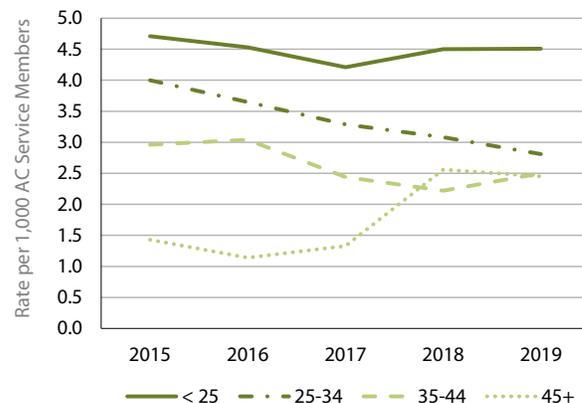
Incidence of Chlamydia and Gonorrhea by Age Group and Sex, AC Female Service Members, 2015–2019

The incidence of chlamydia and gonorrhea increased between 2015 and 2019 among service women less than 25 years of age.



Incidence of Trichomoniasis by Age Group, AC Female Service Members, 2016–2019

The incidence of trichomoniasis increased among service women aged 45 years or older between 2015 and 2019.



Sleep Disorders

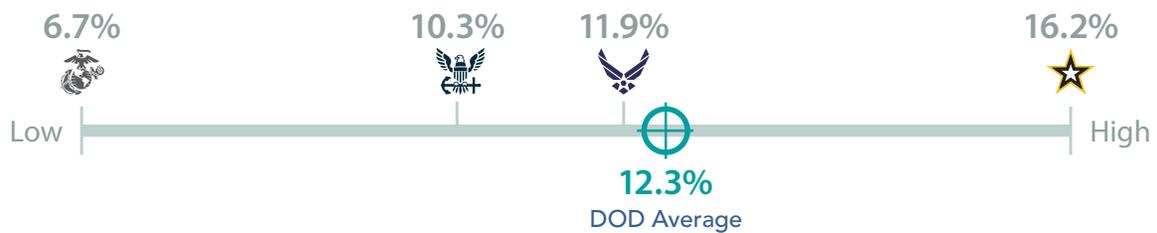
The American Academy of Sleep Medicine recommends at least 7 hours of sleep per night for adults aged 18–60 years.¹⁰ Lack of sleep can impair cognitive function, decreasing performance and increasing the risk for injury and accidents. Insufficient sleep is also associated with a number of chronic diseases including diabetes, heart disease, obesity, and depression.¹¹

The overall prevalence and time trends related to sleep disorders (including sleep apnea, insomnia, hypersomnia, circadian rhythm disorders, narcolepsy, parasomnia, and sleep-related movement disorders) among AC Service members in 2019 are reported here, along with the prevalence of the most commonly diagnosed sleep disorders.

In 2019, 12.3% of AC Service members were diagnosed with at least one sleep disorder. Proportions were similar for males and females (12.5% and 11.4%, respectively). **The most commonly diagnosed sleep disorders were sleep apnea and insomnia (6.9% and 4.7%, respectively).** Male Service members were

far more likely to be diagnosed with sleep apnea than females (7.6% and 3.3%, respectively), while a greater percentage of female Service members were diagnosed with insomnia compared to males (6.5% and 4.4%, respectively).

The prevalence of sleep disorders among AC Service members remained relatively stable during 2015–2019. However, the prevalence of sleep disorders among males and females in the 45 years or older age group increased from 41.9% in 2015 to 49.0% in 2019 and 32.6% in 2015 to 36.2% in 2019, respectively. Previous studies have demonstrated increases in the incidence rates of some conditions, including sleep disorders, when comparing rates during the early, middle, and last phases of a Service member’s career.¹² These increases were independent of age and thought to be due in part to increased reporting during separation and retirement physicals.¹² The impact of career phase was not evaluated here and may be important to consider in the future.



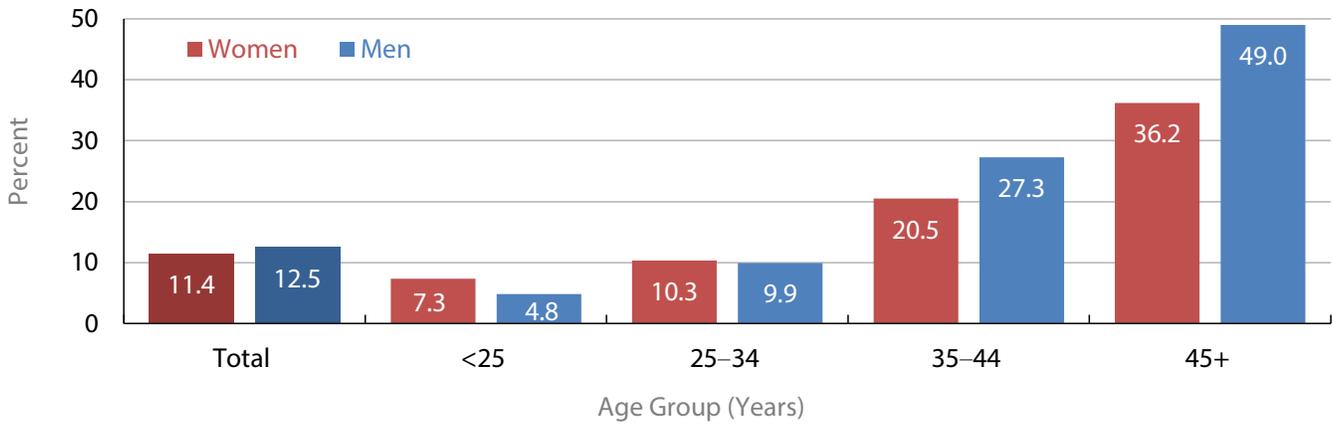
Overall, 12.3% of AC Service members had a sleep disorder in 2019.

Rates ranged from 6.7% to 16.2% across Services.



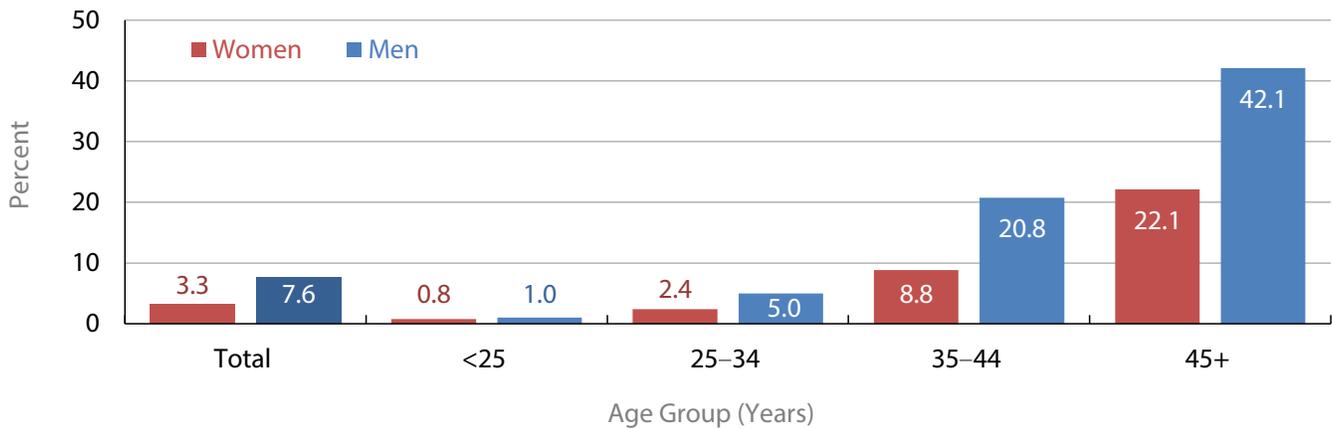
Prevalence of Sleep Disorders by Sex and Age Group, AC Service Members, 2019

The prevalence of sleep disorders was similar for males (12.5%) and females (11.4%) and increased with increasing age group for both sexes.



