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U.S. Army Injury Surveillance 2021 Summary

Prepared for the Defense Safety Oversight Council (DSOC)
Military Injuries Working Group (MIWG)
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Background

- This document provides a summary of injury medical encounter surveillance data for Active Duty Personnel in Calendar Year (CY) 2021.
- Rates and distribution of injuries are presented by leading injury types, injured body regions, injury mechanisms, activities and places.



Data Sources and Injury Definition

- Prepared for the Defense Safety Oversight Council (DSOC) Military Injuries Working Group (MIWG)
- Prepared by DCPH-A Injury Prevention, email: dha.apg.Pub-Health-A.mbx.injuryprevention@health.mil
- Data sources: Defense Casualty Analysis System and Defense Medical Surveillance System (DMSS)
- Injuries defined and classified using the Taxonomy of Injuries¹

¹U.S. Army Public Health Center. 2017. Public Health Information Paper (PHIP) No. 12-01-0717, *A Taxonomy of Injuries for Public Health Monitoring & Reporting*. December 2017. <http://www.dtic.mil/docs/citations/AD1039481>



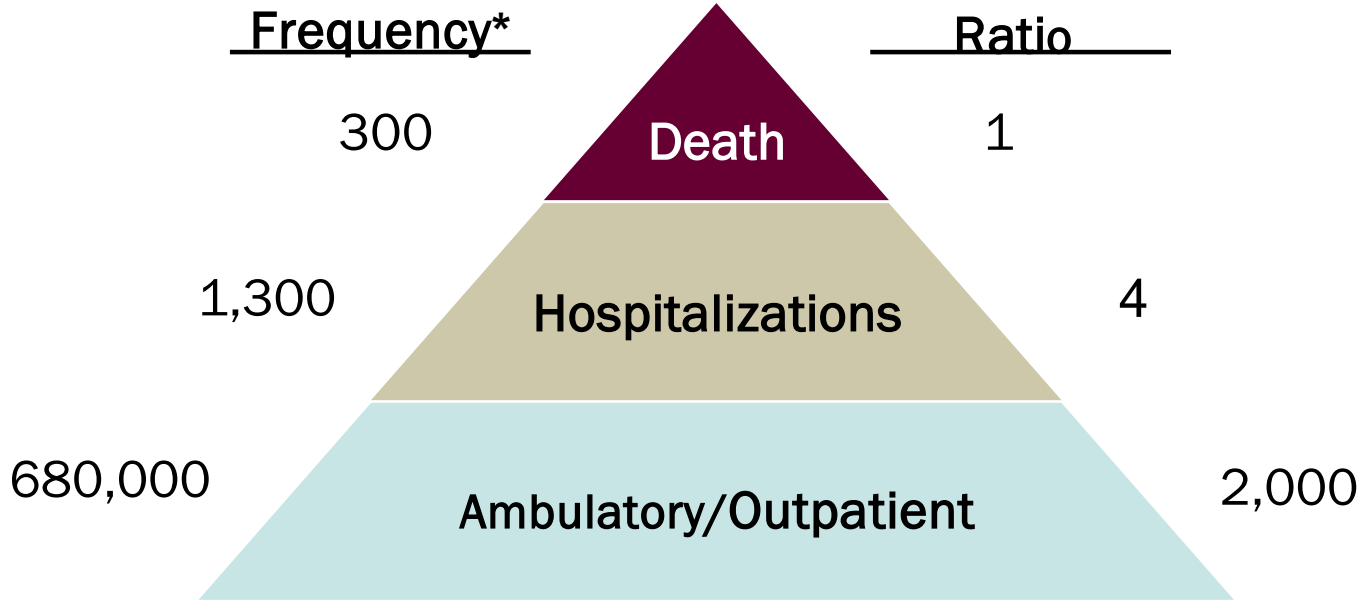
Data Summary, U.S. Army Active Duty, 2021

- Injuries accounted for 42.1% of all medical encounters (n=2,272,256), 2.4 times more encounters than the second leading cause.
- Injuries affected 295,503 individuals (61.3%), 1.5 times more individuals than the second leading diagnosis group.
- A high proportion (70%) of new (incident) injury diagnoses were due to cumulative microtrauma to the musculoskeletal system.
- Most injuries were to the lower extremities (41.2%); followed by spine & back (28.6%).
- Among outpatient injury encounters with a cause code in 2021, leading injury mechanisms were overexertion (25.2%) and falls (19.6%).





