

INDIANA STATE DEPARTMENT OF HEALTH

2008 Firework-Related Injury Report

Through the passage of House Enrolled Act 1131, the Indiana State Department of Health (ISDH) received reports about injuries resulting from fireworks and/or pyrotechnics during 2003 and 2004. However, no reporting occurred in 2005 due to the expiration of this law. With the passage of Public Law 187 in 2006, reporting of firework-related injuries was reinstated with identical reporting requirements to those in the previous statute. All hospitals, medical facilities, and private medical practices are mandated by law to report all firework injuries and deaths to ISDH. This report presents firework-related injury data compiled from submitted firework reporting forms for 2008.

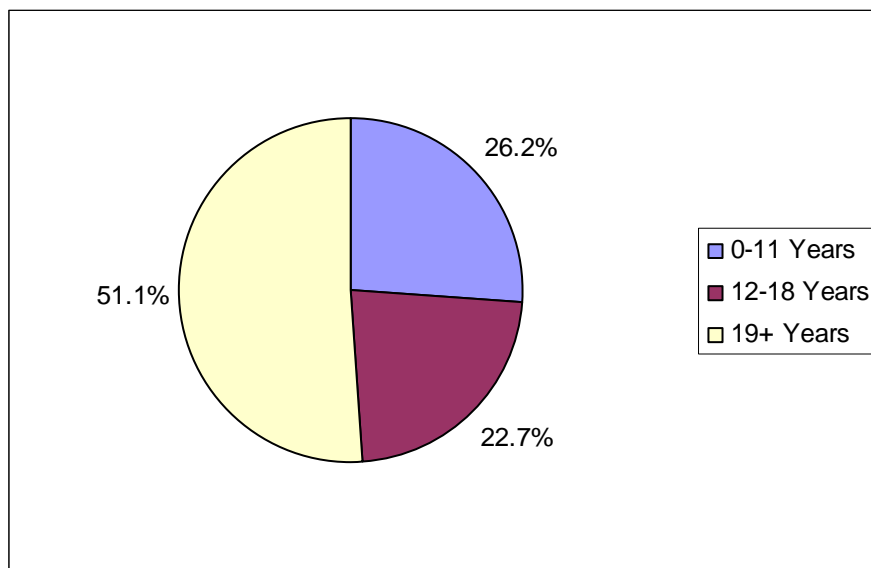
Highlights for 2008

- As of August 12, 2008, 141 unduplicated cases of firework-related injuries were reported to ISDH.
- Almost half (48.9%, 69/141) of all reported firework-related injuries involved children and adolescents (individuals under 18 years of age), who represent 25% of Indiana's population (US Census Bureau, 2006).
- Sixty-five percent (106/163) of firework-related injuries were burns, with the hand or fingers being the most affected body part.
- Four percent (4.3%, 6/141) of injured persons were hospitalized, and 5.0% (7/141) were transferred to a different hospital. One person underwent an amputation of the finger tips, and one person died after sustaining burns on 100% of the body.
- One out of every four (26.2%, 37/141) reported injuries involved the eyes, with 75.7% (28/37) of those with eye injuries not using any method of eye protection such as glasses.
- Most injuries (65.3%, 94/144) were caused by firecrackers, rockets, aerial devices, and sparklers.
- Malfunction and mishandling of fireworks accounted for 58.7% (84/143) of reported problems causing injury.
- Firework use on private property accounted for 86.5% (122/141) of reported injuries.

Demographics

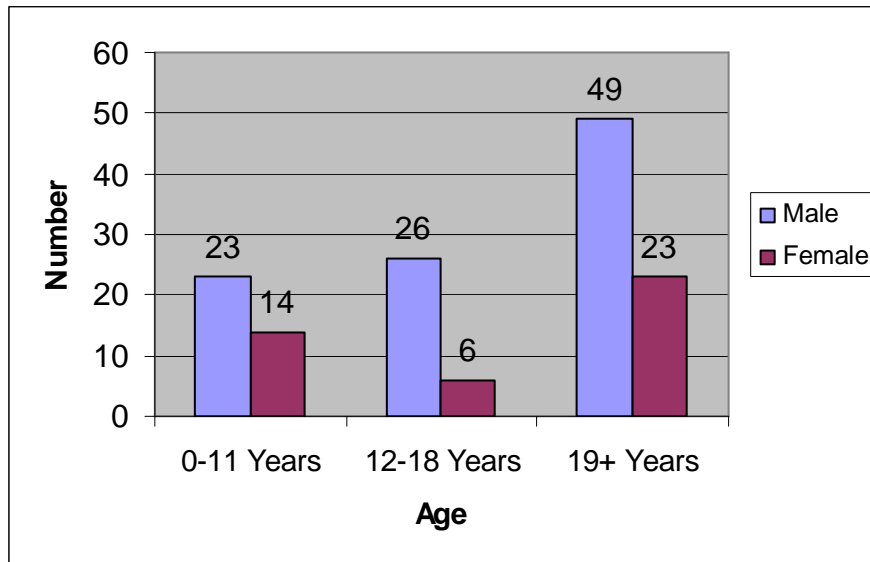
- The median age of persons with a firework-related injury was 19 years. The average age of all injured persons was 21 years with an age range from 10 months to 70 years.
- Almost 50% (69/141) of those injured were 18 years of age or younger (Figure 1).
- Of reported injuries, 69.5% (98/141) involved males, and 30.5% (43/141) involved females. Across all age groups, males reported more firework-related injuries than females (Figure 2).
- Almost three-quarters (73.0%, 103/141) of persons injured were white, 14.2% (20/141) were black, and one (0.7%) was multiracial (Figure 3). Race was unknown or marked as “other” for 12.1% (17/141) of the cases. Seven percent (10/141) reported Hispanic ethnicity.

