

ORANGE COUNTY

2017 Independence Day

After Action Report



Prepared by the Orange County Fire Authority
Irvine, CA

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Executive Summary

Ten Orange County cities permitted the sale of safe and sane fireworks in 2017, for a total of 254 stands throughout the County. A total of 33 public fireworks displays provided safe celebration options for the communities within Orange County. This year, there were no reported injuries as a result of a public display firework show. A few safety concerns were raised by some displays within OCFA (Orange County Fire Authority) jurisdiction that will be addressed for the upcoming 2018 Independence Day festivities.

In 2017, the injuries associated with fireworks decreased to 29 total injuries. Last year, Orange County reported 39 injuries that were related to fireworks. In comparison to the Consumer Product Safety Commission's (CPSC) 2016 fireworks injury statistics, Orange County's total fireworks injuries are less than expected for our population. Safe and sane fireworks did not contribute to any injuries that were reported this year. Illegal fireworks contributed to 45% of Orange County's reported injuries while 55% of reported injuries were caused by an unknown type of firework. Mortars were the firework type that caused the most injuries in 2017. As in previous years, a majority of the reported injuries within Orange County were burns on the hands and fingers.

Firework injuries reported by hospital emergency rooms and urgent care facilities were mapped and compared to areas where the sale of safe and sane fireworks has been permitted. Results are a clear indication that hospitals near the cities where safe and sane firework sales are permitted, reported more fireworks-related injuries.

This year, California experienced very heavy rainfall during the winter months. The rainfall elevated wildfire danger as it contributed to the substantial growth of vegetation that eventually dried out and became foliage that can catch fire and spread quickly. Fireworks safety is more critical than ever to prevent dangerous fires and injuries. While Orange County's reported injuries decreased this year, there was a considerable uptick in several other areas. Orange County experienced a significant increase in estimated property loss; almost tripling from last year's \$53,600 to \$147,121 this year. The acreage lost due to fireworks-related fires was higher than it has been in the past 4 years. Additionally, the amount of both consumer and illegal fireworks that were confiscated this year far surpasses the confiscation numbers of the last 4 years.

We would like to take this opportunity to thank all of the fire departments and medical providers in Orange County who contributed data to the analysis in this report.

Background and Methodology

Each year following the Independence Day holiday, the Orange County Fire Authority gathers data in order to analyze the overall impact of fireworks throughout Orange County. The information included in this report was contributed by hospital emergency rooms, urgent care facilities and Orange County Fire Departments to supplement OCFA's own fireworks data.

Injury data was solicited from a total of 24 hospital emergency rooms and 31 urgent care facilities throughout Orange County for the study period of June 28-July 5, 2017. This year, we received responses from 0 urgent care facilities and 18 hospital emergency rooms, for an overall response rate of 32%. OCFA's own Emergency Medical Services data was also analyzed for injuries related to fireworks. The fireworks injuries contained in this report are only those that were reported to us; it is likely many more injuries occurred that were either not treated or not reported. National statistics extracted from the most recent 2016 CPSC Fireworks Report were also used for a comparison study.

Fireworks-related fire incident and property loss information was gathered from all 11 Orange County municipal fire departments, for a response rate of 100%. Narratives from the 57 fireworks-related fire incidents that OCFA responded to were analyzed for qualitative information regarding the impact of these incidents within Orange County communities. Local newspaper and social media sources were also utilized for information regarding fireworks-related injuries and various fire-related incidents that were caused by fireworks.

Fireworks Policy in Orange County

In 2017, ten Orange County cities permitted the sale of safe and sane fireworks for a total of 254 retail consumer fireworks stands throughout the County.

City	Quantity
Anaheim	16
Buena Park	30
Costa Mesa	35
Fullerton	15
Garden Grove	45
Huntington Beach	15
Santa Ana	74
Stanton	6
Villa Park	3
Westminster	15
Total	254

This year, the City of Anaheim revamped their fireworks program by allowing only 16 stands to operate booths in the City. For the past 2 years, Anaheim allowed every nonprofit to participate, but for 2017, applications were accepted into a lottery for 8 slots. Another 8 slots were reserved for Anaheim high schools. Although this limited the number of nonprofits allowed to participate, it meant that those nonprofits that were selected would stand to make much more in profits this year as opposed to previous years.

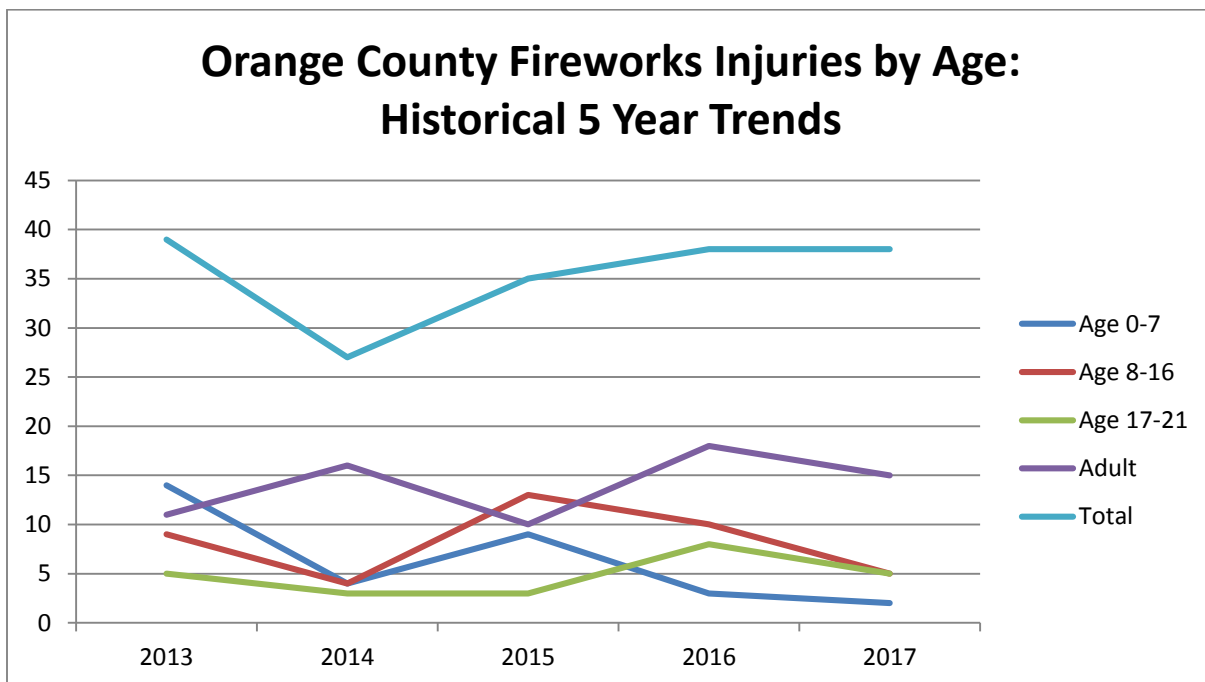
In Santa Ana, illegal mortars and rockets were fired all night across streets and were being aimed at people and cars. More than 5,700 illegal fireworks were seized between the hours of 8pm and 2am. There were close to 400 calls that came in to police and the holiday resulted in 16 arrests, each with a \$1,000 fine. Santa Ana experienced close to \$40,000 in property/content losses due to several building and vehicle fires that took place as a result of firework activity within the city.

Historical Fireworks Injury Trends

In 2017, Orange County hospital emergency rooms reported 29 injuries that were directly caused by fireworks. This is a decrease in comparison to 2016, when 39 injuries were reported and also a decrease from 2015 when 35 injuries were reported. Over the past 5 years, Orange County averaged close to 34 fireworks-related injuries around the Independence Day holiday (June 28th-July 5th).

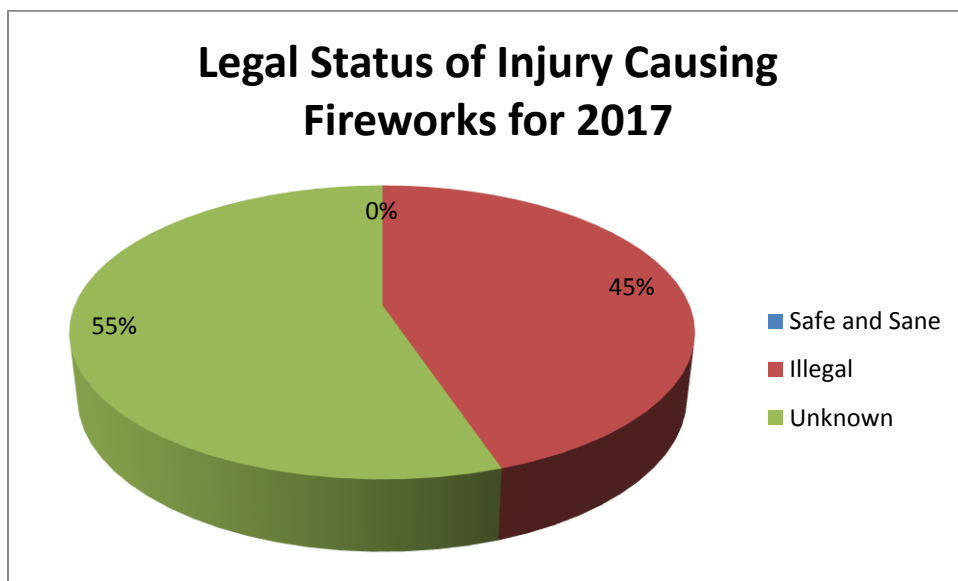
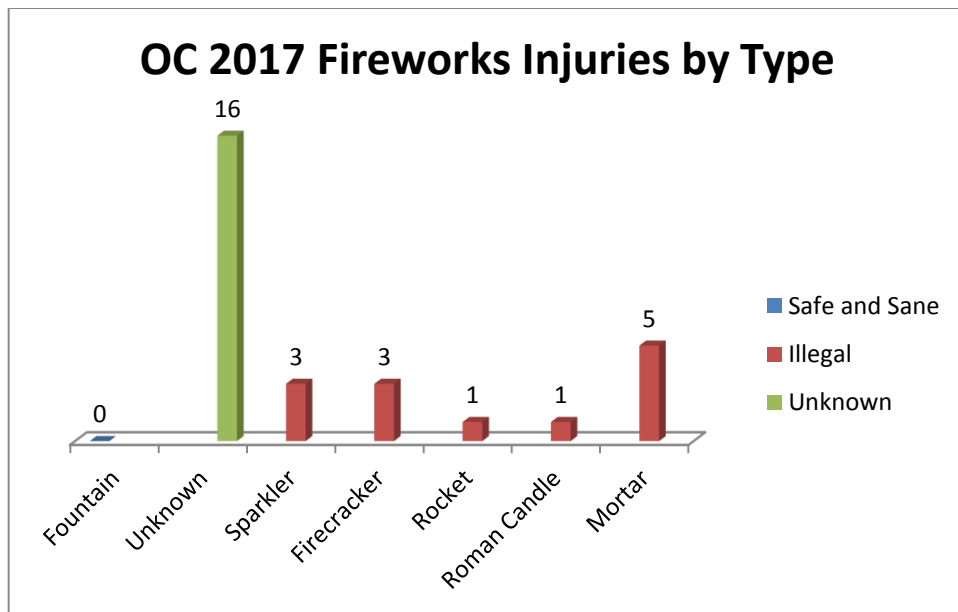
	2013	2014	2015	2016	2017
0-7	14	4	9	3	2
8-16	9	4	13	10	5
17-21	5	3	3	8	5
Adult	11	16	10	18	15
Unknown	0	0	0	0	2
TOTAL	39	27	35	39	29

The number of fireworks-related injuries for adult patients was the highest this year; although it was a slight decrease from 2016 when 18 adult patients were reported. Reported injuries for patients under the age of 21 (age brackets 0-7, 8-16 and 17-21) decreased this year by almost half.



See Appendix A for detailed information about injuries reported by emergency rooms and urgent care facilities.

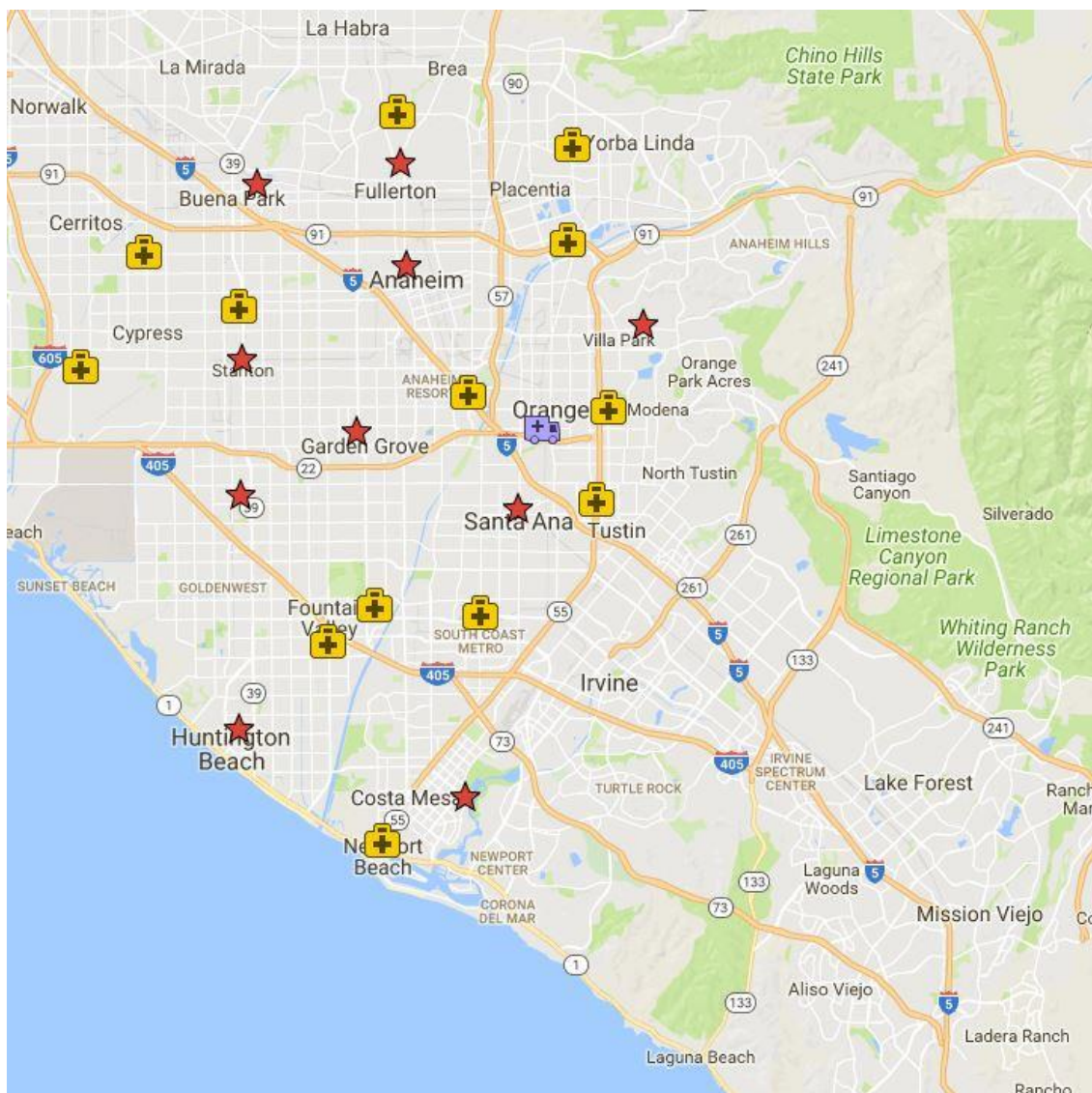
Types of Fireworks Involved in Injuries



This year in Orange County, illegal fireworks accounted for 45% of all fireworks-related injuries while the remaining 55% of injuries were caused by an unknown type. While there were a significant number of “unknown” type of fireworks, Mortars were the type of illegal fireworks that caused the most reported injuries in 2017. Interestingly, Safe and Sane fireworks did not cause any reported injuries in 2017.

Spatial Analysis of Fireworks Injuries

This map displays the locations of the Orange County hospitals that have reported fireworks-related injuries in 2017. The red stars indicate the cities that allowed the sale of safe and sane fireworks. The mustard hospital bag marker indicates hospitals that reported between 1-4 injuries and the purple ambulance marker indicates hospitals that reported 5 or more injuries during the study period of June 28, 2017 through July 5, 2017. St. Joseph's Hospital was the only hospital to report 5 fireworks-related injuries this year. This information does not conclude that the sale of fireworks caused more injuries, but the spatial relationship of fireworks-related injuries that were treated in and around the safe and sane cities is indicative of an on-going trend that injuries are still happening very near to the safe and sane cities.



Fireworks-Related Fire Incidents and Property Loss

Historical Property Loss					
	2013	2014	2015	2016	2017
Property Loss	\$220,050	\$9,580	\$300,540	\$53,600	\$147,121
Acreage Lost	.40 acres	.02 acres	.025 acres	1.21 acres	4.38 acres

In comparison to 2016, reported fireworks-related property loss increased considerably in Orange County for 2017. Additionally, reported acreage that was lost due to fireworks-related fires, was significantly much higher than in the past 4 years. Illegal fireworks ignited a building fire in Placentia which resulted in an estimated \$27,000 in damages. Fireworks caused a vehicle fire in Santa Ana which caused \$20,000 in property loss. Newport Beach reported a \$10,000 loss due to a structure fire. This year, Santa Ana had an incident count of 30 while in 2016, the incident count was only 6. There were 72 incident counts reported for Anaheim alone this year.

In Orange County Fire Authority's jurisdiction, 57 fireworks-related incidents were reported this year.

Incident Calls/Type of Fire	
Roof/Structure Fire	8
Lawn Fire	0
Trash Fire	15
Tree Fire	8
Brush/Acre Fire	14
Vehicle Fire	1
Other	11

California experienced heavy rainfall during the past year which resulted in thick vegetation that has dried in the summer months. This dry brush combined with the continued use of illegal fireworks has elevated wildfire and fire danger within Orange County, which was evident in the 164 incident counts that were reported by Orange County fire departments.

2017 FIREWORKS-RELATED PROPERTY LOSS

Note: Red denotes cities that permit the sale of safe and sane fireworks

CITY	COUNT	\$ LOSS	ACREAGE	COMMENTS
Aliso Viejo	2	1.00	0	1 trash, 1 other
Anaheim	72	0	3.0	N/A
Brea	7	0	0	N/A
Buena Park	9	1,120	0.2	2 brush, 2 trash, 1 other, 4 tree
Costa Mesa	2	0	0	N/A
Cypress	0	0	0	N/A
Dana Point	0	0	0	N/A
Fountain Valley	0	0	0	N/A
Fullerton	7	0	0	N/A
Garden Grove	10	0	0	4 tree, 6 trash
Huntington Beach	4	500	0	1 vehicle
Irvine	2	0	0	2 other
Ladera Ranch	0	0	0	N/A
La Palma	0	0	0	N/A
Laguna Beach	1	0	0	N/A
Laguna Hills	1	0	0.1	1 brush
Laguna Niguel	0	0	0	N/A
Laguna Woods	0	0	0	N/A
Lake Forest	0	0	0	N/A
Los Alamitos	0	0	0	N/A
Mission Viejo	0	0	0	N/A
Orange	3	55,000	0	N/A
Newport Beach	1	10,000	0	1 structure
Placentia	3	29,000	0.1	1 structure, 1 brush, 1 other
Rancho Santa Margarita	0	0	0	N/A
San Clemente	0	0	0	N/A
San Juan Capistrano	0	0	0	N/A
Santa Ana	30	39,000	0.19	5 building, 8 trash, 4 tree, 7 brush, 1 vehicle, 5 other
Seal Beach	0	0	0	N/A
Stanton	2	0	0	2 other
Tustin	1	800	0	1 trash
Unincorporated OC	7	11,700	0.78	1 building, 3 trash, 3 brush
Villa Park	0	0	0	N/A
Westminster	0	0	0	N/A
Yorba Linda	0	0	0	N/A
COUNTY TOTAL	164	\$147,121	4.38	

Note that incidents reported on this list are only the incidents that were reported with a potential property or acreage loss.

Public Display Incidents

There were 33 public displays in Orange County this year. OCFA took part in 22 of those public displays. Of the 22 public displays, there were no injuries and no fires reported as a result of the public displays. There was 1 violation reported for a carnival in San Juan Capistrano where the pyrotechnics technician allowed family members within the established fallout zone. OCFA is working with the city to eliminate this issue for next year's public display.

Orange County shows outside of OCFA areas included: 1 in Anaheim, 2 in Costa Mesa, 1 in Fullerton, 1 in Huntington Beach, 3 in Laguna Beach, and 3 in Newport Beach.

The following table details the malfunctions/injuries/fires that occurred at 5 Orange County Independence Day firework display shows:

City	Injuries	Health & Safety Violations	Fires	Malfunctions/Comments
San Juan Capistrano	0	1	0	15 shells misfired
Mission Viejo	0	0	0	(3) 3" shells misfired
Rancho Santa Margarita	0	0	0	2/3 of the show did not fire – fire board shorted
Laguna Niguel	0	0	0	(15) 4" shells, (5) 6" shells, (12) 3" shells misfired
Santa Ana	0	0	0	60 shells misfired

Confiscated Fireworks

Each year, Orange County Fire Authority measures the amount of fireworks confiscated over the Independence Day holiday. In 2017, the amount of confiscated fireworks was significantly higher than the past 4 years. Brea and Fullerton confiscated more fireworks this year than ever before. Costa Mesa confiscated well over 2,500 pounds of fireworks while Huntington Beach confiscated a little over 1,700 pounds of fireworks. The following tables represents this information, along with data provided by Orange County fire departments.