Injury Pyramid U.S. Army Active Duty, 2021

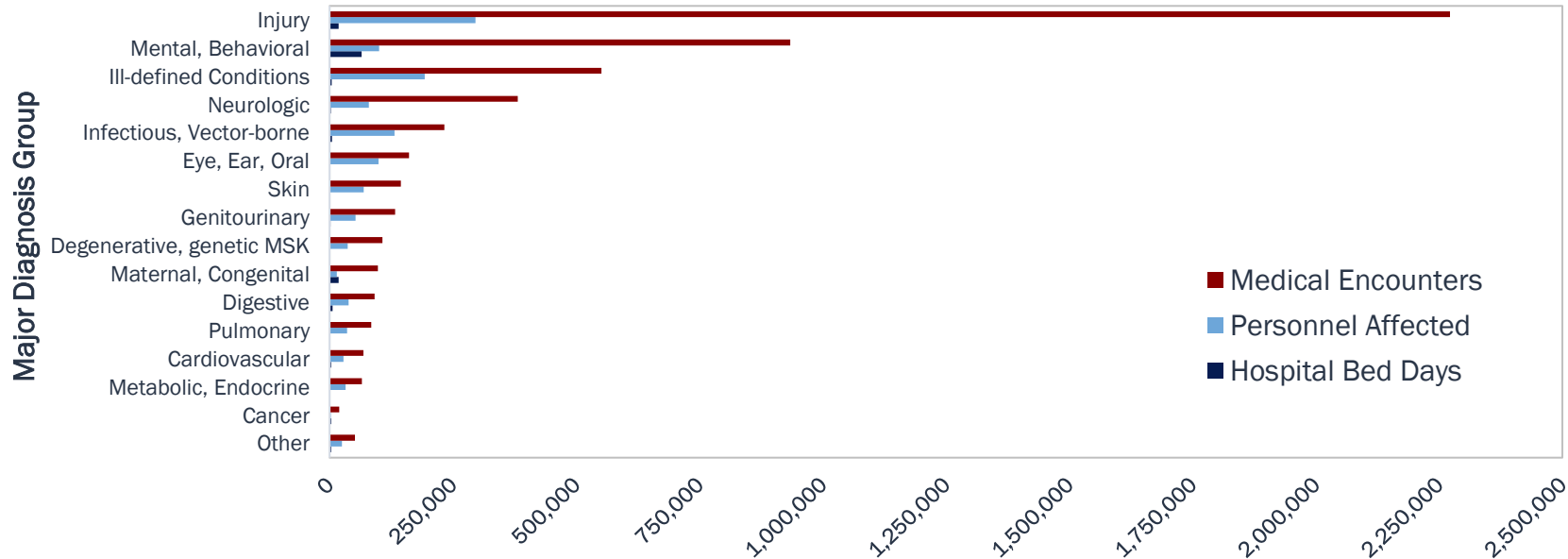


*Frequencies are rounded and represent incident injury encounters



Relative Burden of Illnesses and Injuries

U.S. Army Active Duty, 2021



MSK = damage to tissue(s) of the musculoskeletal system (i.e., bone, cartilage, muscle, tendon, fascia, joint, ligament, bursa, or synovium). Diagnosis group “Other” includes adverse effects of drugs, blood disorders, and other neoplasms (not cancer).



