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# 2021 INJURY REPORT

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An Annual Summary of Fire Fighter Injuries, Exposures, and Cancer Diagnoses Reported to the Texas Commission on Fire Protection in Calendar Year 2021

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of the  
Texas Commission on Fire Protection

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*Copies of this publication can be downloaded free of charge on-line:  
<https://www.tcfp.texas.gov/services/injury-reports>*

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# Mission

The commission shall gather and evaluate data on fire protection personnel injuries and develop recommendations for reducing injuries.

## Why we are collecting injury data

Under Texas Government Code §419.048, the Texas Legislature charged the commission with gathering and evaluating data on injuries. The rules requiring regulated entities to report injuries to the commission are in Texas Administrative Code §435.23. The commission encourages volunteer entities to report injuries so that it can gain as accurate a picture as possible concerning injury trends in the Texas fire service. The injury reporting program began in March 2010.

## Information the commission collects

- Minor, serious, and fatal injuries,
- Exposures (toxic and pathogenic)
- Cancer diagnoses
- Activities where fire personnel are injured
- Types of injuries (burns, strain-sprains, wounds, etc.)
- Body parts being injured
- Tasks performed at the time of injury
- Missed time
- Work assignment after injury
- Malfunctions/failures of personal protective equipment (PPE), self-contained breathing apparatus (SCBA), personal alert safety systems (PASS devices) and standard operating procedures (SOPs)

## How this will help the fire service

- Identify common injuries and exposures
- Identify trends in injuries and exposures
- Identify needed training
- Evaluate and find improvements in procedures

# Executive Summary

The information in this report is collected by the Texas Commission on Fire Protection (TCFP) via an on-line injury reporting application. At the time of this writing, the TCFP regulated 36,938 individuals and 767 entities. This report is a comprehensive analysis of injuries and exposures to Texas fire fighters. These injuries and exposures were reported to the TCFP in 2021 by fire departments throughout the state, and this report contains charts and graphs depicting the results of the information that was collected. The report also compares Texas fire fighter injury statistics with national statistics that were gathered by the National Fire Protection Association (NFPA) in 2020.

Under Texas Government Code §419.048, the Texas Commission on Fire Protection is charged with developing and establishing criteria to receive and analyze injury information pertaining to Texas fire fighters. The commission reviews this information to develop recommendations to help reduce injuries to fire protection personnel. The commission provides this information to the State Fire Marshal's Office (SFMO) by September 1 of each year for inclusion in the SFMO's annual Firefighter Fatality Investigations Report. The commission has enacted rules about reporting injuries in the Texas Administrative Code (TAC) Title 37, Chapter 435, and has established the criteria and policies for reporting and analyzing the information.

The commission originally built the data systems necessary to gather this information in 2010. In 2017 the data systems were migrated from a Microsoft Access database structure to a new system which was developed in-house and designed specifically to meet the information resource needs of the TCFP. Fine-tuning of this newer system is ongoing as we receive feedback from stake-holders. The reporting process is accomplished online via TCFP's FIDO system. Fire departments regulated by the commission have been notified of the requirement to report. Several volunteer departments, which are not regulated by the commission, are also participating voluntarily.

This report concludes with recommendations from the commission to help reduce the number of fire fighter injuries in Texas and to improve the injury reporting program.

## A Note About COVID-19

The on-going COVID-19 pandemic continued to cause the numbers of injuries and exposures to spike sharply in the areas of EMS-related duties (i.e., patient care) and station duties (i.e., contact with contagious co-workers) compared to previous years. Please keep this in mind as you review the report.

# Abstract

This report contains data submitted by regulated and non-regulated entities.

## Grand Totals – 2021

Total number of incidents (injury reports) submitted: 6,326

Total number of individuals who sustained an injury or exposure: 6,495\*

Total number of injuries reported: 3,159

Total number of exposures reported: 3,606

*\*Note that an individual could have more than one injury or could have an injury and an exposure. This explains why the total number of individuals who sustained an injury is less than the total number of injuries + total number of exposures. ( $6,495 < 3,159 + 3,606$ )*

Because the on-line injury reporting system was reconfigured in 2018, the information collected by the TCFP has evolved over the last couple of years. **It's important to remember that one incident report can have multiple individuals involved, and each of those individuals can have one or more injuries.** For example:

Joe and Bob were burned in a fire while on duty. This resulted in:

- One incident (one injury report), with
- Two individuals who...
- Sustained three injuries
  - Joe was burned on the hand and arm (two injuries)
  - Bob was burned on the leg (one injury)

## The “Bird's Eye View”

**Reporting Rate 75%.** 580 of the 767 regulated departments used TCFP's injury reporting system in 2021.

### Top 5 activities that resulted in injuries or exposures

1. EMS = 2,852 injured individuals (45% of the total reported injuries/exposures)
2. Station Duties = 1,594 (25% of the total)
3. Fire Suppression = 691 (11% of the total)
4. Wellness/Fitness = 450 (7% of the total)
5. Skills Training = 423 (7% of the total)

# State of Texas vs. NFPA

## Comparison between the State of Texas (2020) and National Fire Protection Association (NFPA) U.S. Firefighter Injuries (2020)

For the purposes of comparison, the commission has mapped its categories to the NFPA categories as follows:

- “*Fireground*” includes the commission’s Fire Suppression and Rescue – Fire Related categories.
- “*Non-Fire*” includes Rescue Non-Fire, EMS and Hazmat.
- “*Other On-Duty*” includes Fire Prevention, Station Duties and Wellness/Fitness.

The NFPA’s “Responding and Returning” and “Training” categories appear to correspond closely to the commission’s categories. (The NFPA numbers include Texas statistics, although the reporting populations may not be the same.)

*Please keep in mind that Table 1 and Figure 1 reflect 2020 data, and not 2021 data as in the rest of this report. NFPA’s 2021 injury data will not be published and available until 2023.*

*Comparing Texas 2020 and NFPA 2020*

**Table 1: Texas 2020 vs. NFPA 2020**

Category	Texas 2020		NFPA 2020	
	Count	Percent	Count	Percent
Fireground	720	13%	22,450	35%
Non-Fire	2,457	43%	13,650	21%
Other On-Duty	1,916	34%	16,250	25%
Training	398	7%	7,550	12%
Responding and Returning	215	4%	4,975	8%
<b>Total</b>	<b>5,706</b>	<b>100%</b>	<b>64,875</b>	<b>100%</b>

NFPA data is from the [Firefighter Injuries in the United States in 2020](#) report, copyright 2021 National Fire Protection Association, Quincy, MA.

### *Special note about COVID-19*

The NFPA estimates there were 20,900 exposures to infectious diseases in 2020. This is more than two and a half times the 7,675 exposures in 2019. In Texas, we had 3,600 reports of infectious diseases in 2020, while in 2019 we had only 23.

