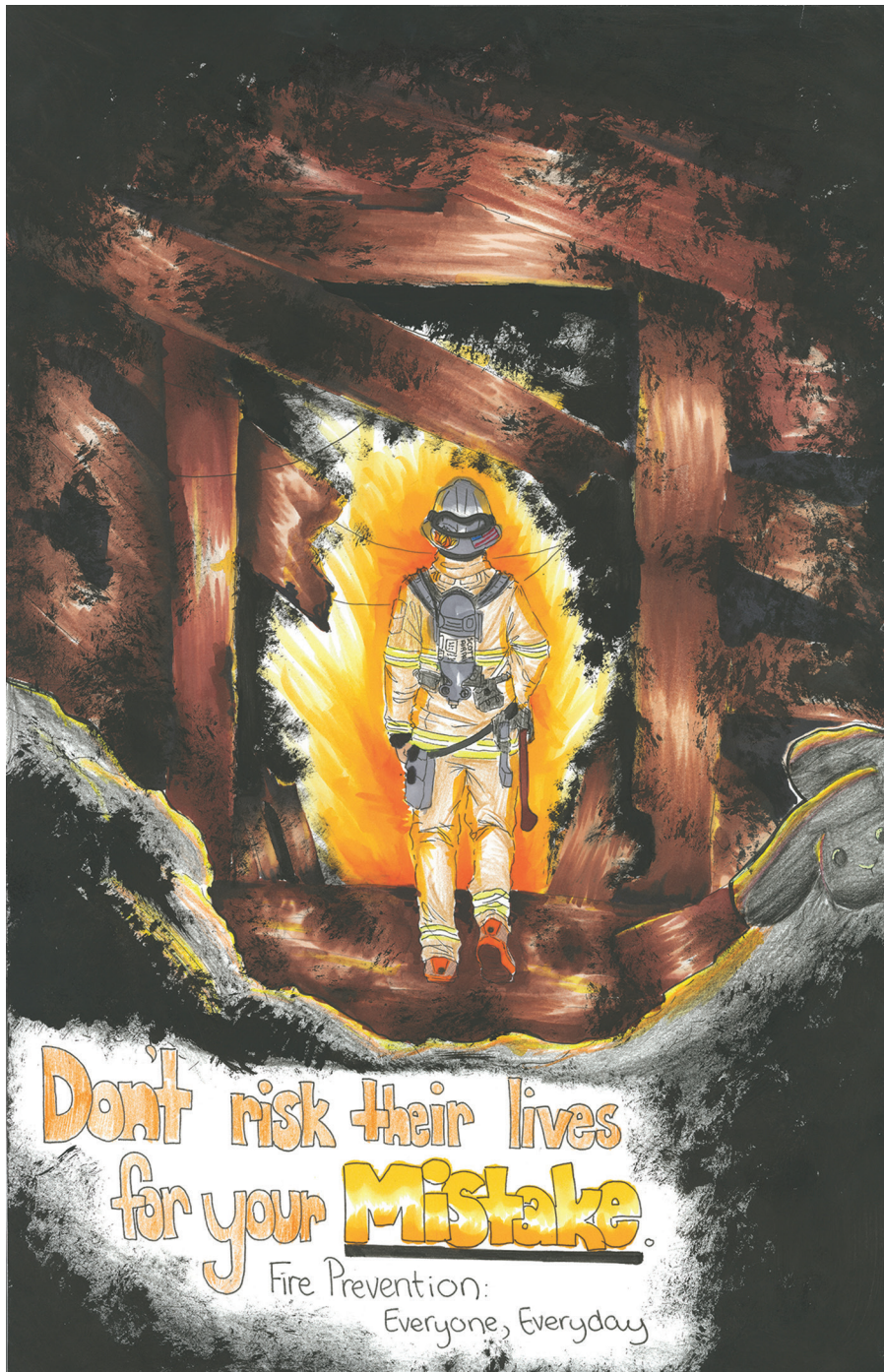


THE MASSACHUSETTS FIRE PROBLEM

Massachusetts Fire Incident Reporting System

2017 Annual Report



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Governor

Karyn E. Polito
Lieutenant Governor

Thomas A. Turco III
Secretary of Public Safety
and Security

Peter J. Ostroskey
State Fire Marshal



Department of Fire Services
Division of Fire Safety • Fire Data and Public Education Unit

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ABOUT THE COVERS

The drawings on the front and back covers of this report are the 2018, 1st and 2nd place winners of the 36th annual statewide **Arson Watch Reward Program Poster Contest**. The contest is sponsored by the Massachusetts Property Insurance Underwriting Association (MPIUA) on behalf of all property and casualty insurance companies of Massachusetts. The poster theme was **Fire Prevention – Everyone/Everyday**.

A countywide poster contest was held for all students in grade 6-8. Twelve out of 14 counties participated and about 1,000 posters were submitted. Posters were judged by an impartial panel. First and 2nd place county winners were chosen at MPIUA. All 1st place county winners were entered into the Massachusetts statewide contest. An award ceremony was held in honor of all county winners at the Sheraton Framingham Hotel on June 7, 2018, and the three state winners were announced and presented with their awards.

The front cover drawing is by Isabella Britton, a student at the St. Xavier Preparatory School in Hyannis, Massachusetts. Isabella's poster was the 1st place winner in the Barnstable County poster contest, and was automatically entered into the statewide contest, along with 11 other county winners, where it was chosen as the 1st place state winner.

The back cover drawing is by Arthur Oganyan, a student at the Agawam Junior High School in Agawam, Massachusetts. Arthur's poster was the 1st place winner in the Hampden County poster contest and was also automatically entered into the statewide contest where it was chosen as the 2nd place state winner.

MPIUA generously sponsored the printing of the *2017 Annual Report of the Massachusetts Fire Incident Reporting System (MFIRS)* and provided the cover posters. MPIUA has provided this sponsorship of the report and the poster contest for 36 years.

DEPARTMENT OF FIRE SERVICES MISSION

The mission of the Department of Fire Services is, through coordinated training, education, prevention, investigation, and emergency response, to provide the citizens of Massachusetts with the ability to create safer communities; to assist and support the fire service community in the protection of life and property; to promote and enhance firefighter safety; and to provide a fire service leadership presence in the Executive Office of Public Safety and Security in order to direct policy and legislation on all fire related matters.

EXECUTIVE SUMMARY

This is the *2017 Annual Report of the Massachusetts Fire Incident Reporting System* (MFIRS), which summarizes the Massachusetts fire experience for 2017. It is based on the 27,895 individual fire reports submitted by members of 359 fire departments and districts in compliance (98.1%) with National Fire Incident Reporting regulations. It is this effort that makes it possible to look at the total fire experience, to identify our fire problems and to develop strategies to address these issues. One of the goals of the Division of Fire Safety is to provide the fire service and the public with accurate and complete information about the fire experience in Massachusetts.

