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# 2017 ANNUAL REPORT

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## Tracking Work-Related Deaths in Michigan



**MICHIGAN**

State **FACE** Program

**Fatality Assessment & Control Evaluation**

Michigan State University  
Department of Medicine • Occupational and Environmental Medicine  
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# **2017 Annual Report**

## **Tracking Work-Related Deaths in Michigan**

A Joint Report  
of  
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## ***Executive Summary***

The Division of Occupational and Environmental Medicine (OEM) at Michigan State University (MSU) began tracking work-related fatalities in the state of Michigan in January 2001. This is the 17<sup>th</sup> annual Michigan Fatality Assessment and Control Evaluation (MIFACE) report on acute traumatic work-related deaths in Michigan. There were **153 work-related deaths in 2017**, a decrease of 9 deaths compared to 2016. There were 151 separate incidents (two deaths occurred in each of two separate incidents). A narrative summary of each work-related fatality is in [Appendix I](#). MIFACE educational material, including on-site Investigation Reports, Summaries of MIOSHA Investigations, and Hazard Alerts are located on the MIFACE webpage on the Michigan State University Division of Occupational & Environmental Medicine ([MSU OEM](#)) website. Key findings for 2017:

- The number of work-related deaths (153) and the fatal injury rate (3.3 deaths/100,000 workers) were down compared to 2016 (162 work-related fatalities, 3.5/100,000 workers).
- The overall rate of work-related deaths in Michigan is lower than the rate in the United States. This is also true for the manufacturing sector but not the agriculture, construction or public administration sectors.
- Construction (29 deaths, 19.0% of all fatalities) had the largest *number* of work-related deaths and the third highest *risk* of death (17.9 deaths/100,000 workers). Agriculture, Forestry, Fishing, and Hunting the second highest number of deaths (19, 12.4%) and the highest risk of death (22.1 deaths/100,000 workers). Arts, Entertainment, and Recreation had the second highest risk (20.8 deaths/100,000 workers).
- Motor vehicle crashes were the leading cause of a work-related death (28, 18.3%). Struck by incidents were the second leading causes of death (27, 17.6%) followed by falls (26, 17.0%) and homicides (25, 16.3%).
- Individuals who died were most likely to be men (90.8%) and Caucasian (79.1%). The average age was 47.6 years old and ranged from 17 to 90 years of age.
- Illegal drugs, alcohol or side effects of prescribed and over-the-counter medication were potential factors in 21.1% of the non-suicide and non-drug abuse deaths.
- By occupational group, Management had the largest number of work-related deaths (28) followed by Construction & Extraction (26) and then Transportation & Material Moving (23).
- Forty-three of Michigan's 83 (51.8%) counties had a work-related fatality. Wayne County had the highest number (36, 23.5%), followed by Oakland and Genesee Counties (10 each, 6.5%).
- Of the 153 work-related fatalities, 41 (26.8%) were MIOSHA program-related and were investigated by a MIOSHA compliance officer.

## Definitions

A **traumatic injury** is any unintentional or intentional wound or damage to the body resulting from acute exposure to energy or from the absence of such essentials as heat or oxygen caused by a specific event, incident or series of events within a single workday or shift.

**Work** is defined as legal duties, activities or tasks that produce a product as a result and that are done in exchange for money, goods, services, profit or benefit.

A **work relationship** exists if an event or exposure results in the fatal injury or illness of a person:

- (1) ON the employer's premises and person is there to work; or
- (2) OFF the employer's premises and person is there to work, or the event or exposure was related to the person's work or status as an employee.

**Incidence** means the number of new cases of an illness, injury, or other health-related event that commence during a specified time period in a specified population.

## Background

In 2001, MSU OEM instituted a tracking program for all traumatic work-related deaths, first with financial assistance from LARA and then from the National Institute of Occupational Safety and Health (NIOSH). This is a joint project of LARA/MIOSHA and MSU OEM.

The purpose of the MIFACE tracking project is three-fold:

- Identify the types of industries and work situations where workers are dying from acute traumatic incidents;
- Identify the underlying causes of the work-related fatality, and
- Formulate and disseminate prevention strategies to reduce future work-related fatalities.

MIFACE uses the National Institute of Occupational Safety and Health (NIOSH) Fatality Assessment and Control Evaluation (FACE) as a model. Since 1982, NIOSH has funded selected states to operate a state FACE program. MIFACE investigations have provided aggregate data to identify high-risk industries and work practices as well as provided the stories or “faces” necessary to make the statistics real and influence change in the workplace. Emphasis on information dissemination and translation of information into user-friendly materials is an important part of the MIFACE program.

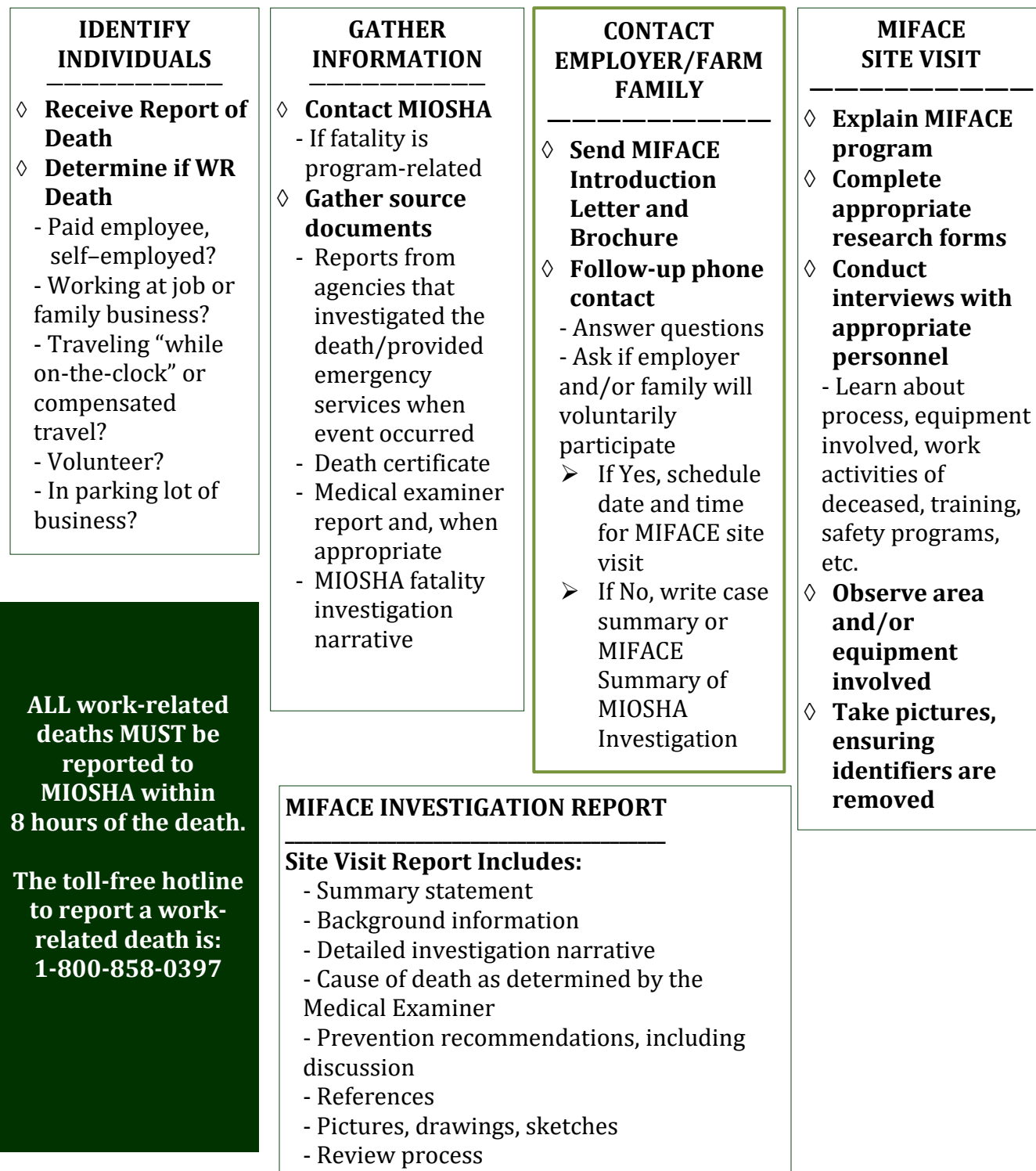
The MSU OEM webpage has many resources available to assist employers, employees, safety and health professionals and others to understand more about work-related illnesses, injuries and deaths.

*Who is Included?* Any individual of any age who meets the criteria of “at work”, including volunteers and prison inmates, who are exposed to the same work hazards and perform the same duties or functions as paid employees. Suicides are included, following the protocol established by the NIOSH FACE program and the Bureau of Labor Statistics (BLS), which collects the official work-related death statistics in all states.

*Who is Not Included?* Individuals who die while “at work” from diseases, such as a heart attack or stroke, individuals commuting to/from work, volunteers not working for a non-profit, students, and homemakers.

## Methods

MIFACE utilizes multiple sources to identify work-related fatalities in Michigan: MIOSHA, Death Certificates, Newspapers, Medical Examiners, Police/Fire/EMT Departments, Workers' Compensation Agency, MSU Extension, Michigan Farm Bureau, Federal Agencies (MSHA, NTSB, etc.), Internet searches, and Michigan citizens reporting a work-related death.



## **FOLLOW-UP ACTIVITIES**

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### ◇ **Identify Stakeholders**

- Internet search for similar companies and/or trade groups

### ◇ **Update Database**

- Information collected from each site visit and statewide tracking entered into a database

### ◇ **Analyze Data**

- Annual Report developed analyzing and discussing data

### ◇ **Educational Outreach**

- MIFACE Summary of MIOSHA Investigation if MIOSHA investigation takes place
- Hazard Alert
- Post on MSU OEM website:
  - Investigation Report
  - MIFACE Summary of MIOSHA Investigation
  - Hazard Alert
- Send notice of posted publications to MIFACE e-mail distribution list
- Guest speaker, display booths at health and safety conferences, industry trade group training programs

The level of information collected for each fatality depended on the type of incident.

For homicides, suicides and most transportation-related fatalities that occurred while the individual was at work, MIFACE collected only source documents.

For many of the remaining work-related fatalities including agricultural fatalities, MIFACE initiated contact with employers or farm family members to request permission for an on-site investigation. It is important to note that MIFACE investigators did not enforce compliance with Michigan Occupational Safety and Health Act (MIOSHA) rules and regulations and did not assign fault or blame. However, to decrease the burden to the employer of multiple investigations, MIFACE accompanied the MIOSHA compliance officer with employer agreement. In addition, MIFACE interviewed the compliance officers about their investigation.

All photographs used in this annual report are courtesy of MIOSHA, the responding police department or pictures taken at the time of the MIFACE investigation. Photographs have been modified as necessary to remove identifiers.



## Results

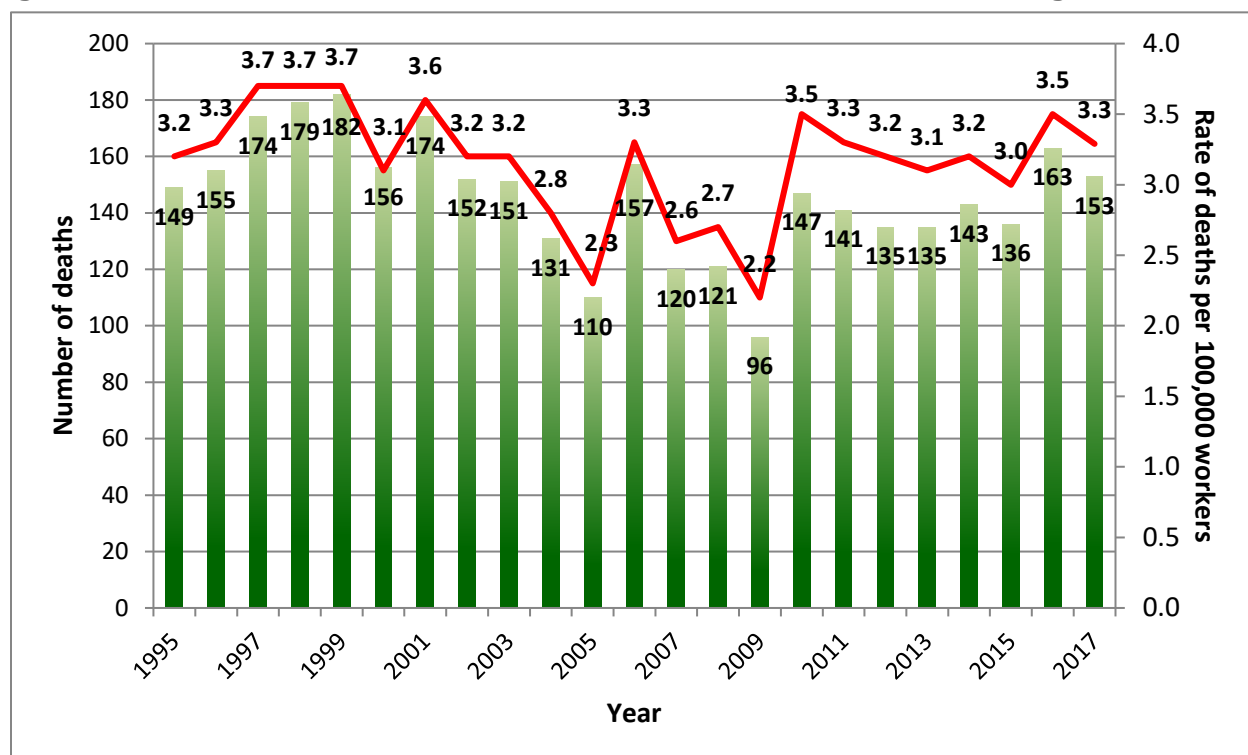
**There were 153 acute traumatic work-related fatalities in 2017.** One hundred forty-eight (96.7%) of the 153 work-related traumatic incidents occurred in 2017; a description of the five individuals who died in 2017 due to complications from a work-related injury sustained in a previous year follows:

- A male construction worker in his 50s died from complications of a 1977 fall at a construction site.
- A male airline baggage handler in his 80s died from complications related to a hernia that developed while lifting baggage in 2015.
- A male auto parts salvage worker in his 50s died from complications of a crushing injury from a vehicle falling on top of him in 1984.
- A male lathe operator in his 70s died from complications of a worksite fall in 1989.
- A male police officer in his 70s died from complications of multiple gunshot wounds sustained while responding to an armed robbery in 1972.

The 153 individuals who died had 151 different employers. An automobile manufacturing company had two employees die in two separate incidents, while a candy importing company had two employees die in homicides that were five days apart but thought to be linked (considered by MIFACE here as one incident).

**Figure 1** shows the number of acute traumatic work-related deaths and incidence rate per year in Michigan since 1995.

**Figure 1. Number and Incidence Rate of Work-Related Fatalities in Michigan, 1995-2017**



In Figure 1, the **red** line shows incidence rate per 100,000 workers. The **green** columns show the number of work-related deaths per year. Incidence rates shown from 1995-2000 were obtained from the [BLS](#) website. Rates shown for 2001-2017 were determined from MIFACE statistics.

## Demographics

**Table 1** shows the demographic characteristics of the 153 traumatic work-related fatalities in Michigan in 2017. Demographic characteristics were obtained from the individual's death certificate.

### *Race*

Of the 139 males who died, 110 were Caucasian and 24 were African American. Two were reported as Arab, two as Hispanic, and one as "Other". Fourteen women, 11 Caucasian and 3 African American, died in a work-related incident.

Ten individuals were of Hispanic ethnicity, including 8 men and 2 women. Death certificates indicated the race as Caucasian for 2 of the 10 Hispanic individuals.

### *Age*

The age at time of death ranged from 17 to 90 years. The average age was 47.6 years, up slightly from 47.0 years of age in 2016. For men, the ages ranged from 17-90 years, and for women, the ages ranged from 19-53 years. The average age for men at the time of death was 48.8 years; for women, it was 35.7 years (**Table 1**).

Twenty-three individuals were 66 years of age or older when they died compared to 16 individuals in 2016.

**Table 1. Demographic Characteristics\* of 153 Work-Related Fatalities, Michigan 2017**

Demographic Characteristics	Number	Percent
<b>Gender</b>		
Male	139	90.8
Female	14	9.2
<b>Race</b>		
White	121	79.1
Black	27	17.6
Hispanic	2	1.3
Arab	2	1.3
Other	1	0.7
<b>Age</b>		
<20	6	3.9
20-29	22	14.4
30-39	24	15.7
40-49	30	19.6
50-59	32	20.9
60-69	24	15.7
70-79	11	7.2
80-89	2	1.3
90+	2	1.3
<b>Education</b>		
Less than High School	24	15.7
High School Graduate	57	37.3
GED	6	3.9
Some College (1-4 years)	46	30.1
Post College (5+ years)	6	3.9
Vocational School	5	3.3
Unknown	9	5.9
<b>Country of Origin</b>		
United States	146	95.4
Mexico	4	2.6
Albania	1	0.7
Canada	1	0.7
Lebanon	1	0.7
<b>Totals</b>	<b>153</b>	

\* Source: Death Certificate (percent may not add to 100 due to rounding)

Six (26.1%) of the 23 individuals aged 66 years or older died due to a fall, six (26.1%) due to a struck-by incident, three (13.0%) to a machine-related incident, two (8.7%) from explosions/fires, two in motor vehicle incidents (8.7%), two (8.7%) from a homicide, one (4.3%) from drowning and one (4.3%) from medical complications due to a hernia.

**Table 2** describes the age distribution of the victims across industry sectors.

<b>Table 2. Traumatic Work-Related Fatalities by Age of Victim and Industry Sector, Michigan 2017</b>				
<b>Industry Sector (NAICS Code)</b>	<b>0-17</b>	<b>18-65</b>	<b>66+</b>	<b>Total</b>
	<b>Number</b>	<b>Number</b>	<b>Number</b>	
Agriculture, Forestry, Fishing & Hunting (11)	--	13	6	<b>19</b>
Construction (23)	1	25	3	<b>29</b>
Manufacturing (31-33)	--	8	3	<b>11</b>
Wholesale Trade (42)	--	7	1	<b>8</b>
Retail Trade (44-45)	1	10	1	<b>12</b>
Transportation & Warehousing (48-49)	--	10	2	<b>12</b>
Information (51)	--	1	--	<b>1</b>
Finance and Insurance (52)	--	1	--	<b>1</b>
Real Estate & Rental & Leasing (53)	--	3	--	<b>3</b>
Professional, Scientific, & Technical Services (54)	--	2	--	<b>2</b>
Administrative & Support & Waste Management & Remediation Services (56)	--	9	1	<b>10</b>
Educational Services (61)	--	1	1	<b>2</b>
Health Care & Social Assistance (62)	--	5	--	<b>5</b>
Arts, Entertainment & Recreation (71)	--	9	2	<b>11</b>
Accommodation & Food Services (72)	--	6	1	<b>7</b>
Other Services (except Public Administration) (81)	--	11	1	<b>12</b>
Public Administration (92)	--	7	1	<b>8</b>
<b>Totals</b>	<b>2</b>	<b>128</b>	<b>23</b>	<b>153</b>

Nationally, the hours-based fatal work injury rate (per 100,000 FTE workers) for individuals aged 65 and over was 10.3 ([https://www.bls.gov/iif/oshwc/cfoi/cfoi\\_rates\\_2017hb.xlsx](https://www.bls.gov/iif/oshwc/cfoi/cfoi_rates_2017hb.xlsx)). Although not directly comparable, Michigan's employment-based fatality rate for workers aged 65 and over was 12.2/100,000 in 2017 (**Table 3**). While the percentage of individuals 65 years of age and older (15.6%) was smaller than other age categories this age group had the highest fatality rate of all age groups, 11.2 deaths per 100,000 workers (Table 3).

**Table 3. Employment Number, Percent of the Civilian Non-institutional Population Employed and Fatality Rate by Age Group, Michigan 2017**

Age Range (in years)	Employment		Number of Deaths	Fatality Rate (per 100,000)
	Number (in thousands)	% of Civilian non- institutional Population within age category that is employed		
16-19	175	35.4	6	3.4
20-24	435	69.3	9	2.1
25-34	1,046	78.8	27	2.6
35-44	899	77.5	22	2.4
45-54	1,043	76.3	31	3.0
55-64	802	59.2	30	3.7
65 and older	251	15.6	28	11.2

<sup>a</sup> <https://www.bls.gov/lau/table14full17.pdf>

### ***Geographic Distribution***

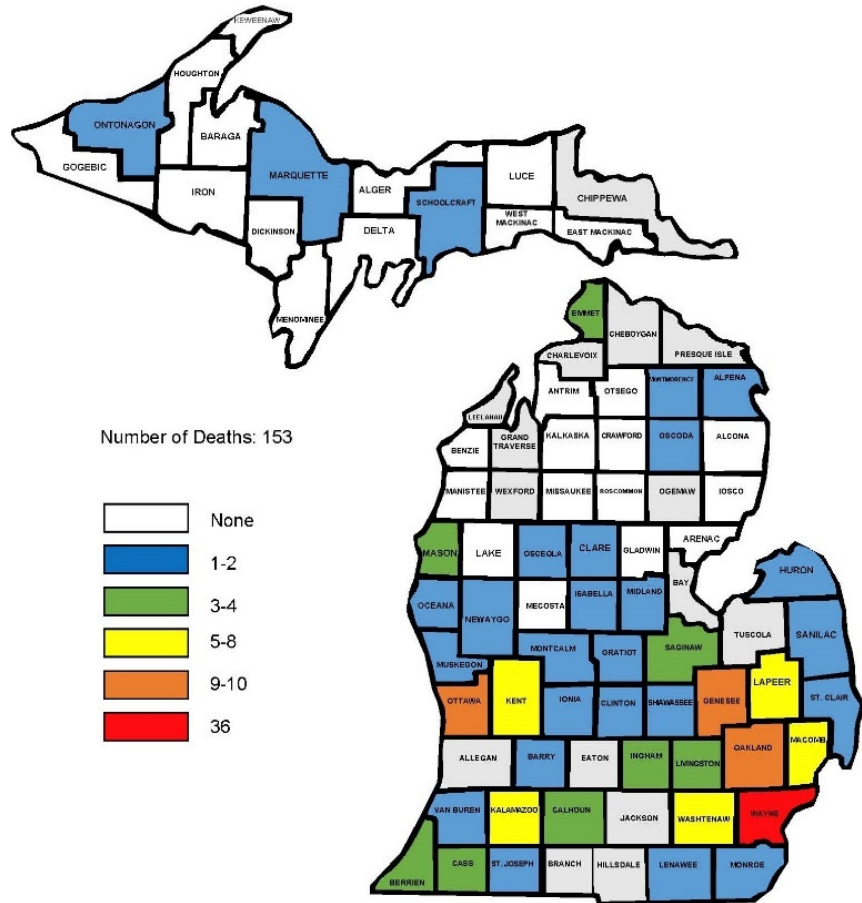
Forty-four (53%) of the 83 Michigan counties had at least one work-related injury that led to the death of the worker (**Figure 2** and **Table 4**).

