

TIP No. 12-113-0820

ANNUAL INJURY SURVEILLANCE REPORT 2018 SUMMARY

INTRODUCTION

This document provides a summary of injury medical encounter surveillance data for Active Duty Soldiers from Calendar Year (CY) 2018, analyzed and presented by the U.S. Army Public Health Center (APHC) Injury Prevention Program (IPP).

According to the Centers for Disease Control and Prevention (CDC) (www.cdc.gov), monitoring of public health outcomes is one of the ten essential public health services. Routine monitoring and surveillance of Army injuries provides a foundation to recognize trends, define the magnitude and distribution of injuries, identify emerging issues, and guide injury prevention priorities.

Injuries summarized in this report are based on medical encounters diagnosed using codes from the International Classification of Diseases, Clinical Modification, 10th Revision (ICD-10 CM). 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, non-environment, or other. The definition of injury used in this report has been described in APHC's Taxonomy of Injuries for Public Health Monitoring and Reporting (see bibliography).

The surveillance data presented in this document, along with past Army injury surveillance summaries, are also available in a slide-set format on the APHC 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 U.S. Army 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>

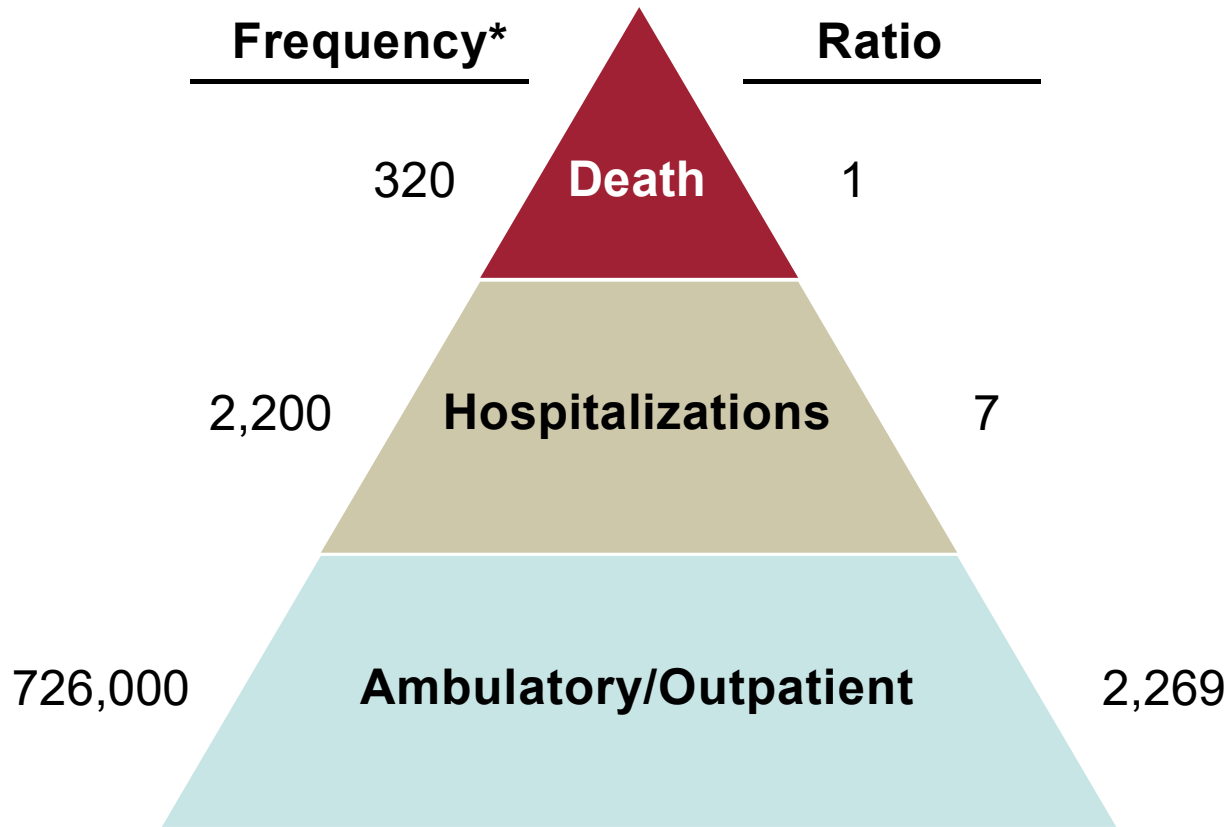
The APHC IPP also provides installation-level injury summaries for both Active Duty and Civilian populations, upon request, for those interested in detailed installation-specific data. Installation injury rates, one element of these summaries, can be accessed at: <https://www.sms.army.mil/>, and navigating 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 > Epidemiology and Disease Surveillance Portfolio > Active Duty Injuries by Installation, MEDCOM Region, and MACOM (Quarterly).

Furthermore, injury data-specific to basic trainee populations is available upon request, and at: <https://carepoint.health.mil/sites/APH/PHPMO/Pages/AD-Training-Related-Injuries.aspx>

For additional information, please visit the Injury Prevention Program Website at: <https://phc.amedd.army.mil/topics/discond/ptsaip/Pages/default.aspx>, and contact us by email at: usarmy.apg.medcom-aphc.mbx.injuryprevention@mail.mil

DISTRIBUTION OF INJURIES

The injury pyramid depicts injuries by level of severity, from deaths to injuries treated in an outpatient setting. In 2018, for every one injury-related death, there were over 2,000 outpatient encounters. Injuries treated on an outpatient basis represent a significant obstacle to Soldier medical readiness.



Injury Pyramid, U.S. Army Active Duty, 2018

Notes:

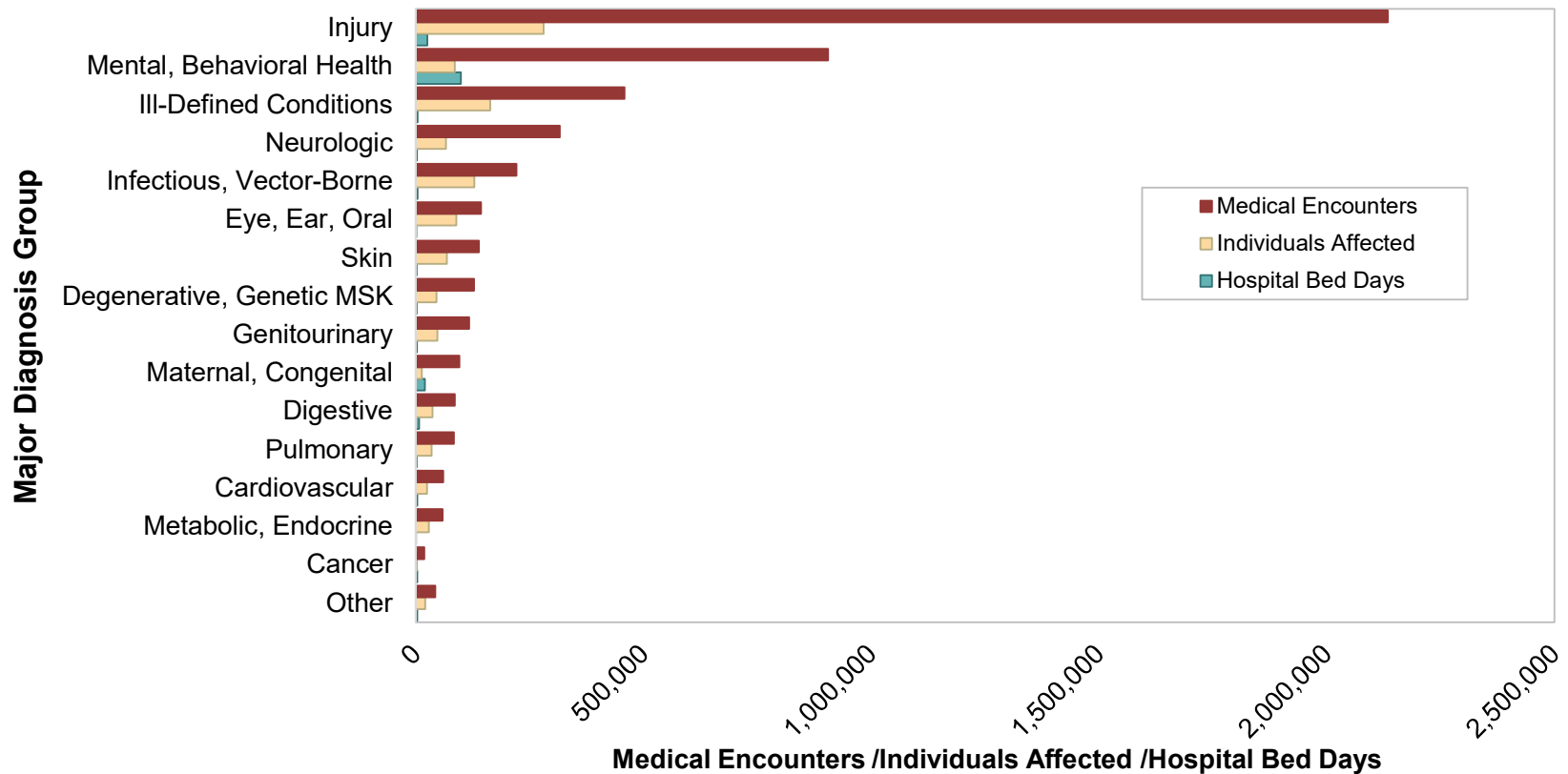
*Frequencies are rounded and represent incident injury visits

Data source: Military Health System Data Repository (MDR) and Armed Forces Medical Examiner System (AFMES); injuries defined using the APHC Taxonomy of Injuries

Prepared by APHC, Injury Prevention

MAGNITUDE OF THE PROBLEM

During 2018, injuries accounted for over 2 million medical encounters (43% of all encounters) among Active Duty Army Soldiers, about 2.3 times as many encounters as the second leading cause, mental disorders (18%). Injuries also affected the greatest number of Soldiers, nearly 300,000, compared to all other medical conditions.



Relative Burden of Injuries and Diseases, U.S. Army Active Duty, 2018

Notes:

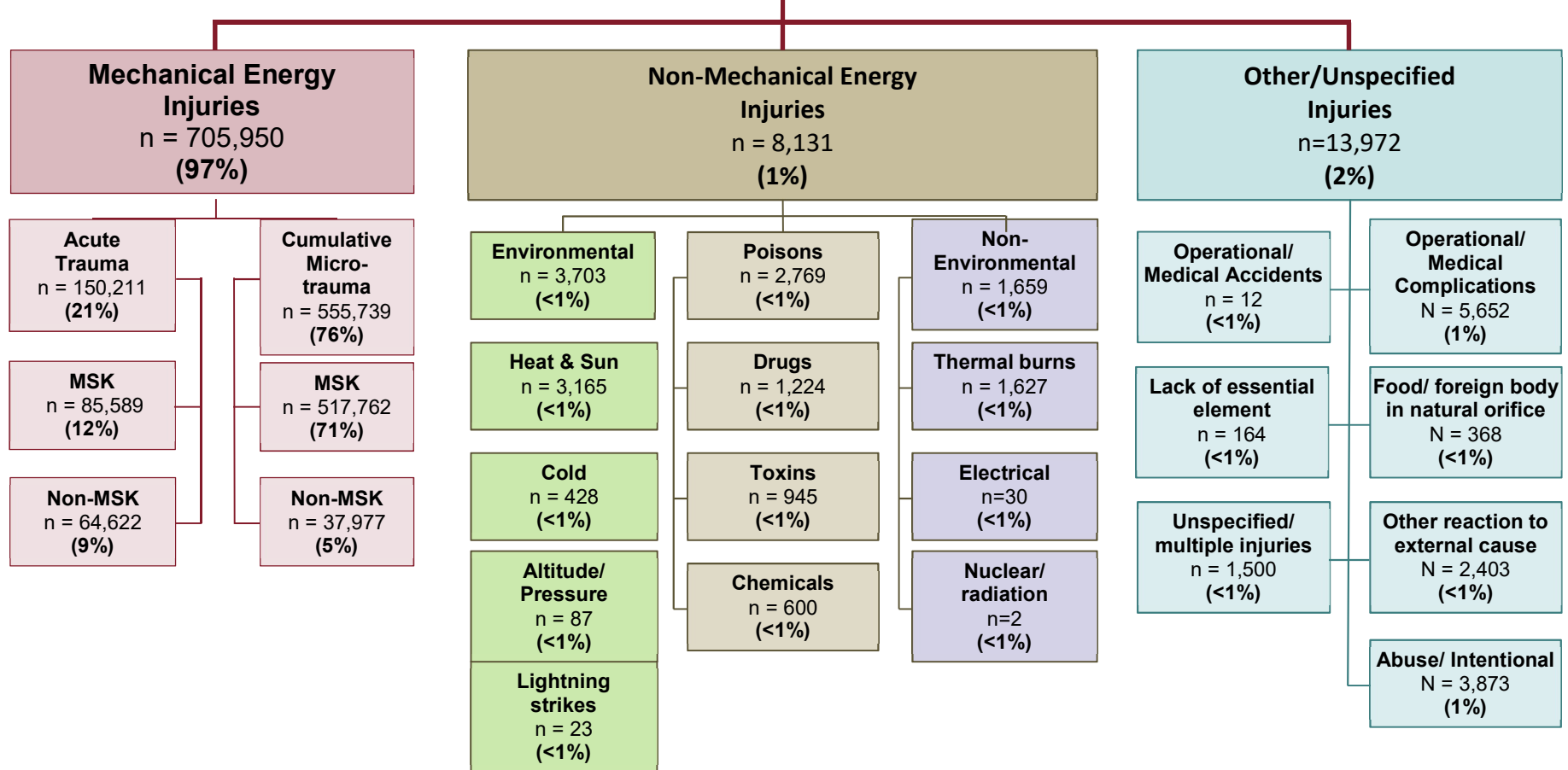
Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer)

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

Prepared by APHC Injury Prevention

The vast majority (97%) of new (incident) injury diagnoses were attributable to mechanical energy sources and 71% to cumulative micro-traumatic musculoskeletal (MSK) “overuse” injuries.

