

TIP NO. 034-0724

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**Annual Injury Surveillance Report 2022 Summary**

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**INTRODUCTION**

According to the Centers for Disease Control and Prevention (CDC) ([www.cdc.gov](http://www.cdc.gov)), monitoring of public health outcomes is 1 of the 10 essential public health services. Monitoring of Army injuries is part of the Defense Centers for Public Health–Aberdeen (DCPH-A) mission and provides a foundation to recognize trends, define the magnitude and distribution of injuries, identify emerging issues, and guide Army injury prevention priorities. This document provides a summary of injury medical encounter surveillance data for Active Duty Soldiers from Calendar Year (CY) 2022, analyzed and presented by the DCPH-A Injury Prevention Branch (IPB).

Incident injuries summarized in this report are based on initial medical encounters diagnosed using codes from the International Classification of Diseases, Clinical Modification, 10th Revision (ICD-10-CM). Follow-up visits less than 60 days apart were excluded. Diagnosis codes for injuries were identified as those describing any damage or interruption of body tissue function caused by an energy transfer that exceeds tissue tolerance suddenly (acute trauma) or gradually (cumulative micro-trauma). Energy transfers resulting in injuries are categorized as mechanical, environmental, electrical, nonenvironmental, or other. The definition of injury used in this report has been described in the Taxonomy of Injuries for Public Health Monitoring and Reporting.

This report includes all Military Health System (MHS) Data Repository (MDR) medical encounter data for Active Duty Army Soldiers in 2022. The MDR includes outpatient encounters, inpatient encounters, encounters at military treatment facilities, and purchased care using TRICARE. Data originate from the following systems: MHS-GENESIS, Comprehensive Ambulatory Professional Encounter Record (CAPER), TRICARE Encounter Data – Not Institutional (TED-NI), Standard Inpatient Data Record (SIDR), and TRICARE Encounter Data – Institutional (TED-I). The surveillance data presented in this document, along with past Army injury surveillance summaries, are available in a slide-set format on the DCPH-A Periodic Publications page:

<https://phc.amedd.army.mil/news/Pages/PublicationDetails.aspx?type=Active%20Duty%20Army%20Injury%20Surveillance%20Summary>

Similar population-level data are presented for injuries, other health outcomes, and key health indicators in the annual Health of the Force Report. Current and past reports can be accessed at: <https://phc.amedd.army.mil/topics/campaigns/hof/Pages/default.aspx>

Health of the Force data are also presented in a dashboard format at: <https://carepoint.health.mil/sites/HOF>

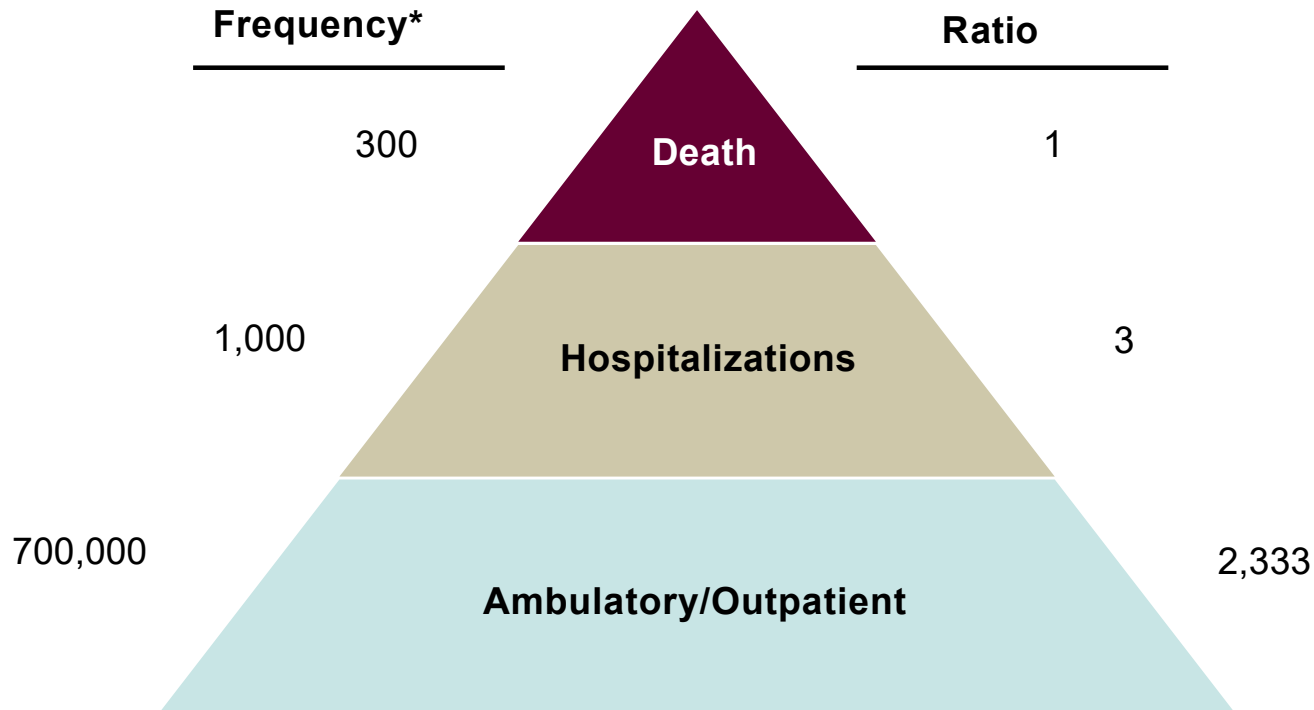
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The DCPH-A IPB also provides installation-level injury summaries for both Active Duty and civilian populations, upon request, for those interested in detailed installation-specific data. Installation injury rates, one element of these summaries, can be accessed at: <https://www.sms.army.mil/>, by navigating the menus to Dashboards (from the top left drop down) > Army Enterprise (from the left menu pane) > OTSG/MEDCOM > OTSG/MEDCOM HQ > DCS, Public Health > Clinical Public Health and Epidemiology > Active Duty Injuries by Installation, MEDCOM Region, and MACOM (Quarterly).

For additional information, please visit the IPB Website at: <https://phc.amedd.army.mil/topics/discond/ptsaip/Pages/default.aspx>, and contact us by email at: [dha.apg.Pub-Health-A.mbx.injuryprevention@health.mil](mailto:dha.apg.Pub-Health-A.mbx.injuryprevention@health.mil)

### DISTRIBUTION OF INJURIES

The injury pyramid depicts injuries by level of severity, from deaths to injuries treated in an outpatient setting. In 2022, for every injury-related death, there were over 2,333 outpatient encounters. Injuries treated on an outpatient basis represent a significant obstacle to Soldier medical readiness.



