2017 HEALTH OF THE FORCE

Create a **healthier force** for tomorrow.

U.S.ARMY

APHC

— U.S. Army Public Health Center —

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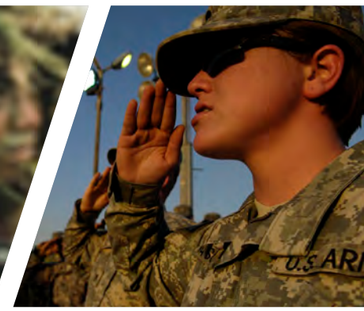
CONTENTS





Create a Healthier Force for Tomorrow

OVERVIEW

Health of the Force is in its third year of comprehensive, annual population-health reporting. The report you are reading is the core document of what is now a series of Army Medicine reports of leading health indicators and military-relevant health readiness measures. Additional reports are available for specific populations, including the U.S. Army Medical Command (MEDCOM), the U.S. Army Training and Doctrine Command (TRADOC), the U.S. Army Special Operations Command (USASOC), the U.S. Army Intelligence and Security Command (INSCOM), and a collaborative effort with the Army National Guard (ARNG). The purpose of the *Health of the Force* is to empower senior leaders with the knowledge and context to improve Soldier health and readiness. This report summarizes calendar year 2016 (CY16) data for readiness indicators (medical readiness, dental readiness, sensory injuries), health outcome metrics (injuries, behavioral health disorders, sleep disorders, chronic disease), health factors (obesity, tobacco use, substance use, sexually-transmitted infections), environmental health indicators (air quality, drinking water quality, solid waste diversion, mosquito-borne illness, tick-borne illness), healthcare effectiveness measures, and Performance Triad data (sleep, physical activity, nutrition) from existing medical data systems. A "best ranking" list identifies the highest-performing installations for most measures. To inform local initiatives, installation health profiles also provide specific data for most Army installations. Educational vignettes promote the development and expansion of successful programs that reduce illness and injury, to leverage best practices across the Army.

NEW CONTENT

Illnesses and injuries resulting from exposure to heat or cold are now included with the injury outcomes. In addition to obesity data, as reflected by Body Mass Index (BMI) obtained from the Clinical Data Repository (CDR), the 2017 report includes overweight and obesity diagnoses from medical records. A section describing overall Army demographics has been added to the report, and the Environmental Health section introduces five new indicators to promote hazard awareness and exposure mitigation. Installation pages now include installation-level air quality, mosquito-borne illness risks, and a side-by-side comparison of installation and Army demographics. To facilitate installation leaders in assessing their installation's overall health, installation health index scores are now presented as percentile score ranges.

DATA UPDATES

Those familiar with the 2016 *Health of the Force* may notice slight changes in the values of reported metrics. The 2017 edition expanded the population reported in aggregate rates to include all Active Component (AC) Soldiers, including those stationed outside the U.S. and on installations not specifically profiled in the report. Since these differences produced visible changes from the values reported in the 2016 edition, the 2017 update includes historical trends reflecting the redefined population, where possible. Installation metrics now reflect unadjusted rates, which provide a better assessment of attributable burden; however, all metric "best ranking" lists were derived from age- and sex-adjusted rates to allow for appropriate comparisons across locations. More comprehensive data sources were used to assess the prevalence of sleep disorders and obesity for the 2017 report, so readers may note variations from the 2016 edition. To account for the continuously evolving nature of Healthcare Effectiveness Data and Information Set (HEDIS) composite scores, this year's report presents seven components of the healthcare effectiveness metrics tracked for Army beneficiaries.

CONCLUSION

This edition of *Health of the Force* describes ongoing efforts by MEDCOM and its partners to improve the health of Army communities by promoting proven health promotion and wellness strategies for the Total Army Family. The report combines surveillance metrics with program snapshots to inform and highlight initiatives that reduce and prevent illness and injury. These perspectives, in addition to the new features of this year's report and the volume of metrics updated from the 2016 edition, create a valuable tool for leaders at all levels. The 2017 *Health of the Force* aims to facilitate informed decisions that ultimately improve the readiness, health, and well-being of our Soldiers, Civilians, and Families.

REPORT HIGHLIGHTS

MEDICAL READINESS — pg. 8

MEDICAL READINESS CLASSIFICATION (MRC) — pg. 10
Medical readiness was achieved by 83.3% of Active Component (AC) Soldiers. Readiness decreased with age (85.5% of AC Soldiers <25 were medically ready compared to 76.2% of AC Soldiers 45 and over).

DENTAL READINESS CLASSIFICATION (DRC) — pg. 10
Dental readiness was achieved by 96.9% of AC Soldiers. Readiness decreased with age (97.9% for AC Soldiers <25 to 94.3% for AC Soldiers ≥45).

HEALTH OUTCOMES — pg. 14

INJURY — pg. 16
In 2016, 51.6% of Soldiers were injured; some individuals experienced multiple injuries during that period. There were 1,399 new injuries per 1,000 AC person-years in 2016 (range: 1,097 to 2,123 per 1,000 AC person-years). Over half of all injuries were lower extremity injuries believed to be related to physical training.

HEAT-RELATED ILLNESSES AND COLD WEATHER INJURIES — pg. 26
A total of 3.3 new heat illnesses per 1,000 person-years and 0.8 new cold weather injuries per 1,000 AC person-years were documented in 2016. Considerable variation by geographic region was observed (range across installations: 0 to 17 new heat illnesses and 0 to 7 new cold weather injuries per 1,000 AC person-years).

HEARING INJURY — pg. 28
Among Soldiers receiving audiometry testing, 4.2% experienced a new Significant Threshold Shift (STS) in 2016. Approximately 36.6 new Noise-Induced Hearing Injuries (NIHI) were diagnosed per 1,000 AC person-years (range: 8.5 to 143.8 per 1,000 person-years across installations).

EYE INJURY — pg. 31
Approximately 12.4 new eye injuries were diagnosed per 1,000 AC person-years (range: 2.9 to 16.5 injuries per 1,000 AC person-years across installations).

BEHAVIORAL HEALTH — pg. 34
In 2016, 20.4% of AC Soldiers had a diagnosis of behavioral health disorder (range: 14.7% to 28.9% across installations). Among behavioral health diagnoses, adjustment disorder, mood disorders, and anxiety disorders were most common.

SLEEP DISORDERS — pg. 40
In 2016, 14.4% of AC Soldiers had a diagnosis of a sleep disorder (range across installations: 7.7% to 26.0%).

CHRONIC DISEASE — pg. 42
Among the AC Soldiers evaluated, 12.7% had one or more diagnoses of chronic conditions (range: 8.2% to 33.8% across installations). Cardiovascular conditions were the most common condition diagnosed, followed by arthritis and asthma.

HEALTH FACTORS — pg. 46

OBESITY — pg. 48
In 2016, 17.3% of AC Soldiers were classified as obese based on BMI calculated from height and weight measurements. Prevalence ranged from 7.9% to 25.8% across installations.

TOBACCO USE — pg. 52
In 2016, tobacco use (smoke or smokeless) was reported in 26.4% of AC Soldiers, with use ranging from 7.3% to 35.8% across installations.

SUBSTANCE USE — pg. 56
Among AC Soldiers, 5.0% had a diagnosis of substance use disorder (range across installations: 1.8% to 8.3%).

SEXUALLY TRANSMITTED INFECTIONS (STI) — pg. 62
Chlamydia incidence is widely used as an indicator for overall STI incidence. There were 20.5 new chlamydia infections reported per 1,000 AC person-years (range across installations: 9.0 to 68.2 infections per 1,000 AC person-years). Compliance with screening recommended for female AC Soldiers under 25 was 83.9% (range: 69.8% to 95.9% across installations).

HEALTHCARE DELIVERY — pg. 64

HEDIS PERFORMANCE MEASURES — pg. 65
This report includes measures of diabetes annual screening, diabetes A1C control, and acute low back pain imaging, along with scores for breast, cervical, and colon cancer screenings, and 7-day mental health follow-up visits among enrolled Army beneficiaries. The Army performed well overall, scoring above national averages for all measures except low back pain imaging, for which performance scores were slightly below the 50th percentile.

REPORT HIGHLIGHTS

PERFORMANCE TRIAD (P3) — pg. 68

SLEEP — pg. 71
The overall installation score for optimal sleep among AC Soldiers was 68.4 out of 100. Scores ranged from 66.3 to 72.6 across installations.

ACTIVITY — pg. 71
The overall installation score for optimal physical activity was 83.6 out of 100. Scores ranged from 81.4 to 85.5 across installations.

NUTRITION — pg. 71
The overall installation score for optimal nutritional intake among AC Soldiers was 71.4 out of 100. Scores ranged from 68.0 to 73.7 across installations.

ENVIRONMENTAL HEALTH — pg. 76

AIR QUALITY — pg. 78
In 2016, 18 of the 32 U.S. installations in the Installation Profile Summaries experienced one or more days when air quality failed to meet Federal standards for ozone or particulate matter. Most installations experienced less than 10 poor air quality days in 2016, but four installations experienced more than 10 days in 2016.

DRINKING WATER — pg. 84
In Fiscal Year 2016 (FY16), 91.5% of the population was served by community water systems that reported no health based violations. One installation reported a violation for 270 days, but there was no exposure because an alternative water source was utilized. Two installations were exposed for 40 and 90 days.

INSTALLATION HEALTH INDEX (IHI) — pg. 107

A selection of eight metrics were compiled after adjustment by age and sex in order to create Installation Health Index percentile scores, allowing for comparisons of overall health across installations. These scores are presented on each installation's profile page. Higher IHI percentile scores indicate better overall health.

VIGNETTES

In addition to reporting and visualizing surveillance data, the 2017 *Health of the Force* report provides more than 20 feature articles on emerging health issues, as well as enterprise-wide and local actions being taken to improve Soldier health.

How do you use the Health of the Force?

The *Health of the Force* report aims to improve Soldier health and readiness by informing programs to reduce and prevent illness and injury. The *Health of the Force* report team is seeking your feedback:

- How has the information in the *Health of the Force* report impacted readiness on your installation?
- Have you implemented or modified a program as a result of information you read in the *Health of the Force* report?
- Do you want to take action to address an issue but don't know where to start?

The *Health of the Force* report team at U.S. Army Public Health Center (APHC) can connect you with resources to address your specific concerns and may feature your success story in next year's report.

Send your responses via email to usarmy.apg.medcom-aphc.mbx.pdm-ppd@mail.mil.

Thank you for your feedback!

Please follow the link below to take a 5-minute survey.
https://tiny.army.mil/r/pABFc/

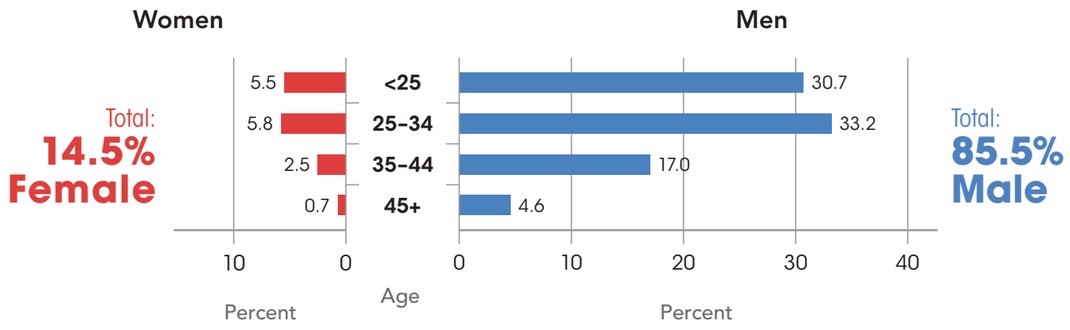
DEMOGRAPHICS

Demographics

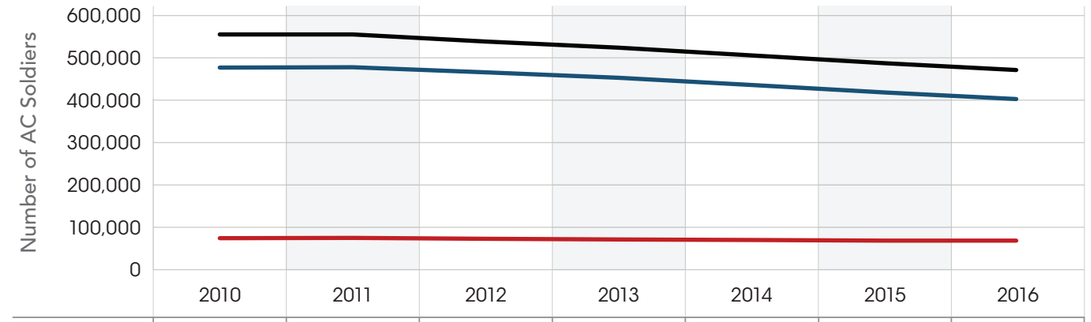
In 2016, the average monthly strength of the Army AC population was 471,000 Soldiers, according to the Defense Manpower Data Center. Enlisted personnel accounted for 80% of AC strength. The majority (85.5%) of AC Soldiers were men.

Although the Army AC population is a subset of the U.S. civilian population, the two populations have significant demographic differences. In addition to being mostly male, the Army AC population is younger than the general population of employed U.S. civilians. Over 75% of AC Soldiers are under the age of 35 compared to the employed civilian population, where 37% are under 35. Since these Soldier demographics differ so dramatically from the overall U.S. population, it is important to keep these differences in mind when comparing the health status of Soldiers and civilians.

Population Distribution by Sex and Age, AC Soldiers, 2016



Personnel Strength by Sex and Year, AC Soldiers, 2010–2016

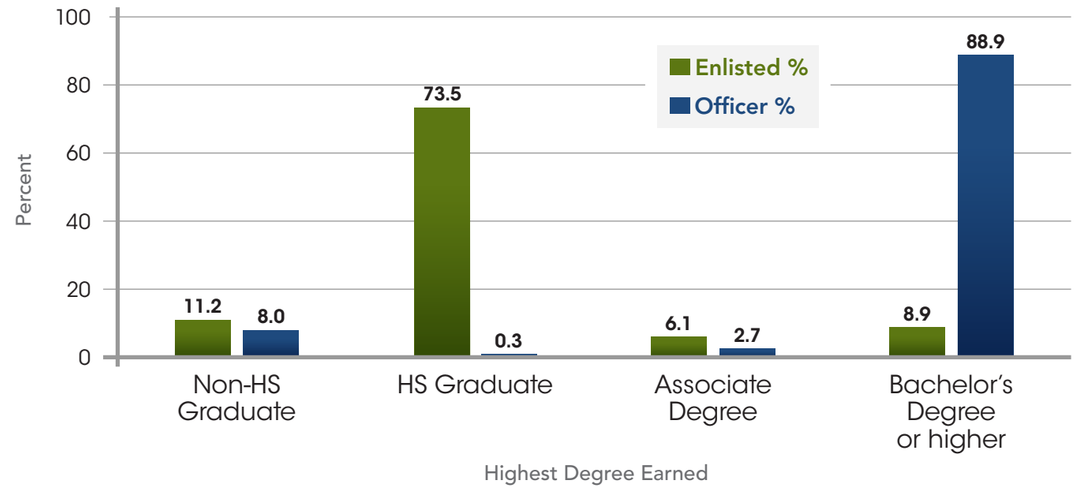


	2010	2011	2012	2013	2014	2015	2016
Female	74,243	74,908	72,829	71,221	69,991	68,923	68,420
Male	476,722	477,582	465,526	452,665	435,696	418,110	402,579
Total	550,965	552,490	538,355	523,886	505,687	487,033	470,999

Education

Many young men and women delay their post-high school educations to serve their country, earning valuable education benefits for their service. Nearly 89% of Army AC officers (Commissioned and Warrant) have earned a four-year degree or higher. The jobs of today's professional Soldiers are intellectually demanding, and the U.S. Army places a high value on an educated fighting force.

Highest Level of Education Attained, AC Soldiers, 2016



HEALTH OF THE FORCE

METRICS

MEDICAL READINESS

- Medical and Dental Readiness Classifications

HEALTH OUTCOMES

- Injury
- Behavioral Health
- Sleep Disorders
- Chronic Disease

HEALTH FACTORS

- Obesity
- Tobacco Use
- Substance Use
- Sexually Transmitted Infections

HEALTHCARE DELIVERY

- HEDIS Performance Measures

Overview

The Surgeon General of the U.S. Army has identified medical readiness as the leading public health priority for the Army. This report presents data on medical readiness itself, as well as the health outcomes that can affect medical readiness, and the health factors and healthcare delivery measures that impact Soldiers. In this way, this report seeks to allow leaders to identify underlying causes of inadequate health and create opportunities for intervention at the root cause of a problem.

The **Medical Readiness** data presented here show medical readiness and dental readiness classifications, both of which are direct components of the determination of medical readiness rates.

The **Health Outcomes** data in this report reflect the injuries, behavioral health disorders, sleep disorders, and chronic diseases affecting Soldiers. These health conditions influence a Soldier's ability to complete the mission and can, in some cases, affect a Soldier's readiness status.

The **Health Factors** presented in this report include elements that are indicative of overall health status or that may indicate engagement in risky behaviors that endanger a Soldier's readiness. Obesity, tobacco use, substance use, and sexually transmitted infections, if not addressed early, could all contribute to more serious health issues and hinder Soldier readiness.

The **Healthcare Delivery** metrics presented here indicate the overall performance of the Military Health System in providing high-quality service to our Soldiers and their Families. A strong healthcare system is important for preventing and treating health conditions, which leads to improved readiness.

Overall crude rates are presented on each health metric page. Best ranking installations are calculated using age- and sex-adjusted rates in order to generate the list of best ranking U.S. and outside the U.S. installations for most metrics.

MEDICAL READINESS

- *Medical and Dental Readiness Classifications*

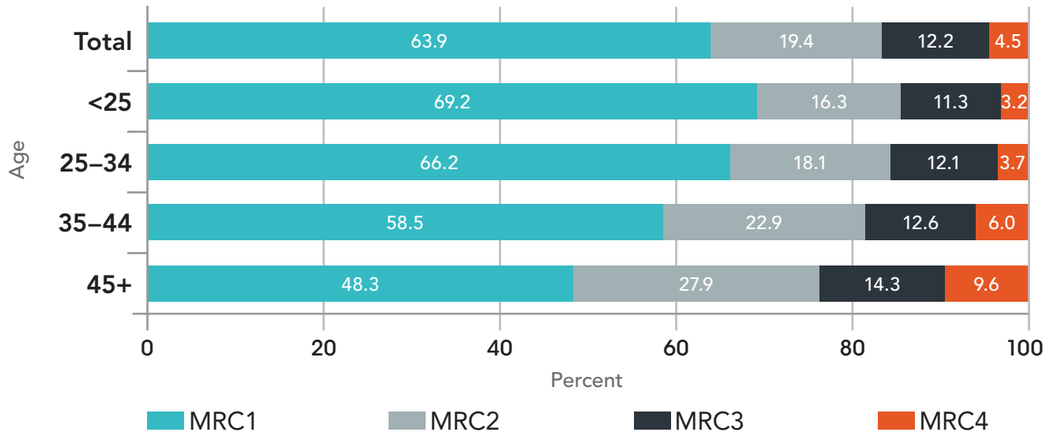
Medical and Dental Readiness Classifications

On 14 August 2015, Chief of Staff of the Army, GEN Mark A. Milley, identified readiness as the U.S. Army's number one priority. To enable commanders to manage their forces more efficiently, each Soldier is assigned one of four MRCs. Each Soldier is also assigned a DRC status, which can influence their MRC.

Soldiers who are classified in MRC1 or MRC2 status are medically ready and deployable. MRC1 Soldiers are fully medically ready and deployable. MRC2 Soldiers are also fully medically ready and deployable, but have temporary profiles up to 14 days in length. Soldiers in MRC3 status are not medically ready and default to nondeployable. These Soldiers may be in need of an administrative review or medical evaluation board or may have a Deployment Limiting (DL) code (including pregnancy) or a temporary profile greater than 14 days. Soldiers who are classified in MRC4 status are missing or late for a medical or dental exam. Soldiers who are in MRC4 status are not medically ready and are by default non-deployable until a commander determines the cause of the unknown medical status.

A Medical Readiness transformation went into effect 01 June 2016. From June through December 2016, overall 83.3% of AC Soldiers were medically ready (MRC1 or 2), and 16.7% were not medically ready (MRC3 or 4). On average, 4.5% of AC Soldiers were classified as MRC4 during that time period.

MRC by Age, AC Soldiers, 2016



MRC1: Medically ready

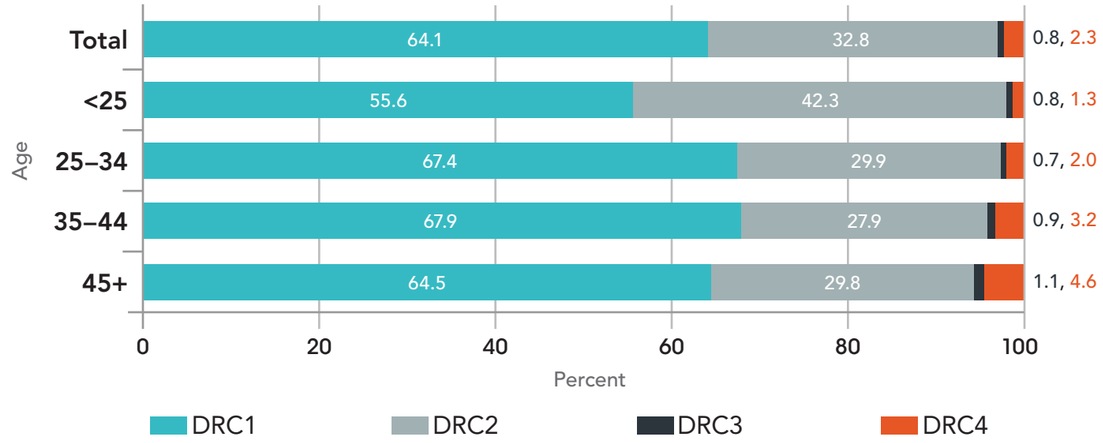
MRC2: Partially medically ready

MRC3: Temp profile >14 days; not medically ready

MRC4: Status unknown; not medically ready

The* Health of the Force *report provides an overview of multiple contributors to medical readiness. This report provides an AC-wide context for health outcomes and health factors. Commanders can use this report to identify issues and target interventions to ultimately improve the readiness and health of AC Soldiers.

DRC by Age, AC Soldiers, 2016



DRC1: Dentally ready

DRC2: Partially dentally ready

DRC3: Requiring urgent dental care; not dentally ready

DRC4: Status unknown; not dentally ready

MEDICAL READINESS TRANSFORMATION AND COMMANDER PORTAL

In response to the newly heightened emphasis on readiness, in 2015 MEDCOM initiated a Medical Readiness transformation across the Army with the goals of focusing resources on medical readiness tasks, increasing access to medical readiness data for commanders, and improving the quality of profiles and communication between commanders and medical providers. This transformation introduced the Commander Portal as well as the revised and standardized electronic profiling system (eProfile). Both systems have direct links to the Medical Readiness Assessment Tool (MRAT), which provides unit readiness forecasts using multiple factors. These improvements empower commanders to make decisions with timely, relevant data.

The Commander Portal provides a real-time snapshot of a unit's current medical readiness as well as the prior 12-month trend. More importantly, it allows Commanders to project their unit's readiness 7, 30, 60, or 90 days into the future.

The redesigned eProfile system consolidates all medical conditions impacting a Soldier's readiness onto one document, routed to the Commander and visible in the Commander Portal immediately upon completion by the provider. The Portal also allows for one-click secure messaging, so the Commander can seek immediate clarification from the provider for any questions. This ensures closed-loop communication between the healthcare provider and the Commander.

The MRAT allows Commanders to identify health-related trends within their unit. For example, a Commander can review temporary profile rates or missed medical appointments over time. The MRAT provides a medical non-availability (MNA) risk, which aggregates several key health indicators within a unit (e.g., smoking, body mass index, medical history), and gives an estimate of the medical deployability of the entire unit for the next 12 months, promoting discussion with their unit provider.

Medical providers can access MRAT data for individual patients when viewing them in eProfile. Commanders can view their units' aggregate MRAT data from a link in the Commander Portal.

SPOTLIGHT

DEVELOPING BETTER STRATEGIC MUSCULOSKELETAL READINESS METRICS

In 2016, the MEDCOM Physical Performance Service Line (PPSL) developed musculoskeletal (MSK) metric reports which focus on—

- Assessing changes in the MSK condition burden,
- Inspiring leaders to support improvement in reducing the MSK burden, and
- Aligning MSK metrics with clinical practice patterns.

As of February 2017, MSK conditions were responsible for 53% of the MRC3 temporary medical profiles among AC Soldiers. The PPSL leveraged the MRAT database to develop four strategic MSK metrics, described below.

1. Percentage of Soldiers on MSK profile from 31 to 90 days in the last 6 months

$$\frac{\textit{Soldiers on temporary MSK profile from 31 to 90 days in the last 6 months}}{\textit{Total number of Soldiers assigned to the reporting unit or installation}} \times 100$$

This metric represents the percentage of Soldiers on intermediate-length MSK profiles and reflects the effectiveness of forward MSK care, injury risk reduction, human performance optimization, and profile management programs.

2. Percentage of Soldiers on MSK Profile for >90 days in the last 6 months

$$\frac{\textit{Soldiers on temporary MSK profile >90 days in the last 6 months}}{\textit{Total number of Soldiers assigned to the reporting unit or installation}} \times 100$$

This metric represents the percentage of Soldiers on chronic MSK profiles for more than 90 days. While only 4% of AC Soldiers are on chronic MSK profiles, they account for 51% of all MSK-related limited duty days (approximately 5 million days annually). As chronicity increases, the prognosis for recovery and return to full duty decreases over time, significantly impacting unit readiness. Effective, early management of MSK conditions greatly reduces risk of chronicity; appropriate care pathways for Soldiers with chronic MSK conditions impact unit readiness.

3. Number of temporary MSK profile days per 100 Soldiers per month

$$\frac{\textit{Temporary MSK profile days for Soldiers in a given month} \times 100}{\textit{Total number of Soldiers assigned to the reporting unit or installation}}$$

This metric represents a function of both the number of Soldiers on profile and the profile duration.

4. Percentage of MRC3 Soldiers with MSK conditions

$$\frac{\textit{Soldiers identified as MRC3 due to MSK conditions}}{\textit{Total number of Soldiers assigned to the reporting unit or installation}} \times 100$$

This metric represents the percentage of MRC3 Soldiers with MSK profiles longer than 14 consecutive days. This metric may fail to capture Soldiers with chronic conditions who have been placed on a series of short, non-consecutive 14 day profiles; therefore, the three preceding metrics are preferred for assessing relative MSK readiness.

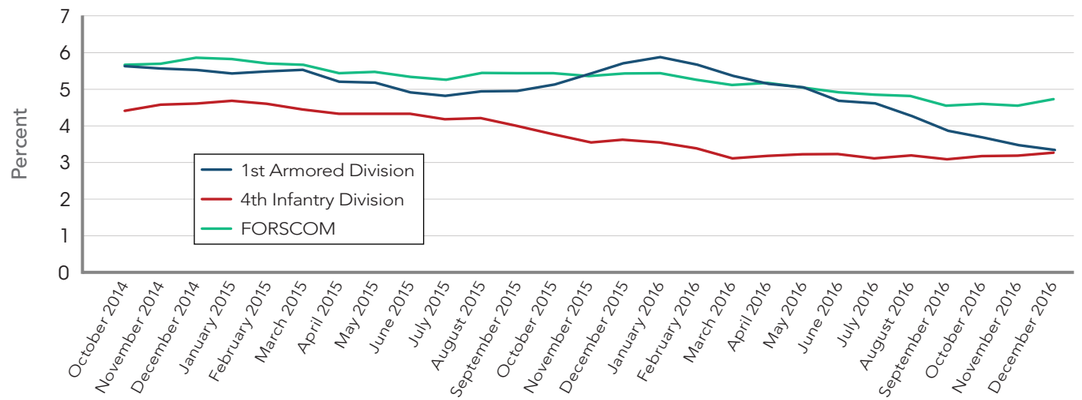
Strategic MSK Readiness Metrics for December 2016

Reporting Unit	% Soldiers on MSK profile 31–90 days in the last 6 months	% Soldiers on MSK profile >90 days in the last 6 months	Number of temporary MSK profile days per 100 Soldiers per month	% MRC3 Soldiers on MSK profile >14 days
Army Installations	6.3–19.6	2.0–7.1	92–314	2.1–7.6
FORSCOM Divisions	10.3–15.3	3.3–5.5	144–250	3.0–4.6
FORSCOM Brigades	8.3–27.4	2.3–12.3	100–480	1.7–11.1

STRATEGIC MSK METRICS INSIGHTS

Data collected from August 2014 through June 2017 indicate that MSK burden from mid-2016 to present affected FORSCOM readiness to a lesser extent than in previous years. This sustained improvement most directly correlates to the fielding of the Medical Readiness Transformation initiative in June 2016 and reflects the synergistic alignment of command interest, MEDCOM initiatives, and local unit tactics, techniques, and procedures (TTPs). There was high variability among units in terms of the MSK burden on readiness. At the division level, the 4th Infantry Division (4ID, Fort Carson) and 1st Armored Division (1AD, Fort Bliss) emerged as the clear leaders in the management of MSK conditions. Some of the leading practices implemented by 1AD are included in the Spotlight featured on page 24 of this report.

Percent Soldiers with Temporary MSK Profiles >90 Days in the Last 6 Months



HEALTH OUTCOMES

- *Injury*
- *Behavioral Health*
- *Sleep Disorders*
- *Chronic Disease*

Injury

Injury is a significant contributor to the Army's healthcare burden, impacting medical readiness and Soldier health. Over 1 million medical encounters and roughly 10 million days of limited duty occur annually as a result of injuries and injury related musculoskeletal conditions, affecting over half of Soldiers each year.

Among AC Soldiers, approximately 1,399 new injuries were diagnosed per 1,000 person-years in 2016, comparable to rates in prior years. Rates ranged from 1,097 to 2,123 per 1,000 person-years across U.S. installations. The high rate reflects multiple injuries among affected Soldiers. Sixty-four percent of all injuries were lower extremity injuries commonly attributed to military physical training. While overall injury rates have remained stable, lower extremity training-related injury rates have been increasing for the past two years. Injury rates continue to decrease among younger Soldiers and increase for those 35 and older. Injury risk is higher among older age groups, affecting 72% of Soldiers 45 and older compared to 46% of Soldiers under age 25. Injuries were more frequent among women than men. Sixty-one percent of women had a diagnosed injury, compared to 50% of men.

Overall, 52% of Soldiers had an injury.
There were 1,399 new injuries per 1,000 person-years.

Rates ranged from 1,097 to 2,123 injuries per 1,000 person-years across U.S. installations.

Rates ranged from 1,068 to 1,440 injuries per 1,000 person-years across installations outside the U.S.

BEST RANKING INSTALLATIONS

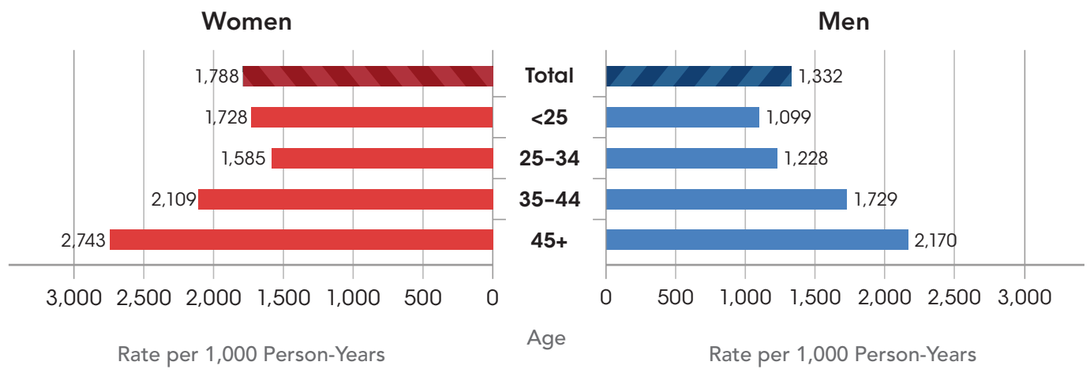
U.S.

1. JB MYER-HENDERSON HALL
2. FORT BRAGG
3. USAG WEST POINT
4. FORT BLISS
5. FORT CARSON

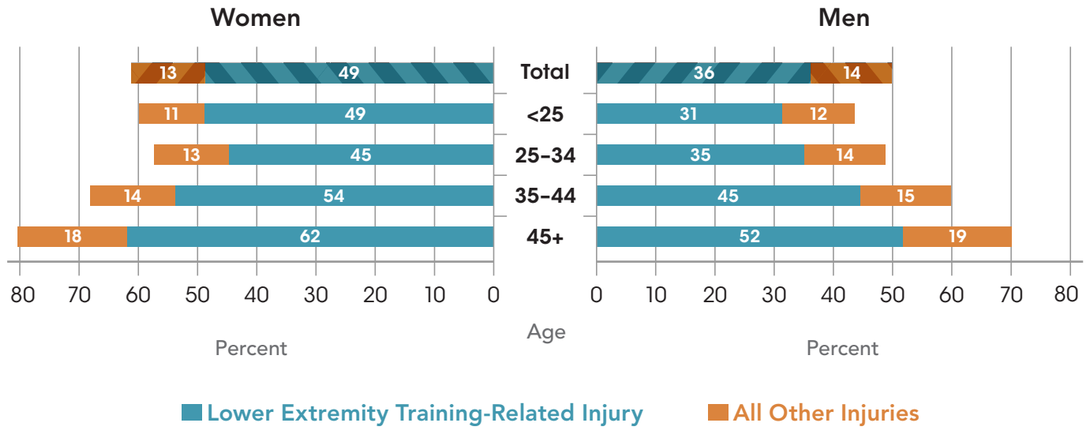
OUTSIDE THE U.S.

1. USAG VICENZA
2. USAG RED CLOUD
3. JAPAN

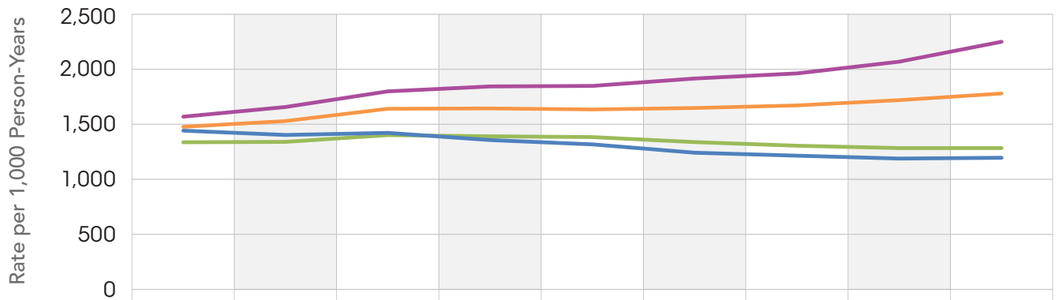
Rate of Injuries by Sex and Age, AC Soldiers, 2016



Percent of Injured Soldiers by Sex and Age, AC Soldiers, 2016

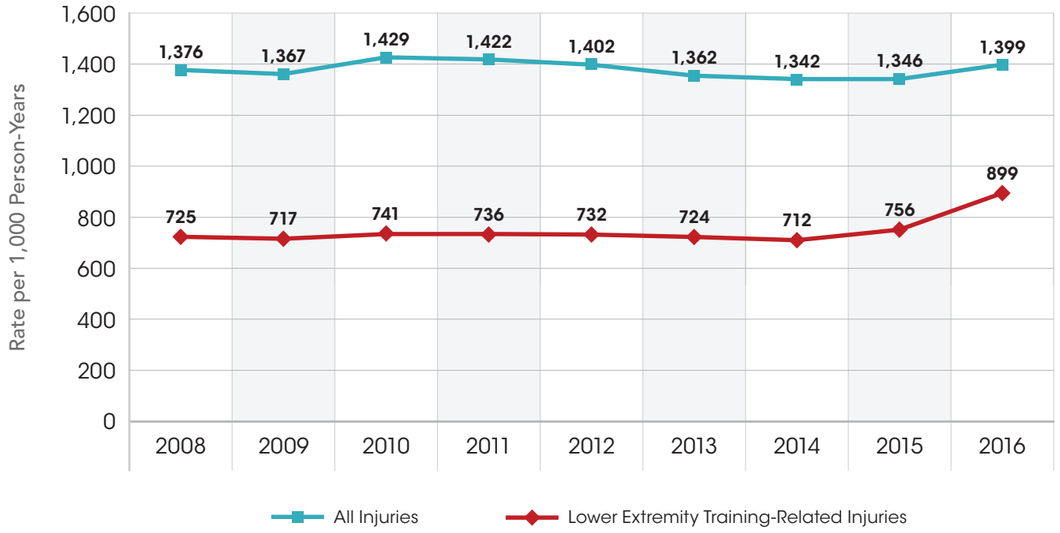


Annual Injury Rates by Age, AC Soldiers, 2008–2016



	2008	2009	2010	2011	2012	2013	2014	2015	2016
<25	**1,442**	**1,402**	**1,421**	**1,356**	**1,317**	**1,241**	**1,214**	**1,188**	**1,195**
25–34	**1,336**	**1,340**	**1,401**	**1,390**	**1,383**	**1,338**	**1,305**	**1,283**	**1,282**
35–44	**1,476**	**1,528**	**1,640**	**1,643**	**1,634**	**1,647**	**1,671**	**1,718**	**1,778**
45+	**1,570**	**1,656**	**1,798**	**1,843**	**1,848**	**1,915**	**1,961**	**2,069**	**2,249**

Annual Injury Rates, AC Soldiers, 2008–2016



SPOTLIGHT

FORWARD MUSCULOSKELETAL CARE

According to data obtained from the Soldier Outcomes Trajectory Assessment (SOTA) database, MSK conditions are the primary challenge to medical readiness, accounting for more than half of all medically non-deployable AC Army Soldiers and 10 million limited duty days annually.[1] The MEDCOM PPSL focuses on reducing the MSK burden through forward MSK care, which provides early, expert MSK screening and intervention.

Back problems are the primary MSK-related condition affecting active duty service members.[2] Evidence supports early physical therapy evaluation and treatment for a new episode of low back pain; evaluation within 14 days of referral (early care) when compared with delayed evaluation resulted in a 40% decrease in healthcare costs among nearly 123,000 military medical beneficiaries.[3] Less opioid use and fewer surgeries, injections and advanced imaging studies accounted for the decreased costs.

The MEDCOM PPSL supports three forward MSK efforts to improve early access to expert MSK care: 1) FORSCOM Forward MSK Care; 2) TRADOC Forward MSK Care; and 3) Physical Therapy in Army Medical Homes.

Army physical therapist and physical therapy technician teams started transitioning into Brigade Combat Teams (BCTs) in 2003. MEDCOM provides guidance to FORSCOM Forward MSK Care and supported the development of Army Training Circular 8-280, Brigade Physical Therapy Section.[4] Per recent analysis, Soldiers assigned to brigades without organic physical therapy assets experience up to 79% more limited duty days for MSK problems than Soldiers in BCTs with organic assets. The BCT's organic physical therapy assets are likely one of multiple factors contributing to this difference. MEDCOM currently supports a pilot study assessing the readiness and performance-based benefits of augmenting FORSCOM battalions with multi-functional teams that include dietitians, occupational therapists, physical therapists, and strength and conditioning specialists.

TRADOC Forward MSK Care embeds athletic trainers (ATs) in training battalions. MEDCOM supports ATs at the four U.S. Army Initial Entry Training sites. The ATs screen and treat trainees at sick call (within the battalion footprint) for up to 2 weeks and refer any high-risk, complex, or chronic pain patients for a physician or physical therapy evaluation at the troop medical clinic. This arrangement enables 75% of all trainees to return to duty before the start of the training day.

MEDCOM also embeds physical therapists in the primary care clinics found in Army Medical Homes. The collaboration between embedded physical therapists and existing primary care teams supports early access to expert MSK care.

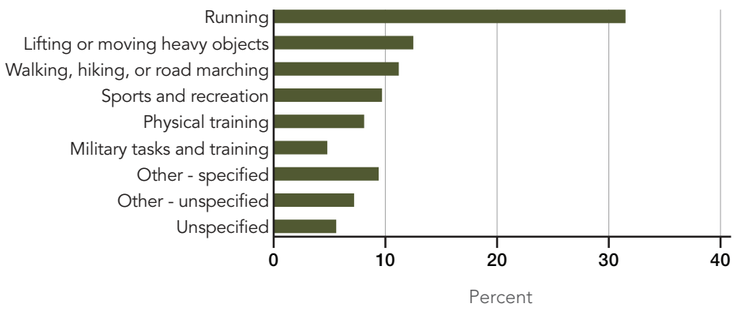
References:
1. MEDCOM Innovative Clinical Analytics (Soldier Outcomes Trajectory Assessment Database).
2. Armed Forces Health Surveillance Branch (AFHSB). Absolute and relative morbidity burdens attributable to various illnesses and injuries, active component, U.S. Armed Forces, 2016. *MSMR*. 2017; 24(4):2-8.
3. Childs, J.D., J.M. Fritz, S.S. Wu, T.W. Flynn, R.S. Wainner, E.K. Robertson, F.S. Kim, and S.Z. George. 2015. Implications of early and guideline adherent physical therapy for low back pain on utilization and costs. *BMC Health Serv Res*, 15:150.
4. Department of the Army. 2017. Training Circular (TC) 8-280, *Brigade Physical Therapy Section*, https://www.apd.army.mil.

SPOTLIGHT

A FOUNDATION FOR PREVENTION
IDENTIFYING CAUSES OF INJURY

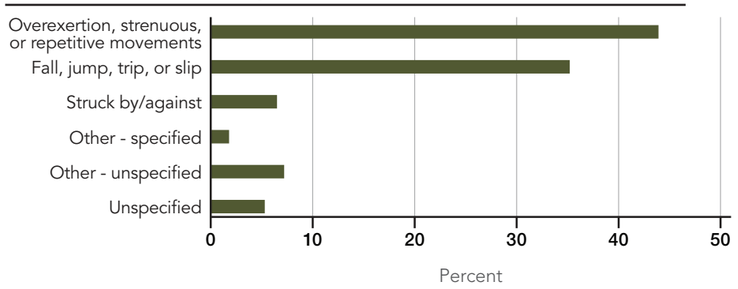
Details concerning activities and mechanisms associated with injuries are necessary to ensure focused, data-driven injury prevention planning. Though it is most efficient and cost-effective to acquire such information from cause-coded medical records data, surveys can also be a source of such key information. In 2011 and 2012, three BCTs preparing for deployment to Afghanistan were surveyed. Among 874 Soldiers injured in the 6 months prior to the survey, the leading activities associated with injury were running (32%), lifting or moving heavy objects (13%), and walking, hiking, or road marching (11%). The leading injury mechanisms were overexertion, strenuous, or repetitive movements (44%); fall, jump, trip, or slip (35%); and being struck by or against an object or person (7%). Development and evaluation of interventions to reduce overexertion and fall-related injuries, especially those related to running and lifting, are potential injury prevention targets for these units.