All Active Duty Army Injuries, Initial Medical Encounters: N = 728,053

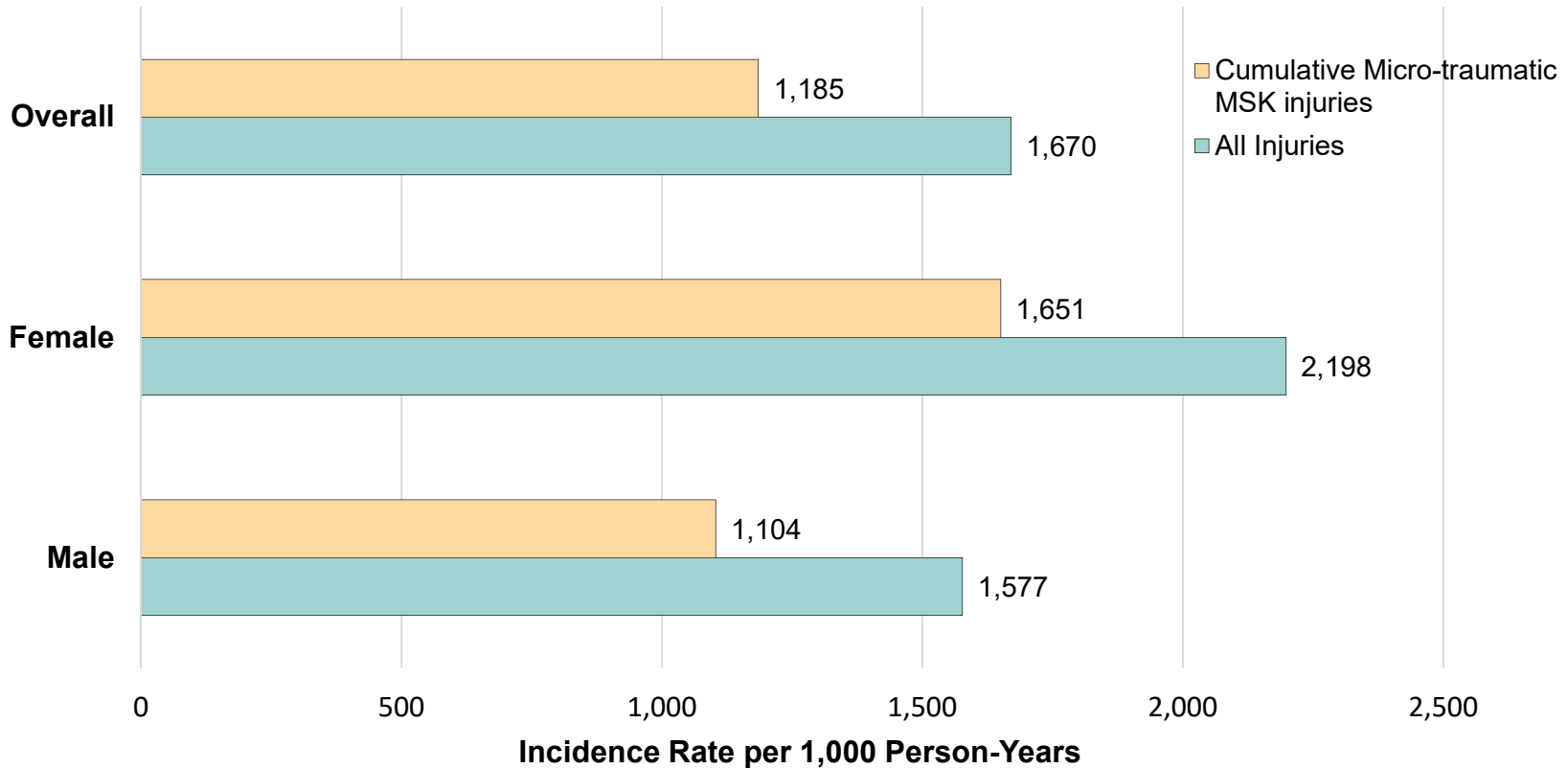


Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries
 Prepared by APHC Injury Prevention

INJURY RATES

The rate of incident injuries among Army Soldiers during 2018 was 1,185 injuries per 1,000 Soldier-years. Rates for all injuries and cumulative micro-traumatic MSK injuries were both significantly higher among women ($p < 0.001$). Across groups, 71% of all injuries were cumulative micro-traumatic MSK injuries.

