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Welcome to the 2020 Health of the Force Report

In this changing world, one constant is the requirement for our Soldiers to remain healthy and ready to achieve Force dominance. In its 6th annual installment, the 2020 Health of the Force report documents conditions that influence the health and medical readiness of the U.S. Army Active Component (AC) Soldier population. Leaders can use Health of the Force to optimize health promotion measures and effect culture changes that influence both individual Soldiers and Army institutions. Health of the Force presents Army-wide and installation-level demographics and data for more than 20 health, wellness, and environmental indicators at more than 40 installations worldwide. Installations included in Health of the Force are those where the AC population exceeds 1,000 Soldiers. Data presented in this report reflect status for the prior year (i.e., the 2020 report reflects calendar year 2019 data).

The range of health metrics detailed in Health of the Force provides an evidence-based resource that can help Army leaders understand the causes of and contributors to medical non-readiness and direct informed policy and programmatic efforts to optimize Soldier health. The medical and environmental metrics detailed in the Health of the Force report will be a valuable resource for Army leaders to provide recommendations to overcome both present and future challenges.

Calendar year 2020 proved to be a challenging year in a multitude of ways. In 2020, the world encountered a global pandemic unlike anything experienced within the past 100 years, coupled with a reckoning of centuries of racial discrimination and the ensuing uprising of activism. Although the 2020 Health of the Force report surveillance period does not cover the timeline of these world events, it is imperative for senior leaders and the Total Army Family alike to begin framing the conversations and analyses now that will be necessary to effect real progress towards equity in health and racial disparities. The 2020 Health of the Force report offers a lens through which leaders can view the initial examination of the essential relationship between social, racial, and health inequities.

Health of the Force Online is a suite of interactive dashboards that provide Army Soldier population health data by installation and command and enhance the accompanying print report. In 2020, Health of the Force Online received an extensive update of design, content, and usability. Users can dynamically display health outcomes and drill down on characteristics and subpopulations with over 70 interactive charts, graphs, and informative narratives across medical and environmental content areas. This product is continuously evolving by incorporating new data, generating new visualizations, and meeting the changing health needs of Army stakeholders. Together with the annual print report, Health of the Force Online facilitates informed decisions that will improve the readiness, health, and well-being of Soldiers.
### 2020 HEALTH OF THE FORCE

#### Report Highlights

**INJURY**

- Over half (55%) of Soldiers experienced a new injury in 2019.
- A majority of injuries (72%) were cumulative musculoskeletal overuse injuries.

**SUBSTANCE USE**

- 3.5% of Soldiers had a substance use disorder diagnosis. Rates were highest among Soldiers <25 years of age, and prevalence decreased with age.

**OBESITY**

- Obesity prevalence remained constant at 17% among Soldiers, but there were marked racial disparities. **Asian Soldiers had the lowest prevalence of obesity**, and rates were highest for Native Hawaiian/Pacific Islander Soldiers.

**BEHAVIORAL HEALTH**

- Overall, 16% of Soldiers had a diagnosis of one or more behavioral health disorders. This prevalence varied little over the last 5 years.

**TOBACCO PRODUCT USE**

- 25% of Soldiers reported the use of tobacco products, excluding those who only used e-cigarettes.

**HEAT ILLNESS**

- Although the number of heat stroke cases remained constant, heat exhaustion cases among Soldiers decreased from the previous reporting year.

**HEARING**

- The percentage of Soldiers with newly identified hearing injuries and potentially requiring a fitness-for-duty hearing evaluation declined over the past 5 years.

**SEXUALLY TRANSMITTED INFECTIONS**

- Reported chlamydia infection rates were 33% higher than in 2015.

**ENVIRONMENTAL HEALTH INDICATORS**

- <40% of Soldiers had access to drinking water from an installation community water system that was fluoridated according to Army regulation and Centers for Disease Control and Prevention guidelines.

**PERFORMANCE TRIAD**

- 37% of Soldiers attained 7 or more hours of sleep during work/duty weeks.
- Less than half of Soldiers are eating the recommended 2 or more servings of fruits per day (33%) or 2 or more servings of vegetables per day (42%).

### DEMOGRAPHICS:

Approximately 469,000 AC Soldiers

- 79% under 35 years old, 15% female
THE ARMY RESPONSE TO THE COVID-19 PANDEMIC

In December 2019, a highly infectious novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first detected in Wuhan, China. SARS-CoV-2 led to a pandemic known as Coronavirus Disease 2019 (COVID-19), which has highlighted the role and importance of public health. The U.S. Army faces a unique challenge when conducting training operations during a pandemic. The convergence of individuals from across the country at training locations, close quarters, and the effects of stressful conditions on trainees’ immune systems can increase the risks of infection and viral transmission.

The U.S. Army Public Health Center (APHC) disseminated COVID-19 preparedness guidelines to Army units. This guidance presented a 3-pronged offensive designed to prevent, detect, and respond to SARS-CoV-2.

1. PREVENT
Infection prevention is the most potent weapon against SARS-CoV-2. The APHC recommended social distancing; quarantine; limiting the size of gatherings; comprehensive respiratory and hand hygiene practices; and thorough cleaning and disinfection.

2. DETECT
Detection and subsequent isolation of probable and confirmed COVID-19 cases limits spread of the virus and maximizes continuity of operations. The APHC provided guidance for rapidly detecting individuals who may be infectious, who are susceptible to infection (including individuals with underlying health conditions that adversely affect the course of the disease), and who may be immune to infection. The APHC also promoted and implemented detection strategies, including population surveillance, disease modeling, screening, aggressive contact tracing, and molecular and serological assay-based testing. For example, a pilot program at Aberdeen Proving Ground is assessing the feasibility of detecting COVID-19 in wastewater as an indicator of COVID-19 prevalence at the installation.

3. RESPOND
To aid training units in their response to Soldiers diagnosed with COVID-19, the APHC recommended isolating infected Soldiers quickly and implementing measures such as contact tracing and quarantine to prevent or reduce the spread of COVID-19. This guidance provides optimal strategies for limiting the number of individuals infected by someone diagnosed with COVID-19, which is at the heart of the public health response to the pandemic.


Conversely, the incidence of some outcomes, such as behavioral health disorders and obesity, may increase, given the added stress and lifestyle changes precipitated by the pandemic. Additionally, reallocation of public health resources to support the COVID-19 response may have compromised routine health surveillance activities, including environmental and entomological testing. Positive changes such as improved air quality are also possible due to decreased energy consumption.

The severity of COVID-19 may be influenced by an individual’s underlying health status, and it seems to vary according to other personal characteristics. The current Health of the Force report may offer insights in the evaluation of Soldiers’ COVID-19 risk through its summaries of influential risk factors.

The 2021 Health of the Force (2020 data) will likely report notable shifts in medical metrics due to reduced healthcare access and utilization. The types of care provided will reflect increased virtual and telephone healthcare consultations. Because both routine and elective care were minimized for large portions of 2020, the frequency of some conditions may appear artificially reduced. Conversely, the incidence of some outcomes, such as behavioral health disorders and obesity, may increase, given the added stress and lifestyle changes precipitated by the pandemic. Additionally, reallocation of public health resources to support the COVID-19 response may have compromised routine health surveillance activities, including environmental and entomological testing. Positive changes such as improved air quality are also possible due to decreased energy consumption.

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INTRODUCTION
NO LONGER SEEING GREEN
WHY ACKNOWLEDGING RACIAL/ETHNIC DIFFERENCES IS KEY TO ADDRESSING HEALTH DISPARITIES

RACISM AND SOCIAL INEQUALITIES EXACERBATED by the COVID-19 pandemic have forced the U.S. and Army Senior Leaders (ASLs) to reevaluate perceptions about ourselves and our institutions.

Health disparities are “preventable differences in the burden of disease, injury, violence, or in opportunities to achieve optimal health experienced by socially disadvantaged racial, ethnic, and other population groups” (CDC 2017a). ASLs may assume that health-related inequities due to race/ethnicity do not exist or have been reduced because of comprehensive military benefits that include universal healthcare, housing availability, and a federally mandated, rank-based pay structure, among others.

While health disparities by race/ethnicity are well-documented in the U.S. civilian population (Raifman & Raifman 2020; Rentsch et al. 2020; Mackey et al. 2021), the peer-reviewed literature demonstrates a lack of comparable studies in the Army. It is important for ASLs to understand whether health and healthcare disparities exist among Soldiers in their units and how such disparities may impact mission readiness. The 2020 Health of the Force is the first edition to include metrics stratified by race and ethnicity. This year’s data demonstrate the most pronounced racial and ethnic disparities in obesity, tobacco product use, and sexually transmitted infections.

While Army benefits should ameliorate the impact of some of these factors, generations of discriminatory societal norms, specifically for Black Americans, cannot be discounted. Knowledge gained through understanding whether health and healthcare disparities exist among Soldiers may also elucidate unique stressors among Black or African-American Soldiers. Listed below are several steps the Army can take to begin to investigate the presence of these issues.

Each of these listed factors has been associated with health and healthcare disparities among racial and ethnic minorities. Understanding and dismantling the negative health outcomes created as byproducts of race-related issues must be thoughtful and deliberate. As stated by renowned American author and activist James Baldwin, “Not everything that is faced can be changed, but nothing can be changed until it is faced.”

Actions to Reduce Racial and Ethnic Disparities throughout the Enterprise

1. Annually report health outcomes and health care utilization patterns by race/ethnicity and ensure that ongoing surveillance efforts include information by race/ethnicity to determine if disparities exist.

2. Assess for the presence of implicit bias among military healthcare providers, and incorporate discussions of implicit bias into routine didactic sessions and required training.

3. Establish training on racism and its effects on health for medical providers.

4. Reassess strategies to recruit and retain healthcare providers who are underrepresented minorities.

5. Comprehensively review military healthcare policies to ensure they do not produce or sustain inequity among race/ethnicity groups.

“We know from the data that communities of color continue to lag their counterpart white communities in measures of health, wellness, economic opportunity and quality of life. In real-time, we see that the most severe COVID-19 complications and death disproportionately affect people of color. Army Medicine is committed to practices that deliver first rate medical care that ensures the health of our entire fighting Force and all of the people who support them.”

—Lieutenant General R. Scott Dingle
The U.S. Army Surgeon General and Commanding General, U.S. Army Medical Command

Racism and social inequalities exacerbated by the COVID-19 pandemic have forced the U.S. and the Army to reevaluate perceptions about ourselves and our institutions.
Introduction

Demographics

DEBUT OF RACE AND ETHNICITY IN HEALTH OF THE FORCE

The U.S. Army recognizes that Soldiers and their Families may experience racial and ethnic disparities at both the individual and societal levels. The 2020 Health of the Force introduces health measure reporting by race and ethnicity with the goal of identifying potential health disparities and providing leaders with the data to support policies or programs aimed at reducing these disparities throughout the Force. The Army is uniquely positioned to improve health equity for all Soldiers by addressing disparities that may negatively impact individual and unit readiness.

The Office of Management and Budget (OMB) recommends the use of at least five categories when reporting race: (1) American Indian or Alaska Native, (2) Asian, (3) Black or African American, (4) Native Hawaiian or Other Pacific Islander, and (5) White. These categories are social-political constructs and are not scientific or anthropological identities. Ethnicity is a different demographic than race that specifically reflects heritage, nationality, lineage, or country of birth of a person or a person’s parents or ancestors. The OMB recommends a minimum of two categories for reporting ethnicity: (1) Hispanic or Latino and (2) Not Hispanic or Latino (FR 1997). People who are Hispanic or Latino may be any race.

Race and ethnicity data were obtained from the Defense Manpower Data Center. When available and not otherwise suppressed by case count rules (e.g., heat illness, sexually transmitted infection metrics), race and ethnicity are reported for medical metrics and Performance Triad measures. In some cases, Soldier records reflect races or ethnicities that are not captured in the OMB-recommended categories. As a result, the total number of Soldiers for whom race and ethnicity are reported is less than the total AC population.

Distribution by Race and Ethnicity, AC Soldiers, 2019

Soldiers are reported in five categories of race and two categories of ethnicity. About 4% of Soldiers had an Unknown or Other race, and 1% of Soldiers had an Unknown or Other ethnicity. Hispanic or Latino Soldiers with unknown race are reported only in the Hispanic or Latino category.

Intersection of Race and Ethnicity,* AC Soldiers, 2019

The above chart displays an example of how health outcomes are reported by race and ethnicity in this year’s report. Soldiers who report more than one race are reported in each race category for which they identify. However, Soldiers who identify only as Hispanic with no race or Hispanic and a White race are only included in the “Hispanic” category.

* About 12,000 Soldiers identified as Hispanic or Latino, but had an Unknown or Other race. For this visualization, these Soldiers were placed under the White race, as a majority of Hispanic or Latino Soldiers with an identified race were White (95%).
HEALTH OF THE FORCE ONLINE

Health of the Force Online is a digital platform that allows users to access detailed population health data by installation and command. Through this suite of tools, leaders can inform health promotion and prevention, drive cultural and programmatic changes, and meet the emerging health needs of the U.S. Army AC Soldier population.

Users can dynamically display health outcomes, make comparisons between populations, and easily share findings with their colleagues and stakeholders. These findings can be reinforced with the appropriate context since health outcomes can now be examined by demographic characteristics including age group, sex, and race/ethnicity. Further, connectedness to other APHC dashboards and products provides context for leaders to make evidence-based decisions necessary to achieve force dominance.

Health of the Force Online houses over 70 charts, graphs, and information pamphlets across 18 content areas. This suite is constantly evolving by incorporating new data, generating new visualizations, and meeting the changing health needs of the AC Soldier population. Together with the Health of the Force print report, these products can provide the necessary data to improve the readiness, health, and well-being of Soldiers and the Total Army Family.

From a CAC-enabled device, visit the Health of the Force homepage and select “Online Data” or visit https://tiny.army.mil/r/tMG6.
**Introduction**

The 2019 Community Strengths and Themes Assessment Report (CSTA) is a public health survey tool used to support each Army installation’s assessment of its community’s perspectives. Questions focus on the five domains of public health: physical, emotional, family, spiritual, and social/environmental. Each local Commander’s Ready and Resilient Council (CR2C) works with the APHC to conduct the CSTA over a 3-month period, after which the results are compiled and a report is provided to local leadership.

30% of respondents indicated a belief that seeking help will negatively impact their career.

**Key Findings of the 2019 CSTA Report**

Top strengths among respondents included the diversity of the Army community, recreation activities, clean environments, and safe neighborhoods. Overwhelmingly, respondents viewed their communities as healthy and resilient.

For a majority of respondents, the most frequently cited issues of concern were work-life balance, financial issues, stress, depression, overweight/obesity, and lack of family time or community connections (see figure). Qualitative feedback included recurring themes of high operational tempo, stress, and funding competing demands with limited resources.

Respondents also reported stigma from seeking help and accessing resources related to emotional needs. Thirty percent (30%) of respondents indicated a belief that seeking help will negatively impact their career; 26% indicated that doing so was unlikely to impact their career. Informal support networks such as talking with a friend or chaplain were preferred.

The full 2019 Army CSTA Report is available from the APHC Health Promotion Operations Division, https://iphc.amed.army.mil/organization/HPW/Pages/HealthPromotionOperations.aspx. Community- and command-specific CSTA results are available through the local CR2C.

**Most Frequently Cited Concern for Each Public Health Domain, 2019**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health</td>
<td>poor diet</td>
<td>35%</td>
</tr>
<tr>
<td>Emotional Health</td>
<td>stress</td>
<td>51%</td>
</tr>
<tr>
<td>Spiritual Health</td>
<td>no concerns</td>
<td>43%</td>
</tr>
<tr>
<td>Social/Environmental</td>
<td>work-life balance</td>
<td>57%</td>
</tr>
<tr>
<td>Family Health</td>
<td>financial issues</td>
<td>32%</td>
</tr>
</tbody>
</table>

**Spotlight: Health of the Canine Force: Medical Problems Among Non-Deployed Military Working Dogs**

Since World War I, the U.S. military has used Military Working Dogs (MWDs) in a variety of capacities, including explosive detection, drug detection, patrol/attack work, and special operations support. Despite the long-term use of MWDs, comprehensive MWD medical data has not often been reported in the scientific literature, especially for MWDs in non-deployed settings. This lack of published literature limits the identification of trends or areas of focus that could potentially guide future veterinary medical support of MWDs.

Because MWDs are a valuable military resource, achieving a better understanding of their common medical problems is crucial for keeping them healthy and mission-ready. Furthermore, better knowledge of MWD medical data may also improve readiness and training focus among the U.S. Army Veterinary Corps Officers specifically responsible for the comprehensive veterinary medical care of MWDs.

A recent study investigated all medical problems recorded in the DOD Remote Online Veterinary Record for a population of young, non-deployed MWDs (n=762) participating in initial entry training or providing support to their assigned permanent home stations (APHC 2019a). Medical problems for this population were recorded on the Master Problem List (2,416 entries) by an attending veterinarian during MWD visits to a veterinary treatment facility. Results are shown in the figure, organized by previously established categorizations for MWD medical problems (Takara et al. 2014; Mley et al. 2019). Risk factors for the five leading conditions (dermatologic, alimentary [nutritional], dental, soft tissue, and musculoskeletal) were investigated. While they varied by condition, common risk factors for MWD medical conditions included sex, spay/neuter status, breed, and occupational duty certification.

Assessing the training and work environments is recommended to identify unnecessary exposures to hazards, as well as additional preventive strategies for MWDs at greater risk for medical conditions. Future efforts should collect demographic and hazard exposure information on all MWDs, potentially through future annual and post-deployment handler surveys.

**Top 5 Medical Conditions Among Active MWDs, as Reported in the Remote Online Veterinary Record, February 2014 – July 2017**

*Source: APHC 2019a*
Medical Metrics

- Injury
- Behavioral Health
- Substance Use
- Sleep Disorders
- Obesity
- Tobacco Product Use
- Heat Illness
- Hearing
- Sexually Transmitted Infections
- Chronic Disease
SPOTLIGHT

PROJECTING THE COURSE OF PANDEMICS—MODELING AS A TOOL IN THE FIGHT AGAINST COVID-19

Models are a suite of quantitative tools that attempt to project the course of a disease through equations. While it is impossible to capture all of the complexities of the real world, enough data exist to develop models that provide useful projections. New data help refine models and allow actionable recommendations to be made at the local level.

Early in the SARS-CoV-2 pandemic, medical treatment facility (MTF) commanders had to make critical and short-suspend logistics decisions with limited data. To overcome this challenge, the APHC, U.S. Army Futures Command, and U.S. Military Academy developed the Army COVID-19 Model for Epidemics (ACME) tool to provide MTF commanders with projections of the expected numbers of hospital ward beds, intensive care unit beds, and ventilators they would need over time (see figure). Underlying the ACME are mathematical and statistical models estimating the average number of people that a single infectious person could infect (i.e., effective reproduction number; Rt) in each county and at each MTF. Similarly, garrison commanders need guidance on when to reduce Force Health Protection Conditions and allow non-essential personnel to return to work. From the models that estimate Rt, the ACME produces a green-amber-red indicator to help commanders make this decision.*

\[
R_t = 1.24 \text{ secondary infections per infectious person}
\]

Similar modeling efforts can be applied to non-communicable diseases. In April 2020, the Office of The Surgeon General wanted to project the impact of COVID-19 on the demand for behavioral health (BH) care services when MTFs re-open. After MTFs re-open and additional data on BH encounters are available, forecasts will be more reliable because the models will be able to identify the general trajectory of BH care demand.

The Army COVID-19 Model for Epidemics (ACME) tool used the number of current hospitalizations to project capacity needs at each MTF. For more information, please go to: https://cpore.army.mil/rsc/acme

* Increasing/decreasing criteria:
- The most recent 7-day window was used to best fit a line through the Rt daily estimates.
- An up arrow denotes that local transmission is increasing (slope > 0.0005).
- A down arrow denotes that local transmission is decreasing (slope < -0.0005).
- A circle denotes that the local transmission is at a flat rate (-0.0005 ≤ slope ≤ 0.0005).

** Green/Amber/Red criteria:
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- Green means that the entire 50% CI is below 1.0.
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- Red means that the entire 50% CI is above 1.0.

SPOTLIGHT

HOW DO THE NUMBERS COMPARE?
A DESCRIPTION OF SOLDIERS’ MEDICAL CARE

When a soldier sees a healthcare provider, the provider must assign at least one diagnosis code selected from the International Classification of Diseases (CDC 2020a). Providers can include clinicians, physician assistants, and specialists in hospital settings as well as physical therapists and psychologists. The diagnosis codes for each medical visit or encounter are captured in the Soldier’s electronic health record. Military medical data are often presented as statistics that summarize all soldier diagnoses for a given timeframe.

In addition to the specific medical metrics reported in Health of the Force, the APHC consolidates the millions of primary diagnoses (i.e., first listed diagnosis per medical encounter) for all Soldier encounters into 16 medical diagnosis categories. The burden that each category has on the Military Health System can then be compared using three summary measures: 1) the number of encounters, 2) the number of Soldiers affected, and 3) the number of hospital bed days. Because each measure represents a different aspect of impact or severity, all three measures are useful in prioritizing prevention goals.

For example, for all Soldiers’ diagnoses in 2019 (see figure), injuries resulted in the greatest number of encounters and individuals affected. These numbers were two and three times as great, respectively, compared to those for the second leading diagnosis category: mental and behavioral health. Therefore, prioritizing injury prevention strategies may result in an overall reduction in medical encounters. However, mental and behavioral health diagnoses required three times as many hospital bed days compared to injuries, an outcome that may encourage initiatives aimed at enhancing behavioral health to reduce hospital stays.

The APHC produces this medical burden comparison for each installation annually, as public health goals are often best implemented at the local level and with installation partners such as the CR2C. These installation-specific data are accessible through the Health of the Force Online dashboards (APHC 2020a).

Medical Encounters, Individuals Affected, and Hospital Bed Days by Category, AC Soldiers, 2019

<table>
<thead>
<tr>
<th>Medical Encounters</th>
<th>Individual Affected</th>
<th>Hospital Bed Days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cancer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Injury</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Neurologic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cardiovascular</strong></td>
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<tr>
<td><strong>Cardiomyopathy</strong></td>
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<tr>
<td><strong>HIV/AIDS</strong></td>
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<tr>
<td><strong>Metabolic, Endocrine</strong></td>
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<td></td>
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<tr>
<td><strong>Malignant, Cachexia</strong></td>
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<tr>
<td><strong>Genitourinary</strong></td>
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In 2019, injuries and behavioral health conditions were the leading reasons for Soldier profiles. Combined, these conditions resulted in over 11.7 million limited duty days (see table). Injuries were the leading cause of medical non-readiness, accounting for 64% (10.1 million days) of all limited duty days in 2019, affecting over 154,000 Soldiers. The average duration of injury profiles recorded in e-Profile in 2019 was over 2 months. Musculoskeletal injuries, i.e., those affecting bones, muscles, tendons, and ligaments, were the most common cause of injury profiles. Musculoskeletal injuries result from strenuous or repetitive activities, including lifting, carrying, or setting down objects; falls; and repetitive movement and strain. Injuries to the knee accounted for the greatest proportion of limited duty days due to injury (17.5% among men and 15.8% among women), followed by lower back, shoulder, ankle, and foot injuries in men, and hip, lower back, foot, and ankle injuries in women. Together, injuries to these sites resulted in over 5 million limited duty days, accounting for approximately 55% of all limited duty days for injuries in both men and women.

Although fewer Soldiers received a profile for behavioral health conditions than for injuries, the average number of limited duty days for a behavioral health profile was higher than the corresponding average for an injury profile (see table). The ranking of behavioral health conditions resulting in profiles mirrors the prevalence of behavioral health conditions in the Army. Adjustment disorders were the most common reason for a behavioral health profile, followed by depressive disorders, substance use and treatment, posttraumatic stress disorder, and anxiety disorders.

Public health practitioners recommend that Soldiers with injuries and behavioral health conditions seek care as early as possible to foster a more rapid and full recovery, possibly reducing the impact on operational readiness. Programs and policies that facilitate early access to care could potentially reduce the length of profiles for injuries and behavioral health conditions.

Reducing medical non-readiness by mitigating or preventing injuries and behavioral health conditions is a primary objective of the APHC. MODS e-Profile data offer insights regarding leading causes of medical non-readiness and complement medical metric data to provide a more comprehensive picture of the health of the Force.

In 2019, 15.8 million limited duty days were recommended for more than 188,000 AC Soldiers.
Injury

Injury is a substantial contributor to the Army’s healthcare burden, impacting medical readiness and Soldier health. Each year, over half of all Soldiers experience an injury or injury-related musculoskeletal (MSK) condition, accounting for approximately 2 million medical encounters and roughly 10 million days of limited duty. Injuries were defined as damage or interruption of body tissue function caused by an energy transfer that exceeds tissue tolerance suddenly (acute trauma) or gradually (cumulative micro-trauma) (APHC 2017a). Cumulative micro-traumatic MSK injuries are referred to as “overuse” injuries. Injury incidence was estimated using injury-specific diagnostic codes from inpatient and outpatient medical encounter records in the Military Health System Data Repository (MDR).

There were 1,756 new injuries diagnosed among Soldiers per 1,000 person-years. Incidence ranged from 1,257 to 2,739 injuries per 1,000 person-years across Army installations.

Incidence of Injury by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

Among AC Soldiers, 1,756 new injuries were diagnosed per 1,000 person-years in 2019. The rate reflects the potential occurrence of multiple injuries per Soldier. Injury rates were higher among females, Soldiers over age 35 years, and Black or African American Soldiers. Native Hawaiian/Pacific Islander Soldiers had lower rates of injury than Soldiers identifying as other races.

Females (2,327 injuries per 1,000 person-years average)

Males (1,653 injuries per 1,000 person-years average)

The incidence of all new injuries and new “overuse” injuries in 2019 was similar to incidence rates in recent years.

Percent Injured by Sex and Age, AC Soldiers, 2019*

Overall, 55% of Soldiers had a new injury in 2019, and 72% of these injuries were considered overuse injuries. Age is a risk factor for injuries, as 71% of Soldiers 45 years old and older reported injuries, compared to 52% of Soldiers under the age of 25. Sixty-five percent of female Soldiers had a diagnosed injury in 2019 compared to 54% of male Soldiers. For both male and female Soldiers across all age groups, overuse injuries, commonly attributed to military training, accounted for the majority of injuries.

The leading mechanisms of injury among outpatient encounters for injuries with a cause code were overexertion (25%) and falls (21%). Note, however, that only 10% of outpatient injury encounters in 2019 included a provider-specified International Classification of Diseases, 10th revision, Clinical Modification (ICD-10-CM) cause code.

*Soldiers with overuse injuries are represented in both injury categories.
LOCAL ACTION

Using Evidenced-Based Science to Reduce U.S. Army–Europe Musculoskeletal Injury Rates

The number of first-time medical visits for musculoskeletal injury (MSKI) within U.S. Army–Europe (USAREUR) has increased steadily since April 2018 (DA 2020a). To better monitor these MSKI rates, USAREUR created the Physical Health of the Force (PHoF) Injury Prevention Working Group in April 2020. The working group focuses on evaluating the rates of MSKI profiles, Active Duty Soldiers on a MSKI profile, and developing a strategic plan to reduce MSKI rates across the Theater.

Research has shown that increased frequency and distance of running elevates the likelihood of a lower extremity MSKI (Jones and Hauschild 2015). Many unit physical readiness training (PRT) schedules call for daily distance running or ruck marching and leave little time for rest between similar activities. Therefore, the PHoF Injury Prevention working group standardized a ramped PRT and special-population PRT schedule that aligns with the doctrinal principles of Holistic Health and Fitness (DA 2020b) and the Building the Soldier Athlete handbook (AMEDD 2013). The standardized USAREUR program not only allows units flexibility in choosing specific training activities but also ensures the activities are well-balanced each day and throughout the week, allowing adequate rest for each muscle group.

