



Special Report from the CDC

Unintentional injuries treated in hospital emergency departments among persons aged 65 years and older, United States, 2006–2011☆☆☆

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ABSTRACT

Introduction: With the aging of the United States population, unintentional injuries among older adults, and especially falls-related injuries, are an increasing public health concern. **Methods:** We analyzed emergency department (ED) data from the Nationwide Emergency Department Sample, 2006–2011. We examined unintentional injury trends by 5-year age groups, sex, mechanism, body region, discharge disposition, and primary payer. For 2011, we estimated the medical costs of unintentional injury and the distribution of primary payers, plus rates by injury mechanisms and body regions injured by 5-year age groups. **Results:** From 2006 to 2011, the age-adjusted annual rate of unintentional injury-related ED visits among persons aged ≥ 65 years increased significantly from 7987 to 8163, per 100,000 population. In 2011, 65% of injuries were due to falls. Rates for fall-related injury ED visits increased with age and the highest rate was among those aged ≥ 100 . Each year, about 85% of unintentional injury-related ED visits in this population were expected to be paid by Medicare. In 2011, the estimated lifetime medical cost of unintentional injury-related ED visits among those aged ≥ 65 years was \$40 billion. **Conclusion:** Increasing rates of ED-treated unintentional injuries, driven mainly by falls among older adults, will challenge our health care system and increase the economic burden on our society. Prevention efforts to reduce falls and resulting injuries among adults aged ≥ 65 years have the potential to increase well-being and reduce health care spending, especially the costs covered by Medicare. **Practical applications:** With the aging of the U.S. population, unintentional injuries, and especially fall-related injuries, will present a growing challenge to our health care system as well as an increasing economic burden. To counteract this trend, we must implement effective public health strategies, such as increasing knowledge about fall risk factors and broadly disseminating evidence-based injury and fall prevention programs in both clinical and community settings.

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1. Introduction

In the United States, the number of older adults (those aged 65 years and older) is expected to increase from 54 million, or 17% of the population in 2015, to 83 million, or 23% of the population, in 2030 (U.S. Census, 2014). Injury is the eighth leading cause of death among older adults (Centers for Disease Control and Prevention [CDC], 2013a). In 2011, older adults accounted for over 20.3 million hospital emergency department (ED) visits and 25% of these visits were for unintentional injuries (NCHS, 2011). Clearly, unintentional injuries among older adults are an important public health concern.

Among older adults, falling is the leading mechanism of both fatal and nonfatal unintentional injuries (Centers for Disease Control and Prevention [CDC], 2014). In 2011, unintentional falls accounted for 22,901 injury deaths and 2.4 million nonfatal injuries treated in EDs (Centers for Disease Control and Prevention [CDC], 2013c). Unintentional fall injury rates increase sharply with age and these injuries are associated with significant morbidity, limited mobility, decreased physical functioning, and loss of independence (Lo, Brown, Sawyer, Kennedy, & Allman, 2014; Sterling, O'Connor, & Bonadies, 2001; Stevens, 2005).

This study provides nationally representative data on trends in unintentional injury rates for ED visits among persons aged ≥ 65 years, with an emphasis on fall-related injuries.

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☆☆ The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

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2. Methods

Data on hospital ED visits for unintentional injuries were from the U.S. Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project (HCUP)–National Emergency Department Sample (NEDS). HCUP–NEDS, is the largest all-payer ED database publicly available in the United States. Injury diagnoses and external causes of injury are coded using ICD-9-CM (International Classification of Diseases, Ninth revision, Clinical Modification) codes.

Although NEDS provides ICD-9-CM codes for up to 15 diagnoses per ED visit, injuries were identified using the first-listed, or principal, diagnosis codes to avoid multiple counting of discharge records. (HCUP, 2006) The ICD-9-CM codes used to identify injuries were: 800–908, 909.0–909.2, 909.4, 909.9, 995.5, 910–994, and 995.80–995.85. The ICD-9-CM external cause codes (E-codes) used to define unintentional injuries were E800–E869 and E880–E929. Specific mechanisms of injury were defined using the first-listed E-code in the ED record and applying the Centers for Disease Control and Prevention's (CDC) recommended framework of E-code groupings (Centers for Disease Control and Prevention [CDC], 2011b). Diagnosis code groupings for the primary body region injured were defined using the Barell matrix (Centers for Disease Control and Prevention [CDC], 2011a).