Notes:

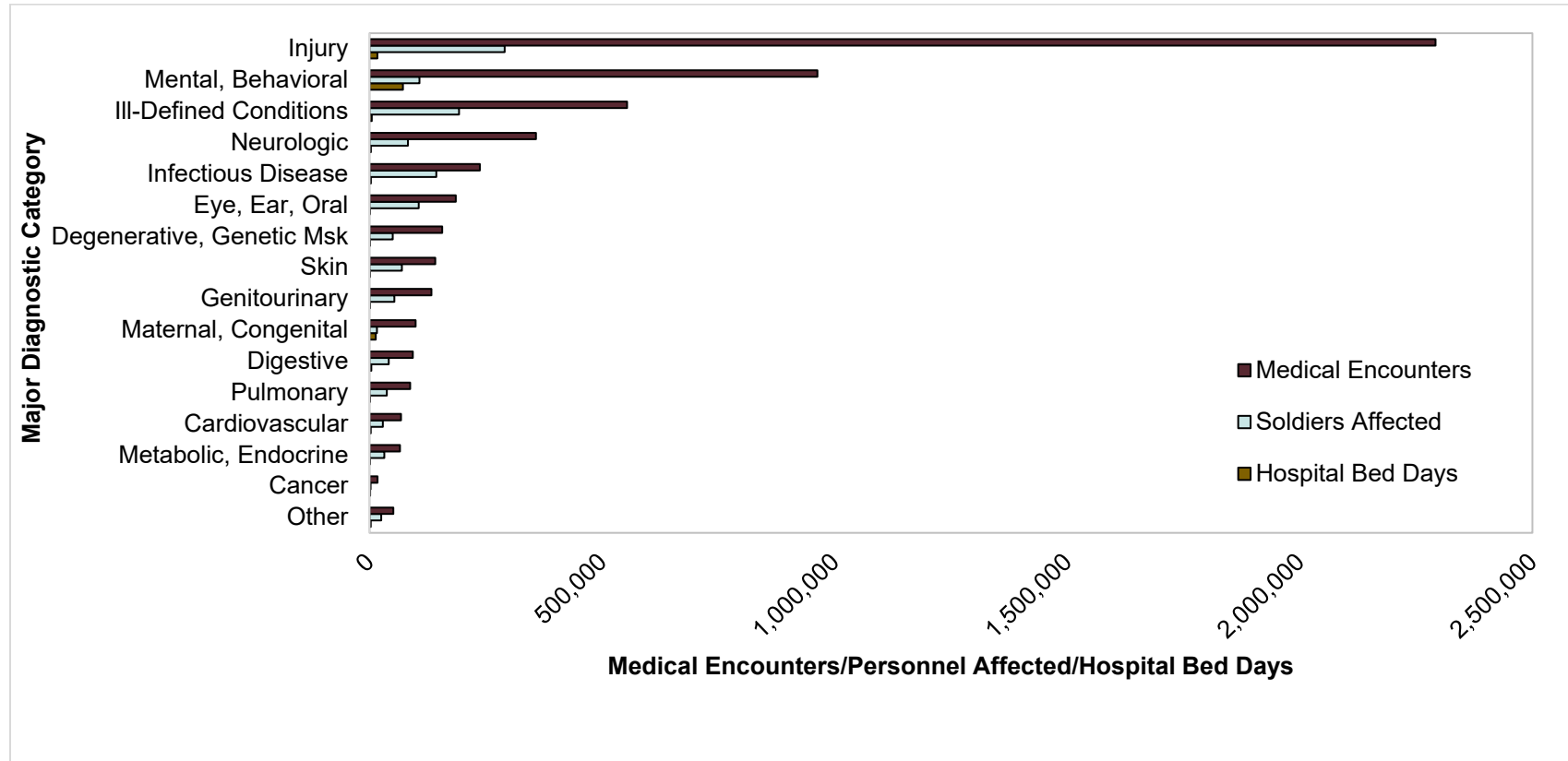
\*Frequencies are rounded and represent incident injury visits.

Data source: Military Health System Data Repository (MDR) and Defense Casualty Analysis System (DCAS); injuries defined using the Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

**MAGNITUDE OF THE PROBLEM**

During 2022, injuries accounted for over 2 million medical encounters (42% of all encounters) among Active Duty Soldiers, about 2.4 times as many encounters as the second leading cause, mental and behavioral health conditions (18%). Injuries also affected the greatest number of Soldiers (over 290,000) compared to all other medical conditions.



**Relative Burden of Injuries and Diseases, U.S. Army Active Duty, 2022**

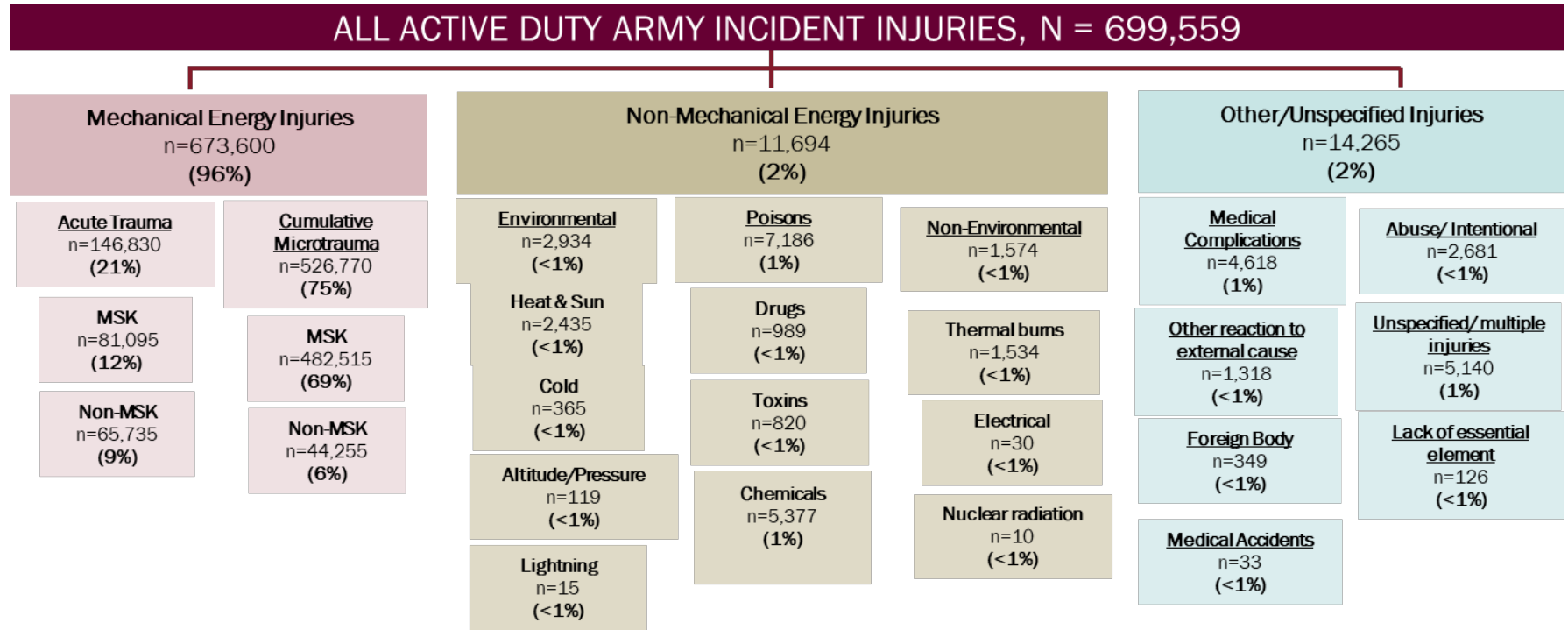
Notes:

Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer).

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

The vast majority (n=673,600, 96%) of new (incident) injury diagnoses were attributable to mechanical energy sources and 75% (n=526,770) were cumulative micro-traumatic injuries.