Educating Soldiers on why and how to increase training intensity gradually is just as important as creating standardized schedules. The working group established an Injury Prevention Pilot course that targets Master Fitness Trainers. The course offers hands-on training in advanced physical fitness techniques in order to develop and implement comprehensive training plans, utilizing proper exercise techniques that safely progress Soldiers to the next level of physical fitness while reducing MSKI. The course builds upon the foundational knowledge taught in the Master Fitness Trainer Certification Course and allows for additional hands-on application. The working group also established an injury prevention training block in the USAREUR Commander and First Sergeant Courses in order to reach unit leadership. The goal of addressing injury prevention from two approaches is to change Soldier behavior and attitudes regarding PRT, ultimately reducing MSKI rates and increasing medical readiness.

Injury Risk by APFT Run Time and BMI, Males and Females, AC Soldiers, 2017

Soldiers with higher BMI and slower 2-mile run time were at greatest risk of injury. These Soldiers are therefore identified by the AWC referral guidelines.

SPOTLIGHT

ARMY WELLNESS CENTERS HELP SOLDIERS IMPROVE PERFORMANCE

A RMY WELLNESS CENTERS (AWCs), LOCATED at 35 Army Installations, are uniquely positioned to provide state-of-the-art assistance to Soldiers struggling to meet body composition standards and run times. AWCs provide health and performance assessments and personalized exercise prescriptions to Soldiers, Family Members, Soldiers for Life, and Department of the Army (DA) Civilians. The AWC’s comprehensive approach to health and performance includes utilization of advanced technology to assess an individual’s aerobic fitness, body composition, and resting metabolic rate, and to provide coaching on nutrition, stress management, tobacco-free living, and general wellness.

To identify Soldiers who would benefit from AWC services, a recent study established AWC referral guidelines for Soldiers (APHC 2021) based on a combination of aerobic fitness levels (e.g., 2-mile run time) and the Army Body Composition height-weight standards (DA 2019), which are based on body mass index (BMI). The figure illustrates trends in injury risks by aerobic fitness level and BMI for Soldiers and provides recommended AWC referral guidelines. Based on these guidelines, an estimated 23% of Soldiers will meet referral criteria.

The data are consistent with injury trends in Army subpopulations. While current AWC referral guidelines are based on Army Physical Fitness Test (APFT) performance, future guidelines will be based on assessments of Army Combat Fitness Test (ACFT) performance. Because the ACFT is structured differently than the APFT, i.e., the 2-mile run is the last of six events, performance on the run test will change. It is expected that general trends will remain the same, and the slowest Soldiers with highest BMI will benefit from AWC services. Interim recommendations are for leaders to refer Soldiers to the AWC if they fail the ACFT run test and/or their weight is outside the Army Body Composition standard. When comprehensive ACFT performance data are available, specific guidance based on ACFT run times will be developed.

Injury Risk by APFT Run Time and BMI, Males and Females, AC Soldiers, 2017

Looking for this logo on the installation profile pages to learn where AWCs are located.

Chart notes:
Data included all Soldiers with APFT run data, height, and weight recorded during 2017. Cells represent octiles (males) and quartiles (females).
Darker shading indicates a higher proportion of Soldiers at risk of injury.
SPOTLIGHT

SLEEP, INJURY, AND PHYSICAL PERFORMANCE

The American Academy of Sleep Medicine and Sleep Research Society recommends that adults 18–64 years old get 7 or more hours of sleep per night (AASM/SRS 2015). Poor sleep can result in fatigue, which can contribute to factors influencing injury risk, such as reduced proprioceptive ability (i.e., the body’s ability to perceive its own position), changes in gait and balance, ligament laxity, and alterations in muscle activity (Candau 1998, Dickin 2008, Rozzi 1999, Sakai 1992). A recent investigation found that U.S. Army Special Operations Command Soldiers who slept less than 8 hours per night were 1.2 to 2.4 times more likely to experience a MSKi compared to those who slept 8 or more hours per night (Grier et al. 2020). Since approximately 60% of Soldiers are getting less than the recommended 7 hours of sleep per night (AASM/SRS 2015), interventions to improve sleep duration in Army populations may have a positive impact on musculoskeletal injury prevention and physical performance. For more information on sleep education, contact your local Army Wellness Center.

Sleep deprivation adversely affects both aerobic and resistance training performance (Fullagar 2015). Poor sleep quality has also been linked to a lower likelihood of meeting aerobic and resistance training recommendations from the U.S. Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (Lentino et al. 2013). Soldiers who get the recommended 7 or more hours of sleep per night are more likely to have lower body fat and higher aerobic endurance. To optimize sleep, reduce the risk of MSKi, and maintain or improve performance, Soldiers can implement three sleep strategies: establish a target bedtime and stick with it; sleep in a comfortable, cool, quiet, dark, and safe area; and relax and wind down 30–60 minutes before going to sleep.

Interventions to improve sleep duration in Army populations may have a positive impact on musculoskeletal injury prevention and physical performance. For more information on sleep education, contact your local Army Wellness Center.

MUSCULOSKELETAL INJURY INCIDENCE AND HOURS OF SLEEP PER NIGHT, U.S. ARMY SPECIAL OPERATIONS COMMAND SOLDIERS, 2018

Soldiers who slept less than 8 hours per night were 1.2 to 2.4 times more likely to experience a musculoskeletal injury.

The Army Health Hazard Assessment Program provides support and assessments throughout the Army acquisition lifecycle process. This support involves evaluating new materiel systems, such as individual Soldier equipment and weapons, for potential occupational health hazards prior to fielding. These assessments require medical criteria, injury models, system test data, and assessment tools to identify and evaluate potential hazards associated with normal use of a system and to formulate recommendations for eliminating or controlling those hazards. Newly developed injury and medical criteria must be compatible with current design standards to ensure the consistency of hazard assessments for specific potential injury categories such as HSM. Injury models for HSM should provide the capability to assess neck response to chronic and acute exposures to Soldiers in military environments. In support of this effort, the U.S. Army Aeromedical Research Laboratory (USAARL) is developing HSM criteria for delivery to the APHC Health Hazard Assessment Division in FY23. The USAAR Laboratory is also collaborating with Army stakeholders to deliver standardized methodology for measuring HSM, and with academic and military partners to develop expanded HSM injury risk criteria.

This effort to develop and share technology to address HSM is based on a 3-phased approach: understand the problem, develop applicable medical criteria for assessment of health hazards, and calculate and report the risk of potential HSM injuries. Army leaders can use this information to understand and mitigate HSM exposures, improve readiness, decrease costs, and improve the long-term well-being of Soldiers. Future efforts will address HSM risk associated with flight operations and ground vehicles.
**SPOTLIGHT**

**MOUTHGUARDS – KEEPING MORE THAN JUST YOUR SMILE SAFE**

A N INJURY RELATED TO THE MOUTH AND face is known as an orofacial injury, examples of which include jaw fractures, soft tissue lacerations, and fractured/dislocated teeth. While the injury itself may be confined to a small area, the consequences can extend well beyond. Orofacial injuries can be accompanied by substantial, long-lasting functional, financial, and emotional burdens (Knapik et al. 2020). Within the Army, these injuries can lead to medical profiles and lost workdays, threatening military readiness.

A mouthguard is a piece of equipment designed to reduce the risk of an orofacial injury by cushioning and redistributing the force from an impact (Knapik et al. 2007). Commanders are directed to enforce mouthguard use during specific training activities such as rifle/bayonet and pugil stick training per Army Regulation 600-63 (DA 2015). However, a multitude of activities and sports have the potential to injure the orofacial region. The American Dental Association (ADA) has identified 29 activities which warrant mouthguard use, including skateboarding, basketball, weightlifting, and bicycling (ADA 2006). While Soldiers are required to use mouthguards during specific activities, there is great value in encouraging mouthguard use during any activity that presents risk for an orofacial injury, both on and off duty.

Custom-fitted mouthguards provide the highest level of comfort, fit, and most importantly, protection (ADA 2006). Many military dental treatment facilities have the capability to manufacture mouthguards at a Soldier’s request. Two additional types of mouthguards include stock (ready-to-wear) and boil-and-bite. While these types are less expensive and do not require a visit to the dentist, they also do not fit as well, thereby offering a lower level of protection than a custom-fitted mouthguard (ADA 2006). Soldiers’ proper use of mouthguards, both on and off duty, will help preserve and promote the health of the Force.

**SPOTLIGHT**

**DEPARTMENT OF THE ARMY CIVILIAN WORK-RELATED INJURY CLAIMS AND LOST DAYS**

THE U.S. ARMY EMPLOYS APPROXIMATELY 330,000 Department of the Army (DA) Civilians (DA 2018), known as the Army Civilian Corps. These personnel work in a variety of settings, including military installations and industrial, office, and healthcare settings. DA Civilians build and repair vehicles, electronics, weapons, and materiel; provide technical and administrative support; provide medical care; and perform numerous other functions in support of Soldiers. Like their military counterparts, DA Civilians may suffer injuries related to their job requirements. These injuries cost the Army in both direct (e.g., medical) and indirect (e.g., lost time, temporary replacement workers) costs. For example, the Army paid over $3.4 million in Workers’ Compensation costs related to new claims from July 2019 through June 2020. Understanding likely causes of injuries and where these injuries frequently occur can help focus efforts to prevent injuries to the DA Civilian workforce.

In 2019, the highest number of lost days due to DA Civilian injuries were the result of slips/trips/falls, followed by handling materials/equipment, and injuries involving a vehicle/aircraft/watercraft. Similarly, the injury categories with the highest reported number of claims included slips/trips/falls, handling materials/equipment, and injuries involving a vehicle/aircraft/watercraft (DOD 2020a; see figure).

The occupational categories that experienced the highest rate of lost days were sheet metal mechanics, fire protection and prevention, and maintenance mechanics. Similarly, the highest lost time case rates were among the maintenance mechanics, fire protection and prevention, and sheet metal mechanics categories (DOD 2020a).

There is value in understanding the primary causes of lost time and Workers’ Compensation claims, as well as the occupational categories most impacted by work-related injuries. The variety of jobs performed by DA Civilians necessitates identifying highest-risk tasks and jobs, as well as tailoring and prioritizing related assessments and interventions to effect the greatest possible impact and strongest return on investment. Reducing the occurrence and minimizing the severity of these injuries will decrease costs and improve morale, retention, and mission readiness.
Behavioral Health

The stresses of military life can strongly influence the psychological well-being of Soldiers and their families. Behavioral health conditions, particularly when unrecognized and untreated, can adversely impact Soldiers' medical readiness. Behavioral health conditions are also risk factors for other adverse outcomes, such as impaired job performance, early discharge from the Army, and suicidal behavior.

The prevalence of behavioral health disorders was estimated using specific diagnostic codes from inpatient and outpatient medical records in the MDR. In 2019, 16% of Soldiers had a diagnosis of one or more behavioral health disorders, which include adjustment disorders, mood disorders, anxiety disorders, posttraumatic stress disorder (PTSD), substance use disorders (SUDs), personality disorders, and psychoses. Identifying behavioral health concerns early and encouraging Soldiers to seek treatment are priority goals of the Army and lead to better long-term outcomes. Soldiers who do not receive timely treatment for behavioral health concerns are at risk for negative outcomes and decreased readiness.

Overall, 16% of Soldiers had a diagnosed behavioral health disorder. Prevalence ranged from 9.9% to 26% across Army installations.

Prevalence of Behavioral Health Disorder Diagnoses by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

The prevalence of any behavioral health diagnosis was higher among female Soldiers relative to male Soldiers in all age and race categories. Behavioral health diagnoses were more common among older Soldiers relative to younger Soldiers (<35 years of age); prevalence was 5% higher for older White (Not Hispanic or Latino), Asian, and Native Hawaiian/Pacific Islander Soldiers. Asian and Native Hawaiian/Pacific Islander Soldiers had the lowest prevalence of behavioral health diagnoses, and Black or African American Soldiers had the highest prevalence of behavioral health diagnoses.

Females (24% Average)

Males (14% Average)

Prevalence of Behavioral Health Disorder Diagnoses by Condition, AC Soldiers, 2019

The most common behavioral health diagnosis was adjustment disorder. The proportion of female Soldiers diagnosed with adjustment disorder, anxiety disorder (excluding PTSD), or mood disorder was twice that of male Soldiers (e.g., 15% and 7.5% for adjustment disorder, respectively). Substance use disorder was the only behavioral health condition for which the prevalence among male Soldiers exceeded that among female Soldiers (3.7% and 2.6%, respectively).

Prevalence of Behavioral Health Disorder Diagnoses by Condition, AC Soldiers, 2015–2019

The proportion of AC Soldiers with a diagnosed behavioral health disorder changed little over the last 5 years.

MEDICAL METRICS
Profiles for Behavioral Health Issues, AC Soldiers, 2019

During 2019, behavioral health issues were the second most frequent reason for temporary profiles after injury (see page 19 for details). Approximately 18,000 Soldiers were placed on temporary profiles longer than 7 days for issues related to behavioral health. The mean length of these profiles was 82 limited duty days. Adjustment disorder accounted for the largest number of behavioral health profiles, affecting approximately 6,300 Soldiers (34% of those with behavioral health profiles). Profiles for substance abuse treatment, which affected approximately 1,100 Soldiers (6%) were the longest of the behavioral health profiles (86 limited duty days, on average).

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### SPOTLIGHT

**ADDRESSING STIGMA AND BARRIERS TO RECEIVING BEHAVIORAL HEALTH CARE**

Receiving BH treatment still carries stigma both in the military and society at large. Many Soldiers express reluctance to receive BH treatment due to fears that it might impact their careers or that they might be treated differently by their peers or leaders. Soldiers also sometimes avoid receiving BH treatment because they feel they should be able to handle problems on their own, or because they have negative perceptions of what the treatment will be like. The Army has been actively addressing stigma and other barriers to BH treatment through a combination of education, research, and routine screenings for BH problems during periodic and deployment health assessments, as well as during primary care visits.

BH conditions are afforded the same levels of confidentiality and privacy protections as other medical issues. Soldiers can choose from a range of available BH treatment options (e.g., talk therapy, behavioral therapy, medications), and Soldiers receiving BH treatment always have the opportunity to provide their input in the shared decisions that are made regarding their care. BH providers work with Soldiers to determine the optimal plan for ensuring health, well-being, and mission readiness.

BH treatment is an important part of the comprehensive medical services available to Soldiers and their Families. Army leaders are at the front lines of combating stigma and other barriers to BH care; their continued attention to these issues is a key factor in contributing to optimal mission readiness.

**WAYS TO RECEIVE BH HELP**

1. **Self-Referral**
   - Walk-in to an installation BH clinic, and ask for an appointment.

2. **Provider Referral**
   - Ask your Primary Care Provider; some BH providers are located in the same building.

3. **Urgent Need**
   - Go to the nearest emergency room, or call the National Suicide Prevention Hotline at 1-800-273-8255.

**MEDICAL METRICS**

**SPOTLIGHT**

**INCLUDED BUT NOT COUNTED—LACK OF SEXUAL ORIENTATION DATA HAMPERs HEALTH OF THE FORCE**

Despite the 2011 repeal of “Don’t Ask, Don’t Tell”—the policy that prohibited openly lesbian, gay, and bisexual (LGB) persons from military service—the U.S. Army still lacks an understanding of the health status and disparities experienced by LGB Soldiers.

The biannual Workplace and Gender Relations Survey of Active Duty Members (Office of People Analytics 2018) reported that 14% of female and 4% of male Soldier respondents identified as LGB. Further, this survey found that LGB Service members experienced sexual assault at rates far higher than their non-LGB peers (see figure).

Additional evidence of health disparities was revealed in the 2015 Health Related Behaviors Survey where 5% of heterosexual female Service members had ever attempted suicide compared to 9% of lesbian female Service members and 15% of bisexual female Service members (Beymer et al. 2021).

These studies signal unique health and readiness implications for LGB Soldiers, yet most Department of Defense (DOD) health surveys fail to collect sexual orientation demographics. Since 2015, the U.S. Surgeon General has flagged the deficit of sexual orientation data in the Healthy People project and has established objectives to improve health data collection for LGB populations (DHHS 2020). The lack of demographic data on LGB Soldiers means that ASLs are unaware of the issues affecting the personal and professional lives of 5% (or more) of their Soldiers. Engaging in targeted data collection will allow the Army to assess the needs of LGB Soldiers (and, by extension, their Families) more accurately, thus facilitating policy and programs that ensure equitable health outcomes for all Soldiers, regardless of sexual orientation.

![Sexual Assault among AC Service Members by Sexual Orientation, 2016 and 2018](image)

**Source:** Office of People Analytics 2018

Non-Lesbian, Gay, or Bisexual includes respondents who selected Heterosexual or straight, Other, or Prefer not to answer.
INTIMATE PARTNER VIOLENCE, AGE, TREATMENT COMPLETION, AND RECIDIVISM

INTIMATE PARTNER VIOLENCE (IPV) IS DEFINED as physical violence, sexual violence, or emotional abuse by a current or former spouse or intimate partner. IPV is a serious, treatable, public health problem (WHO 2012). In the military, unique life stressors that elevate the risk for IPV include multiple deployments, family separation and reintegration, combat-related brain injuries, frequent relocations, financial strains, higher rates of alcohol abuse, and military cultural norms (CRS 2019). IPV can lead to separation/divorce, pending loss of career, demotion, and increased risk for mental health conditions like posttraumatic stress disorder, all of which are risk factors associated with suicide ideation and attempt (Bachynski et al. 2012; Bossarte et al. 2012; Hyman et al. 2012; LeardMann et al. 2012).

In FY19, the Army Family Advocacy Program (FAP) received over 3,700 reports of IPV (DA 2020c). Of those, over 1,800 spouse and intimate partner abuse incidents were substantiated (i.e., met the DOD definition of abuse and were adjudicated by the Incident Determination Committee) (DOD 2016a, DA 2020c). Five-year data (see figure) demonstrate that 96% of Soldiers and Families who completed treatment did not experience a recurrence of IPV in the following year; however, only 73% of Soldiers initiated treatment, and only 55% completed treatment.

To address IPV, Army leaders should—
1. Understand the ongoing data collection to monitor violence and the attitudes and beliefs that perpetuate IPV.
2. Support research on the causes, consequences, and costs of IPV and effective prevention measures.
3. Deepen their understanding of both the risk and protective factors related to violence, focusing on identifying key factors that are modifiable.

People in positions of authority and influence (e.g., Officers, Noncommissioned Officers, Chaplains, healthcare providers) can play an essential role in raising awareness of IPV. Unit commanders are encouraged to prioritize IPV, as it impacts the health and well-being of unit personnel, their Families, and the Force.

Results of Soldier IPV Offender Treatment Programs, 5-year average, FY15–19

<table>
<thead>
<tr>
<th>Number of Soldier IPV offenders</th>
<th>1,626</th>
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<tr>
<td>Soldier IPV offenders with substantiated cases that completed treatment</td>
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</tr>
<tr>
<td>Soldier IPV offenders who completed treatment and did not have a follow-on incident within 12 months</td>
<td>864</td>
</tr>
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</table>

Source: DA 2020c.
Substance Use

Substance use disorder includes the misuse of alcohol, cannabis, cocaine, hallucinogens, opioids, sedatives, or stimulants. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5®), a substance use disorder diagnosis is based on evidence of impaired control, social impairment, risky use, and pharmacological criteria (APA 2013). The misuse of alcohol, prescription medications, and other drugs can impact Soldier readiness and resilience and may have negative effects on Family, friends, and the Army community. Drug and alcohol overdose is the leading method of suicide attempts (APHC 2017b). The Army continues to adapt prevention and treatment efforts to the unique characteristics of military life and culture.

In Health of the Force, substance use disorder prevalence was estimated using specific diagnostic codes from inpatient and outpatient medical encounters in the MDR. Overall, more than 17,000 Soldiers were diagnosed with a substance use disorder in 2019.

Prevalence of Substance Use Disorder Diagnoses by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

More than 17,000 Soldiers were diagnosed with a substance use disorder in 2019. The prevalence of substance use disorders generally decreased with age. Prevalence was greater among Soldiers under the age of 25 compared to those in any other age group. Male Soldiers had a higher prevalence of substance use disorder diagnoses relative to female Soldiers in all age and race categories. The highest prevalence of substance use disorder diagnoses was observed among American Indian/Alaskan Native Soldiers, followed by Black or African American Soldiers. The lowest prevalence was observed among Asian Soldiers.

Female (2.6% Average)

<table>
<thead>
<tr>
<th>Age</th>
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<td>25-34</td>
<td>5.1%</td>
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<tr>
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Male (3.7% Average)

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<tbody>
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<td>35-44</td>
<td>5.0%</td>
</tr>
<tr>
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<td>8.1%</td>
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</tbody>
</table>

American Indian/Alaskan Native
Asian
Black or African American
Native Hawaiian/ Pacific Islander
White (Not Hispanic or Latino)
Hispanic

Overall, 3.5% of Soldiers had a substance use disorder.
Prevalence ranged from 1.4% to 7.0% across Army installations.

REDUCING EXCESSIVE ALCOHOL USE: A JOINT RESPONSIBILITY

EXCESSIVE ALCOHOL USE THREATENS SOLDIER and Family health and readiness by increasing risks for injuries, suicides, IPV, and sexual assaults. Binge drinking (for men: five or more drinks per occasion; for women: four or more drinks) is the most common form of excessive alcohol use (CDC 2020b).

Data from a random sample of Soldiers in 2015 showed that approximately 28% reported binge drinking in the past month (Meadows et al. 2018). Although many factors influence excessive alcohol use, Soldier perceptions about drinking in the military and the availability of non-drinking recreation are strongly associated with drinking patterns. For example, in a recent survey of over 4,000 Soldiers, respondents who endorsed statements that alcohol use and binge drinking were the “norm” were 1.5 to 2.5 times as likely to screen positive for excessive alcohol use (APHC 2019b; see figure). Soldiers who reported a lack of non-drinking recreational activities were more than 3 times as likely to screen positive for excessive alcohol use.

At the direct leadership level, leaders have an opportunity and responsibility to shape unit climates and group norms to actively discourage binge drinking and promote help-seeking for Soldiers who may experience alcohol-related problems. Leaders can also support their units by identifying and promoting non-drinking off-duty activities, particularly for underage Soldiers.

Binge drinking and its devastating costs and consequences to Soldiers and Families are preventable. To advance efforts at the direct leadership level, ASLs should work with local governments and the communities surrounding installations to implement available, evidence-based public health strategies to reduce excessive alcohol use, such as reducing the density of alcohol outlets around and on post, limiting hours of sale, and enhancing enforcement of underage drinking laws (CPSTF 2020).

Soldier Endorsement of Norms about Excessive Alcohol Use at a U.S. Army Installation

Community
- Drinking is part of being in the military. (36%)
- It’s hard to fit in this command if you don’t drink. (12%)

Relationship
- Peers at my rank think getting drunk is acceptable. (26%)
- Leadership tolerates off-duty intoxication. (34%)

Individual
- Drinking is encouraged at parties at my installation. (23%)
- Drinking is part of being in my unit. (15%)
- Drinking is part of being in the military. (36%)
- It’s hard to fit in this command if you don’t drink. (12%)
- Peers at my rank think getting drunk is acceptable. (26%)
- Leadership tolerates off-duty intoxication. (34%)

Source: Adapted from the CDC Social-Ecological Model (CDC 2020b)
Numbers indicate the percentage of Soldiers who agreed or strongly agreed with the statement (APHC 2019b).
High-quality sleep is critical to Soldier readiness and mission success. Quality sleep can help increase productivity and decrease the risk of accidents, errors, and injuries. The prevalence of sleep disorders that can impair readiness and function, including sleep apnea, insomnia, hypersomnia, circadian rhythm sleep disorder, and narcolepsy, were assessed.

The prevalence of sleep disorders was determined using specific diagnostic codes from inpatient and outpatient medical encounter records in the MDR. Soldiers may have more than one sleep disorder; however, the overall prevalence of sleep disorders represents the percentage of AC Soldiers who have at least one of the sleep disorders assessed.

Overall, 14% of Soldiers had a diagnosed sleep disorder. Prevalence ranged from 6.9% to 25% across Army installations.

Sleep apnea and insomnia diagnoses made up more than 50% of the diagnosed sleep disorders in 2019. Sleep apnea accounted for 39% of all sleep disorder diagnoses. The majority of these diagnoses were for obstructive sleep apnea, a disorder that is associated with being overweight or obese. The percentage of males diagnosed with sleep apnea was over two times greater than that of females. Insomnia accounted for 34% of sleep disorder diagnoses. In contrast to sleep apnea, the percentage of females diagnosed with insomnia was over 1.5 times greater than that of males.

The prevalence of both sleep apnea and insomnia was highest among Black or African American Soldiers.
Obesity is a risk factor for cardiovascular disease, metabolic syndrome, type II diabetes, hypertension, and other diseases. Early studies of SARS-CoV-2 patients indicate that being overweight or obese increases risk of hospitalization, poor disease outcomes, and mortality.

BMI provides an estimate of body fat in adults and is calculated by dividing weight in kilograms by the square of height in meters. The measurements used to calculate BMI are non-invasive and inexpensive to obtain. For the Health of the Force, BMI was calculated using Soldiers’ height and weight measurements obtained during outpatient medical encounters and stored in the Military Health System Clinical Data Repository Vitals (CDR Vitals). The CDC defines BMI greater than 18.5 but less than 25 as “normal weight,” BMI greater than or equal to 25 but less than 30 as “overweight,” and BMI greater than or equal to 30 as “obese.” While BMI does not differentiate between lean and fat mass, BMI greater than or equal to 30 typically indicates excess body fat.

Although BMI provides a good estimate of body fat for a population, accurate assessment of body fat for individuals requires more information. The relationship between BMI and body fat is influenced by age and sex. Among males, especially younger males, BMI is more highly correlated with lean muscle mass than percent body fat. Males and females of a given height and weight will have the same calculated BMI; however, females will have, on average, a higher percent body fat compared to males. As males and females age, they tend to lose muscle mass, and percent body fat increases.

The overall prevalence of obesity among AC Soldiers was 17%. Among Soldiers of both sexes, the prevalence of obesity increased with age until the mid-40s. Obesity prevalence was lowest for Asian Soldiers and highest for Native Hawaiian/Pacific Islander Soldiers.

* The prevalence of obesity among Soldiers was lower compared to the employed U.S. adult population, after adjustment for differences in distributions of age and sex.

Source: Behavioral Risk Factor Surveillance System (BRFSS 2020)
IMPACT OF AGE AND SEX ON BODY COMPOSITION AND PHYSICAL FITNESS OF SOLDIERS

Soldiers must maintain adequate levels of physical fitness to perform physically demanding military tasks, including ruck marching, digging trenches, unloading equipment, etc. (Friedl 2015). Given the emergence of gender- and age-neutral fitness standards in the new ACFT (DA 2020d), it is important to understand how age and sex are related to Soldier body composition and fitness.

As Soldiers age, a decline in physical fitness and an increase in body fat typically occur (Anderson 2014, Dada 2017, Vogel 1992). Males exhibit higher levels of aerobic fitness and muscle strength than females (Friedl 2012, Vogel 1992). Although females have lower body mass index (BMI) than males, females exhibit higher percentages of body fat (Friedl 2012). Higher body fat percentages and BMIs are associated with lower aerobic fitness and slower run times (Anderson et al. 2014, Friedl 2012, Pierce 2017).

