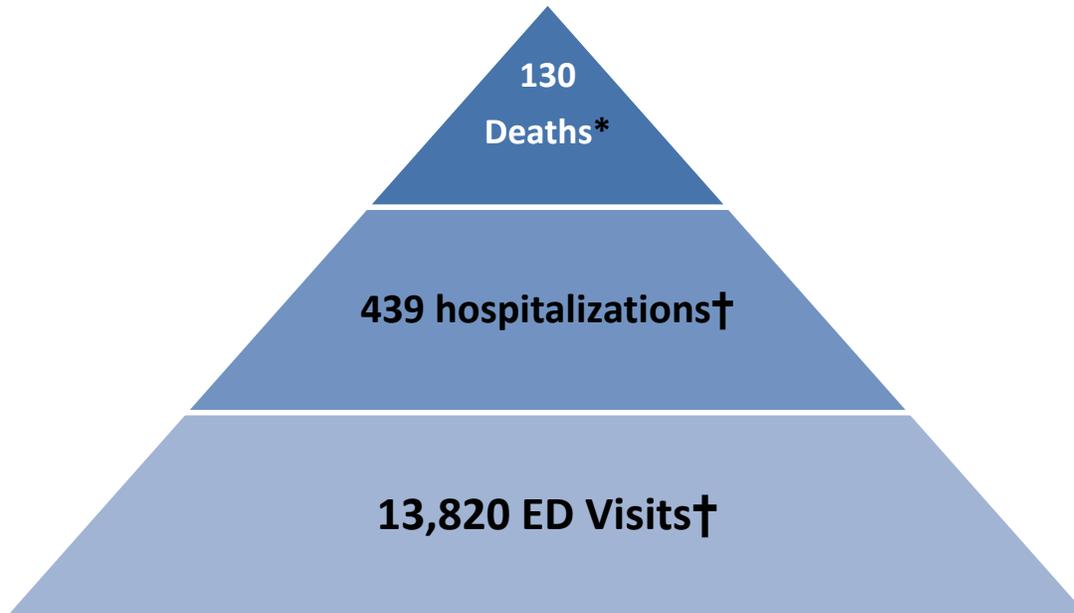


SECTION 3.8: BURNS



*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

CHAPTER HIGHLIGHTS:

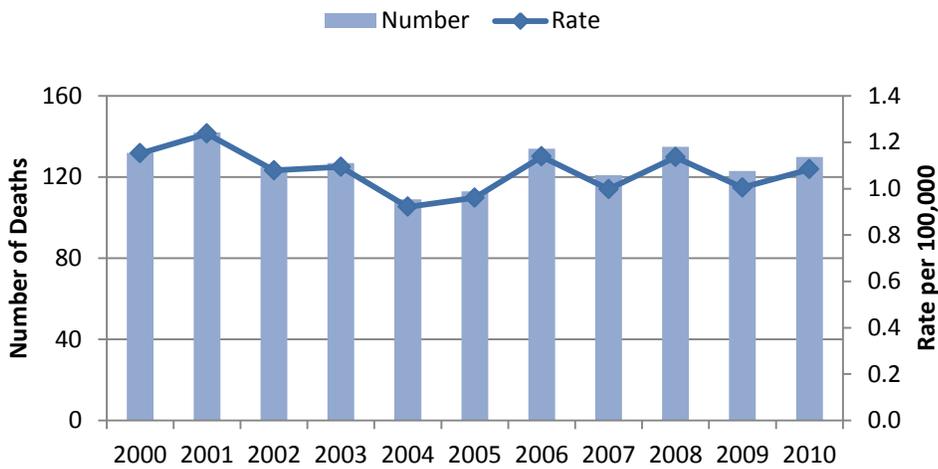
Patterns:

- Highest rates of fatal burns were found among ages 85 or older while the highest rates of non-fatal burns were found among children less than 5 years of age.
- Fatal and non-fatal burn rates were higher among males than females.
- Most fatal burns were caused by an uncontrolled fire while touching hot objects was the most common cause of non-fatal burns.

Trends:

- Death rates did not follow a consistent linear pattern in 2000-2010.
- Hospitalization rates have decreased 43 percent while ED visit rates increased 17 percent since 2002.
- Largest increase in fatal burns was found among adults ages 75-84 and largest increase in ED visits was found among children less than 5 years of age.
- Most fatal burns were caused by an uncontrolled fire and touching hot objects were most common cause of non-fatal burns throughout the study period.

Figure 10.1. Number and age adjusted rate for unintentional burn deaths by year, Ohio, 2002-2010



Source: Ohio Department of Health, Office of Vital Statistics

DEATHS:

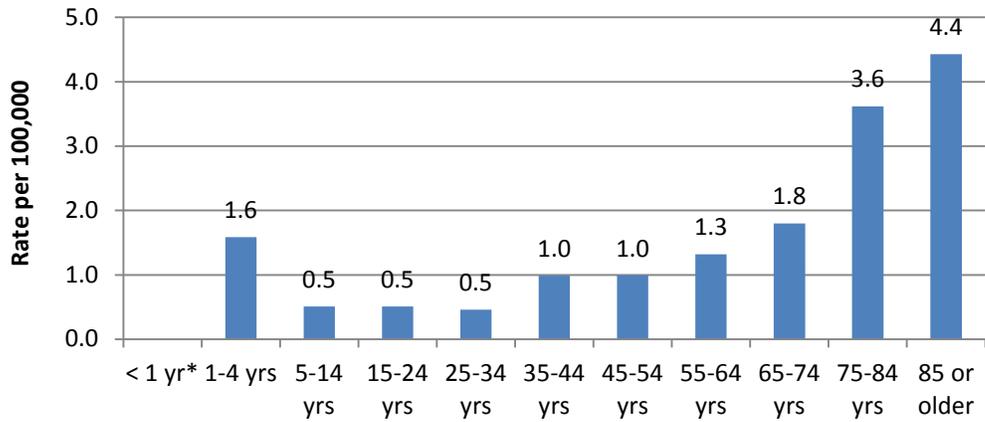
In 2010, 130 deaths resulted from unintentional burns. The burn fatality rate was 1.1 per 100,000 (Figure 10.1). Burn fatality rates were higher among males (1.3 per 100,000) than females (0.9 per 100,000). Rates decreased with age among ages 0-24 and increased with age among ages 25 or older. The highest death rates were found among ages 85 or older (Figure 10.2). The burn death rate was 1.2 per 100,000 for whites while rates were suppressed for other race and ethnic groups due to less than 20 deaths. Death rates were generally higher among blacks than whites in previous years when the number of deaths exceeded 20 for blacks. Nearly 84 percent of fatal burns were caused by an uncontrolled fire (Figure 10.3). See Table 10.1 for an unintentional burn death risk profile.

Table 10.1 Unintentional Burn Death Risk Profile		
	2010 At Risk Groups	Annual trend since 2000
Overall		Inconsistent trend
Sex	Males	Inconsistent trends
Age	85 or older	75-84 (largest increase)
Race and ethnicity	Blacks	Inconsistent trends

TRENDS:

From 2000 to 2010, the unintentional burn death rate did not follow a consistent linear trend. Rates varied from a high of 1.24 per 100,000 in 2001 to a low of 0.92 per 100,000 in 2004. Slight increases were found among ages 75-84 (+0.1 per 100,000 per year) and ages 55-64 (+0.03 per 100,000 per year) while a slight decrease was found among children ages 1-4 years (-0.2 per 100,000 per year). Rates did not follow a consistent linear trend among males or females nor by race or ethnic group. See Tables 37a-c located at the end of this section for more detailed information on the number and rate of unintentional burn deaths in Ohio.

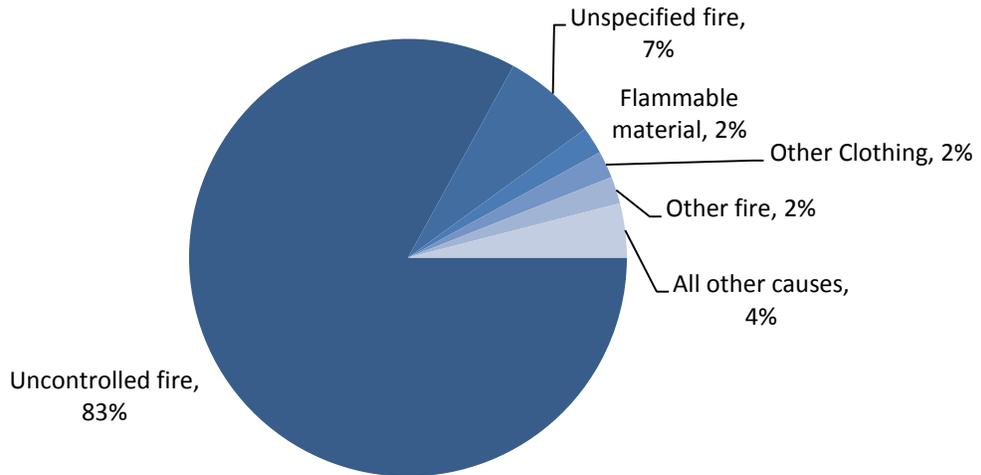
Figure 10.2. Rate of unintentional burn death rate by age group, Ohio, 2008-2010



Source: Ohio Department of Health, Vital Statistics

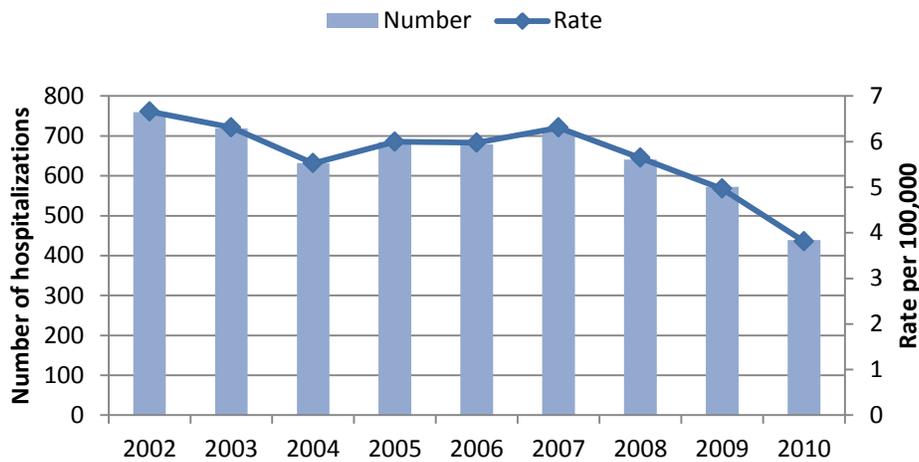
*Rates suppressed due to small cell sizes

Figure 10.3. Distribution of deaths resulting from unintentional burns by cause, Ohio, 2010



Source: Ohio Department of Health, Vital Statistics

Figure 10.4. Number and age adjusted rate for unintentional burn hospitalizations by year, Ohio, 2002-2010