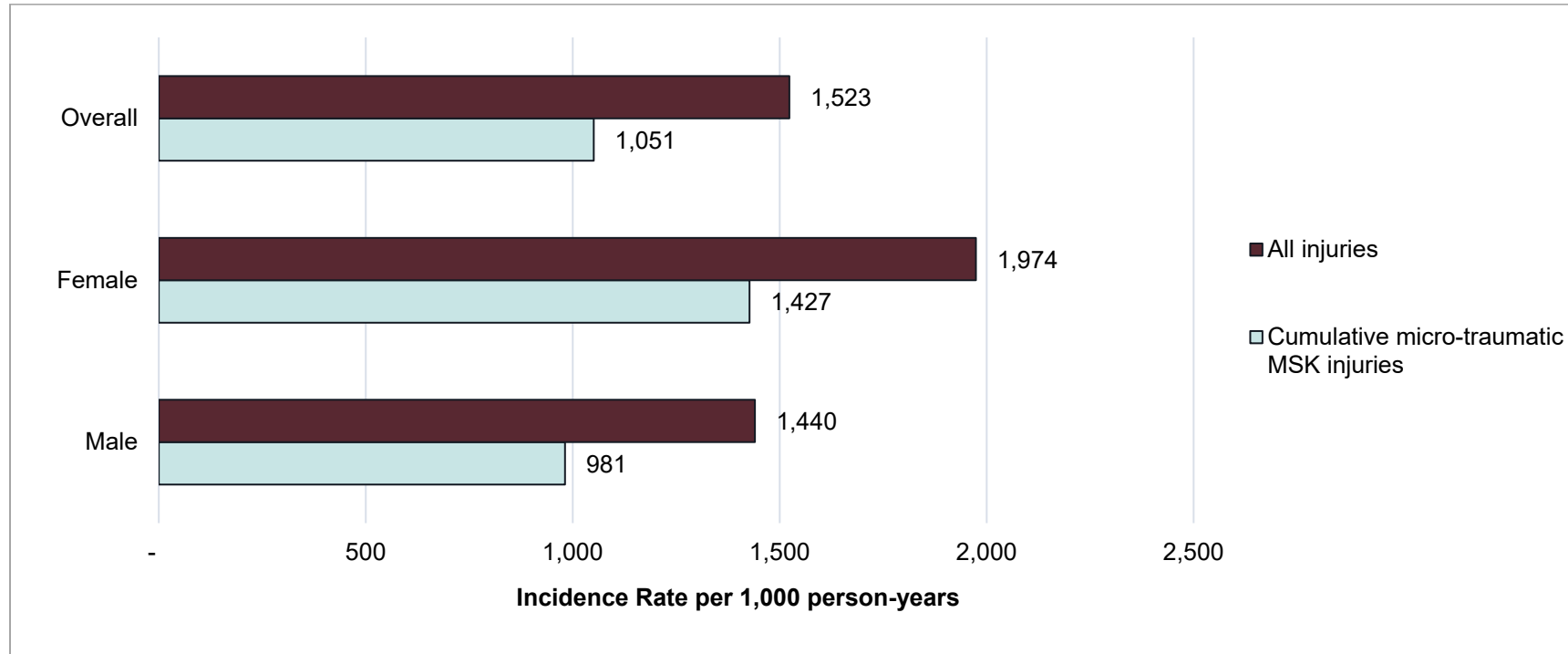
Taxonomy Distribution of Injuries, U.S. Army Active Duty, 2022

Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.  
Prepared by DCPH-A Injury Prevention.

### INJURY RATE

The rate of incident injuries among Army Soldiers during 2022 was 1,523 injuries per 1,000 person-years. Rates for all injuries and cumulative micro-traumatic musculoskeletal (MSK) injuries were both significantly higher among women ( $p < 0.001$ ). Across groups, 69% of all injuries were cumulative micro-traumatic MSK overuse injuries.



**All Injury and Cumulative Micro-traumatic Musculoskeletal (MSK) Incident Injury Visit Rates by Sex  
U.S. Army Active Duty, 2022**

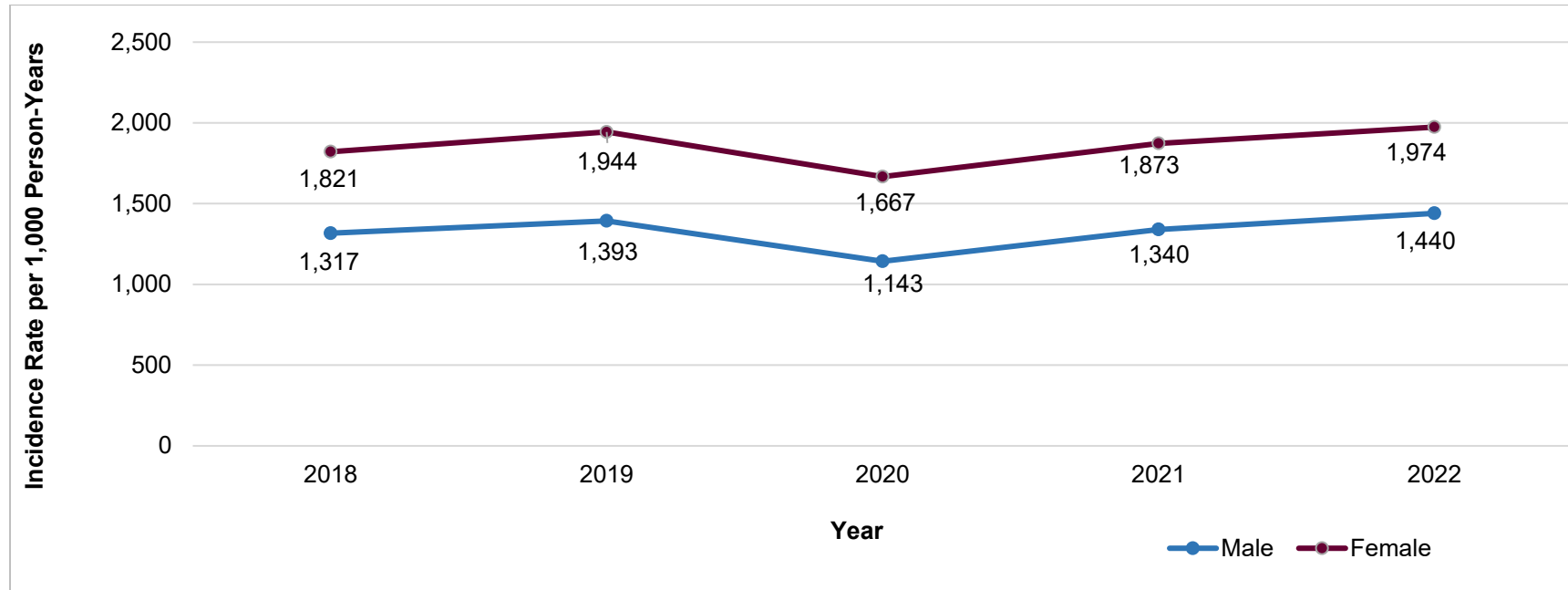
Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

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The rates of incident injuries among female Soldiers were consistently and significantly higher than male Soldiers from 2018 to 2022 ( $p < 0.001$ ).