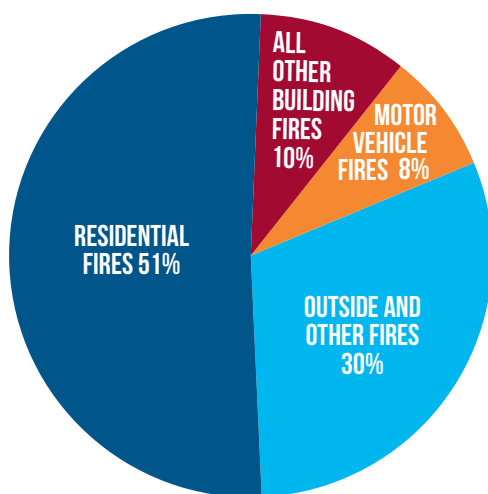
FIRES BY INCIDENT TYPE

17,099 Structure, 2,367 Vehicle, 8,429 Outside and Other Fires in 2017

There were 27,895 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2017. The 17,099 structure fires, 2,367 motor vehicle fires, and 8,429 outside and other fires caused 58 civilian deaths, two fire service deaths, 269 civilian injuries, 434 fire service injuries, and an estimated dollar loss of \$390.5 million in property damages. In 2017, there were 2.08 civilian deaths for every 1,000 fires. See Figure 1.

Figure 1

FIRES BY INCIDENT TYPE



CIVILIAN FIRE DEATHS

58 Civilians Died in Massachusetts Fires

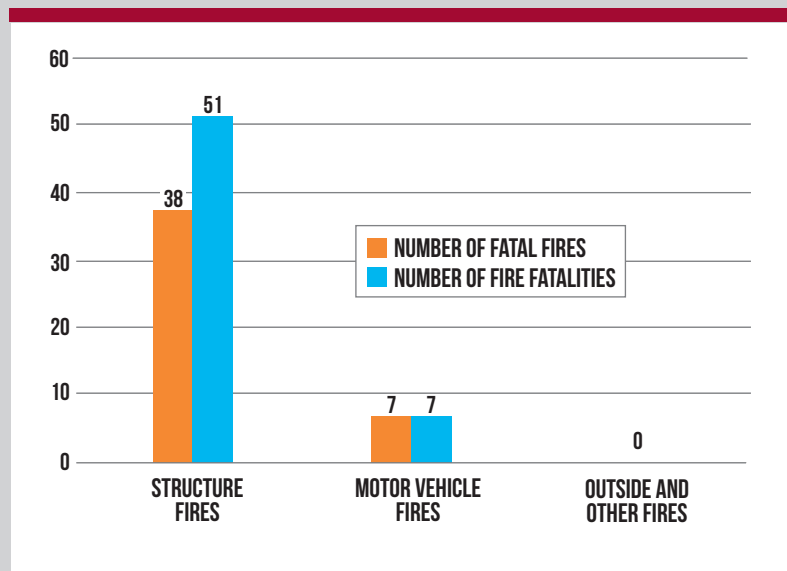
Fifty-eight (58) civilians died in Massachusetts fires in 2017. Fifty-one (51), or 88%, of these deaths occurred in structure fires. Eighty-four percent (84%) of these fire deaths, occurred where people feel safest, in their home. There were seven civilian deaths, or 12% in motor vehicle fires. No one was killed in outside fires. See Figure 2.

Structure fires decreased by less than 1% from the 17,146 that happened in 2016.

Twenty-four civilians over the age of 65 died in Massachusetts fires in 2017. These fatalities accounted for 41% of fire deaths in the state.

Figure 2

FATAL FIRES AND FIRE DEATHS



Half of People Died in Fires at Night

Over half, 55%, of civilians died at night, at home, while they were sleeping. Many of these fire victims did not have working smoke alarms or residential sprinklers. See Figure 3.

2017 Is Above the 5- and 10-Year Averages

The 58 fire deaths in 2017 are 6% above the five-year average and 19% above the 10-year average number of fire deaths. See Figure 4.

Figure 3

CIVILIAN FIRE DEATHS BY HOUR

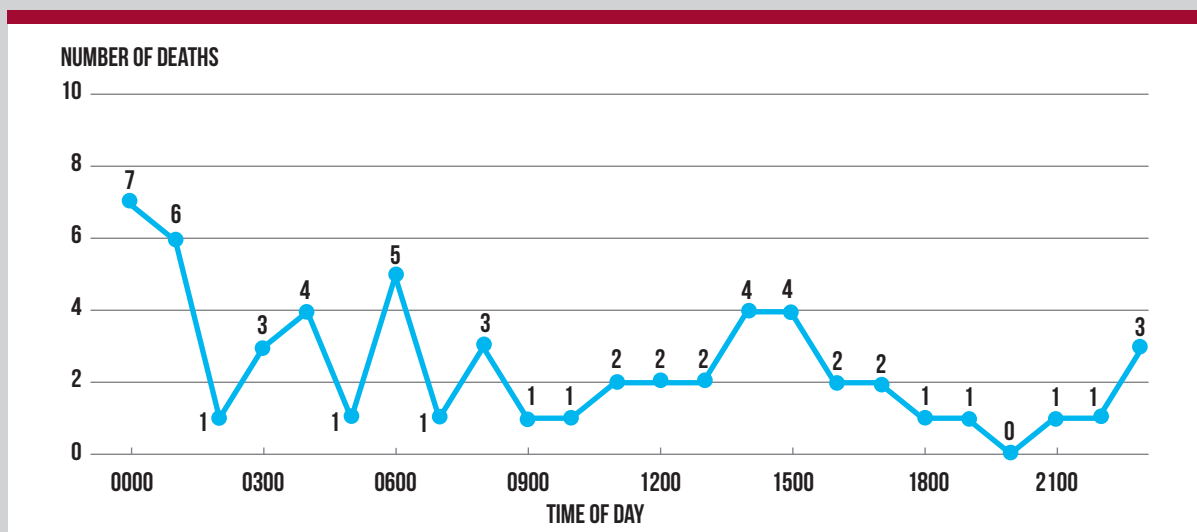
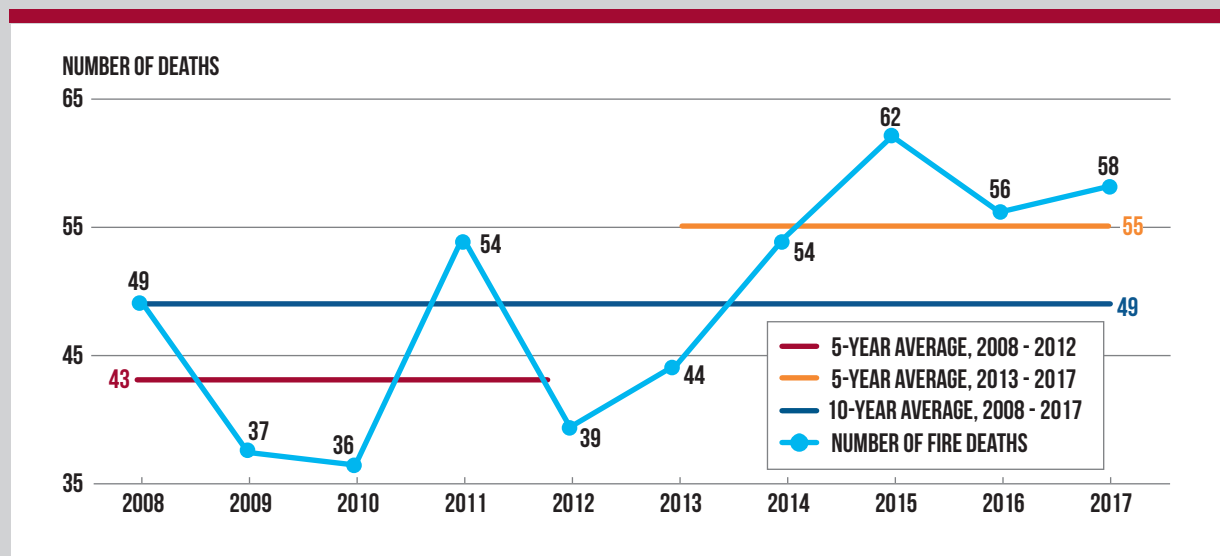