Percentage of Injured Soldiers by Activity Associated with Injury (n=874)



Note: "Other – specified" includes "Stepping or climbing (stairs, ladder)," "Repairing or maintaining equipment or vehicles," and "Riding or driving in or on a motorized vehicle."

Percentage of Injured Soldiers by Mechanism of Injury (n=874)



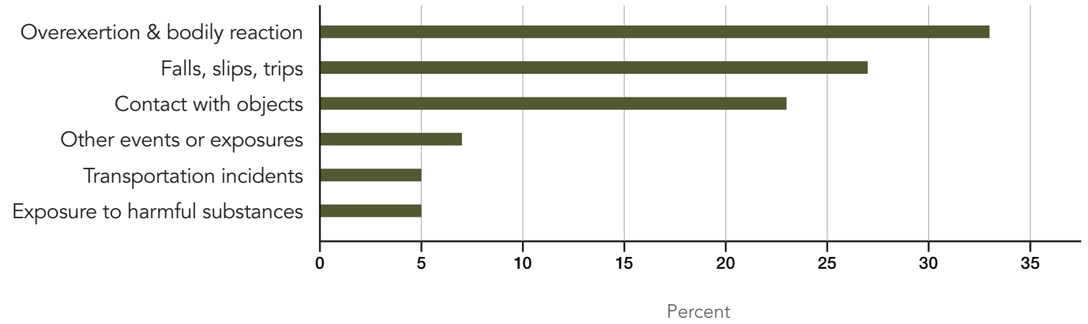
Note: "Other – specified" includes "Cut by a sharp instrument, tool, or object," "Environmental factors such as heat or cold," and "Fire, hot substance or object, or steam."

SPOTLIGHT

APHC ERGONOMIC SUPPORT
BEST PRACTICES AND LESSONS LEARNED

According to the Bureau of Labor Statistics (BLS), work-related musculoskeletal disorders (WMSDs), such as sprains or strains from overexertion in manual material handling, accounted for 33% of all nonfatal occupational injury and illness cases in 2015.[1] APHC Ergonomists assist organizations in establishing best practices to identify and mitigate WMSD hazards. An organization's multidisciplinary ergonomics committee should be trained to identify WMSD risk factors and formulate interventions to reduce injury. APHC ergonomists provide consultations and assist with risk factor identification and mitigation to reduce the incidence and severity of WMSDs. For example, Letterkenny Army Depot, Pennsylvania, achieved an 18% reduction in reported WMSDs from FY15 to FY16 after APHC Ergonomists provided several phases of focused ergonomic consultation, training support, job hazard assessment, and recommendations.[2] WMSDs exact an unacceptable toll on the military and civilian workforce. Identification and remediation of these risk factors is critical for the health of the force and the mission.

Event or Exposure Leading to Injury or Illness, U.S. Workers, 2015[1]



References:
1. BLS. 2016. *Nonfatal Occupational Injuries and Illnesses Requiring Days Away from Work, 2015* [Internet], https://www.bls.gov/news.release/osh2.nr0.htm.
2. E.D. Maddox, letter to APHC Ergonomics Division Team, 15 December 2016, subject: Memorandum of Appreciation.

SPOTLIGHT

INJURIES CAUSED BY RUNNING OR ROAD MARCHING

THE NEED FOR BALANCED TRAINING

Running is a required unit training activity that is frequently reported as the cause of training injuries, especially lower extremity overuse injuries.[1] Therefore, in an attempt to reduce running injuries, Commanders may consider replacing running with other physical training activities like road marching.[2]

In a recent study investigating injury risks, infantry Soldiers reported road marching as the second leading cause of injuries.[3] However, when miles of exposure were considered, injury risk during road marching was significantly higher than during running. Soldiers who road marched the most often (≥5 times/month) and carried heavier loads (≥26% of one's body weight) were at significantly greater risk of injury ($p \leq 0.05$).[3] Furthermore, as monthly road marching distances increased, the frequency and intensity of other weight-bearing activities like occupational lifting also became significant risk factors for injury during road marching.

Replacing unit distance running with additional road marching is not recommended, as doing so would likely increase injury rates. The lowest injury incidence (15% to 19%) was among those who ran the most, regardless of road marching demands. Soldiers who run more miles per month likely possess higher aerobic fitness, a key factor in physical performance.[4] Physical training programs should be balanced to enhance aerobic fitness with a variety of activities such as shuttle runs, movement drills, obstacle courses, terrain runs, ability group runs, and foot marches.[2] These should be accompanied by sufficient recovery time and progressive loading that are balanced in terms of frequency, duration, and intensity in order to minimize overtraining and injury risk. Further details on recommended training activities and schedules can be found in Army Field Manual (FM) 7-224 and FM 18-21.[5]

The lowest injury incidence … was among those who ran the most, regardless of road marching demands.

For more information, contact the APHC Injury Prevention Division: usarmy.apg.medcom-phc.mbx.injuryprevention@mail.mil

References:
1. Grier, T., M. Canham-Chervak, M. Anderson, T. Bushman, and B. Jones. 2017. Effects of Physical Training and Fitness on Running Injuries in Physically Active Young Men. *J Strength Cond Res*, 31(1):207–216.
2. U.S. Army Public Health Center (Provisional). 2016. APHC (Prov) Technical Information Paper No. 12-054-0616, *Foot Marching, Load Carriage, and Injury Risk*, http://www.dtic.mil/get-tr-doc/pdf?AD=AD1010939.
3. Schuh-Renner, A., T.L. Grier, M.C. Chervak, V.D. Hauschild, T.C. Roy, J. Fletcher, and B.H. Jones. 2017. Risk Factors for Injury Associated with Low, Moderate, and High Mileage Road Marching in a U.S. Army Infantry Brigade. *J Sci Med Sport*, 20:S28-S33.
4. Department of the Army (DA). 2012. FM 7-22, *Army Physical Readiness Training*, https://www.apd.army.mil.
5. DA. 1990. FM 21-18, *Foot Marches*, https://www.apd.army.mil.

Running and Road Marching-Related Injuries, Mileage, and Relative Risk of Injury (n=831 Infantry Soldiers)

Activity associated with injury	# of injuries in prior 6 months	Total miles exposed in prior 6 months	Rate of injury per 10,000 miles
Running	113	347,537*	3.3
Road Marching	96	163,392	5.9

*Exposed miles based on combined unit and personal PT running participation

SPOTLIGHT

MEASURING AND REDUCING THE IMPACT OF MUSCULOSKELETAL CONDITIONS ON MEDICAL READINESS

FT. BLISS ACHIEVES 36% REDUCTION IN CHRONIC (>90 DAYS) MUSCULOSKELETAL PROFILES

Many leaders have attempted to reduce the MSK injury burden on medical readiness, but the absence of actionable data has led to challenges in assessing the impact of these initiatives. To support unit and installation leaders, the MEDCOM PPSL led the development of several strategic MSK metrics using available data for Active Army Soldiers. These metrics include the percentage of Soldiers on chronic MSK profile (>90 days in a 6-month period) and the overall number of days on MSK profile per 100 Soldiers. The first metric is important in that 4% of Soldiers on chronic MSK profiles account for 51% of all MSK limited duty days. The second metric is a function of both profile length and the proportion of a unit's or installation's Soldiers on temporary MSK profiles.

A comparison of CY16 Q1 and CY16 Q4 across the Active Army showed an 18% decrease in Soldiers profiled for chronic MSK conditions and a 4% decrease in days on MSK profile per 100 Soldiers. Fort Bliss, the most improved installation, achieved a 36% decrease in chronic MSK profiles and a 33% decrease in days on profile over this period. A review of Fort Bliss' actions reveals multiple leading practices.

To address unwarranted variance in length of MSK profiling, the 1AD surgeon and physician assistant collaborated with the medical treatment facility (MTF) to limit nonsurgical, hospital provider-generated MSK profiles to 14 days, along with guidance to follow up with a unit medical officer. Additionally, 1AD implemented robust, multi-functional profile review boards at the division, brigade, and battalion levels. These meetings further enabled commanders and medical staff to collaboratively write more precise MSK profiles and identify all Soldiers who had reached their medical retention determination point.

In the spring of 2016, the 1AD 2BCT physical therapist moved from the Soldier-Centered Medical Home into the BCT footprint and started educating first-line leaders on the value of early, targeted MSK injury intervention. Fellow BCT physical therapists followed 2BCT's lead and began providing forward MSK care from within their BCT footprints. 2BCT also improved Soldier accountability by enforcing physical performance and body composition standards during unit in-processing and adding rigor to reconditioning physical readiness training.

A comparison of CY16 Q1 and CY16 Q4 across the Active Army showed an 18% decrease in Soldiers profiled for chronic MSK conditions...

1AD and MTF leadership also collaborated to provide units lacking organic physical therapy assets with convenient access to physical therapists during sick call. The BCT physical therapists, coupled with hospital physical therapy and occupational therapy clinics, also led the way in reviewing the Medical Readiness Assessment Tool (MRAT) that enables the screening of Soldiers at risk for chronic MSK pain.

DID YOU KNOW?

INJURY PREVENTION

Several Army organizations produce technical and educational materials that encourage the prevention of military injuries, with the shared goal of improving military readiness:

U.S. Army Public Health Center
Injury Prevention Division

https://phc.amedd.army.mil/topics/discond/ptsaip/Pages/default.aspx

The APHC Injury Prevention Division employs a systematic public health approach to prevent injuries through rigorous epidemiologic investigation and analysis. Materials are based on results of medical data monitoring, program and policy evaluations, and systematic reviews of scientific literature. Available products include injury surveillance data summaries, installation-level injury data dashboards, fact sheets, technical reports, videos, educational seminars, and scholarly journal articles.

U.S. Army Combat Readiness Center

https://safety.army.mil/

The Combat Readiness Center, at Fort Rucker, Alabama, leads safety and occupational health initiatives for the Army. The Center provides accident reports and statistics, information papers, safety training, and instructional materials such as posters, brochures, and videos. The Center also publishes the Army Knowledge Magazine, which features articles on various safety- and injury prevention-related topics written by subject matter experts throughout the Army.

Army Medicine Campaign
Physical Performance Service Line

Directed by the Office of the Surgeon General, the Army Medicine Campaign seeks to develop an integrated system of health for the military. The Physical Performance Service Line aims to enhance Soldier physical readiness through access to early, expert musculoskeletal care, improved identification and management of injuries, and implementation of injury prevention, rehabilitation, and reintegration programs, with a focus on synchronizing efforts of medical providers and unit leaders. Related technical materials can be found on the PPSL milSuite site.

Heat-Related Illnesses and Cold Weather Injuries

Exertional heat illnesses are a subset of heat-related disorders with significant operational and readiness impacts. Exertional heat illnesses occur when the regulation of body temperature is imbalanced due to heat stress from internal and external heat sources, leading to dysfunction of multiple body systems. These illnesses can include heat exhaustion, heat stroke, and in rare cases exertional hyponatremia. Although more common in the warmer months (April through September), exertional heat illnesses occur year-round. Among AC Soldiers, heat illnesses are the third most common reportable medical event recorded in the Disease Reporting System, internet (DRSi). Rates vary by location and occupational exposure. In 2016, the Army-wide rate was approximately 3 new exertional heat illnesses diagnosed per 1,000 person-years with rates ranging from almost 0 to 17 per 1,000 person-years across installations. At Basic Combat Training posts and posts with large training rotations, rates ranged from 3 to 17 per 1,000 person-years.

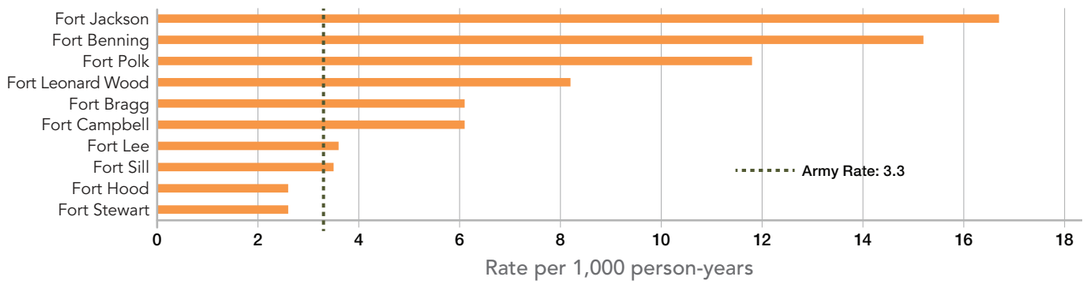
Cold Weather Injuries (CWI) are associated with imbalances of body temperature regulation in cold or wet environments. The Army-wide rate for CWI in 2016 was 0.8 per 1,000 person-years. The highest rates were at Bavaria (7.1 new CWI diagnosed per 1,000 person-years) and Fort Jackson (4.4 new CWI diagnosed per 1,000 person-years).

Effective mitigation strategies are available for these conditions. Detailed information can be found at the following APHC web pages:

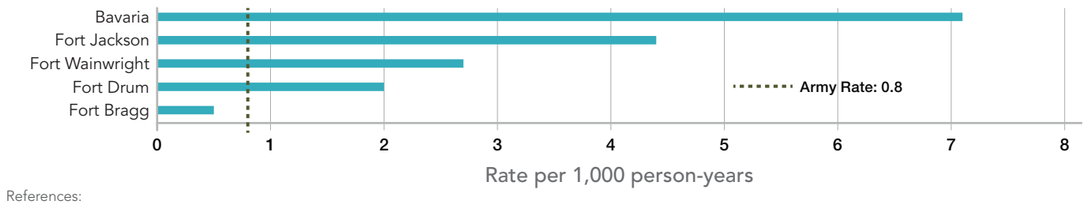
Heat Illnesses — https://phc.amedd.army.mil/topics/discond/hipss/Pages/default.aspx

Cold Weather Injuries — https://phc.amedd.army.mil/topics/discond/cip/Pages/default.aspx

Leading Heat-Related Illness Rates by Installation, AC Soldiers, 2016



Leading Cold Injury Rates by Installation, AC Soldiers, 2016



References:
1 Armed Forces Health Surveillance Branch. 2017. Update: Heat illness, active component, U.S. Armed Forces, 2016. *MSMR*, 24(3):9–13.
2 APHC. 2016. Fact Sheet 12-005-0316, *Injury Prevention: Just the Facts. Heat Illness*, http://phc.amedd.army.mil/topics/discond/hipss/Pages/HeatInjuryPrevention.aspx.
3 APHC. 2015. Fact Sheet 12-004-0915, *Injury Prevention: Just the Facts. Cold Weather Injuries*, http://phc.amedd.army.mil/topics/discond/cip/Pages/ColdCasualtiesInjuries.aspx

SPOTLIGHT

ENSURING PROPER HYDRATION

TOO MUCH WATER CAN BE AS HARMFUL AS TOO LITTLE

The Army reports an average of 2 to 3 heat-related fatalities and over 1,000 non-fatal heat illnesses each year. These illnesses include a spectrum of conditions from milder illness (e.g., heat cramps), to heat exhaustion, to the most serious and sometimes fatal medical emergency: heat stroke. Since dehydration is a risk factor for these conditions, a primary Army prevention tactic is to ensure Soldiers consume adequate fluids on a regular basis. Maintaining proper hydration is fundamental to decreasing the risk for developing heat illness and necessary to optimize performance.

However, a Soldier's collapse and subsequent death following training at Fort Benning, Georgia, in July 2016 demonstrated an uncommon, but real, health threat: overhydration. Drinking too much water or sports drinks during and after training may lead to an imbalance of electrolytes, known as Exercise-Associated Hyponatremia, or EAH.

Though EAH fatalities are not common, an estimated 6,000 cases of fluid and electrolyte disturbances are treated annually in the Army training environment. The exact number of EAH cases is not known. Unlike heat stroke and heat exhaustion, EAH conditions are not often captured as reportable medical events.

To minimize the risks of EAH, doctrine recommends fluid intake not to exceed 1.5 quarts per hour or 12 quarts per 24 hours (under the most strenuous conditions). Consumption of 1 quart per hour is sufficient under most conditions. Adherence to fluid intake doctrine and the proper consumption of rations ensure adequate water and electrolyte replacement. However, even these guidelines cannot fully protect against EAH. Hot weather, combined with prolonged exertion and an early heat season that leaves Soldiers inadequately acclimatized, presents a high-risk environment for all types of heat illness. Leaders should continue to ensure proper hydration to decrease the risk of the more common heat illnesses and also be on the lookout for signs that Soldiers are drinking amounts in excess of water intake doctrine and/or their food and electrolyte consumption is insufficient. Early signs and symptoms of EAH are similar to those of heat illness and often occur during the heat illness season. These include confusion, weakness, and vomiting. If these signs are evident, seek medical care for the affected Soldier.

- Monitor Soldier hydration by using beads, knots, or other markings to track the number of bottles, canteens, and hydration system refills of water and other liquids consumed to ensure amount does not exceed a maximum of 1.5 quarts/hr or 12 quarts/24 hrs.
- Encourage Soldiers to check their urine color first thing in the morning to ensure they are starting out hydrated (view the Factsheet at http://phc.amedd.army.mil/topics/discond/hipss/Pages/HeatInjuryPrevention.aspx).
- Ensure Soldiers stay properly fueled and hydrated by making certain they consume proper nutrition and rations for the conditions and activities in which they are engaged.
- Consider substituting 2 quarts of an electrolyte-rich beverage for 2 quarts of daily water.

References:
Binkley, H.M., J. Beckett, D.J. Casa, D.M. Kleiner, and P.E. Plummer. 2002. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train*, 37;3: 329.

Hew-Butler, T., M.H. Rosner, S. Fowkes-Godek, J.P. Dugas, M.D. Hoffman, D.P. Lewis, R.J. Maughan, et al. 2015. Statement of the Third International Exercise-Associated Hyponatremia Consensus Development Conference, Carlsbad, California, 2015. *Clin J Sport Med*, 25(4); 303–20.

Howe, A.S., and B.P. Boden. 2007. Heat-related illness in athletes. *Am J Sports Med*, 35;8:1384–95.

APHC. 2016. *APHC Army Injury Prevention Heat Injury Factsheet*, http://phc.amedd.army.mil/topics/discond/hipss/Pages/HeatInjuryPrevention.aspx (accessed August 17, 2017).

APHC. 2016. Heat Can Kill You. *Army Knowledge Magazine*, https://safety.army.mil/MEDIA/Knowledge/tabid/97/ArtMID/478/ArticleID/588/Default.aspx (accessed August 16, 2017).

U.S. Army Research Institute of Environmental Medicine. 2016. Information Paper

MCMR-EMT, subject: *Guidance Concerning Commercial Electrolyte Replacement Beverages and Hyponatremia Risk during Hot Weather Training.* Natick, Massachusetts.

Sensory Injuries

Visual and auditory acuity are essential to readiness. Heightened awareness and response are crucial on the battlefield. Operational exposures can compromise these senses. Both hearing and eye injuries are commonly reported during deployment, and hearing injury is a leading cause of disability among veterans.

Hearing Injury

The Defense Occupational and Environmental Health Readiness System – Hearing Conservation (DOEHRS-HC) is a Military Health System (MHS) information system designed to support personal auditory readiness and prevent significant hearing loss through the early detection of hearing changes. DOEHRS-HC collects, maintains, compares, and reports hearing conservation and hearing readiness data for Department of Defense (DOD) personnel and is one of the authoritative data sources for Medical Protection System (MEDPROS) Hearing Readiness Classification (HRC) calculations. The Army Hearing Program uses DOEHRS-HC to monitor the hearing ability of military and Civilian personnel as well as for program management.

Data from DOEHRS-HC show decreased hearing injuries and hearing impairment among Soldiers from 2011 to 2014, with slight increases in 2015 and 2016. In 2016, 4.2% of screened Soldiers experienced an STS. An STS shift is decreased hearing in one or both ears when compared to the baseline test.* Some hearing loss is considered unavoidable as a person ages, making it unlikely that STS levels would ever reach zero across the population.

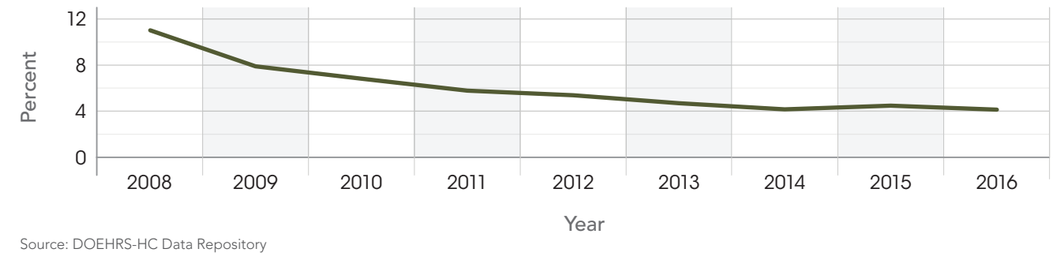
Clinically diagnosed hearing injuries provide additional insight into the burden of hearing loss in the Army. In 2016, approximately 36.6 new Noise-Induced Hearing Injuries (NIHI) were diagnosed among AC Soldiers per 1,000 person-years, ranging from 8.5 to 143.8 per 1,000 person-years across installations.

The proportion of Soldiers with hearing-related medical profiles has been declining. From 2009 to 2016, the percent of Soldiers with an H3 profile (indicative of moderate hearing impairment) has fallen from 1.8% in 2009 to under 0.9% in 2016.

The proportion of Soldiers with hearing-related medical profiles has been declining.

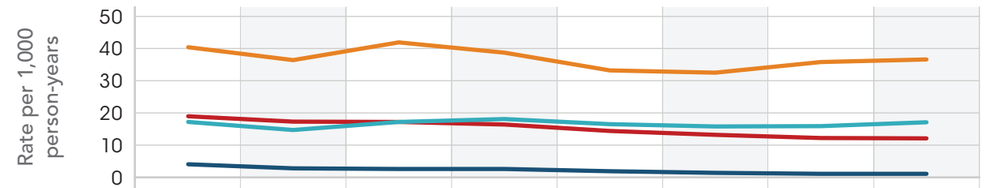
*Per DA Pam 40-501, a significant threshold shift is defined as a change in hearing of an average of +/- 10 decibels at 2,000, 3,000, and 4,000 hertz in either ear, relative to the individual's earliest or most current re-established audiogram.

Percent of AC Soldiers with New Significant Threshold Shifts, 2008–2016



Source: DOEHRS-HC Data Repository

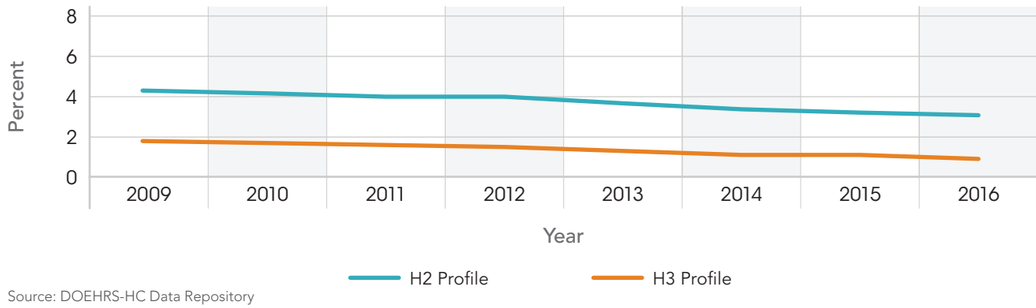
Rate of AC Soldiers Diagnosed with NIHI by NIHI Category, 2009–2016



	2009	2010	2011	2012	2013	2014	2015	2016
Noise-Induced Hearing Loss	**4.1**	**2.8**	**2.6**	**2.6**	**1.9**	**1.4**	**1.1**	**1.1**
Tinnitus	**17.2**	**14.7**	**17.2**	**18.1**	**16.5**	**15.8**	**15.9**	**17.1**
Sensorineural Hearing Loss	**19.0**	**17.3**	**17.2**	**16.5**	**14.4**	**13.2**	**12.2**	**12.1**
Any NIHI*	**40.4**	**36.4**	**41.9**	**38.7**	**33.2**	**32.5**	**35.8**	**36.6**

* Includes significant threshold shifts identified by an audiologist. Data not shown.

Hearing Profiles, AC Soldiers, 2009–2016



Source: DOEHRS-HC Data Repository

SPOTLIGHT

PREVENTING AND ADDRESSING HEARING LOSS IN AC SOLDIERS

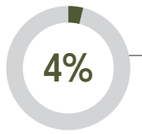
Noise-induced hearing loss is painless, progressive, permanent, and preventable. The focus of the Army Hearing Program (AHP) is to enhance Soldier survivability, lethality, and readiness, and to enhance Soldier and Civilian performance, communication, and conservation of hearing. Hearing injuries impact mission performance during garrison activities, deployments, active training, and combat. The AHP is a comprehensive, multi-faceted program that spans a multitude of elements within its four key components: Hearing Readiness, Operational Hearing Services, Clinical Hearing Services, and Hearing Conservation. The AHP is not a hearing testing program; rather, it is a prevention and education program that incorporates hearing testing. Noise hazard identification and engineering controls, hearing protection use, hearing health education, and command enforcement are the preventive aspects of the AHP. Certified hearing conservation technicians, occupational health and preventive medicine personnel, and military audiologist program managers perform hearing testing and provide AHP oversight at over 161 Army installations worldwide.

In Calendar Year 2016:

Approximately **600,000** reference and periodic hearing tests were administered to AC Soldiers through DOEHRS-HC, the tri-Service hearing test system of record. DOEHRS-HC data are provided to MEDPROS for determination of the Soldier's hearing readiness classification.

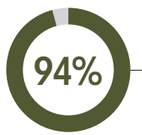
21% of AC Soldiers had some degree of hearing loss.

41% of AC Soldiers with an initial hearing test indicative of hearing loss received required follow-up testing, and 4,611 (1%) required a hearing readiness evaluation as a result of follow-up tests. Failure to complete follow-up testing compromises the hearing health of the individual as well as unit productivity. The Chief of Staff of the Army (CSA) follow-up hearing test goal is "at least 70%."



4% of AC Soldiers experienced a new hearing injury. The CSA hearing injury rate goal is "less than 3%."

22% of AC Soldiers have experienced a significant change in hearing during their military career.



94% (from averaged quarterly data) of AC Soldiers were hearing ready. The AHP hearing ready goal is at least 90%, consistent with the Office of The Surgeon General (OTSG) Individual Medical Readiness (IMR) goal, and exceeding the Assistant Secretary of Defense, Health Affairs DOD IMR goal of 85%.

Over the past four decades, there have been significant decreases in Soldier hearing injuries, and hearing injury rates have remained below pre-war levels (Fiscal Year 2000):

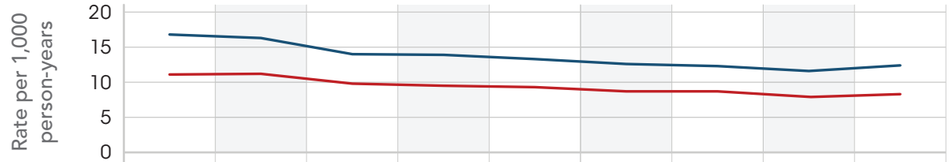
- **1974** 35%–40% hearing loss among Combat Arms Soldiers (Infantry, Armor, and Artillery)
- **1989** 15%–20% hearing loss among Combat Arms Soldiers (Infantry, Armor, and Artillery)
- **2016** 6% hearing loss among all Army Soldiers regardless of service component
- **2016** 4% hearing loss among AC Soldiers

Although hearing health in the Army has improved over time, noise-induced hearing loss and associated problems have not been eliminated. Hearing loss impacts survivability, lethality, and mission effectiveness. The AHP hearing test requirements ensure the hearing readiness of Soldiers is accurately documented, allowing commanders to make informed decisions regarding readiness and the hearing functionality of their Soldiers. Continued command emphasis on all aspects of the AHP, including consistent and appropriate hearing protection use, hearing health education, and noise hazard identification and engineering controls, is critical to promoting and enhancing readiness.

Eye Injury

The incidence of eye injuries has declined in the last decade. In 2016, the total rate of incident eye injuries was 12.4 per 1,000 person-years, down from a high of 16.8 per 1,000 person-years in 2008. Superficial eye injuries are more common than non-superficial injuries, both of which have decreased since 2008 but showed a slight increase in 2016. Total eye injury rates ranged from 2.9 to 16.5 per 1,000 person-years across installations, suggesting an opportunity to further reduce rates by sharing best practices.

Eye Injury Rates by Year, AC Soldiers, 2008–2016



	2008	2009	2010	2011	2012	2013	2014	2015	2016
Superficial Eye Injuries	11.1	11.2	9.8	9.5	9.3	8.7	8.7	7.9	8.3
Total Eye Injuries	16.8	16.3	14.0	13.9	13.3	12.6	12.3	11.6	12.4

DID YOU KNOW?

NEW VIDEOS SUPPORT SOLDIER LASER SAFETY TRAINING

When the laser was invented in 1960, it was described by some as "a solution looking for a problem;" however, the Army has resolved many problems with the aid of the laser. On the battlefield, lasers are used to aim weapons at targets, point to targets, illuminate objects, range to targets, designate targets for laser guided munitions, and mark targets for crew-served weapons. Nearly every Soldier who has fired a weapon has likely also operated a laser.

The threat of injury due to battlefield laser use is both real and significant. Lasers can permanently damage an individual's vision and burn the skin. Although laser injuries in the Army have been rare, training on the safe use of lasers has been insufficient—until now. With assistance from the U.S. Army Training Support Center (USATSC) at Fort Eustis, Virginia, the APHC Nonionizing Radiation Division laser safety subject matter experts have created seven laser training videos.

For the first time, commanders, program officers, and training instructors have a laser safety training tool that can augment new equipment or sustainment training packages as well as fulfill the annual training requirement for all Soldiers, laser safety officers, and employees who work with, operate, or may be potentially exposed to hazardous laser systems.

The new laser videos can be accessed on the Army milTube page (www.milsuite.mil).

Moviemaking – A Behind-the-Scenes Look (Photo courtesy of Mr. Rodney Wood, APHC)

"We prepare our equipment and we train to ensure we are ready to go. But what about your eyes? Are they ready to go?"

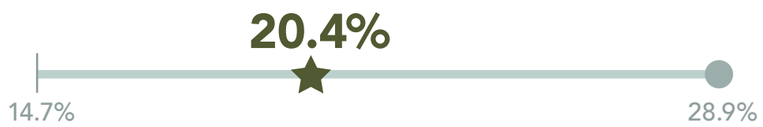
–Robert N. Kang, Ph.D.
U.S. Army Public Health Command
March 2013

Behavioral Health

The stressors of military life can have a profound impact on the psychological well-being of Soldiers and Families. Behavioral health (BH) disorders such as depression, posttraumatic stress disorder (PTSD), and substance use disorder (SUD) are risk factors for a number of negative outcomes for Soldiers, including lack of medical readiness, early discharge from the Army, and suicidal behavior. BH disorders are second only to injuries in overall impact on the force. Roughly 110,000 Soldiers seek care for BH conditions each year. As stigma around seeking care decreases, the number of Soldiers seeking care for BH conditions could actually increase, representing progress for Army Medicine toward a goal of increased access to mental health care.

In 2016, 20.4% of Soldiers had a diagnosis of one or more BH conditions, which include SUD, adjustment disorder, personality disorder, psychosis, anxiety disorder, PTSD, and mood disorders. Across installations, the prevalence of BH disorders diagnosed among Soldiers ranged from 14.7% to 28.9%.

BH diagnosis rates were higher among female Soldiers (29.3%) than male Soldiers (18.9%). Older Soldiers were more likely to have BH diagnoses than younger Soldiers. Among both males and females, the most common BH diagnoses were adjustment disorder (10.5% and 19.8%, respectively), followed by anxiety disorder (6.2% and 11.0%) and mood disorders (5.3% and 11.7%).



Overall, 20.4% of Soldiers had a behavioral health disorder.

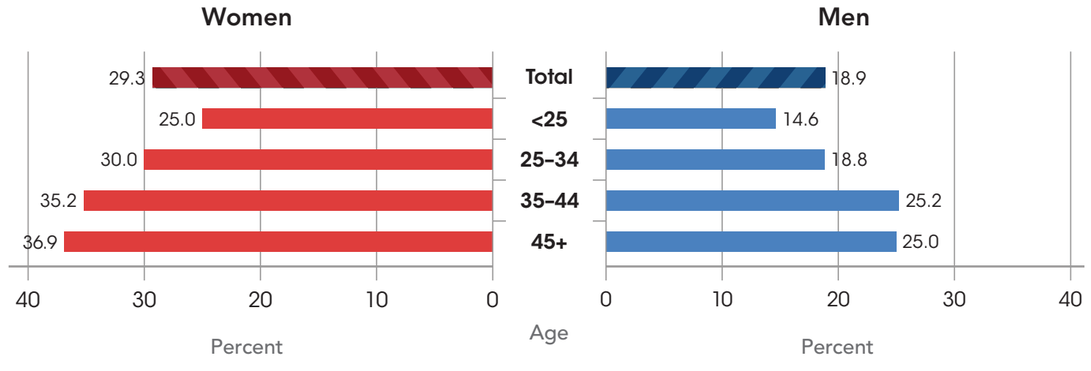
Prevalence ranged from 14.7% to 28.9% across U.S. installations.

Prevalence ranged from 16.5% to 24.4% across installations outside the U.S.

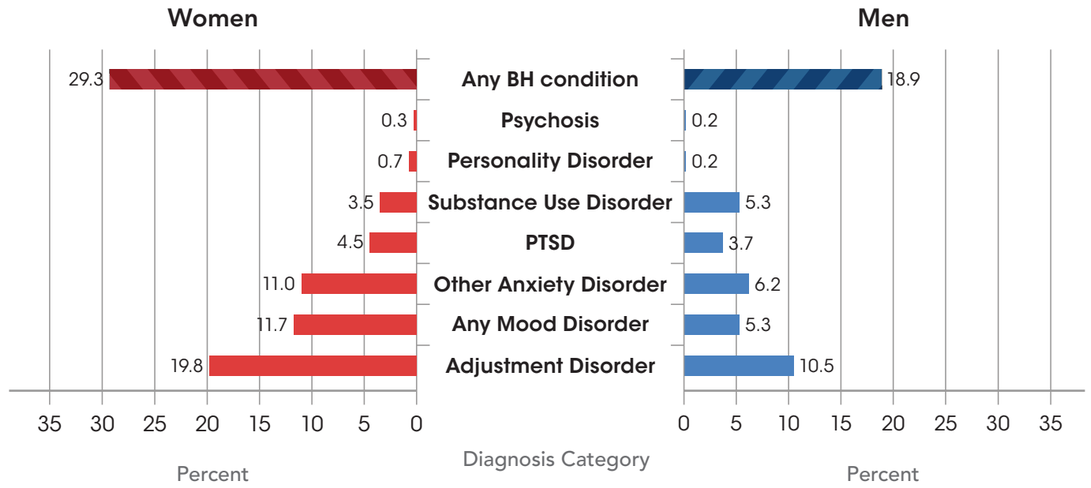
BEST RANKING INSTALLATIONS

Installations are not rank-ordered for BH disorders because higher percentages of Soldiers with established diagnoses may, in fact, reflect lower levels of stigma and greater access to care. Identifying concerns early and encouraging Soldiers to seek treatment is a primary goal of Army Medicine and leads to better clinical outcomes. Soldiers who do not receive timely treatment for their BH conditions are at risk for negative outcomes and decreased readiness.

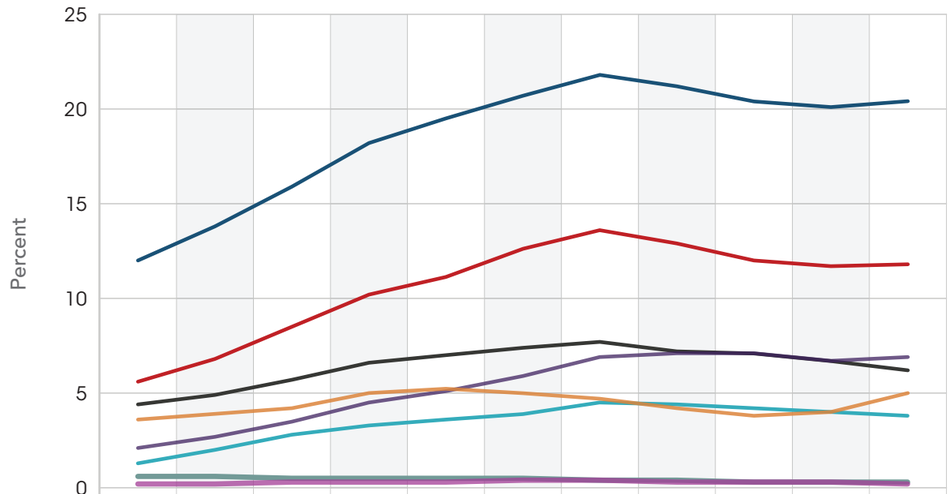
Percent with Behavioral Health Disorders by Sex and Age, AC Soldiers, 2016



Percent with Behavioral Health Disorders by Sex and Diagnosis Category, AC Soldiers, 2016



Percent with Behavioral Health Disorders by Diagnosis Category, AC Soldiers, 2006–2016



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Any BH Disorder	12.0	13.8	15.9	18.2	19.5	20.7	21.8	21.2	20.4	20.1	20.4
Adjustment Disorder	5.6	6.8	8.5	10.2	11.3	12.6	13.6	12.9	12.0	11.7	11.8
Mood Disorder	4.4	4.9	5.7	6.6	7.0	7.4	7.7	7.4	7.1	6.7	6.2
Other Anxiety Disorder	2.1	2.7	3.5	4.5	5.1	5.9	6.9	7.1	7.1	7.2	6.9
PTSD	1.3	2.0	2.8	3.3	3.6	3.9	4.5	4.4	4.2	4.0	3.8
Substance Use Disorder	3.6	3.9	4.2	5.0	5.2	5.0	4.7	4.2	3.8	4.0	5.0
Personality Disorder	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3
Psychosis	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2

The proportion of AC Soldiers with a behavioral health disorder has slowly declined in the last 5 years from a high of 21.8% in 2012 to 20.4% in 2016.

SPOTLIGHT

THE APPLIED BEHAVIORAL HEALTH AND WELLNESS INITIATIVE

BRIDGING THE BEHAVIORAL PUBLIC HEALTH GAP BETWEEN THE U.S. ARMY PUBLIC HEALTH CENTER AND ARMY COMMUNITIES

The Applied Behavioral Health and Wellness (ABHW) initiative was established to place health findings from the APHC into a behavioral public health framework. This initiative aims to effectively disseminate evidenced-based findings to enhance installation public health services and identify gaps in service. Working in partnership with the Community Health Promotion Council (CHPC) Behavioral Health Working Groups (BHWGs), the ABHW WG intends to provide local leaders and stakeholders the support they need to make informed decisions about behavioral health services and policy. This goal will be accomplished through a multi-disciplinary approach, combining the capabilities of the APHC's Health Promotion and Wellness (HPW) Directorate and the Behavioral and Social Health Outcomes Practice (BSHOP) Division.

LINES OF EFFORT

The ABHW sub-working group's three lines of effort (LOE) are focused on developing and implementing a process to translate findings and scientifically-validated practices to the field:

LOE 1: Leverage the Army-wide CHPCs through the Health Promotion Operations Division and, with the support of the Public Health Communications Directorate, disseminate training aids and social media postings that are informed by scientific findings from the HPW Directorate and the BSHOP Division.

LOE 2: Partner with CHPC BHWGs to develop a standardized model to leverage APHC assets for the effective identification of installation behavioral public health issues. Implement community-based participatory action research principles to develop action plans to address and monitor locally developed solutions.

LOE 3: Identify and develop a set of standardized social indicators interfaced with the Army Strategic Management System (SMS) for use by the CHPC BHWGs. Provide installation leadership and stakeholders a systematic process that will assess and monitor the BH well-being of the installation's community as well as inform policy-related decision making.

The strategic and long-range intent of the ABHW WG is to enhance mission readiness, interconnect each LOE within a standardized model to enhance the behavioral public health mission capabilities of each BHWG, and improve the quality of life of the Army community.

References:
1. DA. 2015. Army Regulation (AR) 600-63, *Army Health Promotion*, http://www.apd.army.mil/.
2. DA. 2015. AR 15-1, *Department of the Army Federal Advisory Committee Management Program*, http://www.apd.army.mil/.

Are Your Soldiers Struggling with PTSD Symptoms?

Help Them Stop Avoiding and Start Healing.

Soldier: **"I don't want to go to the range, Sir."** 1 Scenario

Leader (thinking): *"This is the second time I've noticed my Soldier trying to get out of this."*

2 Scenario Soldier: **"I can't go to the concert. There are too many people there."**

Leader (thinking): *"He stopped going to the concerts he used to enjoy so much."*

Soldier: **"I know I'm late for morning formation again, Ma'am. I haven't been sleeping well."** 3 Scenario

Leader (thinking): *"These excuses about oversleeping—from one of my best Soldiers—are getting old. I wonder why this is happening more frequently."*

One in 10 Soldiers reported symptoms of PTSD 3 to 6 months after returning from deployment.

If you have heard statements like those on the left, or have had these or similar concerns, your Soldier may be exhibiting symptoms of PTSD. PTSD symptoms can vary greatly among individuals and though they often present soon after the traumatic event, it is possible for symptoms to appear months or years later.

Symptoms of PTSD generally fall into four categories:

1. Avoidance, e.g., avoiding people, places, sounds, and activities that are a reminder of the traumatic event, and avoiding speaking/thinking about the event
2. Intrusive memories, e.g., reoccurring negative memories of the traumatic event, flashbacks, nightmares, and severe physical and/or emotional reaction to something that is reminiscent of the event
3. Negative thoughts and mood, e.g., relationship issues, loss of interest in activities, feeling hopeless, numb, or detached
4. Changes in physical/emotional reactions, e.g., sleep problems, angry outbursts, misuse/abuse of alcohol, easily startled by loud noises

Avoidance of people, places, and activities that could trigger negative memories is a common but ineffective coping mechanism. For example, Soldiers may fear the negative memories and feelings associated with a particular activity and avoid engagement for fear of a trigger. Negative emotions may lead to Soldiers isolating themselves and not participating in activities they once enjoyed. Nightmares and sleep problems are also common symptoms which may be recognized by their impact on a Soldier's work performance.

Approximately 1 in 10 Soldiers reported symptoms of PTSD 3 to 6 months after returning from deployment (2015 Behavioral Health Risk Assessment Data Report (BH-RADR); 11% reported symptoms on the Post-Deployment Health Reassessment (PDHRA)). Of Soldiers who attempted suicide in 2015 and had completed the PDHRA, nearly half had endorsed experiencing at least one symptom of PTSD, regardless of whether or not they received a full PTSD diagnosis. It is important to recognize the behaviors your Soldiers may exhibit and reassure them that they are not alone. Due to increased awareness over the years, the stigma is fading (2015 BH-RADR). Most Soldiers who reported PTSD and/or depression symptoms on the Pre-Deployment Health Assessment, Post Deployment Health Assessment, or PDHRA had at least one BH encounter prior to that screening, indicating that Soldiers are likely obtaining needed BH care, and evidence-based therapies to treat PTSD are readily available. Awareness has also created an environment in which Soldiers are better equipped to identify PTSD symptoms in their fellow Soldiers, and those suffering are more likely to accept help.

