

TIP No. 12-109-0520

ANNUAL INJURY SURVEILLANCE REPORT 2017 SUMMARY

INTRODUCTION

This document provides a summary of injury medical encounter surveillance data for Active Duty Soldiers from Calendar Year (CY) 2017, analyzed and presented by the U.S. Army Public Health Center (APHC) Injury Prevention Program (IPP) with assistance from the Defense Health Agency (DHA) Armed Forces Health Surveillance Branch (AFHSB)—Army Satellite.

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 & 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>.

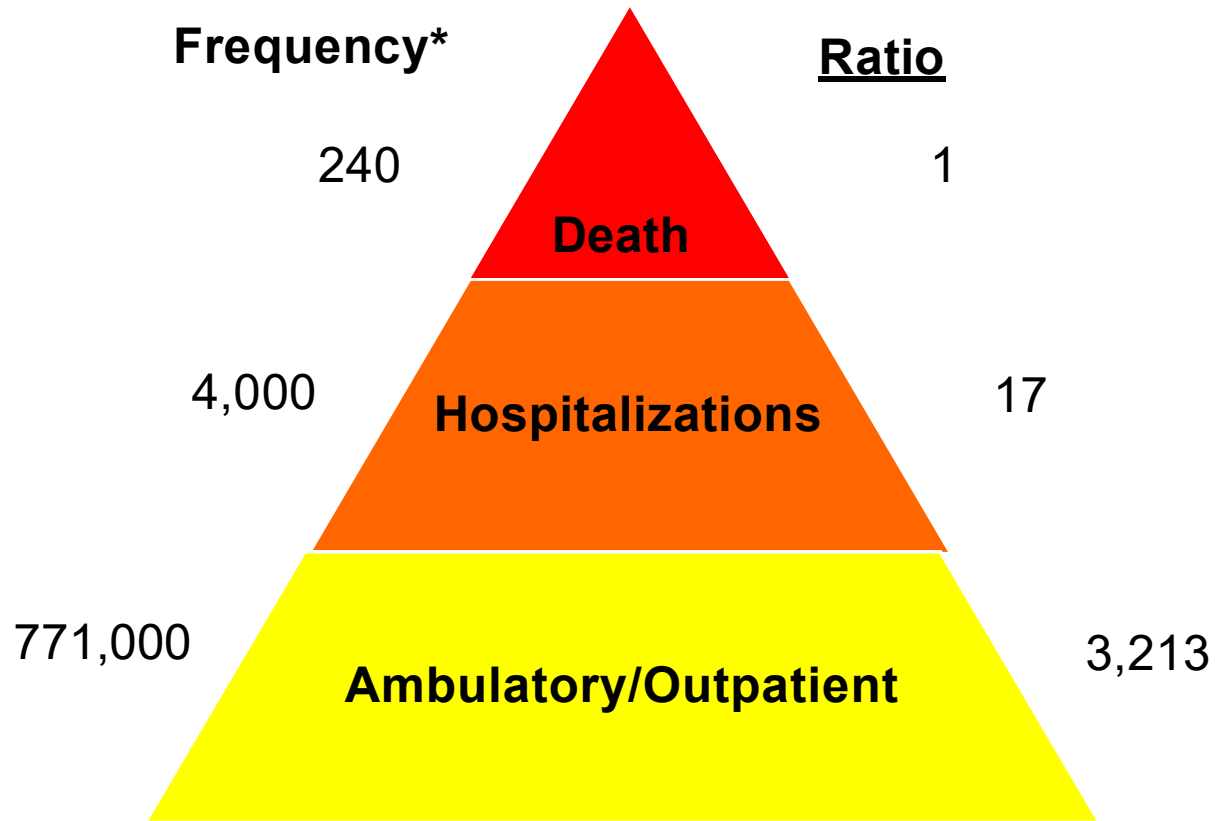
The APHC IPP also provides installation-level injury summaries for both Active Duty and Civilian populations, upon request, for those interested in detailed installation-specific data. Installation injury rates, one element of these summaries, can be accessed at: <https://www.sms.army.mil/>, and navigating 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 2017, for every one injury-related death, there were over 3,000 outpatient encounters. Injuries treated on an outpatient basis represent a significant obstacle to Soldier medical readiness.



Injury Pyramid, U.S. Army Active Duty, 2017

Notes:

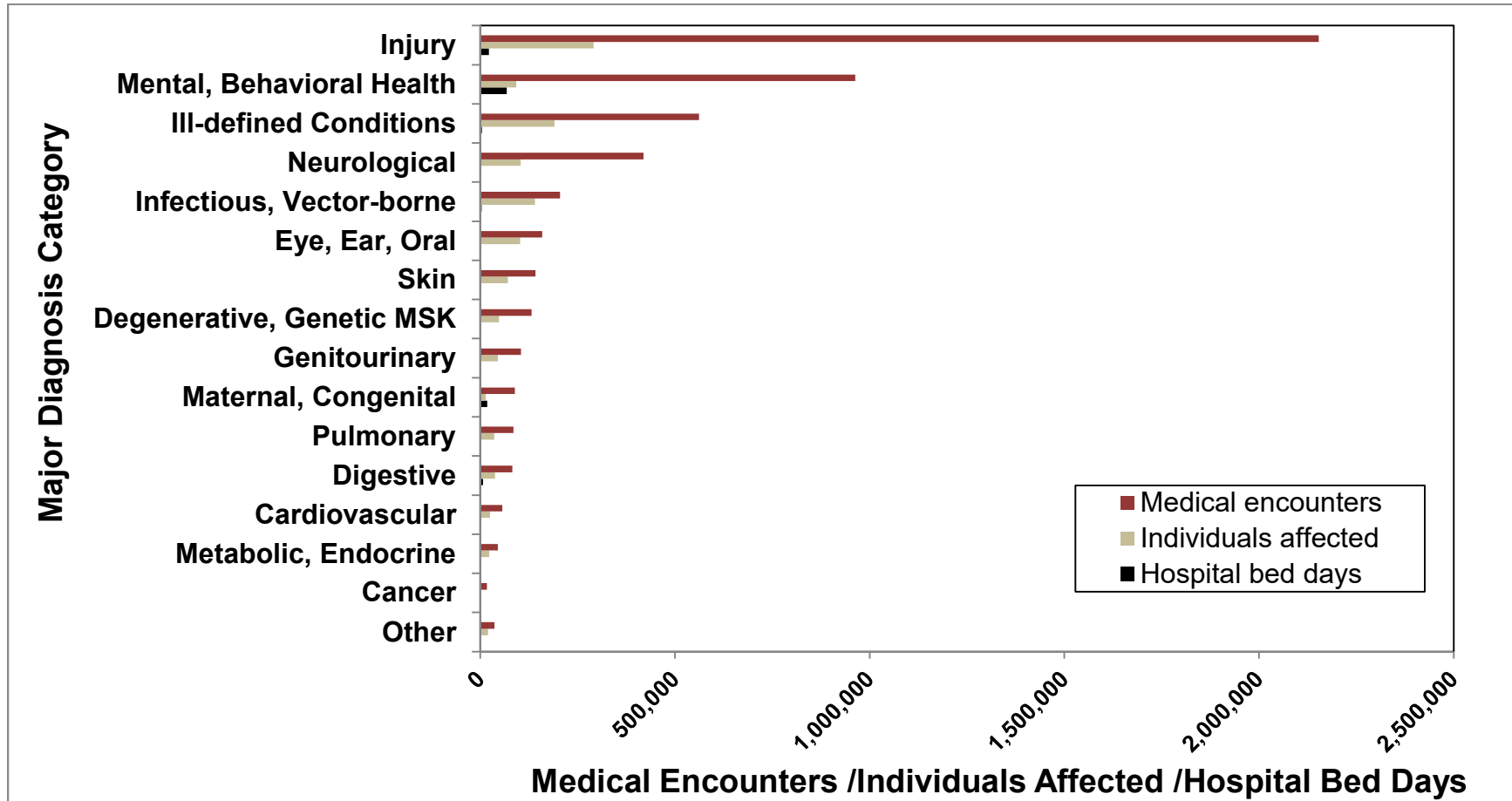
*Frequencies are rounded

Data sources: Defense Medical Surveillance System (DMSS) and Armed Forces Medical Examiner System (AFMES); injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC Injury Prevention

MAGNITUDE OF THE PROBLEM

During 2016, injuries accounted for over 2 million medical encounters (39% of all encounters) among Active Duty Army Soldiers, about 2.2 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, 2017

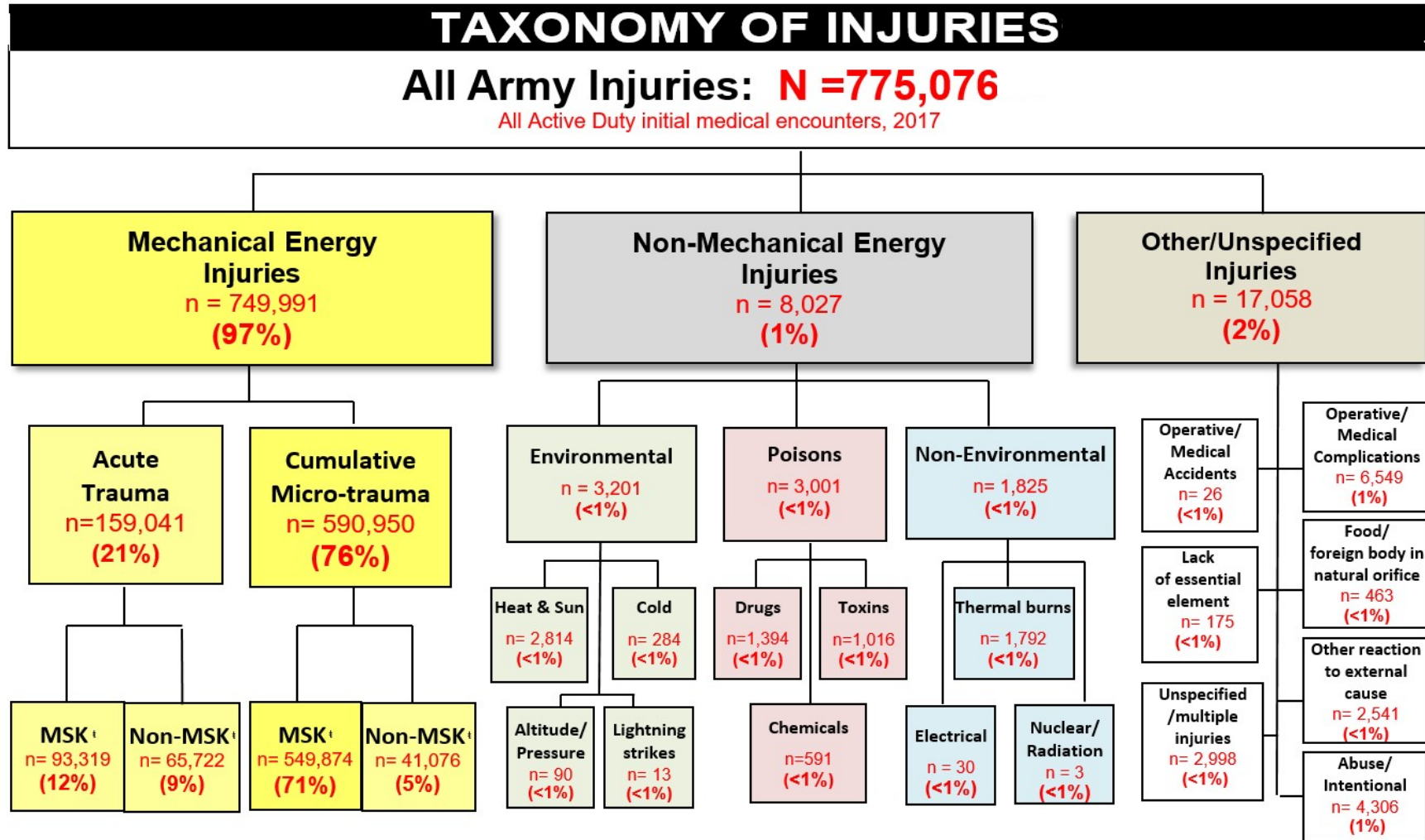
Notes:

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

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

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.



