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Medical and work loss costs of violence, self-harm, unintentional and traumatic brain injuries per injured person in the USA

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Abstract

Objective: Injuries and poisoning are leading causes of US morbidity and mortality. This study aimed to update medical and work loss cost estimates per injured person.

Methods: Injuries treated in emergency departments (ED) during 2019–2020 were analysed in terms of mechanism (eg, fall) and intent (eg, unintentional), as well as traumatic brain injury (TBI) (multiple mechanisms and intents). Fatal injury medical spending was based on the Nationwide Emergency Department Sample and National Inpatient Sample. Non-fatal injury medical spending and workplace absences (general, short-term disability and workers' compensation) were analysed among injury patients with commercial insurance or Medicaid and matched controls during the year following an injury ED visit using MarketScan databases.

Results: Medical spending for injury deaths in hospital EDs and inpatient settings averaged US\$4777 (n=57 296) and US\$45 678 per fatality (n=89 175) (2020 USD). Estimates for fatal TBI were US\$5052 (n=5363) and US\$47 952 (n=37 184). People with ED treat and release visits for non-fatal injuries had on average US\$5798 (n=895 918) in attributable medical spending and US\$1686 (11 missed days) (n=116 836) in work loss costs during the following year, while people with non-fatal injuries who required hospitalisation after an ED injury visit had US\$52 246 (n=32 976) in medical spending and US\$7815 (51 days) (n=4473) in work loss costs. Estimates for non-fatal TBI were US\$4529 (n=25 792), US\$1503 (10 days) (n=1631), US\$51 241 (n=3030) and US\$6110 (40 days) (n=246).

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Conclusions and relevance: Per person costs of injuries and violence are important to monitor the economic burden of injuries and assess the value of prevention strategies.

INTRODUCTION

Over 300 000 US injury deaths and 23 million emergency department (ED) visits for non-fatal injuries occur annually.¹ Medical expenditures for injury and poisoning exceed US\$133 billion and the estimated economic cost including lost healthy life years is US\$4.2 trillion annually.^{2 3} Per-person medical spending and work loss cost estimates by injury mechanism (eg, fall) and intent (eg, unintentional) from 2014 to 2015 have been applied in multiple assessments of the economic impact of injuries and violence, including the Center for Disease Control and Prevention's (CDC) Web-based Injury Statistics Query and Reporting System (WISQARS) Cost of Injury website.^{1 4–6} Future assessments will benefit from updated cost data. This study aimed to update medical and work loss cost estimates per injured person.

METHODS

Previously described methods to estimate payer-perspective medical spending and work loss were applied to Healthcare Cost and Utilization Project (HCUP) and MarketScan databases to analyse ED-treated injuries during 2019–2020.^{5 6} HCUP provides nationally representative estimates of community hospital visits. MarketScan is a convenience sample of millions of insured patients' healthcare expenditures from approximately 350 health insurance payers and multiple state Medicaid payers. Costs were assessed by injury type—mechanism and intent, and traumatic brain injury (TBI; multiple mechanisms and intents)—using standard ICD-10-CM codes.^{7 8} Time horizon for fatal costs was the hospital visit and for non-fatal costs it was 1 year following the ED visit. Undiscounted costs are 2020 USD (not inflated from source data). An online supplemental file S1–S8 reports sample counts and model variance. Authors used SAS V.9.4 and Stata V.18. This study did not require institutional review (Common Rule 45 CFR§46).

Fatal injuries

Fatal injury medical spending was assessed among patients with an injury primary diagnosis (hospitalisations) or any listed injury diagnosis plus injury external cause code (E-code) (ED visits) and hospital-based death in the National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS) (figure 1).⁹ Mechanism and intent were classified by first-listed E-code and TBI was flagged using primary diagnosis (hospitalisations) or any listed diagnosis (ED visits). Medical spending was the facility charge multiplied by the hospital-specific cost-to-charge ratio (CCR; analysed records mean: 0.272 NIS and 0.171 NEDS) and diagnosis-specific professional fee ratio (PFR), plus ambulance and coroner/medical examiner (C/ME) costs. PFR was assigned by Clinical Classification Software Refined diagnoses and primary payer (analysed records mean: 1.191 NIS and 1.339 NEDS).¹⁰ The ambulance cost was US\$123 (19% of ED visits have ambulance transport at an average cost of US\$644).^{11 12} The C/ME cost was US\$1157 (US\$1.5 billion annual budget for C/ME offices referred 1.3 million deaths plus inflation to 2020 USD).¹³ ¹⁴ Adjusted average medical spending per ED-treated fatality was the average of model-

predicted values (Stata *margins*) from generalised linear models (*svy glm family(gamma) link(log)*) per injury type. Models controlled for patient sex, age, race/ethnicity (inpatient only), comorbidities (Elixhauser Comorbidity Software V.3.7), primary payer (eg, Medicare) and injury mechanism and intent.