Taxonomy Distribution of Injuries

U.S. Army Active Duty, 2021

Incident injuries, N = 679,906

Mechanical Energy Injuries
n=653,104 (96%)

Acute Trauma
n=139,288 (20%)

Cumulative Microtrauma
n=513,816 (76%)

MSK
n=74,975 (11%)

MSK
n=475,381 (70%)

Non-MSK
n=64,313 (9%)

Non-MSK
n=38,435 (6%)

Non-Mechanical Energy Injuries
n=13,277 (2%)

Environmental
n=3,091 (<1%)

Heat & Sun
n=2,562 (<1%)

Cold
n=428 (<1%)

Altitude/Pressure
n=95 (<1%)

Lightning
n=6 (<1%)

Poisons
n=8,616 (1%)

Drugs
n=1,262 (<1%)

Toxins
n=980 (<1%)

Chemicals
n=6,374 (<1%)

Non-Environmental
n=1,570 (<1%)

Thermal burns
n=1,525 (<1%)

Electrical
n=35 (<1%)

Nuclear radiation
n=10 (<1%)

Other/Unspecified Injuries
n=13,525 (2%)

Medical Complications
n=5,479 (<1%)

Other reaction to external cause
n=1,208 (<1%)

Foreign Body
n=383 (<1%)

Medical Accidents
n=26 (<1%)

Abuse/Intentional
n=3,304 (<1%)

Unspecified/multiple injuries
n=2,950 (<1%)

Lack of essential element
n=175 (<1%)

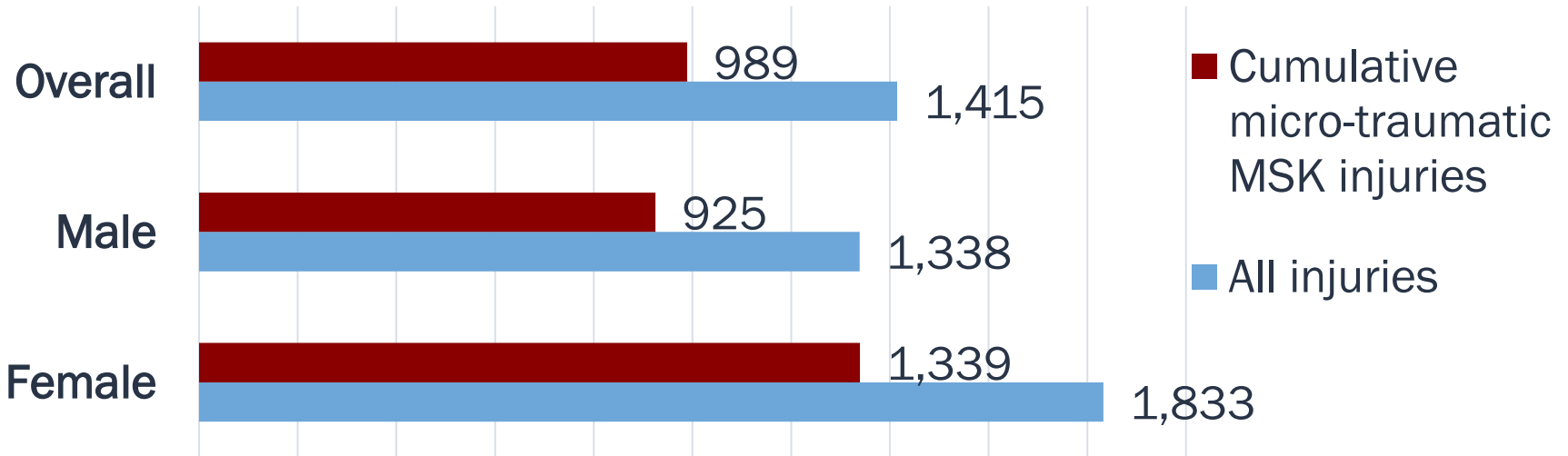




Incident Injury Encounter Rates by Sex

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All Injury and Cumulative Micro-traumatic Musculoskeletal (MSK) U.S. Army Active Duty, 2021



Incidence Rate per 1,000 person-years

Rates for all injuries and cumulative micro-traumatic MSK injuries were both significantly higher among females ($p < 0.001$).