**Incident Injury Visit Rates by Sex, U.S. Army Active Duty, 2018 – 2022**

**Notes:**

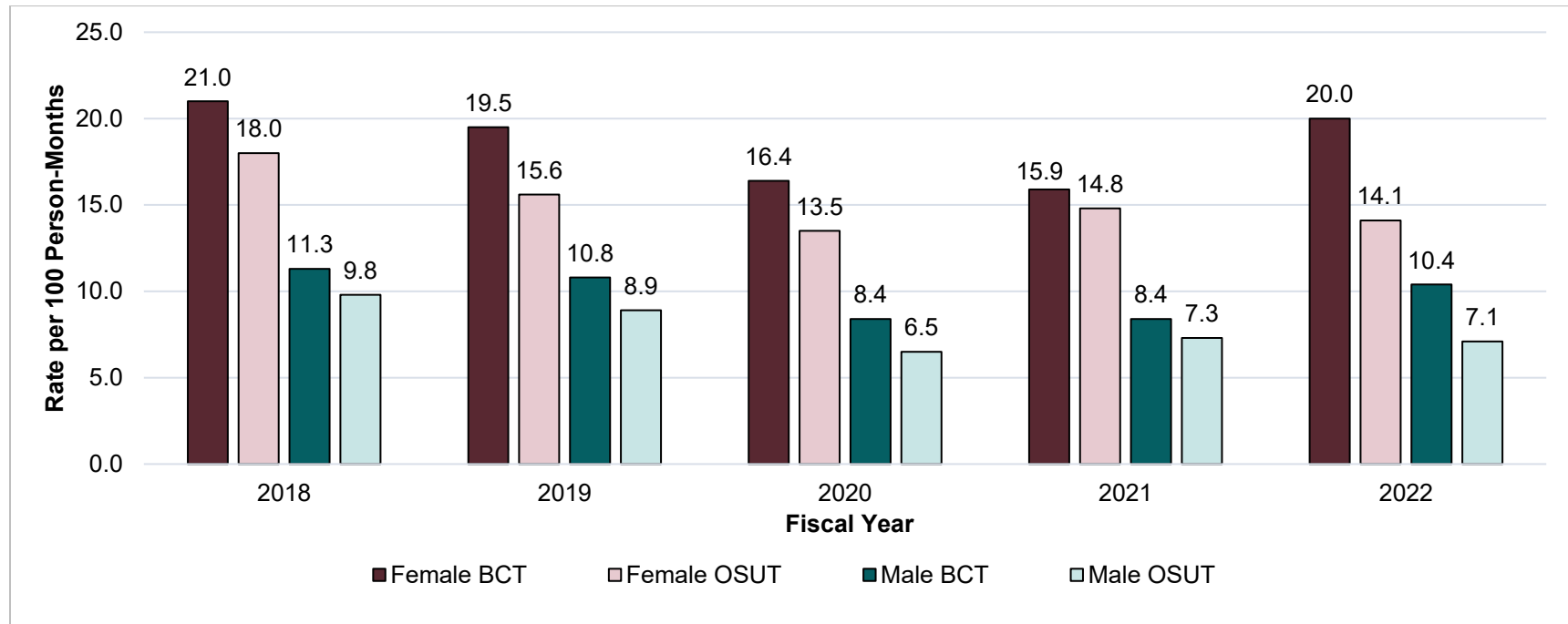
Active duty injury adjusted to remove deployed injury and deployed person-time.

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

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For all years 2018 – 2022, incident injury rates among female trainees in Basic Combat Training (BCT) and One Station Unit Training (OSUT) were significantly higher than male trainees ( $p < 0.05$ ). Injury rates during BCT were higher than rates during OSUT for all trainees ( $p < 0.05$ ) for all years. Injury rates from BCT were significantly higher in 2022 compared to 2021 and 2020 for all trainees ( $p < 0.05$ ), but not 2019. BCT injury rates were significantly lower in 2022 compared to 2018 for male trainees only ( $p < 0.05$ ). Injury rates during OSUT in 2022 were significantly lower compared to 2018 – 2019 for all trainees ( $p < 0.05$ ), but not 2021. OSUT injury rates were significantly higher in 2022 compared to 2020 among male trainees only ( $p < 0.05$ ).



**Incident Injury Visit Rates by Sex, U.S. Army Trainees, FY2018 – FY2022**

**Notes:**

Data source: Defense Medical Surveillance System (DMSS); injuries defined using the Taxonomy of Injuries.  
 Data reproduced from: DCPH-A. 2023. Injury Surveillance and Longitudinal Studies for Gender Integration in the Army: Eighth Annual Assessment, 2023.  
 Prepared by DCPH-A Injury Prevention.



**INJURY DISTRIBUTION**

Injuries resulting from mechanical energy are categorized as those that exceed tissue tolerance suddenly (acute trauma) or gradually over time (cumulative micro-trauma). Over three-quarters (78%) of incident mechanical injury encounters among Active Duty Soldiers were due to cumulative micro-trauma (overuse). Regarding body region, most mechanical injuries were to the lower extremities (40%), followed by the spine and back (29%) and upper extremities (21%).

**Incident Mechanical Injuries by Body Region and Acute/Overuse\*, U.S. Army Active Duty, 2022**

Body Region	Acute Traumatic n (%)	Cumulative Micro-traumatic (Overuse) n (%)	All n (%)
Lower Extremity	55,102 (8.2)	214,114 (31.8)	268,971 (40.0)
Spine & Back	11,224 (1.7)	184,914 (27.5)	196,138 (29.1)
Upper Extremity	44,094 (6.5)	94,262 (14.0)	137,565 (20.5)
Head, Face, & Neck	27,238 (4.0)	19,778 (2.9)	47,008 (7.0)
Torso	8,474 (1.3)	676 (0.1)	9,135 (1.4)
Other	698 (0.1)	13,026 (1.9)	13,724 (2.0)
Total	146,830 (21.8)	526,770 (78.2)	673,600 (100)

Notes:

\*In order of most frequently injured body region.

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

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Musculoskeletal tissue damage like joint pain, tendinitis, and bursitis accounted for nearly three-quarters (73%) of incident mechanical injury encounters during 2022.

