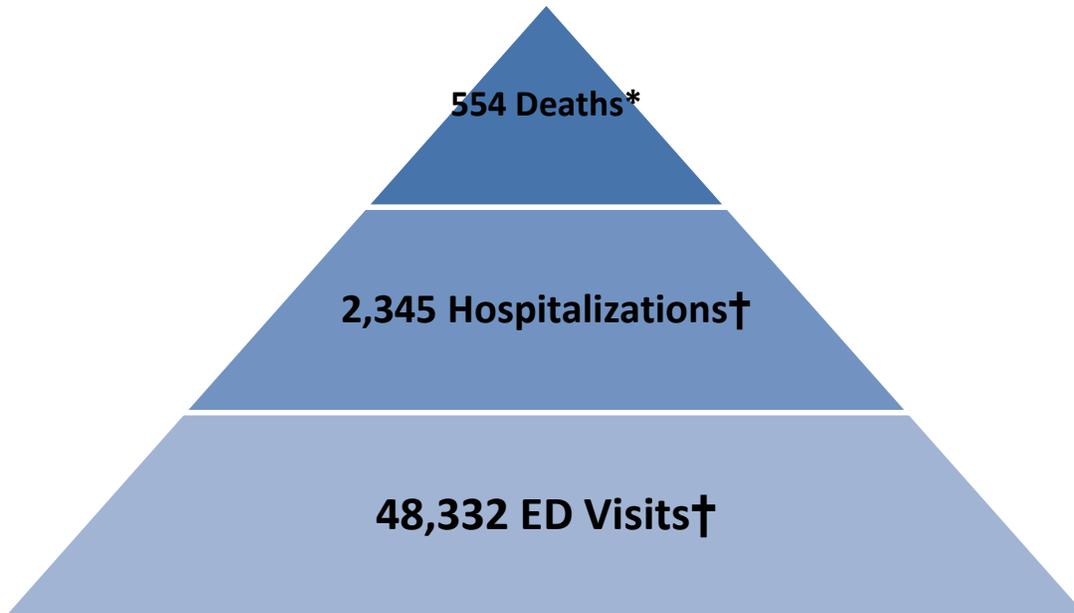


SECTION 4.2: HOMICIDES AND ASSAULTS



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

† SOURCE: OHIO HOSPITAL ASSOCIATION

CHAPTER HIGHLIGHTS:

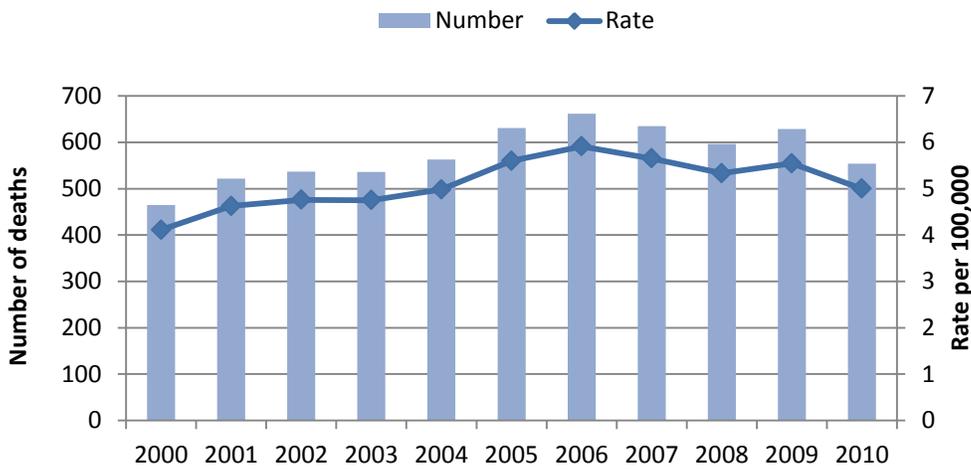
Patterns:

- Significant disparities were found in homicide rates by race and sex. Blacks were 10 times more likely to die from homicides than whites. Males were 4 times more likely to die from homicides than females.
- Highest rates of homicides and assaults were found among males ages 15-34.
- Firearms were the most common cause of homicide and assault related hospitalizations while fighting was the most common cause of assault related ED visits.
- 1 in 3 high school students reported being in a physical fight during the last 12 months.

Trends:

- Disparities in homicide rates by race and sex have increased since 2000.
- Hospitalization rates increased slightly while ED visits increased 50 percent.
- The largest increases in homicides and assault related ED visits were found among males ages 25-34
- Firearms were the most common cause of homicide and assault related hospitalizations while fighting was the most common cause of assault related ED visits throughout the study period.
- Percentage of high school students who reported being in a physical fight decreased since 1997.

Figure 12.1 Number and age adjusted rate for homicides by year, Ohio, 2002-2010



Source: Ohio Department of Health, Office of Vital Statistics

DEATHS:

In 2010, 554 homicides occurred in Ohio. The homicide rate was 5.0 per 100,000 (Figure 12.1). Rates varied significantly by sex, age, and race. Homicide rates were 4 times higher among males (8.0 per 100,000) compared to females (2.1 per 100,000). The highest rates were found among ages 25-34 (11.3 per 100,000) followed by ages 15-24 (9.1 per 100,000). A significant disparity in rates was found by race. Blacks were 10 times more likely to die from a homicide than whites (22.7 per 100,000 compared to 2.2 per 100,000). See Table 12.1 for homicide risk profile.