**Table 4. County of Fatal Work-Related Injury, Michigan 2017**

County	Number	Percent*	County	Number	Percent	County	Number	Percent	County	Number	Percent
Alcona	--	--	Dickinson	--	--	Lake	--	--	Oceana	1	0.7
Alger	--	--	Eaton	--	--	Lapeer	5	3.3	Ogemaw	--	--
Allegan	--	--	Emmet	3	2.0	Leelanau	--	--	Ontonagon	1	0.7
Alpena	1	0.7	Genesee	10	6.5	Lenawee	2	1.3	Osceola	1	0.7
Antrim	--	--	Gladwin	--	--	Livingston	3	2.0	Oscoda	1	0.7
Arenac	--	--	Gogebic	--	--	Luce	--	--	Otsego	--	--
Baraga	--	--	Grand Traverse	--	--	Mackinac	--	--	Ottawa	9	5.9
Barry	1	0.7	Gratiot	1	0.7	Macomb	8	5.2	Presque Isle	--	--
Bay	--	--	Hillsdale	--	--	Manistee	--	--	Roscommon	--	--
Benzie	--	--	Houghton	--	--	Marquette	1	0.7	Saginaw	4	2.6
Berrien	4	2.6	Huron	1	0.7	Mason	3	2.0	St. Clair	2	1.3
Branch	--	--	Ingham	3	2.0	Mecosta	--	--	St. Joseph	2	1.3
Calhoun	3	2.0	Ionia	2	1.3	Menominee	--	--	Sanilac	1	0.7
Cass	3	2.0	Iosco	--	--	Midland	1	0.7	Schoolcraft	1	0.7
Charlevoix	--	--	Iron	--	--	Missaukee	--	--	Shiawassee	2	1.3
Cheboygan	--	--	Isabella	1	0.7	Monroe	1	0.7	Tuscola	--	--
Chippewa	--	--	Jackson	--	--	Montcalm	1	0.7	Van Buren	1	0.7
Clare	1	0.7	Kalamazoo	5	3.3	Montmorency	1	0.7	Washtenaw	6	3.9
Clinton	1	0.7	Kalkaska	--	--	Muskegon	2	1.3	Wayne	36	23.5
Crawford	--	--	Kent	5	3.3	Newaygo	1	0.7	Wexford	--	--
Delta	--	--	Keweenaw	--	--	Oakland	10	6.5	Unknown	1	0.7

**Figure 2. County of Fatal Work-Related Injury, Michigan 2016**

Collectively, the four southeast Michigan Counties of Macomb, Oakland, Washtenaw, and Wayne had 60 (39.2%) of all work-related deaths. Wayne County had nearly a quarter of the total number of deaths (36, 23.5%), followed by Oakland and Genesee (10 each, 6.5%), Ottawa (9, 5.9%), Macomb (8, 5.2%), Washtenaw (6, 3.9%), and Kalamazoo, Kent, and Lapeer (5 each, 3.3%).

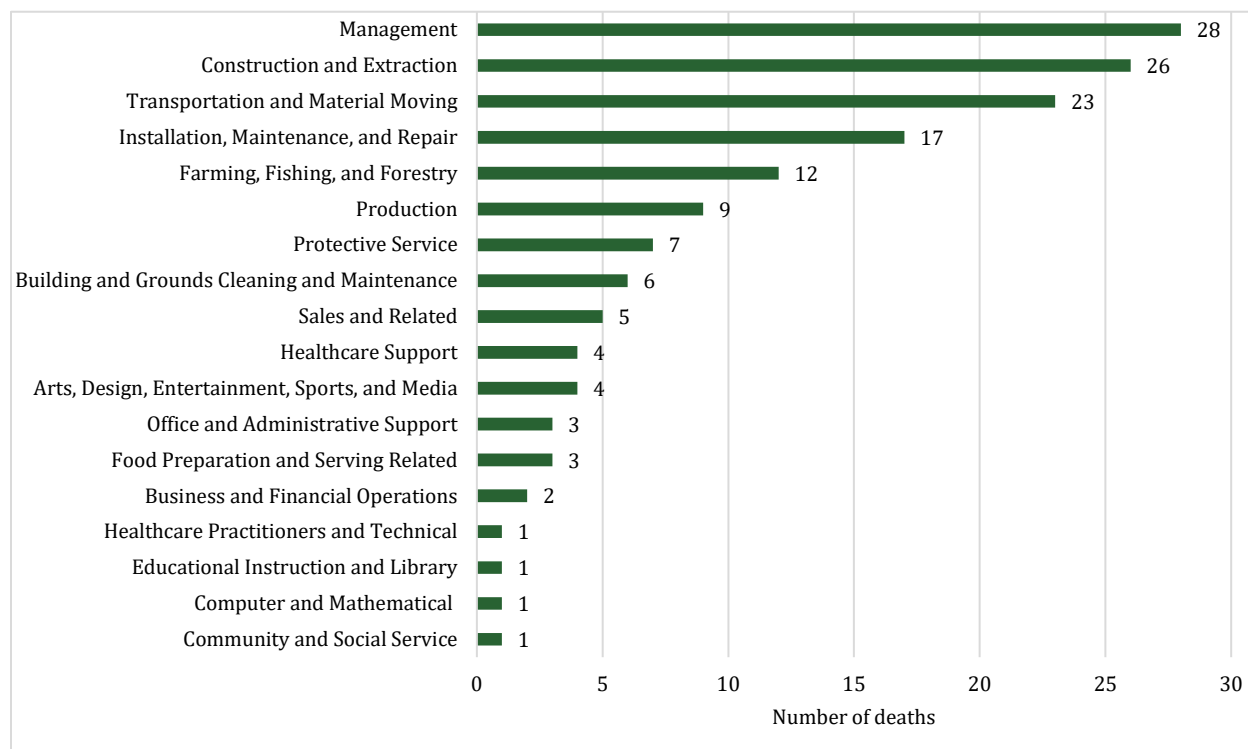


## Occupation

**Figure 3** shows the occupation distribution of the 153 work-related deaths utilizing 2018 Standard Occupational Classification (SOC) categories; the occupation of one individual was unknown. Occupation was determined from the reporting source data. The SOC categories are divided into 23 major groups. These major groups combine occupations according to the nature of the work performed, placing all people who work together into the same group regardless of their skill level.

The Management occupations major group had the largest number of deaths (28, 18.3%). The Construction and Extraction Occupations group had the second highest number of deaths (26, 17.0%), followed by Transportation and Material Moving Occupations (23, 15.0%), Installation, Maintenance and Repair Occupations (17, 11.1%), and Farming, Fishing, and Forestry Occupations (12, 7.8%). Five of the twenty-three SOC major groups (Architecture and Engineering, Legal, Life/Physical/Social Sciences, Military, and Personal Care and Service) had no deaths this year.

**Figure 3. Number of Deaths by Standard Occupational Classification, Michigan 2017**



### ***Working Status of the Decedent***

One hundred and fifty-one employers were associated with the 153 individuals who died in 152 separate incidents.

The employer/employee status was known for 151 of the 153 (98.7%) work-related deaths. Ninety-nine (65.6%) individuals were employees, three of whom were temporary workers. Forty-seven (31.1%) were self-employed or the owner/co-owner of the business, and five (3.3%) individuals were volunteer workers.

The decedent was working alone in 99 (68.3%) incidents and with a coworker in 46 (31.7%) incidents. The work status was unknown in eight incidents. For homicides, the decedent was working alone in 12 (50.0%) incidents and with a coworker in 12 incidents. For one homicide, it was unknown if the decedents were working alone or with a coworker at the time of the incident.

## ***Location of Injury***

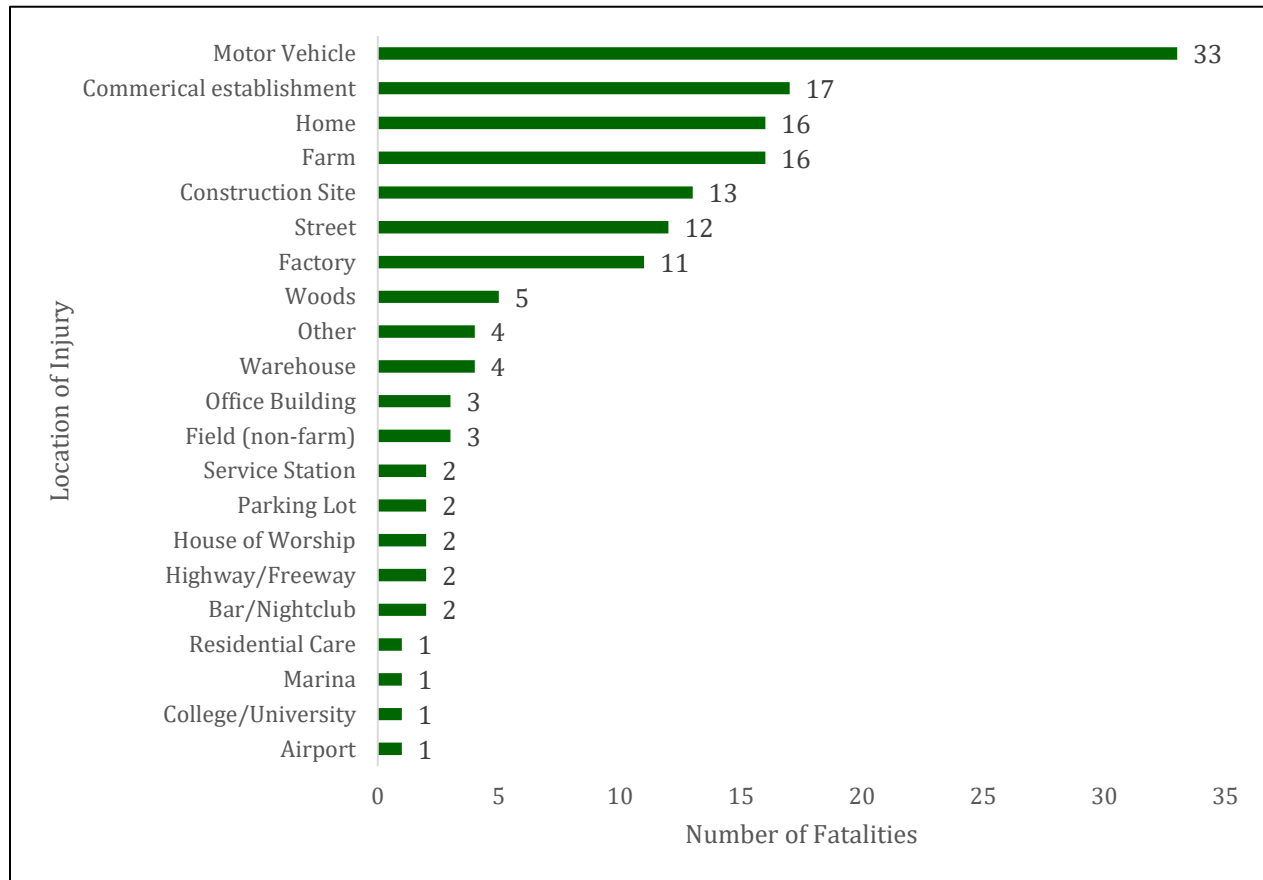
The location of injury for the fatal incident was identified for 151 (98.7%) of the 153 deaths. Beginning in 2012, MIFACE began using a coding system for location as follows: a) Designations of specific buildings (such as “house, apartment” or “bar, nightclub”) include both the building itself and the area directly outside, such as a driveway, porch, or front walk; b) If a victim was injured in a variety of locations (e.g., the victim was stabbed on a bus and was pursued by the attacker off the bus and into a store and stabbed a second time), the location at which the victim was first injured was coded; c) Events that occurred on public sidewalks were coded as “street,” with the exception of those occurring on sidewalks that were the private property of an adjacent building, which were coded to the building. For example, an incident that occurred on a walkway on the front lawn of a home was coded as “house, apartment”. If an incident occurred in a garage at a private home, “house, apartment” was coded. If an incident occurred in a commercial parking garage, parking lot, or a garage used by four or more different households (e.g., a garage serving a large apartment building), the location “parking lot/public parking garage” was used; d) If an incident occurred while the victim was in a motor vehicle, the place of injury was coded as a “motor vehicle” - for annual report years 2001-2011, MIFACE coded the location (street/road) rather than “motor vehicle”.



A laborer died when the roof of a carport/garage combination at a residential property being demolished fell onto him. [Narrative #45](#)

**Figure 4** depicts the distribution of incident locations for the 2017 traumatic deaths. A motor vehicle was the location where the largest number of the fatal injuries occurred (33, 21.9%). A commercial establishment was the site of 17 (11.3%) incidents. Sixteen (10.6%) of the incidents occurred each at a home and at a farm. Construction sites (13, 8.6%), streets (12, 7.9%), and factories (11, 7.3%) were each also the sites of over 10 fatal incidents.

**Figure 4. Location and Number of Fatal Work-Related Injuries, Michigan 2017**



### ***Location of Death***

For 77 (50.3%) individuals, the death certificate indicated the death occurred at the scene of the traumatic incident, for 70 (45.8%), in the hospital, three (2.0%), at home, for two (1.3%), an ambulance, and for one (0.6%), in an assisted living home.

### **Illegal Drug/Alcohol/Medication Use**

Of the 133 individuals whose death was not a suicide (16 deaths) or a drug overdose (4 deaths), 41 (30.8%) individuals had detectable levels of alcohol, illegal drugs or medications in their system. Twenty-eight (68.3%, 21.1% of total non-suicide/drug overdose deaths) of these in turn had levels that were considered on review to possibly have contributed to the fatal incident (**Table 5**).



Several states have adopted a legal limit of 5 µg/l (5 ng/ml) for marijuana (THC) in blood for being impaired while driving. Although this level does not directly correlate with impairment as does blood alcohol levels, the THC level of 5 µg/l was used to define that marijuana use was possibly related to the death. It was unknown if the presence of hydrocodone, oxycodone, fentanyl, amphetamine, morphine and marijuana was from the use of a prescribed medication or from illegal use.

**Table 5. Type of Work-Related Fatal Incident and Drug Found in Toxicological Analysis Among 28 Individuals Where the Substance Detected was Considered a Possible Contributor to the Individual's Death, Michigan 2017**

Incident Type	Alcohol level (blood %)	Prescription	Marijuana &/or marijuana metabolite	Cocaine, Heroin, metabolites	Other Illegal	Unknown Prescription/Non-Prescription
Asphyxiation	0.86					
Drowning	0.1					
Electrocution			√			Fentanyl
Electrocution						Hydrocodone
Fall	0.027					
Fall			√			
Fall			√			Fentanyl
Fall						Oxycodone
Fall		Duloxetine				
Fall		Dicyclomine, Midazolam		√		Fentanyl
Fire/Explosion		Midazolam				Fentanyl
Homicide				√		
Homicide	0.099					
Homicide	0.017		√			
Homicide			√			
Homicide			√	√		
Homicide			√			
Homicide			√			
Machine						Codeine
Motor Vehicle	0.042			√		
Motor Vehicle			√		Methamphetamine	
Motor Vehicle			√			
Motor Vehicle						Fentanyl
Motor Vehicle		Lorazepam				Morphine
Motor Vehicle		Alprazolam				
Struck By					Methamphetamine	Amphetamine Hydrocodone
Struck By						Fentanyl
Struck By		Bupenorphine				Amphetamine

## Work-Related Fatality Incidence Rates by Industry

**Employment-based** incidence rates measure the risk of fatal injury for those employed during a given period of time, regardless of hours worked.

**Hours-based** incidence rates measure fatality risk per standardized length of exposure. Hours-based rates use the average number of employees at work and the average hours each employee works (40 hours/week, 50 weeks/year).

The BLS uses hours-based incidence rates to measure fatality risk for industry sectors.

Employment-based and hours-based incidence rates will be similar for industries which tend to have full-time employees. However, differences will be observed for industries that tend to have a high percentage of part-time workers, such as in the fast food industry.

The number of hours worked was not available for several industry sectors. When provided, MIFACE calculated the hours-based work-related fatality incidence rate (See **Table 6**).

Michigan data shows that in industry sectors with a large number of part-time workers (30 hours or less), the work-related fatality hours-based rate is higher than the employment-based incidence rate, such as in Retail Trade and

Accommodation & Food Service. When the number of hours worked is 40 hours or more, the hours-based incidence rate is similar to or lower than the employment-based incidence rate, such as in Construction, Manufacturing, and Wholesale Trade.

### *Industry Highlights, Michigan 2017*

**Table 6** shows the number of traumatic work-related fatalities and Michigan's annual incidence rate by industry sector for number of employees and hours worked.

*Highlights from Table 6:*

**Eight** industry sectors had fewer work-related deaths and a lower employment-based incidence rate in 2017 compared to 2016:

Industry	Decrease in Number of Deaths from 2016	Number of 2017 WR Deaths	2017 Incidence Rate	Number of 2016 WR Deaths	2016 Incidence Rate
Mining	1	0	0.0	1	0.6
Construction	11	29	17.9	40	25.7
Manufacturing	4	11	1.8	15	2.5
Wholesale Trade	2	8	4.6	10	5.8
Transport/Warehousing	4	12	10.1	16	11.6
Real Estate	2	3	5.5	5	9.5
Administrative/Support/Waste Management/Remediation Services	2	10	3.5	12	4.1
Public Administration	2	8	3.3	10	5.0

**Seven** industry sectors had a higher number of work-related deaths and a higher employment-based incidence rate in 2017 compared to 2016:

Industry	Increase in Number of Deaths from 2016	Number of 2017 WR Deaths	2017 Incidence Rate	Number of 2016 WR Deaths	2016 Incidence Rate
Retail Trade	3	12	2.5	9	1.9
Finance and Insurance	1	1	0.7	0	0.0
Professional, Scientific, & Technical Services	1	2	0.7	1	0.3
Educational Services	1	2	3.1	1	0.3
Arts, Entertainment, & Recreation	8	11	20.8	3	5.8
Accommodation & Food Service	1	7	1.9	6	1.6
Other Services	4	12	8.7	8	4.7

**Three** industry sectors had the same number of work-related deaths in 2017 compared to 2016 (although the Incidence Rate varies due to fluctuating levels of employment).

Industry	Number 2016 & 2017 WR Deaths	Incidence Rate 2017	Incidence Rate 2016
Agriculture, Forestry, Fishing & Hunting	19	22.1	22.3
Information	1	1.8	1.7
Health Care & Social Assistance	5	0.8	0.8

The industry sector with the highest employment-based industry rate was Agriculture (22.1 deaths/100,000 workers), followed by Arts, Entertainment & Recreation (20.8 deaths/100,000 workers) and then Construction (17.9/100,000 workers). The industry subsector with the highest overall incidence rate was Support Activities for Agriculture (under Agriculture), which had an incidence rate of 87.6 deaths/100,000 workers.

**Table 6. Number of Traumatic Work-Related Fatalities by Industry and Incidence Rates by Number of Employees and by Hours Worked, Michigan 2017**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees <sup>a</sup>	Rate <sup>d</sup>	Number Hours <sup>e</sup>	Rate <sup>g</sup>
<b>Agriculture, Forestry, Fishing &amp; Hunting (11)</b>	<b>19</b>	<b>12.4</b>	<b>85,870<sup>b</sup></b>	<b>22.1</b>		<b>40.1</b>
Crop Production (111) (Owners/Operators)	5	3.3	51,156 <sup>b</sup>	9.8	**	**
Animal Production (112) (Owners/Operators)	3	2.0	29,276 <sup>b</sup>	10.2	**	**
Crop Production (111) (Hired Workers)	3	2.0	59,903 <sup>b</sup>	5.0	37.6 <sup>f</sup>	8.2
Animal Production (112) (Hired Workers)	3	2.0	17,572 <sup>b</sup>	17.1		
Support Activities for Agriculture (115)	3	2.0	3,424	87.6	**	**
Unknown	2	1.3	**	**	**	**
<b>Construction (23)</b>	<b>29</b>	<b>19.0</b>	<b>161,903</b>	<b>17.9</b>	<b>40.8</b>	<b>17.6</b>
Construction of Buildings (236)	5	3.3	38,540	13.0	39.2	13.2
Heavy & Civil Engineering Construction (237)	2	1.3	16,938	11.8	**	**
Specialty Trade Contractors (238)	20	13.1	106,425	18.8	40.0	18.8
Unknown	2	1.3	**	**	**	**
<b>Manufacturing (31-33)</b>	<b>11</b>	<b>7.2</b>	<b>615,108</b>	<b>1.8</b>	<b>43.1</b>	<b>1.7</b>
Wood Product (321)	1	0.7	10,096	9.9	**	**
Plastics & Rubber Products (326)	2	1.3	42,217	4.7	**	**
Nonmetallic Mineral Product (327)	1	0.7	10,626	9.4	**	**
Fabricated Metal Products (332)	3	2.0	79,661	3.8	42.3	3.6
Transportation Equipment (336)	2	1.3	188,329	1.1	46.8	0.9
Furniture and Related Products (337)	2	1.3	22,603	8.8	**	**
<b>Wholesale Trade (42)</b>	<b>8</b>	<b>5.2</b>	<b>172,437</b>	<b>4.6</b>	<b>39.6</b>	<b>4.7</b>
Merchant Wholesalers, Durable Goods (423)	5	3.3	98,098	5.1	40.0	5.1
Merchant Wholesalers, Non-durable Goods (424)	3	2.0	50,895	5.9	**	**
<b>Retail Trade (44-45)</b>	<b>12</b>	<b>7.8</b>	<b>472,600</b>	<b>2.5</b>	<b>30.6</b>	<b>3.3</b>
Motor Vehicle & Parts Dealers (441)	3	2.0	63,195	4.7	37.7	5.0
Furniture and Home Furnishings Stores (442)	1	0.7	13,239	7.6	**	**
Food & Beverage Stores (445)	2	1.3	80,611	2.5	**	**
Health and Personal Care Stores (446)	2	1.3	34,964	5.7	**	**
Gasoline Stations (447)	2	1.3	26,972	7.4	**	**
Clothing and Clothing Accessories (448)	1	0.7	31,605	3.2	**	**
Non-store Retailers (454)	1	0.7	8,453	11.8	**	**
<b>Transportation &amp; Warehousing (48-49)</b>	<b>12</b>	<b>7.8</b>	<b>119,144</b>	<b>10.1</b>	<b>**</b>	<b>5.4</b>
Truck Transportation (484)	4	2.6	46,718	8.9	**	**
Transit & Ground Passenger Transportation (485)	1	0.7	9,380	10.7	**	**
Support Activities for Transportation (488)	4	2.6	15,069	26.5	**	**
Postal Service (491)	1	0.7	21,100 <sup>c</sup>	4.7	**	**
Couriers and Messengers (492)	1	0.7	13,067	7.7	**	**
Unknown	1	0.7	**	**	**	**