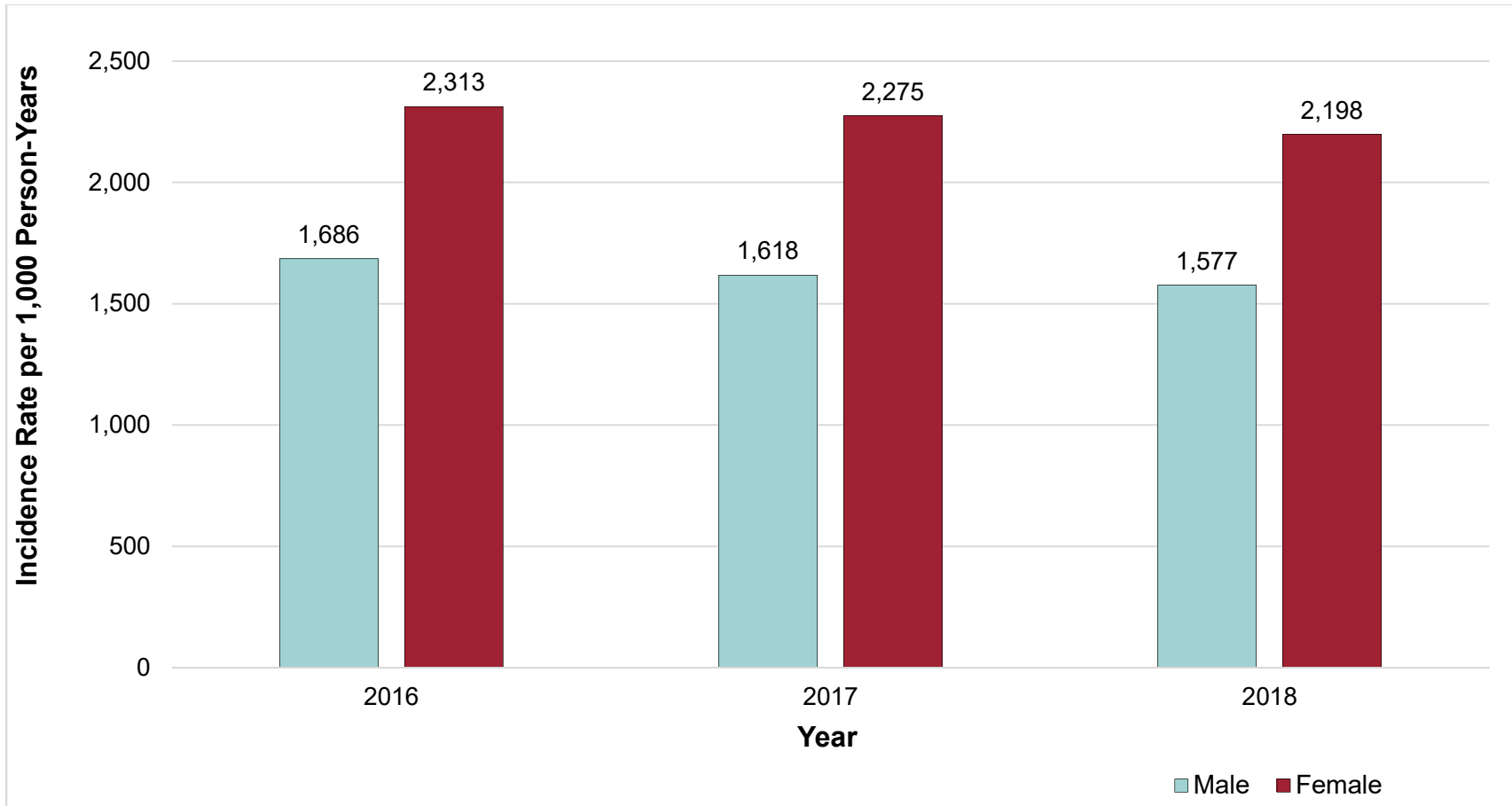


All Injury and Cumulative Micro-traumatic Musculoskeletal Incident Injury Visit Rates by Sex, U.S. Army Active Duty, 2018

Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries Prepared by APHC Injury Prevention

The rates of incident injuries among female Army Soldiers were consistently and significantly higher than male Soldiers from 2016 to 2018 ($p < 0.001$). No significant changes in rates were observed for either sex 2016-2018 ($p > 0.05$).



**All Injury Incident Injury Visit Rates by Sex,
U.S. Army Active Duty, 2016-2018**

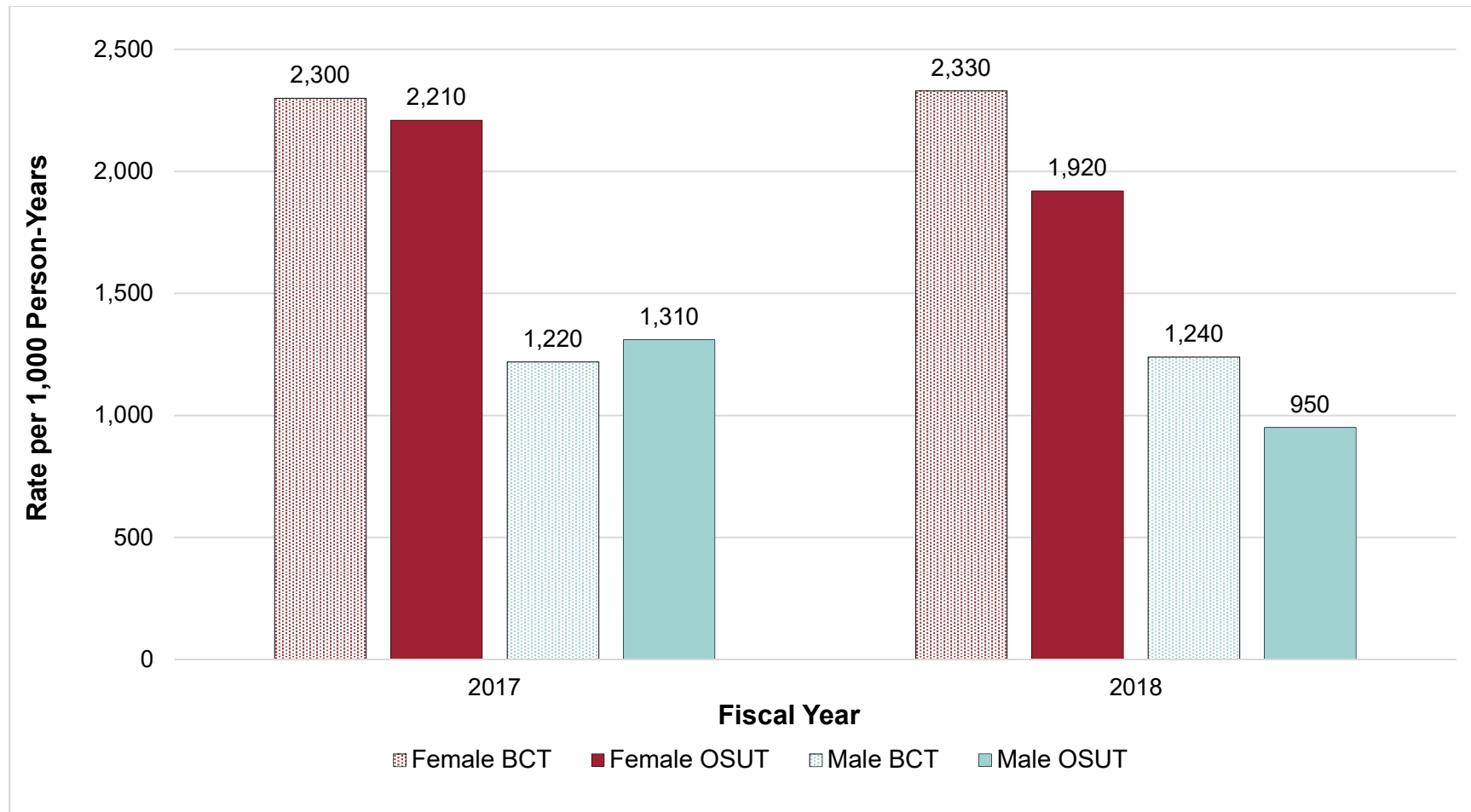
Notes:

Active Duty injury adjusted to remove deployed injury and deployed person-time

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries

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Incident injury rates among female trainees in Basic Combat Training (BCT) and One Station Unit Training (OSUT) were significantly higher than male trainees in both 2017 and 2018 ($p < 0.001$). In 2018, injury rates during BCT were significantly higher than rates during OSUT ($p < 0.001$), but the rates in the two environments were much closer in 2017 ($p > 0.05$).