The negative memories and emotions associated with experiences from deployment can be difficult to change without professional intervention. Without proper help, PTSD symptoms can lead to other maladaptive coping behaviors such as alcohol and substance abuse, depression, and suicidal behavior. If you notice changes in a Soldier's behavior, such as avoidance of activities, poor work performance, or isolation, ensure the Soldier gets care from a behavioral health provider in an embedded behavioral health unit or at the local MTF.

Sleep Disorders

High-quality sleep is critical to readiness. A good night's sleep can help increase productivity and decrease risk of accidents, errors, and injuries. Sleep disorders include insomnia, hypersomnia, circadian rhythm sleep disorder, narcolepsy, and sleep apnea, all of which can impair readiness and function. The two most common sleep disorders among Soldiers are insomnia and obstructive sleep apnea. Interventions such as cognitive behavioral therapy typically help with most sleep disorders, and continuous positive airway pressure (CPAP) devices or custom oral appliances to maintain an open airway may help with sleep apnea. Cognitive behavioral therapy for insomnia and oral appliance therapy for sleep apnea are well suited for Soldiers in forward deployed, austere environments. These non-pharmacologic interventions can improve sleep quality and cognitive performance in Soldiers with sleep disorders.

In 2016, 14.4% of Soldiers had a sleep disorder. The prevalence of sleep disorders increased with age, affecting over a third of Soldiers age 45 and older. Men were more likely than women to experience a sleep disorder, particularly as they age. The prevalence of sleep disorders ranged from 7.7% to 26.0% across installations.

Overall, 14.4% of Soldiers had a sleep disorder.

Rates ranged from 7.7% to 26.0% across U.S. installations.

Rates ranged from 10.6% to 18.6% across installations outside the U.S.

BEST RANKING INSTALLATIONS

U.S.

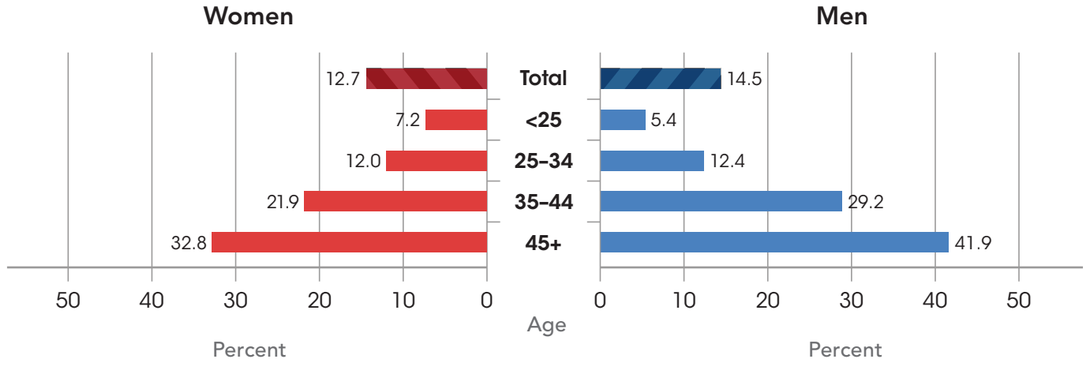
1. USAG WEST POINT
2. FORT BRAGG
3. JB ELMENDORF-RICHARDSON*
3. JB MYER-HENDERSON HALL*
5. FORT JACKSON

OUTSIDE THE U.S.

1. JAPAN
2. USAG VICENZA
3. USAG RED CLOUD

* Tied rankings for 3rd place

Percent with a Sleep Disorder by Sex and Age, AC Soldiers, 2016



"The quality of Soldiers' sleep has a direct bearing on readiness."

–COL Vincent Mysliwiec
Sleep Medicine Consultant to the Army Surgeon General

Chronic Disease

Chronic diseases are a major public health burden for civilian and military populations. Chronic medical conditions can seriously hinder military medical readiness by decreasing a Soldier's capability to conduct physically demanding mission requirements or to deploy to remote locations where healthcare resources are limited. The chronic conditions assessed for *Health of the Force* include cardiovascular disease, cancer, asthma, arthritis, chronic obstructive pulmonary disease (COPD), and diabetes, many of which can be prevented and managed in part by the adoption of healthy lifestyle choices such as maintaining a healthy weight and avoiding tobacco use.

In 2016, 12.7% of Soldiers had a chronic health condition. Cardiovascular disease (including hypertension) was the most common condition with 7.4% of Soldiers diagnosed. Rates of chronic disease increased with age, with 52.0% of female Soldiers and 48.3% of male Soldiers over the age of 45 with at least one condition, compared to 4.5% and 2.7% of female and male Soldiers under the age of 25, respectively. The proportion of all Soldiers with a chronic disease has slowly declined in the last five years from a high of 15.5% in 2012 to 12.7% in 2016.

Hypertension, or high blood pressure, is a substantial contributor to chronic disease levels among AC Soldiers. The Centers for Disease Control and Prevention (CDC) describes hypertension as a "silent killer" because it often has no warning signs or symptoms but can lead to deadly outcomes such as heart disease or stroke. In 2016, 5.1% of AC Soldiers had hypertension. Seventy percent of Soldiers with diagnosed cardiovascular disease had hypertension. Fortunately, once identified, hypertension can be controlled through medication or lifestyle changes.

Overall, 12.7% of Soldiers had a chronic condition.

Prevalance ranged from 8.2% to 33.8% across U.S. installations.

Prevalance ranged from 8.7% to 17.3% across installations outside the U.S.

BEST RANKING INSTALLATIONS

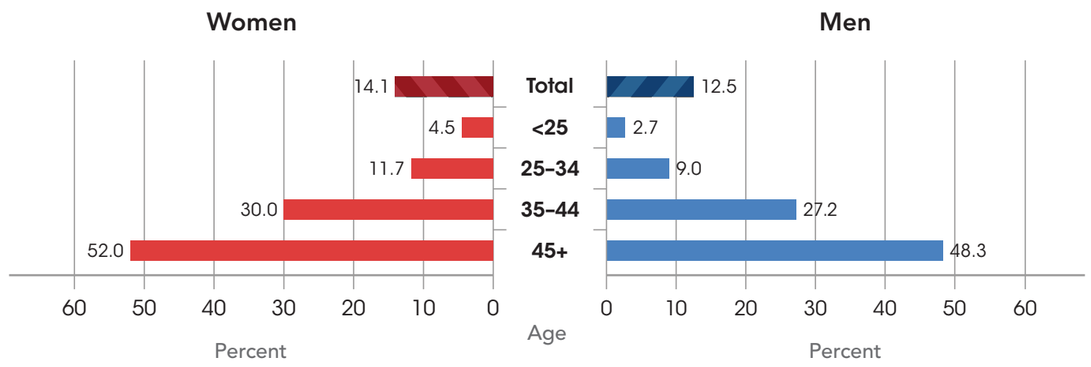
U.S.

1. FORT BRAGG
2. FORT CAMPBELL
3. JB MYER-HENDERSON HALL
4. FORT CARSON
5. USAG WEST POINT

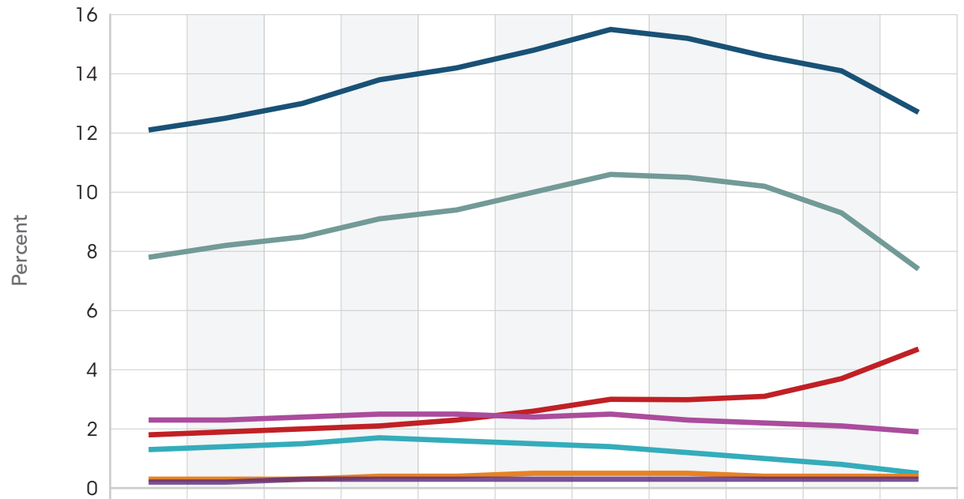
OUTSIDE THE U.S.

1. USAG VICENZA
2. JAPAN
3. USAG RED CLOUD

Percent with Selected Chronic Diseases by Sex and Age, AC Soldiers, 2016



Percent with Chronic Disease by Diagnosis Category, AC Soldiers, 2006–2016



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Any	12.1	12.5	13.0	13.8	14.2	14.8	15.5	15.2	14.6	14.1	12.7
Cardiovascular	7.8	8.2	8.5	9.1	9.4	10.0	10.6	10.5	10.2	9.3	7.4
Arthritis	1.8	1.9	2.0	2.1	2.3	2.6	3.0	3.0	3.1	3.7	4.7
Asthma	2.3	2.3	2.4	2.5	2.5	2.4	2.5	2.3	2.2	2.1	1.9
COPD	1.3	1.4	1.5	1.7	1.6	1.5	1.4	1.2	1.0	0.8	0.5
Diabetes	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4
Cancer	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

70%
of those with Cardiovascular Disease had Hypertension

The CDC describes hypertension as a "silent killer" because it often has no warning signs or symptoms but can lead to deadly outcomes such as heart disease or stroke.

In 2016, 5% of AC Soldiers had hypertension.

DID YOU KNOW?

AIR POLLUTION IS A SIGNIFICANT RISK FACTOR FOR HEART HEALTH.

Two decades of scientific studies have concluded that outdoor air pollution—especially particle pollution—can trigger heart attacks, stroke, irregular heart rhythms, and reduce lifespan. Those most at risk from particle pollution are people with pre-existing cardiovascular disease, diabetes, or COPD. However, recent research has shown that smokers and people with high blood pressure, high cholesterol, or who are overweight are also at increased risk. Particles that can cause the most serious health effects are emitted from combustion sources such as motor vehicles, furnaces, generators, incinerators, burning vegetation or solid waste, and forest fires.

The U.S. Environmental Protection Agency (EPA) has partnered with the CDC and the American Heart Association to get the message out to physicians and the public about the serious health implications of both short- and long-term exposure to particle pollution. In September 2017, the EPA and CDC announced a new accredited course designed for healthcare professionals called *Particle Pollution and Your Patients' Health*. The course provides tools to help patients understand how particle pollution affects their health and how to effectively use the EPA Air Quality Index (AQI).

For more information, visit https://www.epa.gov/pmcourse

Soldiers can protect themselves by heeding recommendations of the EPA AQI and local environmental officials on days when outdoor air quality is poor. Regardless of outdoor air quality, people should always avoid working or exercising near sources that emit combustion exhaust.

HEALTH FACTORS

- *Obesity*
- *Tobacco Use*
- *Substance Use*
- *Sexually Transmitted Infections*

Obesity

Body Mass Index

The increasing prevalence of obesity in the U.S. poses a serious challenge to recruiting and maintaining healthy Soldiers. Soldiers who are obese may be at greater risk of death, hypertension, type 2 diabetes, stroke, and injuries, compared to those with a normal weight. Obesity can have a serious and immediate impact on health and readiness of the Force through reduced physical functioning and performance, quality of life, and mental and physical well-being.

Body Mass Index (BMI) is a ratio of weight to height. Obesity is defined as a BMI of at least 30 kg/m2 (weight in kilograms divided by height in meters squared), and those with a BMI between 25.0 and 29.9 are defined as overweight by the CDC.* BMI provides an estimate of relative body fat. At any given BMI, women typically have higher proportions of body fat than men, so the measure can only be used to compare women with women and men with men. Although there has been concern by some that BMI may misclassify individuals with higher muscle mass as "obese," a BMI above 30 is a reliable indicator of excess body fat. Alternative methods of measuring body fat include hydrostatic (underwater) weighing, air-displacement plethysmography (e.g., BodPod®, available at Army Wellness Centers), measuring skin folds, and taking circumference measurements, as in the Army Body Composition Program (ABCP). Calculating BMI offers an advantage over other measurements because of its ease of use and low cost in large populations. BMI is also a useful guideline for identifying patients who may be at risk for related adverse health outcomes. In addition, because BMI calculation is standardized across diverse populations, public health professionals and Army leaders can easily compare and track progress among and within large populations over time.

The prevalence of obesity in the Army was determined from the percentage of Soldiers with a recorded BMI of 30 or higher in their medical records. In 2016, 17.3% of Soldiers were classified as obese by BMI values, and 51.5% were overweight.* Obesity prevalence was 18.8% among men and 8.6% among women. Obesity rates increased as age increased.

*The CDC definition of overweight is based on the general U.S. population. As a result, a Soldier with a large muscle mass may have a BMI in the range 25–27.5 and not be "overweight" by CDC guidelines. Unlike CDC guidelines, Army standards for height and weight are adjusted for age and sex.

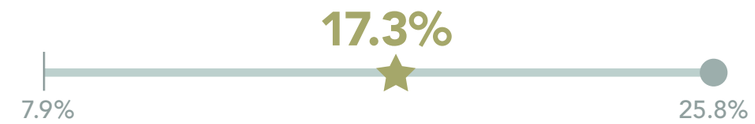
BEST RANKING INSTALLATIONS

U.S.

1. FORT HUACHUCA
2. FORT RUCKER
3. FORT POLK
4. JB MYER-HENDERSON HALL
5. PRESIDIO OF MONTEREY

OUTSIDE THE U.S.

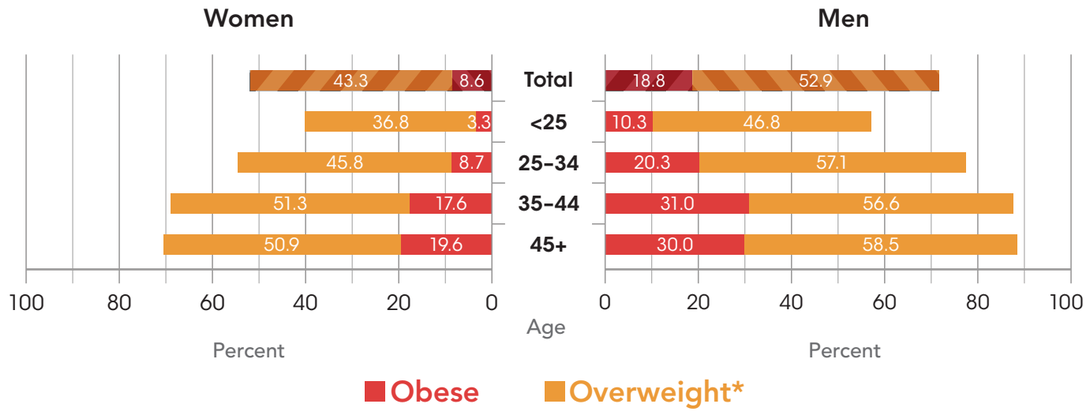
1. USAG YONGSAN
2. USAG RED CLOUD
3. USAG HUMPHREYS



Overall, 17.3% of Soldiers were classified as obese.

Prevalence ranged from 7.9% to 25.8% across U.S. installations.
Prevalence ranged from 12.7% to 20.5% across installations outside the U.S.

Percent Classified as Overweight* or Obese by BMI by Sex and Age, AC Soldiers, 2016

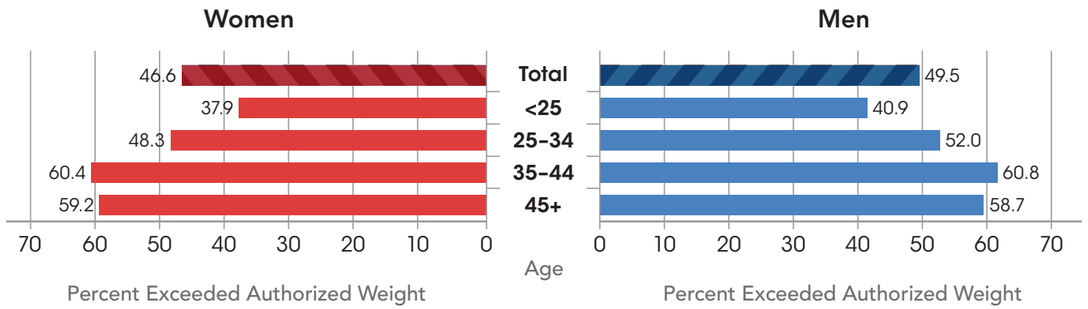


BMI of <18.5 kg/m² is indicative of underweight and was recorded in 0.2% of male Soldiers and 0.6% of female Soldiers.

The internationally accepted definitions of underweight, normal weight, overweight, and obese based on calculated BMI provide a means of assessing the overall body composition of Soldiers. However, the Army has established body composition standards to ensure force readiness. Individual Soldiers must meet prescribed sex- and age-specific body fat standards as defined in AR 600-9. Some Soldiers who would be classified as overweight by international BMI cutoff points are within the acceptable standards defined in the regulation. Soldiers who exceed the authorized weight for their height and age receive the "Tape Test," which employs prescribed circumference measurements to estimate body fat percentage.

In 2016, according to outpatient data, 49.5% of male Soldiers and 46.6% of female Soldiers exceeded the authorized weight for their height and age, indicating referral for a "Tape Test" (see graph). By regulation, the personnel records of Soldiers who fail the "Tape Test" are flagged, and those Soldiers are enrolled in the ABCP until they meet the body fat standards specified in AR 600-9. According to data provided by the Army G1, the records of approximately 10% of AC Soldiers who exceeded their weight-for-height standard were flagged at some point in CY16. These flags are an administrative marker of a health and fitness issue that ultimately impacts readiness.

Percent of AC Soldiers Who Exceeded the Authorized Weight for the Height and Age, by Sex and Age, 2016

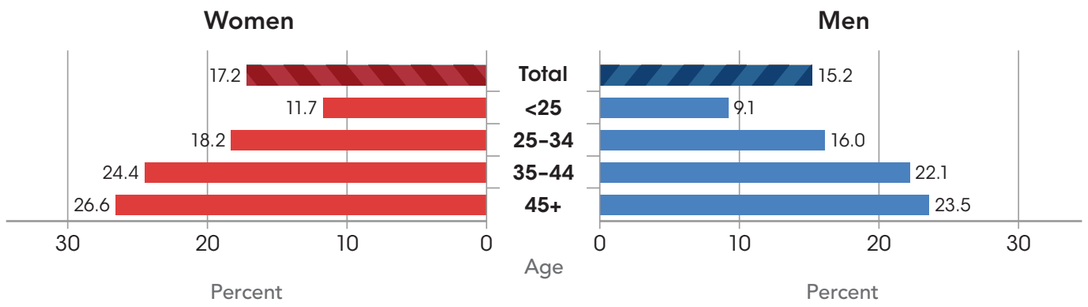


Clinical Overweight and Obesity

Overweight and obesity are also medical conditions that healthcare providers diagnose and treat. An examination of diagnoses made by healthcare providers in 2016 revealed that only 15.4% of AC Soldiers were clinically diagnosed as overweight or obese. In contrast, a total of 71% of AC Soldiers were identified as overweight or obese as determined by BMI. This discrepancy suggests that a substantial number of overweight or obese Soldiers are not being treated for these conditions. For Soldiers with comorbidities such as diabetes, high blood pressure, or hyperlipidemia, a clinical diagnosis of overweight or obesity would aid in linking them with the necessary additional care.

Women were more likely than men to be diagnosed as clinically overweight or obese across all age groups, a result which appears to be in conflict with BMI-based prevalence data. However, clinical diagnosis is determined from actual body fat measures, not BMI. At any given BMI, women carry roughly 10% more fat than men, which may explain why it appears that more men than women are classified as obese when BMI is used as the criterion measure and the reverse is true when percent body fat is the measure used. The prevalence of either diagnosis (overweight or obese) increases with age for men and women, a trend that mirrors the civilian population.

Percent Obese or Overweight by Sex and Age, AC Soldiers, 2016



HOW CAN WE FIGHT OBESITY IN OUR FORCES?

The Army's Performance Triad offers a variety of principles to help our Soldiers and Families maintain a healthy body and mind, to include—

Eating at least 8 servings of fruit and vegetables per day.

Participating in 150 minutes of moderate-intensity exercise, 75 minutes of vigorous-intensity exercise, 2 days of strength training, and 1 day of agility training per week.

Aiming to walk at least 10,000 steps per day.

The CDC also offers several tips to help all Americans maintain a healthy weight:

Try to eat whole grains, fruits, vegetables, and lean protein.

Drink water rather than sugary beverages.

For more information, visit the P3 Web site: https://p3.amedd.army.mil/

Tobacco Use

Tobacco use is the leading cause of preventable death in the U.S. and a serious health and readiness concern for the Army. In the short term, tobacco use has been associated with increased sick call visits and higher likelihood of injury. In the long term, tobacco use can lead to reduced lung capacity, reduced fine motor coordination, slower wound healing, greatly decreased stamina, and even cancer or death. The Army has implemented "tobacco-free living" initiatives to decrease the health risks associated with tobacco use and to support healthier lifestyles.

Smoking rates as determined from Soldier dental exams in 2016 revealed that 14.3% of AC Soldiers smoked, 9.1% used smokeless tobacco, and 3.0% used both, bringing the total tobacco usage to 26.4%. Tobacco use ranged from 7.3% to 35.8% across installations. Usage by men was almost triple that of women (29.2% compared to 10.1%), and men were much more likely than women to use smokeless tobacco. Rates of tobacco use were highest among Soldiers under 35 years of age.

Overall, 26.4% of Soldiers reported tobacco use.

Rates ranged from 7.3% to 35.8% across U.S. installations.

Rates ranged from 15.2% to 33.5% across installations outside the U.S.

BEST RANKING INSTALLATIONS

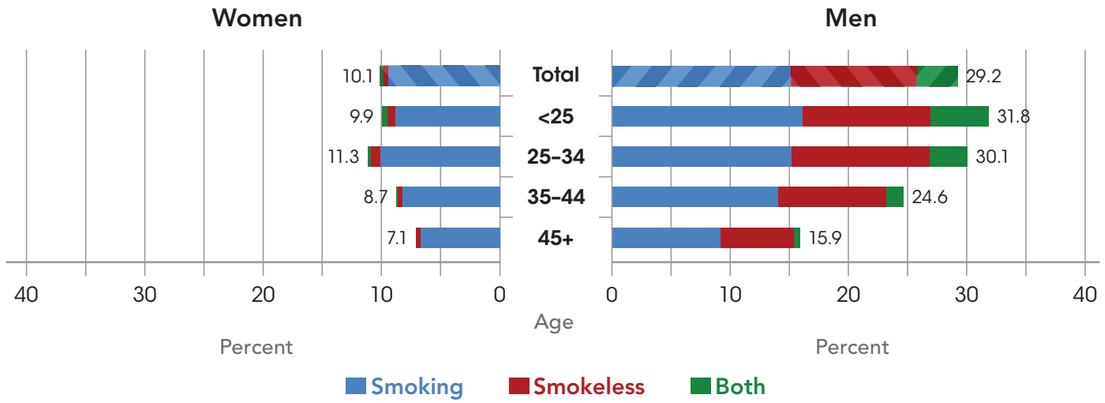
U.S.

1. USAG WEST POINT
2. JB SAN ANTONIO
3. FORT RUCKER
4. PRESIDIO OF MONTEREY
5. FORT MEADE

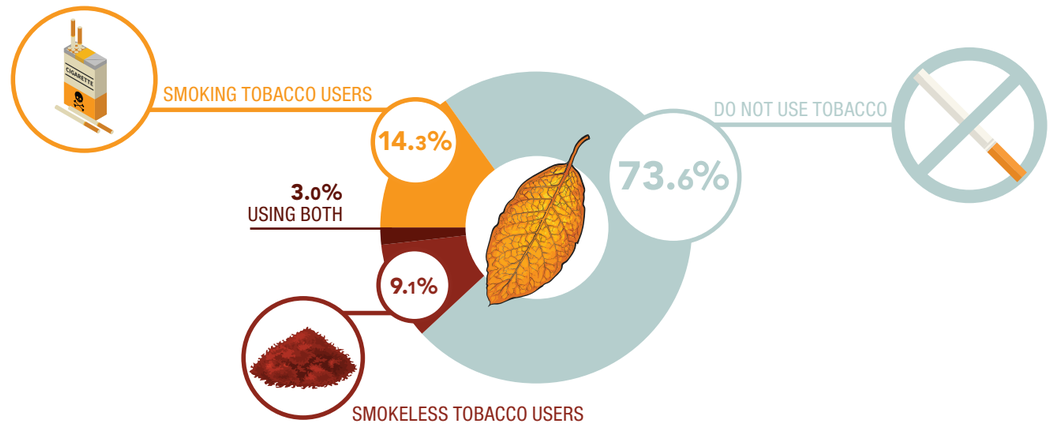
OUTSIDE THE U.S.

1. USAG YONGSAN
2. USAG STUTTGART
3. USAG RHEINLAND-PFALZ

Percent Reporting Tobacco Use by Sex and Age, AC Soldiers, 2016



Tobacco Use by Type, AC Soldiers, 2016



Percentages of all tobacco use are based on smoking and/or smokeless tobacco use; because some Soldiers use both, the individual percentages do not add to the total.

SPOTLIGHT

CREATING A TOBACCO-FREE ZONE

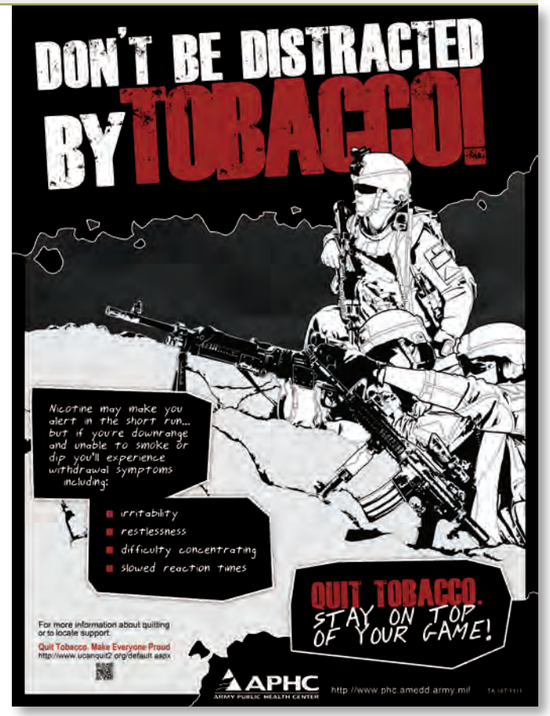
The DOD facilitates the health, welfare, and physical fitness of Military personnel, DA Civilians, and Families by educating the Total Force about the negative impact of tobacco use and the harmful effects of second-hand smoke. The DOD is committed to a comprehensive tobacco policy by preventing initiation of tobacco use, helping those who want to quit, and decreasing exposure to second-hand smoke. One of the ways that the DOD fulfills this commitment is through the designation of Tobacco-Free Zones on military installations.

Tobacco-Free Living Environment

The current Policy Memorandum 16-001, Department of Defense Tobacco Policy, directs that all DOD facilities restrict tobacco use to specifically designated outdoor areas which must be at least 50 feet from building entrances and air intake ducts. The policy establishes guidance on increasing tobacco-free zones and directs military Departments to improve education and strengthen resources for tobacco cessation. To protect all community members, the policy emphasizes creating tobacco-free zones where children live, learn, and play. The U.S. Army Installation Management Command Healthy Army Communities program will implement plans, including education and enforcement, to increase tobacco-free zones around areas frequented by children. Areas not specifically designated as "tobacco use areas" are to be considered "tobacco-free" on all installations where people congregate or organized activities take place. If the current distance is insufficient for protecting individuals from exposure to second-hand smoke, the responsible official is required to take appropriate action to successfully eliminate the exposure.

In compliance with AR 600-63, Army Health Promotion, commanders are authorized to use locally manufactured signs or DA signage to designate authorized smoking areas.

Improving education on the harmful effects of tobacco products will help to strengthen tobacco cessation programs. In addition to causing disease and premature death in children and adults who do not smoke, secondhand smoke is implicated in conditions such as Sudden Infant Death Syndrome, pneumonia, bronchitis, middle ear infections, and asthma. In teenagers, it can cause hearing loss or deafness, depending on exposure levels.[1] Nonsmokers exposed to secondhand smoke at home or at work increase their risk of developing heart disease by 25–30 percent and increase their risk of developing lung cancer by 20–30 percent.[2]



Education

Materials for leaders, health care providers, and community members are located in the Tobacco Free Living Toolkit on the U.S. Army Public Health Center Web site at http://phc.amedd.army.mil/topics/healthyliving/tfl/Pages/default.aspx.

Another DOD resource is UCANQUIT2 (https://www.ucanquit2.org), which personalizes quit plans for TRICARE beneficiaries, includes access to a 24/7 chat with cessation coaches, and allows participants to sign up for #SmokefreeMIL, a text message program to help those who want to quit tobacco. Federal employees are eligible for free tobacco cessation treatment under the Federal Employees Health Benefits (FEHB) plans. For TRICARE beneficiaries, tobacco cessation education and pharmaceutical therapies are available for free in accordance with the 2014 expanded TRICARE Tobacco Cessation Program provision through military medical treatment facilities: www.tricare.mil/tobaccocessation.

References:
1. American Academy of Otolaryngology. *Secondhand Smoke and Children* [Internet], http://www.entnet.org/content/secondhand-smoke-and-children.
2. CDC and Prevention. *Secondhand Smoke* (SHS) Facts [Internet], https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/index.htm

Substance Use

The misuse and abuse of alcohol, prescription medication, and other drugs has recently drawn increased attention nationwide. In August 2016, the President of the United States declared the opioid crisis a national emergency. Yet, data suggest that the DOD's extensive efforts in prevention, education, and treatment are countering opioid misuse in Service members. Although Service members are prescribed opioid medications at a higher rate than the general population, prescription drug misuse in the military is low and declining. The number of Service members diagnosed with opioid use disorder decreased by 38 percent between 2012 and 2016 (Military Health System (MHS) Data Repository); likewise, opiate-positive drug tests among Service members declined over 60 percent between fiscal year (FY) 2013 and FY16.

Substance use also plays a prominent role in suicide, with about one third of AC Soldier suicides linked to alcohol or drug use. Alcohol is the most misused substance and has the potential to negatively impact short- and long-term health, productivity, and overall readiness. In 2016, 5.0% of AC Soldiers had one or more diagnoses SUD. Across installations, the prevalence of a SUD diagnosis among Soldiers ranged from 1.8% to 8.3%. SUD diagnoses were higher among male Soldiers (5.3%) than female Soldiers (3.5%). SUD diagnoses were highest among male Soldiers under age 25 (6.0%). Among both males and females, the proportion affected decreased with older age. As in the civilian population, it is likely that the Soldiers diagnosed with SUD represent only a fraction of the true number of Soldiers affected by substance use problems.

Overall, 5.0% of Soldiers had a substance use disorder.

Prevalence ranged from 1.8% to 8.3% across U.S. installations.
Prevalence ranged from 3.5% to 8.0% across installations outside the U.S.

BEST RANKING INSTALLATIONS

U.S.

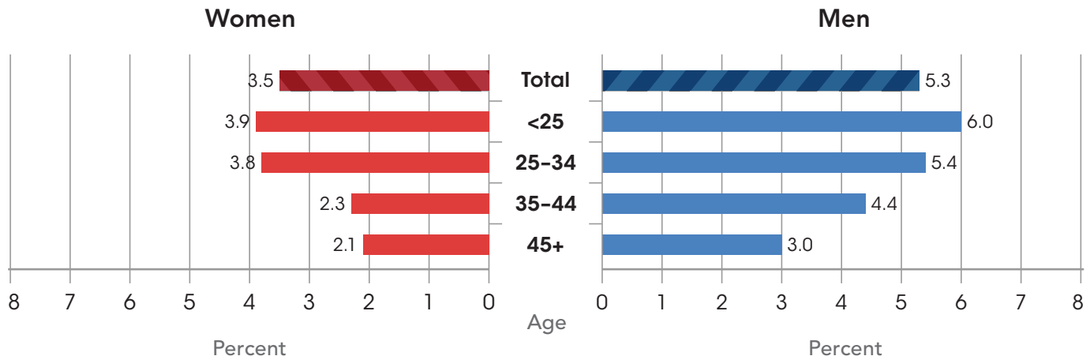
1. FORT RUCKER*
1. USAG WEST POINT*
3. FORT JACKSON
4. JB SAN ANTONIO
5. FORT HUACHUCA*
5. PRESIDIO OF MONTEREY*

OUTSIDE THE U.S.

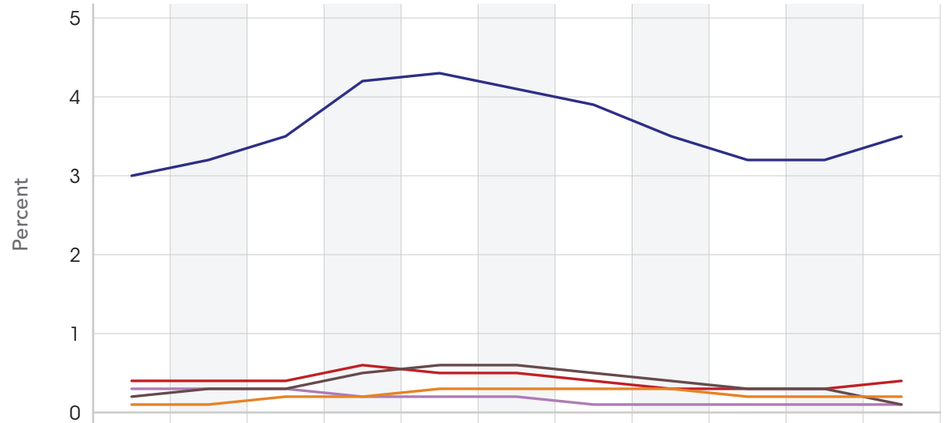
1. USAG YONGSAN
2. JAPAN
3. USAG HUMPHREYS

* Tied rankings for 1st and 5th place

Percent with a Substance Use Disorder by Sex and Age, AC Soldiers, 2016



Percent with a Substance Use Disorder by Type of Substance, AC Soldiers, 2016



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Alcohol	**3.0**	**3.2**	**3.5**	**4.2**	**4.3**	**4.1**	**3.9**	**3.5**	**3.2**	**3.2**	**3.5**
Opioid	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
Cannabis	**0.4**	**0.4**	**0.4**	**0.6**	**0.5**	**0.5**	**0.4**	**0.3**	**0.3**	**0.3**	**0.4**
Cocaine	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Inhalants	**0.2**	**0.3**	**0.3**	**0.5**	**0.6**	**0.6**	**0.5**	**0.4**	**0.3**	**0.3**	**0.1**

Substances infrequently identified in the diagnoses are not displayed here.

SPOTLIGHT

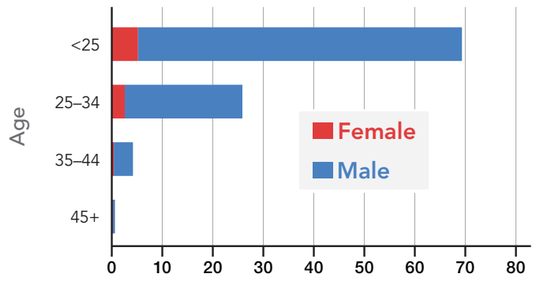
ARMY SUBSTANCE ABUSE PROGRAM (ASAP)

Drug and alcohol abuse is inconsistent with Army values and decreases the readiness of the force. The Army Substance Abuse Program is a command program composed of integrated functions which include deterrence, drug testing, prevention, and training that emphasizes readiness and personal responsibility.

The Army's drug testing policy depends on an aggressive and thorough urinalysis program. Commanders across the Army institute a random testing program to deter Soldiers from using drugs, facilitate the early identification of drug abuse, and assess the security, military fitness, good order, and discipline of their units. Additionally, the drug testing program monitors the rehabilitation of those enrolled in alcohol and/or drug abuse programs and the prevalence of drug abuse across the Army. All positive urinalysis specimens that could be the result of a medical prescription undergo complete medical review by a trained officer within 15 working days of laboratory certification. Soldiers with positive tests due to illicit use are referred to Behavioral Health for SUD evaluation, as are Soldiers with any substance use related incident.

Overall, 0.8% of AC Soldiers tested positive for one or more illicit drugs in 2016. Illicit-positive Soldiers were predominantly males (91.7%). Males under age 25 (64.2%), followed by males 25–34 years (23.3%) made up the bulk of this population. Cannabis was the most common substance found on urinalysis testing in 2016, accounting for 56.9% of positive results, followed by amphetamines (15%), cocaine (13.3%), and opioids (10.3%). Illicit positives due to cannabis have steadily increased since 2012, while positives due to opioids have decreased across the Army since 2013.

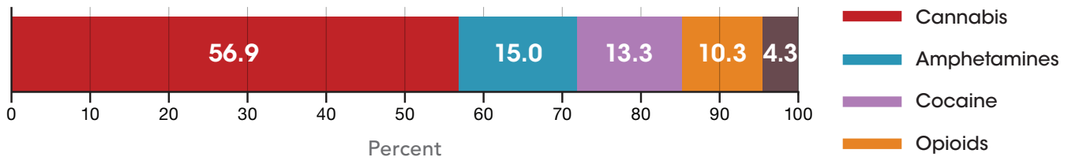
Demographics for Illicit-Positive AC Soldiers, 2016



During the period of 2012–2016, on average 18,553 Soldiers were referred for SUD screening each year, and 68.9% were enrolled in the program. The majority of enrollments were due to alcohol (77.7%), followed by cannabis (10.2%) and opioids (4.8%).

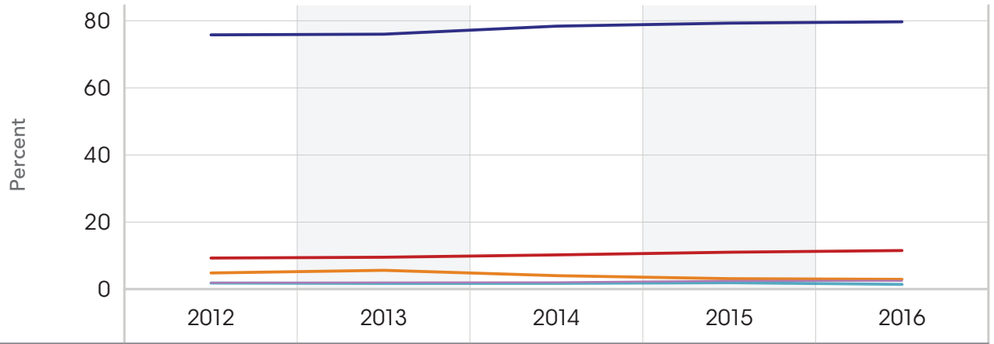
Reference:
AR 600-85. The Army Substance Abuse Program. 28 November 2016
Data Source: Army Resiliency Directorate

Proportion Illicit-Positive by Drug Type, AC Soldiers, 2016*



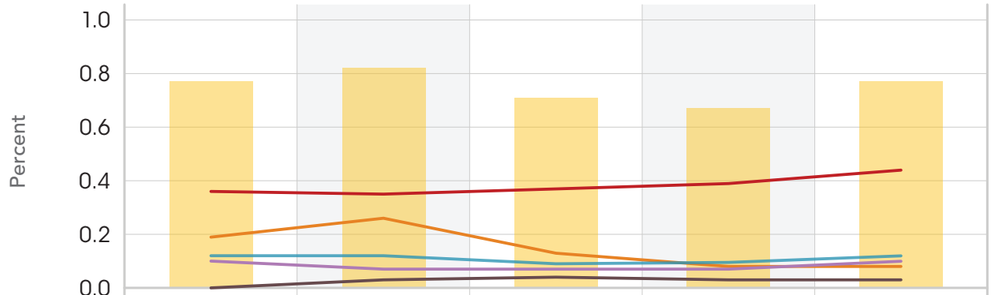
*Data Source: ASAP; represents proportion of specimens testing positive by drug type, excluding steroids which account for 0.2%

Percent of Treatment Enrollments by Substance, AC Soldiers, 2012–2016



	2012	2013	2014	2015	2016
Number Enrolled	16,599	13,689	11,847	10,911	10,778
Alcohol	75.9	76.1	78.5	79.4	79.8
Cannabis	9.3	9.5	10.2	11.0	11.5
Opioids	4.8	5.6	4.0	3.1	2.9
Cocaine	1.9	2.0	2.0	2.2	2.2
Amphetamines	1.8	1.7	1.6	1.9	1.4

Percent of Positive Drug Tests by Substance and Year, AC Soldiers, 2012–2016*



	2012	2013	2014	2015	2016
Any Positive	0.77	0.82	0.71	0.67	0.77
Cannabis	0.36	0.35	0.37	0.39	0.44
Cocaine	0.10	0.07	0.07	0.07	0.10
Amphetamines	0.12	0.12	0.09	0.10	0.12
Opioids	0.19	0.26	0.13	0.08	0.08
Benzodiazepines	0.00	0.03	0.04	0.03	0.03
Specimens Tested	1,496,186	1,413,952	1,356,598	1,208,303	1,007,656

*Data Source: ASAP; Multiple drug positives per test possible

SPOTLIGHT

TRANSFORMING SUBSTANCE ABUSE TREATMENT WITHIN THE ARMY

To address the growing importance of prevention and treatment of substance use disorders, the Secretary of the Army initiated a transformation of the Army Substance Abuse Program to support Army beneficiaries' health and readiness more effectively. Effective 1 October 2016, MEDCOM began integrating Substance Use Disorder Clinical Care (SUDCC) treatment into the Behavioral Health System of Care and is working to improve outcomes for Soldiers and Family members with substance use disorders through earlier detection and intervention.

The transformation includes placing behavioral health providers with addiction training into the unit footprint with other embedded behavioral health providers. This change in proximity reduces missed duty time, streamlines appointments, and improves communication between medical providers and commanders.

A well-known association also exists between alcohol abuse and behavioral health conditions, such as PTSD, which are often related to combat deployments. The Army is committed to getting ahead of this issue by transforming how the Army delivers care to Soldiers with substance use disorders.

How is the DOD Fighting Drug Abuse?

The DOD offers education to Service members about the risks of prescription medication and offers treatment options for Service members suffering from addiction. Ongoing efforts and successes include the following:

- Installation ASAP personnel provide evidence-based prevention education and execute awareness training regarding the laws, regulations, misuse and abuse of substances, and how to refer someone for treatment.
- Service members and other beneficiaries assigned to Army Medical Homes or Army Warrior Transition Units receive personalized care plans and information from pharmacists on mitigating prescription medication risks.
- Behavioral health and addiction providers develop individual treatment plans and utilize evidence-based therapy for those with substance use disorders. Upon receiving an evaluation, beneficiaries will receive treatment in an outpatient setting, in an addiction medicine intensive outpatient program, or at a residential treatment facility.