The most common mechanisms associated with homicides were firearms (70 percent) followed by sharp objects (10 percent) and hanging (4 percent). Approximately 9 percent of homicides had an unspecified mechanism.

TRENDS:

Homicide rates increased from 4.0 per 100,000 in 2000 to 5.0 per 100,000 in 2010. While an increase in rates was observed, results from the trend analysis indicate that rates did not follow a consistent linear pattern throughout the period. Disparities in homicide rates increased by sex and race. Males were 2 times more likely than females to die from a homicide in 2000 and were 4 times more likely to die from a homicide than females in 2010 (data not shown). Blacks were 6 times more likely than whites to die from a homicide in 2000 and were 10 times more likely than whites to die from a homicide in 2010 (Figure 12.2). Firearms were the most common mechanism associated with homicides throughout the study period. The number of homicides associated with firearms increased by an average of 17 per year while homicides resulting from sharp objects,

Table 12.1 Homicide Risk Profile

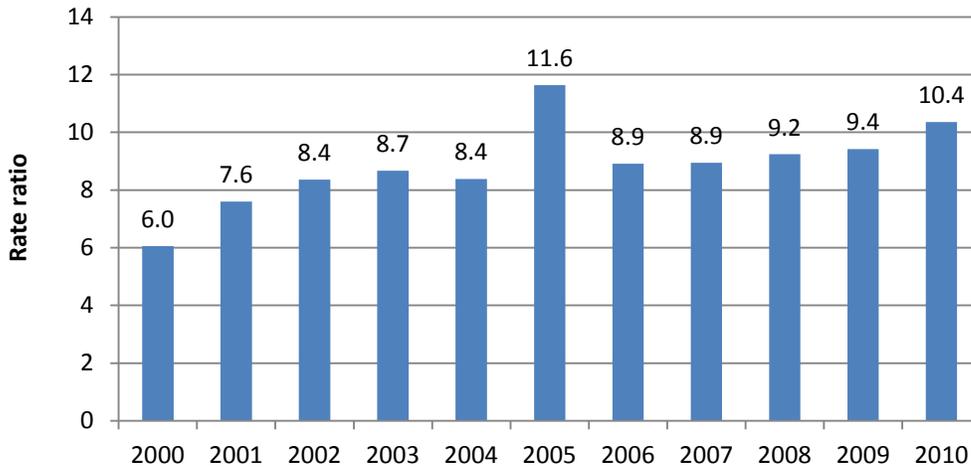
	2010 At Risk Groups	Annual Trend since 2000
Overall		Inconsistent
Sex	Males	Males (largest increase)
Age	25-34	25-34 (largest increase)
Race and ethnicity	Blacks	Blacks (largest increase)

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

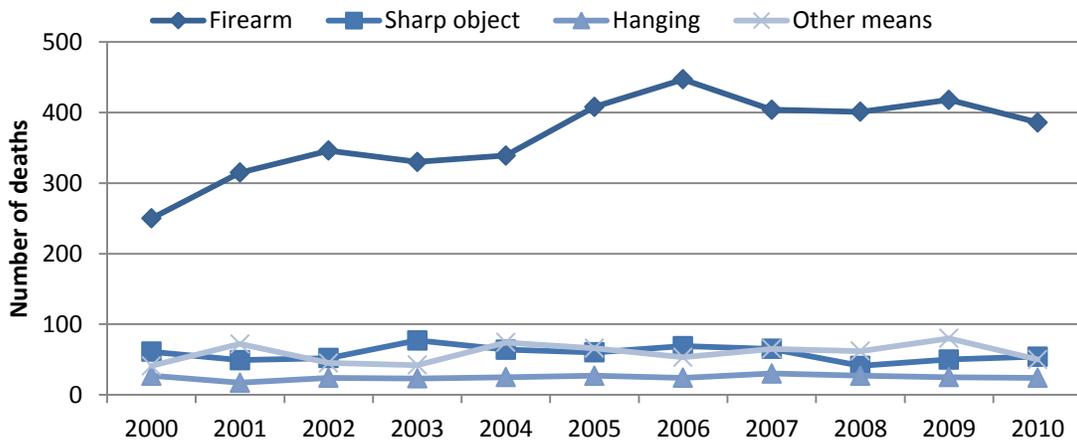
hanging, and other means did not follow a consistent trend (Figure 12.3). See Tables 44a-c located at the end of the section for more detailed information on homicides.

Figure 12.2. Black to white homicide rate ratio by year, Ohio, 2000- 2010



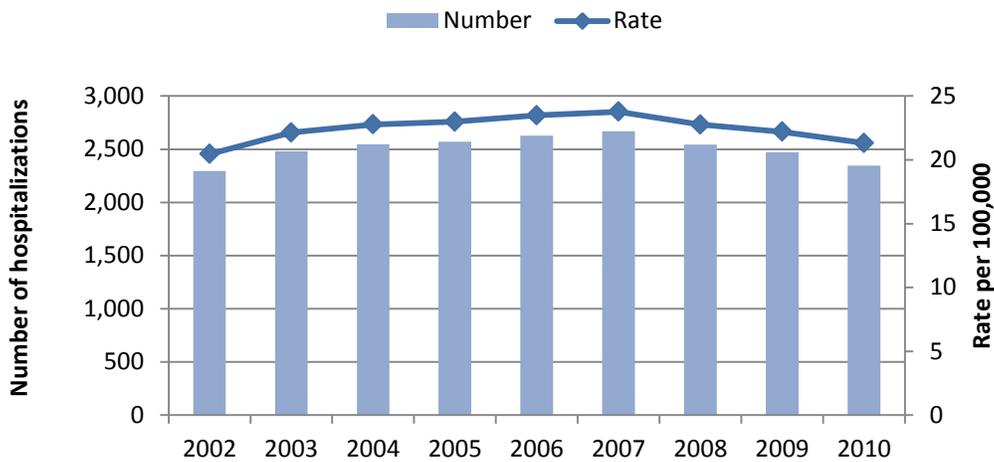
Source: Ohio Department of Health, Office of Vital Statistics