Figure 1: Firework-Related Injuries by Age Group, Indiana, 2008



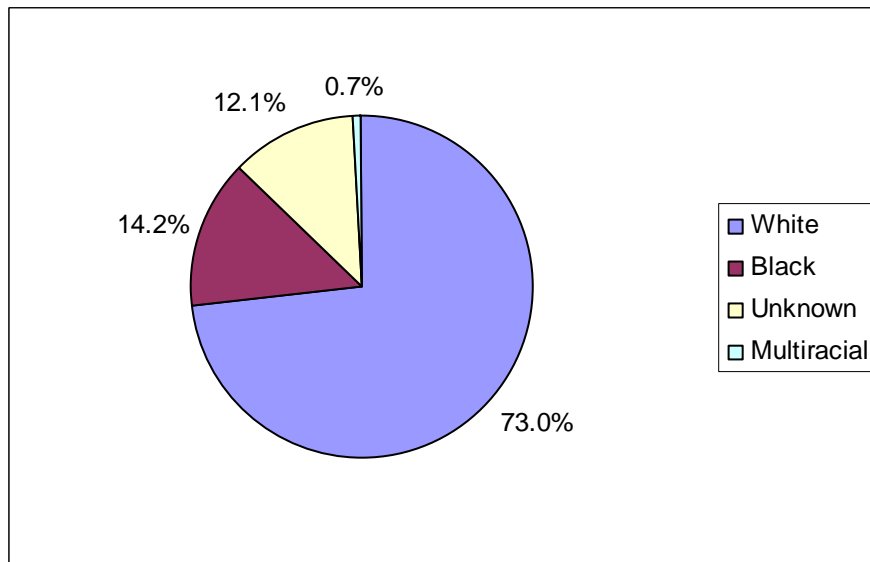
Source: Indiana State Department of Health, Injury Prevention Program

Figure 2: Firework-Related Injuries by Age and Sex, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Figure 3: Firework-Related Injuries by Race, Indiana, 2008