Overall Incident Injury Visit Rates, U.S. Army Active Duty vs. Trainee, 2017-2018

Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries Prepared by APHC 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 (76%) of incident mechanical energy injury encounters among Active Duty Soldiers were due to cumulative micro-trauma (overuse). With regard to body region, most injuries were to the lower extremities (47%), followed by the spine and back (24%) and upper extremities (22%).

Incident Mechanical Injuries by Body Region and Acute/Overuse, U.S. Army Active Duty, 2018

Body Region	Acute Traumatic (Trauma)	Cumulative Micro-traumatic (Overuse)	All
Lower Extremity	60,108 (40.0)	268,383 (48.3)	328,491 (46.5)
Spine & Back	8,382 (5.6)	158,045 (28.4)	166,436 (23.6)
Upper Extremity	47,575 (31.7)	104,242 (18.8)	151,817 (21.5)
Head, Face & Neck	25,314 (16.9)	15,124 (2.7)	40,438 (5.7)
Torso	8,241 (5.5)	699 (0.1)	8,940 (1.3)
Other	591 (0.4)	9,237 (1.7)	9,828 (1.4)
Total	150,211 (100)	555,739 (100)	705,950 (100)

Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries Prepared by APHC Injury Prevention

Musculoskeletal tissue damage like joint pain, tendinitis, and bursitis accounted for nearly three-quarters (74%) of incident mechanical injury encounters during 2018.

Incident Mechanical Injury Diagnoses by Body Region, U.S. Army Active Duty, 2018

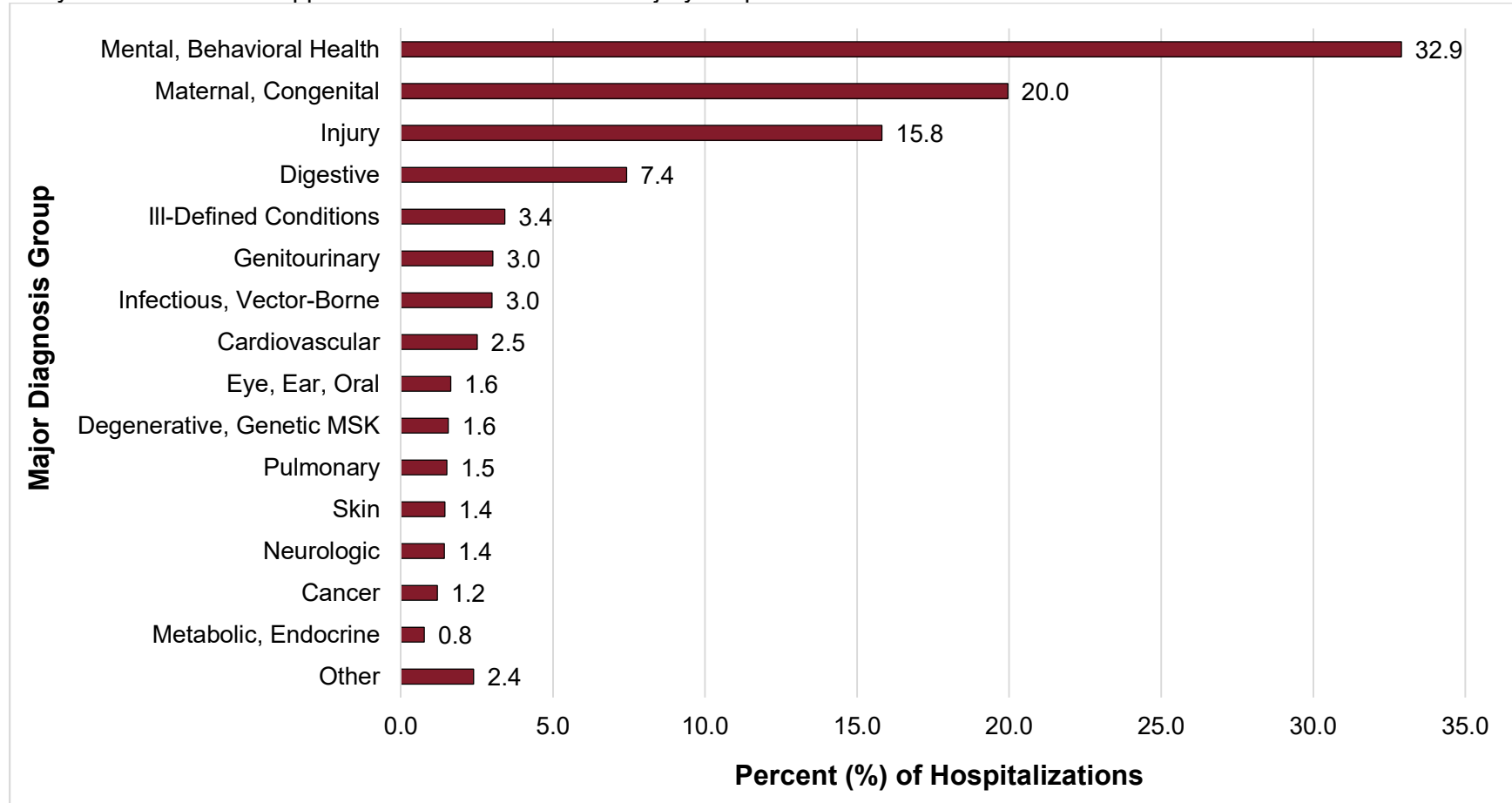
Diagnosis	Head, Face & Neck		Spine & Back		Torso		Upper Extremity		Lower Extremity		Other		Total	% Total
	Acute (ACT)	Cumulative (CMT)	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT		
MSK Tissue Damage	47	22	68	143,700	60	3	3,279	96,285	7,625	259,359	151	9,091	519,690	73.6
Sprain/Joint Damage	10	0	1,912	0	625	0	6,249	545	23,795	2,435	60	29	35,660	5.1
Tissue Damage, Other	7,500	15,074	1,998	0	1,634	0	4,678	0	3,686	0	363	1	34,934	4.9
Contusion/Superficial	5,044	28	0	0	2,123	15	6,094	109	6,870	3,582	0	0	23,865	3.4
Nerve	50	0	26	14,337	5	380	3,530	3,675	927	776	0	0	23,706	3.4
Strain/Tear	2,314	0	3,404	0	1,954	0	4,692	3,616	7,315	5	17	11	23,328	3.3
Fracture	1,429	0	811	17	686	301	8,593	12	6,725	2,226	0	105	20,905	3.0
Open Wound	3,924	0	0	0	410	0	7,556	0	2,324	0	0	0	14,214	2.0
Internal Organ & Blood Vessel	4,954	0	116	0	702	0	81	0	17	0	0	0	5,870	0.8
Dislocation	30	0	47	0	34	0	2,108	0	616	0	0	0	2,835	0.4
Crush	7	0	0	0	8	0	565	0	173	0	0	0	753	0.1
Amputation	5	0	0	0	0	0	150	0	35	0	0	0	190	<0.1
Total	25,314	15,124	8,382	158,054	8,241	699	47,575	104,242	60,108	268,383	591	9,237	705,950	
% Total	3.6%	2.1%	1.2%	22.4%	1.2%	0.1%	6.7%	14.8%	8.5%	38.0%	0.1%	1.3%		100.0