**Figure 1: Injuries by Activity, percentages**  
(Comparing Texas 2020 and NFPA 2020)

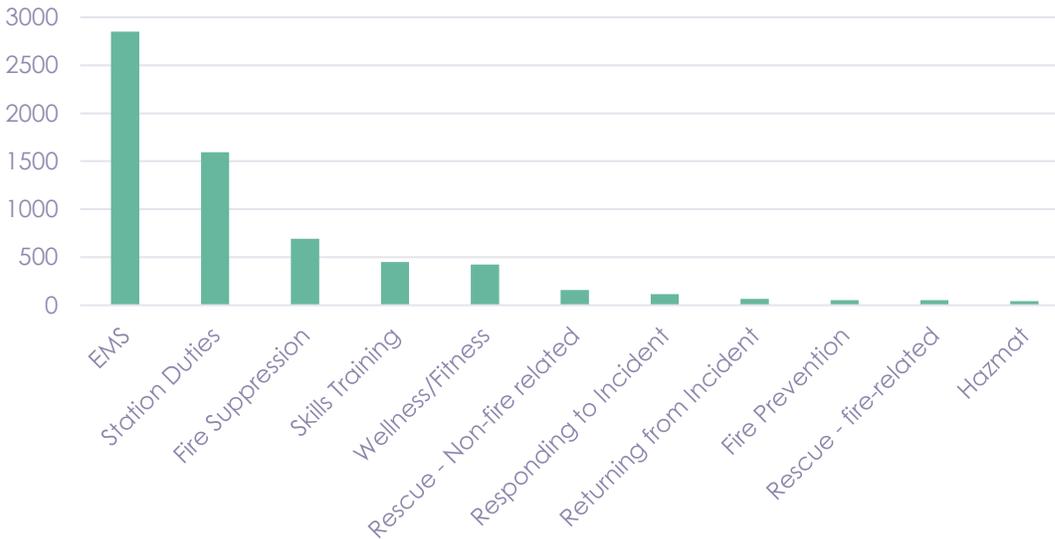


# Fire Protection Personnel Injuries

**Table 2: Total Injured or Exposed Individuals by Activity and Severity, 2021**

<b>Activity</b>	<b>Minor</b>	<b>Serious</b>	<b>Fatal</b>	<b>Total</b>	<b>2020</b>	<b>2019</b>
EMS	1,633	667	3	2,303	3,192	922
Station Duties	750	701	0	1,451	1,454	739
Fire Suppression	522	147	1	670	525	763
Wellness/Fitness	290	131	0	421	422	469
Skills Training	284	114	0	398	429	407
Responding to Incident	117	35	0	152	91	157
Rescue - nonfire	89	22	0	111	118	143
Returning from Incident	40	23	0	63	41	60
Rescue - fire-related	40	10	0	50	29	53
Fire prevention	35	9	0	44	76	26
Hazmat	40	3	0	43	29	41
<b>Total</b>	<b>3,840</b>	<b>1,862</b>	<b>4</b>	<b>5,706</b>	<b>6,406</b>	<b>3,780</b>

**Figure 2: Total Injured or Exposed Individuals by Activity, 2021**



## Injuries/Exposures by Activity

EMS activities resulted in the highest number of minor injuries in 2021 (see Table 3), which is consistent with the previous five years. The total numbers of minor and serious injuries and exposures is up significantly in 2021 compared with the years prior to 202 due to the continuing COVID-19 pandemic.

### Definitions

**Minor** = An injury/exposure that does not result in the employee missing a full duty period.

**Serious** = An injury/exposure that results in the employee missing one or more full duty periods.

**Fatal** = The injured/exposed individual did not survive.

**Table 3: Minor Injury/Exposure Activities, 2017 – 2021**

Activity	2017		2018		2019		2020		2021	
	Count	%								
EMS	929	29%	843	30%	776	26%	2,529	56%	2,095	47%
Station Duties	481	15%	437	15%	591	20%	722	16%	828	19%
Fire Suppression	662	21%	607	21%	616	21%	397	9%	537	12%
Wellness/Fitness	254	8%	286	10%	290	10%	306	7%	311	7%
Skills Training	291	9%	277	10%	330	11%	304	7%	303	7%
Responding to Incident	156	5%	99	3%	114	4%	68	2%	123	3%
Rescue - Non-Fire	206	7%	157	6%	140	5%	89	2%	94	2%
Hazmat	21	1%	27	1%	24	1%	22	0%	41	1%
Rescue - Fire Related	113	4%	39	1%	37	1%	26	1%	41	1%
Returning from Incident	42	1%	57	2%	39	1%	28	1%	41	1%
Fire Prevention	50	2%	69	2%	46	2%	49	1%	40	1%
<b>Total</b>	<b>3,155</b>	<b>100%</b>	<b>2,829</b>	<b>100%</b>	<b>2,957</b>	<b>100%</b>	<b>4,491</b>	<b>100%</b>	<b>4,454</b>	<b>100%</b>

(Numbers in red above = least amount of injuries for the five-year period.)

**Table 4: Serious Injury/Exposure Activities, 2017 – 2021**

Activity	2017		2018		2019		2020		2021	
	Count	%	Count	%	Count	%	Count	%	Count	%
Station Duties	185	21%	201	20%	147	19%	731	39%	766	38%
EMS	147	17%	184	19%	146	19%	660	35%	755	37%
Fire Suppression	157	18%	191	19%	145	19%	127	7%	153	8%
Wellness/Fitness	129	15%	131	13%	117	15%	116	6%	139	7%
Skills Training	120	14%	123	13%	139	18%	125	7%	120	6%
Responding to Incident	53	6%	64	7%	28	4%	23	1%	35	2%
Returning from Incident	28	3%	34	3%	14	2%	13	1%	24	1%
Rescue - Non-Fire	27	3%	26	3%	17	2%	29	2%	22	1%
Fire Prevention	15	2%	21	2%	14	2%	27	1%	11	1%
Rescue - Fire Related	1	0%	1	0%	2	0%	3	0%	10	0%
Hazmat	7	1%	5	1%	4	1%	7	0%	3	0%
<b>Total</b>	<b>869</b>	<b>100%</b>	<b>981</b>	<b>100%</b>	<b>773</b>	<b>100%</b>	<b>1,861</b>	<b>100%</b>	<b>2,038</b>	<b>100%</b>

(Numbers in red above = least amount of injuries for the five year period.)

## Fatalities

The commission's 2021 injury report includes three fatalities (two from COVID-19 and one from colon cancer). Fatalities noted in this report include only those reported to the Texas Commission on Fire Protection (TCFP) by the entities it regulates.