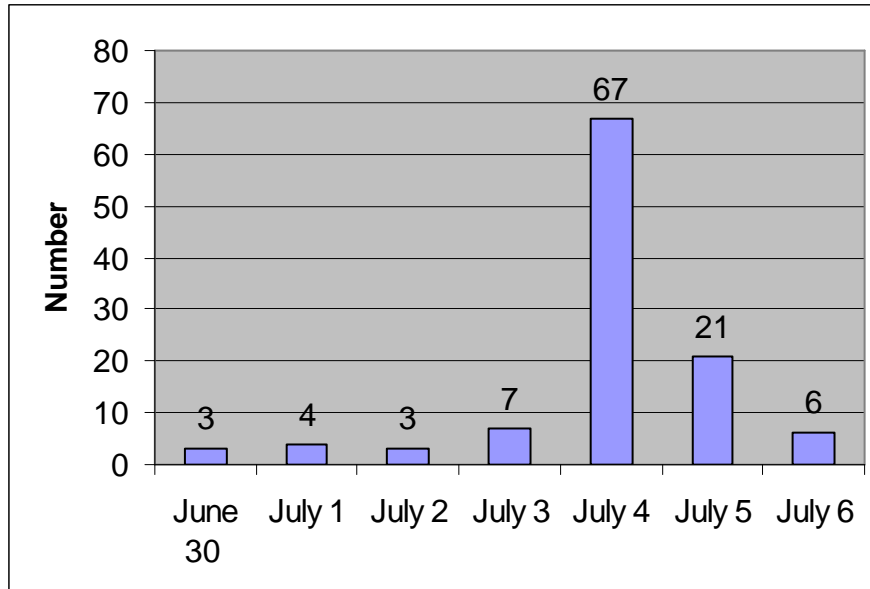


Source: Indiana State Department of Health, Injury Prevention Program

Date and Time of Injuries

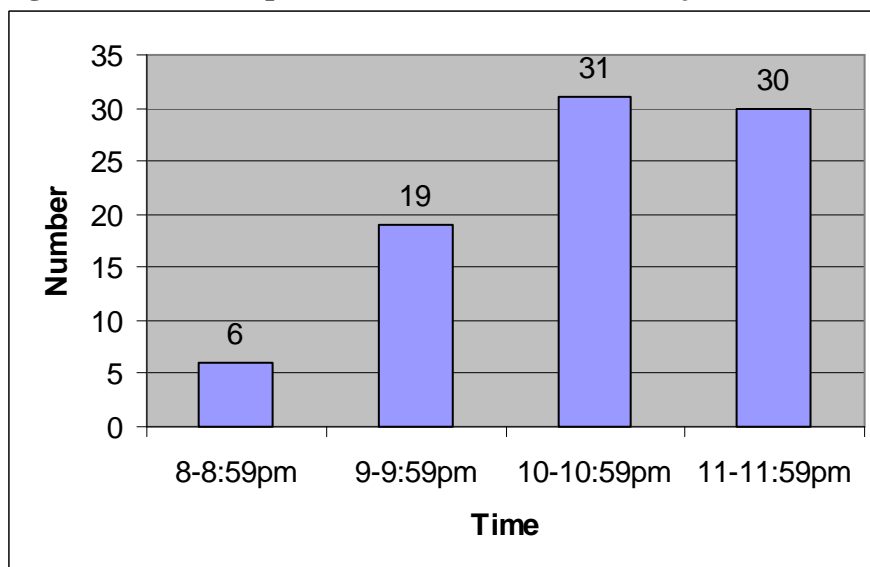
- Over three-quarters (78.7%, 111/141) of all reported injuries occurred between June 30 and July 6, 2008 (Figure 4). Almost half (47.5%, 67/141) of injuries occurred on July 4, 2008.
- Sixty-one percent (86/141) of all injuries occurred between 8pm and midnight with 36% (31/86) of those occurring between 10-11pm (Figure 5).

Figure 4: Firework-Related Injuries by Date, June 30–July 6, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Figure 5: Most Frequent Times when Firework Injuries Occurred, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Type of Fireworks Involved in Injuries

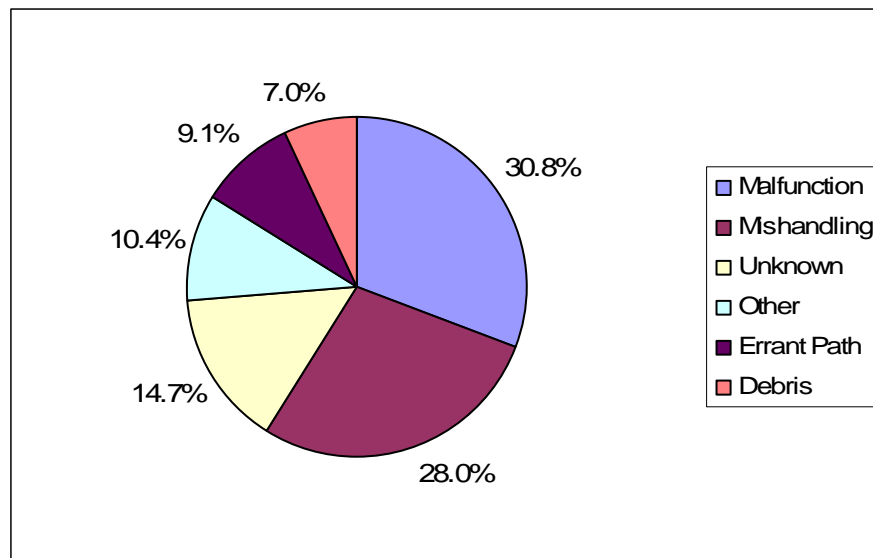
- The 141 individuals were injured by 144 fireworks as two individuals were injured by more than one type of firework. Five individuals were injured by pyrotechnics (public firework shows) with one reporting that the firework that caused the injury was an aerial firework. The other four did not report the type of firework causing injury.
- Firecrackers, rockets, aerial devices, and sparklers accounted for 65.3% (94/144) of the types of fireworks most cited as causing injury (Table 1).
- Malfunction and mishandling of fireworks accounted for 58.7% (84/143) of reported problems causing injury (Figure 6).

