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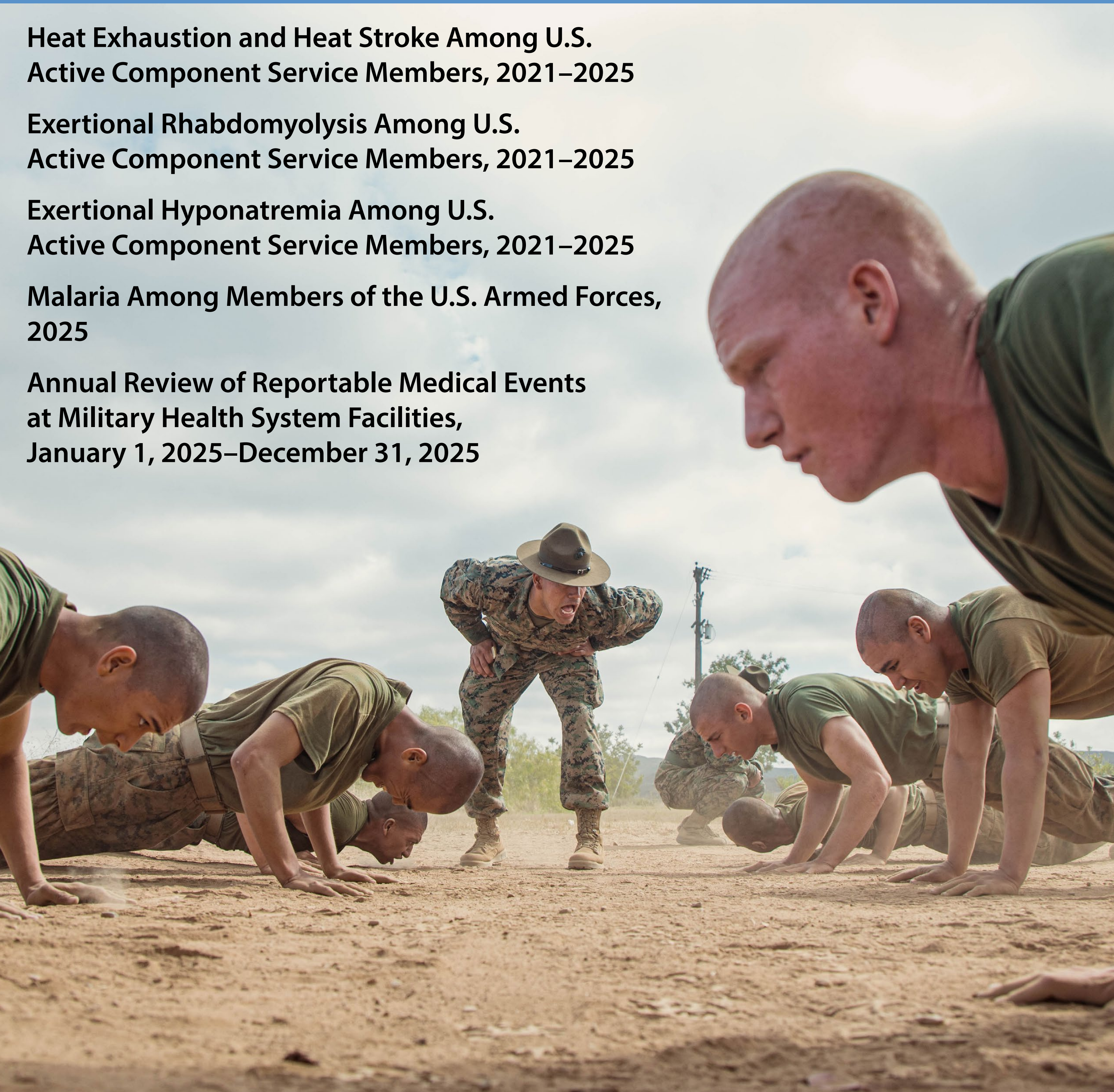

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Medical Surveillance for Military Readiness

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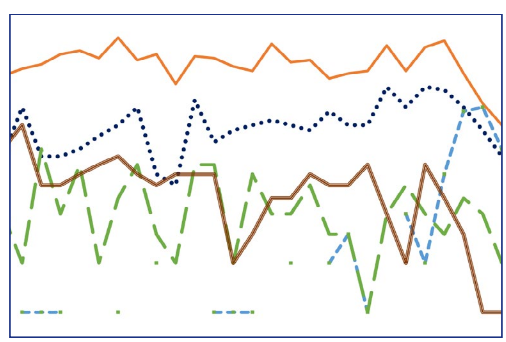

*Update*

# Heat Exhaustion and Heat Stroke Among U.S. Active Component Service Members, 2021–2025

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In 2025, the unadjusted incidence rates of heat stroke and heat exhaustion among U.S. active component service members were 39.4 and 170.0 cases per 100,000 person-years, respectively. The rate of heat stroke increased in 2024 and 2025, after declining for 3 years (2021-2023) at the beginning of the 5-year surveillance period. In contrast, the rate of heat exhaustion decreased in 2025, following a 4-year increase from 2021 through 2024. In 2025, male service members experienced higher rates of heat stroke, when compared to their female counterparts. Female service members and non-Hispanic Black service members experienced higher rates of heat exhaustion than their male counterparts and service members of other racial and ethnic groups, respectively. Consistent with prior annual reports, heat illness rates remained the highest among those younger than age 20 years, Marine Corps and Army members, and recruit trainees. To protect the force and increase readiness, military leaders and public health personnel can implement evidence-based prevention strategies, train service members to recognize the signs and symptoms of heat illness and take early action to counter the threat.

**What are the new findings?**

The unadjusted incidence rate of heat stroke increased 6.9% from 2024 to 2025, for the second year in a row, while the unadjusted annual incidence rate of heat exhaustion fell by 9.1% in 2025, following a 4-year increase from 2021 through 2024. Locations where entry training are conducted for new Army, Air Force, Marine Corps, and Space Force personnel accounted for 40.3% of all heat illness diagnoses over the 5-year surveillance period. Training, specifically initial training upon service entry, remains a major risk factor for heat illness occurrence among U.S. active component service members.

**What is the impact on readiness and force health protection?**

Heat exhaustion and heat stroke can both be prevented through situational awareness, application of appropriate risk management strategies, and, when necessary, effective countermeasures. Units that fail to implement heat illness mitigation measures risk impeding or interrupting training programs, leading to reduced operational tempo or critical mission failure due to lost personnel and resources.

The most serious types of heat illnesses, heat exhaustion and heat stroke, are occupational hazards associated with many of the military's training and operational environments, posing potential risks for force health protection. Heat illness refers to a group of disorders that result from a disruption of thermoregulation caused by high energy expenditure (i.e., metabolic heat production), environmental heat exposure, or a combination of both factors.[1-4]

Heat illness occurs within a continuum of severity, from less severe (e.g., heat cramps, rash, edema), to heat exhaustion, followed by potentially life-threatening heat stroke.[5] Heat exhaustion and heat stroke are reportable medical events (RMEs) in the Military Health System (MHS) to the Disease Reporting System internet (DRSi). All heat casualties that require medical intervention or result in change of duty status must be reported by U.S. Armed Forces installation public health personnel.[6]

During or immediately following a period of physical exertion or heat exposure, specific signs and symptoms that characterize heat illnesses allow initial recognition of their occurrence in the field, and subsequent identification or diagnosis of a heat illness that should be reported. Common signs and symptoms of heat exhaustion include weakness, muscle cramps, headache, dizziness, nausea or vomiting, tachycardia, and short-term physical collapse or debilitation. Heat exhaustion is often characterized by elevated core body temperature (greater than 100.5 °F [38 °C], but not greater than 104 °F [40 °C]) with no significant central nervous system dysfunction. If central nervous system dysfunction develops (e.g., dizziness, confusion, headache), it should be mild and rapidly resolve with rest and cooling measures, otherwise the individual may be experiencing heat stroke.[7-10]

Heat stroke is a debilitating and potentially life-threatening condition most frequently characterized by evidence of severe hyperthermia (greater than or equal to 104 °F [40 °C]) and central nervous system dysfunction that can include change in mental status, delirium, stupor, loss of consciousness, or coma.[7-9,11] Onset of heat stroke should prompt aggressive intervention featuring rapid cooling, such as cold water immersion and iced sheets.[12-14]

The literature on heat stroke management indicates consensus on prioritizing cooling over transportation for further medical attention.[11,13,15,16] Cooling is prioritized because, clinically, severity of end-organ damage and increased possibility of mortality are directly related to the degree and duration of hyperthermia.[8,14,16] End-organ damage due to heat stroke is most frequently observed in the liver, kidneys, cardiac and skeletal muscle.[8,11,15,17]

While temperature and humidity are well recognized environmental risk factors for heat illness, there are individual, occupational, and organizational risk factors that influence heat illness occurrence. Individual risk factors include lack of acclimatization, physical fitness levels, pre-existing or recent viral illness, body composition, and personal motivation to excel.[7,12] Organizational factors include type of activity, training intensity and duration, and training schedules.[7,12] These risk factors do not work independently of each other; there is literature that suggests risk factors interact to increase risk of heat illness, making it essential that military leaders and service members recognize the full spectrum of potential factors in a training or operational environment.[18] For example, metabolic heat production increases during prolonged engagement in strenuous physical activity, and additional exposure to environmental heat stress elevates core and skin temperatures.[2,3,8]

Identifying high-risk service members is critical for preventing heat illness and reducing morbidity due to heat illnesses.[19] Early detection reduces heat illness morbidity and severity and requires educating service members and leadership on the signs and symptoms of heat illness in addition to the incorporation of physiological monitoring, managing exceptional individuals during training (i.e., establishing minimum or maximum pacing), and removing service members from high-risk events. Heat illness mitigation strategies should be implemented for individuals as well as organizations, using a tiered risk management model.[13] To achieve hazard reduction, progressive training, heat acclimatization, along with ensuring proper hydration, electrolyte replacement, and nutrition before training can prepare individual service members for training and operating in high heat environments.[3,20] Risk mitigation strategies that can be instituted during training activities include adherence to work and rest guidelines, modified clothing and uniform standards, individual- or group-pacing during high-risk events (e.g., timed ruck marches), climate-adapted schedules or activities, and available cooling measures (e.g., arms immersion cooling or microclimate cooling).[13,14,20]

Surveillance of heat illnesses is necessary to evaluate whether prevention guidelines and countermeasures are working, in addition to identifying high-risk groups and activities that may lead to heat illness. Since 2011, *MSMR* has published regular updates on the incidence of heat illness among U.S. active component service members (ACSMs). This update presents summaries of heat stroke and heat exhaustion case counts, incidence rates, and locations from 2021 through 2025.

## Methods

The surveillance population for this analysis includes all individuals who served in the active component of the Army, Navy, Marine Corps, Air Force, Space Force, or Coast Guard at any time during the surveillance period of January 1, 2021 through December 31, 2025. Space Force data are only complete for 2023 through 2025.

All data used to determine incident heat illness diagnoses were derived from 4 sources: MHS Management, Analysis and Reporting Tool (M2), Defense Medical Surveillance System (DMSS), DRSi, and Theater Medical Data Store (TMDS). Heat illness cases were identified using specific diagnostic codes from the ambulatory care encounters and hospitalizations of ACSMs in fixed military and civilian (if reimbursed through the MHS) hospitals and clinics worldwide. In addition to medical encounter data, heat illness medical event reports were identified in DRSi, including information on hospitalization status (i.e., 'yes' or 'no'). If a heat illness was reported in DRSi, but not found in the medical record, the case was still counted. For example, an individual could be treated in the field by a medic for a mild or non-life-threatening heat illness without a recorded medical encounter, but the case is deemed a reportable heat exhaustion because of symptoms observed in the field.

In this update, a case of heat illness was defined as an individual with 1) a hospitalization or outpatient medical encounter record with a primary (first-listed) or secondary (second-listed) diagnosis of heat stroke (International Classification of Diseases, 9th Revision [ICD-9]: 992.0; International Classification of Diseases, 10th Revision [ICD-10]: T67.0*) or heat exhaustion (ICD-9: 992.3–992.5; ICD-10: T67.3*–T67.5*) or 2) a RME record of heat exhaustion or heat stroke.[19] Asterisks denote that all subsequent digits or characters noted in that diagnostic code were included in the identification of ICD-10 codes (e.g., T67.3XXA).

An individual was considered a case of heat illness only once per year. If a service member had diagnoses for both heat stroke and heat exhaustion during a given year, the more severe diagnosis (i.e., heat stroke) was selected. If a service member had inpatient and outpatient encounters for heat stroke or heat exhaustion, the inpatient encounter was prioritized over the outpatient visit, when identifying hospitalized cases. Within a calendar year, if an individual had a diagnostic code that denoted a subsequent encounter (i.e., ICD-10 seventh digit 'D') or an encounter for sequelae (i.e., ICD-10 seventh digit 'S'), but had no diagnostic codes indicating an initial visit (i.e., ICD-10 seventh digit 'A'), the case was removed to avoid over-estimating heat illness cases by including those receiving follow-up care.

For health surveillance purposes, recruit trainees were identified as ACSMs assigned to service-specific training locations and basic training periods, using an algorithm based on age, rank, and time in service. Recruit trainees were considered a separate enlisted service member category in heat illness summaries by military grade. In summaries of heat illness by location, the Defense Medical Information System Identifier (DMIS ID) was used to determine installation or geographic location of diagnosis and medical treatment.

In-theater diagnoses of heat illness were identified from medical records of deployed service members whose health care encounters were documented in TMDS. Those encounters were analyzed separately, and the same case-defining criteria and incidence rules described previously were applied.

Incidence rates (IRs) were calculated as incident cases of heat illness per 100,000 ACSM person-years (p-yrs). Percent change in IRs was calculated using unrounded rates. Because reporting heat exhaustion and heat stroke cases is required, the proportion of outpatient and inpatient cases with a report in DRSi was also calculated.[6]

## Results

In 2025, 518 cases of heat stroke occurred throughout the MHS, resulting in an unadjusted IR of 39.4 cases per 100,000 p-yrs **(Table 1)**. Recruit trainees, Marine Corps and Army personnel, and service members younger than age 20 years experienced the highest subgroup-specific IRs of heat stroke, as well as those in combat-specific occupations. Service members of different races and ethnicities had similar rates of heat stroke. The rate of heat stroke was 76.2% higher among men (42.8 cases per 100,000 p-yrs) compared to women (24.3 cases per 100,000 p-yrs). Recruit trainees experienced rates of heat stroke 3.5 and 3.1 times higher than other enlisted service members and officers, respectively.

In 2025, the unadjusted annual incidence of heat stroke increased 6.9% compared to the IR in 2024 **(Figure 1)**. In 2025 IRs of heat stroke increased among service members in the Army (21.1%) and Marine Corps (6.3%) but decreased among service members in the Air Force (-24.5%) and Navy (-51.0%) **(Table 2)**. The proportion of hospitalized heat stroke cases increased slightly, to 38.6% in 2025, from 35.9% in 2024 **(Figure 1)**. Of all inpatient heat stroke cases from 2021 through 2025, 78.7% had a medical event report in DRSi, compared to 60.5% of outpatient heat stroke cases.