The State Fire Marshal's Office conducted four Texas fire fighter fatality incident investigations in 2021. Comprehensive information about the investigations may be found on their website at the following web address:

<https://www.tdi.texas.gov/fire/fmloddannals.html>

**Table 5: Number of Individuals Who Sustained Fatal Injuries/Exposures, 2021**

Activity	Count	Percent
EMS	2	67%
Fire Suppression	1	33%
<b>Total</b>	<b>3</b>	<b>100%</b>

## Emergency vs. Non-Emergency Injuries

**Table 6: Number of Injured Individuals by Emergency Activity and Severity, 2021**

<b>Activity</b>	<b>Minor</b>	<b>Serious</b>	<b>Fatal</b>	<b>Total</b>
EMS	2,095	755	2	2,852
Fire Suppression	537	153	1	691
Rescue - Non-fire related	94	22	0	116
Responding to Incident	123	35	0	158
Returning from Incident	41	24	0	65
Hazmat	41	3	0	44
Rescue - Fire related	41	10	0	51
<b>Total</b>	<b>2,972</b>	<b>1,002</b>	<b>3</b>	<b>3,977</b>

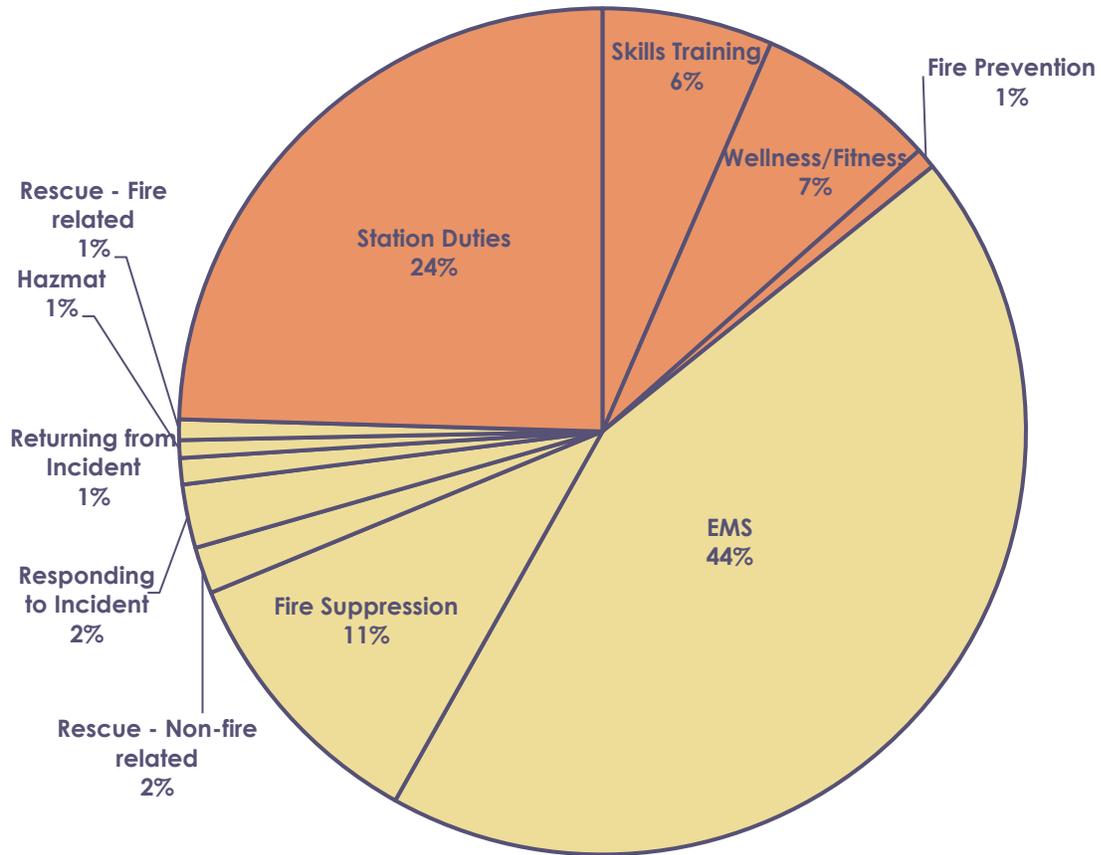
**Table 7: Number of Injured Individuals by Non-Emergency Activity and Severity, 2021**

<b>Activity</b>	<b>Minor</b>	<b>Serious</b>	<b>Fatal</b>	<b>Total</b>
Station Duties	828	766	0	1,594
Skills Training	303	120	0	423
Wellness/Fitness	311	139	0	450
Fire Prevention	40	11	0	51
<b>Total</b>	<b>1,482</b>	<b>1,036</b>	<b>0</b>	<b>2,518</b>

Figure 3: Percentages of Injured Individuals in Emergency and Non-Emergency Activities, 2021

Emergency Activities = 62%

Non-emergency Activities = 38%

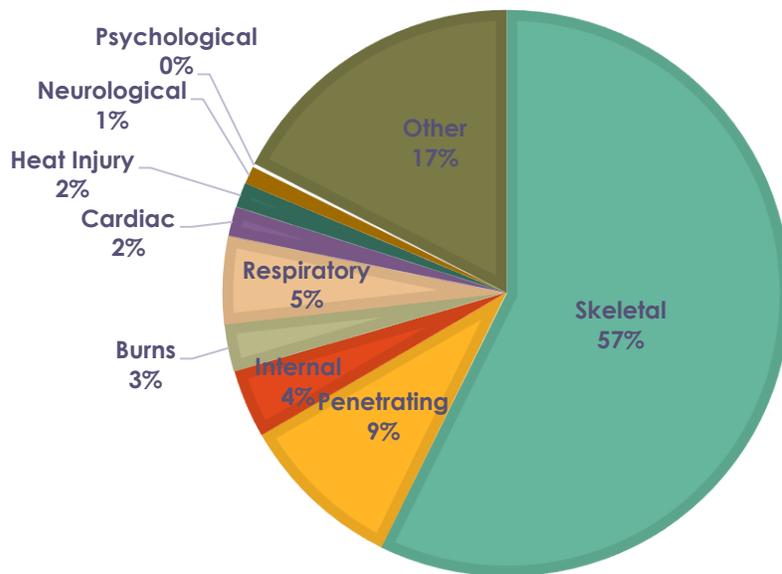


# Types of Injuries

Table 8: Types of Injuries, 2021

Type of Injury	2021	
	Count	Percent
Skeletal	1,809	57%
Penetrating	296	9%
Respiratory	157	5%
Internal	123	4%
Burns	85	3%
Cardiac	53	2%
Heat Injury	45	1%
Neurological	32	1%
Psychological	8	0%
Other	550	17%
<b>Total</b>	<b>3,158</b>	<b>100%</b>