Table 1: Frequency and Percent of Firework Type Involved in Injury, Indiana, 2008

Firework Type	Frequency	Percent
Firecrackers	30	20.8%
Rockets	28	19.4%
Other, Specified	21	14.6%
Aerial	18	12.5%
Sparkler	18	12.5%
Unknown	9	6.3%
Roman Candle	8	5.6%
Pyrotechnics	5	3.5%
Smoke Bomb	4	2.8%
Fountain	3	2.1%
Total	144	100.0%

Source: Indiana State Department of Health, Injury Prevention Program

Figure 6: Problem/Cause of Firework-Related Injury, Indiana, 2008

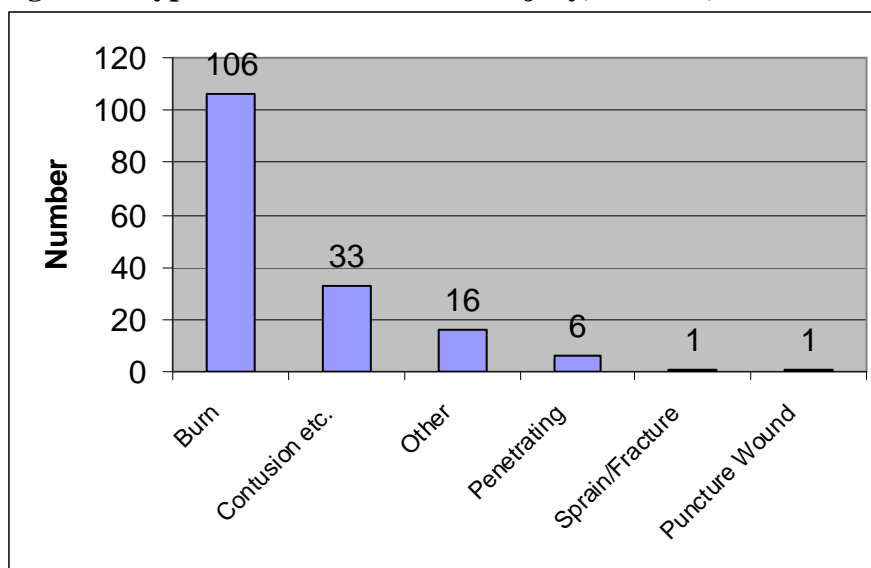


Source: Indiana State Department of Health, Injury Prevention Program

Type of Injuries

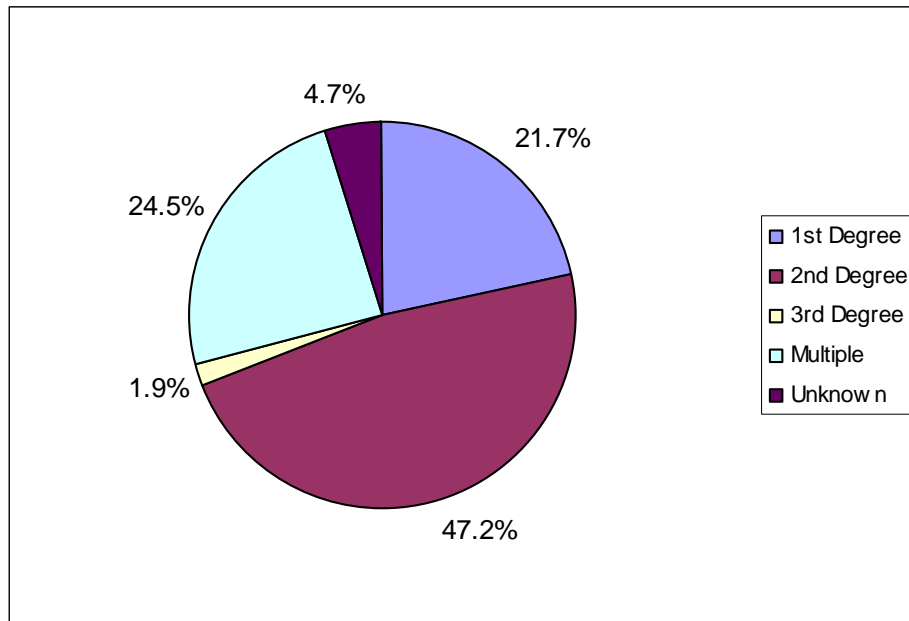
- Fifteen percent (21/141) of those injured reported having multiple injuries, resulting in a total of 163 injuries occurring to 141 individuals.
 - There were 106 burn injuries (65.0%) reported (Figure 7). Of these, 47.2 % (50/106) were second-degree, and 21.7% (23/106) were first-degree. Nearly one fourth (24.5%, 26/106) of burns were multiple degrees (Figure 8).
- Other types of injuries included contusions/lacerations/abrasions (20.3%, 33/163), penetrating foreign body/missiles (3.7%, 6/163), puncture wounds (0.06%, 1/163), and sprains/fractures (0.06%, 1/163) (Figure 7).