Notes:

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries Prepared by APHC Injury Prevention

HOSPITALIZATIONS

Injuries were the third leading cause of hospitalizations during 2018, accounting for 16% of all hospitalizations among Active Duty Army Soldiers. See the appendix for data on causes of injury hospitalizations.



Major Diagnosis Groups Resulting in Hospitalizations, U.S. Army Active Duty, 2018

Notes:

Total number of hospitalizations = 26,710

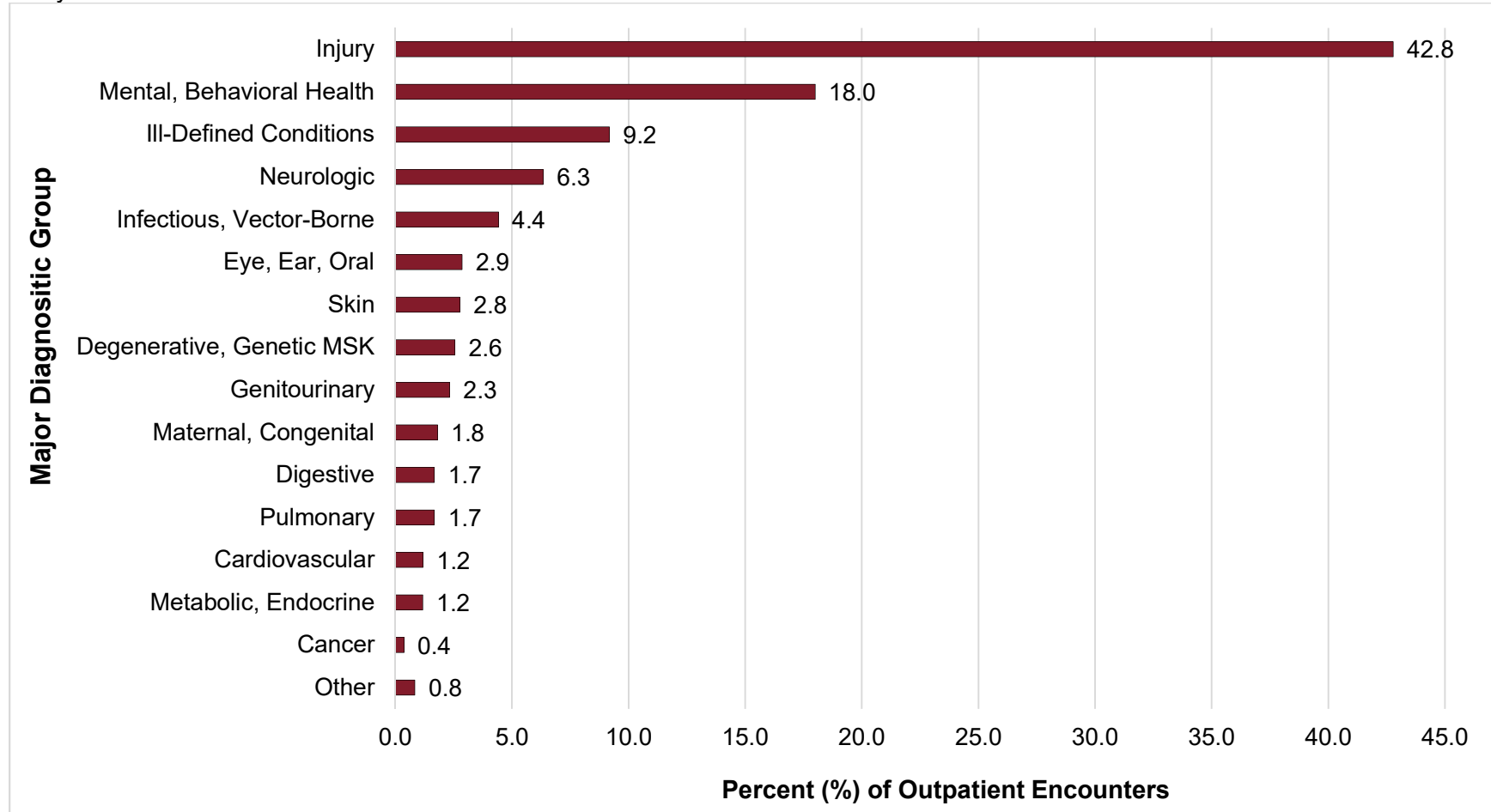
Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer)

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries

Prepared by APHC Injury Prevention

OUTPATIENT ENCOUNTERERS

Injuries were the leading cause of outpatient encounters during 2018, accounting for 43% of all outpatient visits among Active Duty Army Soldiers.