The 2,233 cases of heat exhaustion in 2025 correspond to an unadjusted IR of 170.0 cases per 100,000 p-yrs **(Table 1)**. As with heat stroke, rates of heat exhaustion remained highest for service members younger than age 20 years,

**TABLE 1.** Incident Cases[a] and Incidence Rates[b] of Heat Illness, Active Component, U.S. Armed Forces, 2025

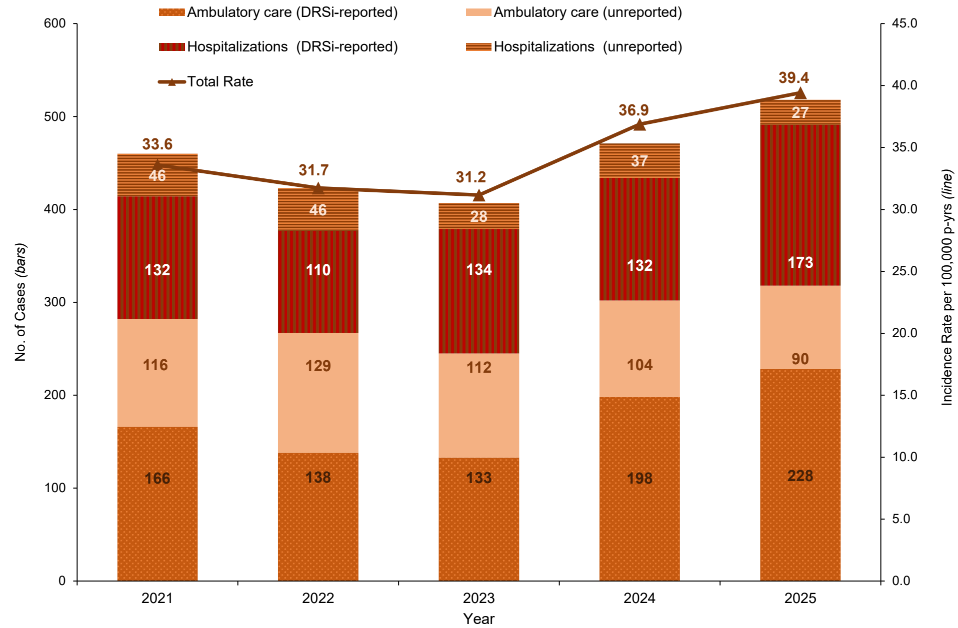
| | Heat Stroke | | Heat Exhaustion | | Total Heat Illness Diagnoses | |
|---|---|---|---|---|---|---|
| | No. | Rate[b] | No. | Rate[b] | No. | Rate[b] |
| Total | 518 | 39.4 | 2,233 | 170.0 | 2,751 | 209.4 |
| Sex | | | | | | |
| Male | 460 | 42.8 | 1,776 | 165.2 | 2,236 | 208.1 |
| Female | 58 | 24.3 | 457 | 191.3 | 515 | 215.6 |
| Age group, *y* | | | | | | |
| <20 | 77 | 86.3 | 471 | 527.8 | 548 | 614.0 |
| 20–24 | 239 | 61.1 | 966 | 247.0 | 1,205 | 308.1 |
| 25–29 | 121 | 39.0 | 443 | 142.9 | 564 | 181.9 |
| 30–34 | 55 | 25.5 | 192 | 89.1 | 247 | 114.6 |
| 35–39 | 15 | 8.9 | 112 | 66.2 | 127 | 75.1 |
| 40+ | 11 | 7.9 | 49 | 35.3 | 60 | 43.3 |
| Race and ethnicity | | | | | | |
| White, non-Hispanic | 265 | 40.4 | 1,031 | 157.2 | 1,296 | 197.6 |
| Black, non-Hispanic | 88 | 40.0 | 441 | 200.2 | 529 | 240.2 |
| Hispanic | 105 | 38.2 | 474 | 172.6 | 579 | 210.9 |
| Other, unknown[c] | 60 | 36.8 | 287 | 176.1 | 347 | 213.0 |
| Branch of service | | | | | | |
| Army | 307 | 68.8 | 1,223 | 274.0 | 1,530 | 342.7 |
| Navy | 32 | 9.6 | 240 | 72.3 | 272 | 81.9 |
| Air Force | 19 | 6.1 | 253 | 80.6 | 272 | 86.6 |
| Marine Corps | 158 | 92.9 | 483 | 284.0 | 641 | 376.9 |
| Space Force | 1 | 10.1 | 5 | 50.7 | 6 | 60.8 |
| Coast Guard | 1 | 2.4 | 29 | 70.7 | 30 | 73.1 |
| Military status | | | | | | |
| Recruit trainee | 36 | 127.1 | 414 | 1,462.2 | 450 | 1,589.3 |
| Enlisted | 383 | 36.8 | 1,622 | 155.7 | 2,005 | 192.5 |
| Officer | 99 | 40.6 | 197 | 80.8 | 296 | 121.4 |
| Military occupation | | | | | | |
| Combat-specific[d] | 185 | 115.8 | 515 | 322.4 | 700 | 438.2 |
| Motor transport | 17 | 39.3 | 63 | 145.5 | 80 | 184.8 |
| Pilot, air crew | 3 | 6.9 | 9 | 20.7 | 12 | 27.5 |
| Repair, engineering | 28 | 7.9 | 115 | 32.5 | 143 | 40.4 |
| Communications, intelligence | 17 | 6.3 | 38 | 14.1 | 55 | 20.5 |
| Health care | 25 | 23.9 | 85 | 81.4 | 110 | 105.3 |
| Other, unknown | 243 | 71.5 | 1,408 | 414.1 | 1,651 | 485.5 |

Abbreviations: No., number; y, years.
[a] One case per person per calendar year.
[b] Rate per 100,000 person-years.
[c] Includes those of American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, and unknown race or ethnicity.
[d] Includes infantry, artillery, combat engineering, armor.

Marine Corps and Army personnel, and recruit trainees. Unlike heat stroke, however, the rate of heat exhaustion was higher among women (15.8% higher compared to men) and non-Hispanic Black service members (27.4% higher compared to non-Hispanic White service members). Recruit trainees experienced rates of heat exhaustion 9.4 and 18.1 times higher than other enlisted service members and officers, respectively.

After increasing in the previous 4 years, in 2025 the unadjusted annual incidence of heat exhaustion decreased 9.1% compared to 2024. Service-specific rates of heat exhaustion decreased in 2025 among Marine Corps (-28.6%), Air Force (-16.7%), and Army personnel (-1.6%) compared to the rates observed in 2024 **(Table 2)**. The proportion of hospitalized heat exhaustion cases in the U.S. Armed Forces remained small (4.5%) **(Figure 2)**. Three-quarters (75.6%) of inpatient heat exhaustion cases had reports in DRSi from 2021 to 2025, while only 38.2% of outpatient heat exhaustion cases had a medical event report.

**FIGURE 1.** Incident Cases[a] and Incidence Rate of Heat Stroke, by Encounter Type and Year of Diagnosis, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: No., number; p-yrs, person-years.
[a]Diagnosis codes were prioritized by severity and record source (heat stroke > heat exhaustion; hospitalizations > ambulatory visits). Reported denotes case was reported to DRSi. Not reported denotes case was not reported to DRSi.

**TABLE 2.** Annual Incident Cases[a] and Incidence Rates[b] of Heat Illness, by Service, Active Component, U.S. Armed Forces, 2021–2025

| | Army | | Navy | | Air Force | | Marine Corps | | Space Force | | Coast Guard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Rate[b] | No. | Rate[b] | No. | Rate[b] | No. | Rate[b] | No. | Rate[b] | No. | Rate[b] |
| Heat exhaustion | | | | | | | | | | | | |
| 2021 | 1,032 | 215.6 | 147 | 43.0 | 184 | 53.8 | 494 | 275.4 | — | — | 5 | 12.4 |
| 2022 | 1,033 | 224.3 | 191 | 56.5 | 237 | 73.8 | 554 | 318.5 | — | — | 19 | 47.9 |
| 2023 | 1,179 | 263.1 | 205 | 62.7 | 363 | 111.0 | 491 | 290.7 | 7 | 81.9 | 6 | 15.5 |
| 2024 | 1,211 | 278.4 | 203 | 63.2 | 298 | 92.8 | 655 | 397.5 | 4 | 43.4 | 17 | 43.2 |
| 2025 | 1,223 | 274.0 | 240 | 72.3 | 253 | 76.2 | 483 | 284.0 | 5 | 50.7 | 29 | 70.7 |
| Heat stroke | | | | | | | | | | | | |
| 2021 | 298 | 62.3 | 25 | 7.3 | 27 | 7.9 | 110 | 61.3 | — | — | 0 | 0.0 |
| 2022 | 225 | 48.8 | 31 | 9.2 | 32 | 10.0 | 134 | 77.0 | — | — | 1 | 2.5 |
| 2023 | 234 | 52.2 | 36 | 11.0 | 20 | 6.1 | 114 | 67.5 | 0 | 0.0 | 3 | 7.7 |
| 2024 | 247 | 56.8 | 41 | 12.8 | 38 | 11.8 | 144 | 87.4 | 0 | 0.0 | 1 | 2.5 |
| 2025 | 307 | 68.8 | 32 | 9.6 | 19 | 5.7 | 158 | 92.9 | 1 | 10.1 | 1 | 2.4 |
| Total heat illness diagnoses | | | | | | | | | | | | |
| 2021 | 1,330 | 277.9 | 172 | 50.3 | 211 | 61.7 | 604 | 336.7 | — | — | 5 | 12.4 |
| 2022 | 1,258 | 273.1 | 222 | 65.7 | 269 | 83.7 | 688 | 395.6 | — | — | 20 | 50.4 |
| 2023 | 1,413 | 315.3 | 241 | 73.7 | 383 | 117.1 | 605 | 358.2 | 7 | 81.9 | 9 | 23.2 |
| 2024 | 1,458 | 335.2 | 244 | 76.0 | 336 | 104.6 | 799 | 484.9 | 4 | 43.4 | 18 | 45.8 |
| 2025 | 1,530 | 342.7 | 272 | 81.9 | 272 | 81.9 | 641 | 376.9 | 6 | 60.8 | 30 | 73.1 |

Abbreviations: No., number; y, years.
[a]One case per person per calendar year.
[b]Rate per 100,000 person-years.

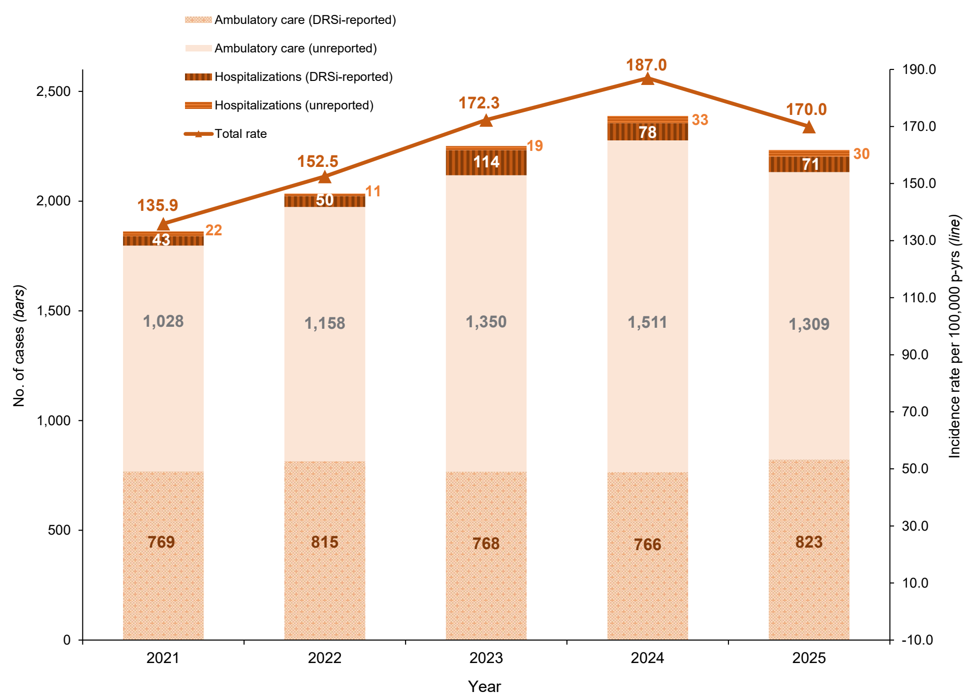
### Heat illnesses by location

During the 5-year surveillance period, at more than 300 military installations and geographic areas worldwide, a total of 13,047 heat illness cases were diagnosed among ACSMs **(Table 3)**. Only 7.5% of those heat illness cases occurred outside the U.S., including 409 in Okinawa, Japan. From 2021 to 2025, 21 locations reported at least 100 cases of heat illness, and those 21 locations accounted for over three-quarters (75.4%) of all ACSM cases. The 4 Army installations (Fort Benning, GA; Fort Jackson, SC; Fort Leonard Wood, MO; Fort Sill, OK), 2 Marine Corps bases (Marine Corps Recruit Depot [MCRD] Parris Island/ Beaufort, SC and MCRD San Diego/NB San Diego, CA) and 1 Joint Base (JB San Antonio, TX) where initial entry training occurs accounted for 40.3% of the heat illnesses during the surveillance period. Of the 21 locations with at least 100 cases of heat illness, 14 are in the southern U.S.

### In-theater diagnosis of heat illness

During the 5-year surveillance period, 404 cases of heat illness occurred in-theater, with the highest number reported in 2025 **(Figure 3)**. Heat stroke cases accounted for 7.4% (n=30) of those 404 cases of heat illness. Cases of heat illness occurred most frequently among deployed ACSMs who were male (n=295, 73.0%), ages 20-24 years (n=194, 48.0%), and in the Navy (n=230, 56.9%) (data not shown).

**FIGURE 2.** Incident Cases[a] and Incidence Rates of Heat Exhaustion, by Encounter Type and Year of Diagnosis, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: No., number; p-yrs, person-years.

[a]Diagnosis codes were prioritized by severity and record source: heat stroke > heat exhaustion, hospitalizations > ambulatory visits); "reported" denotes that case was reported to DRSi; "unreported" denotes that case was not reported to DRSi.

## Discussion

During the 5-year surveillance period, the rate of total heat illness diagnoses increased annually from 2021 through 2024 and then decreased by 6.4% in 2025. The 2025 decrease was driven by a 9.1% decrease in the rate of heat exhaustion among ACSMs in 2025 compared to 2024. The decreased IR of heat exhaustion was most prominent among Marine Corps and Air Force ACSMs. The rate of heat stroke increased by 6.9% during the same period, however, with rising IRs among Army and Marine Corps personnel.

To support the surveillance of heat illnesses among the U.S. Armed Forces, reporting heat exhaustion and heat stroke cases to DRSi is required.[6] As in previous reports, the proportion of heat exhaustion cases reported in 2025 to DRSi was substantially lower than the proportion of heat stroke cases reported (40.0% versus 77.4%, respectively). The proportion of heat stroke cases being reported to DRSi continues to improve, however, with the highest frequency of cases reported in 2025. The *Armed Forces Reportable Medical Events Guidelines and Case Definitions* provides military Preventive Medicine and Public Health departments with the criteria for reporting these cases to DRSi.[6]

There are limitations to this update that should be considered when interpreting its findings. Although heat illnesses were summarized by the location of diagnosis or report, medical care may not occur at the same location (i.e., installation or base) as the heat illness event, particularly if the case required a level of care not available locally. To account for locations with medical care redundancy, some installations were combined (e.g., MCB Camp Lejeune / Cherry Point, NC in **Table 3**); this merging of locations was most prevalent with Marine Corps and Navy locations. Further, the method used to identify recruit trainees likely resulted in some misclassification of recruit training status. The algorithm did not account for the additional training time in the Army's One Station Unit Training beyond the traditional basic combat training period and does not account for service members who are recycled through training, likely leading to an under-estimation of the heat illnesses among recruit trainees. Finally, there was likely incomplete capture of heat illnesses treated in the field during training and deployments, rather than at a fixed military hospital or clinic; this may be particularly true for heat exhaustion cases when symptoms rapidly resolve after a period of rest.

Heat illness surveillance helps military public health and leadership understand the impact these conditions have on service member health, training, and force readiness. To mitigate the personal and organizational impacts of heat illness,

**TABLE 3.** Heat Injury Events[a] by Location of Diagnosis or Report (with at least 100 cases during period of surveillance), Active Component, U.S. Armed Forces, 2021–2025

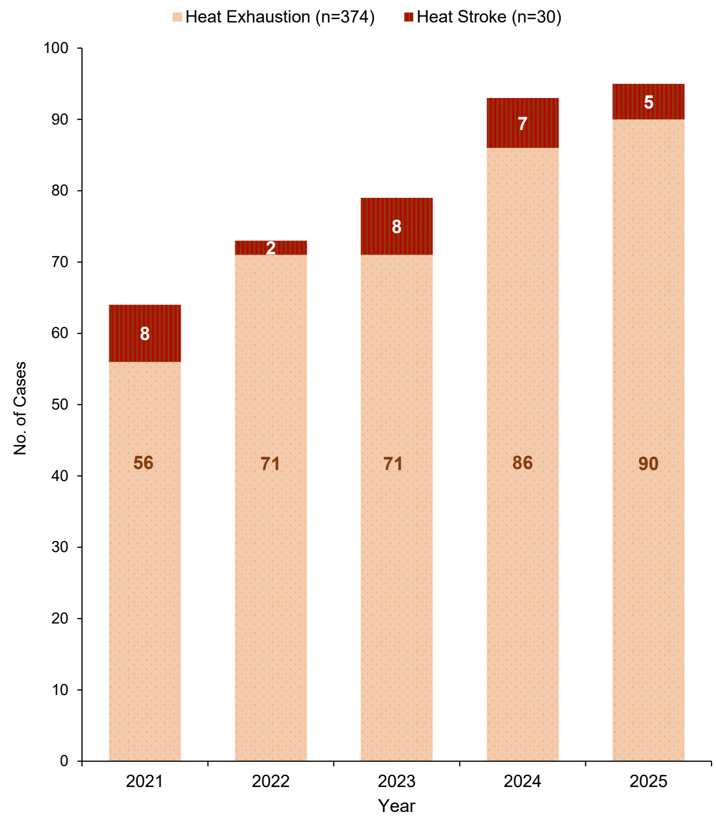
| Location of Diagnosis | No. | % Total |
|---|---|---|
| Fort Benning, GA | 1,737 | 13.3 |
| Fort Bragg, NC | 942 | 7.2 |
| MCB Camp Lejeune/ Cherry Point, NC | 829 | 6.4 |
| JB San Antonio, TX | 751 | 5.8 |
| MCRD Parris Island/ Beaufort, SC | 679 | 5.2 |
| Fort Campbell, KY | 640 | 4.9 |
| Fort Polk, LA | 533 | 4.1 |
| MCRD San Diego/ NB San Diego | 485 | 3.7 |
| Fort Hood, TX | 452 | 3.5 |
| Okinawa, Japan | 409 | 3.1 |
| Fort Jackson, SC | 328 | 2.5 |
| MCB Quantico, VA | 316 | 2.4 |
| MCB Camp Pendleton, CA | 313 | 2.4 |
| Fort Sill, OK | 290 | 2.2 |
| Fort Stewart, GA | 180 | 1.4 |
| Fort Shafter, HI | 177 | 1.4 |
| Twentynine Palms, CA | 177 | 1.4 |
| Fort Irwin, CA | 175 | 1.3 |
| Fort Leonard Wood, MO | 162 | 1.2 |
| NAS Pensacola, FL | 137 | 1.1 |
| Fort Bliss, TX | 127 | 1.0 |
| Outside the U.S.[b] | 573 | 4.4 |
| All other locations | 2,635 | 20.2 |
| Total | 13,047 | 100 |

Abbreviations: No., number; MCB, Marine Corps Base; MCRD, Marine Corps Recruit Depot; NAS, Naval Air Station; NB, Naval Base; JB, Joint Base.
[a]One heat illness per person per year.
[b]Excluding Okinawa, Japan.
Note: Initial entry recruit training locations include Fort Jackson, Fort Leonard Wood, Fort Benning, Fort Sill, MCRD Parris Island/Beaufort, MCRD San Diego/NB San Diego, and JB San Antonio. Fort Polk is the Joint Readiness Training Center (JRTC) and Fort Irwin is the National Training Center (NTC).

leaders, training cadres, and supporting medical and safety personnel must inform both their subordinate and supported service members of heat illness risks, preventive measures, early signs and symptoms of illness, and appropriate interventions.