The figures show 2017 data on age and gender with body fat, BMI, 2-mile run times, push-ups, and sit-ups on the APFT for 123,963 male and 21,462 female Soldiers (DTMS 2017). These data indicate that for any measure of physical fitness (e.g., aerobic fitness, muscle endurance, body composition), older males exhibit lower levels of physical fitness than their younger counterparts, and females do not perform as well as males. These data suggest females and older males can be expected to not perform as well, on average, for any of the six events in the new ACFT.

These relationships are important to keep in mind as the Army moves to gender- and age-neutral fitness standards. The ACFT will not only narrow traditional gaps in fitness but may also inspire Soldiers to maintain their fitness levels throughout their careers.

Notes:
*Body fat percentages were calculated using well accepted age- and gender-adjusted equations (Gallagher et al. 2000).
Medical Metrics

Tobacco Product Use

Using tobacco products negatively impacts Soldier readiness by impairing physical fitness and by increasing illness and absenteeism (DA 2015). In Health of the Force, the prevalence of tobacco product use is estimated using data from the Periodic Health Assessment (PHA; DOD 2016b). The PHA asks Soldiers which tobacco products they have used on at least one day in the last 30 days. For this report, smoking products are defined as cigarettes, cigars, cigarillos, bidis, pipes, and hookah/waterpipes; smokeless products are defined as chewing tobacco, snuff, dip, snus, and dissolvable tobacco products; e-cigarettes are defined as electronic cigarettes or vape pens. Soldiers complete the PHA as part of a regular physical exam which determines an individual’s ability to deploy. To avoid potential negative attention, Soldiers may choose to underreport their tobacco usage or not to report it at all.

Excluding e-cigarette use, 25% of Soldiers reported using tobacco products. Prevalence ranged from 11% to 31% across Army installations.

Prevalence of Tobacco Use by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

Regardless of sex, the majority of tobacco product users were 34 years of age or younger. Across the age groups, the prevalence of tobacco use among male Soldiers was roughly double that among female Soldiers. Tobacco use was lowest among Black or African American Soldiers or Hispanic Soldiers. Tobacco use was most common among Native Hawaiian/Pacific Islander Soldiers, followed by White (Not Hispanic or Latino) Soldiers and American Indian/Alaskan Native Soldiers.

Females (11% Average)

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>&lt;25</th>
<th>25–34</th>
<th>35–44</th>
<th>≥45</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Percent</td>
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<tr>
<td></td>
<td>15.6</td>
<td>13.1</td>
<td>18.2</td>
<td>14.7</td>
<td>7.7</td>
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</table>

Males (27% Average)

<table>
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<tr>
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<th>Total</th>
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<th>25–34</th>
<th>35–44</th>
<th>≥45</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.0</td>
<td>11.1</td>
<td>8.5</td>
<td>10.3</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Prevalence of Nicotine Product Use, AC Soldiers, 2019

Among the tobacco product use categories reported in the PHA, the largest number of Soldiers reported smoking (n=56,638; 17%), followed by the number of Soldiers who reported smokeless tobacco use (chewing or dipping) (n=42,679; 13%). A total of 32,214 Soldiers (9.4%) who completed the PHA self-reported the use of e-cigarettes.

The age- and sex-adjusted U.S. population prevalence of tobacco product use (23%) is lower than the corresponding Army prevalence (25%). In contrast, the U.S. smoking product use is higher in the US population (18%) than in the Army (17%). The difference in tobacco use is driven by smokeless tobacco product use: the adjusted Army prevalence (13%) is nearly double the age- and sex-adjusted national estimate (7.6%) (BRFSS 2020).

U.S. population tobacco use is estimated using BRFSS data, which were adjusted to the 2015 AC Soldier age and sex distribution for working age adults 18–64 years of age. Tobacco product use is defined differently in the BRFSS than in the PHA. While the PHA considers any use for at least one day in the past 30 days, BRFSS has a more stringent requirement (more than 100 cigarettes in their lifetime and currently smoking some days or every day). Therefore, AC Soldier tobacco product use prevalence estimates may be inflated relative to U.S. estimates. Comparisons of 2019 PHA data to historical PHA data and to national data should be interpreted with caution. The BRFSS did not include e-cigarette use data.

Prevalence of Tobacco Product Use by Type, Sex, and Age, AC Soldiers, 2019

For both sexes, smoking tobacco products were the primary type of tobacco used across age groups. However, e-cigarette use among female Soldiers younger than 25 neared the prevalence of smoking tobacco products. Male Soldiers most frequently reported using smoking tobacco products, followed by smokeless and e-cigarette products, across age groups. Female Soldiers most frequently reported using smoking products, followed by e-cigarette products and smokeless products, across age groups.

Females

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>&lt;25</th>
<th>25–34</th>
<th>35–44</th>
<th>≥45</th>
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<tr>
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<td>Percent</td>
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<tr>
<td></td>
<td>9.9</td>
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<td>8.9</td>
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Males

<table>
<thead>
<tr>
<th>Age</th>
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<th>&lt;25</th>
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<td></td>
<td>18.1</td>
<td>14.0</td>
<td>21.0</td>
<td>16.7</td>
<td>15.6</td>
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</table>
Tobacco use can have a negative impact on physical performance. In a study investigating tobacco use, dual users (i.e., those who used cigarettes and vape products) had the lowest average performance results on the APFT (Dinkeloo et al. 2020; figure). On average, dual users ran 32 seconds slower on the 2-mile run and performed 5 fewer push-ups and 4 fewer sit-ups compared to non-smokers. Other studies have shown relationships between smoking history and reductions in physical performance (de Borba et al. 2014, Misigoj-Durakovic et al. 2012). One study demonstrated reductions in aerobic capacity in young adults with a history of only up to 5 years of cigarette smoking (Misigoj-Durakovic et al. 2012). Therefore, even newer tobacco users may be susceptible to the negative effects of tobacco use.

### Average Army Physical Fitness Test Performance for Non-Smokers, Smokers, Electronic Nicotine Delivery System (ENDS) Users, and Dual Users*

<table>
<thead>
<tr>
<th></th>
<th>Mean APFT 2-mile Run Time (Minutes)</th>
<th>Mean APFT Push-up Performance (Repetitions)</th>
<th>Mean APFT Sit-up Performance (Repetitions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No use</td>
<td>14.60</td>
<td>65.92</td>
<td>66.83</td>
</tr>
<tr>
<td>Smoking</td>
<td>14.72</td>
<td>62.82</td>
<td>67.80</td>
</tr>
<tr>
<td>ENDS use</td>
<td>15.03</td>
<td>64.97</td>
<td>68.37</td>
</tr>
<tr>
<td>Dual use</td>
<td>15.13</td>
<td>59.86</td>
<td>65.92</td>
</tr>
</tbody>
</table>

*Dual users = smokers and ENDS users

Some positive effects of tobacco-free living include a higher level of aerobic fitness, greater muscular strength, increased likelihood of meeting sleep recommendations of 7–9 hours per night, reduced likelihood of MSKi, and faster healing of injured tissues (Knapik and Bedno 2018, Dinkeloo et al. 2020, Grier et al. 2020).

If you want to quit, your local medical treatment facility is a good place to start. Another resource is the DOD YouCanQuit2 campaign (DOD 2020b), which includes a 24/7 Live Chat feature providing support, encouragement, and information. There’s no better time to quit than now!

### If your goal is to quit smoking, here are a few ways to get started:

1. **Use nicotine replacement therapy, such as the patch, gum, lozenges, inhaler, nasal spray, and prescription medications.**

2. **Avoid triggers by replacing cravings and urges with positive behaviors such as delaying tobacco use for 5 to 10 minutes, engaging in physical exercise, and consuming fruits and vegetables (Haibach et al. 2012).**

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**LOCAL ACTION**

**Up in Smoke: Decreasing Vaping Rates in the Military District of Washington**

The Military District of Washington (MDW) installations include Joint Base Myer-Henderson Hall (JBM-HH), Fort Meade, and Fort Belvoir. Of the 30 installations in the continental U.S. analyzed for 2018, Soldiers at JBM-HH and Fort Meade reported the highest electronic cigarette use at 11% and 10%, respectively.

In response to high rates of electronic cigarette use, senior installation leaders directed the development of safety briefing materials to enable first-line squad leaders to support vaping deterrence efforts. Additionally, in coordination with MDW, the APHC developed a strategic communication plan to reach Service members, Family members, and Civilians. MDW worked with the APHC experts in toxicology and health promotion to develop materials that support tobacco and electronic cigarette use behavior change across the National Capital Region.

In August 2020, the APHC presented a briefing on health effects and communication strategies aligned to vaping dangers and their subsequent potential impact on Soldier readiness and resilience. Following this presentation, the team developed products which included a safety briefing training support package, short video vignettes tailored to social media platforms, information graphics to amplify the dangers from vaping, and tobacco cessation resources. These resources are available for Army-wide utilization on the APHC website at: https://phc.amedd.army.mil/topics/healthyliving/tfl/Pages/Vaping.aspx (APHC 2020b).

**Do you know what’s REALLY in an e-cigarette?**

- Formaldehyde
- Acetaldehyde
- Acrolein
- Nicotine

These chemicals might cause cancer and respiratory diseases. **Think before you vape.**

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**IMPACTS OF TOBACCO USE ON PHYSICAL PERFORMANCE**

**Figure:** Impact of tobacco use on physical performance.
Heat Illness

Heat illness refers to a group of conditions that occur when the body is unable to compensate for increased body temperatures due to hot and humid environmental conditions and/or exertion during exercise or training. These illnesses exist along a continuum of symptoms and, in the most severe cases, can be life threatening. The heat illnesses assessed in Health of the Force include heat exhaustion and heat stroke. These are reportable medical events that should be reported through the Disease Reporting System internet (DRSi).

Heat illness was determined using specific diagnostic codes from inpatient and outpatient medical encounter records in the MDR, in addition to cases of heat exhaustion and heat stroke reported through DRSi. An incident case is defined as an AC Soldier who had one or more qualifying heat exhaustion or heat stroke diagnoses, or who was reported as a case of heat exhaustion or heat stroke in the calendar year 2019. Soldiers who experienced more than one heat illness event in the calendar year were only counted once.

Incident Cases of Heat Illness by Month*, AC Soldiers, 2019

In 2019, 1,427 incident cases of heat illness occurred. Of the incident cases, the majority (79%) were heat exhaustion, and the remaining 21% were heat stroke. Although heat exhaustion and heat stroke were diagnosed and reported year-round, the number of incident cases of heat illness was highest during the warmer months (May through September).

Incident Cases of Heat Illness by Age, AC Soldiers, 2019

In 2019, 69% of heat exhaustions and 63% of heat strokes occurred in AC Soldiers younger than 25 years old.
HEAT STRAIN DECISION AID KEEPS SOLDIERS SHARP AND READY TO FIGHT

SOLDIERS OFTEN WORK IN EXTREMELY HOT and humid environments. In 2015, there were 2,350 incident diagnoses of heat illness among AC Service members (AFHSB 2016). Cadre leaders find themselves having to mitigate the potential causes of heat illness among their troops to maintain a high level of readiness.

The U.S. Army Medical Materiel Development Activity (USAMMDA) is developing the Heat Strain Decision Aid (HSDA), a smartphone app that simplifies the many variables involved in calculating an optimal work/rest cycle at both the individual and unit levels. The user enters values into the HSDA for weather, time of day and year, hydration, work intensity, and uniform, and the app calculates the likelihood of heat injuries based on that information. Uptake of this personalized tool will help Army leaders reduce the unknowns associated with heat illness. In this development effort, the USAMMDA partnered with the United States Army Research Institute of Environmental Medicine, which developed the algorithm used for the predictions.

The HSDA will also be used at the unit level to help Soldiers acclimatize safely to new environments and training activities. The app will assist unit leaders with mission planning, such as requiring the appropriate amount of clothing, load, hydration, rest, first aid, and on-the-ground medical personnel, based upon the prediction of heat injuries that may occur over the course of the mission.

After undergoing an operational assessment in July 2021, the HSDA will be deployed on Nett Warrior devices and the U.S. Army Training and Doctrine Command App Gateway. The HSDA will provide commanders, leaders, training cadre, and the preventive medicine community with a tool that will allow for greater awareness of heat illness and subsequently maximize Force readiness.
Hearing

Good hearing preserves situational awareness during critical communication and auditory tasks (e.g., verbal conversation, acoustic stealth, sound detection, sound identification, and sound localization) and is crucial to the success of training and both conventional and unconventional operations. Hearing readiness is an essential component of medical readiness and is monitored via the Medical Protection System (MEDPROS) using Defense Occupational and Environmental Health Readiness System – Hearing Conservation (DOEHRS-HC) hearing test data. The Army Hearing Program (AHP) uses hearing metrics to monitor hearing injuries and hearing readiness among AC Soldiers.

Percent New Significant Threshold Shifts, AC Soldiers, 2015–2019

Overall, new significant threshold shifts (STS) decreased from 2015 to 2019, though a small increase of 0.35% was noted between 2018 and 2019. An STS is a measure of hearing injury and is an average hearing decrease, in one or both ears, across three critical speech frequencies. A Soldier’s annual hearing test is evaluated against their baseline hearing test for the presence of an STS. In 2019, 4.2% of AC Soldiers experienced an STS, exceeding the AHP hearing injury goal of less than or equal to 3%.

Prevalence of Projected Hearing Profiles, AC Soldiers, 2015–2019

The prevalence of projected hearing profiles among AC Soldiers continues to decline. AC Soldiers with a projected hearing profile indicative of clinically significant hearing loss (i.e., an H-2 profile) decreased from 3.2% in 2015 to 2.6% in 2019. AC Soldiers with a projected profile indicative of at least a moderate hearing loss and requiring a fitness-for-duty hearing readiness evaluation (i.e., hearing profile ≥H-3) decreased from 1.1% in 2015 to 0.80% in 2019.

Percent Not Hearing Ready – HRC 4, AC Soldiers, 2016*–2019

In 2019, 6.9% of AC Soldiers were “Not Hearing Ready” and were assigned Hearing Readiness Classification 4 (HRC 4). This is an increase from 2018 and above the desired AHP goal of ≤6%. AC Soldiers who are “Not Hearing Ready - HRC 4” are either overdue for their annual hearing test (HRC 4A), require follow-up hearing testing to identify their true hearing ability (HRC 4B), or missed the 90-day follow-up hearing test window (HRC 4C).

Hearing is a necessity for Soldier performance, affecting both survivability and lethality. Hearing injuries impact mission performance during garrison activities, training, deployments, and combat. Soldiers are susceptible to noise-induced hearing loss (NIHL), in part, because such injuries are often painless, progressive, and lack the immediacy for medical care associated with an open wound or broken bone. NIHL is preventable with the use of noise control engineering, monitoring audiometry, appropriate hearing protection, hearing health education, and AHP command enforcement!

Contact your installation AHP Manager, Regional Health Command Audiology Consultant, or the APHC AHP for assistance.

What you hear—or don’t hear—matters!
Sexually Transmitted Infections

Chlamydia is the most commonly reported sexually transmitted infection (STI) in the U.S., with about 4 million new infections estimated each year (CDC 2021). It is often referred to as the silent infection because most infections do not cause symptoms, leaving people unaware that they are infected. Without treatment, chlamydia can lead to reproductive health complications such as pelvic inflammatory disease, ectopic pregnancy (i.e., pregnancy outside the uterus), chronic pelvic pain, and infertility, all of which can compromise Soldier readiness and well-being.

Screening is essential to prevent transmission and the progression to severe disease outcomes which disproportionately affect women. The U.S. Preventive Services Task Force (USPSTF) recommends that sexually active females under 25 years of age, and those at increased risk (e.g., individuals with multiple partners), be screened annually.

For the Army AC population, chlamydia cases reported by military MTFs were identified using the DRSi. Incidence rates reflect all new infections; therefore, Soldiers may have more than one chlamydia infection per calendar year. Rates presented are conservative, in part, because of the high proportion of non-symptomatic infections which may evade detection and reporting.

Overall, 24 new chlamydia infections were reported per 1,000 person-years. Incidence ranged from 11 to 41 per 1,000 person-years across Army installations.

Incidence of Reported Chlamydia Infection by Sex, Race, and Ethnicity, AC Soldiers, 2019

Disparities in rates of reported chlamydia infections were observed by race and ethnicity, with higher rates observed among Black or African American Soldiers (rates were more than 3 times those reported among White (Not Hispanic or Latino) Soldiers). Native Hawaiian/Pacific Islander Soldiers and Hispanic Soldiers had rates that were roughly twice the rate observed among White (Not Hispanic or Latino) Soldiers. These disparities by race and ethnicity were observed among both male and female Soldiers. Notably, rates among male Black or African American Soldiers were 2–4 times higher than rates among male Soldiers identifying as another race or ethnicity. Similar differences in chlamydia incidence by race and ethnicity have been observed nationally (CDC 2021a).

Incidence of Reported Chlamydia Infection by Sex and Age, AC Soldiers, 2019

The rate of reported chlamydia infections among female Soldiers was nearly 3 times the rate among male Soldiers. Rates were highest among female Soldiers under 25 years of age, with 107 reported infections per 1,000 person-years. These rates may be partially due to increased screening among pregnant females and female Soldiers under 25 years.

Incidence of Reported Chlamydia Infection by Sex, AC Soldiers, 2015–2019

A steady rise in reported chlamydia infections has occurred over the past 5 years, consistent with rising chlamydia incidence observed nationally. There has been a steady increase in rates of chlamydia among Soldiers, resulting in a 39% increase since 2015. Greater increases were observed among male Soldiers over this period (a 41% increase compared to a 28% increase observed among female Soldiers).
4.8

4.8

56

56

57

57

case definitions. The NEDSS and the military’s DRSi track chlamydia and other nationally notifiable conditions using comparable

data to the CDC (CDC 2021a); these data were restricted to the 15–64 age range and were adjusted to the 2015 AC Soldier age and sex
distribution; U.S. population chlamydia rates are estimated using National Notifiable Disease Surveillance System (NNDSS) data reported by

*Army and U.S. rates adjusted by the 2015 AC Army age and sex distribution; U.S. data include 15–64-year-olds

Source: Military Health System Population Health Portal (MHSPHP) available through Carepoint.

COMPARISON WITH U.S. RATES

Age- and Sex-Adjusted Incidence Rates of Reported Chlamydia, AC Soldiers Compared to U.S. Adults, 2015–2019*

Chlamydia incidence rates observed among AC Soldiers were more than two-fold those reported among U.S. peers after adjusting for age and sex differences between the two populations. This discrepancy is not necessarily indicative of differences in the burden of disease. Higher observed rates of infection may also be attributed to increased access to care and enhanced screening or reporting, both of which are positive attributes of a health system.

ANTIBIOTIC-RESISTANT GONORRHEA – AN URGENT HEALTH THREAT

Approximately 1.6 million new gonorrhea infections are estimated to occur annually in the U.S., making it the second most common reportable infectious disease (CDC 2021b). With up to 70% of women and up to 60% of men showing either mild or no symptoms, infections can easily spread and potentially progress to complications such as pelvic inflammatory disease and infertility (Ghanem 2018). Annual screening is recommended for high-risk groups such as women under 25 years and men who have sex with men.

Successful treatment has become increasingly challenging as the availability of effective antibiotics has rapidly diminished. Complicating matters, there are no rapid tests for antibiotic resistance that can inform treatment (CDC 2019). The continued loss of effective first-line treatments prompted the CDC to declare antibiotic-resistant gonorrhea an urgent health threat (CDC 2019). Currently, more than half of gonorrhea infections are resistant to one or more antibiotics (CDC 2021a), leaving only one class of antibiotics effective: ceftriaxone. The CDC recommends a single intramuscular injection of ceftriaxone for uncomplicated gonorrhea (St. Cyr et al. 2020). Since emerging resistance remains a concern, patients are strongly encouraged to be reevaluated by their healthcare provider if their symptoms do not resolve within a few days of treatment (CDC 2021a).

The phenomenon of antibiotic resistance has likely contributed to surging gonorrhea infection rates, which have increased nationally by 92% from a low in 2009 (CDC 2021a). Increases have also been observed in the Army. When comparing age- and sex-standardized incidence rates of gonorrhea between Soldiers and 15–64-year-olds in the U.S., the national rates are higher than those reported in the Army (Figure 1).

*Army and U.S. rates adjusted by the 2015 AC Army age and sex distribution; U.S. data include 15–64-year-olds

U.S. population chlamydia rates are estimated using National Notifiable Disease Surveillance System (NNDSS) data reported by the CDC (CDC 2021a); these data were restricted to the 15–64 age range and were adjusted to the 2015 AC Soldier age and sex distribution. The NEDSS and the military’s DRSi track chlamydia and other nationally notifiable conditions using comparable case definitions.

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While adjusted rates within the Army are lower than national estimates, the continued rise in gonorrhea infections is concerning in light of increasing antibiotic resistance. Improvements in condom use, screening, therapeutics, and treatment compliance are needed to reduce transmission and combat antibiotic resistance.

Comparison with U.S. Rates

Age- and Sex-Adjusted Incidence Rates of Reported Chlamydia, AC Soldiers Compared to U.S. Adults, 2015–2019*

Chlamydia incidence rates observed among AC Soldiers were more than two-fold those reported among U.S. peers after adjusting for age and sex differences between the two populations. This discrepancy is not necessarily indicative of differences in the burden of disease. Higher observed rates of infection may also be attributed to increased access to care and enhanced screening or reporting, both of which are positive attributes of a health system.

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*Army and U.S. rates adjusted by the 2015 AC Army age and sex distribution; U.S. data include 15–64-year-olds

U.S. population chlamydia rates are estimated using National Notifiable Disease Surveillance System (NNDSS) data reported by the CDC (CDC 2021a); these data were restricted to the 15–64 age range and were adjusted to the 2015 AC Soldier age and sex distribution. The NEDSS and the military’s DRSi track chlamydia and other nationally notifiable conditions using comparable case definitions.
Chronic Disease

Many chronic diseases can limit Soldiers’ medical readiness. The chronic diseases assessed in Health of the Force include cardiovascular disease, hypertension, cancer, asthma, arthritis, chronic obstructive pulmonary disease (COPD), and diabetes. Each of these chronic diseases can be prevented and/or managed in part by adopting healthy lifestyle choices such as maintaining a healthy diet, exercising regularly, and avoiding tobacco use.

The prevalence of chronic diseases was determined using specific diagnostic codes from inpatient and outpatient medical encounter records in the MDR. Soldiers may have more than one chronic disease; however, the overall prevalence of chronic disease represents the proportion of AC Soldiers who have at least one of the chronic diseases assessed.

Overall, 18% of Soldiers had a diagnosed chronic disease. Prevalence ranged from 12% to 35% across Army installations.

Prevalence of Chronic Disease by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

Among AC Soldiers in 2019, 20% of women and 17% of men had at least one diagnosed chronic disease. The prevalence of chronic disease increased with age in the AC Soldier population. With the exception of male Soldiers 45 years and older, Black or African American Soldiers had the highest prevalence of chronic disease compared to Soldiers identifying as any other race. American Indian/Alaskan Native Soldiers had the highest prevalence of chronic disease among male Soldiers 45 years and older.

Females (20% Average)

Males (17% Average)

Prevalence of Chronic Diseases by Disease Category, AC Soldiers, 2015–2019

In 2019, 18% of AC Soldiers had a diagnosed chronic disease. The prevalence of AC Soldiers with any diagnosed chronic disease has been decreasing since 2015. The most prevalent diagnosed chronic disease was arthritis (8.9%), followed by cardiovascular disease (5.7%). Hypertension (high blood pressure), although a contributor to cardiovascular disease, was analyzed separately to characterize its distinct burden.

Prevalence of Arthritis by Sex, Age, Race, and Ethnicity, AC Soldiers, 2019

Arthritis is the common name for a group of inflammatory conditions that affect joints, the tissue around the joints, and other connective tissue. Even though the prevalence is decreasing over time, arthritis is consistently the most prevalent chronic disease among AC Soldiers. Arthritis can be related to overuse injuries and severe injuries to the joints, and is most common among Soldiers 45 years and older. In this age group, Black or African American Soldiers and American Indian/Alaskan Native Soldiers have the highest prevalence of arthritis.
Environmental Health Indicators

- Air Quality
- Drinking Water Quality
- Water Fluoridation
- Solid Waste Diversion
- Tick-borne Disease
- Mosquito-borne Disease
- Heat Risk
Air Quality

The air quality environmental health indicator (EHI) reports how frequently the outdoor air near an Army installation is in violation of U.S. health-based standards. It is quantified as the number of days in a year when air pollution levels near the installation were deemed unhealthy for some or all of the general public (i.e., days when the U.S. Environmental Protection Agency (EPA) Air Quality Index (AQI) was greater than 100).

Poor air quality can contribute to both acute and chronic health effects for personnel who train, work, exercise, or reside in an affected area. A growing body of evidence implicates air pollution in a range of health conditions including cardiovascular and respiratory disease, cancer, type 2 diabetes, adult cognitive decline, childhood obesity, and adverse birth outcomes (Bowe et al. 2018, Chen et al. 2017, Alderete et al. 2017, Sapkota et al. 2010). Additionally, recent studies report that chronic exposure to fine particulate matter increases vulnerability to the most severe COVID-19 outcomes, including death (Wu 2020).

Worldwide, the air pollutants responsible for the majority of poor air quality days are ground-level ozone, fine particulate matter known as PM\textsubscript{2.5}, and coarse particulate matter known as PM\textsubscript{10}.

Outdoor air pollution levels are measured at monitoring stations operated by State and Federal environmental authorities. Using these data, the EPA publishes a daily AQI for over 1,000 counties in the U.S. The EPA AQI is used to calculate poor air quality days at Army installations located within the U.S. At installations located outside the U.S., air quality data are obtained from host nation environmental authorities and converted to the EPA AQI to determine the number of poor air quality days per year.

Distribution of Army Installations by Air Quality Status, 2019

The chart shows the number of poor air quality days at selected Army installations in 2019. Annual poor air quality days ranged from 0 to 154, with the greatest number of days occurring at installations in Italy and South Korea.

<table>
<thead>
<tr>
<th>Poor Air Quality Days/Year</th>
<th>Italy</th>
<th>South Korea</th>
<th>U.S.-Based Installation</th>
<th>Outside U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤5 days/year</td>
<td>7,675</td>
<td>1,116</td>
<td>65.3%</td>
<td>14.2%</td>
</tr>
<tr>
<td>6–20 days/year</td>
<td>1,296</td>
<td>21,860</td>
<td>14.2%</td>
<td>6.1%</td>
</tr>
<tr>
<td>≥21 days/year</td>
<td>382</td>
<td>127</td>
<td>6.1%</td>
<td>14.4%</td>
</tr>
<tr>
<td>No data</td>
<td>113</td>
<td>436</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distribution of Army Population by Air Quality Status, 2019

The chart shows the percentage of the AC Soldiers based on the number of poor air quality days experienced at their installation. In 2019, all of the highest risk installations were located outside of the continental U.S.

<table>
<thead>
<tr>
<th>Poor Air Quality Days/Year</th>
<th>65.3%</th>
<th>14.2%</th>
<th>6.1%</th>
<th>14.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤5 days/year</td>
<td></td>
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<tr>
<td>6–20 days/year</td>
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<tr>
<td>≥21 days/year</td>
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<tr>
<td>No data</td>
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</tr>
</tbody>
</table>

What’s Happening at Army Installations?

At Army installations within the U.S., most poor air quality days were due to ground level ozone, which is elevated seasonally between May and September. Exceptions occurred at Fort Wainwright, which experienced high levels of PM\textsubscript{10} in winter months due to use of fireplaces and wood-burning stoves, and in summer months due to local wildfires in the Fairbanks area.