Figure 4: Types of Injuries, 2021

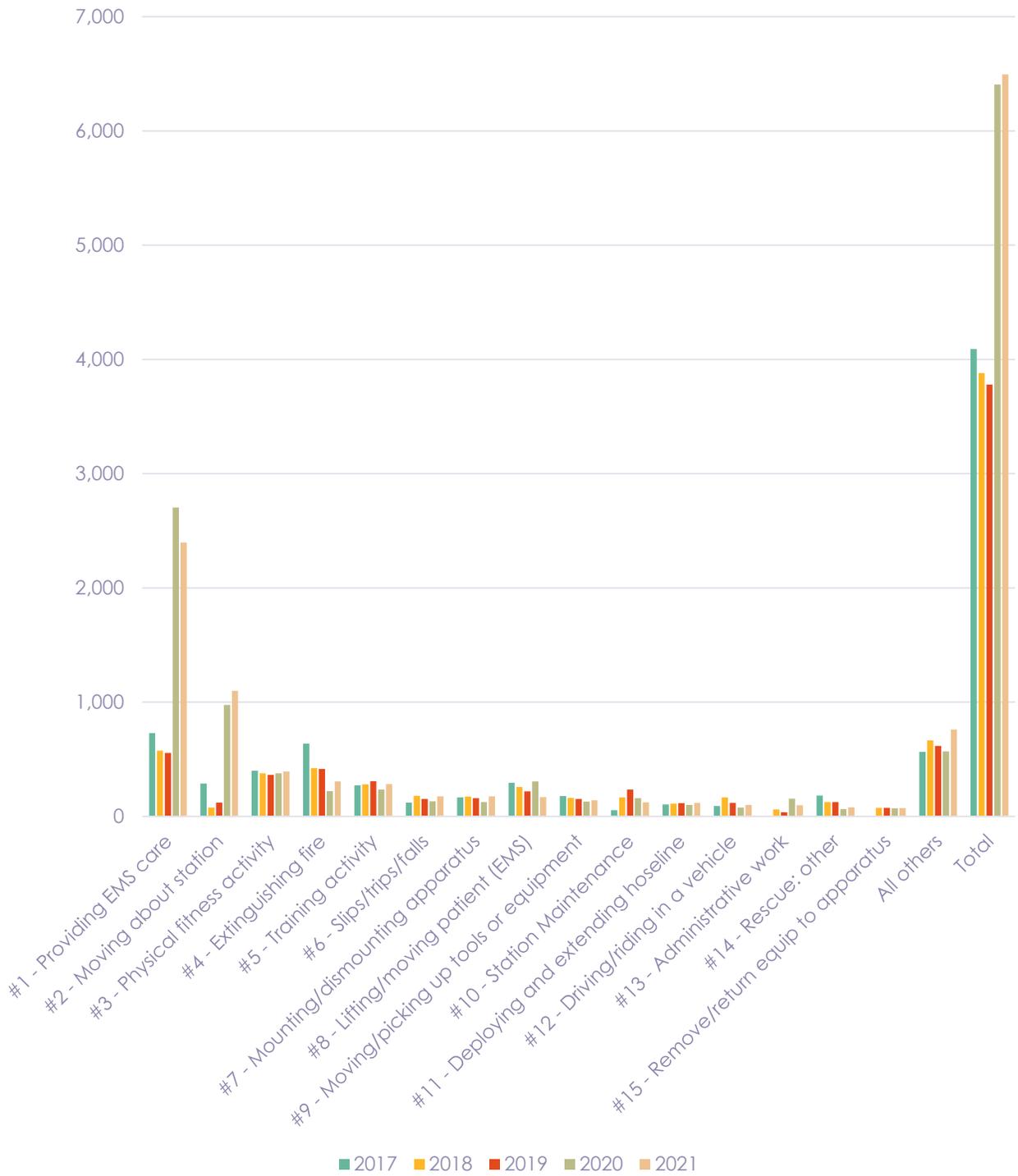


## Task at Time of Injury

**Table 9: Top 15 Tasks at Time of Injury, 2017 – 2021 (ordered by 2021, descending)**

<b>Task</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
#1 - Providing EMS care	728	575	556	2,704	2,398
#2 - Moving about station	289	77	122	975	1,100
#3 - Physical fitness activity	401	376	364	376	394
#4 - Extinguishing fire	638	423	416	222	306
#5 - Training activity	273	281	309	236	284
#6 - Slips/trips/falls	122	181	154	132	177
#7 - Mounting/dismounting apparatus	166	173	159	125	175
#8 - Lifting/moving patient (EMS)	294	259	220	307	168
#9 - Moving/picking up tools or equipment	179	163	153	130	142
#10 - Station Maintenance	55	166	235	161	123
#11 - Deploying and extending hoseline	106	113	117	100	119
#12 - Driving/riding in a vehicle	92	166	119	77	100
#13 - Administrative work	n/a	61	37	156	98
#14 - Rescue: other	183	126	126	64	79
#15 - Remove/return equip to apparatus	n/a	76	76	71	72
All others	564	665	617	570	760
<b>Total</b>	<b>4,090</b>	<b>3,881</b>	<b>3,780</b>	<b>6,406</b>	<b>6,495</b>

**Figure 5: Top 15 Tasks at Time of Injury, 2017 – 2021**



## Injuries by Body Part

**Table 10: Injuries by Body Part, 2017**

<b>Injured Body Part</b>	<b>2017</b>
Multiple body parts, whole body	1,064
Hand and fingers	365
Knee	315
Hip, lower back, or buttocks	292
Back, except spine	248
Shoulder	221
Ankle	179
Multiple parts	151
Face	127
Arm, lower, not including elbow or wrist	121
Leg, lower	113
Foot and toes	87
Head	78
Ear	76
Chest	76
Eye	73
Multiple body parts, upper body	73
Elbow	72
Wrist	56
Other body parts injured	303
<b>Total</b>	<b>4,090</b>

Because TCFP migrated to a new data management system in 2017, the data collected in years 2018-2021 is categorized differently than it had been in prior years. This is why Table 10 only goes through 2017, and we now have new tables (11 & 12) for 2018 - 2021 data.

**Table 11: Injuries by Body Part Type, 2018 – 2021**

<b>Injured Body Part</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Upper Extremities	864	795	700	812
Lower Extremities	810	684	616	724
Back	490	466	445	492
Internal	105	125	144	402
Multiple Parts	318	255	281	284
Head	300	327	197	248
Chest	104	108	107	124
Hip	23	33	29	35
Neck	64	56	33	38
<b>Total</b>	<b>3,078</b>	<b>2,849</b>	<b>2,552</b>	<b>3,159</b>

**Table 12: Injuries by Body Part Sub-Type, 2018 – 2021**

<b>Body Part by Sub-Type</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Back: Back	198	194	191	191
Back: Buttocks	1	3	2	2
Back: Lower Back	282	258	248	287
Back: Neck	4	4	1	8
Back: Spine	5	7	3	4
Chest: Abdomen	5	4	2	3
Chest: Abdominal Area	10	4	9	5
Chest: Chest	89	100	96	116
Head: Brain	n/a	n/a	n/a	7
Head: Cheek	5	7	4	7
Head: Chin	7	1	4	2
Head: Ear	77	117	50	52
Head: Eye	64	60	44	50
Head: Face	111	112	78	57
Head: Forehead	n/a	n/a	n/a	3
Head: Jaw	1	6	2	2
Head: Mouth	15	16	10	8

Head: Nose	20	8	3	9
Head: Skull	n/a	n/a	2	51
Hip: Groin	9	14	9	12
Hip: Hip	13	18	18	23
Hip: Pelvis	1	1	2	0
Internal: Genito-urinary	4	11	4	1
Internal: Heart	5	7	4	6
Internal: Internal	66	71	74	264
Internal: Intestinal tract	5	4	3	2
Internal: Lungs	9	11	51	114
Internal: Stomach	15	20	8	14
Internal: Trachea	1	1	0	1
Lower Extremities: Ankle	206	163	135	171
Lower Extremities: Foot	93	88	78	78
Lower Extremities: Knee	347	273	252	316
Lower Extremities: Lower leg	111	97	95	104
Lower Extremities: Toes	15	22	13	14
Lower Extremities: Upper Leg	38	41	43	41
Multiple Parts: Lower Body	26	19	20	15
Multiple Parts: Unknown	26	11	27	22
Multiple Parts: Upper Body	74	76	65	74
Multiple Parts: Whole Body	192	149	169	173
Neck: Neck	59	49	30	37
Neck: Throat	5	7	3	1
Upper Extremities: Elbow	68	44	34	44
Upper Extremities: Hands	361	326	319	315
Upper Extremities: Lower Arm	10	59	55	55
Upper Extremities: Shoulder	234	235	170	270
Upper Extremities: Upper Arm	112	72	45	68
Upper Extremities: Wrist	79	59	77	60
<b>Total</b>	<b>3,078</b>	<b>2,849</b>	<b>2,552</b>	<b>3,159</b>