FIRE DEPARTMENT NAME	ILLEGAL	CONSUMER	TOTAL
Anaheim Fire & Rescue	50 lbs	0	50 lbs
Brea Fire Department	75 lbs	0	75 lbs
Costa Mesa Fire Department	2000 lbs	587 lbs	2587 lbs
Fountain Valley Fire Department	0	0	0
Fullerton Fire Department	100 lbs	0	100 lbs
Garden Grove Fire Department	300 lbs	0	300 lbs
Huntington Beach Fire Department	1715 lbs	3 lbs	1718 lbs
Laguna Beach Fire Department	0	0	0
Newport Beach Fire Department	26.6 lbs	23.2 lbs	49.8 lbs
Orange City Fire Department	100 lbs	0	100 lbs
Orange County Fire Authority	274.5 lbs	13.5 lbs	288 lbs
<i>ORANGE COUNTY TOTAL</i>	<i>4641.1 lbs</i>	<i>626.7 lbs</i>	<i>5267.8 lbs</i>

Confiscated Illegal Fireworks					
	2013	2014	2015	2016	2017
Consumer	35 lbs*	None	52.4 lbs**	30 lbs***	626.7 lbs
Dangerous/Illegal	209 lbs*	824.5 lbs	877 lbs**	3104 lbs***	4641.1 lbs

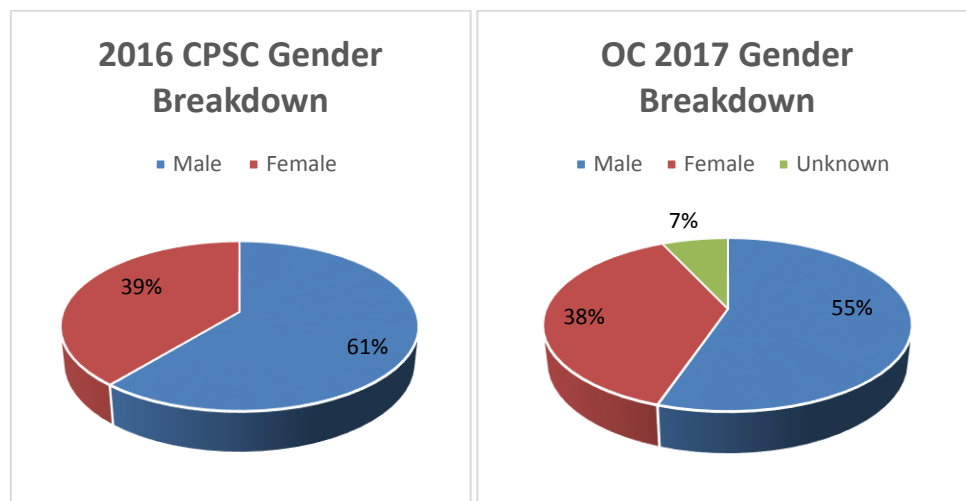
*Huntington Beach statistics included

**Newport Beach, Huntington Beach and Fountain Valley statistics included

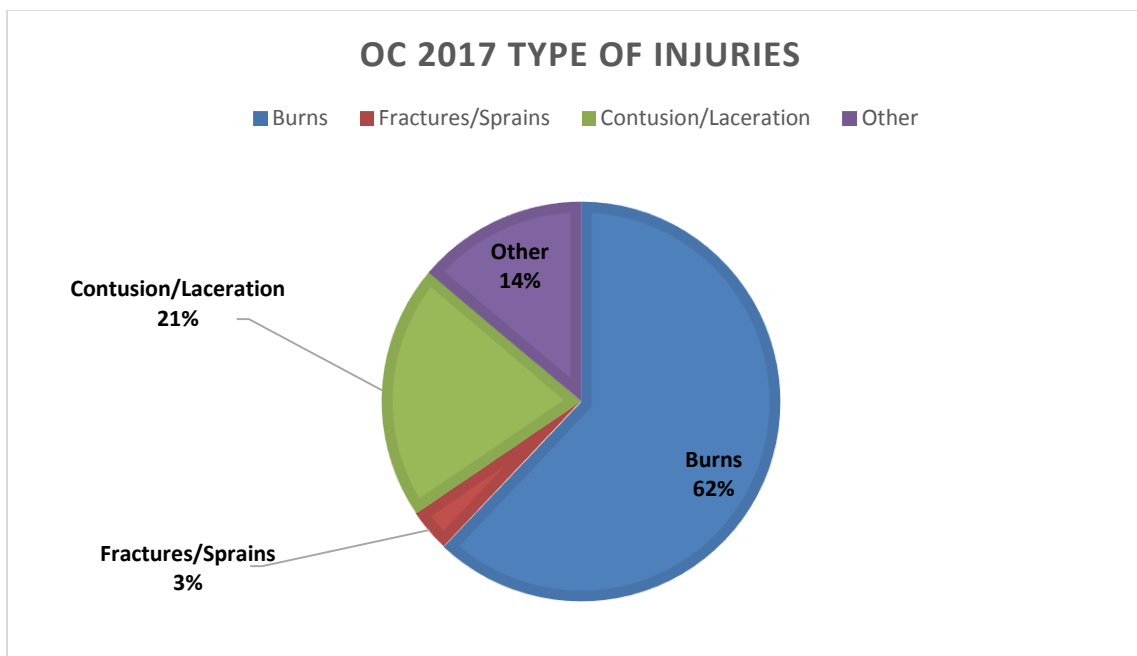
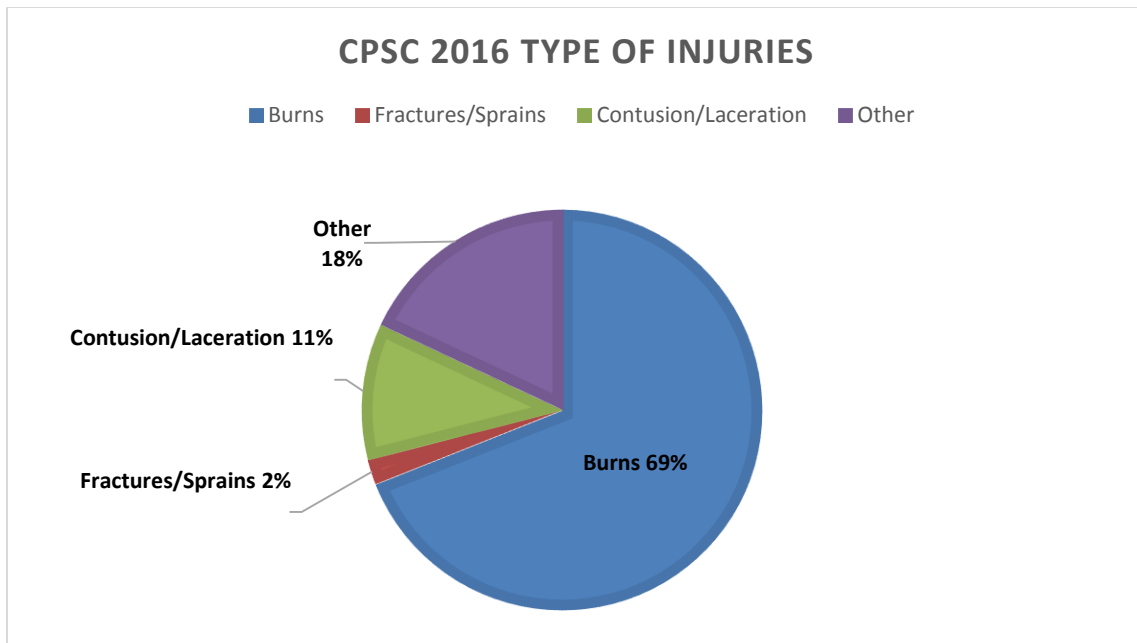
***Anaheim and Laguna Beach statistics NOT included

National Statistics Comparison

According to the 2016 CPSC Annual Fireworks Report, fireworks were involved in an estimated 11,100 injuries treated in US hospital emergency departments during calendar year 2016. Orange County's average number of fireworks injuries was 29 in 2017 which was a decrease from the 39 injuries reported in 2016. The same ten cities allowed for the sale of safe and sane fireworks in 2017 as they did in 2016. In comparison to the national average of injuries reported, Orange County seems to be significantly lower in average injuries. This difference could be attributed to the fact that the sale of safe and sane fireworks is limited to 10 Orange County cities, while 47 US states allow the sale of consumer and/or safe and sane fireworks (with various local restrictions).



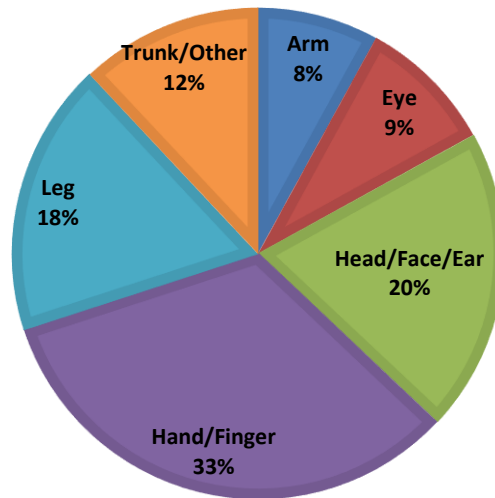
Nationally, 61% of fireworks injuries were experienced by males and 39% of fireworks injuries were experienced by females. This year in Orange County, the gender breakdown was very closely aligned with the national average, with 55% of fireworks injuries experienced by males, 38% of fireworks injuries experienced by females while 7% of the gender of firework injuries remains unknown.



The type of injuries reported within Orange County this year very closely aligns with the national average. As with previous years, burns make up the majority of fireworks-related injuries in Orange County, at 62% this year. This year, the percentage is lower than the national rate of 69% for burns. Orange County experienced very few fractures and sprains this year, which aligns with the national average of 2%.

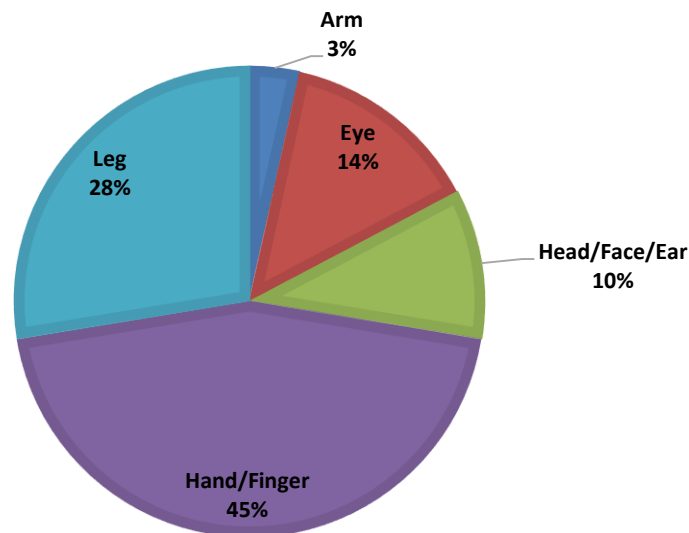
CPSC 2016 BODY REGIONS INJURED

■ Arm ■ Eye ■ Head/Face/Ear ■ Hand/Finger ■ Leg ■ Trunk/Other



OCFA 2017 BODY REGIONS INJURED

■ Arm ■ Eye ■ Head/Face/Ear ■ Hand/Finger ■ Leg



In Orange County, most injuries were to the hands or fingers. While eye, hand/finger and leg percentages for Orange County were slightly higher than the national averages, the arm, trunk/other and head/face/ear categories came in lower than the national percentages reported by CPSC for 2016.

Appendix A

2017 INJURIES BY EMERGENCY CARE FACILITY			
AGE	GENDER	DESCRIPTION OF INJURY	CARE FACILITY
44	M	Watching neighbor's fireworks from 8-10 feet away	Orange Coast Memorial
18	M	Tried to light fuse and firework exploded	Orange Coast Memorial
49	F	Burned by neighbor's fireworks	St. Joseph Hospital
24	M	Holding roman candle in hand	St. Joseph Hospital
27	M	Mortar fell over and exploded	St. Joseph Hospital
17	M	Mortar went off and hit left leg	St. Joseph Hospital
55	F	Struck by firework from neighbor's house	St. Joseph Hospital
42	M	Sparkler backfired to left hand	Placentia Linda Hospital
5	F	Unknown firework caused burns	Fountain Valley Regional
20	F	Unknown firework caused burns to foot	Fountain Valley Regional
10	F	Bottle rocket caused burn to leg	Fountain Valley Regional
27	M	Unknown firework exploded	Fountain Valley Regional
51	F	Sparkler caused burns	Kaiser-Anaheim
10	M	Firecracker caused burns to thumb	OC Global Medical Center
30	M	Firework exploded in hand	OC Global Medical Center
19	M	Mortar blew up in hand	OC Global Medical Center
53	F	Unknown firework caused burn to foot	OC Global Medical Center
18	M	Mortar went off in backpack	HOAG Memorial
12	M	Unknown firework hit eye while on ladder	HOAG Memorial
13	M	Unknown firework caused burn to leg	HOAG Memorial
29	F	Unknown firework exploded in hand	UCI
39	F	Unknown firework caused laceration to eye	Los Alamitos Medical Center
48	M	Fell off roof while watching firework public display	Chapman Global
38	F	Firecracker that was thrown caused burn to leg	South Coast Global Medical
14	M	Mortar exploded in hand	La Palma Intercommunity
N/A	F	Unknown firework caused burn to hand	St. Jude Medical Center
N/A	M	Unknown firework caused burn to hand	St. Jude Medical Center
29	F	Unknown firework exploded in hand	West Anaheim Medical
6	M	Sparkler went into eye	West Anaheim Medical

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Executive Summary

Ten Orange County cities permitted the sale of safe and sane fireworks in 2018, for a total of 229 stands throughout the County. A total of 25 public fireworks displays provided safe celebration options for the communities within Orange County.

In 2018, the injuries associated with fireworks increased to 38 total reported injuries. Last year, Orange County reported 29 injuries that were related to fireworks. In comparison to the Consumer Product Safety Commission's (CPSC) 2017 fireworks injury statistics, Orange County's total fireworks injuries are less than expected for our population. While last year, there were no reported Safe and Sane fireworks-related injuries, this year, Safe and Sane injuries accounted for 13% of reported county-wide injuries. 19% of fireworks-related injuries were due to illegal fireworks while the outstanding 68% of injuries remain unknown. As in previous years, a majority of the reported injuries within Orange County were burns to the eyes, hands and fingers.

Firework injuries reported by hospital emergency rooms and urgent care facilities were mapped and compared to areas where the sale of Safe and Sane fireworks has been permitted. Results are a clear indication that hospitals near the cities where Safe and Sane firework sales are permitted, did not necessarily report more injuries than those hospitals that are not near those same cities.

Orange County experienced a slight decrease in estimated property loss this year. The acreage lost due to fireworks-related fires was also lower than it was last year. Additionally, the amount of both consumer and illegal fireworks that were confiscated (by local fire departments) this year has gone down over 2,300 pounds compared to 2017.

With devastating wildfires forcing evacuations and destroying thousands of homes, wildfires have become a major concern for many Southern California citizens. Fireworks have become a wildfire liability and there is deliberation about the possibility of an outright ban on fireworks in fire-prone California. There have been more than 2,350 wildfires in California within the first half of 2018. This year, many wildfire-plagued cities across America have turned to drones as an alternative to fireworks. While this has not yet become the norm for California, it could very well be on the horizon as the future for holiday festivities. Orange County has yet to see a drone show, but it would be no surprise if one were to take place in the near future.

We would like to take this opportunity to thank all of the fire departments and medical providers in Orange County who contributed data to the analysis in this report.

Background and Methodology

Each year following the Independence Day holiday, the Orange County Fire Authority gathers data in order to analyze the overall impact of fireworks throughout Orange County. The information included in this report was contributed by hospital emergency rooms, urgent care facilities and Orange County Fire Departments to supplement OCFA's own fireworks data.

Injury data was solicited from a total of 25 hospital emergency rooms and 103 urgent care facilities throughout Orange County for the study period of June 30th-July 5, 2018. This year, we received responses from 3 urgent care facilities and 11 hospital emergency rooms, for an overall response rate of 9%. OCFA's own Emergency Medical Services data was also analyzed for injuries related to fireworks. The fireworks injuries contained in this report are only those that were reported to us; it is likely many more injuries occurred that were either not treated or not reported. National statistics extracted from the most recent 2017 CPSC Fireworks Report were also used for a comparison study.

Fireworks-related fire incident and property loss information was gathered from 10 out of 11 Orange County municipal fire departments, for a response rate of 90%. Narratives from the 69 fireworks-related fire incidents that OCFA responded to were analyzed for qualitative information regarding the impact of these incidents within Orange County communities. Local newspaper and social media sources were also utilized for information regarding fireworks-related injuries and various fire-related incidents that were caused by fireworks.

Fireworks Policy in Orange County

In 2018, 10 Orange County cities permitted the sale of safe and sane fireworks for a total of 229 retail consumer fireworks stands throughout the County.

City	Quantity
Anaheim	16
Buena Park	28
Costa Mesa	33
Garden Grove	39
Huntington Beach	15
Santa Ana	75
Stanton	5
Villa Park	3
Westminster	15
Total	229

Anaheim Fire and Rescue experienced a 16% increase in firework related calls this year. Also, citations increased from 2 in 2017 to 17 in 2018. There was a garage fire in Anaheim that is still under investigation but most likely caused by illegal fireworks. Although no injuries were reported, the fire did displace a family.

Garden Grove had an OCSD Bomb Squad response call involving a man on a mini-bike pulling a trailer that was assembled to set off illegal fireworks as he rode up the street. There were over 200 calls received regarding illegal fireworks. Garden Grove had 37 officers deployed on fireworks watch this year. Additionally, there were a total of 71 citations (each for \$1000) issued for illegal fireworks.

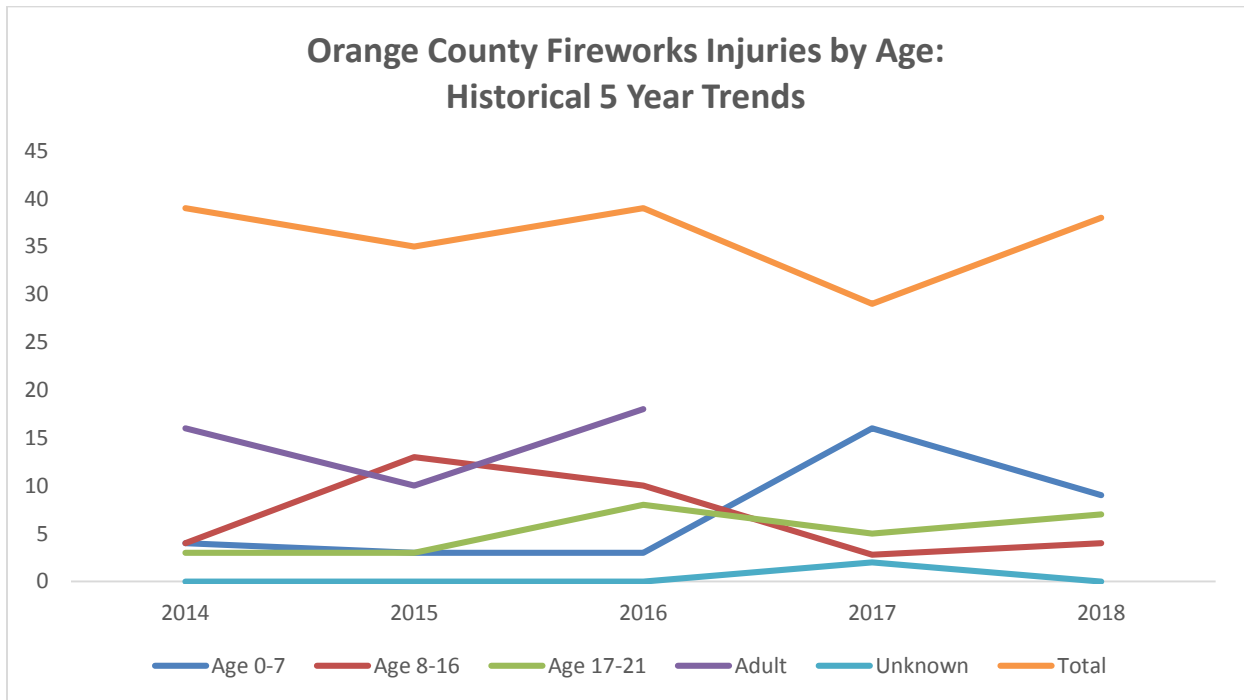
Stanton's Police Department received 34 calls for services for fireworks this year, which is a 28% decrease in calls from 2017. Overall, the City of Stanton found that there was less firework debris on the streets this year. For 2019, the City of Stanton is considering options to decrease response times, alter deployment models and utilize undercover enforcement to assist with future firework enforcement efforts.

Historical Fireworks Injury Trends

In 2018, Orange County hospital emergency and urgent care rooms reported 38 injuries that were directly caused by fireworks. This is an increase in comparison to 2017, when 29 injuries were reported. Over the past 5 years, Orange County averaged close to 34 fireworks-related injuries around the Independence Day holiday (June 30th-July 5th).

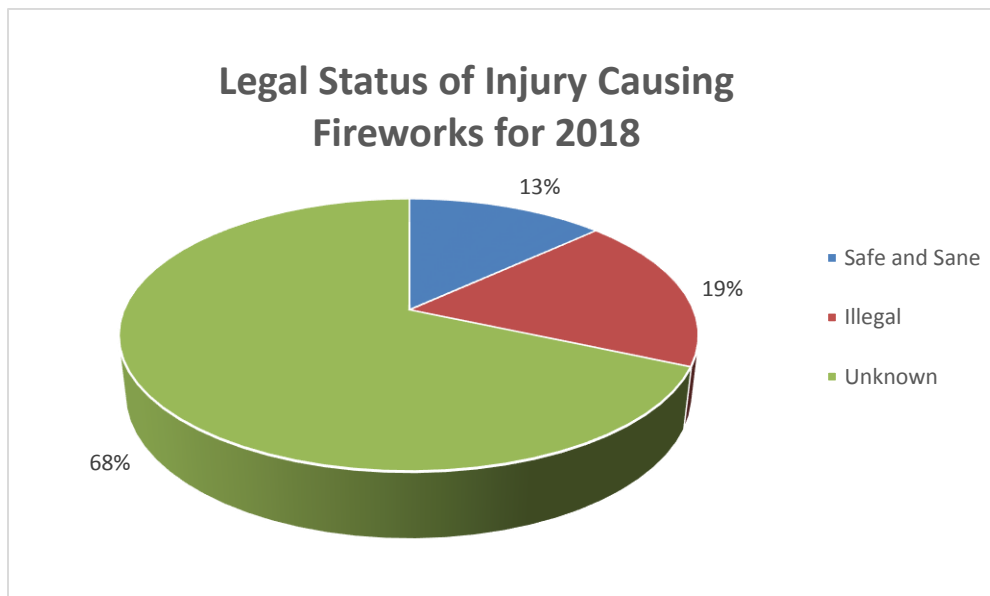
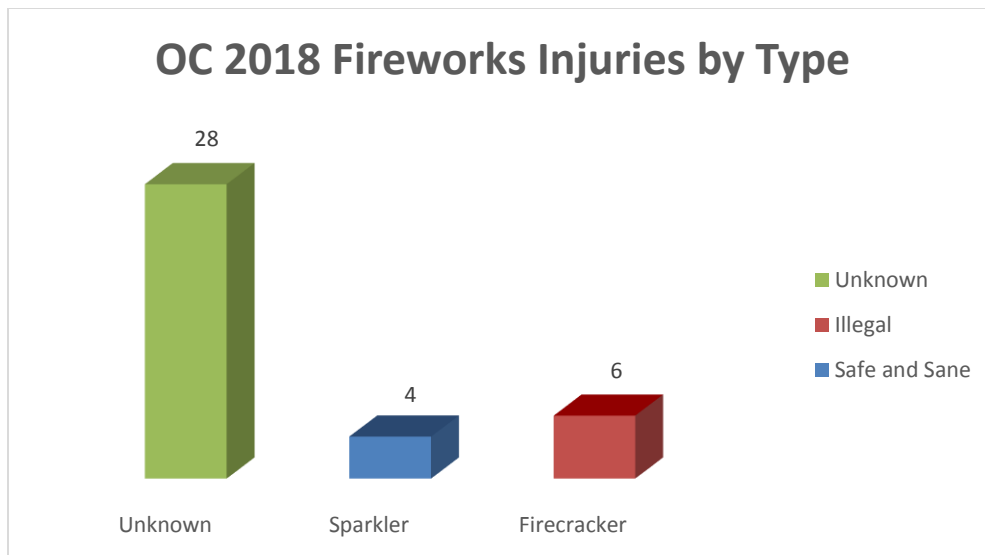
	2014	2015	2016	2017	2018
0-7	4	9	3	2	9
8-16	4	13	10	5	4
17-21	3	3	8	5	7
Adult	16	10	18	15	18
Unknown	0	0	0	2	0
TOTAL	27	35	39	29	38

The number of fireworks-related injuries for adult patients was the highest this year. Most years, the adult category seems to yield the highest number of injuries. Reported injuries for patients under the age of 21 (age brackets 0-7, 8-16 and 17-21) increased from 12 to 20 this year.