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Incident Mechanical Injuries by Body Region

U.S. Army Active Duty, 2021

Body Region	Acute Traumatic n (%)	Cumulative Micro-traumatic (Overuse) n (%)	All n (%)
Lower Extremity	51,525 (7.9)	217,294 (33.3)	268,819 (41.2)
Spine & Back	10,352 (1.6)	176,301 (27.0)	186,653 (28.6)
Upper Extremity	42,608 (6.5)	90,290 (13.8)	132,898 (20.4)
Head, Face, & Neck	25,670 (3.9)	16,485 (2.5)	42,155 (6.5)
Torso	8,440 (1.3)	705 (<1.0)	9,145 (1.4)
Other	693 (<1.0)	12,741 (2.0)	13,434 (2.1)
Total	139,288 (21.3)	513,816 (78.7)	653,104 (100)

*In order of most frequently injured body region for All



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Incident Mechanical Injury Diagnoses by Injury Type and Body Region, U.S. Army Active Duty, 2021

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		
MSK Tissue Damage	33	240	3,020	161,846	203	3	4,131	82,871	7,471	209,041	133	12,535	481,527	73.7
Other Tissue Damage	9,225	16,222	1,484	0	2,207	0	4,657	0	3,862	0	493	0	38,150	5.8
Sprain/Joint Damage	14	0	1,353	0	532	0	5,174	467	18,215	2,334	34	59	28,182	4.3
Nerve	43	0	23	14,421	8	489	3,600	3,830	1,007	750	0	0	23,229	3.7
Strain/Tear	1,929	0	3,681	0	1,894	0	4,135	3,020	6,610	5	33	22	21,329	3.3
Contusion/Superficial	4,643	23	0	0	1,937	14	5,315	94	6,058	2,592	0	0	20,676	3.2
Fracture	1,136	0	570	34	630	199	5,590	8	5,074	2,572	0	125	15,938	2.4
Open Wound	3,495	0	0	0	377	0	7,501	0	2,425	0	0	0	13,798	2.1
Internal Organ and Blood Vessel	5,096	0	190	0	579	0	56	0	25	0	0	0	5,946	<1.0
Dislocation	44	0	31	0	64	0	1,776	0	550	0	0	0	2,465	<1.0
Crush	9	0	0	0	9	0	561	0	203	0	0	0	782	<1.0
Amputation	3	0	0	0	1	0	112	0	25	0	0	0	140	<1.0
Total	25,670	16,485	10,352	176,301	8,440	705	42,608	90,290	51,525	217,294	693	12,741	653,104	100.0
Percent Total (%)	3.9	2.5	1.6	27.0	1.3	<1.0	6.5	13.8	7.9	33.3	<1.0	2.0	100.0	