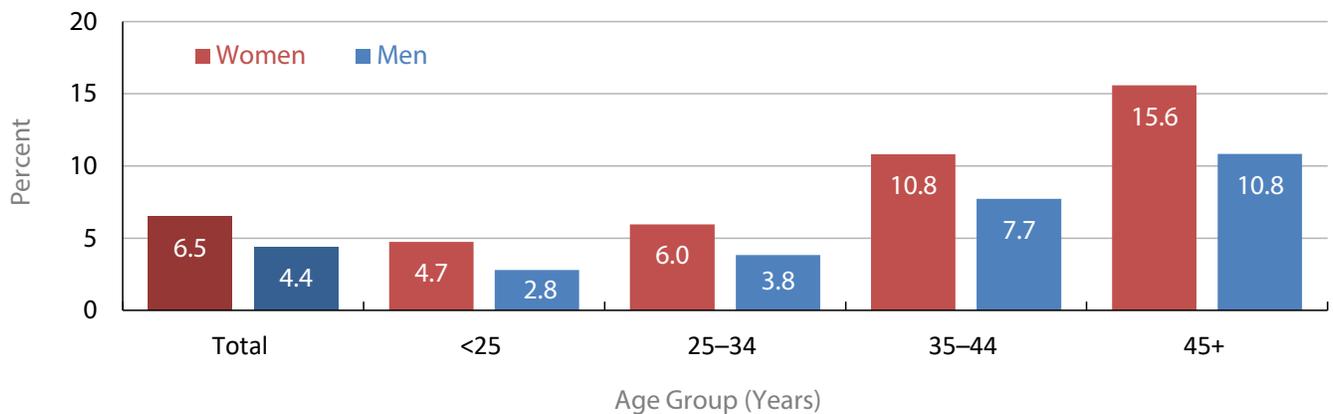
Prevalence of Sleep Apnea by Sex and Age Group, AC Service Members, 2019

The prevalence of sleep apnea was higher for males (7.6%) compared to females (3.3%), but the prevalence increased with increasing age group for both sexes.



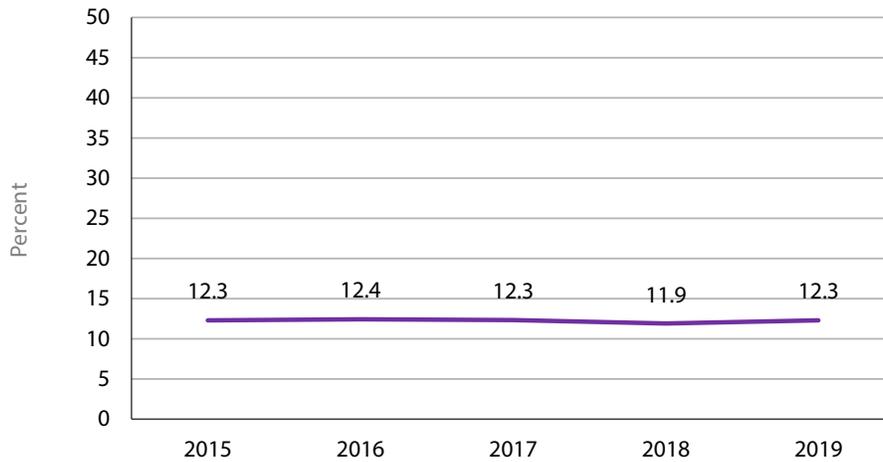
Prevalence of Insomnia by Sex and Age Group, AC Service Members, 2019

The prevalence of insomnia was higher for females (6.5%) compared to males (4.4%), and prevalence increased with increasing age group.



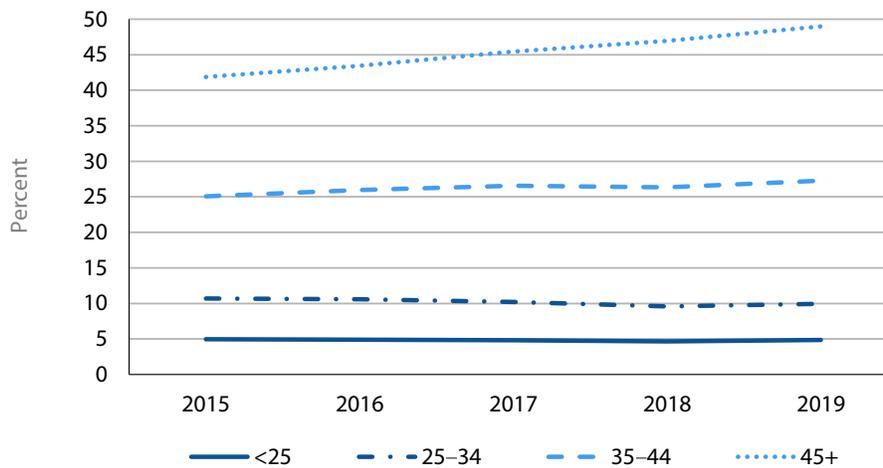
Prevalence of Sleep Disorders, AC Service Members, 2015–2019

The prevalence of sleep disorders remained relatively stable between 2015 and 2019.



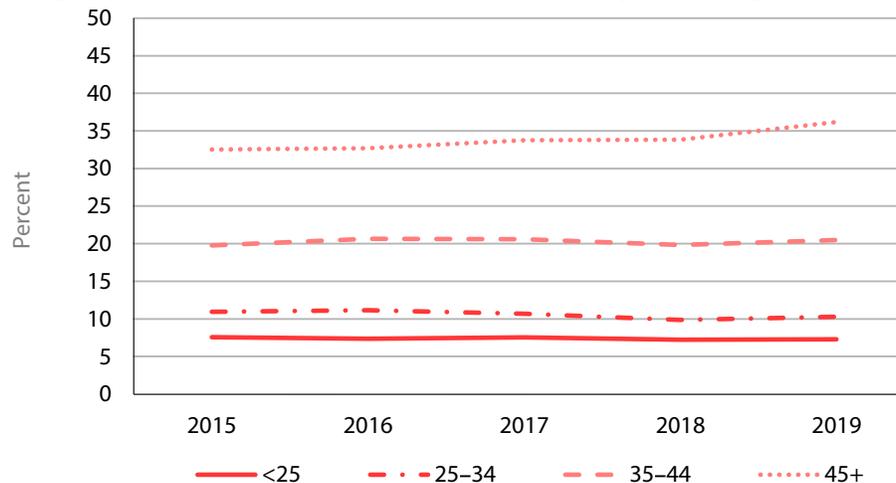
Prevalence of Sleep Disorders by Age Group, Male AC Service Members, 2015–2019

The prevalence of sleep disorders remained relatively stable among males ≤44 years between 2015 and 2019. The prevalence of sleep disorders among male Service members in the 45 years and older age group increased from 41.9% in 2015 to 49.0% in 2019.



Prevalence of Sleep Disorders by Age Group, Female AC Service Members, 2015–2019

The prevalence of sleep disorders remained relatively stable among female service members 44 years and younger between 2015 and 2019. The prevalence among female Service members in the 45 years and older age group rose slightly from 32.6% in 2015 to 36.2% in 2019.



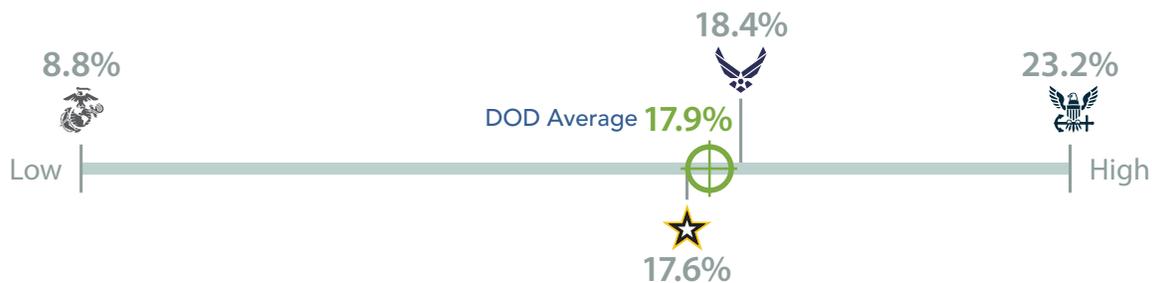
Obesity

Obesity negatively impacts physical performance and military readiness and is associated with long-term health problems such as hypertension, diabetes, coronary heart disease, stroke, cancer, and risk for all-cause mortality. Studies also suggest that healthcare utilization is higher among obese Service members than their normal-weight counterparts.¹³

The Clinical Data Repository (CDR) vital sign table within the MHS Data Repository (MDR) was used to identify all records for AC Service members with a height and weight measurement available on the same day; pregnant Service members were excluded. Body mass index