Figure 4

CIVILIAN FIRE DEATHS BY YEAR



35 Men, 18 Women and 5 Children under 18 Died from Fires in 2017

Of the 58 fire deaths in 2017, 35, or 60%, were men, 18, or 31%, were women and five or 9%, were children under 18. See Figure 5.

More than 40% of Fire Deaths in 2017 Were People over the Age of 65

Twenty-four (24), or 41%, of civilian fire victims were over 65 years of age. This included 14 elderly men and 10 elderly women. Five (5), or 9%, of the civilian fire victims were under 18 years old. Twenty-nine (29), or 50%, were adults between 18 and 65 years of age. See Figure 6.

Figure 5

CIVILIAN FIRE DEATHS BY GENDER

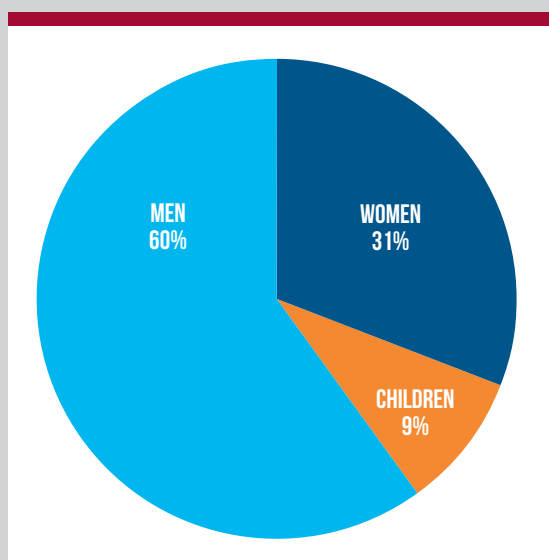


Figure 6

CIVILIAN FIRE DEATHS BY AGE

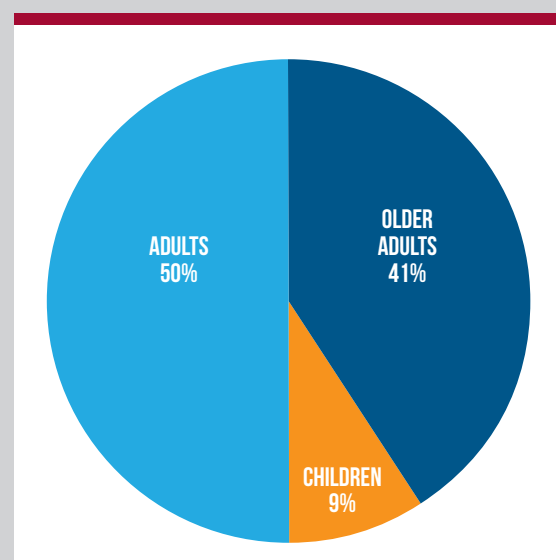


Figure 7

FIRE DEATHS BY AGE COMPARED TO PERCENT OF POPULATION

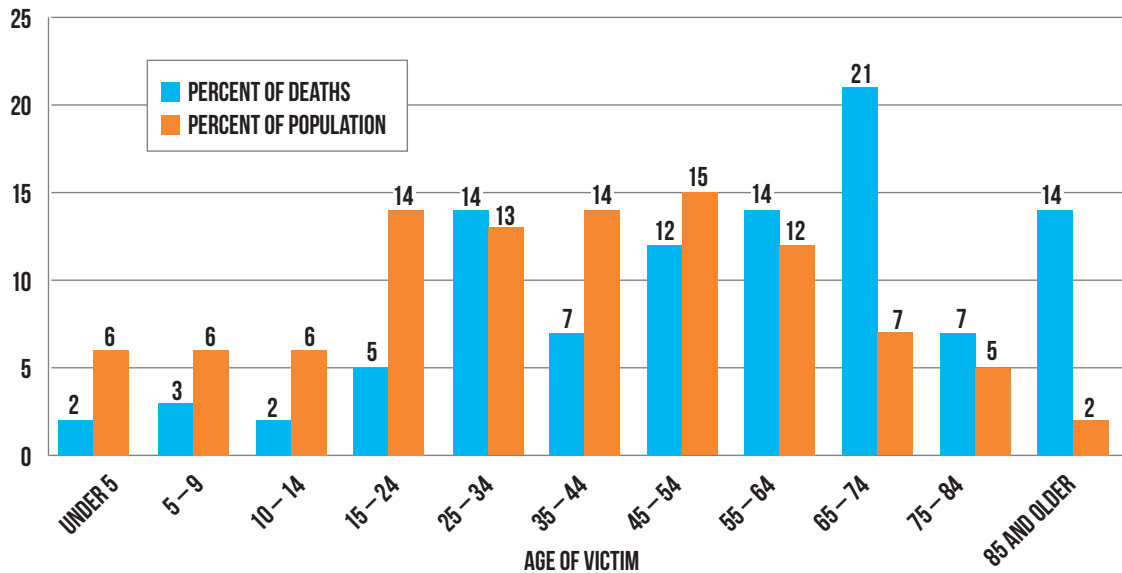


Figure 8

CHILD FIRE DEATHS BY YEAR

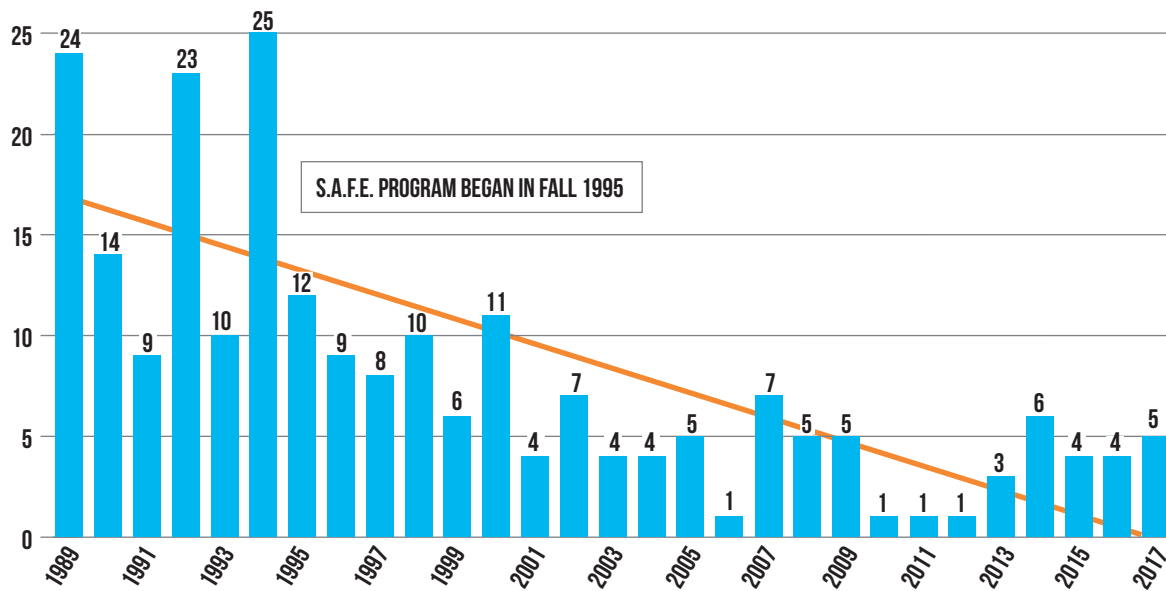
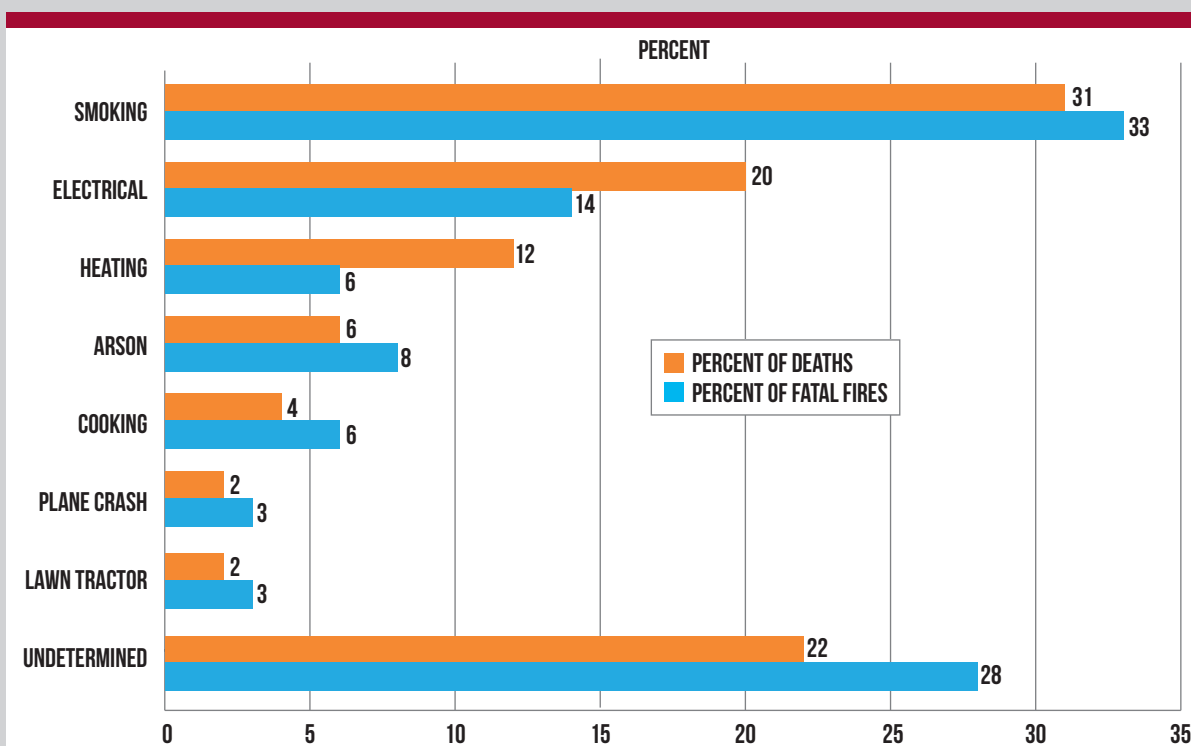


Figure 9

CAUSES OF RESIDENTIAL FATAL FIRES AND FIRE DEATHS



Older Adults More Likely to Die in a Fire than any Other Age Group

Older adults, especially those over the age of 85, had the greatest risk of dying in a fire. Adults over the age 85 account for 2% of the population but 14% of the fire deaths, making them 7 times more likely to die in a fire than any other age group. Figure 7 shows the percentage of fire deaths versus population percentage by age groups in 2017.

Average Annual Child Fire Deaths Down 72% Since the Start of S.A.F.E.