See Appendix A for detailed information about injuries reported by emergency rooms and urgent care facilities.

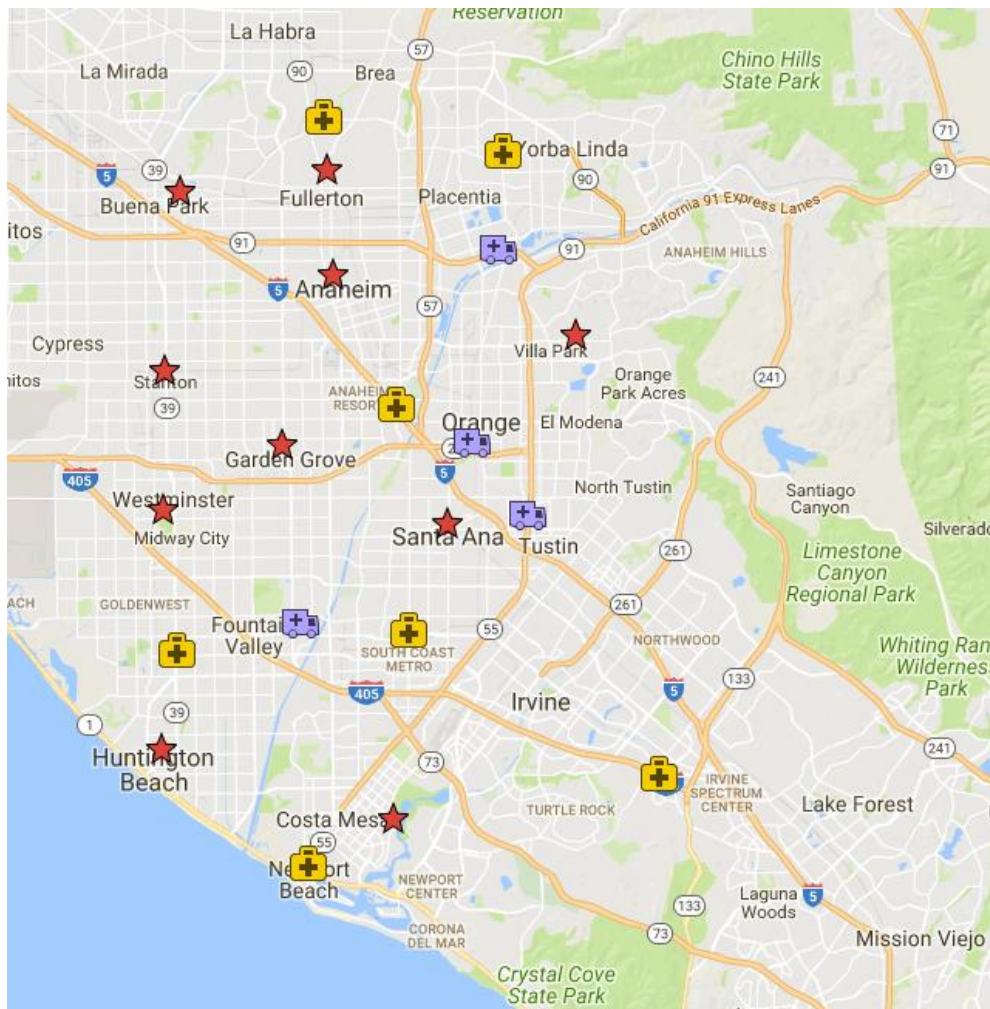
Types of Fireworks Involved in Injuries



This year in Orange County, fireworks-related injuries were caused by both illegal and Safe and Sane fireworks. Illegal fireworks accounted for 19% of all fireworks-related injuries while Safe and Sane fireworks accounted for 13% of fireworks-related injuries. The remaining 68% of injuries were caused by an unknown type. While there were a significant number of “unknown” type of fireworks, Firecrackers were identified as the type of illegal firework that caused the most reported injuries this year and Sparklers were the type of Safe and Sane firework that caused the most reported injuries this year.

Spatial Analysis of Fireworks Injuries

This map displays the locations of the Orange County hospitals that have reported fireworks-related injuries in 2018. The red stars indicate the cities that allowed the sale of Safe and Sane fireworks. The mustard hospital bag marker indicates hospitals that reported between 1-4 injuries and the purple ambulance marker indicates hospitals that reported 5 or more injuries during the study period of June 30, 2018 through July 5, 2018. There were 4 hospitals that reported 5 or more injuries this year (compared to 1 hospital with 5 injuries last year). This information does not conclude that the sale of fireworks caused more injuries. The spatial relationship of fireworks-related injuries that were treated in and around the Safe and Sane cities is not necessarily indicative of an on-going trend that injuries are happening near to the Safe and Sane cities. Reported injuries seem to be spread out throughout the county, regardless of firework sales.



Fireworks-Related Fire Incidents and Property Loss

Historical Property Loss					
	2014	2015	2016	2017	2018
Property Loss	\$9,580	\$300,540	\$53,600	\$147,121	\$115,975
Acreage Lost	.02 acres	.025 acres	1.21 acres	4.38 acres	1.19 acres

In comparison to 2017, reported fireworks-related property loss decreased slightly in Orange County for 2018. Additionally, reported acreage that was lost due to fireworks-related fires, was significantly lower than in 2017. Illegal fireworks ignited a building fire in Aliso Viejo which resulted in an estimated \$10,000 in damages. Fireworks caused a vehicle fire in Santa Ana which caused \$21,500 in property loss. There was a \$37,000 loss in Tustin for 4 vehicles (in a single incident) that burned due to illegal fireworks. One building and one vehicle sustained minor damage due to rubbish fires that caused an estimated \$4,000 worth of damage in Huntington Beach. This year, Laguna Beach had an incident count of 17 while in 2017, the incident count was only 1. There were 757 incident counts reported for Anaheim alone this year (includes police department calls).

In Orange County Fire Authority's jurisdiction, 69 fireworks-related incidents were reported this year.

Incident Calls/Type of Fire	
Roof/Structure Fire	4
Lawn Fire	2
Dumpster (or Trash) Fire	28
Tree Fire	6
Brush/Acre Fire	5
Vehicle Fire	3
Other	21

As California continues to face another season of drought and wildfires, fireworks safety is critical to prevent dangerous fires and injuries. Dry brush combined with the continued use of illegal fireworks has elevated wildfire and fire danger within Orange County, which was evident in the 878 incident counts that were reported by Orange County fire departments.

2018 FIREWORKS-RELATED PROPERTY LOSS

Note: Red denotes cities that permit the sale of safe and sane fireworks

CITY	COUNT	\$ LOSS	ACREAGE	COMMENTS
Aliso Viejo	2	10,100	0	1 building, 1 dumpster
Anaheim	757*	0	0	5 tree, 6 dumpster, 746 other
Brea	1	0	0	1 unknown
Buena Park	2	0	0.010	1 tree, 1 dumpster
Costa Mesa	16	5,000	0	N/A
Cypress	0	0	0	N/A
Dana Point	2	100	0.010	1 tree, 1 other
Fountain Valley	0	0	0	N/A
Fullerton	8	0	0	2 tree, 5 dumpster 1 other
Garden Grove	4	0	0	2 dumpster, 1 tree, 1 other
Huntington Beach	5	4,000	0.1	1 vehicle, 1 structure, 3 other
Irvine	2	0	0.010	1 brush, 1 other
Ladera Ranch	0	0	0	N/A
La Palma	0	0	0	N/A
Laguna Beach	17	0	0	17 other
Laguna Hills	0	0	0	N/A
Laguna Niguel	0	0	0	N/A
Laguna Woods	0	0	0	N/A
Lake Forest	2	50	0	1 dumpster, 1 other
Los Alamitos	0	0	0	N/A
Mission Viejo	2	200	0	1 dumpster, 1 other
Orange	4	200	0	2 dumpster, 2 other
Placentia	2	0	0.010	1 brush, 1 other
Rancho Santa Margarita	0	0	0	N/A
San Clemente	0	0	0	N/A
San Juan Capistrano	0	0	0	N/A
Santa Ana	32	32,200	1.13	1 building, 2 tree, 2 vehicle, 19 dumpster, 1 brush, 2 grass, 2 other, 3 unknown
Seal Beach	0	0	0	N/A
Stanton	4	0	0	1 other, 3 unknown
Tustin	6	37,000	0.010	1 vehicle, 1 dumpster, 4 other
Unincorporated OC	2	25	0	1 tree, 1 brush
Villa Park	1	0	0	1 other
Westminster	5	100	0	1 dumpster, 3 other, 1 unknown
Yorba Linda	2	40,000	0.010	1 building, 1 tree
COUNTY TOTAL	878	\$128,975	1.29	

Note that incidents reported on this list are only the incidents that were reported with a potential property or acreage loss. (*Police Department statistics included)

Public Display Incidents

There were 25 public displays in Orange County this year. OCFA took part in 22 of those public displays. Of the 22 public displays, there were no injuries reported. At the Monarch Beach Resort in Dana Point, there was 1 ornamental vegetation fire that was extinguished by the pyro crew. There was 1 violation issued for the Dana Point Barge where the mortars were not buried correctly.

Orange County shows outside of OCFA areas included: 1 in Orange, 1 in Costa Mesa and 1 in Huntington Beach.

The following table details the malfunctions/injuries/fires that occurred at various Orange County Independence Day firework display shows:

City	Injuries	Health & Safety Violations	Fires	Malfunctions/Comments
Irvine	0	0	0	1 shell misfired
San Juan Capistrano	0	0	0	15 shells misfired
Dana Point	0	0	1	Minor fire in ornamental vegetation.
Dana Point Harbor	0	1	0	Mortars not buried correctly and unstable. Violation notice issued.
Ladera Ranch	0	0	0	Significant amount of misfires-total of 85 shells, 136 displays, 5 cakes. Altercation between pyro crew members resulted in poor show.
Mission Viejo	0	0	0	4 shells misfired, recommend closing trails for site security.
Rancho Santa Margarita	0	0	0	2 cakes misfired
Tustin	0	0	0	6 shells, 2 cakes misfired, recommend portable fencing for site security.
Laguna Hills	0	0	0	12 shells misfired
Laguna Niguel	0	0	0	29 shells misfired
Aliso Viejo	0	0	0	1 shell, 1 cake misfired
Laguna Woods	0	0	0	5 shells misfired
Lake Forest	0	0	0	1 shell misfired
Santa Ana	0	0	0	60 shells misfired
Orange	0	0	2	2 cakes caught fire after firing. Technicians extinguished the fire. 1 shell misfired when fired after the show.

Confiscated Fireworks and Citations

Each year, Orange County Fire Authority measures the amount of fireworks confiscated over the Independence Day holiday. In 2018, the amount of reported confiscated fireworks (to local fire departments) was significantly lower than the past couple of years, however, there was no shortage of confiscation activity for local law enforcement. In Stanton, deputies confiscated over 30 pounds of illegal fireworks which resulted in an arrest and several citations. Westminster Police reported several arrests and the confiscation of hundreds of pounds of illegal fireworks. Costa Mesa Police Department seized 1,300 pounds of illegal fireworks in the two weeks leading up to the Independence Day holiday. Newport Beach Police Department confiscated more than 631 pounds of illegal fireworks. The following tables represents the information provided by Orange County fire departments.

FIRE DEPARTMENT NAME	ILLEGAL	CONSUMER	TOTAL	CITATIONS
Anaheim Fire & Rescue	200 lbs	0	200 lbs	18
Brea Fire Department	0	0	0	0
Costa Mesa Fire Department	1300 lbs	0	1300 lbs	0
Fountain Valley Fire Department	0	0	0	0
Fullerton Fire Department	300 lbs	0	300 lbs	1
Garden Grove Fire Department	60 lbs	0	60 lbs	71
Huntington Beach Fire Department	198 lbs	0	198 lbs	16
Laguna Beach Fire Department	5 lbs	0	5 lbs	0
Orange City Fire Department	120 lbs	25 lbs	145 lbs	0
Orange County Fire Authority	146 lbs	2 lbs	148 lbs	0
<i>ORANGE COUNTY TOTAL</i>	<i>2329 lbs</i>	<i>27 lbs</i>	<i>2356 lbs</i>	<i>106</i>

Confiscated Illegal Fireworks					
	2014	2015	2016	2017	2018
Consumer	None	52.4 lbs*	30 lbs**	626.7 lbs	27 lbs***
Dangerous/Illegal	824.5 lbs	877 lbs*	3104 lbs**	4641.1 lbs	2329 lbs***

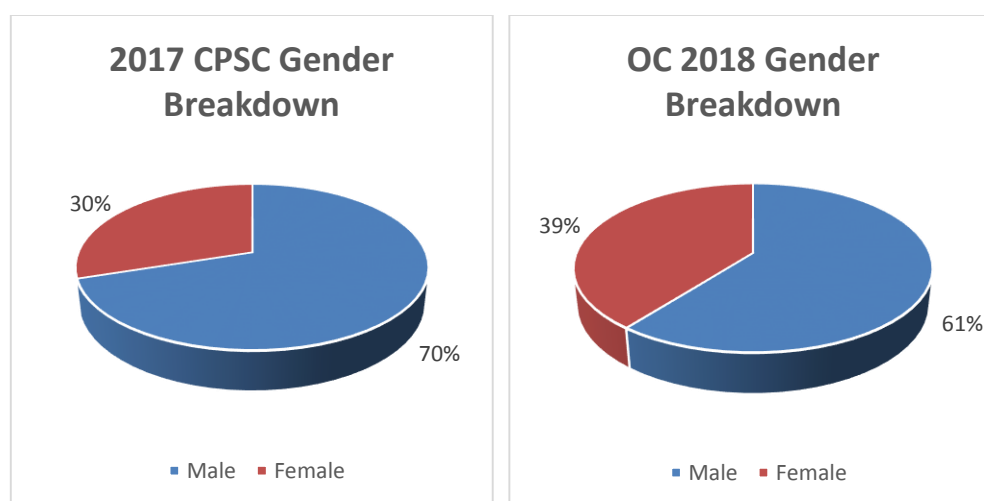
*Newport Beach, Huntington Beach and Fountain Valley statistics included

**Anaheim and Laguna Beach statistics NOT included

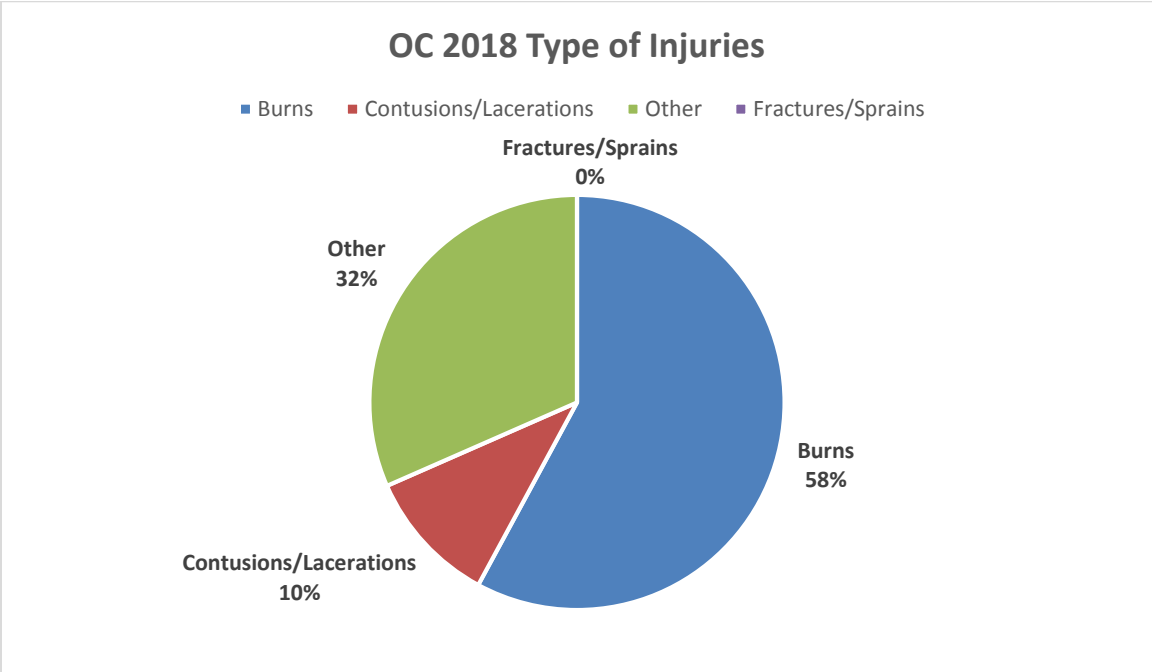
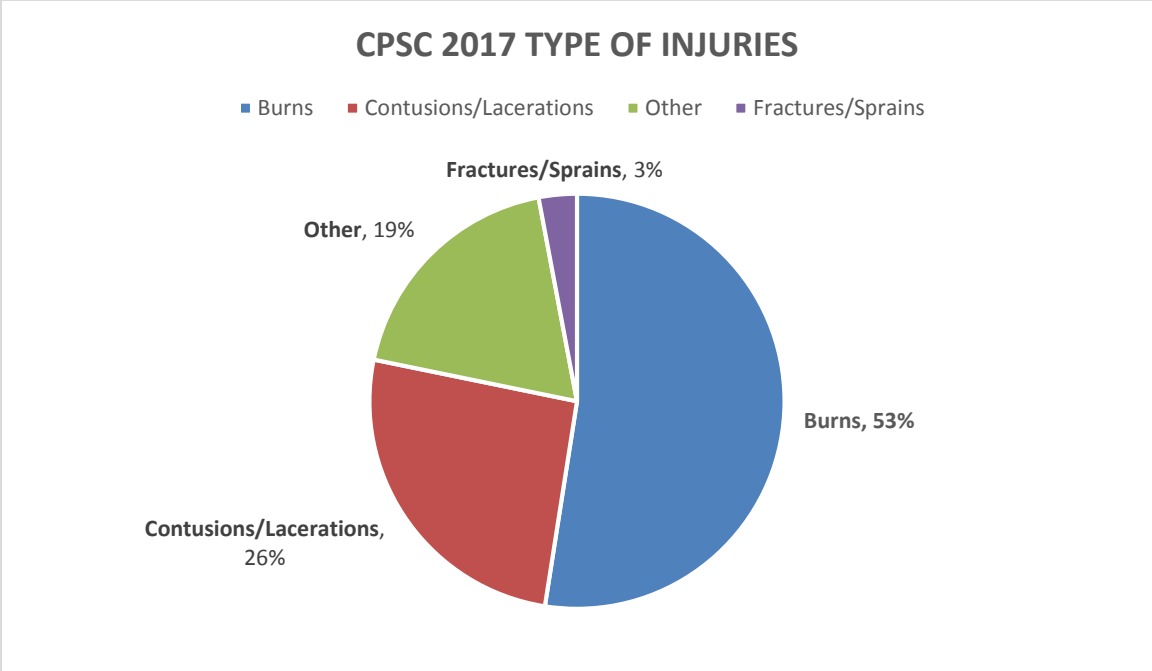
***Newport Beach statistics NOT included

National Statistics Comparison

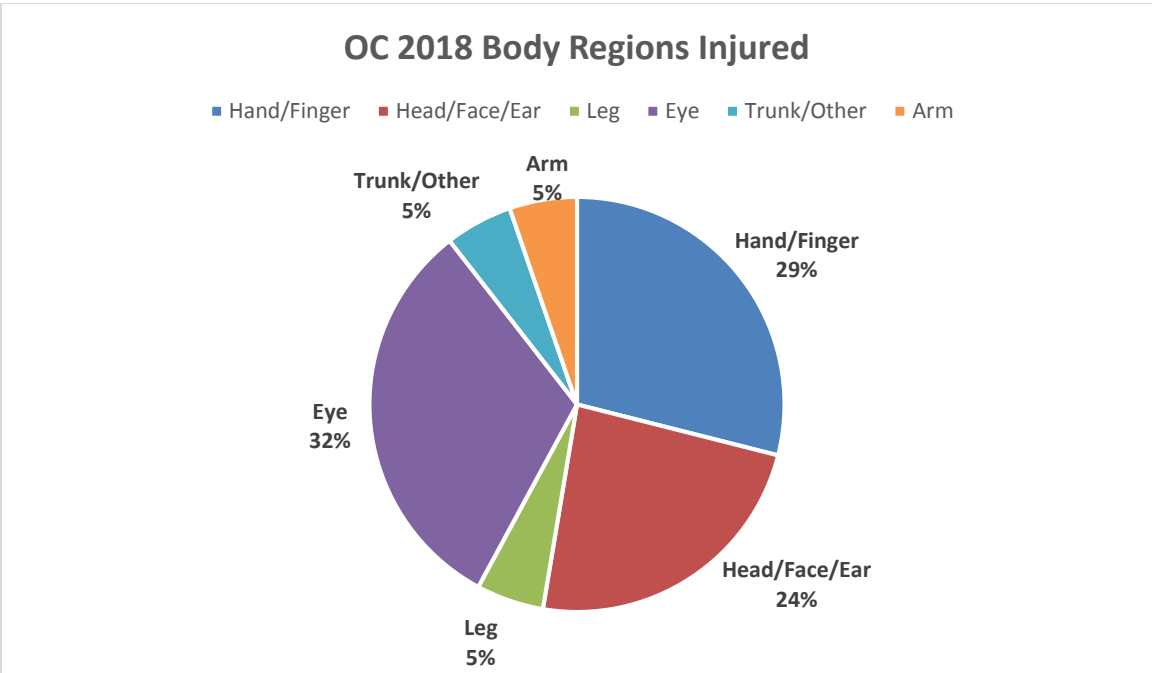
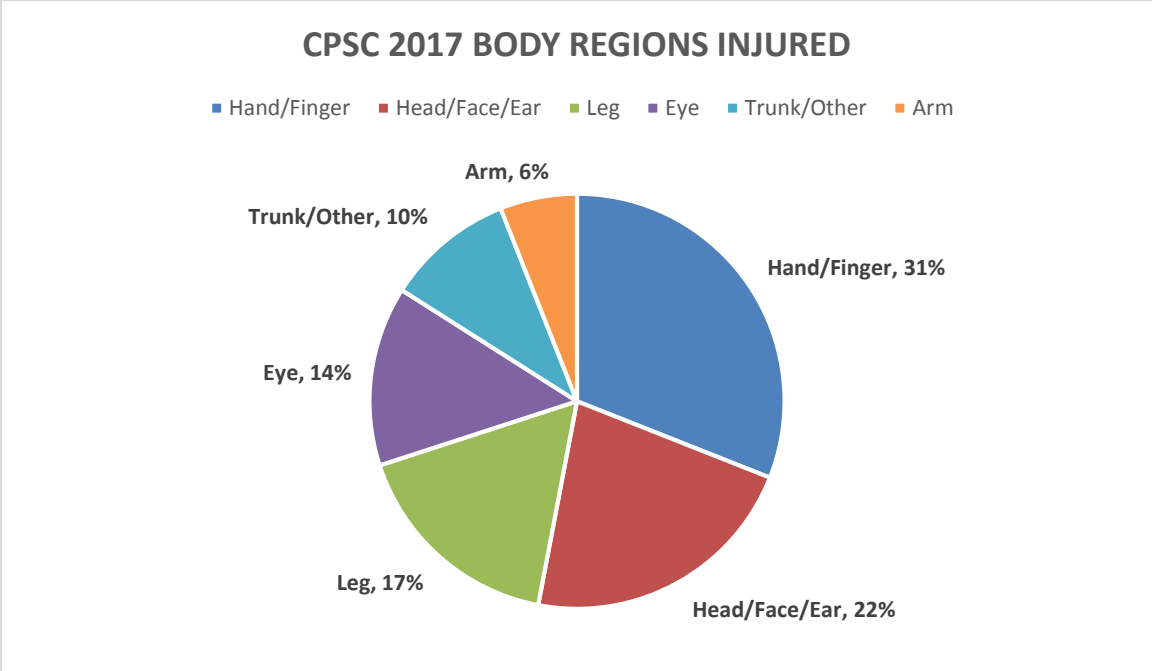
According to the 2017 CPSC Annual Fireworks Report, fireworks were involved in an estimated 12,900 injuries treated in US hospital emergency departments during calendar year 2017. Compared to the 11,100 injuries treated during calendar year 2016, there were 1800 more injuries treated in calendar year 2017. Orange County's average number of reported fireworks injuries was 38 in 2018 which is an increase from the 29 injuries reported in 2017. The same 10 cities allowed for the sale of Safe and Sane fireworks in 2018 as they did in 2017. In comparison to the national average of injuries reported, Orange County seems to be significantly lower in average injuries. This difference could be attributed to the fact that the sale of Safe and Sane fireworks is limited to 10 Orange County cities, while 47 US states allow the sale of consumer and/or Safe and Sane fireworks (with various local restrictions). Another contributing factor is that not all injuries may have been reported to hospitals and not all hospitals may have provided us with their reported injuries.