In Germany and Japan, most poor air quality days were due to ground-level ozone. In contrast, poor air quality days in Italy and South Korea were due primarily to PM\textsubscript{2.5}. Industrial emissions and vehicular activity are responsible for degraded air quality conditions in both locations, with South Korea experiencing an influx of PM\textsubscript{10} from seasonal dust storms originating in western China and Mongolia. Multi-year trends at USAGs Vicenza and Humphreys are shown in the charts. These installations continually experience the highest number of poor air quality days compared to other installations tracked in Health of the Force.

Climate Effects on Air Quality

Rising global temperatures driven by climate change are creating conditions that exacerbate poor air quality. In 2019, Alaska experienced record temperatures that were more than 6 degrees Fahrenheit higher than the long-term average for the state. Dry conditions resulting from this heat fueled July wildfires that burned nearly 2.5 million acres, equivalent to the combined area of Delaware and Rhode Island. These wildfires produced PM\textsubscript{2.5} levels in Fairbanks that violated U.S. air quality standards, including multiple days in the Hazardous category on the AQI. Across the U.S., scientists have documented trends that show fire seasons start earlier, end later, and result in fires that burn for longer intervals.

In addition to being a consequence of climate change, some air pollutants serve as an accelerant, creating a feedback loop. Rising temperatures create conditions conducive to wildfire, which emits carbon into the atmosphere, leading to more warming. Similarly, high temperature is a catalyst in the formation of ground-level ozone—a greenhouse gas. Thus, rising ozone levels become a cause, as well as an effect, of climate change.

Service members can stay abreast of local air quality in the U.S.—along with recommended behavior modifications—via the EPA AirNow Mobile App. In addition to real-time air quality reports, it forecasts conditions for the coming week to permit planning of outdoor activities. For locations outside the U.S., real-time air quality is available at the Air Pollution in the World website: aqicn.org.
Environmental Health Indicators

Drinking Water Quality

The drinking water quality EHI reflects whether community water systems (CWS) serving Army garrisons comply with health-based standards promulgated in the National Primary Drinking Water Regulations (NPDWR). Health-based standards protect consumers against the presence of toxic contaminants and excessive disinfectant, and obligate the use of treatment techniques to ensure a safe water supply. These standards protect against acute health effects, which develop shortly after exposure (e.g., hemorrhagic diarrhea caused by E. coli), as well as non-acute health effects. Non-acute health effects result from repeated exposure to a contaminant over a longer period of time (e.g., increased risk of bladder cancer associated with elevated trihalomethanes). Although the U.S. drinking water supply is generally considered very safe, an estimated 16.4 million cases of gastroenteritis are attributed to U.S. CWS each year (Allaire 2018). Aging infrastructure and increasingly degraded water sources present ongoing challenges to providing safe water.

In order to meet the health-based standards specified in the NPDWR, water systems are required to monitor for multiple contaminants. Monitoring frequency depends on the contaminant, with results reported to the local environmental authority. NPDWR compliance data for CWS serving Army garrisons come from an annual environmental data survey conducted by the Deputy Chief of Staff, G-9 (Installations), from the EPA Safe Drinking Water Information System (SDWIS), and from annual Consumer Confidence Reports prepared by local water purveyors.

Distribution of Army Installations by Drinking Water Quality Status, FY19

The chart shows the occurrence of health-based water quality violations at selected Army installations in FY19. Standards violated in FY19 included the Surface Water Treatment Rule (SWTR) and Stage 2 Disinfectants/Disinfection Byproduct Rule (D/DBPR). The Stage 2 D/DBPR has been violated at various Army installations in each of the last 4 years.

Distribution of Army Population by Drinking Water Quality Status, FY19

The chart shows the percentage of AC Soldiers based on drinking water violation status at Army installations in FY19. Nearly 95% of AC Soldiers had access to drinking water on their installation that met all health-based drinking water standards, which was better than Healthy People 2030 (HP2030) goal of 92.1% (DHHS 2020). Six health-based drinking water violations were documented at five Army CWS in FY19. All were violations of non-acute health effect standards. USAG Wiesbaden exceeded the copper action level, a repeat violation at Clay Kaserne. The water at USAG Stuttgart (Patch Barracks and Kelley Barracks), USAG Ansbach and USAG Wiesbaden (McCully Barracks) was not properly chlorinated, a violation of the SWTR. There were two violations of the Stage 2 D/DBPR: USAG Japan was not accurately monitoring turbidity, and Fort Riley experienced elevated trihalomethanes. Trihalomethanes can occur when chlorine based disinfectant reacts with naturally occurring organic matter in water.

What’s Happening at Army Installations?

When comparing Army CWS to those across the U.S., the Army has performed favorably since FY16. In FY19, 94.8% of the AC population at Army installations tracked in Health of the Force were served by CWS with no health-based violations, compared to the national value of 91.3% (EPA 2020). Six health-based drinking water violations were documented at five Army CWS in FY19. All were violations of non-acute health effect standards. USAG Wiesbaden exceeded the copper action level, a repeat violation at Clay Kaserne. The water at USAG Stuttgart (Patch Barracks and Kelley Barracks), USAG Ansbach and USAG Wiesbaden (McCully Barracks) was not properly chlorinated, a violation of the SWTR. There were two violations of the Stage 2 D/DBPR: USAG Japan was not accurately monitoring turbidity, and Fort Riley experienced elevated trihalomethanes. Trihalomethanes can occur when chlorine based disinfectant reacts with naturally occurring organic matter in water.

Population Served by CWS with No Reported Health-Based Violations

What’s New?

Some efforts to curtail the spread of SARS-CoV-2 have created health concerns unrelated to the virus. The shutdown of residential, commercial, and industrial properties has resulted in dormant plumbing systems and stagnant water supplies, promoting potentially hazardous conditions. Lead and copper may leach into stagnant water due to corrosion of water lines; this is exacerbated in water with higher acidity or low mineral content. Stagnant water also promotes protective conditions for pathogens such as Legionella by encouraging biofilm formation, creating undesirable water temperatures, and reducing the disinfectant level.

Although there are no national standards for re-opening buildings after a prolonged shutdown, the APhC has produced a Technical Information Paper on returning water systems to service after prolonged shutdowns (https://tiny.army.mil/r/dGNWP/). Establishing a Water Management Plan is the holistic means to protect water quality in larger buildings and healthcare facilities. It uses a risk-based approach to detect and abate hazardous conditions. This process is outlined in the American National Standards Institute (ANSI) / American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) Standard 188-2020, Legionella: Risk Management for Building Water Systems (ASHRAE 2020) and in a CDC “toolkit” (https://www.cdc.gov/legionella/wmp/toolkit/index.html). Consumers can learn more about their water quality in the annual Consumer Confidence Report for their CWS, or at the EPA SDWIS (https://www.epa.gov/enviro/sdwis-overview).
Water Fluoridation

The year 2020 marked the 75th anniversary of the commencement of community water fluoridation in the United States. Community water fluoridation is the practice of controlling the level of fluoride in drinking water so that it meets optimal levels established by the U.S. Public Health Service (PHS). The American Dental Association and CDC promote this practice as a safe, effective, cost-saving, and socially equitable means of preventing and controlling dental caries in both children and adults. The water fluoridation EHI reports the annual average fluoride concentration in the drinking water at Army installations.

Army regulations require drinking water supplies at Army installations to be “optimally fluoridated,” which refers to the CDC- and PHS-recommended fluoride level of 0.7 mg/L. Fluoride is also regulated in CWS as a requirement of the Safe Drinking Water Act (SDWA), which mandates a maximum level of 4 mg/L. Most Army water systems need to fluoridate their water to achieve a level of fluoride that will provide benefits to the consumers. However, some areas of the U.S. have naturally occurring fluoride. In these areas, water systems may need to remove fluoride in order to meet federal and state standards.

To ensure optimally fluoridated water and compliance with the SDWA, water suppliers monitor fluoride levels and report them to the local environmental authority. Data on fluoridation levels in Army CWS come from an annual survey conducted by the Deputy Chief of Staff, G-9 (Installations) and SDWA-mandated Consumer Confidence Reports.

Distribution of Army Installations by Water Fluoridation Status, FY19

The chart shows the average fluoride concentration in drinking water at selected Army installations in FY19. Fluoride concentrations ranged from 0–1.5 mg/L. The number of installations providing optimally fluoridated water increased from 17 in FY18 to 21 in FY19.

Distribution of Army Population by Water Fluoridation Status, FY19

The chart shows the percentage of AC Soldiers based on the level of fluoride in drinking water at Army installations in FY19. Less than 38% of AC Soldiers had access to installation drinking water that met the CDC-recommended fluoride level.
**Environmental Health Indicators**

### Solid Waste Diversion

The Solid Waste Diversion EHI measures the extent to which Army installations use beneficial practices such as recycling, composting, or donating to divert solid wastes from landfill and incinerator disposal. Diversion reduces the potential for waste-derived contaminants to be released from disposal sites into air, surface water, and sources of drinking water, thus reducing the second-order health risks from human exposures. The solid waste diversion rate is calculated as the mass of diverted waste divided by the mass of the total waste stream (diverted plus disposed), and is expressed as a percentage.

Land disposal and incineration create potential health hazards when waste constituents such as dioxins, chlorinated organics, and heavy metals are released to the environment via air emissions, soil gas, surface runoff, and landfill leachate. Recent studies found that residing near landfills significantly increased the likelihood of asthma, diabetes, and depression (Tomita et al. 2020), as well as respiratory disease, particularly in children (Mataloni 2016). The heightened risk of certain human cancers (bladder, brain, and leukemia) in proximity to landfills has also been documented (Lewis-Michl 1998). Diverting waste through resource reallocation efforts is a strategy to mitigate these risks.

Solid Waste Annual Reporting for the Web (SWARWeb), operated by the Deputy Chief of Staff, G-9, is the Army system of record for installation solid waste diversion data. Installations generating more than 1 ton of non-hazardous solid waste per day report facility tonnage for waste generation and diversion efforts semiannually. These and other SWARWeb data are used to compute metrics for the DOD’s Integrated Solid Waste Management Measures of Merit, reported by fiscal year.

#### Distribution of Army Installations by Solid Waste Diversion Rate, FY19

The chart shows the FY19 solid waste diversion rate at selected Army installations in FY19. Green status indicates that an installation met or exceeded the FY19 DOD solid waste diversion goal of 50%. Waste diversion rates ranged from 0–73%. Notably, 10 out of 11 installations outside the U.S. had diversion rates that were higher than the DOD goal.

#### In celebration of America Recycles Day, I am proud to announce the national goal to increase the U.S. recycling rate to 50 percent by 2030.”

—Andrew R. Wheeler, November 2020

former Administrator, U.S. Environmental Protection Agency

### How Does the Army Compare?

Of the installations tracked in this report, nearly half (21 of 43) met or exceeded the current DOD goal, which is comparable to FY18 (20 of 38 reporting data). The FY19 average solid waste diversion rate for all AC installations rose slightly from last year, reaching 45%. The FY19 DOD average diversion rate was 39%, just under the FY18 rate of 40%. Despite consistently meeting or exceeding 40% diversion from FY15–18, the DOD issued a rollback of its diversion rate goal from 50% to 40%, effective in FY20 (OSD 2020).

The Army has met the 50% diversion goal in 2 of the last 3 years. Weakening global recycling markets and the discontinuation of reimbursement for DOD recycling programs have produced uncertainty, prompting the lowered standard.

#### How much do goals affect outcomes when it comes to reducing waste? To answer this question, we look to the world’s top recyclers for components of success. Germany claims the number one spot, having recycled more than 56% of its waste and composting another 18% in 2018, a remarkable increase from 3% reported three decades earlier (Parker 2019). Germany has adopted the European Union target of 65% household recycling by 2035, as well as an aggressive goal for recycling packaging materials. South Korea recycled almost 54% in 2018, bolstered by its pledge to cut plastic waste in half by 2030 (Parker 2019). In contrast, the 2018 diversion rate in the U.S. was 32%. In 2020, after a 15-year hiatus, the EPA established a national recycling goal of 50% by 2030, but participation is voluntary.

In addition to ambitious goals, the world’s best recyclers also institute landfill bans and make manufacturers responsible for waste streams created by their products – actions the U.S. has been reluctant to take at a national level (Alexander 2020). Notably, AC Army installation recycling rates around the world generally reflect the host nations’ commitment to diverting solid waste, exceeding the 50% benchmark in all countries except the U.S.

#### Average Solid Waste Diversion Rates for Countries with U.S. Army Garrisons

<table>
<thead>
<tr>
<th>Country</th>
<th>Army Garrison</th>
<th>Host Nation</th>
<th>DOD Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: SWARWeb; Statista (Japan); EPA (U.S.); EEA 2017 (Italy, Belgium); and Parker 2019 (Germany and South Korea).
Tick-borne Disease

The tick-borne disease EHI reflects the risk of acquiring Lyme disease at Army installations. Lyme disease risk is defined as low, moderate, or high risk of coming into contact with a Lyme vector tick that is infected with the agent of Lyme disease. These ticks can be found on and around Army installations, and Soldiers can be bitten while working or recreating on-post, or when spending time outside in tick habitat off-post.

Lyme disease is the most common vector-borne disease in the U.S., with over 300,000 new cases estimated each year. Bites from blacklegged ticks (also called "deer ticks") cause the majority of Lyme disease cases in the U.S. Ticks capable of transmitting Lyme disease are found worldwide, so the risk is present abroad as well as at home. Lyme and many other tick-borne diseases have similar symptoms, such as fever, headache, rash, and fatigue, which can make them difficult to diagnose. If left untreated, Lyme disease can cause joint inflammation, memory problems, and even heart failure.

The Military Tick Identification/Infection Confirmation Kit Program (MilTICK, formerly the DOD Human Tick Test Kit Program) is a free tick identification and testing service available to DOD-affiliated personnel; approximately 3,000 ticks are submitted each year. Lyme disease risk data came from MilTICK and environmental tick surveillance conducted by the Army Regional Public Health Commands. Installations with "No Data" did not participate in MilTICK in 2019, and no Army environmental surveillance data were available for that year. Additional data were obtained from the CDC and scientific literature (CDC 2017b, Eisen et al. 2016, Li et al. 2019, Hyoung Im et al. 2019).

Presence of Lyme Disease Vector Ticks and Risk of Lyme Disease at Selected U.S. Army Installations

The likelihood of coming into contact with a Lyme vector tick infected with the agent of Lyme disease varies based on the climate, habitat, and wildlife present at an Army installation. In the U.S., Soldiers at installations in the northeast, midwest, and mid-Atlantic are at greatest risk of contracting Lyme disease, although Lyme vector ticks and the Lyme bacteria are present in many other areas.

Corona and Lyme? Not in this Army!

With COVID-19 sweeping the world, it’s easy to forget about more commonplace risks to our health. However, tick-borne diseases such as Lyme disease continue to threaten the health of Soldiers and outdoor enthusiasts. The MilTICK Program is a free service for ticks removed for DOD personnel and their beneficiaries. Any tick that has bitten an eligible person can be submitted to MilTICK by healthcare providers using kits available at DOD healthcare facilities or by individuals using a mail-in process. Ticks are identified, assessed for engorgement, and tested for human pathogens. Results are used to assess the risk associated with each tick bite. As more ticks are submitted to MilTICK, more data become available to assess tick-borne disease risk at U.S. Military installations.

Visit MilTICK at:
https://phc.amedd.army.mil/topics/envirohealth/epm/Pages/HumanTickTestKitProgram.aspx
Environmental Health Indicators

Mosquito-borne Disease

The mosquito-borne disease EHI reflects the risk of being infected with dengue, chikungunya, or Zika viruses carried by day-biting Aedes mosquitoes at Army installations. The warming global climate is increasing the range where mosquitoes can live and thrive, as well as the portion of the year when they are active and able to transmit disease (Kamal et al. 2018, Kraemer et al. 2015, Reinhold et al. 2018). This metric combines parameters characterizing the window of vector activity and disease transmission, local presence of vectors, and human case confirmation (local and travel-related) into a site-specific risk index.

Health impacts from Aedes mosquitoes range from allergic reactions and dermatitis to debilitating infection and birth defects. Mosquito-borne pathogens often circulate in mosquito populations long before human cases occur. Because of this, robust vector surveillance at the installation level is necessary to create an early warning system for mosquito-borne disease threats. Since the majority of mosquito-borne diseases have no vaccines, bite avoidance is the most important method of prevention.

Data used to derive the parameters summarized in the mosquito-borne disease EHI came from a variety of sources. These sources included state-of-the-art models on mosquito species behavior, community surveillance reports on mosquito populations, human case confirmation, and local daily weather reports provided by the U.S. Air Force 14th Weather Squadron.

Distribution of Army Installations by Mosquito-borne Disease Risk, 2019

The chart shows the risk of Aedes-specific mosquito-borne diseases at selected Army installations in 2019. While the Ae. albopictus mosquito is more likely to be found in cooler climates than its vector counterpart, Ae. aegypti, the presence of both species in an area greatly increases the risk of disease transmission.

Distribution of Army Population by Mosquito-borne Disease Risk, 2019

The chart shows the percentage of AC Soldiers at risk of Aedes-specific mosquito-borne disease at selected Army installations in 2019. Although a majority of installations are at moderate risk, nearly half of the AC Soldier population is at high risk for disease transmission from day-biting mosquitoes.

Mosquito-borne Disease Risk and Transmission Days

The icons on the risk map indicate an installation’s risk of disease (Zika, chikungunya, or dengue) transmission by day-biting Aedes mosquitoes. The number in the icon represents the number of days per year that day-biting mosquitoes are likely to be active and able to transmit a disease-causing pathogen. The distribution of both Aedes vectors is shown in the underlying map and represents the 50–100% probability that they are present, based on spatial modeling (Kraemer et al. 2015).

A Data-Driven Dashboard for Mosquito Surveillance

We live in a data-driven world, and our approach to assessing the presence and threat of vector-borne diseases should be no different. The APHC has launched a new capability that permits installations around the world to view a calendar grid of predicted mosquito activity and riskiest days for disease transmission. Not only is this tool useful for planning a surveillance season, but commanders could use it either to plan outdoor training events that avoid the riskiest periods or to ensure extra precautions are taken through control measures applied during those times.

The surveillance metric was created to provide a benchmark of surveillance days needed to adequately characterize mosquito-borne disease risk to Service members working and living in a specific locale. Using this benchmark provides confidence that no positives truly mean the disease-burden is low and not an artifact of inadequate sampling. To view these products, visit the CAC-enabled CarePoint site at https://carepoint.health.mil/sites/ENTO/opord (APHC 2020c).

Mosquito Surveillance Planning Tool

* A transmission day (TD) occurs when the daily average temperature is between 64.2°F and 96.8°F.
* A high transmission day (HTD) occurs when the daily average temperature is between 78.8°F and 84.2°F.
The heat risk EHI reports the portion of the year when outdoor conditions heighten the risk of heat-related health impacts. A heat risk day occurs when the National Weather Service heat index is greater than 90°F for one or more hours during a day. Heat index incorporates outdoor temperature and relative humidity, which are well-established as the principal environmental agents of heat illness (Mora 2017). The EHI reports the number of heat risk days per year in proximity to an Army installation, and whether the year of interest is consistent with the prior decade.

Globally, 2019 was the second-warmest year on record based on annual average surface temperatures, with 9 of the 10 warmest years occurring since 2005 (NOAA 2020a). Within the U.S., four of the five hottest years on record have occurred since 2012 (NOAA 2020b). The frequency, persistence, and magnitude of temperature rise has made heat the leading cause of weather-related fatalities in the U.S. over the last 30 years (National Weather Service 2018). Further, annual rates of heat illness across all military services have risen in 4 of the last 5 years, with a slight decrease in 2019 (AFHSB 2020). Additional consequences anticipated due to rising temperatures include increases in outdoor air pollution, seasonal allergens, and weather-related mental health stress (USGCRP 2016).

Outdoor temperature, relative humidity, and the associated heat index used to characterize the area-wide heat risk to an installation were acquired from weather stations nearest the population center of the installation. Weather data was provided by the U.S. Air Force 14th Weather Squadron. Historic heat index at the county level was obtained from scientific literature (Dahl 2019).

**Distribution of Army Installations by Heat Risk Days, 2019**

Of the 43 Army installations tracked for this report, 10 experienced more than 100 heat risk days in 2019, mostly concentrated in the south and southeast U.S. Heat risk days ranged from 0–149 days per year in 2019.

**Distribution of Army Population by Heat Risk Days, 2019**

The chart shows the percentage of AC Soldiers based on the heat risk days documented at Army installations in 2019. Nearly 40% of AC Soldiers were stationed at a location with more than 100 heat risk days during the year.

**Consequence of Rising Temperatures: Injury Rates**

Climate studies have documented many human health impacts associated with rising ambient temperatures. Consequences such as heat illness, worsened air quality, vector-borne disease, food-related infections, and mental health stress are among those most commonly cited. Recent research has posited an additional impact: increased injury morbidity and mortality.

In reviews of injury data from the last four decades, patterns have emerged pertaining to the seasonality of injury due to intentional (assault, suicide) and unintentional (transportation, drowning, fall) events. These studies assert the risk of certain injuries increases with rising ambient temperature (Otte im Kampe 2016). One model developed from U.S. injury mortality data spanning 1980–2017 predicts increases in suicide, transportation, and assault deaths—particularly among males aged 15–64—associated with small changes (1.5° Celsius) in average ambient temperature (Parks 2020).

In addition to measures mitigating heat illness in training settings, new programs and interventions may be necessary to increase awareness and address other forms of Soldier health impacts that result from exposure to rising ambient temperatures.
Environmental Health Indicators

ARMY ADVANCES AWARENESS OF CLIMATE HAZARDS IN THE U.S.

The U.S. climate continues to experience record-setting conditions that have become common in recent years; 2019 was the 23rd consecutive year in which the national average temperature was above the 20th century average. Locations in the southeast U.S., Alaska, and Hawaii recorded all-time high temperatures in 2019, and annual precipitation in the continental U.S. totaled almost 35 inches, making it the second wettest year on record (NOAA 2020a). Because of these trends, Congress continues to prioritize investigation of climate change impacts to national security, as evidenced by mandates in the National Defense Authorization Act (NDAA) (Public Law 116–285, 2021). Climate hazards highlighted in the NDAA include the following:

Drought · Energy Demand · Flood · Heat · Land Degradation · Wildfire

The cost of U.S. climate-related disasters—$525 billion over the last 5 years (2015–2019)—is testament to the increasing frequency and intensity of these conditions (NOAA 2020b). In comparison, the entire DOD budget for FY20 was $690 billion. Beyond damage to property and the natural environment, demonstrated health risks also result from the changing climate, as shown in the table.

Health Risks Associated with Climate Hazards

<table>
<thead>
<tr>
<th>Climate Hazard</th>
<th>Poor Air Quality</th>
<th>Poor Water Quality</th>
<th>Loss of Comfort</th>
<th>Cooking or Refrigeration</th>
<th>Heat Illness</th>
<th>Desiccation of Water Supply</th>
<th>Waste or Sewage Overflows</th>
<th>Vector-borne Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Energy Demand</td>
<td></td>
<td></td>
<td>X</td>
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<td></td>
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<tr>
<td>Flood</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
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<td>Heat</td>
<td></td>
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<td>X</td>
<td>X</td>
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<tr>
<td>Land Degradation</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>Wildfire</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

In an effort to characterize climate hazards impacting military infrastructure and operational viability, the Assistant Secretary of the Army (Installations, Energy and Environment) has released tools to help Army leaders quantify and plan for impacts at their installation. The Army Climate Resilience Handbook (USACE 2020) and the Army Climate Assessment Tool (DA 2020e) are resources designed to identify site-specific threats and develop climate resilience measures. They assess and score severity of exposure to climate hazards at Army installations for two 30-year climate epochs centered on 2050 and 2085, and at the lower future warming and higher future climate resilience measures. They assess and score severity of exposure to climate hazards at Army installations studied (U.S. Army Installation Management Command, U.S. Army National Guard, U.S. Army Reserve, and the U.S. Army Materiel Command). Exposure scores were evaluated for the near-term climate epoch (2050) at the lower future warming scenario.

Severity of Climate Hazards at Selected Army Installations in the U.S.

<table>
<thead>
<tr>
<th>Installation</th>
<th>Climate Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drought</td>
</tr>
<tr>
<td>Aberdeen Proving Ground</td>
<td></td>
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<tr>
<td>Fort Benning</td>
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<td>Fort Bliss</td>
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<td>Fort Bragg</td>
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<td>Fort Campbell</td>
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<td>Fort Carson</td>
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<td>Fort Drum</td>
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<td>Fort Gordon</td>
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<tr>
<td>Fort Huachuca</td>
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<td>Fort Irwin</td>
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<td>Fort Jackson</td>
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<td>Fort Knox</td>
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<td>Fort Leavenworth</td>
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<td>Fort Lee</td>
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<tr>
<td>Fort Leonard Wood</td>
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<tr>
<td>Fort Meade</td>
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<td>Fort Polk</td>
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<td>Fort Riley</td>
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<td>Fort Rucker</td>
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<td>Fort Sill</td>
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<tr>
<td>Fort Stewart</td>
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<tr>
<td>Fort Wainwright</td>
<td></td>
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<tr>
<td>Hawaii</td>
<td></td>
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<tr>
<td>JB Elmdorf-Richardson</td>
<td>ND</td>
</tr>
<tr>
<td>JB Langley-Leusts</td>
<td>ND</td>
</tr>
<tr>
<td>JB Lewis-McChord</td>
<td>ND</td>
</tr>
<tr>
<td>JB May-Henderson Hall</td>
<td>ND</td>
</tr>
<tr>
<td>JB San Antonio</td>
<td>ND</td>
</tr>
<tr>
<td>Presidio of Monterey</td>
<td>ND</td>
</tr>
<tr>
<td>USAG West Point</td>
<td>ND</td>
</tr>
</tbody>
</table>

The projected severity of exposure to climate hazards at selected AC Army installations is shown in the table. Colored cells denote installations with exposure scores within the first or second quartile from among 148 U.S.-based Army installations studied (U.S. Army Installation Management Command, U.S. Army National Guard, U.S. Army Reserve, and the U.S. Army Materiel Command). Exposure scores were evaluated for the near-term climate epoch (2050) at the lower future warming scenario.

“...we know first-hand the risk that climate change poses to national security because it affects the work we do every day. There is little about what the Department does to defend the American people that is not affected by climate change. It is a national security issue, and we must treat it as such.”
—The Honorable Lloyd J. Austin III
Secretary of Defense

Exposure is only one of three determinants that influence ultimate vulnerability to the effects of climate change; sensitivity and adaptability also play a role in whether and to what extent Army installations and populations may be impacted. Early planning using these new resources can help to identify and mitigate the mounting effects of global climate change on military health and readiness.
SPOTLIGHT

PROPER DISPOSAL OF UNWANTED ANTIBIOTICS IS KEY TO MAINTAINING HEALTH

In the U.S., about two-thirds of all prescription medications go unused and become waste (Law et al. 2015). These unused products are sometimes discarded as household trash, flushed down the toilet, or washed down the drain. Medications disposed in this manner can end up in landfills or wastewater, leading to contaminated waterways and drinking water sources, and contributing to antimicrobial resistance (AMR).

AMR occurs when microorganisms (such as bacteria, fungi, viruses, and parasites) acquire the ability to overcome the antibiotics designed to defeat them. Annually in the U.S., more than 2.8 million infections and 35,000 deaths are attributed to antibiotic-resistant infections (CDC 2019). Monitoring for AMR pathogens is crucial to understanding the prevalence of AMR in any given community. AMR can be combated through modified prescribing practices, such as eliminating the dispensing of antibiotics for viral infections such as the flu or common cold. Proper disposal is a simple way for everyone to reduce AMR, and waste pharmaceuticals can be collected at participating DOD pharmacies. Through this initiative, over 119,000 pounds of patient waste pharmaceuticals were collected in 2019, thereby providing secured destruction of unused medications.