Source: Office of the Secretary of Defense. 2016. D-4-DE23415, *Report to Congress on Prescription Drug Abuse*

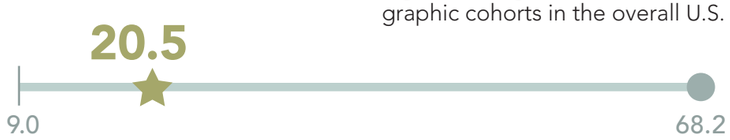
"Army Medicine has been looking closely at developing a strategy for pain management for over a decade; we recognize that there are complex clinical and social consequences with chronic pain, and we are deeply concerned about the reduced quality of life for those that abuse opioids and the consequences for their families, friends and communities."

–Lieutenant General Nadja Y. West
Surgeon General of the U.S. Army and Commanding General, U.S. Army Medical Command, October 2017

Sexually Transmitted Infections

Chlamydia is the most commonly reported STI both in the U.S. and the Army. Civilian and military public health agencies use chlamydia diagnoses as an indicator to monitor the overall burden of STIs. Infection rates provide a measure of risk behavior and help to identify vulnerable populations that can benefit from targeted prevention and treatment. Chlamydia can also have an impact on medical readiness and Soldier well-being. Most people infected with chlamydia are unaware because they have no symptoms. If the infection is left untreated, severe health complications may occur, particularly among women, who may experience pelvic inflammatory disease, ectopic pregnancy, and infertility. The CDC and U.S. Preventive Services Task Force (USPSTF) recommend that pregnant women, sexually active women under 25 years old, and women or men with risk factors be screened annually for chlamydia. Chlamydia incidence is accepted as a reliable indicator of STI incidence as a whole.

In 2016, 20.5 new chlamydia infections per 1,000 person-years were reported. Rates ranged from 9.0 to 68.2 infections per 1,000 person-years across installations. Rates among women were more than 3 times those among men. Women under 25 years of age were particularly affected, with 103.8 infections per 1,000 person-years reported. The elevated rate observed in this demographic may be partially due to increased screening among this group. In 2016, 83.9% of female AC Soldiers under age 25 were screened for chlamydia (range across installations: 69.8 to 95.9%) Chlamydia incidence and screening compliance rates have been documented as higher among Soldiers than among similar demographic cohorts in the overall U.S. population.



Overall, 20.5 new chlamydia infections were reported per 1,000 person-years.

Rates ranged from 9.0 to 35.4 infections per 1,000 person-years across U.S. installations.

Rates ranged from 9.0 to 68.2 infections per 1,000 person-years across installations outside the U.S.

BEST RANKING INSTALLATIONS

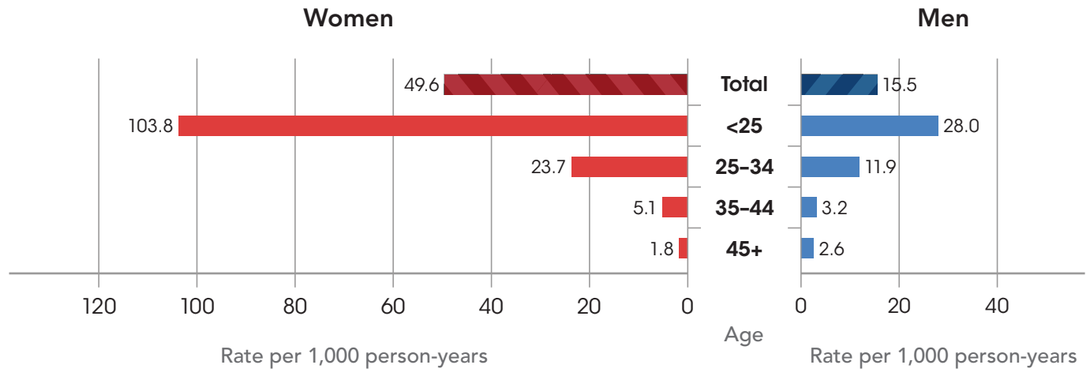
U.S.

1. FORT LEE
2. FORT LEONARD WOOD
3. FORT WAINWRIGHT
4. FORT MEADE
5. FORT GORDON

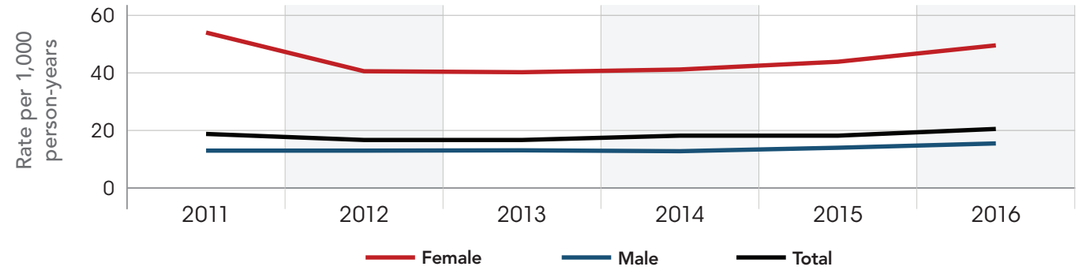
OUTSIDE THE U.S.

1. USAG VICENZA
2. USAG WIESBADEN
3. USAG STUTTGART

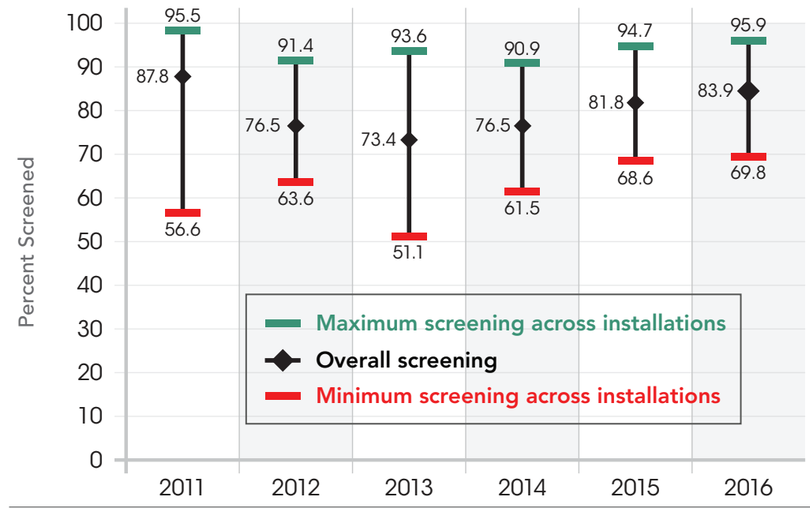
Rate of Chlamydia Infection Reported by Sex and Age, AC Soldiers, 2016



Rate of Chlamydia Infection Reported, AC Soldiers, 2011–2016



Percent of AC Female Soldiers under 25 Years Old Screened for Chlamydia, 2011–2016



Since 2013, testing rates have substantially increased among the key population of women under 25 years old. Testing young women for chlamydia allows for prompt treatment with antibiotics, preventing more costly complications of chronic infection such as pelvic inflammatory disease. Continued efforts are needed to further close the gap and bring all installations into compliance with high screening standards.

HEALTHCARE DELIVERY

- *HEDIS Performance Measures*

HEDIS

The Healthcare Effectiveness Data and Information Set (HEDIS®) is one of the most widely utilized performance measurement tools throughout the United States. Administered by the National Committee for Quality Assurance (NCQA), HEDIS is used by more than 90 percent of U.S. health plans to measure performance on certain dimensions of healthcare delivery. This standardized set of measures allows for true "apples to apples" comparisons of healthcare performance metrics within and across healthcare systems. These metrics allow the MHS to identify successes and target areas for improvement. To allow comparisons across healthcare systems, the NCQA publishes annual benchmarks. HEDIS criteria are used to benchmark treatment facilities using a common methodology; however, these measures should not be confused with Clinical Practice Guidelines, quality indicators, or standard of care. As displayed in the Military Health System Population Health Portal (MHSPHP), scores that fall below the national 50th percentile are designated as needing improvement, those that fall between the 50th and 75th percentiles are fair, those between the 75th and 90th percentile are good, and scores that are above the 90th percentile are excellent.

Of the 81 HEDIS measures published by NCQA, the MHS collects data on all or part of 18 measures for the direct and purchased care systems. These 18 measures, to include methodology documents, are displayed and tracked in the MHSPHP. The measures listed here are considered relevant to the Army and support readiness, which is the number one priority of the Chief of Staff of the Army and the Army Surgeon General.

Diabetes A1C Screening

The Diabetes A1C Screening score indicates the percent of patients enrolled in TRICARE Prime with Type 1 or Type 2 diabetes, age 18–75 years, with at least one A1C test during the past 12 months. Hemoglobin A1C screening indicates how well the percentage of glucose in the body has been controlled over the preceding months. In 2016, the score for Army beneficiaries was just above the nationwide average.

Diabetes A1C Screening Score: Fair

Diabetes A1C <8 Good Control

The Diabetes A1C <8 Good Control score shows the percentage of patients enrolled in TRICARE Prime with Type 1 or Type 2 diabetes, age 18–75 years, whose most recent A1C value was <8.0. The Army is performing very well on this metric.

Diabetes A1C <8 Good Control Score: Good

Low Back Pain Imaging

The Low Back Pain imaging score is defined as the percentage of adults 18 to 50 years of age with a primary diagnosis of low back pain who did not have an imaging study (plain x-ray, MRI or CT scan) within 28 days of the diagnosis. For this measure, a higher score indicates better performance and appropriate treatment. Avoiding unnecessary imaging can help prevent unwarranted interventions and reduce healthcare costs. In 2016, the score for Army beneficiaries was below the nationwide average on this metric.

Lower Back Pain Imaging Score: Needs improvement

Breast Cancer Screening

The Breast Cancer Screening score indicates the percentage of women continuously enrolled in TRICARE Prime, age 52–74 years, who had a mammogram in the previous 27 months. Guideline organizations disagree over the age at which to begin routine breast cancer screening. The USPSTF recommends that routine breast cancer screenings begin at age 50, while the American Cancer Society and American College of Gynecology recommend that annual screenings begin starting at age 40. It is recommended that women age 40–50 discuss screening options with a trusted health care provider to decide the best option based on individual patient needs and conditions. In 2016, the score for Army beneficiaries was below the nationwide average.

Breast Cancer Screening Score: Fair

Cervical Cancer Screening

The Cervical Cancer Screening score indicates the percentage of women continuously enrolled in TRICARE Prime, age 24–64 years, who had either:

- A cervical cancer screening in the past 3 years, or...
- A cervical cancer screening and human papillomavirus (HPV) co-testing in the past 5 years, where the woman was age 30 or older at the time of the co-test.

Cervical cancer screening provides for early detection and treatment for better health outcomes. In 2016, the score for Army beneficiaries was above average compared to other health systems across the country.

Cervical Cancer Screening Score: Good

Colorectal Cancer Screening

The Colorectal Cancer Screening score is defined as the percentage of adults enrolled in TRICARE Prime, age 51–75 years, who had appropriate colorectal cancer screening. Acceptable screenings and time intervals vary according to the methods of testing. Colorectal cancer screening provides for early detection and prevention of colon cancer. In 2016, the score for Army beneficiaries was outstanding and should be maintained.

Colorectal Cancer Screening Score: Excellent

Mental Health Follow-Up 7 Days

The Mental Health Follow-Up 7 Days score is defined as the percentage of discharges for members 6 years of age and older who were hospitalized for treatment of selected mental illness diagnoses and who had an outpatient visit, an intensive outpatient encounter, or partial hospitalization with a mental health practitioner within 7 days of discharge. This measure is based on discharges; outpatient follow-up after discharge provides an opportunity to assess the patient's transition back to home or work and ensure gains made during hospitalization are not lost. In 2016, the score for Army beneficiaries was outstanding and should be maintained.

Mental Health Follow-Up 7 Days Score: Excellent

All methodology information was retrieved from the Military Health System Population Health Portal.

PERFORMANCE TRIAD

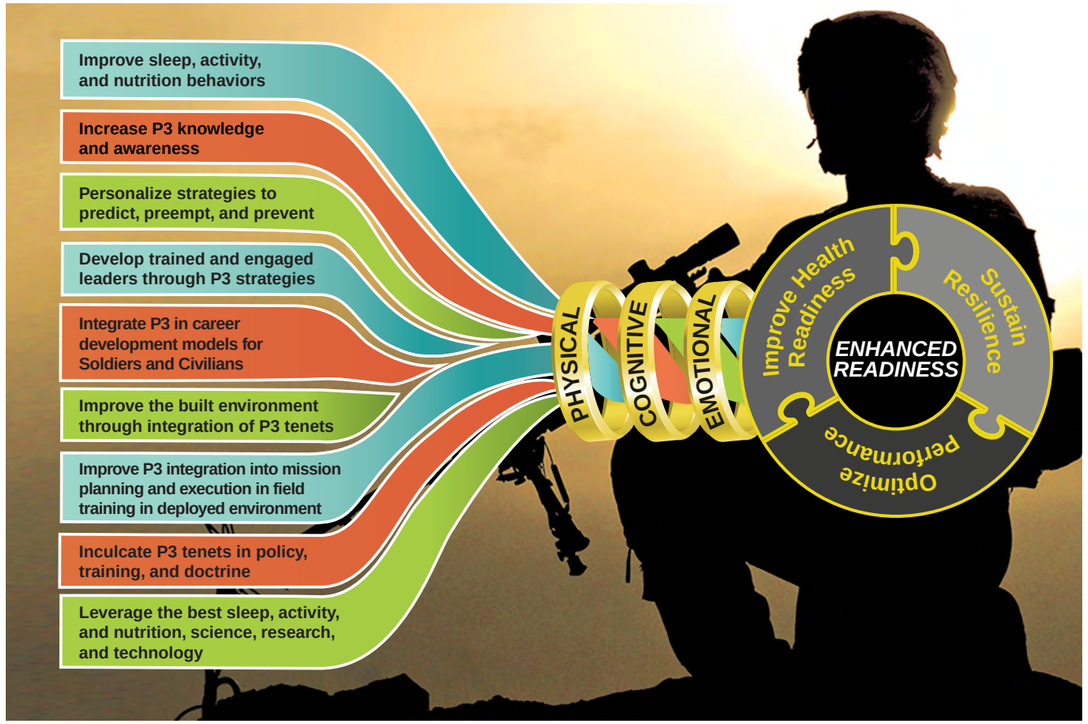
- *Sleep/Activity/Nutrition*

Performance Triad

Poor sleep, inadequate or improper activity, and poor nutrition, alone or in combination, can dramatically impact the force. One of the best ways to ensure the sustainment of an agile and adaptive Army, ready to protect national interests and win our Nation's wars, is to invest in the health and wellness of our Soldiers. The P3 concept is the Army's investment to sustain personal health readiness, enhance resilience, and optimize performance of the Total Army (Soldiers, DA Civilians, Soldiers for Life, and Families). As a readiness concept, P3 leverages the best sports science in sleep, activity, and nutrition (SAN) to address not only the health requirements, but also the physical, psychological, social, spiritual, and family fitness necessary to sustain a dominant land force.

A major tenet of the Army P3 concept is that the foundation of combat readiness is personnel health readiness, and that begins with Soldiers. Total Army health and readiness are interdependent.The aim of the Army P3 concept is to strengthen the health readiness of the Total Army through four overarching LOEs, illustrated below: personal health readiness and accountability; agile and adaptive leaders who champion personal health readiness; environments that enable readiness; and tactical environments to optimize performance.

Achieving these LOEs requires leader engagement and commitment, as well as strong partnerships across commands, programs, and concepts to optimize readiness and human performance. The ways to achieve the LOEs are detailed within nine supporting objectives. Collectively, these optimize personal physical, psychological, social, spiritual, and family fitness and create an Army with improved health readiness, sustained resilience, and optimal performance. The desired P3 end state is Army-wide adoption and incorporation of P3 tenets in all entities supporting the Total Army within all domains of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P). To better incorporate P3 into the DOTMLPF-P domains, the Army has developed nine strategic approaches, several of which are described on the following page.



Nine Ways Performance Triad Enhances Readiness

Leverage Senior Army Leaders: Senior Leaders are at the core of sustainment by helping to promote P3 tenets (i.e., adequate sleep, appropriate activity, and nutrition). Leadership engagement continues to be the most important component of P3. Leader investment is crucial to promoting, training, prioritizing, and improving the health readiness of Soldiers and units. Leaders serve as change agents of the built environment. They can drive and accelerate culture change and provide resources to facilitate personal readiness.

Infuse P3 tenets into Professional Military Education functional areas and education curriculum: Institutionalize P3 tenets into all Army policies, training, and doctrine, where Soldiers are viewed as "tactical athletes" in garrison training, pre-deployment activities, and field and deployment environments. Such integration will help optimize performance while ensuring sleep, activity, and nutrition serve as the foundation for guiding Warfighter Management. Starting with Soldier basic training and continuing through Senior Leader courses, discussions surrounding the tenets of P3 will promote a cultural shift, a life-sustaining change that allows the forum to not just "talk the talk" but truly "walk the walk."

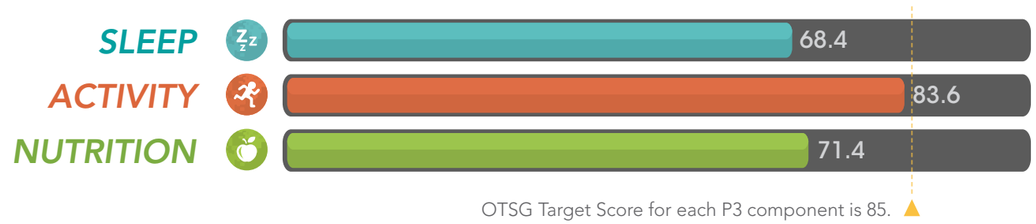
Execute a comprehensive P3 strategic communication campaign: The P3 concept includes an equal effort that focuses on Soldiers, DA Civilians, Soldiers for Life, and Family members. The goal is to leverage multiple platforms and venues to increase knowledge and awareness of P3 messaging, programs, tools, and resources to change behavior and establish a Total Army culture that adopts P3 tenets.

Inculcate P3 tenets and messaging into doctrine, policy, training, curriculum, and core Army programs: By institutionalizing P3 tenets into all Army policies, training, and doctrine, we can reach a larger segment of the population and increase the potential for greater effectiveness. The P3 concept is nested within the *Army Strategic Planning Guidance*, the *Army Operating Concept*, the *Army Human Dimension Strategy*, and the Army's *Ready and Resilient* strategy and efforts. The Army continues to develop and sustain strategic partnerships with internal and external agencies that have shared existing concepts to synchronize SAN efforts related to existing infrastructure (e.g., the Installation Management Command's *Healthy Army Communities*) and programming (e.g., *Go for Green*).

Investing in P3 creates the decisive edge and builds trusted teams of professionals that have the cognitive, physical, and social capability to thrive. Collectively, healthy sleep, activity, and nutrition behaviors help optimize performance and affirm physical supremacy, cognitive dominance, and emotional resilience of the Total Army.

Sleep, activity, and nutrition scores are based on survey responses from the Global Assessment Tool (GAT) assessing sleep duration, sleep satisfaction, being bothered by poor sleep, exercise frequency, exercise intensity, resistance training frequency, BMI, healthy eating, breakfast habits, frequency of recovery snacks, and water consumption. The OTSG Target Score for each P3 component is 85, with a maximum score of 100. The overall sleep score in 2016 for all Soldiers was 68.4; the overall activity score was 83.6; and the overall nutrition score was 71.4. No significant differences were observed across age groups.

Average P3 Scores, AC Soldiers, 2016



SPOTLIGHT

EVALUATION OF FY15–16 PERFORMANCE TRIAD PILOT IMPLEMENTATION ACROSS 5 ARMY BRIGADES

The Performance Triad was designed as a public health concept to improve Soldiers' readiness and resilience via emphasis on the tenets of SAN. The concept was implemented as a pilot within five FORSCOM brigades over a 6-month pilot period. Two brigades received P3 education only, two brigades received education and fitness trackers, and one brigade did not receive either the education or the fitness tracker and served as a comparison group. Part of the P3 education and messaging campaign included information on meeting nine evidence-based SAN targets: weekday sleep, weekend sleep, caffeine use, aerobic exercise, resistance training, agility training, vigorous exercise, fruit and vegetable intake, and refueling after exercise.

Evaluation Activities

Survey data from 4,418 Soldiers were matched over three data collection periods and assessed the impact of P3 information and activities on SAN knowledge, attitudes, and behaviors. Additional data sources included Army Physical Fitness Test results and focus groups with 479 Soldiers participating in P3. The evaluation focused on four primary domains: Soldier health and readiness, leadership support, SAN environment, and mission planning and field work.

15 minutes

Soldiers in P3 brigades demonstrated an additional 15 minutes of weekday sleep.

1.5 servings

Soldiers in P3 brigades demonstrated an increase of 1.5 servings of fruits and vegetables consumed daily.

7 in 10

At baseline, each activity target was achieved by over 70% of Soldiers. This means that, in general, Soldiers are getting the recommended aerobic exercise, resistance training, agility training, and vigorous exercise.

Findings

When compared to the brigade of Soldiers who did not participate, Soldiers in brigades participating in P3 experienced significantly greater changes in 6 of 22 health-related outcomes over the course of the pilot. The self-reported outcomes for which Soldiers in P3 brigades demonstrated positive effects included, on average—

- A 7%–9% increase in P3-related knowledge
- An increase of 1.5 daily servings of fruits and vegetables
- An additional 15 minutes of weekday sleep
- Increased frequency of refueling after exercise
- Higher engagement in SAN-related goal setting
- Engagement in SAN-related self-monitoring (only among Soldiers who received fitness trackers)

An analysis of whether Soldiers in P3 groups met evidence-based SAN health targets revealed that over 70% of Soldiers were able to meet activity targets, but sleep and nutrition targets were attained less frequently. With the exception of weekend sleep, which over 50% of Soldiers reported attaining, fewer than 30% of Soldiers in the P3 groups met sleep and nutrition targets. Soldiers expressed how their leadership was working to improve their sleep by rearranging physical training (PT) schedules.

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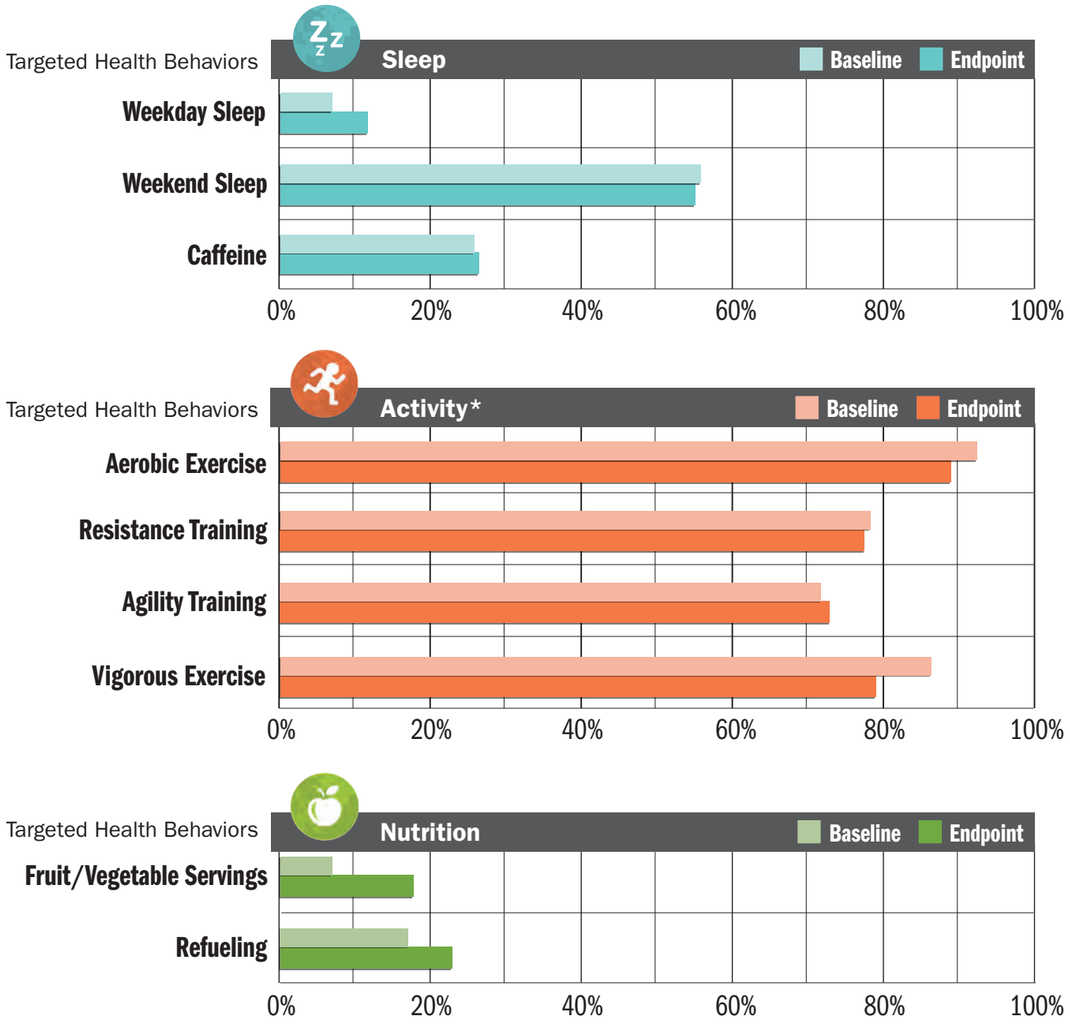
Percent of Soldiers in the P3 Training Group who Attained Targets at Baseline and Endpoint



*Though the percentage of P3 Training Group Soldiers meeting activity targets decreased over time, similar declines were observed in the P3 Comparison Group. This suggests larger Army trends (e.g., seasonal changes).

> "My leadership really bit into it, they really wanted to initiate sleep stuff. They actually changed our PT schedule to the afternoon so that we could sleep in and report at 0830 in the morning, and then PT in the afternoon at 1600. Still got out at 1700'ish and we were able to still do family stuff and then get a good seven to eight hours of sleep."
>
> —P3 Participant, Data Source: Focus Groups

At the end of the pilot, Soldiers in the P3 groups rated their leader support higher than Soldiers in the brigade serving as a comparison. Additionally, around half of Soldiers in the P3 groups reported that leader abilities to coach, teach, and mentor SAN were either somewhat or much better than at the beginning of the pilot. In focus groups, Soldiers indicated that leadership support is an integral component to the success of P3.

Unit and installation environments directly influence health readiness and are known to influence individual behavior. Soldiers' perceptions of the SAN environment on the installation did not show positive change over time in any of the groups. However, these ratings are helpful to identify those areas in which Soldiers perceive their environments to be most and least supportive of positive SAN behaviors. For example, Soldiers in P3 groups indicated their environments as generally supportive of activity behaviors, but Soldiers showed less agreement to statements relating to the installation environment surrounding sleep and the ability to obtain healthy food.

The subset of Soldiers who reported integrating P3 concepts in the field were asked to select the activities in which they engaged from a list. More than half of this subset of Soldiers reported that their unit developed a sleep rotation plan, discussed SAN while in the field, and monitored Soldiers' hydration status.

Conclusion and Way Ahead

The FY15–16 P3 pilot implementation and evaluation has provided valuable information on the way ahead for the P3 concept. Incremental changes, similar to those observed in fruit and vegetable consumption and weekday sleep, paired with leadership support and environmental changes can result in positive effects on health, fitness, and performance when sustained over time. The future of the P3 concept emphasizes lines of effort to include leveraging Senior Army Leaders to promote P3 tenets; synthesizing P3 tenets and messaging into doctrine, policy, training, curriculum, and core Army programs; and executing a comprehensive P3 strategic communication campaign to reach the Total Army Family.

> "Not everybody's going to buy in right at first, but the more you put it out there, the more they're going to buy in and this is with anything, if the leadership doesn't buy in, the juniors, lowest Soldiers, are not going to buy in."
>
> —P3 Participant, Data Source: Focus Groups

OVERVIEW

Soldier Health and the Environment

The condition of the environment plays an integral role in Soldiers' ability to work, train, and deploy. Is it cold or hot or rainy? Are air contaminants present that might compromise visibility or one's ability to breathe? Is there clean drinking water to sustain the troops? Are vectors present that might transmit disease? The answers to these questions will influence the health readiness of the fighting force and, ultimately, the success of the mission.

Sometimes the environment is contaminated with toxic substances. At other times, the natural setting harbors risks. In either case, awareness of the risks posed by the environment is critical to maintaining the health of the Army community. Environmental health scientists monitor the air we breathe, the water we drink, the disposal of waste, and the prevalence of disease-carrying insects. They monitor the condition of the environment to manage our risk of contracting acute or chronic illness as a result of our necessary interactions with the world around us.

This year, the *Health of the Force* introduces five Environmental Health Indicators (EHIs) and several brief narratives on environmental issues that can affect Army health and readiness. EHIs, as defined by the CDC, serve as surveillance tools to monitor environmental hazards, exposures, health effects, or interventions to mitigate an environmental exposure. For example, to mitigate contamination of water resources or air quality, a solid waste indicator measures the intervention of minimizing the amount of waste consigned to a landfill or incinerator. EHIs raise awareness of potential situations in which the environment, and how we manage our interactions with it, can impact human health. Knowing the condition of the environment helps us avoid unnecessary risks and supports our ability to perform at the highest level.

The EHIs presented in this chapter reflect environmental conditions for U.S. installations included in the Installation Profile Summaries. Data was not available for installations outside the U.S.

Installations where our Soldiers and Families serve enable everything else that comes from a strong Army—a ready Army.

— Gen. Daniel B. Allyn,
Vice Chief of Staff of the Army

THE AIR WE BREATHE

Although air quality in the U.S. has improved dramatically since the first Federal air quality standards were published in 1971, scientific research shows that current levels of air pollution continue to exact a toll on our health and life expectancy. Exposure to ground-level ozone can harm the respiratory system and aggravate asthma and other lung diseases. Exposure to fine particulate matter ($PM_{2.5}$) is linked to asthma attacks and has been causally related to heart attack, stroke, and premature death. The health implications of air pollution led the U.S. Surgeon General to designate outdoor air quality as a Leading Health Indicator in the nation's health blueprint, *Healthy People 2020*.[1]

Annual Mortality for Selected Exposures in the U.S.

Drunk Driving	Secondhand Smoke	Drug Overdose	Ozone and $PM_{2.5}$ Air Pollution
10,265 deaths (2015)	41,284 deaths (2014)	52,404 deaths (2015)	100,100 deaths (2015)

Risks in Context

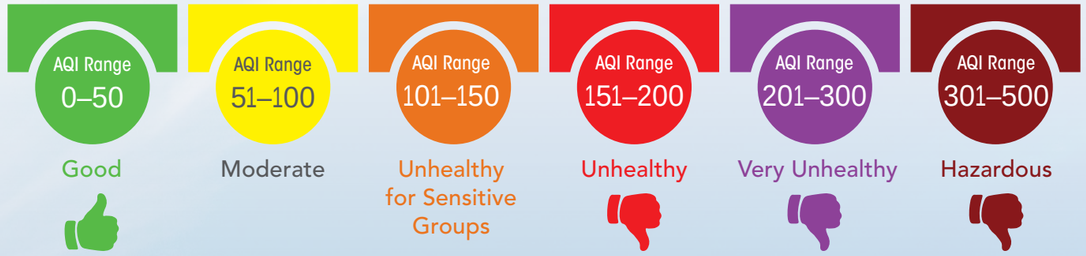
Because air pollution does not create the same visual impact as a mismanaged waste dump or an oil spill, it's easy to underestimate the harm associated with this unseen exposure. In 2013, the World Health Organization designated outdoor air pollution a human carcinogen alongside familiar dangers such as asbestos, tobacco, and radiation. However, the health threat of air pollution has yet to substantially permeate public awareness. For example, the public is generally aware of the health implications of drunk driving, secondhand tobacco smoke, and drug abuse. However, the annual mortality burden of all of these familiar hazards is less than that from exposure to ozone and $PM_{2.5}$ in outdoor air.[2,3,4,5]

What's Happening at Army Installations?

Most poor air quality days at the U.S Army installations shown in the chart on the next page are due to ground-level ozone, which typically develops between May and September. The exceptions are Presidio of Monterey, Fort Gordon, and Fort Wainwright where air quality was impaired due to high levels of $PM_{2.5}$. In the case of Fort Wainwright, $PM_{2.5}$ levels in Fairbanks, Alaska, are chronically elevated in winter months. This is due to widespread use of wood-burning heaters which create more $PM_{2.5}$ than natural gas or distillate fuel oil furnaces.

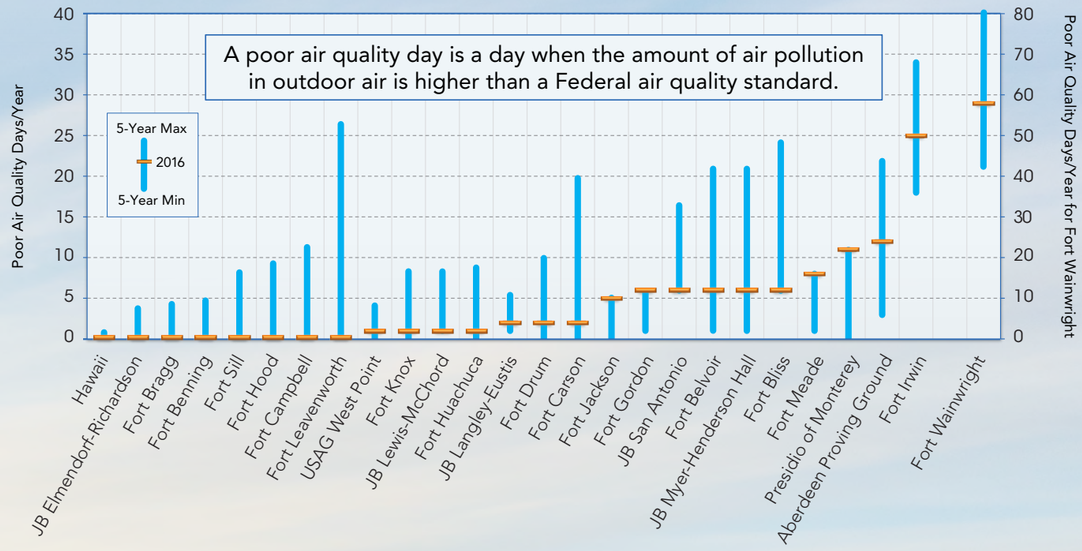
Air Quality Index

The EPA AQI is designed to let the public know whether air quality complies with Federal standards so people can make informed decisions about outdoor activities. The color-coded AQI is expressed as a numerical value from 0 to 500. An AQI score greater than 100 means that air pollution levels are considered unhealthy for some or all of the general public. The graph shows the days in 2016 when the AQI exceeded 100 in airsheds surrounding installations, as well as the variation in annual poor air quality days over the last 5 years.



U.S. EPA Air Quality Index and Associated Colors

Poor Air Quality Days in 2016 with 5-year Maximum and Minimum*



*No data available for Forts Lee, Leonard Wood, Polk, Riley, Rucker, and Stewart.

Global Concerns

Air pollution continues to be a worldwide health concern. The Global Burden of Disease (GBD) project found that long-term exposure to outdoor $PM_{2.5}$ accounted for 4.2 million deaths in 2015.[6] Although the majority of this burden is concentrated in Asia, 88,400 deaths during 2015 were attributed to $PM_{2.5}$ exposures in the U.S.

What to Do on Poor Air Quality Days?

Environmental authorities in the U.S. predict poor air quality a day in advance in order to provide planning time. The forecast identifies the problem pollutant, the target population, and precautions to minimize exposure. Typically, this announcement is delivered via radio, television, newspapers, social media, and on an EPA smartphone app called AIRNOW.

On bad ozone days—

- Shift outdoor activities to the early morning since ozone levels are usually highest in the late afternoon and evening.
- Limit the duration and intensity of outdoor physical activity.
- Curtail lawn mowing, idling in drive-thru lines, and discretionary auto travel.

On bad $PM_{2.5}$ days—

- Move activities indoors, or postpone outdoor activities until air quality improves.
- Limit the duration and intensity of outdoor physical activity.
- Curtail the use of fireplaces and wood-burning stoves.

Even on **good air quality days... Avoid working or exercising near**

$PM_{2.5}$ produced by these types of combustion has been linked to the most serious health outcomes.

References:
1. U.S. Department of Health and Human Services (DHHS). *Healthy People 2020* [Internet], https://www.healthypeople.gov/2020/leading-health-indicators/2020-LHI-Topics (accessed July 17, 2017).
2. Mothers Against Drunk Driving. Drunk Driving Statistics [Internet], http://www.madd.org/drunk-driving/about/drunk-driving-statistics.html (accessed July 18, 2017).
3. DHHS. 2014. *The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General*. Atlanta, GA: DHHS Centers for Disease Control and Prevention.
4. Rudd, R.A., P. Seth, F. David, and L. Scholl. 2016. Increases in Drug and Opioid-Involved Overdose Deaths - United States, 2010–2015. *MMWR*, 65:1445–1452.
5. Health Effects Institute. 2017. State of Global Air 2017. *Special Report*. Boston, MA: Health Effects Institute.
6. GBD 2015 Risk Factor Collaborators. 2016. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*, 388:1659–1724.

LEAD EXPOSURES ON LIVE-FIRE TRAINING RANGES

Lead (periodic symbol: Pb) is a known human toxin. Research findings over the past decade have demonstrated adverse health effects of lead in adults at blood lead levels previously considered acceptable in the workplace.[1,2] Chronic lead poisoning at low levels is associated with elevated blood pressure, cardiovascular issues, and possible kidney and subclinical neurocognitive deficits. Reproductive health risks include possible spontaneous abortion, reduced birth weight, and adverse effects on sperm or semen at levels below 20 micrograms per deciliter (µg/dL). The National Academy of Sciences Committee on Toxicology determined that the Occupational Safety and Health Administration (OSHA) standards are not sufficiently protective of personnel who have repeated lead exposures on firing ranges.[1] Lead exposure not only affects Soldiers but can also pose a hazard to their families, especially children, if Soldiers carry lead dust home on their skin and clothing.

Lead is found in the primer and/or projectile of small arms ammunition and in some artillery propellant charges. Even rounds that are advertised as "green," such as the 855A1 Enhanced Performance Round, contain lead in the primer. Lead is also present in tactical devices such as flash bang grenades and explosive initiators. Soldiers are exposed to lead when it becomes aerosolized upon firing a projectile or detonating an explosive. The resulting airborne lead particles can be inhaled or ingested, leading to elevated blood lead levels. If blood levels are chronically elevated, lead can be sequestered in bone and remain there for years. This can create a further hazard if the lead is released during pregnancy, lactation, or with the onset of osteoporosis. If blood lead levels are too high, personnel may be prevented from training, thus impacting Soldier readiness. The recently revised DODM 6055.05-M adopts protective medical guidelines (more stringent than OSHA) to protect the health and well-being of Soldiers and Civilians exposed to lead.[3]

Small Arms Ammunition and Lead-Free Replacements


9-mm ball


Lead-free 9-mm ball


Training ammo 5.56mm


Lead-free training ammo 5.56mm

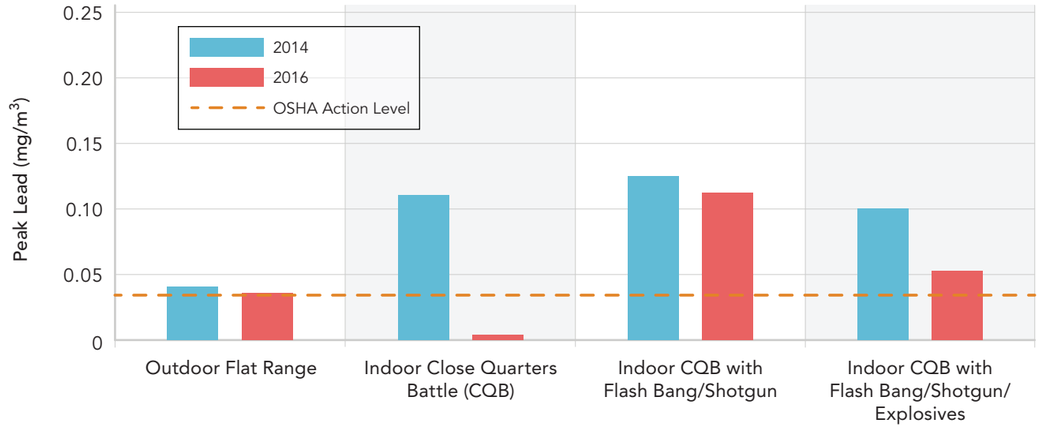

5.56-mm ball


Lead-free 5.56-mm ball

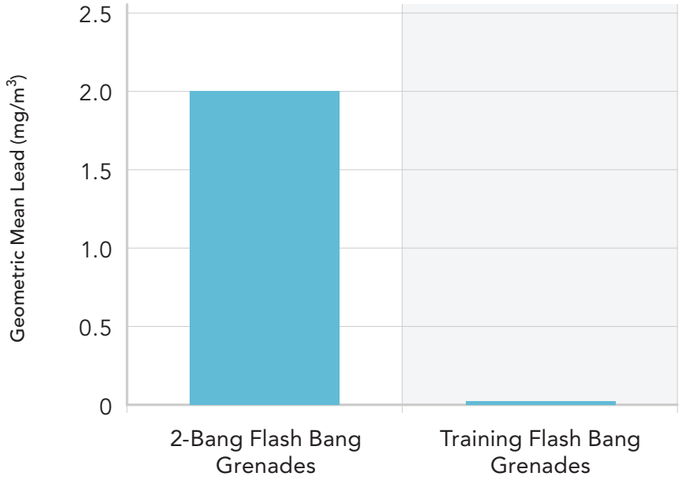
Lead Hazard Elimination: 2014 vs 2016

Thousands of air samples collected by APHC in 2014 showed airborne lead at levels exceeding OSHA occupational exposure limits during live-fire training when lead-containing items were used. Using these data, APHC advocated for the replacement of lead-containing ammunition with lead-free ammunition. Air samples repeated in 2016 after the lead-free rounds were introduced demonstrated a significant reduction in airborne lead levels at the firing ranges. Isolation tests showed that training with 2-bang flash bang grenades created significant airborne lead exposures. Training type flash bang grenades were shown to be a viable alternative for preventing lead exposure.