Nationally, 70% of fireworks injuries were experienced by males and 30% of fireworks injuries were experienced by females. This year in Orange County, the gender breakdown was very closely aligned with the national average, with 61% of fireworks injuries experienced by males and 39% of fireworks injuries experienced by females.



The type of injuries reported within Orange County this year very closely aligns with the national average. As with previous years, burns make up the majority of fireworks-related injuries in Orange County, at 58% this year. This year, the percentage is slightly higher than the national rate of 53% for burns. Orange County experienced no reported fractures and sprains this year, which aligns with the national average of 3%.



In Orange County this year, eye injuries were quite high. At 32%, this is more than double the national average of 14%. While hand/finger, head/face/ear and arm percentages for Orange County were on par with the national averages, the trunk/other and leg categories came in lower than the national percentages reported by CPSC for 2017.

Appendix A

2018 INJURIES BY EMERGENCY CARE FACILITY			
AGE	GENDER	DESCRIPTION OF INJURY	CARE FACILITY
48	M	Digit amputation with chest and abdominal burns	HOAG Memorial
23	M	Second degree burns	HOAG Memorial
42	F	Fireworks shot in her direction	HOAG Memorial
7	F	Firework spark hit eye	St. Jude Medical Center
9	F	Sparkler burned down to hand/fingers	St. Jude Medical Center
15	M	Placed firecracker by way of buttocks, fell and landed on firecracker	Kaiser Permanente Irvine
5	F	Foreign body sensation and burning to eyes	Kaiser Permanente Irvine
25	M	Firework blew up in hand while lighting	St. Joseph Hospital
19	M	Debris got in eye while watching fireworks	St. Joseph Hospital
55	F	Ashes got in eye from fireworks	St. Joseph Hospital
20	M	Firework launched into head	St. Joseph Hospital
38	M	Firework that was lit struck left eye	St. Joseph Hospital
63	M	Struck in eye by falling firework	St. Joseph Hospital
39	M	Tried to stop lit container of fireworks from falling	St. Joseph Hospital
14	M	Firecracker exploded in hand	St. Joseph Hospital
6	F	Burn occurred at neighbor's house	OC Global Medical Center
48	F	Firework flew up from ground	OC Global Medical Center
5	F	Eye became irritated while watching fireworks	OC Global Medical Center
17	M	Firework blew up in hand	OC Global Medical Center
18	M	Burned while lighting a firework	OC Global Medical Center
32	M	Burned while lighting a firework	OC Global Medical Center
25	F	Firework flew in	Fountain Valley Hospital
5	M	Foreign body in eye	Fountain Valley Hospital
5	M	Debris fell into eye	Fountain Valley Hospital
20	F	Firecracker exploded on shoulder	Fountain Valley Hospital
32	F	Firecracker exploded on ear	Fountain Valley Hospital
4	M	Held towards eye accidentally	Kaiser Permanente Anaheim
19	M	Firecracker exploded in hand	Kaiser Permanente Anaheim
23	M	Hit by firework while watching fireworks	Kaiser Permanente Anaheim
29	M	Picked up firework	Kaiser Permanente Anaheim
18	F	Firework went off in hand while lighting	Kaiser Permanente Anaheim
23	M	Pain and redness after watching fireworks	Kaiser Permanente Anaheim
3	M	Firework exploded while lighting	Placentia Linda Hospital
23	F	Firework exploded while lighting	Placentia Linda Hospital
5	M	Burn to foot	Memorial Care HB
10	F	Watching fireworks when something hit eyelid	South Coast Global
29	M	Checked on firework he thought did not light and burned palm	South Coast Global
44	M	Firework exploded in hand	OCFA transfer to UCI

ORANGE COUNTY

2019 Independence Day After Action Report



Prepared by the Orange County Fire Authority
Irvine, CA

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Executive Summary

Ten Orange County cities permitted the sale of safe and sane fireworks in 2019, for a total of 241 stands throughout the County. A total of 32 public fireworks displays provided safe celebration options for the communities within Orange County.

In 2019, the injuries associated with fireworks decreased to 24 total reported injuries. Last year, Orange County reported 38 injuries that were related to fireworks. In comparison to the Consumer Product Safety Commission's (CPSC) 2018 fireworks injury statistics, Orange County's total fireworks injuries are less than expected for our population. Last year, of all reported injuries, 13% were Safe and Sane fireworks-related injuries, 19% were due to illegal fireworks, and an outstanding 68% of injuries remain unknown. This year, only 12% of fireworks-related injuries were known to be Safe and Sane fireworks, 44% were reported to be illegal, and 44% of the firework types were unknown. The majority of the reported injuries this year were to the hand/finger or trunk/other. The firework related injuries reported by hospital emergency rooms and urgent care facilities were mapped and compared to areas where the sale of Safe and Sane fireworks has been permitted. Results are a clear indication that hospitals near the cities where Safe and Sane firework sales are permitted, did not necessarily report more injuries than those hospitals that are not near those same cities.

Orange County experienced a radical decrease in the numbers of reported counts of property loss, however had a drastic increase in estimated property loss this year. The acreage lost due to fireworks-related fires was also lower than it was last year. Additionally, the amount of both consumer and illegal fireworks that were confiscated (by local fire departments) this year has gone up by over 3,600 pounds compared to 2018.

With devastating wildfires forcing evacuations and destroying thousands of homes, wildfires have become a major concern for many Southern California citizens. Fireworks have become a wildfire liability and there is deliberation about the possibility of an outright ban on fireworks in fire-prone California. There have been more than 2,500 wildfires in California within the first half of 2019 and more than 21,000 acres of land were affected. Many wildfire-plagued cities across America have turned to drones as an alternative to fireworks. While this has not yet become the norm for California, it could very well be on the horizon as the future for holiday festivities. Orange County has yet to see a drone show, but it would be no surprise if one were to take place in the near future.

We would like to take this opportunity to thank all of the fire departments and medical providers in Orange County who contributed data to the analysis in this report.

Background and Methodology

Each year following the Independence Day holiday, the Orange County Fire Authority gathers data in order to analyze the overall impact of fireworks throughout Orange County. The information included in this report was contributed by hospital emergency rooms, urgent care facilities and Orange County Fire Departments to supplement OCFA's own fireworks data.

Injury data was solicited from a total of 25 hospital emergency rooms and 103 urgent care facilities throughout Orange County for the study period of June 30th-July 5, 2019. This year, we received responses from 5 urgent care facilities and 8 hospital emergency rooms, for an overall response rate of 10%. OCFA's own Emergency Medical Services data was also analyzed for injuries related to fireworks. The fireworks injuries contained in this report are only those that were reported to us; it is likely many more injuries occurred that were either not treated or not reported. National statistics extracted from the most recent 2018 Consumer Product Safety Commission's Fireworks Report were also used for a comparison study.

Fireworks-related fire incident and property loss information was gathered from all 11 Orange County municipal fire departments. Narratives from the 76 fireworks-related fire incidents that OCFA responded to were analyzed for qualitative information regarding the impact of these incidents within Orange County communities. Local newspaper and social media sources were also utilized for information regarding fireworks-related injuries and various fire-related incidents that were caused by fireworks.

Fireworks Policy in Orange County

In 2019, 10 Orange County cities permitted the sale of safe and sane fireworks for a total of 230 retail consumer fireworks stands throughout the County.

City	Quantity
Anaheim	16
Buena Park	25
Costa Mesa	32
Fullerton	15
Garden Grove	37
Huntington Beach	15
Santa Ana	69
Stanton	3
Villa Park	3
Westminster	15
Total	230

Overall, there was a decrease in retail consumer fireworks stands, except in the cities of Anaheim, Huntington Beach, Villa Park, and Westminster, all who kept the same number of stands they had in 2018.

Anaheim Fire and Rescue experienced a 16% decrease in firework related calls and also a decrease in citations issued from 17 in 2018 down to 11 this year. Although there were no structure fires, there were dumpster and tree fires that resulted in an estimated loss of \$3,250.00.

Garden Grove had 2 less stands this year than in 2018. They received two significant civilian injuries due to mortars exploding; one in a victim's hand and one in the chest and face.

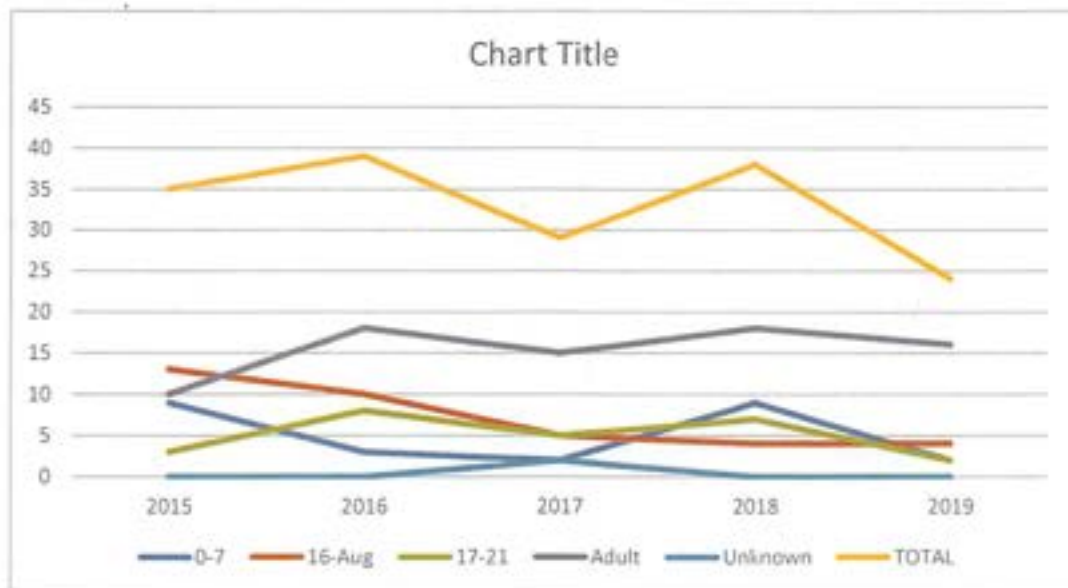
Orange had an incident during peak hours on July 4th when an officer was assaulted with a firework (mortar) being thrown at him which drew the majority of the department resources for several hours.

Historical Fireworks Injury Trends

In 2019, Orange County hospital emergency and urgent care rooms reported 24 injuries that were directly caused by fireworks. This is a decrease in comparison to 2018, when 38 injuries were reported. Over the past 5 years, Orange County averaged about 33 fireworks-related injuries around the Independence Day holiday (June 30th-July 5th).

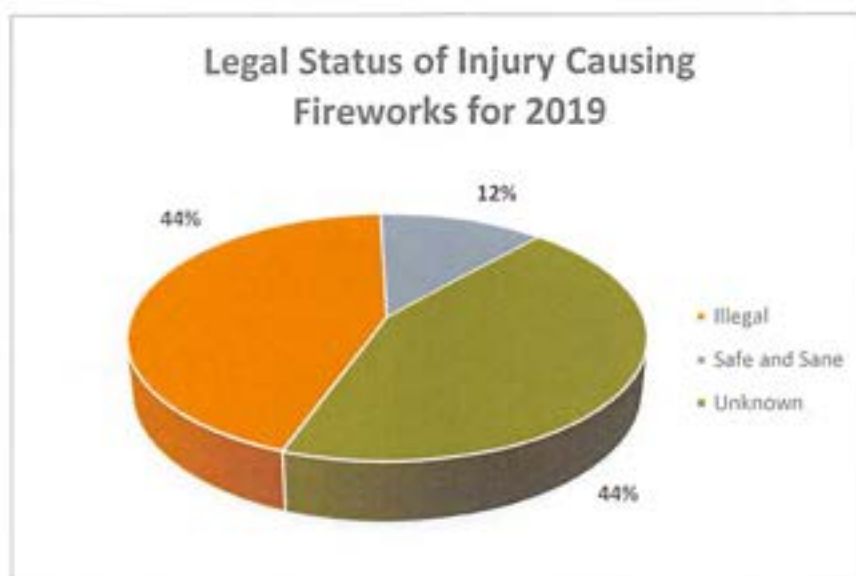
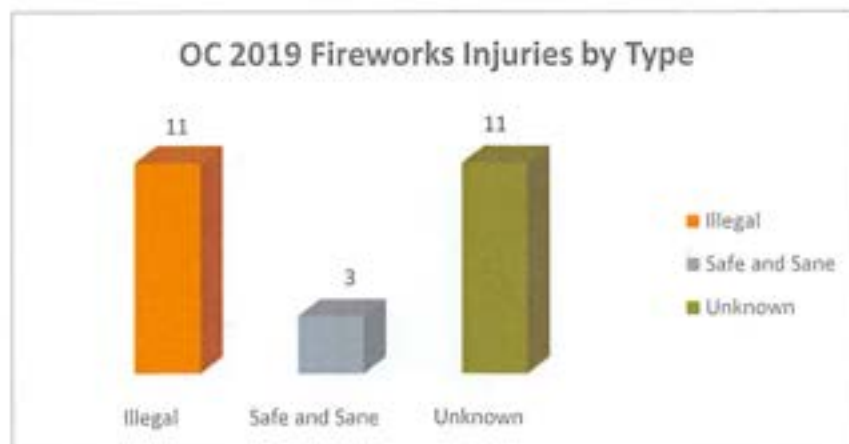
	2015	2016	2017	2018	2019
0-7	9	3	2	9	2
8-16	13	10	5	4	4
17-21	3	8	5	7	2
Adult	10	18	15	18	16
Unknown	0	0	2	0	0
TOTAL	35	39	29	38	24

On an average, the adult category tend to yield the highest number of injuries. Reported injuries for patients under the age of 21 (age brackets 0-7, 8-16 and 17-21) decreased from 20 to 8 this year.



See Appendix A for detailed information about injuries reported by emergency rooms and urgent care facilities.

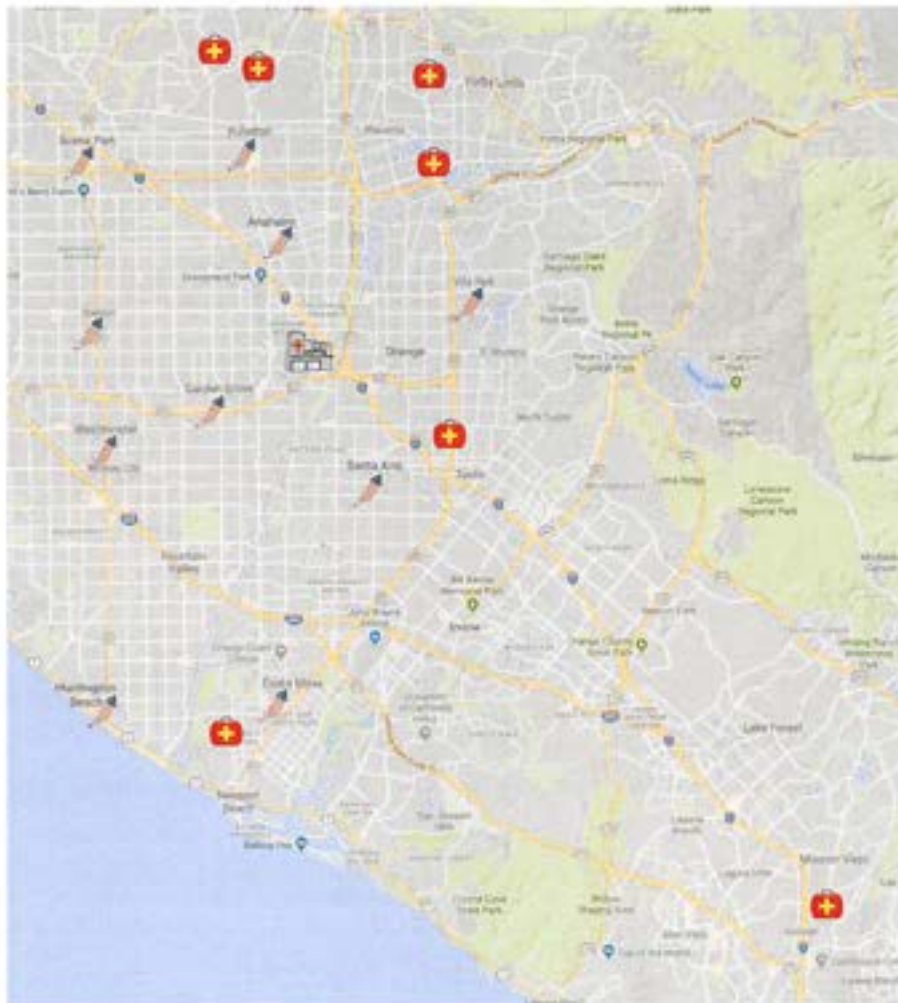
Types of Fireworks Involved in Injuries



This year in Orange County, fireworks-related injuries were caused by both illegal and Safe and Sane fireworks. The Illegal fireworks accounted for 44% of all fireworks-related injuries as well as the unknown types, while Safe and Sane fireworks accounted for 12%. There were a significant number of "unknown" type of fireworks; however, firecrackers were still identified as the type of illegal firework that caused the most reported injuries this year. There were only 2 reported firework-related injuries this year caused by Sparklers, which is a type of Safe and Sane firework.

Spatial Analysis of Fireworks Injuries

This map displays the locations of the Orange County hospitals that have reported fireworks-related injuries in 2019. The **firecracker markers** indicate the cities that allowed the sale of Safe and Sane fireworks. The **hospital bag markers** indicate hospitals that reported between 1-4 injuries and the **hospital marker** indicates the hospital that reported 5 or more injuries during the study period of June 30, 2019 through July 5, 2019. There was only one hospital that reported 5 or more injuries this year (compared to 4 hospitals with 5 or more injuries last year). This information does not conclude that the sale of fireworks caused more injuries. The spatial relationship of fireworks-related injuries that were treated in and around the Safe and Sane cities is not necessarily indicative of an on-going trend that injuries are happening near to the Safe and Sane cities. Reported injuries seem to be spread out throughout the county, regardless of firework sales.



Fireworks-Related Fire Incidents and Property Loss

Historical Property Loss					
	2015	2016	2017	2018	2019
Property Loss	\$300,540	\$53,600	\$147,121	\$115,975	\$913,705
Acreage Lost	.025 acres	1.21 acres	4.38 acres	1.19 acres	.14 acres

In comparison to 2018, reported fireworks-related property loss increased considerably in Orange County for 2019. A total of .14 acres loss due to fireworks-related fires were reported this year. A building fire in Villa Park resulted in an estimated \$700,000 in damages. Multiple miscellaneous fireworks-related fires in Santa Ana resulted in a total damage of about \$127,950 in property and contents loss. This year, Irvine had an incident count of 8, increasing from 2 in 2018; Santa Ana decreased from 32 counts last year to 17 this year.

In Orange County Fire Authority's jurisdiction, 76 fireworks-related incidents were reported this year.

Incident Calls/Type of Fire	
Roof/Structure Fire	11
Lawn Fire	9
Dumpster (or Trash) Fire	29
Tree Fire	0
Brush/Acre Fire	10
Vehicle Fire	8
Other	17

California experienced a wet winter resulting in an extraordinary show of vegetation growth. Fireworks safety is critical to prevent dangerous fires and injuries. High quantity of dry brush (from the wet winter) combined with the continued use of illegal fireworks has elevated wildfire and fire danger within Orange County.

2019 FIREWORKS-RELATED PROPERTY LOSS

Note: Red denotes cities that permit the sale of safe and sane fireworks

CITY	COUNT	\$ LOSS	ACREAGE	COMMENTS
Aliso Viejo	1	2,500	0	Passenger vehicle fire
Anaheim	7	3,250	0	Misc. dumpster, tree fires, vehicle
Brea	0	0	0	none
Buena Park	3	5	0	3 trash/rubbish fire
Costa Mesa	3	0	0	None
Cypress	1	0	0	1 rubbish fire
Dana Point	0	0	0	none
Fountain Valley	2	0	0	1 brush/grass, 1 bedroom fire
Fullerton	2	0	0	None
Garden Grove	11	250	0	5 dumpsters, 1 trash can, 3 bush/tree fires
Huntington Beach	4	5,100	0	1 rubbish/trash fire
Irvine	8	14,425	0	1 building, 3 cooking, 1 dumpster, 1 vegetation, 2 vehicle fires
Laguna Hills	0	0	0	N/A
Laguna Niguel	3	200	0	1 building, 1 brush/grass, 1 trash/waste fires
Laguna Woods	0	0	0	N/A
Lake Forest	4	125	.1	1 cooking, 2 rubbish, 1 brush/grass fires
Los Alamitos	1	1,000	0	1 dumpster fire
Mission Viejo	1	45,000	0	1 vehicle fire
Newport Beach	0	0	0	None
Orange Park	0	0	.01	None
Rancho Santa Margarita	0	0	0	N/A
San Clemente	1	0	0	1 building fire
San Juan Capistrano	2	17,000	0	1 brush/grass, 1 vehicle fires
Santa Ana	17	127,950	.02	5 dumpster, 3 buildings, 3 rubbish, 3 vegetation, 1 brush, 2 other
Tustin	3	4,500	0	1 grass, 1 equipment, 1 vehicle fires
Unincorporated OC	5	0	0	2 brush/wildland, 2 rubbish/trash, 1 other
Villa Park	1	700,000	0	1 building
Westminster	6	1,000	.01	2 dumpster, 2 rubbish, 1 brush, 1 other
Yorba Linda	0	0	0	N/A
COUNTY TOTAL	628	\$922,305	.14	

Note that incidents reported on this list are only the incidents that were reported with a potential property or acreage loss. (*Police Department statistics included)

Public Display Incidents

There were 32 public displays in Orange County this year. OCFA took part in 23 of those public displays. Of the 23 public displays, there were 2 injuries reported, one of which was not reported until July 10, 2019. There was no violation issued and no fire resulted from any malfunction or misfiring.