In 2019, the EPA published the Hazardous Waste Pharmaceuticals Final Rule (CFR 2019). The rule streamlines standards for handling hazardous waste pharmaceuticals, with the goal of making drinking and surface water safer. This approach is consistent with Policy Memorandum 18-031, Management and Disposition of Unwanted and Waste Pharmaceuticals (OTSG/MEDCOM 2018). The policy requires Army MTFs to manage unusable antibiotics as pharmaceutical waste for incineration, when possible, or according to Federal, state, and local regulations.

Installations should adopt a conservative approach by managing waste medications, except those on the controlled substance list, as hazardous waste. Although this approach could result in higher disposal costs, it will reduce compliance confusion and regulatory fines, as well as align with other countries in the stewardship of waterways and protection of antibiotic efficacy.

LOCAL ACTION

Environmental Data Spur Policy to Limit Soldier Exposure to Poor Air Quality

In 2018, Health of the Force reported six EHIs that characterize Soldier exposure to environmental hazards at Army locations worldwide. One of these EHIs—Air Quality—tracks the number of poor air quality days in the regions surrounding Army installations. Data appearing in Health of the Force validated the perceptions of Service members stationed in South Korea and led U.S. Forces Korea (USFK) Command Surgeons to revamp the local Medical Services regulation on air quality.

The EHI data showed that from 2015 through 2019, outdoor air pollution levels at Army installations in South Korea violated U.S. health-based air quality standards on more than 75 days per year (see figure). In contrast, U.S. installations experienced an average of 6 days per year when air quality standards were violated during the same interval.

USFK, in coordination with the APHC, published a comprehensive regulation, which includes air quality surveillance tools, action thresholds, and behavior management guidance when air pollution levels exceed health-based standards (USFK 2020). The goal of the regulation is to reduce exposure to air pollutants that cause and exacerbate respiratory and cardiovascular conditions. To that end, it provides guidance for Service members engaged in non-mission-critical activities; healthy adults; medically sensitive individuals; and young Family members. This guidance is particularly timely, as recent studies report that chronic exposure to fine particulate matter increases vulnerability to the most severe COVID-19 outcomes, including death (Wu et al. 2020).

Number of pharmaceuticals detected in surface water, groundwater, tap water, and/or drinking water

Source: aus der Beek et al. 2016
Sleep, activity, and nutrition (SAN), also known as the Performance Triad (P3), work together as the pillars of optimal physical, behavioral, and emotional health. Neglect of any single SAN domain can lead to suboptimal performance and, in some cases, injury. The interrelationships between SAN domains are critical for maximizing Soldier performance—Soldiers need to have balanced nutrients to fuel their physical activity, and physical activity can impact the amount and quality of sleep. To address those deficiencies, Leaders and Soldiers need information about the SAN targets that Soldiers do not meet.

The Azimuth Check, previously known as the Global Assessment Tool (GAT), is a survey designed to assess an individual’s SAN behaviors, among other domains. Soldiers are required to complete the Azimuth Check annually per Army Regulation 350-53, Comprehensive Soldier and Family Fitness (DA 2014). The data presented here summarize the proportions of Soldiers who met expert-defined SAN targets based on data reported in the 2019 Azimuth Check.
Sleep, Activity, Nutrition

Sleep

The CDC (CDC 2020c) and the National Sleep Foundation (NSF 2020) both recommend adults attain 7 or more hours of sleep per night. On the Azimuth Check, Soldiers report the average approximate hours of sleep they attain within a 24-hour period, during work/duty weeks and weekends/days off.

Distribution of AC Soldiers Who Met Sleep Targets, 2019

Overall, a smaller proportion of Soldiers reported meeting the sleep target of 7 or more hours of sleep during work/duty weeks. During work/duty weeks, over one-third of Soldiers (37%) reported obtaining 7 or more hours of sleep. During weekends/days off, the majority of Soldiers (70%) reported obtaining 7 or more hours of sleep.

Percent of AC Soldiers Who Met the Work/Duty Weeks Sleep Target by Sex, Age, Race, and Ethnicity, 2019

A similar proportion of males (37%) and females (36%) reported meeting the sleep target of 7 or more hours of sleep during work/duty weeks. For females, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (42%), while Black or African American Soldiers had the lowest proportion overall (30%). For males, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (40%), while Black or African American Soldiers had the lowest proportion overall (29%).

Females (36% Average)

Males (37% Average)

Percent of AC Soldiers Who Met the Weekend/Days-Off Sleep Target by Sex, Age, Race, and Ethnicity, 2019

An equal proportion of males and females (70%) reported meeting this sleep target. For females, American Indian/Alaskan Native, Asian, and White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (76%), while Black or African American Soldiers had the lowest proportion overall (62%). For males, Asian and White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (73%), while Black or African American Soldiers had the lowest proportion overall (60%).

Females (70% Average)

Males (70% Average)

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Overall, 37% of Soldiers reported meeting the sleep target of 7 or more hours of sleep during work/duty weeks.

Prevalence of meeting this sleep target ranged from 31% to 49% across Army installations.

Overall, 70% of Soldiers reported meeting the sleep target of 7 or more hours of sleep during weekends/days off.

Prevalence of meeting this sleep target ranged from 63% to 84% across Army installations.

The CDC (CDC 2020c) and the National Sleep Foundation (NSF 2020) both recommend adults attain 7 or more hours of sleep per night. On the Azimuth Check, Soldiers report the average approximate hours of sleep they attain within a 24-hour period, during work/duty weeks and weekends/days off.

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Males (37% Average)

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Females (70% Average)

Males (70% Average)

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Percent of AC Soldiers Who Met the Work/Duty Weeks Sleep Target by Sex, Age, Race, and Ethnicity, 2019

A similar proportion of males (37%) and females (36%) reported meeting the sleep target of 7 or more hours of sleep during work/duty weeks. For females, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (42%), while Black or African American Soldiers had the lowest proportion overall (30%). For males, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (40%), while Black or African American Soldiers had the lowest proportion overall (29%).

Females (36% Average)

Males (37% Average)

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Females (70% Average)

Males (70% Average)
Sleep, Activity, Nutrition

Activity

The CDC recommends two physical activity targets (CDC 2020d). The first is attaining 2 or more days per week of resistance training. The second is attaining adequate aerobic activity. The amount of activity can be attained in one of three ways:

—150 minutes a week of moderate-intensity aerobic activity, or
—75 minutes a week of vigorous-intensity aerobic activity, or
—an equivalent combination of moderate- and vigorous-intensity aerobic activity.

On the Azimuth Check, Soldiers report the average number of days per week in which they participated in resistance training in the last 30 days. Soldiers also report the average number of days per week in which they engaged in (a) vigorous activity and (b) moderate activity in the last 30 days, and the average number of minutes per day in which they engaged in these activities.

Overall, the majority of Soldiers met the activity targets. The majority of Soldiers (84%) engaged in resistance training 2 or more days per week. Most Soldiers (90%) achieved adequate moderate/vigorous aerobic activity targets.

Percent of AC Soldiers Who Met the Resistance Training Target by Sex, Age, Race, and Ethnicity, 2019

A greater proportion of males (85%), relative to females (79%) reported engaging in resistance training 2 or more days per week. For females, Native Hawaiian/Pacific Islander Soldiers had the highest proportion meeting this target overall (83%), while American Indian/Alaskan Native Soldiers had the lowest proportion overall (75%). For males, all racial and ethnic groups were within 2% of one another overall, and there were no meaningful differences.

Percent of AC Soldiers Who Met the Aerobic Activity Target by Sex, Age, Race, and Ethnicity, 2019

A greater proportion of males (91%) relative to females (88%) achieved adequate moderate and/or vigorous aerobic activity targets. For females, Native Hawaiian/Pacific Islander, White (Not Hispanic or Latino), and Hispanic Soldiers had the highest proportion meeting this target overall (90%), while American Indian/Alaskan Native and Black or African American Soldiers had the lowest proportion overall (85%). For males, all racial and ethnic groups were within 2% of one another overall, and there were no meaningful differences.

Overall, 84% of Soldiers reported engaging in resistance training 2 or more days per week. Prevalence of meeting this activity target ranged from 76% to 88% across Army installations.

Overall, 90% of Soldiers achieved adequate moderate and/or vigorous aerobic activity. Prevalence of meeting this activity target ranged from 87% to 93% across Army installations.

Sleep, Activity, Nutrition
Sleep, Activity, Nutrition

Nutrition

On the Azimuth Check, Soldiers report the approximate servings of fruits and vegetables they consumed during the past 30 days. Most Soldiers’ fruit consumption ranged from 3 to 6 servings per week to 2 to 3 servings per day. Vegetable consumption was a bit higher, with more Soldiers reporting multiple servings per day. The nutrition targets used for the purposes of this report were informed using recommendations provided by the U.S. Department of Agriculture (USDA 2019) two or more servings of fruits and two or more servings of vegetables per day.

Percent of AC Soldiers Who Met the Nutrition Targets, 2019

Overall, less than half of Soldiers met the nutrition targets. Nearly one-third of Soldiers (33%) met the target of two or more servings of fruits per day. Less than half of Soldiers (42%) met the target of two or more servings of vegetables per day.

A greater proportion of females (45%) relative to males (42%) reported meeting this target overall (39%). For males, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (52%), while Black or African-American and Hispanic Soldiers had the lowest proportion overall (31%). For females, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (52%), while Native Hawaiian/Pacific Islander Soldiers had the lowest proportion overall (39%). For males, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (45%), while Black or African-American and Hispanic Soldiers had the lowest proportion overall (38%).

Percent of AC Soldiers Who Met the Vegetable Consumption Target by Sex, Age, Race, and Ethnicity, 2019

A greater proportion of females (45%) relative to males (42%) reported eating two or more servings of vegetables per day. For females, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (52%), while Native Hawaiian/Pacific Islander Soldiers had the lowest proportion overall (39%). For males, White (Not Hispanic or Latino) Soldiers had the highest proportion meeting this target overall (45%), while Black or African-American and Hispanic Soldiers had the lowest proportion overall (38%).
Summary

Percent of AC Soldiers Who Met SAN Targets, 2019

Sleep
- 37% attained 7 or more hours of sleep on weeknights/duty nights.
- 70% attained 7 or more hours of sleep on weekends/non-duty nights.

Activity
- 84% engaged in resistance training 2 or more days per week.
- 90% achieved adequate moderate and/or vigorous aerobic activity targets.

Nutrition
- 33% ate 2 or more servings of fruits per day.
- 42% ate 2 or more servings of vegetables per day.

SPOTLIGHT

FROM FOOD DESERT TO FOOD OASIS: TRANSFORMING HEALTHY FOOD OPTIONS ON ARMY INSTALLATIONS

Healthy Army Communities (HAC) is an Army commitment focused on improving the environment in three major areas: culture change, active living (physical activity, environment, and infrastructure), and healthy eating choices. HAC stakeholders have made significant improvements in the food environment on Army Installations, with the goal of ensuring healthier eating choices are available regardless of location.

The Army Food Program has implemented revised Dining Facility menu standards to deliver improved performance nutrition and identification (Army Go For Green® Program). Recipes revamped with healthier ingredients, and equipment updates such as air fryers allow for healthier food preparation. In addition to deploying food trucks and kiosks to expand Soldiers’ food access across installations, the Army Food Program is enhancing its overall communication of options and the benefits of healthy choices via print and electronic media.

The Army Family and Morale, Welfare, and Recreation (MWR) now requires that 25% of its food and beverages are healthy menu items and meet aligned nutritional criteria. Army Family MWR is providing “healthy-only” food trucks and healthy-only “grab-and-go” options to ensure healthier choices are available in non-traditional locations.

The Defense Commissary Agency’s “Thinking Outside the Box” is a growing internet resource providing easy, nutritious, economical meal solutions, which feature recipes and nutrition education incorporating shelf-stable, chilled, and/or frozen items. Prices of highlighted food items are discounted 10%. Incorporation of “Dietitian Approved” labels has quadrupled in the last 2 years; these labels identify healthier choices available in the deli, sushi bar, and displays of healthy grab-n-go items.

As each Army installation strives to become a station of choice and align with the types of healthy food offered on university and corporate campuses nationwide, HAC and its stakeholders continue to support healthier choices in all areas of Army life to ensure the food deserts of yesterday become the healthy food oases of today and beyond.
The *Health of the Force* presents metrics with the intent of revealing actionable interpretations of health data. The Installation Health Index (IHI) is a composite measure that can be used to gauge the health of installation populations. The purpose of the IHI is to motivate discussions about successes and challenges that can be leveraged across the Force.

The IHI combines installation-specific metric scores, each calculated by contrasting the installation’s metric value to the average value for the installations evaluated (subsequently referred to as the Army average). It also incorporates the number of poor air quality days, an environmental health metric. The IHI consists of two components: a score and a percentile.

### How should IHI be interpreted?

<table>
<thead>
<tr>
<th>IHI Score</th>
<th>IHI Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>The IHI is a global installation health indicator defined as a weighted average of z-scores corresponding to six installation medical metric values and an installation air quality score. IHI scores are standardized such that a score of zero represents the average across the Army installations included in the 2020 <em>Health of the Force</em>; positive scores are above-average, and negative scores are below-average. Higher IHI scores reflect comparatively better installation health. IHI scores less than -2 (i.e., more than 2 standard deviations (SD) below the average) are color-coded in red; IHI scores between -1 and -2 (i.e., between 1 and 2 SD below the average) are color-coded in yellow; IHI scores greater than or equal to 1 (i.e., ≥1 SD above the average) are color-coded in green. Higher IHI percentiles reflect more favorable installation health relative to other installations. The percentile for a given installation is the probability of having an IHI equal to or lower than that installation’s IHI.</td>
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<tr>
<td>The IHI should not be compared with prior years due to changes in data sources and methodology (e.g., new weighting, new metric inclusion criteria, new tobacco product use definitions, etc.).</td>
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</tbody>
</table>

The IHI incorporates age- and sex-adjusted values for six medical metrics (injury, sleep disorders, chronic disease, obesity, tobacco product use, STI), and installation air quality. The weights given to each metric for calculation of the IHI are shown here:

- Injury (30%)
- Obesity (BMI) (15%)
- Sleep disorders (15%)
- Chronic disease (15%)
- Tobacco product use (15%)
- Sexually transmitted infections (chlamydia) (5%)
- Air quality (5%)

See the Methods Appendix for more information on the IHI.
The health data used to rank installations are adjusted by age and sex to allow for a more accurate comparison of health outcomes throughout the Force. In contrast, the medical metrics pages report crude estimates. Installations outside of the U.S. are ranked separately from U.S.-based installations due to differences which may bias their comparison.

**COLOR-CODE KEY:**
- GREEN: Better than the Army average by 1 or more SD
- AMBER: Worse than the Army average by between 1 and 2 SD
- RED: Worse than the Army average by more than 2 SD
- NO COLOR ADDED: About the same as the Army average

The ranking order is based on adjusted, unrounded rates. U.S.-based installations and installations outside the U.S. are ranked separately.

**Installations Outside the U.S.**

<table>
<thead>
<tr>
<th>Installation</th>
<th>Installation Health Index</th>
<th>Injury</th>
<th>Chronic Disease</th>
<th>Obesity</th>
</tr>
</thead>
</table>

- **Installations Outside the U.S.**
  - USAG Red Cloud
  - USAG Daegu
  - Japan
  - USAG Vicenza
  - USAG Humphreys
  - USAG Stuttgart
  - USAG Bavaria
  - USAG Ansbach
  - USAG Rheinland-Pfalz
  - USAG Wiesbaden

- **Installations Presented, 2019**
  - Fort Bragg
  - JB Myer-Henderson Hall
  - Fort Campbell
  - Fort Bliss
  - JBLM
  - Fort Carson
  - Fort Irwin
  - Fort Jackson
  - Fort Wainwright
  - Fort Huachuca
  - Fort Drum
  - Fort Benning
  - Hawaii
  - Fort Leavenworth
  - JB Langley-Eustis
  - Fort Sill
  - Fort Sisco
  - Fort Jackson
  - Fort Rucker
  - Fort Hood
  - Fort Drum
  - Fort Riley
  - Fort Polk
  - Fort Knox
  - Fort Drum
  - Fort Sisco

- **Installations Outside the U.S.**
  - USAG Vicenza
  - USAG Vincenza
  - Japan
  - USAG Humphreys
  - USAG Bavaria
  - USAG Daegu
  - USAG Wiesbaden
  - USAG Ansbach
  - USAG Rheinland-Pfalz
  - USAG Wiesbaden

- **Installations Presented, 2019**
  - Fort Bragg
  - JB Myer-Henderson Hall
  - Fort Campbell
  - Fort Bliss
  - JBLM
  - Fort Carson
  - Fort Irwin
  - Fort Jackson
  - Fort Wainwright
  - Fort Huachuca
  - Fort Drum
  - Fort Benning
  - Hawaii
  - Fort Leavenworth
  - JB Langley-Eustis
  - Fort Sill
  - Fort Sisco
  - Fort Jackson
  - Fort Rucker
  - Fort Hood
  - Fort Drum
  - Fort Riley
  - Fort Polk
  - Fort Knox
  - Fort Drum
  - Fort Sisco
Installation Health Index

Tobacco Product Use

Tobacco product use, including e-cigarettes, adjusted average (and range) for the installations presented, 2019

<table>
<thead>
<tr>
<th>Installation</th>
<th>Percentage</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>JB San Antonio</td>
<td>13%</td>
<td>25</td>
<td>30%</td>
</tr>
<tr>
<td>USAG West Point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Rucker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Meade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Gordon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Belvoir</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Huachucha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Lee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Leavenworth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Jackson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB Myer-Henderson Hall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB Langley-Eustis</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fort Knox</td>
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</tr>
<tr>
<td>Fort Bragg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB Elmendorf-Richardson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Leonard Wood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Army Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E-cigarette Use

E-cigarette use, adjusted average (and range) for the installations presented, 2019 (Note: E-cigarette use is not incorporated into the installation health index calculations.)

<table>
<thead>
<tr>
<th>Installation</th>
<th>Percentage</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
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</thead>
<tbody>
<tr>
<td>Fort Jackson</td>
<td>4.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Rucker</td>
<td></td>
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</tr>
<tr>
<td>USAG West Point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Benning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Belvoir</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB San Antonio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USAG West Point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Leavenworth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Lee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JB Elmendorf-Richardson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Leonard Wood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Army Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Installation Profiles

The below footnotes pertain to the installation profiles found on pages 96 through 139.

1. Crude values are not adjusted by age and sex.

2. Adjusted values are weighted averages of crude age- and sex-specific frequencies, where the weights are the proportions of Soldiers in the corresponding age and sex categories of the 2015 Army AC population. By using a common adjustment standard such as this, we are able to make valid comparisons across installations because it controls for age and sex differences in the population which might influence crude rates.

3. The Army values represent crude values for the entire Army, and the ranges represent crude values for the installations included in the report.

4. EHI color coding (green, amber, and red) indicates metric status at the affected installation. Green denotes the desired condition.

5. The IHI is a standardized weighted average of scores corresponding to six medical metrics and an air quality metric. The percentile reflects the approximate probability of having an IHI equal to or lower than the installation's IHI. Higher percentiles reflect better installation health.

6. Air quality status was imputed from the surrounding Air Quality Control Region.

* Medical metric values were not displayed if <20 cases were reported or when the reporting compliance was estimated to be <50%. However, every installation met the reporting compliance threshold for the reporting year.
Installation Profile Summaries

U.S. Installations

Fort Belvoir

Demographics:
Approximately 3,400 AC Soldiers
46% under 35 years old, 23% female

Main Healthcare Facility: Fort Belvoir Community Hospital

Footnotes: See page 95.

Installation Health Index Score: -1.5 (<20th percentile)

Footnotes: See page 95.

Installation Health Indicators:
- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.70 mg/L
- Solid waste diversion rate: 55%
- Mosquito-borne disease risk: High
- Lyme disease risk: High
- Heat risk: 73 days/year

Medical Metrics:

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>2,193</td>
<td>1,973</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>26</td>
<td>24</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>3.0</td>
<td>3.8</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>25</td>
<td>19</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>26</td>
<td>22</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>16</td>
<td>19</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>11</td>
<td>18</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>35</td>
<td>24</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

Performance Triad Measures:

- 7+ hours of sleep (weeknight/duty night)
- 2+ days per week of resistance training
- 150+ minutes per week of aerobic activity
- 2+ servings of fruits per day
- 2+ servings of vegetables per day

Percentages:
- 42% 37%
- 71% 69%
- 76% 84%
- 32% 33%
- 47% 42%

Environmental Health Indicators:
- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.70 mg/L
- Solid waste diversion rate: 55%
- Mosquito-borne disease risk: High
- Lyme disease risk: High
- Heat risk: 73 days/year
Installation Profile Summaries

Fort Benning

Demographics: Approximately 21,000 AC Soldiers
85% under 35 years old, 7% female
Main Healthcare Facility: Martin Army Community Hospital

ENVIRONMENTAL HEALTH INDICATORS:

- Poor air quality: 0 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.61 mg/L
- Solid waste diversion rate: 19%
- Mosquito-borne disease risk: High
- Lyme disease risk: Low
- Heat risk: 137 days/year

PERFORMANCE TRIAD MEASURES:

- 7+ hours of sleep (weeknight/duty night): 36% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 71% (Installation), 69% (Army)
- 2+ days per week of resistance training: 88% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 92% (Installation), 90% (Army)
- 2+ servings of fruits per day: 41% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 49% (Installation), 42% (Army)

Installation Health Index Score*: -0.6 (20–29th percentile)

Footnotes: See page 95.

Fort Bliss

Demographics: Approximately 26,000 AC Soldiers
81% under 35 years old, 15% female
Main Healthcare Facility: William Beaumont Army Medical Center

ENVIRONMENTAL HEALTH INDICATORS:

- Poor air quality: 13 days/year
- Poor water quality: 0 days/year
- Water fluoridation: No Data
- Solid waste diversion rate: 19%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: No Data
- Heat risk: 86 days/year

PERFORMANCE TRIAD MEASURES:

- 7+ hours of sleep (weeknight/duty night): 34% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 68% (Installation), 69% (Army)
- 2+ days per week of resistance training: 83% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 91% (Installation), 90% (Army)
- 2+ servings of fruits per day: 29% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 39% (Installation), 42% (Army)

Installation Health Index Score*: -0.4 (30–39th percentile)

Footnotes: See page 95.
Installation Profile Summaries

Fort Bragg
Demographics: Approximately 44,000 AC Soldiers
78% under 35 years old, 12% female
Main Healthcare Facility: Womack Army Medical Center

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value¹</th>
<th>Adjusted Value²</th>
<th>Value</th>
<th>Range³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,607</td>
<td>1,650</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
<td>Behavioral health (%)</td>
<td>12</td>
<td>13</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>3.9</td>
<td>3.8</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>27</td>
<td>26</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>24</td>
<td>25</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>15</td>
<td>17</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERFORMANCE TRIAD MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7+ hours of sleep (weeknight/duty night)</td>
</tr>
<tr>
<td>7+ hours of sleep (weekend or non-duty night)</td>
</tr>
<tr>
<td>2+ days per week of resistance training</td>
</tr>
<tr>
<td>150+ minutes per week of aerobic activity</td>
</tr>
<tr>
<td>2+ servings of fruits per day</td>
</tr>
<tr>
<td>2+ servings of vegetables per day</td>
</tr>
</tbody>
</table>

Fort Campbell
Demographics: Approximately 27,000 AC Soldiers
85% under 35 years old, 12% female
Main Healthcare Facility: Blanchfield Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value¹</th>
<th>Adjusted Value²</th>
<th>Value</th>
<th>Range³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,665</td>
<td>1,763</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>3.5</td>
<td>3.2</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>13</td>
<td>15</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>17</td>
<td>18</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>29</td>
<td>28</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>21</td>
<td>19</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>14</td>
<td>18</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERFORMANCE TRIAD MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7+ hours of sleep (weeknight/duty night)</td>
</tr>
<tr>
<td>7+ hours of sleep (weekend or non-duty night)</td>
</tr>
<tr>
<td>Water fluoridation: 0.60 mg/L</td>
</tr>
<tr>
<td>Solid waste diversion rate: 84%</td>
</tr>
<tr>
<td>2+ servings of fruits per day</td>
</tr>
<tr>
<td>2+ servings of vegetables per day</td>
</tr>
</tbody>
</table>

Footnotes: See page 95.
## Installation Profile Summaries

### Fort Carson

**Demographics:** Approximately 24,000 AC Soldiers  
84% under 35 years old, 14% female  
Main Healthcare Facility: Evans Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,459</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>4.5</td>
<td>4.1</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>11</td>
<td>14</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>13</td>
<td>14</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>28</td>
<td>27</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>29</td>
<td>25</td>
<td>24</td>
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</tr>
<tr>
<td>Chronic disease (%)</td>
<td>14</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Fort Drum

**Demographics:** Approximately 15,000 AC Soldiers  
86% under 35 years old, 12% female  
Main Healthcare Facility: Guthrie Army Health Clinic

<table>
<thead>
<tr>
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<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,560</td>
<td>1,711</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>4.3</td>
<td>3.9</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>9.9</td>
<td>13</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>18</td>
<td>20</td>
<td>17</td>
<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>28</td>
<td>27</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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</tr>
<tr>
<td>Chronic disease (%)</td>
<td>13</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Installation Health Index Score

- **Fort Carson:** 1.1 (80–89th percentile)  
- **Fort Drum:** 0.0 (40–49th percentile)

**Environmental Health Indicators**

| Poor air quality: 0 days/year | Installation | Army |
| Poor water quality: 0 days/year | Installation | Army |
| Water fluoridation: 0.41 mg/L | Installation | Army |
| Solid waste diversion rate: 42% | Installation | Army |
| Mosquito-borne disease risk: Low | Installation | Army |
| Lyme disease risk: No data | Installation | Army |
| Heat risk: 3 days/year | Installation | Army |

Footnotes: See page 95.
### Installation Profile Summaries

#### Fort Gordon

Demographics: Approximately 8,700 AC Soldiers
75% under 35 years old, 20% female
Main Healthcare Facility: Dwight D. Eisenhower Army Medical Center

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,805</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>2.1</td>
<td>2.1</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>22</td>
<td>23</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>18</td>
<td>19</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>22</td>
<td>19</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>19</td>
<td>20</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### Environmental Health Indicators

- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.73 mg/L
- Solid waste diversion rate: 39%
- Mosquito-borne disease risk: High
- Lyme disease risk: Low
- Heat risk: 137 days/year

Installation Health Index Score: -0.3 (30–39th percentile)

#### Fort Hood

Demographics: Approximately 34,000 AC Soldiers
83% under 35 years old, 16% female
Main Healthcare Facility: Carl R. Darnall Army Medical Center

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,720</td>
<td>1,801</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>18</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>5.1</td>
<td>4.7</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>16</td>
<td>19</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>17</td>
<td>19</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>26</td>
<td>26</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>41</td>
<td>34</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>16</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### Environmental Health Indicators

- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: No data
- Solid waste diversion rate: 36%
- Mosquito-borne disease risk: High
- Lyme disease risk: No data
- Heat risk: 130 days/year

Installation Health Index Score: -1.0 (<20th percentile)

Footnotes: See page 95.
Installation Profile Summaries

Fort Huachuca
Demographics: Approximately 4,000 AC Soldiers
- 78% under 35 years old, 16% female
Main Healthcare Facility: Raymond W. Bliss Army Health Clinic

Fort Irwin
Demographics: Approximately 4,100 AC Soldiers
- 76% under 35 years old, 14% female
Main Healthcare Facility: Weed Army Community Hospital

MEDICAL METRICS

<table>
<thead>
<tr>
<th></th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>2,031</td>
<td>2,025</td>
<td>1,756</td>
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<tr>
<td>Behavioral health (%)</td>
<td>9.9</td>
<td>10</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>2.1</td>
<td>2.1</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Chronic disease (%)</td>
<td>18</td>
<td>21</td>
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<td>12–35</td>
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ENVIRONMENTAL HEALTH INDICATORS

<table>
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<tr>
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<td>Poor air quality:</td>
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<td>0 days/year</td>
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<tr>
<td>Poor water quality:</td>
<td>0 days/year</td>
<td>0 days/year</td>
</tr>
<tr>
<td>Water fluoridation:</td>
<td>0.70 mg/L</td>
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<tr>
<td>Solid waste diversion rate:</td>
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<tr>
<td>Mosquito-borne disease risk:</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Lyme disease risk:</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Heat risk:</td>
<td>24 days/year</td>
<td>24 days/year</td>
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</table>

PERFORMANCE TRIAD MEASURES

<table>
<thead>
<tr>
<th></th>
<th>Installation</th>
<th>Army</th>
</tr>
</thead>
<tbody>
<tr>
<td>7+ hours of sleep (weeknight/duty night)</td>
<td>40%</td>
<td>37%</td>
</tr>
<tr>
<td>7+ hours of sleep (weekend or non-duty night)</td>
<td>73%</td>
<td>69%</td>
</tr>
<tr>
<td>2+ days per week of resistance training</td>
<td>83%</td>
<td>84%</td>
</tr>
<tr>
<td>150+ minutes per week of aerobic activity</td>
<td>91%</td>
<td>90%</td>
</tr>
<tr>
<td>2+ servings of fruits per day</td>
<td>28%</td>
<td>33%</td>
</tr>
<tr>
<td>2+ servings of vegetables per day</td>
<td>41%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Installation Health Index Score:\ 0.3 (60–69th percentile)

Footnotes: See page 95.