Source: Ohio Hospital Association

HOSPITALIZATIONS:

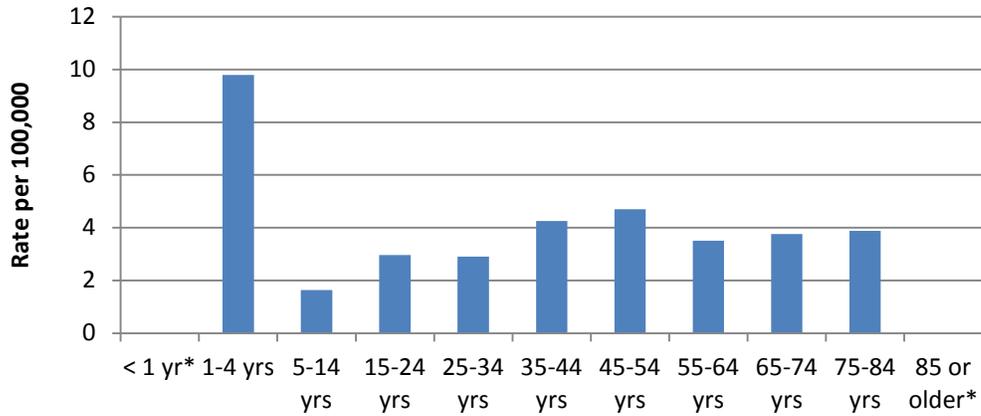
In 2010, 439 hospitalizations resulted from unintentional burns. The burn hospitalization rate was 3.8 per 100,000 (Figure 10.4). The hospitalization rate was higher for males. The highest rates were found among children 1-4 years (see Figure 10.5). The majority of burns were caused by touching hot objects (54 percent) followed by ignition of materials (18 percent) and conflagration (16 percent) (Figure 10.6). See Table 10.2 for an unintentional burn hospitalization risk profile.

Table 10.2 Unintentional Burn Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		-43%
Sex	Males	Females (Inconsistent)
Age	1-4	1-14 (Inconsistent)

TRENDS:

Hospitalizations resulting from unintentional burns decreased 43 percent from 6.7 per 100,000 in 2002 to 3.8 per 100,000 in 2010. Rates decreased by an average of -0.2 per 100,000 per year. Rates among males decreased on average by -0.4 per 100,000 per year while rates among females did not follow a consistent trend. Hospitalization rates decreased among ages 15-84 with the largest average annual decrease found among adults ages 75-84 (-0.6 per 100,000). Rates among children ages 1-14 did not follow a consistent trend and cell sizes were too small to complete a trend analysis of infants and adults ages 85 or older. Burns caused by ignition of materials decreased by an average of 10 hospitalizations per year while the number of hospitalizations resulting from the other leading causes of burns did not follow a consistent trend. See Tables 38a-c located at the end of this section for more detailed information on the number and rate of unintentional burn hospitalizations.

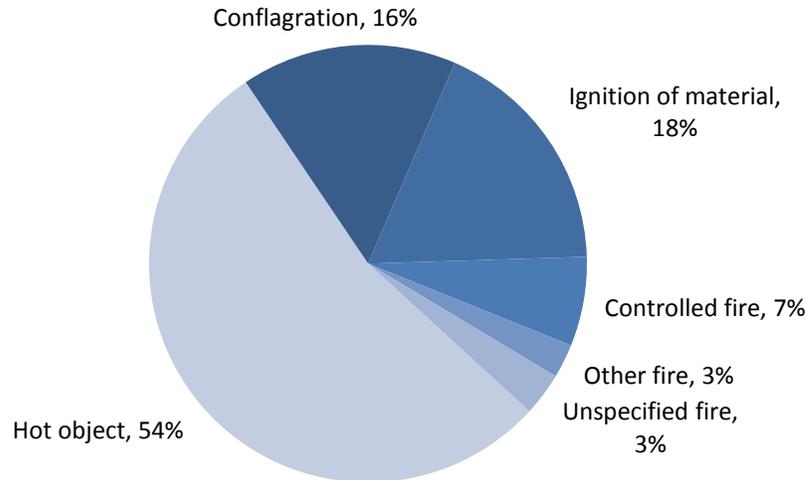
Figure 10.5. Hospitalization rates for unintentional burns by age, Ohio, 2010