In the 23 years since the S.A.F.E. Program began (1995 to 2017), the average number of child fire deaths per year was 5.3. In the 23 years prior to the S.A.F.E. Program (1972 to 1994), the average number of child fire deaths per year was 20.6. This 74% drop in the number of child fire deaths is significant compared to the 48% drop in the number of all fire deaths during the same years. See Figure 8.

Smoking Fires are Leading Cause of Fire Deaths

In 2017, the improper use and disposal of smoking materials was the leading cause of residential fire deaths and fatal residential fires. These fires accounted for 15, or 31%, of residential fire deaths. Electrical problems were the second leading cause of fire deaths, and heating fires were the third leading cause of fire deaths. See Figure 9.

SMOKE ALARMS

Of the 58 civilian fire deaths in 2017, 49 occurred in residential structures. Only 37% of the buildings where these deaths happened had working smoke alarms.

One- and Two-Family Homes had Lowest Percentage of Operating Alarms

Only 40% of smoke alarms operated in one- and two-family homes in 2017. See Figure 10.

Smoke alarms don't last forever and must be replaced, like all appliances. Smoke alarms last 10 years, whether they are battery-powered or hard-wired. Smoke alarms that are 10 years old or older should be replaced.

Smoke alarms are the key to notifying occupants of danger whether they are asleep or awake, but smoke alarms cannot guarantee escape from fires.