**Table 6. Number of Traumatic Work-Related Fatalities by Industry and Incidence Rates by Number of Employees and by Hours Worked, Michigan 2017, Cont.**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees <sup>a</sup>	Rate <sup>d</sup>	Number Hours <sup>e</sup>	Rate <sup>g</sup>
<b>Information (51)</b>	<b>1</b>	<b>0.7</b>	<b>56,524</b>	<b>1.8</b>	<b>35.0</b>	<b>2.0</b>
Telecommunications (517)	1	0.7	18,451	5.4	**	**
<b>Finance and Insurance (52)</b>	<b>1</b>	<b>0.7</b>	<b>148,179</b>	<b>0.7</b>	<b>35.8</b>	<b>0.8</b>
Insurance Carriers and Related Activities (524)	1	0.7	57,563	1.7	**	**
<b>Real Estate &amp; Rental &amp; Leasing (53)</b>	<b>3</b>	<b>2.0</b>	<b>54,180</b>	<b>5.5</b>	<b>**</b>	<b>**</b>
Real Estate (531)	3	2.0	40,098	5.0	**	**
<b>Professional, Scientific, &amp; Technical Services (54)</b>	<b>2</b>	<b>1.3</b>	<b>292,424</b>	<b>0.7</b>	<b>34.9</b>	<b>0.8</b>
Professional, Scientific, & Technical Services (541)	2	1.3	292,424	0.7	**	**
<b>Administrative &amp; Support &amp; Waste Management &amp; Remediation Services (56)</b>	<b>10</b>	<b>6.5</b>	<b>286,797</b>	<b>3.5</b>	<b>**</b>	<b>**</b>
Administrative & Support Services (561)	7	4.6	274,466	2.6	**	**
Waste Management & Remediation Services (562)	3	2.0	12,331	24.3	**	**
<b>Educational Services (61)</b>	<b>2</b>	<b>1.3</b>	<b>65,280</b>	<b>3.1</b>	<b>**</b>	<b>**</b>
Educational Services (611)	2	1.3	65,280	3.1	**	**
<b>Health Care &amp; Social Assistance (62)</b>	<b>5</b>	<b>3.3</b>	<b>590,732</b>	<b>0.8</b>	<b>32.2</b>	<b>1.1</b>
Ambulatory Health Care (621)	2	1.3	205,938	1.0	**	**
Hospitals (622)	1	0.7	207,464	0.5	36.8	
Nursing and Residential Care Facilities (623)	2	1.3	106,814	1.9	**	**
<b>Arts, Entertainment, &amp; Recreation (71)</b>	<b>11</b>	<b>7.2</b>	<b>52,982</b>	<b>20.8</b>	<b>25.0</b>	<b>33.3</b>
Performing Arts, Spectator Sports, & Related Industries (711)	5	3.3	9,931	50.3	**	**
Museums, Historical Sites, and Similar Institutions (712)	2	1.3	4,398	45.5	**	**
Amusement, Gambling & Recreation Industries (713)	4	2.6	38,652	10.3	**	**
<b>Accommodation &amp; Food Services (72)</b>	<b>7</b>	<b>4.6</b>	<b>378,335</b>	<b>1.9</b>	<b>22.9</b>	<b>3.2</b>
Accommodation (721)	1	0.7	42,596	2.3	**	**
Food Services & Drinking Places (722)	6	3.9	335,739	1.8	**	**
<b>Other Services (except Public Administration) (81)</b>	<b>12</b>	<b>7.8</b>	<b>137,568</b>	<b>8.7</b>	<b>31.3</b>	<b>11.1</b>
Repair & Maintenance (811)	9	5.9	41,107	21.9	**	**
Personal and Laundry Services (812)	1	0.7	41,582	2.4	**	**
Religious, Grantmaking, Civic, Professional & Similar Organizations (813)	2	1.3	41,696	4.8	**	**
<b>Public Administration (92)</b>	<b>8</b>	<b>5.2</b>	<b>242,000<sup>h</sup></b>	<b>3.3</b>	<b>**</b>	<b>4.0</b>
Executive, Legislative & Other Government Support (921)	2	1.3	**	**	**	**
Justice, Public Order, & Safety Activities (922)	6	3.9	**	**	**	**
<b>Totals</b>	<b>153</b>		<b>4,661,000<sup>i</sup></b>	<b>3.3</b>		<b>3.4</b>

<sup>a</sup> Employment numbers from Michigan Department of Technology, Management and Budget (DTMB), Bureau of Labor Market Information and Strategic Initiatives, QCEW Industry Employment and Wages (<https://milmi.org/DataSearch/QCEW>) unless otherwise noted.

<sup>b</sup> 2017 United States Department of Agriculture Census of Agriculture, Michigan-level data, Table 75. Summary by North American Industry Classification System ([https://www.nass.usda.gov/Publications/AgCensus/2017/Full\\_Report/Volume\\_1\\_Chapter\\_1\\_State\\_Level/Michigan/st26\\_1\\_0075\\_0075.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_1_State_Level/Michigan/st26_1_0075_0075.pdf)). Number of owners/operators are defined as the number of producers in

Table 75. Total number of workers in NAICS Sector 11 defined as total number of producers (owner/operators). See below for discussion.

<sup>c</sup> Total number of United States Postal Service workers in Michigan taken from Michigan DTMB CES estimates (<https://milmi.org/DataSearch/CES>).

<sup>d</sup> Employment-based incidence rates calculated per 100,000 full-time equivalent (FTE) workers.

<sup>e</sup> Average number of hours worked per week by industry taken from Michigan DTMB CES estimates (<https://milmi.org/DataSearch/CES>) unless otherwise noted.

<sup>f</sup> Number of hours worked per week by hired farm workers taken as the average of four quarterly estimates for all agricultural workers in the Lake Region for 2017 as reported in the May 2018 USDA National Agricultural Statistics Service Farm Labor report (<https://downloads.usda.library.cornell.edu/usda-esmis/files/x920fw89s/hd76s1508/4j03d115j/FarmLabo-05-17-2018.pdf>). Corresponding hours-based rate is calculated using the number of hired farm worker fatalities from the Crop and Animal production sectors combined.

<sup>g</sup> Hours-based incidence rates calculated as  $(N/EH) \times 200,000,000$ , where N is the number of fatalities, EH is the total employee-hours (number of employees \* average number of hours worked per week \* 50 weeks), and 200,000,000 is the benchmark number of hours worked by 100,000 FTE (40 hour/week) employees in one year.

<sup>h</sup> The number of workers in the Public Administration sector was calculated as the sum of Federal, State, and Local government employees in Michigan, minus the number of USPS, state and local hospital, and state and local education workers. All numbers from Michigan DTMB CES estimates (<https://milmi.org/DataSearch/CES>).

<sup>i</sup> Total 2017 state employment taken from Michigan DTMB LAUS report (<https://milmi.org/DataSearch/LAUS>).

\*\* No data available from corresponding sources.

**Table 7** compares the employment-based and hours-based work-related fatality incidence rates by industry in Michigan to national hours-based rates for 2017 as computed by the Bureau of Labor Statistics (BLS). When calculating the fatal injury rates for the United States, BLS excludes workers under the age of 16 years, volunteers and the resident military.

**In 2017, both the overall employment-based fatality rate per 100,000 workers (3.3) calculated by the MIFACE program and the hours-based fatality incidence rate calculated by BLS (3.4) were lower in Michigan than the BLS-calculated hours-based fatality incidence rate (3.5/100,000 FTEs) in the United States.**

Hours-based fatal injury rates should not be directly compared to employment-based rates because of the differences in the denominators used. When available, MIFACE used Michigan-specific hourly rates from Michigan DTMB CES; when unavailable, MIFACE used the BLS CFI State-based hourly rate for Michigan.

Overall, Michigan's hours-based work-related fatality rate was lower than the U.S. national rate (3.4 vs 3.5). Although not directly comparable, most Michigan industry groups had a higher hours-based rate than the U.S rate for that industry. Exceptions included the Mining (0.0 vs 12.9), Manufacturing (1.7 vs 1.9), Wholesale Trade (4.7 vs 4.8), and Transportation and Warehousing (5.4 vs 13.2) industries (**Table 7**).

**Table 7. Traumatic Work-Related Fatalities by Industry Sector, Michigan Incidence Rates Compared to US Incidence Rates, 2017**

Industry Sector (NAICS Code)	Number of Fatalities	2017 MI Employment-based Rate <sup>a</sup>	2017 MI Hours-Based Rate <sup>a</sup>	2017 US Hours-Based Rate <sup>b</sup>
Agriculture, Forestry, Fishing and Hunting (11)	19	22.1	40.1	23.0
Mining (21)	0	0.0	0.0	12.9
Construction (23)	29	17.9	17.6	9.5
Manufacturing (31-33)	11	1.8	1.7	1.9
Wholesale Trade (42)	8	4.6	4.7	4.8
Retail Trade (44-45)	12	2.5	3.3	2.0
Transportation & Warehousing (48-49)	12	10.1	5.4	13.2 <sup>c</sup>
Information (51)	1	1.8	2.0	1.6
Finance and Insurance	1	0.7	0.8	0.5
Real Estate and Rental and Leasing (53)	3	5.5	**	2.4
Professional & Business Services (54)	2	0.7	0.8	0.6
Administrative & Support & Waste Management & Remediation Services (56)	10	3.5	**	7.4
Educational Services (61)	2	3.1	**	1.0
Health Care & Social Assistance (62)	5	0.8	1.1	0.8
Arts, Entertainment, & Recreation (71)	11	20.8	33.3	3.2
Accommodation & Food Services (72)	7	1.9	3.2	1.9
Other Services (except Public Administration) (81)	12	8.7	11.1	2.9
Public Administration (92)	8	3.3	4.0	2.0
<b>Total</b>	<b>153</b>	<b>3.3</b>	<b>3.4</b>	<b>3.5</b>

<sup>a</sup> From Table 5

<sup>b</sup> US Bureau of Labor Statistics Census for Fatal Occupational Injuries (CFOI), Hours-based fatal injury rates by industry, occupation, and selected demographic characteristics, 2017 (<https://www.bls.gov/iif/oshcfoi1.htm#rates>)

<sup>c</sup> Calculated as the combined hours-based rate from separate CFOI rates for Transportation & Warehousing and Utilities.

## Means of Work-Related Death

The means of death was known for all of the 153 work-related deaths in Michigan in 2017 (**Table 8**). Motor vehicle crashes were the leading cause of a work-related death (28, 18.3%) in Michigan in 2017. Struck by incidents were the second leading causes of death (27, 17.6%) followed by falls (26, 17.0%) and homicides (25, 16.3%).

Motor vehicle crashes were the leading (or tied for the leading) cause of death in 7 of 17 (41.2%) industry sectors, including Wholesale Trade (25.0% of deaths within the sector), Transportation & Warehousing (33.3%), Information (100%), Finance & Insurance (100%), Accommodation & Food Service (28.6%), Administrative, Support, Waste Management & Remediation Services (30.0%), Professional, Scientific, and Technical services (50.0%) and Public Administration (50.0%).

Homicides were the, or one of the, leading causes of death in 4 sectors (23.5%), including Wholesale Trade (25.0%), Retail Trade (66.7%), Health Care & Social Assistance (40.0%), and Arts, Entertainment, & Recreation (27.2%). Struck by incidents also lead 4 industry

sectors, including Manufacturing (45.4%), Real Estate, Rental, & Leasing (33.3%), Accommodation & Food Service (28.6%) and Other Services (33.3%).

Falls were a leading cause of death in Construction (41.4%) and Administrative, Support, Waste Management & Remediation Services (30.0%). Construction falls accounted for 46.1% of all fall-related deaths.

Suicides were a leading cause of death in Real Estate, Rental, & Leasing (33.3%) and Professional, Scientific, and Technical Services (50.0%). Machine-related incidents were the leading cause of death in Agriculture (36.8%) while Drowning was a leading cause of death for Real Estate, Rental, & Leasing (33.3%).

**Table 9** displays the number of fatalities across leading means of death by year from 2001-2017. Certain means of death, such as “medical”, have been omitted from this table for space due to a particularly low number of deaths. There are variations in the means of death each year and because of small numbers in any given means of death, no dramatic temporal trends in the means of death is discernable.



A plasterer/drywall installer died when he fell approximately 30 feet through a 24-inch by 48-inch plastic skylight. [Narrative #29](#)



**Table 8. Traumatic Work-Related Fatalities by Means of Death and Industry Sector, Michigan 2017**

Industry Sector (NAICS)	Asphyxiation	Drowning	Drug Overdose	Electrocution	Explosion/ Fire	Fall	Homicide	Machine	Medical	Motor Vehicle	Struck by	Suicide	Total
Agriculture, Forestry, Fishing & Hunting (11)	--	1	--	1	--	--	--	7	--	1	4	5	19
Construction (23)	--	2	--	3	2	12	1	1	--	3	2	3	29
Manufacturing (31-33)	--	--	--	1	--	1	1	--	--	2	5	1	11
Wholesale Trade (42)	1	--	1	--	--	--	2	1	--	2	1	--	8
Retail Trade (44-45)	--	--	--	--	1	2	8	--	--	--	--	1	12
Transportation & Warehousing (48-49)	--	--	1	--	--	2	2	--	1	4	2	--	12
Information (51)	--	--	--	--	--	--	--	--	--	1	--	--	1
Finance & Insurance (52)	--	--	--	--	--	--	--	--	--	1	--	--	1
Real Estate, Rental, & Leasing (53)	--	1	--	--	--	--	--	--	--	--	1	1	3
Professional, Scientific, & Technical Services (54)	--	--	--	--	--	--	--	--	--	1	--	1	2
Administrative & Support & Waste Management & Remediation Services (56)	--	--	--	--	--	3	--	--	--	3	2	2	10
Educational Services (61)	--	--	--	--	--	2	--	--	--	--	--	--	2
Health Care & Social Assistance (62)	--	--	1	--	--	--	2	--	--	1	1	--	5
Arts, Entertainment, & Recreation (71)	--	2	--	--	--	2	3	--	--	2	1	1	11
Accommodation & Food Services (72)	--	--	1	--	--	1	1	--	--	2	2	--	7
Other Services (except Public Administration) (81)	--	--	--	--	1	1	3	--	--	1	4	2	12
Public Administration (92)	--	--	--	--	--	--	2	--	--	4	2	--	8
<b>Total</b>	<b>1</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>26</b>	<b>25</b>	<b>9</b>	<b>1</b>	<b>28</b>	<b>27</b>	<b>17</b>	<b>153</b>

**Table 9. Leading Means of Death by Year, 2001-2017**

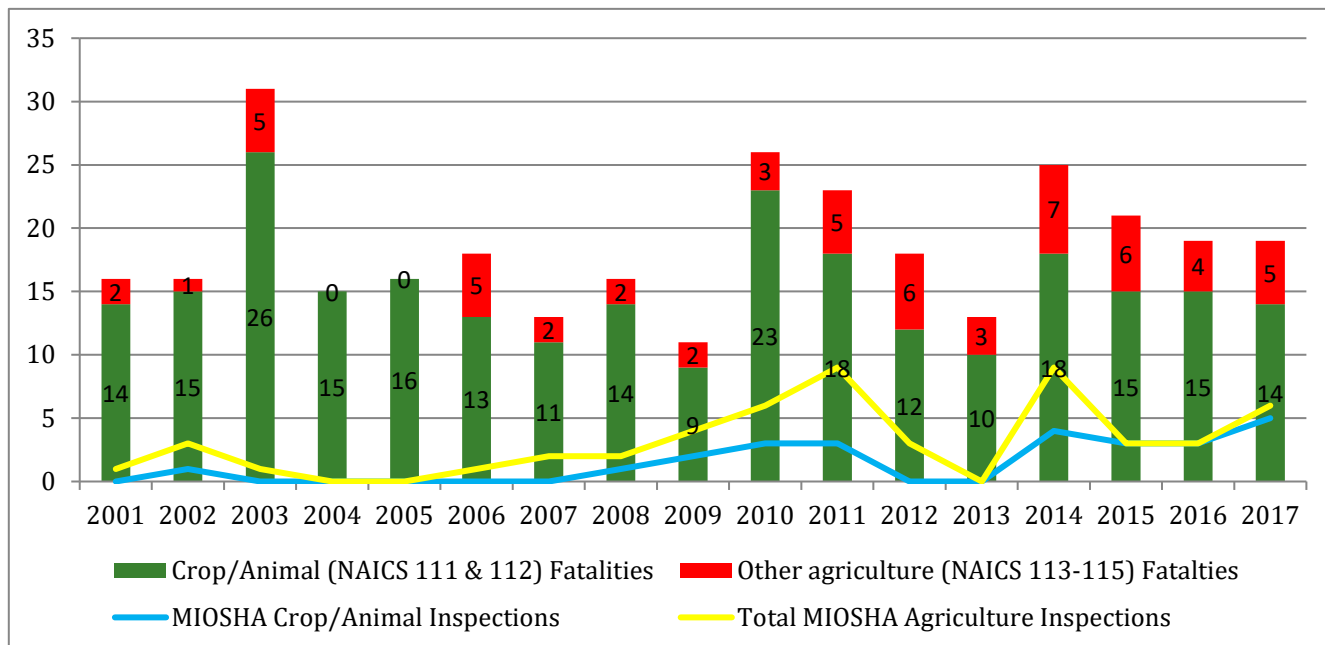
Year	Motor Vehicle	Fall	Homicide	Struck-by	Machine	Suicide	Electrocution	Toxic Exposure	Aircraft	Fire/Explosion	Drug Overdose	Drowning	Asphyxiation	Animal	Heat/Cold
2001	39	26	24	13	32	12	4	4	1	6	1	2	3	1	2
2002	31	21	22	18	20	11	8	4	5	4	--	2	1	2	2
2003	31	19	15	16	36	5	10	3	2	4	3	1	4	2	1
2004	29	16	22	13	26	4	7	4	4	3	1	--	1	1	--
2005	24	20	16	10	18	2	4	2	6	4	3	1	--	--	--
2006	35	24	11	31	14	8	10	6	8	4	1	2	1	2	--
2007	28	17	21	17	16	6	4	4	--	1	2	--	--	2	1
2008	30	26	14	15	12	9	5	2	--	3	2	1	1	1	--
2009	20	14	11	17	7	12	5	--	2	--	4	--	1	2	--
2010	28	24	26	15	16	11	7	6	4	3	2	2	--	--	1
2011	25	21	15	13	20	16	7	4	7	3	1	1	2	2	2
2012	36	18	28	14	14	12	3	--	--	--	2	3	--	--	--
2013	27	19	16	24	10	22	2	1	2	3	3	--	1	--	1
2014	28	24	19	28	11	9	5	--	5	1	4	3	3	3	--
2015	27	18	22	21	15	12	5	4	3	3	3	2	2	1	--
2016	28	32	22	20	19	13	5	9	1	2	5	3	1	1	1
2017	28	26	25	27	9	17	5	--	--	4	4	6	1	--	--
Total	494	365	329	312	295	181	96	53	50	48	41	29	22	20	11

## Highlights and Discussion by Select Industries and Means of Death

### *Agriculture, Forestry, Fishing & Hunting (NAICS 11)*

**Figure 5** shows the number of fatalities in the Agriculture, Forestry, Fishing and Hunting sector (NAICS 11), split between crop and animal-raising industries (NAICS 111 and 112, respectively) and other agricultural industries (NAICS 113-115), by year for 2001-2017. The Figure also shows the number of fatalities which were investigated through MIOSHA fatality inspections by year.

**Figure 5. Number of Agriculture Fatalities and MIOSHA Inspections, 2001-2017**



In providing funding for Occupational Safety and Health Administration (OSHA) and hence the MIOSHA program, the U.S. Congress placed restrictions on use of federal funds for program activities regarding two categories of employers: small farming operations and small employers in low-hazard industries. This is solely a restriction on expending federal funds; it does not prohibit state-funded MIOSHA activities at these worksites.

The MIOSHA Act defines Agriculture as “agricultural operations as the work activity designated in major groups 01 and 02 of the Standard Industrial Classification (SIC) manual, United States Bureau of the Budget, 1972 edition. Agricultural operations include any practices performed by a farmer or on a farm as an incident to or in conjunction with farming operations including preparation for market delivery to storage or market or to carriers for transportation to market (MCL 408.10004(1))”.

The federal Appropriations Act exempts small farming operations from federally-funded activities. Only State funds can be used by MIOSHA for interventions at farming operations when a farm operation:

- Employs 10 or fewer employees currently and at all times during the preceding 12 months; and
- Has not had an active temporary labor camp during the preceding 12 months.

It is important to note that immediate family members of farm employers are not counted when determining the number of employees. The majority of agricultural work-related deaths in Michigan have occurred on family farms with fewer than 10 employees and who did not have an active temporary labor camp. Therefore, few MIOSHA work-related fatality inspections on family farm operations have been performed.

The average age of those who died working in Agriculture was 52.5 years, with a range of 19-90 years. **Table 10** shows the average age at the time of death for the past 16 years for those employed in Agriculture. In 13 of the 17 previous years (76.5%), the average age of the individual was in their 50s or 60s.



A farm family member in his teens was electrocuted when the 21-foot-long metal pole he was using to knock down grain from the walls of a bin contacted an energized 4,800-volt overhead line. [Narrative #2](#)

<b>Table 10. Age at Time of Death, Agriculture, Michigan 2001-2017</b>			
Year	Age (in years)	Year	Age (in years)
2001	47.4	2010	53.0
2002	48.0	2011	56.6
2003	58.1	2012	52.2
2004	59.7	2013	56.6
2005	54.9	2014	46.8
2006	49.9	2015	55.3
2007	54.2	2016	61.0
2008	67.9	2017	52.5
2009	51.5		

### *Special Considerations Regarding Employment Estimates in Agriculture*

Traditional farm operations (Crop and Animal Production) accounted for 14 of the 19 (73.7%) deaths in 2017. Eight of the 14 (57.1%) known work-related deaths were identified as a farm owner/operator, while six (42.9%) were identified as hired labor.

Hired labor includes paid family members, bookkeepers, office workers, maintenance workers, etc., if their work was primarily associated with agricultural production on the operation. Hired labor excludes contract (migrant) laborers. Unpaid workers likely make up a significant portion of the agricultural workforce – the 2017 USDA Census of Agriculture reports 77,475 hired workers and 54,839 unpaid workers

([https://www.nass.usda.gov/Publications/AgCensus/2017/Full\\_Report/Volume\\_1\\_Chapter\\_1\\_State\\_Level/Michigan/st26\\_1\\_0075\\_0075.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_1_State_Level/Michigan/st26_1_0075_0075.pdf)).



A male farmhand in his 80's died after being struck by a tree branch from a downed tree that he was moving with his tractor.