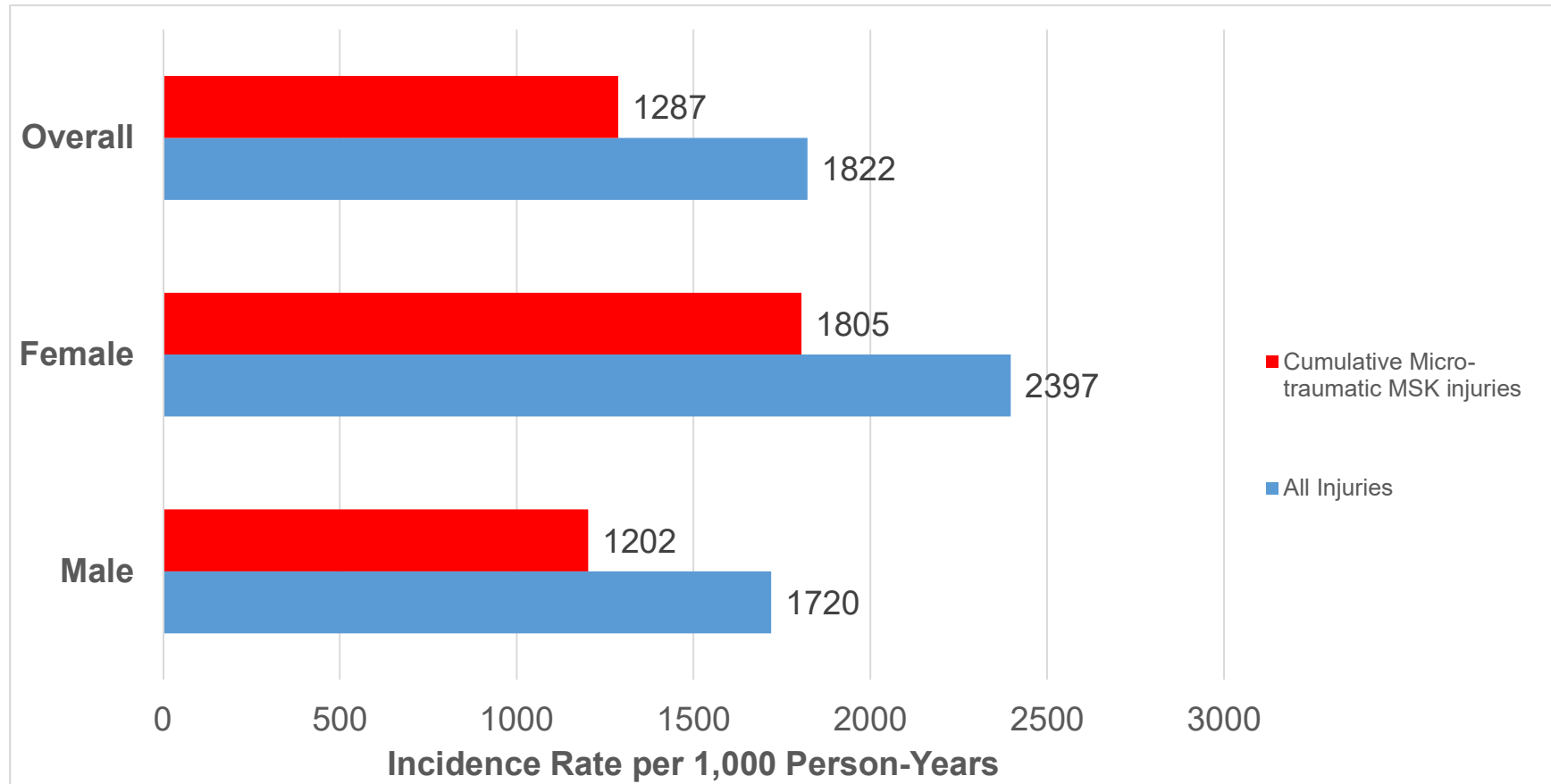
Taxonomy of Injuries

Notes:

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries; Prepared by DHA Army Satellite; APHC IPP

INJURY RATES

The rate of incident injuries among Army Soldiers during 2017 was 1,822 injuries per 1,000 Soldier-years. Rates for all injuries and cumulative micro-traumatic MSK injuries were both higher among women. Across groups, 71% of all injuries were cumulative micro-traumatic MSK injuries.



