

# 2013 INDIANA FIREWORK-RELATED INJURY REPORT

November 2013

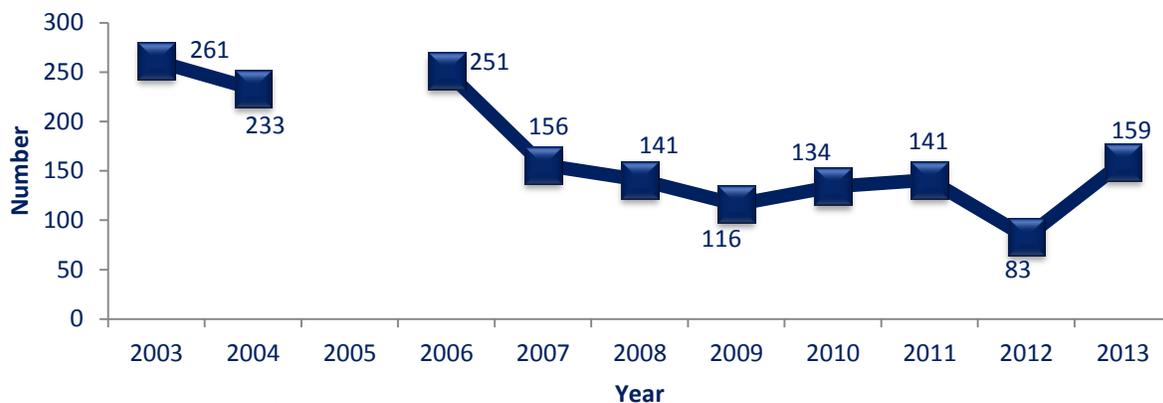


Division of Trauma and Injury Prevention

# 2013 FIREWORK-RELATED INJURY REPORT

The Indiana State Department of Health (ISDH) began receiving reports about injuries resulting from fireworks and pyrotechnics in 2003 and 2004. However, the law expired, and no firework-related injury reporting occurred in 2005. In 2006, Indiana Code 35-47-7-7 reinstated the reporting of firework-related injuries 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; however, this law does not include any enforcement, and we believe that the number of injuries reports received is an underestimation of the true burden of fireworks injuries. This report presents firework-related injury data compiled from submitted firework injury forms for the 2013 reporting cycle of September 13, 2012 to September 12, 2013. Figure 1 indicates the number of firework-related injuries reported in Indiana to the ISDH from 2003-2004 and 2006 to 2013.

**Figure 1. Firework-related injuries by reporting cycle year, Indiana, 2003–2013\***



\* Reporting not mandated in 2005

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention.

## 2013 Highlights

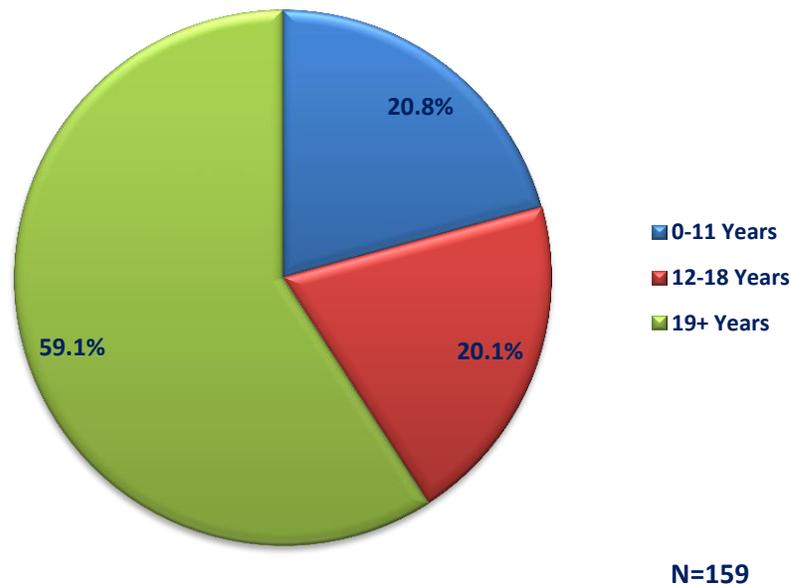
- ❑ There were 159 unduplicated cases of firework-related injuries reported to the ISDH.
- ❑ No deaths resulting from firework-related injuries were reported.
- ❑ Seventy-five injuries occurred on July 4, 2013, which represents 47.2 percent of all cases reported.
- ❑ Forty-one percent of reported firework-related injuries were among those ages 18 years and younger.
- ❑ Sixty-four percent of those children injured were under adult supervision.
- ❑ Thirty-seven percent of firework-related injuries were burns of the hands and/or fingers.
- ❑ Nearly eleven percent of injured persons were hospitalized or transferred to another hospital for treatment.
- ❑ Eye injuries accounted for 16.5 percent of the total number of injuries; three-quarters of those with eye injuries did not use eye protection.
- ❑ Fifty-nine percent of the injuries were caused by firecrackers, rockets, and sparklers.
- ❑ Malfunctioning or mishandling of fireworks accounted for fifty-three percent of reported fireworks injury mechanisms.
- ❑ Firework use on private property accounted for 59.8 percent of reported injury cases.
- ❑ Overall, there was a significant increase in the number of firework-related injuries reported during 2013 from 2012. This increase may be due to the lifting of the previous year's "burn ban."