Analysis variables included age, sex, mechanism of injury, and primary body part injured. Also included were patients' discharge disposition from the ED and the expected primary payer.

Data were weighted to provide national estimates of annual numbers and rates per 100,000 population. From 2006 through 2011, age-adjusted rates were calculated based on the U.S. Census Bureau's bridged-race postcensal population estimates of the resident population (Centers for Disease Control and Prevention [CDC], 2013b). Rates were age-adjusted by 5-year age groups to the standard 2000 U.S. population. Joinpoint regression software from the National Cancer Institute (NCI, 2014) was used to calculate the average annual percent changes (AAPCs) in unintentional

Table 1

Age adjusted annual rates per 100,000 population of unintentional injury-related emergency department visits for persons aged 65 and older, United States, 2006–2011[§].

	Rate						AAPC*	P-value of AAPC
	2006	2007	2008	2009	2010	2011		
Total	7987	7917	8086	8097	8145	8164	0.5	0.004
<i>Age group</i>								
65–69	5390	5409	5391	5402	5343	5351	–0.2	0.075
70–74	5985	5948	6000	6024	6033	6064	0.3	0.013
75–79	7430	7392	7473	7512	7669	7652	0.7	0.009
80–84	10,058	9932	10,162	10,147	10,419	10,455	1.0	0.012
85–89	13,862	13,857	14,351	14,426	14,570	14,661	1.2	0.003
90–94	18,118	18,162	18,789	18,865	18,857	18,848	0.9	0.029
95–99	20,660	21,374	21,608	21,259	22,238	21,794	1.0	0.057
100 +	21,785	22,509	23,056	21,754	21,937	22,375	0.1	0.928
<i>Sex</i>								
Male	6530	6519	6624	6610	6658	6699	0.5	0.004
Female	9056	9044	9175	9202	9274	9284	0.6	0.003
<i>Injury mechanism</i>								
Falls	5057	5105	5260	5321	5319	5341	1.1	0.048
Motor vehicles	520	503	490	469	475	452	–2.6	0.001
Struck by/against	429	413	415	420	431	427	0.3	0.491
Cut/pierce	408	387	375	367	364	367	–2.2	<0.000
Overexertion	355	339	333	315	309	230	–3.3	<0.000
Poisoning	97	98	106	107	111	112	3.1	0.003
Hot object/substance	39	40	37	36	38	36	–1.4	0.111
Fire/flame	16	14	16	18	17	15	1.0	0.677
Other	1064	1069	1051	1042	1080	1112	0.8	0.200
<i>Body region injured</i>								
Extremities	4312	4266	4242	4143	4115	4119	–1.0	0.003
Upper extremity	2032	2007	1982	1933	1938	1948	–0.9	0.019
Lower extremity	1358	1359	1352	1338	1339	1342	–0.3	0.029
Hip	922	8,99	908	872	838	829	–2.2	0.002
Head & neck (non-TBI)	1589	1609	1677	1788	1827	1844	3.4	0.001
Torso	872	866	875	865	864	867	–0.1	0.334
Spine & upper back	536	534	556	541	554	552	0.6	0.117
TBI	246	263	295	318	329	323	5.9	<0.0001
Unclassified	433	434	440	442	456	459	1.3	0.002
<i>Disposition of patient</i>								
Home	5782	5873	6016	6050	6116	6142	1.3	<0.0001
Admitted	1523	1530	1556	1524	1493	1439	–1.0	0.026
Transferred	402	418	464	484	499	542	6.1	0.0002
Left against medical advice	23	24	24	24	23	25	1.1	0.251
Died	5	4	5	5	4	7	2.8	0.470
Destination unknown	252	123	21 [^]	9 [^]	10	10	–49.3	0.006

TBI: traumatic brain injury.

[§] Data are from the US Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project–National Emergency Department Sample.

* Average Annual percent change (AAPC) calculated by using Joinpoint regression analysis.

[^] If the relative standard error was over 30% or equal to 0, the value of the estimate was considered unreliable and was not reported.

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