

INDIANA STATE DEPARTMENT OF HEALTH 2009 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 2009.

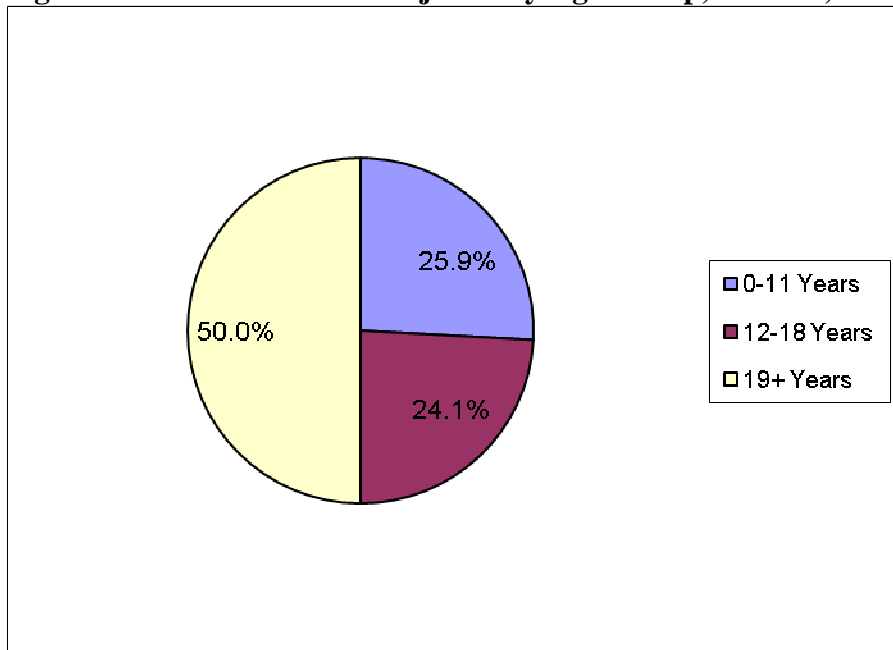
Highlights for 2009

- As of August 3, 2009, 116 unduplicated cases of firework-related injuries were reported to ISDH.
- Half (50.0%, 58/116) of all reported firework-related injuries involved children and adolescents (individuals 18 years of age and under), who represent 25% of Indiana's population (US Census Bureau, 2007).
- Sixty-one percent (82/135) of firework-related injuries were burns, with the hand or fingers being the most affected body part.
- Three percent (3.4%, 4/116) of injured persons were hospitalized, and 6.0% (7/116) were transferred to a different hospital.
- Almost one out of every six (15.5%, 23/148) reported injuries involved the eyes, with 56.5% (13/23) of those with eye injuries not using any method of eye protection (if known; 34.7% was unknown) such as glasses.
- Over half of the injuries (51.7%, 61/118) were caused by firecrackers, rockets, and sparklers.
- Malfunction and mishandling of fireworks accounted for 53.8% (64/119) of reported problems causing injury.
- Firework use on private property accounted for 83.6% (97/116) of reported injuries.

Demographics

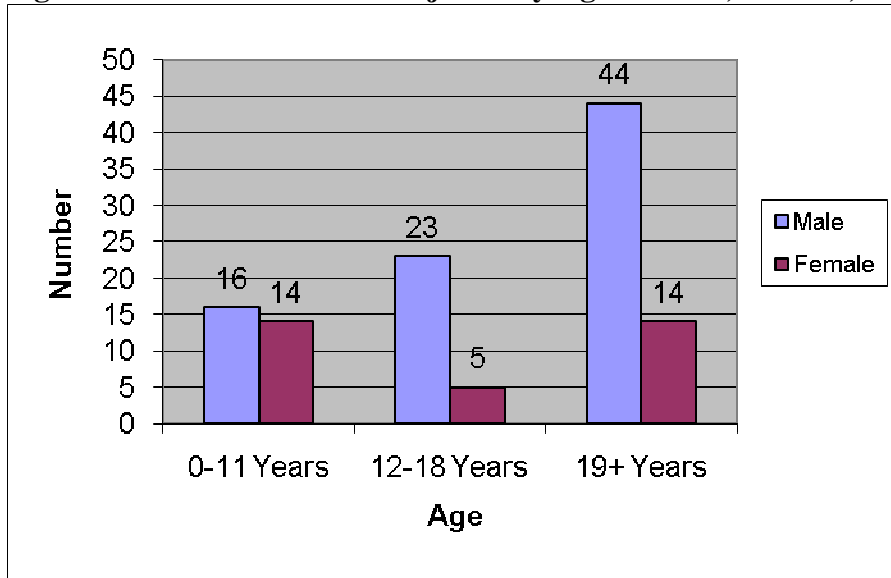
- The median age of persons with a firework-related injury was 18.5 years. The average age of all injured persons was 21 years with an age range from 0 to 81 years.
- Fifty percent (58/116) of those injured were 18 years of age or younger (Figure 1).
- Of reported injuries, 71.6% (83/116) involved males, and 28.4% (33/116) involved females. Across all age groups, males reported more firework-related injuries than females (Figure 2).
- Over eighty percent (81.9%, 95/116) of persons injured were white, 7.0% (8/116) were black, and one (0.9%) was multiracial (Figure 3). Race was unknown or marked as “other” for 10.3% (11/116) of the cases. Less than four percent (3.4%, 4/116) reported Hispanic ethnicity.