To preserve readiness and protect military personnel, Department of War standards, policies, or guidelines should support heat illness surveillance coupled with evidence-based prevention, mitigation, and management practices.

**FIGURE 3.** Incident Cases of In-Theater Heat Illnesses, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: No., number.

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*Disclaimer*

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*Update*

# Exertional Rhabdomyolysis Among U.S. Active Component Service Members, 2021–2025


Exertional rhabdomyolysis is a pathologic muscle breakdown associated with strenuous physical activity. A largely preventable condition, it persists as an occupational hazard of military training and operations, especially in high heat environments among individuals pushing their endurance limits. A total of 521 cases of exertional rhabdomyolysis were identified in the U.S. Armed Forces in 2025, corresponding to a crude incidence rate of 39.7 cases per 100,000 person-years. This rate is consistent with 2023-2024 levels but remains higher than rates from 2021-2022. The percentage of inpatient cases rose to a 5-year peak of 46.3% in 2025, however, a 21.6% relative increase from the low of 38.0% recorded in 2022. In 2025, the Air Force demonstrated the most significant rate increase, 60.0%, followed by the Army, with a 16.4% increase. In contrast, the Marine Corps and Navy showed rate decreases of 32.4% and 34.8%, respectively, when compared to 2024. The Coast Guard's annual case numbers remained low, ranging 4–6 cases throughout the 5-year surveillance period. Consistent with prior reports, subgroup-specific crude rates in 2025 were highest among men, those younger than age 20 years, non-Hispanic Black service members, Marine Corps or Army members, and those in combat-specific or 'other' military occupations. In 2025, recruit trainees continued to experience the highest rates of exertional rhabdomyolysis, with a rate more than 6 times greater than officers and enlisted members.


**What are the new findings?**

In 2025, a total of 521 cases of exertional rhabdomyolysis resulted in a crude incidence rate of 39.7 cases per 100,000 person-years, consistent with 2023-2024 levels, yet higher than 2021-2022 levels. Meanwhile, in 2025 the proportion of cases requiring inpatient admission climbed to a 5-year peak of 46.3%, marking at 21.6% increase from the 2022 low. The period from 2024 to 2025 manifested opposite trends, with rates increasing in the Army and the Air Force while decreasing in the Marine Corps and the Navy. The Air Force showed the largest increase, with incidence rates 60% higher from the previous year.

**What is the impact on readiness and force health protection?**

Exertional rhabdomyolysis is a serious threat to military members that can limit their service effectiveness and potentially predispose them to serious injury. Risk of developing exertional rhabdomyolysis can be reduced by awareness of environmental conditions, cognizance of troop fitness levels, emphasis on graded pre-conditioning prior to more strenuous training, adherence to recommended work and rest ratios with appropriate hydration schedules, especially in hot, humid weather, and prompt recognition of symptoms by commanders.

Initiation of a high-intensity physical activity at unaccustomed intensity or duration, particularly under heat stress, increases the risk of exertional rhabdomyolysis.[1] A potentially serious condition, exertional rhabdomyolysis requires vigilance for early diagnosis and aggressive treatment to prevent serious consequences. Rhabdomyolysis is characterized by the breakdown of skeletal muscle cells and leakage of intracellular contents (e.g., myoglobin, sarcoplasmic proteins, electrolytes) into the extracellular fluid and the circulatory system. Myoglobin is toxic to the tubular cells of the kidney and can lead to renal failure.

Rhabdomyolysis severity ranges from asymptomatic or mild elevation of serum muscle enzyme levels to life-threatening emergencies, such as electrolyte imbalances, acute kidney failure, disseminated intravascular coagulation, compartment syndrome, cardiac arrhythmia, or liver dysfunction.[1-4] The characteristic triad of rhabdomyolysis symptoms are muscle pain, weakness, and red- to brown-colored urine, due to high levels of myoglobin, although over half of patients do not have all of these specific symptoms.[5]

The standard diagnostic criteria for exertional rhabdomyolysis are muscle pain, weakness, and dark urine, or elevated serum creatine kinase (CK) levels, indicating myonecrosis, usually defined as a CK level of at least 5 times the upper limit of normal, following recent exercise.[2,3,6]

Exertional rhabdomyolysis is most commonly identified among new recruits at recruit training and combat installations, during the first 90 days of basic training,[7,8] but it can be observed in athletes accustomed to intense training, particularly when they extend themselves to the maximal limits of their physical endurance.[9] The condition occurs most frequently from mid-spring through early autumn at installations that support basic combat, recruit training, or major Army or Marine Corps combat units. Recruits can be exposed to environments requiring acclimatization to high heat or humidity in hotter months, while soldiers and marines in combat units often perform rigorous unit physical training, personal fitness training, and field training exercises regardless of weather conditions. A history of heat illness or prior heat stroke has also been described as significant risk factors for service members who sustained rhabdomyolysis,[8,10] revealing the potential for co-morbid conditions.

*MSMR* annually summarizes the numbers, rates, trends, risk factors, and locations of exertional heat injury occurrences including exertional rhabdomyolysis. This report includes updated surveillance data from 2021 through 2025. Additional information about the definition, causes, and prevention of exertional rhabdomyolysis can be found in previous issues of *MSMR*.[7]

## Methods

The surveillance period ranged from January 2021 through December 2025 and included all individuals who served in the active component of the U.S. Army, Navy, Air Force, Marine Corps, Space Force, or Coast Guard. Due to small numbers, Space Force members were included in the Air Force population. All data used to determine incident exertional rhabdomyolysis diagnoses were derived from records routinely maintained in the Defense Medical Surveillance System (DMSS). These records document both ambulatory encounters and hospitalizations of active component members of the U.S. Armed Forces in fixed military and civilian (if reimbursed through the Military Health System) hospitals and clinics worldwide.

A case of exertional rhabdomyolysis was defined as an individual with International Classification of Diseases, 9th or 10th revision (ICD-9/ICD-10) diagnostic codes in any position indicating a hospitalization (i.e., inpatient) or outpatient medical encounter record with either "rhabdomyolysis" or "myoglobinuria" listed, plus a diagnosis in any position of 1 of either "volume depletion (dehydration)," "effects of heat and light," "effects of thirst (deprivation of water)," "exhaustion due to exposure," or "exhaustion due to excessive exertion (overexertion)" **(Table 1)**.[11] Each individual could be considered an incident case of exertional rhabdomyolysis only once per calendar year.

Cases of rhabdomyolysis associated with trauma, intoxications, and adverse drug reactions were excluded.[12] For health surveillance purposes, recruit trainees were identified as active component members assigned to service-specific training locations during coincident, service-specific basic training periods. Recruit trainees were considered a separate enlisted service member category in exertional rhabdomyolysis summaries by military grade.

**TABLE 1.** ICD-9/ICD-10 Diagnostic Codes Used to Define a Case of Exertional Rhabdomyolysis

| Primary condition | ICD-9 | ICD-10 |
|---|---|---|
| Rhabdomyolysis | 728.88 | M62.82 |
| Myoglobinuria | 791.3 | R82.1 |
| **Associated conditions** | **ICD-9** | **ICD-10** |
| Volume depletion (dehydration) | 276.5* | E86.0, E86.1, E86.9 |
| Effects of heat and light | 992.0-992.9 | T67.0*-T67.9* |
| Effects of thirst (deprivation of water) | 994.3 | T73.1* |
| Exhaustion due to exposure | 994.4 | T73.2* |
| Exhaustion due to excessive exertion (overexertion) | 994.5 | T73.3* |

Abbreviations: ICD-9, International Classification of Diseases, 9th Revision; ICD-10, International Classification of Diseases, 10th Revision.
* Indicates that any subsequent digit or character is included.

The surveillance data reflect the most current information available at the time of analysis. Case counts are finalized over subsequent reporting cycles to incorporate data from all treatment facilities, which may be subject to routine reporting delays. Consequently, case numbers and incidence rates for a given year may be retrospectively adjusted in future reports.

## Results

In 2025, a total of 521 cases of rhabdomyolysis likely associated with physical exertion or heat stress (i.e., exertional rhabdomyolysis) were identified, corresponding to a crude incidence rate (IR) of 39.7 cases per 100,000 person-years (p-yrs) **(Table 2)**. This rate is consistent with 2023-2024 levels and remains higher than rates observed in 2021-2022 **(Figure 1)**. Consistent with prior annual reports, crude IRs remained highest among men, those younger than age 20 years, Marine Corps or Army members, non-Hispanic Black service members, and those in combat-specific, motor transport, and 'other' occupations **(Table 2)**. During the surveillance period, 2021-2025, approximately three-quarters (75.9%) of cases occurred during the warmer months (April–September) **(Figure 3)**.

Recruit trainees continued to have the highest rates of exertional rhabdomyolysis in 2025, at a rate of over 6 times greater than officers and enlisted members. The percentage of rhabdomyolysis cases hospitalized in 2025 was 46.3% (n=241), a 13.7% increase from 2024. Proportions of hospitalized or inpatient cases were lowest in 2022, at 38.0% **(Figure 1)**.

Over the 5-year surveillance period, the highest case counts and IRs of exertional rhabdomyolysis were observed in the Marine Corps (n=736, IR 85.9 per 100,000 p-yrs) and the Army (n=1,371, IR 60.4 per 100,000 p-yrs) (data not shown). The rates for the Air Force (n=268, IR 16.6 per 100,000 p-yrs ), Navy (n=196, IR 11.8 per 100,000 p-yrs), and Coast Guard (n=24, IR 12.1 per 100,000 p-yrs) were substantially lower. The Coast Guard's annual case count remained consistently low, ranging 4–6. No cases were identified among Space Force members.

When comparing 2025 rates to 2024, the IR of the Air Force increased by 60.0%, while the IR for the Army rose by 16.4% **(Figure 2)**. In contrast, rates decreased in the Marine Corps and the Navy, by 32.4% and 34.8%, respectively. The 2025 IR of exertional rhabdomyolysis in the Navy was the lowest, at 8.7 cases per 100,000 p-yrs.

From 2024 to 2025, the IR among Hispanic service members decreased by 30.4% (from 42.4 to 29.5 cases per 100,000 p-yrs). Non-Hispanic Black service member rates were more than double those of other racial and ethnic groups, rising by 13.4% from 2024 (65.7 per 100,000 p-yrs) to 2025 (74.5 per 100,000 p-yrs). The rate remained stable for non-Hispanic White service members (34.3 in 2024 vs. 34.6 cases in 2025) (data not shown).

During the 5-year surveillance period, 22 installations diagnosed at least 20 cases each; when combined, these installations diagnosed 68.1% of all cases **(Table 3)**. Of those 22 installations, 7 support recruit or basic combat training centers: Marine Corps Recruit Depot (MCRD) Parris Island/Beaufort, South Carolina; Fort Benning, Georgia; Joint Base San Antonio-Lackland, Texas; Fort Leonard Wood, Missouri; MCRD San Diego, California; Fort Jackson, South Carolina; and Fort Sill, Oklahoma; while 11 installations support large combat troop populations: Fort Bragg, North Carolina; Fort Campbell, Kentucky; Marine Corps Base (MCB) Camp Lejeune, North Carolina; Fort Shafter, Hawai'i; Fort Hood, Texas; MCB Camp Pendleton, California; Fort Bliss, Texas; Fort Polk, Louisiana; Fort Stewart, Georgia; Fort Carson, Colorado; and Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, California. From 2021 through 2025, Fort Bragg, MCRD Parris Island/Beaufort, and Fort Benning together accounted for over 28.3% of all cases **(Table 3)**.

**TABLE 2.** Incident Cases[a] and Incidence Rates[b] of Exertional Rhabdomyolysis, Active Component, U.S. Armed Forces, 2025

| | Hospitalizations | | Ambulatory Visits | | Total | |
|---|---|---|---|---|---|---|
| | No. | Rate | No. | Rate | No. | Rate |
| Total | 241 | 18.3 | 280 | 21.3 | 521 | 39.7 |
| Sex | . | . | . | . | . | . |
| Male | 226 | 21.0 | 261 | 24.3 | 487 | 45.3 |
| Female | 15 | 6.3 | 19 | 8.0 | 34 | 14.2 |
| Age, *y* | . | . | . | . | . | . |
| <20 | 35 | 21.7 | 70 | 43.3 | 105 | 65.0 |
| 20–24 | 70 | 22.0 | 88 | 27.6 | 158 | 49.6 |
| 25–29 | 68 | 21.9 | 71 | 22.9 | 139 | 44.8 |
| 30–34 | 34 | 15.8 | 31 | 14.4 | 65 | 30.2 |
| 35–39 | 23 | 13.6 | 13 | 7.7 | 36 | 21.3 |
| 40+ | 11 | 7.9 | 7 | 5.0 | 18 | 13.0 |
| Race and ethnicity | . | . | . | . | . | . |
| White, non-Hispanic | 101 | 15.4 | 126 | 19.2 | 227 | 34.6 |
| Black, non-Hispanic | 76 | 34.5 | 88 | 40.0 | 164 | 74.5 |
| Hispanic | 42 | 15.3 | 39 | 14.2 | 81 | 29.5 |
| Other, unknown[c] | 22 | 13.5 | 27 | 16.6 | 49 | 30.1 |
| Branch of service | . | . | . | . | . | . |
| Army | 141 | 31.6 | 166 | 37.2 | 307 | 68.8 |
| Navy | 15 | 4.5 | 14 | 4.2 | 29 | 8.7 |
| Air Force | 40 | 12.3 | 27 | 8.3 | 67 | 20.7 |
| Marine Corps | 44 | 25.9 | 69 | 40.6 | 113 | 66.4 |
| Coast Guard | 1 | 2.4 | 4 | 9.7 | 5 | 12.2 |
| Military rank | . | . | . | . | . | . |
| Enlisted | 185 | 17.8 | 195 | 18.7 | 380 | 36.5 |
| Officer | 36 | 14.8 | 43 | 17.6 | 79 | 32.4 |
| Recruit | 20 | 70.6 | 42 | 148.3 | 62 | 219.0 |
| Military occupation | . | . | . | . | . | . |
| Combat-specific[d] | 53 | 33.2 | 82 | 51.3 | 135 | 84.5 |
| Motor transport | 11 | 25.4 | 12 | 27.7 | 23 | 53.1 |
| Pilot, air crew | 5 | 11.5 | 4 | 9.2 | 9 | 20.7 |
| Repair, engineering | 36 | 10.2 | 34 | 9.6 | 70 | 19.8 |
| Communications, intelligence | 47 | 17.5 | 33 | 12.3 | 80 | 29.8 |
| Health care | 15 | 14.4 | 13 | 12.4 | 28 | 26.8 |
| Other | 74 | 21.8 | 102 | 30.0 | 176 | 51.8 |
| Home of record | . | . | . | . | . | . |
| Midwest | 38 | 19.6 | 37 | 19.1 | 75 | 38.6 |
| Northeast | 33 | 21.1 | 34 | 21.7 | 67 | 42.8 |
| South | 124 | 21.3 | 135 | 23.2 | 259 | 44.6 |
| West | 33 | 10.9 | 62 | 20.4 | 95 | 31.2 |
| Other, unknown | 13 | 16.7 | 12 | 15.4 | 25 | 32.2 |

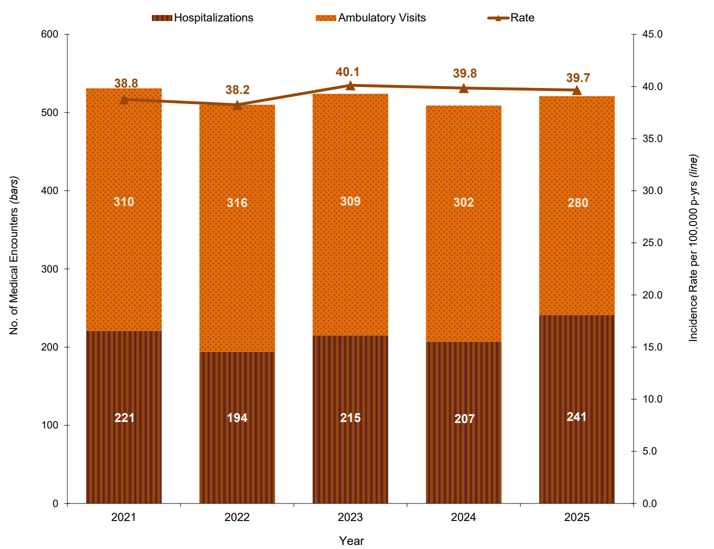
Abbreviations: No., number; *y*, years.
[a]One case per person per year.
[b]Rate per 100,000 person-years.
[c]Includes those of American Indian/Alaska Native, Asian/Pacific Islander, and unknown race/ethnicity.
[d]Infantry/artillery/combat engineering/armor.