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## Demographics

- The median age of persons with a firework-related injury was 23.5 years. The average age of all injured persons was 25.3 years old; ages ranged from one to 78 years old.
- Forty-one percent of those injured were 18 years of age or younger, with 20.7 percent of those injured under the age of 12 years (Figure 2).
- Of reported injuries, 70.4 percent involved males and 28.9 percent involved females. One case did not report gender. Across all age groups, males had more firework-related injuries than females (Figure 3).
- Nearly eighty percent (78.6 percent) of persons injured were white, 11.3 percent were black or African American, and 2.5 percent were multiracial (Figure 4). Race was not known or not reported in eight percent of the injury reports. White males represented 56.6 percent of cases.
- Thirty-six percent of the injury reports did not record ethnicity. Of those who reported ethnicity, Hispanic ethnicity was reported in three percent of cases.
- Eighty percent of injured people provided a home address in Indiana, 5.6 percent reported out of state addresses, and 13.8 percent did not provide an address. Vanderburgh, Lake, and Marion counties reported the most cases of firework-related injuries with 8, 13, and 14 cases, respectively.

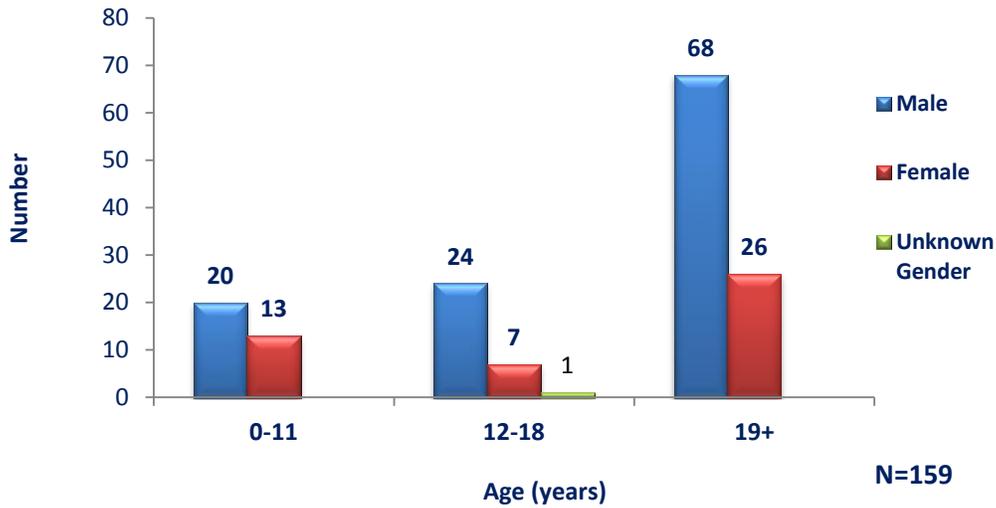
**Figure 2. Firework-related injuries by age group, Indiana, 2013\***



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

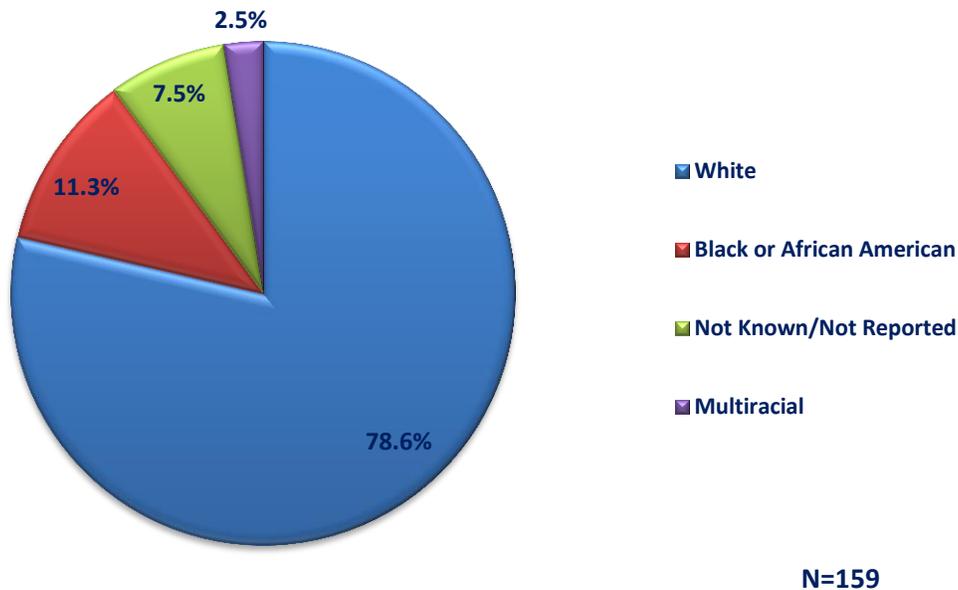
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**Figure 3. Firework-related injuries by age and sex, Indiana, 2013\***