Figure 1: Firework-Related Injuries by Age Group, Indiana, 2009



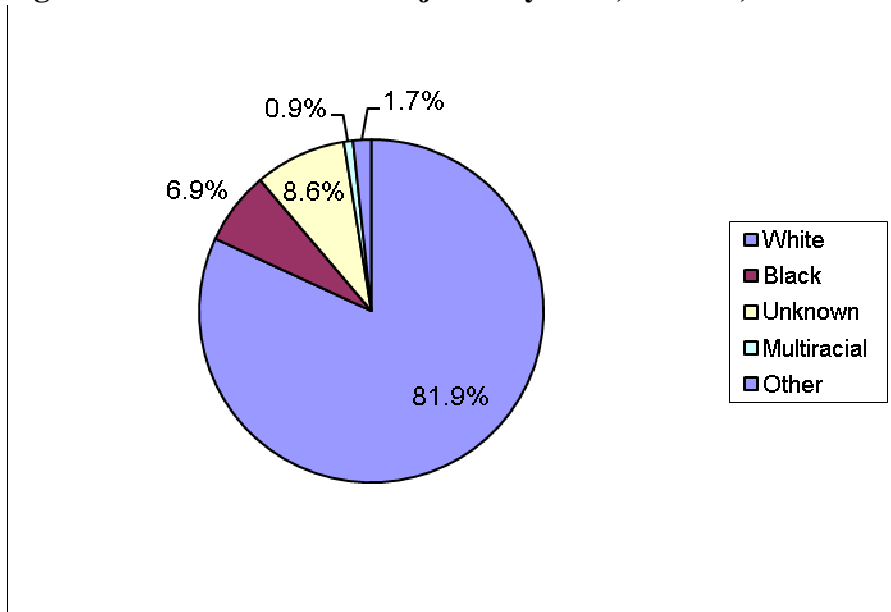
Source: Indiana State Department of Health, Injury Prevention Program

Figure 2: Firework-Related Injuries by Age and Sex, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Figure 3: Firework-Related Injuries by Race, Indiana, 2009