Non-fatal injuries

Medical spending (inpatient, outpatient, outpatient drugs) for non-fatal injuries was assessed using MarketScan databases. Patients with commercial insurance (including Medicare supplemental) or Medicaid were analysed using the first ED visit during the study period (index visit) with a primary injury diagnosis (identified by the facility charge record) (figure 2). Mechanism and intent were classified by first-listed E-code and TBI was flagged using the primary injury diagnosis. Hospitalisations following the index visit were identified on the same or next day. Injury patients were matched to control enrollees (figure 2 notes) (online supplemental table S7). All subjects were enrolled 12 months before and after the index visit month. Authors excluded enrollees with capitated insurance plans, missing data and injury patients with $\leq$ US\$0 total payments for the 1-year observation period (figure 2 notes). Total payments for control enrollees were set to minimum US\$0. Total payments for all enrollees were top-coded to the 99th percentile value (US\$123 146).¹⁵ Adjusted average 1-year injury medical spending per person was the average marginal effect of an injury indicator (Stata *margins, dydx*) in two-part models (*twopm firstpart (logit) secondpart (glm, family(gamma) link(log))*) of injury and control patients' 1-year total medical spending, assessed by ED visit disposition (treated and released (T&R) or hospitalised) and injury type. Models controlled for patient insurance type, age, sex, race/ethnicity (Medicaid only), region (commercial only), health plan type, comorbidities and injury mechanism and intent.

Work loss due to non-fatal injuries was assessed among commercially insured injury patients from the medical spending analysis with workplace absences reported in MarketScan's Health and Productivity Management (HPM) (figure 2) (online supplemental table S8). HPM reports millions of employees' absent workdays using employer-submitted administrative data: general absences (sick or annual leave), short-term disability (STD; typically, up to 12 months), long-term disability (LTD; typically applicable after STD) and workers' compensation (WC; for workplace-related illnesses and injuries). LTD was not assessed. Analysis of each absence type comprised separate enrollee samples (figure 2); total lost workdays is the sum of a statistically higher ($p < 0.05$) number of absent days by absence type among injury patients versus controls. The adjusted average 1-year number of lost workdays due to injuries was the average marginal effect of an injury indicator (Stata *margins, dydx*) in negative binomial models (*nbg*) of injury and control patients' 1-year total number of absent days, assessed by ED visit disposition (T&R or hospitalised), absence type (general, STD, WC) and injury type. Models controlled for patient insurance type, age, sex, region, health plan type, comorbidities and injury mechanism and intent. Lost work days were assigned a daily market productivity value reflecting all-ages total employee compensation (wages and benefits) inflated to 2020 USD (US\$153).^{14 16}

RESULTS

Medical spending for injury deaths in hospital EDs and inpatient settings averaged US\$4777 (n=57 296) and US\$45 678 per person (n=89 175), respectively (figure 1, table 1). Estimates for fatal TBI were US\$5052 (n=5363) and US\$47 952 (n=37 184) (S1–S2). The range by fatal injury type in an ED was US\$2863 (other specified, not elsewhere classified self-harm injury) to US\$6867 (motor vehicle traffic-pedal cyclist unintentional) and in inpatient settings was US\$26 639 (drug poisoning undetermined intent) to US\$124 033 (fire/flame unintentional). People with ED T&R visits for non-fatal injuries averaged US\$5798 (n=895 918) (figure 2) in attributable medical spending and US\$1686 (11 missed days) (n=1 16 836) in work loss costs during the following year, while people with requiring hospitalisation averaged US\$52 246 (n=32 976) in medical spending and US\$7815 (51 days) (n=4473) in work loss costs (table 2) (S5–S6). Estimates for non-fatal TBI were US\$4529 (n=25 792) and US\$1503 (10 days) (n=1631), and US\$51 241 (n=3030), and US\$6110 (40 days) (n=246) (S3–S6). The range per non-fatal injury type was US\$2475 (drowning/submersion undetermined intent) to US\$8927 (non-drug poisoning self-harm) in medical spending and US\$756 (5 days; other land transport) to US\$1929 (13 days; poisoning) in work loss after injury ED T&R visits and US\$21 061 (drowning/submersion undetermined intent) to US\$75 405 (unintentional suffocation) for medical spending and US\$5538 (36 days; motor vehicle traffic) to US\$8293 (54 days; drug poisoning) for work loss following injury hospitalisations.