Airborne Lead Levels During Live-Fire Training



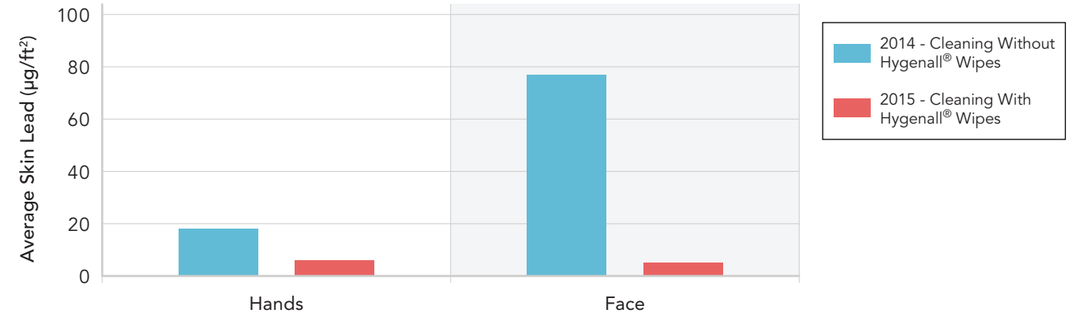
Airborne Lead Levels During Isolation Tests of Flash Bang Grenades



Hygiene Evaluation

APHC collected skin swab samples that showed that washing with soap and/or water was not effective at removing lead from skin, creating a potential ingestion risk. The use of lead removal wipes such as Hygenall® Field Wipes™ was found to reduce lead levels on contaminated skin.

Residual Lead Levels After Live-Fire Training



The Army is actively working to remove lead from ammunition and other tactical devices. Until that is achieved, Soldiers can apply the following measures to reduce and prevent potential lead exposure:

- Do not use tobacco products or eat while training on any firing range or while handling ammunition.
- Thoroughly clean hands and face prior to eating and at the end of training. Use lead removal skin wipes, such as Hygenall® Field Wipes, in addition to soap and water. Shower at the end of the day before going home.
- Consult with Industrial Hygienists to learn about personal protective options such as the use of respiratory protection.
- After training, remove your uniform and boots before getting into a personally-owned vehicle. Store potentially lead-contaminated items separately, such as in plastic bags. At home, wash uniforms separately.
- Ask about the availability of lead-free ammunition. A fully lead-free round currently approved for use is the M1037 (AB66), an 8.55-millimeter, short-range training ammunition.
- Contact your Occupational Health medical provider if you are concerned about your health and your exposure to lead. Evaluation of symptoms related to lead exposure is complex, and should only be performed by an Occupational Health medical professional.

For more information on lead exposure health risks and lead exposure countermeasures, contact the APHC Industrial Hygiene Field Services Division at usarmy.apg.medcom-aphc.mbx.ohs-army-ih-online@mail.mil.

References:
1. National Academy of Sciences. National Research Council (NRC). 2013. *Potential Health Risks to DOD Firing-Range Personnel from Recurrent Lead Exposure*. Washington, DC: That National Academies Press.
2. Kosnett, M.J., R.P. Wedeen, S.J. Rothenberg, K.L. Hipkins, B.L. Materna, B.S. Schwartz, H. Hu, and A. Woolf. 2007. Recommendations for medical management of adult lead exposure. *Environ Health Perspect*, 115(3):463–71, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1849937/.
3. Under Secretary of Defense for Acquisition, Technology and Logistics. 2007. DOD 6055.05-M, *Occupational Medical Examinations and Surveillance Manual*, Incorporating Change 2, April 17, 2017, http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/605505mp.pdf?ver=2017-08-14-111314-123.

FIT TO DRINK

Although the U.S. produces some of the safest drinking water in the world, waterborne disease outbreaks and chemical contamination can still occur. The Safe Drinking Water Act (SDWA) requires water system managers to monitor for water contaminants that could pose acute or chronic health risks. The EPA establishes the National Primary Drinking Water Regulations (NPDWR), as required by the SDWA, that identify which contaminants to monitor. Limits are set for more than 90 contaminants to protect against illness and disease in public drinking water.[1] These standards apply to all public water systems (PWSs). In FY16, approximately 95% of Americans received at least a portion of their water supply from a community water system (CWS), which is the most common type of a PWS.[2]

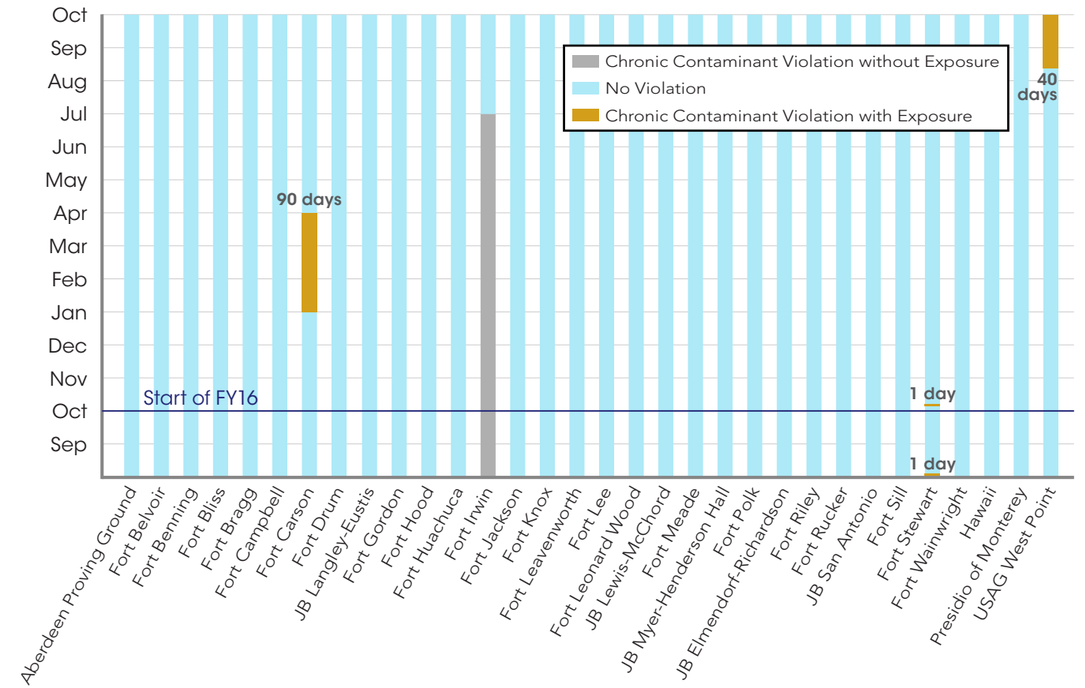
How does the Army compare?

Army water systems are required to meet the same NPDWR standards as public, non-Army water systems. The DOD tracks compliance with health-based water standards as a Measure of Merit[3], and Army installations must report their status semi-annually. Data from the EPA's Report on the Environment may be used to compare Army CWSs to public water systems across the U.S., as illustrated below for FY16.[4,5]

Health of the Force Population Served by CWS		U.S. Population Served by CWS	
8.5%	91.5%	8.8%	91.2%
Population with Health-Based Violations	Population with No Health-Based Violations	Population with Health-Based Violations	Population with No Health-Based Violations

The chart on the next page provides a more detailed evaluation of the quality of drinking water provided to Army personnel. It shows exposure days for violations of health-based drinking water standards at U.S. installations in FY16. The length of the segment represents the number of days from the violation's discovery until the affected population was provided with an alternate safe drinking water source or a permanent mitigation was completed. Fort Irwin's source water has naturally occurring levels of arsenic and fluoride that exceed chronic contaminant standards. However, there was no population exposure because an alternate source of drinking water was provided until the new water treatment plant commenced operation in July 2016. Water provided by Fort Carson's water supplier exceeded the chronic contaminant standard for total organic carbon (TOC). The supplier is researching how to reduce TOC in the source water and treated water supplied to customers. West Point's drinking water had levels of disinfection byproducts above the maximum allowable level, but subsequently implemented both immediate improvements and longer term fixes. There were no violations of any acute contaminant drinking water standards in FY16.

Exposure Days for Violations of Health-Based Water Standards in FY16



How can the Army continue to provide safe drinking water?

The FY16 violations at Army water systems were related to operation, maintenance, treatment, and sampling issues. Water system managers can use this information to uncover the root causes of the violations and make improvements to the system. One way to do this is to request a sanitary survey that reviews sources, treatment, equipment, and operation and maintenance. Regional Health Commands can perform these surveys. The APHC can provide a more intensive engineering evaluation of a system—a Water System Performance Evaluation—upon request.

Where can I find information on my water quality?

Most PWSs are required to publish an annual Consumer Confidence Report (CCR) that identifies compliance with relevant water standards. CCRs are one of the most widely accessible and important means of communicating a water system's drinking water quality. The EPA maintains the Safe Drinking Water Information System (SDWIS), which provides basic information such as name, classification, and population size for PWSs throughout the U.S., along with violation and enforcement history.

References:
1. EPA. 2017. *National Primary Drinking Water Regulations* [Internet], https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed July 2017).
2. EPA. 2017. *Report on the Environment* [Internet], https://cfpub.epa.gov/roe/ (accessed July 2017).
3. Department of Defense. Office of the Under Secretary of Defense Memorandum, 15 Nov 2012, subject: *Minor Revisions to the Safe Drinking Water Act and Clean Water Act Metrics.*
4. EPA. 2017 Envirofacts Safe Drinking Water Information System (SDWIS) Search [Internet], https://www.epa.gov/enviro/sdwis-search (accessed July 2017).
5. Department of the Army. Assistant Chief of Staff for Installation Management. 2017. *Army Stationing and Installation Plan Common Operating Picture Report for 2016.*

TESTING FOR PERFLUOROOCTANE SULFONATE (PFOS) AND PERFLUOROOCTANOIC ACID (PFOA) IN DRINKING WATER SYSTEMS

The EPA identifies PFOS and PFOA to be emerging contaminants that may pose a threat to human health or the environment. In May 2016, the EPA issued a non-regulatory lifetime health advisory (LHA) of 70 parts per trillion (ppt) for the combined concentration of PFOS and PFOA in drinking water.[1] The LHA was based on epidemiological studies of human populations and the best available peer-reviewed studies of the effects of PFOS and PFOA on laboratory animals. Research is continuing to further determine the extent and health impact of humans' exposure to PFOS and PFOA. Such exposures can occur not only from drinking water but also from other consumer products and food.

What are PFOS and PFOA?

PFOS and PFOA are perfluorinated compounds (PFCs) present in products such as carpets, clothing, fabrics, and paper packaging for food to enhance their resistance to water, grease, and stains. Some Aqueous Film Forming Foams (AFFFs) used for firefighting also contain PFCs. PFOS and PFOA are PFCs commonly found in past formulations of AFFF. In the early 2000s, AFFF was reformulated to no longer contain PFOS. Since 2010, the EPA has worked with major chemical companies to reduce or remove PFOA in their products.

How do PFOS and PFOA get into Army drinking water systems?

Many Army drinking water systems obtain their water supply from surface water or groundwater within or immediately adjacent to the installation boundaries. These water resources are vulnerable to contamination by PFOS and PFOA if airfields, aircraft hangars, or firefighter training sites are or have been located on the installation. PFOS and PFOA do not break down in the environment and are highly soluble in water.

Has water testing identified PFOS and PFOA in Army drinking water systems?

As of September 2017, 369 Army-owned, privatized, or purchased water systems that provide drinking water on Army installations have been tested for the presence of PFOS and PFOA by the Army Installation Management Command (IMCOM) and the Army Materiel Command. Approximately 73% of the drinking water systems had no detectable concentrations of either PFOS or PFOA. Approximately 3% of the tested water systems had concentrations of PFOS or PFOA above the LHA, while the remaining 24% had levels below the LHA.

Testing Results for PFOS and PFOA in Drinking Water Systems at Army Facilities

What is the Army doing to reduce or eliminate PFOS and PFOA in Army drinking water systems?

Because conventional drinking water treatment operations do not remove PFCs, the most expedient solution is to either discontinue using a contaminated water source or minimize the flow contribution from an affected water source. Water systems with combined PFOS and PFOA concentrations above the LHA were able to lower or eliminate PFOS and PFOA levels by discontinuing use of the contaminated water supply. In all cases for which the LHA level was exceeded, the contaminated source waters came from groundwater wells. Some drinking water systems for which the combined PFOS and PFOA concentration was below the LHA were able to further reduce their PFOS and PFOA levels by blending source waters. IMCOM is implementing long-term treatment systems for JB Lewis-McChord and at U.S. Army Garrison Daegu to remove the PFOS and PFOA chemicals from the drinking water supplies and to ensure that the water quantity demands are met.

Will the Army continue to monitor for PFOS and PFOA in drinking water systems?

The Office of the Assistant Chief of Staff for Installation Management has developed and distributed guidance for continued monitoring of PFOS and PFOA in Army drinking water systems.[2] Such monitoring is to be conducted in accordance with a prescribed schedule depending upon the initial sampling results. The monitoring aims to ensure that good quality drinking water continues to be provided to Soldiers, Families, and Civilians on Army installations and in Army facilities. Water quality data is archived in DOEHRS, which is a Defense Health Agency (DHA) database.

References:
1. EPA. 2016. Fact Sheet, PFOA & PFOS Drinking Water Health Advisories. EPA-800-F-16-003. Washington, DC: EPA.
2. Department of the Army. Assistant Chief of Staff for Installation Management Memorandum, 21 June 2007, subject: *Supplemental Drinking Water Monitoring Guidance for Perfluorooctane Sulfonate and Perfluorooctanoic Acid.*

THE ERROR OF OUR WASTE

Waste is more than what we throw away. For the Army, waste management is tied to mission sustainability, health, well-being, and relationships with communities. We know that managing waste improperly can create unhealthy conditions and attract pests that can spread disease. However, we rarely think about waste after it's out of sight. Does the waste we generate ever really go away?

According to the EPA, approximately 53% of U.S. municipal solid waste is landfilled, 35% is diverted through recycling or composting, and the remainder undergoes combustion for energy recovery.[1] With over half our waste going to landfills, there is justifiable concern for the resulting environmental damage and potential health effects. Landfills are known to produce air emissions that contribute to climate change, air pollution, and explosive hazards. Landfills also generate leachate, a toxic liquid resulting from rainfall percolating through waste material. Leachate may contaminate surface and ground waters, potentially impacting drinking water sources used by Soldiers, Families, and their local communities.

~53%
of U.S. municipal solid waste is landfilled
—EPA

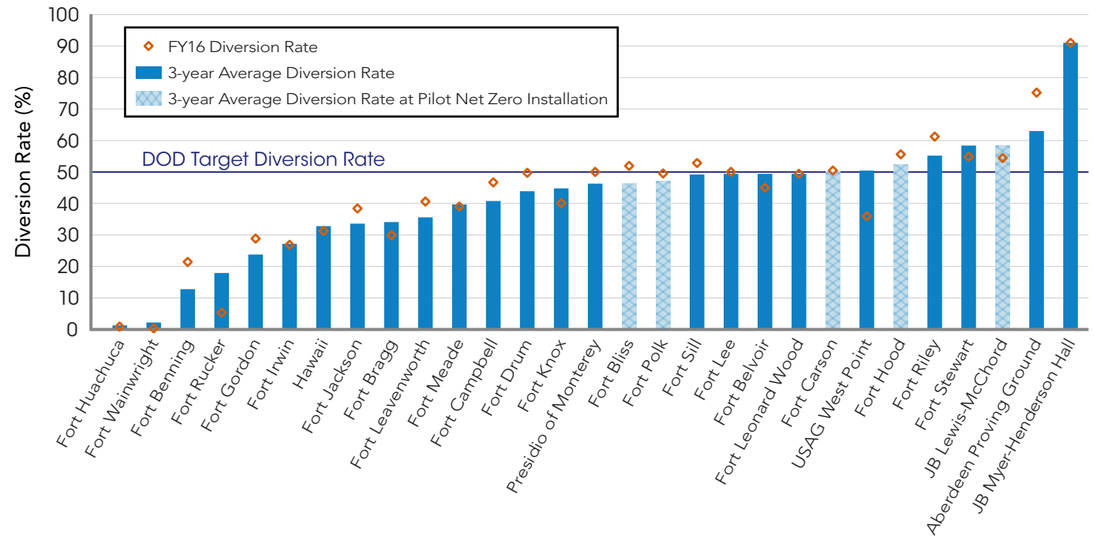
An axiom of the computer age, "garbage in, garbage out," can also be applied to the generation of landfill leachate, which may contain toluene, ammonia, dioxins, polychlorinated biphenyls, chlorinated pesticides, heavy metals, and endocrine-disrupting chemicals. One compound common in plastics, di(2-ethylhexyl) phthalate (DEHP), is "reasonably anticipated to be a human carcinogen," according to the National Institutes of Health.[2] Of equal concern are improperly managed wastes, such as plastic bottles found in the oceans. Studies show that plastics are making their way into the food chain and are present in seafood consumed by humans.[3]

The crucial question is this:

A Solution is Waste Reduction

Many contaminants that compromise air quality, ground water, and drinking water supplies are created by both proper and improper waste disposal. The ultimate solution to this problem is the minimization and elimination of the waste streams that create the contaminants. Enter the Army's 2011 Net Zero Waste pilot program, in which eight installations committed to reducing waste streams with the goal of zero waste going to landfills over the course of a year. These installations (five of which are identified in the figure) employed innovative technologies and sought new ways to divert wastes from disposal. In 2014, the Secretary of the Army directed that all installations adopt Net Zero Waste goals, citing it as a "force multiplier that enables the Army to appropriately steward available resources, manage costs, and provide Soldiers, Families and Civilians with a sustainable future."[4]

FY16 Solid Waste Diversion Rate with 3-Year Average (FY14–16)*



*Source: SWARWeb FY14-16 Measure of Merit Summary Reports (excluding construction/demolition wastes and privatized housing). No data were available for JB Elmendorf-Richardson, JB Langley-Eustis and JB San Antonio since Air Force is the lead Service at those bases and they no longer report solid waste information to the Army database.

How is Waste Reduction Measured?

The Army's system of record for waste generation data is the Assistant Chief of Staff for Installation Management's Web-based Solid Waste Annual Report (SWARWeb). Solid waste managers report their facility's tonnage for waste, recycling, and other diversion efforts in SWARWeb semiannually. A metric derived from the data is the ***solid waste diversion rate***: the rate at which nonhazardous solid waste is diverted from a disposal facility by means such as recycling, composting, mulching, and donating. The diversion rate has been used as a DOD Measure of Merit since 1999. The current diversion rate goal is 50%, as stated in DOD Instruction (DODI) 4715.23.[5]

Why Does Diversion Rate Matter?

The diversion rate metric captures efforts to reduce waste, and by extension, the associated diminishment of health risks. As an example, plastic bottles diverted through recycling programs are kept out of the ocean, and their derivatives (such as DEHP) are kept out of landfills, leachate, and drinking water sources. The graph on the previous page shows FY16 solid waste diversion rates at U.S. installations, as well as the average diversion rate over FY14–16. The FY14 average diversion rate for installations shown was 40.8%, which exceeded the U.S. average diversion rate of 35% reported by EPA for calendar year 2014[1]. The FY16 average diversion rate rose to 42.3% for these same installations, showing overall improvement in Army's diversion efforts. A commitment to waste reduction pays off; the average FY14–16 diversion rate for installations that were Net Zero waste pilots was 50.9%, as compared to 39.7% for those not participating. The solid waste diversion rate demonstrates an installation's commitment to promoting sustainability, conserving resources, and fostering a healthy environment and community.

Graphic courtesy of Assistant Secretary of the Army for Installations, Energy and Environment

What Can Be Done?

An installation's Integrated Solid Waste Management Plan (ISWMP), required by AR 200-1[7], is a valuable tool for identifying components of the waste stream and the ways to divert them. DODI 4715.23 also calls for a solid waste characterization study to define the basis for the installation's diversion strategy.

References:
1. EPA. Office of Land Emergency Management. 2016. *Advancing Sustainable Materials Management 2014 Fact Sheet.* EPA530-R-17-01. Washington, DC: EPA.
2. U.S. Department of Health and Human Services. National Institutes of Health. 2016. *Fourteenth Report on Carcinogens.* Research Triangle Park, NC: National Toxicology Program.
3. Laville, S. and M. Taylor. 2017. "A Million Bottles a Minute: World's Plastic Binge…" [Internet] In: *The Guardian*, https://www.theguardian.com/environment/2017/jun/28/a-million-a-minute-worlds-plastic-bottle-binge-as-dangerous-as-climate-change?CMP=share_btn_tw (accessed July 2017).
4. DA. Secretary of the Army Memorandum, subject: Army Directive 2014-02, *Net Zero Installations Policy*, 28 January 2014.
5. DOD. 2016. DODI 4715.23, *Integrated Recycling and Solid Waste Management*, https://www.esd.whs.mil.
6. U.S. Army Assistant Chief of Staff for Installation Management. 2017. *SWARWeb Measure of Merit Summary Reports (Fiscal years 2014–2016)*, https://www.u0s.army.mil/suite/page/620420 (accessed July 3–18, 2017).
7. DA. 2007. AR 200-1, *Environmental Protection and Enhancement*, https://www.apd.army.mil.

MANAGEMENT OF PHARMACEUTICALS

Improper disposal of medications, such as flushing or discarding in the trash, can lead to unintended health and environmental consequences. In 2012, an APHC study evaluated pharmaceuticals found in wastewater at Army installations. The study concluded that on average, 14% of target pharmaceuticals remained in the treated wastewater that was discharged to the environment.[1] This is significant because treated wastewater is discharged into surface waters used for drinking water, and trace amounts of pharmaceuticals have been detected in drinking water across the U.S.[2]

Failure to manage pharmaceuticals properly can also pose risks to children. An analysis of American Association of Poison Control data from 2001 to 2008 found that 544,133 children aged 5 years or younger were admitted to emergency rooms due to poisoning by medication.[3] Further, the National Institute on Drug Abuse's *Monitoring the Future* survey found prescription and over-the-counter drugs among the substances most commonly abused by high-schoolers.[4] Unsecured or mismanaged pharmaceuticals could also get into the hands of someone with or at risk of a substance abuse problem.

How should unused medications be disposed?

In 2015, MEDCOM issued Policy Memorandum 15-049, which directs its MTFs to coordinate drug take-back programs and education campaigns.[5] To this end, MEDCOM has installed Drug Enforcement Agency-compliant collection receptacles near its outpatient pharmacies. Individuals can use these receptacles—instead of the sink, toilet, or trash—to dispose their unwanted pharmaceuticals with no questions asked, regardless of how the drugs were obtained or how long they were in an individual's possession. In 2016, the MEDCOM Pharmacy Consultant noted that these receptacles collected more than 16,000 pounds of unwanted pharmaceuticals, thus reducing potential drug abuse and accidental poisonings, and preventing wastewater discharge of pharmaceuticals. Working together, the Army community can keep drugs out of the environment and away from children and at-risk individuals.

References:
1. U.S. Army Public Health Command. 2012. *Pharmaceutical Baseline Wastewater Evaluation.* Aberdeen Proving Ground, Maryland.
2. Associated Press, *Pharmaceuticals in water: 46 million Americans drinking* [Internet], http://hosted.ap.org/specials/interactives/_national/pharmawater_update/index.html (accessed April 2017).
3. Bond, G.R. 2012. The Growing Impacts of Pediatric Pharmaceutical Poisoning. *The Journal of Pediatrics*, 160(5); 888–889.
4. National Institute on Drug Abuse. 2016. Misuse of Prescription Drugs. Adolescents and Young Adults [Internet]. https://www.drugabuse.gov/publications/research-reports/prescription-drugs/trends-in-prescription-drug-abuse/adolescents-young-adults (accessed July 3, 2017).
5. MEDCOM. 2015. Policy Memorandum 15-049, subject: Management and Disposition of Pharmaceutical Waste and Implementation of Prescription Drug Take Back Programs. JB San Antonio, Texas.

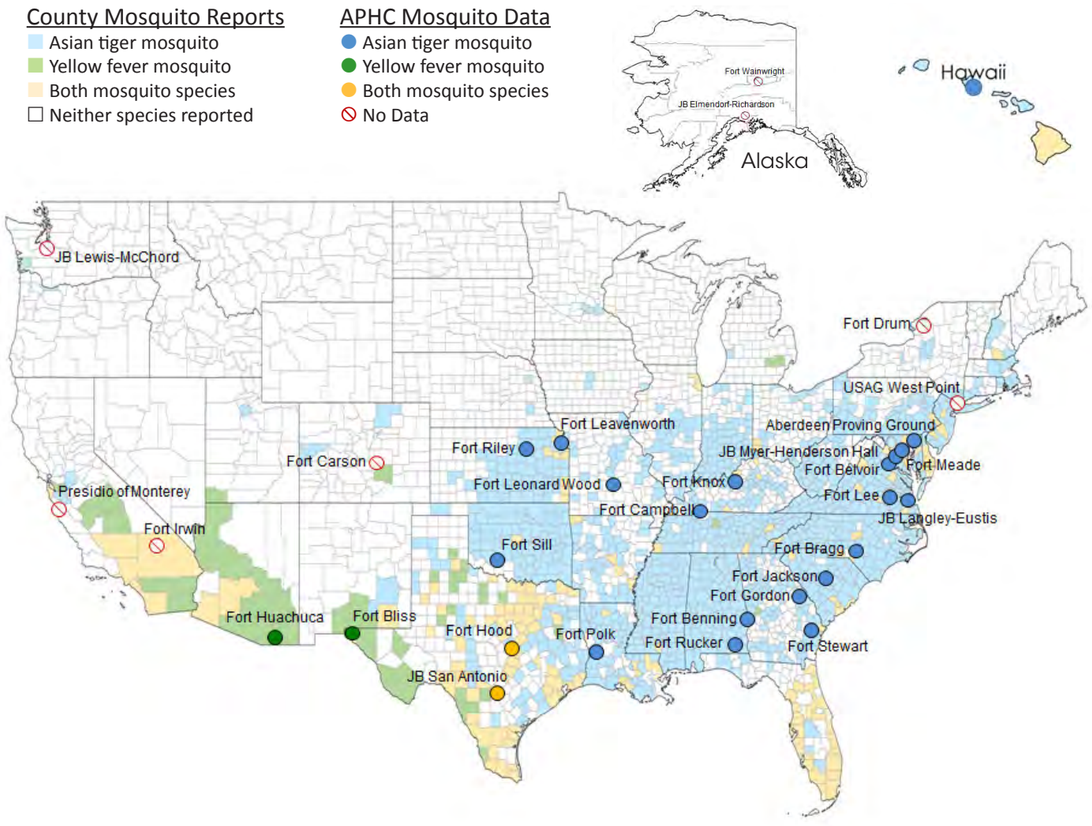
MOSQUITOES: THE THREAT THAT NEVER SLEEPS

A mosquito is a mosquito…right?

Mosquitoes are excellent disease transmitters, and their annoying bites can spread disease to many people very quickly. Mosquitoes that spread disease are called vectors. Different mosquito species have unique behaviors and habitats, making mosquitoes difficult to control. Some bite at night, while others bite during the day. Some prefer human blood, while others prefer animal blood. Some live in human-made areas, while others prefer natural habitats.

Some lay eggs in small containers, some in ponds and lakes, some in water with high organic content (e.g., pit latrines), and others in rain puddles or water collected for human use. As a result, it is impossible to craft a one-size-fits-all strategy to eradicate mosquitoes. Preventing mosquito bites stops disease transmission, but stopping bites means understanding the mosquitoes responsible for making people sick.

Presence of Vector Mosquitoes in the U.S. and at Selected Army Installations




Aedes aegypti

Which mosquitoes spread Zika virus?

The primary mosquito vector for Zika is the yellow fever mosquito, *Aedes aegypti*. This mosquito bites during the day, prefers to feed on humans, and reproduces in manmade containers where water collects. This mosquito can also transmit other diseases, such as yellow fever, dengue fever, and chikungunya, which are often more severe and have higher mortality rates than Zika. Another Zika virus vector is the Asian tiger mosquito, *Aedes albopictus*. Like the yellow fever mosquito, it is a container breeder; however, it also breeds in natural sites such as tree holes and feeds on nonhuman hosts. Due to these factors, it is not as efficient at spreading disease.[1] Both species bite during the day and lay their eggs in small, temporary containers. The perfect habitat for either mosquito is a cluttered yard with potted plants, tires, garbage, clogged gutters, or tarped equipment that can collect rain water.


Aedes ablopictus

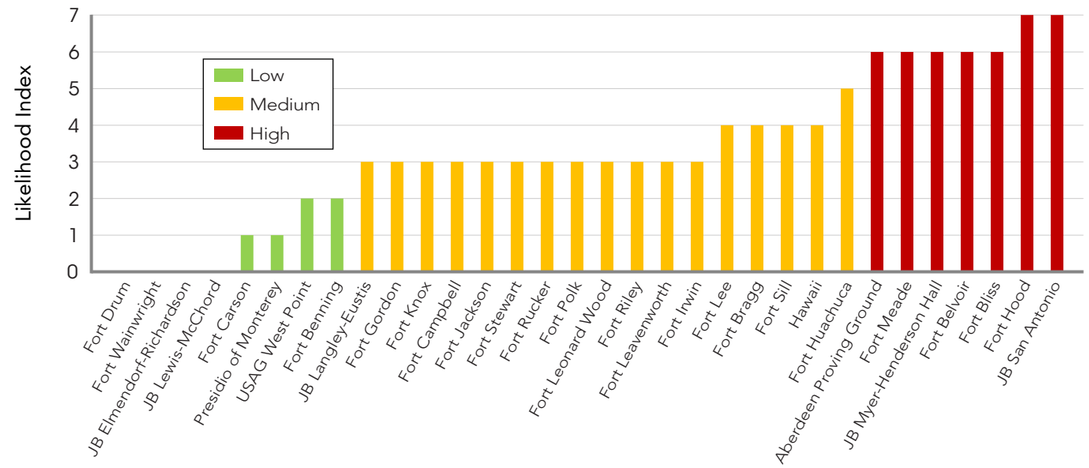
How do we assess the presence of vector mosquitoes?

The highest risk of exposure to mosquito bites occurs outdoors. However, day-biting mosquitoes will readily follow people indoors, especially where doors are propped open or have delayed closing mechanisms. The primary methods for estimating the risk of mosquito-borne illnesses are human case reporting and mosquito surveillance. Human case reports are retrospective and document disease only after transmission has begun. Mosquito surveillance can be prospective by detecting conditions needed to support transmission, allowing a prevention strategy to be implemented before human cases occur. Environmental health staff at the MTF are responsible for mosquito surveillance and collaboration with garrison pest control personnel to mitigate risk of disease.[2] The Public Health Commands aligned with each Regional Health Command can provide assistance with mosquito surveillance programs and recommend control strategies. They also provide laboratory services to detect infected mosquitoes.

What is the likelihood of established mosquito populations in garrison?

Since garrison surveillance data may not fully characterize presence of vector populations, such data are evaluated in combination with county-level mosquito surveillance reports.[3] The index developed by APHC, shown in the graph below, represents the likelihood that the yellow fever or Asian tiger mosquitoes have established populations within the respective garrison. The index considers whether the garrison is within the predicted range for these vectors, whether vectors have been reported in county records, and whether the vector has actually been collected in garrison. An index value of zero means that no vector mosquitoes were collected and the installation is outside the CDC predicted range for the mosquitoes. A value greater than zero indicates the relative potential that mosquitoes are present and have established populations on the installation. High-likelihood installations are those with presence data for both species.

Likelihood of Vector Mosquitoes in the Local Environment



*Data represents likelihood for the yellow fever mosquito *(Aedes aegypti)* and Asian tiger mosquito *(Aedes albopictus)* only.

What can be done?

Individuals can protect themselves by wearing permethrin-treated clothing and using approved insect repellents on their exposed skin. Mosquito populations can be curtailed by removing containers that collect water or emptying containers weekly; ensuring that gutters are unclogged and drain properly; treating water-filled landscape ornaments with mosquito larvicides; and eliminating standing water. To keep mosquitoes out of buildings, check that window and door screens are in good repair, and use air curtains where appropriate (e.g., loading docks, handicap doors).

References:
1. World Health Organization Regional Office for Europe. 2016. News Item: ZIKA–Competence of *aegypti* and *albopictus* vector species [Internet], http://www.euro.who.int/__data/assets/pdf_file/0007/304459/WEB-news_competence-of-Aedes-aegypti-and-albopictus-vector-species.pdf (accessed 20 July 2017).
2. DA. 2009. DA Pamphlet 40-11, *Army Preventive Medicine*, https://www.apd.army.mil.
3. Hahn, M.B., L. Eisen, J. McAllister, H.M. Savage, J-P Mutebi, and R.J. Eisen. 2017. Updated Reported Distribution of *Aedes (Stegomyia) aegypti* and *Aedes (Stegomyia) albopictus (Diptera: Culicidae)* in the United States, 1995–2016 (Diptera: Culicidae). *J Med Entomol*, 54(5):1420-24.

TICKS: A RISK FOR SOLDIERS TRAINING AT HOME

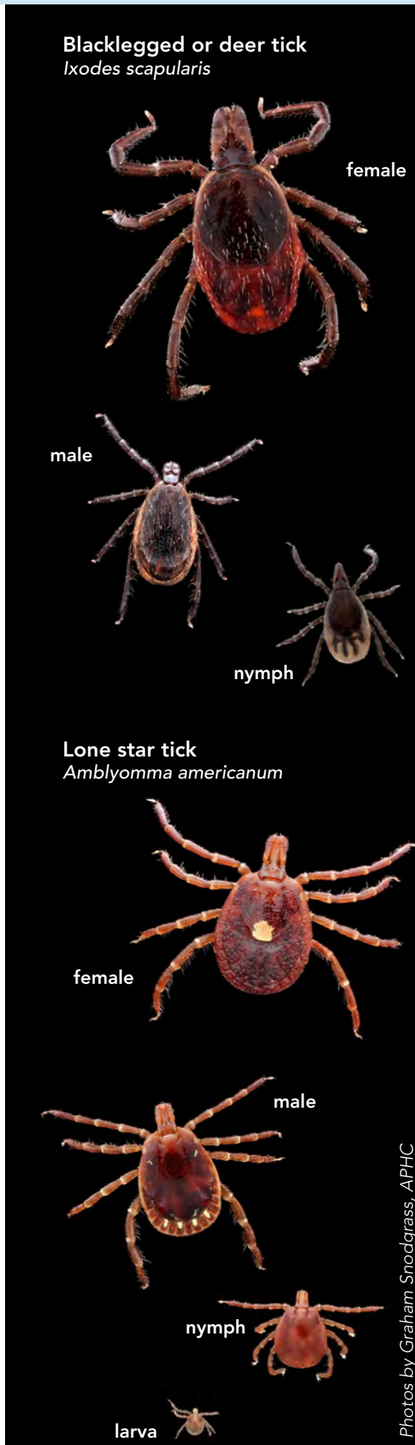
Many Soldiers on installations across the U.S. have had the unpleasant experience of finding a tick attached at the end of the day. Tick bites are not only creepy but may also result in serious disease if the tick is carrying a pathogen. In the U.S., ticks transmit more cases of disease than mosquitoes, and the CDC recently estimated that up to 300,000 new cases of Lyme disease are acquired annually in the U.S.[1] Lyme disease cases diagnosed at Air Force, Army, and Navy facilities continue to increase every year.[2,3]

Lyme disease is the most frequently reported tick-borne disease in the U.S. military,[4] but many other tick-borne diseases can make Soldiers sick or even kill previously healthy Soldiers.[5] Ticks can transmit pathogenic bacteria, viruses, and protozoans and can even transmit multiple pathogens in a single bite. The risks vary depending on the geographic location where the tick bite was acquired and which species of tick caused the bite, so it is important to be aware of how the risks differ at each installation.

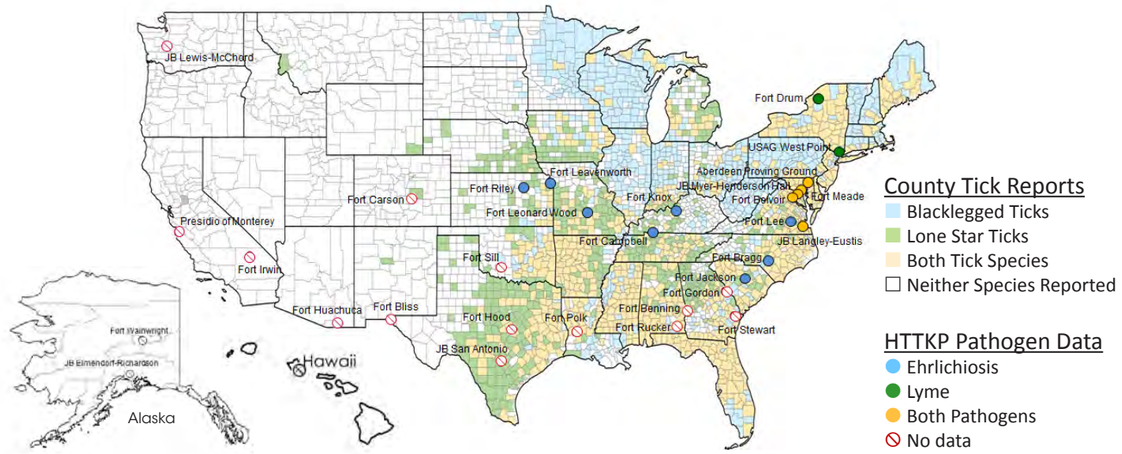
To help protect Soldiers and their Families, the DOD Human Tick Test Kit Program (HTTKP) offers a free identification and testing service for all ticks removed from DOD-affiliated personnel. In addition to reporting test results to tick-bite victims, the HTTKP also works with installations to provide data on installation-specific risks and targeted prevention measures. Although tick-borne diseases, such as tick-borne encephalitis, can also pose serious risks to Soldiers deployed in Europe, Asia, and beyond, currently the HTTKP receives and tests only US-based ticks.

Different Ticks? Different Risks

The two main ticks that transmit disease in the eastern U.S. are the blacklegged tick, also called the deer tick, and the lone star tick. The blacklegged tick is the main vector of the bacteria that causes Lyme disease in the U.S. The lone star tick is the most common source of tick bite in the southeastern U.S.[6] and transmits three different bacteria that cause a disease called ehrlichiosis, which causes mild to severe flu-like symptoms and can be fatal. In the southeastern U.S. the lone star tick represents a much greater public health risk than the blacklegged tick. The map shows the ranges of the blacklegged tick[7] and the lone star tick[8], with data from Army installations overlaid. Circles indicate installations that submitted 50 or more ticks to the HTTKP between 2006 and 2016. The red null circles indicate installations that do not regularly submit ticks, and the HTTKP dataset cannot produce risk assessments for those installations.



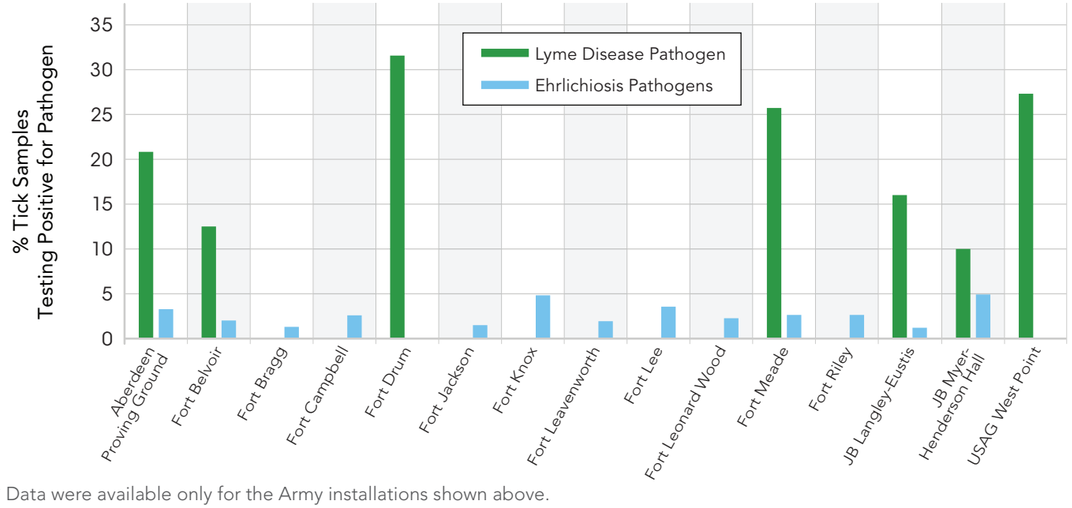
Presence of Ticks in the U.S. and Tick Pathogens at Selected Army Installations



The bar chart shows HTTKP data for infected lone star and blacklegged ticks submitted from *Health of the Force* installations. Each of these ticks was submitted to the HTTKP after biting a person at these installations. Lone star ticks were tested for all three agents of ehrlichiosis, and blacklegged ticks were tested for the agent of Lyme disease. The number of ticks submitted by each installation to the HTTKP is noted in the table. It's important to note that a lack of positive ticks does not indicate that there is no risk of acquiring that disease at an installation. The more often each installation submits ticks, the better the understanding of tick-borne disease risks to Soldiers.

Pathogens in Human-Biting Ticks at Selected U.S. Army Installations 2006–2016*

	Aberdeen Proving Ground	Fort Belvoir	Fort Bragg	Fort Campbell	Fort Drum	Fort Jackson	Fort Knox	Fort Leavenworth	Fort Lee	Fort Leonard Wood	Fort Meade	Fort Riley	JB Langley-Eustis	JB Myer-Henderson Hall	USAG West Point
# Blacklegged Ticks Tested	389	216	15	3	282	66	16	2	4	2	70	1	25	30	44
# Lone star Ticks Tested	2,012	1,285	153	857	6	133	3,844	103	438	352	227	190	497	61	1



* Data were available only for the Army installations shown above.

Another tick species of concern is the American dog tick, which is widespread in the U.S. and is the vector of the bacterial agent of Rocky Mountain spotted fever (RMSF). The bites of other tick species, including the Rocky Mountain wood tick and the brown dog tick, can also transmit the agent of RMSF; however, the HTTKP has rarely detected the agent of RMSF in any tick species.[9]

Protecting Soldiers from Tick-borne Illness

It is essential that Soldiers and medical personnel understand how the threats associated with tick-borne illness vary by installation. For example, treating for Lyme disease when it is not present at an installation could result in an unnecessary antibiotics prescription that might inadvertently increase the severity of ehrlichiosis. To increase awareness of current conditions at each installation, APHC publishes the *Army Vector-borne Disease Report* during the height of vector season. This report presents both entomology and human case data, and is available on the APHC Web site.

To minimize risks, Soldiers should wear their permethrin-treated uniform when training in tick habitat and should use approved insect repellents on exposed skin. After spending time in tick habitat, Soldiers should always conduct a thorough tick check and remove embedded ticks promptly with sharp tweezers. Any ticks found biting military personnel or their Family members should be submitted to the HTTKP for testing; tick kits available at medical treatment facilities should be used. Test results are returned to the clinic to assist the tick-bite victim's healthcare provider in making appropriate treatment decisions. Submitting ticks to the HTTKP also helps the APHC better assess tick-borne disease risks across Army installations.