## Discussion

The crude IR of exertional rhabdomyolysis in 2025 was 39.7 cases per 100,000 p-yrs, consistent with 2023 and 2024 rates, remaining elevated in relation to 2021-2022 levels. While provisional data in last year's report suggested a decline in 2024,[13] more complete data (as of March 2026), show that the rate was consistent with those of 2023 and 2025. Overall, these data indicate a stable but elevated incidence during the latter 3 years (2023-2025) of the 5-year surveillance period compared to the initial 2 years (2021-2022) .

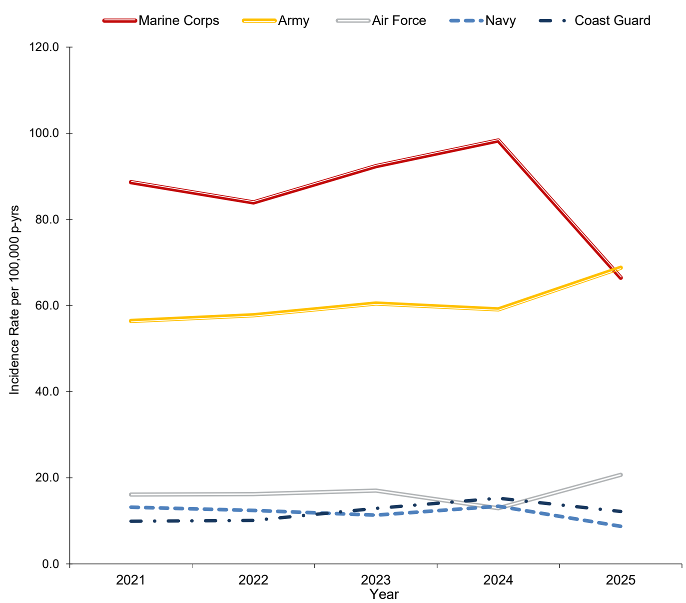
Following last year's reporting period, divergent trends emerged, however, among the service branches: Rates increased in the Army and the Air Force and decreased

**FIGURE 1.** Incident Cases and Incidence Rates of Exertional Rhabdomyolysis by Source of Report and Year of Diagnosis, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: No., number; p-yrs, person-years.

**FIGURE 2.** Annual Incidence Rates of Exertional Rhabdomyolysis by Service, Active Component, U.S. Armed Forces, 2021–2025




Abbreviation: P-yrs, person-years.

in the Marine Corps and the Navy. The Air Force demonstrated the most substantial rate increase for exertional rhabdomyolysis incidence in 2025, at 60.0%, the highest among all service branches, after showing the largest decline in 2024.[12] In contrast, the Marine Corps and the Navy saw comparable rate decreases in 2025, of 32.4% and 34.8%, respectively, when compared to 2024 data, with the Navy recording its lowest rate in 2025.

In 2025 the percentage of cases hospitalized rose to a 5-year peak of 46.3%, a 21.6% increase from the lowest percentage, in 2022. This trend may reflect a rebound to pre-pandemic levels or increased clinical vigilance for risk mitigation that possibly led to a higher proportion of cases managed in an inpatient setting. This trend coincides with the release of the updated *Clinical Practice Guideline for the Management of Exertional Rhabdomyolysis in Warfighters*[6] in September 2025, which emphasizes standardized risk stratification and clearer admission criteria, focusing on early recognition of symptoms and CK thresholds.

The IR for non-Hispanic Black service members increased by 13.3% in 2025, while rates declined for Hispanic service members and remained stable for non-Hispanic White members. The persistently high IRs of exertional rhabdomyolysis among non-Hispanic Black service members (approximately twice the rates in other racial and ethnic groups), has been attributed, in part, to increased risk of exertional rhabdomyolysis among individuals with Sickle Cell Trait (SCT),[13-15] for which the carrier frequency is approximated at 1 in 13 for non-Hispanic Black individuals in the U.S.[16-20] Despite the 2023 TRADOC Regulation[21] formally recognizing SCT as a risk factor, with updated screening, early recognition, and prevention of exercise collapse associated with sickle cell trait (ECAST) strategies, the disparity has not improved. Further analysis into additional physiological, social, or environmental risk factors may be warranted.

The findings of this report should be interpreted with consideration of its limitations. A diagnosis of rhabdomyolysis alone does not indicate cause. Ascertaining the probable causes of exertional rhabdomyolysis cases was attempted by using a combination of ICD-9/ICD-10 diagnostic codes related to rhabdomyolysis with additional codes indicating effects of exertion, heat, or dehydration. Other ICD-9/ICD-10 codes were used to exclude cases of rhabdomyolysis that may have been secondary from trauma, intoxication, or adverse drug reactions. Recruit trainees were identified using an algorithm based on entry date into service, age, rank, location, and time in service, which was only an approximation and likely resulted in some misclassification of recruit training status.

The surveillance data for 2025 should be interpreted with caution due to reporting lags and updates of annual case counts, as data feeds are continuously uploaded and as data matures. Nevertheless, the diverging trends among the service branches from 2024 to 2025 suggest varied and possibly unequal implementation of preventive strategies within the services. These data also present an opportunity for further comparative analysis of contributing factors among the service branches. Service-specific public health and medical assets are encouraged to conduct targeted studies to identify and assess individual, operational, and environmental factors contributing to risk of exertional rhabdomyolysis, and evaluate the effectiveness of any preventive or mitigative interventions implemented.

Management after treatment for exertional rhabdomyolysis, including the decision to return to physical activity and duty, is a persistent challenge for military members and athletes.[22,23] The updated Clinical Practice Guideline provides a detailed and structured framework for return-to-duty decisions, allowing lower-risk individuals to follow a standard, criterion-based progression model, while higher-risk cases require more cautious and individualized plans, managed by specialists. The most severe consequences of exertional rhabdomyolysis are preventable with effective mitigation measures accompanied by heightened suspicion of probability when environmental conditions favor muscular injury.

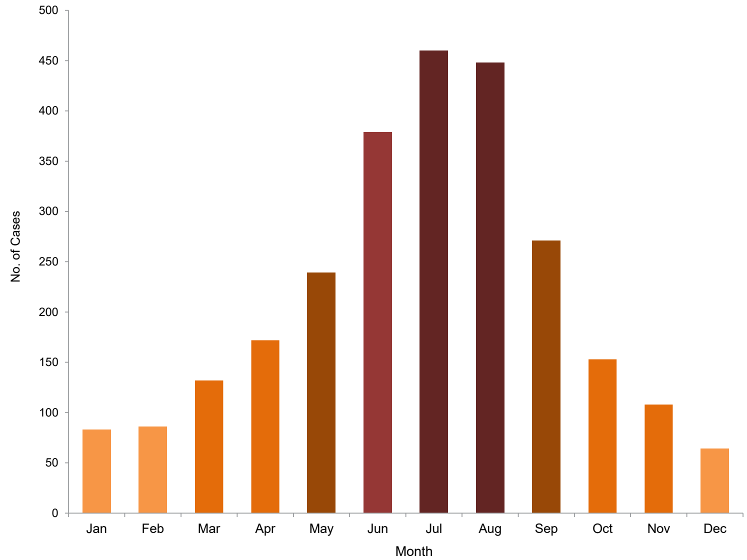
Commanders and supervisors at all levels should ensure that guidelines for heat illness prevention are consistently implemented, maintain vigilance for early signs of exertional heat injury, and intervene aggressively when exertional rhabdomyolysis is suspected.

**TABLE 3.** Incident Cases of Exertional Rhabdomyolysis by Location of Diagnosis or Report (with at least 20 cases during period of surveillance), Active Component, U.S. Armed Forces, 2021–2025

| Location of Diagnosis | No. | % Total |
|---|---|---|
| Fort Bragg, NC | 298 | 11.5 |
| MCRD Parris Island, SC | 242 | 9.3 |
| Fort Benning, GA | 195 | 7.5 |
| Fort Campbell, KY | 119 | 4.6 |
| MCB Camp Lejeune, NC | 102 | 3.9 |
| Fort Shafter, HI | 81 | 3.1 |
| Fort Hood, TX | 80 | 3.1 |
| MCB Camp Pendleton, CA | 75 | 2.9 |
| JBSA-Lackland, TX | 74 | 2.9 |
| Fort Leonard Wood, MO | 65 | 2.5 |
| MCRD San Diego, CA | 59 | 2.3 |
| Quantico, VA | 55 | 2.1 |
| Fort Bliss, TX | 52 | 2.0 |
| Fort Polk, LA | 42 | 1.6 |
| Fort Jackson, SC | 37 | 1.4 |
| Fort Stewart, GA | 33 | 1.3 |
| Fort Belvoir, VA | 32 | 1.2 |
| Fort Carson, CO | 32 | 1.2 |
| MCAGCC Twentynine Palms, CA | 28 | 1.1 |
| Fort Sill, OK | 25 | 1.0 |
| NMC Portsmouth, VA | 22 | 0.9 |
| Fort Gordon, GA | 20 | 0.8 |
| Other, unknown | 827 | 31.9 |
| Total | 2,595 | 100 |

Abbreviations: No., number; MCRD, Marine Corps Recruit Depot; MCB, Marine Corps Base; NMC Naval Medical Center; JBSA, Joint Base San Antonio; MCAGCC, Marine Corps Air Ground Combat Center.

**FIGURE 3.** Cumulative Numbers of Exertional Rhabdomyolysis Cases by Month of Diagnosis, Active Component, U.S. Armed Forces, 2021–2025




Abbreviation: No, number.

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*Update*

# Exertional Hyponatremia Among U.S. Active Component Service Members, 2021–2025

Exertional hyponatremia, also known as exercise-associated hyponatremia, is a fluid electrolyte disorder defined by a low sodium level in the blood (below 135 mEq/L). Exertional hyponatremia results from excessive fluid intake that dilutes serum sodium, impairing neurological and other organ functions. Hyponatremia can be fatal if not detected early and managed properly. From 2021 through 2025, 609 cases of exertional hyponatremia were diagnosed among U.S. active component service members (ACSMs), with an overall incidence rate of 9.2 cases per 100,000 person-years (p-yrs). In 2025, 106 cases of exertional hyponatremia were diagnosed among ACSMs, resulting in an incidence rate of 8.1 per 100,000 p-yrs. The highest incidence rates in 2025 were observed among males, individuals ages 35-39 years, non-Hispanic White service members, those in health care occupations, and personnel stationed in the western U.S. Notably, between 2024 and 2025 the Marine Corps and recruit populations showed a sharp decline in cases. From 2021 to 2023, annual rates of incident exertional hyponatremia diagnoses increased, peaking in 2023 (11.6 per 100,000 p-yrs) and then decreased to 8.1 cases per 100,000 p-yrs in 2025. Although the incidence of exertional hyponatremia is decreasing, continued monitoring and specialized prevention strategies are critical, as the associated risk factors may affect individuals differently.

**What are the new findings?**

Incidence rates of exertional hyponatremia decreased from 10.6 per 100,000 people per year in 2024 to 8.1 per 100,000 in 2025. Rates increased sharply in the 35-39-years age group, however, while decreasing sharply among those younger than age 20 years, ages 25-29 years, and in the Marine Corps.

**What is the impact on readiness and force health protection?**

The recent decline in cases of exertional hyponatremia is positive, but shifting rates among demographic groups show that risks are still dynamic. Due to the fact exertional hyponatremia can be fatal, commanders and trainers should prioritize enforcement of proper hydration protocols, maintain vigilance to identify early symptoms, and if necessary ensure immediate, prescribed intervention.

Exertional hyponatremia is a fluid electrolyte disorder resulting from excessive consumption of hypotonic fluids such as water. Although exertional hyponatremia is relatively rare, it can be fatal if not detected early and managed properly. Exertional hyponatremia is caused by increased consumption of hypotonic fluids, such as water or sports drinks, before or during strenuous physical activity, such as prolonged military field training and combat operations. Active component military personnel are particularly susceptible to fluid and electrolyte imbalances due to intense exertion and demanding physical activities.[1,2] Key individual risk factors besides excessive fluid intake include exercise lasting more than 4 hours, inadequate training, and a high or low body mass index.[3] Risk of exertional hyponatremia is influenced by a range of factors, including the duration and type of activity—from military exercises to endurance races—as well as environmental conditions such as heat stress and water availability.

The severity and onset of exertional hyponatremia symptoms depend on the rate and degree of the decrease in serum sodium from normal levels. When a serum or plasma sodium concentration is less than 135 milliequivalents per liter (mEq/L) within 24 hours after prolonged physical activity, hyponatremia or exertional hyponatremia occur. Normal plasma sodium concentration (Na+) is closely regulated between 135 and 145 mEq/L to maintain proper cell size and function.[1] Excessive intake of sodium will stimulate thirst to increase body water to maintain normal sodium serum concentration.[4,5] Exertional hyponatremia can also be caused by inappropriate secretion of a non-osmotic antidiuretic hormone due to physical exertion, resulting in increased total body and free water retention.[6]

Symptoms of exertional hyponatremia, which can manifest during or after physical activity, range from mild to life-threatening. Mild symptoms include lightheadedness, malaise, fatigue, irritability, weakness, headache, nausea, and reduced urine excretion. Severe symptoms can escalate to vomiting, oliguria or anuria, altered mental status, collapse, seizures, coma, and death.[6] Hyponatremia is treated primarily by managing the underlying cause and free water restriction,[7] focusing on pre-hospital care through rapid on-site emergency medical service assessment, as well as emergency and inpatient hospital management.[8] Depending on the physical demands of military operations and prevailing environmental conditions, replacement fluid composition may vary.[9]

Hyponatremia is particularly problematic in the military, where it can be mistaken for an exertional heat illness (EHI), such as heat exhaustion or heat stroke, with corresponding symptomology that makes differential diagnosis difficult.[8] Exertional hyponatremia must be differentiated from EHI to avoid inappropriate treatment and adverse outcomes.[10] Failure to differentiate between these conditions can lead to incorrect treatment including overhydration, which risks severe and potentially permanent neurological damage.[11]

The fundamental characteristics of military operations, such as long-term military training and combat operations in extreme environmental conditions, mean that exertional hyponatremia continues to pose a health risk to U.S. military personnel, with the potential for significantly reducing performance and combat effectiveness. There is growing evidence that hyponatremia is associated in various clinical settings and diseases with increased morbidity, mortality, and health costs.[12-14] *MSMR* annually summarizes the numbers, rates, trends, risk factors, and locations of exertional heat injury occurrences including exertional hyponatremia. This report includes updated surveillance data from 2021 through 2025. Additional information about the definition, causes, and prevention of exertional hyponatremia can be found in previous issues of *MSMR*.[14] This report summarizes the frequency, rates, trends, demographic, geographic location, and military characteristics of exertional hyponatremia cases among U.S. active component service members (ACSMs) from 2021 to 2025.

## Methods

The surveillance period ranged from January 2021 through December 2025 and included all individuals who served in the active component of the U.S. Army, Navy, Air Force, Marine Corps, Space Force, or Coast Guard. All data used to determine incident exertional hyponatremia diagnoses were derived from records routinely collected and maintained in the Defense Medical Surveillance System (DMSS). Those records document both ambulatory encounters and hospitalizations of U.S. Armed Forces ACSMs in fixed military and civilian (if reimbursed through the Military Health System) hospitals and clinics worldwide.

A case of exertional hyponatremia was defined as an individual with 1) a hospitalization or ambulatory visit with a primary (first-listed) diagnosis of "hypo-osmolality and/or hyponatremia" (International Classification of Diseases, 9th and 10th revisions, ICD-9: 276.1, ICD-10: E87.1) and no other illness or injury-specific diagnoses (ICD-9: 001–999, ICD-10: 'A'–'U') in any diagnostic position or 2) both a diagnosis of 'hypo-osmolality and/or hyponatremia' (ICD-9: 276.1, ICD-10: E87.1) and at least 1 of the following within the first 3 diagnostic positions (dx1–dx3): 'fluid overload' (ICD-9: 276.9; ICD-10: E87.70, E87.79), 'alteration of consciousness' (ICD-9: 780.0*, ICD-10: R40.*), 'convulsions' (ICD-9: 780.39, ICD-10: R56.9), 'altered mental status' (ICD-9: 780.97, ICD-10: R41.82), 'effects of heat/light' (ICD-9: 992.0–992.9, ICD-10: T67.0*–T67.9*), or 'rhabdomyolysis' (ICD-9: 728.88, ICD-10: M62.82).[15]

Medical encounters were excluded from case-defining events if the associated records listed diagnoses in any diagnostic position that included alcohol or illicit drug abuse; psychosis, depression, or other major mental disorders; endocrine disorders; kidney diseases; intestinal infectious diseases; cancers; major traumatic injuries; or complications of medical care. An individual could be considered a case of exertional hyponatremia only once per calendar year. Incidence rates were calculated as cases of hyponatremia per 100,000 person-years (p-yrs) of active component service.

For health surveillance purposes, recruits were identified as active component members assigned to service-specific training locations during coincident service-specific basic training periods. Recruits were considered as a separate category of enlisted service members in summaries of exertional hyponatremia by military grade overall. Incidence rates reported in this update represent unadjusted rates.