Source: Ohio Hospital Association

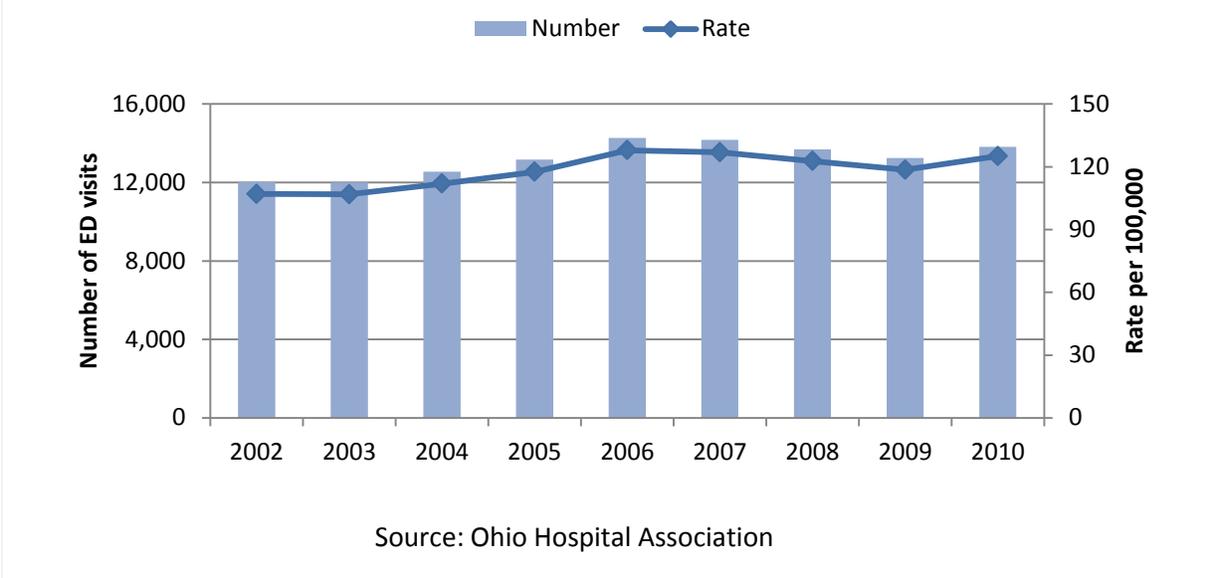
*Rate suppressed due to < 20 hospitalizations

Figure 10.6. Distribution of hospitalizations resulting from unintentional burns by cause, Ohio, 2010



Source: Ohio Hospital Association

Figure 10.7. Number and age adjusted rate for unintentional burn ED visits by year, Ohio, 2002-2010



EMERGENCY DEPARTMENT VISITS:

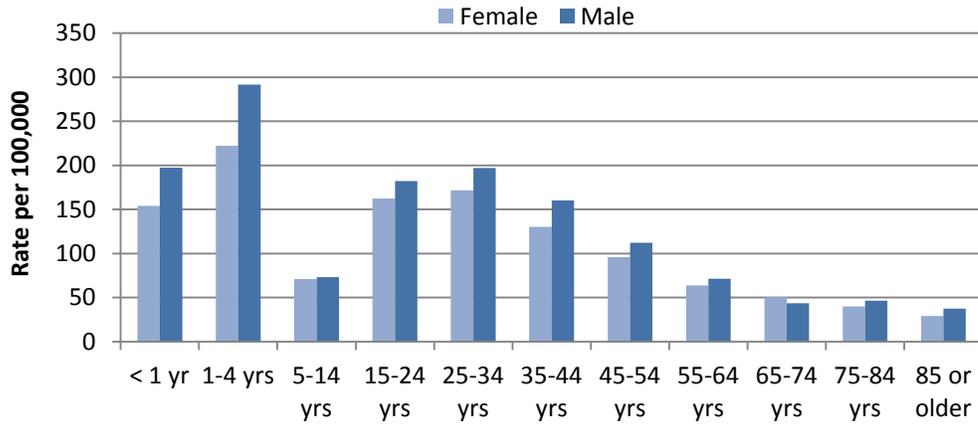
Nearly 14,000 ED visits were associated with unintentional burns in 2010. The ED visit rate was 125 per 100,000 (Figure 10.7). Males were more likely than females to visit the ED for a burn which was consistent throughout the lifespan. For both males and females, the highest rates of ED visits were found among birth through age 4 and ages 15-34 (Figure 10.8). Touching hot objects caused 78 percent of ED visits resulting from burns (Figure 10.9). See Table 10.3 for an unintentional burn ED visit risk profile.

Table 10.3 Unintentional Burn ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		+17%
Sex	Males	Females (largest increase)
Age	1-4 yrs	1-4 yrs (largest increase)

TRENDS:

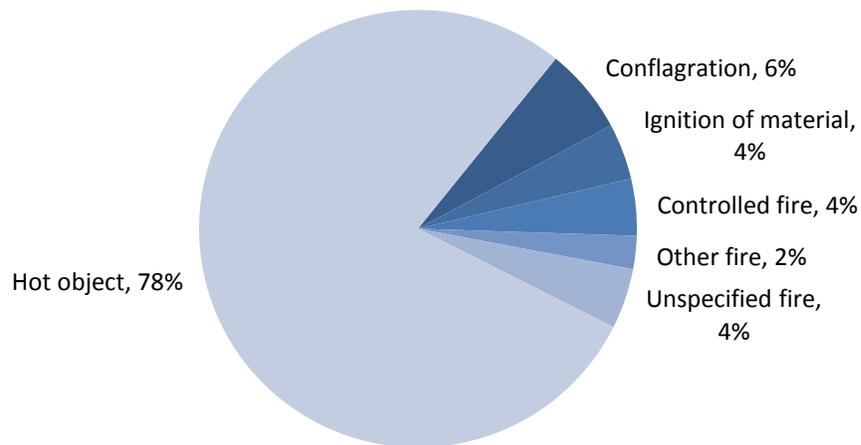
Between 2002 and 2010, ED visit rates resulting from unintentional burns increased 17 percent from 107 per 100,000 in 2002 to 125 per 100,000 in 2010. Rates increased by an average of 2.3 per 100,000 per year. An increase was found among females (+2.6 per 100,000 per year) while rates among males did not follow a consistent trend. An increase was found among most age groups with largest average annual increases occurring among children ages 1-4 (+6.4 per 100,000 per year) and infants less than 1 year (5.7 per 100,000 per year). ED visits resulting from burns caused by touching hot objects increased by an average of 180 ED visits per year and burns caused by controlled fires increased by an average of 24 per year. ED visits resulting from other types of fires decreased by an average of 13 visits per year. Other leading causes of burns did not follow a consistent trend. See Tables 39a-c located at the end of this section for more detailed information about unintentional burn ED visits.