Orange County shows outside of OCFA areas included: 1 in Anaheim, 3 in Costa Mesa, 1 in Fullerton, 1 in Huntington Beach, and 3 in Newport Beach.

The following table details the malfunctions/injuries/fires that occurred at various Orange County Independence Day firework display shows:

City	Injuries	Health & Safety Violations	Fires	Malfunctions/Comments
Aliso Viejo	0	0	0	2 Roman Candles, 3-2.5" and 2-2.5" single shot not fired.
Buena Park	0	0	0	10-3" not fired and 1-3" dud.
Cypress	0	0	0	Show stopped w/ 10 min left due to wind pushing burning debris out of secured fallout zone.
Ladera Ranch	1	0	0	Injury reported 7/10, hit in face with cardboard tube. 5 cakes not fired.
Laguna Hills	0	0	0	60-3" and 6 4" not fired.
Laguna Woods	0	0	0	Single shell burst in mortar, caused surrounding shells to fire. 16 shells loaded incorrectly, subsequently reloaded/fired.
Lake Forest	0	0	0	10 cakes and 2 Roman Candles were not fired. Recommend no larger than 2" shells at this site.
Lake Mission Viejo	0	0	0	1 low burst and 18-3", 10-4", 15-5" not fired.
Mission Viejo CC	0	0	0	1-2" dud.
Rancho Santa Margarita	1	0	0	6 low breaks, 1 caused a person to be hit with a cardboard insert in the crowd, treated onsite. 1 cake and 18 shells not fired.
San Clemente	0	0	0	4 low breaks.
San Juan Capistrano	0	0	0	Shell burst in mortar causing rack to fail and shoot 2 other shells on finale chain horizontally. 3" finale chain and 2 cakes not fired.
Tustin	0	0	0	2-2" not fired and 2-2" duds
Yorba Linda	0	0	0	1 finale chain and 1 cake not, rewired and shot with no issues.

Confiscated Fireworks and Citations

Each year, Orange County Fire Authority measures the amount of fireworks confiscated over the Independence Day holiday. In 2019, the amount of reported confiscated fireworks (to local fire departments) was significantly greater than the past couple of years. In Costa Mesa, deputies confiscated 4,650 pounds of illegal fireworks which resulted in 40 citations. Anaheim Police reported 50% decrease in confiscation of illegal fireworks this year from last year. Fullerton and Orange Police had a drastic decrease this year. Orange County Fire Authority increased in confiscation from 146 pounds of illegal fireworks to 750 pounds. The following tables represents the information provided by Orange County fire departments.

FIRE DEPARTMENT NAME	ILLEGAL	CONSUMER	TOTAL	CITATIONS
Anaheim Fire & Rescue	100 lbs.	0	100 lbs.	11
Brea Fire Department	20 lbs.	0	20 lbs.	1
Costa Mesa Fire Department	4650 lbs.	30 lbs.	4680 lbs.	40
Fountain Valley Fire Department	N/A	N/A	N/A	N/A
Fullerton Fire Department	40 lbs.	0	40 lbs.	0
Garden Grove Fire Department	25 lbs.	0	25 lbs.	74
Huntington Beach Fire Department	292 lbs.	0	292 lbs.	0
Laguna Beach Fire Department	5 lbs.	5 lbs.	10 lbs.	0
Orange City Fire Department	50 lbs.	10 lbs.	60 lbs.	0
Orange County Fire Authority	750 lbs.	4 lbs.	754 lbs.	0
Newport Beach Fire Department	33 lbs.	15 lbs.	48 lbs.	0
ORANGE COUNTY TOTAL	5965 lbs.	64 lbs.	6029 lbs.	126

Confiscated Illegal Fireworks					
	2015	2016	2017	2018	2019
Consumer	52.4 lbs.*	30 lbs.**	626.7 lbs.	27 lbs.***	64 lbs.****
Dangerous/Illegal	877 lbs.*	3104 lbs.**	4641.1 lbs.	2329 lbs.***	5965 lbs.****

*Newport Beach, Huntington Beach and Fountain Valley statistics included

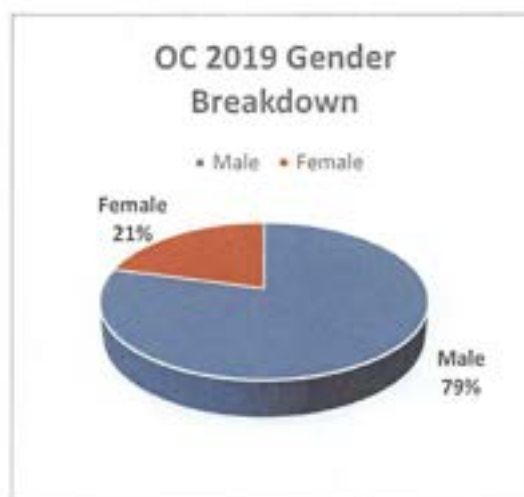
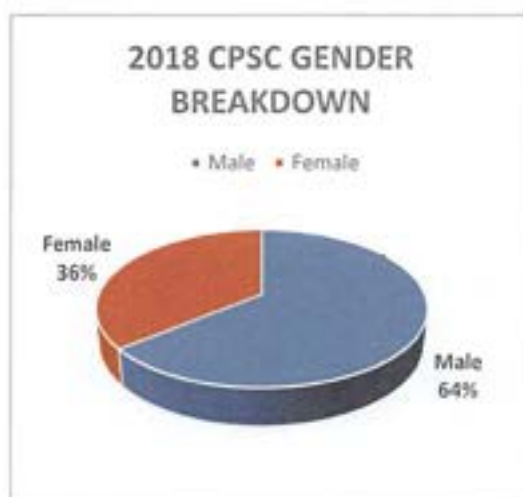
**Anaheim and Laguna Beach statistics NOT included

***Newport Beach statistics NOT included

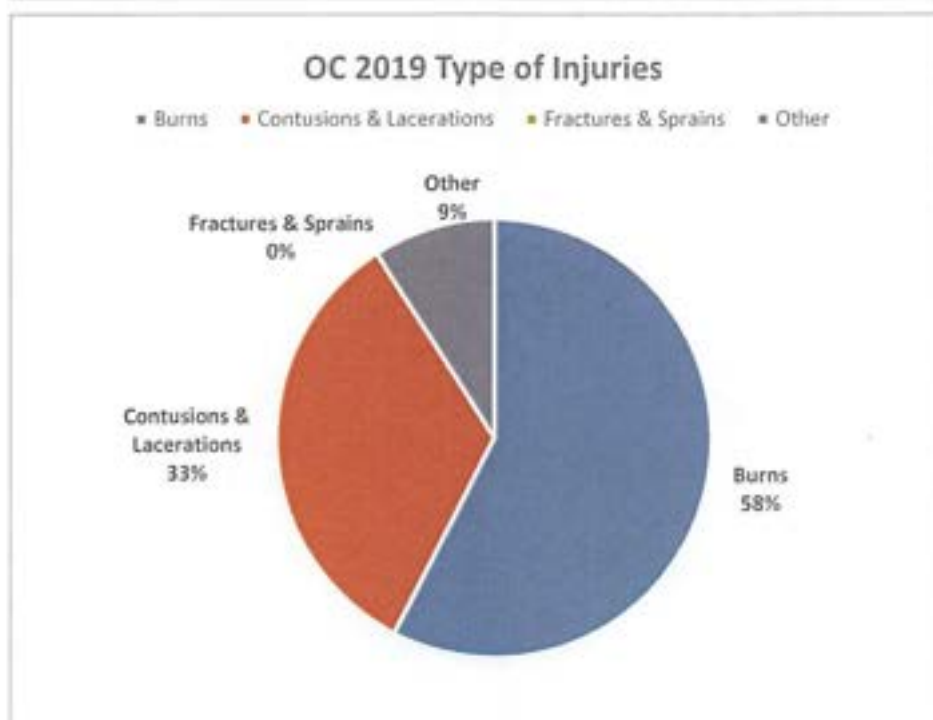
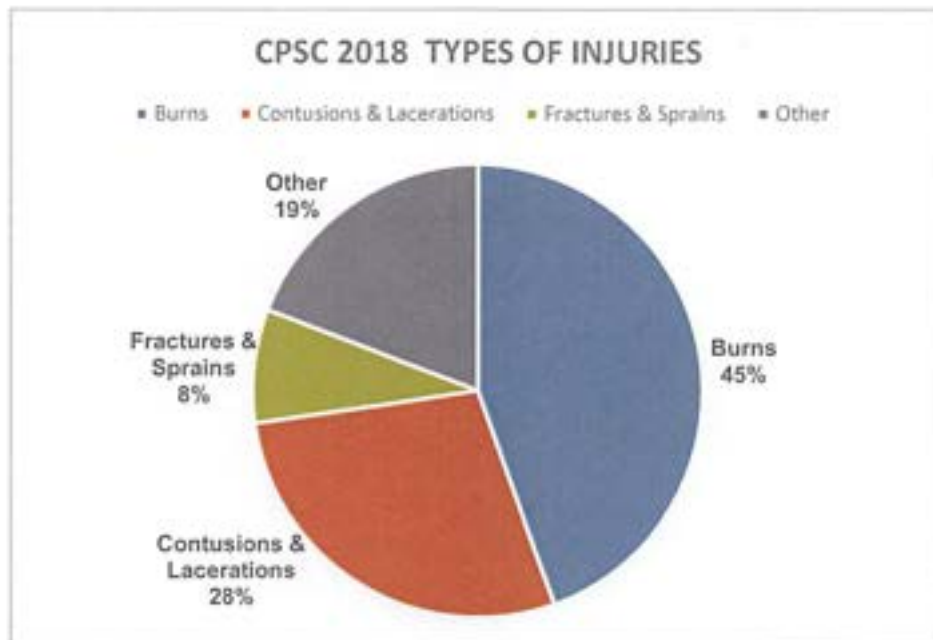
****Fountain Valley statistics NOT included

National Statistics Comparison

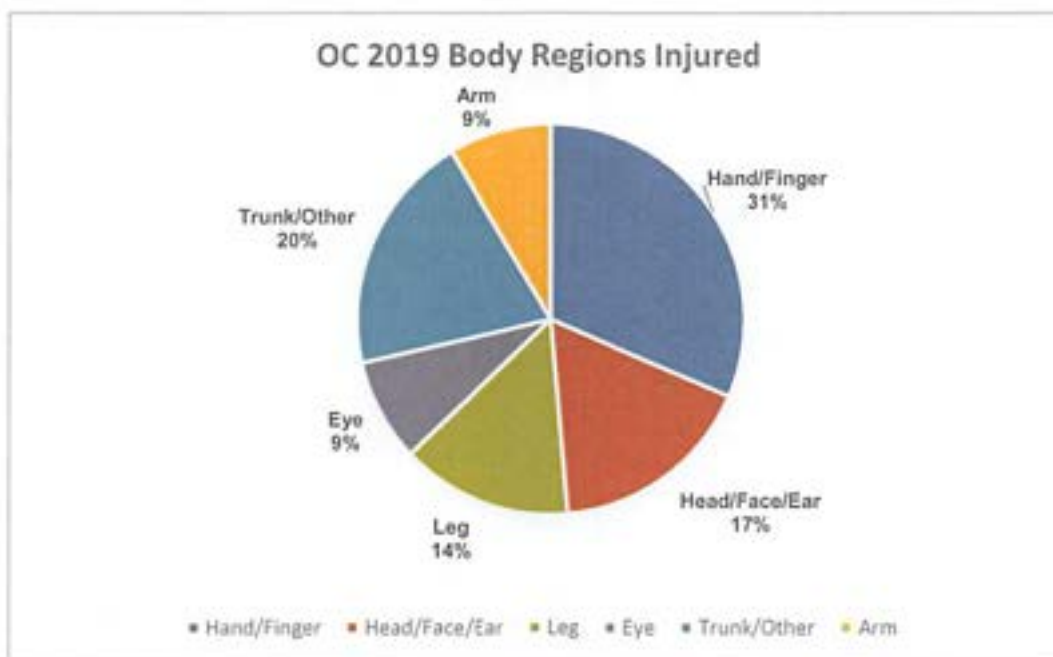
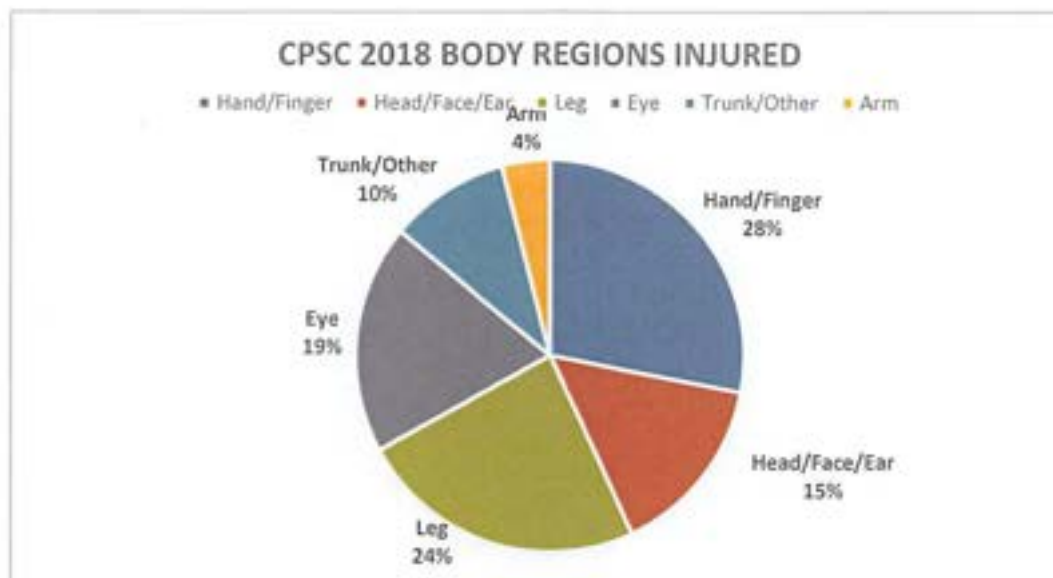
According to the 2018 Consumer Product Safety Commission's Annual Fireworks Report, fireworks were involved in an estimated 9,100 injuries treated in US hospital emergency departments during calendar year 2018. Compared to the 12,900 injuries treated during calendar year 2017, there were 3800 less injuries treated in calendar year 2018. Orange County's average number of reported fireworks injuries was 24 in 2019 which is a decrease from the 38 injuries reported in 2018. The same 10 cities allowed for the sale of Safe and Sane fireworks in 2019 as they did in 2018. In comparison to the national average of injuries reported, Orange County seems to be significantly lower in average injuries. This difference could be attributed to the fact that the sale of Safe and Sane fireworks is limited to 10 Orange County cities, while 47 US states allow the sale of consumer and/or Safe and Sane fireworks (with various local restrictions). Another contributing factor is that not all injuries may have been reported to hospitals and not all hospitals may have provided us with their reported injuries.



Nationally, 64% of fireworks injuries were experienced by males and 36% of fireworks injuries were experienced by females. This year in Orange County, the gender breakdown changed significantly compared with the national average, with 79% of fireworks injuries experienced by males and 21% of fireworks injuries experienced by females.



The type of injuries reported within Orange County this year very closely aligns with the national average. As with previous years, burns make up the majority of fireworks-related injuries; Orange County had remained at 58% this year, which is higher than the national rate of 45% for burns. Orange County experienced no reported fractures and sprains this year, which does not align with the national average of 8% in 2018.



In Orange County this year, trunk/other and arm injuries, at 21% and 9%, respectively, had more than doubled the national average of 10% and 4%, respectively. Hand/finger injury category increased by only 1% from last year, putting Orange County 3% above the national average. Head/face/ear percentages were on par with the national averages; however, leg injury category had increased to 15% this year and eye injuries drastically decreased from 32% last year to 9% this year, Orange County average still came in lower than the national percentages reported by CPSC for 2018.

Appendix A

2019 INJURIES BY EMERGENCY CARE FACILITY			
AGE	GENDER	DESCRIPTION OF INJURY	CARE FACILITY
7 mos	M	Left foot was burned by unknown illegal firework	Kaiser Permanente Anaheim
11	M	Burn/Laceration to body and leg by firecracker	Kaiser Permanente Anaheim
48	M	Burn to the hand when firecracker was thrown @ the police	OC Global Medical Center
8	F	Burn to the arm; firecracker backfired	OC Global Medical Center
12	M	Burn to the neck; firecracker was thrown in air	OC Global Medical Center
26	M	Burn to the eye; firecracker blew up in the face	OC Global Medical Center
50	F	Minor burn to the neck; novelties (fireworks)	Placentia Linda Hospital
18	M	Lacerations to hand/knees; bottle rocket blew up in hand	UCI Medical Center
29	M	Burn/Lac/ Fx Avulsion to left hand; Mortor, blew up in hand	UCI Medical Center
35	M	Burn/Laceration to face/chest; M80 explosion to the face	UCI Medical Center
23	M	Burn to left wrist; "Cake", turning right side up while lit & it went off	UCI Medical Center
16	M	Burn/Laceration to right habd/face/chest; Mortor, placed on floor, lit it & it blew up	UCI Medical Center
23	F	Laceration to left hand; Roman candle, Last one didn't go off, then exploded in hand	UCI Medical Center
27	M	Laceration/Burn to right hand; Unknown type, was walking, it in hand	UCI Medical Center
27	M	Laceration to right hand; unknown type, lit it, was setting it down as it exploded	UCI Medical Center
62	F	Burn to left hand; sparklers, was holding a bunch of them & someone lit them all at once	UCI Medical Center
31	M	Burn to left hand; sparkler, holding bundle & all went off	UCI Medical Center
44	M	Abrasion to right eye/left ear; unknown type, neighbors firework shot into his yard	UCI Medical Center
1	M	Burn to left leg; Flower type	St. Jude Heritage Medical Group
40	F	Burn to left ear; unknown firework type	St. Jude Heritage Medical Group
22	M	Burn to the back; unknown firework type	Mission Hospital – Mission Viejo
28	M	Injury to lower abdomen, above penis; unknown firework type	St. Jude Medical Center Fullerton
26	M	Burn to face/eyes; unknown firework type; Firework broke, attempted to relight – basically just gun powder.	St. Jude Medical Center Fullerton
18	M	Lacerations and burns to palms and dorsals of left and right hand. 1" laceration to the bridge of his nose and left knee and abrasion to his right forearm; bottle rocket firework.	Hoag Hospital – Newport Beach

ORANGE COUNTY

2020 Independence Day

After Action Report



Prepared by the Orange County Fire Authority
Irvine, CA

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Executive Summary

All across the country, the COVID-19 pandemic affected the Independence Day celebrations in 2020. Social distancing, facial masks, sanitizing, working from home, and various levels of quarantines have become the new societal norm for most residents in Orange County. 10 Orange County cities permitted the sale of safe and sane fireworks in 2020, for a total of 208 stands throughout the County. A total of 4 public fireworks displays provided safe celebration options for the communities within Orange County.

In 2020, the injuries associated with fireworks increased to 32 total reported injuries. Last year, Orange County reported 24 injuries that were related to fireworks. In comparison to the Consumer Product Safety Commission's (CPSC) 2019 fireworks injury statistics, Orange County's total fireworks injuries are less than expected for our population. While in 2019, reported Safe and Sane fireworks-related injuries accounted for 12% of total injuries, this year, Safe and Sane injuries accounted for only 6% of reported county-wide injuries. 25% of fireworks-related injuries were due to illegal fireworks while the outstanding 69% of injuries remain unknown. As in previous years, a majority of the reported injuries within Orange County were burns to the hands and fingers.

Firework injuries reported by hospital emergency rooms and urgent care facilities were mapped and compared to areas where the sale of Safe and Sane fireworks has been permitted. Results are a clear indication that hospitals near the cities where Safe and Sane firework sales are permitted, did not necessarily report more injuries than those hospitals that are not near those same cities.

Orange County experienced a decrease in estimated property loss this year. However, the acreage loss due to fireworks-related fires was significantly higher than it was in previous years. Additionally, the reported amount of both consumer and illegal fireworks that were confiscated (by local fire departments) this year has gone down over 1,700 pounds compared to 2019.

We would like to take this opportunity to thank all of the fire departments and medical providers in Orange County who contributed data to the analysis in this report.

Background and Methodology

Each year following the Independence Day holiday, the Orange County Fire Authority gathers data in order to analyze the overall impact of fireworks throughout Orange County. The information included in this report was contributed by hospital emergency rooms, urgent care facilities and Orange County Fire Departments to supplement OCFA's own fireworks data.

Injury data was solicited from a total of 26 hospital emergency rooms and 126 urgent care facilities throughout Orange County for the study period of June 30th-July 5, 2020. This year, we received responses from 13 hospital emergency rooms and 4 urgent care facilities, for an overall response rate of 11%. OCFA's own Emergency Medical Services data was also analyzed for injuries related to fireworks. The fireworks injuries contained in this report are only those that were reported to us; it is likely many more injuries occurred that were either not treated or not reported. National statistics extracted from the most recent 2019 CPSC Fireworks Report were also used for a comparison study.

Fireworks-related fire incident and property loss information was gathered from 10 out of 11 Orange County municipal fire departments, for a response rate of 90%. Narratives from the 76 fireworks-related fire incidents that OCFA responded to were analyzed for qualitative information regarding the impact of these incidents within Orange County communities. Local newspaper and social media sources were also utilized for information regarding fireworks-related injuries and various fire-related incidents that were caused by fireworks.

Fireworks Policy in Orange County

In 2020, 10 Orange County cities permitted the sale of safe and sane fireworks for a total of 208 retail consumer fireworks stands throughout the County.

City	Quantity
Anaheim	16
Buena Park	21
Costa Mesa	30
Fullerton	15
Garden Grove	29
Huntington Beach	15
Santa Ana	62
Stanton	2
Villa Park	3
Westminster	15
Total	208

Pandemic lockdowns and social distancing put a damper on many public celebratory traditions this year. With various new safety measures in place, sales of “Safe and Sane” fireworks skyrocketed as most Orange County professional displays went dark. With most local businesses, restaurants, attractions, and public beaches closed this year, the pandemic did help Orange County residents to become more creative in finding new ways to celebrate with drive-through and virtual gatherings.

While most professional displays were cancelled due to COVID-19, Orange County had no shortage of bootleg firework shows. The large number of unsanctioned fireworks combined with unfavorable weather conditions resulted in the worst air quality that Southern California has seen for the Independence Day holiday in over a decade.

Orange County Sheriff’s Department reported that illegal fireworks calls were up nearly 300% across Orange County compared to the holiday statistics from last year. With the pandemic restrictions in place, many residents may have tried to recreate their own fireworks celebrations at home, which led to the influx of fireworks-related emergency calls. Newport Beach reported over 330 fireworks-related complaints registered to code enforcement and police this year. Orange City reported 353 fireworks-related calls this year.