## Results

In 2025, a total of 106 cases of exertional hyponatremia were identified among ACSMs, corresponding to an incidence rate (IR) of 8.1 per 100,000 p-yrs, a noteworthy decrease from 10.6 per 100,000 p-yrs in 2024. The IR of 8.1 recorded in 2025 represents the lowest annual rate for the entire 2021–2025 surveillance period, just 2 years after the peak in incidence, 11.6 per 100,000 p-yrs, in 2023. From 2021 through 2025, 609 incident cases of exertional hyponatremia were reported among ACSMs, resulting in an overall IR of 9.2 cases per 100,000 p-yrs. During the 5-year surveillance period, 91.8% (n=559) of all cases were diagnosed and treated without hospitalization (data not shown). **Figure 1** displays the annual incident cases and rates among ACSMs.

Although the Marine Corps had the highest overall IR (12.6 per 100,000 p-yrs) from 2021 to 2025, the Marine Corps rate dropped significantly between 2024 and 2025, from 17.0 to 7.6 per 100,000 p-yrs. While the annual IRs in the Army had been trending upward from 2022 to 2024, the IR for this service branch also declined in 2025 **(Figure 3)**.

Incidence of exertional hyponatremia among recruits showed a sharp decline, of 64.8%, from 2024 to 2025, dropping from 49.9 cases per 100,000 p-yrs to 17.6 per 100,000 p-yrs. Only 5 cases of hyponatremia were recorded among recruits in 2025 **(Table 1)**. The trend aligns with the overall pattern of case occurrence, which peaked in 2023 before shifting downward (data not shown).

In 2025, the highest occupational IRs were found in the health care (14.4 per 100,000 p-yrs) and pilot and air crew (11.5 per 100,000 p-yrs) military professions; no cases were reported in motor transport. Although the overall trend has declined since its peak in 2023, the rates for health care as well as pilot and air crew occupations have continued to rise (data not shown).

In 2025, service members ages 35-39 years had the highest IR for exertional hyponatremia, followed by those ages 40 years and older (18.3 and 17.3 per 100,000 p-yrs, respectively). The IR for the 35-39-years age group increased noticeably in 2025 compared to 2024, to 18.3 from 7.2 per 100,000 p-yrs, respectively. Since 2023, the incidence of exertional hyponatremia has decreased for all age groups except the 30-39-years group (data not shown).

For both male and female ACSMs, cases of exertional hyponatremia declined in 2025 from the previous year. There was no significant difference in the annual IRs of male and female ACSMs in 2025: 8.1 and 8.0 per 100,000 p-yrs, respectively. While the IRs of hyponatremia for both sexes decreased from 2024 to 2025, the drop was more significant for women. The female IR fell by 35.0% (from 12.3 to 8.0 per 100,000 p-yrs), compared to a 20.6% decrease in the male IR (from 10.2 to 8.1 per 100,000 p-yrs). This higher variability in female rates was evident in all observed periods (**Figure 3**).

From 2024 to 2025, the IRs of exertional hyponatremia declined among all racial and ethnic groups, excluding the 'other or unknown' category. The most substantial decrease was among Hispanic ACSMs, followed by non-Hispanic White and non-Hispanic Black service members. Notably, the trend for non-Hispanic White ACSMs had been increasing until 2024, when it began to decline. For all other ethnic groups, the decline in IRs started in 2023 (data not shown).

ACSMs stationed in the western U.S. exhibited a higher IR of exertional hyponatremia in 2025 compared to their counterparts in other regions, whereas other duty stations including the northeast, midwest, and southern regions showed similar IRs (data not shown). Exertional hyponatremia cases were diagnosed at more than 103 U.S. military installations and geographic locations worldwide during the surveillance period, but 12 U.S. installations contributed 7 or more cases each and accounted for 45.6% of total cases (**Table 2**). Fort Benning, Georgia, reported 48 cases of exertional hyponatremia, the highest in the Department of War.

**TABLE 1.** Incident Cases[a] and Ratesb of Exertional Hyponatremia, Active Component, U.S. Armed Forces, 2021–2025

| | 2025 | | Total, 2021–2025 | |
|---|---|---|---|---|
| | No.[a] | Rate[b] | No.[a] | Rate[b] |
| Total | 106 | 8.1 | 609 | 9.2 |
| Sex | | | | |
| Male | 87 | 8.1 | 496 | 9.1 |
| Female | 19 | 8.0 | 113 | 9.7 |
| Age, *y* | | | | |
| <20 | 7 | 7.8 | 55 | 12.9 |
| 20–24 | 15 | 3.8 | 131 | 6.5 |
| 25–29 | 14 | 4.5 | 110 | 7.1 |
| 30–34 | 15 | 7.0 | 83 | 7.7 |
| 35–39 | 31 | 18.3 | 92 | 11.0 |
| 40+ | 24 | 17.3 | 138 | 20.3 |
| Race and ethnicity | | | | |
| White, non-Hispanic | 58 | 8.8 | 344 | 9.9 |
| Black, non-Hispanic | 17 | 7.7 | 107 | 10.1 |
| Hispanic | 16 | 5.8 | 93 | 7.3 |
| Other, unknown | 15 | 9.2 | 65 | 8.0 |
| Branch of service | | | | |
| Army | 40 | 9.0 | 218 | 9.6 |
| Navy | 20 | 6.0 | 122 | 7.3 |
| Air Force | 29 | 9.0 | 142 | 8.8 |
| Marine Corps | 13 | 7.6 | 108 | 12.6 |
| Coast Guard | 4 | 9.7 | 19 | 9.5 |
| Military rank | | | | |
| Enlisted | 73 | 7.0 | 390 | 7.4 |
| Officer | 28 | 11.5 | 164 | 13.5 |
| Recruit | 5 | 17.6 | 55 | 43.5 |
| Military occupation | | | | |
| Combat-specific[c] | 13 | 8.1 | 90 | 10.6 |
| Motor transport | | 0.0 | 9 | 4.1 |
| Pilot, air crew | 5 | 11.5 | 20 | 8.8 |
| Repair, engineering | 18 | 5.1 | 116 | 6.2 |
| Communications, intelligence | 22 | 8.2 | 129 | 9.3 |
| Health care | 15 | 14.4 | 55 | 10.3 |
| Other | 33 | 9.7 | 190 | 12.7 |
| Home of record | | | | |
| Midwest | 14 | 7.2 | 100 | 9.7 |
| Northeast | 12 | 7.7 | 77 | 9.7 |
| South | 42 | 7.2 | 259 | 9.0 |
| West | 31 | 10.2 | 130 | 8.5 |
| Other, unknown | 7 | 9.0 | 43 | 11.5 |

Abbreviation: No., number; *y*, years
[a] Count 1 per person per year
[b] Cases per 100,000 person-years
[c] Includes infantry, artillery, combat engineering, armor.
Source: Defense Medical Surveillance System (DMSS) as of 16MAR2026
Prepared by Armed Forces Health Surveillance Division (AFHSD)

## Discussion

Since 2023, overall IRs of exertional hyponatremia among U.S. ACSMs have been on a downward trend, with substantial decreases in incidence among Marine Corps members, recruits, those in motor transport occupations, individuals ages 25-29 years, and female service members. Air Force exertional hyponatremia IRs were more variable throughout the 5-year surveillance period.

With the exception of the Air Force, all branches of service evinced downward trends in exertional hyponatremia IRs from 2024 to 2025. Marines and recruits demonstrated particularly sharp declines in exertional hyponatremia cases from 2024 to 2025.

In 2025, incidence of exertional hyponatremia declined for all military occupations, with 2 notable exceptions: health care personnel and pilots and air crew, which had the highest and second-highest IRs, respectively.

Exertional hyponatremia IRs in 2025 decreased among all age groups except for ACSMs ages 30-39 years. The most significant decline was seen in the 25-29-years age group, followed by the 20-24-years age group. A sharp surge in the IR for the ages 35-39-years group reversed the 2024 trend, where the ages 40 years and older group had the highest rate.

In 2022 and 2023, non-Hispanic Black service members had higher IRs, while in 2024 and 2025, non-Hispanic White service members had higher rates. Rates are comparable, however, among racial and ethnic groups. Risk is not definitively linked to any single ethnic group.[16-18]

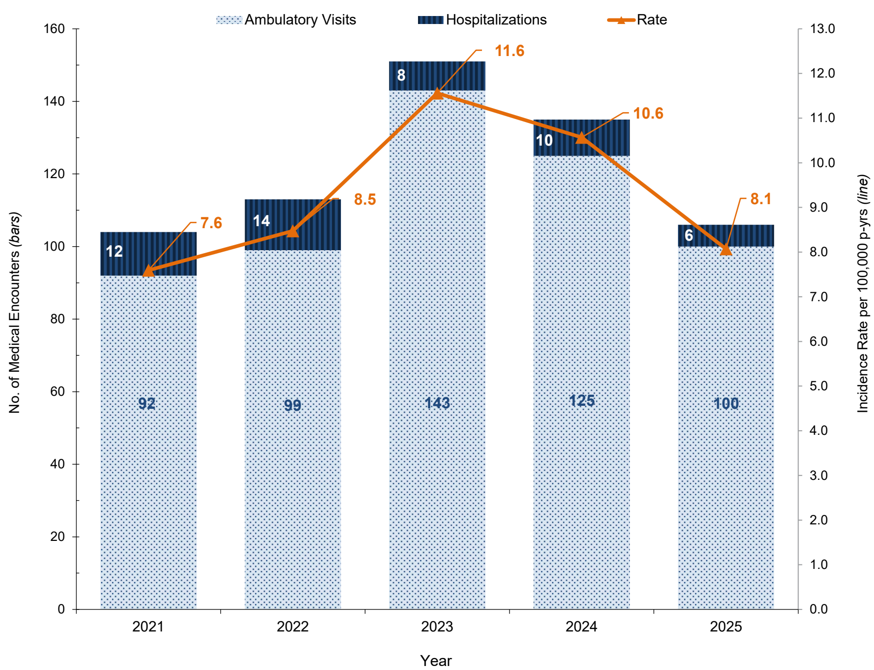
The IR for hyponatremia in the western U.S. increased in 2025 to become the highest in the nation. Notably, this region contains major military training centers in desert environments, such as the National Training Center at Fort Irwin, California, and the Marine Corps Air Ground Combat Center at Twentynine Palms, California. This report did not assess the intensity of military training or specific climate exposures during the reporting period, however. Consequently, no conclusions can be drawn about the impact of these operational and environmental factors on the observed increase.

Several important limitations should be considered when interpreting the results of this analysis. First, there is no diagnostic code specific for exertional hyponatremia. This lack of specificity may result in inclusion of some non-exertional cases of hyponatremia, thus overestimating the true rate. Consequently, the results of this analysis should be considered estimates of the actual incidence of symptomatic exertional hyponatremia from excessive water consumption among U.S. military members.

In addition, the accuracy of estimated numbers, rates, trends, and correlates of risk depends on the completeness and accuracy of diagnoses that are documented in standardized records of relevant medical encounters. Nonetheless, the decline in the number of diagnoses presenting with exertional hyponatremia may reflect increased awareness, concern, and aggressive management of early cases by military supervisors and primary health care providers. Finally, recruits were identified using an algorithm based on age, rank, location, and time in service, which was only an approximation and likely resulted in some misclassification of recruit training status.

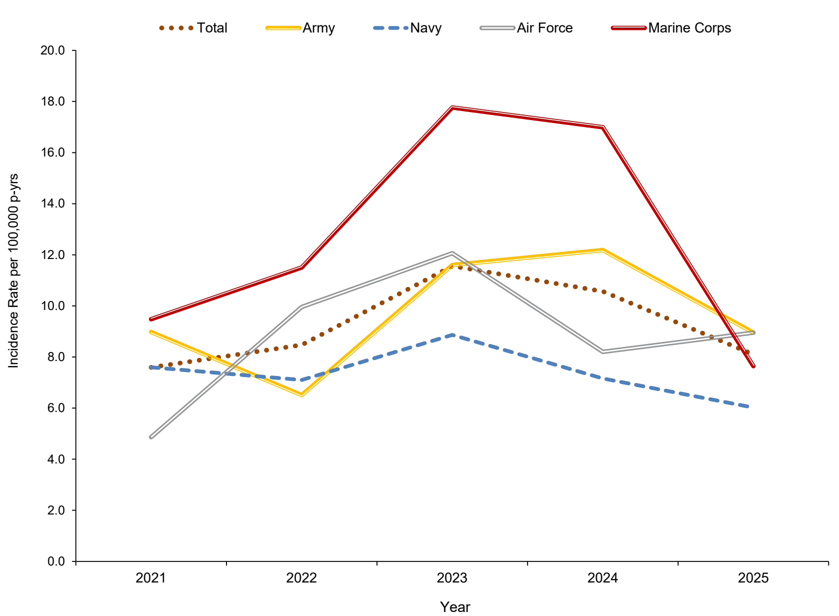
The downward-trending IR for hyponatremia during the surveillance period may be the result of evidence-based policies implemented by the service branches following a period characterized by a surge, particularly among recruits, in the incidence of exertional hyponatremia. The Army's policy, TRADOC Regulation 350-29, was developed to ensure heat illness protocols were more specific and scientifically grounded.[19] This policy, reflecting the latest medical knowledge and lessons about exertional illnesses, established a more effective system for managing heat

**FIGURE 1.** Annual Incident Cases and Rates of Exertional Hyponatremia, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: No, number; p-yrs, person-years.

**FIGURE 2.** Annual Incidence Rates of Exertional Hyponatremia by Branch of Service[a], Active Component, U.S. Armed Forces, 2021–2025

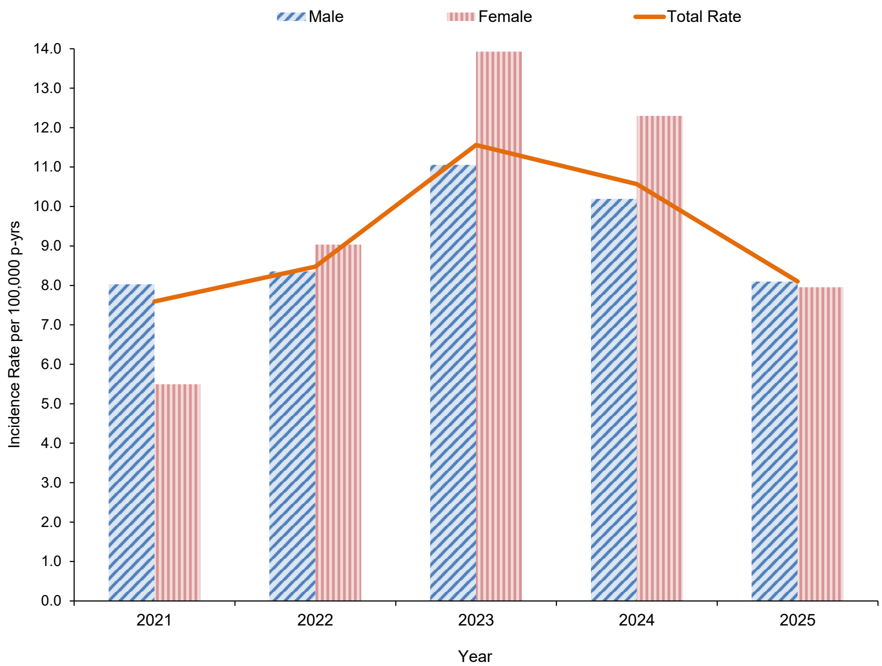



Abbreviation: P-yrs, person-years.
[a] Coast Guard not included due to small case counts and unstable rates.

illness and led to more scientific hydration and work protocols, more precise field diagnosis, improved individual risk assessment, and enhanced leader confidence. The Army protocol combines scientific risk management using Wet Bulb Globe Temperature, strict regulations like fluid intake limits, and targeted education to empower leaders and individual soldiers to prevent the condition. Further investigation and monitoring are needed to enhance effective management of exertional hyponatremia within the Air Force, the only service branch without a recent decline in hyponatremia incidence. The Air Force uses its own heat safety manual, DAFMAN 48-151,[20] which is based on the same scientific principles as the Army's TRADOC 350-29[19] but is adapted for its specific operational environment.

The high rates of hyponatremia in 2 seemingly low-risk professional categories, health care and pilots and air crew, may stem not from routine operational duties but instead from unique, high-stress training regimens. Notably, motor transport occupations had 0 cases, underscoring that risk

**FIGURE 3.** Annual Incident Rates of Exertional Hyponatremia by Sex, Active Component, U.S. Armed Forces, 2021–2025




Abbreviations: p-yrs, person-years.