Installation Profile Summaries

2020 HEALTH OF THE FORCE REPORT

Installation Profile Summaries
Installation Profile Summaries

### Fort Jackson

Demographics: Approximately 8,900 AC Soldiers
86% under 35 years old, 28% female
Main Healthcare Facility: Moncrief Army Health Clinic

#### MEDICAL METRICS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>2,388</td>
<td>1,756</td>
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<tr>
<td>Behavioral health (%)</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>1.4</td>
<td>2.0</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>6.9</td>
<td>11</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>12</td>
<td>15</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>20</td>
<td>21</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>16</td>
<td>11</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>13</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### PERFORMANCE TRIAD MEASURES

- **7+ hours of sleep (weeknight/duty night):** 37%
- **7+ hours of sleep (weekend or non-duty night):** 64%
- **2+ days per week of resistance training:** 84%
- **150+ minutes per week of aerobic activity:** 88%
- **2+ servings of fruits per day:** 38%
- **2+ servings of vegetables per day:** 42%

- **Heat risk:** 117 days/year

### Fort Knox

Demographics: Approximately 4,400 AC Soldiers
65% under 35 years old, 23% female
Main Healthcare Facility: Ireland Army Health Clinic

#### MEDICAL METRICS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>2,510</td>
<td>1,938</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
<td>Behavioral health (%)</td>
<td>20</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>2.4</td>
<td>2.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>21</td>
<td>17</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
<td>20</td>
<td>17</td>
<td>17</td>
<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>21</td>
<td>23</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>15</td>
<td>14</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>30</td>
<td>23</td>
<td>18</td>
<td>12–35</td>
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</tbody>
</table>

#### PERFORMANCE TRIAD MEASURES

- **7+ hours of sleep (weeknight/duty night):** 44%
- **7+ hours of sleep (weekend or non-duty night):** 85%
- **2+ days per week of resistance training:** 87%
- **150+ minutes per week of aerobic activity:** 93%
- **2+ servings of fruits per day:** 37%
- **2+ servings of vegetables per day:** 37%

- **Heat risk:** 64 days/year

### Installation Health Index Score

- **Fort Jackson:** 0.0 (50–59th percentile)
- **Fort Knox:** -0.8 (20–29th percentile)
Installation Profile Summaries

### Fort Leavenworth

#### Demographics:
- Approximately 3,200 AC Soldiers
- 50% under 35 years old, 16% female

#### Main Healthcare Facility:
- Munson Army Health Center

#### Environmental Health Indicators
- Poor air quality: 0 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.40 mg/L
- Solid waste diversion rate: 30%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: Low
- Heat risk: 61 days/year

**Medical Metrics**

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<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>2,215</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
<td>Behavioral health (%)</td>
<td>18</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>3.3</td>
<td>4.1</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>20</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>19</td>
<td>21</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>12</td>
<td>22</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>34</td>
<td>23</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 43% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 72% (Installation), 69% (Army)
- 2+ days per week of resistance training: 81% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 89% (Installation), 90% (Army)
- 2+ servings of fruits per day: 35% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 46% (Installation), 42% (Army)

**Installation Health Index Score**: -1.5 (<20<sup>th</sup> percentile)

### Fort Lee

#### Demographics:
- Approximately 6,700 AC Soldiers
- 75% under 35 years old, 25% female

#### Main Healthcare Facility:
- Kenner Army Health Clinic

#### Environmental Health Indicators
- Poor air quality: 0 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.59 mg/L
- Solid waste diversion rate: 54%
- Mosquito-borne disease risk: High
- Lyme disease risk: Moderate
- Heat risk: 75 days/year

**Medical Metrics**

<table>
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<th>Value</th>
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</thead>
<tbody>
<tr>
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<td>2,333</td>
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<td>18</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>3.0</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>14</td>
<td>16</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>16</td>
<td>19</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
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<td>20</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>17</td>
<td>14</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>18</td>
<td>22</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 32% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 65% (Installation), 69% (Army)
- 2+ days per week of resistance training: 82% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 91% (Installation), 90% (Army)
- 2+ servings of fruits per day: 27% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 35% (Installation), 42% (Army)

**Installation Health Index Score**: -1.3 (<20<sup>th</sup> percentile)

Footnotes: See page 95.
### Fort Leonard Wood

**Demographics:** Approximately 9,400 AC Soldiers
- 84% under 35 years old, 21% female

**Main Healthcare Facility:** General Leonard Wood Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
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<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
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<tr>
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<td>15</td>
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<tr>
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<tr>
<td>Tobacco product use (%)</td>
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<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<td>9.1</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>13</td>
<td>20</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**PERFORMANCE TRIAD MEASURES**

- 7 hours of sleep (weeknight/duty night): 36% (Army: 37%)
- 2+ days per week of resistance training: 86% (Army: 84%)
- 150+ minutes per week of aerobic activity: 92% (Army: 90%)
- 2+ servings of fruits per day: 38% (Army: 33%)
- 2+ servings of vegetables per day: 43% (Army: 42%)

**ENVIRONMENTAL HEALTH INDICATORS**

- Poor air quality: No data
- Poor water quality: 0 days/year
- Water fluoridation: 0.71 mg/L
- Solid waste diversion rate: 50%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: Moderate
- Heat risk: 60 days/year

**Installation Health Index Score**: -0.4 (30–39th percentile)

**Footnotes:** See page 95.

---

### Fort Meade

**Demographics:** Approximately 3,900 AC Soldiers
- 63% under 35 years old, 20% female

**Main Healthcare Facility:** Kimbrough Ambulatory Care Center

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
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<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,857</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
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<td>20</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>2.3</td>
<td>2.6</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
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<td>17</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>21</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>17</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>12</td>
<td>14</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>27</td>
<td>22</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**PERFORMANCE TRIAD MEASURES**

- 7 hours of sleep (weeknight/duty night): 38% (Army: 37%)
- 2+ days per week of resistance training: 83% (Army: 84%)
- 150+ minutes per week of aerobic activity: 90% (Army: 90%)
- 2+ servings of fruits per day: 31% (Army: 33%)
- 2+ servings of vegetables per day: 45% (Army: 42%)

**ENVIRONMENTAL HEALTH INDICATORS**

- Poor air quality: 7 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.95 mg/L
- Solid waste diversion rate: Moderate
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: High
- Heat risk: 74 days/year

**Installation Health Index Score**: -0.8 (20–29th percentile)

**Footnotes:** See page 95.
Installation Profile Summaries

Fort Polk

Demographics: Approximately 7,700 AC Soldiers
82% under 35 years old, 12% female
Main Healthcare Facility: Bayne-Jones Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range^3</th>
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<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,599</td>
<td>1,687</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>17</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>4.6</td>
<td>4.3</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>15</td>
<td>18</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
<td>16</td>
<td>18</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>27</td>
<td>23</td>
<td>24</td>
<td>11–41</td>
</tr>
</tbody>
</table>

Injury (rate per 1,000) | 1,257 | 1,366 | 1,756 | 1,257–2,739 |
Behavioral health (%) | 14 | 15 | 16 | 9.9–26 |
Substance use disorder (%) | 4.8 | 4.4 | 3.5 | 1.4–7.0 |
Sleep disorder (%) | 11 | 13 | 14 | 6.9–25 |
Obesity (%) | 15 | 17 | 17 | 12–26 |
Tobacco product use (%) | 31 | 30 | 25 | 11–31 |
STIs: Chlamydia infection (rate per 1,000) | 33 | 27 | 24 | 11–41 |

ENVIRONMENTAL HEALTH INDICATORS^4
- Poor air quality:
  - No data
- Poor water quality:
  - 0 days/year
- Water fluoridation:
  - 1.00 mg/L
- Solid waste diversion rate:
  - 50%
- Mosquito-borne disease risk:
  - High
- Lyme disease risk:
  - No data
- Heat risk:
  - 130 days/year

Installation Health Index Score^5: -1.3 (<20th percentile)

Fort Riley

Demographics: Approximately 15,000 AC Soldiers
86% under 35 years old, 13% female
Main Healthcare Facility: Irwin Army Community Hospital

<table>
<thead>
<tr>
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<th>Crude Value</th>
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<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,257</td>
<td>1,366</td>
<td>1,756</td>
<td>1,257–2,739</td>
</tr>
<tr>
<td>Behavioral health (%)</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>4.8</td>
<td>4.4</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>31</td>
<td>30</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>33</td>
<td>27</td>
<td>24</td>
<td>11–41</td>
</tr>
</tbody>
</table>

Injury (rate per 1,000) | 1,257 | 1,366 | 1,756 | 1,257–2,739 |
Behavioral health (%) | 14 | 15 | 16 | 9.9–26 |
Substance use disorder (%) | 4.8 | 4.4 | 3.5 | 1.4–7.0 |
Sleep disorder (%) | 11 | 13 | 14 | 6.9–25 |
Obesity (%) | 15 | 17 | 17 | 12–26 |
Tobacco product use (%) | 31 | 30 | 25 | 11–31 |
STIs: Chlamydia infection (rate per 1,000) | 33 | 27 | 24 | 11–41 |

ENVIRONMENTAL HEALTH INDICATORS^4
- Poor air quality:
  - No data
- Poor water quality:
  - 90 days/year
- Water fluoridation:
  - 0.51 mg/L
- Solid waste diversion rate:
  - 83%
- Mosquito-borne disease risk:
  - Moderate
- Lyme disease risk:
  - Low
- Heat risk:
  - 80 days/year

Installation Health Index Score^5: 0.3 (60–69th percentile)

Footnotes: See page 95.
Installation Profile Summaries

**Fort Rucker**

Demographics: Approximately 2,900 AC Soldiers

66% under 35 years old, 14% female

Main Healthcare Facility: Lyster Army Health Center

### Installation Health Index Score:

-0.1 (40–49th percentile)

#### Performance Triad Measures

- **7+ hours of sleep (weeknight/duty night)**: 47% (Army: 37%)
- **7+ hours of sleep (weekend or non-duty night)**: 76% (Army: 69%)
- **2+ days per week of resistance training**: 83% (Army: 84%)
- **150+ minutes per week of aerobic activity**: 88% (Army: 90%)
- **2+ servings of fruits per day**: 29% (Army: 33%)
- **2+ servings of vegetables per day**: 44% (Army: 42%)

#### Environmental Health Indicators

- **Poor air quality:**
  - No data
- **Poor water quality:**
  - 0 days/year
- **Water fluoridation:**
  - 0.79 mg/L
- **Solid waste diversion rate:**
  - 55%
- **Mosquito-borne disease risk:**
  - High
- **Lyme disease risk:**
  - Low
- **Heat risk:**
  - 135 days/year

### Medical Metrics

<table>
<thead>
<tr>
<th>Medical Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>2,152</td>
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<td>11</td>
<td>10</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>1.5</td>
<td>1.6</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
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</tr>
<tr>
<td>Obesity (%)</td>
<td>19</td>
<td>17</td>
<td>17</td>
<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>17</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>14</td>
<td>16</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>22</td>
<td>20</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Environmental Health Indicators

- **Heat risk:**
  - 135 days/year

Footnotes: See page 95.

**Fort Sill**

Demographics: Approximately 12,000 AC Soldiers

86% under 35 years old, 17% female

Main Healthcare Facility: Reynolds Army Community Hospital

### Installation Health Index Score:

-2.0 (<20th percentile)

#### Performance Triad Measures

- **7+ hours of sleep (weeknight/duty night)**: 36% (Army: 37%)
- **7+ hours of sleep (weekend or non-duty night)**: 76% (Army: 69%)
- **2+ days per week of resistance training**: 86% (Army: 84%)
- **150+ minutes per week of aerobic activity**: 93% (Army: 90%)
- **2+ servings of fruits per day**: 30% (Army: 33%)
- **2+ servings of vegetables per day**: 39% (Army: 42%)

#### Environmental Health Indicators

- **Poor air quality:**
  - No data
- **Poor water quality:**
  - 0 days/year
- **Water fluoridation:**
  - 0.58 mg/L
- **Solid waste diversion rate:**
  - 55%
- **Mosquito-borne disease risk:**
  - High
- **Lyme disease risk:**
  - Low
- **Heat risk:**
  - 125 days/year

### Medical Metrics

<table>
<thead>
<tr>
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<tr>
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<td>Substance use disorder (%)</td>
<td>3.5</td>
<td>3.7</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>13</td>
<td>19</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<td>15</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>14</td>
<td>21</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

Footnotes: See page 95.
Installation Profile Summaries

### Fort Stewart

**Demographics:** Approximately 19,000 AC Soldiers
84% under 35 years old, 15% female

**Main Healthcare Facility:** Winn Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
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<tr>
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<td>1,756</td>
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<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>4.3</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>Sleep disorder (%)</td>
<td>13</td>
<td>16</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>27</td>
<td>27</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>26</td>
<td>21</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>17</td>
<td>22</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL HEALTH INDICATORS²**

- **Poor air quality:** No data
- **Poor water quality:** 0 days/year
- **Water fluoridation:** 0.99 mg/L
- **Solid waste diversion rate:** 60%
- **Mosquito-borne disease risk:** High
- **Lyme disease risk:** Moderate
- **Heat risk:** 131 days/year

**Installation Health Index Score³:** -0.7 (20–29th percentile)

### Fort Wainwright

**Demographics:** Approximately 6,200 AC Soldiers
87% under 35 years old, 11% female

**Main Healthcare Facility:** Bassett Army Community Hospital

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range¹</th>
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</thead>
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<td>1,512</td>
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<td>13</td>
<td>14</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>2.7</td>
<td>2.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>Sleep disorder (%)</td>
<td>11</td>
<td>15</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
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<td>17</td>
<td>17</td>
<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>29</td>
<td>28</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<td>19</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>12</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL HEALTH INDICATORS²**

- **Poor air quality:** 39 days/year
- **Poor water quality:** 0 days/year
- **Water fluoridation:** 0.32 mg/L
- **Solid waste diversion rate:** 1%
- **Mosquito-borne disease risk:** Low
- **Lyme disease risk:** No data
- **Heat risk:** 0 days/year

**Installation Health Index Score³:** 0.1 (50–59th percentile)

Footnotes: See page 95.
### Hawaii
**Demographics:** Approximately 19,000 AC Soldiers
77% under 35 years old, 18% female

**Main Healthcare Facility:** Tripler Army Medical Center and Desmond T. Doss Health Clinic Schofield Barracks

#### Installation Profile Summaries

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
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<td>1,707</td>
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<td>15</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>3.1</td>
<td>3.1</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
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<td>15</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
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<td>20</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>36</td>
<td>36</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>18</td>
<td>20</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### ENVIRONMENTAL HEALTH INDICATORS

- **Poor air quality:** 0 days/year
- **Poor water quality:** 0 days/year
- **Water fluoridation:** 0.63 mg/L
- **Solid waste diversion rate:** 29%
- **Mosquito-borne disease risk:** High
- **Lyme disease risk:** No data
- **Heat risk:** 48 days/year

#### PERFORMANCE TRIAD MEASURES

- 7+ hours of sleep (weeknight/duty night): 36% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 68% (Installation), 69% (Army)
- 2+ days per week of resistance training: 83% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 90% (Installation), 90% (Army)
- 2+ servings of fruits per day: 29% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 41% (Installation), 42% (Army)

**Installation Health Index Score**: 0.5 (60–69th percentile)

### JB Elmendorf-Richardson
**Demographics:** Approximately 5,000 AC Soldiers
88% under 35 years old, 8% female

**Main Healthcare Facility:** Joint Base Elmendorf-Richardson Health and Wellness Center

#### Installation Profile Summaries

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,744</td>
<td>1,756</td>
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<tr>
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<td>10</td>
<td>11</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>3.7</td>
<td>3.3</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
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<td>24</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<td>28</td>
<td>24</td>
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<tr>
<td>Chronic disease (%)</td>
<td>12</td>
<td>18</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

#### ENVIRONMENTAL HEALTH INDICATORS

- **Poor air quality:** 9 days/year
- **Poor water quality:** 0 days/year
- **Water fluoridation:** 0.46 mg/L
- **Solid waste diversion rate:** 28%
- **Mosquito-borne disease risk:** Low
- **Lyme disease risk:** No data
- **Heat risk:** 0 days/year

#### PERFORMANCE TRIAD MEASURES

- 7+ hours of sleep (weeknight/duty night): 36% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 72% (Installation), 69% (Army)
- 2+ days per week of resistance training: 86% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 91% (Installation), 90% (Army)
- 2+ servings of fruits per day: 28% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 41% (Installation), 42% (Army)

**Installation Health Index Score**: 0.1 (50–59th percentile)

Footnotes: See page 95.
### JB Langley-Eustis

**Demographics:** Approximately 5,600 AC Soldiers
- 73% under 35 years old, 14% female
**Main Healthcare Facility:** McDonald Army Health Clinic

#### Installation Profile Summaries

**Medical Metrics**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>2,284</td>
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<td>16</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>3.0</td>
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</tr>
<tr>
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<tr>
<td>Tobacco product use (%)</td>
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<td>STIs: Chlamydia infection (rate per 1,000)</td>
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</tr>
<tr>
<td>Chronic disease (%)</td>
<td>21</td>
<td>21</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**Environmental Health Indicators**

- Poor air quality: 0 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.80 mg/L
- Solid waste diversion rate: 42%
- Mosquito-borne disease risk: High
- Lyme disease risk: Moderate
- Heat risk: 76 days/year

**Performance Triad Measures**

- 7+ hours of sleep (weeknight/duty night): 38% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 68% (Installation), 69% (Army)
- 2+ days per week of resistance training: 83% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 91% (Installation), 90% (Army)
- 2+ servings of fruits per day: 30% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 40% (Installation), 42% (Army)

**Installation Health Index Score**: -1.5 (<20th percentile)

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### JB Lewis-McChord

**Demographics:** Approximately 26,000 AC Soldiers
- 81% under 35 years old, 15% female
**Main Healthcare Facility:** Madigan Army Medical Center

#### Installation Profile Summaries

**Medical Metrics**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,756</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>--</td>
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<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>24</td>
<td>24</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>34</td>
<td>32</td>
<td>24</td>
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<tr>
<td>Chronic disease (%)</td>
<td>--</td>
<td>--</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**Environmental Health Indicators**

- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.72 mg/L
- Solid waste diversion rate: Moderate
- Mosquito-borne disease risk: Low
- Lyme disease risk: Moderate
- Heat risk: 1 days/year

**Performance Triad Measures**

- 7+ hours of sleep (weeknight/duty night): 36% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 70% (Installation), 69% (Army)
- 2+ days per week of resistance training: 84% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 91% (Installation), 90% (Army)
- 2+ servings of fruits per day: 29% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 42% (Installation), 42% (Army)

**Installation Health Index Score**: Not Calculated

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Footnotes: See page 95.

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Footnotes: See page 95.

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### JB Myer-Henderson Hall

**Demographics:** Approximately 2,000 AC Soldiers
- 77% under 35 years old, 11% female

**Main Healthcare Facility:** Andrew Rader Army Health Clinic

**MEDICAL METRICS**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,414</td>
<td>1,452</td>
<td>1,756</td>
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<tr>
<td>Behavioral health (%)</td>
<td>17</td>
<td>18</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>4.1</td>
<td>3.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>13</td>
<td>14</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>23</td>
<td>21</td>
<td>25</td>
<td>11–31</td>
</tr>
</tbody>
</table>

**PERFORMANCE TRIAD MEASURES**

- 7+ hours of sleep (weeknight/duty night): 47% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 76% (Installation), 69% (Army)
- 2+ days per week of resistance training: 81% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 90% (Installation), 90% (Army)
- 2+ servings of fruits per day: 36% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 53% (Installation), 42% (Army)

**PERFORMANCE TRIAD HEALTH INDICATORS**

- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.70 mg/L
- Solid waste diversion rate: 68%
- Mosquito-borne disease risk: High
- Lyme disease risk: Moderate
- Heat risk: 75 days/year

**ENVIRONMENTAL HEALTH INDICATORS**

- Poor air quality: 2 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.70 mg/L
- Solid waste diversion rate: 68%
- Mosquito-borne disease risk: High
- Lyme disease risk: Moderate
- Heat risk: 75 days/year

**Installation Health Index Score:** 1.8 (≥90th percentile)

Footnotes: See page 95.

### JB San Antonio

**Demographics:** Approximately 8,200 AC Soldiers
- 62% under 35 years old, 30% female

**Main Healthcare Facility:** San Antonio Military Medical Center

**MEDICAL METRICS**

<table>
<thead>
<tr>
<th>Metric</th>
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<td>1,896</td>
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<td>20</td>
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<tr>
<td>Substance use disorder (%)</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>21</td>
<td>19</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>15</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>12</td>
<td>13</td>
<td>25</td>
<td>11–31</td>
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</table>

**PERFORMANCE TRIAD MEASURES**

- 7+ hours of sleep (weeknight/duty night): 37% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 73% (Installation), 69% (Army)
- 2+ days per week of resistance training: 80% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 88% (Installation), 90% (Army)
- 2+ servings of fruits per day: 36% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 48% (Installation), 42% (Army)

**PERFORMANCE TRIAD HEALTH INDICATORS**

- Poor air quality: 6 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.18 mg/L
- Solid waste diversion rate: High
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: Moderate
- Heat risk: 149 days/year

**ENVIRONMENTAL HEALTH INDICATORS**

- Poor air quality: 6 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.18 mg/L
- Solid waste diversion rate: High
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: Moderate
- Heat risk: 149 days/year

**Installation Health Index Score:** -0.1 (40–49th percentile)

Footnotes: See page 95.
Installation Profile Summaries

Presidio of Monterey

Demographics: Approximately 1,100 AC Soldiers
83% under 35 years old, 21% female
Main Healthcare Facility: Presidio of Monterey Army Health Clinic

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<tr>
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<td>1,756</td>
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<td>--</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>--</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>Tobacco product use (%)</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<tr>
<td>Chronic disease (%)</td>
<td>--</td>
<td>--</td>
<td>18</td>
<td>12–35</td>
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</tbody>
</table>

ENVIRONMENTAL HEALTH INDICATORS⁴

Poor air quality: 1 days/year
Poor water quality: 0 days/year
Water fluoridation: 0.25 mg/L
Solid waste diversion rate: 38%
Mosquito-borne disease risk: Moderate
Lyme disease risk: No Data
Heat risk: 3 days/year

Performance Triad Measures

7+ hours of sleep (weeknight/duty night) 44% 37%
7+ hours of sleep (weekend or non-duty night) 81% 69%
2+ days per week of resistance training 84% 84%
150+ minutes per week of aerobic activity 92% 90%
2+ servings of fruits per day 35% 33%
2+ servings of vegetables per day 51% 42%

Installation Health Index Score⁵: Not Calculated

USAG West Point

Demographics: Approximately 1,500 AC Soldiers
57% under 35 years old, 19% female
Main Healthcare Facility: Keller Army Community Hospital

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<td>11</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>1.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>Sleep disorder (%)</td>
<td>13</td>
<td>11</td>
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<td>Obesity (%)</td>
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<td>17</td>
<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>11</td>
<td>15</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>Data suppressed*</td>
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<tr>
<td>Chronic disease (%)</td>
<td>27</td>
<td>23</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL HEALTH INDICATORS⁴

Poor air quality: 0 days/year
Poor water quality: 0 days/year
Water fluoridation: 0.40 mg/L
Solid waste diversion rate: High
Mosquito-borne disease risk: Moderate
Lyme disease risk: High
Heat risk: 25 days/year

Performance Triad Measures

7+ hours of sleep (weeknight/duty night) 49% 37%
7+ hours of sleep (weekend or non-duty night) 77% 69%
2+ days per week of resistance training 79% 84%
150+ minutes per week of aerobic activity 88% 90%
2+ servings of fruits per day 41% 33%
2+ servings of vegetables per day 52% 42%

Installation Health Index Score⁵: 1.9 (≥90th percentile)

Footnotes: See page 95.
-- MHS GENESIS data were unavailable for these metrics.
Periodic Health Assessment data were unavailable for this installation.
Personnel and medical data were not available for cadets; estimates are limited to permanent party AC Soldiers.
## Installation Profile Summaries

### MEDICAL METRICS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
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<td>1,362</td>
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<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>2.4</td>
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<td>1.4–7.0</td>
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<td>9.1</td>
<td>9.0</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<td>19</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
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<tr>
<td>Chronic disease (%)</td>
<td>17</td>
<td>16</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### PERFORMANCE TRIAD MEASURES

- 7+ hours of sleep (weeknight/duty night): 36% (Army 37%)
- 2+ days per week of resistance training: 82% (Army 84%)
- 150+ minutes per week of aerobic activity: 91% (Army 90%)
- 2+ servings of fruits per day: 30% (Army 33%)
- 2+ servings of vegetables per day: 42% (Army 42%)

### ENVIRONMENTAL HEALTH INDICATORS

- Poor air quality: 20 days/year
- Poor water quality: 365 days/year
- Water fluoridation: 1.1 mg/L
- Solid waste diversion rate: 50%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: No data
- Heat risk: 44 days/year

### Footnotes

Footnotes: See pages 95.
## Installation Profile Summaries

### USAG Ansbach

**Demographics:** Approximately 1,000 AC Soldiers  
82% under 35 years old, 12% female  
Main Healthcare Facility: Ansbach Army Health Clinic; Landstuhl Regional Medical Center

<table>
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<td>16</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>1.4–7.0</td>
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<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>28</td>
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<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>25</td>
<td>23</td>
<td>24</td>
<td>11–41</td>
</tr>
</tbody>
</table>

### USAG Bavaria

**Demographics:** Approximately 10,000 AC Soldiers  
84% under 35 years old, 11% female  
Main Healthcare Facility: U.S. Army Health Clinic Grafenwoehr

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<tr>
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<th>Adjusted Value</th>
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<tr>
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<tr>
<td>Obesity (%)</td>
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<td>12–26</td>
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<td>Tobacco product use (%)</td>
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<td>32</td>
<td>29</td>
<td>24</td>
<td>11–41</td>
</tr>
</tbody>
</table>

### Performance Triad Measures

#### Installation Health Index Score:

- **USAG Ansbach:** 0.9 (80–89th percentile)  
- **USAG Bavaria:** 0.6 (70–79th percentile)

### Environmental Health Indicators

#### USAG Ansbach

- **Poor air quality:** 3 days/year
- **Poor water quality:** 12 days/year
- **Water fluoridation:** 0.60 mg/L
- **Solid waste diversion rate:** 62%
- **Mosquito-borne disease risk:** Moderate
- **Lyme disease risk:** High
- **Heat risk:** 5 days/year

#### USAG Bavaria

- **Poor air quality:** 3 days/year
- **Poor water quality:** 0 days/year
- **Water fluoridation:** 0.61 mg/L
- **Solid waste diversion rate:** 60%
- **Mosquito-borne disease risk:** Moderate
- **Lyme disease risk:** High
- **Heat risk:** 7 days/year

---

Footnotes: See page 95.
Installation Profile Summaries

**USAG Daegu**

Demographics: Approximately 3,100 AC Soldiers
78% under 35 years old, 20% female
Main Healthcare Facility: Wood Army Health Clinic

<table>
<thead>
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<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,344</td>
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<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>2.5</td>
<td>2.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
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<td>13</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>21</td>
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<td>41</td>
<td>35</td>
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<td>11–41</td>
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</tbody>
</table>

ENVIRONMENTAL HEALTH INDICATORS

- Poor air quality: 89 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.70 mg/L
- Solid waste diversion rate: 68%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: No data
- Heat risk: 51 days/year

Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 31% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 63% (Installation), 69% (Army)
- 2+ days per week of resistance training: 81% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 89% (Installation), 90% (Army)
- 2+ servings of fruits per day: 28% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 38% (Installation), 42% (Army)

Installation Health Index Score: 1.1 (80–89th percentile)

Footnotes: See page 95.