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
 Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 4. Firework-related injuries by race, Indiana, 2013\***



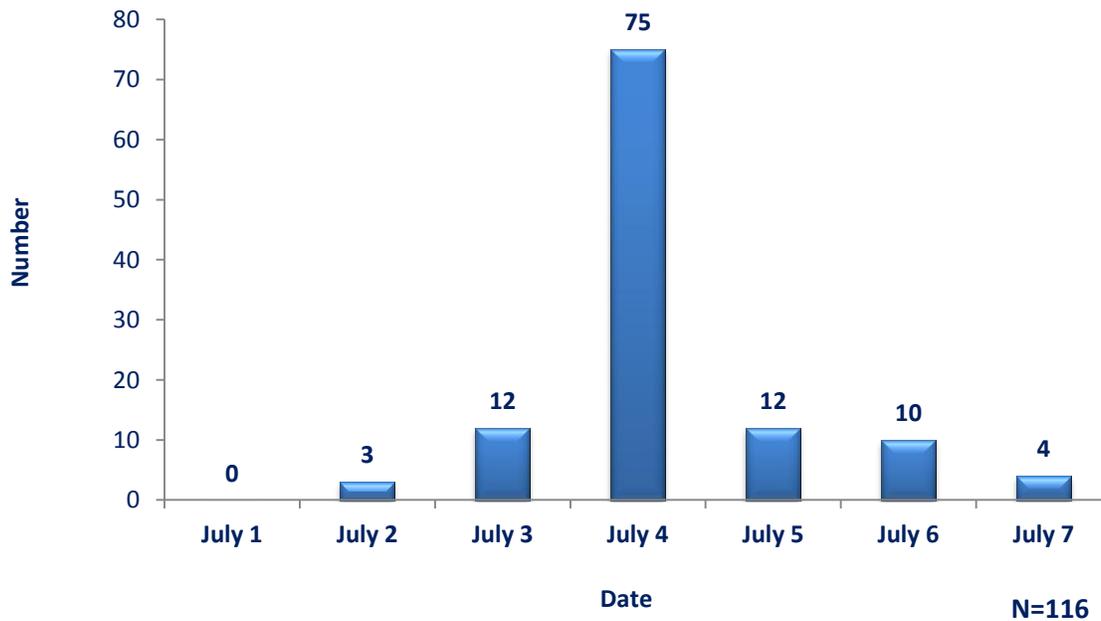
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# 2013 FIREWORK-RELATED INJURY REPORT

## Date and Time of Injuries

- Four firework-related injuries were reported from September 12 to December 31, 2012. Twelve firework-related injuries were reported from January 1 to June 30, 2013. Seventeen cases in 2013 occurred from July 8 to September 12. Ten cases did not have information about date of the injury.
- Nearly three-quarters of all reported injuries in 2013 occurred from July 1–7, 2013; 47.2 percent of all fireworks injuries occurred on July 4, 2013 (Figure 5).
- Fifty-eight percent of reported firework-related injuries occurred between 8 p.m. and midnight, with 62 reported injuries occurring between 9–11 p.m. (Figure 6).
- Twenty-eight cases failed to report the time of injury, of which twenty failed to report if the injury occurred in the a.m. or p.m.