**TABLE 2.** Incident Cases of Exertional Hyponatremia by Location of Diagnosis or Report (with at least 7 cases during period of surveillance), Active Component, U.S. Armed Forces, 2021–2025

| Location of Diagnosis | No. | % Total |
|---|---|---|
| Fort Benning, GA | 48 | 7.88 |
| MCRD Parris Island, SC | 27 | 4.43 |
| NMC San Diego, CA | 27 | 4.43 |
| NMC Portsmouth, VA | 22 | 3.61 |
| Camp Lejeune, NC | 17 | 2.79 |
| Fort Bragg, NC | 15 | 2.46 |
| Walter Reed NMMC, MD | 15 | 2.46 |
| Camp Pendleton, CA | 13 | 2.13 |
| Fort Carson, CO | 12 | 1.97 |
| Fort Hood, TX | 11 | 1.81 |
| JB San Antonio, TX | 11 | 1.81 |
| Fort Shafter, HI | 10 | 1.64 |
| Fort Belvoir, VA | 9 | 1.48 |
| Fort Campbell, KY | 9 | 1.48 |
| JB Lewis-McChord, WA | 9 | 1.48 |
| Camp Foster | 8 | 1.31 |
| Fort Bliss, TX | 8 | 1.31 |
| NAS Jacksonville, FL | 7 | 1.15 |
| Other Locations | 331 | 54.4 |
| Total | 609 | 100.0 |

Abbreviations: No., number; MCRD, Marine Corps Recruit Depot; JB San Antonio, Joint Base San Antonio; NMC, Naval Medical Center; NMMC, National Military Medical Center; NH, Naval Hospital.
Note: Referral centers include Walter Reed NMMC, NMC San Diego, and NMC Portsmouth.

**TABLE 3.** TRADOC Recommendations[a] for Continuous Work Duration and Fluid Replacement in Warm and Hot Environments

| | | Easy Work | | Moderate Work | | Heavy Work | | Very Heavy Work | |
|---|---|---|---|---|---|---|---|---|---|
| Heat Category | WBGT Index (°F) | Work (min.) | Water Intake (qt/hr) | Work (min.) | Water Intake (qt/hr) | Work (min.) | Water Intake (qt/hr) | Work (min.) | Water Intake (qt/hr) |
| 1 (White) | 78–81.9 | NL[b] | ½ | NL[b] | ¾ | 110 | ¾ | 45 | ¾ |
| 2 (Green) | 82–84.9 | NL[b] | ½ | NL[b] | 1 | 70 | 1 | 40 | 1 |
| 3 (Yellow) | 85–87.9 | NL[b] | ¾ | NL[b] | 1 | 60 | 1 | 25 | 1 |
| 4 (Red) | 88–89.9 | NL[b] | ¾ | 180 | 1¼ | 50 | 1¼ | 20 | 1¼ |
| 5 (Black) | >90 | NL[b] | 1 | 70 | 1½ | 45 | 1½ | 20 | 1½ |

Notes:
1. Applies to average-sized and heat-acclimatized service member wearing the operational camouflage pattern uniform.
2. Fluid needs can vary based on individual differences (± ¼ qt/hr) and exposure to full sun or shade (± ¼ qt/hr).
3. CAUTION: Hourly fluid intake should not exceed 1½ qts.
4. CAUTION: Daily fluid intake should not exceed 12 qts.
Abbreviations: TRADOC, Training and Doctrine Command; WBGT, wet bulb global temperature; F, Fahrenheit; min., minimum; qt, quart; hr, hour; NL, no limit.
[a]Reference 13, page 24.
[b]No work limit per hour, up to 4 continuous hours.

is most concentrated in prolonged, individual physical exertion rather than duties centered on vehicle-based operations.

The surge in hyponatremia incidence among ACSMs ages 30-39 years highlights the need for continuous monitoring and investigation into military-specific circumstances.[21] Aging is a known risk factor for hyponatremia, and this sudden spike in a typically lower-risk group suggests a possible link to a specific event, such as a unit deployment to a hot environment or a new high-intensity training program for mid-level officers. The fact that the significant decline in the hyponatremia IR among female service members from 2023 to 2025 demonstrated distinct fluctuations suggests an opportunity for in-depth investigation. Published studies present conflicting results on the association between sex and hyponatremia,[16,17,21-24] and sustained monitoring among ACSMs could help clarify the influence of biological sex while improving prevention of exertional hyponatremia.

Proper hydration strategies and effective collaborative management, guided by current policy, are crucial for preventing exertional hyponatremia **(Table 3)**. To reduce risk of exertional hyponatremia, service members of all ranks should be cognizant of mitigation measures such as fluid and electrolyte replacement guidelines, identification of high-risk individuals, and the importance of vigilance during associated activities.[19] Prevention strategies for exertional hyponatremia, developed for the unique physical demands and environmental exposures of military personnel, should be applied universally to all service members. To resolve scientific ambiguities and protect the health of all service members, collection of detailed data on all cases of exertional hyponatremia is crucial, to inform future analysis and more accurately identify trends and risk factors.

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*The views expressed in this report reflect the results of research conducted by the authors and do not necessarily reflect official policy nor position of the Defense Health Agency, Department of War, or the U.S. Government.*

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*Update*

# Malaria Among Members of the U.S. Armed Forces, 2025


Malaria infection remains a potential health threat to U.S. service members located in or near endemic areas due to duty assignments, participation in contingency operations, or personal travel. This report summarizes findings from surveillance of malaria infections among U.S. service members in 2025 and analyzes trends for a 10-year period, from 2016 through 2025. In 2025, 36 cases of malaria were diagnosed among U.S. service members, representing a 12.5% increase from 32 cases reported in 2024. The majority of malaria cases occurred in service members who were male (94.4%), in the active component (80.6%), and serving in the Army (63.9%). Africa was the leading region of acquisition (n=14), primarily for *P. falciparum* infections. A significant 2025 finding is a shift in the predominant species to *P. vivax*, which accounted for 41.7% (n=15) of all cases, a notable increase from 10% of all cases in 2024. Most *P. vivax* cases (80.0%) were acquired in Korea. Seasonality of infection remained consistent, with 72.1% of cases diagnosed May through October. These findings underscore the critical need for continuous surveillance, strict command emphasis on personal protective measures, and region-specific prevention strategies to protect the health of the force and maintain military readiness.


**What are the new findings?**

Findings from 2025 indicate a 12.5% increase in malaria cases among U.S. service members compared to 2024, with a notable increase of new *P. vivax* cases. This change was driven almost entirely by *P. vivax* infections acquired in Korea, while Africa remained the principal source for *P. falciparum* cases.

**What is the impact on readiness and force health protection?**

The rise of *P. vivax* from Korea along with persistent *P. falciparum* infection from Africa not only directly affect force health protection but demonstrate a dynamic, regionally specific threat that requires specialized prevention strategies to maintain military readiness.

Malaria has long posed a significant risk to U.S. military service members and operations.[1] Before World War II, the disease was endemic across the southern U.S., prompting the 1942 establishment of the Office of Malaria Control in War Areas—an organization that would later become the Centers for Disease Control and Prevention—to mitigate vector-borne diseases around military installations.[2] While this campaign was successful in the elimination of malaria as a public health threat to the U.S. by 1949, the disease remains a persistent risk to the operational readiness of U.S. service members when deployed to endemic tropical and subtropical regions.[3-5]

The risk to military personnel is heightened by operational realities, the emergence of drug-resistant parasites, and inconsistent adherence to preventive measures such as chemoprophylaxis and personal protective equipment.[6-9] Travel to malaria-endemic regions, especially for foreign-born personnel visiting their countries of origin, also presents a significant medical concern.[10-11] Studies have shown a significantly higher incidence of malaria in service members and their families with connections to malaria-endemic countries, particularly those from sub-Saharan Africa. This increased risk persists despite universal health coverage and access to pre-travel medical care for this specific population.[11]

Most human malaria cases are caused by 4 *Plasmodium* species—*P. falciparum*, *P. vivax*, *P. malariae*, and *P. ovale*—with *P. falciparum* and *P. vivax* the most significant. *P. falciparum*, found predominantly in Africa, is the most dangerous species, accounting for over 90% of malaria-related deaths,[12] while *P. vivax* has the widest geographic distribution, with a high prevalence in Southeast Asia, the Western Pacific, and the Americas.[13] These 2 species, *P. falciparum* and *P. vivax*, have distinct epidemiological profiles. A critical difference is the ability of *P. vivax* to cause relapses weeks or even months after initial infection,[14] which occurs because the parasite can remain in the liver as hypnozoites, allowing dormant endemicity during the colder, mosquito-free seasons and extending its geographic range into temperate zones, such as the Korean peninsula.[15]

*MSMR* has published regular updates on malaria's impact on service members since 1999. Current surveillance efforts include the differentiation of malaria types, such as the more lethal *P. falciparum* and relapsing *P. vivax*. This sustained surveillance provides critical data to inform force health protection strategy, and this update continues that mission by describing malaria's epidemiological patterns among U.S. Armed Forces from 2016 through 2025.

## Methods

The surveillance population for this report includes service members of the U.S. Army, Navy, Air Force, Marine Corps, Space Force, and Coast Guard. The surveillance period was January 1, 2016 through December 31, 2025. Records from the Defense Medical Surveillance System (DMSS) were searched to identify qualifying evidence of a malaria diagnosis from reportable medical events (RMEs), hospitalizations, outpatient encounters (in military and non-military facilities), and laboratory results from military facilities.

Case definition criteria for malaria included either 1) an RME record of confirmed malaria, 2) a hospitalization record with a primary diagnosis of malaria, 3) a hospitalization record with a non-primary diagnosis of malaria due to a specific *Plasmodium* species, 4) a hospitalization record with a non-primary diagnosis of malaria plus a diagnosis of anemia, thrombocytopenia, and related conditions, or malaria-complicating pregnancy in any diagnostic position, 5) a hospitalization record with a non-primary diagnosis of malaria plus diagnoses of signs or symptoms consistent with malaria in each diagnostic position preceding malaria, or 6) a positive malaria antigen test plus an outpatient record with a diagnosis of malaria in any diagnostic position within 30 days of the specimen collection date.[16] The relevant International Classification of Diseases, 9th and 10th revisions (ICD-9/ICD-10) codes used to identify cases are shown in **Table 1**.

This analysis restricted each service member to 1 episode of malaria per 365-day period. When multiple records documented a single episode, the date of the earliest record was considered the date of clinical onset. Records within 30 days of the clinical onset date were reviewed for evidence of a *Plasmodium* species.

Presumed locations of malaria acquisition were estimated with a hierarchical algorithm: 1) cases diagnosed in a malaria-endemic country were considered acquired in that country, 2) RMEs that listed exposures to malaria-endemic locations were considered acquired in those locations, 3) RMEs not listing exposures to malaria-endemic locations but reported from installations in malaria-endemic locations were considered acquired in those locations, 4) cases diagnosed among service members during or within 30 days of deployment or assignment to a malaria-endemic country were considered acquired in that country, and 5) cases diagnosed among service members deployed or assigned to a malaria-endemic country within 2 years before diagnosis were considered acquired in those countries. All remaining cases were considered to have acquired malaria in unknown locations.

## Results

In 2025, a total of 36 U.S. service members were diagnosed with, or reported to have, malaria **(Table 2)**. The annual total for 2025 represents a 12.5% increase in malaria cases from the 32 cases reported in 2024 **(Figure 1)**. Twenty-eight (77.8%) of the 36 cases in 2025 were identified from RME records. The remaining 8 cases were identified through additional case definition criteria: 5 cases from hospitalization records with a defining diagnosis of malaria in the primary diagnostic position, 2 cases from hospitalization records with a case defining diagnosis of malaria in a non-primary diagnostic position due to a specific *Plasmodium* species or additional diagnoses for malaria-related conditions, and 1 case

**TABLE 1.** ICD-9 and ICD-10 Diagnosis Codes Used to Define Malaria Cases from Inpatient, Hospitalization Records

| | ICD-9 | ICD-10 |
|---|---|---|
| Malaria *Plasmodium* species | | |
| *P. falciparum* | 84.0 | B50 |
| *P. vivax* | 84.1 | B51 |
| *P. malariae* | 84.2 | B52 |
| *P. ovale* | 84.3 | B53.0 |
| Unspecified | 84.4, 84.5, 84.6, 84.8, 84.9 | B53.1, B53.8, B54 |
| Anemia | 280–285 | D50–D53, D55–D64 |
| Thrombocytopenia | 287 | D69 |
| Malaria complicating pregnancy | 647.4 | O98.6 |
| Signs, symptoms, or other abnormalities consistent with malaria | 276.2, 518.82, 584.9, 723.1, 724.2, 780.0, 780.01, 780.02, 780.03, 780.09, 780.1, 780.3, 780.31, 780.32, 780.33, 780.39, 780.6, 780.60, 780.61, 780.64, 780.65, 780.7, 780.71, 780.72, 780.79, 780.97, 782.4, 784.0, 786.05, 786.09, 786.2, 786.52, 786.59, 787.0, 787.01, 787.02, 787.03, 787.04, 789.2, 790.4 | E87.2, J80, M54.2, M54.5, N17.9, R05, R06.0, R06.89, R07.1, R07.81, R07.82, R07.89, R11*, R16.1, R17, R40*, R41.0, R41.82, R44*, R50*, R51, G44.1, R53*, R56*, R68.0, R68.83, R74.0 |

Abbreviations: ICD-9, International Classification of Diseases, 9th Revision; ICD-10, International Classification of Diseases, 10th Revision; *P., plasmodium*.
* Indicates that any subsequent digit or character is included.

from a U.S. Department of War laboratory report of a positive malaria antigen test plus 1 outpatient medical encounter for a case-defining diagnosis of malaria in any diagnostic position within 30 days of the specimen collection date (data not shown).

As in previous years, the majority of U.S. military members diagnosed with malaria in 2025 were men (94.4%), members of the active component (80.6%), and in the Army (63.9%). No cases were reported in the Space Force or Coast Guard. Non-Hispanic Black service members and individuals ages 20-24 years accounted for the most cases of malaria (44.4% and 30.6%, respectively) (**Table 2**).

Examination of the 28 malaria case records reported as RMEs in 2025 revealed that 5 of the case exposures were classified as deployment-related, 5 as duty-related (but not deployment-related), 10 were non-deployment and non-duty related, while 8 cases were missing exposure classification. Six of the 10 cases classified as non-deployment and non-duty related were documented as acquired in Africa (data not shown).

During the 2016-2025 surveillance period, malaria cases acquired in Africa (n=169, 44.5%) and other or unspecified locations (n=88, 23.2%) accounted for the largest numbers, followed by Korea (n=65, 17.1%), Afghanistan (n=56, 14.7%), and South and Central America (n=2, 0.5%) (**Figure 2**). Africa consistently reported the highest numbers of malaria cases throughout the period. Cases in Afghanistan peaked to 21 in 2018, thereafter declining to 0 cases during last 3 years of the surveillance period. Malaria cases were diagnosed or reported in 2025 from 21 different medical facilities: 14 facilities in the U.S., 3 facilities in the Republic of (South) Korea, and 1 facility each in Germany, Africa, and Japan, as well as 1 TRICARE Prime remote location (**Table 3**).

Most U.S. service member malaria cases in 2025 were caused by *P. vivax* (n=15, 41.7%). Twelve of those 15 *P. vivax* cases were acquired in Korea. The remaining cases were attributed to *P. falciparum* (n=14, 38.9%) and other or unspecified types of malaria (n=7, 19.4%). Most cases acquired in Africa (n=14) were caused by *P. falciparum* (n=10, 71.4%) (**Figure 3**). The 14 malaria cases acquired in Africa were associated with several countries, including Djibouti (n=3), Ghana (n=3), Cameroon (n=2), Nigeria (n=2), Sierra Leone (n=1), Guinea (n=1), and Tanzania (n=1); 1 case was associated with an unknown African location (data not shown).