(BMI) was calculated utilizing the latest height and weight record in a given year. In accordance with the Centers for Disease Control and Prevention (CDC), a BMI ≥ 30 was considered obese.¹⁴

The overall prevalence of obesity among AC Service members was 17.9% in 2019. Obesity rates were higher among males (18.8%) compared to females (14.3%). The lowest prevalence of obesity was in Service members less than 25 years of age (10.2%) and the highest was among those in the 35–44 year age group (28.9%). **The overall prevalence of obesity has increased steadily since 2015.**



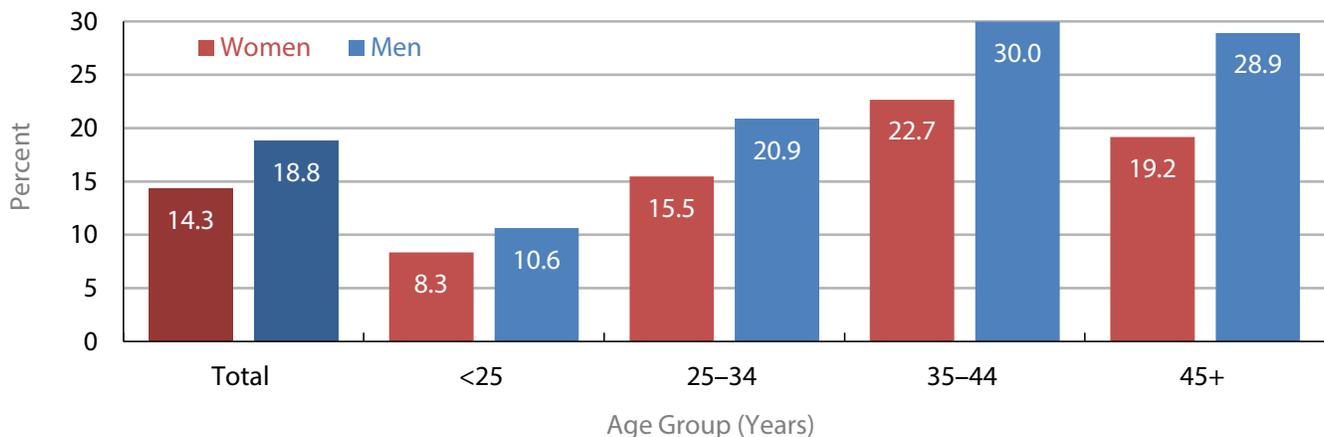
Overall, 17.9% of AC Service members were classified as obese in 2019.

Rates ranged from 8.8% to 23.2% across Services.



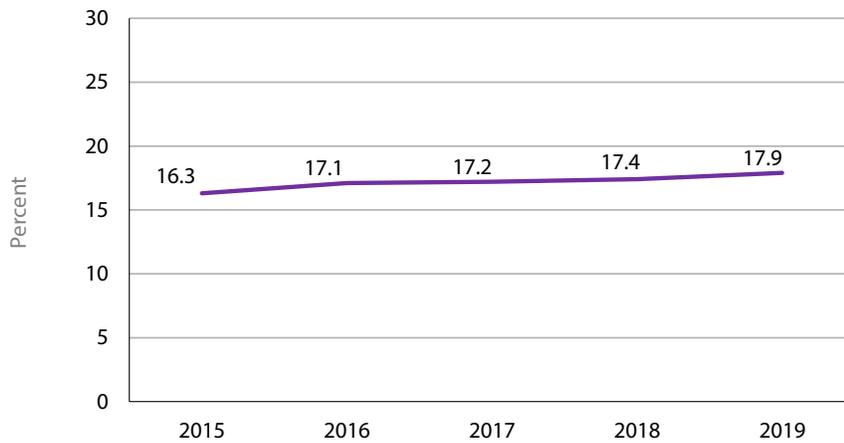
Prevalence of Obesity by Sex and Age Group, AC Service Members, 2019

Obesity rates were higher among males (18.8%) compared to females (14.3%). The prevalence of obesity increased with increasing age group through 35–40 years then decreased in the 45+ age group.



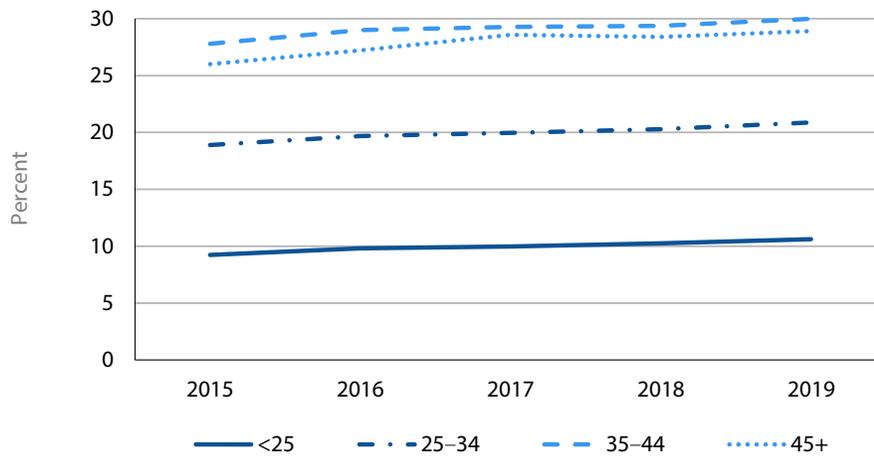
Prevalence of Obesity, AC Service Members, 2015–2019

The prevalence of obesity increased slightly from 16.3% in 2015 to 17.9% in 2019.



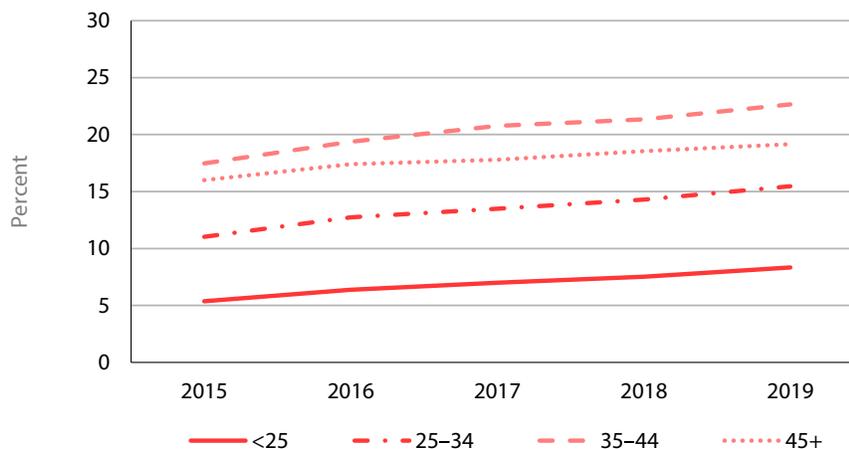
Prevalence of Obesity by Age Group, Male AC Service Members, 2015–2019

The prevalence of obesity increased slightly among males for all age groups between 2015 and 2019.



Prevalence of Obesity by Age Group, Female AC Service Members, 2014-2018

The prevalence of obesity increased slightly among females for all age groups between 2015 and 2019.



Acute Respiratory Illnesses

Outbreaks and epidemics of acute respiratory illnesses can have adverse effects on individual and military unit readiness. The Armed Forces have long recognized the special risks of respiratory illnesses among Service members who live in congregate settings, mix with Service members from other geographic regions, undergo the stresses of military training and operations, and travel to foreign countries. To counter the threat of such illnesses, the Armed Forces have for many years emphasized both preventive measures as well as continuous surveillance for respiratory infections. Vaccines are given to new Service members to prevent a variety of respiratory diseases caused by bacteria (diphtheria, pertussis, and meningococcal infections) and viruses (adenovirus, influenza, measles, mumps, rubella, and varicella). This report summarizes temporal trends of specific respiratory infections and syndromes as well as specific symptoms of respiratory illness. For this metric, data are also presented separately for recruits.

