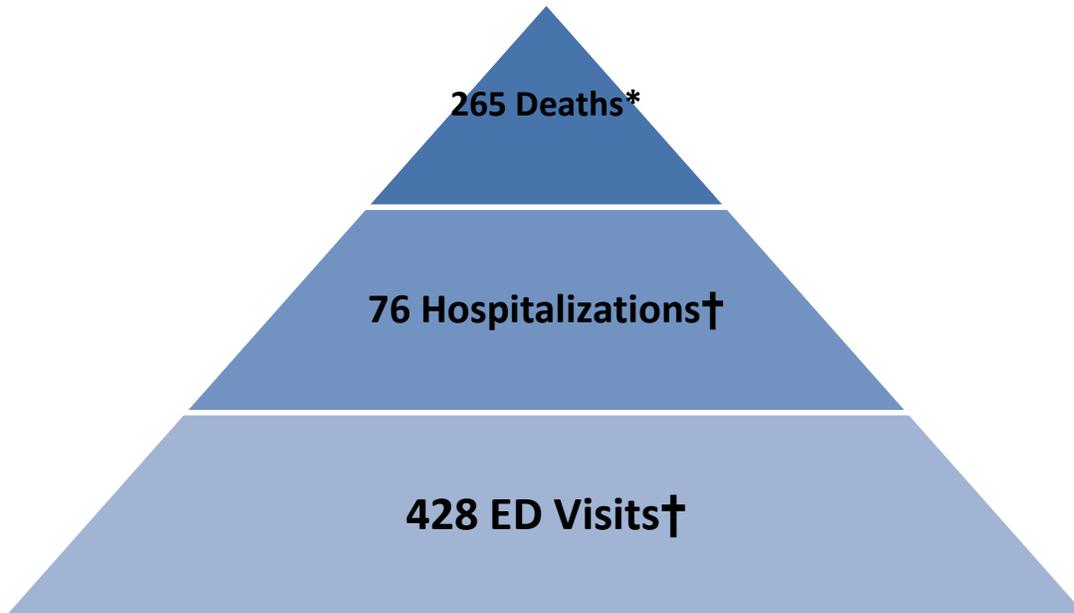


SECTION 3.6: SUFFOCATIONS



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

† SOURCE: OHIO HOSPITAL ASSOCIATION

CHAPTER HIGHLIGHTS:

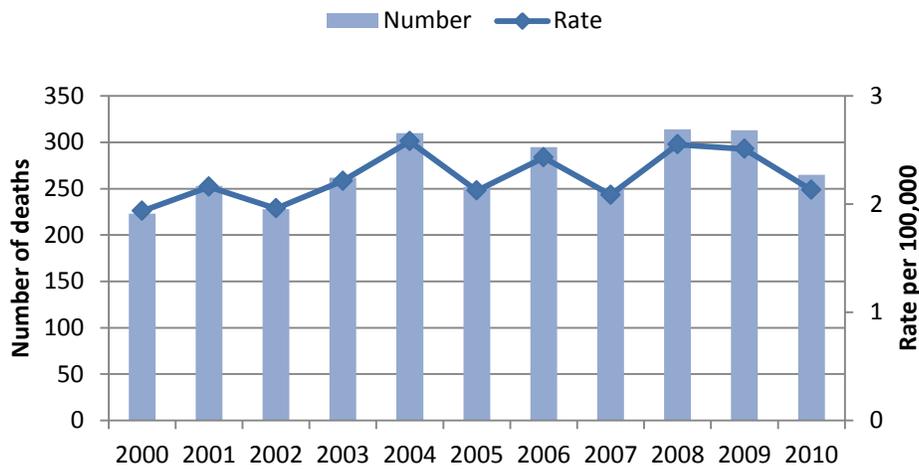
Patterns:

- Highest rates of fatal and non-fatal unintentional suffocations were found among children less than 5 years of age and adults 85 or older.
- Most fatal suffocations were caused by a non-food object for all ages while most fatal suffocations among infants occurred in a bed.
- Most non-fatal suffocations were caused by a non-food object for both children and adults.
- 29% of mothers reported unsafe sleeping practices with their infants.

Trends:

- Death and ED visit rates did not follow a consistent linear trend.
- Hospitalization rates have increased 46 percent since 2002.
- Death rates among infants increased 73 percent from 2000-2002 to 2008-2010.
- Fatal suffocations in bed and from food objects increased since 2000.
- Food and non-food objects have caused most non-fatal suffocations since 2002.
- 1 in 3 mothers reported unsafe sleep practices with their infants throughout the study period.

Figure 8.1. Number and age adjusted rate for unintentional suffocation deaths by year, Ohio, 2002-2010



Source: Ohio Hospital Association

DEATHS:

In 2010, 265 deaths resulted from unintentional suffocations in Ohio. The death rate was 2.1 per 100,000 (Figure 8.1). Males were more likely to die from suffocation than females (2.6 versus 1.8 per 100,000). The distribution of suffocation deaths varied by age. The highest rates were found among children less than 1 year (34.1 per 100,000) and adults ages 85 or older (30.6 per 100,000) (Figure 8.2). Suffocation fatality rates were similar among whites and blacks. See Table 8.1 for an unintentional suffocation death risk profile.

Nearly one-half of fatal suffocations were caused by the ingestion of non-food objects (49 percent). Food objects caused 22 percent of suffocations and 12 percent of suffocations were in bed (Figure 8.3).