[Narrative #13](#)

The number of migrant workers was not noted on the 2017 Agricultural Census, only the number of farms utilizing migrant labor. The 2013 Michigan Migrant and Seasonal Farmworker Enumeration Profiles Study estimated 49,135 migrant and seasonal farm laborers in 2013. Seasonal farm labor was described as “an individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last twenty-four months” ([https://www.michigan.gov/documents/dhs/FarmworkerReport\\_430130\\_7.pdf](https://www.michigan.gov/documents/dhs/FarmworkerReport_430130_7.pdf)).

Migrant farm workers were defined as meeting the seasonal farm labor definition but “establishes for the purposes of such employment a temporary abode” (U.S. Code, Public Health Services Act, “Migrant Health”). Migrant farm workers include both individuals who met the definition of a migrant but only travel within the state of Michigan (intrastate migrants) and others who come from outside the state to work in Michigan (interstate migrants). The 2017 USDA Census of Agriculture reports that 11,907 farms in Michigan reported using hired labor, while only 828 reported using migrant labor ([https://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1\\_Chapter\\_1\\_State\\_Level/Michigan/st26\\_1\\_068\\_068.pdf](https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1_Chapter_1_State_Level/Michigan/st26_1_068_068.pdf)).

If the total number of Agricultural operators (80,432), hired farm labor (77,475), and unpaid workers (54,839) identified in the 2017 Agriculture Census are added to the above estimate for migrant and seasonal farm laborers (49,135), as well as to the number of employees working in Forestry & Logging (1,837), Fishing, Hunting and Trapping (177) and Agricultural Support



Activities (3,424) estimated by the Michigan DTMB in 2017, the total number of workers in Agriculture was 267,319. The increase in the number of workers in Agriculture, Fishing, Forestry and Hunting would dramatically lower the NAICS 11 Agriculture, Forestry, Hunting and Fishing work-related fatality incidence rate from 22.1 deaths/100,000 workers to 7.1. Both rates are appreciably lower than the BLS CFOI hours-based rate for Michigan of 40.1, which only includes hired employees. If only employment estimates from the Michigan DTMB Industry Employment and Wages report are used, the number of workers in agriculture totals only 31,359, which would drive the employment-based rate up to 60.6.

The transient nature of crop production complicates the picture of Agricultural employment. A single farm may produce a number of crops utilizing hired labor to harvest. Workers may come and go (leave the state) to harvest other crops. Given that many of these work stints may be for durations significantly shorter than a year, it is possible that many hired and/or migrant workers will work at multiple farms in a year, each of which may count the worker in their reported number of hired workers, leading to overestimation of total employment in the industry.



A male laborer died when he was entangled in a Woods Mower Model HD 315-4 secondary PTO shaft while chopping corn stubble. [Narrative #5](#)

Due to uncertainties regarding the true total number of hired, unpaid, and seasonal/migrant workers, and which of these categories may be overlapping or enveloped by others, the employment-based incidence rate of work-related fatalities across Agriculture (22.1/100,000 workers) utilizes only the total number of operators in Crop and Animal Production reported by the USDA Census combined with employee counts for Forestry & Logging, Fishing, Hunting and Trapping and Agricultural Support Activities from the Michigan DTMB. It is likely that the most accurate employment-based incidence rate lies somewhere between this number and the rate given when all possible counts of hired, unpaid, and migrant labor are combined (7.1/100,000 workers).

### ***Construction (NAICS 23)***

The number of deaths in Construction decreased by 11 (29 deaths in 2017 compared to 40 deaths in 2016). This decrease was driven entirely by a decrease in the number of deaths of the specialty trade group subsector (NAICS 238), which encompasses roofers, painters, drywall installers, carpenters, etc., with 20 deaths in 2017 compared to 33 in 2016. The other two subsectors, Construction of Buildings (NAICS 236) and Heavy & Civil Engineering Construction (NAICS 237) both increased in 2017 compared to 2016, from 3 to 5 and from 1 to 2, respectively.

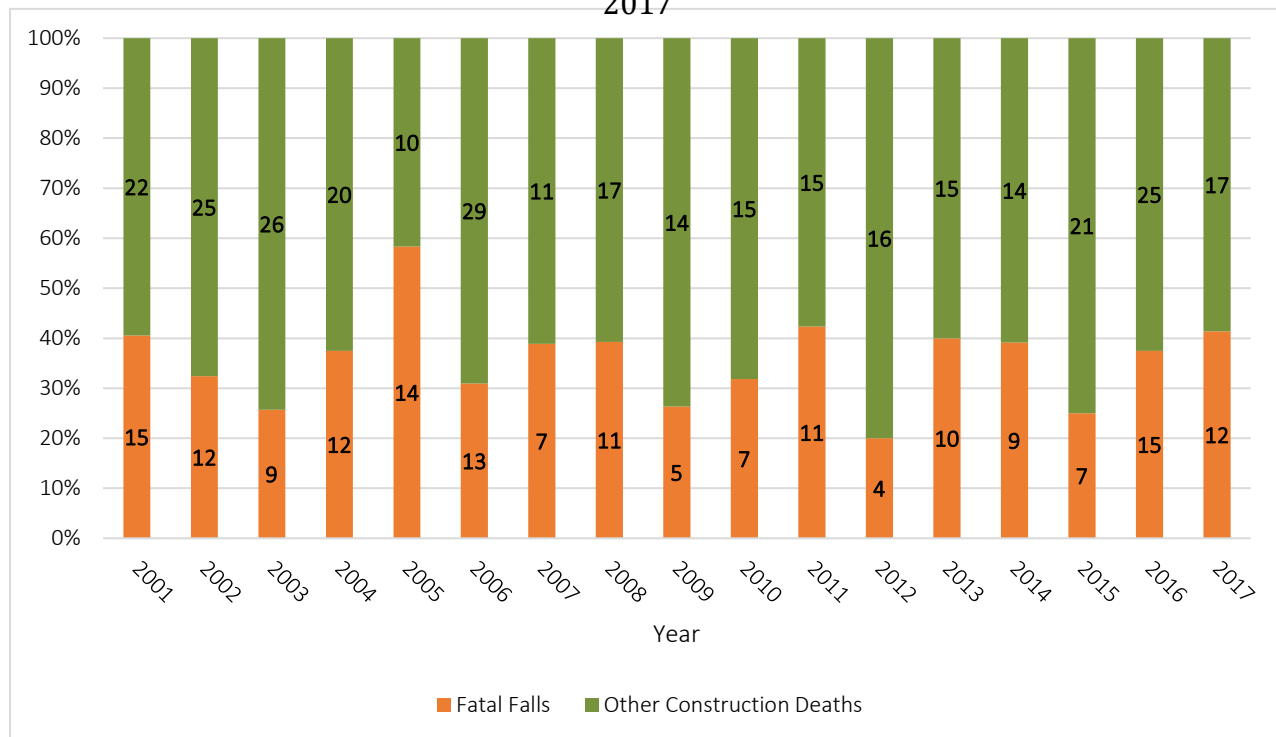
Eleven of the 12 fatal falls in Construction occurred in the specialty trade group subsector, of which 5 were roofers. Both nationally and in Michigan, falls continue to be a top cause of death, particularly in Construction. The national Campaign to Prevent Falls in Construction is a joint effort by government, labor, and management to address this leading cause of construction industry fatalities. **Figure 6** shows the number of fatal falls in Construction by year and the percentage of construction work-related deaths the fatal falls represent.



A male carpenter fell approximately 36 feet from a roof to the base of an egress basement window well. [Narrative #28](#)

Between 2001 and 2017, the number of fatal falls in Construction ranged from a low of four falls in 2012 to a high of 15 falls in 2001 and 2016. The percentage of fatalities in construction secondary to a fall ranged from 20.0% in 2012 to 58.3% in 2005.

**Figure 6. Fatal Falls as Percent of Total Construction Deaths by Year, 2001-2017**



## Manufacturing (NAICS 31-33)

As can be seen in **Figure 7**, manufacturing deaths as a proportion of total work-related deaths have been on an overall decline over the years 2001-2016. The employment-based rate in 2017, 1.8 deaths per 100,000 full-time workers, is below the overall rate of 3.3, continuing a trend seen in previous years and running counter to the perception of Manufacturing as an especially or stereotypically hazardous industry sector.

There were no machine-related deaths in Manufacturing in 2017. Machine-related incidents have historically been the leading means of death in the Manufacturing sector; 65 (28.1%) of the 231 total deaths in Manufacturing from 2001-2017 were from machine-related incidents. However, the second leading means of death, struck-by incidents (41 incidents, 17.7%), was the highest in 2017, with 5 deaths (41.7% of total Manufacturing deaths for the year).



A maintenance worker in a manufacturing plant died when struck by part of a pressurized stainless-steel furnace door that ruptured. [Narrative #58](#)

**Figure 7.** Percent of Total Work-Related Deaths in Manufacturing (NAICS 31-33), 2001-2017

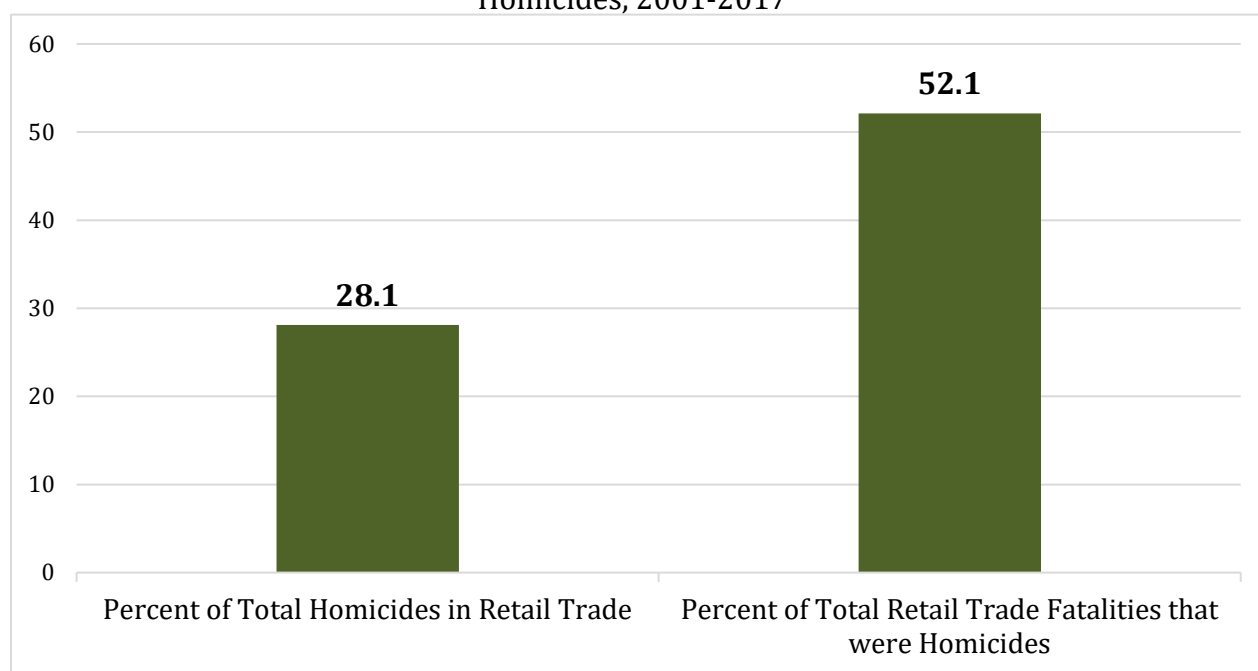




### ***Retail Trade (NAICS 44-45)***

The Retail Trade industry sector (NAICS 44-45) has the largest number and percent of homicides (**Figure 8**). Homicides account for 52.1% of all fatalities in this industry sector from 2001-2017. The next highest means of death in Retail Trade are motor vehicle incidents, falls, and suicide (15.4%, 12.4%, and 11.2%, respectively). Conversely, decedents in the Retail Trade industry have made up the largest portion of total homicide deaths (28.1%) of any sector; homicides in the Accommodation and Food Service sector make up the next highest proportion of total homicides at 13.6%, less than half the proportion of Retail Trade.

**Figure 8.** Relationship between the Retail Trade Industry Sector and Homicides, 2001-2017



### ***Transportation and Warehousing (NAICS 48-49)***

Motor vehicle collisions were the most common means of death in the Transportation and Warehousing industry sector in 2017 (4 deaths, 33.3% of total sector deaths). Furthermore, Transportation and Warehousing was tied with Public Administration for the industry sector with the highest number of motor vehicle crashes with 4 incidents (14.3% of total motor vehicle incidents) each. These reflect overall trends, in which the motor vehicle-related crashes comprise the most common means of death in the Transportation and Warehousing industry sector (45.5% of all deaths in the sector), with struck-by incidents being the next highest type of fatality (13.9% of all deaths). Furthermore, this industry accounts for nearly a quarter (121 deaths, 24.5%) of all motor vehicle-related deaths from 2001-2017, the largest proportion of all industry sectors (**Table 11**).

<b>Table 11. Number of Motor Vehicle-Related Work-Related Deaths by Industry Sector, Michigan 2001-2017</b>	
<i>Industry</i>	<i># MV -related deaths (%)</i>
Agriculture	25 (5.1)
Mining	3 (0.6)
Utilities	5 (1.0)
Construction	72 (14.6)
Manufacturing	23 (4.7)
Wholesale Trade	29 (5.9)
Retail Trade	26 (5.3)
Transportation/Warehousing	121 (24.5)
Information	17 (3.4)
Finance/Insurance	7 (1.4)
Real Estate/Rental/Leasing	2 (0.4)
Professional/Scientific/Technical Services	15 (3.0)
Administrative/Support/Waste Management/Remediation	33 (6.7)
Education	11 (2.2)
Health Care/Social Assistance	22 (4.5)
Arts/Entertainment/Recreation	10 (2.0)
Accommodation/Food Service	6 (1.2)
Other Services	24 (4.9)
Public Administration	43 (8.7)

## Comparisons to MIOSHA and CFOI Fatalities

### *MIOSHA Fatality Investigations*

In 2017, MIOSHA personnel conducted a work-related fatality program-related compliance investigation at 43 (45.7%) of the 94 employers for 26.5% of all the deaths. A fatality was recorded as a MIOSHA “Program-Related” fatality if the deceased party was employed in an occupation included under MIOSHA jurisdiction as defined in Public Act 154 of 1974, as amended, and the fatality appeared to be related to one or more of the following conditions:

- The incident was found to have resulted from violations of MIOSHA safety and health standards or the “general duty” clause.
- The incident was considered the result of a failure to follow a good safety and health practice that would be the subject of a safety and health recommendation.
- The information describing the incident is insufficient to make a clear distinction between a “Program-Related” and “non-Program-Related” incident, but the type and nature of the injury indicated that there was a high probability that the injury was the result of a failure to adhere to one or more MIOSHA standards, the “general duty” clause, or good safety and health practice.

**Table 12** shows the number of work-related fatalities in Michigan in 2017 by industry sector and the number of MIOSHA work-related fatality compliance inspections for each industry sector.



A male truck driver died as a result of air released from a pressurized tire sidewall failure.

[Narrative #91](#)

For each company that had a work-related fatality, MIFACE accessed the Federal OSHA Integrated Management Information System (IMIS) to determine any previous MIOSHA compliance activity at the company. Eighteen of the 41 (43.9%) employers having a MIOSHA work-related fatality compliance inspection in 2017 were identified as having a MIOSHA work-related compliance inspection prior to 2017. Of the 18 companies, which had a work-related fatality in 2017 and were previously inspected by MIOSHA, one was in Agriculture, nine were in Construction, three were in Manufacturing, one was in Wholesale Trade, two were in Administrative & Support & Waste Management & Remediation Services, one was in Educational Services, and one was in Public Administration.

MIOSHA issued a violation citation to the firm at the conclusion of the fatality investigation in 31 of the 41 (75.6%) investigations. Citation penalties assessed at the conclusion of the compliance inspection (not the penalties decided after appeal) ranged from a low of \$2800 to a high of \$98,000.

<b>Table 12. Work-Related Fatalities and Number of MIOSHA Work-Related Fatality Compliance Inspections, Michigan 2017</b>		
<b>Industry</b>	<b>Number of Work-Related Fatalities</b>	<b>Number of Work-Related Fatality MIOSHA Compliance Inspections (%)</b>
Agriculture, Forestry, Fishing & Hunting (11)	19	6 (31.6%)
Construction (23)	29	17 (58.6%)
Manufacturing (31-33)	11	5 (45.5%)
Wholesale Trade (42)	8	1 (12.5%)
Retail Trade (44-45)	12	0
Transportation & Warehousing (48-49)	12	3 (25.0%)
Information (51)	1	0
Finance & Insurance (52)	1	0
Real Estate & Rental & Leasing (53)	3	1 (33.3%)
Professional, Scientific, & Technical Services (54)	2	0
Administrative & Support & Waste Management & Remediation Services (56)	10	3 (33.3%)
Educational Services (61)	2	1 (50.0%)
Health Care & Social Assistance (62)	5	0
Arts, Entertainment, & Recreation (71)	11	1 (9.1%)
Accommodation & Food Services (72)	7	1 (14.3%)
Other Services (ex. Public Administration) (81)	12	1 (8.3%)
Public Administration (92)	8	1 (12.5%)
<b>Total</b>	<b>153</b>	<b>41 (26.8%)</b>

### ***Number of 2017 Deaths Compared to Michigan CFOI***

The Census of Fatal Occupational Injuries (CFOI) is the surveillance system funded in most states by the US Department of Labor, Bureau of Labor Statistics. The Michigan CFOI program reported 153 work-related deaths in 2017 (<https://www.bls.gov/iif/oshwc/cfoi/tgs/2017/iiffw26.htm>).

## Sensitivity of “Injury at Work” Box on Death Certificate

If the manner of death (Box 39) on the death certificate indicated accident, suicide, homicide, indeterminate or pending, the “injury at work” box (41d) is completed by the Medical Examiner with “Yes”, “No”, or “Unknown”. “Yes” signifies that the fatal injury occurred at work, “No” signifies it did not occur at work, and “Unknown” signifies that the Medical Examiner did not know if the injury occurred at work. As described in the Methods Section, MIFACE determined a death to be work-related by compiling multiple source documents, including: Workers’ Compensation forms; Police/Fire/EMT Department reports; MIOSHA 24-hour fatality log; hospital records; newspaper reports; family interviews; and Federal agencies (OSHA, NTSB, MSHA, etc.).

**Table 13** shows that from 2001-2017, 13.1%-44.8% of the work-related deaths would have been missed if MIFACE had solely relied on the “Injury at Work” box being completed with “Yes”.

<b>Table 13. Sensitivity of Death Certificate “Injury at Work” Box Predicting Fatal Injury at Work, Michigan 2017</b>		
Year (# Deaths)	DC Coded as at work (%)	DC not coded at work (%)
2001 (174)*	133 (79.6%)	34 (20.4%)
2002 (151)	126 (86.9%)	19 (13.1%)
2003 (152)	110 (74.3%)	38 (25.7%)
2004 (131)	93 (74.4%)	32 (25.6%)
2005 (110)	88 (83.0%)	18 (17.0%)
2006 (157)	122 (79.2%)	32 (20.8%)
2007 (121)	99 (85.3%)	17 (14.7%)
2008 (121)	100 (84.0%)	19 (16.0%)
2009 (96)	72 (75.8%)	23 (24.2%)
2010 (147)	102 (70.3%)	43 (29.7%)
2011 (141)	95 (69.3%)	42 (30.7%)
2012 (135)	74 (55.2%)	60 (44.8%)
2013 (134)	82 (62.6%)	49 (37.4%)
2014 (143)	89 (62.7%)	53 (37.3%)
2015 (136)	89 (67.9%)	42 (32.1%)
2016 (158)	99 (62.7%)	59 (37.3%)
2017 (153)	85 (55.5%)	68 (44.4%)

\*All death certificates were not obtained/reviewed each year. Percentages based on number of death certificates received for that year.

**Table 14** shows that in 2017, the “Injury at Work” box was misidentified most frequently in the designation of an injury at work in Real Estate & Rental & Leasing (3 of 3 deaths) and Professional, Scientific, & Technical Services (3 of 3 deaths), followed by Agriculture (13 of the 19 deaths).

**Table 14. Industry and Number of Deaths and Number and Percent of Misidentified Deaths, Michigan 2017**

Industry (NAICS Code)	Number of Deaths	Number of Misidentified Deaths (%)
Agriculture, Forestry, Fishing & Hunting (11)	19	13 (68.4%)
Construction (23)	29	9 (31.0%)
Manufacturing (31-33)	11	5 (45.4%)
Wholesale Trade (42)	8	4 (50.0%)
Retail Trade (44-45)	12	6 (50.0%)
Transportation & Warehousing (48-49)	12	5 (41.7%)
Information (51)	1	0
Finance & Insurance (52)	1	0
Real Estate & Rental & Leasing (53)	3	3 (100%)
Professional, Scientific & Technical Services (54)	2	2 (100%)
Administrative & Support & Waste Management & Remediation Services (56)	10	3 (30.0%)
Educational Services (61)	2	0
Health Care & Social Assistance (62)	5	3 (60.0%)
Arts, Entertainment & Recreation (71)	11	6 (54.5%)
Accommodation & Food Service (72)	7	3 (42.9%)
Other Services (ex. Public Administration (81)	12	5 (41.7%)
Public Administration (92)	8	1 (12.5%)

## **MIFACE Activities**

### ***Importance of Using Multiple Data Sources***

MIFACE used many data sources to ascertain if a fatal injury occurred “on the job”. Reliance on just the information in the “Injury at Work” box on the individual’s death certificate would have missed 68 (44.4%) of the work-related deaths in 2017, particularly with causes of death from motor vehicle crashes, homicides, struck-by incidents and work-related suicides. That MIFACE is able to capture these work-related fatalities that would otherwise be missed when relying solely on the “Injury at Work” box supports the utility, and need, for surveillance programs that collate fatality information from multiple sources.

### ***Prevention Material Dissemination***

On the MSU OEM website (<http://www.oem.msu.edu/>) are copies of the completed MIFACE Investigation Reports, Hazard Alerts, and MIFACE Summaries of MIOSHA Investigations (work-related fatality compliance inspection) conducted by MIOSHA personnel.

MIFACE Investigation Reports, MIFACE Summaries of MIOSHA Investigations, Hazard Alerts, and the annual MIFACE Data Fact sheet were posted on the MSU OEM website and distributed to stakeholders. MIFACE Summaries of MIOSHA Investigations included a summary of the work-related fatality and the citations issued to the employer by MIOSHA compliance personnel at the conclusion of the fatality investigation. Hazard Alerts are 1-page documents that review work-related fatalities and provide prevention recommendations that target specific industrial sectors or repeated work-related fatality incidents. The MIFACE Data Fact Sheet summarizes information received regarding the state's work-related deaths and was updated periodically when new information was received. The most current MIFACE Data Fact Sheet can be found [here](#).

