2006 Fireworks Annual Report

Fireworks-Related Deaths, Emergency Department-Treated Injuries, and Enforcement Activities During 2006

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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 2006. The report also includes a summary of CPSC staff enforcement activities during 2006.

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 and the firework involved, and the characteristics of the victim were based on a special study conducted between June 16 and July 16, 2006. About 70 percent of the annual fireworks-related injuries for 2006 occurred during that period.

Highlights of the report are as follows:

- CPSC staff has reports of 11 deaths associated with fireworks during 2006. Four people were killed in incidents involving manufacturing or storing of illegal fireworks. Two were killed when they were struck by aerial fireworks that had just been launched. A third person was killed when an aerial firework exploded on a section of concrete causing a piece of concrete to strike the victim. Three people were killed in fires started by fireworks and one person was killed in a gas tank explosion where fireworks were the ignition source.

- Fireworks were involved in an estimated 9,200 injuries treated in U. S. hospital emergency departments during calendar year 2006 (95 percent confidence interval (6,900 – 11,600). CPSC staff estimated that there were 10,800 injuries during 2005.

- An estimated 6,400 fireworks-related injuries were treated in U. S. hospital emergency departments during the one month special study period between June 16, 2006 and July 16, 2006 (95 percent confidence interval 4,600 – 8,200). CPSC staff estimated that there were 6,500 injuries during the 2005 special study period.

  Results from the special study include the following:

  - About three times as many males were injured as females.

  - Injuries to children were a major component of total fireworks-related injuries with children under 15 accounting for 36 percent of the estimated injuries. Children and young adults under 20 had 47 percent of the estimated injuries.

  - Among different types of fireworks, firecrackers were associated with the greatest number of estimated injuries at 1,300. There were 1,000 injuries

associated with sparklers and 800 associated with rockets. Sparklers accounted for one-third of the injuries to children less than 5 years of age.

- Staff estimated that there were a small number of emergency department-treated injuries (100) at public fireworks displays.

- The parts of the body most often injured were hands (estimated 2,300 injuries), eyes (1,500 injuries) and the head, face and ear (1,400 injuries).

- More than half of the injuries were burns. Burns were the most common injury to all parts of the body except the eyes and head areas, where contusions, lacerations, and foreign bodies in the eye occurred more frequently.

- Most patients were treated at the emergency department and then released. Approximately 10 percent of patients were treated and transferred to another hospital, admitted or held for observation.

CPSC staff conducted telephone follow-up investigations of some fireworks-related injuries reported at NEISS hospital emergency departments during the special study period. Most cases were selected for follow-up because they involved potentially serious injuries and/or hospital admissions. Telephone interviews were completed in 52 cases.

A review of data from telephone follow-up investigations showed that the typical causes of injuries were as follows: (1) misuse of fireworks, (2) fireworks exploding earlier or later than expected, (3) errant flight paths, (4) sparks or debris from fireworks igniting fires, and (5) other malfunctions. According to the investigations, most victims already had recovered from their injuries or were expected to recover completely. Several victims had surgery or skin grafts.

During 2006, 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 Customs, staff from CPSC selectively sampled and tested 282 shipments of fireworks in fiscal year 2006 to determine if they were in compliance with CPSC regulations. Of those, approximately 31 percent were found to contain noncompliant fireworks.

- Also, CPSC staff, working with the Department of Justice, completed six cases against firms and individuals that offer kits and components to make illegal and dangerous firecracker type explosives such as M-80s. These companies and individuals were prohibited from selling chemicals and components.

- CPSC staff also participated in several multi-state criminal investigations with the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATFE), the Department of Justice and 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.

Introduction

This report describes injuries and deaths associated with fireworks during 2006. The report also describes CPSC staff enforcement activities for 2006. Reports for earlier years in this series can be found on the internet at www.cpsc.gov/library/data.html.

The report is organized into seven sections. Following the discussion of data and methods in this section, the second section describes fireworks-related deaths. Section 3 provides a national annual estimate of fireworks-related emergency department-treated injuries for 2006 and compares that estimate with estimates for previous years. Section 4 is based on a special study of emergency department-treated injuries during the month around July 4th. That section presents tables of the number of injuries broken down by different categories. Section 5 summarizes the in-depth telephone investigations of fireworks injuries. Section 6 describes enforcement activities by CPSC's Office of Compliance and Field Operations. 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 estimated fireworks consumption between 1996 and 2006. Appendix B contains more detail on the completed telephone investigations.

Sources of Information

Information on non-work-related fireworks deaths occurring during 2006 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. There may be multiple reports on a single death. Staff screened reports to eliminate duplicate reports of the same incident recorded in multiple sources. Then the CPSC field staff conducted in-depth investigations on these fireworks-related deaths. The purpose of these investigations was to determine the type of fireworks involved and the circumstances that led to the fatal injury.

Because IPII is based on voluntary reports and because it takes up to 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 2006 fireworks-related deaths at the time this report was prepared. As a result, the number of deaths for 2006 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 fireworks-related injuries is the National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U. S. hospitals with emergency departments.[1] Injury information is taken from the emergency

[1] 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® statistical software for trend and

department record. This includes the victim's age and sex, where the injury occurred, the emergency department diagnosis, 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 4th (for this report, June 16, 2006 to July 16, 2006) CPSC staff conducts a special study of fireworks-related injuries. Staff efforts focus on fireworks during this period because historically about two-thirds of the annual injuries occur then. During this period, hospital emergency department staff are requested to show patients pictures of different types of fireworks in order to help them identify the type of fireworks device associated with their injury. 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 firework and the incident scenario, CPSC staff may then assign cases for telephone investigations. Most cases were selected because they involved the most serious injuries and/or hospital admissions. Serious injuries included eye injuries, finger and hand amputations, and head injuries. In most years, phone interviewers are able to collect information from 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 about the type of fireworks involved, where it was obtained, how the injury occurred, the medical treatment and prognosis. 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.

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 the July 4th special study period or after the special study period, the NEISS record is almost always the only information. Many NEISS records collected during that period do not specify the type of fireworks involved in the incident. During the special study period, the NEISS record contains additional information on the type of fireworks and the incident scenario. In addition, there is a subset of the special study cases for which staff has completed 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 all NEISS cases for the entire year, 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

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confidence interval estimation is documented in Schroeder (2000). SAS® is a product of the SAS Institute, Inc., Cary, NC.

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.[2]

- 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, we remove 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 the victim was not attempting to light the device. These cases represent a sample of the most serious fireworks-related injuries.

Statistical Methods

Injuries reported by NEISS sample hospitals were multiplied by the NEISS 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 4th. Confidence intervals were estimated and other statistics were calculated using computer programs that were written to take into account the sampling design.[3] Results are rounded to the nearest 100 injuries.

The report also contains a number of detailed tables about fireworks-related injuries during the special study period. National estimates in these tables were made using the sampling weights. To avoid cluttering the tables, we do not include confidence intervals with these tables. Because the estimates are based on subsets of the data, they have large 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 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

[2] 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).
[3] See Schroeder (2000).

the difference between estimates is associated with sampling variability and how much comes from real differences in national injury totals. Estimates in the tables are also rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are shown with an asterisk (*). Estimates may not sum exactly to totals as a result of rounding the estimates.

Fireworks Related Deaths for 2006

CPSC has reports of 11 fireworks-related deaths that occurred in 2006. Brief descriptions of the incidents are as follows:

Four deaths associated with manufacturing or storing illegal fireworks

- A 75-year-old man and his 54-year-old nephew were killed when their Connecticut home exploded sending debris hundreds of feet. Explosions continued for 22 hours. The older victim bought fireworks in New Hampshire and transported them to his home where he removed the powder in order to create larger and louder illegal fireworks.

- A 47-year-old Nebraska man was found dead after explosions in the detached garage at his home. The man manufactured illegal fireworks and also painted Halloween masks with an air brush sprayer. It is not known if the initial explosion resulted from the fireworks or the air-paint vapor mixture. Exploded fireworks were found at the scene.

- A 44-year-old Florida man died in an explosion inside a recreational vehicle that he used as a place to manufacture and store illegal fireworks. Several smaller explosions followed the initial blast. Numerous M-80 type casings were discovered on the ground near the site. The RV, another building and several vehicles were destroyed as a result of the explosions.

Four deaths in fires where fireworks were the ignition source

- After setting off some fireworks outside his mobile home, a 37-year-old Iowa man went inside the home. According to the fire department, some of the exploded fireworks may have ignited piles of dried leaves near the home. The fire spread under the home, then engulfed it in flames. The victim was unable to escape and died inside the mobile home.

- A 41-year-old Kansas man threw large fireworks such as M-80s, quarter sticks and other devices at his neighbor's house. There was a loud explosion from the house, which then caught on fire. All residents escaped from the house except an 8-year-old female who subsequently died from smoke inhalation and burns. The man was convicted of involuntary manslaughter.

- A 19-year-old Nebraska man died in a fire after a bottle rocket set off in a dormitory ignited a mattress. Three other victims were rescued from the fire and were hospitalized due to inhalation and burn injuries. Alcohol and drugs were involved in the incident.

- A 4-year-old Kansas male and his 7-year-old brother were setting off fireworks in their front yard near a gas tank. The tank exploded killing the 4-year-old and seriously injuring the 7-year-old.

Three deaths involved aerial fireworks

- A 22-year-old Rhode Island man lit a globe-shaped firework with a cigarette lighter, then dropped it in a launching tube. The firework exploded when the man was close to the tube resulting in severe head injuries. He died from his injuries in the hospital three days later.

- A 51-year-old Missouri woman died after being struck in the neck by a piece of concrete when a mortar shell exploded. The incident occurred at a party where the owner of the property was setting off fireworks that had been placed around a sea wall.

- A 15-year-old Virginia male died from severe head trauma two days after he apparently tripped and fell into the path of a mortar shell that had just been launched. The victim was airlifted to a hospital and died two days later.

CPSC staff has reports of four fireworks-related deaths in 2005, eight fireworks-related deaths in 2004, seven fireworks-related deaths in 2003, four deaths in 2002, six in 2001 and nine in 2000. According to the Centers for Disease Control and Prevention, there were 115 fireworks-related deaths (an average of 6.4 deaths annually) between 1988 and 2004.[4]

National Injury Estimates for 2006

Table 1 and Figure 1 present the estimated number of non-occupational fireworks-related injuries for 1991-2006 that were treated in U. S. hospital emergency departments.

[4] Data from CDC for ICD 9 code 923.0 (1988-1998) and ICD 10 code W39 (1999-2002). See http://wonder.cdc.gov/mortSQL.html. Different from CPSC statistics, the CDC statistics include both work-related and non work-related fireworks deaths.

Table 1
Estimated Fireworks-Related Injuries 1991-2006

Year	Estimated Injuries	Injuries per 100,000 people
2006	9,200	3.1
2005	10,800	3.6
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

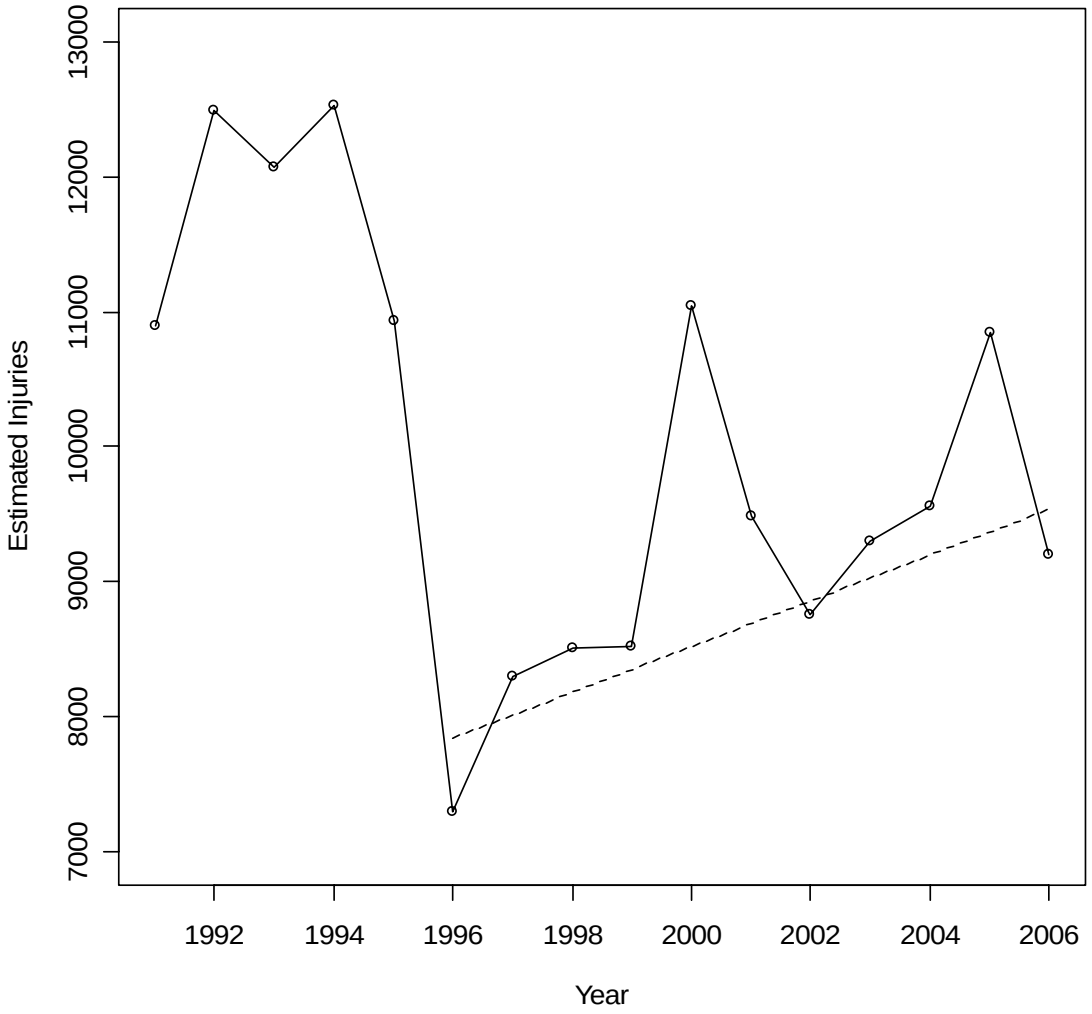
Source: NEISS, U. S. Consumer Product Safety Commission/EPHA. The estimate for 2003 excludes an estimated 150 emergency department-treated injuries following the nightclub fire in West Warwick, Rhode Island. Estimates for 1991-1996 were revised to adjust for the changed sampling frame and do not match values published in reports for 1997 or earlier. U. S. population estimates from 1991-1999 were obtained from the U. S. Bureau of the Census at http://www.census.gov/popest/archives/1990s/nat-total.txt and population projections for 2000-2006 from http://www.census.gov/popest/states/NST-ann-est.html.

In calendar 2006, there were an estimated 9,200 fireworks-related injuries (95 percent confidence interval 6,900 – 11,600). Total emergency department-treated injuries and per capita injuries were fewer than 2005, but the difference is not statistically significant. The injury estimates include one incident where the victim was transported to a NEISS hospital and died. This death was reported in the previous section.

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. From the lowest annual estimate of 7,300 in 1996 to the estimate of 10,800 in 2005, there was a statistically significant upward trend. As a result of the decrease in estimated injuries in 2006, the trend is still upward, but it is no longer statistically significant.[5]

[5] The regression line for injuries from 1996 to 2006 has a positive slope of 169.69 injuries per year (standard error 96.13, t= 1.77 at 9 df, p= 0.0557 one tail). The *p value* is just above the threshold for

Figure 1. Fireworks Injuries 1991-2006



Appendix A presents a table showing estimated fireworks-related injuries and fireworks imports between 1997 and 2006.

Injury Estimates for the 2006 Special Study

The injury analysis in this section presents the results of the 2006 special study of fireworks-related injuries that were treated between June 16 and July 16, 2006. During this period, there were an estimated 6,400 fireworks-related injuries (95% confidence interval 4,600 – 8,200), accounting for about 70 percent of the total injuries for the year. The remainder of this section presents estimates for fireworks-related injuries broken down by different categories.

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significance of 0.05. The regression procedure incorporates the sampling design. For details see Schroeder (2000) and Marker et al (1999).

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 16-July 16, 2006

Fireworks Device Type	Estimated Injuries	Percent
Total	6,400	100
All Firecrackers	1,300	20
Small	600	9
Illegal	100	2
Unspecified	500	8
All Rockets	800	13
Bottle Rockets	600	9
Other Rockets	200	3
All Other Devices	2,700	42
Sparklers	1,000	16
Fountains	100	2
Novelties	200	3
Reloadable	600	9
Roman Candles	700	11
Homemade/Altered	100	2
Public Display	100	2
Unspecified	1,400	22

Source: NEISS, U. S. Consumer Product Safety Commission/EPHA. Based on 188 NEISS emergency department reported injuries between June 16, 2006 and July 16, 2006 and supplemented by 52 In-Depth Investigations (IDI). Fireworks types are reported by victims to emergency department staff or reported to telephone investigators for the IDI. Illegal firecrackers include M-80s, M-500s, Quarter Sticks and other firecrackers banned under the Federal Hazardous Substances Act (16CFR1500.17). Some firecrackers and other types of fireworks may be illegal under some state and local regulations. Subtotals include categories listed directly below. Estimates of fewer than 50 injuries are shown with an asterisk (*). Estimates rounded to nearest 100 injuries. Percentages computed from the rounded estimates. Totals for either estimated injuries or percents may not add due to rounding.

As shown in Table 2, firecrackers accounted for an estimated 1,300 emergency department-treated injuries, which was 20 percent of the total fireworks-related injuries. Most of these injuries involved small firecrackers. The estimate for illegal firecracker-related injuries was 100 injuries; however, some of the estimated 500 unspecified firecracker-related injuries and some of the estimated 1,400 unspecified injuries may have involved illegal firecrackers. After firecrackers, sparklers accounted for an estimated 1,000 injuries, 16 percent of the total. Rockets also accounted for an estimated 800 injuries, 13 percent of the total. Most of the rocket injuries involved bottle rockets. In most years, firecrackers, sparklers and bottle rockets have been associated with about equal proportions of the injuries.

Table 2 shows that victims knew that the device was a firecracker but did not know if it was a small or large firecracker in an estimated 500 injuries (8 percent of total estimated injuries). These are listed in Table 2 as "Firecrackers: Unspecified." The fireworks device was unreported for another 1,400 injuries (22 percent), listed on the last row of the table as "Unspecified." This occurs when the victim does not know the type of device because the victim did not purchase or light the firework or the victim did not want to respond. Estimates from previous years have shown a similar number of injuries where fireworks types were unknown.

There were a small number of injuries associated with public display fireworks and with homemade or altered devices. This is also in keeping with previous years. While these devices are not involved in a large number of injuries, such devices often play a role in fireworks-related deaths. There were four deaths this year involving fireworks manufacturing (see Section 2 above).

Age and Sex of Injured Persons

Children under 5 experienced about 600 injuries (9 percent of all fireworks-related injuries) as shown below in Table 3. The injury rate was 2.8 injuries per 100,000 for these children. Children in the 5 to 14 age group experienced an estimated 1,700 injuries (27 percent of all injuries). The injury rate for children 5 to 14 was 4.3 injuries per 100,000. Breaking that age group down further, children 5 to 9 had 3.6 injuries per 100,000 and children 10 to14 had 5.0 injuries per 100,000. Children 10 to 14 years old had the highest per capita injury rate among all age groups. In the aggregate, children under 15 accounted for 36 percent of the fireworks injuries. Children and young adults under 20 had 47 percent of the injuries.

The age group 15 to 24 had about 26 percent of the injuries (1,700) slightly less than the 25 to 44 age group with 29 percent (1,800 injuries). The per capita injury rate was 4.0 injuries per 100,000 for 15 to 24 and 2.2 for 25 to 44 year-old people. Historically, the per capita injury rate increases until age 10 to 14 then decreases for older age groups.

Males had 4,800 injuries, representing about 75 percent of the total. The concentration of injuries among males and of victims under 25 is typical of fireworks-related injuries for previous years.

Table 3
Estimated Fireworks-Related Injuries
By Age and Sex
June 16-July 16, 2006

Age Group	Total	Male	Female	Per 100,000 in the Age Group
Total	6,400	4,800	1,600	2.1
0 to 4	600	400	100	2.8
5 to 14	1,700	1,200	500	4.3
5 to 9	700	500	200	3.6
10 to 14	1,000	800	300	5.0
15 to 24	1,700	1,400	300	4.0
15 to 19	700	600	100	3.4
20 to 24	1,000	800	100	4.6
25 to 44	1,800	1,300	500	2.2
45 to 64	600	400	200	0.8

Sources NEISS, U. S. Consumer Product Safety Commission/EPHA , U. S. population from http://www.census.gov/ipc/www/usinterimproj/usproj2000-2050.xls; file description in http://www.census.gov/ipc/www/usinterimproj/usproj2000-2050.txt. See notes for Table 2.

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, sparklers accounted for the largest number of estimated injuries at 200, which was about one-third of the total injuries in that age group. Children 5 to 14 had an estimated 400 injuries from sparklers, accounting for the largest number of injuries in that age group. There were also an estimated 300 injuries from small firecrackers, and 200 injuries from bottle rockets in that age group.

Bottle rockets accounted for the largest number of injuries in the 15 to 24 age group with an estimated 400 injuries, about one-quarter of the total injuries.

Table 4
Estimated Fireworks-Related Injuries
By Device Type and Age Group
June 16-July 16, 2006

Fireworks Type	Total	0-4	5-14	15-24	25-44	45+
Total	6,400	600	1,700	1,700	1,800	600
All Firecrackers	1,300	100	400	500	300	*
Small	600	*	300	200	100	*
Illegal	100	*	*	100	*	*
Unspecified	500	100	100	100	200	*
All Rockets	800	100	300	400	100	*
Bottle Rockets	600	*	200	400	*	*
Other Rockets	200	100	100	*	100	*
Other Devices	2,700	200	600	500	1,000	200
Sparklers	1,000	200	400	100	200	*
Fountains	100	*	100	*	*	*
Novelties	200	*	100	100	100	*
Reloadable	600	*	*	100	300	100
Roman Candles	700	*	*	200	400	100
Homemade/Altered	100	*	100	*	*	*
Public Display	100	*	*	*	100	*
Unspecified	1,400	100	300	300	300	300

Source: NEISS, U. S. Consumer Product Safety Commission/EPHA. See notes for Table 2. Totals may not add due to rounding.

As mentioned previously, males experienced three-quarters of the fireworks injuries and females had one-quarter. For most of the fireworks device types that pattern held. For example, at 1,000 firecracker injuries, males had slightly more than 75 percent of the 1,300 total injuries. Also males had about 80 percent of the 200 injuries involving novelties, 75 percent of the 1,400 injuries associated with unspecified fireworks and 80 percent of the 600 estimated injuries involving reloadable devices.

For other fireworks devices there were differences between the injury patterns by gender. For incidents involving bottle rockets, males had almost 90 percent of the estimated 600 injuries; Roman candles: 90 percent of the 700 injuries; fountains, homemade/altered and public displays : 100 percent of the injuries. On the other hand,

the estimated 1,000 injuries involving sparklers were almost evenly distributed between males and females.

Injury Diagnosis and Body Part Injured

Table 5 presents the estimated injuries by specific parts of the body where the injury occurred. Hands and fingers, with an estimated 2,300 injuries, accounted for about 40 percent of the total injuries, followed by an estimated 1,500 eye injuries (25 percent), and 1,400 injuries (20 percent) to the head/face/ear region injuries.

Burns, with 3,500 estimated injuries (55 percent), was the most frequent injury diagnosis. Contusions and lacerations, at 1,900 injuries and 30 percent of the total, was the second most frequent diagnosis.

Injuries to hands and fingers, leg injuries and injuries to the trunk were for the most part burn injuries, while less than half the injuries to the head and face were burns. Most eye injuries were contusions and lacerations, and other diagnoses that included foreign bodies in the eye.

Table 5
Estimated Fireworks-Related Injuries
By Body Part and Diagnosis
June 16-July 16, 2006

Part of the Body Injured	Total	Burns	Contusions Lacerations	Fractures Sprains	Other Diagnoses
Total	6,400	3,500	1,900	100	900
Arm	100	100	*	*	*
Eye	1,500	200	800	*	400
Hand/Finger	2,300	2,100	200	*	100
Head/Face/Ear	1,400	400	700	*	300
Leg	600	500	100	*	*
Trunk	400	200	100	100	*

Source: NEISS, U. S. Consumer Product Safety Commission/EPHA. See notes for Table 2.
Fractures and sprains also includes dislocations. Other diagnoses include all other injury categories. Arm and shoulder includes NEISS codes for upper arm, elbow, lower arm, shoulder and wrist. Head/Face/Ear includes eyelid, eye area, nose, neck, and mouth. Leg includes upper leg, knee, lower leg, ankle, foot and toe. Trunk includes lower trunk, upper trunk, pubic region, all parts of body, internal and 25-50% of body.

Type of Fireworks Device and Body Part Injured

Table 6 below presents estimated injuries by the type of fireworks device and body part involved.

Table 6
Estimated Fireworks-Related Injuries
By Type of Fireworks Device and Body Part Injured
June 16-July 16, 2006

Fireworks Type	Total	Arm	Eye	Head/Face	Hands/Fingers	Leg	Trunk
Total	6,400	100	1,500	1,400	2,300	600	400
All Firecrackers	1,300	*	200	300	800	*	*
Small	600	*	100	100	400	*	*
Illegal	100	*	*	*	100	*	*
Size Unk	500	*	100	100	200	*	*
All Rockets	800	100	300	200	100	100	*
Bottle Rockets	600	*	300	200	100	*	*
Other Rockets	200	100	*	100	*	100	*
Other Devices	2,700	*	400	600	1,100	300	200
Sparklers	1,000	*	200	*	500	200	*
Fountains	100	*	*	100	*	*	*
Novelties	200	*	*	*	100	*	100
Multiple Tube	0	*	*	*	*	*	*
Reloadable	600	*	*	200	300	*	*
Roman Candles	700	*	200	300	200	*	100
Homemade/Altered	100	*	100	*	*	*	*
Public Display	100	*	*	*	*	*	100
Unspecified	1,400	*	500	300	300	200	100

Source: NEISS, U. S. Consumer Product Safety Commission/EPHA. See notes for Table 2 and Table 5.
Totals may not add due to rounding.

Approximately half the estimated sparkler injuries involved the hands and fingers, the same pattern as firecracker injuries. About half the bottle rocket injuries involved the eyes and almost 30 percent involved the head/face/ear body region.

Hospital Treatment

Although 90 percent of the fireworks-related injuries were characterized as "treat and release," an estimated 6 percent (360 estimated emergency department-treated injuries) were treated and transferred to another hospital, and 2 percent (158 estimated) were admitted or held for observation. One victim (NEISS weight 5.4), as mentioned previously, died. The proportion of fireworks-related treat and release injuries is slightly lower than the proportion for all products of 93 percent.

Telephone Investigations of Fireworks-Related Injuries

CPSC staff assigned telephone investigations of some fireworks injuries that occurred during the one month special study period surrounding the July 4th holiday (June 16 to July 16, 2006). Completed telephone investigations provide more detail about the incident and injury than the emergency department record that is summarized in NEISS. In the telephone questionnaire, respondents were asked about the hazard patterns associated with the injury, the medical care following the emergency department treatment and the long term effects, if any, of the injury. Also, respondents were asked about the source of the fireworks that were associated with the injury.

Most of the cases selected for telephone investigations were chosen because the injuries were among the most severe that were reported by the NEISS hospitals. From the point of view of preventing the most serious injuries, staff wanted to determine the scenarios where such injuries occurred. As a result, these cases are representative of the most serious injuries, not typical fireworks-related injuries.

From the 188 emergency department-treated fireworks-related injuries during the special study period, staff assigned 108 incidents for telephone investigations, of which 52 (48 percent) were completed. Table 7 shows the final status of the investigations.

Table 7
Final Status for Telephone Investigations

Final Case Status	Number of Cases	Percent
Total Assigned	108	100
Completed	52	48
Failed to Reach Patient	5	5
Questionnaire Mailed but not Returned	13	12
Victim ID not Provided by Hospital	27	25
Victim Refused to Cooperate	11	10

Short descriptions of the cases are found in Appendix B. The cases are organized in order of decreasing emergency department dispositions with Died first, followed by Admit (to the hospital), followed by Treat and Transfer and then Treat and Release. Within disposition, cases are organized by the age of the victim.

Summary Statistics

Of the 52 completed cases, 41 (79 percent) were males and 11 (21 percent) were females. There were 21 victims age 15 or younger (40 percent). There were four victims in their 40s and the oldest victim was 48. One victim died, four were admitted to the hospital, three were treated in the emergency department and transferred to another medical facility, and 44 were treated and released.

The most frequently used fireworks device in these incidents was aerial shells (16 cases, 31 percent), followed by Roman candles (9 cases, 17 percent), sparklers (6 cases, 12 percent) and bottle rockets (5 cases, 10 percent). The remaining 16 incidents were associated with a variety of other fireworks devices, none accounting for more than three incidents each. The distribution of the fireworks devices in the telephone investigations is different from Table 2 (all estimated fireworks injuries) reflecting the focus in the investigations on the more serious injuries.

Hazard Patterns

Misuse (14 incidents, 27 percent). The most frequent incident scenario was some form of accidental or intentional misuse of the fireworks device.

In Case 1, a neighbor threw firecrackers into his neighbors home, resulting in a fire that caused the death of an 8-year-old female. This incident has already been described above.

Six cases involved misuse of sparklers; four with children as the victims. In Case 2, the 4-year-old male victim was burned when he reached for the hot part of the sparkler. He was admitted to the hospital for treatment. A 3-year-old female (Case 10), in a similar situation held a sparkler by the middle portion instead of the bottom, again resulting in burns. A 2-year-old female (Case 9) burned her cheek with a lit sparkler that she pulled away from an older sister. An 11-year-old female (Case 18) burned her thumb when trying to catch a falling sparkler. Two injuries among adults occurred when they lit more than one sparkler at a time. A 35-year-old male was burned when five sparklers he was holding in his hand ignited (Case 8) and a 24-year-old male was burned when 10 sparklers he held all ignited (Case 35). The victim in Case 8 was transferred to a Burn Center for further treatment. All victims except for Case 8 and Case 2 were treated and released.

Three incidents involved Roman candles. A 13-year-old male lit a Roman candle in the back of his father's truck. Sparks from the device got in his eyes (Case 22). A 28-year-old male lit one of the balls of a Roman candle while holding it, resulting in burns to his hand in Case 38. A 30-year-old male, in Case 41, lit a Roman candle in the back of a truck. One of the balls went into his eye. All three victims were treated and released.

A 21-year-old male, in Case 31, was attending a barbecue with friends. They asked him to light some gasoline-soaked logs with a mortar-type firework. They lit the fuse of the firework and handed the lit device to him. It immediately exploded and blew off his left pinky finger. Mortars are meant to be launched from the ground, not held.

In Case 11, an unknown type of fireworks was thrown into the air, then burned a 3-year-old male. Another incident with an unspecified reported fireworks type involved a 15-year-old female who was injured by a firework that was thrown at the ground then bounced up and hit her (Case 24). A 12-year-old female was injured when her sister put a bottle rocket stick in the ground then lit it. The device tipped over before launching then hit the victim in the eye (Case 21).

<u>Early or Late Explosions (10 incidents, 19 percent).</u> Victims were injured when the firework exploded before or after anticipated. When exploding too early, the victim may be unable to throw the device or move away from it. Alternatively, when devices take too long to go off, victims may believe that the device is out. They may then be injured when they pick it up or approach it. Victims reported early or late explosions in the scenarios below.

A 26-year-old male was admitted to the hospital as a result of injuries sustained when a mortar shell that he lit exploded immediately (Case 5). All the remaining injuries involved treat and release emergency department dispositions. Two similar scenarios to Case 5 involving early aerial shell explosions occurred in Case 27 with a 19-year-old

male and Case 45 with a 34-year-old male. A 38-year-old male in Case 47 reported that a Roman candle exploded immediately when lit, resulting in burns to his face. A 19-year-old male in Case 29 was injured when a fountain he lit in his driveway exploded before he could move away. A 19 year-old male in Case 28 was injured when he lit a firecracker that exploded immediately.

Four injuries were associated with late ignitions. In Case 6, a 14-year-old victim lit a bottle rocket that then tipped over. When he picked up the rocket, it went off and hit him in the eye.[6] In Case 23, a 14-year-old male picked up an M-80 that someone had lit and then dropped on the ground. It then exploded in his hand. Case 32 was similar involving a 22-year-old male and an M-80 that had been dropped. Finally, Case 25 involved a 16-year-old male who was hit in the eye with a bottle rocket that he had lit that did not launch when expected.

Errant Flight Paths (10 incidents, 19 percent). Aerial shells are designed to go into the air after being lit. Injuries occurred when the shell traveled horizontally. Such injuries may be caused by the launching tube being misaimed, a malfunction in the shell, or the device tipping over. If the victim is not near the device then the reason for the errant flight path is usually unknown and may involve tipover. Four incidents involving reported device tipover are discussed in a later section.

Two victims were admitted to the hospital after being struck by fireworks devices on errant flight paths. In Case 3, an 8-year-old female was hit in the face with an aerial shell; an injury requiring 40 stitches. An 11-year-old male was hit in the eye by a bottle rocket (Case 4).

The remaining cases involved treat and release dispositions. A 22-year-old male was hit in the eye by a bottle rocket in Case 33. A 4-year-old male in Case 12 was hit in the lower leg by an aerial firework traveling horizontally. Similarly in Case 16, a 7-year-old male was hit in the chest; and in Case 19, a 12-year-old male was struck on the arm. An aerial shell was also involved in Case 44, where a 33-year-old female was struck in the neck.

In Case 13, a 6-year-old male was burned on the chest, when the ball from a Roman candle traveled sideways and hit the victim instead of going into the air. A 28-year-old male in Case 39 was also struck by a Roman candle. In Case 49, a 44-year-old male was struck in the hand by an aerial firework that was fired from a cannon. The shell traveled parallel to the ground before hitting the victim.

Other Malfunctions (7 incidents, 13 percent). The seven injury incidents described below are other types of malfunctions, that exclude errant flight paths and tipovers, which are described in other parts of this section.

[6] This is not considered a tipover incident because the bottle holding the bottle rocket tipped over, not the device itself.

In Case 7, a 22-year-old male was hit in the eye by one of the balls from a Roman candle after he lit it. According to the victim this was due to a malfunction, but no further information was provided. The victim was treated at the emergency department and then transferred for further treatment. In Case 14, a 7-year-old male dropped an unlit aerial shell into a launching tube that then exploded sending fragments from the launching tube into his eyes and forehead.

Two incidents involved public display fireworks. In Case 40, a 28-year-old male was injured at a public display by a firework that exploded in the tube sending debris in all directions. In a similar incident, a 34-year-old female was injured when the launching tube of a display firework flew into the air, hitting her in the chin (Case 46).

There were three other malfunction incidents. The launching tube of a mortar snapped, hitting a 45-year-old male in the lip (Case 51). A fireworks cannon blew up in Case 30, injuring a 20-year-old male. Finally, in Case 50, a 44-year-old male tried to kick away a ground spinner that was supposed to rise into the air, but did not. He was burned on the ankle.

Sparks, Debris (5 incidents, 10 percent). Hot embers, sparks and debris from fireworks explosions were associated with five injury incidents.

In Case 20, a 12-year-old male was watching a fireworks display where the fireworks were launched from a boat. Debris from the fireworks blew into his eye resulting in burns. Similarly, in Case 52, a 48-year-old male victim was watching people setting off fireworks, when some debris got in his eyes. Debris and sparks from a Roman candle got in a 25-year-old male's eyes in Case 36.

The 23-year-old victim in Case 34 lit some homemade M-80s and placed them on the ground. Debris from the explosions went into his eyes. In Case 48, a spark from a lit mortar fuse burned a 39 year-old victim's left palm and fingers.

Tipovers (4 incidents, 8 percent). Tipovers are a cause of errant flight paths for aerial shells and rockets. The incidents listed below contain reports of tipovers. Some of the cases listed under errant flight paths may also have involved tipovers, but the victim did not observe the launch of the fireworks device. All tipover cases involved treat and release injuries.

In Case 15, a 7-year-old male was hit in the lower leg by an aerial fireworks device that fell over launching the shell at the victim. An 18-year-old male was injured when the launching tube of a mortar was knocked over and the shell hit his ankle (Case 26). A 27-year-old female was injured in the foot in a similar tipover incident (Case 37). A Roman candle fell off a roof and exploded near the victim damaging his hearing in Case 43.

Other cases (2 incidents, 4 percent). There were two incidents where the hazard pattern could not be classified.

In Case 17, a 7-year-old female fell off a porch trying to avoid some jumping jack fireworks that had been lit near her. She was treated for neck pain. In Case 42, a 31-year-old male was lighting a popper type firework when an ember from a previously lit firework ignited the one he was holding. This resulted in burns to his lower arm.

Long Term Consequences of Fireworks-Related Injuries

Victims were asked if there were any long term consequences of their injuries. Most expected a complete recovery. Some victims who did not expect to fully recover reported the following:

- Case 3. An 8-year-old female was hit in the face by an aerial shell. She had 40 stitches and will have scarring from the injury.

- Case 4. An 11-year-old male was struck in the eye by a bottle rocket. There was permanent loss of vision in the eye.

- Case 25. A 16-year-old male was also struck in the eye by a bottle rocket. Although full vision has returned, the injury was reported to have elevated the victim's risk for cataracts and glaucoma.

- Case 31. A 21-year-old male had a mortar shell explode in his hand. His left pinky finger was blown off and there was nerve damage to other fingers.

Where Fireworks Were Obtained

Of the 52 respondents to the telephone survey, 32 knew where the devices were obtained. The largest response categories were "a stand that sells only fireworks" (19 cases) and "a friend or relative " (9 cases). Two cases involved homemade fireworks, one case involved an illegal purchase of display fireworks and one involved purchase of fireworks at a gas station.

Victims reported that they did not know the source of the fireworks in 20 incidents (38 percent). That is typically the case when the victim did not purchase or light the fireworks device that caused the injury.

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. CPSC staff's enforcement activities are focused on reducing the number

of fireworks-related deaths and injuries. A variety of enforcement techniques and initiatives were utilized in 2006 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 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 282 shipments of imported fireworks in fiscal year 2006 to determine if they were in compliance with CPSC regulations. Of those, approximately 31 percent were found to contain fireworks that did not comply with the Federal Hazardous Substances Act.

Another enforcement activity that continues to remain a priority for CPSC staff is the investigation into firms and individuals that offer kits and components to make illegal and dangerous firecracker type explosives, such as M-80s and Quarter Sticks. In 2006, CPSC staff, working with the Department of Justice, completed six cases resulting in the companies and/or individuals involved being prohibited from selling the chemicals and components to make illegal fireworks.

CPSC staff participated in several multi-state criminal investigations. 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.

Summary

In 2006 the 11 reported deaths were greater than previous years. There were four reported deaths in 2005, eight in 2004, seven in 2003, four in 2002, six in 2001, and nine in 2000. Estimated emergency department-treated injuries were smaller in 2006 than in 2005. Although there still is an upward trend from 1996 the trend line is not statistically significant.

During the one-month special study period of June 16 to July 16, 2006, there were an estimated 6,400 emergency department-treated injuries, slightly less than the 2005 estimate of 6,500 injuries, 2004 estimate of 6,600 and the 2003 estimate of 6,800. Similar to previous years, in 2006 children under 15 experienced more than one-third of the injuries and males were estimated to have three times as many emergency-department treated injuries as females.

Also similar with previous years, more than half the injuries in 2006 involved burns. Burns were the most frequent injury to all parts of the body except the eyes, where contusions, lacerations, and foreign bodies occurred more frequently. The parts of the body most often injured were hands (estimated 2,300 injuries), eyes (1,500 injuries)

and the head, face and ear (1,400 injuries). Most injuries, 90 percent, involved treat and release dispositions. An estimated 6 percent were treated and transferred to another hospital.

Among different types of fireworks, firecrackers were associated with the greatest number of estimated injuries at 1,300. Rockets and sparklers were associated with 1,000 injuries each. Sparklers accounted for one-third of the injuries to children under 5.

A review of data from telephone follow-up investigations showed that the typical causes of injuries were as follows: (1) misuse of fireworks, (2) fireworks exploding earlier or later than expected, (3) errant flight paths, (4) sparks or debris from fireworks igniting fires, and (5) other malfunctions. According to the investigations, most victims already had recovered from their injuries or were expected to recover completely.

Finally, in 2006, CPSC staff's enforcement activities remained at a high level. CPSC's Office of Compliance and Field Operations worked with U.S. Customs 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.

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Appendix A
Fireworks-Related Injuries and Imports

Table A-1 below shows that during the last 10 years, the amount of fireworks (in weight) imported into the U.S. has more than doubled. Except for the millennium year of 2000, the number of estimated emergency department treated injuries has fluctuated between 8,300 and 10,800 with increases in 2003, 2004 and 2005. During this same period, as shown in the table below, the number of injuries per 100,000 pounds of fireworks has declined steadily between 2000 and 2006 from 7.5 injuries per 100,000 pounds to 3.4 injuries per 100,000 pounds in 2006.

Table A-1
Estimated Fireworks-Related Injuries and
Estimated Fireworks Imported into the U. S. 1997-2006

Year	Estimated Injuries	Estimated Fireworks Imports (millions of pounds)	Injuries Per 100,000 Pounds
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

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 HTS code 360410 and provided by the CPSC Directorate for Economic Analysis. Imports include consumer and display fireworks. These totals exclude fireworks manufactured in the U.S. which is likely to be small relative to imports.

This table should be interpreted with caution. First, the logical unit of exposure is number of devices consumed instead of the 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. 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.

Second, we do not have data to break down the weight in Table A-1 by fireworks device types. As shown above in Table 2, different fireworks devices have different numbers of injuries. As a result, it is unclear if the increase in consumption in recent years is across the board, greater in the larger and heavier display shells that historically have produced few injuries, or in firecrackers and sparklers or some mixture of these devices.

Appendix B
Completed Telephone Investigations

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
1	8	Female	Anoxia	Died	All Parts of Body	Large, Illegal Firecracker	A neighbor threw M-80 firecrackers into the victim's home, causing a fire and explosion. All of the residents except the victim were able to escape from the fire.	Died
2	4	Male	Burns	Admitted to Hospital	Hand	Sparklers	Victim was holding a 3 foot sparkler which went out but was still hot. The victim put his hand on the hot part of the sparkler.	Victim had second and third degree burns on fingers, and was admitted overnight to the hospital for observation. Victim recovered from the injury in 6 weeks.
3	8	Female	Contusions, Abrasions, Lacerations	Admitted to Hospital	Face	Aerial Shell	Victim was hit in the face with an aerial shell.	Victim was admitted for surgery and had 40 stitches. Time to full recovery is not known.
4	11	Male	Contusions, Abrasions, Lacerations	Admitted to Hospital	Eye	Bottle Rocket	Victim struck in the eye by a bottle rocket traveling horizontally.	Permanent loss of vision in his eye.
5	26	Male	Contusions, Abrasions, Lacerations	Admitted to Hospital	Eye	Aerial Shell	Victim lit a mortar shell that immediately exploded.	Debris inside the victim's eyes, burns to his eyes and face. After one week, victim fully recovered.
6	14	Male	Burns	Treated and Transferred	Eye	Bottle Rocket	Victim lit a bottle rocket that tipped over. When he picked it up, it went off and hit him in the eye.	Victim referred to a medical center for further treatment of a corneal injury. Full recovery expected two months after the injury.
7	22	Male	Foreign Body in Eye	Treated and Transferred	Eye	Roman Candle	When the victim lit the Roman candle, one of the balls hit him in the eye.	Victim had eye surgery. No information available on prognosis.
8	35	Male	Burns	Treated and Transferred	Hand	Sparklers	Victim was holding 5 sparklers in his hand. When he lit one, all ignited.	First and second degree burns to the hand. Victim went to a Burn Center for further treatment. Full recovery within two months.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
9	2	Female	Burns	Treated and Released	Face	Sparklers	The 2 year-old victim pulled a lit sparkler away from her older sister. The sparkler then made contact with her cheek and eyelid.	Victim had second degree burns, but fully recovered without further treatment after the Emergency Room.
10	3	Female	Burns	Treated and Released	Hand	Sparklers	Victim held the sparkler by the middle portion instead of the bottom.	Treated for second degree burns to fingers and the palm of her hand. Recovered in 14 days.
11	3	Male	Burns	Treated and Released	Neck	Unknown	Another child threw a lit firework into the air that came down, hitting the victim in the neck.	Victim treated for burn to his neck. Not sure how long to recovery, but no long term effects expected.
12	4	Male	Burns	Treated and Released	Lower Leg	Aerial Shell	Victim was at some distance from a person who was lighting aerial fireworks. The device went parallel to the ground instead of upward, hitting the victim in the leg.	Second degree burns to victim's legs. Additional medical treatment to change bandages and check for infection. Victim fully recovered in one month.
13	6	Male	Burns	Treated and Released	Upper Trunk	Roman Candle	Roman candle ball hit the victim instead of going up in the air.	After further medical treatment for a second degree burn on his chest, the victim recovered in two weeks.
14	7	Male	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Aerial Shell	Victim dropped an unlit aerial shell in a launching tube. The shell then exploded sending fragments into his eyes and forehead.	Corneal abrasions and stitches to forehead. Unsure if there will be vision loss.
15	7	Male	Burns	Treated and Released	Lower Leg	Aerial Shell	Launching tube of aerial fireworks device fell over, launching the shell at the victim.	Victim fully recovered from a minor burn on his left leg.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
16	7	Male	Burns	Treated and Released	Upper Trunk	Aerial Shell	Victim was hit in the chest by an aerial firework.	Victim had second and third degree burns on chest, neck, and chin. Full recovery in four weeks.
17	7	Female	Other	Treated and Released	Neck	Ground Spinner	Victim fell off a porch trying to avoid some lit jumping jack fireworks.	Treated for neck pain. Fully recovered.
18	11	Female	Burns	Treated and Released	Hand	Sparklers	Victim burned her thumb when trying to catch a falling sparkler.	No further medical care required. Victim fully recovered.
19	12	Male	Burns	Treated and Released	Arm	Aerial Shell	Victim was hit by an aerial shell traveling parallel to the ground.	No further medical care required. Victim fully recovered.
20	12	Male	Burns	Treated and Released	Eye	Public Display Firework	Debris from professional display fireworks that were launched from a boat blew into the victim's eye.	After further medical treatment for a burn to the eye, victim recovered in three weeks.
21	12	Female	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Bottle Rocket	Victim's sister put a bottle rocket stick in the ground, and lit the device. The rocket tipped over, then launched into the victim's eye.	Corneal abrasion, but not further medical treatment required, and victim fully recovered.
22	13	Male	Burns	Treated and Released	Eye	Roman Candle	Victim lit a Roman candle in the back of his father's truck. Sparks got in his eye.	After returning for medical treatment, victim recovered fully in a month.
23	14	Male	Burns	Treated and Released	Finger	Large, Illegal Firecracker	Victim picked up a lit M-80 that someone had dropped that exploded in his hand.	Victim fully recovered after Emergency Department treatment.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
24	15	Female	Burns	Treated and Released	Upper Arm	Unknown	Victim struck by a firework that was thrown at the ground, then bounced up and hit her on the arm.	Victim fully recovered after Emergency Department treatment.
25	16	Male	Contusions, Abrasions, Lacerations	Treated and Released	Face	Bottle Rocket	Victim looking down at a bottle rocket that he had lit, but had not launched. It then launched striking him in the eye.	Victim was treated by an eye specialist after the Emergency Room visit. Although full recovery was expected in two months, the injury puts the victim at higher risk of cataracts and glaucoma.
26	18	Male	Burns	Treated and Released	Ankle	Aerial Shell	Launching tube of mortar was knocked over. The shell hit the victim in the ankle.	Third degree burn. The victim is unsure if he will fully recover.
27	19	Male	Burns	Treated and Released	Hand	Aerial Shell	Aerial shell exploded immediately when the victim lit it.	Second degree burns to the hand. Victim fully recovered.
28	19	Male	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Small Firecracker	Firecracker exploded immediately on ignition, injuring victim's eye.	After further medical treatment, victim recovered fully in a month.
29	19	Male	Burns	Treated and Released	Hand	Fountain	Victim lit a fountain type firework in his driveway that exploded immediately.	First and second degree burns to the hand. Victim has fully recovered.
30	20	Male	Contusions, Abrasions, Lacerations	Treated and Released	Finger	Cannon	Cannon blew up after it was lit.	Victim received lacerations to his right index finger. After removal of stitches, he recovered fully in three weeks.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
31	21	Male	Contusions, Abrasions, Lacerations	Treated and Released	Fingers	Aerial Shell	Victim was handed a lit mortar shell that his friends wanted him to shoot into logs to start a fire. The device exploded in the victim's hands.	Left pinky amputated by the blast; nerve damage to the ring finger. Victim had plastic surgery. Full recovery uncertain.
32	22	Male	Burns	Treated and Released	Hand	Large, Illegal Firecracker	Victim picked up an M-80 that had been lit but did not explode. It then exploded in his hand.	First degree burns. Victim fully recovered.
33	22	Male	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Bottle Rocket	Victim launched bottle rocket that hit him in the eye.	Victim had eye surgery for a corneal abrasion. Unsure if he will need more surgery and if he will fully recover.
34	23	Male	Foreign Body in Eye	Treated and Released	Eye	Homemade	Victim lit some homemade M-80 type firecrackers that were 10-15 years old, placing them on the ground. Debris from the explosions went into his eye.	Following a consultation with an eye specialist, victim recovered fully in three weeks.
35	24	Male	Burns	Treated and Released	Hand	Sparklers	Victim holding more than 10 sparklers in his hand. When he lit several, the others ignited.	First and second degree burns to the hand. Victim recovered fully without further treatment.
36	25	Male	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Roman Candle	Debris and sparks from a Roman candle got in victim's eyes.	Victim fully recovered from a corneal abrasion.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
37	27	Female	Burns	Treated and Released	Foot	Aerial Shell	After an aerial shell was lit, the tube fell over and the shell went into the victim's foot.	Third degree burn to the foot. After further medical treatment, victim expects to fully recover within two months.
38	28	Male	Burns	Treated and Released	Hand	Roman Candle	Victim was launching Roman candles. He lit one of the balls while holding it, resulting in burns to his hand and fingers.	Second degree burns to three fingers and palm. Victim fully recovered.
39	28	Male	Burns	Treated and Released	Eye	Roman Candle	Victim struck in the eye by a Roman candle.	Burned on the eyelid and abrasion to the eye. After seeing an eye specialist, victim fully recovered in one month.
40	28	Male	Contusions, Abrasions, Lacerations	Treated and Released	Upper Trunk	Public Display Firework	At a public display, a professional firework exploded in a tube causing debris to fly and hit the victim.	Fully recovered.
41	30	Male	Contusions, Abrasions, Lacerations	Treated and Released	Eye	Roman Candle	Victim lit a Roman candle in the back of a truck. One of the balls went into his eye.	Victim was treated and released at the Emergency Room. No information provided on further treatment or prognosis.
42	31	Male	Burns	Treated and Released	Lower Arm	Poppers	Victim was lighting popper type fireworks when an ember from a previously lit firework ignited one that he was holding.	Victim has completely recovered from first and second degree burns to his arm.
43	32	Male	Other	Treated and Released	Ear	Roman Candle	Roman candle fell off a roof and exploded near the victim damaging his hearing.	Fully recovered.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
44	33	Female	Contusions, Abrasions, Lacerations	Treated and Released	Neck	Aerial Shell	A number of people, including the victim, were at a lake launching fireworks. A rocket came across the road and hit the victim in the neck.	Victim received seven stitches to close a laceration on her neck. Fully recovered in a month.
45	34	Male	Burns	Treated and Released	Hand	Aerial Shell	Victim lit an aerial shell device that exploded immediately in his hand.	No further medical care required. Victim fully recovered.
46	34	Female	Contusions, Abrasions, Lacerations	Treated and Released	Face	Public Display Firework	The launching tube of a professional display mortar type firework flew up into the air hitting the victim in the chin.	Victim had plastic surgery. Full recovery is uncertain, possibly occurring in three or four months.
47	38	Male	Burns	Treated and Released	Face	Roman Candle	Victim lit a Roman candle that exploded immediately.	In addition to burns on the face and a lacerated hand, the victim had blurred vision. Victim is unsure if full vision will return.
48	39	Male	Burns	Treated and Released	Hand	Aerial Shell	A spark from a lit mortar fuse burned the victim's left palm and parts of his fingers.	Second degree burns. Victim fully recovered.
49	44	Male	Burns	Treated and Released	Hand	Aerial Shell	Aerial firework fired from cannon traveled parallel to the ground, hitting the victim in the hand.	Third degree burns to hand, continued medical treatment; after 4 months full recovery uncertain.

Case	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
50	44	Male	Burns	Treated and Released	Ankle	Ground Spinner	Victim tried to kick away ground spinner that was expected to rise into the air, but did not.	Victim treated for second degree burns in the Emergency Room. Fully recovered.
51	45	Male	Contusions, Abrasions, Lacerations	Treated and Released	Face	Aerial Shell	Victim ignited two reloadable mortar shells, then picked up the third. The launching tube snapped and hit him in the lip.	The victim saw a surgeon after the Emergency Room visit. Fully recovered by six weeks after the incident.
52	48	Male	Foreign Body in Eye	Treated and Released	Eye	Unknown	Victim watching people setting off fireworks when some debris from those fireworks got into his eye.	After treatment in the Emergency Room, victim fully recovered.