On average, 23.3 per 1,000 AC Service members were diagnosed with an acute respiratory infection each month during 2019, with rates highest in January (31.2 per 1,000) and lowest in June (16.5 per 1,000). Females had higher monthly rates of acute respiratory infections and respiratory symptoms compared to males. Those in the youngest age category (less than 25 years old) had the highest rates of acute respiratory infections, but those in the oldest age group had the highest rate of respiratory symptoms. **Compared to AC Service members overall, recruits had higher average monthly rates of acute respiratory infections (101.9 per 1,000) and respiratory symptoms (9.8 per 1,000).**

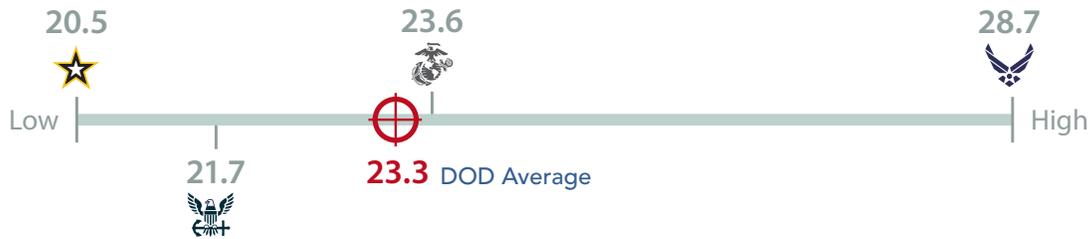
Rates of acute respiratory infections and respiratory symptoms remained relatively stable between 2015

and 2019; however, **there were noteworthy patterns of seasonal increases (in winter) and declines (in summer) for both AC Service members overall and for recruits.**

A total of 296,091 Service members had at least one acute respiratory infection diagnosis in 2019. Of these Service members, 1,139 (0.4%) were hospitalized, resulting in 3,755 total bed days.

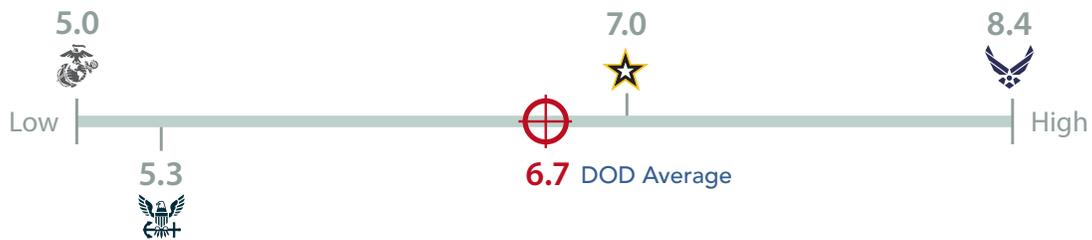
Rates among trainees were likely higher because of their relative youth, the spread of infections among trainees in congregate settings during basic training, strict requirements for sick trainees to receive medical care, and more thorough surveillance of trainees, including collection of specimens to identify etiologic pathogens. For both the trainees and AC service members, the rates of diagnoses of respiratory symptoms were considerably lower than the rates of specific acute respiratory illnesses. This observation indicates that healthcare providers recorded specific diagnoses much more often than nonspecific symptom diagnoses during encounters for acute respiratory illnesses.

The relatively steady incidence among recruit trainees contrasts with data from 1999–2011, a period during which the unavailability of the highly efficacious adenovirus vaccine allowed a doubling of the rates of acute respiratory disease among basic trainees.¹⁵ For 2020, it will be of interest to document the impact of the SARS-CoV-2 virus on the rates of acute respiratory illness among recruit trainees and among the AC as a whole. These surveillance data can be used to inform decisions about instituting additional preventive measures (e.g., isolation, quarantine, social distancing, protective clothing and masks, prophylactic antibiotics, and vaccine boosters).



On average, 23.3 per 1,000 AC Service member per month were diagnosed with acute respiratory infections in 2019.

Average monthly rates varied by Service and ranged from 21.7 to 28.7 per 1,000 AC Service members.



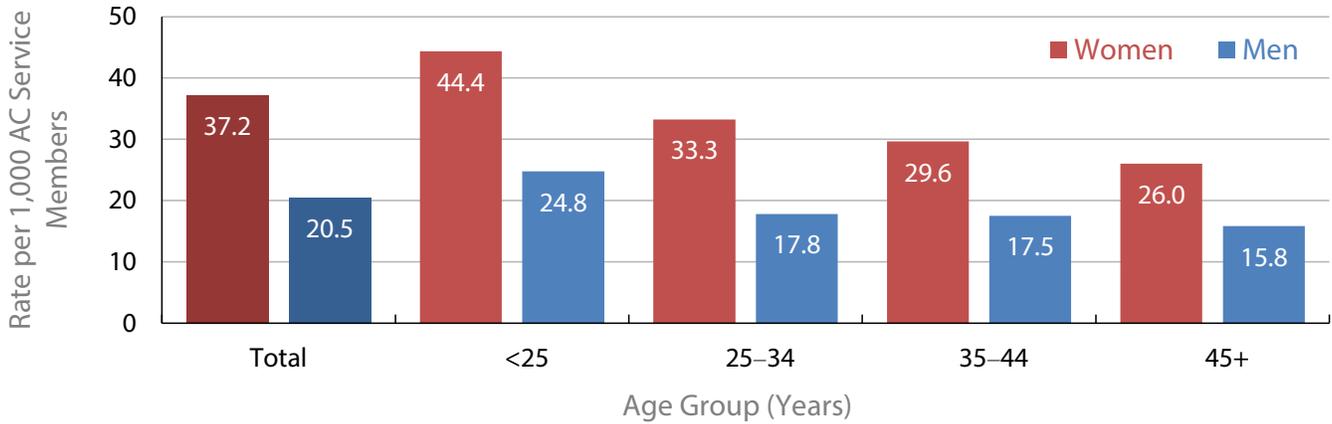
On average, 6.7 per 1,000 AC Service members per month were diagnosed with respiratory symptoms in 2019.

Average monthly rates varied by Service and ranged from 5.0 to 8.4 per 1,000 AC Service members.



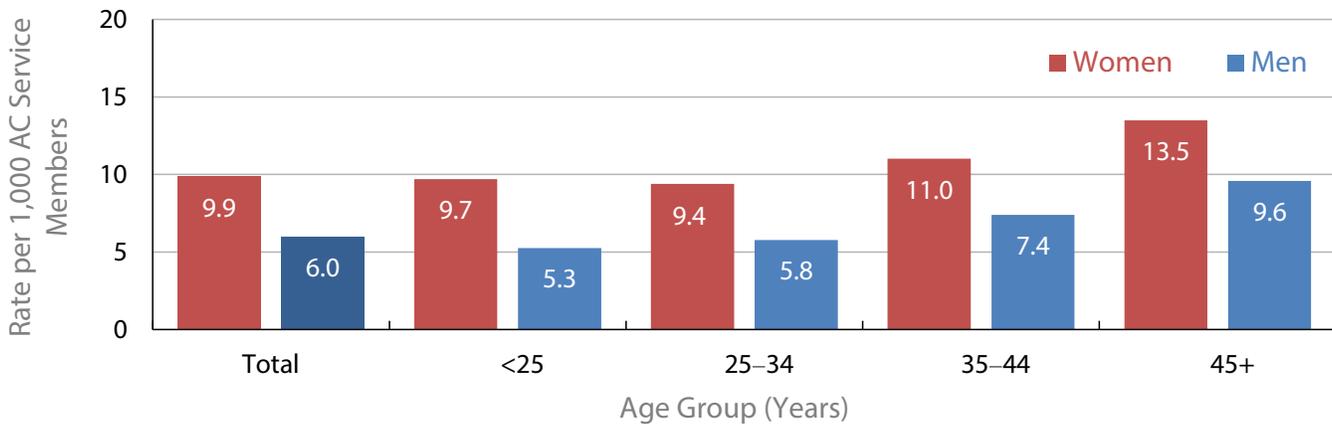
Average Monthly Incidence of Acute Respiratory Infections by Sex and Age Group, AC Service Members, 2019

Service members in the younger age groups had higher average monthly rates of acute respiratory infections than those in the older groups. Compared to males, females had higher rates within each age group.