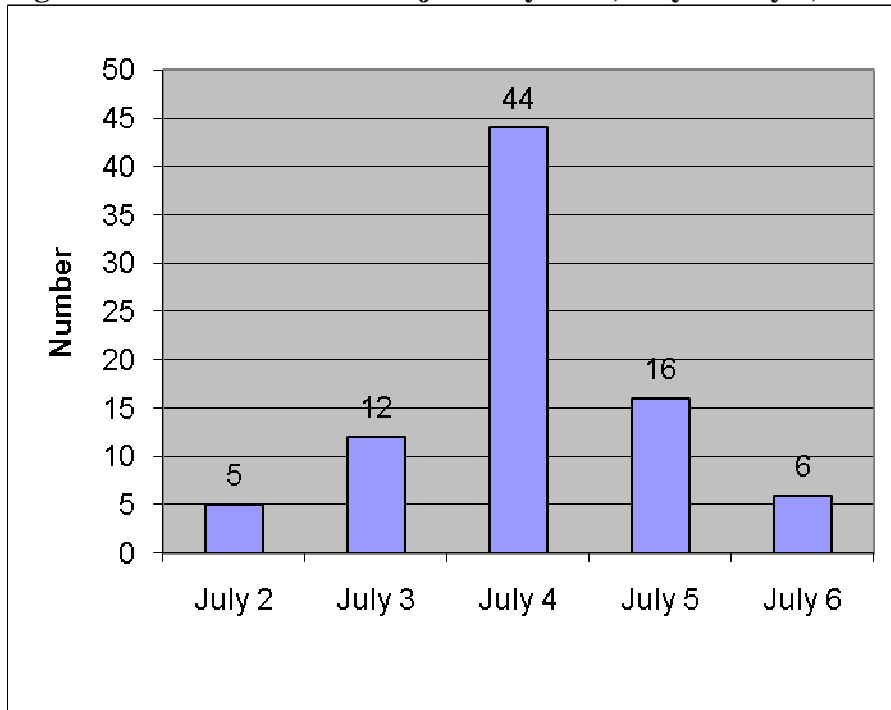


Source: Indiana State Department of Health, Injury Prevention Program

Date and Time of Injuries

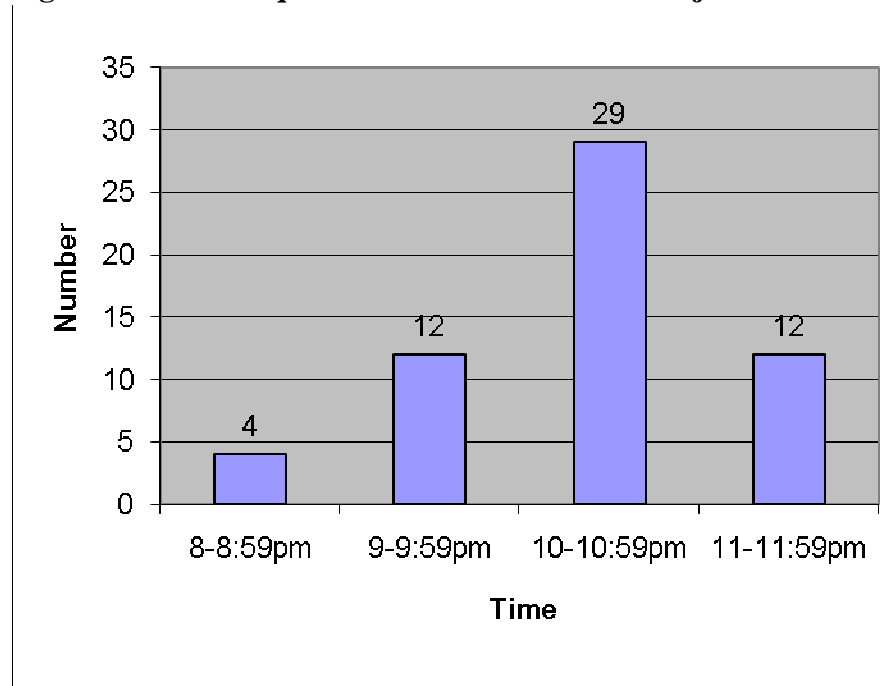
- Almost three-quarters (71.6%, 83/116) of all reported injuries occurred between July 2 and July 6, 2009 (Figure 4). Over one-third (37.9%, 44/116) of injuries occurred on July 4, 2009.
- Sixty-six percent (77/116) of all injuries occurred between 8pm and midnight (20 reports only indicated pm, but the assumption was made that it was between 8pm and midnight) with 50.9% (29/57 [reports with specific times]) of those occurring between 10-11pm (Figure 5).

Figure 4: Firework-Related Injuries by Date, July 2–July 6, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Figure 5: Most Frequent Times when Firework Injuries Occurred, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Type of Fireworks Involved in Injuries

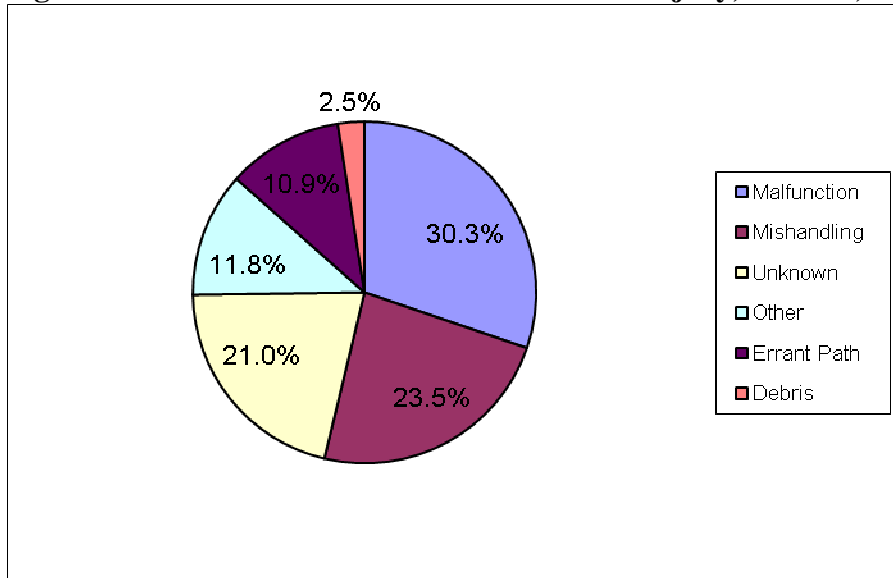
- The 116 individuals were injured by 118 fireworks, as two individuals were injured by more than one type of firework.
- Firecrackers, rockets, and sparklers accounted for 51.7% (61/118) of the types of fireworks most cited causing injury (Table 1).
- Malfunction and mishandling of fireworks accounted for 53.7% (64/119) of reported problems causing injury (Figure 6).