Table 8.1 Unintentional Suffocation Death Risk Profile		
	2010 At Risk Groups	Annual trend since 2000
Overall		Inconsistent trend
Sex	Males	Inconsistent trend
Age	< 1 yr	< 1 year (+2/100,000)
Race and ethnicity	Similar among whites and blacks	Inconsistent trend

TRENDS:

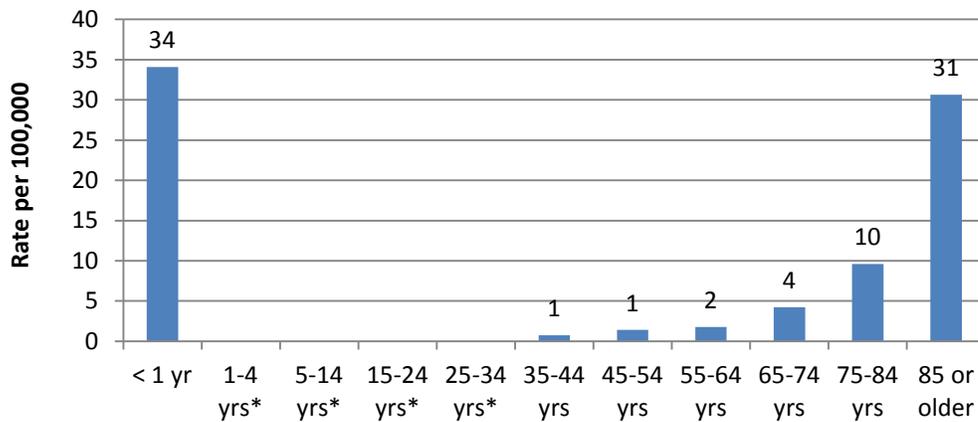
The suffocation death rate did not follow a consistent trend since 2000 (Figure 8.1). Death rates among males were consistently higher than females throughout the study period. Fatality rates among children less than 1 year and adults ages 85 or older were consistently higher than other age groups. The suffocation fatality rate for children less than 1 year of age increased while rates fluctuated up and down for other age groups. Non-food objects, food objects, and suffocation in bed were the most common mechanisms of suffocation throughout the study period. The number of fatal suffocations in bed and resulting from food objects

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

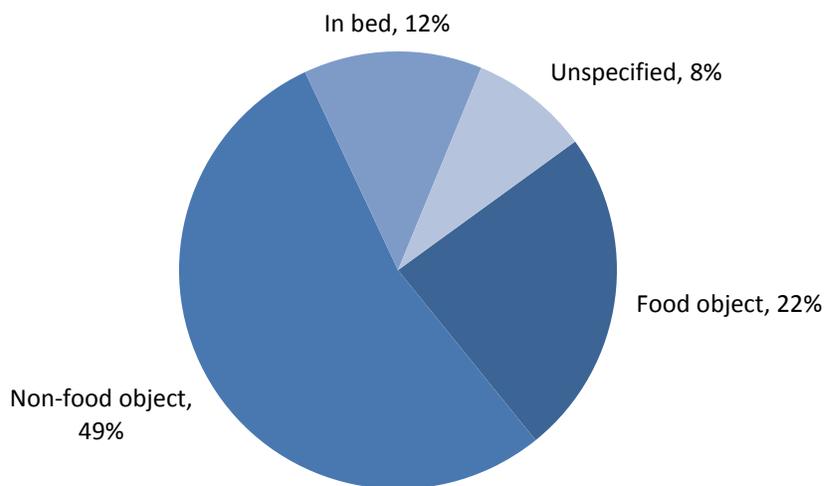
increased while suffocations resulting from ingestion of non-food objects fluctuated during the study period. See Tables 27a-c located at the end of this section for more detailed information on the number and rate of suffocation deaths in Ohio.

Figure 8.2. Rate of unintentional suffocation death rate by age group, Ohio, 2009-2010



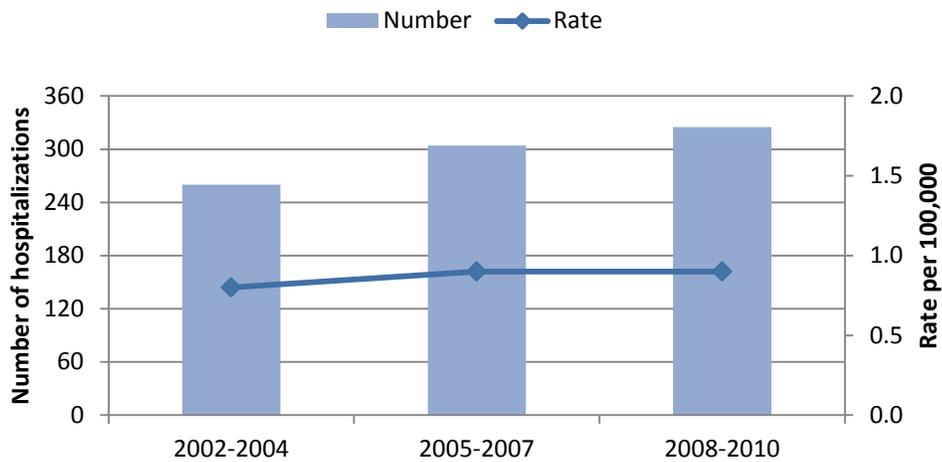
Source: Ohio Department of Health, Vital Statistics
*Rates suppressed due to small cell sizes

Figure 8.3. Distribution of deaths resulting from unintentional suffocations by object, Ohio, 2010



Source: Ohio Department of Health, Vital Statistics

Figure 8.4. Number and age adjusted rate for unintentional suffocation hospitalizations by year, Ohio, 2002-2010



Source: Ohio Hospital Association

HOSPITALIZATIONS:

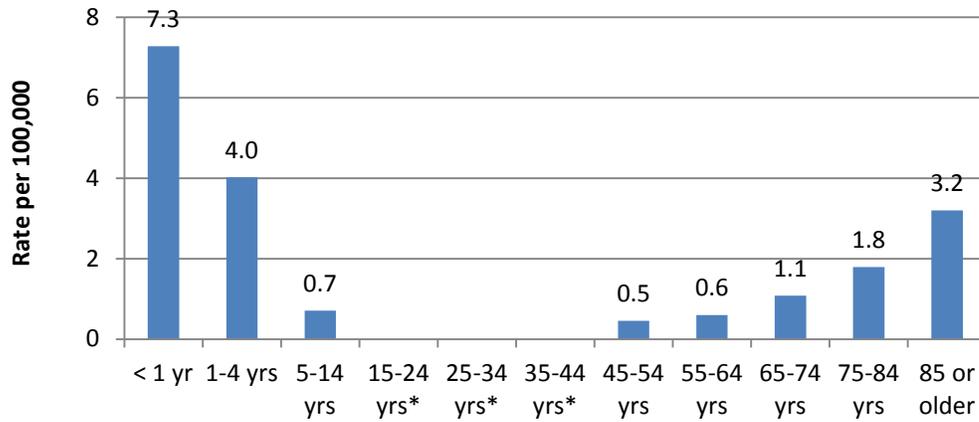
In 2008-2010, 325 hospitalizations resulted from unintentional suffocations. The suffocation hospitalization rate was 0.9 per 100,000 (Figure 8.4). The hospitalization rate was similar for males and females. The highest rates of hospitalizations were found among infants less than 1 year of age (7.3 per 100,000), children 1-4 years (4.0 per 100,000), and adults 85 or older (3.2 per 100,000). The lowest rates were found among individuals 5-54 years of age (Figure 8.5). Between 2008 and 2010, the majority of hospitalizations were caused by the ingestion or inhalation of a non-food object (54 percent) followed by ingestion or inhalation of a food object (41 percent) causing obstruction of the respiratory tract. Approximately 5 percent of hospitalizations were caused by unintentional mechanical suffocation.

Table 8.2 Unintentional Suffocation Hospitalization Risk Profile		
	2008-2010 At Risk Groups	Annual trend since 2002
Overall		+24%
Sex	Similar for males and females	Males (largest increase)
Age	< 1 year	1-4 (largest increase)

TRENDS:

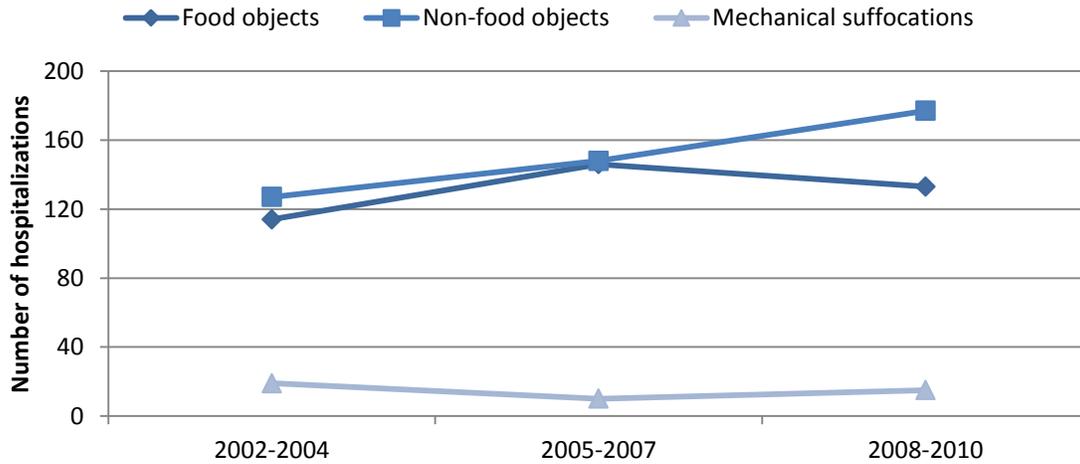
Hospitalization rates resulting from unintentional suffocations increased 24 percent from 0.75 per 100,000 in 2002-2004 to 0.93 per 100,000 in 2008-2010. An increase was found among males while rates did not change among females. Hospitalization rates increased among children ages 5-14 or younger and adults ages 45-54 65-74 while rates decreased among adults ages 75-84. The distribution in the causes of the suffocation changed between 2002-2004 and 2008-2010. Suffocations resulting from non-food objects increased and surpassed food objects as the leading cause of suffocation related hospitalizations (Figure 8.6). See Tables 28a-c for more detailed information on the number and rate of unintentional suffocation hospitalizations.

Figure 8.5. Rate of unintentional suffocation hospitalizations by age group, Ohio, 2008-2010