DISCUSSION

Compared with 2014–2015 estimates, this study's 2019–2020 estimates used new ICD-10-CM injury classifications, included the COVID-19 pandemic era (lower per person healthcare utilisation and spending¹⁷), used ED CCRs (newly available; replaced inpatient CCRs in previous estimates), and estimated average marginal effects from models of all subjects by injury outcome (fatal or non-fatal) and non-fatal injury ED visit disposition (T&R or hospitalised), rather than models limited to patients by injury type.^{5 6} This study's medical spending estimate for ED injury fatalities (US\$4777; 2020 USD) is lower than the previous (US\$6,880; 2015 USD)—affected by new HCUP ED-specific CCR values, on average just 43% (0.171/0.396) of ED CCR values in the previous study—but the estimate for inpatient fatalities is higher (US\$45 678 vs US\$41 570). This study's estimates for medical spending and work loss following a non-fatal ED T&R visit are modestly higher than previous estimates (US\$5798 vs US\$5600 and US\$1686 vs US\$1402), as is estimated medical spending for non-fatal injury hospitalisation (US\$52 246 vs US\$49 665), whereas estimated work loss for non-fatal hospitalised injuries is lower than previous (US\$7815 vs US\$8511).

Limitations

This study did not examine cost differences by injury type between this study and previous similar estimates and did not compare costs by geography nor demographics. This study's modelling approach yielded more precise measures for covariates compared with previous but might have obscured the effect of unobserved factors common among patients with

some injury types. Non-fatal injury costs were assessed during only the first year after an injury ED visit, which underestimates costs for injuries resulting in long-term physical disability or mental health consequences. Injury visits were classified by single mechanism and intent, which could misrepresent costs for multiple injuries. Commercial insurance enrollees assessed for workplace absences were more male, older and had more consumer-directed health plans than the total medical spending sample. This study did not address non-paid lost productivity such as time away from school, personal and voluntary tasks. This study did not address non-hospital injury fatality medical costs—an estimated US\$38 781 (US\$255 per day for 5 months) per patient for nursing home care and US\$13 112 per hospice beneficiary.^{18–20}

CONCLUSION

Up to date per person average costs of injuries and violence are important to monitor the economic burden of injuries and assess the value of prevention strategies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Per person medical and work loss cost estimates for injuries and violence are needed to monitor the total economic burden and help to prioritise cost-effective public health prevention activities.

WHAT THIS STUDY ADDS

⇒ This study provides updated average US medical care and work loss costs per injured person due to fatal and non-fatal injuries by mechanism and intent, as well as traumatic brain injury, to support public health decision-making.



Figure 1.

Fatal injuries sample. ^aAll counts are survey weighted. ^bReported visit charges, patient sex (male, female), age, race/ethnicity (white, black, Hispanic, Asian or Pacific Islander, Native American, other, unknown; reported only for inpatient visits), and primary payer for admission or visit (Medicare, Medicaid, private insurance, self-pay, other (worker's compensation, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Title V and other government programmes), no charge, unknown). Data source: HCUP NIS and NEDS 2019–2020. HCUP, Healthcare Cost and Utilization Project; NEDS, Nationwide Emergency Department Sample; NIS, National Inpatient Sample.