Figure 7: Type of Firework-Related Injury, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Figure 8: Degree of Burn Experienced from Firework-Related Injury, Indiana, 2008

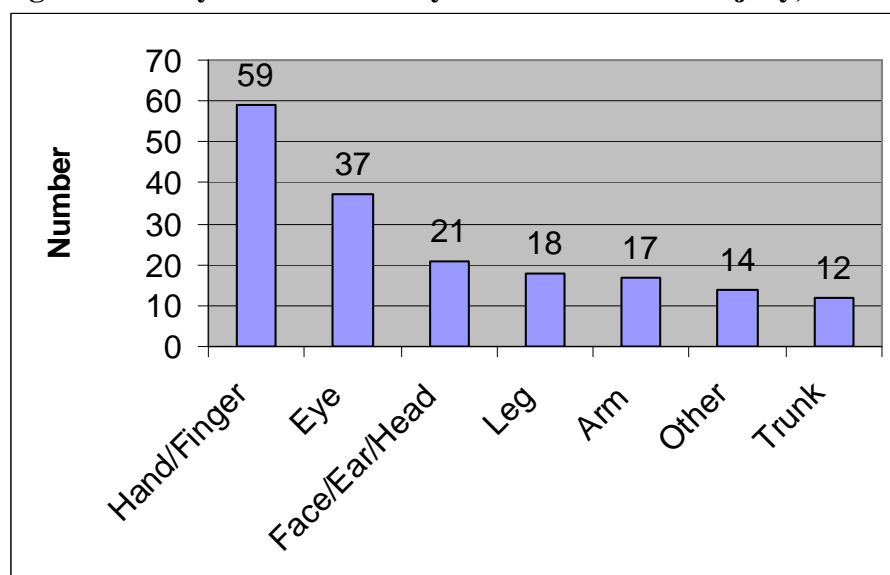


Source: Indiana State Department of Health, Injury Prevention Program

Body Part Injured

- There were 178 body parts injured, with 26 individuals (18.4%) experiencing injury to multiple areas of their body.
- Over half (53.9%, 96/178) of the injuries involved the hands/fingers or eyes (Figure 9). Injuries to the face, ears, and head accounted for 11.8% (21/178), and injuries to the leg accounted for 10.1% (18/178).
- Of those who had eye injuries, only 5.4% (2/37) had some sort of eye protection (i.e. glasses). Eye protection was not used by 75.7% (28/37) of the cases, and information was unknown for 18.9% (7/37) of the cases.

Figure 9: Body Part Affected by Firework-Related Injury, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

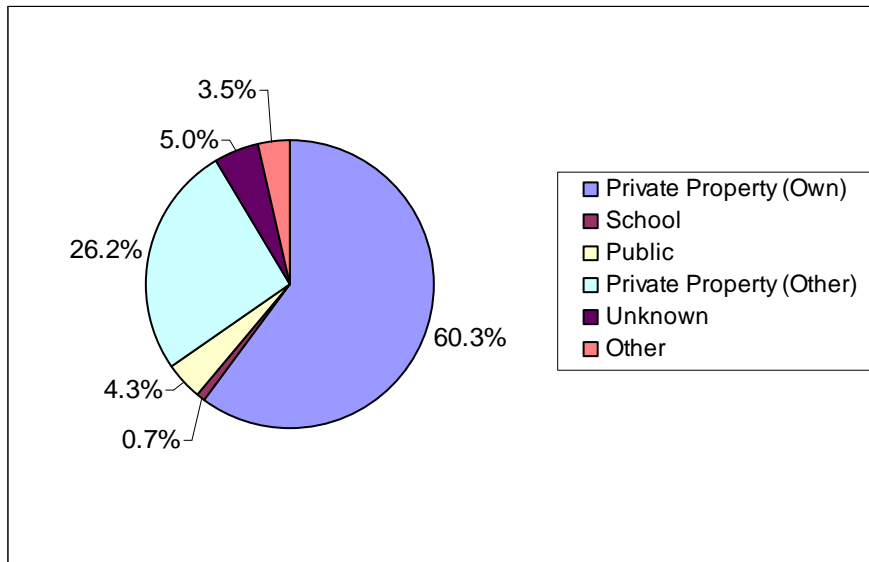
Source of Care and Outcome of Injury

- The majority (83.0%, 117/141) of people injured by fireworks sought care at an emergency department. The remaining cases (17.0%, 24/141) sought care by another type of provider.
- Ninety percent (127/141) of those seeking treatment were evaluated and released to go home. However, 9.2 % (13/141) were admitted to the hospital or transferred to another hospital.
- One person underwent an amputation of the finger tips, and one person died.