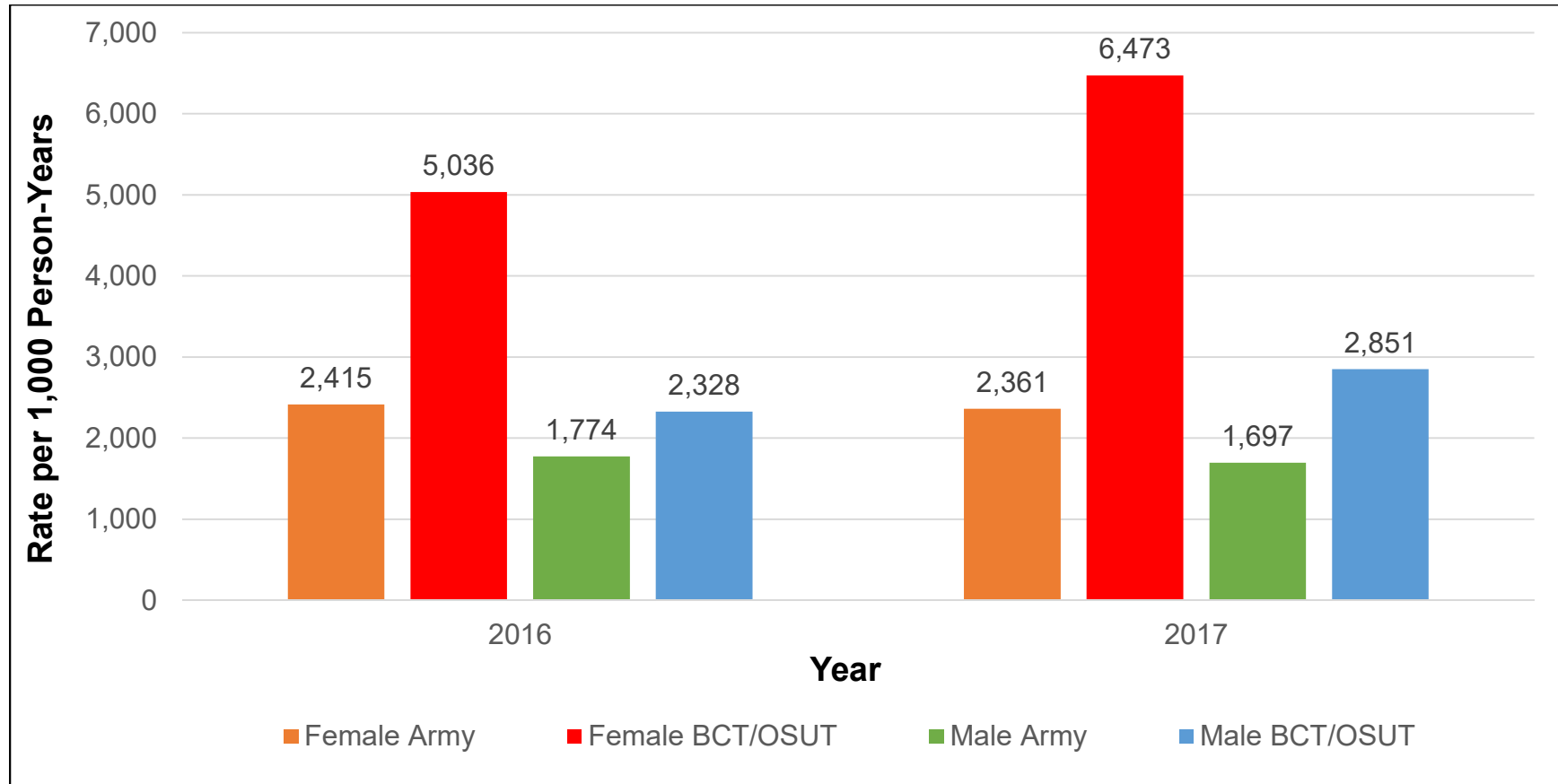
All Injury and Cumulative Micro-traumatic Musculoskeletal (MSK) Incident Injury Visit Rates by Sex, U.S. Army Active Duty, 2017

Notes:

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

Incident injury rates among trainees in Basic Combat Training (BCT) and One Station Unit Training (OSUT) were higher than overall Active Duty Army injury rates. For all Soldiers and trainees, injury rates for females were higher than those for males.



Overall Incident Injury Visit Rates, U.S. Army Active Duty vs. Trainee, 2016-2017

Notes:
 Active Duty injury adjusted to remove deployed injury and deployed person-time
 Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries
 Prepared by DHA Army Satellite; APHC IPP

INJURY DISTRIBUTION

As noted above, mechanical energy injuries account for 97% of all Army injuries. 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 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 (21%).

Body Region	Acute Traumatic (Trauma)	Cumulative Micro-traumatic (Overuse)	All
Lower Extremity	65,447 (41.2%)	282,942 (48.1%)	351,000 (46.8%)
Spine & Back	8,340 (5.2%)	168,346 (28.6%)	176,687 (23.6%)
Upper Extremity	50,511 (31.8%)	107,531 (18.3%)	158,614 (21.1%)
Head, Face & Neck	24,983 (15.7%)	17,592 (3.0%)	42,575 (5.7%)
Torso	9,129 (5.7%)	871 (0.1%)	10,000 (1.3%)
Other	631 (0.4%)	10,458 (1.8%)	11,115 (1.5%)
Total	159,041 (100%)	587,740 (100%)	749,991 (100%)

Incident Mechanical Injuries by Body Region and Acute/Overuse, U.S. Army Active Duty, 2017

Notes:

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

Musculoskeletal tissue damage like joint pain, tendinitis, and bursitis accounted for nearly three-quarters (74%) of incident mechanical injury encounters during 2017.