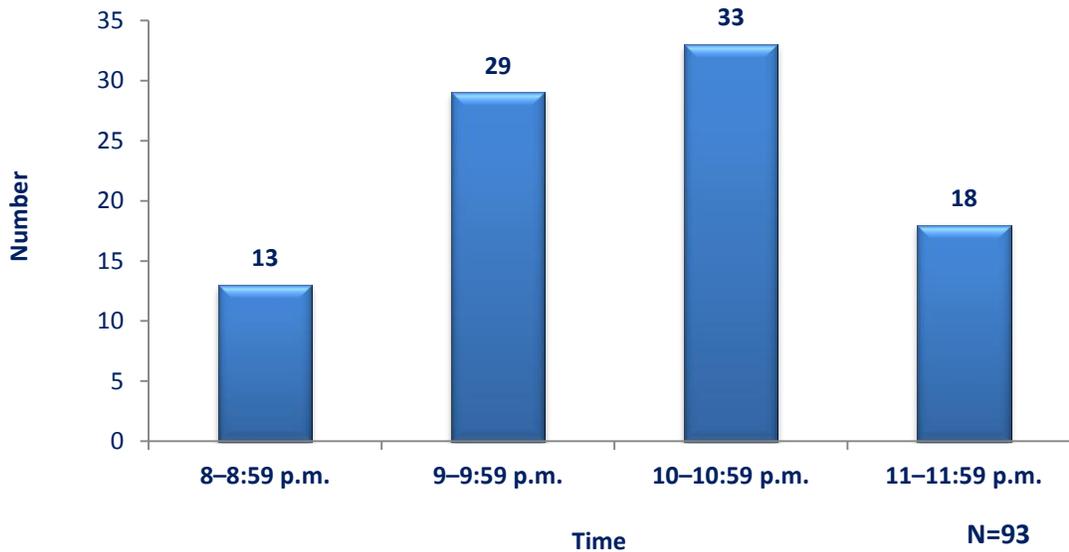
Figure 5. Firework-related injuries by date, July 1–July 7, Indiana, 2013\*



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2013 FIREWORK-RELATED INJURY REPORT

Figure 6. Most frequent times when firework injuries occurred, Indiana, 2013\*



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

### Type of Fireworks Involved in Injuries

- The 159 individuals with reported injuries were injured by a total of 165 fireworks, as three individuals were reported to be injured by more than one firework. One individual was reportedly injured from holding 5 sparklers.
- Rockets, firecrackers, and aerial devices accounted for more than half (54.1 percent) of the reported injuries (Table 1).
- Thirty-nine percent of the other types of fireworks injuries involved mortars, which are tube-shaped devices used as launching mechanisms for shells in aerial fireworks displays.
- Malfunction and mishandling of fireworks accounted for over half (53.0 percent) of reported problems causing injury (Figure 7). For nine reports, there was more than one cause of firework-related injury, leading to 168 causes for 159 reported injuries.

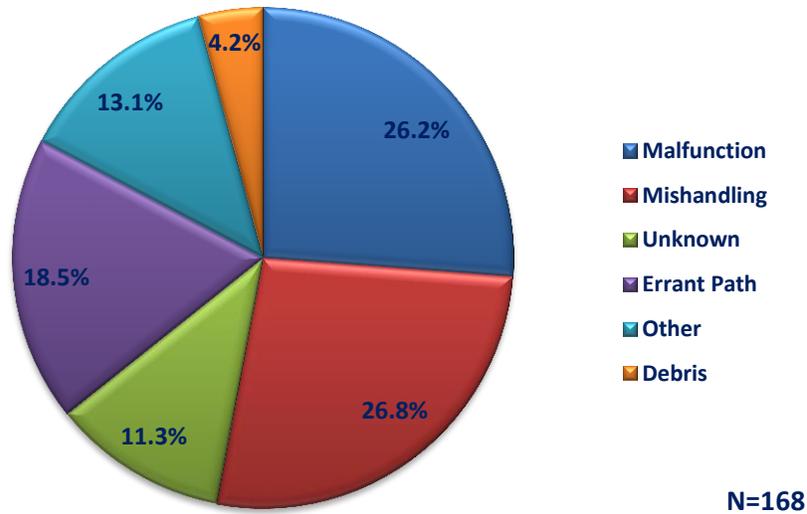
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**Table 1. Frequency and Percent of Firework Type Involved in Injury, Indiana, 2013\***

Firework Type	Frequency	Percent
Firecrackers	33	20.8%
Rockets	33	20.8%
Sparklers	28	17.6%
Other, specified	22	13.8%
Aerial	20	12.6%
Unknown	14	8.8%
Twisters	4	2.5%
Homemade fireworks	3	1.9%
Pyrotechnics	2	1.3%
Lighting Gunpowder	0	0.0%
<b>Total</b>	<b>159</b>	<b>100.0%</b>

\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
 Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 7. Cause of firework-related injury, Indiana, 2013\***



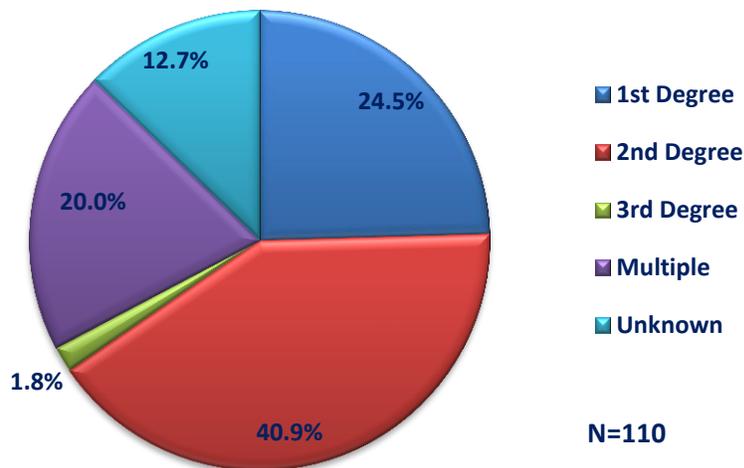
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## Type of Injuries