Figure 10.8. ED visit rates for unintentional burns by age and sex, Ohio, 2010



Source: Ohio Hospital Association

Figure 10.9. Distribution of ED visits resulting from unintentional burns by cause, Ohio, 2010



Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 37a. Number of deaths resulting from unintentional fire or burns, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	132	142	125	127	109	113	134	121	135	123	130
Sex											
Males	79	77	75	72	66	62	72	68	75	74	71
Females	53	65	50	55	43	51	62	53	60	49	59
Age											
< 1 yr	<5			6			<5			7	
1-4 yrs	35			38			21			28	
5-14 yrs	24			31			37			23	
15-24 yrs	16			29			26			24	
25-34 yrs	22			34			18			20	
35-44 yrs	34			26			40			45	
45-54 yrs	39			49			48			52	
55-64 yrs	21			43			46			55	
65-74 yrs	31			34			43			45	
75-84 yrs	34			48			58			59	
85 or older	15			23			28			30	
Race and ethnicity											
White‡	107	122	100	101	86	83	111	91	109	90	119
Black‡	23	19	22	26	21	29	21	26	19	32	10
Hispanic	0	<5	<5	0	<5	<5	<5	<5	7	<5	<5
Other‡	<5	0	<5	0	0	0	0	0	0	0	0

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 37b. Death rates per 100,000 resulting from unintentional fire or burns, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.15	1.24	1.08	1.09	0.92	0.96	1.14	1.00	1.14	1.00	1.08	<-0.1 (NL)
Sex†												
Males	1.49	1.44	1.43	1.36	1.21	1.14	1.33	1.22	1.34	1.35	1.28	<-0.1 (NL)
Females	0.89	1.06	0.82	0.89	0.71	0.82	0.99	0.81	0.95	0.75	0.91	<-0.1 (NL)
Age												
< 1 yr	*			*			*			*		*
1-4 yrs	2.91			2.11			1.18			1.59		-0.17
5-14 yrs	0.73			0.65			0.80			0.51		<-0.1 (NL)
15-24 yrs	*			0.61			0.55			0.51		*
25-34 yrs	0.73			0.77			*			0.46		*
35-44 yrs	0.95			0.51			0.82			0.99		<0.1 (NL)
45-54 yrs	1.22			0.98			0.92			0.99		<-0.1 (NL)
55-64 yrs	1.03			1.27			1.22			1.32		0.03
65-74 yrs	1.98			1.47			1.84			1.80		<-0.1 (NL)
75-84 yrs	3.12			2.87			3.47			3.62		0.08
85 or older	*			4.05			4.51			4.43		*
Race and ethnicity†												
White‡	1.10	1.24	1.01	1.02	0.84	0.81	1.11	0.87	1.07	0.85	1.20	NL
Black‡	2.02	*	1.70	1.90	1.49	2.15	1.57	1.95	*	2.38	*	*
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 37c. Number of death resulting from unintentional fire or burns, by cause and year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 00-10	Trend (per yr)
Uncontrolled fire	115	124	100	110	90	97	116	97	114	99	105	83.9%	-1 (NL)
Controlled fire	<5	0	0	0	<5	0	<5	<5	5	<5	<5	1.4%	*
Flammable material	<5	0	<5	<5	0	<5	5	<5	<5	<5	5	1.7%	*
Nightwear	0	0	0	0	0	0	0	0	0	0	<5	0.1%	*
Other clothing	0	<5	<5	<5	0	<5	0	<5	<5	0	<5	1.5%	*
Other fire	0	<5	0	<5	<5	<5	<5	<5	<5	<5	<5	1.5%	*
Unspecified fire	2	10	15	8	10	7	8	12	9	11	9	7.3%	*
Hot water	0	<5	<5	<5	0	<5	0	<5	<5	<5	0	0.6%	*
Other hot fluids	0	<5	0	<5	0	0	0	0	<5	<5	0	0.3%	*
Steam or hot vapors	0	0	0	0	0	0	0	0	0	<5	0	0.1%	*
Hot air or gases	0	0	0	0	0	0	0	0	0	0	<5	0.1%	*
Household appliances	0	0	0	0	0	0	<5	0	0	0	0	0.1%	*
Hot heating appliances	0	0	0	0	<5	<5	0	0	<5	<5	0	0.4%	*
Other hot metals	0	<5	0	0	0	0	<5	0	0	0	0	0.1%	*
Unspecified substance	<5	0	<5	0	0	0	0	0	0	0	0	0.1%	*

*Analysis suppressed due to less than 20 deaths

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 38a. Number of hospitalizations resulting from unintentional burns by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	760	719	632	685	679	714	641	572	439
Sex									
Males	514	461	451	452	451	485	418	349	276
Females	246	258	181	233	228	229	223	223	163
Age									
< 1 yr	9	15	15	23	31	27	31	29	11
1-4 yrs	86	84	65	75	112	110	129	101	57
5-14 yrs	53	47	43	44	62	71	72	52	25
15-24 yrs	99	87	83	87	82	88	63	60	47
25-34 yrs	105	88	73	85	87	79	73	60	41
35-44 yrs	113	126	103	109	68	101	53	49	63
45-54 yrs	109	123	95	101	90	96	85	85	82
55-64 yrs	67	47	57	66	52	65	48	47	51
65-74 yrs	54	36	42	39	39	37	44	34	32
75-84 yrs	47	49	42	40	38	29	31	31	21
85 or older	18	17	14	16	18	11	12	24	9