For each MIFACE Investigation Report, MIFACE Summary of a MIOSHA Investigation, and Hazard Alert there was a dissemination plan to maximize awareness of the Report and Alert. Investigation Reports and Hazard Alerts were sent via email to appropriate trade associations, unions, trade journals, employers who did the same type of work, and to employers who have expressed interest in receiving the reports.

MIFACE presentations are regularly given to trade groups ranging from health and safety professionals in construction, agriculture and general industry.

## **Case Narratives**

Based on the information collected during MIFACE on-site investigations and/or from source documents, a brief narrative summary organized by industry of each of the 153 acute traumatic work-related deaths in 2017 is included in [Appendix I](#).

**Table 15** provides the narrative case number and cause of death by NAICS code found in the Appendix. Each combination of industry and cause of death is hyperlinked to the beginning of the corresponding narratives. Additionally, each cause of death label is hyperlinked to its corresponding heading in the Appendix.

When the brand name of equipment was known, MIFACE included this information in the narrative. Unless noted, the inclusion of the brand does not signify that there was a defect or other problem with the equipment. Each case narrative that was a work-related fatality that had a MIOSHA work-related fatality compliance investigation is noted by a specific MIFACE case number and hyperlinked to its MIFACE Summary of MIOSHA Investigation (MIFACE Summary) on the MSU OEM/MIFACE webpage. If a MIFACE Investigation Report was written, the MIFACE Investigation number is hyperlinked to its corresponding report on the MSU OEM/MIFACE website.

**Table 15.** Narratives for 2017 Work-Related Fatalities

Industry Sector (NAICS)	Asphyxiation	Drowning	Drug Overdose	Electrocution	Explosion/ Fire	Fall	Homicide	Machine	Medical	Motor Vehicle	Struck by	Suicide
<a href="#">Agriculture, Forestry, Fishing &amp; Hunting (11)</a>	--	<a href="#">1</a>	--	<a href="#">2</a>	--	--	--	<a href="#">3-9</a>	--	<a href="#">10</a>	<a href="#">11-14</a>	<a href="#">15-19</a>
<a href="#">Construction (23)</a>	--	<a href="#">20-21</a>	--	<a href="#">22-24</a>	<a href="#">25-26</a>	<a href="#">27-38</a>	<a href="#">39</a>	<a href="#">40</a>	--	<a href="#">41-43</a>	<a href="#">44-45</a>	<a href="#">46-48</a>
<a href="#">Manufacturing (31-33)</a>	--	--	--	<a href="#">49</a>	--	<a href="#">50</a>	<a href="#">51</a>	--	--	<a href="#">52-53</a>	<a href="#">54-58</a>	<a href="#">59</a>
<a href="#">Wholesale Trade (42)</a>	<a href="#">60</a>	--	<a href="#">61</a>	--	--	--	<a href="#">62-63</a>	<a href="#">64</a>	--	<a href="#">65-66</a>	<a href="#">67</a>	--
<a href="#">Retail Trade (44-45)</a>	--	--	--	--	<a href="#">68</a>	<a href="#">69-70</a>	<a href="#">71-78</a>	--	--	--	--	<a href="#">79</a>
<a href="#">Transportation &amp; Warehousing (48-49)</a>	--	--	<a href="#">80</a>	--	--	<a href="#">81-82</a>	<a href="#">83-84</a>	--	<a href="#">85</a>	<a href="#">86-89</a>	<a href="#">90-91</a>	--
<a href="#">Information (51)</a>	--	--	--	--	--	--	--	--	--	<a href="#">92</a>	--	--
<a href="#">Finance &amp; Insurance (52)</a>	--	--	--	--	--	--	--	--	--	<a href="#">93</a>	--	--
<a href="#">Real Estate, Rental, &amp; Leasing (53)</a>	--	<a href="#">94</a>	--	--	--	--	--	--	--	--	<a href="#">95</a>	<a href="#">96</a>
<a href="#">Professional, Scientific, &amp; Technical Services (54)</a>	--	--	--	--	--	--	--	--	--	<a href="#">97</a>	--	<a href="#">98</a>
<a href="#">Administrative &amp; Support &amp; Waste Management &amp; Remediation Services (56)</a>	--	--	--	--	--	<a href="#">99-101</a>	--	--	--	<a href="#">102-104</a>	<a href="#">105-106</a>	<a href="#">107-108</a>
<a href="#">Educational Services (61)</a>	--	--	--	--	--	<a href="#">109-110</a>	--	--	--	--	--	--
<a href="#">Health Care &amp; Social Assistance (62)</a>	--	--	<a href="#">111</a>	--	--	--	<a href="#">112-113</a>	--	--	<a href="#">114</a>	<a href="#">115</a>	--
<a href="#">Arts, Entertainment, &amp; Recreation (71)</a>	--	<a href="#">116-117</a>	--	--	--	<a href="#">118-119</a>	<a href="#">120-122</a>	--	--	<a href="#">123-124</a>	<a href="#">125</a>	<a href="#">126</a>
<a href="#">Accommodation &amp; Food Services (72)</a>	--	--	<a href="#">127</a>	--	--	<a href="#">128</a>	<a href="#">129</a>	--	--	<a href="#">130-131</a>	<a href="#">132-133</a>	--
<a href="#">Other Services (except Public Administration) (81)</a>	--	--	--	--	<a href="#">134</a>	<a href="#">135</a>	<a href="#">136-138</a>	--	--	<a href="#">139</a>	<a href="#">140-143</a>	<a href="#">144-145</a>
<a href="#">Public Administration (92)</a>	--	--	--	--	--	--	<a href="#">146-147</a>	--	--	<a href="#">148-151</a>	<a href="#">152-153</a>	--



## Conclusion

Traumatic occupational fatalities are an important public health issue in Michigan and throughout the United States. These deaths are not random events, and information about the settings and circumstances in which work-related deaths occur is necessary to prevent their occurrence in the future. There were 9 fewer deaths occurring in Michigan in 2017 compared to 2016. The numbers and rates of these acute traumatic fatalities have fluctuated from year to year, and there has not been a clear downward trend over multiple years. Further efforts are needed to have a meaningful reduction of the occurrence of these tragedies.

The lack of a decrease in the number and incidence rate of work-related fatalities, both nationally and in Michigan, is likely a result of many factors and continued investigation of the causal factors of work-related fatalities is necessary to understand and effect a meaningful reduction in these deaths. Understanding the root cause(s) of these tragic events and sharing this information with stakeholders, from individuals to groups, employees to employers, makes these information-gathering efforts worthwhile. If what we learn from any of these deaths can help prevent further tragedies, then the surveillance program has been successful in its goal. An awareness of the hazards of one's job and an attitude of safety-mindfulness on the part of labor and management is critical to prevent future fatal events.

Some important points highlighted by the deaths:

- The workforce age 65 and older continues to grow as individuals put off retirement and part-time workers enter the workforce due to economic or other reasons. Older workers have unique health and safety challenges, including resistance to change long standing work practices that may not be safe, medical issues, or strength issues, all likely contributing to the higher work-related fatality rate in this age group. Federal [OSHA](#) and [NIOSH](#), among other agencies, have developed resources which can help employers address the challenges faced by older workers and provide a safe working environment for this population group.
- Fatalities from falls remain a major concern, particularly in construction. Information regarding the National Construction Fall Prevention Campaign can be found [here](#). The campaign's goal is to prevent fatal falls from roofs, ladders, and scaffolds by encouraging construction contractors to:
  - ✓ PLAN ahead to get the job done safely.
  - ✓ PROVIDE the right equipment.
  - ✓ TRAIN everyone to use the equipment safely.
- Homicides in the retail trade and accommodations and food services sectors and workplace violence in the health care sector have been recognized as important workplace risks. [OSHA](#) and [NIOSH](#) have both developed extensive resources for employers and employees to use to address the risks associated with workplace violence, especially within certain workplaces such [hospitals](#).
- Motor vehicle crashes are a major cause of work-related fatalities. This should not be a surprise in the Transportation and Warehousing industry sector given the nature of work tasks within this industry sector, but it is also true in Public Administration. Employers should create and maintain safe driving policies and offer driver safety training (including

defensive driving) as part of their safety program and training. MIFACE has created [a hazard alert](#) containing recommendations and resources for employers to develop motor vehicle safety policies and programs.

Each of the 153 deaths in this report could have been prevented, whether through installation of engineering controls, development and implementation of health and safety plans, changes to work practice, or the identification and assistance of individuals seeking and receiving mental health counseling so they can better cope with both work and personal stressors. The descriptions of the acute traumatic work-related deaths in Appendix I highlight these tragedies and the need to act to prevent them.

### **Acknowledgements**

We are extremely appreciative of the support of the Michigan OSHA Safety and Health personnel, the employers, the families and the experts who have worked with us to improve work conditions in Michigan.

We are also appreciative of our Advisory Board who provided constructive comments on each MIFACE Report and Hazard Alert, who assisted us by providing thoughts on developing MIFACE policies and educational outreach activities, and their promotion of the MIFACE program to their employees and constituents.

MIFACE is a research effort and relies on the voluntary cooperation of employers and for the self-employed, their family members. We have received funds from the National Institute for Occupational Safety and Health to continue this program through 2020 and look forward to identifying ways to prevent work-related traumatic deaths and sharing what we have learned with those who may benefit from this knowledge.

## ***APPENDIX I - Narratives***

### ***AGRICULTURE, FORESTRY, FISHING & HUNTING (NAICS 11)***

#### *Drowning*

1. A male wildlife remediation specialist in his 20's drowned while attempting to save a coworker from drowning. The decedent was with three coworkers riding in a 17-foot long, 9-foot wide and 3.4-foot high Boston Whaler boat with 60 HP Mercury motor. There were three Near-Shore Buoyant Vest-Type II PED, Intended Use General Boating Vest Adult Universal personal flotation devices present on the boat. The crew had completed spraying for weeds on the beach and were returning to their cars via the boat. The wind picked up and the waves were 3- to 4 feet high and the boat was drifting away from the shoreline. The supervisor had difficulty getting the boat to start. The supervisor unsuccessfully tried to pull start the motor by wrapping the pull cord around the flywheel. On the second try, the boat hit a wave and threw his hand up in the air causing the pull cord to go into the water. He could not reach the pull cord with the boat's oar, so he took off his boots and entered the water without a personal flotation device. The current caused him to drift approximately 60- to 70-feet away from the boat and after several minutes of trying to swim back to the boat, he tired and called out for help. The decedent was not wearing a personal flotation device and was wearing his boots when he entered the water with a personal flotation device for his supervisor. He gave his supervisor the flotation device. The current began to cause the decedent to drift away from the boat. It appeared to his coworkers that the decedent was trying to take his boots off when he submerged. [MIFACE Summary of a MIOSHA Inspection Case 466](#)

#### *Electrocution*

2. A male farm family member in his teens was electrocuted when the 21-foot-long metal pole he was using to knock down grain from the walls of a bin contacted an energized 4,800-volt overhead line. Before placing newly purchased grain into the 20-foot tall bin, the remaining grain, which had been mixed with molasses, had to be removed from the bin. The top of the bin was located approximately 14 feet from the overhead lines. The decedent was using the 21-foot pole to bang the interior sides of the bin to remove the caked grain mixture. In the past, the farm used a wood pole or a mallet. Because the wood pole could not be located, the metal pole was selected. As the decedent was removing the pole from the loading hole at the top of the bin, the pole contacted the overhead line. He was found on fire, laying on top of the silo by a family member, who ran to a neighbor. The neighbor came to the bin and climbed the ladder with a hose in an attempt to extinguish the fire, but the water pressure was too low. Buckets of water were handed up to the neighbor who extinguished the fire on the decedent and the bin. The farm owner estimated family members have been on top of the bin 12 times in the past year and two times to knock grain off the sides of the bin. [MIFACE Summary of a MIOSHA Inspection Case 469](#)

## *Machine*

3. A male farm owner in his 60's died after being pinned under his tractor, which overturned. The tractor tipped over while being driven along a slope. The tractor came to rest in a pond. The decedent was able to keep his head above water while his wife ran to call for an ambulance. However, upon her return the decedent was completely submerged.
4. A male farmer in his 70's died when he was pinned under an overturned tractor. The decedent was using a tractor to pull a pickup truck out of a muddy field. The decedent attached a chain to the rear of the tractor and the front of the pickup truck, and then attempted to pull the truck from the field. The tractor overturned to the rear, pinning the decedent. The tractor was not equipped with a roll over protection device and seat belt.
5. A male laborer in his 60's died when he was entangled in a Woods Mower Model HD 315-4 secondary PTO shaft while chopping corn stubble. The field was flat and already harvested. The decedent was driving a Massey Ferguson Model 194F farm tractor. The Woods mower was powered via a power take off (PTO) from the tractor. The mower had three PTOs; one from the tractor and two secondary PTOs powering the wings of the mowing deck. The decedent was working alone, and the incident was unwitnessed. There was no guarding on the main or two secondary PTO shafts. The secondary shaft involved in the incident had an unguarded lock pin, which extended approximately one inch beyond the shaft's periphery. When the decedent did not call for a ride home, his coworkers drove the two-track back to the field and looked for him. His coworkers found him laying across the mower deck with his left arm completely wrapped up in the PTO of the deck. His coworkers found corn stubble on the mowing deck and rocks from the field near the mowing deck. A possible scenario was that the decedent was removing rocks from the deck when the incident occurred. The decedent did not turn the tractor and PTO off and during the rock removal from the mowing deck. He may have slipped from the deck and/or his clothing caught on the lock pin. The decedent was declared dead at the scene. [MIFACE Summary of a MIOSHA Inspection Case 474](#)
6. A male farm laborer in his 40s died while operating a corn picker. After he reached into the hopper, his clothing became entangled at the top to the machine and his arm was pulled down into the picker. The picker pulled his clothing tight, pinned him against the machine, and asphyxiated him. The laborer was working alone, and the incident was unwitnessed.
7. A male farm laborer in his 40's died when he was run over by a Dutz 3006 farm tractor and trailer. The decedent was driving a Dutz 3006 low profile orchard tractor pulling a 16-foot long, 6-foot wide single axle trailer with fruit lugs and ladders on the two-track drive behind the packing barn to the orchard. The two-track ran downhill south to north with a slight grade. On the west side of the drive were tall weeds and brush. The east side of the two-track was grass. The trailer was a single axle flatbed trailer with a steel frame and wood surface. The farmer had met with the decedent and two other farm hands at approximately 8 a.m. and gave them their work assignments to pick plums in designated orchards. The two farm hands left in a vehicle and drove to the orchard and the decedent was to bring the tractor and trailer with the lugs and ladders to them. His two coworkers waited about 15

minutes, and when he did not arrive, drove back to the packing barn to look for him. One of the coworkers saw the tractor, which was still running and in neutral, positioned at an angle in the tall grass on the west side the two-track drive; the trailer was positioned on the two-track. The coworker looked and called for the decedent. Not seeing him or hearing a response, the coworker got on the tractor and moved it backward onto the farm road. The coworker felt the rear tire of the tractor rise and then the decedent's body came into view. Emergency response and the owner was summoned. The decedent was pronounced dead at the scene. When the owner arrived at the scene, he found a ladder on the trailer tongue. A possible scenario for the incident was that the decedent may have stopped the tractor to put the ladder back on the trailer. Leaving the tractor in neutral, the downhill grade of the two-track combined with the tractor running in neutral, and the weight of the trailer may have caused the tractor and trailer to roll and run him over. [MIFACE Summary of a MIOSHA Inspection Case 470](#)

8. A male farmer in his 60's died when he was pinned between a 1967 Friday model cherry harvester and a barn wall. The decedent had previously placed two cherry shakers in the barn. He appeared to be in the process of placing a walk-behind hydraulically-controlled 1967 Friday cherry harvester between the two previously placed harvesters. The 1967 Friday cherry harvester was approximately 20 feet long and 8 feet wide. The harvester had a 24-inch long constant pressure control lever located approximately 30 inches above the ground. As the decedent backed the harvester between the two previously positioned shakers, the constant pressure lever became caught between the decedent's legs. The lever's position did not allow the lever to disconnect when released causing the decedent to be pinned against the barn wall. [MIFACE Summary of a MIOSHA Inspection Case 472](#)
9. A male farmer in his 60s died when an industrial lawn mower he was using to mow a ditch on the side of a road overturned and pinned him underneath. He was not found until hours later because he and the tractor were not visible from the road due to the depth of the ditch.

#### *Motor Vehicle*

10. A female farmer in her 40's died when the pickup she was driving was struck by a vehicle, which did not stop at the intersection's stop sign. The roadway consisted of frozen mud/dirt/gravel with a speed limit of 55 mph. The decedent was traveling eastbound and had the right of way. She was on her cell phone at the time of the crash. Just prior to the crash, the decedent applied the brakes of her vehicle. There was no evidence that the other vehicle applied their brakes and presumably the driver of the other vehicle disregarded the stop sign and proceeded through the intersection. The decedent was wearing her shoulder harness/lap belt. The pickup's airbags deployed.

#### *Struck By*

11. A male farmer in his 90's died after being struck by a tree branch while operating a tractor. The decedent was operating a garden tractor to clear some brush from his property. The decedent had driven into a lower area of the property where the tractor moved over a tree branch, causing the branch to be thrown up in the air. The branch struck the decedent in

the head after which the decedent drove his tractor back home. A friend subsequently called 911 and the decedent was admitted to a hospital, where he later died.

12. A male farmer in his 70's died when he was run over by a bulldozer. The decedent was working on the bulldozer in a barn; the barn doors were closed. A family member had just placed a motor in the bulldozer and the wiring needed to be finished. The family member indicated that due to the position/insulation of the motor, linkages and clutch, the machine may have been in reverse due to installation of said components. The decedent had medical issues that made him likely to not ascend to the bulldozer's driver's seat. At some point, the decedent started the bulldozer, most likely standing on the ground behind the machine on the right side. The bulldozer was in "reverse" gear and the decedent was run over by the backing bulldozer. The bulldozer continued backwards, tearing the barn door off the track. The bulldozer continued backwards through a farm field, made a large loop, and came to rest against a large piece of farm equipment. The bulldozer continued to run, but was stuck in one place so the tracks dug down in the dirt approximately 18-24 inches until the unit shut off, presumably from a lack of fuel. A family member found the decedent, called 911 and provided CPR until responding police arrived.
13. A male farmhand in his 80's died after being struck by a tree branch from a downed tree that he was moving with his tractor. The decedent drove the Kabota 5000 tractor equipped with a loader in the front and a brush hog to a 10-acre former crop field to mow it; the property was being maintained for future sale. He arrived at the site at approximately mid-morning, mowed for a while, ate lunch with a property owner adjacent to the property being mowed, and then resumed the task. The incident occurred near a tree line. A tree had fallen from the wood line into the field in the mowing path. The tree which fell had several branches forming a "Y". The incident occurred while the decedent, seated in the tractor seat, attempted to use the loader as a bulldozer to move the tree out of the way. Per the police report, it appeared as though the decedent had contacted the tree a couple of different times; there were marks on the hydraulic arms of the tractor as well as where the hydraulics met the hydraulic cylinder. Tractor paint was visible on the tree and transferred in a width which was consistent with the hydraulic arm dimensions. On the decedent's last attempt, it appeared the tree rolled up and over the bucket and a branch struck and pinned him in the tractor seat. [MIFACE Summary of a MIOSHA Inspection Case 464](#); [MIFACE Investigation Report 17MI136](#)
14. A male farmer in his 70's died when he was pinned under a hay baler. The decedent was working under the baler with the tractor still attached. The tractor rolled backwards, knocking the baler off the blocks it was resting on. When the baler fell from the blocks, the axle landed on the decedent's chest.

#### *Suicide*

15. A male farmer in his 50's died from a self-inflicted gunshot wound.
16. A male herdsman in his 30s died from a self-inflicted gunshot wound.



17. A female farm owner in her teens died from a self-inflicted hanging.
18. A male stable hand in his 20's died from a self-inflicted hanging.
19. A male laborer at an equestrian facility in his 40s died from a self-inflicted hanging.