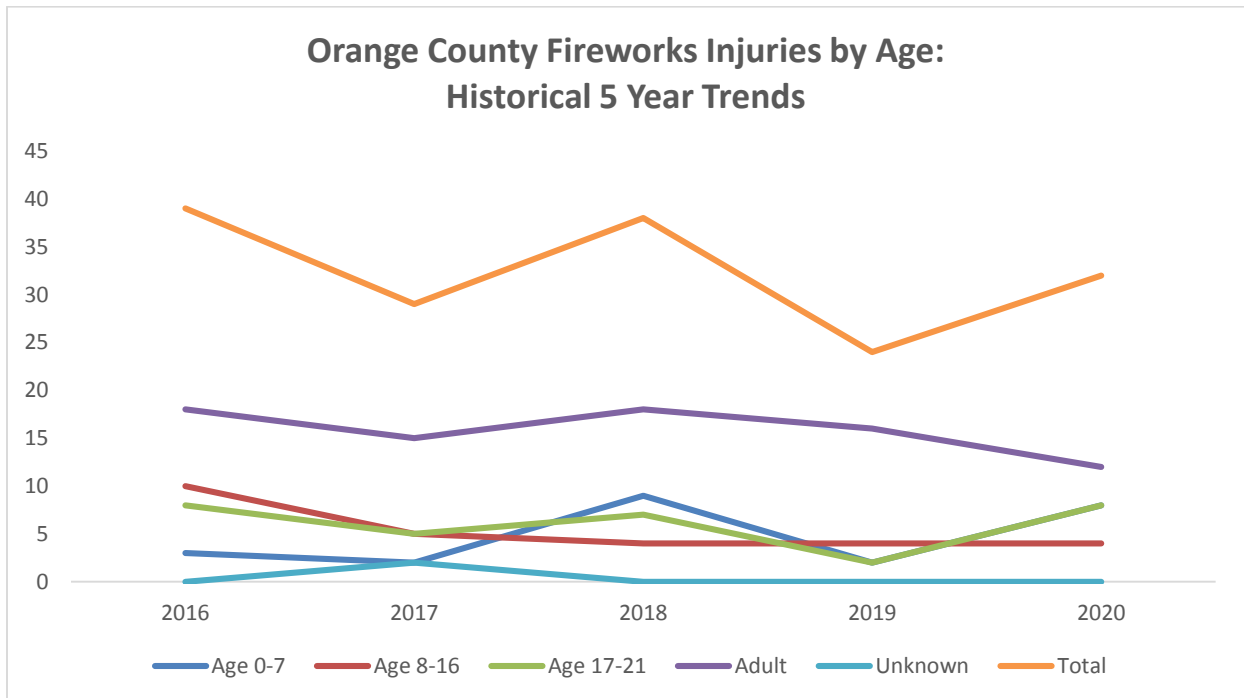
The city of Fullerton had a surge in the use of illegal fireworks for 2 months leading up to the Independence Day holiday. As of July 3, 2020, the Fullerton Police Department issued at least 17 citations for the use of illegal fireworks.

Historical Fireworks Injury Trends

In 2020, Orange County hospital emergency and urgent care rooms reported 32 injuries that were directly caused by fireworks. This is an increase in comparison to 2019, when 24 injuries were reported. Over the past 5 years, Orange County averaged close to 32 fireworks-related injuries around the Independence Day holiday (June 30th-July 5th).

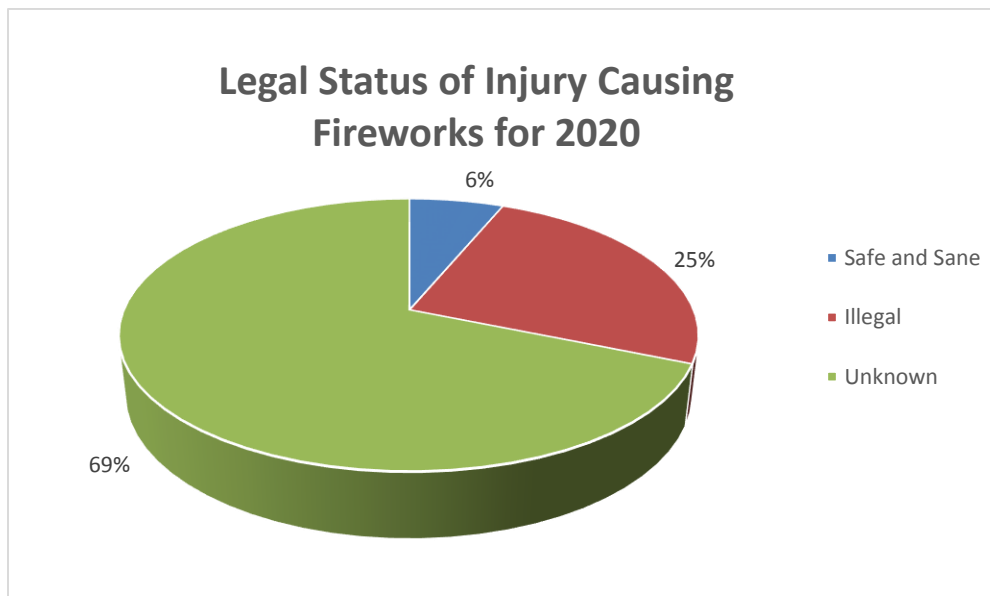
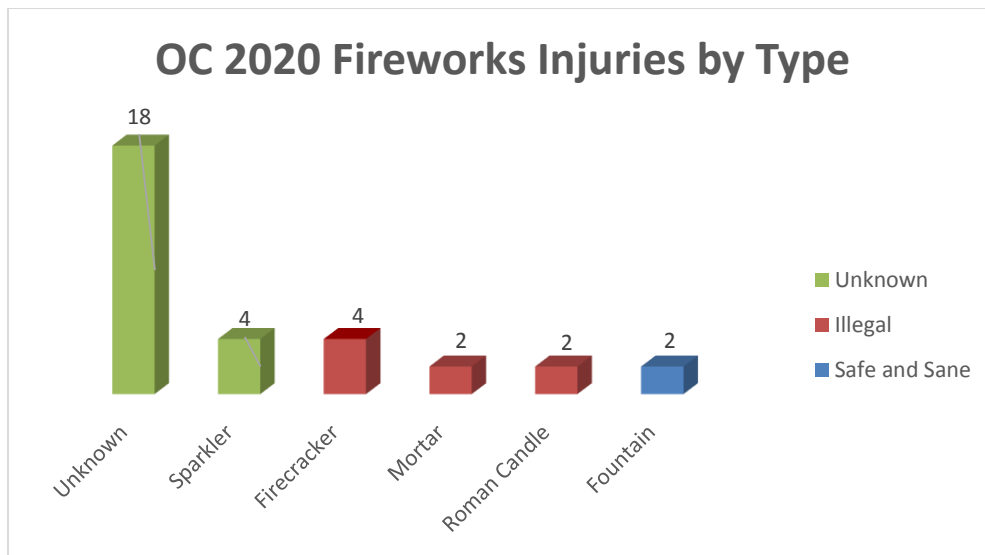
	2016	2017	2018	2019	2020
0-7	3	2	9	2	8
8-16	10	5	4	4	4
17-21	8	5	7	2	8
Adult	18	15	18	16	12
Unknown	0	2	0	0	0
TOTAL	39	29	38	24	32

Similar to previous years, the number of fireworks-related injuries for adult patients was the highest again this year. Most years, the adult category seems to yield the highest number of fireworks-related injuries. Reported injuries for patients under the age of 21 (age brackets 0-7, 8-16 and 17-21) increased from 10 injuries in 2019 to 20 injuries this year.



See Appendix A for detailed information about injuries reported by emergency rooms and urgent care facilities.

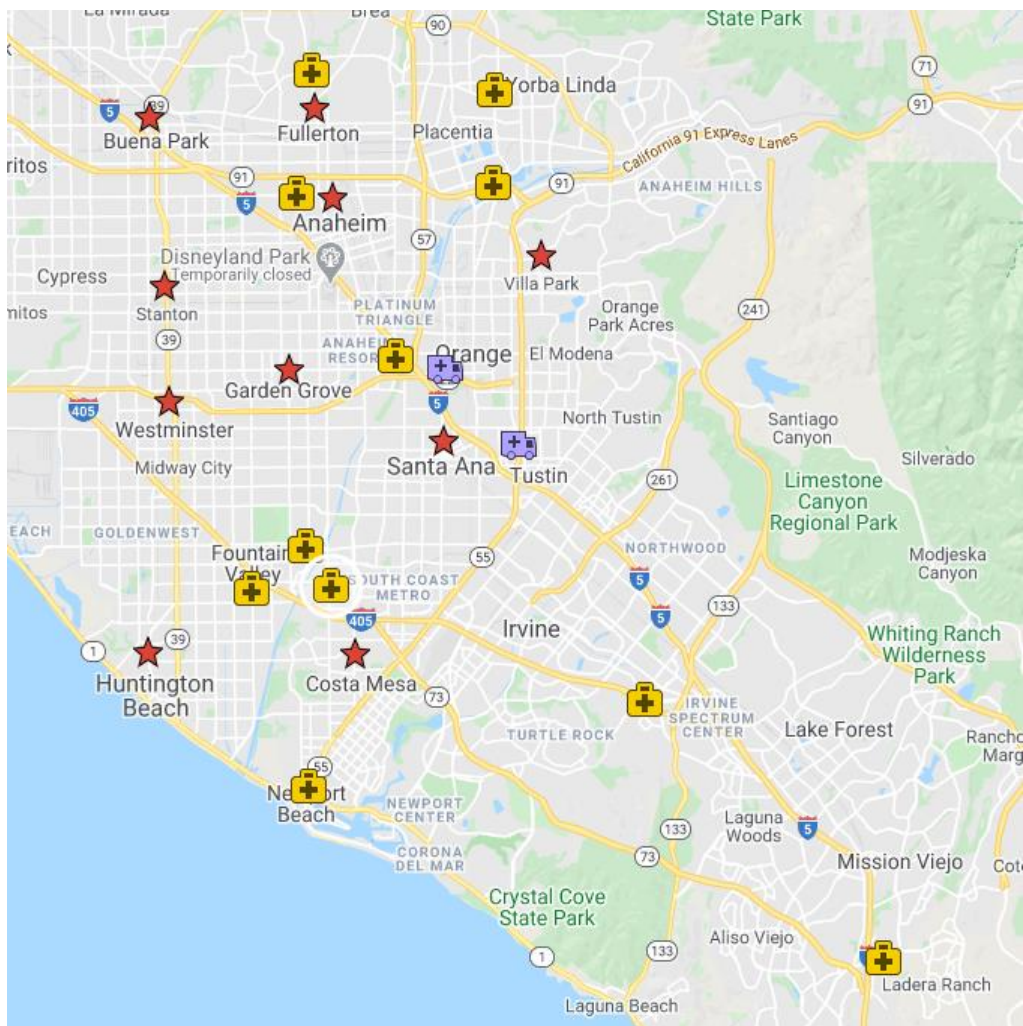
Types of Fireworks Involved in Injuries



This year in Orange County, fireworks-related injuries were caused by both illegal and Safe and Sane fireworks. Illegal fireworks accounted for 25% of all fireworks-related injuries while Safe and Sane fireworks accounted for 6% of fireworks-related injuries. The remaining 69% of injuries were caused by an unknown type. While there were a significant number of “unknown” type of fireworks, Firecrackers were identified as the type of illegal firework that caused the most reported injuries this year and Fountains were the type of Safe and Sane firework that caused the most reported injuries this year.

Spatial Analysis of Fireworks Injuries

This map displays the locations of the Orange County hospitals that provided data regarding reported fireworks-related injuries in 2020. The red stars indicate the cities that allowed the sale of Safe and Sane fireworks. The mustard hospital bag marker indicates hospitals that reported between 1-4 injuries and the purple ambulance marker indicates hospitals that reported 5 or more injuries during the study period of June 30, 2020 through July 5, 2020. There were 2 hospitals that reported 5 or more injuries this year (compared to 1 hospital with 11 injuries in 2019). This information does not conclude that the sale of fireworks caused more injuries. The spatial relationship of fireworks-related injuries that were treated in and around the Safe and Sane cities is not necessarily indicative of an on-going trend that injuries are happening near to the Safe and Sane cities. Reported injuries seem to be spread out throughout the county, regardless of firework sales.



Fireworks-Related Fire Incidents and Property Loss

Historical Property Loss					
	2016	2017	2018	2019	2020
Property Loss	\$53,600	\$147,121	\$115,975	\$913,705	\$42,100
Acreage Lost	1.21 acres	4.38 acres	1.19 acres	0.14 acres	26.1 acres

In comparison to 2019, reported fireworks-related property loss decreased significantly in Orange County for 2020. However, reported acreage that was lost due to fireworks-related fires, was considerably higher than in previous years. Fireworks were the suspected cause of a 21 acre vegetation fire that prompted the temporary closure of Irvine Regional Park. Although there were no injuries, more than 100 firefighters helped to contain that fire. Fireworks also ignited a brush fire near a condominium complex in Mission Viejo that resulted in an estimated property loss of \$4,000. In Lake Forest, an arrest was made when illegal fireworks were discharged that ignited an ornamental vegetation fire. An area of Unincorporated Tustin suffered about \$200 of property damage when fireworks caused an ornamental vegetation fire on a hillside. A residential area in Los Alamitos had a trash fire that cause about \$15,500 worth of damage to a home, a gas meter, electric meter and an electrical panel. Fullerton had a 5 acre vegetation fire that caused over \$10,000 in property losses and law enforcement took 4 suspects into custody for arson related to that vegetation fire. Huntington Beach reported one injury to a police officer who was burned by embers from a box of fireworks that exploded as he approached. There was also a fire in Newport Beach that caused \$10,000 worth of damage to surrounding vegetation and fences.

In Orange County Fire Authority's jurisdiction, 76 fireworks-related incidents were reported this year.

Incident Calls/Type of Fire	
Roof/Structure Fire	3
Lawn Fire	3
Dumpster (or Trash) Fire	28
Tree Fire	0
Brush/Acre Fire	24
Vehicle Fire	3
Other	15

2020 FIREWORKS-RELATED PROPERTY LOSS				
Note: Red denotes cities that permit the sale of safe and sane fireworks				
CITY	COUNT	\$ LOSS	ACREAGE	COMMENTS
Aliso Viejo	0	0	0	None
Anaheim	60	0	0	Trees/dumpster/trash fires – no significant loss identified
Brea	1	\$600	0	1 injury, 1 trash
Buena Park	11	0	0	1 injury, 6 trash/dumpster, 4 vegetation
Costa Mesa	12	0	0	12 brush/trash/other fires – no significant loss identified
Cypress	1	0	0	1 brush
Dana Point	1	0	0	1 dumpster
Fountain Valley	0	0	0	None
Fullerton	8	\$10,100	5	1 trash, 5 tree
Garden Grove	16	0	0	8 dumpster, 5 brush, 1 building, 2 other
Huntington Beach	4	\$1,000	0	1 dumpster
Irvine	0	0	0	None
Ladera Ranch	0	0	0	None
La Palma	0	0	0	None
Laguna Beach	29	0	0	No significant loss identified
Laguna Hills	2	0	0	2 other
Laguna Niguel	1	\$500	0.02	1 vegetation
Laguna Woods	0	0	0	None
Lake Forest	2	\$200	0	1 vegetation, 1 other
Los Alamitos	1	\$15,500	0	1 building
Mission Viejo	1	\$4,000	0.08	1 brush
Newport Beach	1	\$10,000	0	1 brush
Orange	3	0	0	1 trash, 2 brush
Placentia	N/A	N/A	N/A	N/A
Rancho Santa Margarita	1	0	0	1 trash
San Clemente	1	0	0	1 other
San Juan Capistrano	1	0	0	1 brush
Santa Ana	27	0	0	9 brush, 1 building, 8 dumpster, 3 car, 6 other
Seal Beach	0	0	0	None
Stanton	4	0	0	2 dumpster, 1 brush, 1 other
Tustin	0	0	0	None
Unincorporated OC	6	\$200	21	4 brush, 1 building, 1 trash
Villa Park	0	0	0	None
Westminster	0	0	0	None
Yorba Linda	1	0	0	1 building
COUNTY TOTAL	192	\$42,100	26.1	

Note that incidents reported on this list are only the incidents that were reported with a potential property or acreage loss.

Public Display Incidents

Due to COVID-19 safety precautions, there were only 4 public displays in Orange County this year. OCFA took part in 3 of those public displays. There were no injuries, fires or violations reported.

There were no other Orange County shows outside of OCFA's jurisdiction.

The following table details the malfunctions/injuries/fires that occurred at various Orange County Independence Day firework display shows:

City	Injuries	Health & Safety Violations	Fires	Malfunctions/Comments
Dana Point (Monarch Beach)	0	0	0	10 shells/1 cake rewired, 100% of product discharged.
Los Alamitos	N/A	N/A	N/A	No OCFA Inspector assigned as shoot takes place on Joint Forces Base.
San Clemente	0	0	0	4 shells rewired, 100% of product discharged.
San Juan Capistrano	0	0	0	2 shells rewired, 100% of product discharged.

Confiscated Fireworks and Citations

Each year, Orange County Fire Authority measures the amount of fireworks confiscated over the Independence Day holiday. In 2020, the amount of reported confiscated fireworks (to local fire departments) was lower than last year, however, there was no shortage of confiscation activity for local authorities. The following tables represents the information provided by Orange County fire departments.

FIRE DEPARTMENT NAME	ILLEGAL	CONSUMER	TOTAL	CITATIONS
Anaheim Fire & Rescue	100 lbs	0	100 lbs	0
Brea Fire Department	54 lbs	0	54 lbs	0
Costa Mesa Fire Department	1082 lbs	0	1082 lbs	0
Fountain Valley Fire Department	0	0	0	0
Fullerton Fire Department	1400 lbs	0	1400 lbs	17*
Huntington Beach Fire Department	1196 lbs	0	1196 lbs	0
Laguna Beach Fire Department	4 lbs	12 lbs	16 lbs	0
Newport Beach Fire Department	30 lbs	15 lbs	45 lbs	0
Orange City Fire Department	0	0	0	0
Orange County Fire Authority	200 lbs	150 lbs	350 lbs	0
Placentia Fire Department	N/A	N/A	N/A	N/A
ORANGE COUNTY TOTAL	4066 lbs	177 lbs	4243 lbs	17

*Law enforcement statistics included

Confiscated Illegal Fireworks					
	2016	2017	2018	2019	2020
Consumer	30 lbs*	626.7 lbs	27 lbs**	64 lbs ***	177 lbs ****
Dangerous/Illegal	3104 lbs*	4641.1 lbs	2329 lbs**	5965 lbs ***	4066 lbs ****

*Anaheim and Laguna Beach statistics NOT included

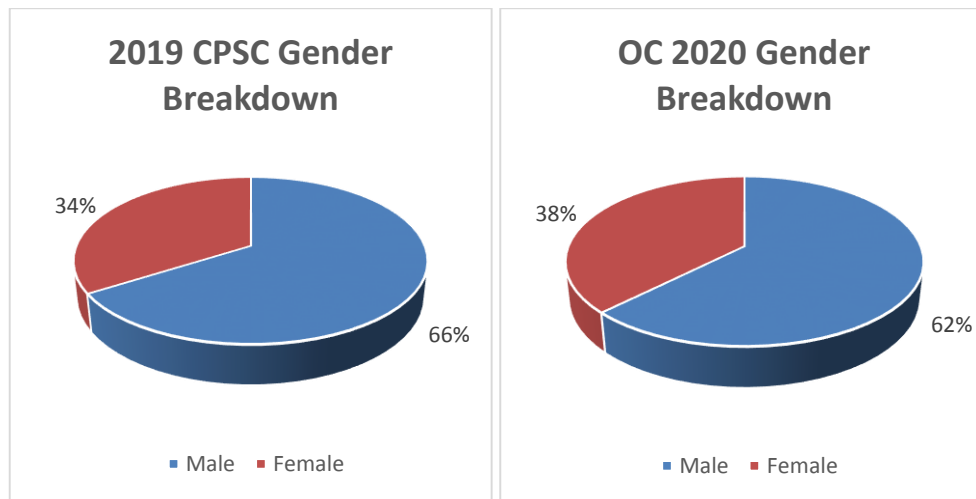
**Newport Beach statistics NOT included

***Fountain Valley statistics NOT included

****Placentia statistics NOT included

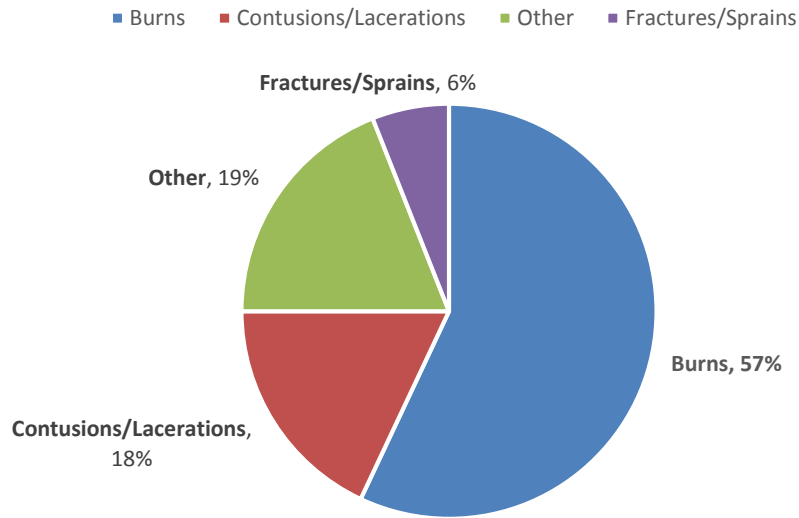
National Statistics Comparison

According to the 2019 CPSC Annual Fireworks Report, fireworks were involved in an estimated 10,000 injuries treated in US hospital emergency departments during calendar year 2019. Compared to the 9,100 injuries treated during calendar year 2018, there were 900 more injuries treated in calendar year 2019. Orange County's number of reported firework-related injuries was 32 in 2020 which is an increase from the 24 injuries reported in 2019. The same 10 cities allowed for the sale of Safe and Sane fireworks in 2020 as they did in 2019. In comparison to the national average of injuries reported, Orange County seems to be significantly lower in average injuries. This difference could be attributed to the fact that the sale of Safe and Sane fireworks is limited to only 10 Orange County cities. Another contributing factor is that not all injuries may have been reported to hospitals and not all hospitals may have provided us with their reported injuries. A special consideration for 2020 is that with the COVID-19 pandemic, many people may have intentionally avoided going to hospitals and/or urgent cares for fear that they may risk exposure to the virus.

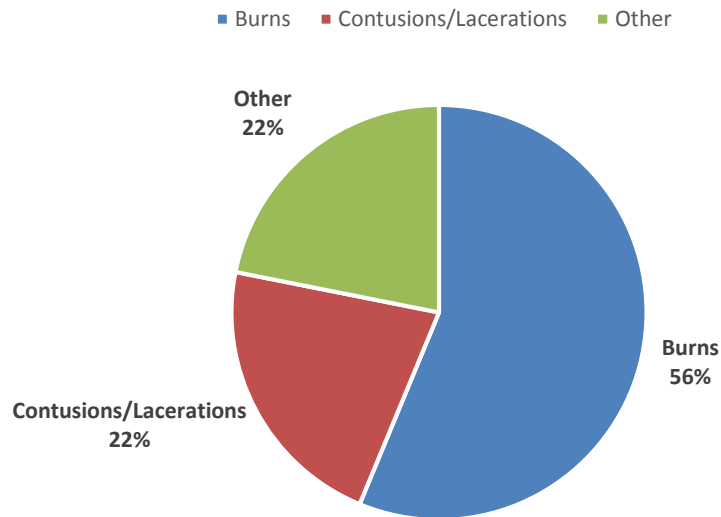


Nationally, 66% of fireworks injuries were experienced by males and 34% of fireworks injuries were experienced by females. This year in Orange County, the gender breakdown was very closely aligned with the national average, with 62% of fireworks injuries experienced by males and 38% of fireworks injuries experienced by females.