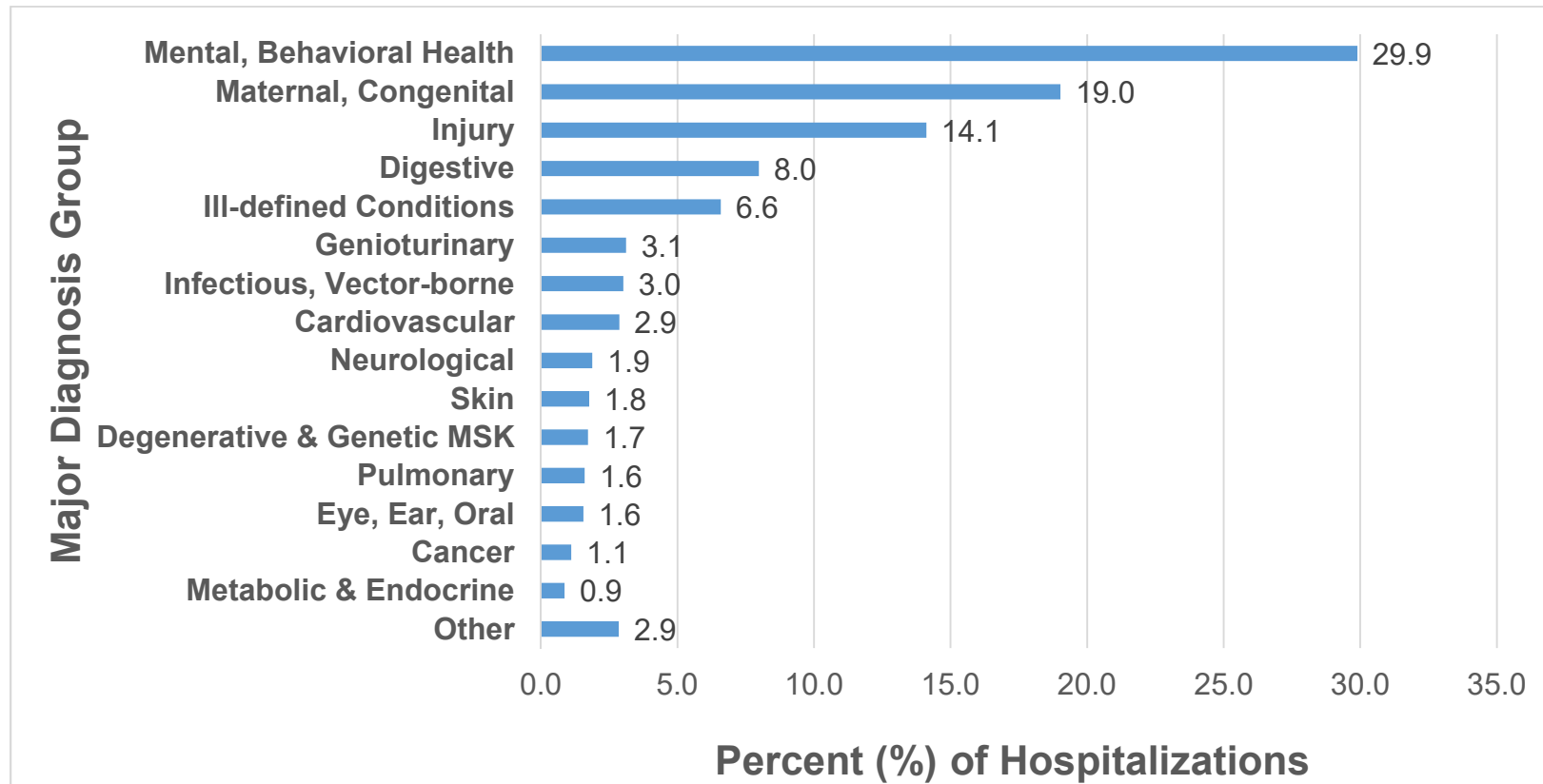
Diagnosis	Head, Face & Neck		Spine & Back		Torso		Upper Extremity		Lower Extremity		Other		Total n (%)
	Acute (ACT)	Cumulative (CMT)	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT	ACT	CMT	
MSK Tissue Damage	26	0	53	152,395	56	1	3,370	100,478	7,777	276,261	130	10371	550,918 (73.5)
Sprain/Joint Damage	13	0	2,253	1	787	0	7,118	572	26,626	2,611	49	26	40,056 (5.3)
Tissue Damage, Other	6,213	17567	1,820	0	1703	0	4,453	0	3,454	0	418	2	35,630 (4.8)
Strain/Tear	2,353	0	3,192	0	2,199	0	5,458	4,132	8,803	11	34	5	26,187 (3.5)
Contusion/Superficial	5,688	25	0	0	2,343	17	6,354	111	7,343	3,314	0	0	25,195 (3.4)
Nerve	59	0	14	15,926	3	430	3,845	2797	979	887	0	0	24,940 (3.3)
Fracture	1,507	0	882	25	724	423	8,884	13	6,899	2,469	0	80	21,906 (2.9)
Open Wound	4,071	0	0	0	525	0	7,897	0	2,577	0	0	0	15,070 (2.0)
Internal Organ & Blood Vessel	4,996	0	100	0	728	0	95	0	37	0	0	0	5,956 (0.8)
Dislocation	44	0	26	0	49	0	2,226	0	703	0	0	0	3,048 (0.4)
Crush	10	0	0	0	12	0	615	0	215	0	0	0	852 (0.1)
Amputation	3	0	0	0	0	0	196	0	34	0	0	0	233 (<0.1)
Total	24,983	17,592	8,340	168,347	9,129	871	50,511	108,103	65,447	285,553	631	10,484	749,991
% Total	3.3%	2.3%	1.1%	22.4%	1.2%	0.1%	6.7%	14.4%	8.7%	38.1%	0.1%	1.4%	

Incident Mechanical Injury Diagnoses by Body Region, U.S. Army Active Duty, 2017

Notes:
 Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries
 Prepared by DHA Army Satellite; APHC IPP

HOSPITALIZATIONS

Injuries were the third leading cause of hospitalizations during 2017, accounting for 14% of all hospitalizations among Active Duty Army Soldiers. See Appendix A for data on causes of injury hospitalizations.