Major Diagnosis Groups Resulting in Outpatient Visits U.S. Army Active Duty, 2018

Notes:

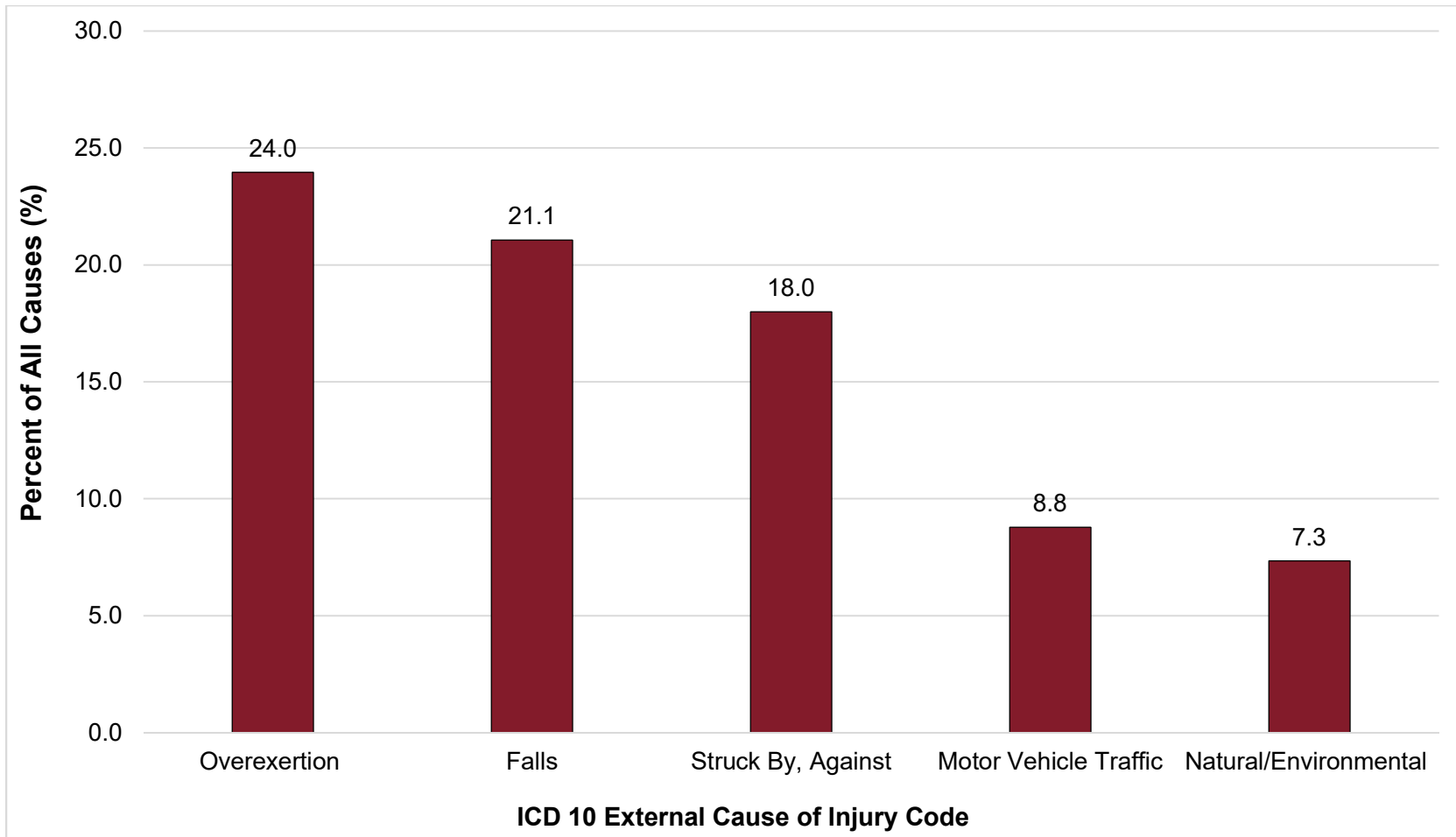
Total number of outpatient visits = 4,978,279

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 Army Public Health Center (APHC) Taxonomy of Injuries

Prepared by APHC Injury Prevention

Among those outpatient injury encounters with a cause code in 2018, leading causes were overexertion (24%) and falls (21%).



Leading External Causes of Unintentional Injury, Outpatient Visits, U.S. Army Active Duty, 2018

Notes:

Total number of cause-coded unintentional outpatient visits = 62,366 (9% of incident injury encounters); may not be representative of the distribution of causes for all injuries

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries

Prepared by APHC Injury Prevention

FINDINGS

- 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.
- Rates are higher among women compared to men.
- Cumulative micro-traumatic MSK (overuse) injuries account for 71% of all Active Duty Army injuries.
- The most common injury types are musculoskeletal tissue damage such as joint pain, tendinitis, and bursitis (74%). The most frequently injured body regions are the lower extremities (47%), spine and back (24%), and upper extremities (22%).
- Leading causes of outpatient injuries are overexertion and falls. Greater detail on causes of injury, information necessary for prevention planning, can be gained from surveys and electronic medical profile data.

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TIP No. 12-113-0820

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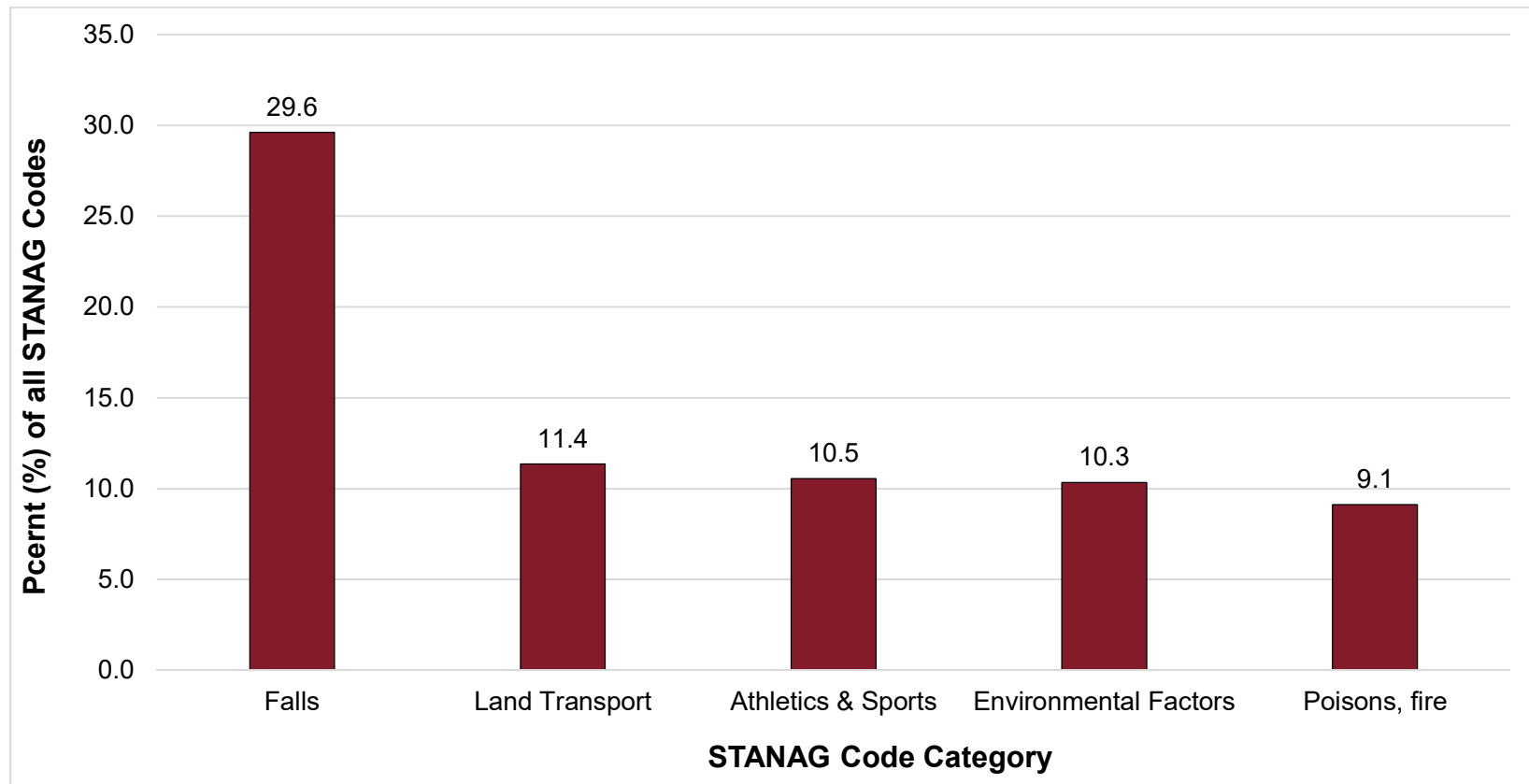
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Prepared by: Injury Prevention Program, usarmy.apg.medcom-aphc.mbx.injuryprevention@mail.mil, 410-417-2886, DSN 583-2886