CPSC 2019 TYPE OF INJURIES

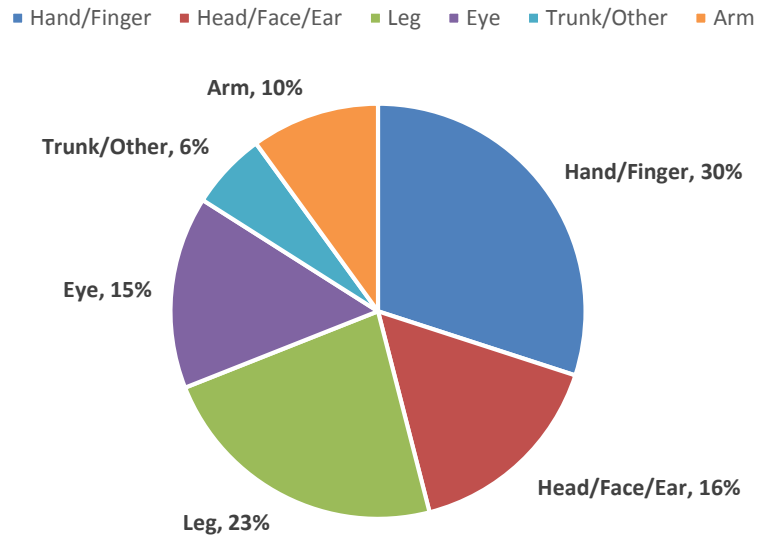


OC 2020 Type of Injuries

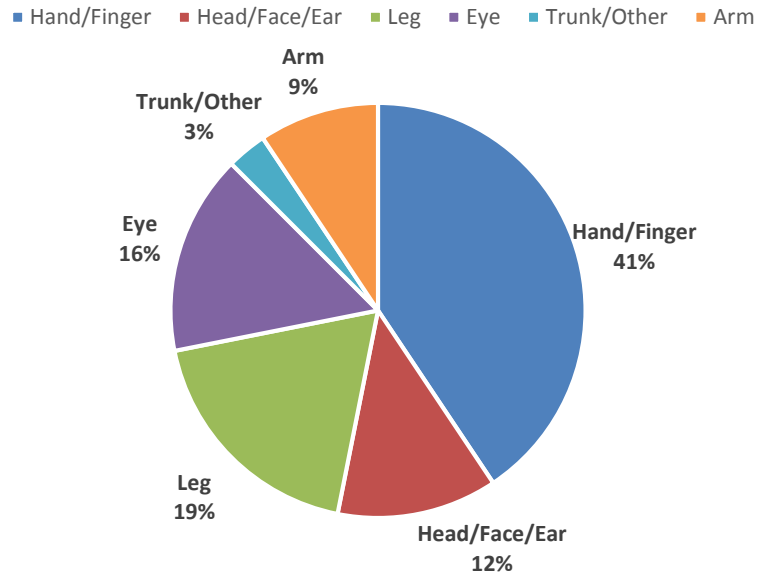


The type of injuries reported within Orange County this year very closely aligns with the national average. As with previous years, burns make up the majority of fireworks-related injuries in Orange County, at 56% this year. This percentage is right on par with the national rate of 57% for burns. Orange County's reported contusions/lacerations in 2020 are slightly higher than the national average; sitting at 22% versus the national average of 18%. Orange County experienced no reported fractures and sprains this year.

CPSC 2019 BODY REGIONS INJURED



OC 2020 Body Regions Injured



In Orange County this year, hand/finger injuries were quite high. At 41%, this is higher than the national average of 30%. While eye and arm percentages for Orange County were on par with the national averages, the head/face/ear, trunk/other and leg categories came in lower than the national averages.

Appendix A

2020 INJURIES BY EMERGENCY CARE FACILITY			
AGE	GENDER	DESCRIPTION OF INJURY	CARE FACILITY
1	F	Touched end of sparkler	CHOC
11	M	Lit firework was unintentionally aimed toward patient by relative	CHOC
12	F	Firework hit patient in the eye	CHOC
4	M	Relative holding firework turned around and hit patient's eye	CHOC
4	M	Patient playing too close to fireworks	CHOC
3	M	Relative threw firework and accidentally hit patient	Kaiser UC – Santa Ana
27	M	Got hit from across the street while watching fireworks	Kaiser Permanente - Anaheim
9	M	Spark from a sparkler flew into eye	Kaiser Permanente – Anaheim
18	F	Firework thrown and got caught in clothing	OCGMC
18	M	Exploded in hand	OCGMC
10	M	Firework hit cheek while flying through the air	OCGMC
19	M	Left hand severely mangled from firecracker	OCGMC
47	F	Injury from sparkler	OCGMC
30	F	Injury from fountain	OCGMC
6	F	Box of fireworks caught fire by thrown sparkler	OCGMC
33	F	Injured while lighting fireworks	Memorial Care Medical Group
2	M	Patient grabbed sparkler with hand	Placentia-Linda Hospital
1	M	Firework exploded on left arm	Anaheim Regional
17	M	Injury from M80	Mission Hospital
5	F	Firework fell over and hit patient in eye	Mission Hospital
47	M	Fireworks in a box ignited and hit patient's thigh	Hoag Newport
27	F	Firework tipped over and hit foot	Fountain Valley Hospital
28	F	Firework fell from sky	Fountain Valley Hospital
58	M	Firework exploded	UCI
37	M	Firework exploded	St. Jude Medical Center
38	F	Patient hit on top of head while watching fireworks	Kaiser Permanente - Irvine
17	M	M80 exploded in hand	OCFA
17	M	Patient holding mortar over head when it exploded	OCFA
19	F	Firework exploded in hand	OCFA
48	M	Firework injury to eye	OCFA
33	M	Struck in leg by firework	OCFA
58	M	Roman candle backfired in hand	OCFA

ORANGE COUNTY

2021 Independence Day

After Action Report



Prepared by the Orange County Fire Authority
Irvine, CA

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Executive Summary

As coronavirus cases continue to drop across California, Independence Day celebrations began to transition back to normal in 2021. With Orange County starting to open back up along with the rest of the state, many venues returned and hosted celebration events this year. 10 Orange County cities permitted the sale of safe and sane fireworks in 2021, for a total of 201 stands throughout the County. A total of 28 public fireworks displays provided safe celebration options for the communities within Orange County.

In 2021, the injuries associated with fireworks increased to 46 total reported injuries. Last year, Orange County reported 32 injuries that were related to fireworks. In comparison to the Consumer Product Safety Commission's (CPSC) 2020 fireworks injury statistics, Orange County's total fireworks injuries are less than expected for our population. While in 2020, reported Safe and Sane fireworks-related injuries accounted for 6% of total injuries, this year, Safe and Sane injuries accounted for only 4% of reported county-wide injuries. 50% of fireworks-related injuries were due to illegal fireworks while the outstanding 46% of injury origins remain unknown. The majority of reported injuries within Orange County were contusions/lacerations and burns to the head, face, ears, hands and fingers.

Firework injuries reported by hospital emergency rooms and urgent care facilities were mapped and compared to areas where the sale of Safe and Sane fireworks has been permitted. Results are a clear indication that hospitals near the cities where Safe and Sane firework sales are permitted, did not necessarily report more injuries than those hospitals that are not near those same cities.

Orange County experienced an increase in estimated property loss this year. However, the acreage loss due to fireworks-related fires was significantly lower than it was in previous years. Additionally, the reported amount of both consumer and illegal fireworks that were confiscated by local fire departments during the Independence Day holiday remained very consistent with the numbers from 2020.

We would like to take this opportunity to thank all the fire departments and medical providers in Orange County who contributed data to the analysis in this report.

Background and Methodology

Each year following the Independence Day holiday, the Orange County Fire Authority gathers data in order to analyze the overall impact of fireworks throughout Orange County. The information included in this report was contributed by hospital emergency rooms and Orange County fire departments to supplement OCFA's own fireworks data.

Injury data was solicited from a total of 25 hospital emergency rooms and 118 urgent care facilities throughout Orange County for the study period of June 30th-July 5, 2021. This year, we received responses from 15 hospital emergency rooms and 2 urgent care facilities, for an overall response rate of 11%. OCFA's own Emergency Medical Services data was also analyzed for injuries related to fireworks. The fireworks injuries contained in this report are only those that were reported to us; it is very likely that many more injuries occurred that were either not treated or not reported. National statistics extracted from the most recent 2020 CPSC Fireworks Report were also used for a comparison study.

Fireworks-related fire incident and property loss information was gathered from 11 out of 11 Orange County municipal fire departments, for a response rate of 100%. Narratives from the 51 fireworks-related incidents that OCFA responded to were analyzed for qualitative information regarding the impact of these incidents within Orange County communities. Local online and social media sources were also utilized for information regarding fireworks-related injuries and incidents in 2021.

Fireworks Policy in Orange County

In 2021, 10 Orange County cities permitted the sale of safe and sane fireworks for a total of 201 retail consumer fireworks stands throughout the County.

City	Quantity
Anaheim	16
Buena Park	21
Costa Mesa	31
Fullerton	15
Garden Grove	29
Huntington Beach	15
Santa Ana	55
Stanton	2
Villa Park	3
Westminster	14
Total	201

With COVID-19 restrictions slowly easing for the Independence Day holiday, most public display shows returned in full force. The number of reported noise and illegal fireworks complaints handled by law enforcement across Orange County decreased in 2021 as spectators flocked to professional pyrotechnic events. Orange County Sheriff's Deputies responded to 299 fireworks-related calls this year. In comparison to the 558 fireworks-related calls responded to in 2020, this was a drastic decrease in reported fireworks-related calls. In Anaheim, police responded to 331 calls involving reports of illegal fireworks, which was a significant drop from the 549 reports officers handled in 2020.

While the return of sanctioned events may have encouraged more people to ditch the DIY firework shows, there were still some neighborhoods that reported serious incidents this year. Fountain Valley Regional Hospital reported a man who had fingers amputated as a result of a firework exploding in his hand. In Garden Grove, an adult male was charged with several felonies related to the detonation of illegal fireworks that resulted in the injuries of 9 people; several of the injured were children. In Anaheim, 2 women were critically injured while watching fireworks from a sidewalk, when a man driving a truck lost control and drove into them.

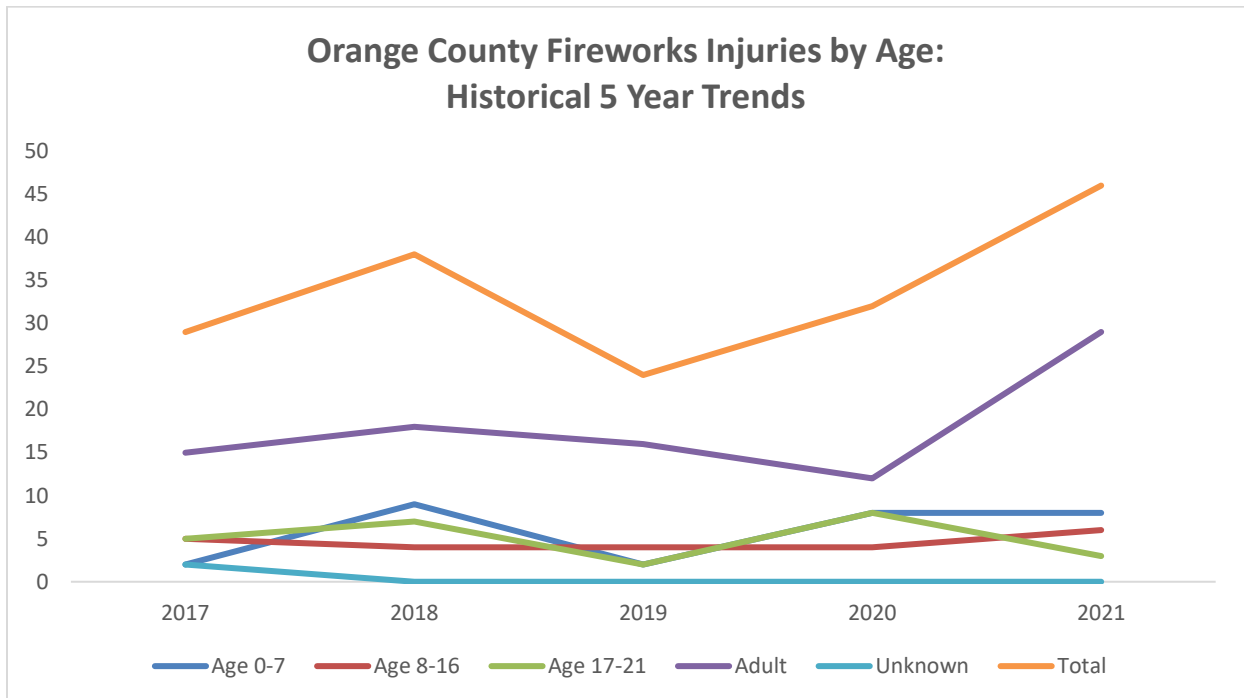
Laguna Beach Fire Department reported 2 arrests, 1 arson fire investigated, and 1 explosive device confiscated this year. Huntington Beach Fire Department had 2 significant civilian injuries that resulted in major hand trauma and critical eye injuries. Orange City Police Department had 375 service calls (down 44% from last year) related to fireworks with the holiday resulting in 5 arrests.

Historical Fireworks Injury Trends

In 2021, Orange County hospital emergency rooms and urgent care facilities reported 46 injuries that were directly caused by fireworks. This is an increase in comparison to 2020, when 32 injuries were reported. Over the past 5 years, Orange County averaged close to 34 fireworks-related injuries around the Independence Day holiday (June 30th-July 5th).

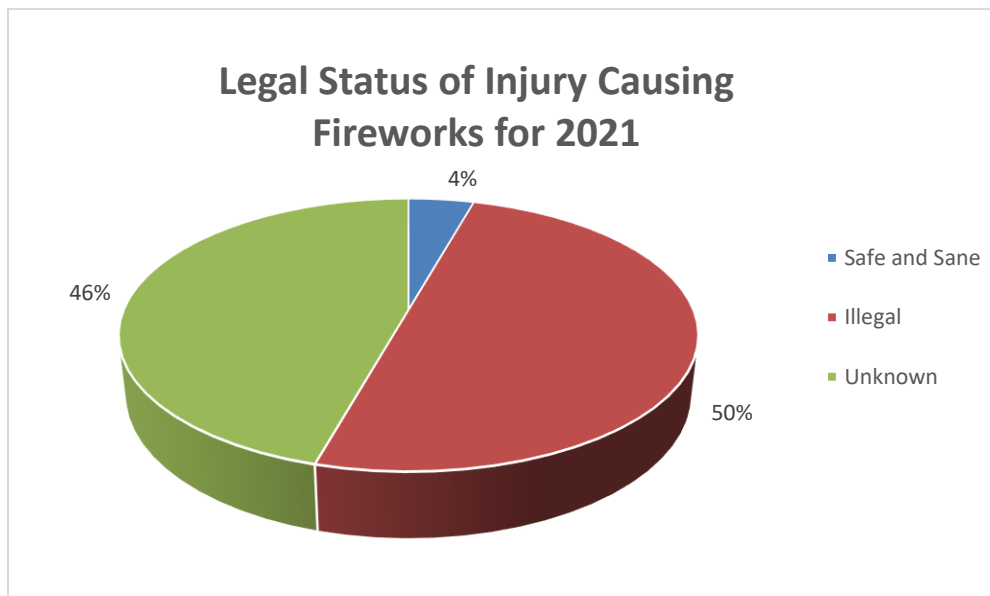
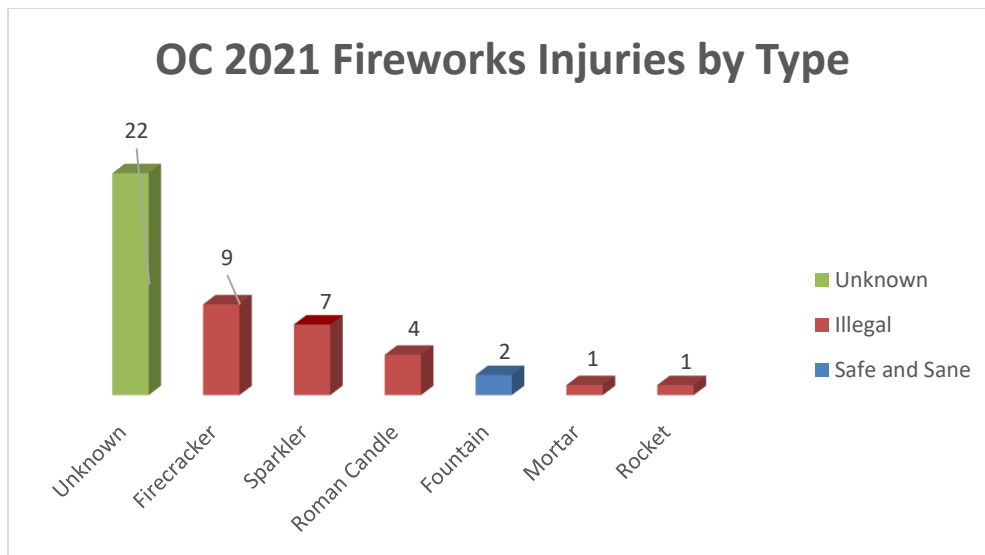
Age Range	2017	2018	2019	2020	2021
0-7	2	9	2	8	8
8-16	5	4	4	4	6
17-21	5	7	2	8	3
Adult	15	18	16	12	29
Unknown	2	0	0	0	0
TOTAL	29	38	24	32	46

As in previous years, the number of reported fireworks-related injuries for adult patients was the highest for 2021. Most years, the adult category seems to yield the highest number of fireworks-related injuries. Reported injuries for patients under the age of 21 (age brackets 0-7, 8-16 and 17-21) decreased from 20 injuries in 2020 to 17 injuries this year.



See Appendix A for detailed information about injuries reported by emergency rooms and urgent care facilities.

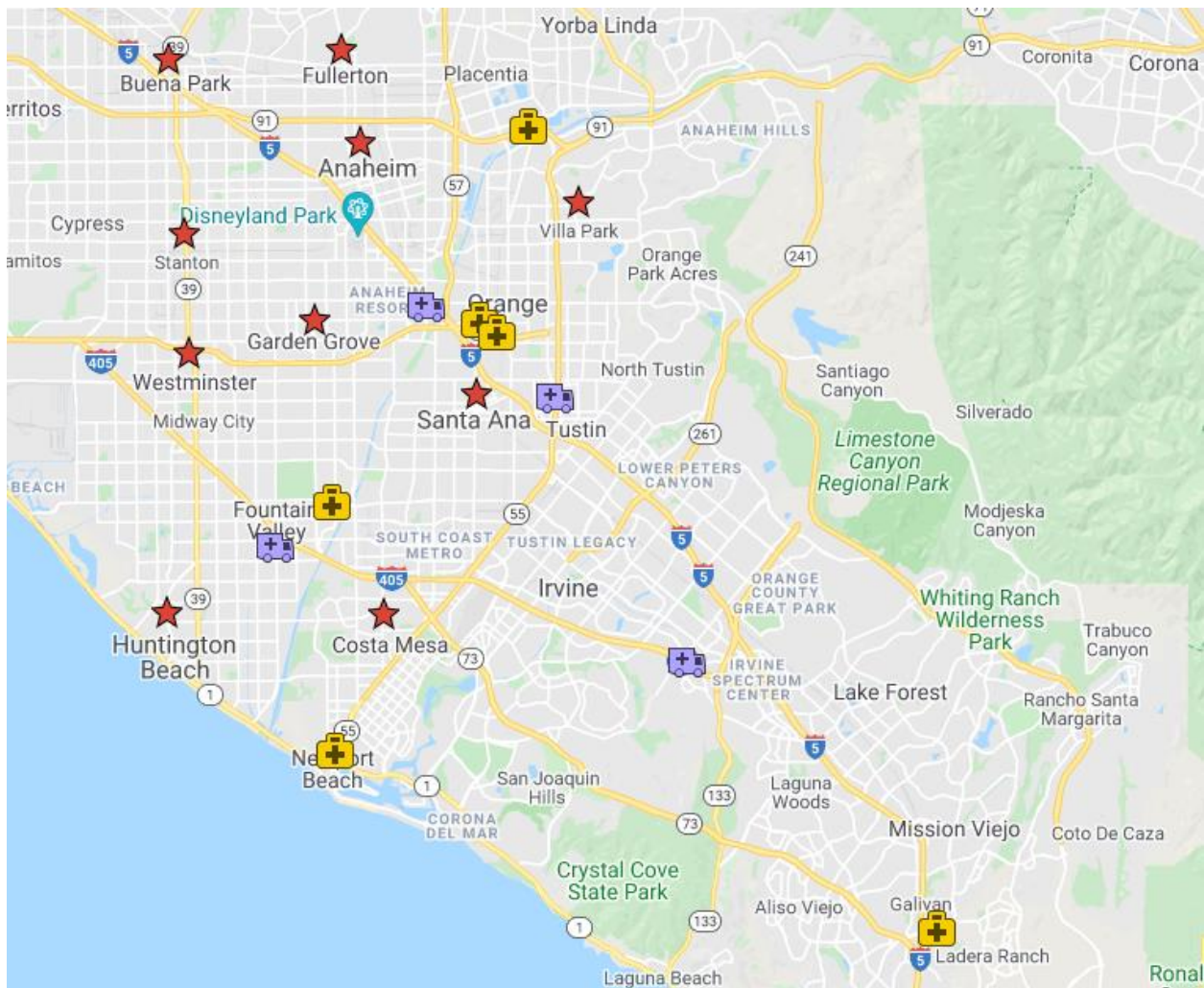
Types of Fireworks Involved in Injuries



This year in Orange County, most of the fireworks-related injuries were caused by illegal or an unknown type of firework. Safe and Sane fireworks accounted for a very small percentage of reported injuries. Reported illegal fireworks accounted for 50% of all fireworks-related injuries while reported Safe and Sane fireworks accounted for a mere 4% of fireworks-related injuries. The remaining 46% of injuries were caused by an unknown type. While there were a significant number of “unknown” type of fireworks, Firecrackers were identified as the type of illegal firework that caused the most reported injuries this year.

Spatial Analysis of Fireworks Injuries

This map displays the locations of the Orange County hospitals that provided data regarding reported fireworks-related injuries in 2021. The red stars indicate the cities that allowed the sale of Safe and Sane fireworks. The mustard hospital bag marker indicates hospitals that reported between 1-4 injuries and the purple ambulance marker indicates hospitals that reported 5 or more injuries during the study period of June 30, 2021 through July 5, 2021. There were 4 hospitals that reported 5 or more injuries this year (compared to 2 hospitals in 2020). This information does not conclude that the sale of fireworks caused more fireworks-related injuries. The spatial relationship of fireworks-related injuries that were treated in and around Safe and Sane cities is not necessarily indicative of an on-going trend that injuries are happening near to the Safe and Sane cities. Reported injuries seem to be spread out throughout the county, regardless of firework sales.