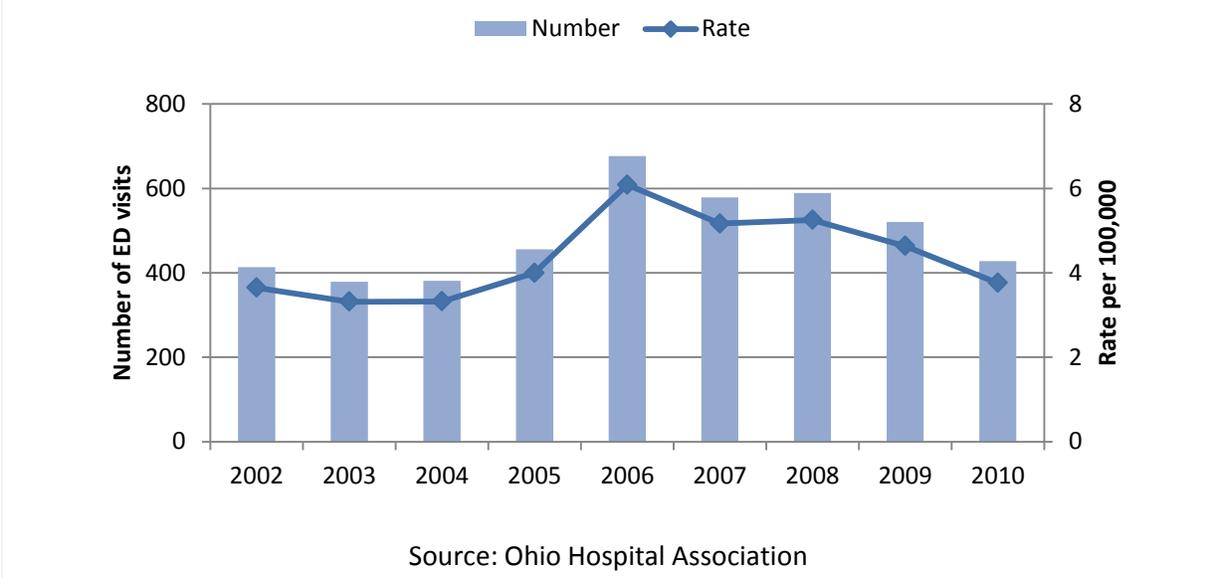
Source: Ohio Hospital Association
 *Rates suppressed due to small cell sizes

Figure 8.6. Number of hospitalizations resulting from unintentional suffocations by object, Ohio, 2002-2010



Source: Ohio Hospital Association

Figure 8.7. Number and age adjusted rate for unintentional suffocation ED visits by year, Ohio, 2002-2010



EMERGENCY DEPARTMENT VISITS:

Approximately 400 emergency department (ED) visits resulted from unintentional suffocations in 2010. The ED visit rate was 3.8 per 100,000 (Figure 8.7). The rate of unintentional suffocation ED visits was slightly higher among males compared to females (4.1 versus 3.4 per 100,000). The distribution of ED visits by age is bimodal with the highest rates occurring among children 4 years of age or younger and adults ages 85 or older. Rates of ED visits among individuals between ages 5 and 74 were low (Figure 8.8). See Table 8.3 for an unintentional suffocation ED visit risk profile.

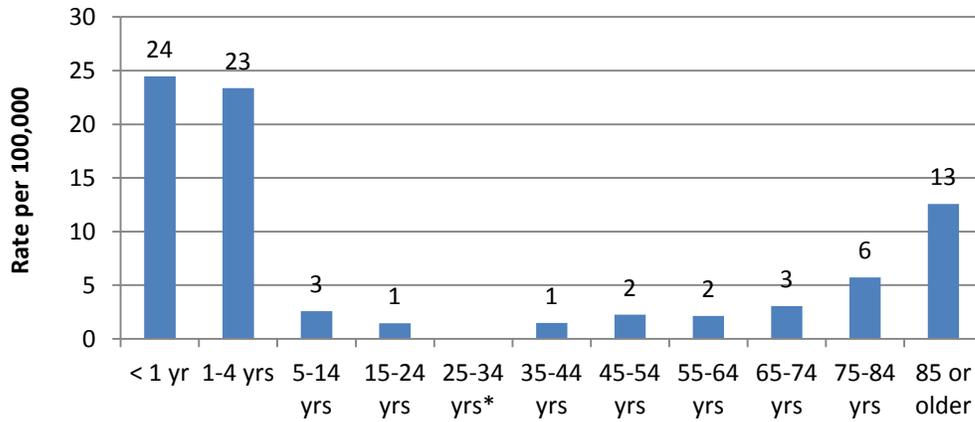
	2010 At Risk Groups	Annual Trend since 2002
Overall		Inconsistent trend
Sex	Males	Similar for males and females
Age	0-4 yrs	Inconsistent trend

The majority of the suffocation ED visits resulted from inhalation or ingestion of a non-food (50 percent) or a food object (44 percent) that caused an obstruction in the respiratory tract. Approximately 5 percent were caused by an unintentional mechanical obstruction (Figure 8.9).

TRENDS:

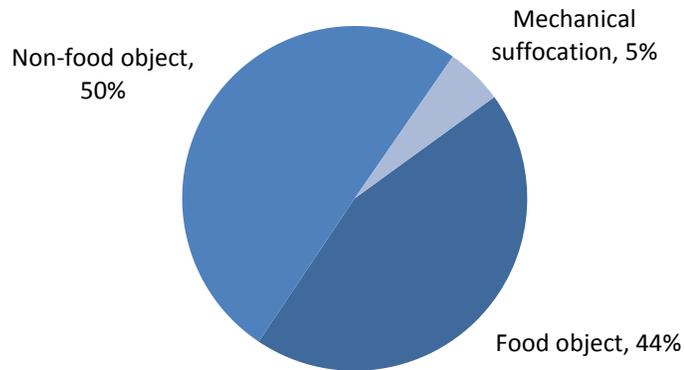
ED visit rates resulting from unintentional suffocations fluctuated throughout the study period but did not follow a consistent linear trend. This pattern was consistent among males and females as well as across all age groups. The distribution in the cause of the suffocation resulting in an ED visit did not change between 2002 and 2010. Food and non-food objects caused approximately 95 percent of suffocations throughout the study period. See Tables 29a-c located at the end of this section for more detailed information on the number and rate of unintentional suffocation ED visits.