**Incident Mechanical Injury Diagnoses by Body Region, U.S. Army Active Duty, 2022**

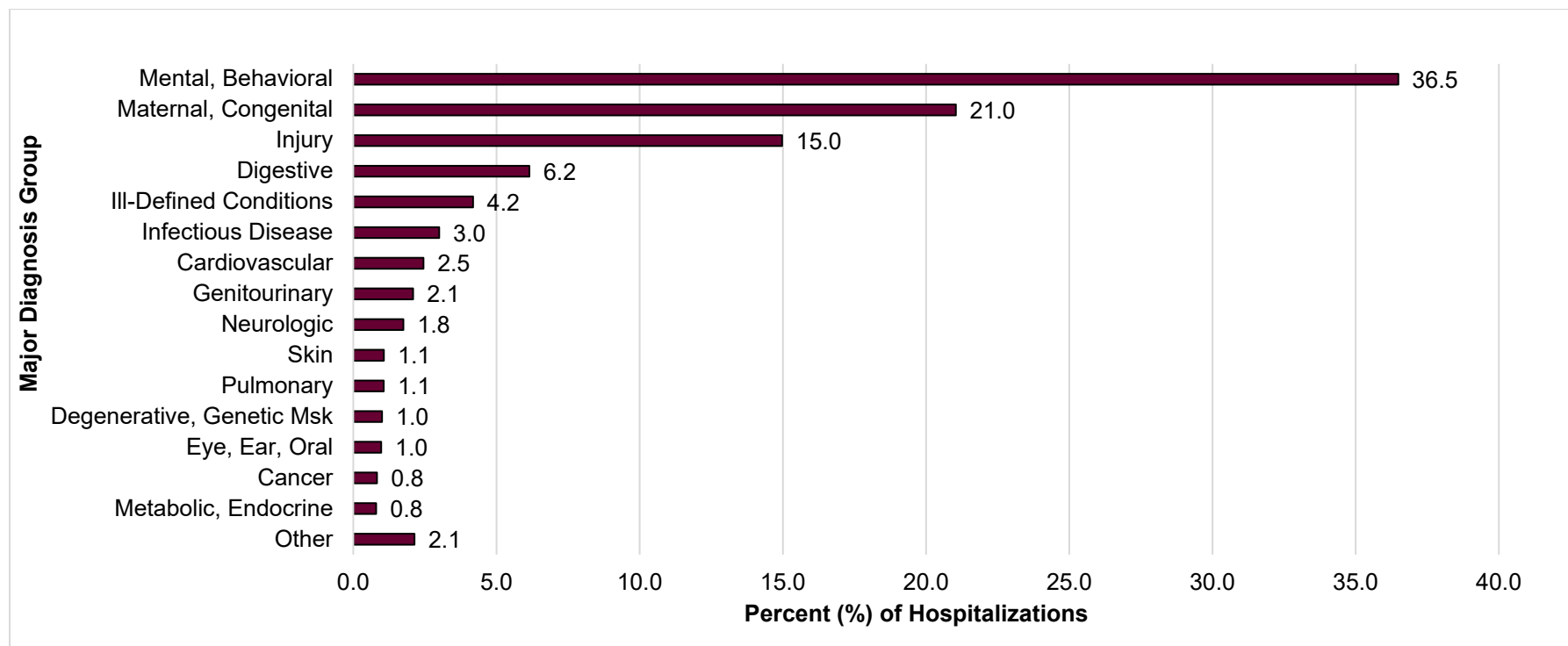
Diagnosis	Head, Face, and Neck		Spine and Back		Torso		Upper Extremity		Lower Extremity		Other		Total	Percent Total (%)
	Acute (ACT)	Cumulative (CMT)	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT		
<b>MSK Tissue Damage, Other</b>	25	226	3,194	167,418	265	0	4,353	86,315	8,511	206,210	181	12,655	489,353	72.6
<b>Tissue Damage, Other</b>	9,771	19,528	1,350	0	2,184	0	4,945	0	3,727	0	442	0	41,947	6.2
<b>Sprain/Joint Damage</b>	20	0	1,587	2	483	0	5,800	541	19,341	2,769	38	139	30,720	4.6
<b>Nerve</b>	62	0	21	17,470	16	493	3,967	4,134	1,062	858	0	0	28,083	4.2
<b>Strain/Tear</b>	1,899	0	4,322	0	2,016	0	4,370	3,191	7,672	15	37	52	23,574	3.5
<b>Contusion/Superficial</b>	4,593	24	0	0	1,885	15	5,455	63	6,235	1,670	0	0	19,940	3.0
<b>Fracture</b>	1,125	0	602	24	639	168	5,708	18	5,455	2,592	0	180	16,511	2.5
<b>Open Wound</b>	3,491	0	0	0	358	0	6,953	0	2,258	0	0	0	13,060	1.9
<b>Internal Organ and Blood Vessel</b>	6,199	0	110	0	556	0	60	0	23	0	0	0	6,948	1.0
<b>Dislocation</b>	45	0	38	0	57	0	1,692	0	573	0	0	0	2,405	0.4
<b>Crush</b>	8	0	0	0	15	0	664	0	220	0	0	0	907	0.1
<b>Amputation</b>	0	0	0	0	0	0	127	0	25	0	0	0	152	<0.1
<b>Total</b>	27,238	19,778	11,224	184,914	8,474	676	44,094	94,262	55,102	214,114	698	13,026	673,600	100.0
<b>Percent Total (%)</b>	4.0	2.9	1.7	27.5	1.3	0.1	6.5	14.0	8.2	31.8	0.1	1.9		100

**Notes:**

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.  
Prepared by DCPH-A Injury Prevention.

### HOSPITALIZATIONS

Injuries were the third leading cause of hospitalizations during 2022, accounting for 15% of all hospitalizations among Active Duty Soldiers. See Appendix A for data on causes of injury hospitalizations.



**Major Diagnosis Groups Resulting in Hospitalizations, U.S. Army Active Duty, 2022**

**Notes:**

Total number of hospitalizations = 17,137.

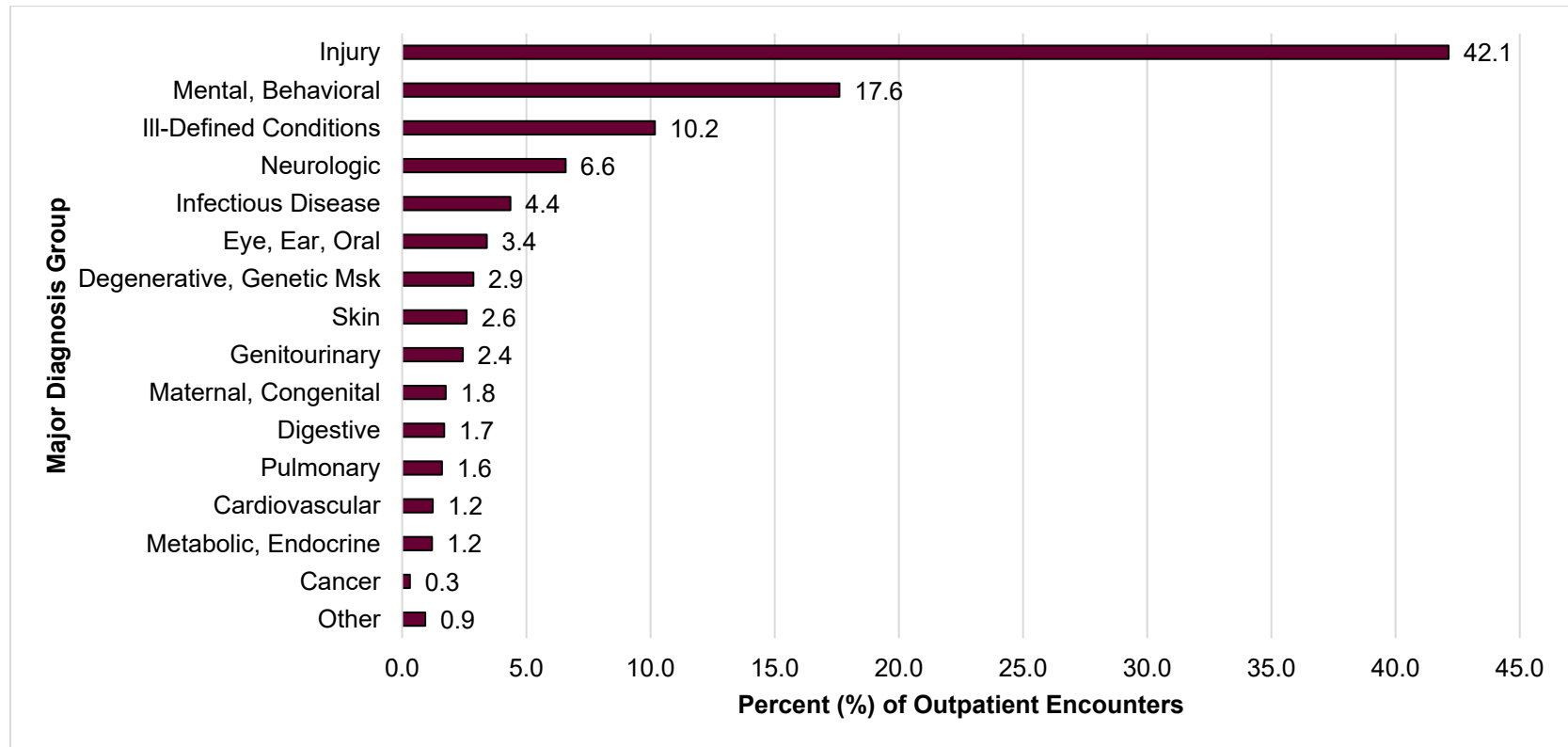
Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer).

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

**OUTPATIENT ENCOUNTERS**

Injuries were the leading cause of outpatient encounters during 2022, accounting for 42% of all outpatient visits among Active Duty Soldiers.



**Major Diagnosis Groups Resulting in Outpatient Visits U.S. Army Active Duty, 2022**

Notes:

Total number of outpatient visits = 5,483,616.