References:

1. CDC. 2017. How many people get Lyme disease? [Internet], https://www.cdc.gov/lyme/stats/humancases.html (accessed July 20, 2017).
2. Anna, M.M., J.D. Escobar, and A.S. Chapman. 2012. Reported Vectorborne and Zoonotic Diseases, U.S. Air Force, 2000-2011. *MSMR*, 19(10):11–14.
3. AFHSB. 2012. Reported Vectorborne and Zoonotic Diseases, U.S. Army and U.S. Navy, 2000–2011. *MSMR*, 19(10):15–16.
4. Rossi, C., E.Y. Stromdahl, P. Rohrbeck, C. Olsen, and F.R. DeFraites. 2015. Characterizing the relationship between tick bites and Lyme disease in active component U.S. Armed Forces in the Eastern U.S. *MSMR*, 22(3):2–10.
5. Martin, G.S., B.W. Christman, and S.M. Standaert. 1999. Rapidly fatal infection with *Ehrlichia chaffeensis*. *New England Journal of Medicine*, 341(10): 763–4.
6. Stromdahl, E.Y., and G.J. Hickling. 2012. Beyond Lyme: Aetiology of tick-borne human diseases with emphasis on the South-Eastern United States. *Zoonoses and Public Health*, 59(s2), 48–64.
7. Eisen, R.J., L. Eisen, and C.B. Beard. 2016. County-scale distribution of *Ixodes scapularis* and *Ixodes pacificus (Acari: Ixodidae)* in the continental United States. *Journal of Medical Entomology*, 53(2): 349–386.
8. Springer, Y.P., L. Eisen, L. Beati, A.M. James, and R.J. Eisen. 2014. Spatial distribution of counties in the continental United States with records of occurrence of *Amblyomma americanum* (Ixodida: Ixodidae). *Journal of Medical Entomology*, 51(2): 342–351.
9. Stromdahl, E.Y., J. Jiang, M. Vince, and A.L. Richards. 2011. Infrequency of *Rickettsia rickettsii* in *Dermacentor* variabilis removed from humans, with comments on the role of other human-biting ticks associated with spotted fever group rickettsiae in the United States. *Vector-borne and Zoonotic Diseases*, 11(7): 969–977.

WHAT IS OPERATIONAL NOISE?

DOD Instruction 4715.13, *DOD Noise Program*, defines operational noise as unwanted sound generated from the operation of military weapons or weapons systems. Although military aircraft and ground vehicles generate noises similar to their civilian counterparts, few sources other than military operations generate the type of high-energy impulsive sounds produced by weapons systems.[1]

Operational noise can contribute to sleep disturbance, stress, anxiety, frustration, annoyance, and even learning impairment in school-age children. During deployments, noise may induce depression and disrupt communication and concentration, thus harming overall mission performance. Soldiers with PTSD placed in Wounded Warrior Transition Housing in close proximity to firing ranges reported the noise startled them in formation, caused them to stay awake and on edge, and induced anxiety attacks.

How do we manage the effects of operational noise?

The Army's Installation Compatible Use Zone (ICUZ) Program strives to protect the health and welfare of military and civilian communities by identifying areas impacted by high levels of operational noise. This information is used to assist the siting of noise-sensitive land uses such as residential housing, K–12 education facilities, child development centers, and medical treatment facilities.

An ICUZ study uses computer models to predict high noise areas resulting from military training and ordnance testing, and delineates areas where noise-sensitive land uses should be avoided. The table summarizes ICUZ study results showing where operational noise is likely to impact noise-sensitive land uses on selected U.S. Army installations. Another tool to mitigate the effect of operational noise is public notification of louder-than-normal training and/or testing events. Prior notifications of upcoming loud events can help to manage the public's expectations of the noise and allow people to adjust their behavior to limit the effects.

A good example of public notification for operational noise awareness can be found on Fort Riley's "Noise and Training Advisory" webpage. The page posts daily training schedules approximately one week in advance, including the date of the training activity, its duration, and whether it is expected to yield significant amounts of noise. Keeping the advisory information current is the result of active communication among the Public Affairs Office (PAO) and various garrison offices. The Noise and Training Advisory Web page provides year-round advanced notifications of noise and vibration occurrences in a way that is easily accessible to Army and civilian communities both on- and off-post.

References:
1. DOD. 2005. DoDI 4715.13, *DOD Noise Program*, http://www.esd.whs.mil/
2. DA. 2007. AR 200-1, *Environmental Protection and Enhancement*, http://www.apd.army.mil/

The table on the right consolidates information from the most recent ICUZ study at selected Army installations. At each installation, the table indicates whether noise-sensitive land uses (housing, schools and medical facilities) are wholly or partially situated within an area exposed to operational noise classified as a significant or severe noise hazard. For example, the table shows that at Fort Benning there are currently some residential homes and schools within Noise Zones II (significant noise exposure) and III (severe noise exposure). This information is useful for long-term planning so that future sensitive land uses are situated away from areas potentially affected by operational noise.

Where can I find operational noise information for my installation?[a]

The Noise Program is typically found within the garrison's Department of Public Works (DPW) Environmental Office. Stakeholders for noise management include training range and airfield operators, master planners, and the PAO. The APHC Environmental Health Sciences Division offers consultative support and maintains a repository of most noise assessments completed since the ICUZ Program's inception.

[a] Predicted noise impacts are for Army activities only. No data were available for Fort Meade, JB Myer-Henderson Hall, or Presidio of Monterey due to the absence of significant operational noise.

[b] Garrison Soldier and Family residential facilities.

[c] Garrison K–12 schools and child development centers.

Operational Noise Impact on Sensitive Land Use[a]

Installation	Housing[b]	Schools[c]	Medical Facilities
Aberdeen Proving Ground	II, III	-	-
Fort Belvoir	-	-	-
Fort Benning	II, III	II, III	-
Fort Bliss	II	-	-
Fort Bragg	II	-	-
Fort Campbell	II	-	-
Fort Carson	II	-	II
Fort Drum	II	-	II
Fort Gordon	-	II	II
Fort Hood	II	-	-
Fort Huachuca	-	-	-
Fort Irwin	II	-	II
Fort Jackson	-	-	-
Fort Knox	II	-	-
Fort Leavenworth	-	-	-
Fort Lee	II	-	-
Fort Leonard Wood	-	-	-
Fort Polk	-	-	-
Fort Riley	-	-	-
Fort Rucker	-	-	-
Fort Sill	II	II	II
Fort Stewart	II	-	-
Fort Wainwright	II	-	-
USAG West Point	II	II	-
Hawaii	II	II	-
JB Elmendorf-Richardson	-	-	-
JB Langley-Eustis	-	-	-
JB Lewis-McChord	II	II	II
JB San Antonio	-	-	-

Noise Zone	Description
I	An area of minimal to moderate noise exposure. Noise-sensitive land uses may be compatible. Noise is not likely to exceed Army guidelines.
II	Area of significant noise exposure. Noise-sensitive land uses are not recommended.
III	Area of severe noise exposure. Noise-sensitive land uses are not compatible.

COMMUNITY HEALTH PROMOTION COUNCILS

CHPCs are essential for driving and synchronizing Ready and Resilient (R2) activities at both the Command and Installation levels. This integrated effort provides commanders with awareness, implements routine assessments, and drives targeted actions for a ready and resilient force. AR 600-63[1] and the Enduring Personal Readiness and Resilience operation order[2] direct Senior Commanders to establish CHPCs in order to coordinate health, wellness, and R2 activities across medical, garrison, and mission operations. These efforts ensure synchronization of data sources to provide a holistic picture for command decision making.

Evaluations of Army CHPCs from FY14 to FY16 indicate that CHPCs chaired by the Senior Commander and managed by a full-time facilitator have greater maturity than CHPCs managed in other forms.[3] CHPCs evaluate stakeholder perceptions of the CHPC mission through a survey of the membership that includes a diverse sector of medical, mission, and garrison personnel (both Active Duty and Civilian). This diverse membership represents key decision makers and program owners across the entire installation. A survey of 1,407 CHPC members indicated a belief that CHPCs are making a difference at the local installation, as shown in the following results:

80% of respondents believe the CHPC encourages coalition building

81% believe the CHPC increases awareness of the importance of prevention

74% believe the CHPC improves awareness of gaps and overlaps

79% believe the CHPC increases communication among tactical, medical, and garrison assets

78% believe the CHPC improves coordination and sharing of data

78% believe the CHPC improves health outcomes

At present, Senior Commanders rely upon contracted staff resources to meet the CHPC requirements. The survey results shown here reflect a period when Health Promotion Officers were transitioning to an enduring Army Civilian Community Ready and Resilient Integrator within each Senior Commander at identified installations.

References:
1 DA. 2015. AR 600-63, *Army Health Promotion*, https://www.apd.army.mil.
2 HQDA. 2016. HQDA Operation Order – Enduring Personal Readiness and Resilience, DTG: 010421ZDec16, https://www.army.mil/readyandresilient/.
3 U.S. Army Public Health Center. 2016. *Army Public Health Center Structure Process Evaluation Tool (SPET) Results, FY 14–16.* Aberdeen Proving Ground, Maryland.

WOMEN'S HEALTH PORTAL

Since the American Revolutionary War, women have served a vital role in the U.S. fighting forces, and they continue to be a significant source of strength for our nation. Today, women make up nearly 15% of our AC Army and can serve in all Army occupations. In our fight against terrorism, women have maintained a crucial role in military operations, and their sacrifices underscore their dedication and willingness to serve.

15% of Active Component Army Soldiers are Female

17% of Active Component Army Officers are Female

14% of Active Component Army Enlisted are Female

As women expand into different roles within the military, it is clear that the heart of a Warrior is not limited to one gender. Increased Service opportunities for women have been accompanied by an increased need for health-related resources and support specifically tailored to meet the unique needs of our female Service members.

Women's health plays a vital role in the overall readiness of the Army and is supported by Army Medicine's four Lines of Effort:

- Readiness and Health
- Healthcare Delivery
- Force Development
- Take Care of Ourselves, our Soldiers for Life, DA Civilians, and Families

The APHC developed the web-based Women's Health Portal (WHP) to give women and healthcare providers access to health-related resources and support that facilitate health and readiness for women in both deployed and garrison settings. The WHP allows women to take proactive measures to positively influence their health by optimizing sleep, activity, and nutrition within their individual lifespace. The WHP has been designed to help meet the unique needs of women by providing female Service members, Leaders, and Family Members with up-to-date information about a variety of women's health topics, to include—

- Breastfeeding
- Deployment Health
- Health and Wellness
- Mental Health and Substance Use
- Pregnancy
- Sexual Health
- Violence Prevention
- Emerging Women's Health Issues
- Self-Care Charts

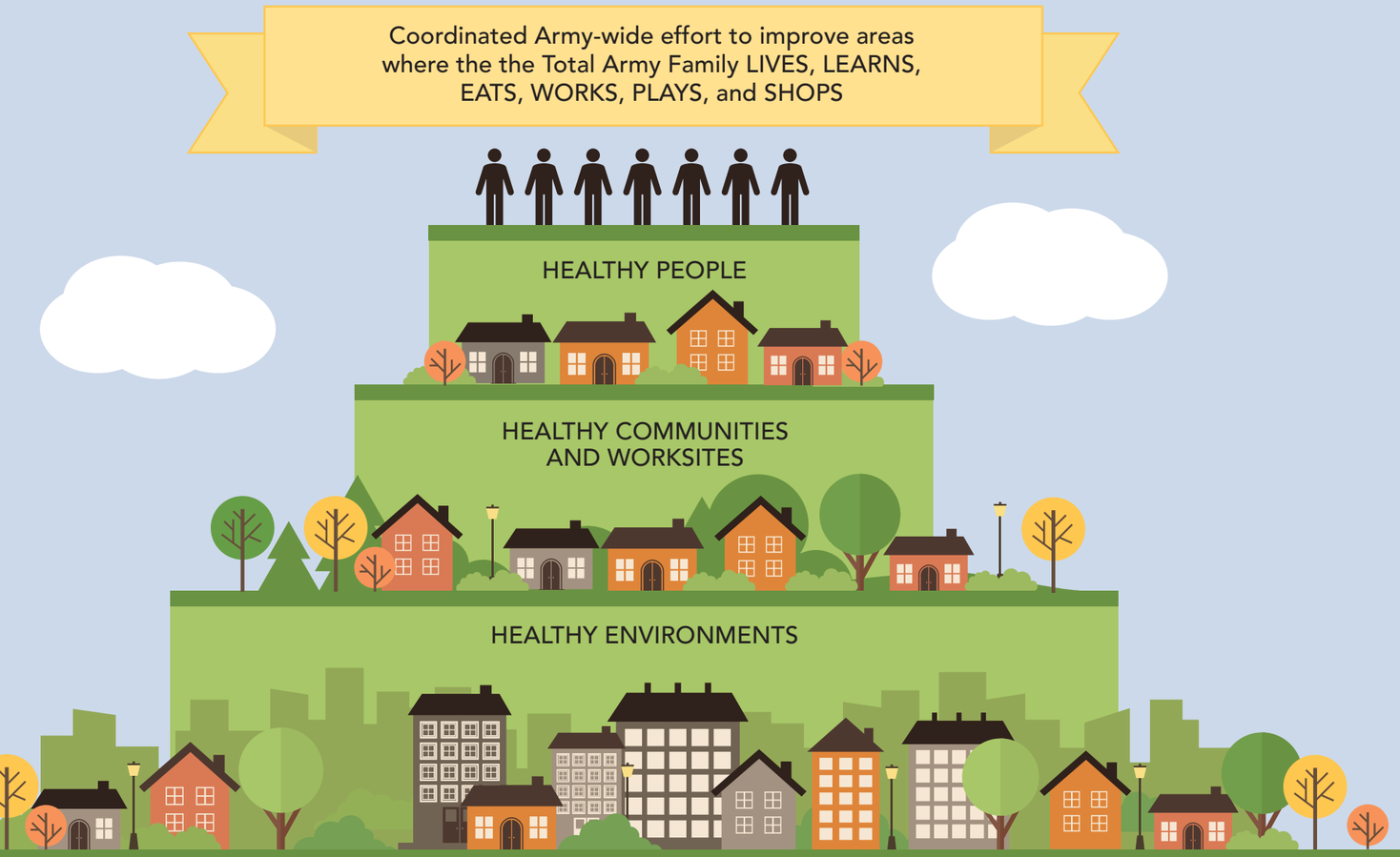
The MEDCOM and Army Medicine are continually seeking ways to raise awareness, educate, and empower women to make their health a top priority and to encourage them to take steps to improve their physical, mental, emotional, and spiritual health.

The Women's Health Portal can be accessed at:
https://phc.amedd.army.mil/topics/healthyliving/wh/Pages/default.aspx

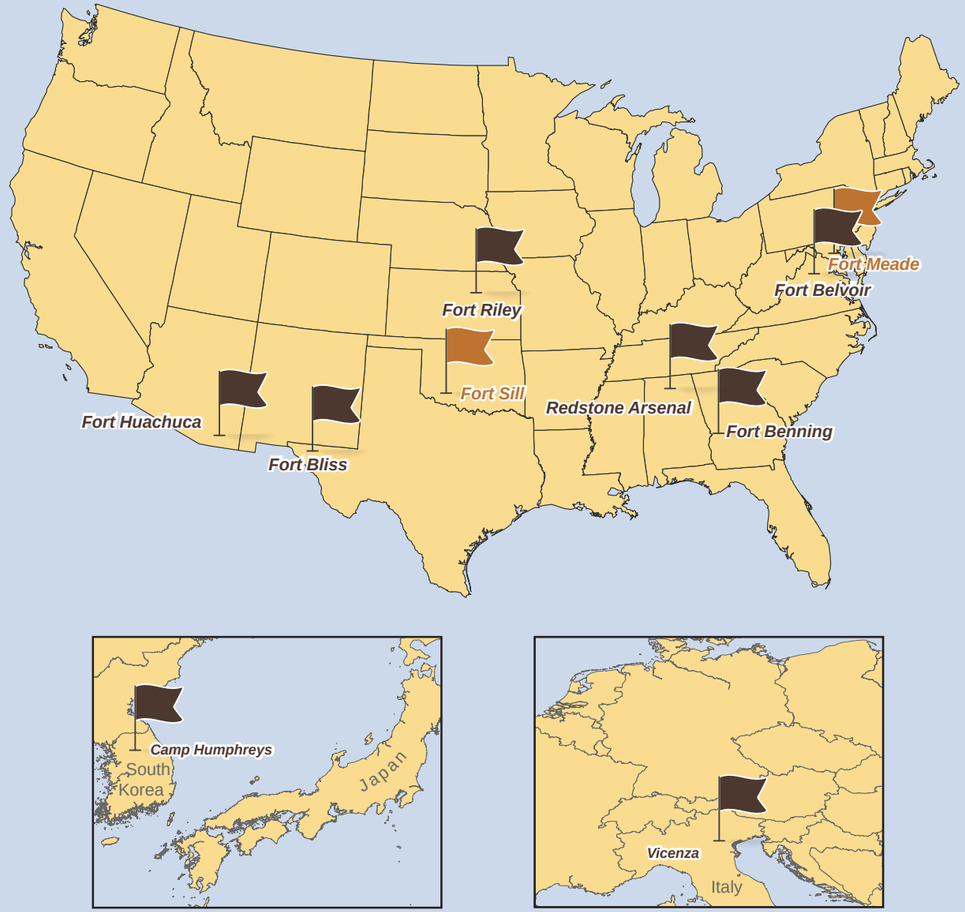
References:
1 DOD. 2016. *Advisory Committee on Women in the Services (DACOWITS) 2016 Report.* Retrieved from http://dacowits.defense.gov/Portals/48/Documents/Reports/2016/Annual%20Report/2016%20DACOWITS%20Report_Final.pdf

SPOTLIGHT

HEALTHY ARMY COMMUNITIES (HAC)



In FY18, HAC will launch several innovations at **8 demonstration sites** supported by **2 legacy Healthy Base Initiative sites** (Fort Sill and Fort Meade).



The community where we live, work, and play can influence all aspects of our lives, including our health. For example, studies have shown that people who live in walk- and bike-friendly communities are more likely to be physically active. Similarly, people who live in food deserts are more likely to have poor diets, whereas people with access to healthy foods are likely to have better diets. While education and interventions can help individuals, community changes are needed to sustain and support a healthy lifestyle.

The Army wants to encourage and sustain healthy lifestyles to support readiness, resiliency, retention, and recruitment. The IMCOM is leading an initiative called Healthy Army Communities in partnerships with the APHC, the Joint Culinary Center of Excellence (JCCoE), G-4 Logistics for Dining Facilities, The Exchange, and the Defense Commissary Agency (DeCA). HAC is a coordinated Army-wide effort to improve the health and wellness of the total Army community, including Active Duty and Reserve Soldiers, Civilians, Retirees and Family Members. It focuses on leveraging existing best practices to change the installation environment to make the healthy choice the easy choice.

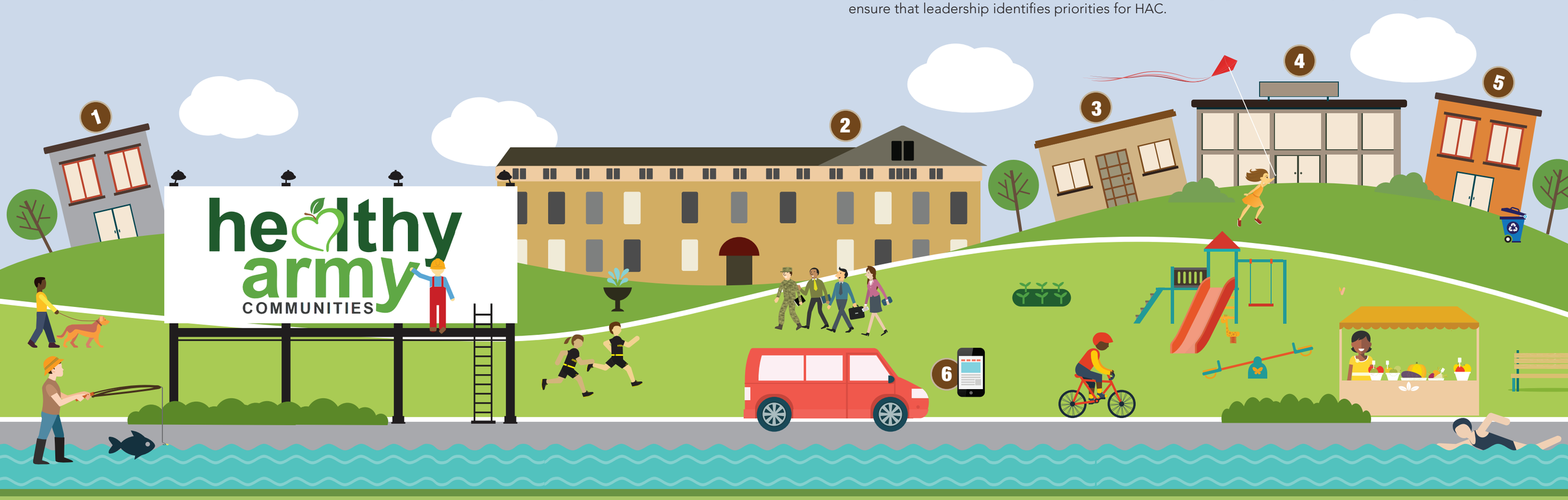
HAC is committed to transforming Army installations. In FY18, it will launch several innovations at eight demonstration sites supported by two legacy Healthy Base Initiative sites (Fort Sill and Fort Meade) (*see figure above*).

HEALTHY ARMY COMMUNITIES INTERVENTIONS

Agency leaders are partnering with installation representatives to implement strategies that will promote healthy eating, active living, and culture change. Based on its specific needs and capabilities, each HAC demonstration site will identify several HAC strategies on which to focus its efforts, with special attention to the sustainability of the innovations. The following infographic depicts examples of HAC initiatives supported by various enterprise-level agencies.

MEDCOM SUPPORTING HEALTHY ARMY COMMUNITIES

MEDCOM is supporting HAC in several ways. The APHC has updated both the military Promoting Active Communities (m-PAC) tool and the military Nutrition Environment Assessment Tool (m-NEAT). The m-PAC and m-NEAT scores will be entered into the Strategic Management System (SMS) and rolled up into a HAC dashboard for garrison leadership. Additionally, HAC will leverage Community Health Promotion Councils to minimize duplication of efforts, engage the community in HAC programs, and ensure that leadership identifies priorities for HAC.



1. Joint Culinary Center of Excellence

- Brand development for Dining Facilities (DFAC), including food trucks
- New healthy recipes in DFACs
- Adopt-a-Chef program
- Go For Green®
- Grab-and-Go healthy meals in DFACs

2. U.S. Army Public Health Center

- Military Nutrition Environment Assessment Tool (m-NEAT) 2.0*
- Military Promoting Active Communities (m-PAC) 2.0*
- Community Health Promotion Council integration of HAC SMS dashboard
- Performance Triad for Total Army Family via Army Wellness Centers
- Inclusion of HAC efforts in the Community Resource Guide*

3. The Exchange

- Incorporation of new healthy brands, such as Au Bon Pain® and Freshëns®
- Digital menu board with calorie information
- Enhanced marketing of BeFit food and beverages in Express outlets and with prepared foods
- 100% healthy vending machines
- Healthy food trucks

*See page 106 for more detail

4. Defense Commissary Agency

- Food labeling program
- Nutritious pre-packaged home meal replacements
- Shopping tours
- Cooking classes
- Dietitian-approved meal solutions
- Grab-n-Go kiosks
- Deli menu enhancements

5. Family and Morale, Welfare, and Recreation

- Charging stations
- Strong B.A.N.D.S.**
- Presidential Youth Fitness Program
- Fitness Activity Measurement in CDC
- Digital menu boards with calorie information
- 25% healthy menu requirements policy
- BeFit standardized recipe book

6. Joint Initiatives

- Healthy Dining app
- Food delivery partnerships between DeCA and MWR
- Health staff training for MWR restaurants
- Repurposing closed DFAC space for MWR/Exchange
- Prescription coupons from wellness staff redeemable at commissaries

**Strong Balance, Activity, Nutrition, Determination and Strength

MEDCOM SUPPORTING HEALTHY ARMY COMMUNITIES (continued)

Military Promoting Active Communities Tool

The m-PAC is an assessment tool that evaluates built environment components in support of active living on Army installations. The m-PAC incorporates best practices of community active living design and looks at the existence and condition of street networks, pedestrian and bicycle infrastructure, public transportation, and environmental support features. These concepts are discussed and planned for in Area Development Plan (ADP) workshops, which are part of an IMCOM G-4 planning process. During these ADP workshops, the installation's DPW and stakeholders discuss demolition, renovation, and construction projects within a specific area of the installation. Through HAC, the m-PAC will be incorporated into the IMCOM ADP Workshops. The goal is to identify and execute short- and long-term changes needed to develop Army installations into active living communities. The APHC will conduct a feasibility study of this process as part of the HAC Innovation Demonstration Project to ensure that the m-PAC is a valuable and impactful addition to the ADP.

Military Nutrition Environment Assessment Tool

The m-NEAT is an assessment tool designed to evaluate an installation's environment and policies related to promoting and supporting healthy eating within the workplace, community, and school settings. The m-NEAT 2.0 is aligned with the updated Food Service Guidelines for Federal Facilities (FSG), emphasizing a behavioral design approach to promoting a healthier food environment on military installations. The m-NEAT 2.0 assesses and scores the food environment using five key constructs: Food Policy, Food Availability, Choice Architecture, Food Labeling, and Food Pricing. Because m-NEAT is maintained in a common data repository, installations can access it over time and develop short-, medium-, and long-term goals for improvement. Results are communicated and displayed through the SMS dashboard. Based on the results, stakeholders at each installation will design action plans for improving the nutrition environment over the upcoming year.

Community Health Promotion Councils

Healthy Army Communities will be briefed through the CHPC to ensure HAC is a priority for senior leadership and the installation. CHPC facilitators will support the local HAC initiatives and coordinate outcomes from activities for inclusion in the CHPC Impact Tracker. HAC resources will be marketed through the Installation Community Resource Guide to ensure saturation of the market across medical, garrison, and mission stakeholders. The Community Resource Guide provides contact information for a variety of health, wellness, and quality of life services. **For more information about the Community Resource Guide, please visit https://www.crg.amedd.army.mil.**

For more information about HAC, please visit
https://www.armymwr.com/programs-and-services/resources/healthy-army-communities/

Installation Health Index (IHI)

Health indices are widely used to gauge the overall health of populations. They offer an evidence-based tool for comparing a broad range of health metrics across communities and can help inform community health needs assessments. Indices are also useful for ranking, which has proven effective in stimulating community interest and driving health improvement. To facilitate comparisons among the overall health of installations, the Installation Profile Summary pages provide an IHI percentile score for each installation. Higher percentile scores indicate better overall Soldier health status at a given installation.

A subset of the health metrics in this report were prioritized as health metrics for the AC Soldier population based on the prevalence of the condition or factor, its potential health or readiness impact, its preventability, its importance to Army leadership, the validity of the data, and the supporting evidence. The IHI percentile scores are derived from the following metrics:

- Injury incidence
- Behavioral health disorders
- Sleep disorders
- Chronic disease
- Obesity (BMI)
- Tobacco use
- Substance use disorders
- Sexually Transmitted Infections

In generating an installation health index, the eight selected metrics were standardized to the Army average using Z-scores. When possible, metrics were adjusted by age and gender prior to the standardization to allow more valid comparisons. The metrics were weighted and then collated into an overall IHI. The IHI percentile score represents how well an installation performed as compared to all other ranked installations. **The assessment revealed a rather homogeneous AC Force in terms of health; the vast majority of installations scored within one standard deviation of each other.**

While indices provide a comprehensive measure of health which may help identify populations that could potentially benefit from enhanced public health prevention measures, examining only the aggregate indices may not reveal some of the driving factors. Healthcare decision makers must further review the individual health metrics that comprise the index in order to identify and effectively target the key outcomes or behaviors that are the most significant health and readiness detractors for each installation.

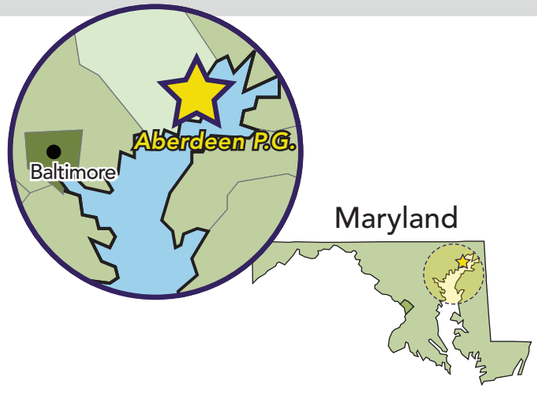
See Installation Profile Summary Pages for IHI scores and Appendix I for additional details regarding methodology.

INSTALLATION PROFILE SUMMARIES

United States

Fort Irwin
California

Aberdeen Proving Ground



Installation Profile (2016)

Population: Approximately 1,200 AC Soldiers:
45.3% under 35 years old, 19.4% female
Main Healthcare Facility: Kirk Army Health Clinic
Affiliated County: Harford

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	2,123	1,399	1,097–2,123
Behavioral health diagnoses (%)	28.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	26.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	33.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	25.8	17.3	7.9–25.8
Tobacco use (%)	16.8	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	ND***	20.5	9.0–35.4
Installation Health Index Percentile Range	*<10th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
*** Rates based on <20 cases are not displayed and were excluded from the ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.9
Army average: 68.4
Army range: 66.3–72.6

Score: 83.6
Army average: 83.6
Army range: 81.4–85.5

Score: 71.2
Army average: 71.4
Army range: 68.0–73.7

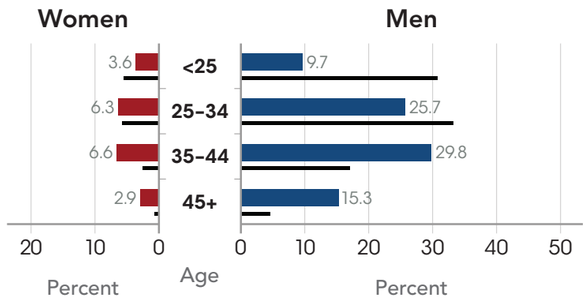
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
12 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Belvoir

Installation Profile (2016)

Population: Approximately 3,350 AC Soldiers:
46.1% under 35 years old, 22.9% female
Main Healthcare Facility: Fort Belvoir Community Hospital
Affiliated County: Fairfax

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,557	1,399	1,097–2,123
Behavioral health diagnoses (%)	27.6	20.4	14.7–28.9
Sleep disorder diagnoses (%)	25.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	23.0	12.7	8.2–33.8
Health Factors			
Obesity (%)	25.5	17.3	7.9–25.8
Tobacco use (%)	12.0	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	17.2	20.5	9.0–35.4
Installation Health Index Percentile Range	*<10th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.9
Army average: 68.4
Army range: 66.3–72.6

Score: 83.4
Army average: 83.6
Army range: 81.4–85.5

Score: 71.3
Army average: 71.4
Army range: 68.0–73.7

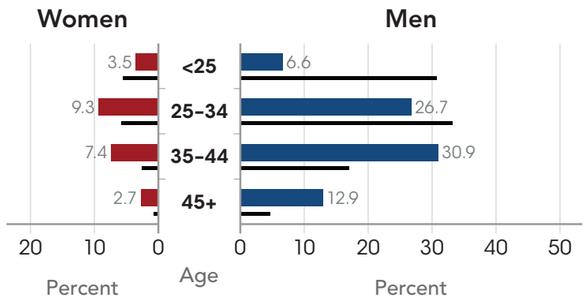
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
6 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Benning

Installation Profile (2016)

Population: Approximately 18,450 AC Soldiers:
83.9% under 35 years old, 6.0% female
Main Healthcare Facility: Martin Army Community Hospital
Affiliated Counties: Chattahoochee and Muscogee, GA

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,439	1,399	1,097–2,123
Behavioral health diagnoses (%)	16.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	10.9	12.7	8.2–33.8
Health Factors			
Obesity (%)	12.0	17.3	7.9–25.8
Tobacco use (%)	31.6	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.5	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	12.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*20–29th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.0
Army average: 68.4
Army range: 66.3–72.6

Score: 84.4
Army average: 83.6
Army range: 81.4–85.5

Score: 72.3
Army average: 71.4
Army range: 68.0–73.7

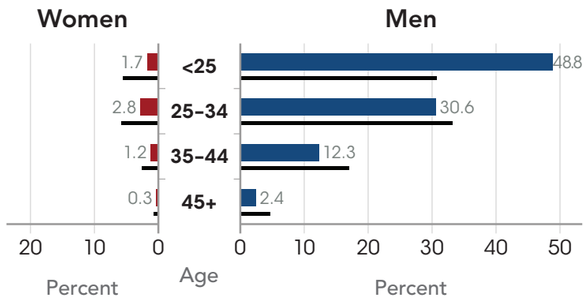
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days *Army average: 6*
Army range: 0–58

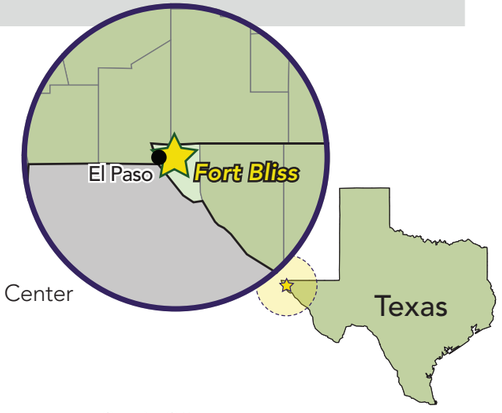
Likelihood of Vector Mosquitoes¶
Low

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Bliss



Installation Profile (2016)

Population: Approximately 25,600 AC Soldiers:
78.3% under 35 years old, 14.2% female
Main Healthcare Facility: William Beaumont Army Medical Center
Affiliated County: El Paso

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE **
Health Outcomes			
Injury incidence (rate per 1,000)	1,229	1,399	1,097–2,123
Behavioral health diagnoses (%)	22.4	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.9	14.4	7.7–26.0
Chronic disease diagnoses (%)	11.1	12.7	8.2–33.8
Health Factors			
Obesity (%)	15.3	17.3	7.9–25.8
Tobacco use (%)	27.8	26.4	7.3–35.8
Substance use disorder diagnoses (%)	6.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	31.0	20.5	9.0–35.4
Installation Health Index Percentile Range	*50–59th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.0
Army average: 68.4
Army range: 66.3–72.6

Score: 83.6
Army average: 83.6
Army range: 81.4–85.5

Score: 69.9
Army average: 71.4
Army range: 68.0–73.7

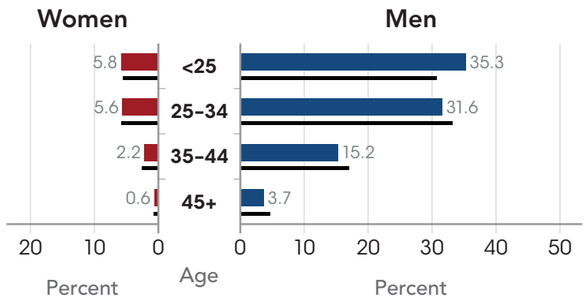
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
6 days *Army average: 6*
Army range: 0–58

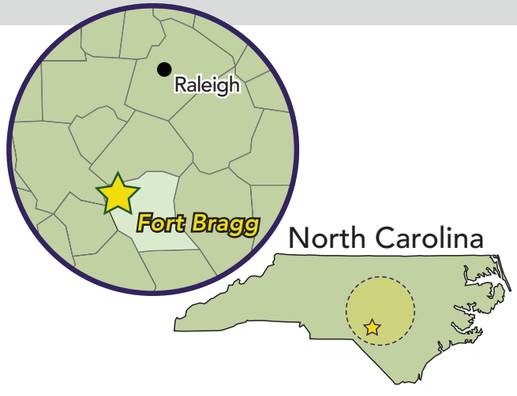
Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Bragg



Installation Profile (2016)

Population: Approximately 44,800 AC Soldiers:
77.1% under 35 years old, 11.9% female
Main Healthcare Facility: Womack Army Medical Center
Affiliated County: Cumberland

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,118	1,399	1,097–2,123
Behavioral health diagnoses (%)	15.2	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.1	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	19.1	17.3	7.9–25.8
Tobacco use (%)	27.3	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	17.4***	20.5	9.0–35.4
Installation Health Index Percentile Range	*≥90th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
***Rate considered conservative based on case finding estimates below 50%; measure excluded from ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.4
Army average: 68.4
Army range: 66.3–72.6

Score: 83.1
Army average: 83.6
Army range: 81.4–85.5

Score: 70.4
Army average: 71.4
Army range: 68.0–73.7

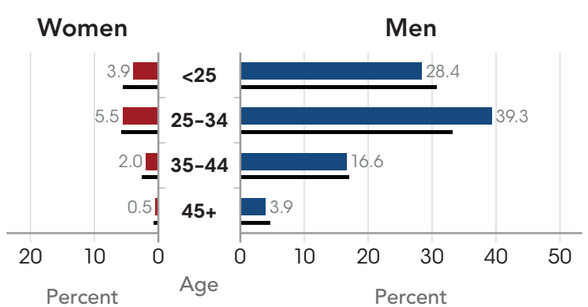
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Campbell

Installation Profile (2016)

Population: Approximately 27,300 AC Soldiers:
82.4% under 35 years old, 10.8% female
Main Healthcare Facility: Blanchfield Army Community Hospital
Affiliated Counties: Montgomery, TN and Christian, KY

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,211	1,399	1,097–2,123
Behavioral health diagnoses (%)	17.6	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.8	14.4	7.7–26.0
Chronic disease diagnoses (%)	8.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	17.7	17.3	7.9–25.8
Tobacco use (%)	34.7	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.5	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	9.0***	20.5	9.0–35.4
Installation Health Index Percentile Range	*80–89th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
***Rate considered conservative based on case finding estimates below 50%; measure excluded from ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.0
Army average: 68.4
Army range: 66.3–72.6

Score: 83.7
Army average: 83.6
Army range: 81.4–85.5

Score: 69.9
Army average: 71.4
Army range: 68.0–73.7

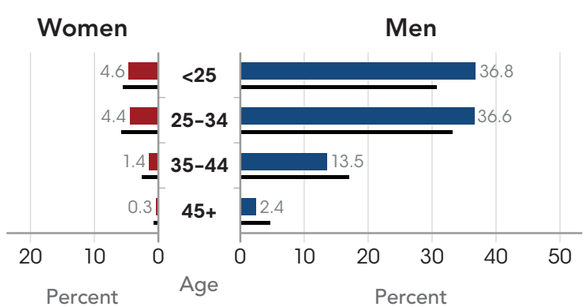
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days *Army average: 6*
Army range: 0–58

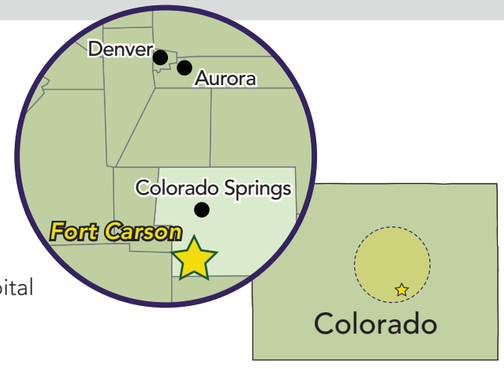
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Carson



Installation Profile (2016)

Population: Approximately 24,100 AC Soldiers:
81.9% under 35 years old, 12.6% female
Main Healthcare Facility: Evans Army Community Hospital
Affiliated County: El Paso

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,227	1,399	1,097–2,123
Behavioral health diagnoses (%)	19.3	20.4	14.7–28.9
Sleep disorder diagnoses (%)	12.5	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.6	12.7	8.2–33.8
Health Factors			
Obesity (%)	14.9	17.3	7.9–25.8
Tobacco use (%)	32.4	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.6	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	29.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*70–79th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.9
Army average: 68.4
Army range: 66.3–72.6

Score: 84.0
Army average: 83.6
Army range: 81.4–85.5

Score: 70.8
Army average: 71.4
Army range: 68.0–73.7

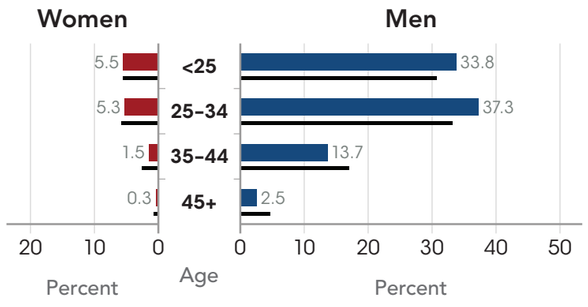
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
2 days *Army average: 6*
Army range: 0–58

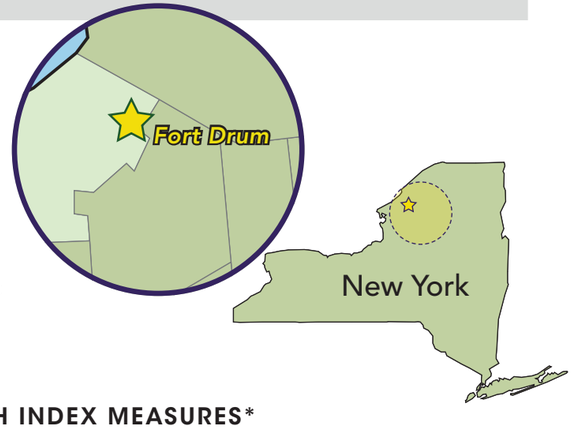
Likelihood of Vector Mosquitoes¶
Low

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Drum



Installation Profile (2016)

Population: Approximately 14,850 AC Soldiers:
83.4% under 35 years old, 10.6% female
Main Healthcare Facility: Guthrie Army Health Clinic
Affiliated County: Jefferson

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,387	1,399	1,097–2,123
Behavioral health diagnoses (%)	19.7	20.4	14.7–28.9
Sleep disorder diagnoses (%)	12.5	14.4	7.7–26.0
Chronic disease diagnoses (%)	10.5	12.7	8.2–33.8
Health Factors			
Obesity (%)	19.5	17.3	7.9–25.8
Tobacco use (%)	31.9	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	17.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*30–39th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.1
Army average: 68.4
Army range: 66.3–72.6

Score: 84.1
Army average: 83.6
Army range: 81.4–85.5

Score: 70.9
Army average: 71.4
Army range: 68.0–73.7

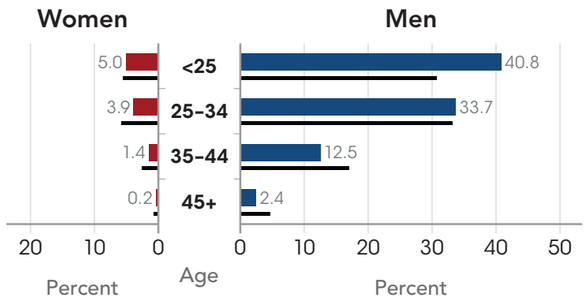
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
2 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Negligible

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Gordon

Installation Profile (2016)

Population: Approximately 8,750 AC Soldiers: 72.3% under 35 years old, 20.0% female
Main Healthcare Facility: Dwight D. Eisenhower Army Medical Center
Affiliated County: Richmond

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,522	1,399	1,097–2,123
Behavioral health diagnoses (%)	21.7	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.3	14.4	7.7–26.0
Chronic disease diagnoses (%)	14.1	12.7	8.2–33.8
Health Factors			
Obesity (%)	25.0	17.3	7.9–25.8
Tobacco use (%)	15.9	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	13.9	20.5	9.0–35.4
Installation Health Index Percentile Range	*40–49th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.1
Army average: 68.4
Army range: 66.3–72.6