Figure 8.8. ED visit rates per 100,000 for unintentional suffocations by age, Ohio, 2008-2010



Source: Ohio Hospital Association
*Rates suppressed due to small cell sizes

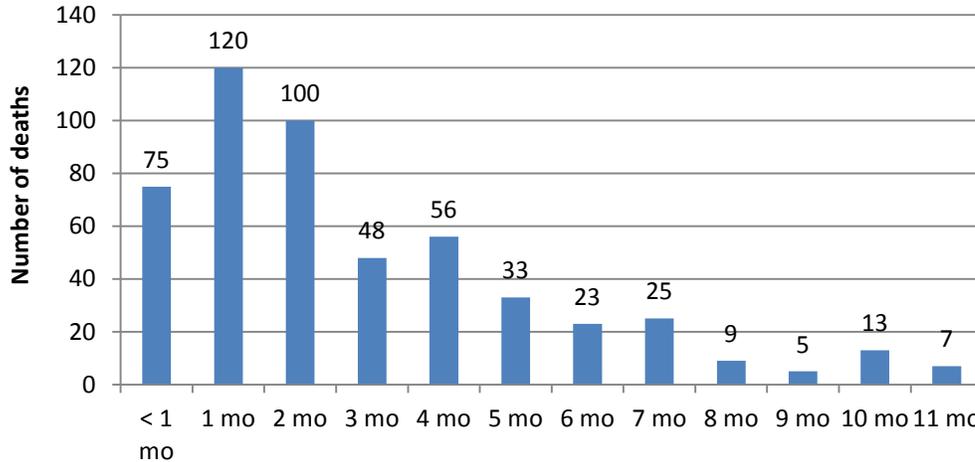
Figure 8.9. Distribution of ED visits resulting from unintentional suffocations by object, Ohio, 2010



Source: Ohio Hospital Association

SECTION 3.6A: INFANT SLEEP RELATED SUFFOCATION

Figure 8.10. Number of unintentional suffocation deaths among infants by age in months, Ohio, 2000-2010



Source: Ohio Department of Health, Vital Statistics

FINDINGS FROM DEATH CERTIFICATES

Nearly 500 infants less than 1 year of age died from an unintentional suffocation between 2000 and 2010. Most of the deaths occurred among males and infants aged 3 months or younger (see Figure 8.10). While most infant suffocation deaths occurred among whites, the death rate among black infants (66 per 100,000) was three times higher than among white infants (22 per 100,000). See Table 8.4 for an infant unintentional suffocation death risk profile.

Sixty-seven percent (329 deaths) of the fatal suffocations occurred in a bed. Approximately 20 percent of the suffocation deaths were unspecified and 8 percent were caused by other listed threats to breathing. See Table 30 located at the end of this section for more detailed information on the number of infant suffocation deaths in Ohio.

Table 8.4 Infant Unintentional Suffocation Death Risk Profile

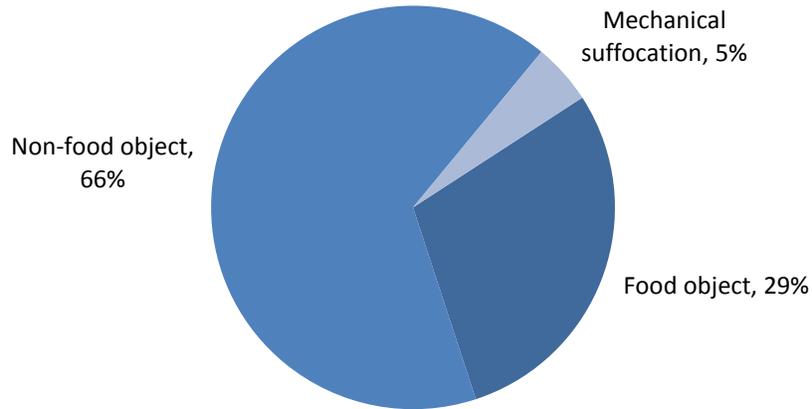
	2010 At Risk Groups
Sex	Males
Age	< 4 months old
Race and ethnicity	Blacks

FINDINGS FROM CHILD FATALITY REVIEW

Approximately 1,000 deaths among infants less than 1 year of age were reviewed by child fatality review teams in Ohio in 2006-2009. Sleep-related deaths (including those attributed to sudden infant death syndrome or SIDS) accounted for 14 percent (153 deaths) of the total infant deaths reviewed. Sleep related deaths were the second leading cause of death reviewed after prematurity. Fifty-eight percent of sleep related deaths occurred on locations considered to be unsafe such as adult beds and couches. Approximately one-half of the deaths occurred to infants who were sharing a sleeping surface with someone at the time of

the death. See Ohio Child Fatality Review Eleventh Annual Report for more detailed information on findings from child fatality review teams.