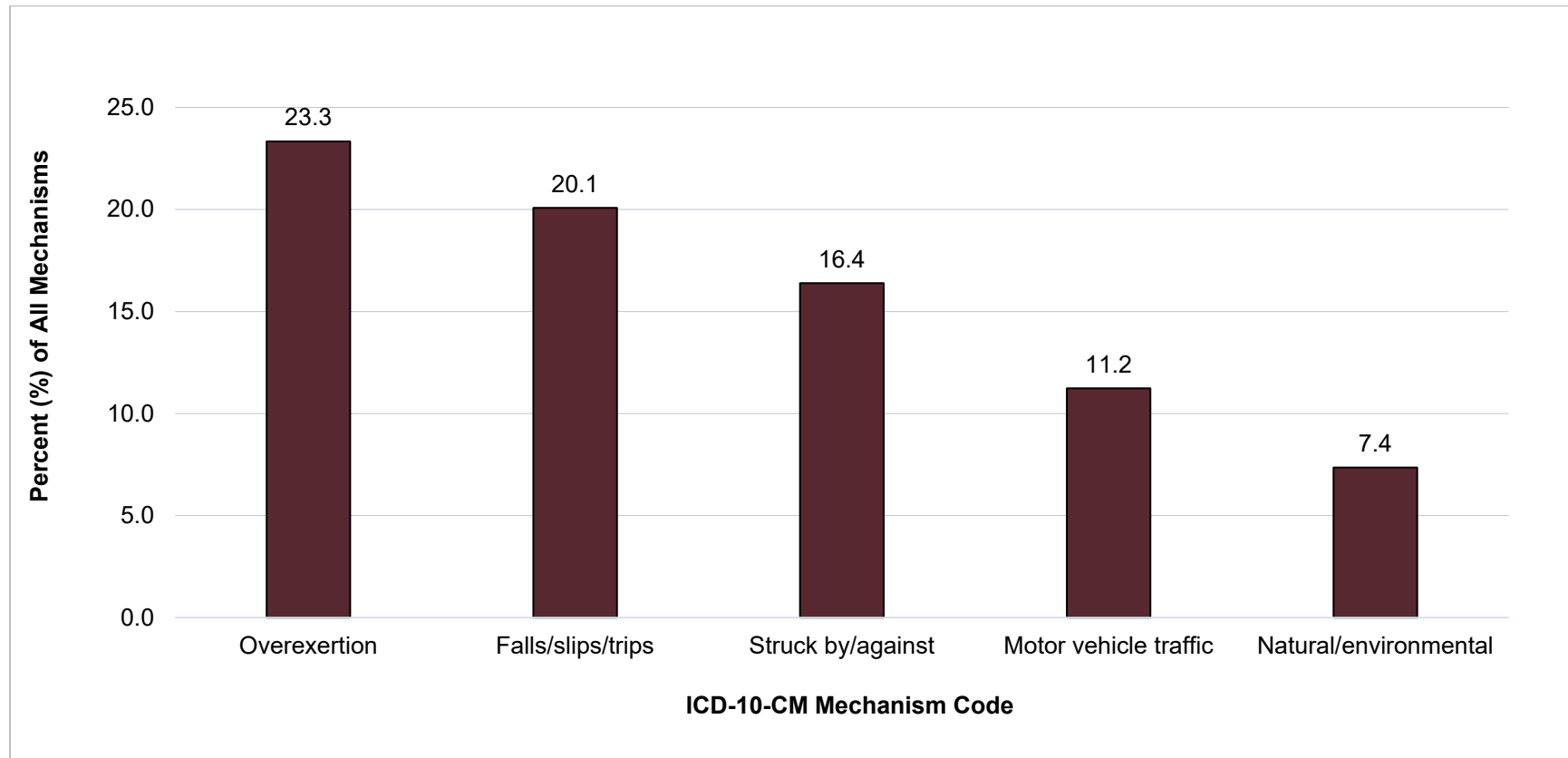
Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer).

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

### MECHANISMS ASSOCIATED WITH INJURIES

Among outpatient injury encounters with a mechanism code in 2022, leading mechanisms of injuries were overexertion (23%) and falls (20%).



**Leading Mechanisms of Unintentional Injury, Outpatient Visits, U.S. Army Active Duty, 2022**

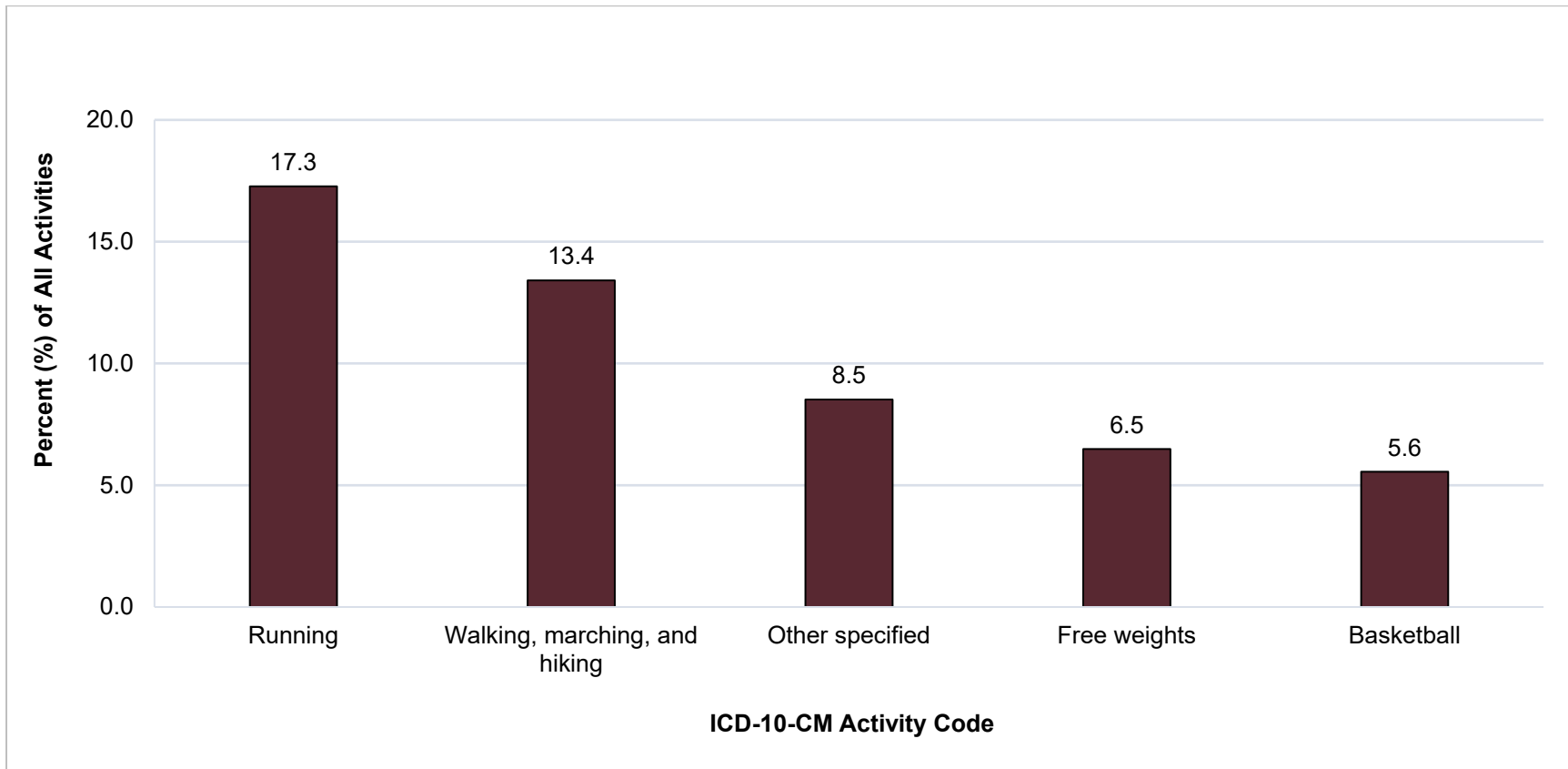
**Notes:**

Total number of unintentional incident injury outpatient visits with mechanism codes = 43,017 (6%); may not be representative of the distribution of mechanisms for all incident injuries.