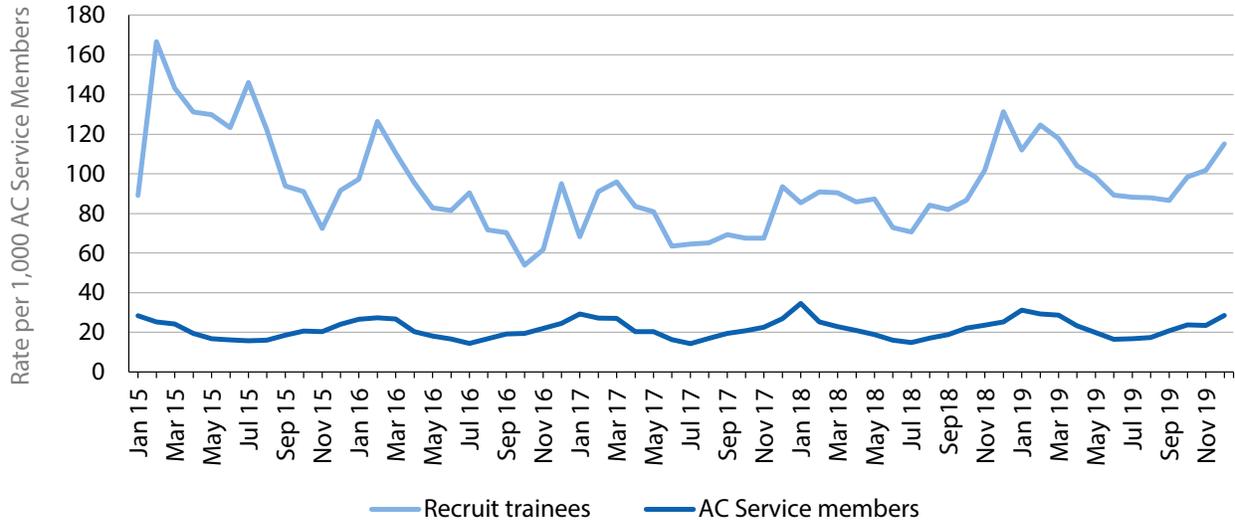
Average Monthly Incidence of Respiratory Symptoms by Sex and Age Group, AC Service Members, 2019

Females had higher rates of respiratory symptoms compared to males. Rates were highest among Service members aged 45 years or older.



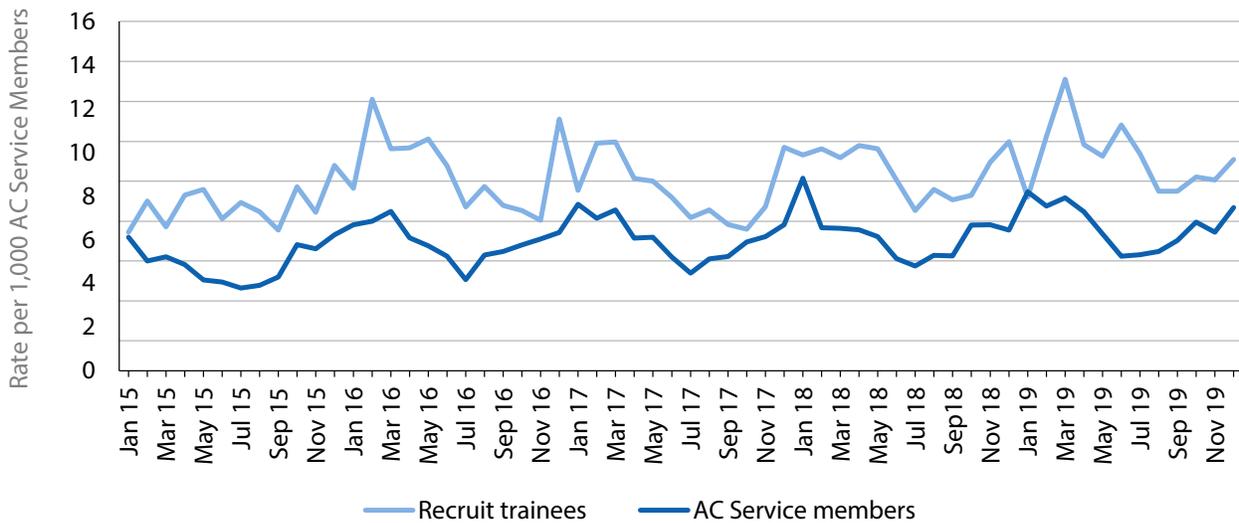
Incidence of Acute Respiratory Infections, AC Service Members and Recruit Trainees, 2015–2019

Rates of acute respiratory infections had seasonal increases in winter months and declines in summer months. The overall rate of respiratory infections remained relatively stable between 2015 and 2019. Recruits had consistently higher rates compared to AC Service members overall.



Incidence of Respiratory Symptoms, AC Service Members and Recruit Trainees, 2015–2019

Similar to acute respiratory infections, rates of respiratory symptoms displayed seasonal increases in winter months and declines in summer months, but the overall rate remained relatively stable between 2015 and 2019. Recruits had higher rates compared to AC Service members overall.



▶ Army



Service Profile (2019):*

Population: Approximately 469,000 Army Service members
77.1% under 35 years old, 15.2% female

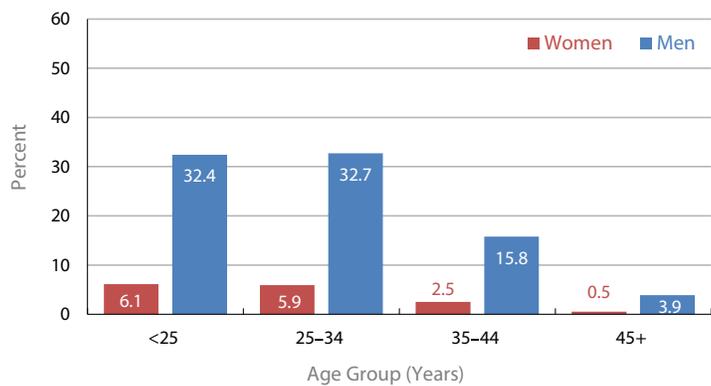
HEALTH INDEX MEASURES**

MEASURE	ARMY VALUE	DOD AVERAGE	DOD RANGE
Acute Injury (rate per 1,000)	328.0	264.5	188.9–328.0
Cumulative Traumatic Injury (rate per 1,000)	1,450.4	1,129.8	706.5–1,450.4
Heat Illness (%)	0.3	0.2	0.05–0.40
BH Disorder 1-Year (%)	10.0	8.4	6.8–10.0
BH Disorder Lifetime (%)	20.6	17.3	10.5–20.6
Hazardous Drinking (%)	13.4	13.3	7.8–20.3
STIs (rate per 1,000)	33.1	27.7	21.7–33.1
Sleep Disorders (%)	16.2	12.3	6.7–16.2
Obesity (%)	17.6	17.9	8.8–23.2
Acute Respiratory Infections (average rate per 1,000 per month)	20.5	23.3	20.5–28.7
Respiratory Symptoms (average rate per 1,000 per month)	7.0	6.7	5.0–8.4

ADDITIONAL INFORMATION

Injury rates in the Army were found to be higher than rates in the Navy, Air Force, and Marine Corps. Mission-specific training and operational requirements likely contribute to the risk for injury among Soldiers. Rates of BH, STIs, and sleep disorders were also higher among Soldiers than Sailors, Airmen, and Marines. Given the potential for each of these conditions to contribute to decreased performance, disability, and separation, further exploration of potential causes and interventions is warranted.

DEMOGRAPHICS



* Number of AC Service members, June 2019; see Appendix for details.