Commercial insurance						Medicaid					
n=28,420,798						n=14,790,116					
Injury 1,150,374						Injury ED visit					
Control 27,270,424						Injury 800,647					
Injury 788,378						≥12 months' enrollment after ED visit ^a					
Control 15,899,160						Injury 618,194					
Injury 589,634						≥12 months' enrollment before ED visit ^a					
Control 12,559,768						Injury 411,447					
Injury 578,131						Analyzed for medical spending ^{b,c}					
T&R: 557,445 Hosp: 20,686						Injury 350,763					
Control 2,808,321 T&R: 2,711,332 Hosp: 96,989						T&R: 338,473 Hosp: 12,290					
Injury						Control 1,534,170					
General 9,892						T&R: 1,484,684 Hosp: 49,486					
STD 63,989						Analyzed for workplace absences ^d					
WC 47,428						General 39,164					
General 9,892						STD 298,790					
T&R: 9,594						WC 215,557					
Hosp: 298						General 38,054					
T&R: 61,537						STD 287,599					
Hosp: 2,452						WC 207,825					
T&R: 45,705						General 11,110					
Hosp: 1,723						STD 11,191					
T&R: 38,054						WC 7,732					
Hosp: 1,110											

Figure 2.

Non-fatal injuries sample. ^aAnalysis limited to injury patients and control enrollees with 12 months' enrolment before and after injury patients' index visit month. This was identifiable for injury patients using the data source Enrollment Detail file in combination with the index injury ED visit date (enrolment for the month was affirmative if the patient was enrolled on the first day of the month). Control enrollees were eligible for matching with an injury patient for any injury ED index visit month that the control enrollee had 24 months' surrounding enrolment. ^bSubjects with missing data were excluded; this included patient sex (male, female), age, race/ethnicity (white, black, Hispanic, Asian or Pacific Islander, Native American, other, unknown; Medicaid only), region of residence (included 'unknown' but not missing values; commercial only), health plan type, basis for Medicaid eligibility (Medicaid only). ^c1:5 patient match (SAS *gmatch*) using insurance type (commercial, Medicare supplemental or Medicaid), enrollee age (as reported in the data source for commercial enrollees; for Medicaid enrollees based on reported year of birth), sex (male/female), race/ethnicity (Medicaid only), region of residence (commercial only; based on metropolitan statistical area), health plan type (eg, health management organisation), comorbidity count (0,1, 2+ diagnosed in the 12 months prior to the index injury date based on Elixhauser Comorbidity Software V.3.7 in any clinical location), same months of enrolment (see previous note), and basis for Medicaid eligibility (eg, foster care; Medicaid only). ^dInjury patients analysed for workplace absences were enrollees from the medical spending analysis who were aged 16–64 years old with commercial insurance and who

also had employer-reported workplace absence data for 12 months following the index visit month. A new sample of matched controls for the workplace absences analysis was identified based on the same factors applied for the medical spending analysis (eg, patient age, etc) among enrollees without ED visits for injuries during the study period who had health insurance enrolment for 12 months before and after the index visit month (same as medical spending analysis) as well as employer-reported workplace absence data for 12 months following injury patients' index visit month. Data source: MarketScan 2019–2020. ED, emergency department; Hosp, hospitalised; STD, short-term disability; T&R, treated and released; WC, workers' compensation.

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Table 1

Medical spending per fatal injury

Mechanism	Location	Intent (US\$)					All
		Unintentional	Self-harm	Assault	Undetermined	Legal/war	
Cut/pierce	ED	5382	5119	6110			5729
	Inpatient	71 094	57 372	93 667			76 794
Drowning/submersion	ED	3027			2945		2975
	Inpatient				32 355		34 098
Fall	ED	4878	4372				4871
	Inpatient	36 305	38 137				36 312
Fire/burn	ED	3396					3384
	Inpatient	121 158	108 174				119 696
Fire/flame	ED	3392					3384
	Inpatient	124 033	116 434				122 973
Hot object/substance	ED						
	Inpatient	108 057					105 207
Firearm	ED	5341	5095	6014	5138	6356	5513
	Inpatient	44 740	31 150	59 160	31 856	73 312	43 212
Machinery	ED	4532					4532
	Inpatient	66 409					66 409
Motor vehicle-traffic	ED	5439					5440
	Inpatient	65 224					65 214
MVT-occupant	ED	5157					5158
	Inpatient	64 089					64 094
MVT-motorcyclist	ED	5453					5453
	Inpatient	63 543					63 543
MVT-pedal cyclist	ED	6867					6867
	Inpatient	61 218					61 218
MVT-pedestrian	ED	6104					6111
	Inpatient	71 314					71 347