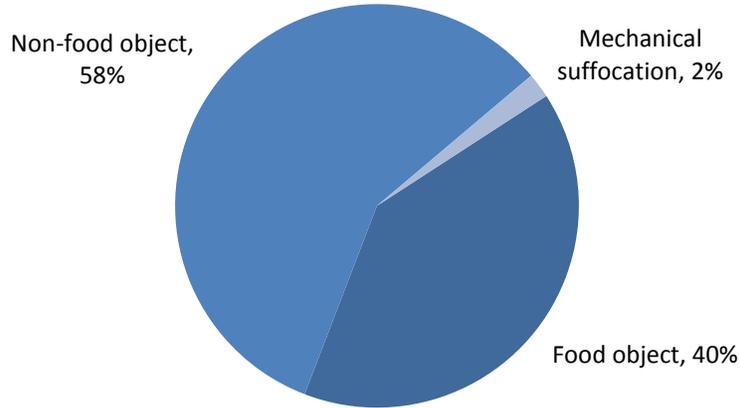
Figure 8.11. Distribution of hospitalizations resulting from unintentional suffocations by object among infants, Ohio, 2002-2010



HOSPITALIZATIONS:

Between 2002 and 2010, 103 hospitalizations resulted from an unintentional infant suffocation. Fifty-five percent of hospitalizations occurred among males while 45 percent were among females. Most suffocations were caused by a non-food object (66 percent) followed by a food object (29 percent) and a mechanical suffocation (5 percent) (Figure 8.11). Mechanical suffocations included suffocations that took place in a bed or cradle, were caused by a plastic bag, resulted from a lack of air in a closed place, or other specified means. See Table 31 located at the end of this section for more detailed information on unintentional suffocations among infants in Ohio.

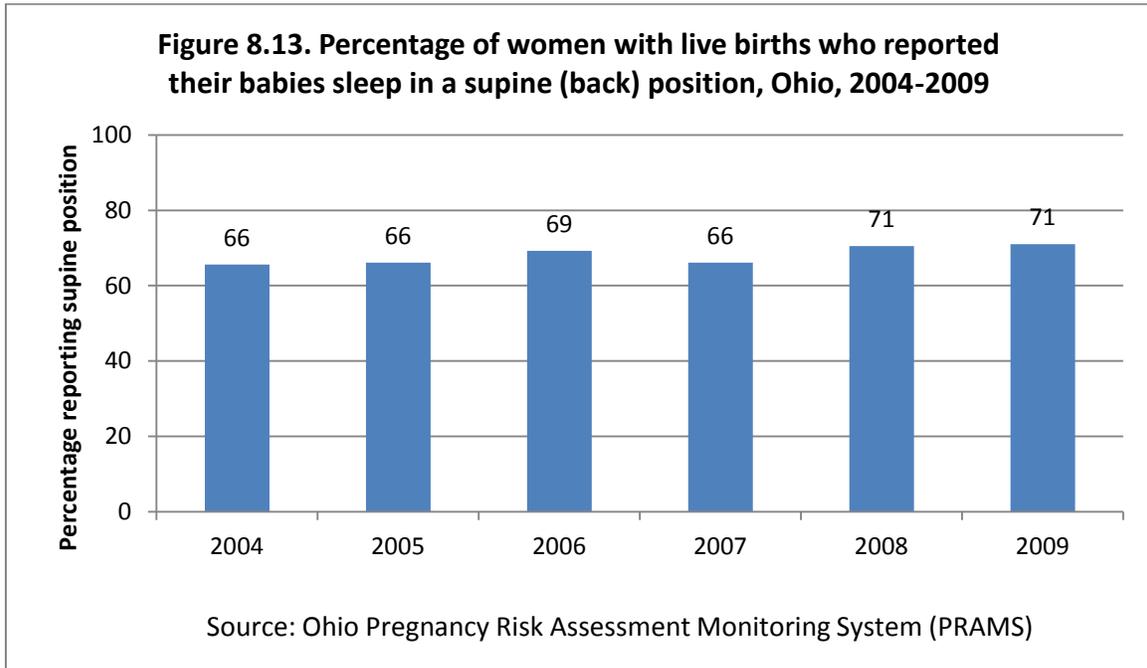
Figure 8.12. Distribution of ED visits resulting from unintentional suffocations by object among infants, Ohio, 2002-2010



EMERGENCY DEPARTMENT VISITS:

Between 2002 and 2010, 484 ED visits resulted from an unintentional suffocation among infants. The percentage of ED visits resulting from infant suffocations was similar among males (47 percent) than females (53 percent). Most ED visits resulting from infant suffocations were caused by a non-food object (58 percent) while 40 percent resulted from a food object and 2 percent resulted from a mechanical suffocation (Figure 8.12). See Table 32 for more detailed information on ED visits resulting from unintentional suffocations among infants.

SECTION 3.6B: SAFE SLEEPING PRACTICES



The American Academy of Pediatrics has developed recommendations for safe infant sleep practices and safe sleep environments. These recommendations include placing babies in a supine (back) sleep position in a crib free from toys, blankets, soft bedding and pillows. The supine position increases pulmonary function and oxygenation compared to the prone (stomach) position. Removing objects in the crib reduces the risk of the infant suffocating on those objects.²

The Ohio Pregnancy Risk Assessment Monitoring System (PRAMS) assesses infant sleep practices among women who have had a live birth. In 2009, 71 percent of women surveyed reported placing their infants in a supine sleep position. The percentage of women who reported putting their infants in a supine sleeping position varied by socio-demographic characteristics. The lowest rates of infant supine sleeping were found among mothers younger than 20 years of age, African Americans, unmarried, and completed less than 12 years of education.³ Infant sleep practices also varied by region in Ohio with highest percentage of supine sleeping found in the Toledo Region (77 percent) and the lowest percentage found in the Columbus Region (62 percent).⁴

Since 2004, the percentage of mothers placing their infants in a supine sleeping position has increased slightly from 66 percent in 2004 to 71 percent in 2009 (see Figure 8.13).⁵ See PRAMS Data Summary, 2004-2009 for more detailed information on safe sleeping practices reported by mothers in Ohio.

