



## **2009 Fireworks Annual Report**

### **Fireworks-Related Deaths, Emergency Department-Treated Injuries, and Enforcement Activities During 2009**

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*This report was prepared by the CPSC staff, has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.*

## Executive Summary

This report provides the results of the U.S. Consumer Product Safety Commission (CPSC) staff analysis of data on non-occupational fireworks-related deaths and injuries during 2009. The report also includes a summary of CPSC staff enforcement activities during 2009.

Staff obtained information on fireworks-related deaths from news clippings and other sources in CPSC's Injury and Potential Injury Incident (IPII) database. Staff estimated fireworks-related injuries from CPSC's National Electronic Injury Surveillance System (NEISS). More detailed analyses of injuries including the type of injury, the fireworks involved, and the characteristics of the victim were based on a special study conducted by CPSC staff between June 19 and July 19, 2009. About two-thirds of the annual fireworks-related injuries for 2009 occurred during that period.

Highlights of the report are as follows:

- CPSC staff has reports of two fireworks-related deaths during 2009. Both fatalities involved aerial shells. In the first incident, a 41 year-old male was killed in an explosion of a professional display mortar shell that he lit in his backyard. In the second incident, a 26 year-old male lit a consumer grade mortar shell that was in a launching tube that he held over his head. The shell discharged from the bottom of the tube resulting in a skull fracture. CPSC staff has reports of seven fireworks-related deaths in 2008. Reporting is not complete for either year and the actual number of deaths may be higher.
- Fireworks were involved in an estimated 8,800 injuries treated in U.S. hospital emergency departments during calendar year 2009 (95 percent confidence interval 6,800 – 10,800). CPSC staff estimated that there were 7,000 fireworks-related injuries during 2008.
- An estimated 5,900 fireworks-related injuries (or 67 percent of the total fireworks-related injuries) were treated in U.S. hospital emergency departments during the one-month special study period between June 19, 2009 and July 19, 2009 (95 percent confidence interval 4,200 – 7,600). CPSC staff estimated that there were 5,000 fireworks-related injuries during the 2008 special study period.

Results from the special study include the following:

- Of the fireworks-related injuries sustained, 73 percent were to males and 27 percent were to females.
- Injuries to children were a major component of total fireworks-related injuries with children under 15 years old accounting for 39 percent of the estimated injuries. Children and young adults under 20 years old had 54 percent of the estimated injuries.

- There were an estimated 1,200 injuries associated with firecrackers. Of these, 700 were associated with small firecrackers, 200 with illegal firecrackers, and 300 where the type of firecracker was not specified.
- There were an estimated 1,000 injuries associated with sparklers and 300 with bottle rockets.
- The parts of the body most often injured were hands and fingers (estimated 1,900 injuries), eyes (1,600 injuries), and head, face, and ears (900 injuries).
- More than half of the injuries were burns. Burns were the most common injury to all parts of the body except the eyes, where contusions, lacerations, and foreign bodies in the eye occurred more frequently.
- Most patients were treated at the emergency department and then released. An estimated 8 percent of patients were treated and transferred to another hospital or admitted to the hospital.

CPSC staff conducted telephone follow-up investigations of some fireworks-related injuries reported at NEISS hospital emergency departments during the special study period. Many of these cases were selected for follow-up because they involved potentially serious injuries and/or hospital admissions. Cases were also selected to clarify information in the hospital record about the incident scenario or fireworks type. Twenty-four telephone interviews were completed. After review, one of these incidents was determined to be out of scope because the explosion was caused by gunpowder, rather than fireworks.

A review of data from telephone follow-up investigations of the 23 in-scope incidents showed that most injuries were associated with the malfunctioning or misuse of fireworks. Typical malfunctions included fireworks exploding earlier or later than expected, errant flight paths and the launching tubes of aerial shells tipping over. Misuse included fireworks lit too close to other fireworks, lighting a firework in a container and mischief. According to the investigations, most victims already had recovered from their injuries or were expected to recover completely, but several victims reported that the injuries could result in long-term effects.

During 2009, CPSC's Office of Compliance and Field Operations continued to work closely with other agencies to conduct surveillance on imported fireworks and to enforce the provisions of the Federal Hazardous Substances Act. Examples of these activities are as follows:

- With assistance from the Bureau of Customs and Border Protection, staff from CPSC selectively sampled and tested numerous shipments of fireworks to determine if they were in compliance with the Federal Hazardous Substances Act.

Approximately 38 percent of those shipments were found to contain fireworks that were noncompliant.

- CPSC staff worked with other Federal agencies, including the Bureau of Alcohol, Tobacco, Firearms and Explosives, the Department of Justice's Office of Consumer Litigation, as well as state and local law enforcement agencies. Staff provided legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers.

Recognizing the global economy, CPSC staff continues to work with our counterpart in China, the General Administration for Quality Supervision, Inspection and Quarantine (AQSIQ). AQSIQ and CPSC established four working groups on consumer products, one of which focuses on fireworks. According to 2009 statistics from the U.S. International Trade Commission, more than 98 percent of all fireworks imported into the United States were manufactured in China.

## **1. Introduction**

This report describes injuries and deaths associated with fireworks during 2009. The report also describes CPSC staff enforcement activities for 2009. Reports for earlier years in this series can be found on the internet at [www.cpsc.gov/library/data.html](http://www.cpsc.gov/library/data.html).

This report is organized into seven sections. Section 1 contains a description of the data and statistical methods used in this analysis. Section 2 summarizes fireworks incidents resulting in deaths. Section 3 provides an annual estimate of fireworks-related emergency department-treated injuries for the U.S. in 2009 and compares that estimate with those for previous years. Section 4 analyzes emergency department-treated fireworks-related injuries occurring during the month around July 4th. Section 5 summarizes the in-depth telephone investigations of a subsample of the injuries during that period. Section 6 describes enforcement activities by CPSC's Office of Compliance and Field Operations during 2009. The main body of the report then concludes with a summary of the findings in Section 7. Appendix A presents a table on the relationship between fireworks-related injuries and fireworks imports between 1996 and 2009. Appendix B contains more detail on the completed telephone investigations.

### *Sources of Information*

Information on non-work-related fireworks deaths occurring during 2009 was obtained from the CPSC Injury and Potential Injury Incident file (IPII) and CPSC's Death Certificate File. Entries in IPII come from sources such as newspaper articles, consumer complaints, referrals by lawyers, medical examiners, and other government agencies. CPSC staff from the Office of Compliance and Field Operations conducted in-depth investigations of the deaths. The purpose of these investigations was to determine the types of fireworks involved and the circumstances that led to the fatal injuries.

Because IPII is based on voluntary reports and because it can take more than two years to receive all death certificates from the various states to complete the Death Certificate File, neither data source can be considered complete for the number of 2008 or 2009 fireworks-related deaths at the time this report was prepared. As a result, the number of deaths might have been greater than the number reported here. Staff updates the number of deaths for previous years when reports are received. Total deaths for previous years may not agree with numbers in reports for earlier years because of such updates.

The source of information on emergency department-treated fireworks-related injuries is the National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U.S. hospitals with emergency departments.<sup>1</sup> Injury information is taken from the emergency department record. This information includes the victim's age and sex, the place where the injury occurred, the emergency department diagnosis, the body part injured, and the consumer product(s) associated with the injury. The information is supplemented by a 160 character narrative that often contains a brief description of how the injury occurred.

To supplement the information available in the NEISS record, every year, during the month around July 4<sup>th</sup>, CPSC staff conducts a special study of fireworks-related injuries. In 2009, the special study period was from June 19, 2009 to July 19, 2009. Staff efforts on fireworks are focused during this period because in most years, about two-thirds of the annual injuries occurred then. During this period, hospital emergency department staff shows patients pictures of different types of fireworks in order to help them identify the type of fireworks device associated with their injuries. The type of fireworks involved in the incident is then written in the NEISS narrative.