**USAG Humphreys**

Demographics: Approximately 7,400 AC Soldiers
78% under 35 years old, 16% female
Main Healthcare Facility: Brian D. Allgood Army Community Hospital

<table>
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<th>Value</th>
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<tr>
<td>Substance use disorder (%)</td>
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<td>3.5</td>
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<tr>
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<td>17</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>23</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>36</td>
<td>29</td>
<td>24</td>
<td>11–41</td>
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</table>

ENVIRONMENTAL HEALTH INDICATORS

- Poor air quality: 154 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.15 mg/L
- Solid waste diversion rate: 73%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: Moderate
- Heat risk: 37 days/year

Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 34% (Installation), 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 69% (Installation), 69% (Army)
- 2+ days per week of resistance training: 83% (Installation), 84% (Army)
- 150+ minutes per week of aerobic activity: 88% (Installation), 90% (Army)
- 2+ servings of fruits per day: 29% (Installation), 33% (Army)
- 2+ servings of vegetables per day: 38% (Installation), 42% (Army)

Installation Health Index Score: 1.1 (80–89th percentile)

Footnotes: See page 95.
Installation Profile Summaries

### USAG Red Cloud

**Demographics:** Approximately 2,800 AC Soldiers
- 75% under 35 years old, 17% female

**Main Healthcare Facility:** Camp Red Cloud Troop Medical Clinic

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<th>Value</th>
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<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
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<td>Sleep disorder (%)</td>
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<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>26</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>28</td>
<td>24</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>17</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**Environmental Health Indicators**

- Poor air quality: 105 days/year
- Poor water quality: 0 days/year
- Water fluoridation: No data
- Solid waste diversion rate: 52%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: No data
- Heat risk: 38 days/year

**Performance Triad Measures**

- 7+ hours of sleep (weeknight/duty night): 33% (Army: 37%)
- 7+ hours of sleep (weekend or non-duty night): 65% (Army: 69%)
- 2+ days per week of resistance training: 83% (Army: 84%)
- 150+ minutes per week of aerobic activity: 88% (Army: 90%)
- 2+ servings of fruits per day: 26% (Army: 33%)
- 2+ servings of vegetables per day: 36% (Army: 42%)

Installation Health Index Score: 0.7 (70–79th percentile)

### USAG Rheinland-Pfalz

**Demographics:** Approximately 6,200 AC Soldiers
- 73% under 35 years old, 21% female

**Main Healthcare Facilities:** Kleber Health Clinic (aka U.S. Army Health Clinic Kaiserslautern); Landstuhl Regional Medical Center

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
<td>1,779</td>
<td>1,756</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
<td>Behavioral health (%)</td>
<td>20</td>
<td>20</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>5.0</td>
<td>5.2</td>
<td>3.5</td>
<td>1.4–7.0</td>
</tr>
<tr>
<td>Sleep disorder (%)</td>
<td>20</td>
<td>20</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>19</td>
<td>19</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>22</td>
<td>23</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>32</td>
<td>32</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>21</td>
<td>20</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

**Environmental Health Indicators**

- Poor air quality: 10 days/year
- Poor water quality: 0 days/year
- Water fluoridation: High
- Lyme disease risk: Moderate
- Heat risk: 8 days/year

**Performance Triad Measures**

- 7+ hours of sleep (weeknight/duty night): 35% (Army: 37%)
- Water fluoridation: 1.0 mg/L
- Solid waste diversion rate: 84%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: High
- Heat risk: 8 days/year

Installation Health Index Score: -0.9 (<20th percentile)

Footnotes: See page 95.
Installation Profile Summaries

**USAG Stuttgart**

Demographics: Approximately 1,700 AC Soldiers
- 55% under 35 years old, 12% female

Main Healthcare Facility: The Stuttgart Army Health Clinic

### Medical Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
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<td>15</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>2.7</td>
<td>3.3</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>19</td>
<td>15</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
<td>20</td>
<td>18</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>21</td>
<td>23</td>
<td>25</td>
<td>11–31</td>
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<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>13</td>
<td>18</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>27</td>
<td>19</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 39% (Installation) 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 70% (Installation) 69% (Army)
- 2+ days per week of resistance training: 81% (Installation) 84% (Army)
- 150+ minutes per week of aerobic activity: 89% (Installation) 90% (Army)
- 2+ servings of fruits per day: 28% (Installation) 33% (Army)
- 2+ servings of vegetables per day: 42% (Installation) 42% (Army)

### Environmental Health Indicators

- Poor air quality: 11 days/year
- Poor water quality: 236 days/year
- Water fluoridation: 0.80 mg/L
- Solid waste diversion rate: 55%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: High
- Heat risk: 8 days/year

Installation Health Index Score: 0.5 (70–79th percentile)

**USAG Vicenza**

Demographics: Approximately 3,200 AC Soldiers
- 78% under 35 years old, 11% female

Main Healthcare Facility: Vicenza Army Health Clinic

### Medical Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Crude Value</th>
<th>Adjusted Value</th>
<th>Value</th>
<th>Range</th>
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</thead>
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<tr>
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<td>1,566</td>
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<td>13</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>3.9</td>
<td>3.7</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<td>12</td>
<td>14</td>
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<tr>
<td>Obesity (%)</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
<td>27</td>
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<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>23</td>
<td>23</td>
<td>24</td>
<td>11–41</td>
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<tr>
<td>Chronic disease (%)</td>
<td>13</td>
<td>16</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 36% (Installation) 37% (Army)
- 7+ hours of sleep (weekend or non-duty night): 72% (Installation) 69% (Army)
- 2+ days per week of resistance training: 84% (Installation) 84% (Army)
- 150+ minutes per week of aerobic activity: 90% (Installation) 90% (Army)
- 2+ servings of fruits per day: 33% (Installation) 33% (Army)
- 2+ servings of vegetables per day: 45% (Installation) 42% (Army)
- Heat risk: 63 days/year

Installation Health Index Score: 1.1 (80–89th percentile)
Installation Profile Summaries

**USAG Wiesbaden**

Demographics: Approximately 1,300 AC Soldiers
71% under 35 years old, 19% female

Main Healthcare Facilities: U.S. Army Health Clinic Wiesbaden; Landstuhl Regional Medical Center

### Installation Health Index Score: -0.1 (40–49th percentile)

<table>
<thead>
<tr>
<th>MEDICAL METRICS</th>
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<th>Adjusted Value</th>
<th>Value</th>
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<tbody>
<tr>
<td>Injury (rate per 1,000)</td>
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<td>1,746</td>
<td>1,756</td>
<td>1,257–2,739</td>
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<tr>
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<td>19</td>
<td>16</td>
<td>9.9–26</td>
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<tr>
<td>Substance use disorder (%)</td>
<td>3.4</td>
<td>3.5</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
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<td>16</td>
<td>16</td>
<td>14</td>
<td>6.9–25</td>
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<tr>
<td>Obesity (%)</td>
<td>17</td>
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<td>12–26</td>
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<tr>
<td>Tobacco product use (%)</td>
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<td>11–31</td>
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<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>27</td>
<td>29</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>20</td>
<td>18</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 35% Installation, 37% Army
- 7+ hours of sleep (weekend or non-duty night): 64% Installation, 69% Army
- 2+ days per week of resistance training: 82% Installation, 84% Army
- 150+ minutes per week of aerobic activity: 87% Installation, 90% Army
- 2+ servings of fruits per day: 24% Installation, 33% Army
- 2+ servings of vegetables per day: 35% Installation, 42% Army

### Environmental Health Indicators
- Poor air quality: 17 days/year
- Poor water quality: 365 days/year
- Water fluoridation: 0.00 mg/L
- Solid waste diversion rate: 51%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: High
- Heat risk: 9 days/year

### Installation Health Profile

Installation Health Profile: See page 95.

**USAG Yongsan**

Demographics: Approximately 2,700 AC Soldiers
70% under 35 years old, 17% female

Main Healthcare Facility: USAG Yongsan Hospital

### Installation Health Index Score: 1.3 (≥90th percentile)

<table>
<thead>
<tr>
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<th>Value</th>
<th>Range</th>
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</thead>
<tbody>
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<td>1,389</td>
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<td>12</td>
<td>11</td>
<td>16</td>
<td>9.9–26</td>
</tr>
<tr>
<td>Substance use disorder (%)</td>
<td>2.6</td>
<td>2.6</td>
<td>3.5</td>
<td>1.4–7.0</td>
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<tr>
<td>Sleep disorder (%)</td>
<td>12</td>
<td>12</td>
<td>14</td>
<td>6.9–25</td>
</tr>
<tr>
<td>Obesity (%)</td>
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<td>15</td>
<td>17</td>
<td>12–26</td>
</tr>
<tr>
<td>Tobacco product use (%)</td>
<td>22</td>
<td>23</td>
<td>25</td>
<td>11–31</td>
</tr>
<tr>
<td>STIs: Chlamydia infection (rate per 1,000)</td>
<td>36</td>
<td>35</td>
<td>24</td>
<td>11–41</td>
</tr>
<tr>
<td>Chronic disease (%)</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>12–35</td>
</tr>
</tbody>
</table>

### Performance Triad Measures

- 7+ hours of sleep (weeknight/duty night): 35% Installation, 37% Army
- 7+ hours of sleep (weekend or non-duty night): 69% Installation, 69% Army
- 2+ days per week of resistance training: 82% Installation, 84% Army
- 150+ minutes per week of aerobic activity: 88% Installation, 90% Army
- 2+ servings of fruits per day: 30% Installation, 33% Army
- 2+ servings of vegetables per day: 40% Installation, 42% Army

### Environmental Health Indicators
- Poor air quality: 71 days/year
- Poor water quality: 0 days/year
- Water fluoridation: 0.97 mg/L
- Solid waste diversion rate: 70%
- Mosquito-borne disease risk: Moderate
- Lyme disease risk: No data
- Heat risk: 38 days/year

### Installation Health Profile

Installation Health Profile: See page 95.
## Installation Profile Summaries

### At a glance...

<table>
<thead>
<tr>
<th>Profiles (2019)</th>
<th>End-strength</th>
<th>Under 35 years old (%)</th>
<th>Female population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Belvoir</td>
<td>3,400</td>
<td>46</td>
<td>23</td>
</tr>
<tr>
<td>Fort Benning</td>
<td>21,000</td>
<td>85</td>
<td>7</td>
</tr>
<tr>
<td>Fort Bliss</td>
<td>26,000</td>
<td>81</td>
<td>15</td>
</tr>
<tr>
<td>Fort Bragg</td>
<td>44,000</td>
<td>78</td>
<td>12</td>
</tr>
<tr>
<td>Fort Campbell</td>
<td>27,000</td>
<td>85</td>
<td>12</td>
</tr>
<tr>
<td>Fort Carson</td>
<td>24,000</td>
<td>84</td>
<td>14</td>
</tr>
<tr>
<td>Fort Drum</td>
<td>15,000</td>
<td>86</td>
<td>12</td>
</tr>
<tr>
<td>Fort Gordon</td>
<td>8,700</td>
<td>75</td>
<td>20</td>
</tr>
<tr>
<td>Fort Hood</td>
<td>34,000</td>
<td>83</td>
<td>16</td>
</tr>
<tr>
<td>Fort Huachuca</td>
<td>4,000</td>
<td>78</td>
<td>16</td>
</tr>
<tr>
<td>Fort Irwin</td>
<td>4,100</td>
<td>76</td>
<td>14</td>
</tr>
<tr>
<td>Fort Jackson</td>
<td>8,900</td>
<td>86</td>
<td>28</td>
</tr>
<tr>
<td>Fort Knox</td>
<td>4,400</td>
<td>65</td>
<td>23</td>
</tr>
<tr>
<td>Fort Leavenworth</td>
<td>3,200</td>
<td>50</td>
<td>16</td>
</tr>
<tr>
<td>Fort Lee</td>
<td>6,700</td>
<td>75</td>
<td>25</td>
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<td>Fort Leonard Wood</td>
<td>9,400</td>
<td>84</td>
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<td>Fort Polk</td>
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<td>Fort Rucker</td>
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<td>Fort Stewart</td>
<td>19,000</td>
<td>84</td>
<td>15</td>
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</table>

<table>
<thead>
<tr>
<th>Profiles (2019)</th>
<th>End-strength</th>
<th>Under 35 years old (%)</th>
<th>Female population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Wainwright</td>
<td>6,200</td>
<td>87</td>
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<td>Hawaii</td>
<td>19,000</td>
<td>77</td>
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<tr>
<td>JB Elmendorf-Richardson</td>
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<td>JB Lewis-McChord</td>
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<td>JB San Antonio</td>
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<td>30</td>
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<td>Presidio of Monterey</td>
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<tr>
<td>USAG West Point</td>
<td>1,500</td>
<td>57</td>
<td>19</td>
</tr>
</tbody>
</table>

### INSTALLATIONS OUTSIDE THE UNITED STATES

- **Japan**: 2,600 end-strength, 74% under 35 years old, 13% female population
- **USAG Ansbach**: 1,000 end-strength, 82% under 35 years old, 12% female population
- **USAG Bavaria**: 10,000 end-strength, 84% under 35 years old, 11% female population
- **USAG Daegu**: 3,100 end-strength, 78% under 35 years old, 20% female population
- **USAG Humphreys**: 7,400 end-strength, 78% under 35 years old, 16% female population
- **USAG Red Cloud**: 2,800 end-strength, 75% under 35 years old, 17% female population
- **USAG Rheinland-Pfalz**: 6,200 end-strength, 73% under 35 years old, 21% female population
- **USAG Stuttgart**: 1,700 end-strength, 55% under 35 years old, 12% female population
- **USAG Vicenza**: 3,200 end-strength, 78% under 35 years old, 11% female population
- **USAG Wiesbaden**: 1,300 end-strength, 71% under 35 years old, 19% female population
- **USAG Yongsan**: 2,700 end-strength, 70% under 35 years old, 17% female population
### Installation Profile Summaries

**Selected Medical Metrics**  
*Presented values are adjusted for age and sex*

<table>
<thead>
<tr>
<th>Installation</th>
<th>Injury (rate per 1,000)</th>
<th>Sleep disorder (%)</th>
<th>Obesity (%)</th>
<th>Tobacco product use (%)</th>
<th>Chronic disease (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Belvoir</td>
<td>1,973</td>
<td>3.8</td>
<td>19</td>
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<tr>
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<tr>
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<td>1,676</td>
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<tr>
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<tr>
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**Selected Medical Metrics**  
*Presented values are adjusted for age and sex*

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**INSTALLATIONS OUTSIDE THE UNITED STATES**

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**Footnotes:** See page 95.
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## Environmental Health Indicators

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## INSTALLATIONS OUTSIDE THE UNITED STATES

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Footnotes: See page 95.
### Installation Profile Summaries

#### Performance Triad

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#### Army

- 7+ hours of sleep (weeknights) (%): 37
- 7+ hours of sleep (weekends) (%): 69
- 150+ minutes per week of resistance training (%): 84
- 2+ servings of fruits per day (%): 90
- 2+ servings of vegetables per day (%): 33

### INSTALLATIONS OUTSIDE THE UNITED STATES

#### Performance Triad

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<th>Installation</th>
<th>7+ hours of sleep (weeknights) (%)</th>
<th>7+ hours of sleep (weekends) (%)</th>
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<th>2+ servings of fruits per day (%)</th>
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#### USAG West Point

- 7+ hours of sleep (weeknights) (%): 37
- 7+ hours of sleep (weekends) (%): 69
- 150+ minutes per week of resistance training (%): 84
- 2+ servings of fruits per day (%): 90
- 2+ servings of vegetables per day (%): 33

#### INSTALLATIONS OUTSIDE THE UNITED STATES

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<td>69</td>
<td>82</td>
<td>88</td>
<td>30</td>
</tr>
</tbody>
</table>

#### Army

- 7+ hours of sleep (weeknights) (%): 37
- 7+ hours of sleep (weekends) (%): 69
- 150+ minutes per week of resistance training (%): 84
- 2+ servings of fruits per day (%): 90
- 2+ servings of vegetables per day (%): 33
APPENDICES

• Methods
• Acknowledgments
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METHODS

I. Methodological and Data Updates

The 2020 edition of Health of the Force includes updates to methods and data, which limit direct comparison to prior reports. Global changes to this report are summarized below. Changes affecting a specific metric are included in the method summary for that metric.

- Population and medical metric estimates were enhanced by transitioning from quarterly to monthly Defense Manpower Data Center (DMDC) personnel rosters. The additional granularity of data resulted in more accurate person-time estimates for installations and demographic subgroups. With this change, estimates were most improved for installations that conduct initial entry training, as trainees have shorter tours of duty and more opportunities to be captured in the monthly data extracts.

- As in prior editions, certain medical metrics (i.e., injury, behavioral health, substance use disorder, sleep disorder, obesity, and chronic disease) cannot be reported for installations that have transitioned to the MHS GENESIS electronic health recordkeeping system. Affected installations include Joint Base Lewis-McChord (JBLM) and Presidio of Monterey (PoM). However, all other Active Component (AC) demographics and metrics are available for these installations and are now reported in the installation profile pages.

- Soldier age was calculated as the difference between the mid-point of the calendar year (July 01, 2019) and the date of birth, rather than using the first day of the year. This change removed the modest skewing of results towards a younger demographic while continuing to stabilize the age categories across all data sources. The 2015 age and sex distribution used as a standard for rate adjustments was also updated to reflect this change (Watkins et al. 2018).

- For the first time, race and ethnicity demographics are presented in Health of the Force. These strata are reported for the AC population, as well as the medical and Performance Triad metrics. The Office of Management and Budget (OMB) has defined minimum standards for collecting and presenting data on race and ethnicity for Federal reporting (FR 1997). Accordingly, the OMB-recommended categories have been adopted for this report. DMDC personnel records including race or ethnicity other than those specified by OMB, including no race or ethnicity, were categorized as other/unknown. These Soldiers contributed to AC Army estimates and were excluded from race- and ethnicity-specific summaries. DMDC data lacked sufficient detail to determine if Soldiers identified as multi-racial.

- As is customary with Health of the Force reporting, multi-year data are presented over a 5-year period for certain medical metrics in order to provide discernment of trends in these outcomes. Any methodological or data updates implemented with this reporting cycle were applied when these trends were generated. As a result, updated estimates may differ slightly from those in previous editions of Health of the Force. The look-back window for trend data is 5 years (2015–2019). However, injury outcomes were restricted to a 4-year
II. AC Soldier Population and Installation Selection

AC Soldier demographics (i.e., age, sex, race, ethnicity, military occupational specialty, unit identification code, and assigned unit ZIP code) were obtained from DMDC personnel rosters. Since the AC Soldier population is a dynamic population, end-strength numbers, based on December 2019 DMDC rosters, were used to determine the proportions of the AC Soldier population by age, sex, race, and ethnicity.

AC Soldier population for installations that appear in Health of the Force were estimated from AC Soldier person-time in DMDC personnel rosters. A Soldier’s contribution to the AC person-time denominator was the number of days of the year that Soldier was on active duty and assigned to a particular installation. A Soldier on active duty for an entire year contributed one person-year to the denominator (population). Similarly, two different Soldiers on active duty for 6 months also contributed one person-year to the denominator (population). Using this approach, population counts reflect the actual amount of time each Soldier contributed to the AC cohort.

Unless otherwise noted, Soldiers were assigned to the last ZIP code of assignment during the calendar year. However, unique methodologies were used for injury, heat illness, and STIs in which installation assignment was determined based on the Soldier’s assigned unit ZIP code during the month of the event, plus or minus 3 months. Soldiers may belong to multiple installations over the course of a year due to changes in unit assignment. Installation reporting units that appear in Health of the Force are those with an average population of 1,000 or more AC Soldiers. Metrics and demographics for installation reporting units appear in the installation profile pages. Personnel and medical data were not available for cadets; therefore, USAG West Point estimates derived from DMDC data were limited to permanent party AC Soldiers.

Metric summaries for the full AC Army cohort include all installations not affected by the MHS GENESIS transition. These appear in the respective metric narratives and installation profile pages. Demographic summaries for the full AC cohort include all Soldiers regardless of installation assignment or use of MHS GENESIS.

When evaluating the Installation Health Index (IHI) and rankings of key medical metrics, installations located within the U.S. were aggregated and compared separately from installations outside the U.S. This was done because the health status and health records of Soldiers stationed outside the U.S. may vary in ways that could create bias when compared to U.S.-based Soldiers. As an example, Soldiers stationed outside the U.S. are more likely to meet deployment medical standards compared to Soldiers stationed at U.S. installations. There may also be differences in the healthcare delivery records since installations outside the U.S. may be more likely to outsource care.

look-back (2016–2019) in order to draw exclusively from diagnostic codes appearing in the International Classification of Diseases, 10th revision, Clinical Modification (ICD-10-CM), which was updated in October 2015.

- The number of AC Soldiers assigned to U.S. Army Garrison (USAG) Ansbach met the estimated average population of 1,000 AC Soldiers required for inclusion in the report.

III. Medical Metrics

Medical metrics were adapted from nationally recognized health indicators routinely tracked by public health authorities such as the CDC, the Robert Wood Johnson Foundation, and the United Health Foundation. For the AC Soldier population, the APHC-selected metrics used specific criteria: 1) the importance of the problem to Force health and readiness (e.g., prevalence and severity of the condition), 2) the preventability of the problem, 3) the feasibility of the metric, 4) the timeliness and frequency of data capture, and 5) the strength of supporting evidence (DHHS 2018). Metrics and supporting health outcomes included in the report are described below; metrics included in the IHI computation are designated with an asterisk.

Data used to calculate medical metric estimates were abstracted from the Military Health System Data Repository (MDR), the Disease Reporting System, internet (DRSI), and the Periodic Health Assessment (PHA). MDR ambulatory encounters were captured through the Comprehensive Ambulatory Professional Encounter Record (CAPER) and the TRICARE Encounter Record – Non-Institutional (TED-NI). MDR inpatient admissions were captured through the Standard Inpatient Data Record (SIDR) and the TRICARE Encounter Record – Institutional (TED-I). MDR vitals records (i.e., height and weight) were captured through the Clinical Data Repository (CDR) Vitalis table.

1. Injury*

Injury incidence rate: Number of newly diagnosed injuries per 1,000 person-years among AC Soldiers in the calendar year

The incidence rates of new injuries were evaluated for AC Soldiers and trainees. Estimates were derived from outpatient and inpatient medical and personnel records. Installation assignment was determined based on the Soldier’s assigned unit ZIP code during the month of the injury, plus or minus 3 months.

Injuries were defined using A Taxonomy of Injuries for Public Health Monitoring and Reporting (APHC 2017a), which is based on the ICD-10-CM adopted in the U.S. as of fiscal year 2016. Injury is defined as any damage to, or interruption of, body tissue caused by an energy transfer (energy may be mechanical, thermal, nuclear, electrical, or chemical). Injury diagnoses include those for traumatic injuries (ICD-10-CM S- and selected T-codes) and for injury-related musculoskeletal (MSK) conditions (selected ICD-10-CM M-codes).

Initial medical encounters with injury diagnosis codes included in the case definition were counted; follow-up visits less than 60 days apart were excluded. After 60 days, a medical encounter with a qualifying diagnosis was counted as a new injury. Rates per 1,000 person-years were computed based on Soldier person-time. The percentage of Soldiers who received at least one new injury diagnosis during the calendar year was also reported by age and sex.

*Medical metrics that were included in the calculation of the IHI are identified with an asterisk.
2. Behavioral Health

Behavioral health disorder prevalence: Percentage of AC Soldiers with at least one qualifying behavioral health diagnosis in the calendar year

The annual prevalence of seven sets of diagnosed behavioral health disorders of interest (adjustment disorders, mood disorders, anxiety disorders, posttraumatic stress disorder (PTSD), substance use disorders, personality disorders, and psychoses) among AC Soldiers and trainees was estimated from International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM) and ICD-10-CM codes identified in Soldiers’ medical records. Case definitions established by the APHC were applied for the seven disorders of interest. Soldiers could have one or more diagnosed behavioral health conditions. A composite measure, “any behavioral health disorder”, included Soldiers with any of these disorder diagnoses. Installation assignment was determined by the Soldier’s last assigned unit ZIP code for the calendar year.

The case definition used for this year’s report is the same as for last year’s report. However, this differs from the case definition used in reports for 2017 and earlier, in which Soldiers who had ever had a qualifying behavioral health diagnosis recorded in their military medical record were considered prevalent cases. For the 2020 report, the look-back period for existing cases was limited to 12 months in order to more accurately reflect the percentage of Soldiers with current diagnoses.

The prevalence of substance use disorders, a subcomponent of the behavioral health disorder measure, was evaluated for AC Soldiers. Disorder categories, which include alcohol, opioids, cannabis, sedatives, cocaine, other stimulants, hallucinogens, inhalants, and other psychoactive substance-related disorders, are presented in aggregate. As with the broader behavioral health disorder metric, substance use disorder prevalence was estimated using ICD-9-CM and ICD-10-CM diagnosis codes identified in the Soldier’s medical records. Installation assignment was determined by the Soldier’s last assigned unit ZIP code for the calendar year.

e-Profile data from the Medical Operational Data System (MODS) were analyzed to assess temporary profiles of 7 or more days for selected behavioral health conditions. The data provide context regarding the potential readiness impact.

3. Sleep Disorders*

Sleep disorder prevalence: Percentage of AC Soldiers with at least one qualifying sleep disorder diagnosis in the calendar year

Sleep disorders were defined as a diagnosis of one of the following conditions: insomnia, hypersomnia, circadian rhythm sleep disorder, sleep apnea, narcolepsy and cataplexy, parasomnia, and sleep-related movement disorders. The prevalence of sleep disorders among AC Soldiers and trainees was estimated from ICD-10-CM diagnosis codes identified in the Soldier’s medical records. Installation assignment was determined by the Soldier’s last assigned unit ZIP code for the calendar year.