Figure 10

SMOKE ALARM STATUS IN 1- AND 2-FAMILY HOME FIRES

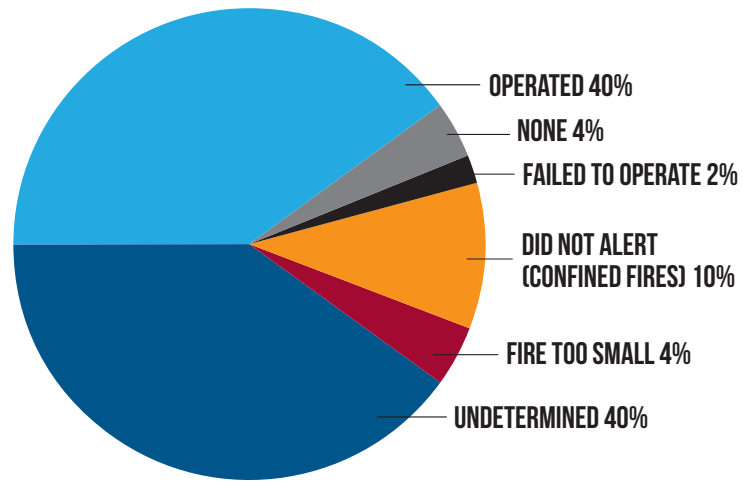
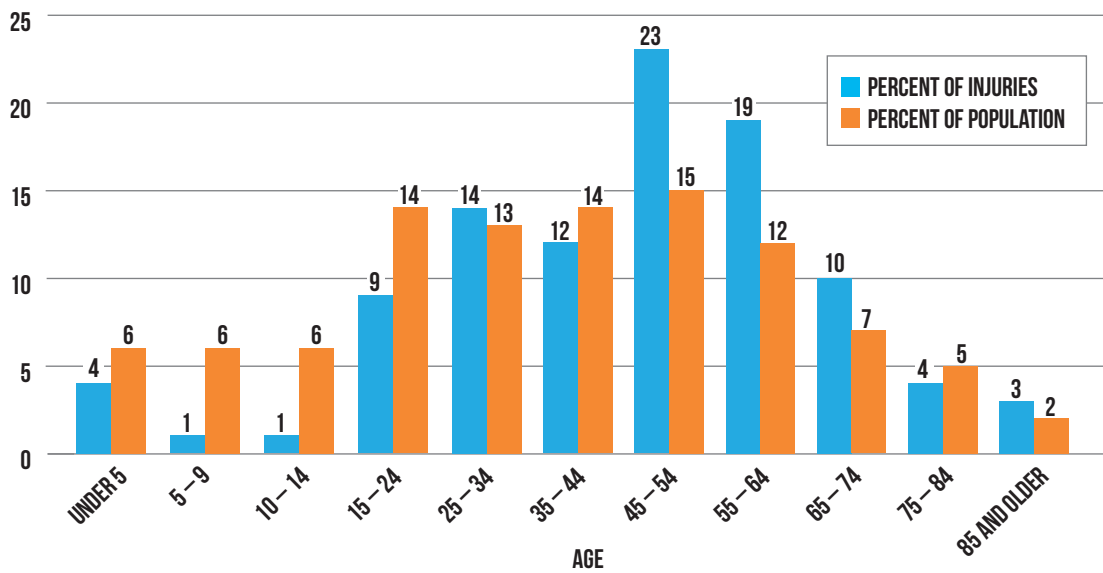


Figure 11

CIVILIAN INJURIES BY AGE COMPARED TO PERCENT OF POPULATION



CIVILIAN INJURIES

269 Civilians Injured in Fires in 2017 – Mostly at Home

Massachusetts fires injured 269 civilians in 2017. Two hundred and ten (210), or 78%, of civilian injuries occurred in structure fires. One hundred and ninety-three (193) injuries occurred in residential building fires, accounting for 72% of all injuries and 92% of all structure fire injuries. Nineteen (19), or 7%, occurred in motor vehicle fires. Forty (40) or 15%, of civilian injuries occurred in outside and other fires. Special outside fires accounted for 14, or 5%, of all civilian injuries. Brush fires accounted for 6, or 2%, of civilian fire injuries; and outside rubbish fires accounted for one, or less than 1% of all civilian fire injuries. Nineteen, or 7%, of civilian injuries were caused by unclassified fires.

Adults 45 to 64 at High Risk for Fire Injury

Adults between the ages of 45 and 54 represent 15% of the Massachusetts population, yet they accounted for 23% of the injuries at structure fires in 2017. Adults between the ages of 55 and 64 represent 12% of the population but they accounted for 19% of the injuries in 2017. People in these age groups are most at risk of being injured in a fire because they are more likely to try and control the fire. In these age groups, 54% of fire-related injuries happened while people were trying to control a fire. See Figure 11.

FIRE SERVICE INJURIES

434 Firefighters Injured in 2017

In 2017, 434 firefighters were injured while fighting the 27,895 reported fires in Massachusetts. On average, one firefighter was injured at one of every 64 fires in 2017.

Firefighters Injured at 1 of Every 6 Vacant Building Fires

Vacant building fires were one of the most dangerous types of fire for firefighters in 2017. These fires accounted for 41, or 9%, of all firefighter injuries. These 41 injuries also represent 11% of firefighter injuries from fighting structure fires in 2017. On average there was one firefighter injury for every six vacant building fires; one firefighter injury for every 16 structure arsons; and one firefighter injury for every 45 structure fires. See Figure 12.

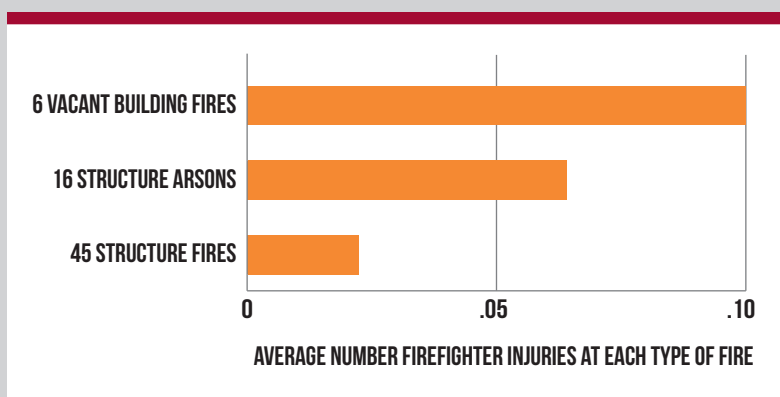
40% of Injuries from Overexertion or Strain

Forty percent (40%) of all firefighter injuries in 2017 were from overexertion or strain. See Figure 13.

In 2017, 434 firefighters were injured while fighting the 27,895 reported fires in Massachusetts. On average, one firefighter was injured at one of every 64 fires in 2017.

Figure 12

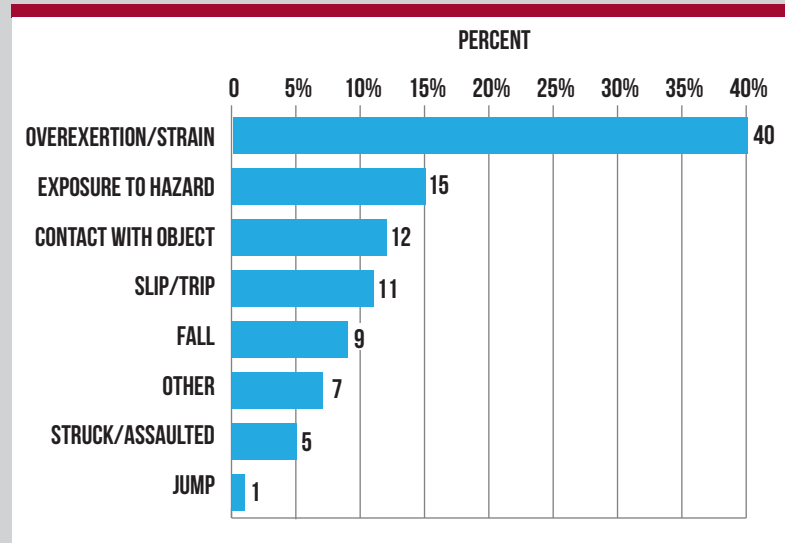
ONE FIREFIGHTER IS INJURED AT EVERY:



In 2017, 40% of all firefighter injuries were from overexertion or strains. Fifteen percent were from exposure to hazards.