After reading the case records, including the narrative description of the fireworks device and the incident scenario, CPSC staff may then assign cases for telephone investigations. Cases are usually selected because they involve the most serious injuries and/or hospital admissions. Serious injuries include eye injuries, finger and hand amputations, and head injuries. Cases also may be assigned to obtain more information about the incident than reported in the NEISS narrative. In most years, phone interviewers are able to collect information for between one-third and one-half of the cases assigned. Information on the final status of the telephone interviews is found in Section 5.

In the telephone investigations, information is requested directly from the victim (or the victim's parent if the victim is a minor) about the type of fireworks involved, where it was obtained, how the injury occurred, and the medical treatment and prognosis.

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<sup>1</sup> For a description of NEISS, including the revised sampling frame, see Kessler and Schroeder (1998). Procedures used for variance and confidence interval calculations, and adjustments for the sampling frame change in 1997 are found in Marker, Lo, Brick, and Davis (1999). SAS<sup>®</sup> statistical software for trend and confidence interval estimation is documented in Schroeder (2000). SAS<sup>®</sup> is a product of the SAS Institute, Inc., Cary, NC.

When the fireworks device reported is different from that reported in the NEISS emergency department record, the device reported in the telephone investigation is used in the data for this report.

As a result of this process, there are three different levels of information that may be available about a fireworks-related injury case. For the cases that occur before or after the July 4<sup>th</sup> special study period, the NEISS record is almost always the only source of information. Many NEISS records collected outside the special study period do not specify the type of fireworks involved in the incident. During the special study period, more information is available for analysis because the NEISS record usually contains the type of fireworks and additional details on the incident scenario. The most information is available for a subset of the special study cases with telephone investigations. These different levels of information about injuries correspond to different analyses in the report as follows:

- Estimated national annual fireworks-related injuries. This estimate is made using NEISS cases for the entire year, from records where fireworks were specified as one of the consumer products involved. For cases outside the special study period, as noted above, there is usually no information on the fireworks type and limited information on the incident scenario. Consequently, there is not enough information to determine the role played by the fireworks in the incident. This means that the annual injury estimate includes a small number of cases where the fireworks device was not lit or no attempt was made to light the device. Calculating the annual estimates without removing these cases makes the estimates comparable with previous years.<sup>2</sup>
- Detailed analyses of injury patterns. The tables in the report that describe fireworks type, body part injured, diagnosis, age and sex of injured people, and other such information are based on the special study period only. Fireworks types are taken from the telephone investigation or the NEISS comment field when there was no telephone investigation. When computing estimates for the special study period, staff does not include cases where the fireworks device was not lit or no attempt was made to light the device.
- Information from the telephone investigations. Individual case injury descriptions and medical prognosis information from the telephone investigations are listed in Appendix B. These listings also exclude cases where the fireworks device was not lit or no attempt was made to light the device. These cases represent a sample of some of the most serious fireworks-related injuries and may not be representative of typical emergency department-treated fireworks-related injuries.

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<sup>2</sup> The only exception to the practice of including all the cases was in 2003 where 9 cases representing an estimated 150 emergency department-treated injuries were excluded from the annual injury estimates. These cases resulted from the nightclub fire in West Warwick, Rhode Island, that also caused 100 deaths. For details see Greene and Joholske (2004).

## *Statistical Methods*

Injuries reported by NEISS sample hospitals were weighted by the NEISS probability-based sampling weights to develop an estimate of total U.S. emergency department-treated fireworks-related injuries for the year and for the special study month around July 4<sup>th</sup>. Confidence intervals were estimated and other statistics were calculated using computer programs that were written to take into account the sampling design.<sup>3</sup> Estimated injuries are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are shown with an asterisk (\*). Percentages are calculated from the rounded estimates. Percentages may not add to subtotals or to the total in the tables due to rounding.

The report also contains a number of detailed tables about fireworks-related injuries during the special study period. National estimates in these tables were also made using the sampling weights. To avoid cluttering the tables, confidence intervals are not included. Because the estimates are based on subsets of the data, they have larger relative sampling errors (i.e., larger coefficients of variation) than the annual injury estimate or the special study month injury estimate. As a result, interpretation and comparison of these estimates with each other or with estimates from prior years should be made with caution. For example, when comparing subsets of the data, say between injuries associated with two different types of fireworks or between two different age groups, it is difficult to determine how much of the difference between estimates is associated with sampling variability and how much comes from real differences in national injury totals.

## **2. Fireworks-Related Deaths for 2009**

CPSC has reports of two non-work fireworks-related deaths that occurred during 2009. Brief descriptions of the incidents are as follows:

- A 41 year-old male from Florida sustained a fatal blast injury to his leg from a professional display mortar type firework. The victim had been setting off fireworks in the backyard of his home and was alone at the time of the fatal injury. Professional display fireworks were recovered from his home by police.
- A 26 year-old male from Oklahoma held the launching tube of a mortar type firework over his head and then lit the device to launch it. The shell discharged from the bottom of the tube striking the victim in the head. The victim suffered a skull fracture and died the next day in the hospital.

CPSC staff has reports of 71 fireworks-related deaths between 2000 and 2009 for an average of 7.1 deaths per year.<sup>4</sup> According to the Centers for Disease Control and

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<sup>3</sup> See Schroeder (2000).

<sup>4</sup> See previous reports in this series, e.g. the report for 2008: Greene and Granados (2009). The number of deaths ranged from 11 deaths in 2006 and 2007 to 7 in 2008.

Prevention (CDC), there were 48 fireworks-related deaths (an average of 6 deaths annually) between 1999 and 2006.<sup>5</sup> Unlike the statistics presented by CPSC staff, the CDC statistics include both work-related and non-work-related fireworks deaths.

### 3. National Injury Estimates for 2009

Table 1 and Figure 1 present the estimated number of non-occupational fireworks-related injuries that were treated in U.S. hospital emergency departments between 1991 and 2009.

Table 1  
Estimated Fireworks-Related Injuries 1991-2009

Year	Estimated Injuries	Injuries per 100,000 People
2009	8,800	2.9
2008	7,000	2.3
2007	9,800	3.3
2006	9,200	3.1
2005	10,800	3.7
2004	9,600	3.3
2003	9,300	3.2
2002	8,800	3.1
2001	9,500	3.3
2000	11,000	3.9
1999	8,500	3.1
1998	8,500	3.1
1997	8,300	3.0
1996	7,300	2.7
1995	10,900	4.1
1994	12,500	4.8
1993	12,100	4.6
1992	12,500	4.9
1991	10,900	4.3

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. The estimate for 2003 excludes an estimated 150 emergency department-treated injuries following the nightclub fire in West Warwick, Rhode Island. Estimates for 1991-1996 were revised to adjust for the changed sampling frame and do not match values published during that period. Population estimates for 2000 to 2009 from Table 1: Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2009 (NST-EST2009-01). Population Division, U.S. Census Bureau. <http://www.census.gov/popest/states/NST-ann-est.html>. Estimates from earlier years at <http://www.census.gov/popest/archives/1990s/nat-total.txt>.

<sup>5</sup> Data from CDC for ICD 10 code W39 (1999-2006). See <http://wonder.cdc.gov/cmfi-icd10.html>.