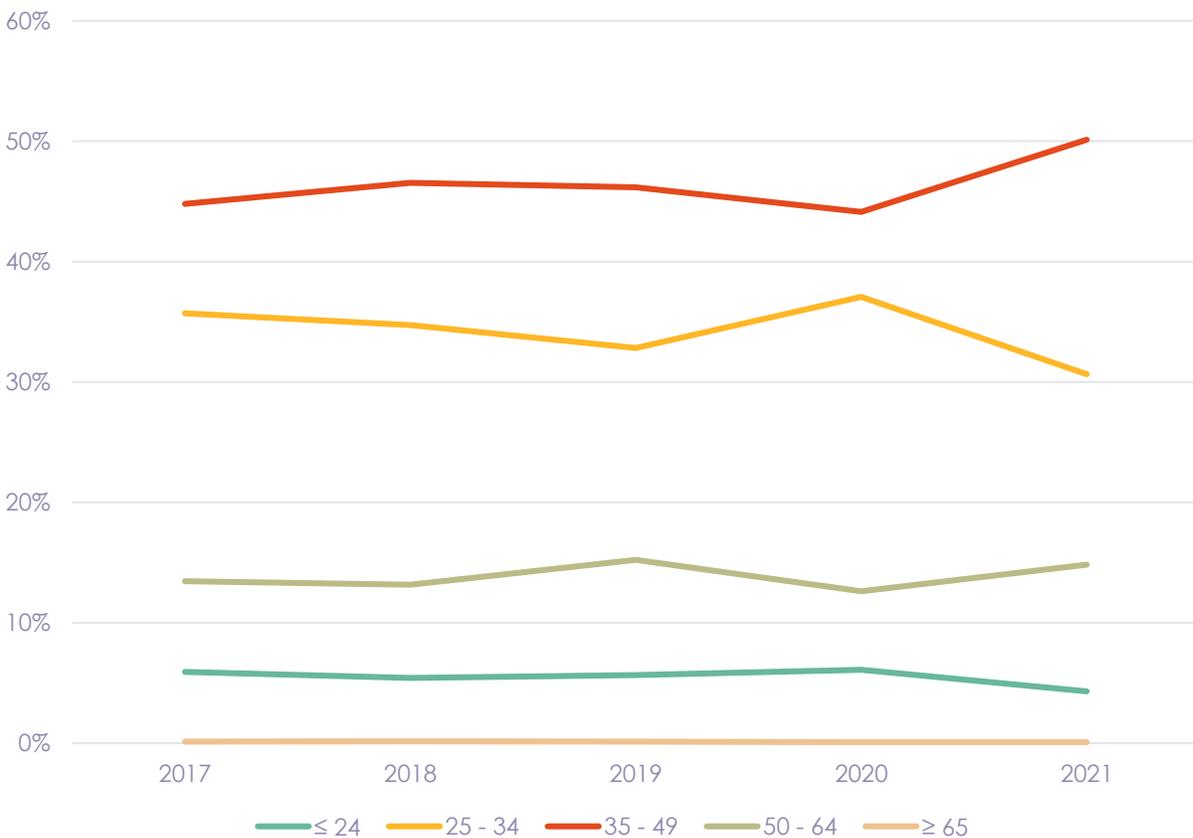
# Individuals by Age Group

**Table 13: Individuals by Age Group\*, 2017 – 2021**

Age Group	2017		2018		2019		2020		2021	
	Count	Percent								
≤ 24	242	5.92%	210	5.41%	210	5.65%	389	6.10%	279	4.31%
25 - 34	1,460	35.70%	1,348	34.73%	1,220	32.82%	2,365	37.07%	1,986	30.65%
35 - 49	1,832	44.79%	1,806	46.53%	1,716	46.17%	2,815	44.13%	3,248	50.12%
50 - 64	550	13.45%	511	13.17%	566	15.23%	805	12.62%	961	14.83%
≥ 65	6	0.15%	6	0.15%	5	0.13%	5	0.08%	6	0.09%
<b>Totals</b>	<b>4,090</b>	<b>100.00%</b>	<b>3,881</b>	<b>100.00%</b>	<b>3,717</b>	<b>100.00%</b>	<b>6,379</b>	<b>100.00%</b>	<b>6,480</b>	<b>100.00%</b>

\*Includes injured individuals and individuals with exposures.

**Figure 6: Individuals by Age Group, percentages, 2017 – 2021**



## Activities Resulting in Lost Time

**Table 14: Activities Individuals Were Doing that Resulted in Lost Time, 2021 Totals**

Activity	Count	Days Missed	
		Average	Sum
EMS	694	20	14,414
Station Duties	511	18	9,238
Fire suppression	92	42	3,915
Skills training	82	47	3,880
Wellness/fitness	79	38	3,009
Responding to incident	22	39	860
Rescue - nonfire-related	15	34	518
Returning from incident	17	23	393
Rescue - fire-related	9	24	223
Fire prevention	9	13	121
Hazmat	1	9	9
<b>Total</b>	<b>1,531</b>	<b>28</b>	<b>36,580</b>

**Table 15: Activities Individuals Were Doing that Resulted in Lost Time, 2021 Between 1 and 30 days**

Activity	Count	Days Missed	
		Average	Sum
EMS	621	13	8,229
Station Duties	476	10	4,813
Wellness/fitness	50	13	683
Fire suppression	64	10	692
Skills training	58	10	617
Responding to incident	15	10	156
Rescue - nonfire-related	10	13	137
Fire prevention	9	13	121
Rescue - fire-related	6	15	93
Returning from incident	13	7	100
Hazmat	1	9	9
<b>Total</b>	<b>1,323</b>	<b>11</b>	<b>15,650</b>

**Table 16: Activities Individuals Were Doing that Resulted in Lost Time, 2021  
Between 31 and 90 days**

Activity	Count	Days Missed	
		Average	Sum
EMS	52	50	2,612
Wellness/Fitness	22	50	1,118
Station Duties	17	57	970
Fire Suppression	12	50	611
Skills Training	12	56	682
Responding to incident	4	47	191
Rescue - nonfire-related	3	57	173
Rescue - fire-related	3	43	130
Returning from incident	2	47	95
<b>Total</b>	<b>127</b>	<b>51</b>	<b>6,582</b>