Score: 83.1
Army average: 83.6
Army range: 81.4–85.5

Score: 69.2
Army average: 71.4
Army range: 68.0–73.7

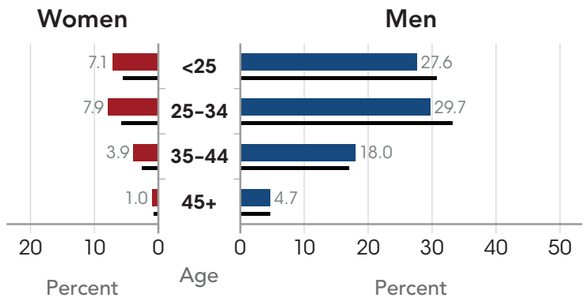
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
6 days *Army average: 6* *Army range: 0–58*

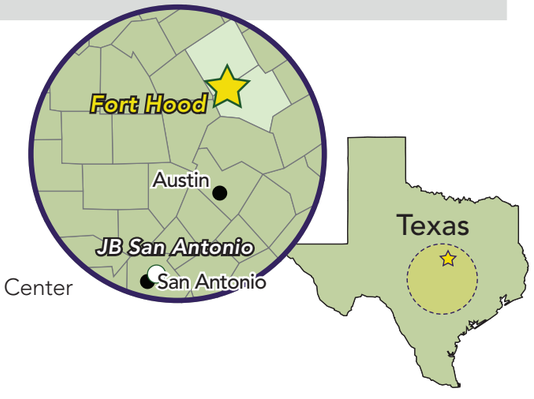
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Hood



Installation Profile (2016)

Population: Approximately 29,850 AC Soldiers: 78.7% under 35 years old, 15.8% female
Main Healthcare Facility: Carl R. Darnall Army Medical Center
Affiliated County: Bell

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,491	1,399	1,097–2,123
Behavioral health diagnoses (%)	27.2	20.4	14.7–28.9
Sleep disorder diagnoses (%)	19.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	13.7	12.7	8.2–33.8
Health Factors			
Obesity (%)	20.7	17.3	7.9–25.8
Tobacco use (%)	28.6	26.4	7.3–35.8
Substance use disorder diagnoses (%)	8.3	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	34.7	20.5	9.0–35.4
Installation Health Index Percentile Range	*<10th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 67.2
Army average: 68.4
Army range: 66.3–72.6

Score: 82.6
Army average: 83.6
Army range: 81.4–85.5

Score: 68.9
Army average: 71.4
Army range: 68.0–73.7

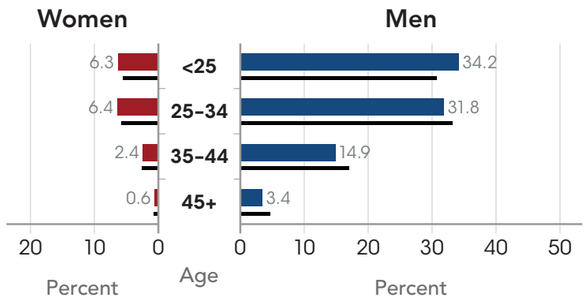
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days *Army average: 6* *Army range: 0–58*

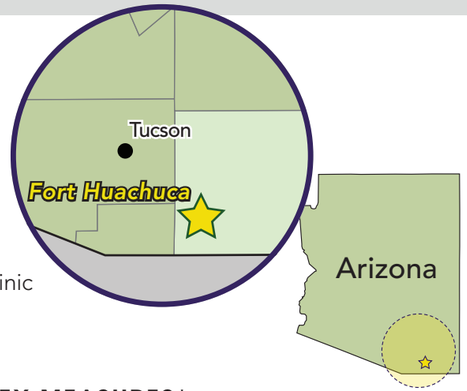
Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Huachuca



Installation Profile (2016)

Population: Approximately 3,800 AC Soldiers:
74.0% under 35 years old, 16.5% female
Main Healthcare Facility: Raymond W. Bliss Army Health Clinic
Affiliated County: Cochise

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,564	1,399	1,097–2,123
Behavioral health diagnoses (%)	15.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	15.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	9.7	17.3	7.9–25.8
Tobacco use (%)	17.1	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	15.9	20.5	9.0–35.4
Installation Health Index Percentile Range	*70–79th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.1
Army average: 68.4
Army range: 66.3–72.6

Score: 83.5
Army average: 83.6
Army range: 81.4–85.5

Score: 70.0
Army average: 71.4
Army range: 68.0–73.7

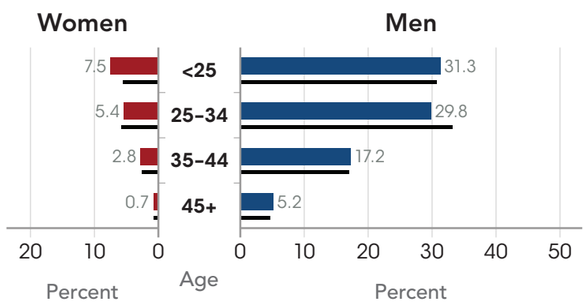
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
1 day *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Irwin

Installation Profile (2016)

Population: Approximately 3,950 AC Soldiers:
74.7% under 35 years old, 13.6% female
Main Healthcare Facility: Weed Army Community Hospital
Affiliated County: San Bernardino

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,682	1,399	1,097–2,123
Behavioral health diagnoses (%)	23.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.2	14.4	7.7–26.0
Chronic disease diagnoses (%)	14.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	18.9	17.3	7.9–25.8
Tobacco use (%)	28.5	26.4	7.3–35.8
Substance use disorder diagnoses (%)	6.3	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	17.5***	20.5	9.0–35.4
Installation Health Index Percentile Range	*10–19th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
*** Rate considered conservative based on case finding estimates below 50%; measure excluded from ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.2
Army average: 68.4
Army range: 66.3–72.6

Score: 81.8
Army average: 83.6
Army range: 81.4–85.5

Score: 70.6
Army average: 71.4
Army range: 68.0–73.7

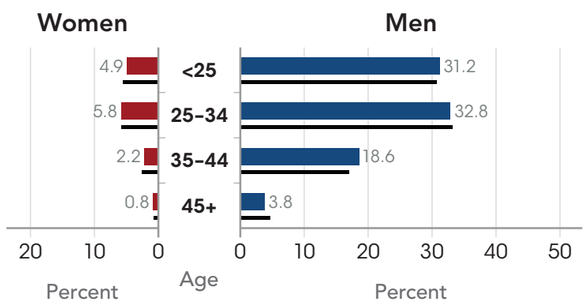
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
25 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Jackson

Installation Profile (2016)

Population: Approximately 8,600 AC Soldiers: 83.6% under 35 years old, 26.9% female
Main Healthcare Facility: Moncrief Army Health Clinic
Affiliated County: Richland

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,665	1,399	1,097–2,123
Behavioral health diagnoses (%)	17.0	20.4	14.7–28.9
Sleep disorder diagnoses (%)	7.7	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.7	12.7	8.2–33.8
Health Factors			
Obesity (%)	10.7	17.3	7.9–25.8
Tobacco use (%)	15.1	26.4	7.3–35.8
Substance use disorder diagnoses (%)	1.8	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	23.0	20.5	9.0–35.4
Installation Health Index Percentile Range	*60–69th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.1
Army average: 68.4
Army range: 66.3–72.6

Score: 85.0
Army average: 83.6
Army range: 81.4–85.5

Score: 70.4
Army average: 71.4
Army range: 68.0–73.7

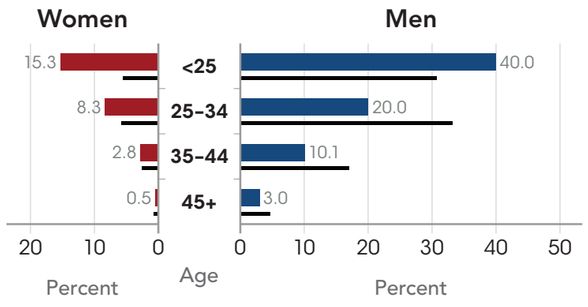
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
5 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Knox

Installation Profile (2016)

Population: Approximately 4,500 AC Soldiers: 67.3% under 35 years old, 20.2% female
Main Healthcare Facility: Ireland Army Community Hospital
Affiliated County: Hardin

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,542	1,399	1,097–2,123
Behavioral health diagnoses (%)	22.0	20.4	14.7–28.9
Sleep disorder diagnoses (%)	19.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	21.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	21.3	17.3	7.9–25.8
Tobacco use (%)	22.3	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.9	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	15.4	20.5	9.0–35.4
Installation Health Index Percentile Range	*30–39th percentile‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.2
Army average: 68.4
Army range: 66.3–72.6

Score: 82.3
Army average: 83.6
Army range: 81.4–85.5

Score: 68.9
Army average: 71.4
Army range: 68.0–73.7

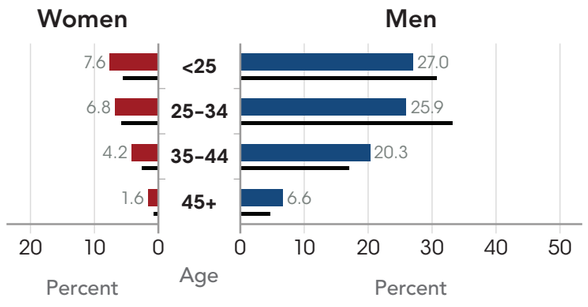
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
1 day *Army average: 6*
Army range: 0–58

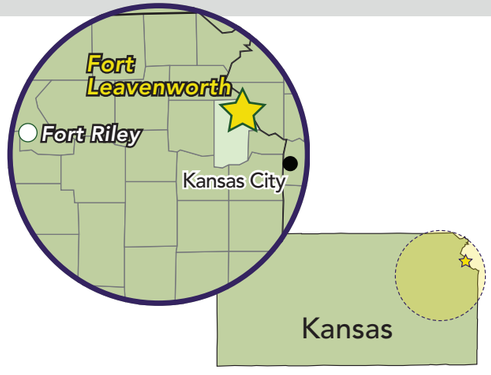
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Leavenworth



Installation Profile (2016)

Population: Approximately 3,300 AC Soldiers:
49.7% under 35 years old, 17.4% female
Main Healthcare Facility: Munson Army Health Center
Affiliated County: Leavenworth

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,830	1,399	1,097–2,123
Behavioral health diagnoses (%)	21.3	20.4	14.7–28.9
Sleep disorder diagnoses (%)	17.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	21.1	12.7	8.2–33.8
Health Factors			
Obesity (%)	18.0	17.3	7.9–25.8
Tobacco use (%)	18.0	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.2	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	15.5	20.5	9.0–35.4
Installation Health Index Percentile Range	*20–29th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 71.5
Army average: 68.4
Army range: 66.3–72.6

Score: 82.7
Army average: 83.6
Army range: 81.4–85.5

Score: 69.6
Army average: 71.4
Army range: 68.0–73.7

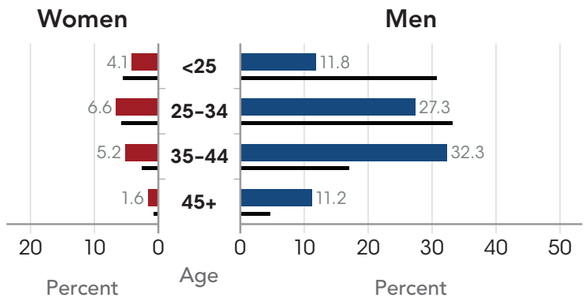
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days *Army average: 6*
Army range: 0–58

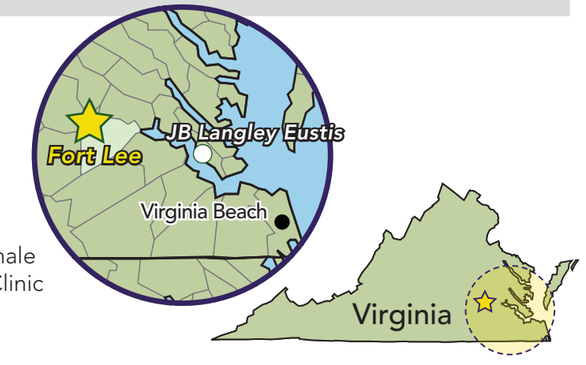
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Lee



Installation Profile (2016)

Population: Approximately 7,050 AC Soldiers:
75.1% under 35 years old, 23.1% female
Main Healthcare Facility: Kenner Army Health Clinic
Affiliated County: Prince George

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,571	1,399	1,097–2,123
Behavioral health diagnoses (%)	18.3	20.4	14.7–28.9
Sleep disorder diagnoses (%)	12.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	14.4	12.7	8.2–33.8
Health Factors			
Obesity (%)	15.2	17.3	7.9–25.8
Tobacco use (%)	15.7	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	12.6	20.5	9.0–35.4
Installation Health Index Percentile Range	*30–39th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 67.2
Army average: 68.4
Army range: 66.3–72.6

Score: 81.4
Army average: 83.6
Army range: 81.4–85.5

Score: 68.7
Army average: 71.4
Army range: 68.0–73.7

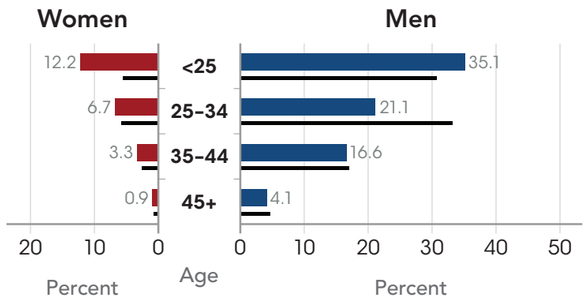
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND *Army average: 6*
Army range: 0–58

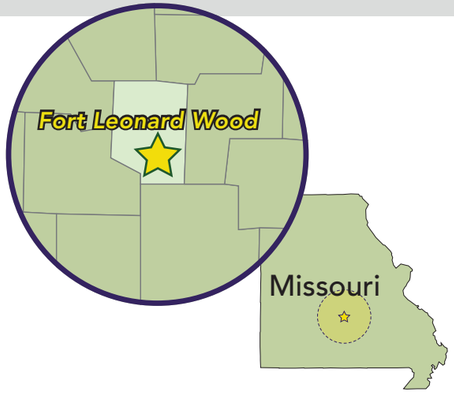
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Leonard Wood



Installation Profile (2016)

Population: Approximately 9,000 AC Soldiers: 81.4% under 35 years old, 18.8% female
Main Healthcare Facility: General Leonard Wood Army Community Hospital
Affiliated County: Pulaski

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,739	1,399	1,097–2,123
Behavioral health diagnoses (%)	19.7	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.2	14.4	7.7–26.0
Chronic disease diagnoses (%)	11.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	13.9	17.3	7.9–25.8
Tobacco use (%)	19.2	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	12.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*20–29th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.7
Army average: 68.4
Army range: 66.3–72.6

Score: 84.3
Army average: 83.6
Army range: 81.4–85.5

Score: 69.6
Army average: 71.4
Army range: 68.0–73.7

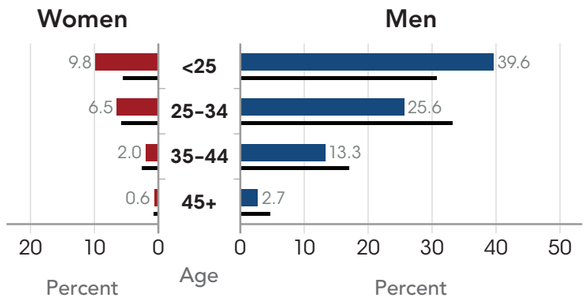
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND *Army average: 6*
Army range: 0–58

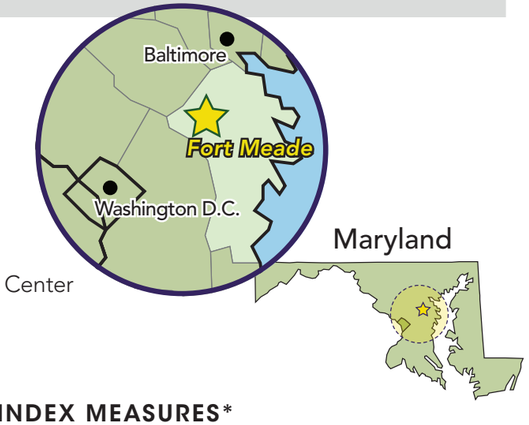
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Meade



Installation Profile (2016)

Population: Approximately 4,100 AC Soldiers: 60.6% under 35 years old, 19.3% female
Main Healthcare Facility: Kimbrough Ambulatory Care Center
Affiliated County: Anne Arundel

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,514	1,399	1,097–2,123
Behavioral health diagnoses (%)	24.2	20.4	14.7–28.9
Sleep disorder diagnoses (%)	17.7	14.4	7.7–26.0
Chronic disease diagnoses (%)	16.7	12.7	8.2–33.8
Health Factors			
Obesity (%)	23.3	17.3	7.9–25.8
Tobacco use (%)	13.2	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.7	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	9.6	20.5	9.0–35.4
Installation Health Index Percentile Range	*50–59th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 71.4
Army average: 68.4
Army range: 66.3–72.6

Score: 84.8
Army average: 83.6
Army range: 81.4–85.5

Score: 72.4
Army average: 71.4
Army range: 68.0–73.7

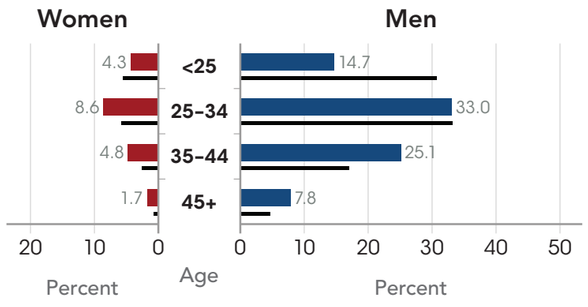
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
8 days *Army average: 6*
Army range: 0–58

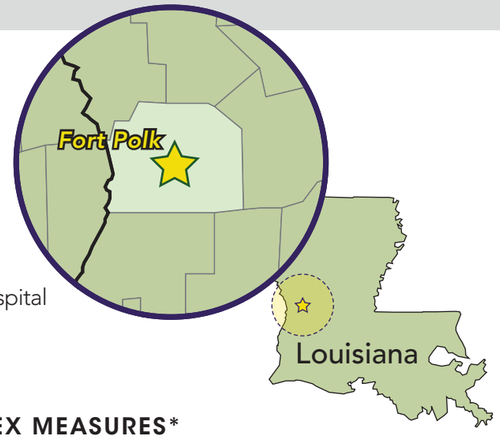
Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Polk



Installation Profile (2016)

Population: Approximately 7,700 AC Soldiers:
78.8% under 35 years old, 11.1% female
Main Healthcare Facility: Bayne-Jones Army Community Hospital
Affiliated County: Vernon Parish

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,417	1,399	1,097–2,123
Behavioral health diagnoses (%)	22.3	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.5	14.4	7.7–26.0
Chronic disease diagnoses (%)	13.7	12.7	8.2–33.8
Health Factors			
Obesity (%)	11.6	17.3	7.9–25.8
Tobacco use (%)	34.2	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.5	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	22.1	20.5	9.0–35.4
Installation Health Index Percentile Range	*10–19th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.9
Army average: 68.4
Army range: 66.3–72.6

Score: 82.7
Army average: 83.6
Army range: 81.4–85.5

Score: 69.5
Army average: 71.4
Army range: 68.0–73.7

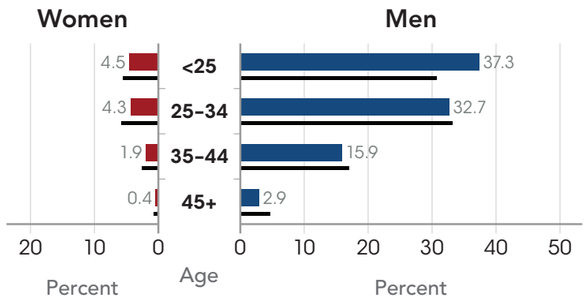
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Riley

Installation Profile (2016)

Population: Approximately 15,950 AC Soldiers:
82.3% under 35 years old, 12.1% female
Main Healthcare Facility: Irwin Army Community Hospital
Affiliated County: Riley

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,279	1,399	1,097–2,123
Behavioral health diagnoses (%)	20.5	20.4	14.7–28.9
Sleep disorder diagnoses (%)	12.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	11.6	12.7	8.2–33.8
Health Factors			
Obesity (%)	16.6	17.3	7.9–25.8
Tobacco use (%)	30.7	26.4	7.3–35.8
Substance use disorder diagnoses (%)	6.6	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	28.2	20.5	9.0–35.4
Installation Health Index Percentile Range	*40–49th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.2
Army average: 68.4
Army range: 66.3–72.6

Score: 84.3
Army average: 83.6
Army range: 81.4–85.5

Score: 68.7
Army average: 71.4
Army range: 68.0–73.7

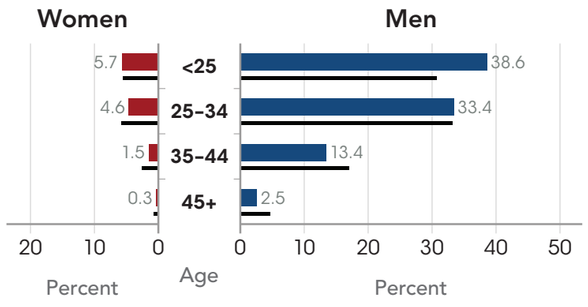
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Rucker

Installation Profile (2016)

Population: Approximately 3,400 AC Soldiers: 67.1% under 35 years old, 12.9% female
Main Healthcare Facility: Lyster Army Health Clinic
Affiliated County: Dale

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,544	1,399	1,097–2,123
Behavioral health diagnoses (%)	15.0	20.4	14.7–28.9
Sleep disorder diagnoses (%)	18.3	14.4	7.7–26.0
Chronic disease diagnoses (%)	15.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	12.3	17.3	7.9–25.8
Tobacco use (%)	14.4	26.4	7.3–35.8
Substance use disorder diagnoses (%)	2.3	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	13.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*≥90th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 71.5
Army average: 68.4
Army range: 66.3–72.6

Score: 85.0
Army average: 83.6
Army range: 81.4–85.5

Score: 71.4
Army average: 71.4
Army range: 68.0–73.7

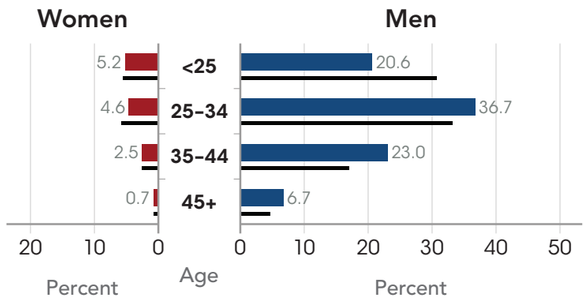
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND
Army average: 6
Army range: 0–58

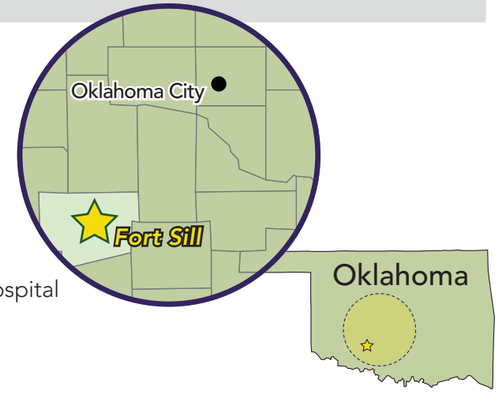
Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Sill



Installation Profile (2016)

Population: Approximately 10,500 AC Soldiers: 81.8% under 35 years old, 17.0% female
Main Healthcare Facility: Reynolds Army Community Hospital
Affiliated County: Comanche

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,420	1,399	1,097–2,123
Behavioral health diagnoses (%)	24.5	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.7	14.4	7.7–26.0
Chronic disease diagnoses (%)	11.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	17.9	17.3	7.9–25.8
Tobacco use (%)	26.6	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.4	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	18.4	20.5	9.0–35.4
Installation Health Index Percentile Range	*10–19th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 66.7
Army average: 68.4
Army range: 66.3–72.6

Score: 83.5
Army average: 83.6
Army range: 81.4–85.5

Score: 68.5
Army average: 71.4
Army range: 68.0–73.7

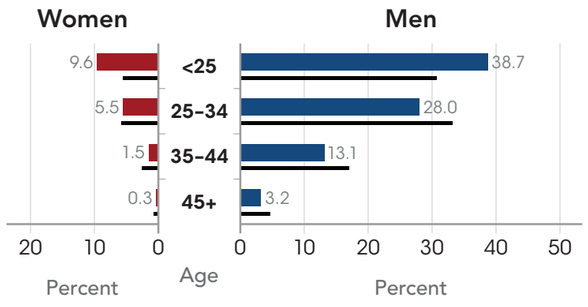
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
0 days
Army average: 6
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Stewart

Installation Profile (2016)

Population: Approximately 19,950 AC Soldiers: 80.8% under 35 years old, 14.6% female
Main Healthcare Facility: Winn Army Community Hospital
Affiliated County: Liberty

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,254	1,399	1,097–2,123
Behavioral health diagnoses (%)	22.4	20.4	14.7–28.9
Sleep disorder diagnoses (%)	13.1	14.4	7.7–26.0
Chronic disease diagnoses (%)	10.9	12.7	8.2–33.8
Health Factors			
Obesity (%)	18.5	17.3	7.9–25.8
Tobacco use (%)	31.7	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	21.7	20.5	9.0–35.4
Installation Health Index Percentile Range	*50–59th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 67.1
Army average: 68.4
Army range: 66.3–72.6

Score: 82.9
Army average: 83.6
Army range: 81.4–85.5

Score: 68.3
Army average: 71.4
Army range: 68.0–73.7

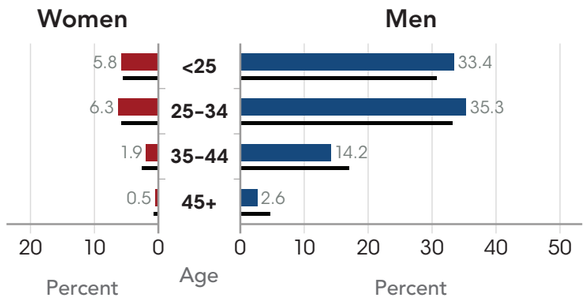
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
ND *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Fort Wainwright

Installation Profile (2016)

Population: Approximately 8,050 AC Soldiers: 86.5% under 35 years old, 9.3% female
Main Healthcare Facility: Bassett Army Community Hospital
Affiliated County: Fairbanks North Star Borough

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,210	1,399	1,097–2,123
Behavioral health diagnoses (%)	20.7	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.2	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.6	12.7	8.2–33.8
Health Factors			
Obesity (%)	17.2	17.3	7.9–25.8
Tobacco use (%)	35.8	26.4	7.3–35.8
Substance use disorder diagnoses (%)	6.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	11.5	20.5	9.0–35.4
Installation Health Index Percentile Range	*50–59th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.6
Army average: 68.4
Army range: 66.3–72.6

Score: 83.6
Army average: 83.6
Army range: 81.4–85.5

Score: 70.1
Army average: 71.4
Army range: 68.0–73.7

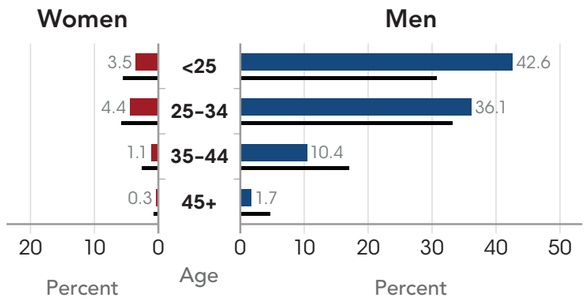
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
58 days *Army average: 6*
Army range: 0–58

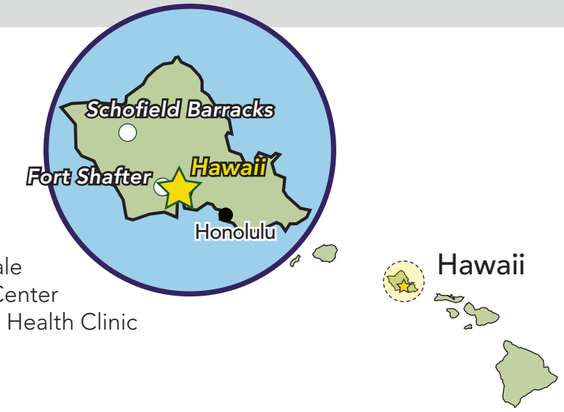
Likelihood of Vector Mosquitoes¶
Negligible

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Hawaii



Installation Profile (2016)

Population: Approximately 21,050 AC Soldiers: 76.0% under 35 years old, 18.0% female

Main Healthcare Facility: Tripler Army Medical Center and Schofield Barracks Health Clinic

Affiliated County: Honolulu

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,422	1,399	1,097–2,123
Behavioral health diagnoses (%)	20.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	12.6	12.7	8.2–33.8
Health Factors			
Obesity (%)	15.6	17.3	7.9–25.8
Tobacco use (%)	23.8	26.4	7.3–35.8
Substance use disorder diagnoses (%)	4.1	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	30.4	20.5	9.0–35.4
Installation Health Index Percentile Range	*60–69th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.6
Army average: 68.4
Army range: 66.3–72.6

Score: 84.0
Army average: 83.6
Army range: 81.4–85.5

Score: 70.9
Army average: 71.4
Army range: 68.0–73.7

ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year

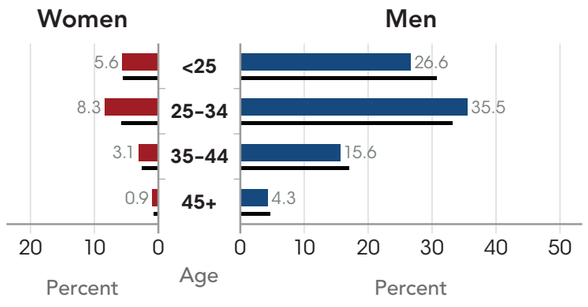
0 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶

Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



JB Elmendorf-Richardson

Installation Profile (2016)

Population: Approximately 3,400 AC Soldiers: 83.0% under 35 years old, 11.1% female

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

Affiliated County: Anchorage

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,485	1,399	1,097–2,123
Behavioral health diagnoses (%)	14.8	20.4	14.7–28.9
Sleep disorder diagnoses (%)	9.7	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	14.4	17.3	7.9–25.8
Tobacco use (%)	31.7	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.8	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	35.4	20.5	9.0–35.4
Installation Health Index Percentile Range	*70–79th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.0
Army average: 68.4
Army range: 66.3–72.6

Score: 83.0
Army average: 83.6
Army range: 81.4–85.5

Score: 70.9
Army average: 71.4
Army range: 68.0–73.7

ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year

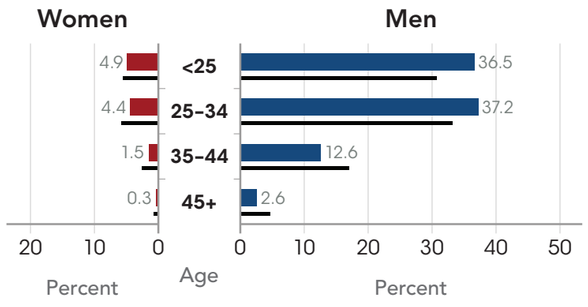
0 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶

Negligible

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



JB Langley-Eustis

Installation Profile (2016)

Population: Approximately 4,800 AC Soldiers:
68.4% under 35 years old, 16.1% female
Main Healthcare Facility: McDonald Army Health Clinic
Affiliated County: Newport News City

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,734	1,399	1,097–2,123
Behavioral health diagnoses (%)	26.2	20.4	14.7–28.9
Sleep disorder diagnoses (%)	15.5	14.4	7.7–26.0
Chronic disease diagnoses (%)	19.2	12.7	8.2–33.8
Health Factors			
Obesity (%)	22.7	17.3	7.9–25.8
Tobacco use (%)	22.1	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.1	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	19.2	20.5	9.0–35.4
Installation Health Index Percentile Range	*<10th percentile* ‡		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 69.9
Army average: 68.4
Army range: 66.3–72.6

Score: 82.7
Army average: 83.6
Army range: 81.4–85.5

Score: 70.8
Army average: 71.4
Army range: 68.0–73.7

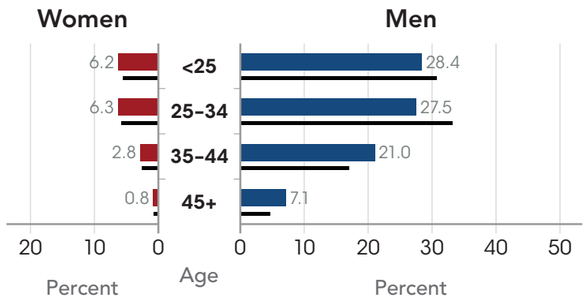
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
2 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Medium

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



JB Lewis-McChord

Installation Profile (2016)

Population: Approximately 27,300 AC Soldiers:
78.7% under 35 years old, 13.8% female
Main Healthcare Facility: Madigan Army Medical Center
Affiliated County: Pierce

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,333	1,399	1,097–2,123
Behavioral health diagnoses (%)	20.9	20.4	14.7–28.9
Sleep disorder diagnoses (%)	14.9	14.4	7.7–26.0
Chronic disease diagnoses (%)	11.0	12.7	8.2–33.8
Health Factors			
Obesity (%)	19.5	17.3	7.9–25.8
Tobacco use (%)	27.0	26.4	7.3–35.8
Substance use disorder diagnoses (%)	5.0	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	23.2	20.5	9.0–35.4
Installation Health Index Percentile Range	*50–59th percentile* ‡		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 68.3
Army average: 68.4
Army range: 66.3–72.6

Score: 83.8
Army average: 83.6
Army range: 81.4–85.5

Score: 70.0
Army average: 71.4
Army range: 68.0–73.7

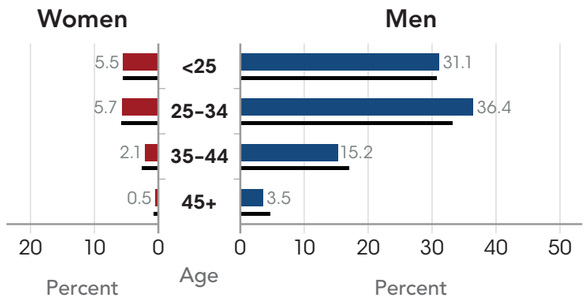
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
1 day *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
Negligible

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



JB Myer-Henderson Hall

Installation Profile (2016)

Population: Approximately 2,150 AC Soldiers:
77.7% under 35 years old, 10.1% female
Main Healthcare Facility: Andrew Rader Army Health Clinic
Affiliated County: Arlington

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,097	1,399	1,097–2,123
Behavioral health diagnoses (%)	22.1	20.4	14.7–28.9
Sleep disorder diagnoses (%)	10.6	14.4	7.7–26.0
Chronic disease diagnoses (%)	9.4	12.7	8.2–33.8
Health Factors			
Obesity (%)	14.5	17.3	7.9–25.8
Tobacco use (%)	20.9	26.4	7.3–35.8
Substance use disorder diagnoses (%)	7.8	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	21.9	20.5	9.0–35.4
Installation Health Index Percentile Range	*80–89th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 70.8
Army average: 68.4
Army range: 66.3–72.6

Score: 84.7
Army average: 83.6
Army range: 81.4–85.5

Score: 73.1
Army average: 71.4
Army range: 68.0–73.7

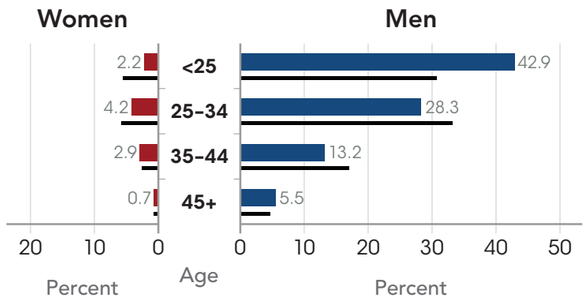
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
6 days *Army average: 6*
Army range: 0–58

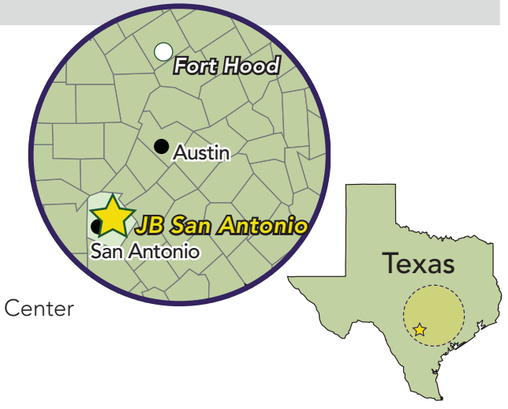
Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



JB San Antonio



Installation Profile (2016)

Population: Approximately 8,300 AC Soldiers:
59.5% under 35 years old, 28.1% female
Main Healthcare Facility: San Antonio Military Medical Center
Affiliated County: Bexar

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,495	1,399	1,097–2,123
Behavioral health diagnoses (%)	24.3	20.4	14.7–28.9
Sleep disorder diagnoses (%)	20.1	14.4	7.7–26.0
Chronic disease diagnoses (%)	19.8	12.7	8.2–33.8
Health Factors			
Obesity (%)	19.5	17.3	7.9–25.8
Tobacco use (%)	7.5	26.4	7.3–35.8
Substance use disorder diagnoses (%)	2.7	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	14.8	20.5	9.0–35.4
Installation Health Index Percentile Range	*70–79th percentile ‡*		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 66.7
Army average: 68.4
Army range: 66.3–72.6

Score: 83.2
Army average: 83.6
Army range: 81.4–85.5

Score: 69.3
Army average: 71.4
Army range: 68.0–73.7

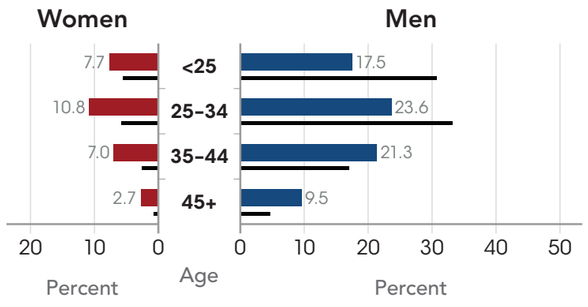
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
6 days *Army average: 6*
Army range: 0–58

Likelihood of Vector Mosquitoes¶
High

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



Presidio of Monterey

Installation Profile (2016)

Population: Approximately 1,300 AC Soldiers: 82.1% under 35 years old, 22.2% female
Main Healthcare Facility: Presidio of Monterey Army Health Clinic
Affiliated County: Monterey

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,308	1,399	1,097–2,123
Behavioral health diagnoses (%)	21.0	20.4	14.7–28.9
Sleep disorder diagnoses (%)	12.7	14.4	7.7–26.0
Chronic disease diagnoses (%)	12.7	12.7	8.2–33.8
Health Factors			
Obesity (%)	10.2	17.3	7.9–25.8
Tobacco use (%)	14.5	26.4	7.3–35.8
Substance use disorder diagnoses (%)	3.1	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	ND***	20.5	9.0–35.4
Installation Health Index Percentile Range	*80–89th percentile* ‡		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
*** Rates based on <20 cases are not displayed and were excluded from the ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: ND
Army average: 68.4
Army range: 66.3–72.6

Score: ND
Army average: 83.6
Army range: 81.4–85.5

Score: ND
Army average: 71.4
Army range: 68.0–73.7

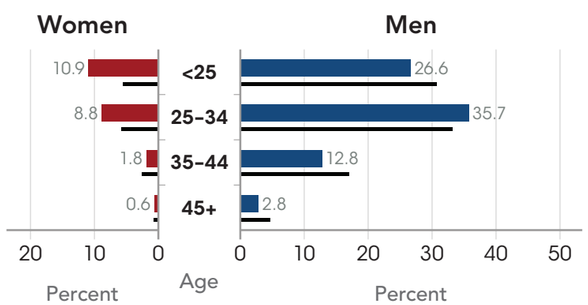
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
11 days *Army average: 6* *Army range: 0–58*

Likelihood of Vector Mosquitoes¶
Low

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army



USAG West Point

Installation Profile (2016)

Population: Approximately 1,500 AC Soldiers: 57.2% under 35 years old, 17.1% female
Main Healthcare Facility: Keller Army Community Hospital
Affiliated County: Orange

INSTALLATION HEALTH INDEX MEASURES*

MEASURE	VALUE	ARMY AVERAGE	VALUE RANGE**
Health Outcomes			
Injury incidence (rate per 1,000)	1,239	1,399	1,097–2,123
Behavioral health diagnoses (%)	14.7	20.4	14.7–28.9
Sleep disorder diagnoses (%)	11.0	14.4	7.7–26.0
Chronic disease diagnoses (%)	15.1	12.7	8.2–33.8
Health Factors			
Obesity (%)	7.9	17.3	7.9–25.8
Tobacco use (%)	7.3	26.4	7.3–35.8
Substance use disorder diagnoses (%)	2.1	5.0	1.8–8.3
STIs: Chlamydia infection incidence (rate per 1,000)	ND***	20.5	9.0–35.4
Installation Health Index Percentile Range	*≥90th percentile* ‡		

*See Appendix I for details regarding measure computations.
**Range for U.S. installations.
*** Rates based on <20 cases are not displayed and were excluded from the ranking and IHI computations.
‡The IHI score is a composite of all listed measures in relation to the Army averages; percentile ranges represent where an installation ranks (higher percentiles reflect better ranking installations).

PERFORMANCE TRIAD SCORES

Score: 72.6
Army average: 68.4
Army range: 66.3–72.6

Score: 84.8
Army average: 83.6
Army range: 81.4–85.5

Score: 73.7
Army average: 71.4
Army range: 68.0–73.7

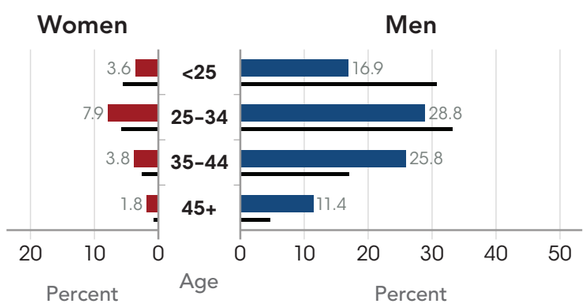
ENVIRONMENTAL HEALTH

Poor Air Quality Days/Year
1 day *Army average: 6* *Army range: 0–58*

Likelihood of Vector Mosquitoes¶
Low

¶Vectors are the yellow fever and Asian tiger mosquitoes.