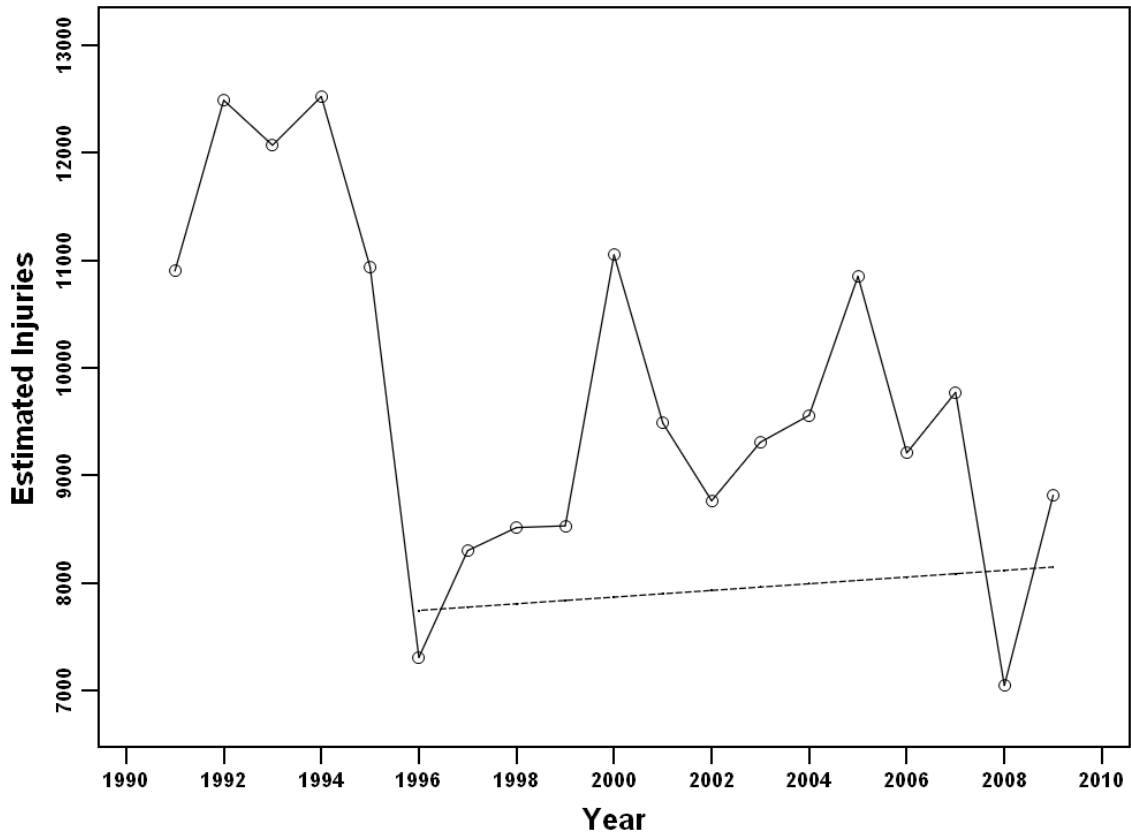
In calendar year 2009, there were an estimated 8,800 fireworks-related emergency department-treated injuries (95 percent confidence interval 6,800 – 10,800). The estimated number of injuries was 26 percent higher than the estimated 7,000 injuries in 2008. The difference between the injury estimates for 2009 and 2008 was not statistically significant ( $z = 1.85$ ,  $p = 0.0641$ , two tails).

Figure 1 shows that the highest estimated numbers of annual injuries were between the years 1991 and 1995, followed by lower estimates between 1996 and 1999. Injuries rose to 11,000 in the millennium year (2000) and then decreased to 9,500 in 2001. Between 2002 and 2007 injuries fluctuated between 8,800 and 10,800. From the second lowest annual estimate of 7,300 in 1996 to the estimate of 9,800 in 2007, there was a statistically significant upward trend. The regression equation from 1996 to 2009 also shows an upward trend, but the slope is not statistically significant.<sup>6</sup> The dashed line in Figure 1 (below) is the regression line estimated from the data between 1996 and 2009.

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<sup>6</sup> For 1996 to 2009 the estimated regression slope was 31.07 injuries per year (standard error 62.86,  $t=0.49$  at 12 df,  $p= 0.315$  one tail). For details on the regression method that incorporates the sampling design, see Schroeder (2000) and Marker et al (1999).

**Figure 1**  
**Estimated Fireworks-Related Emergency Department-Treated Injuries**  
**1991-2009**



Appendix A contains a table showing estimated fireworks-related injuries and fireworks imports between 1996 and 2009.

**4. Injury Estimates for the 2009 Special Study**

The injury analysis in this section presents the results of the 2009 special study of fireworks-related injuries that were treated in hospital emergency departments between June 19 and July 19, 2009. During this period, there were an estimated 5,900 fireworks-related injuries (95% confidence interval 4,200 – 7,600), accounting for 67 percent of the total estimated fireworks-related injuries for the year.

The remainder of this section contains estimates for fireworks-related injuries from this period broken down by different categories.

*Fireworks Device Types and Estimated Injuries*

Table 2 shows the number and percent of emergency department-treated injuries by fireworks device type.

Table 2  
Estimated Fireworks-Related Injuries  
By Type of Fireworks Device  
June 19-July 19, 2009

Fireworks Device Type	Estimated Injuries	Percent
Total	5,900	100
All Firecrackers	1,200	20
Small	700	12
Illegal	200	3
Unspecified	300	5
All Rockets	400	7
Bottle Rockets	300	5
Other Rockets	100	2
All Other Devices	2,200	37
Sparklers	1,000	17
Novelties	300	5
Multiple Tube	100	2
Reloadable Shells	500	8
Roman Candles	200	3
Homemade/Altered	100	2
Public Display	300	5
Unspecified	1,700	29

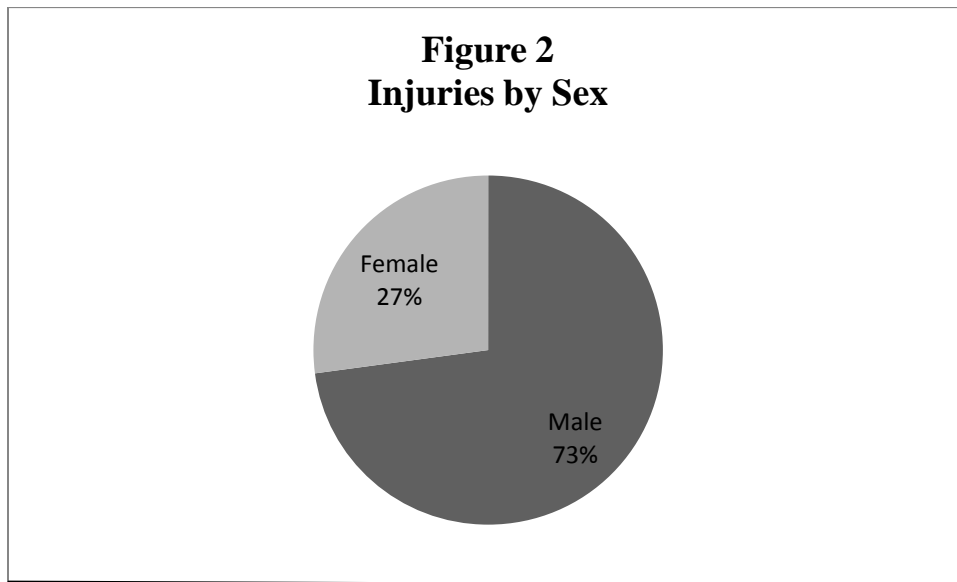
*Source:* NEISS, U.S. Consumer Product Safety Commission/EPHA. Based on 149 NEISS emergency department reported injuries between June 19, 2009 and July 19, 2009 and supplemented by 23 completed In-Depth Investigations (IDI). Fireworks types are obtained from the IDI, when available, otherwise fireworks types are identified from victim's reports to emergency department staff that were contained in the NEISS narrative. Illegal firecrackers include M-80s, M-500s, Quarter Sticks, and other firecrackers that are banned under the Federal Hazardous Substances Act (16 CFR 1500.17). Fireworks that may be illegal under state and local regulations are not listed as illegal unless they violate the FHSA. Subtotals include categories listed directly below. Estimates are rounded to nearest 100 injuries and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding.