**Table 17: Activities Individuals Were Doing that Resulted in Lost Time, 2021  
91+ days**

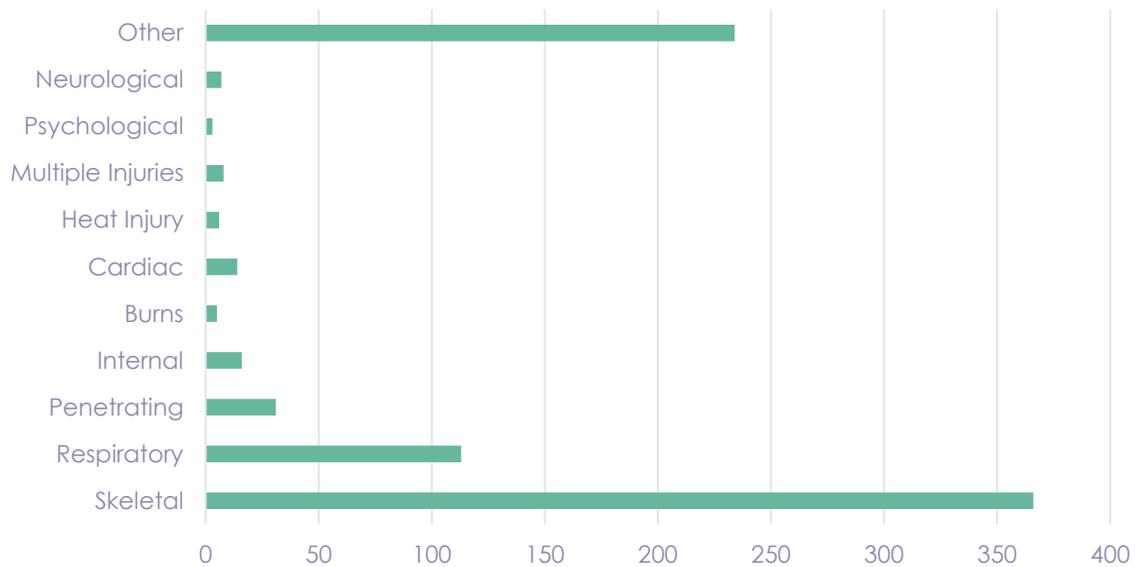
Activity	Count	Days Missed	
		Average	Sum
Fire Suppression	16	163	2,612
EMS	21	170	3,573
Station Duties	18	191	3,455
Skills Training	12	215	2,581
Responding to incident	3	171	513
Wellness/Fitness	7	172	1,208
Rescue - nonfire-related	2	104	208
Returning from incident	2	99	198
<b>Total</b>	<b>44</b>	<b>159</b>	<b>8,163</b>

# Types of Injuries with Lost Time

**Table 18: Types of Injuries Resulting in Lost Time, 2021**

Type of Injury	Count
Skeletal	366
Respiratory	113
Penetrating	31
Internal	16
Burns	5
Cardiac	14
Heat Injury	6
Multiple Injuries	8
Psychological	3
Neurological	7
Other	234
<b>Total</b>	<b>803</b>

**Figure 7: Types of Injuries Resulting in Lost Time, 2021**



## Burn Injuries

**Table 19: All Burns, 2017 – 2021**

<b>All Burns - Types</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Heat/Fire (thermal)	96	108	72	80	66
Scald or Steam	13	12	10	11	12
Chemical	4	6	6	2	3
Electrical	0	1	2	3	4
<b>Totals</b>	<b>113</b>	<b>127</b>	<b>90</b>	<b>96</b>	<b>85</b>

**Table 20: Burns by Body Part Sub-Type, 2021**

<b>Body Part Sub-Type</b>	<b>Count</b>
Back: Back	2
Back: Buttocks	0
Back: Lower Back	0
Back: Neck	0
Back: Spine	0
Chest: Abdomen	0
Chest: Abdominal Area	0
Chest: Chest	0
Head: Brain	0
Head: Cheek	1
Head: Chin	0
Head: Ear	13
Head: Eye	2
Head: Face	2
Head: Forehead	1
Head: Jaw	0
Head: Mouth	0
Head: Nose	1
Head: Skull	0
Hip: Groin	0
Hip: Hip	1

Internal: Genito-urinary	0
Internal: Heart	0
Internal: Internal	0
Internal: Intestinal tract	0
Internal: Lungs	0
Internal: Stomach	0
Internal: Trachea	0
Lower Extremities: Ankle	1
Lower Extremities: Foot	3
Lower Extremities: Knee	0
Lower Extremities: Lower Leg	3
Lower Extremities: Toes	0
Lower Extremities: Upper Leg	0
Multiple Parts: Lower Body	0
Multiple Parts: Unknown	0
Multiple Parts: Upper Body	7
Multiple Parts: Whole Body	3
Neck: Neck	2
Neck: Throat	0
Upper Extremities: Elbow	2
Upper Extremities: Hands	24
Upper Extremities: Lower Arm	8
Upper Extremities: Shoulder	3
Upper Extremities: Upper Arm	3
Upper Extremities: Wrist	3
<b>Total</b>	<b>85</b>

**Table 21: Burns by Body Part, 2017 – 2021, Comparison to Historical Data**

<b>Body Part</b>	<b>2017</b>	<b>2018*</b>	<b>2019*</b>	<b>2020*</b>	<b>2021*</b>
Ear	16	17	17	12	13
Hand and fingers	22	30	16	20	24
Face	9	14	10	12	5
Wrist	7	8	11	9	3
Multiple body parts, upper body	4	10	6	11	7

Eye	0	4	5	3	2
Hip, lower back, or buttocks	0	0	5	0	1
Foot and toes	1	6	4	4	3
Multiple parts	12	5	4	0	3
Arm, upper, not including elbow or shoulder	2	11	3	0	3
Lower extremities	0	8	3	3	4
Chest	1	2	2	0	0
Neck	7	2	2	2	2
Knee	2	0	1	1	0
Shoulder	6	9	1	4	3
Back, except spine	2	1	0	0	2
Elbow	1	0	0	1	2
Pelvis or groin	2	0	0	0	0
Throat	0	0	0	0	0
Arm, lower, not including elbow or wrist	12	n/a	n/a	14	8
Head	1	n/a	n/a	n/a	0
Leg, lower	3	n/a	n/a	n/a	n/a
Upper extremities	0	n/a	n/a	n/a	n/a
Neck and shoulders	1	n/a	n/a	n/a	n/a
Undetermined	2	n/a	n/a	n/a	n/a
<b>Total</b>	<b>113</b>	<b>127</b>	<b>90</b>	<b>96</b>	<b>85</b>

\*The data we collected prior to 2018 was significantly different in that we used different injury categories (like body parts) back then. In order to get a full five-year picture, the 2018 – 2021 columns were pieced together from the data in *Table 20: Burns by Body Part Sub-Type* and then compared with what we have from 2017.