- In 2013, a total of 197 fireworks injuries occurred among 159 individuals.
- Burn injuries were reported in 110 individuals and affected 157 parts of the body:
  - 27 were first-degree burns
  - 45 were second-degree burns
  - 2 were third-degree burns
  - 22 were multiple degree burns
  - 14 did not indicate degree of burn (Figure 8)
- Burns were the most commonly reported injury; thirty-seven percent of burns of the hands and/or fingers and 17.2 percent of burns were of the face, ear, and head.
- Other types of injuries included contusions/lacerations/abrasions (20.3 percent), puncture wounds (5.6 percent), penetrating foreign body/missiles (5.1 percent), sprains/fractures (1.0 percent), other injuries (8.6 percent), and the injury was not known or not recorded in 3.6 percent of cases (Figure 9).

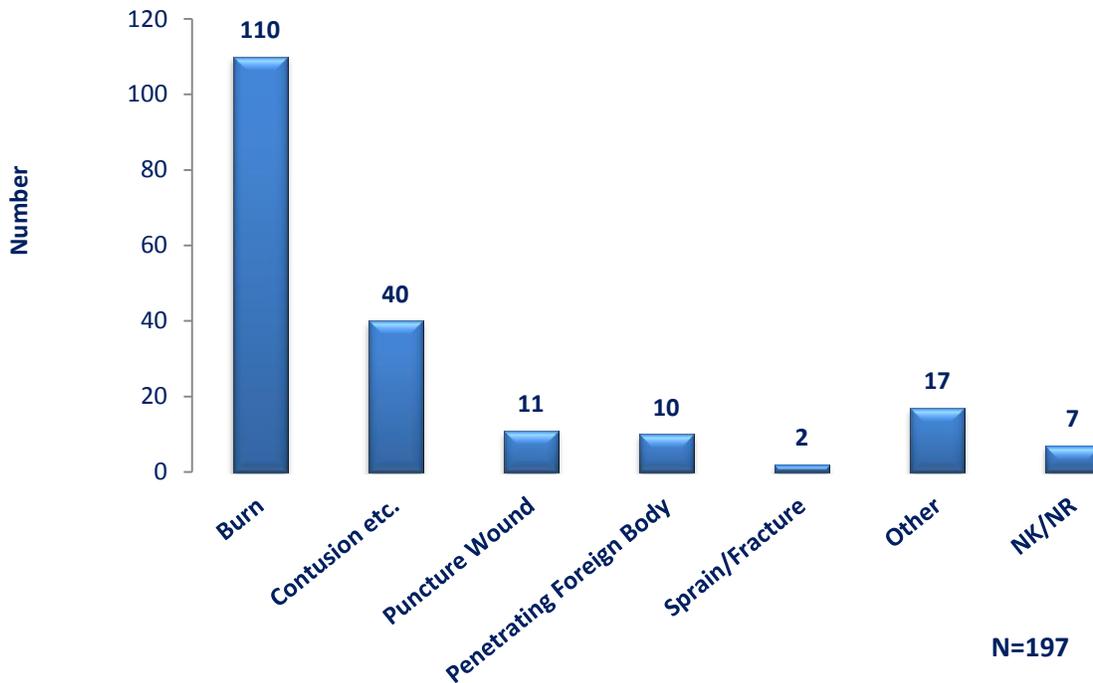
**Figure 8. Degree of burn experienced from firework-related injury, Indiana, 2013\***



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

# 2013 FIREWORK-RELATED INJURY REPORT

Figure 9. Type of firework-related injury, Indiana, 2013\*



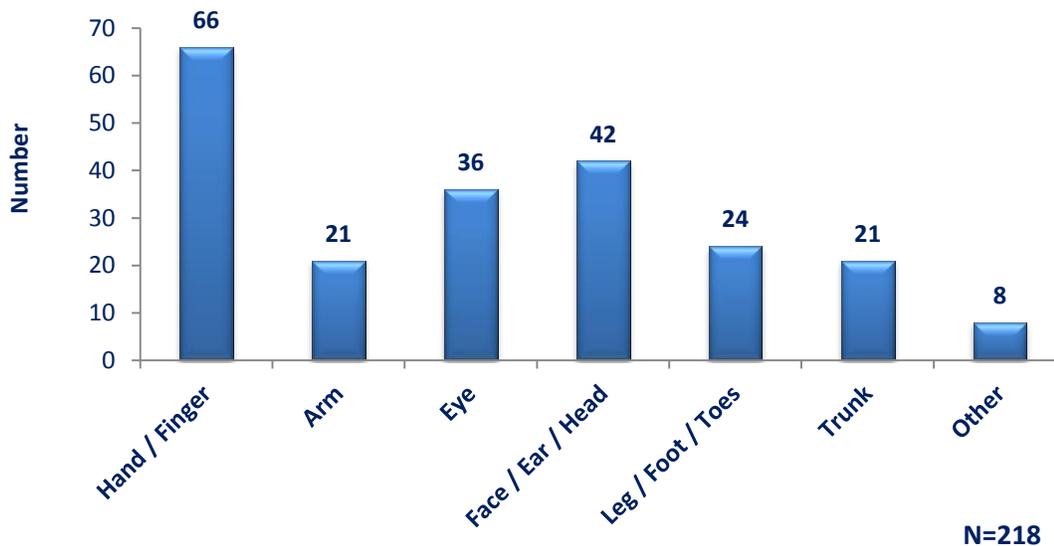
\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## Body Part Injured