As shown in Table 2, firecrackers accounted for an estimated 1,200 emergency department-treated injuries, which was 20 percent of the total fireworks-related injuries during the special study period. Most of these injuries involved small firecrackers. The estimate for illegal firecracker-related injuries was 200 injuries; however, some of the estimated 300 unspecified firecracker-related injuries and some of the estimated 1,700 unspecified fireworks-related injuries may have also involved illegal firecrackers. Also, sparklers accounted for an estimated 1,000 injuries, 17 percent of the total. Bottle rockets accounted for an estimated 300 injuries, 5 percent of the total.

Reloadable shells, novelty fireworks, multiple tube devices, public display fireworks, Roman Candles and homemade or altered devices, each accounted for less than 10 percent of the injuries. This is in keeping with previous years. While these devices are not associated with a large number of injuries, the larger load in these devices makes them disproportionately involved in serious injuries and deaths.

### *Sex and Age of Injured Persons*

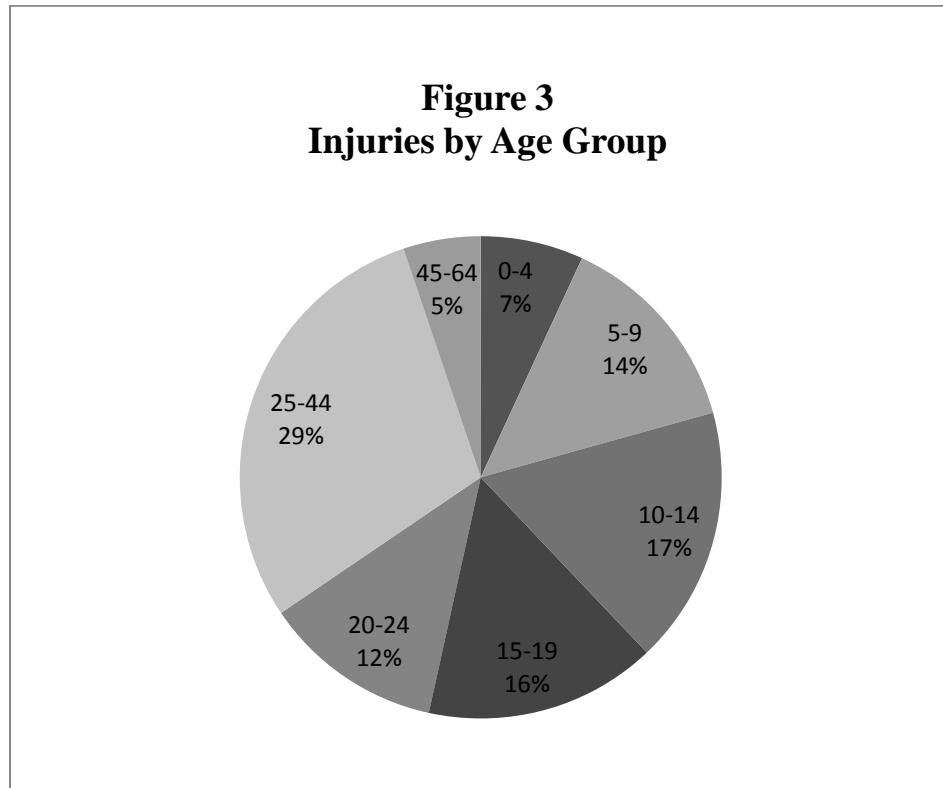
Males had 4,300 fireworks-related injuries, representing 73 percent of the total injuries. Males experienced 3.2 fireworks-related emergency department-treated injuries per 100,000 individuals during the special study period. Females, with 1,600 emergency department treated injuries, had 1.2 injuries per 100,000 people. The concentration of injuries among males and people under 25 has been typical of fireworks-related injuries for many years. Figure 2 shows the distribution of fireworks-related injuries by sex.



Note: Percents are computed from rounded estimates.

Children under 5 years old experienced an estimated 400 injuries (7 percent of all fireworks-related injuries during the special study period) as shown below in Figure 3 and Table 3. Children in the 5 to 14 year age group experienced an estimated 1,900

injuries (32 percent of all fireworks-related injuries). Breaking that age group down further, children 5 to 9 years old had 800 injuries and children 10 to 14 years old had 1,000 injuries. In the aggregate, children under 15 years old accounted for 39 percent of the fireworks-related injuries. Children and young adults under 20 constituted 54 percent of the fireworks-related injuries.



Note: Percents are computed from rounded estimates.

The detailed breakdown by age and sex is shown in Table 3.

Table 3  
 Estimated Fireworks-Related Injuries  
 By Age and Sex  
 June 19-July 19, 2009

Age Group	Total	Per 100,000 People	Male	Female
Total	5,900	2.2	4,300	1,600
0 to 4	400	1.9	300	100
5 to 14	1,900	4.6	1,500	300
5 to 9	800	4.0	700	100
10 to 14	1,000	5.0	800	200
15 to 24	1,600	3.8	1,300	300
15 to 19	900	4.2	800	200
20 to 24	700	3.3	500	100
25 to 44	1,700	2.0	900	700
45 to 64	300	0.4	200	100

Sources: NEISS, U.S. Consumer Product Safety Commission/EPHA, U.S. population from <http://www.census.gov/popest/national/asrh/NC-EST2008-sa.html>. The oldest victim was 62 years old. Estimates are rounded to nearest 100 injuries and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding.

When considering per capita injury rates, children 10 to 14 years old had the highest per capita injury rate at 5 injuries per 100,000 population. This was followed by children ages 15 to 19 years old at 4.2 per 100,000 and children ages 5 to 9 years old at 4 injuries per 100,000. In three of the last five years (2005, 2007, and 2009), the highest per capita injury rate has been among those children ages 10 to 14 years old.

*Age and Sex of the Injured Person by Type of Fireworks Device*

Table 4 shows the ages of those injured by the type of fireworks device associated with the injury. For children under 5 years old, sparklers accounted for the largest number of estimated injuries at 200 injuries, which was half of the total injuries in that age group. Children 5 to 14 years old had an estimated 400 injuries from sparklers.

No clear relationship between age and fireworks type stands out in Table 4. It is worth noting that the number of injuries does not completely represent usage patterns because victims are often injured by fireworks used by other people. This is especially true for rockets and aerial shells (e.g., fountains, multiple tube and reloadable devices, etc.) that can injure people located some distance away from where the fireworks were launched.

Table 4  
Estimated Fireworks-Related Injuries  
By Device Type and Age Group  
June 19-July 19, 2009

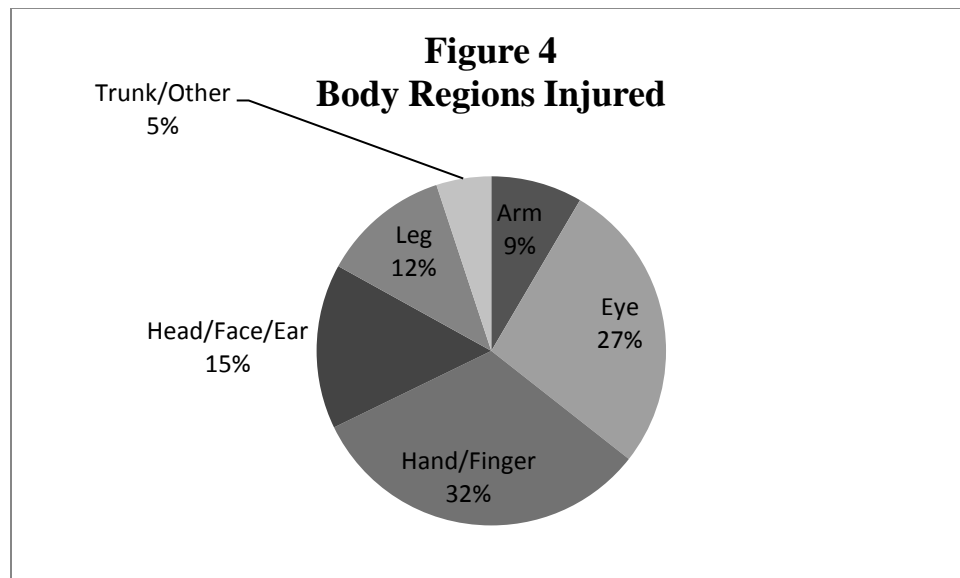
Fireworks Type	Total	Age Group				
		0-4	5-14	15-24	25-44	45-64
Total	5,900	400	1,900	1,600	1,700	300
All Firecrackers	1,200	*	400	500	200	100
Small	700	*	300	200	100	100
Illegal	200	*	*	200	*	*
Unspecified	300	*	100	100	100	*
All Rockets	400	100	*	300	*	*
Bottle Rockets	100	*	*	200	*	*
Other Rockets	300	100	*	100	*	*
Other Devices	2,200	300	800	300	700	100
Sparklers	1,000	200	400	100	300	*
Novelties	300	*	200	*	100	*
Multiple Tube	100	*	*	*	*	*
Reloadable	500	*	*	100	300	*
Roman Candles	200	*	100	100	*	*
Homemade/Altered	100	*	*	*	*	*
Public Display	300	*	100	100	100	*
Unspecified	1,700	100	600	400	500	100