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 38b. Hospitalization rates per 100,000 resulting from unintentional burns by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	6.7	6.3	5.5	6.0	6.0	6.3	5.6	5.0	3.8	-0.2
Sex†										
Males	9.3	8.3	8.2	8.1	8.1	8.7	7.5	6.2	4.9	-0.4
Females	4.1	4.3	3.0	3.9	3.9	3.9	3.9	3.8	2.7	-0.1 (NL)
Age										
< 1 yr	*	*	*	15.7	20.9	17.8	20.3	19.6	*	*
1-4 yrs	14.3	14.0	10.9	12.6	19.1	18.7	21.8	17.1	9.8	0.3 (NL)
5-14 yrs	3.3	2.9	2.7	2.8	4.0	4.7	4.8	3.5	1.6	<0.1 (NL)
15-24 yrs	6.3	5.5	5.2	5.5	5.2	5.6	4.0	3.8	3.0	-0.3
25-34 yrs	7.1	6.0	5.0	5.8	6.0	5.4	5.0	4.1	2.9	-0.4
35-44 yrs	6.5	7.4	6.1	6.6	4.2	6.3	3.4	3.2	4.3	-0.5
45-54 yrs	6.6	7.4	5.6	5.9	5.2	5.5	4.9	4.8	4.7	-0.3
55-64 yrs	6.2	4.2	4.9	5.4	4.1	5.0	3.6	3.4	3.5	-0.3
65-74 yrs	7.0	4.7	5.5	5.1	5.1	4.7	5.5	4.1	3.8	-0.3
75-84 yrs	8.5	8.8	7.6	7.2	6.9	5.3	5.8	5.7	3.9	-0.6
85 or older	*	*	*	*	*	*	*	10.6	*	*

*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

Table 38c. Number of hospitalizations resulting from unintentional burns by cause and year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Conflagration	112	120	83	105	107	116	74	96	70	15.9%	-4 (NL)
Ignition of material	156	166	180	163	128	140	134	100	79	18.0%	-10.35
Controlled fire	60	43	28	36	34	58	43	31	29	6.6%	-2 (NL)
Other fire	26	25	17	20	20	21	20	14	11	*	*
Unspecified fire	28	20	22	18	12	24	31	19	14	*	*
Hot substance or object	378	345	302	323	378	356	339	312	236	53.8%	-9 (NL)

*Rates suppressed due to less than 20 hospitalizations.

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 39a. Number of ED visits resulting from unintentional burns by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	12,029	12,008	12,553	13,171	14,268	14,175	13,690	13,248	13,820
Sex									
Males	6,530	6,560	6,997	7,102	7,841	7,767	7,415	6,966	7,363
Females	5,499	5,448	5,556	6,069	6,427	6,408	6,275	6,282	6,456
Age									
< 1 yr	217	200	206	260	257	275	294	257	245
1-4 yrs	1,333	1,266	1,281	1,315	1,554	1,513	1,499	1,507	1,499
5-14 yrs	952	996	1,026	1,068	1,183	1,249	1,233	1,162	1,099
15-24 yrs	2,679	2,607	2,755	2,867	3,073	2,995	2,721	2,673	2,738
25-34 yrs	2,329	2,219	2,379	2,398	2,664	2,557	2,578	2,460	2,597
35-44 yrs	2,016	2,084	2,159	2,251	2,339	2,221	2,027	1,896	2,146
45-54 yrs	1,347	1,445	1,484	1,643	1,771	1,877	1,808	1,754	1,809
55-64 yrs	630	657	687	759	807	846	865	865	980
65-74 yrs	262	269	322	315	347	358	385	386	403
75-84 yrs	202	204	203	224	206	209	209	199	231
85 or older	62	61	51	71	67	75	71	89	73

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 39b. ED visit rates per 100,000 resulting from unintentional burns by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	107	107	112	118	128	127	123	119	125	2.3
Sex†										
Males	117	98	126	128	141	140	134	125	134	3.0 (NL)
Females	97	96	98	107	114	114	112	112	116	2.6
Age										
< 1 yr	147	136	138	177	173	181	193	174	176	5.7
1-4 yrs	222	212	215	221	265	257	254	255	258	6.4
5-14 yrs	59	62	65	69	77	82	82	78	72	2.5
15-24 yrs	169	163	173	180	194	190	173	171	173	0.8 (NL)
25-34 yrs	158	151	163	165	183	175	176	166	184	3.1
35-44 yrs	115	122	129	137	144	139	130	125	145	2.2 (NL)
45-54 yrs	82	86	87	96	102	107	103	100	104	2.9
55-64 yrs	58	58	59	63	64	65	65	62	67	1.1
65-74 yrs	34	35	42	41	45	46	48	46	47	1.7
75-84 yrs	37	37	37	40	37	38	39	37	43	0.5 (NL)
85 or older	33	31	25	34	31	34	31	39	32	0.5 (NL)

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 39c. Number of ED visit rates resulting from unintentional burns by type and year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Conflagration	811	799	952	932	872	965	907	876	876	6.3%	7 (NL)
Ignition of material	426	506	540	520	522	545	581	485	573	4.1%	11 (NL)
Controlled fire	395	449	460	517	536	578	522	615	579	4.2%	24
Other fire	443	355	415	391	358	396	348	279	338	2.4%	-13
Unspecified fire	473	533	539	609	645	651	548	529	615	4.5%	10 (NL)
Hot substance or object	9,581	9,367	9,647	10,204	11,336	11,040	10,478	10,466	10,826	78.3%	180

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

APPENDICES

APPENDIX 1: DATA SOURCES

This report uses data from behavioral risk factor surveys, hospital discharge records and death certificates to study patterns and trends in injuries among Ohio residents. The following is brief summary of each data source referenced in this report.