² American Academy of Pediatrics, Sudden Infant Death Syndrome Policy Recommendations

³ Ohio Department of Health, Infant Sleeping Position Fact Sheet, 2006-2008

⁴ Ohio Department of Health, Ohio PRAMS Regional Data Summary, 2006-2007

⁵ Ohio Department of Health, Ohio PRAMS Data Summary, 2004-2009

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 27a. Number of deaths resulting from unintentional suffocations, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	223	253	228	262	310	252	295	251	314	313	265
Sex											
Males	130	137	123	141	158	131	156	138	173	163	141
Females	93	116	105	121	152	121	139	113	141	150	124
Age											
< 1 yr	23	26	40	40	45	53	51	58	66	56	42
1-4 yrs	8	<5	<5	9	7	5	<5	10	<5	5	5
5-14 yrs	<5	8	6	<5	5	7	11	<5	<5	<5	<5
15-24 yrs	11	6	8	8	5	7	5	6	6	10	<5
25-34 yrs	6	8	<5	<5	7	7	7	<5	7	7	10
35-44 yrs	18	13	18	14	10	12	13	15	12	11	11
45-54 yrs	9	26	17	13	22	10	25	17	19	32	17
55-64 yrs	14	14	16	14	21	21	28	14	19	26	24
65-74 yrs	24	36	27	25	23	23	28	19	35	36	35
75-84 yrs	49	63	48	73	70	43	51	54	65	56	48
85 or older	58	49	42	62	95	64	72	52	80	72	68
Race and ethnicity											
White‡	188	214	187	229	262	210	241	210	252	266	226
Black‡	33	37	37	29	42	38	48	37	55	43	36
Hispanic	<5	0	<5	<5	<5	<5	5	<5	5	<5	<5
Other‡	0	<5	<5	<5	<5	<5	0	<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 27b. Death rates per 100,000 resulting from unintentional suffocations, by year, Ohio, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.9	2.2	2.0	2.2	2.6	2.1	2.4	2.1	2.6	2.5	2.1	<0.1 (NL)
Sex†												
Males	2.7	2.8	2.5	2.8	3.3	2.6	3.1	2.7	3.3	3.1	2.6	<0.1 (NL)
Females	1.3	1.7	1.6	1.7	2.1	1.7	2.0	1.6	2.0	2.1	1.8	<0.1 (NL)
Age												
< 1 yr		19.7		28.6		35.3		41.5		34.1		1.96
1-4 yrs		*		*		*		*		*		*
5-14 yrs		*		*		*		*		*		*
15-24 yrs		0.5		*		*		*		*		*
25-34 yrs		*		*		*		*		*		*
35-44 yrs		0.9		0.7		0.8		0.9		0.7		<-0.1 (NL)
45-54 yrs		1.1		1.0		1.0		1.0		1.4		<0.1 (NL)
55-64 yrs		1.4		1.5		2.0		1.3		1.8		<0.1 (NL)
65-74 yrs		3.7		3.1		3.3		3.4		4.2		<0.1 (NL)
75-84 yrs		9.7		12.8		8.4		10.8		9.6		<-0.1 (NL)
85 or older		27.4		40.9		33.5		30.4		30.6		<-0.1 (NL)
Race and ethnicity†												
White‡	1.8	2.1	1.8	2.2	2.5	2.0	2.3	2.0	2.4	2.5	2.1	<0.1 (NL)
Black‡	2.8	3.0	3.1	2.4	3.7	3.0	3.4	2.7	4.1	3.2	2.5	<0.1 (NL)
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

*Rates suppressed due to fewer than 20 deaths.

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

‡Non-Hispanic

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 27c. Number of deaths resulting from unintentional suffocations, by mechanism and year, Ohio, 2000-2010

Cause of Suffocation	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Suffocation in bed	17	10	31	33	30	35	43	47	46	46	32	12%	2.7
Other suffocation	14	16	17	12	11	6	18	10	7	7	5	2%	*
Cave-in, falling earth, and other substances	<5	<5	<5	<5	0	<5	<5	0	<5	<5	<5	<1%	*
Inhalation of gastric contents	19	25	11	14	16	9	6	10	14	10	13	5%	*
Ingestion of food	21	32	30	20	43	32	47	35	40	46	57	22%	2.7
Ingestion of other objects	130	139	112	163	179	128	152	125	164	165	129	49%	1.4 (NL)
Low oxygen environment	0	0	<5	0	0	0	0	<5	0	0	0	0%	*
Other specified	6	5	9	5	7	22	9	<5	16	13	6	2%	*
Unspecified	12	24	15	12	24	18	17	19	25	25	22	8%	*

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 28a. Number of hospitalization resulting from unintentional suffocations, by year, Ohio, 2002-2010

	2002-2004	2005-2007	2008-2010
Overall	260	304	325
Sex			
Males	128	169	174
Females	132	135	151
Age			
< 1 yr	28	42	33
1-4 yrs	38	61	71
5-14 yrs	20	20	34
15-24 yrs	9	13	14
25-34 yrs	<5	11	10
35-44 yrs	26	19	8
45-54 yrs	19	24	26
55-64 yrs	23	28	31
65-74 yrs	30	27	34
75-84 yrs	46	41	38
85 or older	17	18	26

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 28b. Hospitalization rates per 100,000 resulting from unintentional suffocations, by year, Ohio, 2002-2010

	2002-2004	2005-2007	2008-2010	Trend (per yr)
Overall†	0.75	0.88	0.92	0.03
Sex†				
Males	0.80	1.04	1.06	0.04
Females	1.16	1.09	1.25	NL
Age				
< 1 yr	6.31	9.41	7.28	0.2 (NL)
1-4 yrs	2.12	3.45	4.02	0.32
5-14 yrs	0.42	0.43	0.71	0.05
15-24 yrs	*	*	*	*
25-34 yrs	*	*	*	*
35-44 yrs	0.51	0.39	*	*
45-54 yrs	0.38	0.46	0.46	0.01
55-64 yrs	0.68	0.74	0.60	-0.01 (NL)
65-74 yrs	1.30	1.17	1.08	0.04
75-84 yrs	2.76	2.49	1.79	-0.16
85 or older	2.90	2.79	3.20	0.05 (NL)