## **CONSTRUCTION (NAICS 23)**

### *Drowning*

20. A male handyman in his 50s drowned while installing a sump pump for a private homeowner. The sump pump was located behind an opening in the basement wall in a recess 38 inches wide by 32 inches long. The float rod of the sump pump had fallen into the 32-inch-deep sump pit. While attempting to retrieve this piece from the sump pit, the decedent became stuck under the 90-degree elbow of a PVC pipe that was part of a radon mitigation system also located within the recess. The homeowner attempted to free the deceased but was unable to do so. By the time emergency responders arrived, the decedent had drowned due to rising water levels.
21. A male water line construction laborer in his 30's drowned in an excavation. The decedent and a coworker were working in the 10-foot by 12-foot long, approximately 7-foot deep excavation locating and hand digging around a buried gate valve of a 12-inch water main located in the north bank of the excavation. The workers were locating the end of the 12-inch pipe which had a cap on it so that they could tie into it. The cap was on a short section of pipe which was attached to an American 2500 Gate Valve. The gate valve was attached to another section of 12-inch pipe with a Gripper Gasket boltless connection. The pipe, gasket and valve had been installed months earlier as part of a larger water main project and backfilled. The system passed a pressure test approximately three weeks prior to the incident. At the base of the excavation were phone lines. For reasons unknown, the valve came off the pipe on the north side of the excavation. As the water entered, at first slowly, and then gushed toward the south with enough force to push the two workers toward the south. Another individual who was standing on a shelf in the excavation just above the two workers was also caught in the water flow. At one point, this worker had hold of the decedent's arm, but the pressure of





the water made him lose his grip. Two of the workers were rescued by other workers who pulled them out of the excavation. The decedent may have become entangled in the phone lines or he may have been struck by the piece of piping. Approximately 20 minutes later, the decedent was found as workers probed the water with a rake. He was pulled from the water and transported to a local hospital where he was declared deceased. After the water was extracted from the trench, the gate valve was located along the southern portion of the hole. The valve did not show any obvious signs of damage. The gasket was also found. The pipe to which the gasket was attached had scrape marks left by the teeth when the gasket came off the pipe. [MIFACE Summary of a MIOSHA Inspection Case 453](#)

### *Electrocution*

22. A male electrical journeyman lineman in his 40's was electrocuted when he contacted an overhead wire energized 7,600 KV to ground. The decedent was a member of a three-person work crew consisting of himself, another journeyman lineman (crew leader) and an apprentice lineman. The crew was scheduled to remove an existing pole transformer and then reinstall it on a new wooden pole. The crew had set the new electrical pole inside the energized upper primary lines prior to transferring electrical equipment from the old pole to the new pole. The new pole was to be attached with a horizontal guy wire to the next westerly pole (Pole 2). The decedent, working from a bucket truck, had installed the pole to pole guy wire hardware at the top of the new pole. It was discovered that Pole 2 would be in contact with the other wires due to the angles. The crew leader instructed the decedent to lower the bucket while the other crew members prepared Pole 2 to re-route the guy wire to the opposite side. The decedent elevated the bucket and was holding a loose, ¼-inch copper ground wire. He was not wearing his rubber gloves or rubber sleeves; the decedent's rubber gloves were found in the bucket along with his rubber sleeves and storage bag. The electrocution may have occurred by either arcing electrical current or by direct contact to the energized 7,600-volt line to his right shoulder. There were burns across his chest terminating at his left hand. His coworkers lowered the bucket to the ground using the ground controls, rotated the bucket and pulled the decedent from it. Emergency response was called, and first aid given at the scene while awaiting emergency response arrival. [MIFACE Summary of a MIOSHA Inspection Case 449](#)

23. A male electrical transformer technician in his 40's died from complications following contact with a 4,800-volt energized wire/parts while reaching for a crescent wrench he had dropped in a buss duct. The buss duct was located below a transformer cabinet not associated with the work being performed. The decedent was a member of a six-person crew which included two journeyman electricians and four technicians, one of whom was the decedent. The crew accessed the penthouse where the transformers were located by a scissor lift. The work crew was performing a transformer upgrade, changing out a 4,800 KV transformer that stepped voltage down to 480 VAC. They were replacing it with a 4800/13200KV which also stepped the voltage down to 480 VAC. The crew opened and turned off, but did not lock out, two main disconnects and tested for electrical supply in the two transition cabinets and the load points of the transformers before beginning removal. Two individuals, a journeyman electrician and a technician, were building lugs and attaching them to the new transformer. The decedent needed a crescent wrench and went to get one. While returning to the transformer, he dropped the crescent wrench and apparently reached into the buss duct below the transformer to retrieve the wrench and contacted a live wire/equipment. He was later noticed laying on the ground by his coworkers who noticed his left hand in the buss duct and that he was "twitching". The coworker yelled to other coworkers for some wood, and he moved the decedent's hand and arm from the duct. The crew began CPR while waiting for emergency response. The decedent died approximately three weeks later from complications of the electrocution. It was determined that although the substation controls were in the "off" position and the employees tested the supply and load side of the transformers to be replaced, there were additional lines in the duct and cabinets which were not tested and guarded to prevent contact with energized parts. [MIFACE Summary of a MIOSHA Inspection Case 465](#)



24. A male electrician apprentice in his 20's was electrocuted in the attic of a church when attempting to supply power to a newly installed electrical outlet. After not hearing from him, church members climbed the ladder to the attic and found the decedent. Another church member turned off the breakers in the fuse panel. The decedent was observed to have wires in his hand. Responding police found three sets of flexible metal shielded braided 3-wire all having been stripped approximately one inch. Two of the stripped wire ends were wrapped in a blue metallic shielding and the third was wrapped in a similar

metal shielding but no blue coating. A screw driver and wire cutter set were recovered nearby. Responding police also checked the church's three service mains. The officer found one breaker had been tripped. Burn marks were located on the decedent's hands and back. The wire cutter and screwdriver did not show signs of an electrical arc.

### *Explosion/Fire*

25. A male owner of a construction firm in his 60's died after a propane tank he was working on in his workshop exploded and caught the decedent's clothing on fire.
26. A male pipefitter in his 30's died when purging the 1-inch gas line feeding a 2nd floor dehumidification unit with natural gas and it exploded. The decedent and a coworker were purging gas lines using natural gas odorized with mercaptan. The gas lines reduced from a 6-inch main located at ground level to a 1-inch line at the dehumidification unit. The decedent and his coworker were charging the gas lines with natural gas and purging any atmospheric air from the line to bring the dehumidification units into service. The gas lines had been purged three times without incident prior to the explosion. Each dehumidification unit was located in its own mechanical room in a penthouse's doghouse. To purge the line, the 1-inch natural gas line feeding each dehumidification unit was opened at each pipe union between the hand valve (Isolation) and the 90-degree elbow, just before the gas train attached to the dehumidification unit, to detect the rotten egg odor of gas. When the rotten egg odor was detected, the workers shut the valve and retightened the union. The incident occurred after approximately one hour of purging. Two dehumidification units were being purged simultaneously. The gas was vented to the mechanical room (not to the outside air) nor was a calibrated combustible gas detector in use prior to the explosion. The penthouse had outside dampers. Additionally, there was an open atrium below the penthouse. An explosion occurred during the decedent's purging activity. Natural gas with the added mercaptan caused the released gas to be heavier than air, sink to lower levels and reach possible ignition sources. The decedent was found on a landing halfway down a stairway. The decedent was able to walk out of the building and notified another worker that the gas was still on. This worker shut off the gas at the 6-inch valve. The decedent passed away from injuries sustained. [MIFACE Summary of a MIOSHA Inspection Case 455](#)

### *Fall*

27. A male in his 50's died of complications of a fall at a construction site in 1977.
28. A male carpenter in his 30's fell approximately 36 feet from a roof to the base of an egress basement window well. Based on the location where the decedent was found and the roof of the dormer was incomplete, it was surmised that the decedent was working on a third-floor dormer. A coworker, who had been working nearby, indicated that when he left the roof to perform another task, the decedent was taking measurements for a trim board. The decedent was not wearing fall protection. The incident was not witnessed. Other workers on the site heard him moan in pain. Upon investigation, the workers found him in the window well, which was positioned directly under the dormer on the roof. The decedent fell 26 feet from the roof and struck the foundation window well wall, and then continued

to fall 10 feet to the base of the window well. Emergency response was called, and the decedent died in the hospital's emergency room. [MIFACE Summary of a MIOSHA Inspection Case 446](#)

29. A male plasterer/drywall installer in his 20's died when he fell approximately 30 feet through a 24-inch by 48-inch plastic skylight. The decedent was working on the west side of the building roof next to the skylight. The roof was flat and had 10 skylights. His work area was cluttered with demolition debris, including lumber, metal pipes, a five-gallon bucket and several pieces of Styrofoam. The decedent's work task was to apply adhesive to the back of an expanded foam board being used for a penthouse exterior wall plastering operation. After applying the adhesive to the foam board, he walked with the foam board to the west side of the building and gave it to the owner, who was working in a boom lift. The decedent's employer stated to police that the decedent was carrying a piece of foam when he tripped and fell. The employer stated to police he heard a crushing sound, and when he looked over towards the sound, saw the decedent in a seated position on the plastic skylight cover. The skylight cover the decedent was sitting on gave out. The decedent attempted to grab the sides of the skylight to keep from falling through but was unsuccessful. The incident skylight's plastic cover was not rated for two times the intended load. [MIFACE Summary of a MIOSHA Inspection Case 448](#)
30. A male roofer in his 20's died when he fell approximately 12 feet 4 inches from the low-sloped, 4/12 pitch roof of a one-story commercial building to a concrete sidewalk. The decedent's employer was contracted to install new roof shingles and a drip edge. The decedent's employer arrived and directed the decedent to travel to another worksite to pick up an air compressor and bring it back to the jobsite. The remaining three individuals at the job site worked from extension ladders to install the drip edge. The decedent returned from the other job site with the air compressor. One of the workers was working approximately 15 feet away from the location where the decedent fell from the roof to the concrete sidewalk below. He was not wearing fall protection. He died approximately one and one-half weeks later from complications of the injury sustained at the time of the fall. [MIFACE Summary of a MIOSHA Inspection Case 447](#)
31. A male roofing company owner in his 60's died from a 26-foot fall from the flat roof of a commercial building. The 35-foot by 70-foot flat roof had a 12-inch parapet on each side of the roof. The decedent and his three coworkers were replacing the roof with a new PVC roof. The coworkers were working at another location on the same roof. The decedent was working west to east pulling roofing material back so he could glue it. As the decedent was walking backward, he tripped on the parapet and fell 26 feet to the grass below. There were no warning lines on the roof. The decedent was not wearing fall protection. [MIFACE Summary of a MIOSHA Inspection Case 450](#)
32. A male construction foreman/carpenter in his 40's died from injuries sustained in a 12-foot fall from a metal pole barn roof. The crew had completed the installation of the plywood and felt for the 4/12 pitch roof. Some metal sheeting on one side of the roof had been installed. According to one coworker at the scene, when the crew arrived at the site, it was sprinkling. The decedent decided to build a platform on the side of the roof that had the metal sheets

installed. The decedent was accessing the roof from a lift that was positioned so he could step from the lift to the roof. He was not wearing fall protection. The decedent was holding onto a sheet of plywood as he stepped from the lift to the roof, to hand the plywood to a coworker who had accessed the roof using a 25-foot ladder. The decedent took a few steps backward and may have stepped on the wet metal sheeting. He slipped and fell approximately 12 feet from the roof edge to the packed dirt below. Another firm's employee at the site called the decedent's employer; his employer called for emergency response. The decedent was taken to a local hospital where he died approximately one month later from complications of the fall. [MIFACE Summary of a MIOSHA Inspection Case 456](#); [MIFACE Investigation Report 17MI128](#)

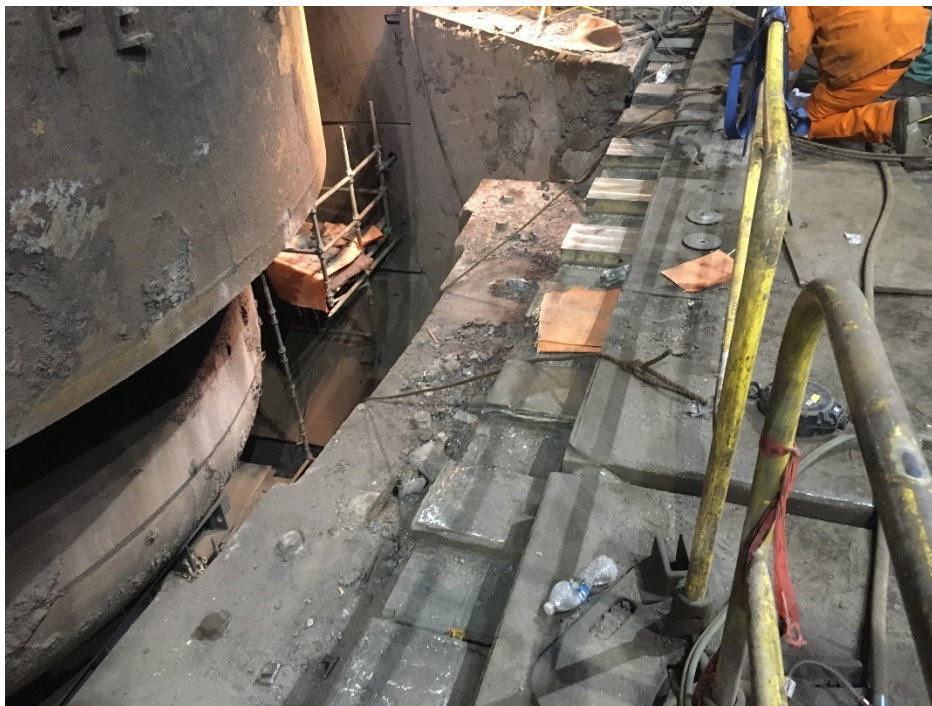
33. A male roofer in his 20's died from injury complications sustained when he fell approximately 15 feet from a 10 in 12-pitch roof, landing on framing lumber for a future deck for a home. The decedent was a member of a four-person crew installing metal trim and edging in preparation of siding and steel roof panel installation. The decedent was installing a piece of drip edge along the rake edge on the southwest corner of the home. His coworkers were installing flashing on a low-slope roof on the east side of the home. The cause of the decedent's fall was unknown. The decedent was not wearing fall protection. He died from complications of the injury several months later. [MIFACE Summary of a MIOSHA Inspection Case 486](#)
34. A male carpenter in his 50's fell approximately 12 feet from a garage roof edge to packed dirt. The decedent owned a construction firm as well as having a full-time job at another construction firm. The decedent was a good friend of an individual who was building a home. The decedent was the framing contractor for this home and performed the residential framing on the weekends as a side job. It appeared the decedent installed some roof jacks on the garage roof, using only two nails instead of four nails. The decedent had hired some family members to assist him that day; one family member was at the rear of the home snapping lines and the other family member was sawing wood. It is unknown if the decedent was sheathing the 12/12 pitch garage roof or was working on the garage 10/12 pitch dormer roof. He was not wearing fall protection. The roof jack gave way and the decedent fell 12 feet from the garage roof to the packed earth below. Both family members heard a noise and went to investigate. Upon finding the decedent, they called for emergency response. The decedent was transported to a local hospital. He died approximately one week later from the injuries sustained at the time of the fall. [MIFACE Summary of a MIOSHA Inspection Case 458](#)
35. A male siding installer in his 50's died when he fell approximately eight feet from a flat roof to the concrete/packed dirt below. The homeowner contracted with Firm A to perform siding installation. The decedent used to be an employee of firm B, which was subcontracted from firm A. Firm B did not want to work for firm A any longer, so the decedent was subcontracted directly by firm A. The decedent and his employee were removing old aluminum siding and installing new cedar shake siding, removing and installing windows, and trimming the new windows and fascia. The decedent's employee was working in another location of the home at the time of incident. It is unclear how the decedent fell from the roof – whether he stepped off the roof or whether he was trying to access a ladder to



descend from the roof. His employee found him, and the decedent told him he fell from the roof and thought he had cracked a rib. The decedent called the owner of firm B on his cell phone and told him he fell from the roof. The owner of Firm B told him to go to the hospital. The decedent stated he was going to go home to rest. The decedent and the employee cleaned up the jobsite, and the employee started to drive the decedent back to his home. They stopped at a gas station, and the employee went into the store while the decedent answered his cell phone as he was getting out of the truck. A customer of the establishment told the employee that his friend fell in the parking lot. The employee and customer placed the decedent in the truck and transported him to a hospital. The decedent died several hours later of complications of the injuries sustained in the fall. [MIFACE Summary of a MIOSHA Inspection Case 457](#); [MIFACE Investigation Report 17MI075](#)

36. A male electrician in his 40's died when he fell 75 feet. The decedent had been testing data communication using an aerial work platform on the 5<sup>th</sup> level. The aerial work platform lost power and his coworker retrieved a power cord and plugged it in. The decedent told his coworker he was going to the bathroom. He left his work area on the 5<sup>th</sup> level and went up to a spotlight platform, located on the 7<sup>th</sup> level. A structural steel beam directly above the area of the fall had one set of visible footprints approximately 15 feet south from the spotlight platform. It is unknown if he slipped on the beam or if he intentionally jumped. He fell 75 feet to the seating area below.
37. A male demolition laborer in his 30's died when a 2nd floor collapsed in a building undergoing demolition. The 9-foot wide by 20-foot long concrete 2nd floor was adjacent to an existing stairway extending from the main floor to an upper seating area. There were two employees performing manual demolition of the floor to the east of the stairway with a 90-pound jackhammer and a sledge hammer. A mini excavator with an attached hydraulic jackhammer, which had performed demolition in other areas, was not able to be utilized for this work. The floor which collapsed had previously been saw cut on the south end. The decedent and his coworker were working from north to south, parallel to where the seats would have been located and perpendicular to the direction of the steps. Both employees were wearing harnesses as part of the personal fall arrest system (PFAS) utilizing a 50-foot long self-retracting lifeline (SRL) attached to a single bar joist overhead, each with a nylon choker. The workers were approximately 10-15 feet away from the attachment location at the time of incident. No shoring had been installed under the floor prior to the manual demolition. The floor collapsed and both workers fell approximately 15-16 feet. [MIFACE Summary of a MIOSHA Inspection Case 451](#)

38. A male journeyman ironworker in his 40's died after falling 16 feet from a work platform in a steel manufacturing facility. The decedent was performing scheduled maintenance, including leveling a rail system by welding shims onto the rail system. To access the work platform, the decedent was required to step through a standard barrier system from a deck area. The decedent was utilizing Guardian Fall Protection, 30-foot velocity SRL (self-retracting lifeline) attached to a shock absorber extension, which was then attached to a personal fall arrest harness. The SRL was attached to Guardian-manufactured D-ring supports strategically placed/welded approximately 10-12 inches in from the deck edge. The decedent attached the SRL hook/carbineer to his shock absorber extension which was attached to his harness and then stepped through the standard barrier system and then down to his work platform. The work platform was covered with debris (e.g. broken concrete and dirt). It appeared the decedent slipped and fell from the work platform. The decedent fell approximately 10-12 feet before his upper chest area made contact with a vertical scaffolding post located below. He continued to fall and landed on the scaffolding deck where he was assisted by a coworker and later transported for treatment. The decedent's fall protection did not stop the fall. [MIFACE Summary of a MIOSHA Inspection Case 462](#)



#### *Homicide*

39. A construction laborer in his 30's died when the vehicle in which he was a passenger was struck by a rock thrown from an expressway overpass.

#### *Machine*

40. A male owner of a landscape/paver business in his 30's died when a saw kicked back and struck his neck. The decedent and a coworker were in the process of removing a metal pool. There had been a few previous vertical cuts in the shallow end of a metal liner, which had a depth of approximately three feet. The sides to the east were in the process of being pushed inward. As cutting work progressed, the last area to be cut was located on the west side of



the shallow end of the pool. The incident occurred near where the pool transitioned from shallow to deep. The decedent was making a vertical cut with a cut-off saw equipped with a 14" Diamond Wheel blade. This type of blade is routinely used for masonry/cement work, not metal work. The decedent's coworker had just returned with a skid steer after loading equipment into a trailer. He turned the skid steer off and heard the decedent scream. The incident was unwitnessed. His coworker stated that he witnessed the decedent touch his neck. The decedent turned off his saw and climbed out of the pool. His coworker ran to him. The decedent started to lean over and fall. His coworker caught him and called 911 while he was trying to stop the bleeding. The 911 operator asked for the address, but his coworker did not know. The 911 operator instructed the coworker to run to the front of the home to obtain the address. While at the front, his coworker flagged down a motorist to provide assistance. The address was provided, and emergency response arrived. The decedent was declared dead at the scene. [MIFACE Summary of a MIOSHA Inspection Case 454](#)

### *Motor Vehicle*

41. A male electrician in his 40s died when his vehicle was struck by a motor vehicle that did not yield to a stop sign. He was traveling eastbound in his work utility van at 50 mph when the other vehicle traveling northbound made a right hand turn at 55 mph without yielding to a stop sign and struck the right front and side of the van. While both vehicles' airbags deployed, the victim was not wearing his seat belt and was partially ejected from, and then was trapped under, the overturned vehicle. The roads were wet from heavy rain and the collision occurred when it was dark at an unlit intersection.
42. A male owner of a hardwood flooring company in his 50's was driving a pick-up truck when he rear-ended two semi-trucks. The decedent was driving on a dry highway divided by a barrier, during a cloudy day with daylight. The two-lane road had a posted speed limit of 70 mph and had a lane closure for construction/maintenance purposes that, at the time, did not have workers. The decedent was heading east in a pick-up truck before the rear-end collision with two stationary semi-trucks.
43. A female heavy equipment operator in her 30's died when she lost control of the dump truck she was driving after the front tire blew out. The truck left the roadway and overturned. The decedent was traveling eastbound on a dry, 2-lane roadway with a posted speed limit of 55 mph. The truck veered hard left and skidded into a guard rail, then overturned to the passenger side where it lost its load of gravel, rolled down into a ditch onto the dump truck's roof. The decedent was not wearing a seatbelt/shoulder harness. The truck was not equipped with an airbag.

### *Struck By*

44. A male equipment operator in his 60's was hit in the head with a tree branch after attempting to clear trees from a plot of land that was to be put up for sale.
45. A male laborer in his 50's died when the roof of a carport/garage combination being demolished fell onto him. The owner of the firm was originally on-site when demolition

began but left the site to buy some needed equipment. The decedent was a member of a 4-person crew. The project was the demolition of a garage. One roof covered both the garage located on the west side of the structure and a carport on the east side of the structure. The crew removed the garage door on the north side and removed the wood siding to the studs on the west and south sides of the garage. The roof was still totally intact. The deceased started to remove the wood on the east garage wall under the carport roof. The east wall collapsed, trapping the decedent under the roof. A coworker who was cleaning up the stripped wood ran to where he thought the decedent was located, and with a sledgehammer, started breaking up the roof to gain access. After approximately 20 minutes, the workers found the decedent. Finding no pulse, he told another coworker to get help. The work crew did not have a phone on the site. The coworker knocked on the doors and windows of neighbors until he found a neighbor at home. The neighbor called for emergency response. When EMS arrived, they extricated the decedent through the hole in the roof made by his coworkers. The decedent was transported to a local hospital where he was declared dead. [MIFACE Summary of a MIOSHA Inspection Case 480](#)

### *Suicide*

- 46. A male property “flipper” in his 50’s who was restoring a residential property died from a self-inflicted gunshot wound at the home in which he was working.
- 47. A teen male who was working in his foster parents' contracting firm, died by self-inflicted hanging.
- 48. A male electrician in his 60s died from a self-inflicted hanging.

## **MANUFACTURING (31-33)**

### *Electrocution*

- 49. A male self-employed carpenter and manufacturer of wooden furniture in his 40’s was electrocuted while using a wood-burning tool.

### *Fall*

- 50. A male lathe operator in his 70’s died in 2017 from complications of a fall occurring in 1989.

### *Homicide*

- 51. A male machine operator died from stab wounds sustained as a result of an argument with a coworker.

### *Motor Vehicle*

52. A semi tractor-trailer driver for a manufacturing firm in his 60s was driving northbound on a wet, 4-lane road on a cloudy day with a posted speed limit of 70mph. The decedent came into contact with an SUV going in the same direction, which caused them to sideswipe one another and move off the roadway. After the decedent ran off the roadway, his truck jackknifed and was completely embanked. The decedent was trapped in the truck and suffered multiple injuries, which later proved to be fatal. Toxicological screens for the decedent were all negative. The decedent was wearing shoulder and lap belts, though airbags were not equipped.
53. A male chief executive officer of a metal products manufacturing firm in his 70s was a passenger in a limousine traveling to the airport to return from a work trip when the vehicle lost control after driving through snow and slush on the left shoulder. The vehicle then veered right across all lanes of traffic and hit an entrance ramp guard rail. While the driver was wearing his seatbelt, the victim was not. He passed away at the hospital.