Figure 12.3. Number of homicides by mechanism and year, Ohio, 2000-2010



Source: Ohio Department of Health, Office of Vital Statistics

Figure 12.4. Number and age adjusted rate for assault related hospitalizations by year, Ohio, 2002-2010



Source: Ohio Hospital Association

HOSPITALIZATIONS:

In 2010, approximately 2,300 hospitalizations resulted from assaults. The assault hospitalization rate was 21.3 per 100,000 (see Figure 12.4). The rate was 6 times higher among males (37 per 100,000) than females (6 per 100,000). Among males, the highest hospitalization rates were found among ages 15-34. Among females, the highest rates were found among infants less than 1 year of age (Figure 12.5). See Table 12.2 for an assault hospitalization risk profile.

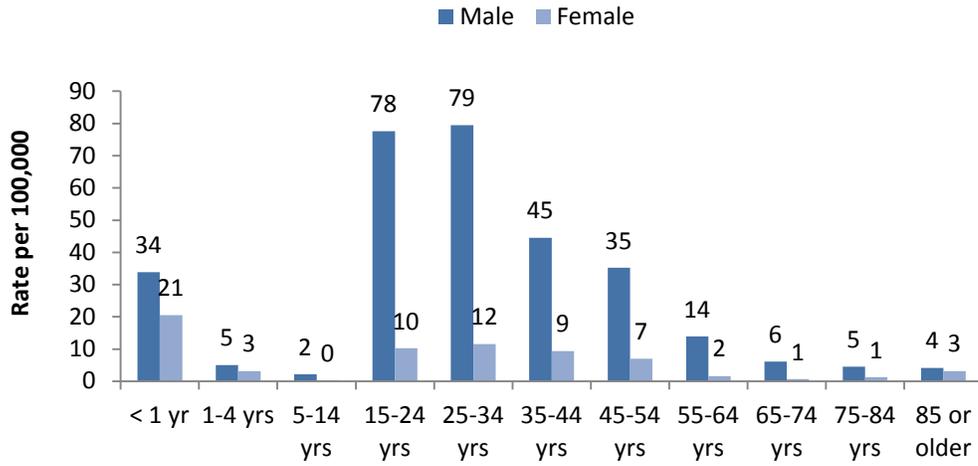
Table 12.2 Assault Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend Since 2002
Overall		Inconsistent
Sex	Males	Inconsistent
Age	15-34	Inconsistent

The leading mechanisms associated with assault related hospitalizations were firearms or explosives (27 percent), fights or brawls (24 percent), and cutting or piercing (14 percent). An additional 31 percent of hospitalizations listed other or unspecified mechanisms (Figure 12.6).

TRENDS:

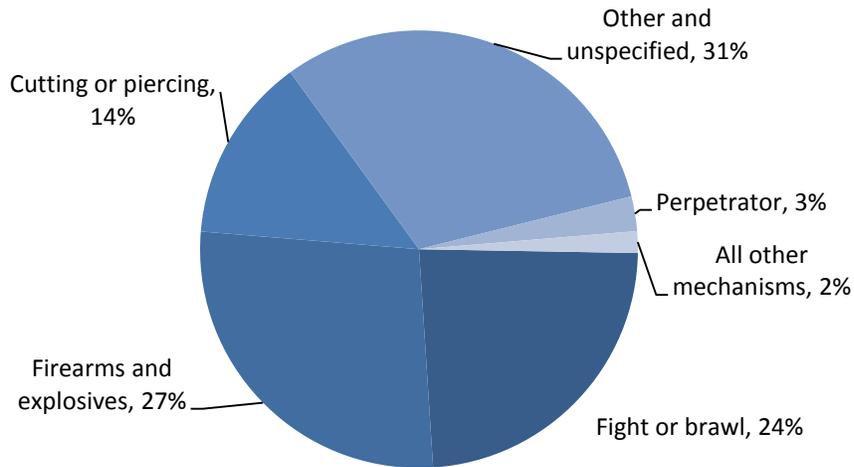
The assault related hospitalization rate increased slightly from 20.5 per 100,000 in 2002 to 21.3 per 100,000 in 2010. While a slight increase was found, rates did not follow a consistent pattern. Inconsistent patterns were also found among males, females, and all age groups. Firearms, fights, cuts or pierces, and other or unspecified means were the most common mechanisms associated with assault related hospitalizations throughout the study period. However, none of the leading mechanisms followed a consistent trend. See Tables 45a-c located at the end of this section for more detailed information about assault related hospitalizations in Ohio.