Figure 13

CAUSES OF FIREFIGHTER INJURIES



RESIDENTIAL BUILDING FIRES

84% of Building Fires Occurred in Residential Occupancies

Massachusetts fire departments reported that 14,325, or 84%, of the 17,006 building fires occurred in residential occupancies. These fires caused 49 civilian deaths, two fire service deaths, 193 civilian injuries, 340 fire service injuries and an estimated dollar loss of \$328.4 million.

Over Half of Residential Fires Happen in Multi-Family Homes

Over half (51%) of residential building fires happened in multi-family buildings in 2017.

Figure 14

RESIDENTIAL FIRES BY OCCUPANCY TYPE

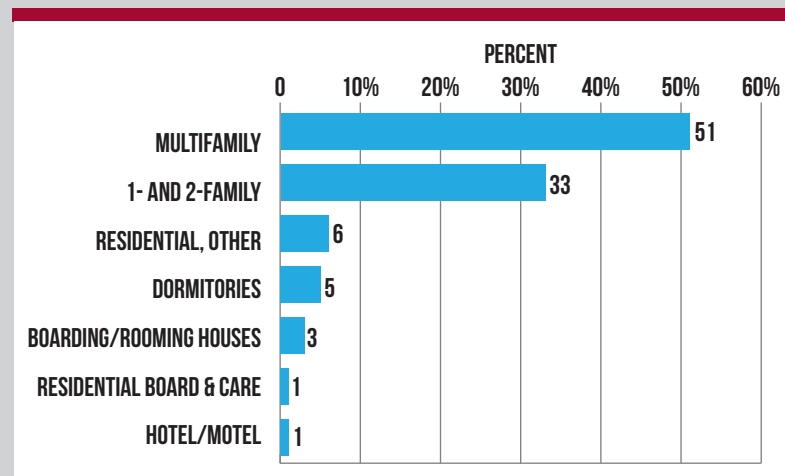
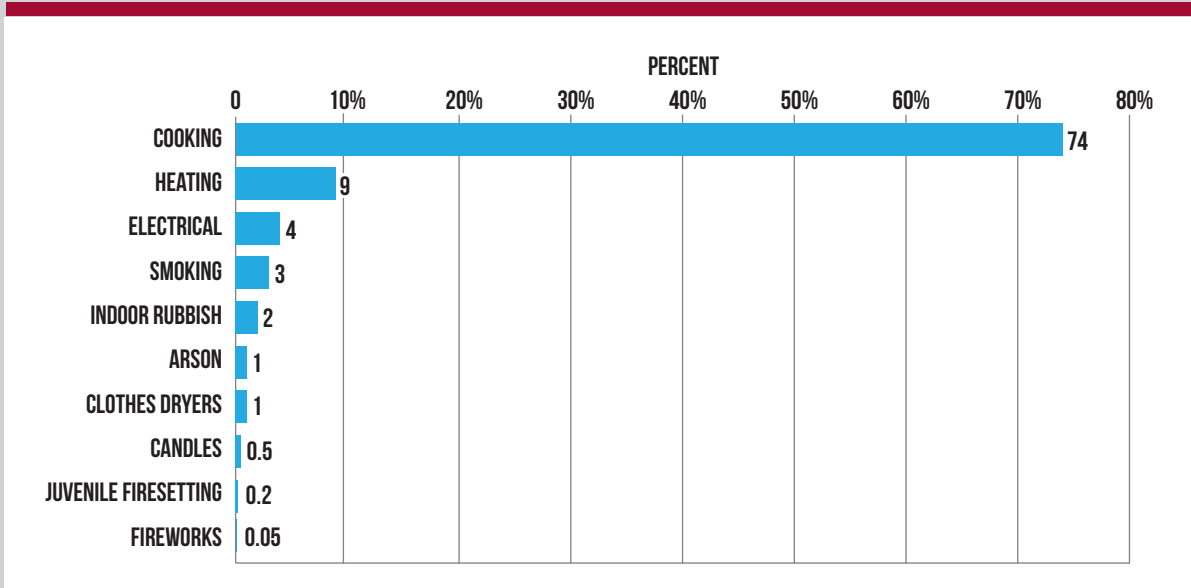


Figure 15

CAUSES OF RESIDENTIAL FIRES



Thirty-three percent (33%) of these fires happened in one- or two-family homes. Dormitories accounted for 5% of the fires. Three percent (3%) happened in rooming houses. Residential board and care facilities and hotels or motels each accounted for 1% of the residential fires. Six percent (6%) of the fires occurred in unclassified residences. See Figure 14.

Cooking & Heating were the Leading Causes of Fires in all Homes

Cooking caused 74% of fires in residential properties in 2017. Heating equipment caused 9% of these fires, electrical problems caused 4%. The unsafe and improper use of smoking materials caused 3% and indoor rubbish fires caused 2% of these fires. Arson and clothes dryer fires each caused 1% of the fires. Candles, juvenile-set fires and fireworks each accounted for less than 1% of the fires in residential properties in 2017. See Figure 15.

MOTOR VEHICLE FIRES

2,367 Motor Vehicle Fires Account for 8% of all Reported Fires

The 2,367 motor vehicle fires in 2017 caused seven civilian deaths, 19 civilian and 19 fire service injuries, and an estimated \$21.2 million in property damage. These incidents accounted for 8% of the reported 27,895 fires in 2017. Motor vehicle fires accounted for 12% of civilian fire deaths. Motor vehicle fires decreased by 1% from 2016.