Based on ICD-10-CM cause codes meeting the National Center for Health Statistics definition for unintentional injuries (excludes intentional self-harm, abuse, and violence). Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries. Prepared by DCPH-A Injury Prevention.

### ACTIVITIES ASSOCIATED WITH INJURIES

In 2022, the leading activity associated with unintentional injuries among Active Duty Soldiers was running (17%), followed by walking, marching, and hiking (13%).



**Leading Activities Associated with Unintentional Injury, Outpatient Visits, U.S. Army Active Duty, 2022**

**Notes:**

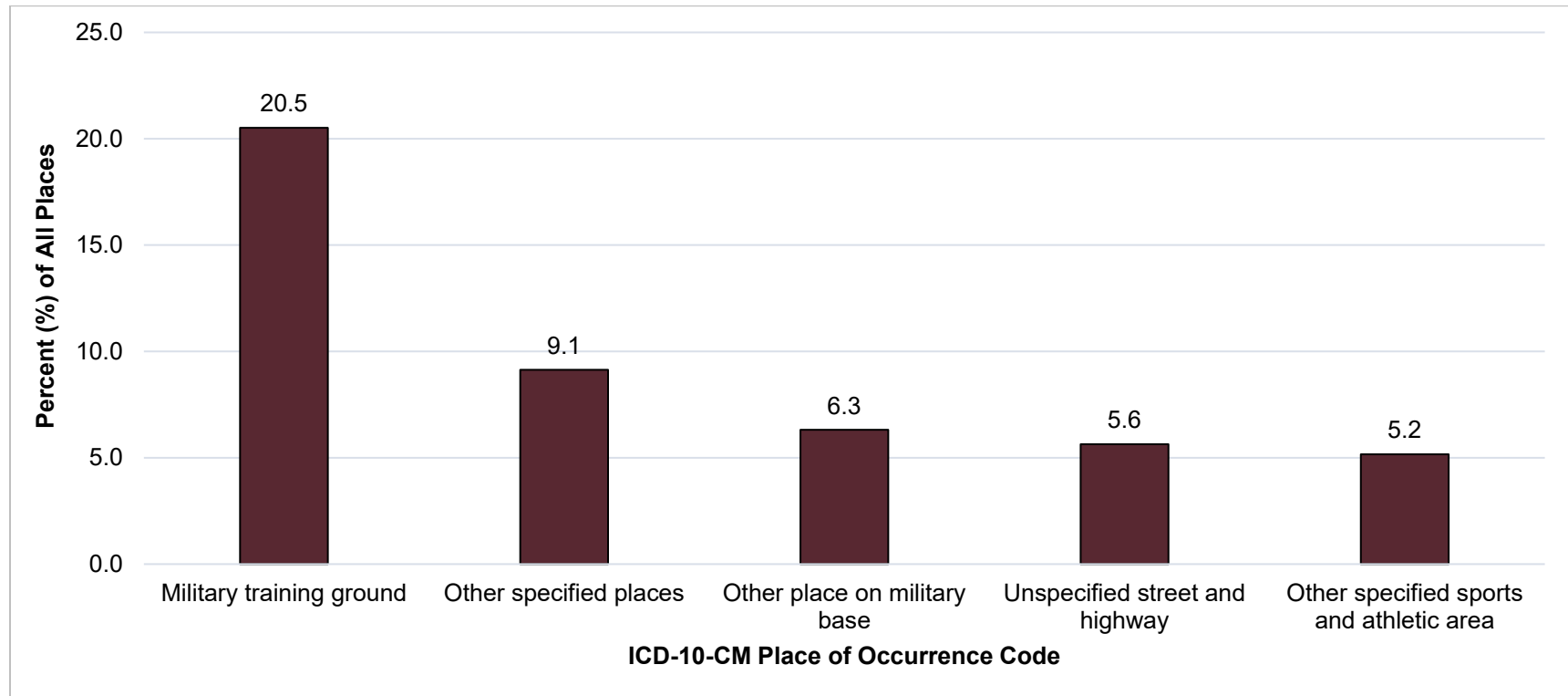
Total number of unintentional outpatient encounters with activity codes = 12,066 (2%); may not be representative of the distribution of activities for all incident injuries.

Based on ICD-10-CM cause codes meeting the National Center for Health Statistics definition for unintentional injuries (excludes intentional self-harm, abuse, and violence).

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries. Prepared by DCPH-A Injury Prevention.

### PLACES OF OCCURRENCE ASSOCIATED WITH INJURIES

The leading place of occurrence associated with unintentional injuries among Active Duty Soldiers in 2022 was a military training ground (21%).



**Leading Places Associated with Unintentional Injury, Outpatient Visits, U.S. Army Active Duty, 2022**

**Notes:**

Total number of unintentional outpatient encounters with place of occurrence codes = 7,190 (1%); may not be representative of the distribution of places for all incident injuries.

Based on ICD-10-CM cause codes meeting the National Center for Health Statistics definition for unintentional injuries (excludes intentional self-harm, abuse, and violence).

Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

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### SUMMARY

Medical encounter data provide evidence of the magnitude and distribution of health conditions for which Active Duty Soldiers seek medical care. These conditions represent barriers to medical readiness.

Injuries are the biggest health problem for U.S. Army Active Duty Soldiers, compared to any other category of medical conditions.

Injury rates are higher among females compared to males.

Cumulative micro-traumatic MSK (overuse) injuries account for a greater proportion of all Active Duty Army injuries than acute traumatic injuries.

The most common injury types are MSK tissue damage such as joint pain, tendinitis, and bursitis. The most frequently injured body region is the lower extremities.

Among those injuries receiving additional provider coding of injury details, activities most frequently associated with injuries are running and walking/marching/hiking, and leading causes of outpatient injuries are overexertion and falls. Surveys and electronic medical profile data can provide greater detail on causes of injury, information necessary for prevention planning.

### BIBLIOGRAPHY OF KEY MILITARY INJURY SURVEILLANCE REFERENCES

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### **Military Injury Prevention Overview**