Table 1: Frequency and Percent of Firework Type Involved in Injury, Indiana, 2009

Firework Type	Frequency	Percent
Rockets	24	20.3%
Firecrackers	23	19.5%
Other, Specified	15	12.7%
Sparkler	14	11.9%
Unknown	12	10.2%
Aerial	12	10.2%
Roman Candle	9	7.6%
Homemade fireworks	4	3.4%
Smoke Bomb	2	1.7%
Twisters	2	1.7%
Gunpowder	1	0.8%
Total	118	100.0%

Source: Indiana State Department of Health, Injury Prevention Program

Figure 6: Problem/Cause of Firework-Related Injury, Indiana, 2009

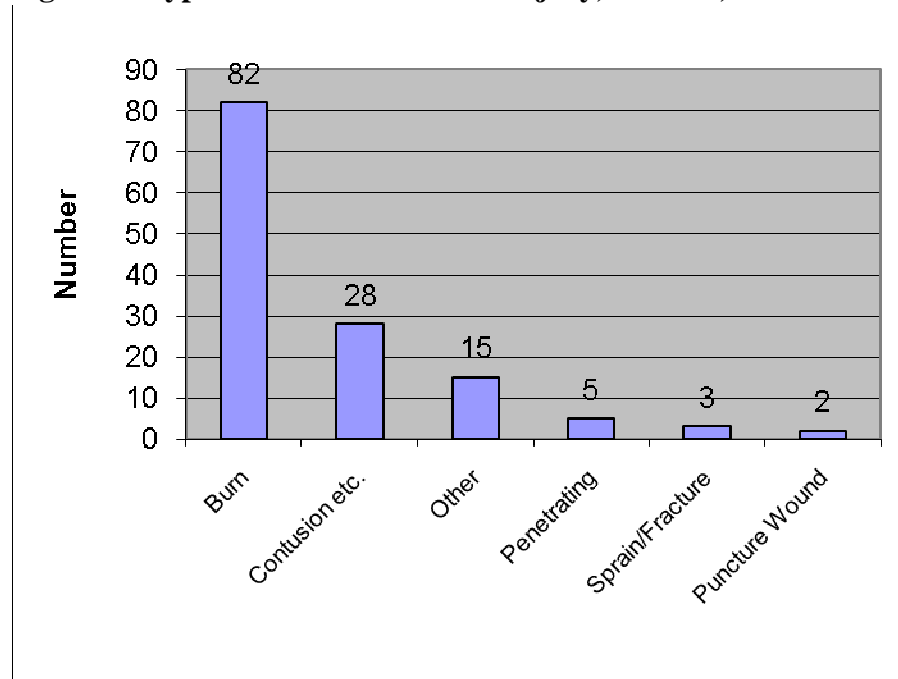


Source: Indiana State Department of Health, Injury Prevention Program

Type of Injuries

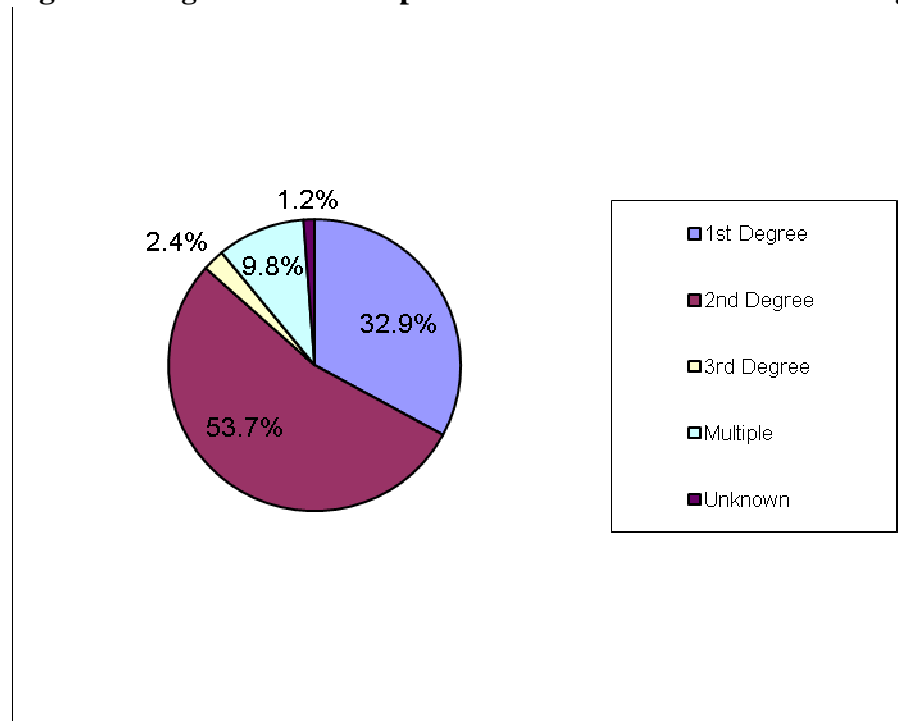
- Fifteen percent (17/114) of those injured reported having multiple injuries; resulting in a total of 135 injuries occurring to 114 individuals (information was unavailable for two patients).
 - There were 82 burn injuries (60.7%) reported (Figure 7). Of these, 53.7 % (44/82) were second-degree, and 32.9% (27/82) were first-degree. Almost ten percent (9.8%, 8/82) of burns were multiple degrees (Figure 8).
- Other types of injuries included contusions/lacerations/abrasions (20.7%, 28/135), penetrating foreign body/missiles (3.7%, 5/135), sprains/fractures (2.2%, 3/135), and puncture wounds (1.5%, 2/135) (Figure 7).