Cost of Injuries

The medical and work loss cost of injuries was estimated by the Centers for Disease Control and Prevention (CDC). Cost estimates for fatal and non-fatal injuries can be queried on the CDC's Web-based Injury Statistics Query and Reporting System Web (WISQARS).

http://www.cdc.gov/injury/wisqars/pdf/WISQARS_Cost_Methods-a.pdf

Death Records

Death records are maintained by ODH's Office of Vital Statistics. Death certificates provide limited information about circumstances of injury circumstances or contributing factors. Both injuries and their external causes were classified according to the 10th Revision of the International Classification of Diseases (ICD-10). See Appendix 3 for a complete list of external cause of injury codes by mechanism and intent.

<http://dwhouse.odh.ohio.gov/datawarehousev2.htm>

Hospital Discharge Records

Hospital discharge records are collected and maintained by the Ohio Hospital Association (OHA) from information provided by member hospitals. Both injuries and their external causes were classified according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM). For hospitalizations, a case was defined as an Ohio resident with an injury listed in the primary diagnosis field. For ED visits, a case was defined as an Ohio resident with an injury listed in the primary diagnosis field or a valid external cause of injury code any of the 15 diagnosis fields. Injury mechanisms for both hospitalizations and ED visits were based on the first listed external cause of injury. See Appendix 2 for a complete list external cause of injury codes by mechanism and intent.

<http://www.ohanet.org/>

Leading Causes of Death

The data source for WISQARS Fatal Injury Data is the National Vital Statistics System (NVSS) operated by the National Center for Health Statistics. WISQARS provides death counts and death rates for the United States and by state, county, age, race, Hispanic ethnicity, sex, and leading cause of death, injury intent, and injury mechanism categories. WISQARS can be used to query death data for the years 1999 - 2009, of which the underlying cause of death is specified using ICD-10 codes.

http://www.cdc.gov/injury/wisqars/leading_causes_death.html

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Ohio Behavioral Risk Factor Surveillance System (BRFSS)

The Ohio Behavioral Risk Factor Surveillance System (BRFSS) is a random digit dial telephone survey of non-institutionalized adults aged 18 years of older. The BRFSS has been conducted annually by the Ohio Department of Health since 1984. The survey collects information on the prevalence of health behaviors, health care usage, and disease diagnosis associated with the leading cause of disease, injury and death in the United States. Results from the survey are weighted to represent the age, sex, race, and ethnic composition of Ohio.

<http://www.odh.ohio.gov/healthstats/brfss/behrisk1.aspx>

Ohio Population Estimates

The National Center for Health Statistics releases bridged-race population estimates of the resident population of the United States for use in calculating vital rates. These estimates result from bridging the 31 race categories used in Census 2000 and Census 2010. The bridged-race population estimates are produced under a collaborative arrangement with the U. S. Census Bureau.

http://www.cdc.gov/nchs/nvss/bridged_race.htm

Ohio Pregnancy Risk Assessment Monitoring System (PRAMS)

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a population-based survey designed to examine maternal behaviors and experiences before, during and after a woman's pregnancy, and during the early infancy of her child. The Centers for Disease Control and Prevention initiated PRAMS in 1987 in an effort to reduce infant mortality and the incidence of low birth weight. PRAMS were implemented in Ohio in 1999.

<http://www.odh.ohio.gov/healthstats/pramshs/prams1.aspx>

Ohio Traffic Crash Reports

The Ohio Department of Public Safety compiles statistical data on crashes that occur on Ohio's roads and highways. Crash data is available in the form of annual reports. Users can also develop customized queries of the data online.

http://ohiohighwaysafetyoffice.ohio.gov/otso_annual_crash_facts.stm

Ohio Youth Risk Behavior Survey (YRBS)

The Ohio Youth Risk Factor Survey (YRBS) is an anonymous paper and pencil survey of high school students enrolled in public and non-public schools. The YRBS has been conducted in Ohio since 1993 and is collaborative project between the Ohio Departments of Education and Health. The survey collects information on the prevalence of health behaviors, health care usage, and disease diagnosis associated with the leading cause of disease, injury and death in the United States. Results from the survey are weighted to represent the age, sex, race, and ethnic composition of Ohio.

http://www.odh.ohio.gov/odhprograms/chss/ad_hlth/youthrsk/youthrsk1.aspx

APPENDIX 2: ANALYTIC METHODS

This analysis was limited to descriptive statistics, which were generated through the use of Statistical Analysis System (SAS) Version 9.1, Cary, N.C. The data were analyzed using injury surveillance guidelines from the Centers for Disease Control and Prevention (CDC).