** See Appendix for details regarding measure computations. Bold values represent Service values above the DoD average.

► Navy



Service Profile (2019):*

Population: Approximately 330,000 Navy Service members
77.6% under 35 years old, 20.0% female

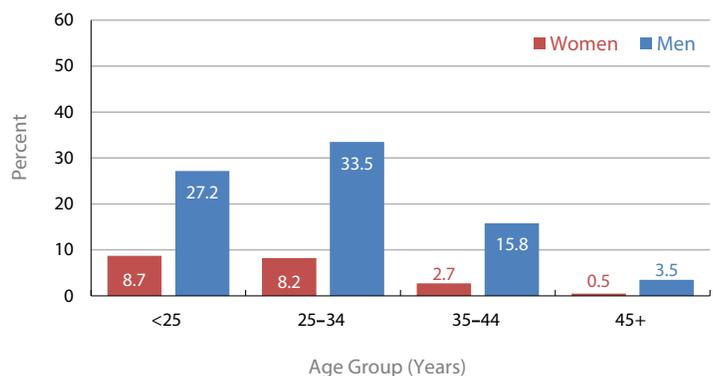
HEALTH INDEX MEASURES**

MEASURE	NAVY VALUE	DOD AVERAGE	DOD RANGE
Acute Injury (rate per 1,000)	188.9	264.5	188.9–328.0
Cumulative Traumatic Injury (rate per 1,000)	706.5	1,129.8	706.5–1,450.4
Heat Illness (%)	0.05	0.2	0.05–0.40
BH Disorder 1-Year (%)	7.9	8.4	6.8–10.0
BH Disorder Lifetime (%)	16.3	17.3	10.5–20.6
Hazardous Drinking (%)	18.8	13.3	7.8–20.3
STIs (rate per 1,000)	26.0	27.7	21.7–33.1
Sleep Disorders (%)	10.3	12.3	6.7–16.2
Obesity (%)	23.2	17.9	8.8–23.2
Acute Respiratory Infections (average rate per 1,000 per month)	21.7	23.3	20.5–28.7
Respiratory Symptoms (average rate per 1,000 per month)	5.3	6.7	5.0–8.4

ADDITIONAL INFORMATION

While injury, sleep disorders, and BH conditions remain important threats to Navy readiness, this report highlights obesity and hazardous drinking as important health concern among Sailors. Obesity contributes to hypertension, diabetes, coronary heart disease, stroke, cancer, all-cause mortality, and increased healthcare costs. It also contributes to failure of Sailors to meet physical fitness standards. Hazardous drinking can increase risk for adverse health events like stroke, damage to the liver, and cancer.

DEMOGRAPHICS



* Number of AC Service members, June 2019; see Appendix for details.

** See Appendix for details regarding measure computations. Bold values represent Service values above the DoD average.

► Air Force



Service Profile (2019):*

Population: Approximately 327,000 Air Force Service members
77.3% under 35 years old, 20.6% female

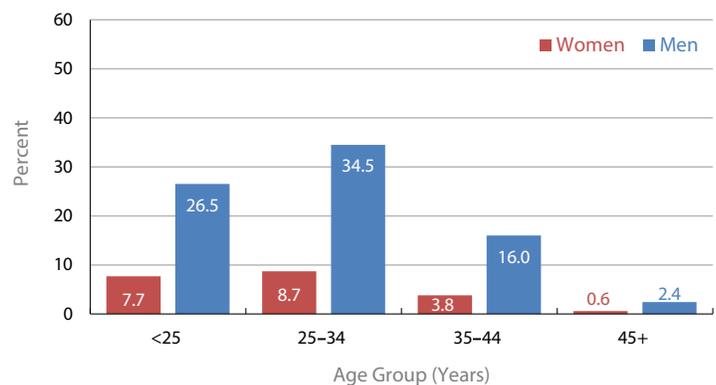
HEALTH INDEX MEASURES**

MEASURE	AIR FORCE VALUE	DOD AVERAGE	DOD RANGE
Acute Injury (rate per 1,000)	253.3	264.5	188.9–328.0
Cumulative Traumatic Injury (rate per 1,000)	1,179.6	1,129.8	706.5–1,450.4
Heat Illness (%)	0.06	0.2	0.05–0.40
BH Disorder 1-Year (%)	7.3	8.4	6.8–10.0
BH Disorder Lifetime (%)	17.6	17.3	10.5–20.6
Hazardous Drinking (%)	7.8	13.3	7.8–20.3
STIs (rate per 1,000)	21.7	27.7	21.7–33.1
Sleep Disorders (%)	11.9	12.3	6.7–16.2
Obesity (%)	18.4	17.9	8.8–23.2
Acute Respiratory Infections (average rate per 1,000 per month)	28.7	23.3	20.5–28.7
Respiratory Symptoms (average rate per 1,000 per month)	8.4	6.7	5.0–8.4

ADDITIONAL INFORMATION

In this analysis, acute respiratory infections, respiratory symptoms, cumulative traumatic injuries and obesity were found to affect Airmen at higher than average rates. Airmen should continue to take preventive measures to protect against respiratory infections, including social distancing and use of protective clothing and masks, particularly in the era of COVID-19. Future efforts to address obesity and repetitive microtrauma as separate conditions as well as efforts to better understand the interplay of these conditions also have the potential to improve the readiness of Airmen.

DEMOGRAPHICS



* Number of AC Service members, June 2019; see Appendix for details.

** See Appendix for details regarding measure computations. Bold values represent Service values above the DoD average.

► Marine Corps



Service Profile (2019):*

Population: Approximately 186,000 Marine Corps Service members
88.7% under 35 years old, 8.9% female

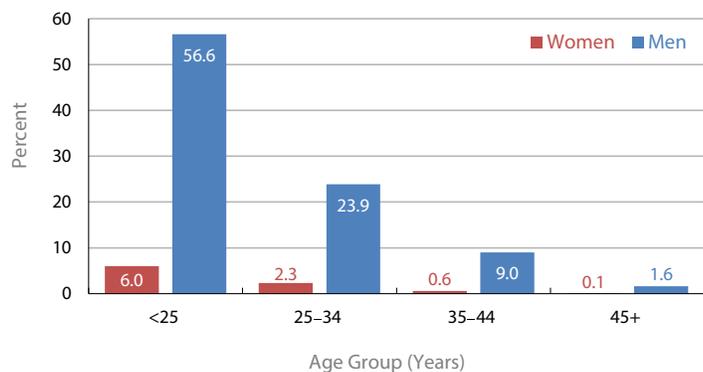
HEALTH INDEX MEASURES**

MEASURE	MARINE CORPS VALUE	DOD AVERAGE	DOD RANGE
Acute Injury (rate per 1,000)	258.3	264.5	188.9–328.0
Cumulative Traumatic Injury (rate per 1,000)	987.2	1,129.8	706.5–1,450.4
Heat Illness (%)	0.4	0.2	0.05–0.40
BH Disorder 1-Year (%)	6.8	8.4	6.8–10.0
BH Disorder Lifetime (%)	10.5	17.3	10.5–20.6
Hazardous Drinking (%)	20.3	13.3	7.8–20.3
STIs (rate per 1,000)	27.8	27.7	21.7–33.1
Sleep Disorders (%)	6.7	12.3	6.7–16.2
Obesity (%)	8.8	17.9	8.8–23.2
Acute Respiratory Infections (average rate per 1,000 per month)	23.6	23.3	20.5–28.7
Respiratory Symptoms (average rate per 1,000 per month)	5.0	6.7	5.0–8.4

ADDITIONAL INFORMATION

Marines have relatively low rates of BH diagnoses, sleep disorders, and obesity compared to the other Services. Heat illnesses, however, emerge as an important area of focus for prevention efforts. In addition, Marines had higher rates of hazardous drinking compared to Soldiers, Airmen, and Sailors. Attention to reducing heat illnesses as well as hazardous drinking could increase the mission readiness among Marines.

DEMOGRAPHICS



* Number of AC Service members, June 2019; see Appendix for details.

** See Appendix for details regarding measure computations. Bold values represent Service values above the DoD average.

METHODS

Injury

Data were derived from records routinely maintained in the DMSS. These records document ambulatory encounters and hospitalizations of AC Service members in fixed military and civilian (if reimbursed through the MHS) treatment facilities worldwide. Acute and cumulative traumatic injuries were identified using ICD-10-CM diagnosis codes from the U.S. Army Public Health Center's (APHC) 2020 Injury Taxonomy.³ Service members were identified as having an injury if they had a qualifying injury diagnosis in any position of an inpatient or outpatient medical encounter. A 60-day gap rule was used to identify incident injuries. To be counted as a new case, at least 60 days must have passed since the last qualifying injury for the same nature of injury and body region affected, as defined by the injury taxonomy. Encounters with a documented "war"- or "battle"-related cause of injury were excluded from the analysis. Causes of injuries were assessed based on North Atlantic Treaty Organization Standard Agreement (STANAG) 2050 and ICD-10-CM "external cause of injury" codes. The denominator was all AC Service members during June of the year of interest.

Among those who were identified as an incident injury case in 2019, hospitalization status and total number of hospital bed days were determined. An individual was counted as being hospitalized for an acute or cumulative traumatic injury if they had an inpatient encounter in 2019 with an injury diagnosis in the primary diagnostic position. Bed days were calculated among all inpatient encounters with an injury diagnosis in the primary diagnostic position in 2019. In addition, for all incident injuries, the frequency and percentage of the nature of injury and body region affected were described.