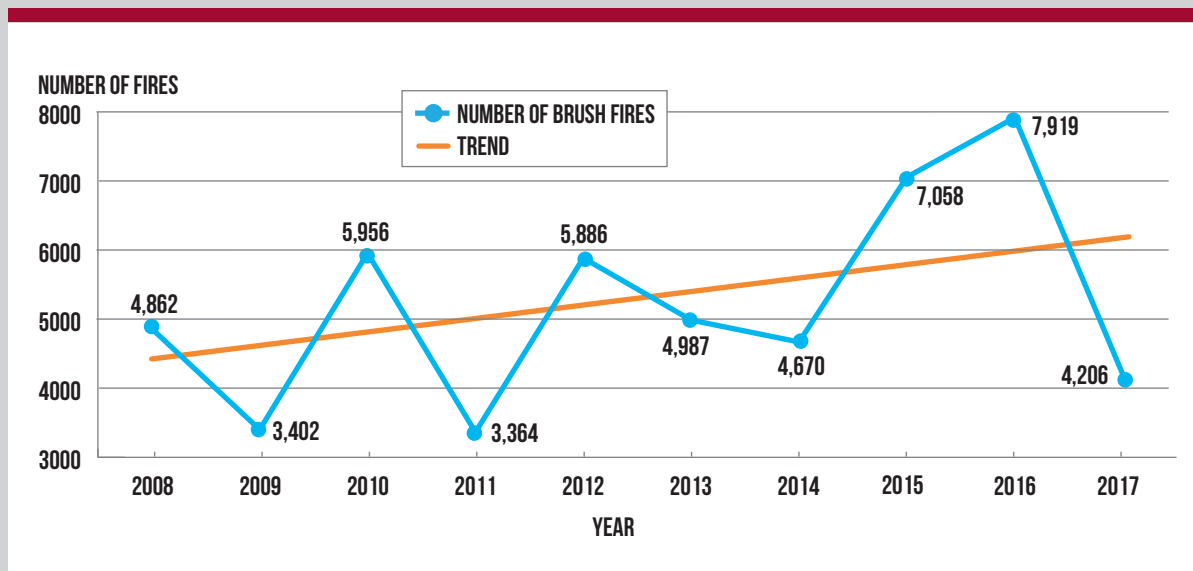
OUTSIDE AND OTHER FIRES

8,429 Brush, Trash, and Other Outside Fires

In 2017, 8,429 outside and other fires caused 40 civilian and 33 fire service injuries, and an estimated dollar loss of \$4.6 million. The 4,206 tree, grass and brush fires, 2,382 outside rubbish fires, 813 special outside fires, 66 cultivated vegetation or crop fires, and 962 other fires accounted for 30% of the total fire incidents in 2017. These fires decreased by 34% from the 12,706 outside and other fire incidents reported in 2016.

Figure 16

BRUSH FIRES BY YEAR



In 2017, 187 structure arsons, 68 motor vehicle arsons, and 416 outside and other arsons caused four civilian deaths, accounting for 7% of civilian fire deaths, five civilian injuries and 13 fire service injuries.

Brush Fires

Brush fires are the most variable category of fires from year to year. Large increases and decreases are not uncommon and are often dependent on the weather. If it is a dry spring or summer, the number of brush fires usually increases. In 2017, the reported number of brush fires decreased by 47%, from the 7,919 reported in 2016. Coincidentally, weather conditions in the spring of 2017 were not conducive to outside fires as they were in previous years. See Figure 16.

ARSON FIRES

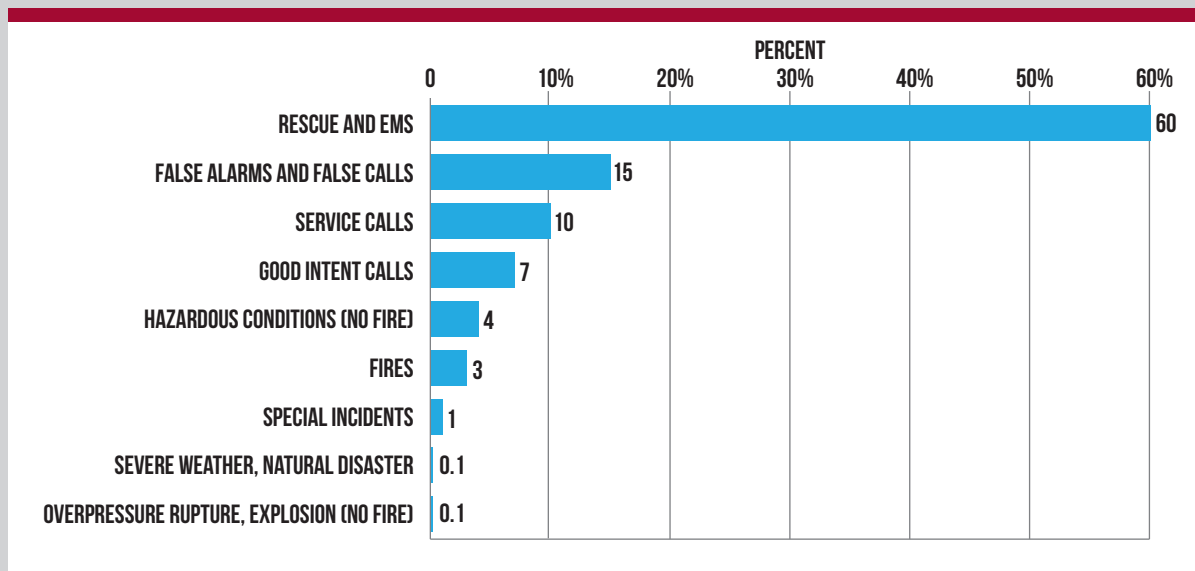
671 Arsons - 187 Structures, 68 Vehicles, and 416 Other Arsons

Six hundred seventy-one (671), or 2%, of the 27,895 fire incidents reported to the Massachusetts Fire Incident Reporting System were considered to be intentionally set, or arson¹. The 187 structure arsons, 68 motor vehicle arsons, and 416 outside and other arsons caused four, or 7%, of civilian fire deaths, five civilian injuries and 13 fire service injuries. Three of the four arson deaths were by suicide. The estimated dollar loss from arsons was \$114.3 million. The average dollar loss per arson was \$170,341. Total arson was down by 11% from the 754 in 2016.

¹ In MFIRS (v5) a fire is considered an arson if the Cause of Ignition = 1 (Intentional) and the Age of Person (Fire Module) is greater than 17 or if the field is blank; or if the Wildland Module is used, the Wildland Fire Cause = 7 (Incendiary) and the Age of the Person (Wildland Module) is greater than 17 or if the field is left blank.

Figure 17

RESPONSES BY INCIDENT TYPE



NON-FIRE INCIDENTS

60% of all Massachusetts Calls were EMS Incidents

In 2017, 349 fire departments in Massachusetts reported 937,310 responses to MFIRS (including mutual aid responses). 907,513 of these were non-fire calls. Rescue and EMS calls were by far the leading type of call that Massachusetts fire departments responded to, with 561,845, or 60% of all reported calls. See Figure 17.

CONCLUSIONS

Working Smoke Alarms Save Lives

Most people die in fires at night in the so-called safety of their own home. While the overall trend in the number of deaths continues to decline, smoking was the leading cause of all fatal fires in 2017. Yet cooking, something we do everyday, is still the leading cause of fires in the home and the leading cause of civilian fire injuries. We must all work to address this problem.

The lack of working smoke alarms or sprinkler systems are contributing factors to these tragedies. We have under 3 minutes to get out of a building if there is a fire. It is important to remember that properly maintained alarms provide early warning of a fire, and residential sprinklers provide the opportunity to safely escape. Having a practiced home escape plan in addition to working smoke alarms and sprinklers allows us to get out of our houses quickly. Time is of the essence in a fire.

Cooking remains the leading cause of fires in the home and the leading cause of civilian fire injuries. The lack of working smoke alarms or sprinkler systems are contributing factors to these tragedies.