4. Obesity*

Obesity prevalence: Percentage of AC Soldiers with a body mass index (BMI) greater than or equal to 30

BMI was calculated from height and weight measurements obtained from the CDR Vitals module and captured during outpatient medical encounters for AC Soldiers and trainees. BMI was not calculated for females who had a pregnancy-related diagnosis code in their ambulatory record or who were assigned a pregnancy-related Medicare Severity Diagnosis Related Group code in their inpatient record.

The measure “any tobacco product use” excludes Soldiers who use e-cigarettes but no other form of tobacco. This differs from the measure in last year’s report, which excluded Soldiers who used e-cigarettes, whether or not they used other forms of tobacco.

Tobacco product use data were obtained from the PHA, which collects self-reported information on respondents’ current smoking behavior, use of smokeless tobacco, and e-cigarette use. Installation assignment was determined by the Soldier’s last assigned unit ZIP code for calendar year 2019.
Appendices

age and sex distribution. Readily available survey data from the BRFSS were used for the analysis of the U.S. population. Tobacco product use questions were modified in the 2018 PHA, and retained in the 2019 PHA, to collect more detailed information regarding the types of tobacco used, including e-cigarette/vaping information. Questions were also reworded to include any use within the past 30 days. This broader definition of current tobacco product use may have resulted in the inclusion of casual users in addition to the frequent users identified in prior assessments. To be categorized as a tobacco product user in national surveys such as the BRFSS, the respondent must meet a designated use threshold (e.g., 100 cigarettes) and self-report current use, as opposed to any use in the past 30 days. Therefore, AC Soldier tobacco product use prevalence estimates may be inflated relative to U.S. estimates. Comparisons of 2019 PHA data to historical PHA data and to national data should be interpreted with caution.

6. Heat Illness

Heat illness cases: Number of AC Soldiers who had one or more qualifying heat exhaustion or heat stroke diagnoses; or who were reported as a case of heat exhaustion or heat stroke through the DRSi in the calendar year

Heat illnesses among AC Soldiers and trainees were reported based on incident cases identified in the Defense Health Agency’s Weather-related Injury Repository, which captures a selection of ICD-9-CM and ICD-10-CM codes in inpatient and outpatient medical encounter records and medical event reports of heat exhaustion and heat stroke through the DRSi. The diagnostic codes used to identify heat illnesses were adapted from standard case definitions of heat exhaustion and heat stroke established by the Armed Forces Health Surveillance Division (AFHSDD). Soldiers were counted as an incident case if they had an initial encounter for a heat illness within that calendar year. Soldiers with only a follow-up or subsequent visit for a heat illness within a calendar year were excluded. Consistent with the AFHSD case definition, Soldiers were considered an incident case only once per calendar year. Installation assignment was determined by the Soldier’s assigned unit ZIP code at the time of the heat illness event based on the month of the heat illness event, plus or minus three months.

7. Hearing

Percent New Significant Threshold Shifts: Percentage of AC Soldiers with a new Significant Threshold Shift (STS)
Prevalence of Projected Hearing Profiles: Percentage of AC Soldiers with a clinically significant hearing loss and/or requiring a fitness-for-duty hearing readiness evaluation
Percent Not Hearing Ready: Percentage of AC Soldiers who are overdue for their annual hearing test, are in need of a follow-up hearing test, or missed the follow-up hearing test window

Army hearing loss and injury data were obtained from the system of record, the Defense Occupational and Environmental Health Readiness System – Hearing Conservation (DOEHRS-HC) Data Repository (DRS). Army hearing readiness data were obtained from DOEHRS-HC data utilized by the Medical Protection System (MEDPROS). Hearing injury and hearing readiness classification metrics are updated on a monthly basis in the Strategic Management System (SMS). Projected hearing profile metrics are updated in the SMS on an annual basis. Hearing metrics are compared to goals established by the Army Hearing Program.

8. Sexually Transmitted Infections (Chlamydia)*

Sexually transmitted infections (Chlamydia) incidence rate: Number of new chlamydia infections reported through DRSi per 1,000 person-years among AC Soldiers in the calendar year

The incidence of reported chlamydia infections was evaluated for AC Soldiers and trainees. Installation assignment was determined based on the Soldier’s assigned unit ZIP code during the month of the chlamydia infection, plus or minus 3 months. For onset dates that fell outside this 3-month window, the MTF reporting the infection was used to determine installation assignment. Prior Health of the Force reports assigned installations based on the reporting MTF; therefore, installation rates may vary from those previously reported.

New or incident infections were identified from medical event reports submitted through the DRSi using incidence rules published by the Armed Forces Health Surveillance Division (now Division AFHSDB 2015). Incident case reports were counted; follow-up reports less than 30 days apart were excluded. After 30 days, follow-up reports were counted as a new infection. DRSi entries which were not confirmed or validated in DMDC as belonging to an AC Soldier were excluded; this exclusion criteria was more restrictive than that used in prior reports and resulted in slight decreases in incidence rate estimates.

Chlamydia infection rates per 1,000 Soldiers were computed using Soldier person-time. Incidence rates for installations with fewer than 20 cases were not reported and were excluded from the IHI computation since small case counts limit the reliability of the estimates. Poor reporting compliance (<50%) was also considered as an exclusion criterion; however, all installations met the reporting threshold. Reporting compliance was determined by the Navy and Marine Corps Public Health Center, which manages the DRSi.

Data extracted from the MHS Population Health Portal in Carepoint were used to examine annual chlamydia screening among MHS-enrolled female AC Soldiers under age 25. The screening estimates contextualized the reported rates and identify areas for improvement.

Age- and sex-adjusted incidence rates for AC Soldiers and a cohort of the U.S. population ranging in age from 15–64 years were compared using the 2015 Army AC population distribution as the adjustment standard. Age- and sex-specific national data published by the CDC were used in the analysis of U.S. population data. The DRSi follows reporting requirements and case classification standards similar to those used by the CDC’s National Notifiable Disease Surveillance System (NNDSS), which is used to generate national estimates.
9. Chronic Disease*

Chronic disease prevalence: Percentage of AC Soldiers with at least one qualifying new or existing chronic disease diagnosis in the calendar year

The prevalence of seven chronic conditions of interest (asthma, arthritis, chronic obstructive pulmonary disease (COPD), cancer, diabetes, cardiovascular conditions, and hypertension) among AC Soldiers and trainees was estimated from ICD-9-CM and ICD-10-CM diagnosis codes identified in the Soldier’s medical records. Prevalent cases of chronic conditions were identified by diagnoses at any point within the window of available medical encounter data (2010–2019). Soldiers with one or more of the selected conditions were identified for the analysis, and Army-level trends were provided for each diagnostic subset. Installation assignment was determined by the Soldier’s last assigned unit ZIP code for the calendar year.

IV. Performance Triad

Performance Triad (P3) metrics reflect the percentage of Soldiers meeting national sleep, activity, and nutrition (SAN) guidelines (e.g., CDC, National Sleep Foundation (NSF)). The P3 measures were obtained in aggregate from the Army Resiliency Directorate in coordination with the Army Analytics Group. Estimates were derived from relevant survey items collected within the Physical Domain of the Azimuth Check (previously the Global Assessment Tool (GAT)). Soldiers are required to complete the Azimuth Check annually per Army Regulation (AR) 350–53 (DA 2014). In 2019, 36% of AC Soldiers completed the self-assessment. The P3 data were reported as an aggregated summary statistic when at least 40 responses were available per stratum (e.g., installation, sex, age, race, and ethnicity group). Installation assignment was determined by the Soldier’s last assigned unit ZIP code for the calendar year.

1. Sleep

The sleep target was based on CDC and NSF guidelines and includes the percentage of Soldiers reporting 7 or more hours of sleep within a 24-hour period. Sleep metrics were based on Azimuth Check survey questions assessing self-reported average hours of sleep per 24-hour period during work/duty weeks and weekends/days off.

2. Activity

Activity targets were based on CDC recommendations. The first activity target included in this report is the percentage of Soldiers meeting the recommended 2 or more days per week of resistance training. Data for this metric were derived from an Azimuth Check survey question asking Soldiers to report the average number of days per week, in the last 30 days, in which they participated in resistance training. The second activity target is the percentage of Soldiers meeting aerobic exercise targets, which may be met by performing either 75 minutes of vigorous aerobic activity per week, 150 minutes of moderate activity per week, or an equivalent combination of moderate and vigorous activity. The equivalent combination is based on a formula in which vigorous activity is more heavily weighted than moderate activity. The data for this metric are derived from a series of Azimuth Check questions asking about the average number of days per week, in the last 30 days, in which the Soldier engaged in (a) vigorous activity and (b) moderate activity, as well as the average number of minutes per day in which the Soldier engaged in these activity levels.

3. Nutrition

Nutrition targets were informed by U.S. Department of Agriculture (USDA) recommendations, which reflect the volume of fruits and vegetables that should be consumed daily. However, the related Azimuth Check questions ask Soldiers to report the average number of fruit and vegetable servings consumed over the last 30 days. Definitions of both USDA and Azimuth Check servings are described in the table below. Due to these differences in how servings of fruits and vegetables are quantified and how consumption frequencies are measured, targets for fruit and vegetable consumption were analyzed as the percentage of Soldiers eating 2 or more servings of fruits and vegetables, respectively, per day.

<table>
<thead>
<tr>
<th></th>
<th>Azimuth Check</th>
<th>USDA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong></td>
<td>Fresh, frozen, canned or dried, or 100% fruit juice. A serving is 1 cup of fruit or ½ cup of fruit juice.</td>
<td>1 cup of fruit or 100% fruit juice, or ½ cup of dried fruit can be considered as 1 cup from the Fruit Group.</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>Fresh, frozen, canned, cooked, or raw. A serving is 1 cup of raw vegetables or ½ cup of cooked vegetables.</td>
<td>1 cup of raw or cooked vege-tables or vegetable juice, or 2 cups of raw leafy greens can be considered as 1 cup from the Vegetable Group.</td>
</tr>
</tbody>
</table>

V. Environmental Health Indicators (EHIs)

EHIs are calculated for Army installations and joint bases with an estimated minimum average population of 1,000 AC Soldiers. This includes the 42 installations shown in the Installation Profiles as well as Aberdeen Proving Ground (APG). APG is retained as a legacy installation due to recent years when its AC Soldier population was greater than 1,000, and the significance of regional environmental exposures.

1. Air Quality*

The metric for air quality is the number of days in a year when outdoor air pollution near an Army installation violates the corresponding short-term (24 hours) U.S. National Ambient Air Quality Standard (NAAQS). For U.S. installations, the number of poor air quality days is obtained from

*Environmental Health Indicators that were included in the calculation of the IHI are identified with an asterisk.
Air Quality Index (AQI) Reports and Daily Data summaries on the U.S. Environmental Protection Agency (EPA) Air Data website. The AQI is a location-specific, daily numerical index derived from air pollution measurements obtained at State- and Federally-operated air monitoring stations throughout the U.S. An AQI score greater than 100 indicates that local air pollution levels are higher than a short-term NAAQS, and the air quality is considered unhealthy for some or all of the general public. Poor air quality days for a U.S. Army installation are calculated as the sum of all days in a calendar year when the local AQI score is greater than 100. Air monitoring data are not available from State or Federal regulatory authorities in the airsheds where the following U.S. Army installations are located: Fort Lee, Fort Leonard Wood, Fort Polk, Fort Riley, Fort Rucker, and Fort Stewart. For the purpose of the IHI computation, missing installation values are set to 0 as the lack of an air monitoring station is deemed indicative of low risk/need.

For installations outside the U.S., poor air quality days are determined by converting local air monitoring data to a daily AQI based on the relevant short-term NAAQS. Days when the AQI was greater than 100 were summed to determine the annual number of poor air quality days. Air monitoring data are obtained from the Air Quality e-Reporting database at the European Environment Agency for installations in Germany and Italy, and host nation environmental authorities for installations in Japan and South Korea.

Green, amber, and red thresholds are established to create an awareness of air quality status in the affected community and to encourage participation in the behavior modifications recommended by public health authorities on days when air quality is degraded. The desired status is fewer poor air quality days. Thresholds are based on the mean and top 5% of poor air quality days per year in U.S. counties where ambient air monitoring occurs.

- **Green**: ≤ 5 poor air quality days per year
- **Amber**: 6–20 poor air quality days per year
- **Red**: ≥ 21 poor air quality days per year

2. Drinking Water Quality

The metric for drinking water quality is whether an Army installation's potable water system meets health-based standards under the Safe Drinking Water Act (SDWA). Data on drinking water violations are obtained from an annual environmental data call issued by Deputy Chief of Staff, G-9, Environmental Division. If there is uncertainty in these data, details of a violation are verified by discussion with garrison environmental staff. Additional references are used to verify drinking water violations including the EPA Safe Drinking Water Information System (SDWIS) database, and the annual Consumer Confidence Report (CCR) for the potable water system(s) serving the installation. The CCR is an EPA-mandated report published annually by the water purveyor to inform consumers about their local drinking water quality.

Green, amber, and red thresholds are established for the purpose of creating awareness of water quality status in the affected community. Compliance with all health-based drinking water standards is the desired status.

- **Green**: No violation of any health-based drinking water standard
- **Amber**: Violation of a drinking water standard for non-acute health effects when population exposure has occurred
- **Red**: Violation of a drinking water standard for acute health effects when population exposure has occurred

3. Water Fluoridation

The metric for water fluoridation is the annual average concentration of fluoride in the potable water provided to an Army installation. This concentration is compared to the CDC-recommended optimal fluoride concentration of 0.7 mg/L, the SDWA secondary maximum contaminant level (SMCL) for fluoride of 2.0 mg/L, and the maximum contaminant level (MCL) of 4.0 mg/L. Fluoride concentration data for potable water systems serving Army installations are obtained from an annual data call issued by the Deputy Chief of Staff, G-9, Environmental Division. Installations that treat their own potable water measure fluoride levels at least annually, and submit this information to the local water regulatory authority. For installations that purchase potable water, fluoride levels were obtained from the annual CCR for community water system(s) that provides potable water to the installation.

Green, amber, and red thresholds are established to create awareness of water quality status in the affected community. A fluoride concentration of 0.7 mg/L is the desired status. A fluoride concentration greater than 4.0 mg/L is a violation of the SDWA MCL.

- **Green**: Average fluoride concentration is 0.7–2.0 mg/L
- **Amber**: Average fluoride concentration is less than 0.7 mg/L or from 2.1–4.0 mg/L
- **Red**: Any fluoride concentration >4.0 mg/L

4. Solid Waste Diversion

The metric for solid waste diversion evaluates the Army’s progress in diverting non-hazardous solid waste from traditional disposal methods that result in waste being consigned to landfills or incinerators. Diversion occurs when waste is recycled, composted, mulched, or donated. The solid waste diversion rate is calculated as the annual mass of diverted waste divided by the annual mass of the total waste stream (diverted plus disposed) and is expressed as a percentage.

Solid waste data are obtained from the Solid Waste Annual Reporting for the Web (SWARWeb) database, which is operated by the Deputy Chief of Staff (DCS), G-9, Energy and Facilities Engineering. Installation solid waste managers report waste generation and diversion data into SWARWeb in response to semiannual data calls from DCS G-9. SWARWeb calculates diversion rates and economic benefits according to the DoD Solid Waste Measures of Merit (MOM) in DoDI 4715.23 (DOD 2016c). For quality assurance, waste management reports for certain installations are reviewed, and installations are contacted to verify data integrity, spot anomalies, and analyze waste generation details. The solid waste diversion rate excludes waste generated from privatized housing, and construction and demolition activities.
Army installations at joint bases where Army is not the lead Service do not have a SWARWeb reporting requirement but are still required to compute diversion rates to meet DOD requirements. Solid waste disposal tonnage and diversion rates from Joint Base (JB) Elmendorf-Richardson, JB Langley-Eustis, and JB San Antonio were obtained by request from the Integrated Solid Waste Management compliance manager of the Air Force Civil Engineer Center (AFCEE).

Green, amber, and red thresholds have been established for the purpose of creating awareness of solid waste management practices and tracking conformance with the current DOD solid waste diversion rate goal. A diversion rate ≥ 50% is the desired status, as stated in the DOD Strategic Sustainability Performance Plan (2016).

- **Green**: ≥ 50% solid waste diversion rate
- **Amber**: 25–49% solid waste diversion rate
- **Red**: ≤ 24% solid waste diversion rate

5. Mosquito-borne Disease

The metric for mosquito-borne disease is an index reflecting the risk of being infected with dengue, chikungunya, and Zika viruses from day-biting mosquitoes (Aedes aegypti and Aedes albopictus) at an Army installation. The risk estimate is calculated by combining applied modeling methods for the number of total and high transmission days per year, likelihood an installation has certain mosquito species, and the presence of local and imported cases of dengue, chikungunya, and Zika.

The index score ranges from 0 to 13 and indicates the risk of coming into contact with a dengue-, chikungunya-, and Zika-competent mosquito vector (day-biting mosquito) at each Army installation. Variables in the index include total transmission days, high transmission days, presence of Aedes aegypti and Aedes albopictus in the local environment, and confirmation of imported or locally-acquired human cases of dengue, chikungunya, and Zika in the area near the Army installation. An index score of 0–4.0 represents negligible or low risk. A score of 4.5–8.5 represents a moderate risk and suggests that the mosquito species may be present, but disease transmission may be low or underreported. A score of 9.0–13.0 represents a high risk of endemic mosquito vector presence and potential disease transmission on an installation.

Green, amber, and red categories have been established for the purpose of creating awareness of selected mosquito-borne disease risks in the affected community and to encourage participation in recommended behavior modifications, such as elimination of breeding and harborage sites, use of screens and self-closing doors, and use of personal protective measures (DOD Insect Repellent System—permethrin-treated clothing, repellent on exposed skin, and proper wear of uniform) when active outdoors.

- **Green**: Risk index score 0–4.0
- **Amber**: Risk index score 4.5–8.5
- **Red**: Risk index score 9.0–13.0

6. Tick-borne Disease

The metric for tick-borne disease is an index reflecting the risk of coming into contact with a Lyme vector tick (i.e., the blacklegged tick *Ixodes scapularis* or other *Ixodes* species tick) that is infected with the agent of Lyme disease at an Army installation. The risk estimate variables include whether an installation is in the predicted range for a Lyme vector tick, the number of human cases of Lyme disease in that county, the number of human-biting ticks identified as Lyme vector ticks submitted to Army programs, such as the Military Tick Identification/Infection Confirmation Kit (MITICK) Program, and the number of Lyme vector ticks carrying the Lyme disease pathogen tested by Army programs.

The index score ranges from 0 to 5 and indicates the risk of contact with a Lyme vector tick infected with the agent of Lyme disease. An index score of 0 to 1 represents a low risk of coming into contact with a Lyme vector tick and being exposed to the agent of Lyme disease. A score of 2 to 3 represents a moderate risk of coming into contact with a Lyme vector tick and being exposed to the agent of Lyme disease. A score of 4 to 5 represents a high risk of coming into contact with a Lyme vector tick and being exposed to the agent of Lyme disease. If no data were available from either MITICK (formerly the DOD Human Tick Test Kit Program) or a Regional Public Health Command, the installation received a score of “ND,” or “No Data.”

Tick-borne disease risk data (tick identification and testing) were compiled from ticks submitted to MITICK. Ticks are voluntarily submitted to MITICK through MTFs or individuals who have access to the MITICK kits. All ticks submitted to MITICK are included in a long-term passive surveillance dataset; MITICK does not actively collect ticks from the environment at DOD installations (i.e., active surveillance).

When no MITICK data were available for 2019, data from environmental tick surveillance conducted by the Army Regional Public Health Commands were used. These ticks were collected actively from pets, wildlife, and the environment, as well as humans in some locations outside the U.S.

Additional data from the CDC on reported Lyme disease cases by county for the years 2009–2018 were also used to estimate risk. All CDC data from this period reflect the case definition which allowed for reporting of “confirmed” and “probable” cases. Only counties with ≥ 100 cases of Lyme disease in the 10-year period were included, in order to rule out travel-related cases. County-level surveillance data were also included to determine the range of Lyme vector ticks, as published most recently by the CDC (Eisen et al. 2016).

No county data were available for Army installations outside the U.S., so recent publications were consulted for estimates of Lyme disease risk (Li et al. 2019; Hyoung Im 2019).

Green, amber, and red categories have been established for the purpose of creating awareness of Lyme disease risk in the affected community and to encourage participation in surveillance programs such as MITICK, and behavior modifications such as tick checks, repellent use, and measures recommended by the DOD Insect Repellent System.

- **Green**: Index score of 0–1; no or low risk of contacting a Lyme vector tick
- **Amber**: Index score of 2–3; moderate risk of contacting a Lyme vector tick
- **Red**: Index score of 4–5; high risk of contacting a Lyme vector tick
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7. Heat Risk

The metric for heat risk reflects the number of days in a year when outdoor temperatures heighten the risk of heat-related health impacts, and whether the year of interest is consistent or different from the prior 10-year period. Heat risk days are calculated as the number of days in a calendar year with at least one hour when the heat index is above 90°F. This corresponds to an outdoor heat status of “Extreme Caution” as classified by the National Weather Service.

Hourly measurements for outdoor temperature and relative humidity are obtained from land-based airport weather stations in closest proximity to installation cantonment areas or population centers. Using these data, the U.S. Air Force 14th Weather Squadron computes hourly heat index values for each location of interest. Annual heat risk days are calculated for the year of interest and each of the 10 years prior to the year of interest. The mean and standard deviation (SD) for the prior 10 years are calculated. Annual heat risk days for the year of interest are compared to the prior 10-year average ± 1 SD to show whether the year of interest is consistent with the prior decade.

VI. Installation Health Index (IHI)

The core metrics included in this report were prioritized for inclusion and weighting in the IHI calculation based on the prevalence of the condition or factor, the potential health or readiness impact, the preventability of the condition or factor, the validity of the data, supporting evidence, and the importance to Army leadership. Although behavioral health impacts readiness, the behavioral health medical metric was removed from the IHI in 2018 to avoid stigmatizing Soldiers who seek treatment, and because treatment options for behavioral health conditions are not uniformly available across all installations.

In generating the IHI, six selected medical metrics (injury, obesity, sleep disorders, chronic disease, tobacco product use, and STIs [chlamydia]) for each included installation were individually standardized to the average across these installations using z-scores. Z-scores follow a standard normal distribution, and reflect the number of standard deviations (amount of variation in data values for a given metric) the installation is from the average for that medical metric. Values above the average have positive z-scores, while values below the average have negative z-scores.

Installation medical metrics were adjusted by age and sex prior to standardization to allow more valid comparisons. The 2015 U.S. Army population distribution was used as the standard for each installation. Metric-specific scores were weighted to prioritize readiness detractors, as follows: injury—30%, sleep disorders—15%, obesity—15%, chronic disease—15%, tobacco product use—15%, STI (chlamydia)—5%, and air quality—5%. The resulting weighted averages of these metrics were then standardized using the mean and standard deviation across all installations presented in Health of the Force (with the exception of JBLM and PoM, which had incomplete medical data) to create the IHI score for each installation.

For ease of interpretation, the IHI is presented as a percentile as well as a z-score. The IHI percentile is equal to the area under the standard normal probability distribution for each installation's IHI score. The IHI percentiles are categorized as follows: <20%, 20–29%, 30–39%, 40–49%, 50–59%, 60–69%, 70–79%, 80–89%, and ≥90%. Higher percentiles reflect more favorable health status.

Normally Distributed Data Curve

outside the U.S., where the number of poor air quality days were especially high relative to the mean across all installations. Accordingly, the number of poor air quality days at each installation was scored as follows for use in calculating the IHI: installations with missing or non-reported air quality data received an air quality score of 0, and thus do not affect the IHI score; installations with no reported poor air quality days received an air quality score of 2, the highest (best) possible score; installations with between 1 and 4 poor air quality days received an air quality score of 1; installations with between 5 and 20 poor air quality days received an air quality score of -1; and installations with greater than 20 poor air quality days received an air quality score of -2, the lowest (worst) possible score. These categories align with those used in the Environmental Health Indicator – Air Quality section of Health of the Force.

Each installation’s IHI is a standardized score (z-score) calculated by pooling the metric-specific scores for that installation. Metric-specific scores were weighted to prioritize readiness detractors, as follows: injury—30%, sleep disorders—15%, obesity—15%, chronic disease—15%, tobacco product use—15%, STI (chlamydia)—5%, and air quality—5%. The resulting weighted averages of these metrics were then standardized using the mean and standard deviation across all installations presented in Health of the Force (with the exception of JBLM and PoM, which had incomplete medical data) to create the IHI score for each installation.

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VII. Installation Profile Summaries

The installation profile summary pages report population estimates, and age and sex distributions. Population estimates were derived from person-time calculated from DMDC personnel rosters. Person-time, which is analogous to Full-Time Equivalents (FTE), estimates the average number of Soldiers at an installation during the year. Installation assignments for AC Soldiers and trainees (excluding cadets) were determined by unit ZIP code.

Installations with a high turnover, such as those with a large trainee population, may not be accustomed to calculating their population size in this way. These estimates are intended to be a frame of reference and do not necessarily correspond to the population evaluated for each metric included in the installation profile summary and report.

VIII. Data Limitations

- Methodology changes from prior Health of the Force reports prevent direct comparisons of measures across the reports. Updated trend charts are provided for affected metrics, and additional details regarding installation demographics and metric components are included to provide clarity.
- Higher estimates for a metric may not be indicative of a problem but rather may reflect a greater emphasis on detection and treatment.
- Composite measures or indices such as the IHI may mask important differences seen at the individual metric level. It is important to examine the components for which more targeted prevention programs can be developed.
- Personnel and medical data for cadets were not available; therefore, USAG West Point estimates using DMDC-derived data are limited to permanent party AC Soldiers.
- Metrics based on ICD-9-CM and ICD-10-CM codes entered in patient medical records are subject to coding errors. Estimates may also be conservative given that individuals may not seek care or may choose to seek care outside the MHS or the TRICARE claims network.
- The obesity proportions among populations reported in Health of the Force are estimated from BMIs recorded for a subset of the population at clinical encounters. BMI alone should not be used to diagnose obesity in individuals.
- Measures based on self-reported data (Azimuth Check and PHA) are limited to a subset of the population (i.e., survey respondents) and may be prone to biases.
- The STI (chlamydia) and heat illness metrics rely on reporting compliance. STI (chlamydia) estimates are conservative given the high proportion of asymptomatic infections that are undetected.
- Azimuth Check data used for the P3 measures were aggregated across demographic strata, and counts below 40 were not reported. Thus, age and sex adjustments for the installations were not possible.
- DMDC race and ethnicity data were not sufficiently detailed to determine which Soldiers identified as multi-racial. Conflicting entries were also possible over the 5-year timeframe; in this situation, the most frequently used entry was selected.
- The Air Quality EHI relies on outdoor ambient air monitoring data that were deemed representative of air pollution levels experienced by the population working and living in the locale where the Army installation is situated. The metric does not reflect exposures from indoor air pollution sources.
- The Solid Waste Diversion EHI relies on SWARWeb solid waste generation and diversion data that may reflect estimates rather than the actual weight of materials.
- The Mosquito-borne Disease EHI relies on mosquito specimens acquired by installations and forwarded to the supporting Public Health Command Region for identification and pathogen testing. Robustness of the risk characterizations is dependent upon installation surveillance programs collecting specimens and ensuring delivery to the supporting region for identification and testing.
- The Tick-borne Disease EHI relies on tick specimens submitted to the MilTICK for identification and pathogen testing. Robustness of the risk estimate is dependent upon installation populations submitting human ticks to the MilTICK for analysis.

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