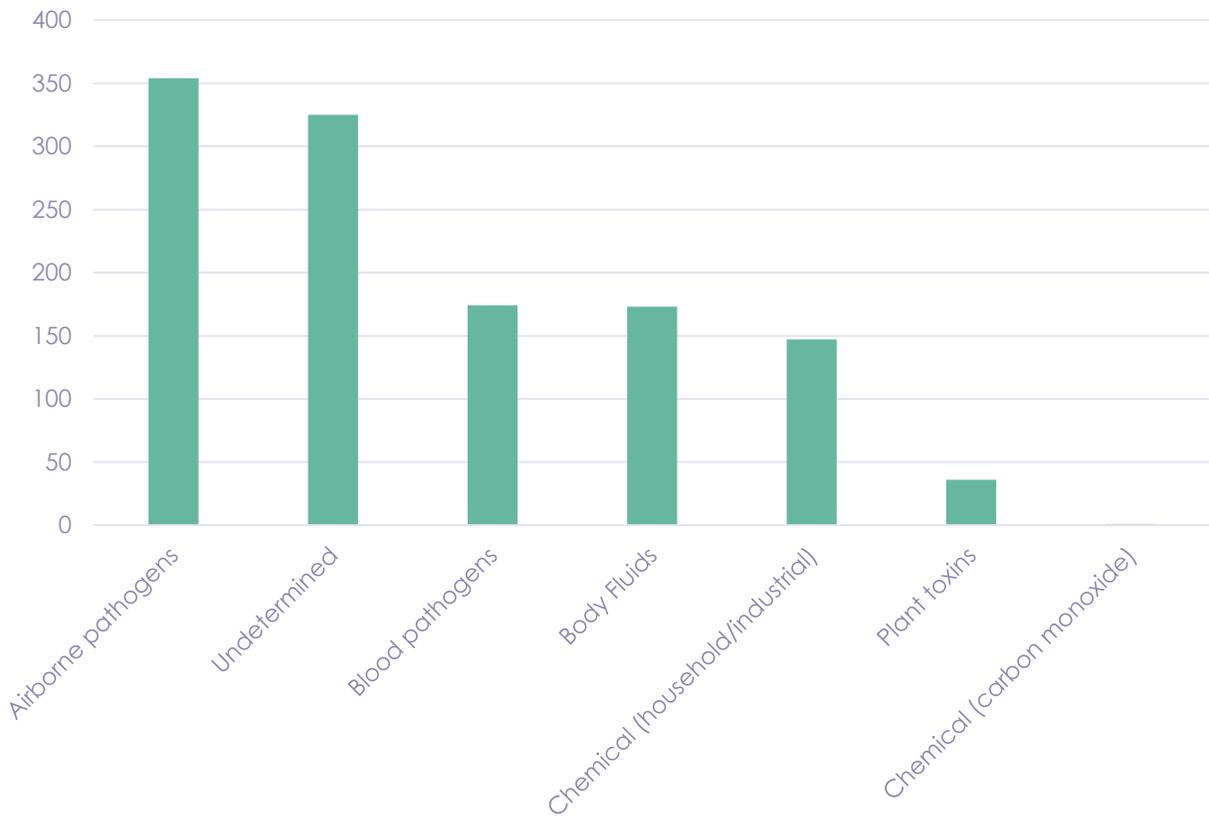
# Exposures

**Table 22: Routes of Exposure, Historical Data, 2017**

<b>Exposure Routes</b>	<b>2017</b>
Airborne pathogens	354
Undetermined	325
Blood pathogens	174
Body Fluids	173
Chemical (household/industrial)	147
Plant toxins	36
Chemical (carbon monoxide)	1
<b>Total</b>	<b>1,210</b>

Tables 22, 23, and Figure 8, show historical data from 2017. This was done in order to present a full five-year period of data that was collected related to exposures. Because TCFP migrated to a new data management system in 2017, the data collected from 2018 onward was categorized differently than it had been through 2017, and this is why there are separate tables and figures presented for 2017.

**Figure 8: Routes of Exposure, Historical Data, 2017**



**Table 23: Exposure Description, Historical Data, 2017**

<b>Exposure description</b>	<b>2017</b>
Unknown	290
Blood	153
Chemicals/household/industrial	122
Asbestos	112
Tuberculosis	109
Body fluids	101
Meningitis	104
Animals or wildlife	58
Sickness, other	49
Poison plants	37
Vomit	17
Chlorine	14
Mold	10
Airborne, other	7
Staph	7
Carbon monoxide	5
HIV	4
Scabies	4
Hepatitis C	3
MRSA	3
Bacterial pneumonia	1
Explosive residue	0
Influenza	0
Lice	0
Strep	0
<b>Total</b>	<b>1,210</b>

**Table 24: Exposure by Sub-Type, 2018 – 2021**

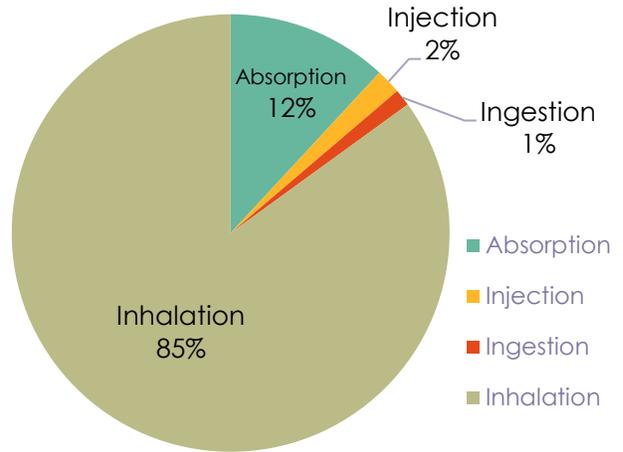
<b>Exposure + Sub-Type</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Chemical: Ammonia	1	3	0	6
Chemical: Battery Acid*	n/a	4	0	2
Chemical: Benzene	2	15	1	1
Chemical: Bleach	1	11	0	2
Chemical: Not listed	151	160	70	40
Chemical: Unidentified	73	55	27	34
Physical: Animal venom	6	17	5	7
Physical: Meningitis	38	40	33	3
Physical: Not listed	138	201	42	27
Physical: Plant toxin	27	14	12	24
Physical: Radiation*	n/a	4	1	0
Physical: Unidentified	87	66	13	17
Physical: UV Light*	n/a	2	1	0
Respiratory: Blood	69	73	78	54
Respiratory: COVID 19*	n/a	1	1,715	2,878
Respiratory: Influenza	4	19	7	2
Respiratory: Not listed	108	118	56	8
Respiratory: Saliva	24	22	28	15
Respiratory: Tuberculosis	98	76	31	16
Respiratory: Unidentified	50	37	6	19
Respiratory: Vomit	7	8	13	4
Other: Asbestos*	n/a	3	1	109
Other: Carbon Monoxide*	n/a	1	6	2
Other: Carcinogenic Substances*	n/a	1	13	15
Other: Contaminated Water/Sewage*	n/a	4	11	8
Other: Chlorine	n/a	n/a	n/a	6
Other: Heavy Metals*	n/a	0	1	0
Other: Mold*	n/a	0	9	4
Other: Smoke/Products of Combustion*	n/a	5	19	37
Other: Virus	n/a	3	1,878	266
<b>Total</b>	<b>884</b>	<b>963</b>	<b>4,077</b>	<b>3,606</b>

\*These exposure types were added to the injury reporting application in 2019, which is why they have n/a in the numbers column for 2018.