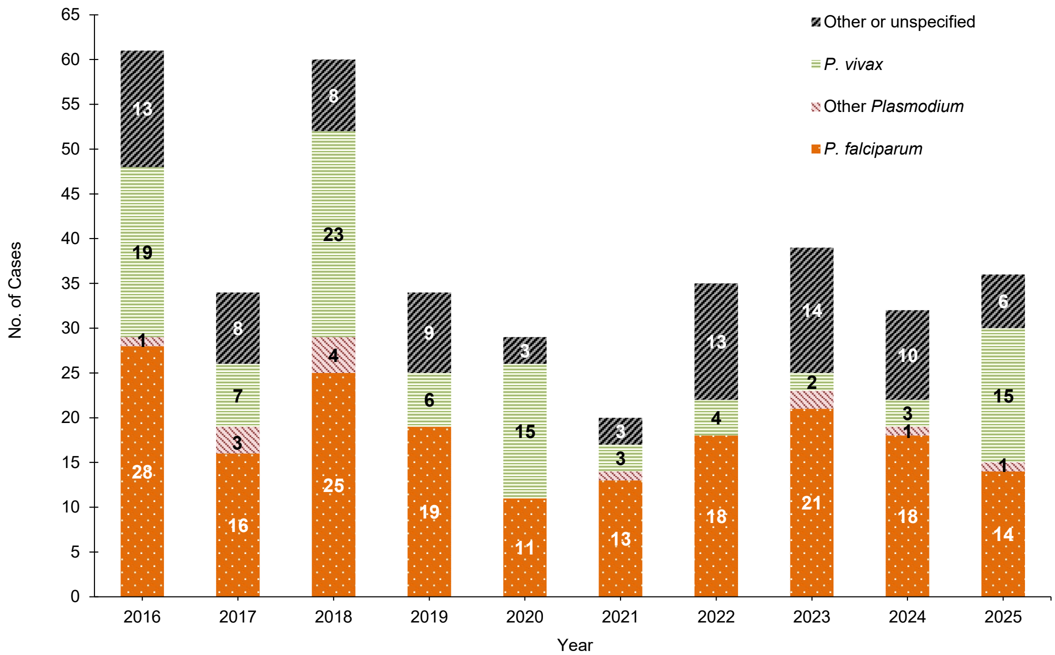
From 2016 to 2025, malaria caused by *P. falciparum* accounted for the greatest number of cases (183, 48.2%) followed by other or unspecified species (n=99, 26.1%), and *P. vivax* (n=98, 25.8%). Over the 10-year surveillance period, most malaria cases (n=274 / 380, 72.1%)

**TABLE 2.** Malaria Cases by *Plasmodium* Species and Selected Demographic Characteristics, U.S. Armed Forces, 2025

| | *P. vivax* | *P. falciparum* | Other or Unspecified | Total | |
|---|---|---|---|---|---|
| | No. | No. | No. | No. | % |
| Total | 15 | 14 | 7 | 36 | 100 |
| Component | | | | | |
| Active | 13 | 11 | 5 | 29 | 80.6 |
| Guard, Reserve | 2 | 3 | 2 | 7 | 19.4 |
| Branch of service | | | | | |
| Army | 12 | 7 | 4 | 23 | 63.9 |
| Navy | 1 | 4 | 0 | 5 | 13.9 |
| Air Force | 1 | 1 | 3 | 5 | 13.9 |
| Marine Corps | 1 | 2 | 0 | 3 | 8.3 |
| Sex | | | | | |
| Male | 14 | 13 | 7 | 34 | 94.4 |
| Female | 1 | 1 | 0 | 2 | 5.6 |
| Age, *y* | | | | | |
| <20 | 2 | 0 | 1 | 3 | 8.3 |
| 20–24 | 7 | 2 | 2 | 11 | 30.6 |
| 25–29 | 3 | 3 | 2 | 8 | 22.2 |
| 30–34 | 2 | 5 | 0 | 7 | 19.4 |
| 35–39 | 1 | 1 | 1 | 3 | 8.3 |
| 40–44 | 0 | 1 | 1 | 2 | 5.6 |
| 45–49 | 0 | 1 | 0 | 1 | 2.8 |
| 50+ | 0 | 1 | 0 | 1 | 2.8 |
| Race and ethnicity | | | | | |
| White, non-Hispanic | 7 | 1 | 3 | 11 | 30.6 |
| Black, non-Hispanic | 0 | 13 | 3 | 16 | 44.4 |
| Other | 8 | 0 | 1 | 9 | 25.0 |

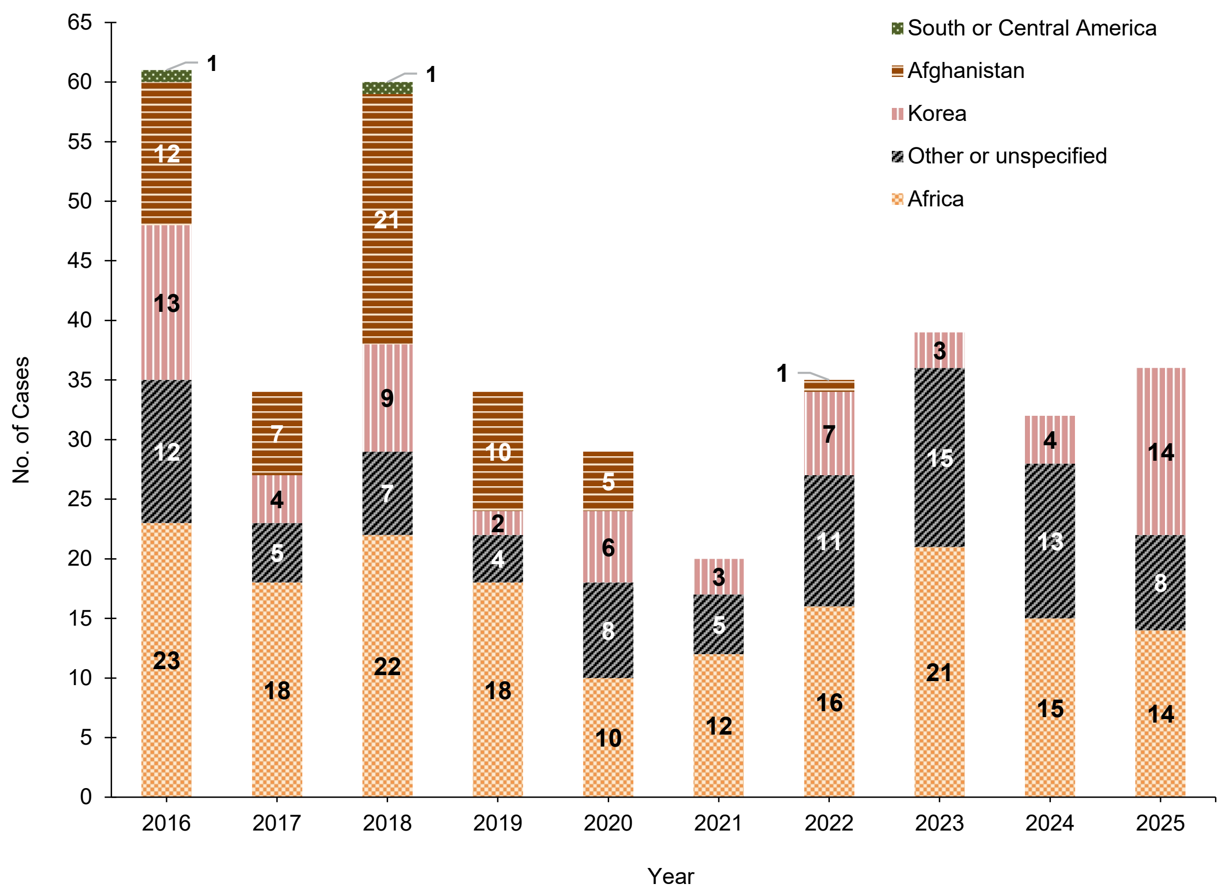
Abbreviations: *P., Plasmodium*; DMSS, Defense Medical Surveillance System; *y*, years.

**FIGURE 1.** Numbers of Malaria Cases by Species and Calendar Year of Diagnosis or Report, Active and Reserve Components, U.S. Armed Forces, 2016–2025



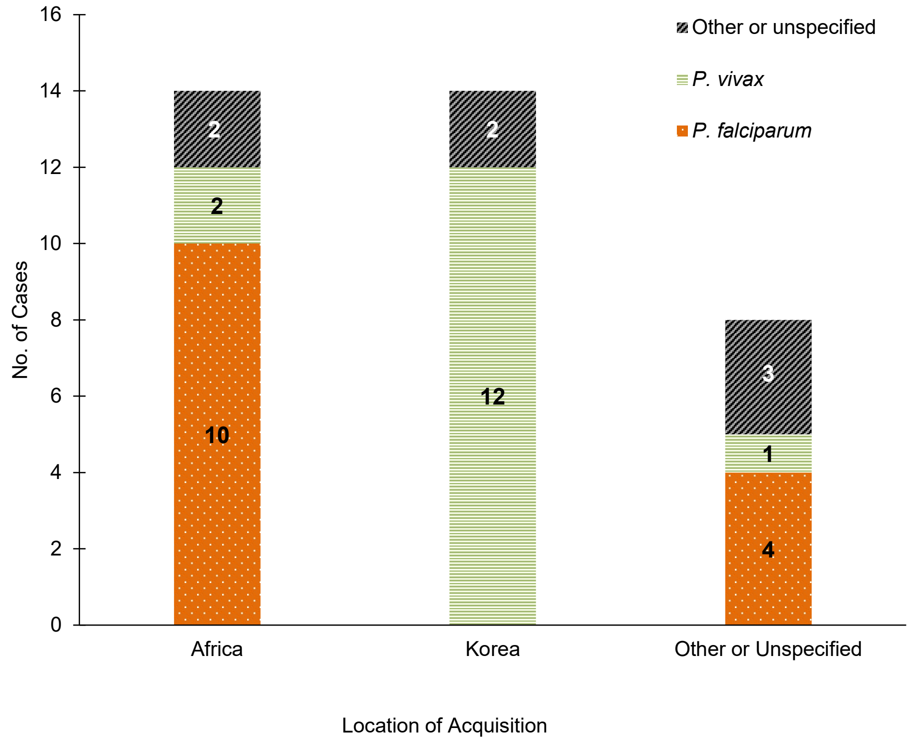

Abbreviations: *P., Plasmodium*; No., number.

**FIGURE 2.** Numbers of Malaria Cases by Location of Acquisition, Active and Reserve Components, U.S. Armed Forces, 2016–2025




Abbreviation: No., number.

**FIGURE 3.** Numbers of Malaria Cases by Species Type and Location of Acquisition, Active and Reserve Components, U.S. Armed Forces, 2025




Abbreviations: No., number; *P.*, *Plasmodium.*

**TABLE 3.** Number of Malaria Cases by Geographic Location of Diagnosis or Report and Presumed Location of Acquisition, Active and Reserve Components, U.S. Armed Forces, 2025

| Location Where Diagnosed or Reported | Korea | Africa | South or Central America | Other or Unknown Location | Total | |
|---|---|---|---|---|---|---|
| | No. | No. | No. | No. | No. | % |
| AHC Camp Casey, South Korea | 9 | 0 | 0 | 0 | 9 | 25.0 |
| ACH Camp Humphreys, South Korea | 2 | 0 | 0 | 0 | 2 | 5.6 |
| Irwin ACH, Fort Riley, KS | 0 | 2 | 0 | 0 | 2 | 5.6 |
| Madigan AMC, Joint Base Lewis-McChord, WA | 2 | 0 | 0 | 0 | 2 | 5.6 |
| NMC Portsmouth, VA | 0 | 1 | 0 | 1 | 2 | 5.6 |
| Travis AFB 60th Medical Group, CA | 0 | 0 | 0 | 1 | 1 | 2.8 |
| NMC San Diego, CA | 0 | 0 | 0 | 1 | 1 | 2.8 |
| Evans Carson ACH, Fort Carson, CO | 0 | 1 | 0 | 0 | 1 | 2.8 |
| NH Jacksonville, FL | 0 | 1 | 0 | 0 | 1 | 2.8 |
| MacDill AFB 6th Medical Group, FL | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Robins AFB 78th Medical Group, GA | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Walter Reed National Military Medical Center, MD | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Womack AMC, Fort Bragg, NC | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Alexander T. Augusta Military Medical Center, Fort Belvoir, VA | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Fairchild AFB 92nd Medical Group, WA | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Barquist AHC, MD | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Landstuhl Regional Medical Center, Germany | 0 | 0 | 0 | 1 | 1 | 2.8 |
| Brian D. Allgood ACH, South Korea | 1 | 0 | 0 | 0 | 1 | 2.8 |
| NH Okinawa, Japan | 0 | 0 | 0 | 1 | 1 | 2.8 |
| Expeditionary Medical Facility, Djibouti | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Pacific Tricare Prime Remote Facility | 0 | 1 | 0 | 0 | 1 | 2.8 |
| Location not reported | 0 | 0 | 0 | 3 | 3 | 8.3 |
| Total | 14 | 14 | 0 | 8 | 36 | 100 |

Abbreviations: No., number; AMC, Army Medical Center; ACH, Army Community Hospital; AHC, Army Health Clinic; AMC, Army Medical Center; AFB, Air Force Base; NH, Naval Hospital; NMC, Naval Medical Center.

were diagnosed or reported during the 6 months from the Northern Hemisphere middle of spring through the middle of autumn (i.e., May–October) (**Figure 4**). The proportions of malaria cases diagnosed or reported May–October varied by region of acquisition: Afghanistan (n=48/56, 85.7%,), Korea (n=58/65, 89.2%), Africa (n=117/169, 69.2%), and South and Central America (n=1/2, 50.0%) (data not shown).

## Discussion

The number of malaria cases among U.S. service members saw a modest increase in 2025, rising by 12.5% from the previous year. While the total number of cases remains relatively low, these malaria data reveal several key trends and a notable shift in the dominant parasite species, underscoring the persistent threat of malaria to military personnel operating globally. Consistent with historical trends, the demographic profile of malaria cases in 2025 comprised predominantly young, male soldiers from the active component.[3-5]

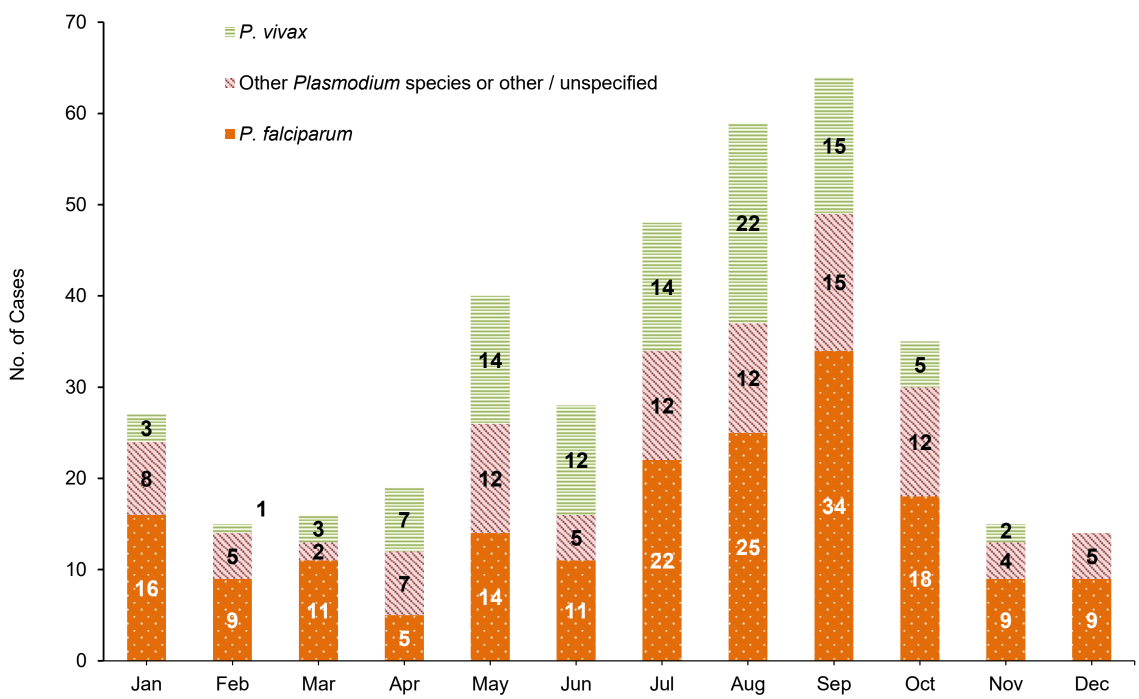
The majority (77.8%) of cases were identified through routine RMEs, with the remainder captured through hospitalization and laboratory records, highlighting the importance of a multi-faceted surveillance strategy to ensure comprehensive case identification.

Geographically, Africa continues to be a primary region of acquisition for malaria infections, a consistent trend over the last decade.[3] The majority of cases acquired in Africa were caused by *P. falciparum*, the most severe form of the parasite. Cases acquired in Africa were traced to at least 7 different countries, reflecting the widespread risk across the continent.

Perhaps the most significant finding from the 2025 surveillance data is the dramatic shift in the causative species. Nearly half of all cases were attributed to *P. vivax*, a stark contrast to 2024, when *P. falciparum* accounted for over half of cases—and *P. vivax* only 10%. This change is almost entirely driven by cases acquired in Korea, which accounted for 80% of *P. vivax* infections in 2025. This finding emphasizes the geographically distinct epidemiology of malaria and the specific risks associated with different operational theaters. This risk has long been documented since the Korean War, however, among U.S. and Korean Forces near the Demilitarized Zone.[17]

The seasonal pattern of malaria diagnoses remains consistent with previous findings, providing predictable opportunity for targeted force health protection measures. Over the 10-year surveillance period, a significant majority (72.1%) of cases were diagnosed May–October, coinciding with the warmer, wetter months that favor mosquito vector activity.[18] This trend was particularly pronounced for cases acquired in Korea (89.2%), aligning with the established transmission season for *P. vivax* in temperate zones and reinforcing the need for heightened awareness and preventative measures during these months for personnel in those regions. Vector surveillance programs have shown a correlation between the number of *Anopheles* species positive for *P. vivax* sporozoites with the number of malaria cases and exposure of soldiers from the Republic of Korea soldiers from May through October.[19] Even in Africa, where transmission can occur

**FIGURE 4.** Cumulative Numbers of Malaria Cases by Species Type and Month of Clinical Presentation or Diagnosis, Active and Reserve Components, U.S. Armed Forces, 2016–2025




Abbreviations: No., number; *P., Plasmodium.*

throughout the year,[18,20] nearly 70% of cases were reported during this same period, underscoring its importance as a peak transmission season globally.

Limitations to this report should be considered when interpreting these findings. Malaria case reporting, especially for reserve components and non-deployment exposures, is likely incomplete, contributing to under-estimation of rates; some cases treated in deployed or non-U.S. military medical facilities may not have been reported or otherwise ascertained at the time of analysis. Malaria diagnoses documented only in outpatient settings without confirmatory testing and not reported as RMEs were not included in this report. Geographic location of malaria acquisition was estimated from reported information, with some cases reporting exposures in multiple malaria-endemic areas and others with no relevant exposure information. Personal travel or deployment to malaria-endemic countries was not documented unless specified in RMEs. Limited information on species types in RME records emphasizes the need for more complete attention to documentation of reportable conditions.