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. Estimates are rounded to nearest 100 injuries. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (\*).

As mentioned previously, males experienced 73 percent of the fireworks-related injuries and females accounted for 27 percent. Males were associated with all of the estimated injuries from illegal firecrackers, novelty devices and reloadable shells. Females experienced more injuries than males in incidents at public fireworks displays.

*Body Region Injured and Injury Diagnosis*

Figure 4 presents the distribution of estimated injuries by specific parts of the body where the injury occurred. Hands and fingers, with an estimated 1,900 injuries, accounted for 32 percent of the total injuries. These were followed by an estimated 1,600 eye injuries accounting for 27 percent, 900 injuries to the head/face/ear region accounting for 15 percent and 700 leg injuries (12 percent).

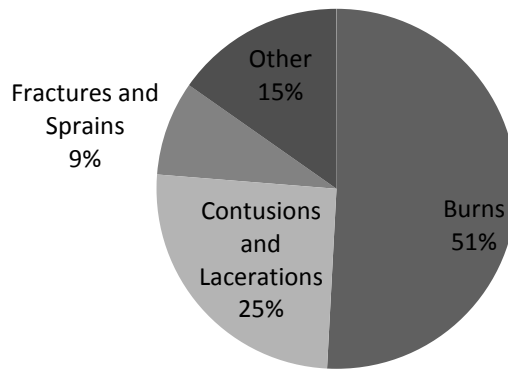


Note: Percents are computed from rounded estimates.

Figure 5 shows the types of injuries. Burns, with 3,000 estimated injuries (51 percent) was the most frequent injury diagnosis. Contusions and lacerations, at 1,500 injuries was the second most frequent (25 percent).



**Figure 5**  
**Type of Injuries**



Note: Percents are computed from rounded estimates.

The most frequent injuries to hands, fingers, legs, and the trunk were burns. Also, more than half the injuries to the head and face were burns. Most eye injuries were contusions, lacerations and other diagnoses that included foreign bodies in the eye. This detail is shown in Table 5.

Table 5  
 Estimated Fireworks-Related Injuries  
 By Body Region and Diagnosis  
 June 19-July 19, 2009

Body Region	Total	Burns	Diagnosis		
			Contusions Lacerations	Fractures Sprains	Other Diagnoses
Total	5,900	3,000	1,500	500	900
Arm	500	400	100	100	*
Eye	1,600	400	500	*	600
Hand/Finger	1,900	1,300	300	300	100
Head/Face/Ear	900	500	300	*	100
Leg	700	400	200	100	*
Trunk/Other	300	100	100	100	100

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. Fractures and sprains also include dislocations. Other diagnoses include all other injury categories. Arm and shoulder region includes NEISS codes for upper arm, elbow, lower arm, shoulder, and wrist. Head/Face/Ear regions include eyelid, eye area, nose, neck, and mouth but do not include the eyeball. Leg includes upper leg, knee, lower leg, ankle, foot, and toe. Trunk/other region includes chest, abdomen, pubic region, all parts of body, internal, and 25-50% of body. Estimates are rounded to nearest 100 injuries and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (\*).

*Type of Fireworks Device and Body Region Injured*

Table 6 presents estimated injuries by the type of fireworks device and body region.

Table 6  
 Estimated Fireworks-Related Injuries  
 By Type of Fireworks Device and Body Region  
 June 19-July 19, 2009

Fireworks Type	Total	Arm	Eye	Region of the Body			
				Head/Face	Hands/Fingers	Leg	Trunk/Other
Total	5,900	500	1,600	900	1,900	700	300
All Firecrackers	1,200	100	200	200	600	100	*
Small	700	*	100	200	400	*	*
Illegal	200	*	*	*	200	*	*
Unspecified	300	100	100	*	*	100	*
All Rockets	400	100	100	200	*	100	*
Bottle Rockets	300	*	100	200	*	*	*
Other Rockets	100	100	*	*	*	100	*
Other Devices	2,200	200	400	100	1,100	300	*
Sparklers	1,000	*	300	*	600	200	*
Novelties	300	100	100	*	100	*	*
Multiple Tube	100	*	*	*	100	100	*
Reloadable	500	100	*	*	200	100	*
Roman Candles	200	*	*	100	100	*	*
Homemade/Altered	100	*	*	*	*	*	*
Public Display	300	*	300	*	*	*	*
Unspecified	1,700	200	600	400	200	200	300

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. See notes for Table 2 and Table 5.

About 60 percent of the estimated sparkler injuries involved the hands and fingers. Fireworks devices that fly or emit sparks were associated with eye, head, and face injuries. These included novelties, public display fireworks, and sparklers.

#### *Hospital Treatment*

An estimated 92 percent of the victims of fireworks-related injuries were treated at the emergency department and then released, about 2 percent of victims were treated and transferred to another hospital, and a little more than 5 percent were admitted to the

hospital. The treat and release percentage was about the same for all consumer products in 2009.<sup>7</sup>

## **5. Telephone Investigations of Fireworks-Related Injuries**

CPSC staff conducted telephone investigations of some fireworks injuries that occurred during the one-month special study period surrounding the July 4<sup>th</sup> holiday (June 19, 2009 to July 19, 2009). Completed telephone investigations provide more detail about incidents and injuries than the emergency department information summarized in the narrative in the NEISS record. In the telephone questionnaire, respondents were asked about how the injury occurred (hazard pattern), the medical care following the emergency department treatment, and the long-term effects, if any, from the injury. Respondents were also asked detailed questions about the fireworks including its type, markings, and where it was obtained.

Cases were selected for telephone investigations on the basis of information provided in the NEISS narrative and coded information in the NEISS records for several reasons. These included (1) unusual hazard patterns, (2) severity of the injury, and (3) lack of clear information in the narrative about the type of fireworks associated with the injury. Cases were also selected when children's clothing was ignited as part of an ongoing agency study of clothing ignition. For these reasons and because many victims did not respond, these telephone investigation cases cannot be considered typical of fireworks-related injuries.

From the 149 emergency department-treated fireworks-related injuries during the special study period, staff selected 69 cases for telephone investigations, of which 23 were completed and determined to be in-scope and one was completed and found to be out of scope. Table 7 shows the final status of these investigations.

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<sup>7</sup>For all injuries in 2009, 92 percent of patients were treated and released, 1 percent were transferred to other hospitals, 5 percent were admitted to the hospital, and slightly over 1 percent had other dispositions including left without being seen, held for observation, and dead on arrival.