### *Struck By*

54. A male maintenance worker in his 40's died when he was struck by an exploding multi-piece tire rim. The decedent was a member of a three-person work crew. The crew was in the process of mounting a flat driver's side front tire on a Terex front end loader. The tire size was 20.5 x 25 with a weight of approximately 400-600 pounds. The crew had placed a bottle of "Green Slime" tire leak sealant in the tire and while the tire was on the rim, sprayed an ether-based starting fluid into the tire. One of the crew members lit the starting fluid with a hand-held propane torch, which caused the tire to expand and seat against the wheel bead. The decedent stood in front of the tire and used an air hose from a nearby semi to inflate the tire. The air hose did not have a clip-on chuck. During tire inflation, the outside portion of the multi-piece rim and the tire blew off, striking the decedent's neck and propelling him approximately 10 feet from the loader. The coworkers called for emergency response and attempted to provide first aid. [MIFACE Summary of a MIOSHA Inspection Case 468](#)
55. A male operator in his 60's died when he was struck and run over by semi-tractor and/or semi-trailer he was moving from a Shipping/Receiving dock. The loading dock contained two loading bays, with the concrete ramp to the bays at a downward angle to the building. The decedent unhooked the semi cab from one trailer and connected the cab to a second trailer. He was in the process of pulling that tractor/trailer out from the dock when the unwitnessed incident occurred. A coworker heard the trailer's landing gear dragging across

the pavement as the tractor/trailer drove away from the dock and went to investigate when the decedent did not return. The coworker found the decedent laying on his back in the dock area and called for emergency response. The tractor/trailer kept moving after the decedent was struck and run over and was found approximately 150 feet east of the incident scene; the landing gear had come into contact with the crest of a roadway, stopping the travel of the unit. There were scrape marks on the passenger side of the unit on the ramp where the trailer was being moved. A coworker ran to the truck and found the driver side tractor door open, the engine running, the transmission in second gear and the brakes not set. The coworker turned off the engine of the truck. [MIFACE Summary of a MIOSHA Inspection Case 463](#)



56. A male steel bay attendant in his 50's died from complications of injuries sustained when, after cutting the bands securing two unsupported steel coils together, one of the steel coils fell onto him. A press machine operator asked the decedent to bring some steel so the job could be completed. The press operator needed only one coil from a pallet containing two steel coils. The steel coil involved in the incident was approximately 69 inches in diameter by 6 inches in width and weighed approximately 5,000 pounds. On the pallet were two coils. Each individual coil was banded. The two steel coils were banded together in pairs with wood separating each coil, and then the banded two coil package was secured by banding to the wood pallet. The coils were laid horizontally on the pallet for transport. The decedent procured a powered industrial truck and transported the pallet with the steel coils to the area of the press. The decedent rotated the coils and placed them vertically (on their 6-inch side) directly on the floor. He moved the powered industrial truck away from the coils. The coils/pallet were free-standing. He then began to cut the bands holding the coils to the pallet. He cut the top two bands and was in the process of cutting the last band on the "bottom" when the coils separated and shifted. The coil nearest to the decedent fell onto him. The second coil remained vertical. The machine operator procured assistance, and using a nearby crane, the coil was lifted from the decedent. The decedent was transported to a local hospital where he died several days later from complications of the injury sustained. [MIFACE Summary of a MIOSHA Inspection Case 477](#)



57. A male welder in his 40's died when an inverted 3,000-pound part fell onto him. The 56-inch by 78-inch by 1-inch thick 3,000-pound part with a 46-inch protrusion in the center was affixed to the underside of the two arm extensions of a Cullen-Freistedt 140-218 positioner. The part had two holes which aligned with holes in the arms of the positioner. The positioner allowed the part to be rotated and appropriately positioned for welding. The decedent, acting independently and without authorization or approval, cut the two specified bolts which should have affixed the part to the positioner and replaced them with two Grade 8 socket head cap screws. He cut the head off of these screws, effectively making them studs. He ground down the diameter of the screws at the top to create a weld fillet area and then welded the modified studs onto the arms of the positioner. On the day of the incident, while the part was placed in the inverted (upside down) position placing the load on the weld of these studs, the decedent utilized an impact wrench to tighten the fastener on the south side of the unit. It appeared that the tension load imparted by the impact wrench caused the stud on one side to yield and separate and the stud on the other side to shear. There was no secondary means of support and the 3,000-pound part fell on top of him. Employees heard a crash and upon investigation, saw the part had fallen onto the decedent. As emergency response was summoned, an overhead crane was used to hook to the part to remove it from him. Found next to the decedent was his impact wrench set to the forward (tightening) position. [MIFACE Summary of a MIOSHA Inspection Case 461](#)



58. A male maintenance worker in his 50's died when struck by part of a pressurized stainless-steel furnace door that ruptured. The 3-person maintenance crew was conducting tests to determine the location(s) of a leak in the approximately 55-inch diameter hollow door of an electric ferritic nitrocarburizing furnace with vacuum purge, Model VDR914 E 60490. The door was insulated with Fiber Frax blanket insulation. The electric furnace was used to anneal automotive steel, heated to 1060 degrees F, and had a vacuum pressure to 50 millibar. A crack in the furnace door had recently been welded, but it had been determined that other leaks were present. The maintenance crew tried to locate the leak(s) by their usual procedure - visual inspection and using a smoke generator inside of the furnace. The crew, for the first time, then tried to locate the door leak(s) using plant pressurized air. The crew detached the vacuum line to the door and attached plant air (100psi) to the inlet portion of the door. There was no pressure gauge at the door inlet, and no one was positioned at the quick disconnect for the plant air. The plant airline was attached for less

than 5 minutes. During the pressurization of the door, the weld failed and ruptured a portion of the door, striking both the decedent and another worker. [MIFACE Summary of a MIOSHA Inspection Case 445](#)

### *Suicide*

59. A male automobile manufacturing laborer in his 20s died from a self-inflicted gunshot wound.

## **WHOLESALE TRADE (NAICS 42)**

### *Asphyxiation*

60. A male grain elevator laborer in his 50's died when he was asphyxiated due to being engulfed in corn dust during clean-out of a dust collector. The milling operation was on the first floor and the dust collector was located on the second floor. The second floor was accessed by stairs. The dust bin had two fans feeding into it which created a cyclone state within the bin. This caused the very fine dust to be blown out the screens at the top of the bin. The heavier dust settled at the bottom of the bin. As the dust bin collected dust, the dust slowly filtered down the chute to the ground level dust collector, which was situated in a connected structure outside the milling operation. The second-floor dust bin was approximately 12 feet and 4 inches tall, 8 feet 6 inches by 8 feet 5 inches wide. At approximately 9'4" from the top of the bin, the bin tapered toward an exit chute external to the building to allow corn dust to accumulate by gravity in the clean-out area at the ground level dust collector. A 12-foot fixed ladder was used to access the top of the bin. There was a 3-foot by 2-foot wide hatchway on the top of the bin to gain access to inside of the bin. A 12-foot fixed ladder on the exterior wall was affixed within the bin itself; a 2-foot gap was present between the top of the bin/access hatchway and the first top step of the ladder inside of the bin. The decedent drove a loader to the incident site. It appeared he climbed the ladder external to the bin with a shovel and portable lights. The incident was unwitnessed. It is unknown if he was attempting to access the ladder inside of the bin or if he slipped on the floor. A divot in the corn dust on the floor was observed. Another worker noticed the loader but did not see the decedent. He climbed the ladder to the access door and did not see him. He returned to ground level, entered the clean-out area and looked up. He saw the decedent's legs hanging out from the location where the dust exits the building. The coworker called for emergency response. Emergency responders cut three holes in the bin to drain the approximately 5 feet of corn dust that had accumulated above the decedent. The fourth cut located the decedent. Emergency responders found the decedent facing the outside wall where the interior ladder was located. They removed him from the bin. He was declared dead at the scene. [MIFACE Summary of a MIOSHA Inspection Case 467](#)

### *Drug Overdose*

61. A male laborer in his 20's died from multiple drug toxicity.

*Homicide*

62. A male candy import owner in his 30's and a male laborer in his 50's at the same business were found shot five days apart.
63. A male candy import owner in his 20's and a male laborer in his 50's at the same business were found shot five days apart.

*Machine*

64. A male owner/operator of a farming/lawn equipment sales business in his 60s died while repairing the boom on a tractor. The incident was unwitnessed, but it is believed that the decedent hit a lever causing the boom to swing behind him, pinning him against the side of the tractor in a standing position and asphyxiating him.

*Motor Vehicle*

65. A male delivery truck driver for a tire wholesaler in his 30's died when the truck he was driving struck a tree. The decedent was driving southbound on a dry, 2-lane roadway with an unposted speed limit of 55 mph. Witnesses stated that the truck slowly crossed the centerline, entered the northbound lane, left the roadway and struck a tree. Witnesses noted that the decedent did not apply the brakes. The decedent was wearing his lap belt/shoulder harness. It is unknown if the truck had airbags.
66. A male truck driver in his 30's died after rear-ending another vehicle. The decedent was heading north on a dry, 3-lane divided highway without a barrier with a posted speed limit of 70 mph. The collision occurred on a cloudy day with daylight on a road without traffic control.

*Struck By*

67. A male auto parts salvage worker in his 50's died from complications of a previous injury. In 1984, while working on a vehicle, the vehicle fell on the decedent, injuring his spine and partially paralyzing him.

**RETAIL TRADE (NAICS 44-45)**

*Explosion/Fire*

68. A male stock/driver for an automotive supply in his teens died when he was struck by the lid of a 55-gallon drum when it exploded. The drum was empty and its previous contents unknown. The lid was fastened to the drum and the bung was closed. The decedent was



wearing a welding helmet and was welding a handle on the drum lid using a MIG welding machine when it exploded.

### *Fall*

- 69. A male grocery store manager in his 60's died after a fall from standing height.
- 70. A male cashier clerk at a retail grocery store in his 40's died after slipping on ice and falling. The decedent was removing trash from an outside trash receptacle when he slipped on black ice and twisted his ankle. He went back to work but was later admitted to the hospital after noticing significant ankle swelling and experiencing an inability to support weight on the ankle. The decedent died in the hospital from complications of his ankle injury.

### *Homicide*

- 71. A male retail service specialist in his 60's died from gunshot wounds sustained during a robbery.
- 72. A male flooring company owner in his 60's died from a gunshot wound.
- 73. A 44-year-old produce truck driver died from a gunshot wound.
- 74. A male marijuana dispensary clerk in his 20's died from multiple gunshot wounds sustained during an armed robbery.
- 75. A male medical marijuana grower in his 20s died from multiple gunshot wounds sustained during a robbery.
- 76. A male gas station attendant in his 30's died from multiple gunshot wounds
- 77. A female retail salesperson in her 20s died from gunshot wounds sustained in an argument with a coworker.
- 78. A female sales associate in her teens died from a gunshot wound.

### *Suicide*

- 79. A male automotive business owner in his 40's died from a self-inflicted hanging.

## ***TRANSPORTATION AND WAREHOUSING (NAICS 48-49)***

### *Drug Overdose*

- 80.** A male truck driver in his 40s died from a heart condition complicated by amphetamine use.

### *Fall*

- 81.** A male mechanic in his 70's died from injuries sustained in an approximate 3.5-foot fall from a semi-tractor cab secured on the bed of a parked low-boy trailer. The decedent had been troubleshooting a lighting issue on a semi-truck tractor in the repair shop. He and a coworker decided to test the relay (Relay #1) to determine if it was defective. In the yard was a wrecked semi-tractor secured to the bed of a low-boy trailer. The low-boy trailer with the wrecked semi-tractor was positioned between two semi tractor-trailer combinations. The decedent walked out to the wrecked semi-tractor carrying Relay #1 with him. The relay from the wrecked semi-tractor in the yard (Relay #2) was in one of the fuse panels under the dashboard, next to the brake pedal and directly above the floor on the driver's side. To access Relay #2, the decedent stepped up 20 inches onto the low-boy trailer bed, then stepped up approximately 17 inches to the first step of the semi-tractor. At some point during this process, he opened the driver's side door of the semi-tractor cab. It is unknown if he stepped up approximately 19 inches to the second step to access the fuse panel. The tractor cab floor was approximately 16 inches above the second step. He removed Relay #2 from the fuse panel. A few minutes later, his coworker decided to check on him because he thought the decedent should have been back to the shop. The coworker walked out to the decedent's location and found him lying on his back on the concrete at an angle to the low-boy trailer, with his feet facing the low-boy. The decedent's safety glasses, flashlight and tool were found on the ground. Nearby was a relay, which was found lying near one of the parked semi tractor-trailers. The wrecked truck's cab door was fully opened, and the fuse panel door removed. A relay was found lying on the carpet inside the cab. It is unknown which relay was found in the tractor cab and which relay was found on the ground near him. His coworker called for emergency response. The decedent was transported to a nearby hospital where he died 10 days later from the head injuries sustained at the time of the fall. [MIFACE Summary of a MIOSHA Inspection Case 488](#)
- 82.** A male postal carrier in his 60's died from complications of a fall while delivering mail.

### *Homicide*

- 83.** A male limo driver in his 40s died from multiple gunshot wounds sustained during a robbery.
- 84.** A male towing business owner in his 40s died from multiple gunshot wounds while assisting a client.

### *Medical*

- 85.** A male airline baggage loader in his 80's died from complications related to a hernia that developed while lifting baggage in 2015.

#### *Motor Vehicle*

- 86.** A male truck driver in his 20's died when his semi left the roadway and struck some trees. The incident occurred on a wet, 2-lane roadway with a posted speed limit of 55 mph. The decedent was traveling northbound at 69 mph (per GPS tracking determined by responding police). The decedent lost control of the semi and trailer hauling a waste spreader. The tractor/waste spreader trailer left the roadway to his right and struck multiple trees, causing the cab to dislodge from the waste spreader trailer. The decedent was ejected from the cab. The decedent stated to witnesses that someone had run him off the road. The decedent was transported to a local hospital where he died in surgery. The decedent was not wearing a lap/shoulder belt. The semi cab was not equipped with an airbag.
- 87.** A male truck driver in his 60's died when his vehicle overturned. The decedent was traveling southbound on a ramp with the intention to enter a southbound freeway. The decedent had been traveling at a high speed on the dry ramp, causing his load to shift during the turn. The semi overturned to its left side. The decedent was wearing a seatbelt/shoulder harness. The airbag did not deploy.
- 88.** A male truck driver in his 50s died in a motor vehicle collision while heading west on a two-way, 5-lane highway with a posted speed limit of 50 mph. The decedent failed to stop at a red traffic signal. He then collided in the intersection with the front of another semi-truck headed north. The decedent was wearing his seatbelt, and his airbag did deploy.
- 89.** A male package delivery driver in his 40's died from multiple injuries after his van was struck by another vehicle. The decedent was driving southwest on a wet, 2-lane road in daylight with a posted speed of 25mph, when he was struck by an intoxicated woman speeding southeast on a road. The woman was fleeing from another collision a few miles away when she drove straight through a stop sign and struck the decedent's van on the front passenger side in the intersection. The decedent's van tipped to the side and the decedent was ejected from the vehicle. The woman's car was sent into the grassy portion of the median where she suffered minor injuries. It is unknown if the decedent was using a seatbelt. The front airbag deployed.

#### *Struck By*

- 90.** A male tow truck operator in his 60's died when a disabled bus fell onto him. The bus driver tried to start the bus and it kept stalling out, so the driver called for a tow. The bus was in the far-right lane of an exit ramp with a slight downhill grade toward the stop sign at the end of the ramp. The bus driver stated that the decedent never entered the bus prior to raising the front end. The decedent raised the front end of the bus and placed a stack of two wood blocks under each tire. The bottom (base) blocks were both 13-inches long by 6 inches wide by 4 inches high. One 9-inch long by 4-inch wide by 3-inch high block was

placed on the top of one 13-inch block and one 7¾-inch long by 3½-inch wide by 3-inch high block was placed on the top of the other 13-inch block. The decedent did not engage the bus's emergency brake, place the bus in gear, or chock the tires. There was no means of secondary support. The bus driver did not know if the bus was in neutral or in gear. The decedent lifted the front of the bus with the tow truck boom. Under each raised tire, he placed the 2-block high stack of wood block. He lowered the wheels onto the blocks. The decedent was partially under the front of the bus looking for attachment points on the undercarriage to connect the wrecker hook when the bus rolled off of the blocks and fell on top of him. The bus rolled approximately 10 feet uphill when it rolled off the support blocks. When the bus began to roll, the bus driver jumped onto it and applied the emergency brake. The decedent was transported by EMS to a local hospital where he died. The tow truck used by the decedent on the incident day was equipped with two rubber wheel chocks for the tires and four jack stands. [MIFACE Summary of a MIOSHA Inspection Case 473](#)

91. A male truck driver in his 60's died in the winter of early 2017 when he was thrown onto a concrete floor as a result of air released from a pressurized tire sidewall failure. The decedent was a contract driver for an owner/operator; the owner operator's trucks were leased by the company where the incident occurred. The decedent's truck had a flat inside left tire on the rear axle of his truck; the tire was off bead. After several unsuccessful attempts to inflate the tire, the two mechanics working on the tire used a jack to raise the rear of the truck to take the pressure off of the tire. After several more unsuccessful attempts to inflate the tire, the mechanics removed the outside tire. After the outside tire was removed, the mechanics again attempted to inflate the tire; this time it was successful (they were able to get the bead) using a TSI Cheetah bead seating tool, but they could hear air leakage from the tire. Mechanic #1 asked the decedent to release the cheetah's air brake. The tire was rotated, and a piece of metal was found. Mechanic #2 left the scene to retrieve a tire plug kit. Mechanic #1 was positioned to the right of the tire. The decedent walked up to the left of Mechanic #1 (the decedent was standing directly in front of the tire) presumably to point out the metal. Mechanic #1 warned the decedent to move away while he removed the air chuck. The sidewall of the pressurized tire failed releasing the pressurized air. The force of air from the explosion launched the decedent backward. He landed approximately 12 feet away on his back and struck his head on the concrete floor. Emergency response was called, and the decedent was transported to a local hospital where he died. [MIFACE Investigation Report 17MI007](#)

## **INFORMATION (NAICS 51)**

### *Motor Vehicle*

92. A male systems technician in his 40's died when the van he was driving crossed the centerline and struck several vehicles. The decedent was traveling westbound on a dry, 7-lane roadway with a posted speed limit of 35 mph. Responding police indicated that it appeared the decedent experienced a medical problem. The decedent had both alcohol and illegal substances in his bloodstream at the time of the incident. He was wearing his seatbelt/shoulder harness. The van's airbags deployed.

## ***FINANCE & INSURANCE (NAICS 52)***

### ***Motor Vehicle***

- 93.** A male insurance adjuster in his 60's died when his vehicle was struck head-on by a driver traveling in the wrong direction on the road. The decedent was traveling southbound on a dry, 2-lane expressway with a posted speed limit of 75 mph. After the collision, the decedent's vehicle came to rest on the right shoulder of the southbound lanes. The decedent was wearing a shoulder and lap belt. The vehicle's front airbags deployed.

## ***REAL ESTATE & RENTAL & LEASING (NAICS 53)***

### ***Drowning***

- 94.** A male land owner and leaser in his 50's died when mowing the edge of his hay field near a drainage ditch with a John Deere 23/20 tractor. There was about a two-foot space between the field and ditch that had not been cut. There was about a 10-foot drop off from the field into the ditch and it did not appear to responding emergency personnel that he was attempting to mow below that drop off area. He was pinned under the tractor. When the tractor was removed from the drainage ditch, responding police found it had a flat driver's side tire. The decedent had a blood alcohol level of 0.204%

### *Struck By*

95. A male employee for a rental property management company in his 30's died when a 7-to 8-foot deep trench wall collapsed. The decedent and the owner of the company were attempting to locate a clogged sewer pipe at a residential home. The owner used an excavator to dig the approximately 70-foot long excavation. The north/south side of the excavation was located right next to the west side of the property's driveway, from the sidewalk to the house. The excavation was approximately 7- to 8-feet deep, 3- to 4-feet wide at the base and 5- to 6-feet wide at the top. The west wall of the excavation was at a 74-degree angle. The east wall of the excavation, right next to the driveway, was nearly vertical. The soils consisted of dry, coarse, brown sand with a gravel mix. The owner placed the spoil piles on both sides of excavation. The decedent and owner went into the excavation to hand dig to find the plugged areas and clean out or replace the sewer. While in the excavation, the wall next to the driveway (east wall) collapsed, completely burying the decedent and burying the owner to his waist. The owner called for help and a neighbor called for emergency response. An excavator was brought in to remove a portion of the spoils to allow for a vacuum truck to be positioned near the decedent's location to remove the dirt surrounding him. The vacuum truck could not get close enough, so the responding fire department performed a trench recovery by placing shoring and bracing in the excavation around the deceased. This was the first time the company owner had performed a deep, long excavation. [MIFACE Summary of a MIOSHA Inspection Case 481](#); [MIFACE Investigation Report 17MI127](#)



### *Suicide*

96. A male residential properties owner in his 50s died from a self-inflicted gunshot wound.

## **PROFESSIONAL, SCIENTIFIC, & TECHNICAL SERVICES (NAICS 54)**

### *Motor Vehicle*

97. A male regional sales manager in his 40's died when the car he was driving to a sales meeting in another state was struck by a semi-truck in an intersection. The decedent was traveling southbound on a wet 2-lane roadway with a posted speed limit of 55 mph. The decedent stopped at the intersection stop sign and then entered the intersection. The decedent's vehicle was struck by the oncoming westbound semi which had the right-of-way. The decedent was wearing a lap belt/shoulder harness. The airbags deployed.

### *Suicide*

98. A male video game tester in his 30s died from a self-inflicted hanging.

## **ADMINISTRATIVE & SUPPORT & WASTE MANAGEMENT & REMEDIATION SERVICES (NAICS 56)**

### *Fall*

99. A male owner of a tree trimming/landscaping service in his 50's died when he was ejected from the bucket of an aerial lift while working approximately 15 feet above the ground. The decedent and his crew were performing a tree removal from a residential property. The tree was located between the sidewalk and the street curb. The decedent was elevated in the basket of an aerial lift mounted on a TEREX articulating arm. The articulating arm had a fixed tie off point next to the connection for the basket. The bucket of the aerial lift became wedged between two limbs growing in the shape of a Y. A coworker attempted to reposition the basket with the articulating arm controls but gave back the control of the arm/basket to the decedent. In trying to free the bucket, the decedent reversed the boom and turned the bucket around. This caused the basket controls to operate in the opposite direction compared to normal operation. Instead of raising the bucket, he was moving the arm/bucket in a downward motion. Another coworker noted the pressure on the limb under the basket/arm. When the basket did not come free, the decedent attempted to cut away a portion of one of the limbs at the base of the bucket to free the basket. While cutting the limb, the limb broke and contacted the articulated arm, which caused the bucket to move downward approximately 10 feet and then spring back upwards and forward, ejecting the decedent from the basket. He landed on the sidewalk. Emergency response was called, and the decedent was transported to a local hospital where he was declared dead. He was not wearing a safety harness or lanyard. [MIFACE Summary of a MIOSA Inspection Case 452](#)
100. A male landscaping business owner in his 50s tripped and fell while loading equipment into a trailer. He died from complications of the fall.



- 101.** A male chimney sweeper in his 70's died following an unwitnessed fall from a ladder. The decedent was retrieving equipment from a storage unit. The top of the ladder was found to be bent, possibly contributing to the fall.