Figure 12.5. Hospitalization rates for assaults by age and sex, Ohio, 2010



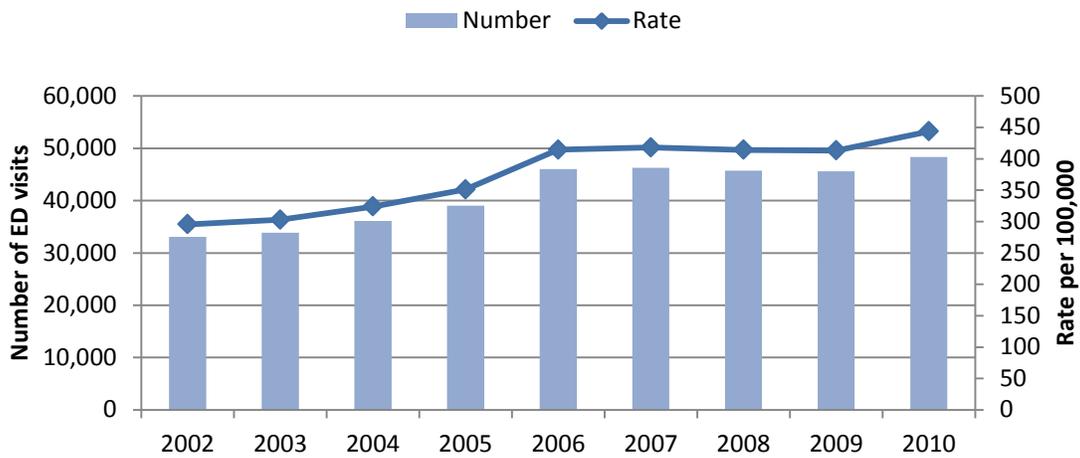
Source: Ohio Hospital Association

Figure 12.6. Distribution of hospitalizations resulting from assaults, by mechanism, Ohio, 2010



Source: Ohio Hospital Association

Figure 12.7. Number and age adjusted rate for assault related ED visits by year, Ohio, 2002-2010



Source: Ohio Hospital Association

EMERGENCY DEPARTMENT VISITS:

Approximately 48,000 ED visits were associated with assaults in 2010. The ED visit rate was 444 per 100,000 (Figure 12.7). ED visit rates were higher among than females throughout the lifespan. ED visits increased from birth through age 24 and then steadily decreased after age 25 (Figure 12.8). See Table 12.3 for an assault ED visit risk profile.

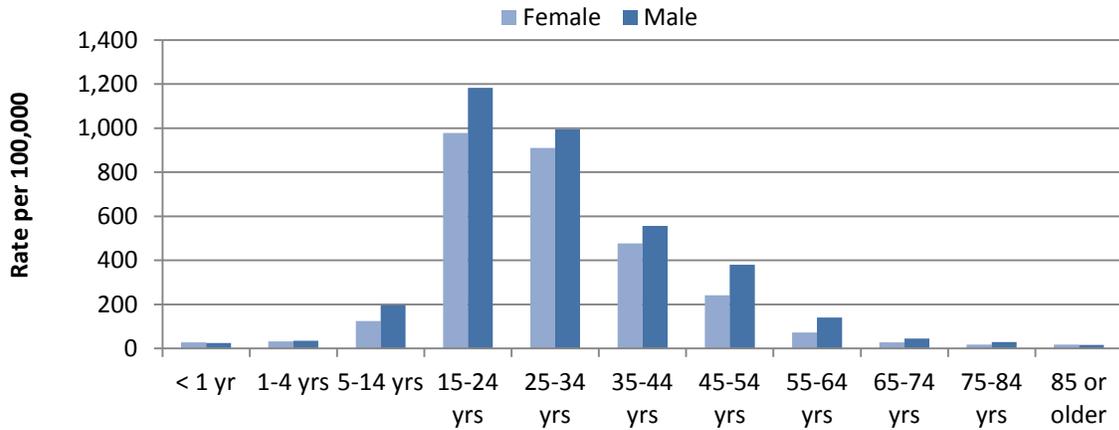
Nearly one-half of assault related ED visits were associated with fights or brawls (43 percent) and 42 percent were associated with other or unspecified reasons.

Table 12.3 Assault ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		+50%
Sex	Males	Males (largest increase)
Age	15-24	25-34 (largest increase)

TRENDS:

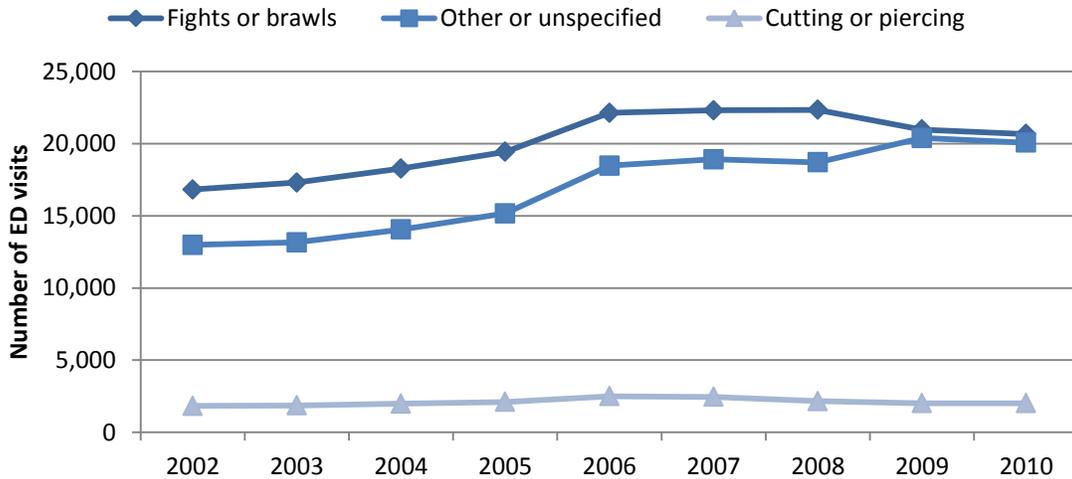
Assault related ED visits increased 50 percent from 296 per 100,000 in 2002 to 444 per 100,000 in 2010. Rates increased by an average of 20 per 100,000 per year. The average annual increase was slightly larger among males (26 per 100,000 per year) than females (20 per 100,000 per year). The largest annual increases were found among ages 25-34 (48 per 100,000 per year) and ages 15-24 (44 per 100,000). The largest annual increases in the number of ED visits resulted from other or unspecified means (1,056) and fights or brawls (623 per year). The number of ED visits resulting cuts or pierces did not follow a consistent linear trend (Figure 12.9). See Tables 46a-c located at the end of this section for more detailed information on assault related ED visits.