Major Diagnosis Groups Resulting in Hospitalizations, U.S. Army Active Duty, 2017

Notes:

Total number of hospitalizations = 28,111

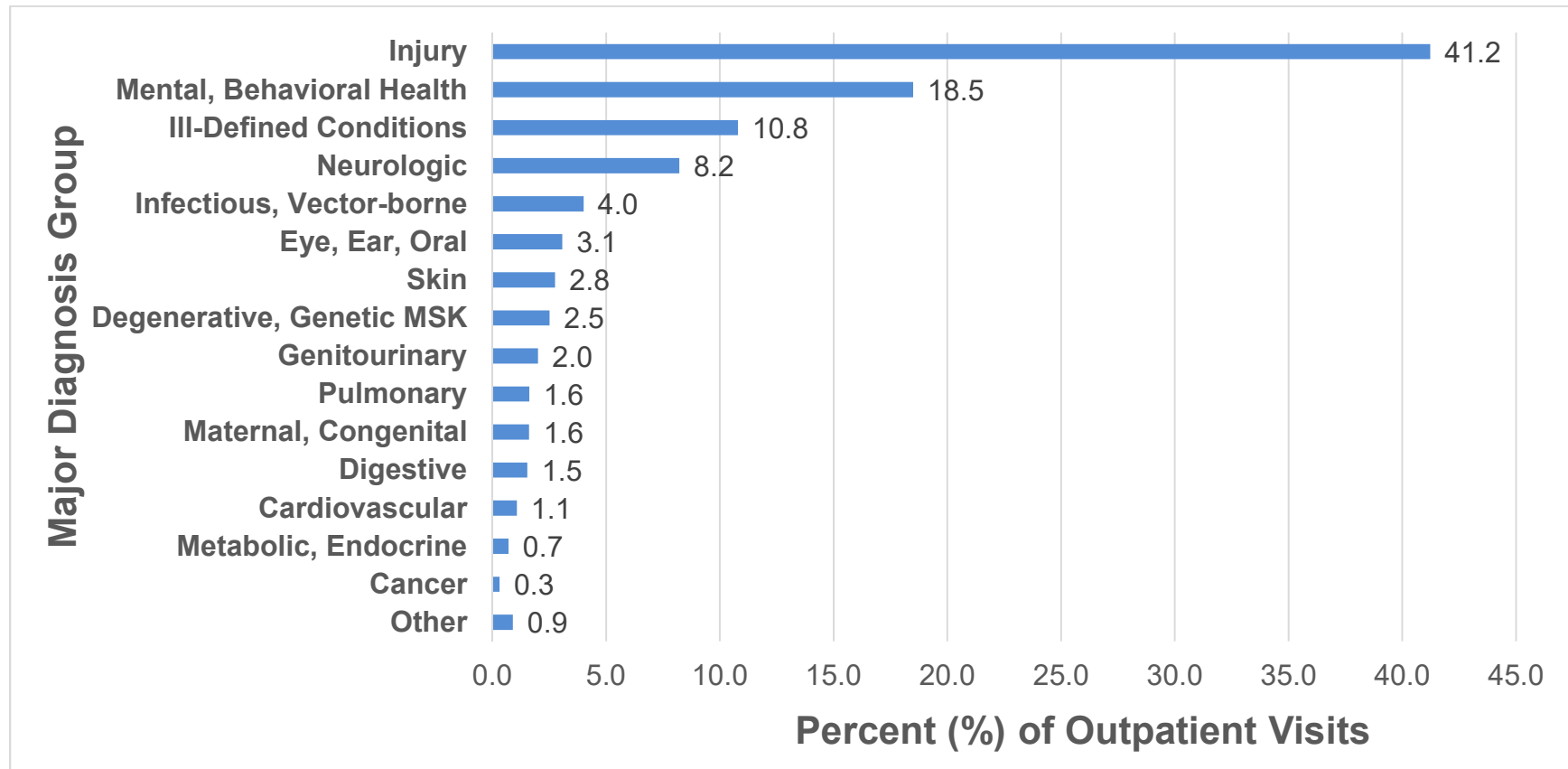
Diagnosis group "Other" includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer)

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

OUTPATIENT ENCOUNTERS

Injuries were the leading cause of outpatient encounters during 2017, accounting for 41% of all outpatient visits among Active Duty Army Soldiers.



Major Diagnosis Groups Resulting in Outpatient Visits U.S. Army Active Duty, 2017

Notes:

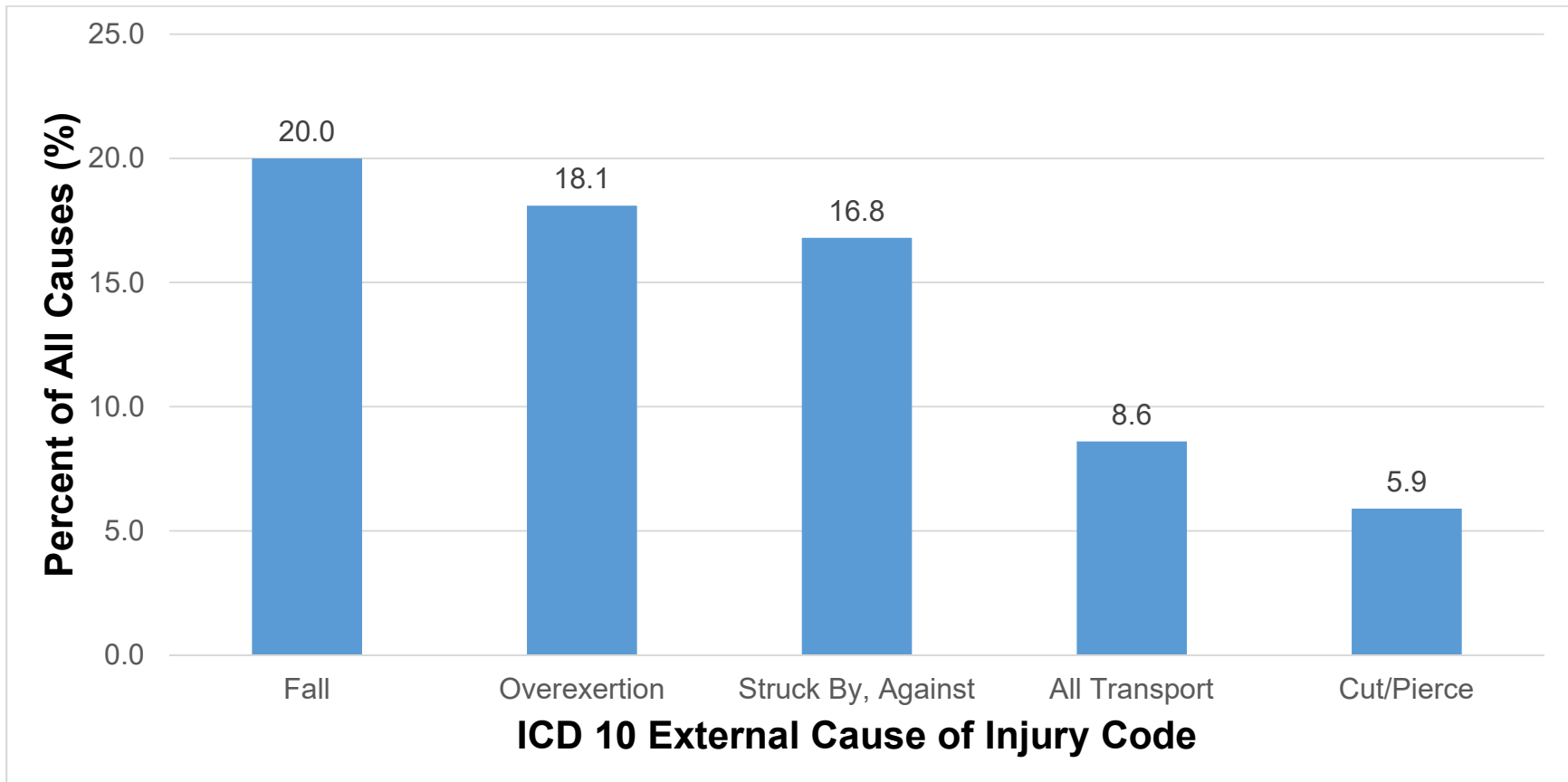
Total number of outpatient visits = 5,471,286

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

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

Among those outpatient injury encounters with a cause code in 2017, leading causes were falls and overexertion.



Leading External Causes of Unintentional Injury, Outpatient Visits, U.S. Army Active Duty, 2017

Notes:

Total number of cause-coded unintentional outpatient visits = 65,581 (8% of incident injury encounters); may not be representative of the distribution of causes for all injuries

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

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, and higher among trainees compared to all Active Duty.
- 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 (46%), spine and back (24%), and upper extremities (21%).
- Leading causes of outpatient injuries are falls and overexertion. 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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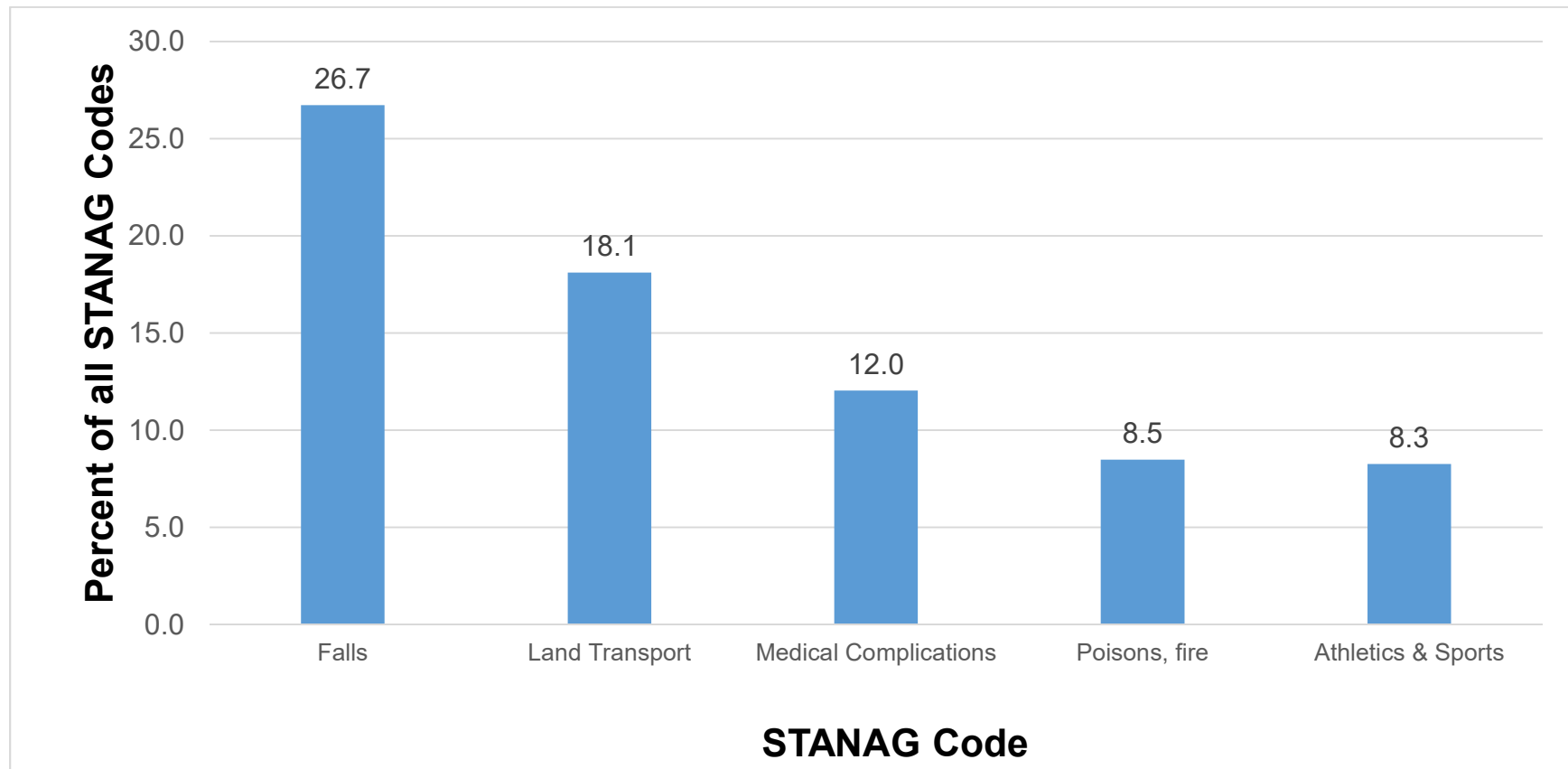
<https://phc.amedd.army.mil/PHC%20Resource%20Library/Systematic%20Process%20to%20Prioritize%20Prevention%20Activities%20Sustaining%20Progress%20toward%20the%20Reduction%20of%20Military%20Injuries.pdf>