Limitations:

1. The transition from International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to ICD-10-CM in October 2015 presented a significant artifact for acute injury surveillance. ICD-10-CM has more than 15 times the number of acute injury codes than ICD-9-CM, and they are far more specific. It is not possible to directly compare rates of highly specific acute injuries captured in ICD-10-CM to the non-specific injuries captured in ICD-9-CM. For this reason, rates of acute injuries captured under ICD-9-CM were not reported here.
2. This report is meant to describe nondeployment-related injuries; however, some deployment-related injuries may have been captured if the war- or battle-related cause of injury was not documented.
3. Diagnosing an acute injury is subjective and provider-dependent. Incident and subsequent diagnoses rendered by different providers introduces error that can result in both undercounting and overcounting of injuries.
4. It is not always possible to differentiate incident injuries from reinjuries using surveillance data. The 60-day gap rule is sufficient for the vast majority of injuries, which are generally not severe, but may lead to overcounting of severe injuries if the subsequent encounters are erroneously coded as incident injuries.

Heat Illness

Data were derived from records routinely maintained in the DMSS. A case of heat illness was defined as having an inpatient or outpatient medical encounter with a diagnosis for heat stroke (ICD-9: 992.0; ICD-10: T67.0*) or heat exhaustion (ICD-9: 992.3–992.5; ICD-10: T67.3*–T67.5*) in the first or second diagnostic position or by having a reportable medical event report for heat illness. A service member could be counted as a case of heat illness once per calendar year. Heat stroke was prioritized over heat exhaustion if the individual had indication of both occurring in the same year. These methods are consistent with those applied in the annual *MSMR* reports on heat illness.⁴ The denominator was all AC Service members during June of the year of interest.

Among those who were identified as a heat illness case in 2019, hospitalization status and total number of hospital bed days were determined. An individual was counted as being hospitalized for a heat illness if they had an inpatient encounter in 2019 with a heat illness diagnosis in the primary diagnostic position. Bed days were calculated among all inpatient encounters with a heat illness diagnosis in the primary diagnostic position in 2019.

Limitations:

1. Similar heat-related clinical illnesses are likely managed and reported differently at different locations and in different clinical settings.
2. Heat illness during deployment was not ascertained.
3. Reporting guidelines for heat illnesses were modified in the 2017 and 2020 revisions of the Armed Forces guidelines. In these updated guidelines, the heat injury category was removed, leaving only case classifications for heat stroke and heat exhaustion. This may cause some variations in reporting.

BH Disorders

Data were derived from records routinely maintained in the DMSS. Healthcare encounters of deployed Service members are documented in records that are maintained in the Theater Medical Data Store (TMDS), which is included in the DMSS. It is important to note that because the TMDS has not fully transitioned to ICD-10-CM, ICD-9-CM codes appear in this analysis.

Service members were identified as having a BH disorder if they had at least two BH disorder diagnoses (ICD-9-CM: 290–319; ICD-10-CM: F01-F99) within 365 days in any diagnostic position. However, diagnoses for post-concussion syndrome, intellectual disabilities, nicotine dependence, and pervasive and specific developmental disorders were excluded (ICD-9: 299*, 305.1, 310.2, 315*, 317* –319*; ICD-10-CM: F07.81, F70–F79, F17*, F80*–F82*, F84*, F88–F89).⁶ Diagnoses could occur in inpatient, outpatient, or in-theater medical encounters. At least one of these diagnoses had to occur during of the year of interest. The denominator was all AC Service members during June of the year of interest.

For specific BH conditions (adjustment disorders, alcohol-related disorders, anxiety disorders, bipolar disorders, depressive disorders, psychoses, PTSD, and substance-related disorders), ICD-9-CM and ICD-10-CM codes from the AFHSD surveillance case definitions were used.⁷ A Service member was considered to have a specific BH condition if they had two diagnoses for the same condition within 365 days of each other. At least one of these diagnoses had to occur during of the year of interest. The denominator was all AC Service members during June of the year of interest.

History (“lifetime” prevalence) of a BH disorder was also measured. Service members were considered to have a history of BH disorder if they had two BH disorder diagnoses within 365 days at any time between 2002 and 2019 and were in service during December 2019 (the last month of the surveillance period). The denominator was all AC Service members during December 2019.

Among those who were identified as a BH disorder case in 2019, hospitalization status and total number of hospital bed days were determined. An individual was counted as being hospitalized for a BH disorder if they had an inpatient encounter in 2019 with a BH disorder diagnosis in the primary diagnostic position. Bed days were calculated among all inpatient encounters with a BH disorder diagnosis in the primary diagnostic position in 2019.

Limitations:

1. Service members do not always seek or receive care for a BH condition within the MHS, and BH disorders may be underestimated here.
2. Some diagnoses may be miscoded or incorrectly transcribed on centrally transmitted records.
3. Some encounters (e.g., screening visits) may have been erroneously diagnosed or miscoded as BH disorders.

Hazardous Drinking

Screening for alcohol misuse is implemented in the Mental Health Assessment (MHA) portion of the PHA through the use of the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C).⁸ The AUDIT-C is a three-item alcohol screen that asks about frequency and amount of drinking. The AUDIT-C can help identify people with hazardous drinking behaviors or who have alcohol dependence or abuse.¹⁶ The AUDIT-C is composed of the first three questions of the longer (10-item) AUDIT that ask about the frequency and amount of alcohol consumption. The

response items for each of the three questions are scored from 0–4 points. The total AUDIT-C score is the sum of the responses to the three questions; possible AUDIT-C scores range from 0–12 points.

A positive screen on the AUDIT-C was defined as a score of greater than or equal to 4 for men and a score of greater than or equal to 3 for women. Percentages of positive screens on the AUDIT-C were calculated among those who completed a PHA during the year of interest. If a service member completed more than one PHA in a given calendar year, the last PHA of the year was selected. Diagnoses for alcohol-related disorders, as well as hospitalizations and bed days for alcohol-related disorders, were assessed separately as part of the BH disorders analysis.

AUDIT-C information was obtained from the electronic PHA data housed in the DMSS. Service members are required to complete the PHA approximately annually in order to assess their health status and assist healthcare providers in making determinations about deployment readiness and recommendations for present or future care.

Limitations:

1. PHA data became available in DMSS beginning in calendar year 2018; however, completeness varies by Service and component.
2. Data are self-reported by the Service member, which may underestimate the true prevalence of hazardous drinking.

How often do you have a drink containing alcohol?

Never (0 points); Monthly or less (1); 2–4 times a month (2); 2–3 times a week (3); 4 or more times a week (4)

How many drinks containing alcohol do you have on a typical day when you are drinking?

0 (0); 1 or 2 (0); 3 or 4 (1); 5 or 6 (2); 7 to 9 (3); 10 or more (4)

How often do you have six or more drinks on one occasion?

Never (0); Less than monthly (1); Monthly (2); Weekly (3); Daily or almost daily (4)

Adapted from: Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA.⁸; Bradley KA, DeBenedetti AF, Volk RJ, Williams EC, Frank D, Kivlahan DR.¹⁶

STIs

Diagnoses of STIs were ascertained from medical administrative data and reports of notifiable medical events routinely maintained in the DMSS for surveillance purposes. STI cases were also derived from positive laboratory test results recorded in the Health Level 7 (HL7) chemistry and microbiology databases maintained by the Navy and Marine Corps Public Health Center at the EpiData Center.

An incident case of chlamydia or trichomoniasis was defined by any of the following: 1) a case defining diagnosis of chlamydia (ICD-9: 099.41, 099.5*; ICD-10: A56*) or trichomoniasis (ICD-9: 131*; ICD-10: A59*) in the first or second diagnostic position of a record of an outpatient or in-theater medical encounter, 2) a confirmed notifiable disease report (for chlamydia only), or 3) a positive laboratory test for chlamydia or trichomoniasis (any specimen source or test type). An incident case of gonorrhea was similarly defined by 1) a case-defining diagnosis (ICD-9: 098*; ICD-10: A54*) in the first or second diagnostic position of a record of an inpatient, outpatient, or in-theater encounter, 2) a confirmed notifiable disease report for gonorrhea, or 3) a positive laboratory test for gonorrhea (any specimen source or test type). For each type of STI, an individual could be counted as having a subsequent case only if there were more than 30 days between the dates on which the case-defining diagnoses were recorded. These case definitions were derived from those used in the *MSMR* annual STI report.⁹

The denominator was all AC Service members during June of the year of interest.