*Rate suppressed due to less than 20 hospitalizations

Source: Ohio Hospital Association

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

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

Table 28c. Number of hospitalizations resulting from unintentional suffocations, by cause and year, Ohio, 2002-2010

	2002-2004	2005-2007	2008-2010	% in 2008-10	Trend (per yr)
Suffocation Cause					
Food object	127	146	133	41%	1 (NL)
Non-food object	114	148	177	54%	11
Mechanical suffocation	19	10	15	5%	*

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 29a. Number of ED visits resulting from unintentional suffocations by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	414	379	381	456	677	579	589	521	428
Sex									
Males	224	186	207	241	377	285	302	279	226
Females	190	193	174	215	300	294	287	242	202
Age									
< 1 yr	39	40	34	48	87	85	62	55	34
1-4 yrs	115	84	88	120	214	178	206	183	136
5-14 yrs	37	28	31	47	119	72	91	80	39
15-24 yrs	24	25	16	26	35	28	33	26	23
25-34 yrs	17	18	26	10	17	17	9	15	18
35-44 yrs	23	25	23	30	33	32	29	15	22
45-54 yrs	32	32	35	35	37	32	49	28	39
55-64 yrs	37	26	34	38	33	29	30	22	31
65-74 yrs	42	33	33	39	33	41	30	36	26
75-84 yrs	31	43	43	30	41	43	27	34	31
85 or older	17	25	18	33	28	22	23	27	29

Source: Ohio Hospital Association

Burden of Injury in Ohio, 2000-2010

Ohio Violence and Injury Prevention Program, Ohio Department of Health

Table 29b. ED visit rates per 100,000 resulting from unintentional suffocations by year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	3.6	3.3	3.3	4.0	6.1	5.2	5.3	4.6	3.8	0.2 (NL)
Sex†										
Males	4.2	3.5	3.8	4.4	6.9	5.2	5.5	5.1	4.1	0.1 (NL)
Females	3.3	3.2	2.9	3.6	5.3	5.1	5.0	4.2	3.4	0.2 (NL)
Age										
< 1 yr	26.5	27.1	22.8	32.8	58.7	56.1	40.6	37.2	24.5	1.4 (NL)
1-4 yrs	19.1	14.0	14.8	20.2	36.5	30.3	34.8	30.9	23.4	2.0 (NL)
5-14 yrs	2.3	1.8	2.0	3.0	7.8	4.8	6.1	5.4	2.6	0.4 (NL)
15-24 yrs	1.5	1.6	*	1.6	2.2	1.8	2.1	1.7	1.4	*
25-34 yrs	*	*	3.6	*	*	*	*	*	*	*
35-44 yrs	1.3	1.5	1.4	1.8	2.0	2.0	1.9	*	1.5	*
45-54 yrs	1.9	1.9	2.1	2.0	2.1	1.8	2.8	1.6	2.2	<0.1 (NL)
55-64 yrs	3.4	2.3	2.9	3.1	2.6	2.2	2.3	1.6	2.1	-0.2 (NL)
65-74 yrs	5.4	4.3	4.3	5.1	4.3	5.2	3.7	4.3	3.1	-0.2 (NL)
75-84 yrs	5.6	7.7	7.7	5.4	7.5	7.9	5.0	6.3	5.7	-0.1 (NL)
85 or older	9.0	12.8	9.0	15.9	13.0	9.9	10.1	11.9	12.6	0.1 (NL)

*Rates suppressed due to less than 20 ED visits

†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 29c. Number of ED visits resulting from unintentional suffocations by object causing suffocation and year, Ohio, 2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Cause of Suffocation											
Food object	180	187	183	209	240	213	198	181	190	44%	1 (NL)
Non-food object	204	168	183	233	388	345	363	328	215	50%	17 (NL)
Mechanical suffocation	30	24	15	14	49	21	28	12	23	5%	*

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 30. Number and percent of infant suffocation deaths by sex, race/ethnicity, and mechanism, Ohio, 2000-2010

	2000-2010 Number	2000-2010 Percent
Overall	490	
Sex		
Males	279	57%
Females	221	45%
Race and ethnicity†		
White‡	313	63.9%
Black‡	174	35.5%
Hispanic	10	2.0%
Other‡	3	0.6%
Mechanism		
Suffocation in bed	329	67.1%
Other suffocation	3	0.6%
Cave-in, falling earth, and other substances	0	0.0%
Inhalation of gastric contents	7	1.4%
Ingestion of food	3	1.0%
Ingestion of other objects	12	2.4%
Other specified	39	8.0%
Unspecified	97	19.8%

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 31. Number of hospitalizations resulting from unintentional suffocations among infants less than 1 year of age, by cause, Ohio, 2002-2010¹

	2002- 2010 N	2002- 2010 %
Overall	103	
Males	57	55%
Females	46	45%
Food object	30	29%
Non-food object	68	66%
Mechanical suffocation	5	5%

¹Source: Ohio Hospital Association

Table 32. Number and percent of ED visits resulting from unintentional suffocations among infants, Ohio, 2002-2010¹

	2002-2010 Number	2002-2010 Percent
Overall	484	
Males	226	47%
Females	258	53%
Food object	195	40%
Non-food object	281	58%
Mechanical suffocation	8	2%

¹Source: Ohio Hospital Association

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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