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

Dated: May 2020

APPENDIX A CAUSES OF INJURY HOSPITALIZATIONS

Among those injury hospitalizations that were given a cause code from the Standardized Agreement Codes (STANAG) in 2016 (22%), leading causes were falls and land transport (motor vehicles).



Leading STANAG Cause Codes for Injury Hospitalizations, U.S. Army Active Duty, 2017

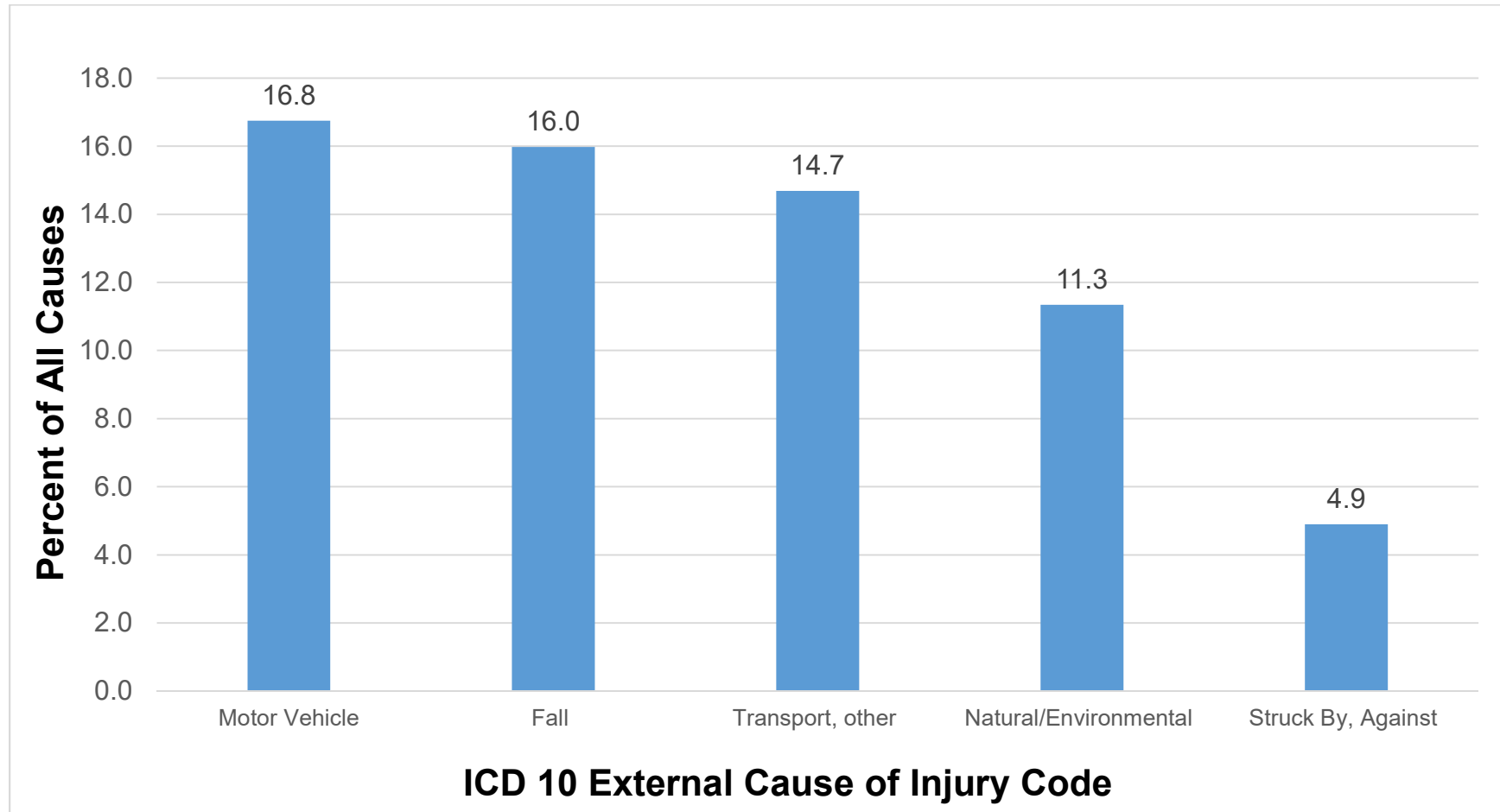
Notes:

Total number of STANAG-coded injury hospitalizations = 872; may not be representative of the distribution of causes for all injuries

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP

Among those injury hospitalizations that were given an ICD-10-CM medical diagnosis cause code in 2017 (10%), leading causes were motor vehicle accidents, falls, and transport.



Leading External Causes of Unintentional Hospitalizations, U.S. Army Active Duty, 2017

Notes:

Total number of cause-coded unintentional injury hospitalizations = 388; may not be representative of the distribution of causes for all injuries

Data source: DMSS; injuries defined using the APHC Taxonomy of Injuries

Prepared by DHA Army Satellite; APHC IPP