Deaths:

- Injury deaths were defined as a death with the underlying cause of death listed as an injury. Traumatic brain injury deaths were defined as deaths with an injury as underlying cause of death and a traumatic brain injury listed in one of the multiple cause of death fields. See Appendix 4 for a list of ICD-10 codes for injury mechanisms and Appendix 6 for a list of mechanism subcategories.
- Deaths included in this report were restricted to Ohio residents.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

Hospitalizations:

- Discharge dataset includes nonfederal, acute care, or inpatient facilities. The dataset does not include Veterans' Affairs and other federal hospitals, rehabilitation centers, or psychiatric hospitals.
- Injury hospitalizations were defined as an inpatient visit with an injury listed in the primary discharge diagnosis field. See Appendix 5 for a list of ICD-9-CM codes for injury mechanisms and Appendix 7 for a list of mechanism subcategories.
- Datasets include readmissions, transfers, and deaths occurring in the hospital.
- Hospitalizations included in this report were restricted to Ohio residents.
- The external cause of injury code used in the analysis was the first listed cause of the discharge diagnosis fields. If the codes E000-E030, E849, E967, E869.4, E870-E879, or E930-E949 were the first listed codes then the next valid external cause code was used.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

Emergency Department Visits:

- Discharge dataset includes nonfederal, acute care, or inpatient facilities. The dataset does not include Veterans' Affairs and other federal hospitals, rehabilitation centers, or psychiatric hospitals.
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- Injury ED visits were defined as an ED visit with an injury listed in the primary discharge diagnosis field or a valid external cause of injury code in any of the discharge diagnosis fields. See Appendix 5 for a complete list of ICD-9-CM codes.
- ED visits included in this report were restricted to Ohio residents.
- Persons who are treated at an ED and later admitted to a hospital are removed from the ED dataset, and therefore are not included in any analysis of ED data.
- The external cause of injury code used in the analysis was the first listed cause of the discharge diagnosis fields. If the codes E000-E030, E849, E967, E869.4, E870-E879, or E930-E949 were the first listed codes then the next valid external cause code was used.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

Trend Analysis for Deaths, Hospitalizations and Emergency Department Visits:

- Trend analysis for annual injury death, hospitalization, and ED visit rates was conducted in Microsoft Excel. Annual injury rates were plotted and a linear trend line was drawn to minimize the distance between the trend line and data point. The goodness of fit for the linear trend line was determined by the R-squared value. Linear trends were defined as a trend line with an R-squared value of 0.5 or higher. Non-linear trends were defined as a trend line with an R-squared value of less than 0.5. The slope and goodness of fit of the trend line were reported in the data tables. Non-linear trends were labeled with (NL) next to the slope.

Poverty Status and County Urbanity Classifications:

- County urbanity was derived from county of residence reported by Ohio Behavioral Risk Factor Surveillance System respondents. County urbanity classifications were based on a combination of proximity and connectedness to urban core economic development area and definitions of Appalachian counties established by the Appalachian Development Commission. See Appendix 11 for a map with county classifications.
- Poverty status was derived from household income and household composition reported by Ohio Behavioral Risk Factor Surveillance System respondents. Respondents were grouped into categories based on the 2010 Federal Poverty Guidelines. See Appendix 12 for household income and composition thresholds.

Cost of Injuries:

- Fatal Injury costs were calculated by multiplying the number of injury deaths in Ohio by the average cost associated the death for Ohio published on the CDC's
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WISQARS website. See Appendix 8 for average cost estimates by mechanism and intent.

- Non-fatal injury costs for hospitalizations were calculated by multiplying the number of hospitalizations by the average cost associated with hospitalizations for the United States published on the CDC's WISQARS website. See Appendix 9 for average cost estimates by mechanism and intent.
 - Non-fatal injury costs for ED visits were calculated by multiplying the number of ED visits by the average cost associated with ED visits for the United States published on the CDC's WISQARS website. See Appendix 10 for average cost estimates by mechanism and intent.
 - Total injury costs were calculated by adding the estimated costs for injury deaths, hospitalizations and ED visits.
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APPENDIX 3: LIMITATIONS OF INJURY SURVEILLANCE DATA

Death Certificate Data:

- The cause of death reported on the death certificate is based on the underlying cause of death determined by a physician or coroner. While physicians and coroners are well trained to investigate and determine causes of death, a standardized process for investigating and determining causes of death does not exist in Ohio. This lack of uniformity may lead to differences in how underlying causes of death are classified and pose limitations for comparing rates across local jurisdictions.

Hospital Discharge Data:

- In each year of the study period, approximately 30 percent of injuries treated in the as inpatients and emergency departments were not assigned an external cause code (E-code). This most likely resulted in an underestimate of total costs and incidence rates, because not all mechanism and intents for injuries could be identified and included in the analysis by mechanism.
- Of the non-fatally injured, only those who sought medical care were captured for this analysis.
- Discharges, not individuals, were the unit of measurement, thereby resulting in duplication when readmissions for the same initial event occurred. The inclusion of readmissions would lead to an overestimate of incidence rates.
- Race and ethnicity are largely incomplete in the hospital discharge data and were not included in the analysis.
- Ohio residents treated in out-of-state hospitals are not consistently included, thereby affecting rates, particularly of border counties.
- Severity of injury is assumed based on type of medical treatment received (i.e., inpatient treatment is for more severe injuries than ED visits).

Behavioral Risk Factor Data:

- Data from the Pregnancy Risk Assessment Monitoring System (PRAMS), Ohio Youth Risk Behavior Survey (YRBS) and Behavioral Risk Factor Surveillance System (BRFSS) are based on self-reported behaviors by respondents. The accuracy of self-reported data depends on the respondents' ability to recall and willing to report the information. Self-reported data can lead to overestimates or underestimates of the true prevalence in the population depending on the topic being asked.
 - Results from Ohio YRBS represent a random sample of students enrolled in high schools in Ohio. The results do not represent high school age youth who have dropped out of school.
 - Results from the Ohio BRFSS represent a random sample of non-institutionalized adults ages 18 or older in Ohio with a landline in their home. The BRFSS excludes institutionalized adults and adults living in cell phone only households.
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