These findings emphasize the need for continuous surveillance, regionally specific prevention strategies, and robust diagnostic capabilities to protect U.S. service members from this persistent infectious disease. While the overall burden of malaria within the U.S. military is not significant, 2025 data illustrate a dynamic and evolving threat, with the continued prevalence of *P. falciparum* in Africa posing a significant risk for severe disease and the sharp increase in *P. vivax* from Korea demonstrating a different, but equally important, regional challenge.

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# Annual Review of Reportable Medical Events at Military Health System Facilities, January 1, 2025–December 31, 2025

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This month's edition of the *MSMR* Reportable Medical Events at Military Health System (MHS) facilities report provides an overview of annual data for 2025 for active component service members (ACSMs) and MHS beneficiaries. Reportable Medical Events (RMEs) are reported in the Disease Reporting System internet (DRSi) by health care providers and public health officials throughout the MHS for monitoring, controlling, and preventing the occurrence and spread of diseases of public health interest. These reports are validated by the Defense Health Agency–Public Health (DHA-PH).

The DRSi collects reports on over 70 different RMEs, including infectious and non-infectious conditions, outbreak reports, sexually transmitted infection (STI) risk surveys, and tuberculosis contact investigation reports. A complete list of RMEs is available in the *2022 Armed Forces Reportable Medical Events Guidelines and Case Definitions.*[1] Data presented in this report are considered provisional and do not represent conclusive evidence until case reports are fully validated.

## Top 5 RMEs in 2025, by MMWR Week, for ACSMs and MHS beneficiaries[a]

The top 5 RMEs reported to DRSi in 2025 for ACSMs included chlamydia, gonorrhea, norovirus, heat illness, and syphilis **(Figure 1)**, unchanged from 2024.

For MHS beneficiaries, the top 5 RMEs reported included chlamydia, norovirus, influenza-associated hospitalization, gonorrhea, and campylobacteriosis **(Figure 2)**, similar to reporting in 2024, with the exception of influenza-associated hospitalization.

## Ratios of RMEs for 2025 compared to 2024 for ACSMs and MHS beneficiaries

The current ratio data are based on incidence counts comparing year 2025 to 2024; low numbers for many conditions limit data interpretation and are not included in the figures. Conditions with less than 10 medical event reports (MERs) per year and syphilis were excluded from the ratio comparisons; syphilis and hepatitis B cases were excluded due to changes in case validation processes implemented throughout 2024. Ratios presented in **Figure 3** and **Figure 4** include any RMEs that had, at minimum, a 30% increase or decrease in MERs in 2025 respective to MERs in 2024.

For ACSMs, the total number of MERs submitted to DRSi in 2025 decreased by 4.8% compared to 2024. Cases of cold weather injuries and cyclosporiasis had the most prominent increases in 2025 compared to 2024, with increases of 155% and 100%, respectively. Increases of case counts in 2025 were also recorded for spotted fever rickettsiosis (+82%), norovirus (+63%), and malaria (+52%). There were decreases in 2 RMEs in 2025 versus 2024 for ACSMs: for coccidioidomycosis (-55%) and *E. coli*, Shiga toxin-producing (-31%) **(Figure 3)**.

For MHS beneficiaries, the total number of MERs submitted to DRSi in 2025 decreased by 12.2% compared to 2024. MHS beneficiaries saw the most prominent increases for cases of influenza-associated hospitalizations and spotted fever rickettsiosis in 2025, with increases of 65% and 50%, respectively. Reports of norovirus also increased among MHS beneficiaries in 2025 versus 2024 (+37%). MHS beneficiaries saw the most significant decrease in cases of COVID-19-associated hospitalization and death (-65%) and shigellosis (-57%) compared to 2024. Decreases were also seen in reports *E. coli,* Shiga toxin-producing (-49%), varicella (-32%), and hepatitis C, acute and chronic (-30%) **(Figure 4)**.

## Discussion

Like the DHA-PH, the U.S. Centers for Disease Control and Prevention (CDC) reported similar trends for the increased influenza-associated hospitalizations in 2025 compared to 2024. The CDC classified the 2024-2025 influenza season as high severity, with the highest estimates of influenza-related illnesses and medical visits since the 2010-2011 influenza season.[2] Hospitalization rates were equivalent in 2024-2025 to those during the 2017-2018 season, the last high-severity influenza season.[2] Additionally, the CDC reported decreases in COVID-19 hospitalization rates from the 2023-2024 season to the 2024-2025 season, with a similar trend in the MHS.[3]

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

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**TABLE.** Reportable Medical Events, Military Health System Facilities, 2024--2025[a]

| Reportable Medical Event[b] | Active Component[c] | | MHS Beneficiaries[d] | |
|---|---|---|---|---|
| | Total, 2025 | Total, 2024 | Total, 2025 | Total, 2024 |
| | No. | No. | No. | No. |
| Amebiasis | 15 | 15 | 1 | 6 |
| Arboviral diseases, neuroinvasive, non-neuroinvasive | 4 | 4 | 1 | 1 |
| Babesiosis | 1 | 0 | 2 | 0 |
| Botulism | 0 | 0 | 2 | 2 |
| Brucellosis | 0 | 1 | 0 | 0 |
| COVID-19-associated hospitalization, death | 33 | 41 | 190 | 543 |
| Campylobacteriosis | 348 | 326 | 243 | 235 |
| Chikungunya virus disease | 0 | 1 | 0 | 1 |
| *Chlamydia trachomatis* | 14,795 | 16,097 | 1,869 | 2,296 |
| Cholera | 0 | 3 | 0 | 2 |
| Coccidioidomycosis | 24 | 53 | 22 | 26 |
| Cold weather injury[e] | 443 | 174 | N/A | N/A |
| Cryptosporidiosis | 73 | 82 | 30 | 32 |
| Cyclosporiasis | 22 | 11 | 19 | 15 |
| Dengue virus infection | 9 | 12 | 2 | 10 |
| *E. coli*, Shiga toxin-producing | 64 | 93 | 38 | 74 |
| Ehrlichiosis, anaplasmosis | 2 | 1 | 9 | 1 |
| Filarial infections | 0 | 0 | 0 | 1 |
| Giardiasis | 103 | 98 | 45 | 53 |
| Gonorrhea | 2,327 | 2,823 | 260 | 368 |
| *H. influenzae,* invasive | 2 | 3 | 7 | 11 |
| Hantavirus disease | 0 | 0 | 1 | 0 |
| Heat illness[e] | 1,412 | 1,276 | N/A | N/A |
| Hepatitis A | 2 | 7 | 4 | 3 |
| Hepatitis B, acute, chronic[f] | 83 | 110 | 68 | 126 |
| Hepatitis C, acute, chronic | 28 | 35 | 46 | 66 |
| Influenza-associated hospitalization[g] | 67 | 54 | 256 | 155 |
| Lead poisoning, pediatric[h] | N/A | N/A | 89 | 94 |
| Legionellosis | 2 | 5 | 11 | 15 |
| Leishmaniasis | 1 | 0 | 0 | 0 |
| Leprosy | 0 | 3 | 0 | 0 |
| Leptospirosis | 0 | 0 | 1 | 2 |
| Listeriosis | 1 | 0 | 1 | 3 |
| Lyme disease | 98 | 101 | 87 | 89 |
| Malaria | 32 | 21 | 6 | 4 |
| Measles | 0 | 0 | 3 | 0 |
| Meningococcal disease | 2 | 2 | 0 | 0 |
| Mpox | 11 | 14 | 4 | 3 |
| Mumps | 2 | 0 | 11 | 5 |
| Norovirus | 1,066 | 654 | 850 | 619 |
| Pertussis | 43 | 39 | 80 | 103 |
| Q fever | 2 | 3 | 0 | 2 |
| Rabies post-exposure prophylaxis | 644 | 637 | 546 | 495 |
| Rubella | 0 | 0 | 3 | 1 |
| Salmonellosis | 162 | 160 | 210 | 221 |
| Schistosomiasis | 0 | 1 | 0 | 0 |
| Shigellosis | 42 | 53 | 15 | 35 |
| Spotted fever rickettsiosis | 40 | 22 | 27 | 18 |
| Syphilis (all)[i] | 469 | 588 | 115 | 134 |
| Toxic shock syndrome | 1 | 2 | 2 | 4 |
| Trypanosomiasis | 2 | 5 | 0 | 0 |
| Tuberculosis | 8 | 6 | 8 | 11 |
| Tularemia | 2 | 1 | 1 | 1 |
| Typhoid fever | 0 | 1 | 1 | 0 |
| Typhus fever | 10 | 2 | 10 | 10 |
| Varicella | 15 | 18 | 54 | 80 |
| Zika virus infection | 0 | 1 | 0 | 0 |
| Total case counts | 22,512 | 23,659 | 5,251 | 5,984 |

Abbreviations: MHS, Military Health System; No., number; N/A, not applicable; *E, Escherichia*; *H., Haemophilus*.

[a] RMEs reported through DRSi as of Apr. 1, 2026 are included in this report. RMEs were classified by date of diagnosis or, where unavailable, date of onset. Annual total counts cover the following periods: Total, 2025, Jan. 1, 2025–Dec. 31, 2025; Total 2024, Jan. 1, 2024–Dec. 31, 2024 for MHS facilities.

[b] RME categories with 0 reported cases among active component service members and MHS beneficiaries for the periods covered were not included in this report.

[c] Service branches included in this report include the Army, Navy, Air Force, Marine Corps, Coast Guard, and Space Force, including personnel classified as active duty, cadet, midshipman, or recruit in DRSi.

[d] Beneficiaries include individuals classified as retired and family members (e.g., spouse, child, other, unknown). National Guard, Reservists, civilians, contractors, and foreign nationals were excluded from these counts.

[e] Only reportable for service members.

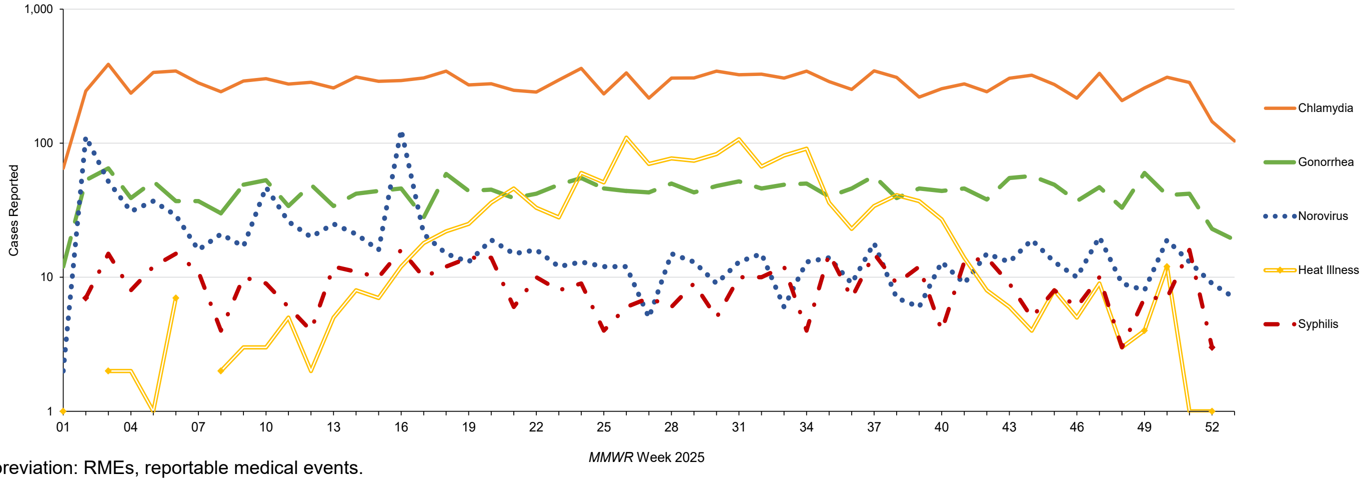
[f] Observed decline in hepatitis B cases from 2024 to 2025 may be attributed, in part, to updated case validation processes.

[g] Influenza-associated hospitalization is reportable only for individuals younger than age 65 years.

[h] Pediatric lead poisoning is reportable only for children ages 6 years or younger.

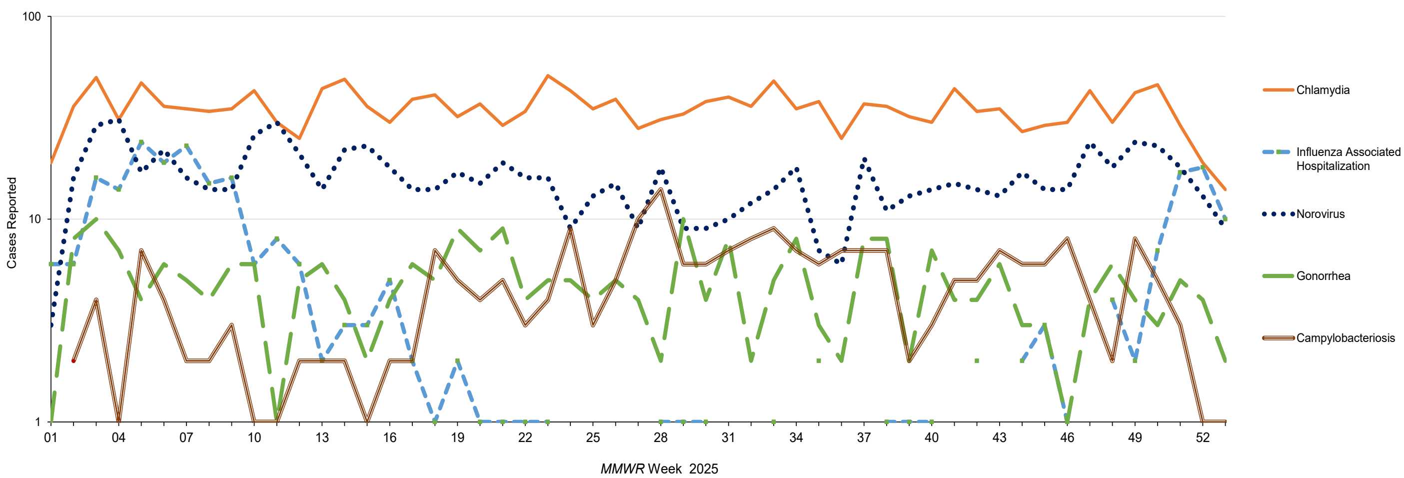
[i] The observed drop in syphilis cases from 2024 to 2025 may be due, in part, to updated case validation process that began Jan. 2024.

**FIGURE 1.** Top Five Reportable Medical Events by *MMWR* Week, U.S. Active Component Service Members, January 1, 2025– December 31, 2025




Abbreviation: RMEs, reportable medical events.
[a]Cases shown on logarithmic scale.
Note: There were no reported heat illness cases during weeks 2, 7, 53 in 2025; there were no reported syphilis cases during weeks 1 and 53 in 2025.

**FIGURE 2.** Top Five Reportable Medical Events by *MMWR* Week, Military Health System Beneficiaries, January 1, 2025– December 31, 2025




Abbreviation: RMEs, reportable medical events.
[a]Cases shown on logarithmic scale.
Note: There were no reported campylobacteriosis cases during Week 1 of 2025; there were no reported cases of influenza-associated hospitalization during weeks 24-27, 31-32, 34, 36-37, 41, 43, 47 in 2025.

**FIGURE 3.** Ratios of Selected Reportable Medical Events, U.S. Active Component Service Members, Year-to-Date, 2025–2024

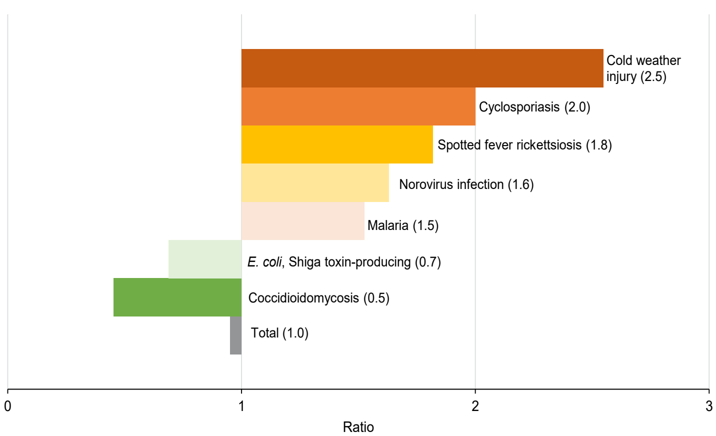
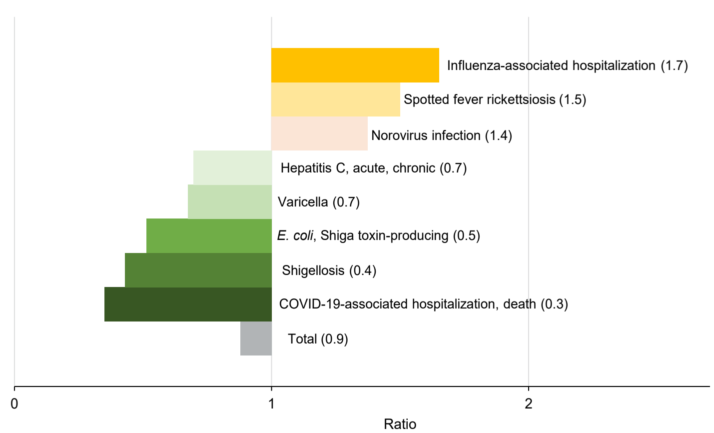



**FIGURE 4.** Ratios of Selected Reportable Medical Events, Military Health System Beneficiaries, Year-to-Date, 2025–2024



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