Figure 7: Type of Firework-Related Injury, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Figure 8: Degree of Burn Experienced from Firework-Related Injury, Indiana, 2009

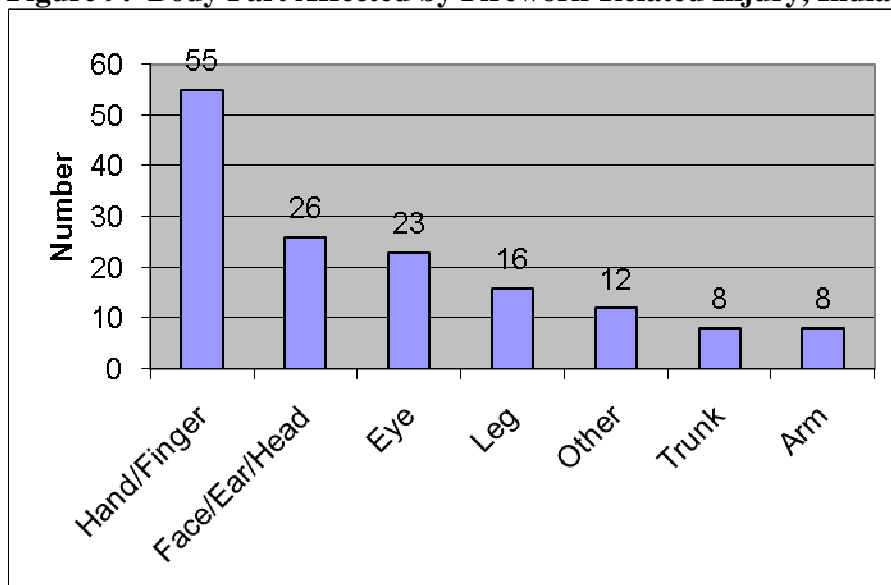


Source: Indiana State Department of Health, Injury Prevention Program

Body Part Injured

- There were 148 body parts injured, with 21 individuals (18.1%) experiencing injury to multiple areas of their body (information was unavailable for one patient).
- Over half (52.7%, 78/148) of the injuries involved the hands/fingers or eyes (Figure 9). Injuries to the face, ears, and head accounted for 17.6% (26/148), and injuries to the leg accounted for 10.8% (16/148).
- Of those who had eye injuries, only 8.7% (2/23) had some sort of eye protection (i.e. glasses or contact lenses). Eye protection was not used in 56.5% (13/23) of the cases, and information was unknown for 34.8% (8/23) of the cases.

Figure 9: Body Part Affected by Firework-Related Injury, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Source of Care and Outcome of Injury