Mechanism	Location	Intent (US\$)					All
		Unintentional	Self-harm	Assault	Undetermined	Legal/var	
MVT-other	ED						
	Inpatient						
MVT-unspecified	ED						
	Inpatient						
Motor vehicle-non-traffic	ED	4696					4696
	Inpatient	62 950					62 950
Pedal cyclist, other	ED	6673					6673
	Inpatient	67 898					67 898
Pedestrian, other	ED	4720					4720
	Inpatient	53 669					53 669
Other land transport	ED	4291					4282
	Inpatient	57 433					56 556
Other transport	ED	4838					4838
	Inpatient	51 962					51 962
Natural/environmental	ED	4072					4065
	Inpatient	45 895					45 895
Bites and stings, non-venomous	ED						
	Inpatient						
Bites and stings, venomous	ED						
	Inpatient						
Natural/environmental, other	ED	4064					4064
	Inpatient	47 833					47 833
Overexertion	ED						
	Inpatient	47 207					47 207
Poisoning	ED	3070	2968		2981		3042
	Inpatient	38 010	28 711		27 476		36 120
Drug	ED	3030	2929		2938		3001
	Inpatient	37 023	27 646		26 639		35 111

Mechanism	Location	Intent (US\$)					
		Unintentional	Self-harm	Assault	Undetermined	Legal/war	Unknown
Non-drug	ED	3335			3260		3314
	Inpatient	50 257	43 901				48 973
Struck by/against	ED	3642					3782
	Inpatient	39 529	68 164				48 292
Suffocation	ED	3286	3049		3057		3174
	Inpatient	46 647	44 429		46 822		46 028
Other specified, child/adult abuse	ED						
	Inpatient			60 913			60 913
Other specified, foreign body	ED	3196					3196
	Inpatient	41 451					41 451
Other specified, classifiable	ED	3254					3278
	Inpatient	103 864					104 169
Other specified, NEC	ED		2863				2983
	Inpatient			92 329			80 378
Unspecified	ED	4034	3832	4337			4033
	Inpatient	44 351	40 245	66 174			47 172
External cause missing	ED						4852
	Inpatient						58 000
TBI*	ED	5069	5049	5506	4824		5052
	Inpatient	46 593	32 601	64 331	36 471		59 746
All mechanisms	ED	4758	4205	5877	3647	5839	4777
	Inpatient	44 454	35 905	64 804	31 787	81 213	58 000

Costs are 2020 USD. Blank cells indicate average cost not calculated if <11 records or relative SE>30% or zero. See online supplemental tables S1 and S2 for associated number of analysed records, survey-weighted number of analysed records, mean and 95% CI costs, modelled SE and 95% CIs.

Data source: HCUP NEDS and NIS 2019–2020.

* Multiple mechanisms.

ED, emergency department; MVT, motor vehicle-traffic; NEC, not elsewhere classifiable; TBI, traumatic brain injury.

Table 2
Injury-attributable medical spending and work loss costs per person in the year following ED-treated non-fatal injuries

Mechanism	Disposition from initial ED visit	Medical spending by injury intent (US\$)					Work loss by absence type (US\$)			
		Unintentional	Self-harm	Assault	Undetermined	Legal/war	All	General absence	Short term disability	Workers' compensation
Cut/pierce	T&R	4641	5628	7408	5190		4689	487	811	260
	Hospitalised	37 091	40 757	49 037			39 782			1558
Drowning/submersion	T&R	3499			2475		2630			
	Hospitalised				21 061		21 061			
Fall	T&R	6916			3213		6909	524	1138	255
	Hospitalised	62 640					62 576		6894	6894
Fire/burn	T&R	5140	6205		6442		5177		950	950
	Hospitalised	37 717	42 632				38 566			
Fire/flame	T&R	5466			4764		5426			
	Hospitalised	47 925					48 121			
Hot object/substance	T&R	5081	6308		7318		5131			
	Hospitalised	32 128	40 611				34 103			
Firearm	T&R	4234		5350	6912		4488			
	Hospitalised	36 096		38 510			36 703			
Machinery	T&R	5469					5469			
	Hospitalised	36 561					36 561			
Motor vehicle-traffic	T&R	5610					5611	412	1150	283
	Hospitalised	41 370					41 401		5538	5538
MV/T-occupant	T&R	5748					5748	412	1187	280
	Hospitalised	42 418					42 414		5770	5770
MV/T-motorcyclist	T&R	4878					4878		898	898
	Hospitalised	38 873					38 873			
MV/T-pedal cyclist	T&R	3733					3733			
	Hospitalised	34 413					34 413			
MV/T-pedestrian	T&R	6346					6339			