Other Information

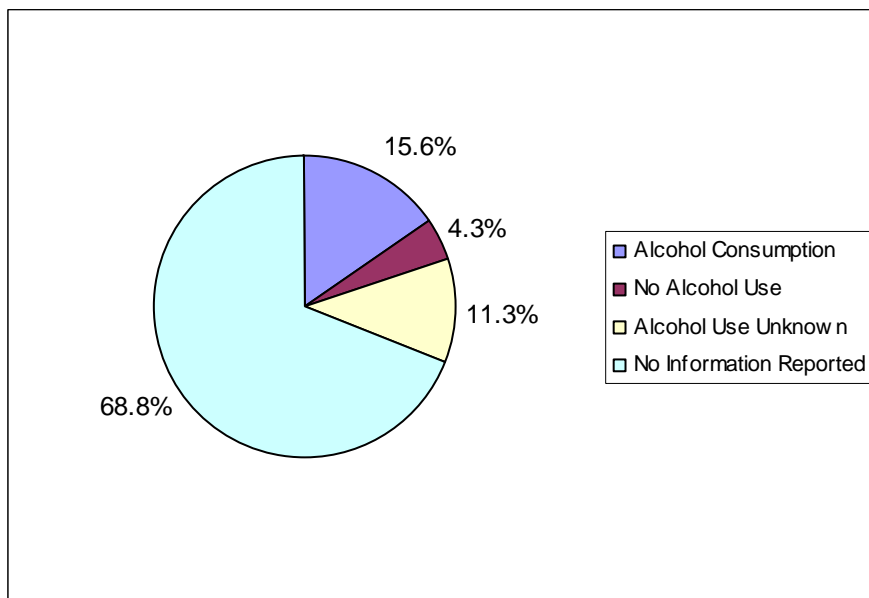
- Sixty percent (85/141) of people were injured at their own private home, yard, or property, while 26.2% (37/141) were injured at someone else's home, yard, or property (Figure 12). Public property was noted for 4.3% (6/141) of people injured. Three people reported the injury occurring somewhere else (unspecified), and information was unknown for 10 people.
- Of injured persons, 16.3% (23/141) were bystanders. Children under 10 years of age made up 21.7% (5/23) of the bystanders injured by fireworks.
- Eighty percent (113/141) of all reports did not provide information (97/141) on alcohol consumption or that information was unknown (16/141) (Figure 13). Alcohol use was reported in 15.6% (22/141) of cases with 77.3% (17/22) of those cases reporting alcohol use within three hours of injury. Of those using alcohol, 9.1% (2/22) were under 21 years of age, and 45.5% (10/22) were in their 20's.
- Nearly 10% (13/141) of cases reported alcohol use by other people at the scene. Of bystanders injured, 17.4% (4/23) reported that alcohol was involved.
- Among those injured who were 18 years of age or less, 62.3% (43/69) were injured while in the presence of an adult, and 11.6% (8/69) had no adult supervision. For 26.1% (18/69) of cases, the information was either unknown (10/69) or was not reported (8/69) (Figure 14).

Figure 12: Locale of Firework-Related Injury, Indiana, 2008



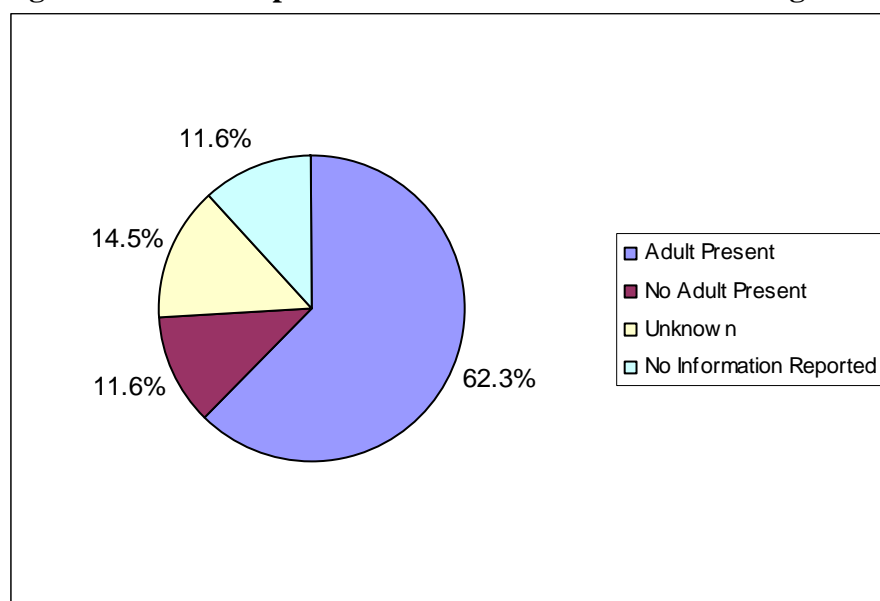
Source: Indiana State Department of Health, Injury Prevention Program