Table 7  
Final Status for Telephone Investigations

Final Case Status	Number of Cases	Percent
Total Assigned	69	100
Completed Investigation	24	35
In-scope	23	33
Out of scope	1	1
Incomplete Investigations	45	66
Failed to Reach Patient	19	28
Questionnaire Mailed but Not Returned	6	9
Victim Name Not Provided by Hospital	9	13
Victim Refused to Cooperate	11	16

Note: Percentages may not add to subtotals or the total due to rounding.

One case was found to be out of scope after receiving information in the telephone investigation that indicated that the explosive involved was gunpowder rather than fireworks. Short descriptions of the remaining 23 completed cases are found in Appendix B. The cases are organized in order of emergency department dispositions with Admitted (to the hospital) first followed by Treat and Transferred (to another hospital), and then Treated and Released. Within dispositions, cases are in order of increasing age of the victim.

#### *Summary Statistics*

Of the 23 completed cases, 17 (74 percent) involved males and six (26 percent) involved females. There were three victims (13 percent) age 0 to 4 years old, four victims (17 percent) age 5 to 14 years old, four victims (17 percent) age 15 to 24 years old, 11 victims (48 percent) age 25 to 44 years old and one victim (4 percent) who was 58 years old. With respect to emergency department dispositions, six victims (26 percent), were admitted to the hospital, two (9 percent) were treated in the emergency department and then transferred to another hospital, and 15 (65 percent) were treated and released.

The most frequently used fireworks devices in these incidents were aerial shells (13 incidents, 57 percent), followed by firecrackers (7 incidents, 30 percent).<sup>8</sup> Five of the

<sup>8</sup> The category “aerial shells” includes multiple tube and reloadable mortars and rockets, but excludes bottle rockets.

firecracker incidents involved large firecrackers while in two incidents, the sizes of the firecrackers were not specified.

Note that the distribution of the types of fireworks and the emergency department dispositions differ from the special study data in Section 4. These differences reflect the focus in the telephone investigation on more serious injuries and incompletely specified NEISS records. Note also that only one-third of the victims selected for the telephone investigations responded.

*Hazard Patterns*

The hazard patterns described below are based on the incident descriptions obtained during the telephone investigations and summarized in Appendix B. When an incident has two or more hazard patterns, the hazard pattern most likely to have caused the injury was selected. Hazard patterns are presented in Table 8, below.

Table 8  
Hazard Patterns in Telephone Investigations of Fireworks-Related Injuries

Hazard Pattern	Number of Cases	Percent
All	23	100
Misuse	5	22
Mischief	2	9
Fireworks Close To Each Other	2	9
Fireworks in Container	1	4
Malfunction	18	78
Early Ignition	5	22
Errant Flight Path	5	22
Tipover	4	17
Debris, Smoke	3	13
Other Malfunction	1	4

Note: Percentages may not add to subtotals or the total due to rounding.

Misuse (5 victims injured, 22 percent)

Five victims were injured when fireworks were used in ways that depart from typical usage.

Mischief. Two victims were injured as a result of mischievous acts by others. In Case 3, a 13 year-old male victim was injured when a person in a car threw a large firecracker at him. The 11 year-old male victim in Case 12 was injured when someone threw a large firecracker toward him, while he was cleaning debris from an earlier fireworks show.

Fireworks Close to Each Other. Lit fireworks can throw off sparks that can ignite unlit fireworks. In Case 8, the 35 year-old male victim was holding several aerial shells while lighting a shell in the launching tube. Sparks from the lit shell ignited the shell the victim was holding resulting in an explosion. In Case 15, in an almost identical scenario, the 19 year-old male victim lit an aerial shell, while holding another shell in his hand. The second shell exploded burning the victim's hand.

Fireworks in a Container. A 20 year-old male, in Case 7, placed six large firecrackers together and then placed a metal can over them. When the firecrackers exploded the victim was injured by shrapnel from the can.

#### Malfunction (18 victims injured, 78 percent)

Eighteen victims were injured when fireworks were reported to have malfunctioned. These included early ignitions with five injuries, errant flight paths with five injuries, tip-overs with four injuries, debris and smoke with three injuries and one incident where the launching tube became airborne. Note that some of the errant flight path injuries may have involved tip-overs, but victims may have been unable to observe the tip-over if they were far from the fireworks.

Early Ignition. A 34 year-old male, in Case 4, lit an M-80 that exploded in his hand. He was holding the firecracker expecting that it would not have ignited as quickly. Case 13 also involved early ignition, where a 15 year-old male lit an M-80 while holding it. In Case 17, a 27 year-old male lit a mortar shell that exploded before he was able to drop it into the launching tube. In Case 19, a 34 year-old male was injured when a mortar shell that he had dropped into the launching tube was reported to have exploded prematurely. The victim noted that he thought that hot embers in the tube may have caused the early ignition. Case 21 also may have involved early ignition. In this incident, the 35 year-old male victim was setting off fireworks at a friend's house. A firecracker exploded while he was holding it.

Errant Flight Path. Two mortar shells launched by the 37 year-old victim in Case 5, malfunctioned by rising 30 and 15 feet, then falling and exploding on the ground. When the victim tried to stop the third shell from launching, it exploded in his hand. In a second incident involving an aerial shell, the 40 year-old male victim in Case 6 kicked a mortar shell that had landed near his car. The shell then exploded. In Case 9, a 3 year-old female was struck in the arm and leg by a rocket that had been launched by some children. She was burned when her shorts were ignited by the firework. In case 14, an 18 year-old male experienced a concussion when an aerial shell launched by a friend

brushed by his head. Finally, in Case 20, a 35 year-old male was burned when the fireworks device he lit spun around and launched shells at his foot.

Tip-over. In case 11, people were putting rockets in bottles and launching them. One bottle tipped over when the rocket was lit and the rocket hit the 4 year-old female victim in the leg. In Case 16, a 26 year-old male victim was injured when the mortar tipped over before launch and the fireworks shot out of the bottom of the tube. A 30 year-old female was injured in Case 18 when the launching tube of a multiple tube device tipped over. The shell hit the victim in the foot. A multiple tube device was reported to have tipped over by the 58 year-old victim in Case 23. The victim was hit in the ankle by the heavy cardboard launching tube.

Debris and Smoke. An 8 year-old female, who has asthma, experienced difficulty breathing at a public fireworks display from the combination of heat and smoke, as reported in Case 2. Complaints of eye irritation after attending a fireworks show resulted in an emergency department visit for the 4 year- old victim in Case 10. In Case 22, the 44 year-old female victim also experienced eye irritation after attending a fireworks show.

Other Malfunction. In Case 1, the victim and family were watching a neighborhood fireworks show when the tubing from a parachute type fireworks device that had been launched flew into the 7 year-old male victim's eye. The victim suffered a hemorrhage of the eye and a ruptured globe.

### *Long-Term Consequences of Fireworks-Related Injuries*

Victims were asked if there were any long-term consequences of their injuries. Most (17 of 23, or 74 percent) expected complete recoveries with no long term effects. Some of the victims who reported that they might experience long-term effects of the injuries were as follows:

- In Case 1, where the victim experienced a ruptured globe after being struck in the eye by a fireworks part, vision had not returned to the victim's eye several weeks after the injury.<sup>9</sup> It is not known if the victim will recover his sight.
- In Case 4, the victim lost part of his index finger and fractured his hand following the explosion of an M-80 firecracker. He does not expect to regain full function in his hand.
- The victim in Case 5, who tried to prevent the explosion of a mortar shell by extinguishing it in his hand, lost part of his thumb. He is unsure if he will recover full range of motion.
- The victim of a shrapnel injury in Case 7, who lost a finger and experienced nerve damage in his hand, reported that he did not know if he would fully recover from the nerve damage.

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<sup>9</sup> A ruptured globe is a disruption to the outer membranes of the eye by a blunt or penetrating trauma.



- The parents of the 3 year-old female victim in Case 9, who had first degree burns on her legs from a rocket on an errant flight path, reported that she may have some scarring from the burns.
- The 30 year-old female victim in Case 18, who was burned by an aerial shell from a tipping over multiple tube device, reported that after additional medical treatments for burns, she was unsure if there would be long term effects of the injury.