**Table 25: Exposure by Route, 2021**

Route	Count
Inhalation	3,065
Absorption	429
Injection/Puncture	67
Ingestion	45
<b>Total</b>	<b>3,606</b>

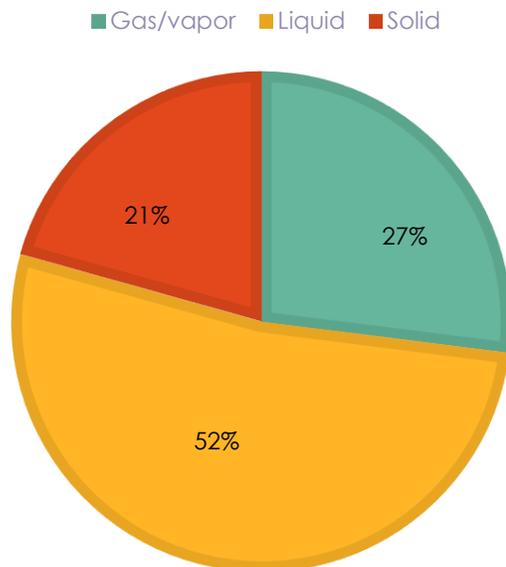
**Figure 9: Exposure by Route, 2021, percentages**



**Table 26: Exposure by Substance, 2021**

Substance	Count
Liquid	1,888
Gas/vapor	973
Solid	745
<b>Total</b>	<b>3,606</b>

**Figure 10: Exposure by Substance, 2021, percentages**



# Cancer

In June of 2019, the Governor of Texas signed Senate Bill 2551 (SB 2551) which expanded the scope of the law in which firefighters and EMTs who suffer from cancer are presumed to have developed the condition during the course and scope of their employment. The types of cancer this law addresses include:

- cancers that originate at the stomach, colon, rectum, skin, prostate, testis or brain
- non-Hodgkin's lymphoma
- multiple myeloma
- malignant melanoma
- renal cell carcinoma

TCFP received **41** reports of cancer diagnoses from fire departments in 2021:

Skin/Melanoma/Basal Cell/Squamous Cell carcinoma – 6 reports  
(Males, ages 29, 42, 46, 46, 47, 49)

Prostate – 6  
(Males – 43, 43, 52, 55, 56, 60)

Testicular – 3  
(Males – 29, 40, 45)

Kidney/renal cell carcinoma – 2  
(Males – 27, 53)

Thyroid – 2  
(Males – 34, 58)

Colon – 1  
(Male - 61)

Adenoid cystic carcinoma – 1  
(Male – 52)

Unidentified to TCFP – 17  
(Males – 24, 35, 38, 38, 38, 38, 43, 46, 54, 54, 56, 56, 57, 58, 58)  
(Females – 18, 18)

## A Reminder for Fire Departments

Any injuries to fire protection personnel that are reported to the Texas Worker's Compensation Commission must be reported to the Texas Commission on Fire Protection. This includes cancer diagnoses.

**The commission strongly encourages fire departments to report cancer diagnoses;** the commission recognizes that the number of job-related cancers reported during this time-period represents only a fraction of the cases that Texas fire departments are currently

managing. There is a growing awareness of the impact that cancer is having on fire protection personnel nationwide, and the commission urges departments to use this reporting tool to help contribute to the education and awareness of the issue in Texas.

## SOP Issues

In 2021 there were 12 injuries attributed to failures of fire protection personnel to follow their departments' standard operating procedures (SOPs). All but a few were instances where the individuals were not wearing their provided PPE/SCBA gear in an environment or situation in which they should have been wearing it.

In its compliance inspections, the Texas Commission on Fire Protection verifies that fire departments have written SOPs that cover the appropriate subject matter.

**Table 27: Injuries Attributed to SOP Issues, 2021**

Activity	Minor	Serious	Total	Previous years' totals			
				2020	2019	2018	2017
EMS	1	0	1	18	11	9	7
Fire Suppression	5	3	8	10	10	19	9
Skills Training	2	0	2	5	1	2	2
Responding to Incident	0	0	0	2	0	1	3
Station Duties	0	1	1	2	6	1	4
Wellness/Fitness	0	1	1	1	1	0	1
<b>Totals</b>	<b>8</b>	<b>5</b>	<b>13</b>	<b>38</b>	<b>29</b>	<b>32</b>	<b>26</b>

**Table 28: Injuries Attributed to PPE & PASS Failures, 2021**

Activity	Minor	Serious	Fatal	Total	Previous years' totals			
					2020	2019	2018	2017*
Fire Suppression	4	0	0	4	7	2	8	n/a
EMS	1	0	0	1	4	0	1	n/a
Skills Training	1	0	0	1	1	2	2	n/a
Station Duties	1	0	0	1	0	1	0	n/a
<b>Totals</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>12</b>	<b>5</b>	<b>11</b>	<b>n/a</b>

\*TCFP did not start collecting information on PPE & PASS failures until 2018.

# Recommendations

The commission would like to thank Texas fire departments for their ongoing participation in reporting fire protection personnel injuries. This report would not be possible without their efforts.

Based on their review of the data contained within this report, the commission offers the following recommendations and reminders for the Texas Fire Service:

1. *NFPA 1851: Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* is required by state law.
2. Review the following updated legislation:
  - TX Gov't Code 607 (benefits relating to certain diseases and illnesses)
  - HB 2073, Legislative Session 87R (quarantine leave)
  - HB 2143, Legislative Session 86R (workers comp & PTSD)
  - SB 22, Legislative Session 87R (presumptive claims for benefits)
3. Continually review and practice roadway safety and traffic incident management practices.
4. Review all of your department's SOPs with a focus on injury prevention.

# Commission-Adopted Standards

The commission has adopted several NFPA and other nationally recognized standards to help keep Texas fire protection personnel safe. This list summarizes the relationships between some of the Texas laws and national standards and is not intended to be all-inclusive:

## Texas Government Code

[§419.040, Protective Clothing](#)

[§419.041, Self-Contained Breathing Apparatus](#)

[§419.042, Personal Alert Safety Systems](#)

[§419.043, Applicable National Fire Protection Association Standard](#)

[§419.044, Incident Management System](#)

[§419.045, Personnel Accountability System](#)

[§419.046, Fire Protection Personnel Operating at Emergency Incidents](#)

[§419.047, Commission Enforcement](#)

## Texas Administrative Code

[CHAPTER 425 FIRE SERVICE INSTRUCTORS](#)

[§443.9 National Fire Protection Association Standard](#)

[CHAPTER 435 FIRE FIGHTER SAFETY](#)

[§435.21 Fire Service Joint Labor Management Wellness-Fitness Initiative](#)

[§435.23 Fire Fighter Injuries](#)

[§435.25 Courage to be Safe So Everyone Goes Home Program](#)

[§435.27 Live Fire Training Structure Evolutions](#)

[CHAPTER 451 FIRE OFFICER](#)

[CHAPTER 457 INCIDENT SAFETY OFFICER CERTIFICATION](#)

Commission's web page

[NFPA Standards adopted by the commission](#)