Mechanism	Disposition from initial ED visit	Medical spending by injury intent (US\$)					Work loss by absence type (US\$)					
		Unintentional	Self-harm	Assault	Undetermined	Legal/war	Unknown	All	General absence	Short term disability	Workers' compensation	Total
MVT-other	Hospitalised	46 228						46 681				
	T&R											
MVT-unspecified	Hospitalised											
	T&R											
Motor vehicle-nontraffic	Hospitalised											
	T&R	4231						4231		1167		1167
Pedal cyclist, other	Hospitalised	32 819						32 819				
	T&R	3451						3451				
Pedestrian, other	Hospitalised	34 101						34 101				
	T&R	6158						6158				
Other land transport	Hospitalised	32 513						32 513				
	T&R	4328						4328		756		756
Other transport	Hospitalised	36 003						36 003				
	T&R	3977						3977				
Natural/environmental	Hospitalised	26 773						26 773				
	T&R	5152			6149			5165	472	843		1315
Bites and stings, nonvenomous	Hospitalised	34 643						34 503				
	T&R	4792						4792	443	852		1295
Bites and stings, venomous	Hospitalised	35 836						35 836				
	T&R	5511			6168			5534	510	849		1360
Natural/environmental, other	Hospitalised	28 506						28 241				
	T&R	6007						6007				
Overexertion	Hospitalised	46 525						46 525				
	T&R	5401						5401	432	1066	238	1737
Poisoning	Hospitalised	54 272						54 272				
	T&R	7530	8124	6607	7935			7647	451	1479		1929

Mechanism	Disposition from initial ED visit	Medical spending by injury intent (US\$)					Work loss by absence type (US\$)					
		Unintentional	Self-harm	Assault	Undetermined	Legal/war	Unknown	All	General absence	Short term disability	Workers' compensation	Total
Drug	Hospitalised	68 500	43 198		53 026			52 462		7883		7883
	T&R	8202	8210	8268	8553			8218		1778		1778
Nondrug	Hospitalised	70 120	43 028		53 487			52 422		8293		8293
	T&R	5687	8927	5592	6046			5785				
Struck by/against	Hospitalised	55 818	47 822		49 707			53 077				
	T&R	3910		6519	5348	6581		4197	452	947	264	1664
Suffocation	Hospitalised	35 430		48 183				38 567				
	T&R	8602	7568	6031				7949				
Other specified, child/adult abuse	Hospitalised	75 405	43 355					59 984				
	T&R			5122				5122				
Other specified, foreign body	Hospitalised			45 851				45 851				
	T&R	4287						4287	405	761		1166
Other specified, classifiable	Hospitalised	50 784						50 784				
	T&R	4161		5784				4172	463	877		1340
Other specified, NEC	Hospitalised	33 346						33 828				
	T&R		4336	7545	4705			5879				
Unspecified	Hospitalised							43 157				
	T&R	5680	8112	7538				5822	420	981		1401
External cause missing	Hospitalised	44 867	35 946	44 626				39 139				
	T&R						5921	5921	402	1007	247	1656
TBla	Hospitalised											
	T&R	4420		6151				55 749	1561	6572		8133
All mechanisms	Hospitalised	49 054		40 750				4538	463	1040		1503
	T&R	5589	7903	6051	5697	6016		54 671	51 241	6110		6110
	Hospitalised	53 619	42 145	46 156	44 019			55 749	1569	6246		7815
	T&R											

Costs are 2020 USD. Blank cells indicate average cost not calculated if <20 injury patients for the medical spending analysis or <50 injury patients or controls with >0 absences for the work loss analysis, or if the 95% CI for the average marginal effect for the cost of injury included 0. See online supplemental tables S3 and S4 for additional information about the medical spending analysis (number of analysed

injury patients and controls, mean medical spending with SE and 95% CIs), and modelled SE and 95% CIs. See online supplemental tables S5 and S6 for additional information about the sample for the work loss analysis (number of analysed injury patients and control enrollees and modelled 95% CIs).

Data source: MarketScan 2019–2021.

* Multiple mechanisms.

ED, emergency department; MVT, motor vehicle-traffic; NEC, not elsewhere classifiable; TBI, traumatic brain injury.