Figure 12.8. ED visit rates resulting from assaults by age and sex, Ohio, 2010



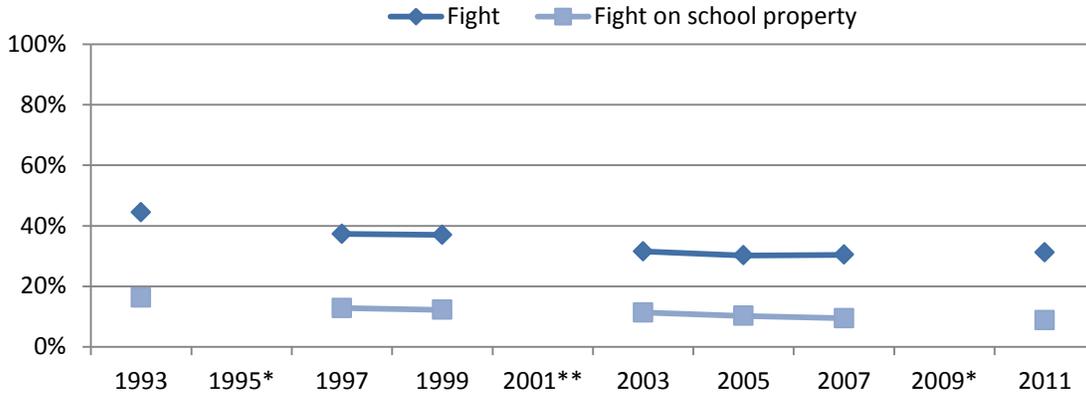
Source: Ohio Hospital Association

Figure 12.9 Number of ED visits resulting from assaults, by mechanism and year, Ohio, 2002-2010



Source: Ohio Hospital Association

Figure 12.10. Percentage of high school students who reported a physical fight and a fight on school property in last 12 months, Ohio, 1993-2011



Source: Ohio Youth Risk Behavior Survey. **Data not collected.

*Suppressed due to poor response rate.

PHYSICAL FIGHTING AMONG HIGH SCHOOL STUDENTS

In 2011, Approximately 1 in 3 high school students reported being in a physical fight in the last 12 months (Figure 12.10). Males were more likely than females to report physical fighting (38 percent versus 24 percent). Students in 9th grade (28 percent) were more likely to report being in a physical fight than students in 12th grade (21 percent). Hispanic students (45 percent) were more likely to report being in a physical fight than white, non-Hispanic students (29 percent) (Figure 12.11). See Table 12.4 for a youth physical fight risk profile.

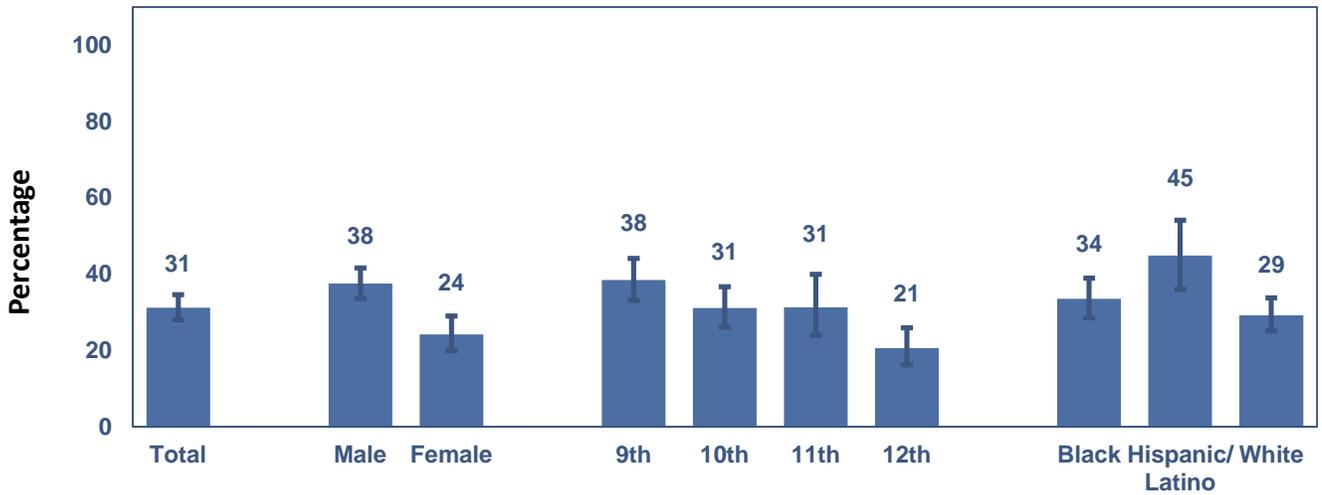
Since 1997, the percentage of students who reported being in a physical fight decreased 16 percent. The largest decreases in physical fighting were reported among female, 10th grade, and black non-Hispanic students (Figure 12.10).

