



**RESEARCH**

# Fireworks Fires and Injuries

Marty Ahrens  
June 2020



*Each year, fireworks injure thousands and cause thousands of fires.*

## **Fires involving fireworks**

An estimated 19,500 fires started by fireworks were reported to local fire departments in the US during 2018. These fires caused five civilian deaths, 46 civilian injuries, and \$105 million in direct property damage.

Brush, grass, or forest fires accounted for three of every five (59 percent) reported fires started by fireworks in 2014–2018. In all, nine of every 10 (87 percent) of the fireworks fires in 2014–2018 were outdoor fires. While only 9 percent of the fireworks fires in this period were structure fires, these incidents accounted for almost all of the fire deaths, three-quarters (74 percent) of the fire injuries, and 45 percent of the fire property damage.

More than one-quarter (28 percent) of fires started by fireworks in 2014–2018 were reported on the Fourth of July.

Looking at just the Fourth of July, half (49 percent) of the reported fires on that day were started by fireworks.

These estimates were derived from the U.S. Fire Administration’s [National Fire Incident Reporting System \(NFIRS\)](#) and NFPA’s annual fire department experience survey. Estimates include proportional shares of fires in which the heat source was unknown or not reported.

## **Fireworks-related injuries seen at emergency rooms**

The Consumer Product Safety Commission (CPSC) estimates that 9,100 consumer fireworks-related injuries were seen in US hospital emergency departments in 2018.<sup>1</sup> The number of people seen in hospital emergency rooms for fireworks-related injuries was lower in 2018 than it had been since 2012.

The CPSC also had reports of five fireworks-related deaths from direct impact of fireworks. Reloadable aerial devices were involved in all five deaths. The CPSC notes that additional deaths may have occurred and not been reported. The five deaths should be considered a minimum.

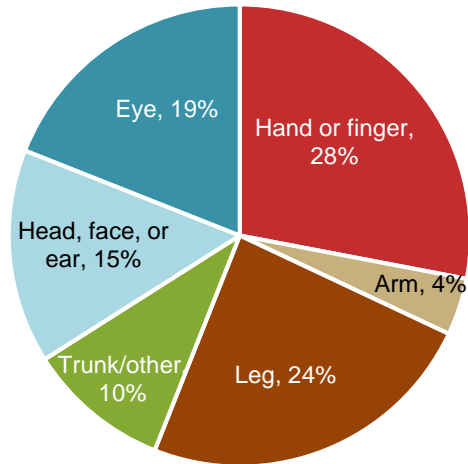
*As in previous years, the CPSC sought additional information on fireworks-related injuries seen in the month around July 4. The detailed statistics below are based only on injuries seen from June 22 to July 22, 2018.*

Burns accounted for 44 percent of the fireworks-related injuries seen in the month around July 4.

Males accounted for almost two-thirds (64 percent) of fireworks-related injuries.

Half of the fireworks-related injuries seen at emergency rooms around the month of July 4, 2018 were to extremities, particularly the finger, hand, or leg. (See Figure 1.) One-third of the fireworks-related injuries were to the eye or other parts of the head.

**Figure 1.**  
2018 Fireworks-Related Injuries\*  
by Part of Body Injured

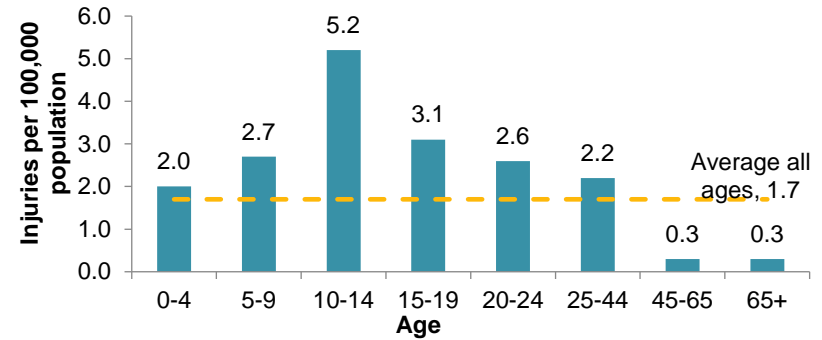


\*Based on injuries during the month around July 4.  
Source: CPSC's 2018 Fireworks Annual Report by Tu and Ng.

More than one-third (36 percent) of the victims of fireworks-related injuries in this period were under the age of 15. Only 8 percent of the injured were 45 years of age or older. Figure 2 shows that children aged 10–14 had the highest rate of fireworks-related injury.

It is important to remember that the individual injured was not always the individual using the fireworks. The examples of injuries to actively involved individuals and to those nearby come from CPSC's National Electronic Injury Surveillance Systems<sup>2</sup> 2018 data.