### *Where Fireworks Were Obtained*

Of the 23 respondents to the telephone survey, 14 (61 percent) knew where the fireworks were obtained. Six respondents reported that the fireworks had been obtained from a store, five indicated the fireworks were obtained from a stand, and one reported to have been injured by fireworks from a professional fireworks show.

Victims reported that they did not know the source of the fireworks in nine incidents (36 percent). This is typically the situation when the victim did not purchase or light the fireworks device that caused the injury.

## **6. Enforcement Activities**

CPSC's Office of Compliance and Field Operations enforces regulations for fireworks devices that are sold to consumers under provisions of the Federal Hazardous Substances Act (FHSA). CPSC staff's enforcement activities are focused on reducing the number of fireworks-related deaths and injuries. A variety of enforcement techniques and both national and international initiatives were utilized in 2009 to keep unsafe fireworks from consumers.

CPSC staff continues to work closely with the Bureau of Customs and Border Protection (Customs) to conduct surveillance on imported shipments of fireworks. Fireworks were selected for testing either at random or based on the past violation history of the type of device, whether the item had been sampled previously, and other factors. With assistance from Customs, staff from CPSC selectively sampled and tested numerous shipments of imported fireworks in fiscal year 2009 for compliance with the FHSA. Approximately 38 percent of those shipments were found to contain fireworks that were noncompliant.

Another enforcement activity that continues to remain a priority for CPSC staff is the investigation of firms and individuals that offer kits and components to make illegal and dangerous firecracker type explosives, such as M-80s and Quarter Sticks. Since 2006, CPSC staff has worked with the Department of Justice on cases involving companies and/or individuals involved in selling the chemicals and components used to make illegal fireworks.

Also, CPSC staff continues to maintain close relations with the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), the Department of Justice's Office of Consumer Litigation, as well as state and local law enforcement agencies. CPSC staff has provided training on consumer fireworks regulations to ATF's Industry Operations Investigators, as well as legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers.

Most fireworks are manufactured outside the U.S., and China (98 percent) and Hong Kong (1 percent) are the sources of most imported fireworks.<sup>10</sup> In light of this, CPSC staff visited consumer fireworks factories in China to gain a better understanding of the manufacturing process. CPSC's agreement and subsequent Work Plans with its counterpart Chinese agency, the General Administration for Quality Supervision, Inspection and Quarantine (AQSIQ), provide for extensive information exchange and cooperation. CPSC staff participates in digital video conferences with AQSIQ technical staff to discuss consumer fireworks activities.

## **7. Summary**

In 2009, there were two reported fireworks-related deaths, a decrease from the seven deaths reported in 2008. However, reporting for 2008 and 2009 may not be complete at this time. Emergency department-treated injuries, estimated at 8,800 for 2009, were almost 26 percent more than the estimated 7,000 injuries in 2008. The difference between the injury estimates for 2008 and 2009 was not statistically significant.

During the one-month special study period of June 19 to July 19, 2009, there were an estimated 5,900 emergency department-treated injuries, somewhat greater than the 2008 estimate of 5,000 injuries. Similar to previous years, in 2009 children under 15 years old experienced about 39 percent of the injuries and males of all ages experienced 73 percent of the injuries.

Also similar to previous years, approximately more than half the injuries in 2009 involved burns. Burns were the most frequent injury to all parts of the body except the eyes, where contusions, lacerations, and other diagnoses (mainly foreign bodies in the eye) occurred more frequently. The parts of the body most often injured were hands and fingers (estimated 1,900 injuries), eyes (1,600 injuries), and the head, face, and ears (900 injuries). Most injuries - 92 percent - involved treat and release dispositions. An estimated 8 percent were treated and transferred to another hospital or admitted to the hospital where the emergency department was located.

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<sup>10</sup> These data are from 2009 statistics from the U.S. International Trade Commission. There were 199.3 million pounds of fireworks imported, with 195.8 million pounds from China (98 percent) and 2.7 million pounds from Hong Kong (1 percent). Staff believes that most fireworks imported from Hong Kong were actually manufactured in China. The next largest exporter was Thailand with 802 thousand pounds.

Among the different types of fireworks, firecrackers were associated with 1,200 estimated injuries (small firecrackers 700 injuries, large illegal firecrackers 200, and unspecified size 300). Sparklers were associated with 1,000 injuries and bottle rockets with 300 injuries.

A review of data from telephone follow-up investigations showed that the typical causes of injuries were as follows: (1) misuse of fireworks including mischief and improper use, (2) fireworks igniting and exploding earlier than expected, (3) errant flight paths, (4) aerial shell device tipovers, and (5) debris and smoke associated with eye and respiratory irritations. At the time of the telephone investigation, typically one to two months after the injury, most victims already had recovered from their injuries. A small number of victims reported that the injuries were likely to have long-term effects.

Finally, in 2009, CPSC staff's enforcement activities remained at a high level. CPSC's Office of Compliance and Field Operations worked with the Bureau of Customs and Border Protection to sample imported fireworks and to seize illegal shipments. Staff provided legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers. Staff also continued working with the General Administration for Quality Supervision, Inspection and Quarantine (AQSIQ) of the Government of the People's Republic of China. China is the world's largest exporter of fireworks, and most fireworks imported into the U.S. come from China. Fireworks is one of four product areas targeted by CPSC and AQSIQ for exchange of information on standards, increased inspection of high risk products, and tighter quality controls on components from parts suppliers.

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**Appendix A**  
**Fireworks-Related Injuries and Fireworks Imported**

Table A-1 shows that fireworks imports have generally risen over the period 1997-2008, peaking in 2005 at 275.1 million pounds and then declining to 199.3 million pounds in 2009. The number of estimated emergency department-treated injuries has fluctuated between 7,000 and 11,000, with the largest number of injuries occurring in the millennium year of 2000. During this period, as shown in the table below, the number of injuries per 100,000 pounds of fireworks has declined from 8.0 injuries per 100,000 pounds in 1997 to 3.4 injuries per 100,000 pounds in 2006 and 2008.

Injuries per 100,000 pounds were slightly higher in 2009 than previous years at 4.4 injuries per 100,000 pounds. Imported fireworks in 2009 were at the lowest level since 2002.

Table A-1  
Estimated Fireworks-Related Injuries and  
Estimated Fireworks Imported into the U.S. 1996-2009

Year	Estimated Injuries	Estimated Fireworks Imports (millions of pounds)	Injuries Per 100,000 Pounds
2009	8,800	199.3	4.4
2008	7,000	208.3	3.4
2007	9,800	260.1	3.8
2006	9,200	272.1	3.4
2005	10,800	275.1	3.9
2004	9,600	230.0	4.2
2003	9,300	214.6	4.3
2002	8,800	175.3	5.0
2001	9,500	155.3	6.1
2000	11,000	146.2	7.5
1999	8,500	146.7	5.8
1998	8,500	123.8	6.9
1997	8,300	103.5	8.0
1996	7,300	108.6	6.7

Source: Injuries from NEISS, U.S. Consumer Product Safety Commission/EPHA. See Table 1 for further details. Estimated fireworks imports from the U.S. International Trade Commission using Harmonized Tariff Schedule (HTS code 3604.10). Imports include consumer fireworks (1.4G HTS code 3604.10.90.10 and 3604.10.90.50) and display fireworks (1.3G HTS code 3604.10.10.00). Display fireworks were about 9 percent of the total imports in 2009. In addition to imported fireworks used in the U.S., there are also a small amount of fireworks manufactured in the U.S. for domestic consumption, which are not available from the International Trade Commission and shown in this table.

Although the table suggests a relationship between weight and the number of injuries, it should be interpreted with caution. First, the logical unit of exposure is number of fireworks devices used instead of the collective weight of the devices, because a person is exposed to injury when a device is consumed (i.e., lit). Injuries per 100,000 fireworks devices imported might be more meaningful, but the number of devices imported is not available. Moreover, using weight over-represents heavy devices and under-represents light devices. There is no reason to assume that a heavy device is inherently more dangerous than a light device because the weight of the device includes other things than just the amount of explosive material.

Also, international trade statistics do not provide weight by fireworks device types. Thus, it is not possible to associate injuries with the weight of different types of fireworks devices that were imported. As shown in Table 2 earlier in this report, different fireworks devices have different numbers of injuries. Thus the decrease in injuries per 100,000 pounds between 1996 and 2008 may be due to different mixtures of types of fireworks imported over time or an overall decrease in injuries among all types of fireworks. Similarly, the increase in injuries per 100,000 pounds in 2009 may have resulted from different fireworks mixtures, a decrease in injuries or just statistical variation. The data do not provide enough information to determine the relative contribution of these factors.

**Appendix B**  
**Completed Telephone Investigations**

<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
1	7	Male	Other/Not Stated	Admit	Eye	Aerial Shell	The victim and his family were watching a neighborhood fireworks show. When a parachute type firework was ignited, the tubing from the firework flew into the victim's eye.	The victim suffered a hemorrhage of the eye and a ruptured globe. After discharge, the victim visited an eye specialist. Several weeks after the incident, vision had not yet returned to the eye. Return of full vision is uncertain.
2	8	Female	Other	Admit	All Parts of Body	Public Display	The victim, who has asthma, experienced difficulty breathing from the combination of heat and smoke at the public fireworks display.	Victim fully recovered after staying in the hospital overnight.
3	13	Male	Other	Admit	Ear	Large Firecracker	A person in a car threw a large firecracker at the victim. The victim reported experiencing ringing in his ears.	Victim expected a complete recovery in 2-3 weeks.
4	34	Male	Amputation	Admit	Finger	Large Firecracker	The victim lit an M-80 that exploded in his hand. Part of his left index finger was blown off in the explosion and his left hand was fractured.	The victim had surgery on his hand. He does not expect to regain full functioning of his hand.

<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
5	37	Male	Laceration	Admit	Hand	Aerial Shell	The victim was lighting mortar shells that malfunctioned by rising only 30 feet, then falling and exploding on the ground. To stop the third shell from malfunctioning, the victim tried to extinguish it with his hand, but it exploded while he was holding it.	The victim lost part of his thumb. He had surgery on his hand. He is unsure if the full range of motion will return.
6	40	Male	Laceration	Admit	Foot	Aerial Shell	Children were launching mortar shells when one landed near the victim's car. When the victim kicked the shell to move it away from his car, it exploded.	The victim was burned on his foot and admitted to the hospital. After discharge, there were additional medical visits to check how the foot was healing. Full recovery was expected in six weeks.
7	20	Male	Fracture	Treat and Transfer	Finger	Large Firecracker	The victim placed six large firecrackers in a metal can and lit them. The firecrackers exploded dispersing shrapnel from the can that resulted in amputation of the victim's finger from his left hand and nerve damage to another finger.	The victim has had surgery. It is unknown if his hand will recover from the nerve damage.



<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
8	35	Male	Thermal Burns	Treat and Transfer	Hand	Aerial Shell	The victim was holding several aerial shells while lighting another in the tube. Sparks from the lit shell in the tube ignited the shell that he was holding. The shell in his hand exploded burning his hand.	The victim was transferred to a burn center and held overnight. He returned several times for dressings. He fully recovered in three weeks.
9	3	Female	Thermal Burns	Treat and Release	Upper Leg	Aerial Shell	Older children were lighting rockets in the street. The victim was hit in the arm and leg by a rocket on an errant flight path. The rocket ignited her shorts.	The victim experienced first degree burns on her legs. Full recovery was expected but there may be some scarring.
10	4	Female	Contusions Abrasions	Treat and Release	Eye	Firecracker Unspecified	The victim complained of eye irritation after attending a fireworks show. Emergency department staff thought that a spark or debris from a fireworks device may have been in her eye.	The victim's eye was washed out and she has fully recovered.
11	4	Female	Contusions Abrasions	Treat and Release	Lower Leg	Rocket Unspecified	At a neighborhood fireworks show, rockets were put into bottles and launched. One bottle tipped over when the rocket was lit. The rocket hit the victim in the leg resulting in burns and abrasions.	The victim was burned on the leg. After emergency department treatment, she has fully recovered.

<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
12	11	Male	Other	Treat and Release	Ear	Large Firecracker	The victim was removing debris from an earlier fireworks show in a park when a person threw a large firecracker toward him. The firecracker exploded near the victim. Afterwards, he experienced ringing in his ears.	After treatment at the emergency department, the victim has fully recovered.
13	15	Male	Laceration	Treat and Release	Finger	Large Firecracker	The victim lit an M-80 that exploded while he was holding it. The victim experienced cuts on his fingers.	The victim was treated for cuts. He also saw a hand surgeon for further treatment. He fully recovered in a month.
14	18	Male	Concussion	Treat and Release	Head	Aerial Shell	An aerial shell launched by a friend brushed by the victim's head. The victim was treated for a concussion.	The victim has fully recovered following emergency department treatment.
15	19	Male	Thermal Burns	Treat and Release	Hand	Aerial Shell	The victim lit an aerial shell while he was holding another shell in his other hand. Sparks from the lit shell ignited the shell in his hand. The victim's hand was burned.	After medical treatment at the emergency department and follow-up medical treatment, the victim recovered fully in 2 weeks.
16	26	Male	Contusions Abrasions	Treat and Release	Lower Trunk	Aerial Shell	The victim lit a mortar that tipped over before the firework was launched. The firework shot out of the bottom of the tube striking the victim in the groin.	The victim sustained cuts to the groin. Following additional medical treatments, the victim expected to fully recover in a month.

<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
17	27	Male	Fracture	Treat and Release	Finger	Aerial Shell	The victim lit a mortar shell that exploded while he was still holding it. He fractured a finger in his right hand.	The victim has fully recovered following emergency department treatment.
18	30	Female	Thermal Burns	Treat and Release	Foot	Aerial Shell	The launching tube of a multiple tube device tipped over after the second shell was ignited. The firework hit the victim resulting in second degree burns to one foot and minor burns to the other foot.	The victim has received additional medical treatments after the emergency department visit. She is unsure if there will be any long term effects from the injury.
19	34	Male	Internal Organ Injury	Treat and Release	Head	Aerial Shell	The victim was lighting mortars when a shell prematurely exploded near his head. He experienced a concussion.	The victim was treated at the emergency department and has fully recovered.
20	35	Male	Thermal Burns	Treat and Release	Lower Leg	Aerial Shell	When the victim lit a multiple tube device, it spun around and launched shells at his foot. The victim was burned on his foot.	After treatment at the emergency department, he has fully recovered.
21	35	Male	Burns not Specified	Treat and Release	Hand	Firecracker Unspecified	A firecracker exploded while the victim was holding it. He had second degree burns on his hand.	The victim was treated at the emergency department and then sought subsequent medical treatment. He has fully recovered.

<b>Case Number</b>	<b>Age</b>	<b>Sex</b>	<b>Diagnosis</b>	<b>Disposition</b>	<b>Body Part</b>	<b>Fireworks Type</b>	<b>Incident Description</b>	<b>Medical Treatment and Prognosis</b>
22	44	Female	Other	Treat and Release	Eye	Unspecified	The victim was watching a neighborhood fireworks show when debris or sparks from fireworks got in her eye.	Following emergency department treatment, the victim has fully recovered.
23	58	Male	Contusions Abrasions	Treat and Release	Ankle	Aerial Shell	The victim lit a multiple tube device which immediately tipped over. The victim was hit in the ankle with the heavy cardboard launching tube.	The victim was badly bruised on his ankle. He has since recovered.