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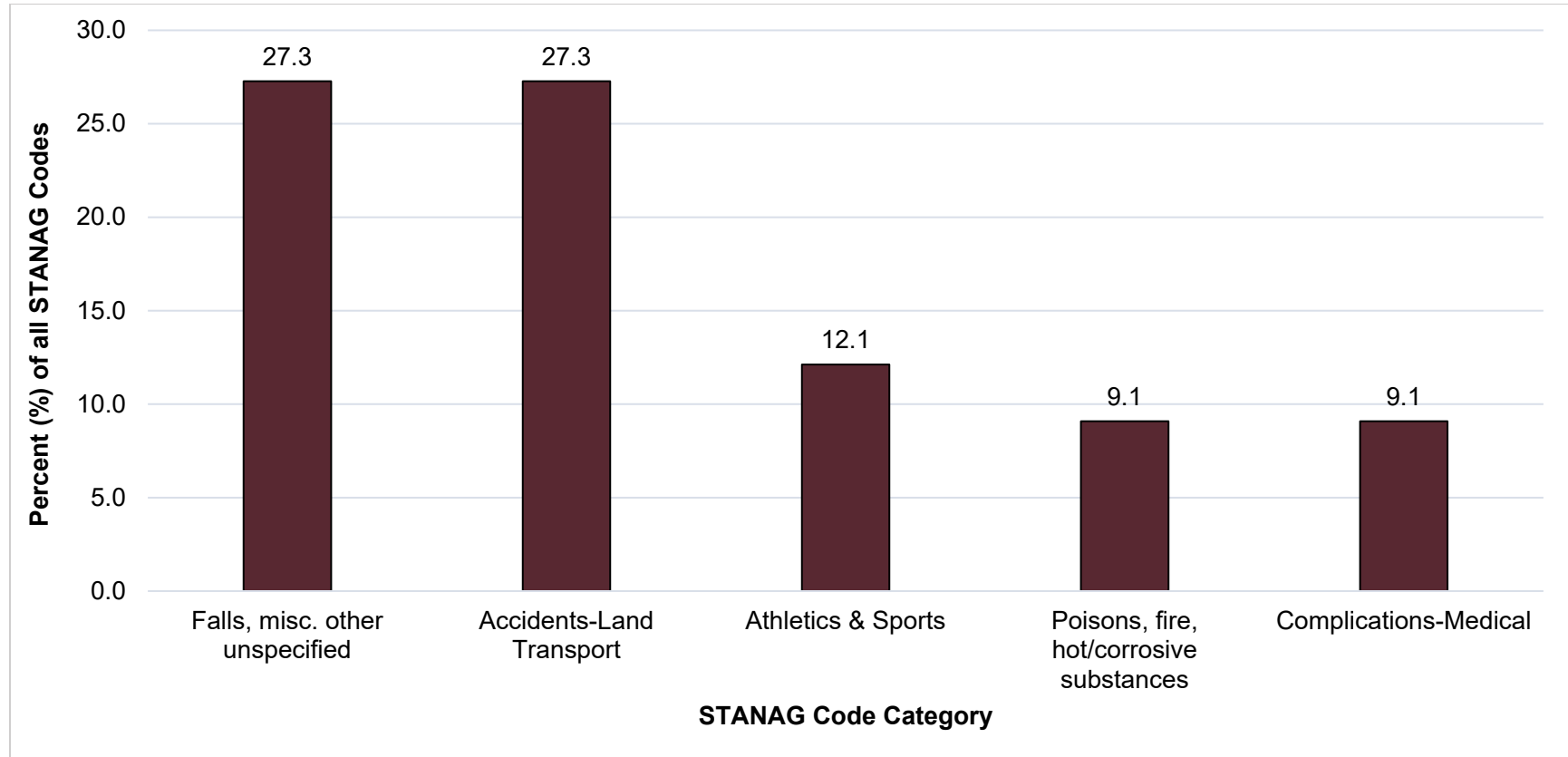
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Dated: May 2024

**APPENDIX A  
CAUSES OF INJURY HOSPITALIZATIONS**

In 2022, a total of 33 hospitalizations for incident injuries received Standardized Agreement Codes (STANAG) cause codes. The leading causes were falls (27%) and land transport (27%).



**Leading Standardized Agreement (STANAG) Cause Codes for Injury Hospitalizations, U.S. Army Active Duty, 2022**

Notes:

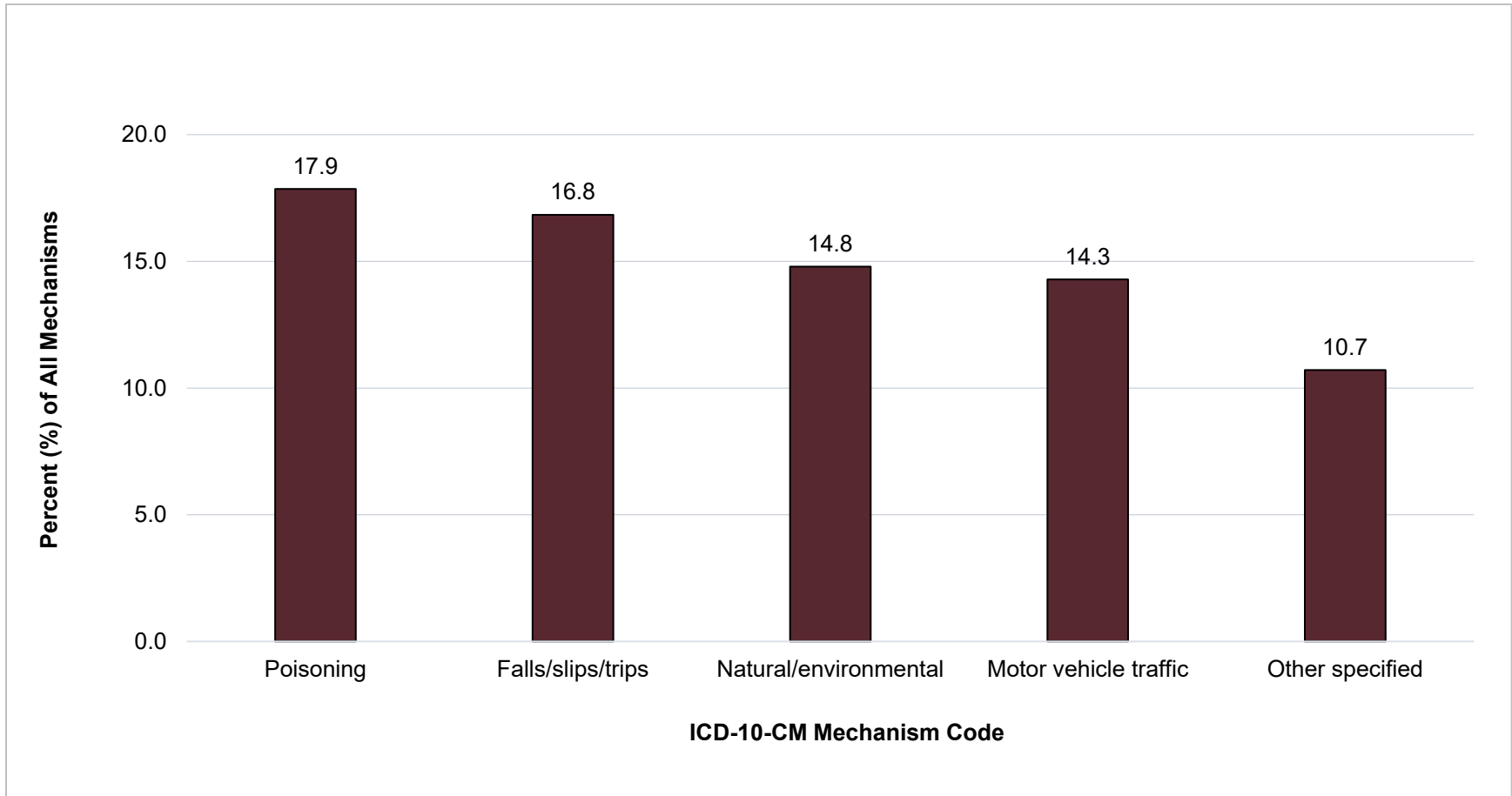
Total number of STANAG-coded incident injury hospitalizations = 33 (4%); may not be representative of the distribution of causes for all injuries.

Data source: Military Health System Data Repository (MDR); injuries defined using Taxonomy of Injuries.

Prepared by DCPH-A Injury Prevention.

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Among incident injury hospitalizations that were given an ICD-10-CM medical diagnosis mechanism code in 2022 (14%), leading mechanisms were poisoning (18%) and falls/slips/trips (17%).



**Leading Mechanisms of Unintentional Injury Hospitalizations, U.S. Army Active Duty, 2022**

**Notes:**

Total number of unintentional incident injury hospitalizations with mechanism codes = 196 (14%); may not be representative of the distribution of mechanisms for all injuries. Data source: Military Health System Data Repository (MDR); injuries defined using the Taxonomy of Injuries. Prepared by DCPH-A Injury Prevention.