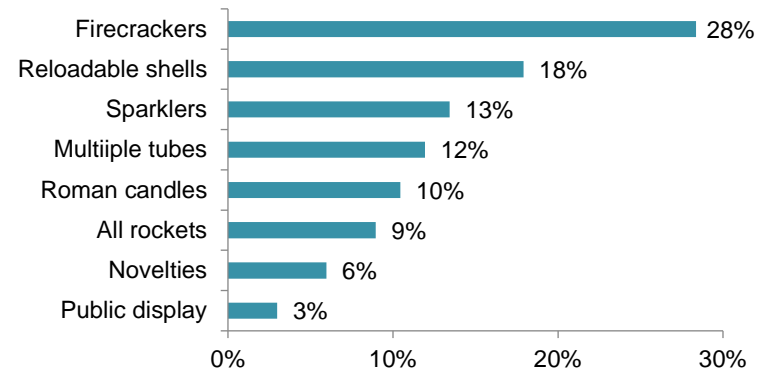
**Figure 2.**  
Fireworks-Related Injury Rates\* per 100,000  
Population by Age of Victim 2018



\*Based on injuries during the month around July 4.  
Source: CPSC's 2018 Fireworks Annual Report by Tu and Ng.

Figure 3 shows that many fireworks-related injuries were caused by fireworks that are legal in most states.

**Figure 3.**  
2018 Fireworks-Related Injuries\*  
by Type of Fireworks  
(Unknowns Allocated)



\*Based on injuries during the month around July 4.  
Source: CPSC's 2018 Fireworks Annual Report by Tu and Ng.

- An 18-month-old girl burned her foot when she stepped on a burning sparkler.
- A 2-year-old girl burned her eyelid when she touched a sparkler that had burned out but was still hot.
- An 8-year old boy suffered a corneal abrasion when sparks from a sparkler flew into his left eye.
- An 11-year-old suffered a corneal abrasion when the firecracker he was trying to re-light went off.
- Someone aimed a Roman candle at a group of people and the device burned a 13-year-old boy on the neck and back.
- An 18-year-old male suffered lacerations to his fingers, and chest and arm abrasions when the M-80 he lit went off immediately.
- A 27-year-old man’s finger was amputated when the firework shell he lit exploded in his hand.

Laws vary considerably. As of June 2019, only Massachusetts bans all consumer fireworks. Illinois, Ohio, and Vermont allow only wire or wood sparklers and other novelty items. Some or all types of consumer fireworks permitted by federal regulations are allowed in the 46 remaining states and the District of Columbia.<sup>3</sup> Some states prohibit firecrackers, aerial devices, and explosive fireworks or fireworks that have more than a specified amount of pyrotechnic composition.

In their analysis of the effect of fireworks laws on pediatric fireworks-related burn injuries, Myers and Lehna note that the CPSC bans the sale of Class B fireworks such as cherry bombs, M-80s, and large firecrackers.<sup>4</sup> The CPSC permits Class C fireworks such as Roman

candles, fountains, certain types of rockets, smoke devices, sparklers, and similar devices. States can decide which, if any, Class C devices may be sold in their jurisdiction. In 1984, consumer use of all Class C fireworks was banned in 14 states. This dropped to 10 states in 2001 and fell to six states by 2016. Using data from the Healthcare Cost and Utilization Project, Myers and Lehna reported that the rate of pediatric fireworks-related injuries increased from 4.28 to 5.12 per 100,000 between 2006 and 2012. The percentage of fireworks-related injuries seen at emergency departments that required inpatient admission almost doubled from 29 percent to 50 percent while the average inpatient length of stay more than doubled from 3.1 to 7.4 days. This suggests that a wider availability of these fireworks is leading to more severe injuries.

Given the high risk of injury associated with consumer fireworks, it is safer to avoid them, and watch professional shows where available.

### For more information

The fire estimates in this analysis were derived from the U.S. Fire Administration’s National Fire Incident Reporting System (NFIRS) and NFPA’s annual Fire Experience Survey. See “*How the NFPA National Estimates Are Calculated for Home Structure Fires*” for more information.

For more details about fireworks fires, see the [companion supporting tables](#)

To learn more about research at NFPA, visit [nfpa.org/research](https://www.nfpa.org/research).

Email: [research@nfpa.org](mailto:research@nfpa.org)  
NFPA No. PSS18

<sup>1</sup>Yongling Tu and Jason Ng. *2018 Fireworks Annual Report: Fireworks-Related Deaths, Emergency Department-Treated Injuries, and Enforcement Activities During 2018*. Consumer Product Safety Commission, 2019. Accessed May 18, 2020, [https://www.cpsc.gov/s3fs-public/Fireworks\\_Report\\_2018.pdf?5kZ4zdr9jPFyhPmeg3MoL35mGX8fB0s7](https://www.cpsc.gov/s3fs-public/Fireworks_Report_2018.pdf?5kZ4zdr9jPFyhPmeg3MoL35mGX8fB0s7)

<sup>2</sup> Consumer Product Safety Commission, “NEISS Estimates Query Builder,” accessed May 18, 2020, <https://www.cpsc.gov/cgibin/NEISSQuery/home.aspx>

<sup>3</sup> American Pyrotechnics Association, “State Fireworks Control Laws,” Accessed May 19, 2020, <https://www.americanpyro.com/state-law-directory>

<sup>4</sup> John Myers and Carlee Lehna, “Effect of Fireworks Laws on Pediatric Fireworks -Related Burn Injuries.” *Journal of Burn Care & Research*, Volume 38, Issue 1, (January-February 2017): pages e79–e82, <https://doi.org/10.1097/BCR.0000000000000435>.