2017 FIRES BY COUNTY

County	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	759	300	85	374	2	11	0	16	\$10,901,238
Berkshire	442	257	52	133	2	6	0	2	4,829,650
Bristol	1,872	847	278	747	6	27	0	12	13,307,487
Dukes	26	16	6	5	0	0	0	0	355,000
Essex	2,474	1,293	256	925	6	17	0	57	21,957,642
Franklin	253	118	22	113	5	5	0	2	1,641,127
Hampden	1,641	939	222	480	12	23	1	52	13,411,119
Hampshire	384	190	41	153	0	1	0	3	4,127,990
Middlesex	5,294	3,501	379	1,414	8	48	1	98	154,635,597
Nantucket	54	19	13	22	0	0	0	1	339,000
Norfolk	2,990	1,808	220	962	6	25	0	53	29,827,456
Plymouth	1,746	822	199	725	3	45	0	35	16,993,556
Suffolk	6,196	4,555	256	1,385	3	25	0	51	83,400,982
Worcester	3,764	2,435	338	991	5	36	0	55	34,754,417
Total	27,895	17,099	2,367	8,429	58	269	2	434	\$390,482,261

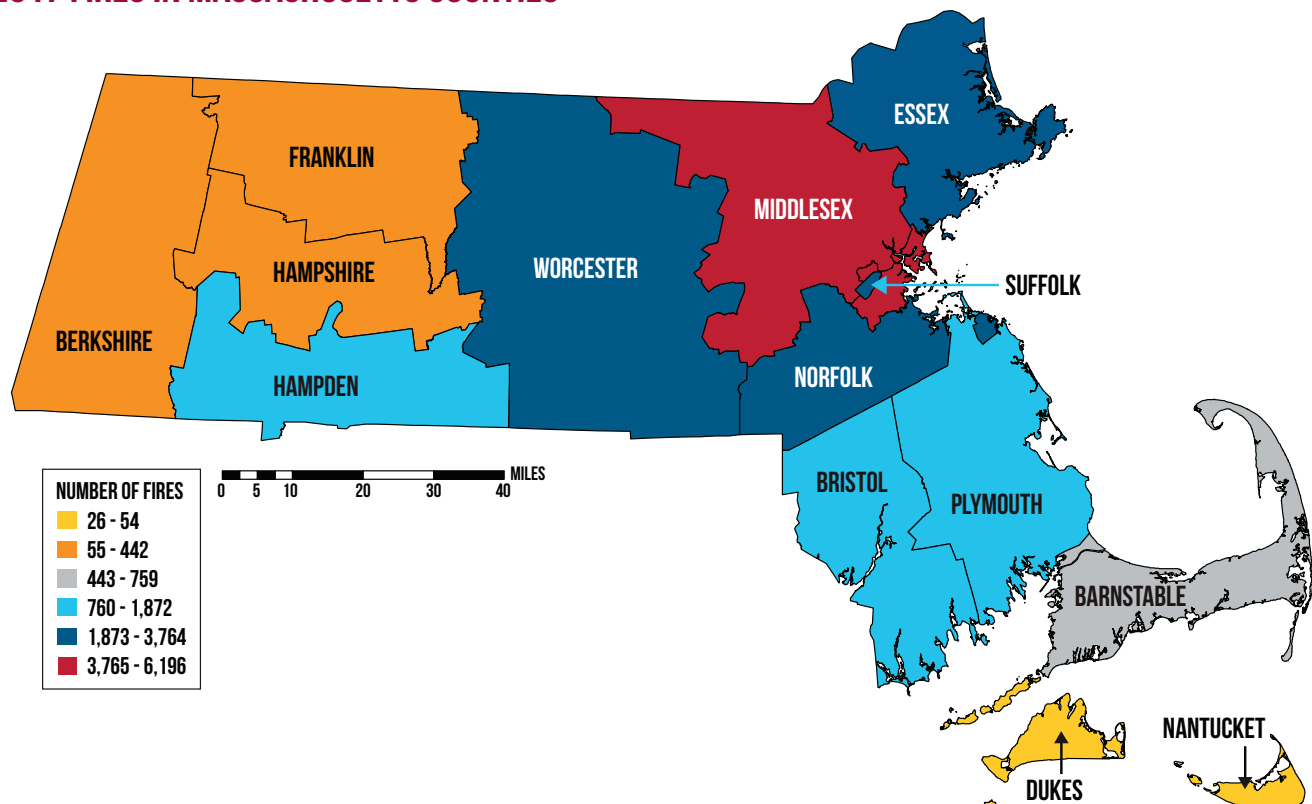
2017 ARSONS BY COUNTY

County	Total Arsons	Structure Arsons	Vehicle Arsons	Other Arsons	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	35	6	2	27	0	0	0	0	\$38,201
Berkshire	11	1	0	10	0	0	0	0	12,400
Bristol	95	36	16	43	0	1	0	1	1,057,498
Dukes	0	0	0	0	0	0	0	0	0
Essex	68	15	6	47	1	0	0	0	70,575
Franklin	18	4	0	14	0	0	0	0	0
Hampden	59	17	11	31	0	0	0	1	94,510
Hampshire	26	6	1	19	0	0	0	0	82,120
Middlesex	43	11	4	28	1	0	0	4	110,035,685
Nantucket	4	2	1	1	0	0	0		155,000
Norfolk	68	16	1	51	0	0	0	0	172,738
Plymouth	35	9	4	22	0	3	0	0	76,925
Suffolk	129	33	12	84	0	1	0	0	1,415,752
Worcester	80	31	10	39	2	0	0	6	1,087,416
Total	671	187	68	416	4	5	0	13	\$114,298,820

2017 NON-FIRE RESPONSES BY COUNTY AND BY INCIDENT TYPE

County	Total Non-Fire Responses	Over-pressure Rupture, Explosion (No-fire)	Rescue, EMS Incidents	Hazardous Conditions (No-fire)	Service Calls	Good Intent Calls	False Alarm Calls	Severe Weather, Natural Disaster	Special Incidents
Barnstable	54,054	54	38,032	2,302	3,994	2,542	6,792	163	175
Berkshire	12,534	15	7,004	690	1,738	685	2,327	16	59
Bristol	68,364	65	45,620	2,669	3,982	4,307	11,255	66	400
Dukes	1,223	6	79	96	52	281	697		12
Essex	109,056	102	62,289	4,572	15,233	7,767	18,184	168	741
Franklin	8,048	25	4,548	683	900	675	918	48	251
Hampden	46,584	87	28,198	1,820	3,774	5,278	7,277	26	124
Hampshire	15,699	25	10,399	693	882	864	2,752	10	74
Middlesex	194,934	118	116,913	10,091	20,204	11,289	30,559	197	5,563
Nantucket	2,817	3	1,521	95	65	40	1,086	1	6
Norfolk	96,029	102	61,320	5,158	8,933	5,667	13,251	74	1,524
Plymouth	88,770	83	60,913	4,467	7,160	5,942	9,830	186	189
Suffolk	106,086	68	56,080	4,675	14,412	10,064	18,738	43	2,006
Worcester	103,315	113	68,929	4,153	8,786	7,144	13,239	58	893
Massachusetts	907,513	866	561,845	42,164	90,115	62,545	136,905	1,056	12,017

2017 FIRES IN MASSACHUSETTS COUNTIES





MFIRS
Massachusetts Fire Incident Reporting System

Department of Fire Services
www.mass.gov/dfs
(978) 567-3380