- In 2013, of the 159 total cases, 39 individuals experienced injuries to multiple body parts.
  - Over half (56.4 percent) of the injuries involved the hand, finger, eye or arm.
  - 19.3 percent of injuries involved the face, ear or head.
  - 9.6 percent of injuries involved the trunk.
  - 11.0 percent of injuries involved the leg, foot, or toes.
  - Other body parts injured included the neck, back and buttock (3.7 percent) (Figure 10).
  
- Of the 36 individuals who had eye injuries, three-quarters of those injured (27 cases) did not have or use eye protection (i.e. glasses or contact lenses). Eyeglasses were worn by one individual and contact lenses were worn by two of those who experienced an eye injury. Eye protection use among six individuals with eye injuries is unknown.

## 2013 FIREWORK-RELATED INJURY REPORT

Figure 10. Body part affected by firework-related injury, Indiana, 2013\*



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

### Source of Care and Injury Outcomes

- The majority of people injured by fireworks sought care at an emergency department or urgent care center (95.1 percent). The remaining seven cases received care from a provider office (i.e. pediatrician, optometrist).
- Eighty-eight percent of those seeking treatment were evaluated and released to go home. However, 3.1 percent were admitted to the hospital and another 7.6 percent were transferred to different hospital. Nineteen records did not provide information regarding the patient's outcome. There were no firework-related injuries resulting in death reported.
- 5 people visited a health care facility more than once; one individual visited three health care facilities due to firework-related injuries.

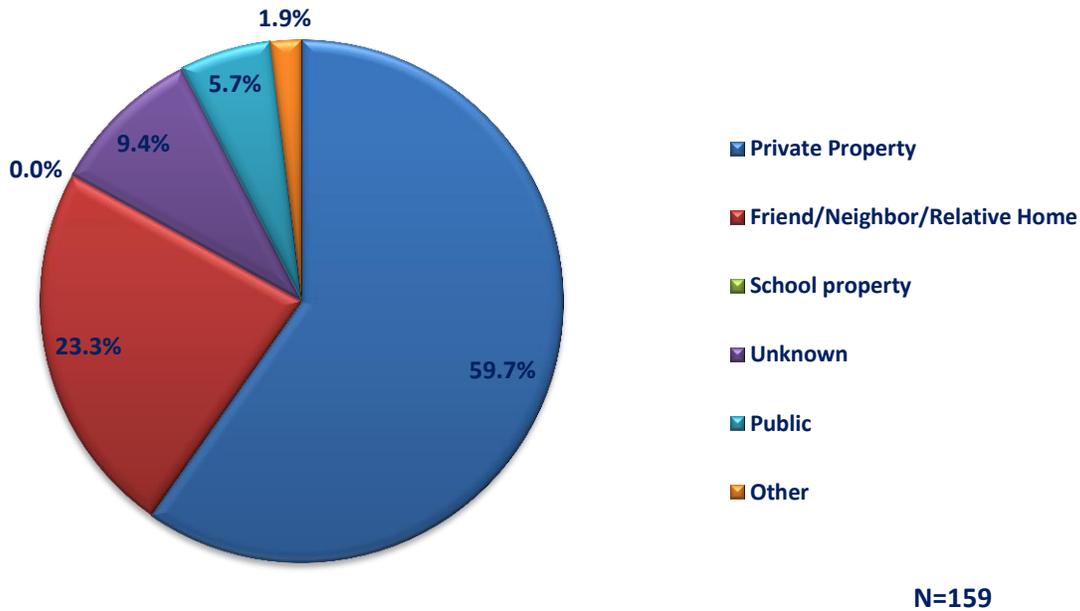
### Additional Information

- Geographical location
  - Nearly 60 percent of people were injured at a private home, yard or property.
  - Twenty-three percent were injured at someone else's home, yard or property.
  - Public property was noted as the site for nearly six percent of injury occurrences.
  - Three people were injured at other, unspecified locations.
  - Injury location information was unknown for 15 (9.4 percent) people (Figure 11).
- Alcohol use
  - Alcohol use was recorded in 22 instances.