Fireworks-Related Fire Incidents and Property Loss

Historical Property Loss					
	2017	2018	2019	2020	2021
Property Loss	\$147,121	\$115,975	\$913,705	\$42,100	\$114,032
Acreage Lost	4.38 acres	1.19 acres	0.14 acres	26.1 acres	0.27 acres

In comparison to 2020, reported fireworks-related property loss increased in Orange County for 2021. However, reported acreage that was lost due to fireworks-related fires, was considerably lower this year. Fireworks were the cause of a dumpster fire in Buena Park that resulted in over \$8,000 worth of damages. In Cypress, 2 homes incurred \$15,250 worth of damage due to a fire where a trash can was utilized to dispose of recently ignited fireworks. Discarded fireworks in a residential trash can also ignited a home fire in Garden Grove, resulting in over \$25,000 worth of damages. Another Garden Grove fire caused about \$15,000 in firework-related damages to cypress trees and a parked vehicle. In Stanton, security cameras showed a firework landing and igniting material that was stored in the bed of a truck. This fire resulted in the loss of that truck and damage to a nearby vehicle with an estimated loss around \$33,000. About \$500 worth of damages were reported in Mission Viejo when a home's solar panel roof caught fire due to suspected fireworks being set off in the nearby area. Costa Mesa had \$500 in damages to a clothing recycling bin caused by fireworks. Anaheim reported an estimated \$8,300 loss due to miscellaneous dumpster and tree fires. With California's intensely dry conditions, Orange County was very fortunate to avoid having significant vegetation fires this year. There were 4 small vegetation fires in Santa Ana that, combined, resulted in less than an acre lost.

In Orange County Fire Authority's jurisdiction, 51 fireworks-related incidents were reported this year.

Incident Calls/Type of Fire	
Roof/Structure Fire	4
Lawn Fire	0
Dumpster (or Trash) Fire	24
Tree Fire	3
Brush/Acre Fire	7
Vehicle Fire	1
Other	12

2021 FIREWORKS-RELATED PROPERTY LOSS

Note: Red denotes cities that permit the sale of safe and sane fireworks

CITY	COUNT	\$ LOSS	ACREAGE	COMMENTS
Aliso Viejo	0	0	0	None
Anaheim	7	\$8,300	0	6 dumpster/trash, 1 tree
Brea	0	0	0	None
Buena Park	11	\$8032	0	7 dumpster/trash, 3 tree, 1 other
Costa Mesa	2	\$500	0	Damage to clothing recycling bin
Cypress	2	\$15,250	0	1 structure, 1 trash
Dana Point	1	0	0	1 other
Fountain Valley	0	0	0	No incidents in Fountain Valley
Fullerton	7	\$6,000	0	Various dumpster/trash, brush, other
Garden Grove	12	\$40,750	0	1 structure, 3 dumpster/trash, 3 brush, 5 other
Huntington Beach	6	0	0	No significant loss identified
Irvine	2	0	0	1 dumpster/trash, 1 other
Ladera Ranch	0	0	0	None
La Palma	0	0	0	None
Laguna Beach	21	0	0	No significant loss identified
Laguna Hills	0	0	0	None
Laguna Niguel	0	0	0	None
Laguna Woods	0	0	0	None
Lake Forest	0	0	0	None
Los Alamitos	0	0	0	None
Mission Viejo	2	\$500	0	2 other
Newport Beach	0	0	0	None
Orange	0	0	0	No significant loss identified
Placentia	0	0	0	None
Rancho Santa Margarita	0	0	0	None
San Clemente	0	0	0	None
San Juan Capistrano	0	0	0	None
Santa Ana	14	\$1,600	0.27	1 structure, 8 dumpster/trash, 4 brush, 1 other
Seal Beach	0	0	0	None
Stanton	2	\$33,000	0	1 vehicle, 1 dumpster/trash
Tustin	0	0	0	None
Unincorporated OC	1	0	0	1 other
Villa Park	0	0	0	None
Westminster	4	\$100	0	1 structure, 3 dumpster/trash
Yorba Linda	0	0	0	None
COUNTY TOTAL	94	\$114,032	0.27	

Note that incidents reported on this list are only the incidents that were reported with a potential property or acreage loss

Public Display Incidents

There were 28 public displays in Orange County this year. OCFA took part in 18 of those public displays. There were no injuries, fires or violations reported. Orange County shows outside of OCFA areas included: 3 in Laguna Beach, 1 in Costa Mesa, 1 in Huntington Beach, 3 in Newport Beach, 1 in Orange and 1 in Anaheim.

The following table details the malfunctions and recommendations that occurred at nine Orange County Independence Day firework display shows:

City	Injuries	Health & Safety Violations	Fires	Malfunctions/Comments
Buena Park (Knotts Berry Farm) 7/3	0	0	0	Significant fallout on OCFA Station 61
Buena Park (Knotts Berry Farm) 7/4	0	0	0	Traffic stopping to watch fireworks affected apparatus departing from Station 61
Cypress (Cypress College)	0	0	0	Recommendation to relocate firing area to 25' south of the fallout
Irvine (Woodbridge Village)	0	0	0	47 shells returned
Laguna Hills (High School)	0	0	0	5 shells misfired, recommendations: (1) larger security presence to deter trespassers into fallout area (2) downsizing or relocating due to fallout adjacent to homes
Mission Viejo (Lake MVO)	0	0	0	3 shells unused, 62 shells returned
San Clemente (Pier)	0	0	0	4" shell detonated in rack, 14 shells misfired
San Juan Capistrano (San Juan Sports Park)	0	0	0	Burning cake fired out at operator standing 6-8 ft away
Tustin (High School)	0	0	0	5 shells misfired, 1 dud, and a 3" 25 shot multi device returned

Confiscated Fireworks

Each year, Orange County Fire Authority measures the amount of fireworks confiscated over the Independence Day holiday. In 2021, the amount of reported confiscated fireworks to local fire departments and law enforcement agencies was very similar to confiscation numbers in 2020 (4247.8 lbs this year versus 4243 lbs in 2020). There was no shortage of confiscation activity for local authorities. The following tables represents the information provided by various Orange County fire departments.

FIRE DEPARTMENT NAME	ILLEGAL	CONSUMER	TOTAL
Anaheim Fire & Rescue	72 lbs	1.5 lbs	73.5 lbs
Brea Fire Department	50 lbs	0	50 lbs
Costa Mesa Fire Department	1706 lbs	0	1706 lbs
Fountain Valley Fire Department	0	15 lbs	15 lbs
Fullerton Fire Department	500 lbs	100 lbs	600 lbs
Huntington Beach Fire Department	901 lbs	0	901 lbs
Laguna Beach Fire Department	17.4 lbs	37.4 lbs	54.8 lbs
Newport Beach Fire Department	8.5 lbs	4 lbs	12.5 lbs
Orange City Fire Department	unknown	unknown	unknown
Orange County Fire Authority	200 lbs	600 lbs	800 lbs
Placentia Fire Department	35 lbs	0	35 lbs
ORANGE COUNTY TOTAL	3489.9 lbs	757.9 lbs	4247.8 lbs

*Law enforcement statistics included when provided

Confiscated Illegal Fireworks					
	2017	2018	2019	2020	2021
Consumer	626.7 lbs	27 lbs*	64 lbs**	177 lbs ***	3489.9 lbs
Dangerous/Illegal	4641.1 lbs	2329 lbs*	5965 lbs **	4066 lbs ***	757.9 lbs

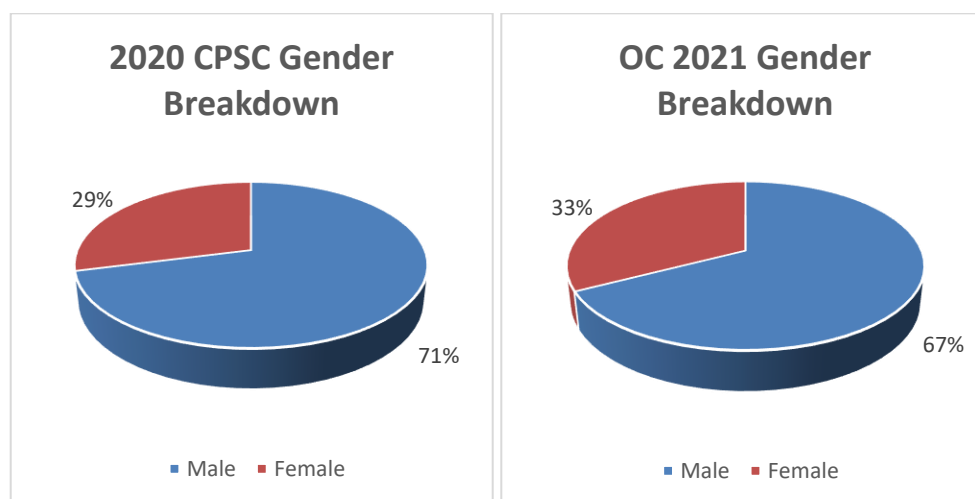
*Newport Beach statistics NOT included

**Fountain Valley statistics NOT included

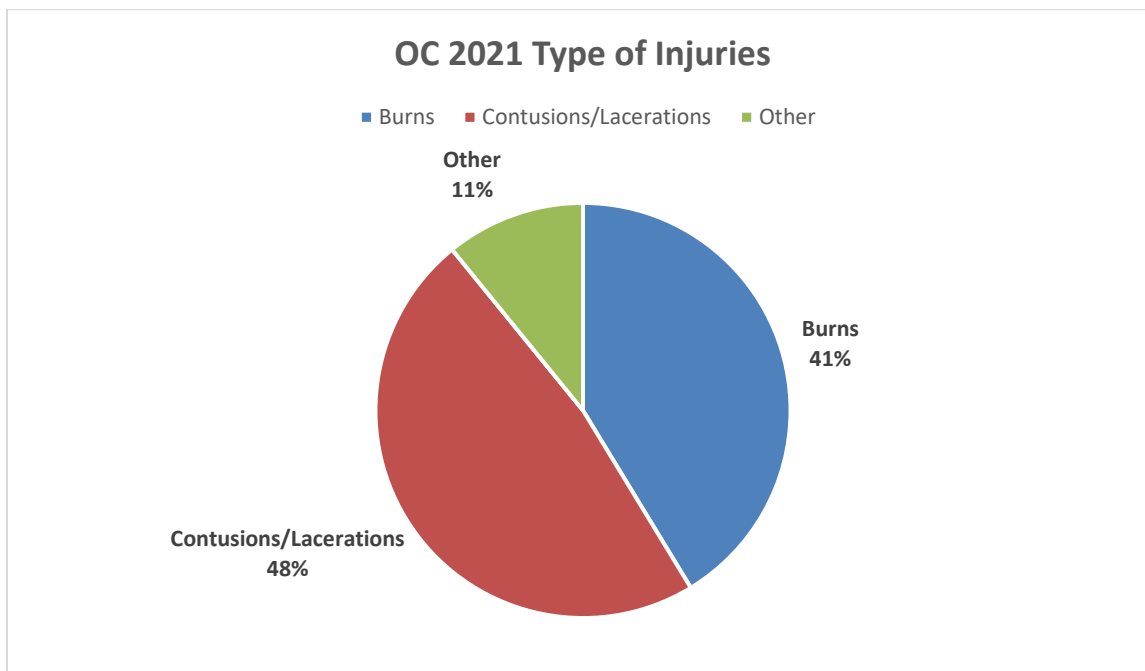
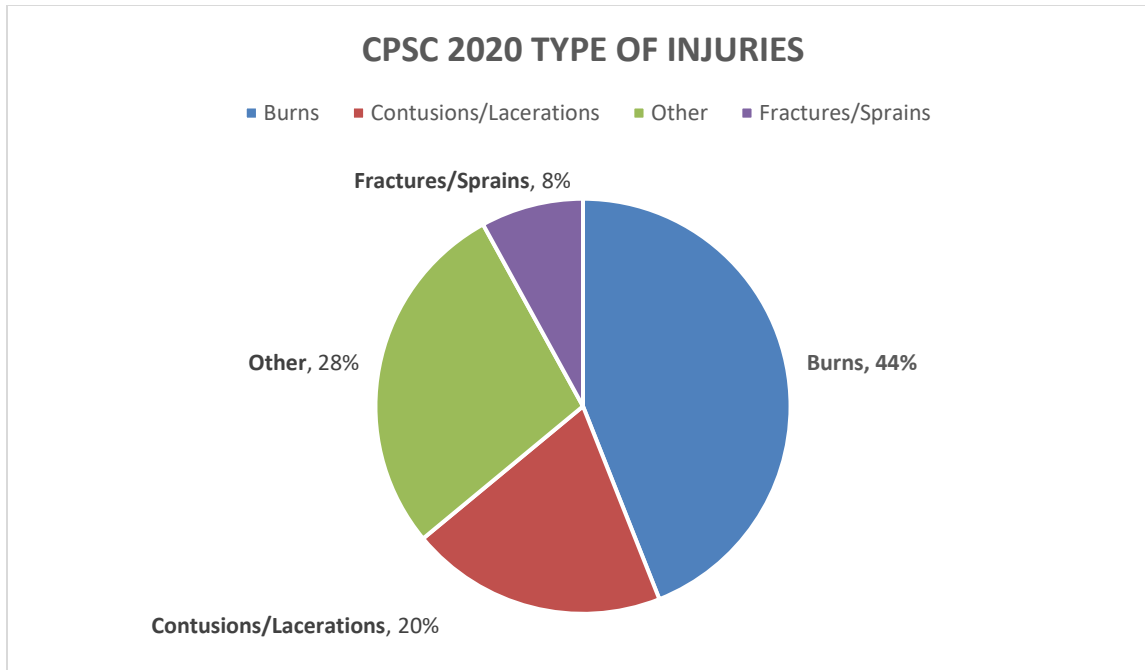
***Placentia statistics NOT included

National Statistics Comparison

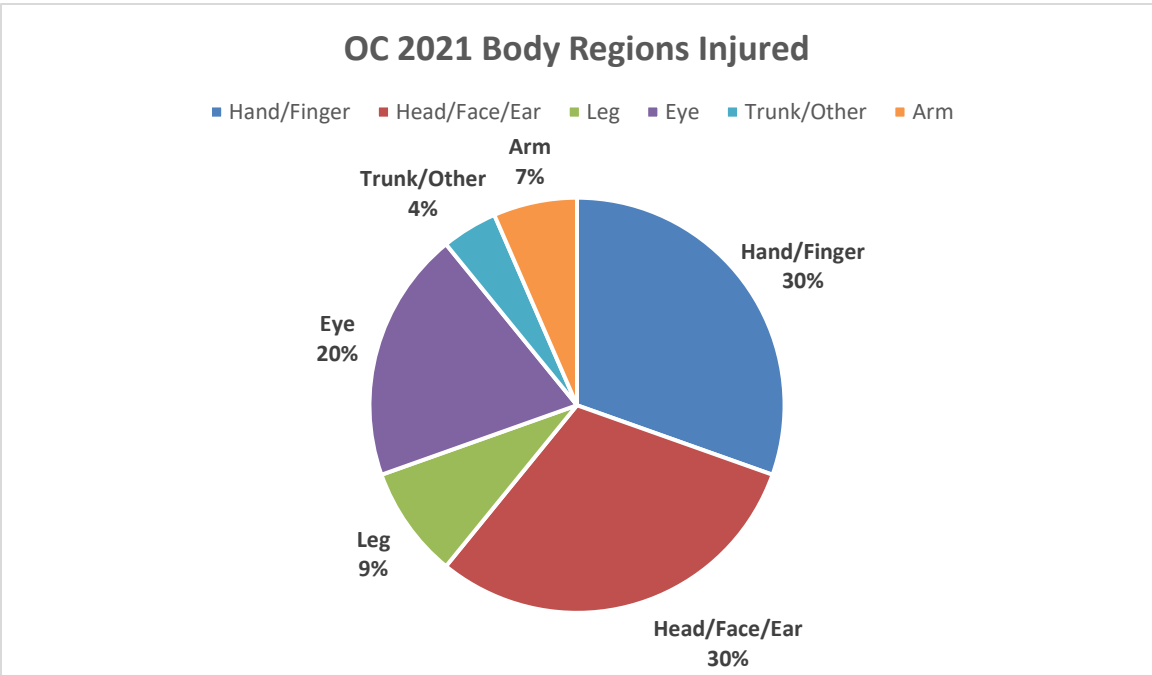
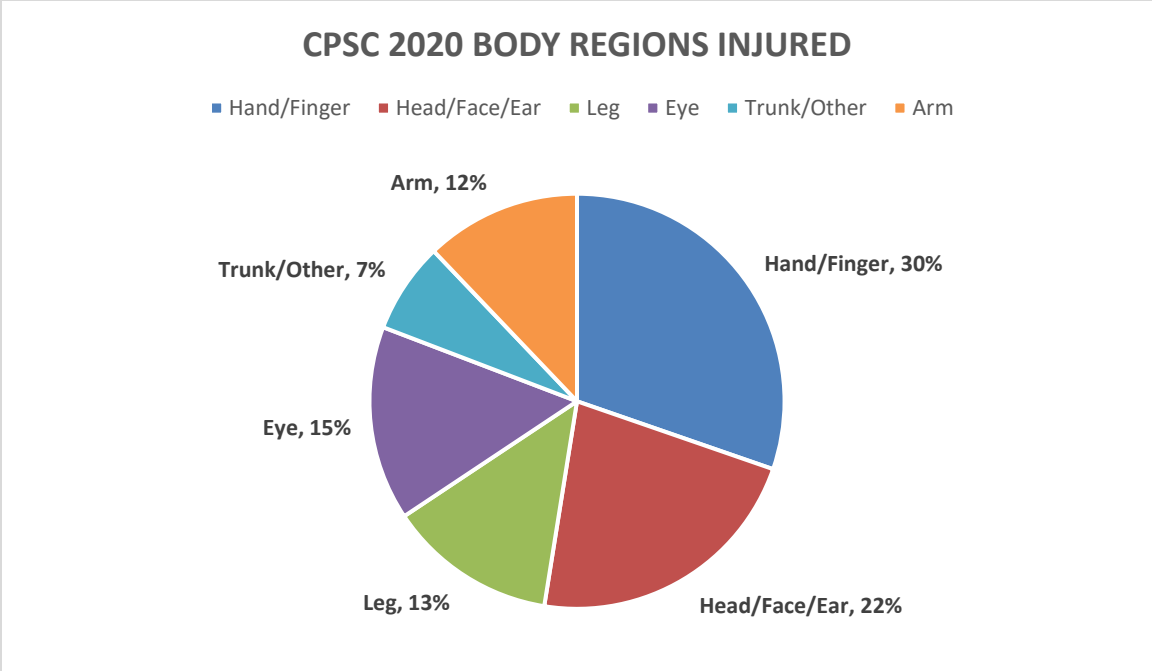
According to the 2020 CPSC Annual Fireworks Report, 66% of fireworks-related injuries occurred in the month around the Independence Day holiday. While there was a total of 15,600 fireworks-related injuries during the entire 2020 calendar year, fireworks were involved in an estimated 10,300 injuries treated in US hospital emergency departments during the single month special study period between June 21, 2020 and July 21, 2020. Compared to the 7,300 injuries treated during the special study period in 2019, there were 3,000 more injuries treated during the same period in 2020. Orange County's number of reported firework-related injuries was 46 in 2021 which is an increase from the 32 injuries reported in 2020. The same 10 cities allowed for the sale of Safe and Sane fireworks in 2021 as they did in 2020. In comparison to the national average of injuries reported, Orange County seems to be significantly lower in average injuries. This difference could be attributed to the fact that the sale of Safe and Sane fireworks is limited to only 10 Orange County cities. Another contributing factor is that not all injuries may have been reported to hospitals and not all hospitals may have provided us with their reported injuries. A special consideration for 2021 is that with the continuation of the COVID-19 pandemic, many people may have intentionally avoided going to hospitals and/or urgent cares for fear that they may risk exposure to the virus.



Nationally, 71% of fireworks injuries were experienced by males and 29% of fireworks injuries were experienced by females. This year in Orange County, the gender breakdown was very closely aligned with the national average, with 67% of fireworks injuries experienced by males and 33% of fireworks injuries experienced by females.



The percentages for the type of injuries reported within Orange County this year deviates slightly from the national averages. This year, contusions/lacerations made up the majority of fireworks-related injuries in Orange County, at 48% this year. This percentage is significantly higher than the national rate of 20% for contusions/lacerations. Orange County's reported burns in 2021 are on par with the national average, sitting at 41% versus the national average of 44%. Orange County experienced no reported fractures and sprains this year.



In Orange County this year, head/face/ear injuries and hand/finger injuries were the highest. Both injury percentages came in at 30%. This percentage aligns with the national hand/finger injury average of 30% but deviates slightly from the 22% head/face/ear injury percentage. Eye injuries in Orange County also came in a tad higher than the national injury percentages. Leg, trunk/other and arm categories came in at lower percentages this year.

Appendix A

2021 INJURIES BY EMERGENCY CARE FACILITY			
AGE	GENDER	DESCRIPTION OF INJURY	CARE FACILITY
6	M	Base of firework hit head	CHOC
8	F	Unspecified firework injury	CHOC
6	M	Firework backfired to face	CHOC
3	F	Firework backfired and hit face	CHOC
47	F	Sparks flew across and hit face	Mission Hospital
5	F	Sparkler flash got into eye	Kaiser Anaheim ED
10	M	Firework hit face	Kaiser Anaheim ED
48	F	Firework was thrown on patient	Kaiser Anaheim ED
67	F	Patient lit firework in hand	OC Global Medical Center
37	M	Patient lit multiple at once and one exploded	OC Global Medical Center
8	M	Hit in the face with projectile firework	OC Global Medical Center
35	M	Box of fireworks thrown in the street	OC Global Medical Center
7	F	Box of fireworks thrown in the street	OC Global Medical Center
2	M	Box of fireworks thrown in the street	OC Global Medical Center
20	M	Firecracker exploded next to face	OC Global Medical Center
23	M	Firecracker fuse went off in hand	OC Global Medical Center
30	M	Firework landed in yard and exploded	Kaiser Irvine ED
11	F	Singed hair while pulling back firework to throw	Kaiser Irvine ED
23	M	Firework exploded in face	Kaiser Irvine ED
28	M	Sparklers burned too quickly in hand	Kaiser Irvine ED
25	F	Lit firework exploded	Kaiser Irvine ED
14	M	Held firework with no fuse	HOAG Newport Beach
11	F	Sparkler in hand	HOAG Newport Beach
26	F	Firework flew from across the street	HOAG Newport Beach
24	F	Firework flew from across the street	HOAG Newport Beach
29	M	Firework blew up in hand	Fountain Valley Hospital
4	M	Firework blasted onto face while watching fireworks	Fountain Valley Hospital
41	M	Firecracker exploded while lighting it	Fountain Valley Hospital
29	M	Firework exploded while lighting it resulting in amputation of fingers	Fountain Valley Hospital
36	M	Unspecified firework injury	Fountain Valley Hospital
29	M	Burn to the hand by touching "firework dust"	UCI
27	M	Picked up mortar and it exploded	UCI
19	F	Firework to eye as fireworks were being set up in the street	UCI
22	M	Firework exploded in hand	UCI
40	M	Hit by fireworks that went off 6 feet away	UCI
30	M	Firework exploded in face	UCI
31	M	Firework exploded in face	UCI
6	M	Struck by firework while walking through the neighborhood	UCI

40	M	Unspecified firework injury	UCI
20	F	Firework sparks flew into eye	St. Joseph Hospital
49	M	Explosive fireworks from neighbor	St. Joseph Hospital
51	M	Firework got into shoe	Memorial Care FV Urgent Care
35	F	Projectile launch of firework hit patient	Memorial Care FV Urgent Care
49	M	Firework sparks flew into eye	Memorial Care FV Urgent Care
54	M	Unspecified firework injury	Hospital name not disclosed
41	M	Firework that was ignited on both ends exploded in hand	Hospital name not disclosed