Figure 13: Alcohol Use of Those Injured by Fireworks, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Figure 14: Adult Supervision of Individuals 18 Years of Age or Younger, Indiana, 2008



Source: Indiana State Department of Health, Injury Prevention Program

Summary of Firework-Related Injuries for 2008

While the ages of those injured ranged from 10 months to 70 years, children and adolescents comprised almost half (48.9%, 69/141) of reported cases. Of those 18 years of age or less, 62.3% (43/69) were injured while in the presence of an adult, and 11.6% (8/69) had no adult supervision. Males (69.5%, 98/141) were injured more often than females (30.5%, 43/141). Almost three-quarters (73.0%, 103/141) of the cases were white, 14.2% (20/141) were black, and one case (0.7%) was multiracial.

Over half (53.9%, 96/178) of the injuries involved the hands/fingers or eyes. Burns were the most common type of injury. The majority (83.0%, 117/141) of people injured by fireworks sought care at an emergency department, with the remaining cases (17.0%, 24/141) seeking medical care from another type of provider. Of those seeking medical care, 90.1% (127/141) were evaluated and released to go home. However, 9.2% (13/141) were admitted to the hospital or transferred to another hospital. One case involved an amputation of the finger tips, and one case resulted in death.

For the 141 cases of firework-related injuries, 78.9% (11/141) occurred between June 30 and July 6 with 47.5% (67/141) of injuries taking place on July 4. The majority (86.5%, 122/141) of injuries occurred on private property. Firecrackers, rockets, aerial devices, and sparklers (65.3%, 94/144) were cited most often as being involved in firework injuries. The cause of injury was most commonly malfunction and mishandling (58.7%, 84/143) of fireworks.

APPENDIX

Firework-Related Injury Year Comparisons

The Indiana State Department of Health began receiving firework injury reports in 2003 after the collection of this information was mandated by law. After two years the law expired and no reports were collected in 2005. In 2006, the law was reinstated with requirements identical to the previous law. Table 2 shows the comparison of firework-related injuries for the years in which reporting was mandated (2003, 2004, 2006, 2007, and 2008).

Table 2: Comparison of Firework-Related Injuries, Indiana, 2003-2004 and 2006-2008

Category	2003	2004	2006	2007	2008
Number of cases reported	261	233	251	156	141
Demographics					
Median Age	18	18	17	20	21
Age Range	0-74 yrs	0-72 yrs	0-67 yrs	0-70 yrs	0-70 yrs
Children/Adolescents	53%	52%	55%	48%	50%
Males	73%	76%	70%	67%	70%
Females	27%	24%	30%	33%	30%
White	84%	87%	82%	87%	73%
Black or African American	10%	8%	13%	7%	14%
Injury Type					
Burns	76%	67%	73%	69%	65%
Body Part Injured					
Hand	34%	32%	36%	41%	33%
Eye	17%	25%	29%	24%	21%
Cases with No Eye Protection	82%	88%	97%	92%	76%
Injury Circumstances					
Injured on Private Property	83%	89%	86%	83%	87%
Children Injured with Adults Present	60%	50%	64%	61%	62%
Received Specialized Care for Burn or Eye Injuries	8%	19%	12%	4%	2%
Hospitalized or Transferred to a Hospital	3%	6%	11%	8%	9%
Died	0%	0%	0%	0%	1%
Fireworks Circumstances					
Injuries from Sparklers, Rocket, and Firecrackers	63%	64%	57%	52%	53%
Injuries from Mishandling Firework	27%	23%	29%	30%	28%
Errant Path or Malfunctioning Firework	21%	37%	41%	35%	40%

Source: Indiana State Department of Health, Injury Prevention Program

Age-Specific Firework-Related Injuries

Table 3 breaks out the firework-related injuries into three specific age groups: 1) children (birth -11 years of age), 2) adolescents (12-18 years of age), and 3) adults (19 years and older). It gives more detail on the type of injury, firework, and cause.

Table 3: Firework Injuries Specific to Age Groups, Indiana, 2008

	Ages 0 -11	Ages 12 – 18	Ages 19 +
Number of Cases	37 (26.2%)	32 (22.7%)	72 (51.1%)
Gender	37 total	32 total	72 total
Male	23 (62.2%)	26 (81.3%)	49 (68.1%)
Female	14 (37.8%)	6 (18.8%)	23 (31.9%)
Age Range	10 months – 11 years (median – 7.5 years)	12 – 18 years (median – 15 years)	19 – 70 years (median – 27 years)
Race	37 total	32 total	72 total
White	25 (67.6%)	20 (62.5%)	58 (80.6%)
Black	5 (13.5%)	10 (31.3%)	5 (6.9%)
Multiracial	1 (0.03%)	0	0
Other/Unknown	6 (16.2%)	2 (6.3%)	9 (12.5%)
Ethnicity	37 total	32 total	72 total
Hispanic	5 (13.5%)	0	5 (6.9%)
Not Hispanic	17 (46.0%)	18 (56.3%)	41 (56.9%)
Unknown	15 (40.5%)	14 (43.8%)	26 (36.1%)
Body Parts Injured	54 total	39 total	85 total
Hand/Fingers	14 (25.9%)	15 (38.5%)	30 (35.3%)
Arm	7 (13.0%)	5 (12.8%)	5 (5.9%)
Eye(s)	11 (20.4%)	6 (15.4%)	20 (23.5%)
Face/Ears/Head	7 (13.0%)	6 (15.4%)	8 (9.4%)
Neck	3 (5.6%)	1 (2.6%)	2 (2.4%)
Leg(s)	5 (9.3%)	2 (5.1%)	11 (12.9%)
Foot	3 (5.6%)	0	2 (2.4%)
Trunk	3 (5.6%)	4 (10.3%)	5 (5.9%)
Groin/Genitals	0	0	2 (2.4%)
Other	1 (1.9%)	0	0
Injury Type	42 total	37 total	84 total
Burn	32 (76.2%)	25 (76.6%)	49 (58.3%)
Contusion	7 (16.7%)	7 (18.9%)	19 (22.6%)
Puncture	1 (2.4%)	0	0
Penetrating	0	1 (2.7%)	5 (6.0%)
Sprain/Fracture	1 (2.4%)	0	0
Other	1 (2.4%)	4 (10.8%)	11 (13.1%)
Source of Care	37 total	32 total	72 total
Emergency Dept.	30 (81.1%)	26 (81.3%)	61 (84.7%)

Provider	7 (18.9%)	6 (18.8%)	11 (9.7%)
	Ages 0 -11	Ages 12 – 18	Ages 19 +
Evaluation Outcome	37 total	32 total	72 total
Home	32 (86.5%)	30 (93.8%)	65 (90.3%)
Hospitalized/ Transferred	4 (10.8%)	2 (6.3%)	7 (9.7%)
Died	1 (2.7%)	0	0
Locale of Injury Occurrence	37 total	32 total	72 total
Private, own	22 (59.5%)	17 (53.1%)	46 (63.9%)
Private, other	10 (27.0%)	11 (34.4%)	16 (22.2%)
Public	1 (2.7%)	1 (3.1%)	4 (5.6%)
Other	2 (5.4%)	0	1 (1.4%)
Unknown	2 (5.4%)	3 (9.4%)	5 (6.9%)
Eye Protection	11 total	6 total	20 total
None	9 (81.8%)	6 (100%)	13 (65.0%)
Glasses	0	0	2 (10.0%)
Unknown	2 (18.2%)	0	5 (25.0%)
Other	37 total	32 total	72 total
Bystander	5 (13.5%)	2 (6.3%)	16 (22.2%)
Type of Firework	37 total	33 total	74 total
Firecracker	7 (18.9%)	7 (21.2%)	16 (21.6%)
Rocket	8 (21.6%)	12 (36.4%)	8 (10.8%)
Sparkler	10 (27.0%)	1 (3.0%)	7 (9.5%)
Twister	1 (2.7%)	0	0
Lighting Gunpowder	0	0	0
Homemade	0	0	0
Aerial	1 (2.7%)	1 (3.0%)	16 (21.6%)
Fountain	1 (2.7%)	1 (3.0%)	1 (1.4%)
Roman candle	2 (5.4%)	5 (15.2%)	1 (1.4%)
Smoke bomb	2 (5.4%)	1 (3.0%)	1 (1.4%)
Other	3 (8.6%)	3 (9.1%)	15 (20.3%)
Pyrotechnics	0	0	5 (6.8%)
Unknown	2 (5.4%)	2 (6.1%)	4 (5.4%)
Problem with Firework	37 total	34 total	72 total
Malfunction	9 (24.3%)	8 (23.5%)	27 (37.5%)
Errant path	4 (10.8%)	3 (8.8%)	6 (8.3%)
Debris	2 (5.4%)	1 (2.9%)	7 (9.7%)
Mishandling*	10 (27.0%)	11 (32.4%)	19 (26.4%)
Other*	6 (16.2%)	2 (5.9%)	7 (9.7%)
Unknown	6 (16.2%)	9 (26.5%)	6 (8.3%)
*Malicious intent	1	3	0