#### *Motor Vehicle*

- 102.** A male landscaper in his 20's died when the work van in which he was a passenger left the roadway and struck a tree. The van was traveling westbound on a dry, dark, unlit 2-lane roadway with an unposted speed limit of 55 mph. The driver and the decedent, who was a front seat passenger, were traveling to the shop to obtain needed work items. The van left the roadway to the right and struck a tree. Responding police did not locate skid marks on the pavement. The decedent was not using a seatbelt/shoulder harness at the time of the crash. The driver of the van was found to have alcohol and illegal drugs in his system.
- 103.** A male employee of a landscaping firm in his 40's died in a head-on collision while driving a company truck. The incident occurred on a dry, 2-lane highway with a posted speed limit of 55 mph. There were three vehicles involved: The decedent was traveling eastbound and Vehicle 2 was traveling westbound; both vehicles had the right of way. Vehicle 3 was traveling southbound; the north-south roadway each had a stop sign. Vehicle 3 attempted to cross the east-west highway to continue traveling south. Vehicle 3 was struck by Vehicle 2. After striking Vehicle 3, Vehicle 2 continued westbound, entered the eastbound lane and struck the decedent's vehicle head-on. The decedent was wearing a lap/shoulder belt. It is unknown if the airbag deployed.
- 104.** A male waste removal truck driver in his 50's died after being crushed in the driver's seat during a rear-end collision. The decedent was travelling west on a 2-lane wet road with a posted speed limit of 55 mph. The day was rainy and dark-unlighted. The decedent came upon slowed traffic and failed to slow and rear-ended another vehicle.

#### *Struck By*

- 105.** A male refuse collector in his 60's died when he was pinned by a passenger car against the side/rear of a 2009 Mack Rear Load Refuse trash truck. The decedent and a coworker were collecting refuse in a condominium complex. The trash truck was located halfway on the shoulder and halfway in the roadway. There was a double yellow line indicating a no passing zone. The incident occurred in partial darkness. The trash truck lights were on. The decedent was wearing a reflective vest and a miner's head lamp. He had placed the trash cans (toter cans) on the right and left side of the toter tippers. He first emptied the right side toter using the controls on the passenger side of the trash truck. He then proceeded to empty the left side toter using the controls on the driver side of the trash truck. A passenger car driver crossed the double yellow line to try to pass the garbage truck and struck the decedent, pinning him between the car and the rear wheel of the trash tuck. The driver of the passenger car backed up and the decedent fell to the ground. The decedent's coworker who was driving the truck called for emergency response. EMS responded and transported the decedent to a local hospital. He died the next day from complications of his injuries.
- [MIFACE Summary of a MIOSHA Inspection Case 471](#)

- 106.** A male recycling laborer in his 30's fell from a steel packer and died when the packer dislodged from a 4-tine grappler, fell to the ground, rolled, and partially landed on him. A Sennebogen 835 E material handler, equipped with a 4-tine grappler, held the steel packer. The packer (or hammer) was a fabricated steel weldment weighing approximately 4,500 pounds and was used to compact metal scrap in the back of open top semi-trailers. The trailer was approximately  $\frac{3}{4}$  full. Another type of metal was to be added to fill the trailer. The decedent was in the trailer placing cardboard on the scrap metal already in the trailer to separate it from the different type of metals to be added. After he was finished, the operator of the material handler swung the 4-tine grappler with the packer over the trailer to pick up the decedent and return him to the ground. While transporting the decedent back to the ground, the packer shifted in the 4-tine grappler, causing the decedent to fall approximately 8 feet to the ground. The 4,500-pound packer then dislodged from the grappler, fell to the ground and rolled end to end, coming to rest on the decedent. [MIFACE Summary of a MIOSHA Inspection Case 489](#)

#### *Suicide*

- 107.** An owner of a landscaping company in his 50's hung himself in his office building.
- 108.** An owner of a landscaping firm in his 30s died from a self-inflicted gunshot wound.

#### **EDUCATIONAL SERVICES (NAICS 61)**

##### *Fall*

- 109.** A male bus attendant in his 70's died from complications sustained when he slipped and fell on a snow/slush/ice-covered sidewalk while walking back to his bus in front of the student loading center. The decedent had gone into the school to use the bathroom facilities. He was returning to his bus at the time of his fall. Students found him on the sidewalk. Another bus driver noticed the group of students and investigated. Emergency response was called, and EMS transported him to a local hospital. After surgery, he was taken to a rehabilitation facility. He died several days later due to complications of the injury sustained when he fell. The bus driver noted that it had been snowing consistently throughout the day and that the grounds crew for the school had attempted to salt and/or plow the sidewalks prior to her arrival. [MIFACE Summary of a MIOSHA Inspection Case 475](#)
- 110.** A male maintenance worker at a university in his 50's died from injuries sustained when he fell approximately 8 feet from a ladder. The decedent and a coworker were cleaning the gutters of a building. The decedent had his coworker prop their ladders against the gutters but did not secure them. The coworker was on the ground moving his ladder when he heard the decedent make a noise. The coworker looked over toward the decedent and saw him lying face down on the ground. The decedent's ladder had fallen from the building. The decedent had a health condition that was hypothesized as the cause of the fall, although he died due to injuries sustained from the fall.

## **HEALTH CARE AND SOCIAL ASSISTANCE (NAICS 62)**

### *Drug Overdose*

- 111.** A male certified nurse aid in his 50's died due to a drug overdose.

### *Homicide*

- 112.** A female caregiver in her 40's died from gunshot wounds sustained during a domestic violence incident.
- 113.** A male co-owner of a wellness retail establishment in his 20's died from a gunshot wound.

### *Motor Vehicle*

- 114.** A female senior living executive director in her 50's died in a head-on collision. The decedent was traveling southbound on a dry, 4-lane curved roadway with a posted speed limit of 55 mph. A northbound vehicle crossed the centerline and struck the driver's side of her vehicle head on. The decedent was wearing a lap/shoulder belt. Her vehicle's airbags deployed.

### *Struck By*

- 115.** A female physician in her 40's died when she was struck by a car while rendering first aid to a victim of a previous crash. The decedent was one of several pedestrians providing aid when the oncoming vehicle traveling eastbound lost control and struck one of the parked vehicles. After striking the side of the parked vehicle, the car then struck the pedestrians.

## **ARTS, ENTERTAINMENT, & RECREATION (NAICS 71)**

### *Drowning*

- 116.** A male owner of a boat restoration company in his 80's drowned next to the dock in his marina. The event was unwitnessed, and the decedent was found submerged in the water. It is unknown what led to his drowning.
- 117.** A male employee of a boat storage and rental firm in his 20's drowned after falling off a jet ski. The jet ski had been rented and used at a party, and at the end of the day the decedent was driving it back to the firm's storage location. Although the decedent was accompanied by another employee, also driving a jet ski back, the events that led to the decedent entering the water and drowning were unwitnessed.

## *Fall*

**118.** A male artist in his 30's died after falling at least 20 feet through the roof of a building to a concrete floor. A fellow artist had warned the decedent previously to walk on the beams of the roof.

**119.** A country club co-owner in his 50's died when he fell approximately 17 feet from a ladder while cutting a tree limb. The decedent was working from a 24-foot extension ladder using a chain saw to trim the tree limbs from a tree that was next to a golf course hole. He was working alone. He had trimmed other trees prior to the incident tree. When he did not come home for dinner, family members went looking for him. It appeared that when the decedent cut one of the limbs, the limb struck him and/or the ladder. The decedent, ladder and chain saw were found



deceased on the cart path by family members. [MIFACE Summary of a MIOSHA Inspection Case 478](#)

## *Homicide*

**120.** A male and female rapper both in their 20's, were driving on an expressway when they sustained fatal gunshot wounds in a drive-by shooting.

**121.** A male and a female rapper both in their 20's, were driving on an expressway when they sustained fatal gunshot wounds in a drive-by shooting.

**122.** A female owner of an indoor play center in her 30's died from gunshot wounds during a domestic violence incident.

## *Motor Vehicle*

**123.** A male marine service/powerboat racer in his 50's died when his boat (Boat 1) was struck by another boat (Boat 2) during a race. The decedent was the throttle man for Boat 1. Both Boat 1 and Boat 2 had completed three laps on the course. The boats were "neck and neck" traveling approximately 170 mph on the northbound leg of lap #4 approaching turn #1. Boat #1's video footage showed that Boat #1 entered into turn 1 on a trajectory that would have resulted in a collision with the turn marker buoy. The boat was in a right-hand turn and the port side was lifted with the starboard side pushed towards the water. As the boat approached the buoy, the port side was seen dropping back toward the water, indicating

that the boat operator had begun to steer back to the left, likely to avoid a collision with the turn 1 buoy. After passing the buoy, the port side lifted back up away from the water with the starboard side dropping back down, indicating the boat began to steer back to the right. As the Boat began this turn to the right after steering to avoid the buoy, Boat 2 struck the port side of Boat 1.

- 124.** A male professional snowmobile racer in his 30's died in a crash at a race. Multiple snowmobiles were involved in the incident. The race was held on a flat, oval, icy racetrack. It was the first time the decedent was racing with this snowmobile. The decedent lost control of his snowmobile in turn #4 and hit hay bales at the turn. The force of the collision with the hay bales caused the snowmobile to overturn and throw the decedent onto the track. The decedent was lying on the racetrack when trailing snowmobiles struck him.

#### *Struck By*

- 125.** A male heavy equipment mechanic in his 60's died when he was crushed under a combine. The decedent was attempting to remove a wheat head for a combine when it fell onto him, pinning him under it. The decedent was a member of a three-man crew from a farm museum. The crew was removing the combine head so the combine/head could be transported to the farm museum. The head was elevated approximately 2-2.5 feet above the ground. No secondary support was utilized for the raised head. The decedent went under the raised head and knocked out the first lower pin. He removed the second lower pin and the head fell. A witness indicated that the head should have hung by the top pins and hydraulics. The crew attempted to raise the head using the combine hydraulic system but was unsuccessful. A crew member found a tractor with a bucket and used it to raise the head from the decedent. The two crewmembers pulled the decedent from under the head and called for emergency response.

#### *Suicide*

- 126.** A project coordinator in her 50s died from a self-inflicted hanging.

### ***ACCOMODATION & FOOD SERVICES (NAICS 72)***

#### *Drug Overdose*

- 127.** A female waitress in her 30's died from mixed drug toxicity.

#### *Fall*

- 128.** A male maintenance laborer in his 70's died from an approximate 5-foot fall from a fiberglass stepladder with aluminum steps to a concrete floor with a carpet overlay. The decedent was working alone, removing a defective ballast for a 120-volt fluorescent lighting located approximately 10 feet above the floor. He did not utilize lockout to isolate electrical

energy, did not use a volt meter to verify the electricity was off, and did not use insulated tools. When he did not show up for coffee break at 10am, employees looked for him. The employees found the decedent 10:30 a.m., lying on the floor, approximately 10 feet away from his ladder, which was also lying on the floor. One side of the light fixture had pulled away from the ceiling. The employees called for emergency response and the decedent was transported to a local hospital, where he died several days later from injury complications. After the incident, an employee tried to turn on the lights in the room, but they did not come on, so he went outside to the panel and found two breakers for the light were tripped. While fixing the light, the employee noticed that the white wire was cut, and the black wire was still intact. [MIFACE Summary of a MIOSHA Inspection Case 476](#)

### *Homicide*

- 129.** A male owner/operator of an after-hours club in his 40's died from multiple gunshot wounds.

### *Motor Vehicle*

- 130.** A male pizza delivery driver in his 40's died as he made a left turn into a business's driveway and his vehicle was struck by an oncoming car. The incident occurred on a dry, 2-lane roadway with a posted speed limit of 55 mph. The decedent was traveling northbound in a SUV. Upon beginning to turn left, just after his vehicle crossed the center line, an oncoming car struck him head-on. The decedent was not wearing a seatbelt/shoulder harness. The SUV's airbags deployed.
- 131.** A female restaurant crew member in her 20's died when her vehicle left the roadway and struck trees. The decedent was traveling westbound on a dry, 2-lane packed gravel roadway with a 55-mph speed limit (not posted). The vehicle crossed the centerline, entered the eastbound lane and continued onto the road shoulder and then struck some trees. The responding police report identified that there was no indication of a loss of control. The decedent applied the brakes and took evasive maneuvers to avoid the crash but was unsuccessful. The decedent was wearing a lap/shoulder belt. The vehicle's airbags deployed.

### *Struck By*

- 132.** A male general laborer at a restaurant in his 50's died from complications of injuries he sustained while carrying metal sheets. The decedent and a coworker were carrying the sheets; the coworker was in the front and the decedent in the back. The coworker stopped suddenly, and the metal sheets struck the decedent's chest. He sought medical care and was diagnosed with a chest contusion. A few days later, he was diagnosed with an inoperable necrotizing soft tissue infection and died three days after the injury, from the injury complications.



133. A male security guard at a bar in his 40's died after being struck by a vehicle. The decedent noticed an out-of-control vehicle approaching the location of another security guard and pushed his coworker out of the way.

***OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION) (NAICS 81)***

*Explosion/Fire*

134. A male owner of a small engine repair shop in his 70's died from burns sustained in a fire. The origin of the fire was at a wood stove in the maintenance room of the business. Evidence around the wood stove suggested improper ignition of the combustible materials within the wood stove may have contributed to the cause of the fire. Responding fire personnel found several containers of flammable liquids were present in the maintenance area; a one-gallon oil container with a blend of used oil, gasoline and/or other flammable solvents was adjacent to the wood stove along with a large soup can or small coffee can. Smoke and soot damage were present directly above the origin of the fire. A recliner the decedent frequently used was completely consumed. The door to the wood burning stove was open when fire personnel arrived and the wood within the wood burner was slightly charred but not consumed. There were fire patterns extending from the floor up into the wood stove.

*Fall*

135. A male crane inspector in his 50's died when he fell approximately 27 feet from an unsecured 5/8-inch plywood platform during a crane inspection. The decedent and his coworker were performing a monthly crane inspection on a K2 crane at a manufacturing facility. The decedent utilized a Genie Z-60/34 Aerial Lift to raise him to the crane. He climbed out of the lift and onto the crow's nest platform catwalk to check the crane's collector shoes. The crow's nest platform catwalk had been made shorter sometime in the 1960s to accommodate larger equipment that had been in the building. The 5/8-inch plywood platform had not been secured to the frame of the crow's nest and was located approximately 3 feet from the crane shoes. The decedent was not required to wear fall protection on the catwalk as it had adequate barriers. When he stepped onto the plywood, it broke and as he fell to the floor, he struck the lift and then the floor. [MIFACE Summary of a MIOSHA Inspection Case 459](#)

*Homicide*

136. A male owner of an auto repair shop in his 30's died from multiple gunshot wounds.
137. A male automotive laborer in his 60s died from gunshot wounds sustained while a passenger in a work van as a result of a road rage incident.
138. A male service provider in his 20s died from a gunshot wound sustained during an armed robbery.



### *Motor Vehicle*

- 139.** A female employee at a non-governmental community services organization in her teens died in a fatal car crash after losing control of the vehicle and striking a tree. The decedent was travelling west on a 2-lane gravel road that was clear and dry.

### *Struck By*

- 140.** A male mechanic in his 60's died from injuries sustained when he was struck by a vehicle in his garage. A customer brought their vehicle to him to determine if new brake pads were necessary. The decedent placed wedges behind the driver's side rear tire. He then elevated the front of the vehicle with a jack and removed the driver's side front tire. He determined that the brake pads were worn and needed replacement. After completing the brake pads replacement, the front of the vehicle was lowered. It appears that there was pressure placed on the wedge behind the rear tire. The decedent asked a bystander to get into the vehicle and drive it forward to relieve pressure on the wedge. The decedent was standing in front of the vehicle. There were only a few feet between the front of the vehicle and a workbench. The bystander attempted to use the brakes to stop the forward motion of the vehicle, but the brakes were non-functional (when the brake pedal was depressed, it went all the way to the floor). The decedent was struck by the vehicle and pinned against the workbench. The decedent asked the bystander to back the car up and shut it off. He fell to the floor and emergency response was called. After the ambulance left the incident location, another bystander started the vehicle and had to pump the brakes several times before they began to function. The decedent indicated to emergency response personnel that he did not "bleed or purge" the brakes before telling the driver to drive it forward.
- 141.** A male automotive mechanic in his 40's died when a vehicle fell on top of him. The decedent had recently purchased the vehicle to take apart for scraps and was working under the vehicle when it fell on him.
- 142.** A male owner of an automobile exhaust repair business in his 60s died when he was struck by a nitrous oxide tank valve he was filling. The decedent was working in a car trailer. A nitrous pump was used for re-filling nitrous oxide tanks used for drag-racing. A braided hose leading from the nitrous compressor was frayed and had ruptured and there were several parts of the compressor, such as the pressure dial and several fittings, near the decedent's location. It appeared to emergency responders that the fitting on the top of the smaller tank being filled, broke off and struck him.
- 143.** A male heavy equipment operator in his 20's died when an upright wing of snow grooming equipment fell and struck him after he removed a pin on a safety chain holding the wing in an upright position. The snow groomer was approximately 20 feet in length and 8 feet in width and the two wings were each approximately 12 feet long and 3 feet wide. Each wing weighed approximately 2,000 pounds and were operated via hydraulic cylinders, which were fixed via hydraulic hoses to a John Deere 7430 tractor. A metal chain on both sides of the groomer were attached from the groomer wing to the base of the groomer to lock the wing in place during transport. The hydraulic cylinder on the wing involved in the incident

was being replaced while the groomer was in a maintenance garage. The decedent and his coworker, both volunteer workers, finished replacing the cylinder. The coworker saw the decedent remove the safety chain from the wing as he was walking to the tractor to start it so they could remove the tractor and groomer from the garage. When the decedent removed the safety chain, the wing dropped onto his chest and pinned him against the garage wall. The coworker started the tractor, engaged the hydraulic cylinders, and lifted the wing from the decedent. He then called for emergency response and began CPR. [MIFACE Summary of a MIOSHA Inspection Case 479](#)

### *Suicide*

- 144.** A male auto repair shop mechanic in his 50's died from multiple self-inflicted knife wounds.
- 145.** A male automotive mechanic in his 30's died from a self-inflicted hanging.

## ***PUBLIC ADMINISTRATION (92)***

### *Homicide*

- 146.** A male deputy sheriff in his 50s was killed after being struck by a vehicle while attempting to stop a suspect. The victim had just laid 'stop sticks' on the road to halt the vehicle of a suspect being pursued by the police and was standing to the side of the road. The suspect took a sharp 90 degree turn before the stop sticks and went off the road, running over and killing the victim. It is unknown whether the vehicle striking the victim was a purposeful assault.
- 147.** A male police officer in his 70s died from complications of multiple gunshot wounds sustained 45 years ago while responding to an armed robbery.

### *Motor Vehicle*

- 148.** A male road commission truck driver in his 50's died in a collision with a semi-tractor trailer. The incident occurred on a dry, 2-lane roadway with a speed limit of 55 mph. The decedent was driving eastbound; the east and westbound traffic had stop signs. The semi-truck which struck him had the right of way and was traveling northbound. The decedent failed to stop at the stop sign and entered the intersection. The northbound semi-truck driver was talking on a hands-free electronic device at the time of the incident. The northbound driver was unable to avoid striking the passenger side of the decedent's vehicle. The decedent was not wearing a seatbelt/shoulder harness. The cab was not equipped with an airbag.
- 149.** A male police officer in his 30's died when the police car he was driving struck a tree. The decedent was on patrol on a dry, dimly lit 2-lane road with a posted speed of 35 mph. For reasons unknown, the car left the roadway to the left, crossed the centerline and struck a

tree. The decedent was wearing a lap/shoulder belt. The vehicle airbags deployed. Police did not note visible brake or skid marks on the roadway.

- 150.** A male police officer in his 20's died while on patrol when the motorcycle he was driving struck another vehicle. The decedent had been traveling southbound on a 2-lane roadway with a posted speed limit of 55 mph. The incident occurred at an intersection. The traffic signal for the southbound traffic was changing to red. The vehicle in front of the decedent stopped for the red light. The decedent did not stop. He attempted to avoid striking the rear of the stopped vehicle but was unable to avoid the collision. After striking the stopped vehicle, the decedent crashed into the curb of the median and was thrown from his motorcycle unto the median.
- 151.** A female probation officer in her 30's died when the vehicle in which she was a passenger was struck by another vehicle (Vehicle 2). The decedent's vehicle was traveling eastbound on a dry, unlit 3-lane roadway with a speed limit of 55 mph. The driver of Vehicle 2 had been drinking. Vehicle 2 was traveling southbound at an excessive rate of speed. Vehicle 2 ran a stop sign and struck the decedent's vehicle in the intersection, causing it to overturn and strike a stop sign. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags deployed. Vehicle 2 overturned and burst into flames.

#### *Struck By*

- 152.** A male road commission worker in his 40's was crushed when the back-up vehicle struck him and his coworker, pinning him against the rear of the lead asphalt truck. The decedent was a member of a 5-person crew engaged in a rolling (continually moving) cold patch operation to repair potholes in a roadway. One crew member, the acting foreman, was driving another vehicle spotting the roadway for potholes and radioing back to the lead asphalt truck driver identifying roadway to be patched. Behind the lead asphalt truck with its attached trailer filled with asphalt, were the decedent and another coworker. Both were conducting cold patch activities, using shovels to obtain asphalt from the trailer and filling potholes. The fifth member of the crew was the driver of the back-up vehicle which had an arrow board, alerting approaching drivers to the road patch work ahead and to the individuals on-foot conducting cold patch activities. The driver of the backup vehicle was attempting to retrieve a water bottle when the incident occurred. The backup truck struck and pinned the two workers on-foot against the asphalt trailer. Feeling the collision, the driver of the lead asphalt truck placed the truck in neutral, set the air brake and left the vehicle. He saw the decedent stumbling and being attended to by a bystander. EMS was called and both workers were transported to a local hospital. [MIFACE Summary of a MIOSHA Inspection Case 460](#); [MIFACE Investigation Report 17MI012](#)
- 153.** A male fire chief in his 50's died when he was struck by a vehicle at a crash scene. The decedent had positioned his vehicle off the roadway and activated his vehicle's flashing lights. The decedent's vehicle was one of several emergency vehicles at the crash scene; all had their emergency lights activated. The 2-lane expressway had a posted speed limit of 70 mph. It was raining and the roadway was unlit. At the time of the incident, the decedent was positioned at the rear of his vehicle. Witnesses indicated that the vehicle striking the

decedent was traveling at a high rate of speed in the left lane. The driver lost control and possibly struck the barrier wall. Once control of the vehicle was lost, it began losing speed as it slid across the lanes of traffic. At this point, the driver applied the brakes but could not avoid the collision with the decedent and the decedent's vehicle.