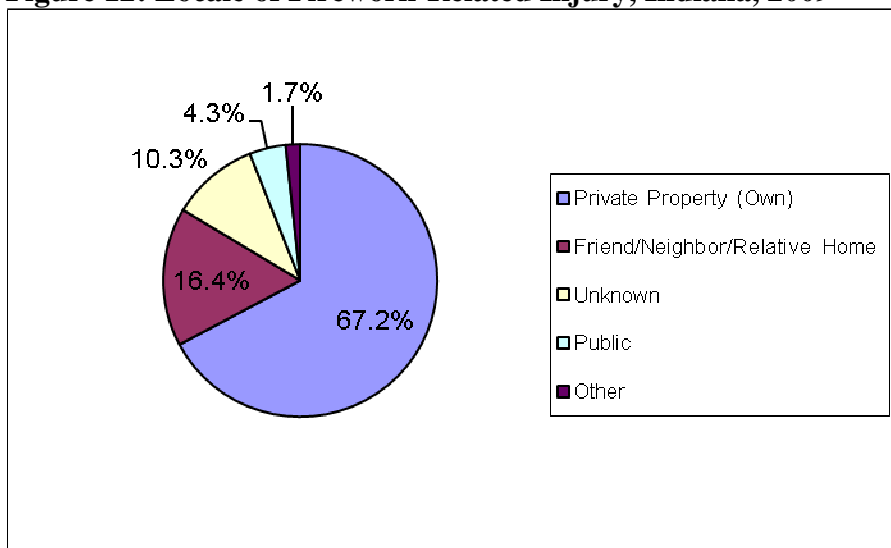
- The majority (76.7%, 89/116) of people injured by fireworks sought care at an emergency department. The remaining cases (23.3%, 27/116) sought care by another type of provider.
- Almost ninety percent (89.7%, 104/116) of those seeking treatment were evaluated and released to go home. However, 9.4% (11/116) were admitted to the hospital or transferred to another hospital and one patient's outcome was unknown.

Other Information

- Over sixty percent (67.2%, 78/116) of people were injured at their own private home, yard, or property, while 16.4% (19/116) were injured at someone else's home, yard, or property (Figure 12). Public property was noted for 4.3% (5/116) of people injured. Two people reported the injury occurring somewhere else (unspecified), and information was unknown for 12 people.

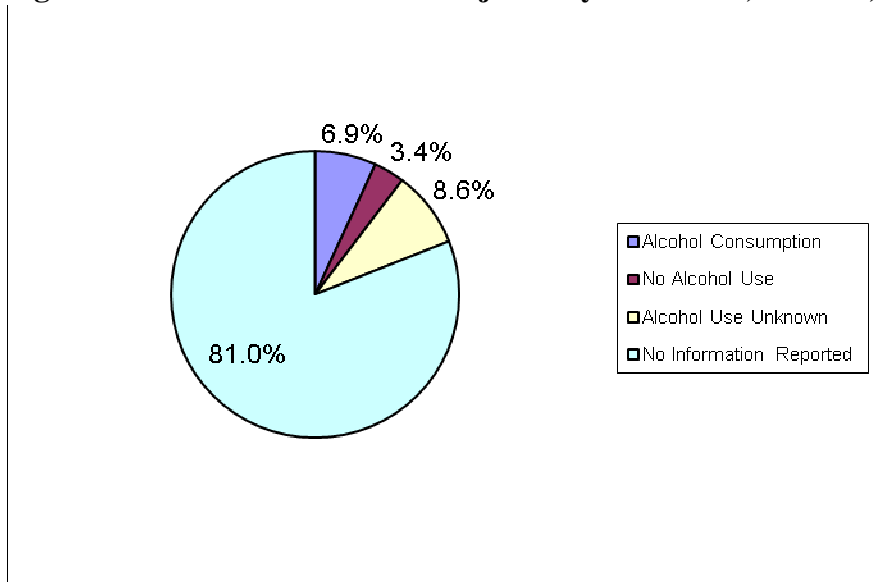
- Of injured persons, 12.9% (15/116) indicated they were bystanders. Children under 10 years of age made up 26.7% (4/15) of the bystanders injured by fireworks.
- Almost ninety percent (89.7%, 104/116) of all reports did not provide information (94/116) on alcohol consumption or that information was unknown (10/116) (Figure 13). Alcohol use was reported in 6.9% (8/116) of cases with 87.5% (7/8) of those cases reporting alcohol use within three hours of injury. Of those using alcohol, 25.0% (2/8) were under 21 years of age. Four people (3.4%) indicated that no alcohol was consumed prior to the injury.
- Among those injured who were 18 years of age or less, 41.4% (24/58) were injured while in the presence of an adult, and 22.4% (13/58) had no adult supervision. For 36.2% (21/58) of cases, the information was either unknown or was not reported (Figure 14).