	2011 At Risk Groups	Trend since 1997
Overall	31%	Decrease (-16%)
Sex	Males	Females (-19%)
Grade	9 th grade	10 th grade (-20%)
Race and ethnicity	Hispanic	Blacks (-26%)

In 2011, approximately 1 in 12 or 9 percent of high school students reported being in a physical fight on school property in the last 12 months (Figure 12.10). Males were nearly two times more likely than females to report being in physical fight (11 percent versus 6 percent). Students in 9th grade (13 percent) were approximately 2 times more likely to report being in a physical fight than students in 12th grade (6 percent). Black non-Hispanic students (13 percent) were more likely to report being in a physical fight than white, non-Hispanic students (8 percent) (Figure 12.12).

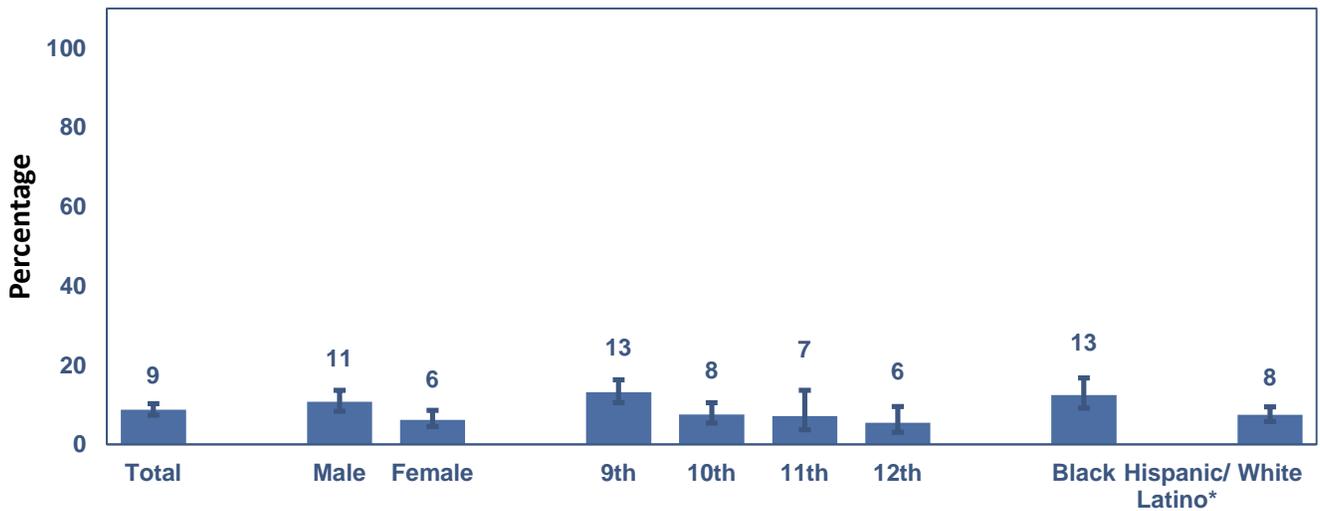
Fighting on school property followed a similar trend as physical fighting among youth as a whole with a 31 percent decrease since 1997.

Figure 12.11. Percentage of high school students who reported being in a physical fight in last 12 months, Ohio 2011



Source: Ohio Youth Risk Behavior Survey

Figure 47c. Percentage of high school students who reported being in a physical fight on school property in last 12 months, Ohio 2011



Source: Ohio Youth Risk Behavior Survey

*Suppressed due to poor response rate.

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 44a. Number of deaths resulting from assaults, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	465	522	537	536	563	631	662	635	597	629	554
Sex											
Males	313	373	387	406	421	479	506	491	465	486	436
Females	152	149	150	130	142	152	156	144	132	143	118
Age											
< 1 yr	7	17	16	17	10	14	14	11	16	13	14
1-4 yrs	18	23	18	16	12	11	19	25	17	23	16
5-14 yrs	22	14	9	9	11	20	26	10	7	16	6
15-24 yrs	104	125	146	160	156	171	168	160	159	147	145
25-34 yrs	95	115	126	132	133	168	167	174	157	165	159
35-44 yrs	88	108	100	87	102	102	124	103	102	90	79
45-54 yrs	66	66	57	64	77	84	80	97	72	88	69
55-64 yrs	21	19	30	21	27	33	35	25	32	52	36
65-74 yrs	22	20	16	13	17	18	12	18	14	16	19
75-84 yrs	17	10	16	12	15	8	10	9	19	10	8
85 or older	5	5	<5	5	<5	<5	7	<5	<5	9	<5
Race and ethnicity											
White‡	246	240	235	224	236	217	268	255	234	247	202
Black‡	207	264	285	288	289	383	363	351	336	352	335
Hispanic	6	11	7	22	30	23	23	24	23	29	12
Other‡	<5	5	6	0	<5	6	6	5	<5	<5	5