Dated: August 2020

APPENDIX A CAUSES OF INJURY HOSPITALIZATIONS

Among those injury hospitalizations that were given a cause code from the Standardized Agreement Codes (STANAG) in 2018 (23%), leading causes were falls (30%) and land transport (i.e., motor vehicles, 11%).



Leading STANAG Cause Codes for Injury Hospitalizations, U.S. Army Active Duty, 2018

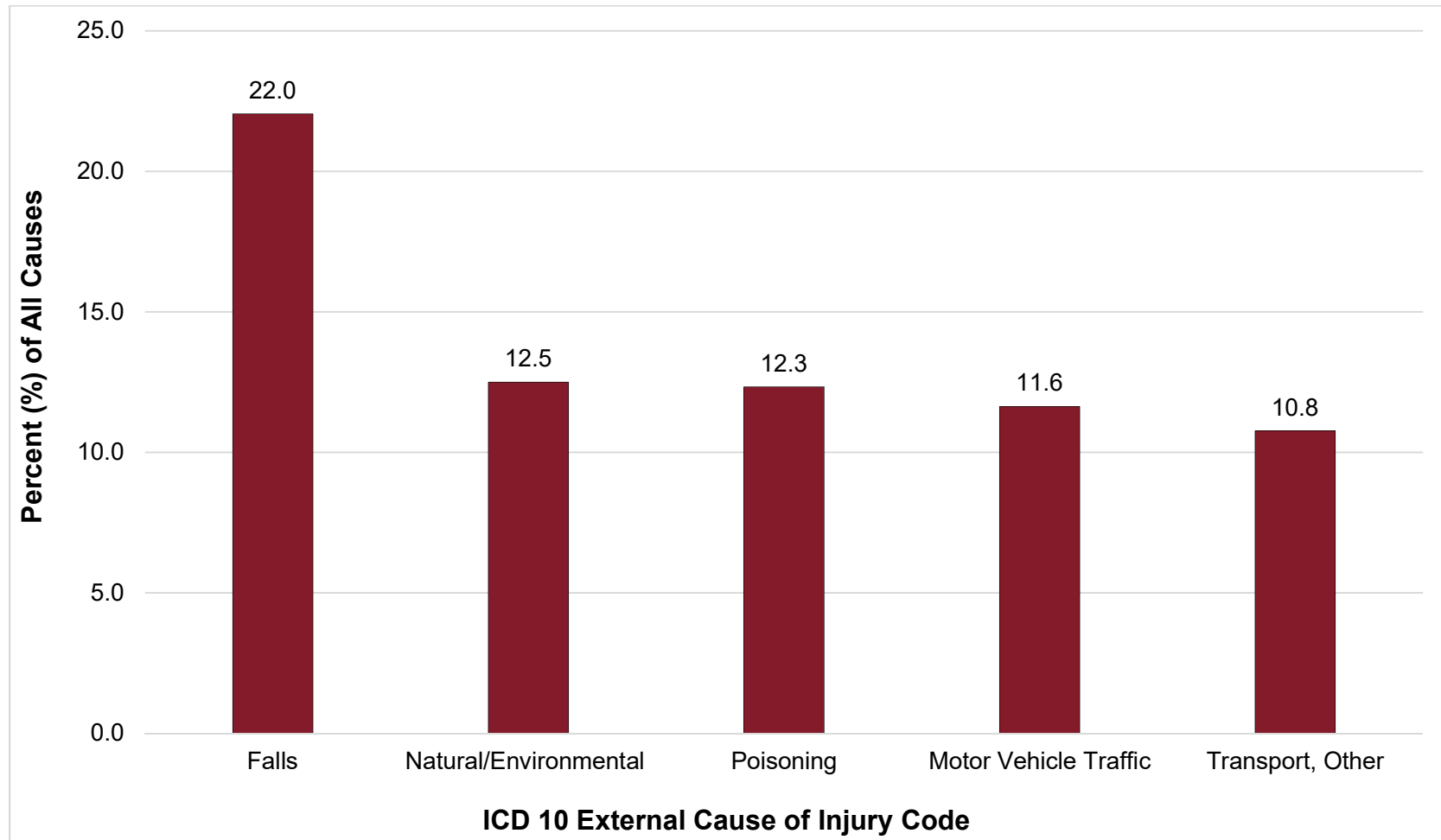
Notes:

Total number of STANAG-coded injury hospitalizations = 493; may not be representative of the distribution of causes for all injuries

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries

Prepared by APHC Injury Prevention

Among those injury hospitalizations that were given an ICD-10-CM medical diagnosis cause code in 2018 (35%), leading causes were falls (22%), natural/environmental (13%), and poisoning (12%).



Leading External Causes of Unintentional Hospitalizations, U.S. Army Active Duty, 2018

Notes:

Total number of cause-coded unintentional injury hospitalizations = 576; may not be representative of the distribution of causes for all injuries

Data source: Military Health System Data Repository (MDR); injuries defined using the Army Public Health Center (APHC) Taxonomy of Injuries

Prepared by APHC Injury Prevention