DEMOGRAPHICS: Installation / All Army

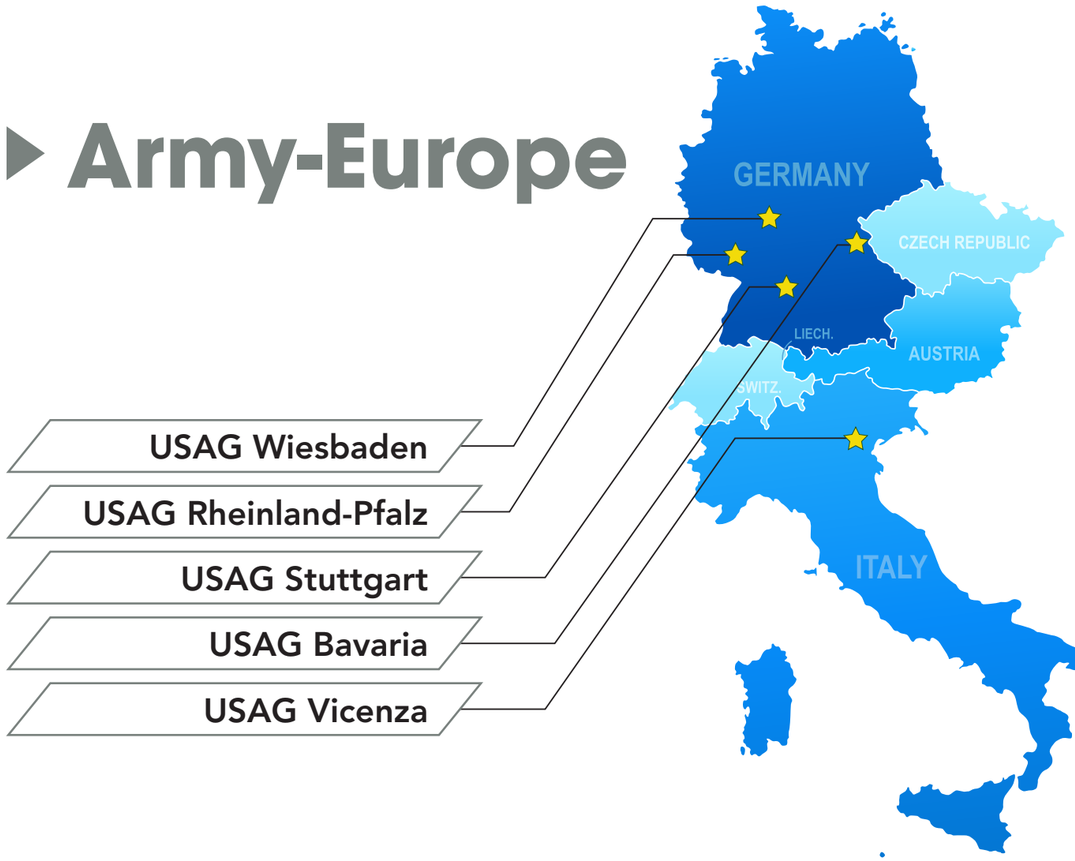


INSTALLATION PROFILE SUMMARIES

Outside the U.S.

USAG Red Cloud
South Korea

Army-Europe



INSTALLATION POPULATION STATISTICS*

	USAG Bavaria	USAG Rheinland-Pfalz	USAG Stuttgart	USAG Wiesbaden	USAG Vicenza
Approximate population	**10,400**	**6,900**	**1,900**	**1,650**	**3,750**
%Female	*9.9*	*21.3*	*9.2*	*16.4*	*9.8*
%Under 35	*82.8*	*69.8*	*55.2*	*69.0*	*77.2*

* For details regarding the installations' population statistics, reference the methods section in Appendix I.

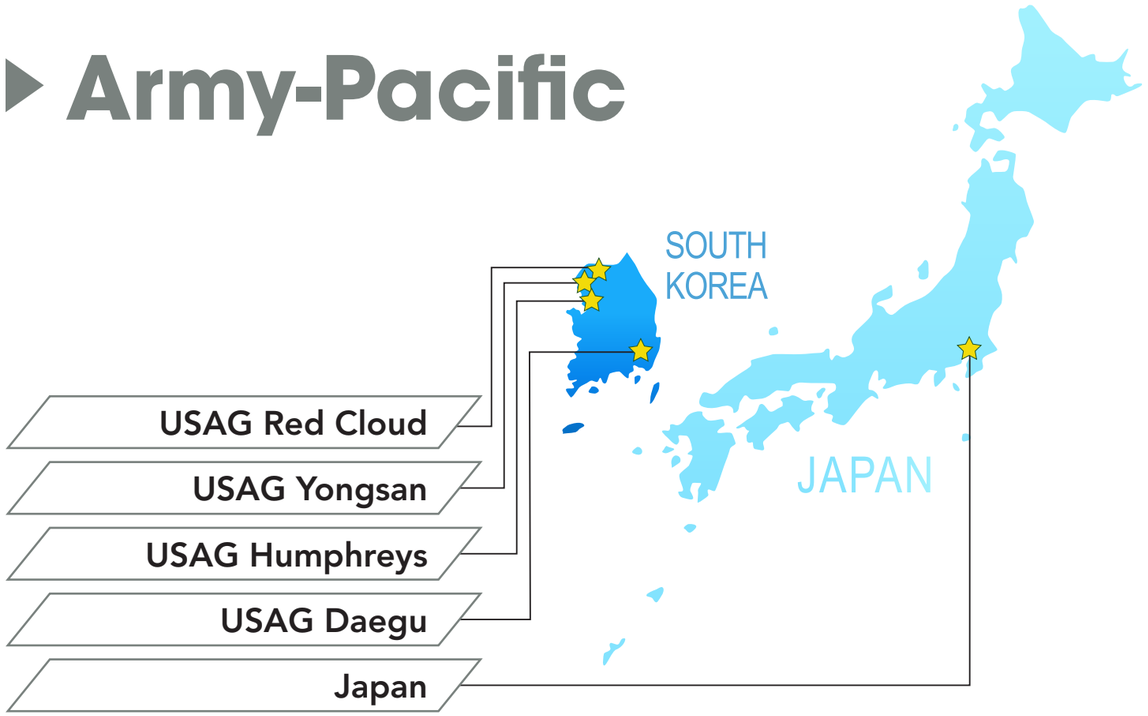
INSTALLATION HEALTH INDEX MEASURES

MEASURE	USAG Bavaria	USAG Rheinland-Pfalz	USAG Stuttgart	USAG Vicenza	USAG Wiesbaden	Army Reference
Health Outcomes						
Injury incidence (rate per 1,000)	1,355	1,440	1,391	1,068	1,340	1,399
Behavioral health diagnoses (%)	21.8	24.4	18.3	18.2	24.0	20.4
Sleep disorder diagnoses (%)	11.5	18.6	15.1	11.1	16.8	14.4
Chronic disease diagnoses (%)	9.9	16.7	17.3	8.7	15.9	12.7
Health Factors						
Obesity (%)	15.1	19.0	19.7	13.7	17.5	17.3
Tobacco use (%)	33.4	17.8	17.7	25.2	19.0	26.4
Substance use disorder diagnoses (%)	8.0	5.7	4.6	5.6	6.9	5.0
STIs: Chlamydia infection incidence (rate per 1,000)	27.4	31.5	13.4	9.0	16.3	20.5

PERFORMANCE TRIAD SCORES

	USAG Bavaria	USAG Rheinland-Pfalz	USAG Stuttgart	USAG Wiesbaden	USAG Vicenza	Army Reference
Sleep Score	68.0	68.2	68.7	66.3	68.5	68.4
Activity Score	83.9	83.1	82.3	82.5	85.5	83.6
Nutrition Score	69.4	69.7	70.9	68.3	72.0	71.4

Army-Pacific



INSTALLATION POPULATION STATISTICS*

	Japan	USAG Daegu	USAG Humphreys	USAG Red Cloud	USAG Yongsan
Approximate population	**2,900**	**1,950**	**4,400**	**2,800**	**5,000**
%Female	*14.7*	*21.5*	*15.9*	*16.4*	*17.8*
%Under 35	*71.7*	*68.4*	*79.7*	*74.4*	*69.8*

* For details regarding the installations' population statistics, reference the methods section in Appendix I.

INSTALLATION HEALTH INDEX MEASURES

MEASURE	Japan	USAG Daegu	USAG Humphreys	USAG Red Cloud	USAG Yongsan	Army Reference
Health Outcomes						
Injury incidence (rate per 1,000)	1,156	1,329	1,204	1,120	1,228	1,399
Behavioral health diagnoses (%)	17.6	20.2	16.5	18.0	16.5	20.4
Sleep disorder diagnoses (%)	10.6	15.5	11.6	11.3	13.0	14.4
Chronic disease diagnoses (%)	10.8	12.6	9.5	10.3	12.1	12.7
Health Factors						
Obesity (%)	20.5	13.9	13.7	12.7	13.5	17.3
Tobacco use (%)	21.2	20.3	26.9	33.5	15.2	26.4
Substance use disorder diagnoses (%)	3.9	5.1	4.7	5.1	3.5	5.0
STIs: Chlamydia infection incidence (rate per 1,000)	ND **	37.1	48.6	68.2	48.3	20.5

** Rates based on <20 cases are not displayed

PERFORMANCE TRIAD SCORES

	Japan	USAG Daegu	USAG Humphreys	USAG Red Cloud	USAG Yongsan	Army Reference
Sleep Score	70.2	67.6	69.6	67.0	69.6	68.4
Activity Score	83.4	84.1	83.9	82.3	84.7	83.6
Nutrition Score	71.2	69.9	70.4	68.0	71.0	71.4

APPENDICES

METHODS

I. Methodological and Data Updates

The 2017 edition of *Health of the Force* includes several methodological updates, including changes to population selection and rate adjustments. In past issues of *Health of the Force*, health measures were calculated for a subset of U.S. Army installations where the AC population was greater than 1000 personnel on average. Army reference values in previous reports were specific to U.S. installations, and separate regional reference values were provided for installations located in the European and Pacific regions in the 2016 edition. In the 2017 edition, Army referenced values reflect the entire Army, including installations outside the U.S. When possible, installation values in previous editions of the report were adjusted by sex and age to the population distribution of the respective Army region (i.e., U.S., Europe, or Pacific). These values are now adjusted to the total Army population.

Because adjustment techniques control for potential biases introduced by influential adjustment factors (e.g., age), they are valuable tools for comparing and ranking groups. However, the drawback of reporting adjusted values (as in previous reports) is that they mask an installation's actual values for each measure. The unadjusted values reported in the current edition are useful for installation health assessments because they better reflect the disease burden attributable for each measure within the population and better align with comparable unadjusted values from other readily available military and national data sources. For this reason, unadjusted values have replaced prior adjusted values throughout the report. Age- and sex-adjusted values (not displayed in the report) were calculated for a given measure in order to compare installations and identify the best ranking; these adjusted values were also used to compute the overall installation health index percentile scores.

Another noteworthy difference from the prior reports is a change in data sources for certain measures. With the 2017 update, there was a migration to a central data source for clinically driven health measures of diagnosed sleep disorders and obesity as measured by BMI. The data source migrated from the MRAT to the Defense Medical Surveillance System (DMSS) for sleep metrics and to the Medical Data Repository (MDR) for obesity metrics. While the MDR data migration had little impact on obesity measurements generated from Soldier BMI, the DMSS data migration resulted in the identification of considerably more sleep disorder diagnoses and the introduction of a surveillance artifact.

Furthermore, there were institutional changes in the way data providers defined and tracked medical readiness and healthcare delivery data. Specifically, the MRCs used in prior reports were modified by the executive agency for readiness following a directive from the Secretary of the Army (Army Directive 2016-07) issued in March 2016, and the healthcare delivery metrics (i.e., preventable admissions and HEDIS Composite measures) that were previously attainable through the Command Management System (CMS) are no longer available for inclusion in the report. The new medical readiness measure reflects the updated MRC, and a subset of the individual HEDIS measures that comprised the earlier composite score are now reported for Army healthcare beneficiaries.

Due to the methodological and data changes implemented, the reported estimates in this year's report should not be directly compared to those provided in prior reports. When available, trend charts were included that provide historical Army-wide estimates which take these changes into account. The more detailed installation demographic information added to the report also provides further clarity that should aid in data interpretation. Specifics regarding the changes are provided in the metric methods descriptions that follow.

II. Installation Selection

Installation summaries are provided for installations and Joint bases with Army MTFs and a minimum of 1,000 AC Soldiers. Estimates from selected U.S.-based installations and installations outside the U.S. were considered in the reported installation ranges for each evaluated measure. Information pertaining to AC Soldiers from excluded installations was also incorporated in the overall Army estimates.

Installation profiles for those installations outside the U.S. were abbreviated and were segregated for the purposes of installation ranking due to inherent differences which may have biased their comparison with U.S.-based installations. For example, Soldiers stationed outside the U.S. are more likely to meet deployment medical standards to qualify for assignment outside the U.S. There are also unique differences in healthcare delivery given that installations located outside the U.S. may be more likely to outsource care. Environmental health indicators were not available for installations outside the U.S.

III. Metrics

With the exception of medical readiness indicators, which are unique to the military, the LHIs selected 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. The choice of indicators relevant to the AC Soldier population was based on a modified version of a vetted prioritization scheme developed by the APHC.[1,2] The following criteria informed the selection: 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/frequency of data captured, and 5) supporting evidence. Metrics and supporting health outcomes and factors included in the report are described below.

a. Medical Readiness

1. Medical readiness classification: MRC data were obtained from the Medical Operational Data System (MODS). Installation assignment was determined by unit identification codes (UICs). Non-deployed AC Soldiers with an MRC of 3 or 4 were identified for the analysis as not medically ready for deployment. Trainees, transients, holdees, and students (TTHS) were excluded. These classifications are defined in Army Directive 2016-07 (Redesign of Personnel Readiness and Medical Deployability). Monthly MRC estimates from June through December 2016 were averaged to approximate the yearly estimate. Monthly variation in MRC was also examined for the Army AC population, revealing stable estimates in aggregate.

2. Dental readiness classification: DRC data were processed similarly to MRC data. DRC3 represents significant additional dental treatment required (often requiring multiple appointments), which is likely to take 30 days or more. Soldiers overdue for their annual exam are designated DRC4. DRC1 represents no dental treatment needs, and DRC2 equates to minor treatment needs. DRC data were also obtained from MODS, limited to non-deployed, non-TTHS AC Soldiers.

*Metrics that were included in the Installation Health Index computation and are designated with an asterisk.

References:

1 U.S. Army Public Health Command. 2013. *Army Community Health Status, 2011.*

2 Canham-Chervak, M., Hooper, T.I., Brennan, F.H. Jr, Craig, S.C., Girasek, D.C., Schaefer, R.A., Barbour, G., et al. 2010. A systematic process to prioritize prevention activities sustaining progress toward the reduction of military injuries. *AJPM*, 38(1S):S11-S18.

b. Health Outcomes

1. Injury:* The overall incidence of injury and musculoskeletal conditions resulting from injury was evaluated for AC Soldiers and trainees, excluding cadets (for whom complete data were unavailable). Estimates extracted from PH360 included data processed from the DMSS. Installation assignment was determined by the Soldier's unit ZIP code.

New or incident injuries were identified based on ICD9 and ICD10 codes outlined in the Soldier's medical records (direct MTF-based care as well as purchased care covered by TRICARE claims) using published case definitions from the APHC. Only unique medical visits with injury diagnoses codes included in the case definition were counted; follow-up visits less than 60 days apart were excluded. Rates per 1,000 Soldiers were computed based on Soldier person-time; time deployed was excluded to account for missed cases not identified during deployment. Installation estimates were adjusted by sex and age prior to ranking (estimates not shown). The percentage of Soldiers injured during the calendar year was also evaluated for the Army as a whole, including examinations of age and sex differences.

2. Heat-related illnesses and cold weather injuries: Heat-related illnesses and cold weather injuries, a subset of the injury metric, were also provided based on ICD9 and ICD10 code data received from the DMSS. Incidence rules established for injury monitoring were applied with one exception, i.e., estimates included injuries and person-time associated with deployed Soldiers. Climatic injuries were identified as per the standard case definition set by the AFHSB. For exertional heat illnesses, the AFHSB case definition includes heat stroke, heat exhaustion, and other effects of heat and light. For cold weather injuries, the AFHSB definition includes frostbite, hypothermia, and immersion injuries. Installation rankings for climatic injury are limited because the condition is influenced so heavily by an installation's climate, geography, and population composition.

3. Hearing and eye injuries: Hearing and eye injuries were provided as a subset of the Injury metric. Diagnosed hearing and vision injury rates per 1000 Soldier person-years were assessed using DMSS medical data and established APHC case definitions which utilized relevant ICD9 and ICD10 codes. Processed data were extracted from Public Health 360 (PH360). Detailed methods for injury incidence rate determination are described in the injury section below and are applicable for identification of incident sensory injuries. Additionally, the DOEHRS-HC was used to assess auditory readiness outcomes such as STS. The DOEHRS-HC hearing testing results provide context to the diagnosed hearing injury rates. Installation assignment for clinical diagnoses was based on the ZIP code for the Soldier's assigned unit; DOEHRS-HC data were mapped to an installation based on the location of the clinic performing the auditory testing.

4. Behavioral health disorders:* The prevalence of seven behavioral health disorders of interest (adjustment disorders, mood disorders, anxiety, PTSD, substance use disorders, personality disorders, and psychoses) among AC Soldiers and trainees (excluding cadets) was evaluated. Installation assignment was determined by the Soldier's unit ZIP code with results reported for the last assigned unit.

*Metrics that were included in the Installation Health Index computation and are designated with an asterisk in the Installation Profile Summaries.

Soldiers with one or more of the selected conditions were identified for the analysis. Medical data were extracted from the DMSS by the selection of ICD9 and ICD10 codes outlined in the Soldier's medical records (direct MTF-based care as well as purchased care covered by TRICARE claims). Case definitions established by the APHC and AFHSB were applied. Although ranking by installation was not performed for this measure, installation estimates included in the IHI computation were adjusted by sex and age prior to ranking (estimates not shown).

5. Sleep disorders:* The prevalence of sleep disorders was evaluated for AC Soldiers and trainees (excluding cadets). Sleep disorder data were obtained from the DMSS. Soldiers were assigned to a disease category if their medical records contained an ICD9, ICD10, CPT, or provider specialty code indicating a sleep disorder. Previous versions of the *Health of the Force* report relied on the MRAT for sleep disorder data. However, the same case definition was applied to both data sources. Installation assignment was determined by the Soldier's unit ZIP code, with estimates mapped to the Soldier's last recorded installation. Installation estimates were adjusted by sex and age prior to ranking (estimates not shown).

6. Chronic disease:* The prevalence of six chronic conditions of interest (asthma, arthritis, COPD, cancer, diabetes, and cardiovascular conditions, including hypertension) among AC Soldiers and trainees (excluding cadets) was evaluated. Installation assignment was determined by the Soldier's unit ZIP code with results reported for the last assigned unit.

Soldiers with one or more of the selected conditions were identified for the analysis, and Army-level trends were provided for each diagnostic subset. Medical encounter data were extracted from the DMSS. Soldiers were assigned to a disease category based on ICD9 and ICD10 codes outlined in the Soldier's medical records (direct MTF-based care as well as purchased care covered by TRICARE claims). Case definitions established by the APHC and AFHSB were applied. Installation estimates were adjusted by sex and age prior to ranking (estimates not shown).

c. Health Factors

1. Obesity (BMI):* Although only obesity was included in the IHI calculations, all BMI categories (obese, overweight, normal, underweight) were evaluated. The prevalence of each category was determined by calculated BMI based on height and weight measurements recorded during medical encounters for AC Soldiers, trainees, and cadets. The data were obtained from the Clinical Data Repository (CDR) Vitals module of the ambulatory encounter record in the MDR and furnished by the Patient Administration Systems and Biostatistics Activity (PASBA). Obese was defined as BMI ≥ 30. Overweight was defined as BMI ≥25 and <30. Underweight was defined as a BMI <18.5. BMI was calculated as weight in kilograms/height in meters^2. Soldiers' BMIs were classified by sex and age groups. 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 (MS-DRG) code in their inpatient record in CY16. The CDC definition of overweight is based on the general U.S. population. As a result, a Soldier with a large muscle mass may have a BMI in the range 25–27.5, but may not exceed Army standards for height and weight.

Prevalence estimates are specific to the outpatient population for which data were available; installation assignment was based on the outpatient clinic. Installation estimates were adjusted for sex and age prior to ranking (estimates not shown).

*Metrics that were included in the Installation Health Index computation and are designated with an asterisk in the Installation Profile Summaries.

2. Clinically-diagnosed overweight and obesity: Outcomes were also evaluated for AC Soldiers and trainees (excluding cadets) based on ICD9 and ICD10 codes entered on Soldier medical records captured by the ambulatory encounter record as supplied by DMSS. ICD coding defines overweight as a BMI ≥25 and <30. Obese is defined as a BMI ≥30. As with other DMSS-extracted health metrics, installation mapping was based on the Soldier's last assigned unit ZIP code.

3. Tobacco use:* The prevalence of tobacco use was evaluated for AC Soldier dental patients. Installation assignment was based on dental clinic location. An annual aggregation of monthly data extracts was obtained from the Strategic Management System (SMS) which uses Corporate Dental System (CDS) data. The CDS collects information on tobacco use (smoking and smokeless) during dental exams. Installation estimates were adjusted by sex and age prior to ranking (estimates not shown).

4. Substance use disorders:* The prevalence of substance use disorders, a subcomponent of the behavioral health disorder measure, was evaluated for AC Soldiers and trainees (excluding cadets). Disorder categories include alcohol, opioids, cannabis, sedatives, cocaine, other stimulants, hallucinogens, inhalants, and other psychoactive substance-related disorders. As with the behavioral health disorder category, diagnoses were extracted from the DMSS. Installation assignment was determined by the Soldier's last assigned unit ZIP code. Soldiers were assigned to a substance abuse category based on ICD10 codes in the Soldier's medical records (direct MTF-based care as well as purchased care covered by TRICARE claims). Installation estimates were adjusted by sex and age prior to ranking (estimates not shown).

5. Positive drug tests: Drug testing results among AC Soldiers were furnished by the Army Resiliency Directorate (ARD). Results were provided for cannabis, opioids, amphetamines, cocaine, and other illicit drugs included in the screening panel. The drug testing population included randomly screened Soldiers, randomly screened units, and Soldiers specifically referred for testing. Installation assignment was based on base ID.

6. ASAP referrals/enrollment: The APHC requested and received data from the Army Resiliency Directorate on ASAP enrollments and illicit-positive Soldiers from CY2012 through CY2016. Enrolled Soldiers are the number of Soldiers enrolled in ASAP per calendar year. ASAP enrollments include those for driving under the influence, illicit-positive drug screen positive, and self-referrals for drug or alcohol concerns. Illicit-positive Soldiers is defined as the number of distinct Soldiers that are illicit-positive (no Soldier is counted more than once per calendar year). The data were reported by cause for ASAP enrollment and for illicit-positive substance found on Soldier testing. Data reported include enrollments by substance and positive drug test by category and year. Age range and counts for males and females were also reported.

7. Sexually transmitted infections (Chlamydia Incidence):* The incidence of reported chlamydia infections was evaluated for non-deployed AC Soldiers and trainees (excluding cadets). Estimates were extracted from PH360, which utilizes DRSi case reports and DMSS person-time estimates. Installation assignment was based on the location of the MTF reporting the infection.

New or incident infections were identified from case reports submitted through the DRSi using case definitions published by the AFHSB. Only unique case reports were counted; follow-up reports less than 30 days apart were excluded. Rates per 1,000 Soldiers were computed based on Soldier person-time extracted from the DMSS; time deployed was excluded to account for missed cases not

*Metrics that were included in the Installation Health Index computation and are designated with an asterisk in the Installation Profile Summaries.

identified during deployment. Installation estimates were adjusted by sex and age prior to ranking (estimates not shown).

Chlamydia rates for installations with fewer than 20 cases were not reported and were excluded from the ranking since small case counts limit the reliability of the estimates. While estimates were provided for all other installations with more than 20 identified cases, installations with an estimated reporting compliance of less than 50% were considered overly conservative and excluded from the ranking. Reporting compliance was determined by the Navy Marine Corps Public Health Center (NMCPHC), which manages the DRSi. This is a change from the compliance determination performed for prior *Health of the Force* reports which was based on DRSi case finding queries which did not adequately account for DRSi reporter updates. Considerable gains in compliance were realized with this transition, which employs validated processing that more accurately reflects installation reporting.

8. Chlamydia screening: Data extracted from the Military Health System Population Health Portal (MHSPHP) were used to examine annual chlamydia screening among female AC Soldiers, which is recommended for sexually active women under age 25. The screening estimates contextualize the reported rates and identify areas for improvement.

d. Healthcare Delivery

1. HEDIS performance measures: The composite measure previously extracted from CMS and included in prior reports as an LHI in the installation health index is no longer available. Information is provided for a subset of seven individual measures which include four adult health indicators prioritized by the Deputy Commanding General – Operations (DCGO) and three cancer screening indicators. The following measures are included in the 2017 report, with estimates aggregated for the entire Army beneficiary population: diabetes annual screening, diabetes A1C control measures, acute low back pain imaging, colon cancer screening, breast cancer screening, cervical cancer screening, and mental health follow-up within 7 days of diagnosis. Information could not be disaggregated to separate AC Soldiers from the overall Army beneficiary population.

IV. Performance Triad (P3) Indicators

Installation P3 measures (sleep, activity, and nutrition) were obtained in aggregate from the ARD-G1 in coordination with the Army Analytics Group. Estimates were derived from relevant survey items in the GAT. The GAT is required to be completed by Soldiers annually. All GAT data was de-identified. These procedures follow policies in place to maintain the confidentiality and privacy of all individual-level responses on the assessment. Data was only reported when at least 40 responses were available as an aggregated summary statistic for an installation.

The sleep metric was based on GAT survey questions assessing sleep duration, sleep satisfaction, and being bothered by poor sleep. The activity metric was based on GAT survey questions assessing BMI, moderate/vigorous activity, resistance training, and low-intensity activity. The nutrition metric was based on GAT survey questions assessing healthy eating habits, breakfast, recovery snacks, and water consumption. Because each metric was based on multiple survey items with varying degrees of healthy behavior possible, each response was assigned a certain number of points. Higher points equaled higher levels of recommended healthy behaviors. Percentages of maximum possible points, similar to a test score, were generated from the assigned points. The reported percentages, ranging from 0 to 100, reflect an installation's overall score for that measure.

V. Environmental Health Indicators

1. Air quality: The frequency of poor air quality days near U.S. Army installations was obtained from AQI Reports and Daily Data summaries on the EPA Air Data Web site. A daily AQI is calculated using air pollution measurements obtained at State- and Federally-operated air monitoring stations throughout the U.S. An AQI score greater than 100 denotes a poor air quality day by indicating that local air pollution levels violate a short-term National Ambient Air Quality Standard. To identify poor air quality days, air quality data and the associated AQI scores from monitoring stations representative of airsheds at *Health of the Force* installations were analyzed. Air monitoring data were not available from State or Federal regulatory authorities in the airsheds where the following *Health of the Force* installations are situated: Fort Lee, Fort Leonard Wood, Fort Polk, Fort Riley, Fort Rucker, and Fort Stewart. Data presented in the report include the number of days in 2016 in which the AQI score exceeded 100 at a specific location, as well as the maximum and minimum numbers of poor air quality days annually from 2011 to 2016.

2. Drinking water: Data on FY16 drinking water violations were obtained from the semi-annual data calls for Army environmental data issued by the Office of the Assistant Chief of Staff for Installation Management (ACSIM). If there was uncertainty in this data, exposure days and details of the violation were verified by means of discussions with garrison environmental staff.

Population data for Army garrisons served by CWSs were obtained from the EPA's SDWIS database. SDWIS CWS data were used for a direct comparison to all of the U.S. CWSs included in the EPA Report on the Environment. Populations comprising USAG Hawaii were identified based on ZIP codes, as defined in *Health of the Force* medical metrics: Schofield Barracks, Fort Shafter, JB Pearl Harbor-Hickam, Coast Guard Air Station Barbers Point, Marine Corps Base Hawaii Kaneohe, and Aliamanu Military Reservation. CWS population information was not available for Fort Benning, Fort Gordon, JB Myer-Henderson Hall, Presidio of Monterey, or Redstone Arsenal; population information from the *Army Stationing and Installation Plan Common Operating Picture Report for 2016* was substituted. For purposes of calculating population exposed to the drinking water violation at USAG West Point, the population provided in the DOD Measure of Merit report (4,000) was used rather than the FY16 base population provided in the *Army Stationing and Installation Plan, Common Operating Picture Report* (12,760).

3. Solid waste diversion: Installation solid waste diversion rate data were extracted from the ACSIM SWARWeb, located on the ACSIM portal under the Installation Management Applications Resource Center. The account-restricted system, accessible through Army Knowledge Online, tracks solid waste collection, disposal, and recycling efforts at the Installation and Command/HQ levels, and provides upward reporting and trend analysis capabilities. The data are generated and compiled by installation solid waste managers, and SWARWeb calculates the diversion rates and economic benefits as required by the DOD Solid Waste Measures of Merit (MOM). Installation diversion rate data were obtained from software-generated reports, including MOM Summary, MOM Elements, and Installation Spreadsheet – Totals and Diversion Criteria, for Fiscal Years 2014 through 2016 (FY14–16). For quality assurance, comprehensive reports for specific installations were also reviewed to verify data integrity, spot anomalies, and analyze waste generation details.

SWARWeb data fields include nonhazardous solid waste disposed (tons) and nonhazardous solid waste diverted (tons), from which the nonhazardous solid waste diversion rate (percentage) is calculated for each installation over a FY. Installation diversion rates for FY 14–16 were averaged to arrive at the 3-year average diversion rate. This diversion rate excludes waste generated from privatized housing and from construction and demolition activities.

Uncertainties. The sources of solid waste generation and diversion data may include estimates and not actual weights. Sources may include contractor invoices, or estimates based on container number, fullness, and frequency of collection.

4. Mosquitoes: Mosquito distribution data for the yellow fever and Asian tiger mosquitoes were obtained from a literature review that compiled county level surveillance records.[1] Colored counties in the 2016 APHC mosquito surveillance map reflect presence of the mosquito species in county records for at least 1 year from 1995 to 2016. Presence of mosquito species at *Health of the Force* installations was obtained from 2016 APHC mosquito surveillance data. To determine whether installations fell within the predicted range for each mosquito species, installations were mapped over the estimated potential ranges provided by the CDC.

The likelihood that yellow fever and Asian tiger mosquitoes are present on an installation was estimated using the predicted CDC distributions, county-level data, and APHC data. A likelihood index was computed for each installation based on the sum of values for the following conditions:

A value of "1" was assigned for each of the following conditions, when true:

- The installation was in the CDC predicted range for either mosquito species.
- APHC installation surveillance data indicated presence of yellow fever mosquitoes.
- APHC installation surveillance data indicated presence of Asian tiger mosquitoes.

If a statement was not true, a value of "0" was assigned to the condition. For the county data, a value of 0–3 was assigned to each installation depending on the number of years the yellow fever mosquito had been reported in that locale (0=never; 1=1 year; 2=2 years; 3=3 or more years). Since the Asian tiger mosquito has a much lower vectorial capacity, values for the county level data were assigned "0" when not present in surveillance collections, and "1" when present. All values were then summed by installation, with a maximum possible score of 7. A score of 1–2 represents a low likelihood of mosquito presence and is often a byproduct of being within the CDC predicted range of the mosquito species. A score of 3–5 represents a medium likelihood of established populations. A score greater than 5 represents a high likelihood of established mosquito populations, with occurrence data for both species.

1 Hahn, M.B., L. Eisen, J. McAllister, H.M. Savage, J-P Mutebi, and R.J. Eisen. 2017. Updated Reported Distribution of *Aedes (Stegomyia) aegypti* and *Aedes (Stegomyia) albopictus* in the United States, 1995–2016 (Diptera: Culicidae). *J Med Entomol*, 54(5): 1420–1424.

5. Ticks: Tick-borne disease risk data were compiled from species identification and pathogen testing of ticks submitted to the DOD HTTKP from 2006 to 2016. Ticks are submitted to the HTTKP after being found attached to (biting) DOD personnel, i.e., Active Duty, Reserve, Retirees, Civilians, and Family members, from all branches of Service. Ticks are voluntarily submitted to the HTTKP through MTFs, which have access to the HTTKP kits. After a tick is received, molecular methods (polymerase chain reaction, or PCR) are applied to identify it and test it for human pathogens. If a tick tests positive for a pathogen, the result is confirmed using a second, independent PCR assay targeting a different gene, after which the complete results are reported to the submitting MTF. After receiving all results data, the submitting MTF reports the results to the tick-bite victim and his or her healthcare provider. The HTTKP retains all data associated with the tick, including the location where the tick-bite was acquired, in an internal database. No personally identifiable information is obtained through the tick kits or retained in the HTTKP database. All ticks submitted to the HTTKP are included in a long-term passive surveillance dataset; the HTTKP does not actively collect ticks from the environment at DOD installations. As all of the submitted ticks have been removed from humans, the HTTKP data give evidence of the direct risk to DOD personnel for tick-borne human pathogens at each installation.

VI. Installation Health Index

Health indices are widely used to gauge the overall health of populations. They offer an evidence-based tool for comparing a broad range of metrics across communities and can help inform community health needs assessments. Indices are also useful for ranking, which has proven effective in stimulating community interest and driving health improvement.

The eight core measures included in this report were prioritized as LHIs for the AC Soldier population 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 the intent is to expand the LHI with future reports as more data become available, some data loss does occur. With this update, MRC data were removed from the index computation along with previous healthcare delivery indicators that are no longer available. Readiness and clinical care remain important health indicators, so pertinent Army aggregations of relevant metrics are included in the report. Similarly, when data relevant to the selected LHI were available, summaries were included in the report to provide context for important contributing factors.

In generating an installation health index, the eight selected indicators were standardized to the Army average using Z-scores. When possible, indicators were adjusted by age and sex prior to the standardization to allow more valid comparisons. The indicators were weighted and then collated into an overall IHI. The weights were as follows: Chronic Disease (20%), Injury (20%), BH (20%), Tobacco (10%), Obesity (10%), Sleep disorders (10%), Substance use (5%), and Chlamydia incidence (5%). When estimates were unavailable for an IHI measure, available measure weights were adjusted to compensate for the loss of data. The IHI represents pooled standard deviations from the Army reference value.

While health indices provide a comprehensive measure of health which may help identify populations that could potentially benefit from enhanced public health prevention measures, aggregate indices may hide some of the driving factors. Healthcare decision makers must further review individual measures that comprise the index in order to identify and effectively target key outcomes or behaviors that are the most significant health and readiness detractors for each installation.

VII. Installation Profile Summaries

The installation profile summary pages provide population demographics to illustrate installation population dynamics in terms of manpower and age and sex distributions. These estimates were derived from the DMSS, which uses DMDC rosters to generate person-time estimates for AC Soldiers and trainees (excluding cadets) assigned to a given installation as determined by unit ZIP codes.

Estimates are based on person-time, which is the time spent at the installation. One Soldier who spends an entire year at an installation will count as one person-year. However, a Soldier who spends just 6 months at an installation will only count as one-half of a person-year. This methodology is commonly used in epidemiology to provide a general snapshot of the average number of Soldiers at the installation at any given point during the year. Installations with a high turnover, such as those with a large trainee population, may not be accustomed to thinking of their population size in this way. The person-time values in the installation profile summaries are rounded and provided as approximations.

These estimates are intended to be a frame of reference and don't necessarily correspond to the population evaluated for each measure included in the installation profile summary and report. As outlined previously, many of these measures were estimated using population subsets from each installation (e.g., survey respondents, MTF enrollees, dental patients).

VIII. Data limitations

- Methodology and data source changes from prior reports to this report prevent direct comparisons of measures across reports. Updated trend charts are provided for affected measures, and additional details regarding installation demographics and metric components are included to provide clarity.
- Higher estimates for a health indicator or metric may not be indicative of a problem but may instead reflect a higher emphasis on detection and treatment.
- Composite measures or indices may hide important differences seen at the individual metric level. It is important to examine the sub-components for which more targeted prevention programs can be developed.
- Medical data for cadets were not available from the DMSS; therefore, West Point estimates using DMSS-derived data are limited to permanent party AC Soldiers.
- Considerably more sleep disorders are reported in this report than were captured in previous reports. This is due to a change in the data source from the MRAT to the DMSS. This streamlined the data process for health outcomes, given that other medical outcomes data are also generated from DMSS data.
- Measures based on ICD9 or ICD10 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.
- Measures based on self-reported data (GAT and tobacco use) are limited to a subset of the population (i.e., survey respondents and dental patients) and may be prone to biases. Obesity estimates are likewise based on a subset of outpatients with recorded height and weight measurements.
- The chlamydia measure relies on reporting compliance. Estimates are conservative given the high proportion of asymptomatic infections that are undetected.
- The comparability of smoking data acquired from dental visits to that collected nationally is unclear. While both data sets assess patients' current smoking rates, their definitions of tobacco use may differ.
- Medical readiness data were not available by sex, which limited the ability to assess sex as a risk factor or provide additional rate adjustment for ranking purposes. Inclusion of sex should be explored further given that pregnancy can impact women's readiness.
- Medical readiness MRCs changed in June 2016, limiting the assessment to data available during the last 6 months of the year.
- GAT data used for the P3 measures were aggregated, which prevented age and sex adjustment for the installations. An assessment of Army-level demographic data revealed some differences, particularly for activity.
- Available injury and medical readiness data were aggregated, which prevented assessment of associations between musculoskeletal injuries (MSKI) and readiness. Given the strong association, these should be explored further.

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ABBREVIATIONS AND ACRONYMS

1AD – 1st Armored Division
4ID – 4th Infantry Division
ABCP – Army Body Composition Program
ABHW – Applied Behavioral Health and Wellness
AC – Active Component
ACSIM – Assistant Chief of Staff for Installation Management
ADP – Area Development Plan
AFFF – Aqueous Film Forming Foams
AFHSB – Armed Forces Health Surveillance Branch
AHP – Army Hearing Program
APHC – U.S. Army Public Health Center
AQI – Air Quality Index
AR – Army Regulation
ARD – Army Resiliency Directorate
ARNG – Army National Guard
ASAP – Army Substance Abuse Program
AT – Athletic Trainer
B.A.N.D.S. – Strong Balance, Activity, Nutrition, Determination and Strength
BCT – Brigade Combat Team
BH – Behavioral Health
BHWG – Behavioral Health Working Group
BLS – Bureau of Labor Statistics
BMI – Body Mass Index
BSHOP – Behavioral and Social Health Outcomes Practice
CCR – Consumer Confidence Report
CDC – Centers for Disease Control and Prevention
CDR – Clinical Data Repository
CDS – Corporate Dental System
CHPC – Community Health Promotion Council
CMS – Command Management System
COPD – Chronic Obstructive Pulmonary Disease
CPAP – Continuous Positive Airway Pressure
CQP – Close Quarters Battle
CSA – Chief of Staff of the Army
CWI – Cold Weather Injury
CWS – Community Water System
CY – Calendar Year
DA – Department of the Army
DeCA – Defense Commissary Agency
DFAC – Dining Facility
DEHP – Di (2-Ethylhexyl) Phthalate
DHA – Defense Health Agency
DMSS – Defense Medical Surveillance System
DOD – Department of Defense
DODI – Department of Defense Instruction
DOEHRS – Defense Occupational and Environmental Health Readiness System
DOTMLPF-P – Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, Facilities, & Policy
DPW – Department of Public Works
DRC – Dental Readiness Classification
DRSi – Disease Reporting System, internet
DOEHRS – Defense Occupational and Environmental Health Readiness System
DOEHRS-HC – Defense Occupational and Environmental Health Readiness System – Hearing Conservation
EAH – Exercise-Associated Hyponatremia
EHI – Environmental Health Indicators
EPA – U.S. Environmental Protection Agency
FEHB – Federal Employees Health Benefits
FORSCOM – U.S. Army Forces Command
FM – Field Manual
FMWR – Family Morale, Welfare and Recreation
FSG – Food Service Guidelines for Federal Facilities
FY – Fiscal Year
GAT – Global Assessment Tool
GBD – Global Burden of Disease
HAC – Healthy Army Communities
HEDIS – Healthcare Effectiveness Data and Information Set
HOF – Health of the Force
HPW – Health Promotion and Wellness
HQDA – Headquarters, Department of the Army
HRC – Hearing Readiness Classification
HTTKP – Human Tick Test Kit Program
ICUZ – Installation Compatible Use Zone
IHI – Installation Health Index
IMCOM – U.S. Army Installation Management Command
IMR – Individual Medical Readiness
INSCOM – U.S. Army Intelligence and Security Command
ISWMP – Integrated Solid Waste Management Plan
JCCoE – Joint Culinary Center of Excellence
LHA – Lifetime Health Advisory
LOE – Line of Effort
MDR – Medical Data Repository
MEDCOM – U.S. Army Medical Command
MEDPROS – Medical Protection System
MHS – Military Health System
MHSPHP – Military Health System Population Health Portal
M-NEAT – Military Nutrition Environment Assessment Tool
MODS – Medical Operational Data System
MOM – Measure(s) of Merit
M-PAC – Military Promoting Active Communities Tool
MRAT – Medical Readiness Assessment Tool
MRC – Medical Readiness Classification
MS-DRG – Medicare Severity Diagnosis Related Group
MSK – Musculoskeletal
MSKI – Musculoskeletal Injury
MTF – Medical Treatment Facility
NCQA – National Committee for Quality Assurance
NIHI – Noise-Induced Hearing Injury
NMCPHC – Navy and Marine Corps Public Health Center
NPDWR – National Primary Drinking Water Regulations
OSHA – Occupational Safety and Health Administration
OTSG – Office of The Surgeon General
P3 – Performance Triad
PAO – Public Affairs Office
PASBA – Patient Administration Systems and Biostatistics Activity
PCR – Polymerase Chain Reaction
PDHRA – Post-Deployment Health Reassessment
PFC – Perfluorinated Compound
PFOA – Perfluorooctanoic Acid
PFOS – Perfluorooctane Sulfonate
PPSL – Physical Performance Service Line
PPT – Parts Per Trillion
PT – Physical Training
PTSD – Posttraumatic Stress Disorder
PWS – Public Water Systems
R2 – Ready and Resilient
RADR – Risk Assessment Data Report
RMSF – Rocky Mountain Spotted Fever
SAN – Sleep, Activity and Nutrition
SDWA – Safe Drinking Water Act
SDWIS – Safe Drinking Water Information System
SMS – Strategic Management System
SOTA – Soldier Outcomes Trajectory Assessment
STI – Sexually Transmitted Infections
STS – Significant Threshold Shift
SUD – Substance Abuse Disorder
SUDCC – Substance Use Disorder Clinical Care
SWARWeb – Solid Waste Annual Report
TOC – Total Organic Carbon
TRADOC – U.S. Army Training and Doctrine Command
TTHS – Trainees, Transients, Holdees, and Students
TTP – Tactics, Techniques, and Procedures
UIC – Unit Identification Code
USASOC – U.S. Army Special Operations Command
USATSC – U.S. Army Training Support Center
WHP – Women's Health Portal
WMSD – Work-related Musculoskeletal Disorder

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