‡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 44b. Death rates per 100,000 resulting from assaults, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	4.1	4.6	4.8	4.8	5.0	5.6	5.9	5.7	5.3	5.5	5.0	0.11 (NL)
Sex†												
Males	5.6	6.7	7.0	7.3	7.5	8.5	9.1	8.8	8.4	8.7	8.0	0.26
Females	2.6	2.6	2.6	2.3	2.5	2.7	2.7	2.5	2.3	2.4	2.1	-0.01
Age												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	3.0	3.8	3.0	2.7	2.0	1.8	3.2	4.2	*	3.9	2.8	0.03 (NL)
5-14 yrs	1.3	*	*	*	*	*	*	*	*	1.1	*	*
15-24 yrs	6.7	8.0	9.2	10.1	9.8	10.8	10.6	10.2	10.1	9.4	9.1	0.19 (NL)
25-34 yrs	6.3	7.7	8.5	8.9	9.0	11.4	11.4	11.9	10.7	11.2	11.3	0.49
35-44 yrs	4.9	6.1	5.7	5.1	6.1	6.2	7.6	6.4	6.5	5.9	5.3	0.08 (NL)
45-54 yrs	4.2	4.0	3.5	3.8	4.5	4.9	4.6	5.5	4.1	5.0	4.0	0.07 (NL)
55-64 yrs	2.1	*	2.8	1.9	2.3	2.7	2.8	1.9	2.4	3.8	2.5	0.07 (NL)
65-74 yrs	2.8	2.6	*	*	*	*	*	*	*	*	*	*
75-84 yrs	*	*	*	*	*	*	*	*	*	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*	*	*
Race and ethnicity†												
White‡	2.6	2.5	2.5	2.4	2.5	2.3	2.8	2.7	2.5	2.6	2.2	<-0.01 (NL)
Black‡	15.4	19.1	20.5	20.5	20.7	27.0	25.3	24.2	23.1	24.1	22.7	0.7
Hispanic	*	*	*	8.6	9.7	8.4	7.2	6.6	8.5	7.4	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

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

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 44c. Number of deaths resulting from assaults, by cause and year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Drugs or biologic substances	0	0	<5	<5	<5	5	<5	<5	<5	<5	0	0%	*
Gases and vapors	5	<5	0	<5	10	<5	0	0	6	<5	0	0%	*
Unspecified chemicals	0	<5	0	0	0	0	0	0	0	0	0	0%	*
Hanging	27	17	24	23	25	27	24	30	27	25	24	4%	*
Drowning	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	*	*
Firearm	250	315	346	330	339	408	447	404	401	418	386	70%	14
Explosive material	0	0	0	0	0	0	<5	0	0	0	0	0%	*
Smoke, fire, or flames	16	<5	16	12	11	13	19	10	15	6	6	1%	*
Sharp object	61	49	52	77	64	60	69	65	41	50	54	10%	-0.75
Blunt object	<5	<5	<5	<5	<5	<5	<5	7	<5	0	0	0%	*
Pushing	<5	0	0	0	<5	<5	0	0	<5	<5	0	0%	*
Motor vehicle crash	9	10	<5	<5	<5	0	0	<5	0	0	<5	*	*
Bodily force	<5	10	<5	11	<5	<5	<5	<5	<5	<5	<5	*	*
Negligence or abandonment	<5	5	<5	<5	0	0	0	0	<5	<5	0	0%	*
Other maltreatment	8	12	13	9	9	10	8	12	10	16	9	2%	*
Other means	30	7	22	15	5	21	19	22	19	12	8	1%	*
Unspecified means	41	72	45	42	74	66	53	65	62	80	50	9%	1.39 (NL)
Sequelae of assault	8	13	<5	5	13	12	12	12	5	9	10	2%	*

*Suppressed due less than 20 deaths.

NL: Interpret with caution, does not follow linear trend ($R^2 < 0.5$)

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 45a. Number of hospitalizations resulting from assaults by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	2,295	2,480	2,547	2,572	2,628	2,668	2,543	2,473	2,345
Sex									
Males	1,909	2,077	2,113	2,179	2,198	2,257	2,110	2,069	2,002
Females	386	403	434	393	430	411	433	404	343
Age									
< 1 yr	63	70	64	62	84	86	76	76	38
1-4 yrs	35	35	30	34	38	39	50	37	24
5-14 yrs	23	31	29	39	52	41	29	35	19
15-24 yrs	693	709	729	798	740	760	741	763	705
25-34 yrs	565	599	641	604	605	632	634	601	640
35-44 yrs	512	568	570	525	527	478	449	434	397
45-54 yrs	295	343	349	351	387	472	375	359	363
55-64 yrs	57	73	81	96	120	104	125	115	110
65-74 yrs	24	22	24	36	32	31	27	27	27
75-84 yrs	23	17	22	22	28	16	24	14	14
85 or older	5	13	8	5	15	9	13	12	8

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 45b. Hospitalization rates per 100,000 resulting from assaults by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	20.5	22.1	22.8	23.0	23.5	23.8	22.8	22.2	21.3	0.07 (NL)
Sex†										
Males	34.2	37.3	38.0	39.0	39.3	40.2	37.8	37.1	36.5	0.16 (NL)
Females	6.9	7.2	7.7	7.0	7.6	7.4	7.7	7.2	6.2	-0.03 (NL)
Age										
< 1 yr	42.8	47.5	42.9	42.3	56.7	56.7	49.8	51.4	27.3	-0.36 (NL)
1-4 yrs	5.8	5.9	5.0	5.7	6.5	6.6	8.5	6.3	4.1	0.04 (NL)
5-14 yrs	1.4	1.9	1.8	2.5	3.4	2.7	1.9	2.3	*	*
15-24 yrs	43.8	44.5	45.7	50.1	46.8	48.3	47.1	48.8	44.4	0.28 (NL)
25-34 yrs	38.3	40.8	43.9	41.4	41.5	43.3	43.3	40.7	45.4	0.48 (NL)
35-44 yrs	29.3	33.3	34.0	31.9	32.5	30.0	28.9	28.6	26.8	-0.61 (NL)
45-54 yrs	17.9	20.5	20.6	20.4	22.3	27.0	21.4	20.5	20.8	0.33 (NL)
55-64 yrs	5.3	6.5	6.9	7.9	9.5	8.0	9.4	8.3	7.6	0.33 (NL)
65-74 yrs	3.1	2.9	3.1	4.7	4.2	4.0	3.3	3.2	3.2	0.02 (NL)
75-84 yrs	4.2	*	4.0	4.0	5.1	*	4.5	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*