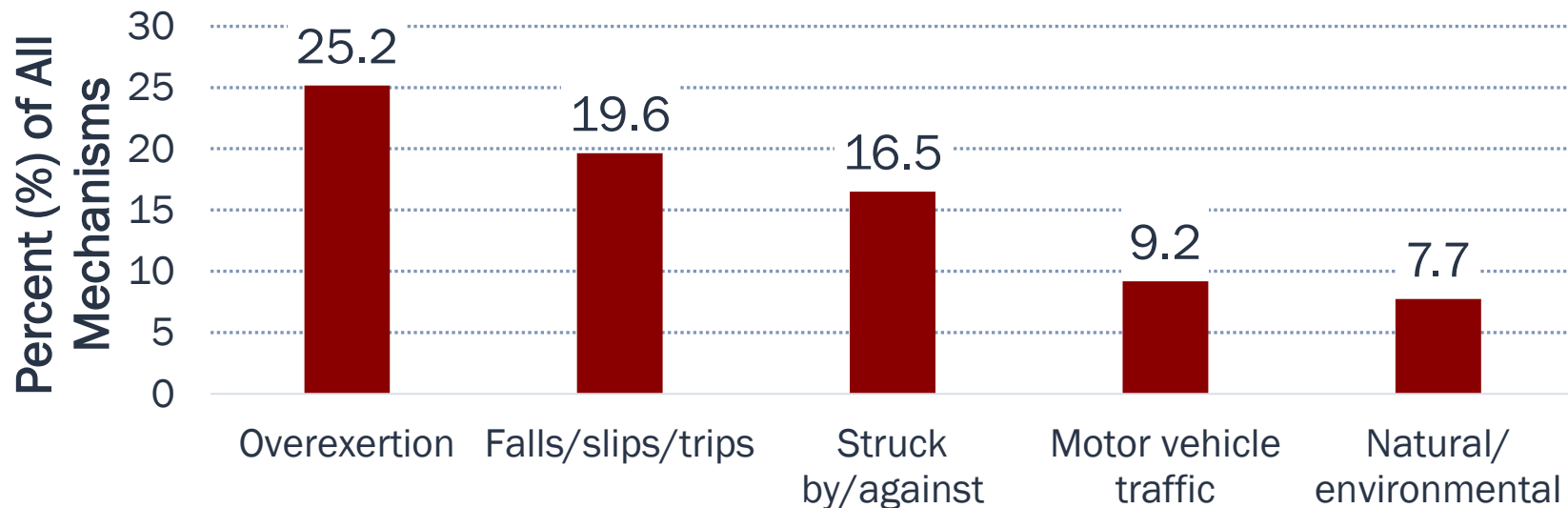
Legend: ACT = Acute trauma, CMT = Cumulative microtrauma



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Leading Mechanisms of Unintentional Injury Outpatient Encounters, U.S. Army Active Duty, 2021