Limitations:

1. STI cases may not be captured if coded in the medical record using symptom codes (e.g., urethritis) rather than STI-specific codes.
2. Cases may be underestimated because some affected Service members may be diagnosed and treated through nonreimbursed, non-military care providers (e.g., county health departments or family planning centers). In addition, laboratory tests that are performed in a purchased care setting, a shipboard facility, a battalion aid station, or an in-theater facility are not captured.
3. Differences in rates between Services may be at least partially due to different practices regarding screening, testing, treatment, and reporting.

Sleep Disorders

Data were derived from records routinely maintained in the DMSS; TMDS data were included. Service members were identified as having a sleep disorder if they had a diagnosis (Table 1) in any diagnostic position during the year of interest. It is important to note that because the TMDS has not fully transitioned to ICD-10-CM, ICD-9-CM codes appear in this analysis. The denominator was all AC Service members during June of the year of interest.

Limitations:

1. Service members do not always seek care for sleep disorders, and sleep disorders may be underrepresented here.
2. Increased screening associated with required medical encounters such as retirement and separation physicals may result in an increased frequency of diagnoses of sleep disorders.

Table 1. ICD-9-CM/ICD-10-CM codes used to identify sleep disorders.

	ICD-9-CM	ICD-10-CM
Any sleep disorder	780.5*, 327.00–327.02, 327.09, 327.10–327.15, 327.19, 327.2*, 327.3*, 327.4*, 327.5*, 327.8, 347.*, 307.4*	G47*, F51*
Insomnia	780.52, 327.00, 327.01, 327.09	G47.0*
Hypersomnia	327.10–327.14, 327.19, 780.54	G47.1*
Circadian rhythm sleep disorders	327.30–327.37, 327.39, 780.55	G47.2*
Sleep apnea	327.20–327.27, 327.29, 780.51, 780.53, 780.57	G47.3*
Narcolepsy	347.00, 347.01, 347.10, 347.11	G47.4*
Parasomnia	327.40–327.44, 327.49	G47.5*
Sleep-related movement disorders	327.51–327.53, 327.59	G47.6*

*Represents any subsequent digit/character.

Obesity

The CDR vital sign table within the MDR was used to identify all records for AC Service members with a height and weight measurement available on the same day. Female Service members with an ICD-9-CM or ICD-10-CM code for pregnancy during any inpatient or outpatient encounter in the same year were excluded. Height and weight data were then matched to the AFHSD DMSS to identify the date of birth, sex, and Service for all records. If the Service member could not be identified in the DMSS or any demographic information was missing from the DMSS, then the height and weight record was excluded. Only the latest height and weight record for each Service member per year was retained. BMI was then calculated from height and weight. Records with BMI measurements less than 12 and greater than 45 and records with erroneous heights or weights (e.g., a weight of 8 pounds) were excluded from the analysis. Cases of obesity were assigned using BMI greater than or equal to 30, according to the CDC definition of obesity.¹⁴

The CDR vital sign table was used to assess BMI because not all Services had complete height and weight records available from Service members' Physical Fitness Tests (PFTs). This method of estimating obesity is similar to the Defense Health Agency's Better Health Prevalence Measure of overweight and obesity.¹⁷

Limitations:

1. Service members with higher lean body mass may be misclassified as obese based on their BMI.
2. Not all Service members had a height or weight measurement available in the CDR Vital sign data each year.
3. BMI measures should be interpreted with caution, as some of them can be based on self-reported height and weight.

Respiratory Conditions

Data were derived from records routinely maintained in the DMSS. Service members were identified as having an acute respiratory infection if they had an inpatient, outpatient, or TMDS encounter with a qualifying diagnosis (Table 2) in the first diagnostic position. For cases of respiratory symptoms, an individual was required to have an inpatient, outpatient, or TMDS encounter with a qualifying diagnosis (Table 3) in any diagnostic position. For both acute respiratory infections and respiratory symptoms, at least 14 days had to have passed between encounters to count as a new case. The denominator was AC Service members in service during the month and year of interest. To calculate rates among recruits, the denominator was the number of people with a recruit training period overlapping with the month and year of interest. To qualify as a case for a recruit, the qualifying encounter also needed to have occurred within the recruit training period.

Among those who were identified with an acute respiratory infection in 2019, hospitalization status and total number of hospital bed days were determined. An individual was counted as being hospitalized for an acute respiratory infection if they had an inpatient encounter in 2019 with an acute respiratory infection in the primary diagnostic position. Bed days were calculated among all inpatient encounters with an acute respiratory infection diagnosis in the primary diagnostic position in 2019.

Limitations:

1. Laboratory confirmation of cases was not ascertained.
2. Rates could be overestimated if miscoded as screening encounters.
3. Rates could be underestimated because of service members not seeking care for mild illness.

Table 2. ICD-9-CM/ICD-10-CM codes used to identify acute respiratory infections.

	ICD-9-CM	ICD-10-CM
Nasopharyngitis	460*	J00*
Sinusitis	461*	J01*
Acute pharyngitis	462*	J02*
Acute laryngitis and tracheitis	464.0, 464.10, 464.20, 464.30, 464.50	J04*
Acute obstructive laryngitis and epiglottitis	464.01, 464.11, 464.21, 464.31, 464.4, 464.51	J05*
Acute upper respiratory infections of unspecified site	465*	J06*
Influenza due to certain identified flu viruses	488*	J09*
Influenza due to other identified flu virus	487*	J10*
Influenza due to unidentified flu virus	NA (new code)	J11*
Viral pneumonia not elsewhere classified	480*	J12*
Pneumonia due to <i>Streptococcus pneumoniae</i>	481*	J13*
Pneumonia due to <i>Haemophilus influenzae</i>	482.2	J14*
Bacterial pneumonia not elsewhere classified	482*	J15*
Pneumonia due to other infectious organisms	484*, 483.0, 483.1, 483.8	J16*
Pneumonia unspecified organism	486, 485	J18*
Acute bronchitis	466	J20*
Acute bronchiolitis	466.1*	J21*
Unspecified acute lower respiratory tract infection	519.8	J22*
Acute tonsillitis	463, 034.0	J03*
Peritonsillar abscess	475	J36
Retropharyngeal and parapharyngeal abscess	478.22, 478.24	J39.0
Other abscess of pharynx	478.21	J39.1
Diphtheria	032.0, 032.1, 032.3, 032.9	A36.0, A36.1, A36.2, A36.9
Scarlet fever	34.1	A38*
Whooping cough	033.0, 033.9, 033.8	A37*
Adenovirus	NA (new code)	B34.0
Measles	055.0, 055.1, 055.2, 055.8, 055.9	B05*
Rubella	056.00, 056.01, 056.09, 056.79, 056.9	B06*
<i>Streptococcus</i> group A	41.01	B95.0
<i>Streptococcus pneumoniae</i> as the cause of disease classified elsewhere	41.09	B95.3
<i>Mycoplasma pneumoniae</i>	41.81	B96.0
<i>Klebsiella pneumoniae</i>	41.3	B96.1
<i>Haemophilus influenzae</i>	41.5	B96.3
Adenovirus	79	B97.0
Coronavirus	NA (new code)	B97.2
Respiratory syncytial virus (RSV)	79.6	B97.4
Otitis media	381.0*, 382.00, 382.01	H65.0*, H65.1*, H66.00*, H66.01*

*Represents any subsequent digit/character.
NA, not applicable.

Table 3. ICD-9-CM/ICD-10-CM codes used to identify respiratory symptoms.

	ICD-9-CM	ICD-10-CM
Cough	786.2	R05
Acute respiratory distress	NA	R06.03
Wheezing	786.07	R06.2
Sneezing	NA	R06.7
Sore throat	784.1	R07.0
Pleurodynia	786.52	R07.81
Pleurisy	511*	R09.1
Abnormal sputum	786.4	R09.3
Nasal congestion	NA	R09.81
Postnasal drip	784.91	R09.82
Fever	780.60	R50.9

*Represents any subsequent digit/character.

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