*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

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 45c. Number of hospitalizations resulting from assaults by type and year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Fight or brawl	513	525	489	511	478	578	574	530	555	24%	7 (NL)
Rape	6	6	13	5	14	6	15	8	<5	*	*
Corrosive substance	<5	<5	5	<5	<5	<5	<5	0	<5	*	*
Poisoning	4	13	9	<5	15	5	<5	<5	9	0%	*
Strangulation	<5	<5	7	<5	7	<5	<5	9	5	0%	*
Drowning	0	<5	0	0	0	<5	0	0	0	0%	*
Firearms and explosives	534	577	610	691	747	647	629	649	640	27%	11 (NL)
Cutting or piercing	347	390	379	378	361	381	357	309	321	14%	-6 (NL)
Perpetrator of abuse	67	51	65	80	110	112	98	99	60	3%	*
Other and unspecified	807	894	934	868	869	904	840	841	729	31%	-10 (NL)
Late affects of injury by other person	17	19	36	29	25	29	23	24	21	1%	*

*Suppressed due to less than 20 hospitalizations.
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 46a. Number of ED visits resulting from assaults by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	33,109	33,897	36,150	39,063	46,029	46,272	45,736	45,583	48,332
Sex									
Males	20,404	20,669	22,212	23,945	28,479	28,493	27,861	27,120	26,744
Females	12,705	13,228	13,938	15,118	17,550	17,779	17,875	18,463	21,588
Age									
< 1 yr	22	30	23	21	34	29	35	23	37
1-4 yrs	119	122	140	133	141	151	148	155	199
5-14 yrs	2,194	2,182	2,216	2,349	2,701	2,481	2,551	2,318	2,459
15-24 yrs	12,267	12,893	13,448	14,526	17,092	16,645	16,797	16,838	17,169
25-34 yrs	8,390	8,351	9,108	9,832	11,672	12,089	11,793	12,345	13,425
35-44 yrs	6,354	6,287	6,725	7,048	7,893	7,983	7,527	7,077	7,645
45-54 yrs	2,828	3,057	3,402	3,914	4,794	5,247	5,123	5,128	5,394
55-64 yrs	594	674	779	891	1,286	1,221	1,294	1,311	1,537
65-74 yrs	197	176	183	220	260	297	293	270	304
75-84 yrs	104	91	88	101	112	89	123	85	122
85 or older	40	34	38	28	44	40	52	33	41

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 46b. ED visit rates per 100,000 resulting from assaults by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	296	303	324	351	414	418	414	413	444	19.5
Sex†										
Males	365	237	398	429	511	512	502	489	488	25.7
Females	227	237	250	273	318	324	326	337	399	19.9
Age										
< 1 yr	15	20	15	14	23	19	23	16	27	0.9 (NL)
1-4 yrs	20	20	24	22	24	26	25	26	34	1.4
5-14 yrs	136	137	140	151	176	164	170	155	162	3.9
15-24 yrs	775	808	843	912	1,080	1,057	1,069	1,076	1,082	43.8
25-34 yrs	569	570	623	675	801	827	806	835	952	47.5
35-44 yrs	364	368	401	428	487	501	484	466	517	19.0
45-54 yrs	172	183	201	228	276	300	293	292	310	18.9
55-64 yrs	55	60	67	73	102	94	97	95	106	6.5
65-74 yrs	26	23	24	29	34	38	36	32	36	1.7
75-84 yrs	19	16	16	18	20	16	23	16	23	0.4
85 or older	21	17	19	14	20	18	23	15	18	NL

†Rates are age adjusted to the 2000 U.S. standard population
 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 46c. Number of ED visit rates resulting from assaults by type and year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Fight or brawl	16,826	17,309	18,279	19,429	22,141	22,316	22,343	20,982	20,668	42.8%	623
Rape	516	378	342	416	457	435	420	492	484	1.0%	6 (NL)
Corrosive substance	25	23	23	29	46	30	41	27	31	0.1%	1 (NL)
Poisoning	46	41	46	47	66	35	42	33	48	0.1%	-1 (NL)
Strangulation	41	68	64	67	101	106	88	99	143	0.3%	10
Drowning	<5	5	<5	0	<5	<5	<5	0	0	0.0%	*
Firearms and explosives	484	522	722	821	1,184	1,018	1,059	706	737	1.5%	41 (NL)
Cutting or piercing	1,829	1,862	1,981	2,103	2,493	2,449	2,159	2,009	2,009	4.2%	31 (NL)
Perpetrator of abuse	0	0	0	0	0	0	0	0	3,292	6.8%	*
Other and unspecified	12,988	13,161	14,054	15,169	18,470	18,917	18,708	20,395	20,072	41.5%	1052
Late affects of injury by other person	357	532	639	987	1,073	967	877	841	848	1.8%	56 (NL)

*Suppressed due to small cell sizes.
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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Ohio Violence and Injury Prevention Program, Ohio Department of Health

- 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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Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

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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