Figure 12: Locale of Firework-Related Injury, Indiana, 2009



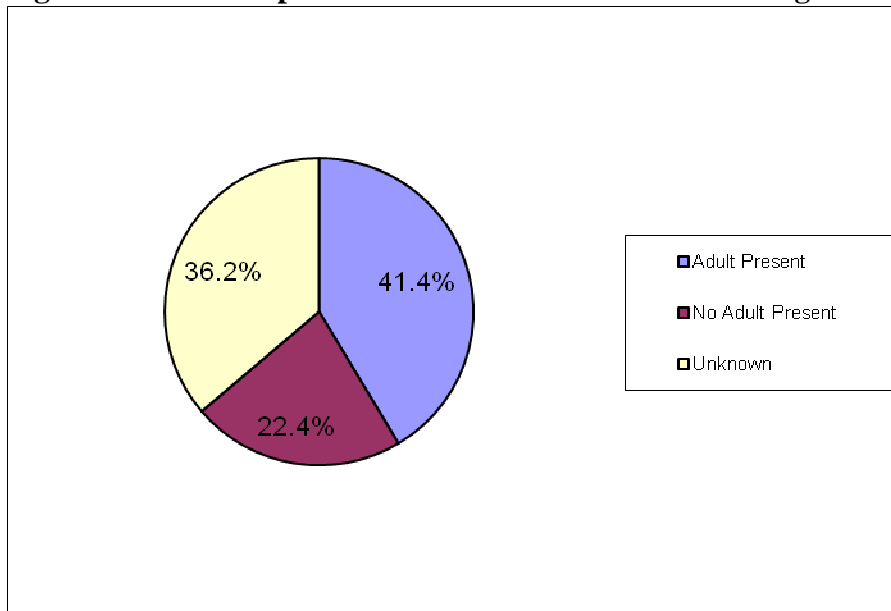
Source: Indiana State Department of Health, Injury Prevention Program

Figure 13: Alcohol Use of Those Injured by Fireworks, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Figure 14: Adult Supervision of Individuals 18 Years of Age or Younger, Indiana, 2009



Source: Indiana State Department of Health, Injury Prevention Program

Summary of Firework-Related Injuries for 2009

While the ages of those injured ranged from 11 months to 81 years, children and adolescents comprised half (50.0%, 58/116) of reported cases. Of those 18 years of age or less, 41.4% (24/58) were injured while in the presence of an adult, and 22.4% (13/58) had no adult supervision. Males (71.6%, 83/116) were injured more often than females (28.4%, 33/116). Over three-quarters (81.9%, 95/116) of the cases were white, 6.9% (8/116) were black, one case (0.9%) was multiracial and two cases were other (1.7%).

Over half (52.7%, 78/148) of the injuries involved the hands/fingers or eyes. Burns were the most common type of injury. The majority (76.7%, 89/116) of people injured by fireworks sought care at an emergency department, with the remaining cases (23.3%, 27/116) seeking medical care from another type of provider. Of those seeking medical care, 89.7% (104/116) were evaluated and released to go home. However, 9.5 % (11/116) were admitted to the hospital or transferred to another hospital.

For the 116 cases of firework-related injuries, 71.6% (83/116) occurred between July 2 and July 6 with 37.9% (44/116) of injuries taking place on July 4. Over two-thirds (67.2%, 78/116) of injuries occurred on private property. Firecrackers, rockets, and sparklers (51.7%, 61/118) were cited most often as being involved in firework injuries. The cause of injury was most commonly malfunction and mishandling (53.8%, 64/119) 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, 2008, and 2009).

Table 2: Comparison of Firework-Related Injuries, Indiana, 2003-2004 and 2006-2009

Category	2003	2004	2006	2007	2008	2009
Number of cases reported	261	233	251	156	141	116
Demographics						
Median Age	18	18	17	20	21	19
Age Range	0-74 yrs	0-72 yrs	0-67 yrs	0-70 yrs	0-70 yrs	0-81 yrs
Children/Adolescents	53%	52%	55%	48%	50%	50%
Males	73%	76%	70%	67%	70%	72%
Females	27%	24%	30%	33%	30%	28%
White	84%	87%	82%	87%	73%	82%
Black or African American	10%	8%	13%	7%	14%	7%
Injury Type						
Burns	76%	67%	73%	69%	65%	61%
Body Part Injured						
Hand	34%	32%	36%	41%	33%	37%
Eye	17%	25%	29%	24%	21%	16%
Cases with No Eye Protection	82%	88%	97%	92%	76%	91%
Injury Circumstances						
Injured on Private Property	83%	89%	86%	83%	87%	84%
Children Injured with Adults Present	60%	50%	64%	61%	62%	41.4%
Received Specialized Care for Burn or Eye Injuries	8%	19%	12%	4%	2%	4%
Hospitalized or Transferred to a Hospital	3%	6%	11%	8%	9%	10%
Died	0%	0%	0%	0%	1%	0%
Fireworks Circumstances						
Injuries from Sparklers, Rockets, and Firecrackers	63%	64%	57%	52%	53%	52%
Injuries from Mishandling Fireworks	27%	23%	29%	30%	28%	24%
Errant Path or Malfunctioning Fireworks	21%	37%	41%	35%	40%	41%