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- Alcohol was consumed by 18 injured individuals, and of those 18, 66 percent reported consuming alcohol within three hours of injury.
- None of those using alcohol were under 21 years of age, but alcohol consumption by other people at the scene was reported in one case of an injured person who was less than 21 years of age (Figure 12).
  
- Adult supervision
  - Among the 65 individuals injured who were 18 years of age or younger at the time of the injury, 64.6 percent were injured while in the presence of an adult and 7.7 percent had no adult supervision.
  - Information regarding adult supervision was not reported in 18 percent of the cases (Figure 13).
  
- Bystanders
  - There were 23 firework-related injuries reported among bystanders.
  - Of the 23 bystanders, six were 18 years of age or younger.

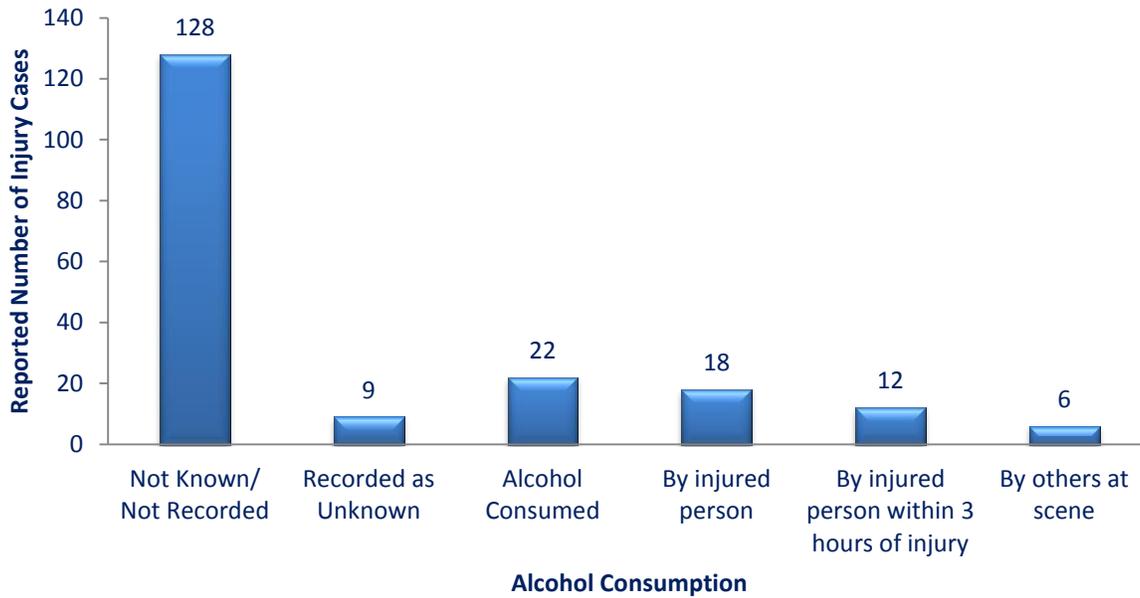
**Figure 11. Location of firework-related injury, Indiana, 2013\***



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 Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

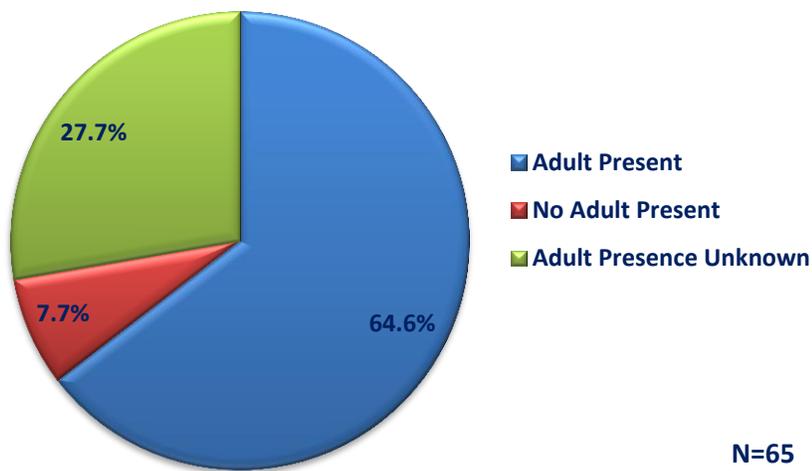
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**Figure 12. Alcohol use of those injured by fireworks, Indiana, 2013\***



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
 Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

**Figure 13. Adult supervision of individuals 18 years of age or younger, Indiana, 2013\***



\* 2013 reporting cycle includes cases from September 13, 2012–September 12, 2013.  
 Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

## 2013 FIREWORK-RELATED INJURY REPORT

### Summary of Firework-Related Injuries for 2013

There were 159 unduplicated cases reported to the ISDH during the 2013 reporting cycle. While the ages of those injured ranged from one to 78 years old, children and adolescents comprised 40.9 percent of reported cases. Males were injured more frequently than females across all age groups and 56.6 percent of all injured persons were white males. More than three-quarters (78.6 percent) of the individuals were white, 11.3 percent were black and four people were multiracial (2.5 percent). Race was not known or not reported for 12 individuals.