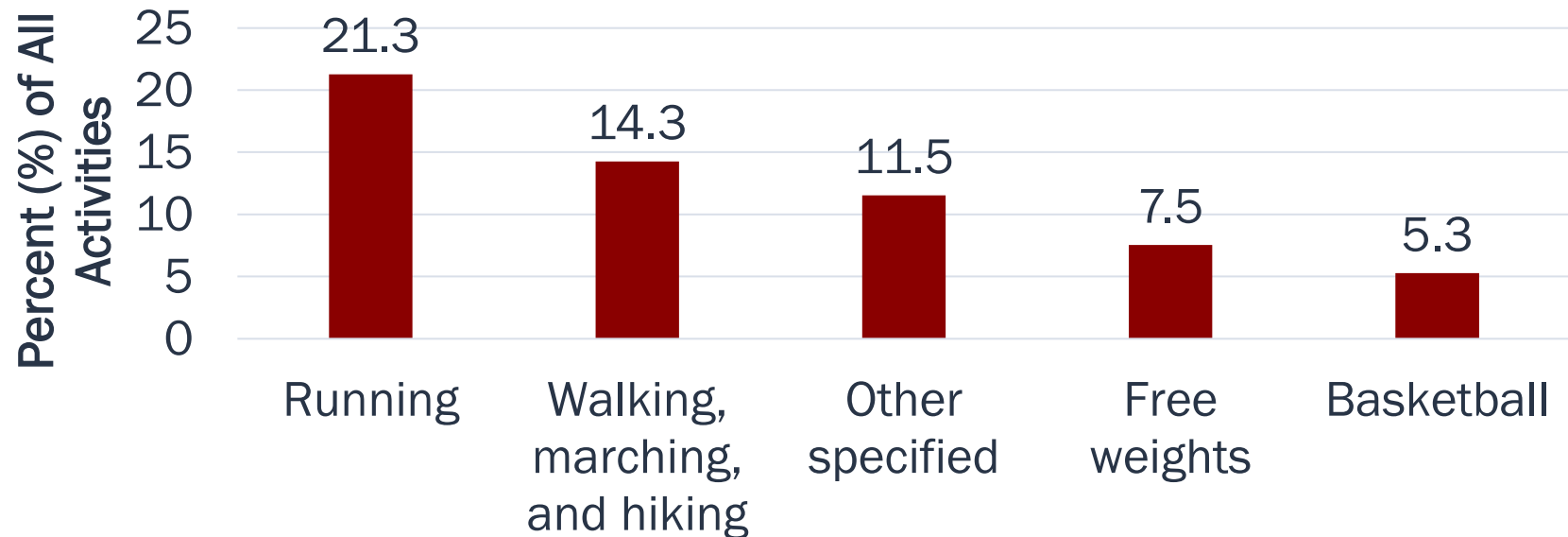


ICD-10-CM Mechanism Code

Total number of unintentional injury outpatient encounters with activity codes = 53,212 (8%); may not be representative of the distribution of mechanisms for all incident injuries.



Leading Activities Associated with Unintentional Injury Outpatient Encounters, U.S. Army Active Duty, 2021



ICD-10-CM Activity Code

Total number of unintentional outpatient encounters with activity codes = 22,353 (3%); may not be representative of the distribution of activities for all incident injuries.



Leading Places Associated with Unintentional Injury Outpatient Encounters, U.S. Army Active Duty, 2021



ICD-10-CM Place of Occurrence Code

Total number of unintentional outpatient encounters with place of occurrence codes = 10,582 (2%); may not be representative of the distribution of places for all incident injuries.



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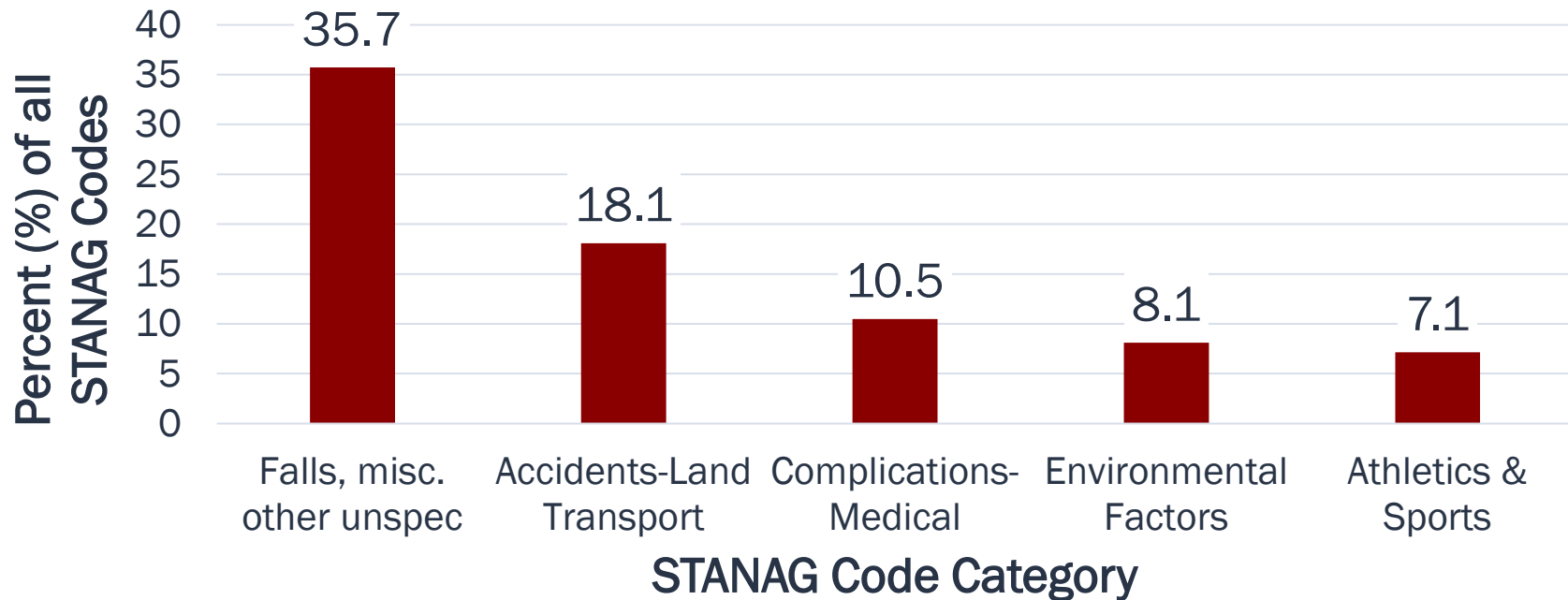




Additional Injury Hospitalization Cause Information



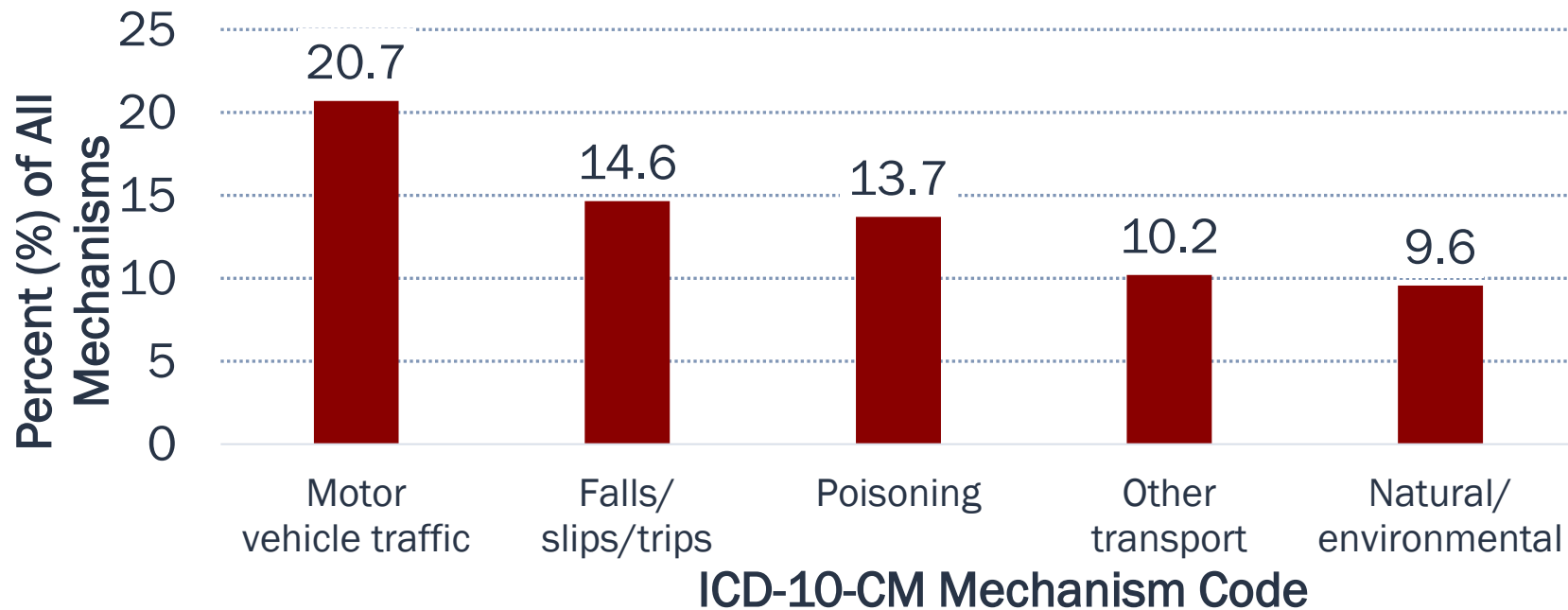
Leading Standardized Agreement (STANAG) Cause Codes for Injury Hospitalizations, U.S. Army Active Duty, 2021



Total number of STANAG-coded injury hospitalizations = 210 (16%); may not be representative of the distribution of causes for all incident injury hospitalizations.



Leading Mechanisms of Unintentional Injury Hospitalizations, U.S. Army Active Duty, 2021



Total number of cause-coded unintentional injury hospitalizations = 314 (24%); may not be representative of the distribution of causes for all incident injury hospitalizations.