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, 2009

	Ages 0 -11	Ages 12 – 18	Ages 19 +
Number of Cases	30 (25.9%)	28 (24.1%)	58 (58.0%)
Gender			
Male	16 (53.3%)	23 (82.1%)	44 (75.8%)
Female	14 (46.7%)	5 (17.8%)	14 (24.1%)
Age Range	11 months – 11 years (median – 5.0 years)	12 – 18 years (median – 16 years)	19 – 81 years (median – 28.5years)
Race	30 total	28 total	58 total
White	22 (73.3%)	21 (75.0%)	52 (89.6%)
Black	4 (13.3%)	4 (14.2%)	0
Multiracial	1 (3.3%)	0	0
Other/Unknown	3 (10.0%)	3 (10.7%)	6 (10.3%)
Ethnicity	30 total	28 total	58 total
Hispanic	0 (0.0%)	1 (3.5%)	3 (5.1%)
Not Hispanic	17 (56.6%)	14 (50.0%)	52 (89.6%)
Unknown	13 (43.3%)	13 (46.4%)	3 (5.1%)
Body Parts Injured	34 total	37 total	72 total
Hand/Fingers	12 (35.2%)	16 (43.2%)	27 (37.5%)
Arm	0	3 (8.1%)	5 (6.9%)
Eye(s)	6 (17.6%)	5 (13.5%)	12 (16.6%)
Face/Ears/Head	5 (14.7%)	5 (13.5%)	16 (22.2%)
Neck	1 (2.9%)	0	0
Leg(s)	5 (14.7%)	1 (2.7%)	10 (13.8%)
Foot	3 (8.8%)	3 (8.1%)	2 (2.7%)
Trunk	1 (2.9%)	2 (5.4%)	0
Other	1 (2.9%)	2 (5.4%)	0
Injury Type	31 total	31 total	72 total
Burn	23 (74.1%)	20 (64.5%)	39 (54.1%)
Contusion	5 (16.1%)	5 (16.1%)	17 (23.6%)
Puncture	0	1 (3.2%)	1 (1.3%)
Penetrating	1 (3.2%)	1 (3.2%)	3 (4.1%)
Sprain/Fracture	0	1 (3.2%)	2 (2.7%)
Other	2 (6.4%)	3 (9.6%)	10 (13.8%)
Source of Care	30 total	28 total	58 total
Emergency Dept.	24 (80.0%)	17 (60.73%)	48 (82.7%)
Provider	6 (20.0%)	11 (39.2%)	10 (17.2%)

	Ages 0 -11	Ages 12 – 18	Ages 19 +
Evaluation Outcome	29 total	27 total	56 total
Home	28 (96.5%)	24 (88.8%)	49 (87.5%)
Hospitalized/ Transferred	1 (3.4%)	3 (11.1%)	7 (12.5%)
Died	0	0	0
Locale of Injury Occurrence	30 total	28 total	58 total
Private, own	19 (63.3%)	23 (82.1%)	36 (62.1%)
Private, other	4 (13.3%)	3 (10.7%)	12 (20.7%)
Public	2 (6.6%)	0	3 (5.2%)
Other	1 (3.3%)	1 (3.5%)	0
Unknown	4 (13.3%)	1 (3.5%)	7 (12.1%)
Eye Protection	6 total	5 total	12 total
None	4 (66.6%)	4 (80.0%)	8 (66.7%)
Glasses	0	0	1 (8.3%)
Lenses	0	1 (20.0%)	0
Unknown	2 (33.3%)	0	3 (25.0%)
Other	30 total	28 total	58 total
Bystander	5 (16.6%)	1 (3.5%)	9 (15.5%)
Type of Firework	30 total	28 total	60 total
Firecracker	5 (16.6%)	5 (17.8%)	13 (21.7%)
Rocket	5 (16.6%)	9 (32.1%)	10 (16.7%)
Sparkler	7 (23.3%)	3 (10.7%)	4 (6.7%)
Twister	1 (3.3%)	0	1 (1.7%)
Lighting Gunpowder	0	1 (3.5%)	0
Homemade	0	0	4 (6.7%)
Aerial	1 (3.3%)	2 (7.1%)	9 (15.0%)
Fountain	0	0	1 (1.7%)
Roman candle	2 (6.6%)	3 (10.7%)	4 (6.7%)
Smoke bomb	1 (3.3%)	1 (3.5%)	0
Other	3 (10.0%)	2 (7.1%)	9 (15.0%)
Pyrotechnics	0	0	0
Unknown	5 (16.6%)	2 (7.1%)	5 (8.3%)
Problem with Firework	31 total	29 total	59 total
Malfunction	2 (6.4%)	11 (37.9%)	23 (39.0%)
Errant path	3 (9.6%)	4 (13.7%)	6 (10.2%)
Debris	3 (9.6%)	0	0
Mishandling*	10 (32.2%)	8 (27.5%)	10 (16.9%)
Other*	5 (16.1%)	2 (6.8%)	7 (11.9%)
Unknown	8 (25.8%)	4 (13.7%)	13 (22.0%)