More than half (56.4 percent) of the injuries involved the hands, fingers, eyes or arms. Burns were the most common type of injury, occurring in 110 injured persons and affecting 157 parts of the body. The majority (95.6 percent) of people injured by fireworks sought care at an emergency department or urgent care center, with the remaining seven cases seeking medical care from another type of provider. Of those seeking medical care, 77.4 percent were evaluated and released to go home and 10.7 percent were admitted to the hospital or transferred to another hospital.

For the 159 cases of firework-related injuries reported to ISDH during the entire reporting cycle, 73.0 percent occurred between July 1 and July 7 and 47.2 percent of injuries took place on July 4. Over half (59.8 percent) of injuries occurred on private property. Firecrackers, rockets, and sparklers use resulted in 59.1 percent of firework-related injuries. The mechanism of injury was most commonly malfunction and mishandling of fireworks.

This report has several implications; first, the knowledge of the most commonly affected body parts in firework-related injury can help focus prevention efforts to eliminate injuries. Second, identifying the day and time of most firework-related injuries can help medical personnel better prepare to treat these injuries. Thirdly, this report can help inform the public regarding which firework types are most dangerous.

There are several limitations of this report, which include the possibility of underreporting and underrepresenting the true burden of firework-related injuries in Indiana because some medical facilities and providers may not report all of their firework injuries to ISDH. It may be because the physician or staff is not aware of the reporting or because the patient does not acknowledge that he was injured by fireworks. Additionally, not every report submitted to the state was completed fully or accurately. Some reports were sent numerous times and this report only contains unduplicated records.

The 2013 report includes 76 more firework-related injuries compared to the previous year's report. This difference may be due to the lifting of the "burn bans" set in place because of severe drought and restricted outdoor burning activities in summer 2012. Local ordinances can prohibit the use of fireworks when certain environmental conditions, like droughts, occur, which increase the likelihood of fires and other serious consequences due to fireworks. During the 2013 reporting cycle, there are no "burn bans" or other situations resulting in the prohibition of fireworks.

This report was prepared by Jessica Skiba, MPH, Indiana State Department of Health, Division of Trauma and Injury Prevention.

# 2013 FIREWORK-RELATED INJURY REPORT

## 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, 2009, 2010, 2011, 2012, and 2013).

**Table 2. Comparison of firework-related injuries, Indiana, 2003-2004 and 2006-2013**

Year	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013
<b>Number of cases reported</b>	261	233	251	156	141	116	134	141	83	159
<b>Demographics</b>										
Median Age	18	18	17	20	21	19	20	21	23	23.5
Age Range (in years)	0-74	0-72	0-67	0-70	0-70	0-81	1-69	0-65	2-64	1-78
Children/Adolescents	53%	52%	55%	48%	50%	50%	47%	42%	36%	41%
Males	73%	76%	70%	67%	70%	72%	75%	72%	87%	70%
Females	27%	24%	30%	33%	30%	28%	25%	28%	13%	29%
White	84%	87%	82%	87%	73%	82%	73%	84%	77%	79%
Black or African American	10%	8%	13%	7%	14%	7%	16%	12%	16%	11%
<b>Injury Type</b>										
Burns	76%	67%	73%	69%	65%	61%	62%	55%	50%	56%
<b>Body Part Injured</b>										
Hand	34%	32%	36%	41%	33%	37%	27%	31%	42%	30%
Eye	17%	25%	29%	24%	21%	16%	17%	18%	13%	17%
No Eye Protection	82%	88%	97%	92%	76%	91%	91%	93%	93%	75%
<b>Injury Circumstances</b>										
Injured on Private Property	83%	89%	86%	83%	87%	84%	79%	67%	61%	60%
Children Injured with Adults Present	60%	50%	64%	61%	62%	41%	57%	87%	57%	64%
Hospitalized or Transferred to a Hospital	3%	6%	11%	8%	9%	10%	14%	12%	24%	11%
Died	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%
<b>Fireworks Circumstances</b>										
Injuries from Sparklers, Rockets, and Firecrackers	63%	64%	57%	52%	53%	52%	51%	51%	47%	59%
Injuries from Mishandling Fireworks	27%	23%	29%	30%	28%	24%	23%	26%	24%	27%
Errant Path or Malfunctioning Fireworks	21%	37%	41%	35%	40%	41%	43%	43%	37%	44%

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention