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2012 ANNUAL REPORT

TRACKING WORK-RELATED DEATHS IN MICHIGAN



2012 Annual Report Tracking Work-Related Fatalities in Michigan

A Joint Report
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Executive Summary

The Division of Occupational and Environmental Medicine at Michigan State University (MSU) began tracking work-related fatalities in the State of Michigan in January 2001. This is the 12th annual Michigan Fatality Assessment and Control Evaluation (MIFACE) report on acute traumatic work-related (WR) deaths in Michigan. There were **135 WR deaths in 2012**, representing 131 employers and 133 separate incidents. Key findings for 2012:

- The number of WR deaths (135) and the fatal injury rate (3.2 deaths/100,000 workers) were down compared to 2011 (141 WR fatalities, 3.3/100,000 workers, respectively).
- The largest *number* of WR deaths occurred in Construction (20, 14.8%), then Transportation & Warehousing (19, 14.1%), then Agriculture (18, 13.3%) and then Retail Trade (12, 8.8%). Manufacturing, Administrative & Support & Waste Management & Remediation Services and Other Services each had 11 WR deaths (8.1%).
- Agriculture had the highest *risk* of death (20.7 deaths/100,000 workers), followed by Transportation & Warehousing (18.6 deaths/100,000 workers), and Construction (15.7 deaths/100,000 workers).
- The most common cause of death was from a motor vehicle (36, 26.7%), followed by homicide (28, 20.9%), then falls (16, 11.9%), and then non-vehicular machines (14, 10.5%). The cause of death could not be determined for one individual.
- Individuals who died were most likely to be men (92.6%), white (79.2%), married (59.7%) and have at least a high school education (70.0%). The average age was 48.3 years old and ranged from 18 to 84 years of age.
- Thirty percent of work-related fatalities occurred to college-educated individuals, the highest percentage since this was first tracked in 2001.
- Illegal drugs, alcohol or side effects of prescribed medication was a potential factor in approximately 10% of the deaths.
- The largest number of work-related traumatic events occurred on a Wednesday (26) followed by Monday (23). March and June were the most common months (16), and 12:00p.m. to 3:59p.m. was the most common time (33).
- Forty (41, 49.4%) of Michigan's 83 counties had a fatal WR incident. Wayne County had the highest number of WR fatal incidents (38, 28.4%), followed by Oakland County (10, 7.5%). The county of incident was unknown for one fatal incident.
- Of the 135 WR fatalities, 27 (20.6%) were MIOSHA program-related and were investigated by a MIOSHA compliance officer.
- The number of WR homicides in 2012 nearly doubled compared to 2011 (28 homicides in 2012 compared to 15 homicides in 2011).

A narrative summary of each WR 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 Department of Occupational & Environmental Medicine ([MSU OEM](#)) website.

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 there to work; or
- (2) OFF the employer's premises and person 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 WR deaths, first with financial assistance from LARA and then from NIOSH. This is a joint project of LARA/MIOSHA and MSU OEM.

The purpose of the [MIFACE](#) tracking project is three-fold:

- Identify types of industries and work situations where workers are dying from acute traumatic incidents;
- Identify the underlying causes of the WR fatality, and
- Formulate and disseminate prevention strategies to reduce future WR 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 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 as well as that of the Bureau of Labor Statistics (BLS), which collects the official statistics of WR deaths in all states.

Who is Not Included? Individuals who die while “at work” from natural causes, 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 the Michigan WR fatalities: 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 WR death.

IDENTIFY INDIVIDUALS

- ◇ **Receive Report of Death**
- ◇ **Determine if WR Death**
 - Paid employee, self-employed?
 - Working at job or family business?
 - Traveling "while on-the-clock" or compensated travel?
 - Volunteer?
 - In parking lot of business?

All Work Related deaths MUST be reported to MIOSHA within 8 hours of the death. The toll-free hotline to report a WR death is: 1-800-866-4674

GATHER INFORMATION

- **Contact**
 - MIOSHA if fatality is program-related
- **Gather source documents**
 - Reports from agencies that investigated the death/provided emergency services when event occurred
 - Death certificate
 - Medical examiner report and, when appropriate
 - MIOSHA fatality investigation narrative.

CONTACT EMPLOYER/FARM FAMILY

- ◇ **Send MIFACE Introduction Letter and Brochure**
- ◇ **Follow-up phone contact**
 - Answer questions
 - Ask if employer and/or family will voluntarily participate
 - If Yes, schedule date and time for MIFACE site visit
 - If No, write case summary or MIFACE Summary of MIOSHA Investigation.

MIFACE SITE VISIT

- ◇ **Explain MIFACE program**
- ◇ **Complete appropriate research forms**
- ◇ **Conduct interviews with appropriate personnel**
 - Learn about process, equipment involved, work activities of deceased, training, safety programs, etc.
- ◇ **Observe area and/or equipment involved**
- ◇ **Take pictures, ensuring identifiers are removed**

MIFACE INVESTIGATION REPORT

Site Visit Report Includes:

- Summary Statement
- Background information
- Detailed investigation narrative
- Cause of death as determined by the Medical Examiner
- Prevention Recommendations, including Discussion
- References
- Pictures, drawings, sketches
- Review process

FOLLOW UP ACTIVITIES

- ◇ **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 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 with employer agreement, accompanied the MIOSHA compliance officer. Also, MIFACE interviewed the compliance officers about their investigation.

Results

There were 135 acute traumatic WR fatalities in 2012. One hundred twenty eight (94.8%) of the 135 work-related traumatic incidents occurred in 2012; seven individuals died in 2012 due to complications from a WR injury sustained in a previous year (as noted by the medical examiner on the death certificate):

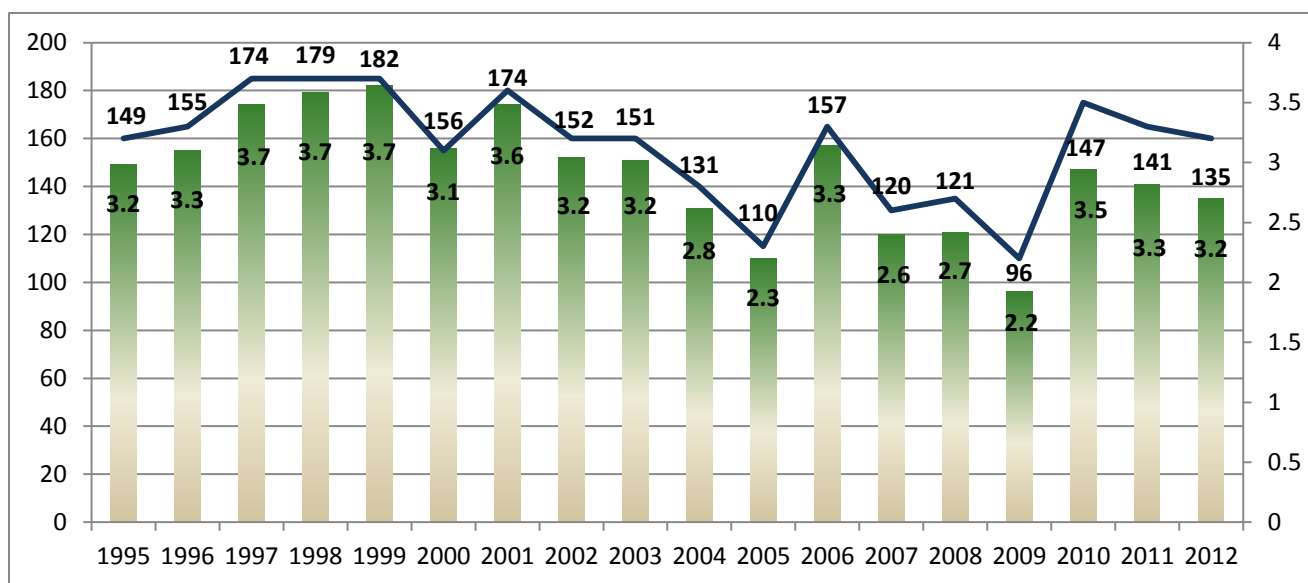
- 1971: male journeyman pipefitter died from complications of a fall that occurred at an automobile manufacturer when a catwalk's railing gave way as he was trying to pass a colleague on the catwalk.

- 1972: male police officer was shot in the line of duty and died from complications of the injury.
- 1999: male store owner died from complications of a stab wound that occurred while attempting to break up an argument between customers.
- 2007: male carpenter died of complications of multiple injuries sustained when his clothing became entangled in an operational 4-foot by 1-foot diameter auger attached to a John Deere tractor at a residential construction site.
- 2009: male senior center volunteer died from complications of a traumatic brain injury that occurred when he did not stop at a Stop sign and the car he was driving entered an intersection and was struck by an oncoming vehicle.
- 2009: male machine operator died from complications of a fall which occurred at a foundry.
- Unknown Date of Injury: aircraft mechanic died of complications of unknown injuries sustained years ago.

The 135 individuals who died had 131 different employers; four employers had a fatal incident where more than one person died. Three employers had two separate work-related deaths occur; a cab company and a nightclub each had two homicides, and a federal agency had a fatal fall and an individual die due to medical complications following a work-related injury. A manufacturing firm had two work-related deaths occur during the same incident (homicide and suicide).

The number of traumatic WR deaths per year in Michigan since 1995 is shown in **Figure 1**. Incidence rates (per 100,000 workers) are shown by the **blue** line. The number of WR deaths per year is shown by the **green** columns. Incidence rates shown from 1995-2000 were obtained from the [BLS](#) website. Rates shown for 2001-2012 were determined from MIFACE statistics.

Figure 1. Number and Incidence Rate of Work-Related Fatalities in Michigan, 1995-2012



Demographics

Table 1 shows the distribution of demographic characteristics of the 135 traumatic WR fatalities in Michigan in 2012.

Gender

One hundred twenty five (92.6%) of the individuals who died were men and 10 (7.4%) were women.

Race

One hundred seven (79.2%) of the individuals who died were Caucasian, twenty one (15.6%) were African American, four individuals (3.0%) were of Asian/Pacific descent, and one individual (0.7%) was an Alaskan/American Indian. Two (1.5%) individual's race was identified as Hispanic.

Table 1. Demographic Characteristics of 135 Work-Related Fatalities, Michigan 2012					
Demographic Characteristics	Number	Percent	Demographic Characteristics	Number	Percent
Gender			Education		
Male	125	92.6	Less than High School	20	15.0
Female	10	7.4	High School Graduate	69	51.9
Race			GED	4	3.0
White	107	79.2	Some College (1-4 years)	31	23.3
Black	21	15.6	Post College (5+ years)	9	6.8
Asian /Pacific Islander	4	3.0	Unknown	2	--
American Indian/Alaskan Native	1	0.7	Country of Origin		
Hispanic (as identified on DC)	2	1.5	United States	123	91.1
Age			South Korea	1	0.7
<20	1	0.7	Mexico	1	0.7
20-29	20	14.8	Iraq	1	0.7
30-39	21	15.6	India	1	0.7
40-49	32	23.7	Bosnia-Herzegovina	1	0.7
50-59	27	20.0	Germany	1	0.7
60-69	23	17.0	Italy	1	0.7
70-79	7	5.2	Yemen	1	0.7
80-89	4	3.0	Vietnam	1	0.7
Marital Status			Ukraine	1	0.7
Never Married	33	24.6	Algeria	1	0.7
Married	80	59.7	Hong Kong	1	0.7
Divorced	18	13.4			
Widowed	3	2.2			
Unknown	1	--			
Totals	135				

Ethnicity

Four men were identified as being of Hispanic ethnicity on their death certificate; two of the four were identified as Hispanic for both *race* and *ethnicity* on their death certificate. There were no women of Hispanic descent who died of a work-related traumatic incident in 2012.

Age

The age distribution of the individuals who died from a work-related injury is shown in **Table 1**, **Figure 2**, and **Table 2**.

The ages ranged from 18 to 84. The average age was 48.3 years, up slightly from 48.0 years of age in 2011.

Figure 2. Age Distribution of Work Related Fatalities, Michigan 2012

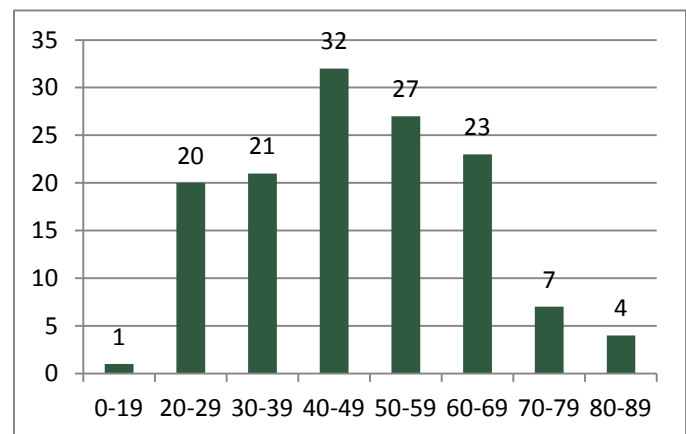


Table 2 shows the distribution of traumatic work-related fatalities by age of the victim and industry sector.

All 11 of the individuals older than 70 years of age were men. Three of the eleven (27.3%) individuals who died from acute work-related events were farm owners who worked in Agriculture. One individual who worked at an automobile manufacturer was injured in a fall 1971 and died in 2012. The other deaths occurred to two volunteers (senior center, firefighter – both 74 years of age), a crossing guard (72 years of age), an individual working in a retail store (71 years of age), and an aircraft mechanic (84 years of age). Two individuals were murdered: an antiques dealer (74 years of age) and a security guard (84 years of age).

Table 2. Traumatic Work-Related Fatalities by Age of Victim and Industry Sector, Michigan 2012									
Industry Sector (NAICS Code)	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	Total
	Number	Number	Number	Number	Number	Number	Number	Number	
Agriculture, Forestry, Fishing & Hunting (11)	--	3	2	3	2	5	2	1	18
Utilities (22)	--	--	--	--	1	--	--	--	1
Construction (23)	--	3	3	5	6	3	--	--	20
Manufacturing (31-33)	--	2	1	6	1	--	1	--	11
Wholesale Trade (42)	--	1	1	2	--	1	--	--	5
Retail Trade (44-45)	--	2	1	2	1	4	2	--	12
Transportation & Warehousing (48-49)	--	3	2	6	5	2	--	1	19
Information (51)	--	1	2	--	1	--	--	--	4
Real Estate & Rental & Leasing (53)	--	--	--	--	1	--	--	--	1
Professional, Scientific, & Technical Services (54)	--	--	--	--	--	1	--	--	1
Administrative & Support & Waste Management & Remediation Services (56)	--	1	3	4	1	1	--	1	11
Education (61)	--	--	1	--	1	--	--	--	2
Health Care & Social Assistance (62)	1	1	2	1	1	1	--	--	7
Arts, Entertainment & Recreation (71)	--	1	--	--	1	--	--	--	2
Accommodation & Food Services (72)	--	2	1	1	--	--	--	--	4
Other Services (except Public Administration) (81)	--	--	1	1	4	4	--	1	11
Public Administration (92)	--	--	1	1	1	1	2	--	6
Totals	1	20	21	32	27	23	7	4	135

Marital Status

Eighty (59.7%) individuals who died from traumatic incidents were married, 33 (24.6%) individuals were single or never married, 18 (13.4%) individuals were divorced, and 3(2.2%) individuals were widowed. Marital status was unknown for one individual.

Educational Level

Twenty individuals (15.0%) had not completed high school, 69 individuals (51.9%) completed high school and received a high school diploma, 4 individuals (3.0%) completed their GED, 31 individuals (23.3%) completed 1-4 years of college, and nine individuals (6.8%) had 5+ years of college. Educational level was unknown for two individuals.

Table 3 shows the distribution of education level by industry.

Table 3. Traumatic Work-Related Fatalities by Education Level and Industry Sector, Michigan 2012										
Industry Sector (NAICS Code)	Did Not Complete High School		Completed High School No College		GED		Some College (1-4 Years)		Post College (5+)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry, Fishing & Hunting (11)	3	16.7	13	72.2	--	--	2	11.1	--	--
Utilities (22)	--	--	1	100.0	--	--	--	--	--	--
Construction (23)	2	10.0	14	70.0	--	--	4	20.0	--	--
Manufacturing (31-33)	1	9.1	8	72.7	--	--	1	9.1	1	9.1
Wholesale Trade (42)	1	20.0	3	60.0	--	--	1	20.0	--	--
Retail Trade (44-45)	1	8.3	5	41.7	--	--	5	41.7	1	8.3
Transportation & Warehousing (48-49) ^a	2	11.1	10	55.6	2	11.1	4	22.2	--	--
Information (51)	--	--	--	--	--	--	3	75.0	1	25.0
Real Estate & Rental & Leasing (53)	--	--	1	100.0	--	--	--	--	--	--
Professional, Scientific & Technical Services (54)	--	--	1	100.0	--	--	--	--	--	--
Administrative & Support & Waste Management & Remediation Services (56)	3	27.3	4	36.4	2	18.2	2	18.2	--	--
Education (61)	--	--	--	--	--	--	1	50.0	1	50.0
Health Care & Social Assistance (62)	1	14.3	2	28.6	--	--	1	14.3	3	42.9
Arts, Entertainment & Recreation (71)	--	--	--	--	--	--	2	100.0	--	--
Accommodation & Food Services (72)	2	50.0	--	--	--	--	2	50.0	--	--
Other Services (except Public Administration) (81) ^a	2	20.0	6	60.0	--	--	1	10.0	1	10.0
Public Administration (92)	2	33.3	1	16.7	--	--	2	33.3	1	16.7
Totals	20	--	69	--	4	--	31	--	9	--

^a Education level unknown for one individual.

MIFACE added an additional educational category - General Education Development (GED) – in 2012. The GED measures proficiency in science, mathematics, social studies, reading, and writing. Passing the GED test gives those who did not complete high school the opportunity to earn their high school equivalency credential, in the United States or Canada. On their death certificates, four individuals were noted to have achieved a GED.

The individuals who died who worked in Information, Education, Health Care & Social Assistance, and Arts, Entertainment & Recreation industry sectors had achieved at least some collegiate level education. Within Health Care and Social Assistance, three of the seven individuals who died had completed 5+ years of college.



[Case 12.](#) House remodeler fell 8-10 feet from roof edge/ladder

Most industry sectors had the highest percentage of deaths occur within the educational category of completed High School, No College. The educational level of the individual working in the three industrial sectors with one WR death (Utilities, Real Estate & Rental & Leasing, and Professional, Scientific & Technical Services) was Completed High School, No College. Among industries with more than one work-related death, the highest percentage of deaths among individuals Completing High School but No College occurred among those individuals working in Manufacturing, followed closely by Agriculture and then Construction.

The largest number of deaths in Public Administration occurred among individuals with 1-4 years of college and Did Not Complete High School. For those individuals not completing high school, one individual was a volunteer fireman and the other individual was a DOT Courtesy Patrol driver.

Illegal Drug/Alcohol/Medication Use

Of the 121 individuals whose death was not a suicide (12 deaths) or a drug overdose (2 deaths), a toxicology screen for alcohol, illegal drugs, prescription or non-prescription medications was performed on 97 (80.2%) individuals; 57 (58.8%) individuals had detectable levels of at least one of these substances. Fourteen (24.6%) of the 57 individuals with detectable levels of alcohol, illegal drugs, prescription and non-prescription medications had levels that were considered on review to possibly have contributed to the fatal incident. No non-prescription drugs were considered to be contributory. Non-



[Case 122.](#) Part owner of a truck repair company died when he was pinned between a truck tire and frame of a semi trailer

prescription drugs found included ibuprofen, caffeine, nicotine, acetaminophen, theobromine (found in chocolate), ranitidine (Zantac) and dextromethorphan.

Table 4 shows the type of incident and detectable drug(s) (alcohol, illegal drugs, prescription and non-prescription medications) that were considered to be possibly contributory. It was unknown if the presence of oxycodone and the marijuana metabolite was from the use of a prescribed medication or from an illegal use of the drug.

Table 4. Type of Work-related Fatal Incident and Drug Found in Toxicological Analysis, Michigan 2012					
Incident Type	Alcohol (blood level %)	Opiates	Prescription	Marijuana &/or marijuana metabolite	Oxycodone
Struck By	0.085				
Fall	0.098			√	√
Motor vehicle	0.23		n-desmethyldrazepam		
Machine	0.33		benzodiazepine	√	
Other Medical	0.334				
Motor Vehicle				√	
Motor Vehicle				√	
Fall				√	
Motor Vehicle			amitripylene	√	
Motor Vehicle			paroxetine	√	
Motor Vehicle					√
Motor Vehicle		√			
Struck By			hydromorphone		
Motor Vehicle			trazodone, venlafaxine		

Ten individuals had a measurable **blood alcohol** level; 5 of these individuals also had detectable levels of drugs that were considered to be possibly contributory; 4 individuals were victims of a homicide and had blood alcohol levels of 0.25%, 0.57%, 0.75%, and 0.81%. One individual, whose cause of death could not be determined, had a blood alcohol of 0.74%. Six individuals (5.9%) had measurable alcohol; five individuals had measurable alcohol in their blood and one individual had measurable alcohol in their urine. One additional individual according to the medical examiner report was under the influence of alcohol at the time of the incident but did not have a measurable blood alcohol at the time of testing.

Work-Related Incident Details

Day of Injury

Table 5 shows the day of week when the work-related traumatic injury occurred.

The largest number of work-related fatalities occurred on a Wednesday (26 of 130, 20.0%). Monday had the next highest number of work-related fatalities (23, 17.9%), followed by Thursday (20, 13.4%), and then Friday and Saturday with 18 each (13.8%). The day of injury was unknown for five individuals.

Within Construction, Thursday and Friday had the most deaths (5 each, 25.0%). Monday had the largest number of work-related fatalities (6 of 18; 33.3%) within the Transportation & Warehousing industry. Agriculture deaths were fairly evenly distributed throughout the week. Interestingly, in Retail Trade, there were no deaths on either Friday or Sunday.

Table 5. Traumatic Work-Related Fatalities by Day of the Week of the Injury and Homicides, Michigan 2012

Day of Injury	All Injuries		Construction ^a (NAICS 23)		Transportation & Warehousing (NAICS 48-49)		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Retail Trade (NAICS 44-45)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Monday	23	17.7	3	15.0	6 ^d	33.3	3	16.7	2 ^d	18.2	4	14.3
Tuesday	13	10.0	2 ^d	10.0	2 ^d	11.1	2	11.1	2 ^e	18.2	4	14.3
Wednesday	26	20.0	3	15.0	2	11.1	2	11.1	3 ^d	27.3	6	21.4
Thursday	20	15.4	5	25.0	2	11.1	3	16.7	2 ^d	18.2	3	10.7
Friday	18	13.8	5	25.0	2	11.1	1	5.6	--	--	2	7.1
Saturday	18	13.8	2 ^d	10.0	2	11.1	3	16.7	2 ^d	18.2	5	17.9
Sunday	12	9.2	--		2 ^d	11.1	4	22.2	--	--	4	14.3
Total	130 ^b		20		18 ^c		18		11 ^c		28	

^a Only industries with 12 or more deaths are included in the table. ^b Day of week of fatal injury unknown for five individuals.

^c Day of week unknown for one individual. ^d One death was a homicide. ^e Two deaths were homicides.

Wednesday was the day of the week when most work-related homicides occurred (6 of 28; 21.4%), followed by Saturday (5 deaths, 17.9%). Retail Trade had 3 (50.0%) of the 6 Wednesday work-related homicides, 2 (66.7%) of the 3 homicides occurring on a Thursday, and 2 (50.0%) of the 4 homicides which occurred on Monday and Tuesday.

Month of Injury

Table 6 shows the number of fatal injuries by month of the year.

June and March had the highest number of injuries resulting in fatalities with 16 (11.9%), followed by August (14, 10.4%), October and December (13 each, 9.7%), and then September (11, 8.2%).



[Case 61](#). Tree service business owner died when he was pinned under tractor while pulling tree out of woods

In the Construction industry, the months of March, August, October, and November had the largest number of fatalities (3 each, 15.0%). In the Transportation & Warehousing sector, July and December were the months that had the highest number of work-related fatalities with 4 deaths (22.2%) each. In Agriculture, November had the most deaths (3, 16.7%) followed by June,

September, October and December with 2 (11.1%) each. March was the month when most work-related deaths occurred in Retail Trade (3, 25.0%).

Work-related homicides occurred in all months but April. September had the largest number of homicides (5, 17.9%), followed by October (4, 14.3%). Six of the 12 (50.0%) work-related deaths in Retail Trade were homicides.

Table 6. Traumatic Work-Related Fatalities by Injury Month and Homicides, Michigan 2012

Month of Injury	All Deaths		Construction ^a (NAICS 23)		Transportation & Warehousing (NAICS 48-49)		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Retail Trade (NAICS 44-45)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
January	8	6.0	2	10.0	1	5.6	--	--	1 ^b	8.3	3	10.7
February	7	5.2	--	--	1	5.6	1	5.6	2 ^b	16.7	2	7.1
March	16	11.9	3	15.0	1	5.6	1	5.6	3	25.0	1	3.6
April	7	5.2	2	10.0	--	--	--	--	--	--	--	--
May	10	7.5	--	--	1	5.6	1	5.6	2 ^c	16.7	3	10.7
June	16	11.9	1 ^b	5.0	1	5.6	2	11.1	--	--	3	10.7
July	9	6.7	1	5.0	4 ^b	22.2	1	5.6	1	8.3	1	3.6
August	14	10.4	3	15.0	1	5.6	1	5.6	2 ^c	16.7	3	10.7
September	11	8.2	2 ^b	10.0	1 ^b	5.6	2	11.1	--	--	5	17.9
October	13	9.7	3	15.0	2 ^b	11.1	2	11.1	--	--	4	14.3
November	10	7.5	3	15.0	1	5.6	3	16.7	--	--	1	3.6
December	13	9.7	--	--	4	22.2	2	11.1	1	8.3	2	7.1
Total	134*		20		18^d		18		12		28	

* Month of injury unknown for 1 individual.

^a Only industries with 12 or more deaths are included in the table. ^b One death was a homicide. ^c Two deaths were homicides.

^d Month of injury unknown for one individual.

Month of Injury by Cause

The type of fatal work-related injury varied by month (see **Table 7**).

Motor vehicles were the cause of 6 of the 7 (85.7%) work-related deaths in April, 6 of 15 (40.0%) in March and 5 of 16 (31.3%) deaths in June. June was also the month when most of the fatal non-vehicular machine-related injuries occurred (5 of 16, (31.3%)). Five of the 11 fatalities (45.5%) in September were attributable to a homicide. Rather than summer months as would be expected for a drowning death, the three individuals who died due to drowning were working outdoors in the winter months. Fatal falls occurred in most of the



Case 102. Male senior center volunteer died when he did not stop for a Stop sign

months of the year with November having the largest number of fatal falls (4, 23.5%). Only May and September did not have a fatal fall. November (4 falls) and March (3 falls) had the largest number of fatal falls.

Table 7. Traumatic Work-Related Fatalities by Injury Month and Cause, Michigan 2012

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Drowning	2	--	--	--	--	--	--	--	--	--	--	1	3
Drug Overdose	--	--	--	--	--	--	--	1	1	--	--	--	2
Electrocution	--	--	1	--	--	--	--	1	--	--	1	--	3
Fall	1	1	3	1	--	1	2	2	--	2	4	1	18
Homicide	3	2	1	--	3	3	1	3	5	4	1	2	28
Machine	--	--	2	--	2	5	1	--	1	--	2	1	14
Motor Vehicles	--	1	6	6	4	5	2	3	1	4	1	3	36
Other Medical	--	2	--	--	--	--	--	1	--	--	--	--	4
Struck By ^a	--	1	2	--	1	2	2	--	1	1	1	2	13
Suicide	2	--	--	--	--	--	1	2	2	2	--	3	12
Unknown Cause	--	--	--	--	--	--	--	1	--	--	--	--	1
Total	8	7	15	7	10	16	9	14	11	13	10	13	134

^a Month of fatal injury unknown for one case.

Time of Injury

Table 8 shows the time of day by 4-hour time periods for the work-related fatality. The time of the injury was known in 106 of the 135 (78.5%) work-related deaths; the time of the fatal injury was unknown for 29 individuals. The 24-hour day has been divided into the following 4-hour time periods: 12:00a.m.-3:59a.m., 4:00a.m.-7:59a.m., 8:00a.m.-11:59a.m., 12:00p.m.-3:59p.m.,

Table 8. Traumatic Work-Related Fatalities by 4-hour Time of Injury and Homicides, Michigan 2012

Time of Injury	All Deaths		Construction ^a (NAICS 23)		Transportation & Warehousing (NAICS 48-49)		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Retail Trade (NAICS 44-45)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
12am-3:59am	10	9.4	--	--	1	7.1	--	--	1	20.0	5	31.3
4am-7:59am	11	10.4	1	5.3	2	14.3	3	20.0	--	--	3	18.8
8am-11:59am	27	25.5	7	36.8	6	42.9	4	26.7	1	20.0	2	12.5
12pm-3:59pm	33	31.1	8	42.1	3	21.4	3	20.0	2	40.0	1	6.3
4pm-7:59pm	18	17.0	3	15.8	2	14.3	4	26.7	--	--	3	18.8
8pm-11:59pm	7	6.6	--	--	--	--	1	6.7	1	20.0	2	12.5
Total	106[*]		19^{bg}		14^{ch}		15^d		5^{ei}		16^f	

^{*} Time of injury unknown for 29 individuals. ^a Only industries with 12 or more deaths are included in the table. ^b Time of injury unknown for 1 individual.

^c Time of injury unknown for 5 individuals. ^d Time of injury unknown for 3 individuals. ^e Time of injury unknown for 7 individuals. ^f Time of injury unknown for 12 individuals. ^g Industry had 2 homicides. ^h Industry had 3 homicides. ⁱ Industry had 6 homicides.

4:00p.m.-7:59p.m., and 8:00p.m.-11:59p.m.

Overall, only 60 (44%) of the known 106 fatal work-related injuries occurred within the traditional working hours of 8:00a.m. - 3:59p.m. The highest number of fatal work-related injuries occurred between 12:00p.m. -3:59p.m. (33, 31.1%), 27 (25.5%) fatal incidents occurred between 8:00a.m.-11:59a.m., 18 (18.0%) fatal incidents occurred between 4:00p.m.-7:59p.m., 11 (10.4%) fatal incidents occurred between 4:00a.m.-7:59a.m., 10 (9.4%) fatal incidents occurred between 12:00a.m.-3:59a.m., and 7 (6.6%) fatal incidents occurred during the evening hours of 8:00p.m.-11:59p.m.

Construction had the highest number of fatal work-related injuries occur during the hours of 12p.m.-3:59p.m. (8, 42.1%). Transportation and Warehousing had the highest number of work-related fatal injuries take place between the hours of 8a.m.-11:59a.m. (6, 42.9%). The majority of the fatal work-related injuries in Construction and Transportation and Warehousing occurred during the normal working hours of 8:00a.m.-3:59p.m., (15 of 19, 78.9% and 9 of 14, 64.3% respectively).

Farm owner/operators and farm workers traditionally work non-standard work hours (12- to 16-hour days), and the data reflect these non-standard work times; 8 deaths occurred outside of the traditional work day of 8:00a.m.-3:59p.m. When the time of injury was known, 3 deaths occurred between 4:00a.m.-7:59a.m., 4 deaths occurred between 4:00p.m.-7:59p.m., and 1 death occurred between 8:00p.m.-11:59p.m.

Thirty one percent of the homicides with a known time of incident occurred between 12:00a.m. - 3:59p.m. Sixty two percent of the work-related homicides occurred during the night hours of 8:00p.m.-4:00a.m.

Geographic Distribution

The county of the fatal work-related injury was known for 134 of the 135 (99.3%) work-related deaths in Michigan in 2012. Forty-one (49.4%) of the 83 Michigan counties had at least one work-related injury that led to the death of the worker.

Figure 3 and **Table 9** show the county in which the victim worked where he/she was fatally injured.

Wayne County had the largest number of work-related fatal injuries (38, 28.4%), followed by Oakland County (10, 7.5%), and then Kent, Kalamazoo and Macomb Counties (7 each, 5.2%). Collectively, the southeast Michigan counties of Macomb, Oakland, Washtenaw, Monroe, and Wayne had 63 (47.0%) of all work-related deaths in Michigan in 2012.

Figure 3. County of Fatal Work-Related Injury, Michigan 2012

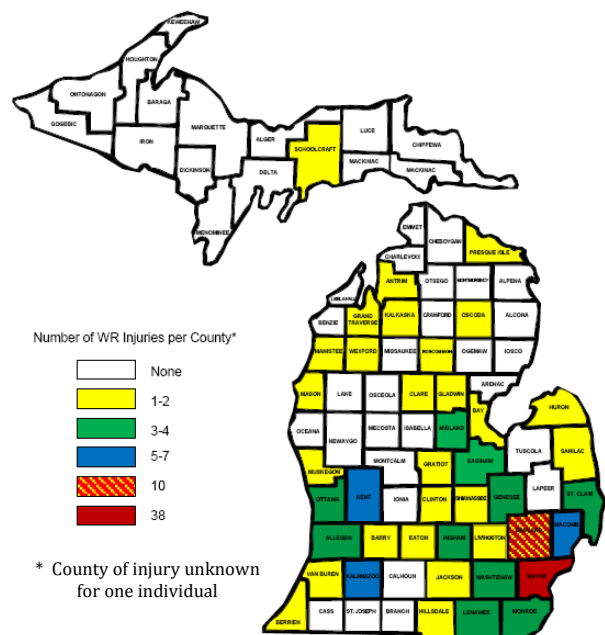


Table 9. County of Fatal Work-Related Injury, Michigan 2012

County	Number	Percent	County	Number	Percent	County	Number	Percent	County	Number	Percent
Alcona	--	--	Dickinson	--	--	Lake	--	--	Oceana	--	--
Alger	--	--	Eaton	1	0.7	Lapeer	--	--	Ogemaw	--	--
Allegan	3	2.2	Emmet	--	--	Leelanau	--	--	Ontonagon	--	--
Alpena	--	--	Genesee	3	2.2	Lenawee	3	2.2	Osceola	--	--
Antrim	2	1.5	Gladwin	1	0.7	Livingston	2	1.5	Oscoda	1	0.7
Arenac	--	--	Gogebic	--	--	Luce	--	--	Otsego	--	--
Baraga	--	--	Grand Traverse	1	0.7	Mackinac	--	--	Ottawa	3	2.2
Barry	1	0.7	Gratiot	1	0.7	Macomb	7	5.2	Presque Isle	1	0.7
Bay	1	0.7	Hillsdale	1	0.7	Manistee	1	0.7	Roscommon	1	0.7
Benzie	--	--	Houghton	--	--	Marquette	--	--	Saginaw	4	3.0
Berrien	2	1.5	Huron	1	0.7	Mason	1	0.7	St. Clair	3	2.2
Branch	--	--	Ingham	4	3.0	Mecosta	--	--	St. Joseph	--	--
Calhoun	--	--	Ionia	--	--	Menominee	--	--	Sanilac	2	1.5
Cass	--	--	Iosco	--	--	Midland	3	2.2	Schoolcraft	1	0.7
Charlevoix	--	--	Iron	--	--	Missaukee	--	--	Shiawassee	1	0.7
Cheboygan	--	--	Isabella	--	--	Monroe	4	3.0	Tuscola	--	--
Chippewa	--	--	Jackson	2	1.5	Montcalm	--	--	Van Buren	1	0.7
Clare	1	0.7	Kalamazoo	7	5.2	Montmorency	--	--	Washtenaw	4	3.0
Clinton	1	0.7	Kalkaska	1	0.7	Muskegon	1	0.7	Wayne	38	28.4
Crawford	--	--	Kent	7	5.2	Newaygo	--	--	Wexford	1	0.7
Delta	--	--	Keweenaw	--	--	Oakland	10	7.5	Unknown	1	--

Work-Related Fatality Injury Rates

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 groups of workers who tend to work full-time. However, differences will be observed for worker groups who tend to have a high percentage of part-time workers, such as younger workers.

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 10**).

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 the employment-based incidence rate, such as in Construction, Manufacturing, and Wholesale Trade.

Industry Highlights, Michigan 2012

Table 10 shows the number of traumatic work-related fatalities and Michigan's annual incidence rate by industry sector for number of employees and hours worked for 2012.

Highlights from Table 11:

Eight industry sectors had fewer work-related deaths and a lower employment-based incidence rate in 2012 compared to 2011:

Industry	Decrease in Number of Deaths from 2011	Number of 2012 WR deaths	2012 Incidence Rate	Number of 2011 WR deaths	2011 Incidence Rate
Agriculture	5	18	20.7	23	26.5
Construction	5	20	15.7	25	20.1
Manufacturing	4	11	2.0	15	2.9
Real Estate & Rental & Leasing	1	1	2.0	2	4.1
Professional, Scientific, & Technical Services	2	1	0.4	3	1.3
Education	2	2	0.7	4	0.8
Arts, Entertainment, & Recreation	3	2	4.4	5	10.5
Public Administration	5	6	2.5	11	7.8

Eight industry sectors had a higher number of work-related deaths and a higher employment-based incidence rate in 2012 compared to 2011:

Industry	Increase in Number of Deaths from 2011	Number of 2012 WR deaths	2012 Incidence Rate	Number of 2011 WR deaths	2011 Incidence Rate
Wholesale Trade	1	5	3.1	4	2.6
Retail Trade	2	12	2.7	10	2.2
Transportation & Warehousing	5	19	18.6	14	12.0
Information	3	4	7.5	1	1.9
Administrative & Support & Waste Management & Remediation Services	4	11	4.0	7	2.6
Health Care & Social Assistance	1	7	1.2	6	1.0
Accommodation & Food Services	1	4	1.2	3	0.9
Other Services (Exc. Public Administration)	6	11	6.5	5	4.1

One industry sector had the same number of work-related deaths and employment-based incidence rates in 2011 and 2012:

Industry	Number 2011 & 2012 Deaths	Incidence rate 2011 & 2012
Utilities	1	5.2

Table 10. Number of Traumatic Work-Related Fatalities by Industry and Rates by Number of Employees and by Hours Worked, Michigan 2012

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees ^c	Rate ^b	Number Hours ^c	Rate ^d
Agriculture, Forestry, Fishing & Hunting (11)	18	13.3	87,114^e	20.7	**	**
Crop Production (111)	6	4.4	53,500	11.2	**	**
Animal Production (112)	3	2.2	31,839	12.6	**	**
Forestry & Logging (113)	5	3.7	1,593 ^a	313.9	**	**
Fishing, Hunting & Trapping (114)	1	0.7	182 ^a	549.5	**	**
Unknown	2	1.5	**	**	**	**
Utilities (22)	1	0.8	19,200	5.2	**	**
Utilities (221) (Power Generation & Supply)	1	0.7	16,360 ^a	6.1	**	**
Construction (23)	20	14.8	127,300	15.7	40.0	15.7
Construction of Buildings (236)	3	2.2	27,100	11.1	37.6	11.8
Heavy & Civil Engineering Construction (237)	3	2.2	14,000	21.4	**	**
Specialty Trade Contractors (238)	12	8.9	86,200	13.9	39.8	14.0
Unknown	1	0.7	**	**	**	**
Manufacturing (31-33)	11	8.7	536,900	2.0	43.5	1.9
Paper (322)	1	0.7	11,270 ^a	8.9	**	**
Chemical (325)	1	0.7	28,500	3.5	**	**
Plastics & Rubber Products (326)	2	1.5	34,300	5.8	**	**
Primary Metal (331)	1	0.7	21,500	4.7	**	**
Fabricated Metal Product (332)	1	0.7	75,900	1.3	40.7	1.3
Transportation Equipment (336)	5	3.7	155,800	3.2	46.2	2.8
Wholesale Trade (42)	5	3.7	158,900	3.1	38.2	3.3
Merchant Wholesalers, Durable Goods (423)	1	0.7	88,600	1.1	38.6	1.2
Merchant Wholesalers, Nondurable Goods (424)	4	3.0	46,500	8.6	**	**
Retail Trade (44-45)	12	8.9	448,400	2.5	30.1	3.6
Motor Vehicle & Parts Dealers (441)	4	3.0	54,600	7.3	40.3	7.3
Food & Beverage Stores (445)	2	1.5	74,300	2.7	**	**
Gasoline Stations (447)	1	0.7	13,600	4.2	**	**
General Merchandise Stores (452)	1	0.7	117,700	0.9	**	**
Miscellaneous Store Retailers (453)	4	3.0	23,400	12.8	**	**
Transportation & Warehousing (48-49)	19	14.1	102,000	18.6	**	**
Truck Transportation (484)	10	7.4	38,700	25.8	**	**
Transit & Ground Passenger Transportation (485)	3	2.2	6,941	43.2	**	**
Support Activities for Transportation (488)	3	2.2	12,078	24.8	**	**
Postal Service (491)	3	2.2	21,200	14.2	**	**
Information (51)	4	3.1	53,100	7.5	35.6	8.5
Publishing Industries (exc. Internet) (511)	2	1.5	15,800	12.7	**	**
Broadcasting (exc. Internet) (515)	2	1.5	5,507	36.3	**	**
Real Estate & Rental & Leasing (53)	1	0.7	48,100	2.1	**	**
Real Estate (531)	1	0.7	34,300	2.9	**	**
Professional, Scientific, & Technical Services (54)	1	0.7	246,100	0.4	36.2	0.4
Professional, Scientific, & Technical Services (541)	1	0.7	246,100	.04	**	**

Table 10. Number of Traumatic Work-Related Fatalities by Industry and Rates by Number of Employees and by Hours Worked, Michigan 2012

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees ^c	Rate ^b	Number Hours ^c	Rate ^d
Administrative & Support & Waste Management & Remediation Services (56)	11	8.1	275,800	4.0	**	**
Administrative & Support Services (561)	11	8.1	265,319 ^a	4.1	**	**
Education (61)	2	1.5	289,800	0.7	**	**
Education (611)	2	1.5	289,800	0.7	**	**
Health Care & Social Assistance (62)	7	5.2	589,800	1.2	32.0	1.5
Ambulatory Health Care Services (621)	7	5.2	190,700	3.7	**	**
Arts, Entertainment, & Recreation (71)	2	0.8	45,800	4.4	22.5	7.8
Performing Arts, Spectator Sports, & Related Industries (711)	2	0.8	8,300	24.1	**	**
Accommodation & Food Services (72)	4	3.0	341,300	1.2	22.5	2.1
Food Services & Drinking Places (722)	4	3.0	302,400	1.3	**	**
Other Services (except Public Administration) (81)	11	8.1	168,300	6.5	**	**
Repair & Maintenance (811)	4	3.0	36,400	11.0	**	**
Personal & Laundry Services (812)	2	1.5	36,600	5.5	**	**
Religious, Grantmaking, Civic, Professional & Similar Organizations (813)	5	3.7	95,300	5.2	**	**
Public Administration (92)	6	4.4	240,800	2.5	**	**
Justice, Public Order, & Safety Activities (922)	4	3.0	**	**	**	**
Administration of Economic Programs (926)	1	0.7	**	**	**	**
National Security & International Affairs (928)	1	0.7	**	**	**	**
Total	135		4,245, 000^f	3.2		

^a Source: Michigan Department of Technology, Management and Budget (DTMB), Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2012. Accessed November 25, 2013. www.milmi.org/cgi/dataAnalysis/

^b Incidence rates calculated per 100,000 workers.

^c Source: Michigan Department of Technology, Management and Budget, Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2012. September 17, 2013. www.milmi.org/cgi/dataAnalysis/

^d Rate represents the number of fatal occupational injuries per 100,000 full time equivalent workers and was calculated as: (N/EH) x 200,000,000 where N= Number of fatal injuries; EH = total hours worked by employees in the industry sector during the calendar year (number of hours x 50 weeks per year); 200,000,000 = base for 100,000 equivalent full-time workers (working 40 hours per week, 50 weeks per year)

^e Source: USDA, National Agricultural Statistics Service. 2007 Census of Agriculture, AC-07-A-51, Issued February 2009, Updated December 2009. Accessed October 23, 2012 www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp

^f Source: Employment status of the civilian noninstitutional population by sex, race, Hispanic or Latino ethnicity, and detailed age, 2012 annual averages – Michigan. Bureau of Labor Statistics, Local Area Unemployment Statistics <http://www.bls.gov/lau/table14full12.pdf>

** No Data provided on DTMB IES or DTMB QCEW-ES202 reports.

Table 11 compares the employment-based and hours-based work-related fatality incidence rates by industry in Michigan to National hours-based rates for 2012 as computed by 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. Hours-based rates measure fatal injury risk per standardized length of exposure, and are generally considered more accurate than employment-based rates. Hours-based rates use the average number of employees at work and the average hours each employee works.

Employment-based fatality rates were calculated using estimates of employed civilian workers (aged 16 and older) from the [Current Population Survey \(CPS\)](#) supplemented with counts for resident armed forces provided by the Department of Defense (DOD). **The overall employment-based fatality rate per 100,000 workers in Michigan for 2012 was lower than the United States hours-based fatality incidence rate (3.4/100,000 workers).** BLS cautions that hours-based fatal injury rates should not be directly compared to employment-based rates because of the differences in the numerators and denominators used.

Table 11. Traumatic Work-Related Fatalities by Industry Sector, Michigan Incidence Rates Compared to US Incidence Rates, 2012

Industry Sector ^a (NAICS Code)	Number of Fatalities	2012 MI Employment- based Rate ^b	2012 MI Hours-Based Rate ^a	2012 US Hours-Based Rate ^c
Agriculture, Forestry, Fishing and Hunting (11)	18	20.7	**	22.8
Utilities (22)	1	5.2	**	2.5
Construction (23)	20	15.7	15.7	9.9
Manufacturing (31-33)	11	2.0	1.9	2.2
Wholesale Trade (42)	4	3.1	3.3	5.4
Retail Trade (44-45)	12	2.5	3.6	1.9
Transportation & Warehousing (48-49)	19	18.6	**	14.6
Information (51)	4	7.5	8.5	1.5
Real Estate and Rental and Leasing (53)	1	2.1	**	**
Professional & Business Services ^d (54, 56)	12	4.6	**	2.7
Educational & Health Services ^d (61, 62)	9	1.0	**	0.9
Leisure & Hospitality ^d (71, 72)	6	1.5	2.8	2.2
Other Services (except Public Administration) (81)	11	6.5	**	2.7
Public Administration (92)	6	2.5	**	2.0
Total	135	3.2	**	3.4

^a Sources: USDA, National Agricultural Statistics Service. 2007 Census of Agriculture, AC-02-A-51, Issued February 2009, Updated December 2009. www.nass.usda.gov/census/. Accessed November 25, 2013. Michigan Department of Technology, Management and Budget (DTMB), Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2012. Accessed September 17, 2013. www.milmi.org/cgi/dataAnalysis/. Michigan Department of Technology, Management and Budget, Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2012. Accessed November 25, 2013. www.milmi.org/cgi/dataAnalysis/.

^b Incidence rates calculated per 100,000 full-time equivalent (FTE) workers.

^c Bureau of Labor Statistics News, United States Department of Labor, USDL 10-1142, Release Date: Revised Data April 2014. Accessed May 15, 2014. <http://www.bls.gov/iif/home.htm>

^d Employment-based rate calculated as $(N+N)/(E+E) \times 100,000$ FTE workers (from Table 9): N=Number fatalities (NAICS+NAICS), E=Number Employees (NAICS+NAICS).

* NAICS unknown for one individual.

** No data reported on DTMB IES report.

Of the six Michigan industry groupings with a calculated hours-based incidence rate, four had higher hours-based incidence rates compared to the US hours-based incidence rate for that industry group: Construction (15.7 compared to 9.9, 60% higher), Retail Trade (3.6 compared to 1.9, 200% higher), Information (8.5 compared to 1.5, 600% higher), and Leisure and Hospitality (2.8 compared to 2.2, 30% higher).

Two of the deaths in the Information industry involved individuals working for newspapers and two working for telecommunication firms.

Wholesale Trade's hours-based rate was approximately 50% lower than the US hours-based incidence rate for industry sector. Manufacturing's hours-based rate was similar to the US hours-based rate (1.9 compared to 2.1).

Occupations

Figure 4 shows the distribution of the 135 work-related deaths where the Standard Occupational Classification (SOC) category could be determined from the reporting source data. MIFACE uses the 2000 Standard Occupational Classification (SOC) system to categorize occupations of the individuals who died. The 2000 SOC is divided into 23 major groups, which are sometimes called "job families". The "job families" 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 23 "job families" are further subdivided using a six-digit structure into 821 detailed occupations.

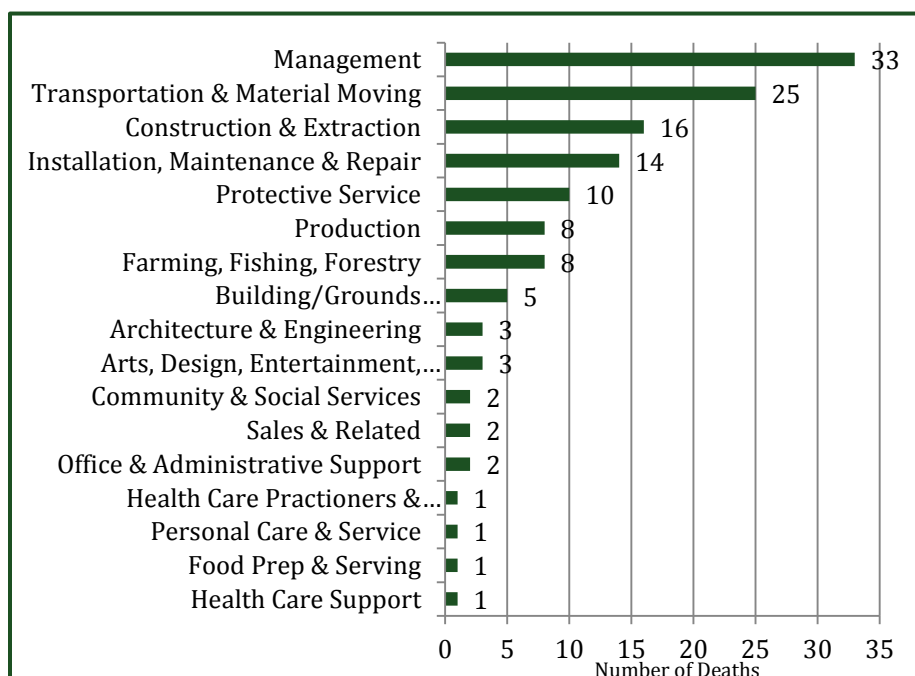


[Case 55](#). Farmer died when tractor overturned while mowing drainage ditch

Overall, in 2012, the Management job family had 33 (24.4%) deaths. Of these 33 deaths, 12 (36.4%) individuals owned/co-owned the business or were self-employed, 11 (33.3%) individuals were farm owners, 8 (24.2%) individuals were managers, directors or administrators of an organization, and 2 (6.1%) individuals were volunteers in an administrative capacity with a charitable organization.

Of the 25 individuals identified as conducting a work activity in the Transportation & Material Moving job family, the Transportation & Warehousing industry sector accounted for 13 (52.0%) of the deaths. Ten (10, 76.9%) individuals were identified as truck drivers, two (15.4%) individuals were cab drivers and one (0.8%) individual was a chauffeur. Other industry sectors represented in the Transportation & Material Moving job family were Manufacturing (two forklift operators), Public

Figure 4. Number of Deaths by Standard Occupational Classification, Michigan 2012



Administration (citizens patrol worker), Information (two newspaper delivery drivers), Wholesale Trade (warehouse worker, porter/driver), Retail Trade (truck driver), Accommodation and Food Service (pizza delivery driver), Other Services (parts delivery driver), Professional, Scientific, & Technical Services (car tester/driver) and Construction (maintenance/driver).

Within the Construction & Extraction job family, plumbers/pipefitters accounted for four (25.0%) deaths, roofers and carpenters each accounted for three (18.8%) deaths, construction laborers had two deaths (12.5%). A heat and frost insulator, painter, ironworker, and siding installer each had one (0.6%) death.

Mechanics were primarily the individuals who were killed in a work-related incident (9 of 14, 64.3%) in the Installation, Maintenance & Repair job family. Other occupations within this job family were automotive restoration, truck repair, first line supervisor, service technician and lineman.



[Case 66.](#) Robot weld technician pinned by clamping mechanism of a transfer robot against a part in a buffer rack

The occupations comprising the Protective Service job family included security guards (4, 40.0%) police officers (2, 20.0%), a crossing guard, a fire fighter/EMT, a border agent and a supervisor in a security firm.

Working Status of the Decedent

One hundred thirty one employers were associated with the 135 individuals who died in 133 separate incidents.

Two employers each had two individuals die in separate work-related incidents due to a work-related homicide, one employer had an individual kill a coworker and then commit suicide, and one employer had two individuals fall in separate incidents; one of the individuals survived the fall but died due to complications of resultant surgery.

The employer/employee status was known for 124 (91.9%) of the 135 work-related deaths in 2012. Seventy five (60.5%) were identified as employees, 43 (34.7%) were identified as self-employed or the owner/co-owner of the business, 5 (4.0%) were identified as volunteers and one (0.8%) was a temporary/contract worker.



[Case 2.](#) Construction worker died when the cantenary suspended scaffold platform sheet collapsed

The decedent was working alone in 81 (66.9.0%) incidents and with a coworker in 40 (33.1.0%) incidents. The work status was unknown in 14 incidents. For homicides, the decedent was working alone in 17 (68.0%) incidents and with a coworker in 8 (32.0%) incidents. The work status is unknown for three incidents.

The place of injury for the fatal incident was identified for 132 (97.8%) of the 135 deaths. For years 2001-2011, if the individual was injured in a motor vehicle accident or injured when struck by a motor vehicle, the decedent's location was a street/roadway. In 2012, MIFACE further refined the location of injury as instructed in the [CDC Death Certificate Section 4 – Main Elements](#). Coding changes include: 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. Those 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”.

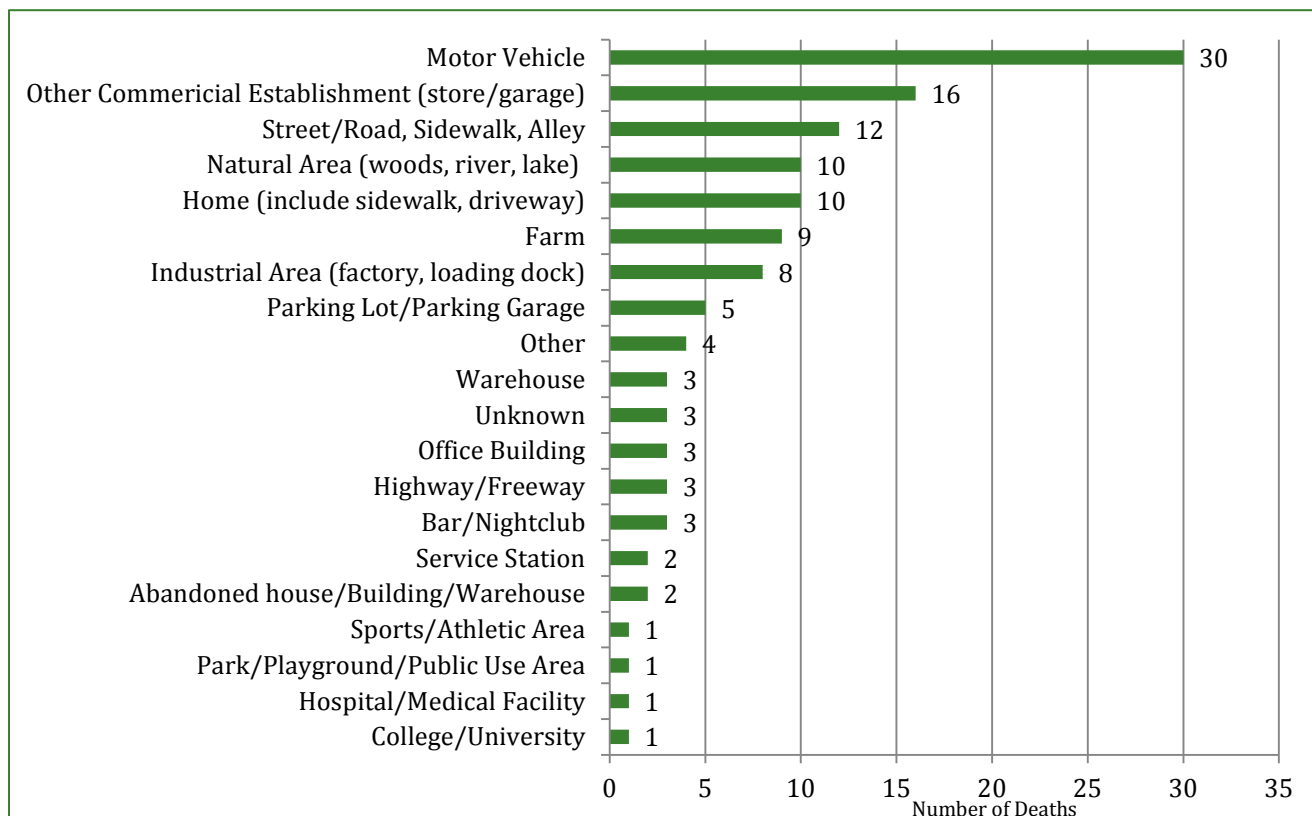


Case 73. Road surveyor died when struck by oncoming vehicle

Motor vehicles were the place where the most fatal injuries occurred (30, 22.7%). Sixteen (12.1%) individuals died at a commercial establishment (retail store, garage at the business, etc.). Twelve (9.1%) individuals died while on a street/road/alley. Natural areas and a home (which included the sidewalk, driveway and the home's garage) had 10 (7.6%) fatal injuries each. Nine (6.8%) fatal injuries occurred on a farm and 8 (6.1%) fatal injuries occurred at an industrial area. Public parking lots/garages were the site for 5 (3.8%) work-related fatal injuries. The 4 deaths in “Other” include a composting machine, airport, post office and pole barn at a home. The location of injury for three deaths was unknown.

Figure 5 shows the place and number of injuries for the 2012 traumatic deaths.

Figure 5. Location and Number of Fatal Work-Related Injuries, Michigan 2012



Location of Death

For 74 (54.8%) individuals, the place of death was at the scene of the traumatic incident. For 53 (39.3%) individuals, the death certificate indicated the death occurred in the hospital. Four (3.0%) individuals were identified as dying at a residential home. Two (1.5%) individuals died while under hospice care. The following locations had one (0.7%) death each: public park and neurocare center.

Means of Work-Related Death

Table 12 shows the means of death by industry sector. Additional information regarding each means of death follows the summary information.

The means of death was known for 134 (99.3%) of the 135 work-related deaths in 2012. For one individual, the death certificate indicated “indeterminate”; it could not be determined if the death was a homicide, suicide, or accidental death. In this case, a heavy equipment mechanic who worked in the Construction industry was found shot at his employer’s place of business.

Table 12. Traumatic Work-Related Fatalities by Means of Death and Industry Sector, Michigan 2012

Industry Sector (NAICS Code)	Drowning (2.2%)	Drug Abuse (1.5%)	Electrocution (2.2%)	Fall (13.3%)	Homicide (20.7%)	Machine (10.4%)	Motor Vehicle (26.7%)	Other Medical (3.0%)	Struck By (10.4%)	Suicide (8.9%)	Unknown (0.7%)	Total
Agriculture, Forestry, Fishing & Hunting (11)	1	--	--	3	--	7	2	1	3	1	--	18
Utilities (22)	--	--	--	--	--	--	1	--	--	--	--	1
Construction (23)	1	--	2	4	2	1	7	--	2	--	1	20
Manufacturing (31-33)	--	--	--	2	2	4	1	--	--	2	--	11
Wholesale Trade (42)	--	--	1	1	--	1	--	--	1	1	--	5
Retail Trade (44-45)	--	--	--	3	6	--	--	--	2	1	--	12
Transportation & Warehousing (48-49)	--	--	--	2	3	--	10	1	1	2	--	19
Information (51)	--	--	--	--	--	--	4	--	--	--	--	4
Real Estate & Rental & Leasing (53)	--	--	--	--	1	--	--	--	--	--	--	1
Professional, Scientific, & Technical Services (54)	--	--	--	--	--	--	1	--	--	--	--	1
Administrative & Support & Waste Management & Remediation Services (56)	--	--	--	2	4	1	--	--	4	--	--	11
Education (61)	--	--	--	--	--	--	1	1	--	--	--	2
Health Care & Social Assistance (62)	--	1	--	--	2	--	3	--	--	1	--	7
Arts, Entertainment, & Recreation (71)	--	--	--	--	--	--	2	--	--	--	--	2
Accommodation & Food Services (72)	--	1	--	--	2	--	1	--	--	--	--	4
Other Services (ex. Public Administration) (81)	1	--	--	--	4	--	2	--	1	3	--	11
Public Administration (92)	--	--	--	1	2	--	1	1	--	1	--	6
Total	3	2	3	18	28	14	36	4	14	12	1	135

Motor vehicles were the leading cause of a work-related death (36, 26.7%) in Michigan in 2012 and the leading cause of death in Transportation & Warehousing (10, 52.6%), Construction (7, 35.0%), and Health Care & Social Assistance (3, 42.9%). Motor vehicles were the only cause of death in Utilities (1 death), Information (4 deaths), Professional, Scientific & Technical Services (1 death) and Arts & Entertainment (2 deaths). A motor vehicle was considered the cause of death if: a) the individual was driving or a passenger in the motor vehicle at the time of the incident; b) the individual was struck by the vehicle while on a public roadway; or c) the investigating agency completed a motor vehicle crash report. If a motor vehicle was the cause of death while on a non-public roadway or if the investigating agency did not complete a crash report, the incident was classified as a struck-by incident.

Work-related homicides were the second leading cause of death (28, 20.7%) in Michigan in 2012 followed by falls (18, 13.3%), and then machines and struck by objects (14 each, 10.4%). Nearly nine percent of the work-related deaths were a result of a suicide (12, 8.9%). Other medical conditions, such as a blood clot following surgery after a work-related incident, were the cause of four (3.0%) deaths. Three individuals drowned (3, 2.2%) and three individuals were electrocuted (3, 2.2%). Two (1.5%) individuals died of a drug overdose.

Homicides were the primary cause of death in Retail Trade (6 of 12, 50.0%) and Real Estate & Rental & Leasing (1 of 1, 100.0%). Other industry sectors where work-related homicides were the primary cause of death include Administrative & Support & Waste Management & Remediation (4 of 11, 36.4%), Other Services (4 of 11, 36.4%), Accommodation & Food Service (2 of 4, 50.0%), and Public Administration (2 of 6, 33.3%).

In Construction, fatal falls were the second leading cause of death (4, 22.2%) after motor vehicles, followed by electrocution, homicide and struck by an object (2 each, 13.3%).

Machines were the primary cause of death in Agriculture (7 of 18, 38.8%) and Manufacturing (4 of 11 deaths, 36.4%). Eleven of the 14 (78.6%) machine-related deaths in 2014 occurred in Agriculture and Manufacturing.

Within Agriculture, three (16.7%) individuals died when struck by an object and three (16.7%) individuals died when they fell from a height. The drowning death which occurred in Agriculture in 2012 occurred in the subsector of Hunting, Fishing & Trapping.

Means of Death by Cause

Drowning

Three individuals died as a result of drowning. One individual was checking his beaver/muskrat traps along a river and was found in a submerged vehicle. One individual fell from a bridge under construction. He survived the fall, but drowned when he was not rescued in a timely manner. The third individual fell into a lake while conducting caretaker activities for a ship preservation association.

Drug Abuse

One individual died due to an accidental overdose of morphine and one individual died due to multiple drug intoxication.

Electrocution

Three individuals died as a result of coming into contact with electrical current. Two of the three deaths occurred in construction and were a result of indirect contact: an aluminum extension ladder contacting an energized 7,600- volt overhead power line. In one incident, the worker was extending the ladder with a coworker. The decedent was holding the ladder with both hands while his coworker was holding the ladder with one hand. Both individuals were electrocuted

with one individual dying. In the second incident involving an aluminum ladder, the individual was lifting a low hanging cable line to permit a truck to access the work area. The ladder contacted the energized overhead line.

In the third incident, the decedent contacted 480 volts when reaching into an electrical cabinet to adjust the temperature on a digital thermostat.

In two of the incidents, the work area was dry and in one incident, the work area was characterized as wet.

Fall

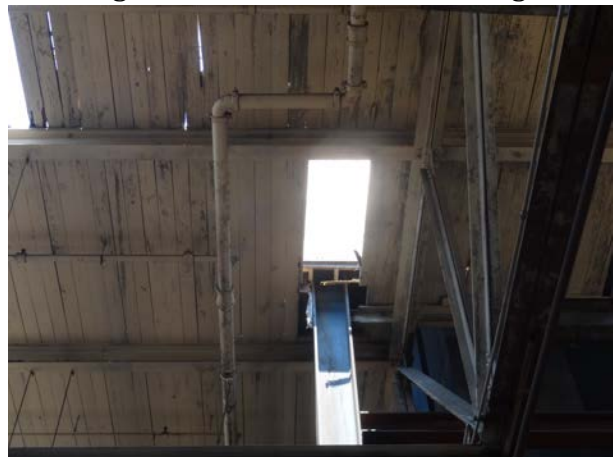
Falls accounted for 18 of the work-related fatalities. The reason for the fall was identified in 13 (72.2%) of the 18 incidents. The structure collapsed in four incidents. The individual slipped or tripped in three incidents. A medical condition was the cause of the fall in two incidents; the injuries that were sustained at the time of the fall were determined to have caused the deaths. Two incidents involved ladders: a) a worker was on a ladder and a falling branch struck him, knocking him from the ladder; b) the individual was working from a ladder and was using a drill when the bit became lodged in wood; the resultant torque produced is presumed to have caused him to lose his balance and fall from the ladder. In one incident, the individual was cutting limbs from a tree and cut through his securement line with his chainsaw. In one incident, the individual inadvertently contacted an energized pole on the top of his building as he was starting to climb from the roof to a ladder; the contact caused him to fall from the roof edge to the ground below.

The distance the worker fell was identified in 14 (77.8%) cases; in the other four cases, the distance was unknown. The individual's fall was less than 10 feet in 5 (35.7%) cases, 10-20 feet in 6 (42.9%) cases, and 21- 50 feet in 3 (21.4%) cases.

The location of the fall was identified for 16 (88.9%) of the 18 fall-related deaths. Individuals fell from a roof edge in 3 (18.8%) instances, a scaffold or ladder in 3 (18.8%) instances, and while standing on the ground in 2 (14.3%) cases. Each of the following surfaces had one fatal fall: hayloft, barn rafter, bumper of a trailer, semi cab, and an unmarked, unsecured roof wood plank area that had been cut.



[Case 6.](#) Roofer was electrocuted when his 40-foot aluminum ladder contacted a 7,600-volt energized power line



[Case 13.](#) Steel erection worker fell 26 feet to the concrete floor during a building re-roof

In 7 (58.3%) instances, the individual fell to a concrete, rock or asphalt surface. The individual fell directly to packed dirt in 2 (16.7%) instances. Other identified surfaces individuals fell to were carpeted/tiled floor (1, 8.3%); previously cut wood laying on the ground (1, 8.3%) and to a tractor, and then a concrete floor (1, 8.3%). The surface the victim landed on was undetermined in six of the cases.

The working surface condition was known in 12 of 16 cases. The working surface was dry in 9 (75.0%) incidents, and damaged in 2 (16.7%) incidents. One (8.3%) work surface was wet.

The site of one fatal fall is unknown. Of the 17 falls where the site of the fall is known, four fatal falls (23.5%) occurred at construction sites. Only one fatal fall occurred at a commercial construction site and three falls occurred at residential construction sites. In Agriculture, two falls occurred on the farm. A greenhouse was the location of the third fall; the individual was trimming a tree. The roof of a furniture store, a pole barn and a supercenter retail store were the fall sites in Retail Trade. One fatal fall occurred at a manufacturing facility.



[Case 11](#). Farmer died when he fell approximately 12 feet from a hayloft

Homicide

MIFACE identified 28 work-related homicides. Twenty seven (96.4%) homicide victims were men and one (3.6%) victim was a woman.

Work-related homicides occurred primarily in Wayne County (21 of 28, 75.0%). Oakland County had 2 (7.1%) homicides and the following counties each had 1 (3.6%) homicide: Jackson, Kalamazoo, Kent, Ottawa and Washtenaw.

Sixteen (57.1%) work-related homicide victims were African American, eleven (39.3%) were Caucasian, and one (3.6%) was Asian/Pacific Islander. Sixteen of the 21 (76.2%) work-related fatalities among African Americans were caused by homicides; all sixteen homicides occurred among African American men. Twenty two of the 28 (78.6%) homicides occurred among individuals born in the United States. The country of origin for six homicides was Algeria, Germany, Iraq, Ukraine, Vietnam, and Yemen.

The average age of a homicide victim was 48.9 years. Ages ranged from 21 years of age to 84 years of age.

Six work-related homicide victims worked in Retail Trade. Administrative & Support & Waste Management & Remediation and Other Services each had four work-related homicides. Three individuals working in Transportation & Warehousing died as a result of a homicide. Construction, Manufacturing, Health Care & Social Assistance, Accommodation & Food Service

and Public Administration each had two deaths. One work-related homicide victim worked in Real Estate & Rental & Leasing.

A gun was the cause of death in 21 (75.0%) incidents and a knife in three (10.7%) incidents. Three individuals died as a result of a beating with a blunt instrument. One individual was set afire.

Machine

There were 14 non-vehicular machine-related fatalities. The leading causes of machine related deaths were being pinned in an overturn in four (28.6%) instances or entangled in the machine in 3 (21.4%) instances. Mechanical suffocation (asphyxia) caused by the machine occurred in 2 (14.3%) cases. One individual each died due to the following machine-related incidents: cut or pierced by the machine, run over by the machine, struck by the machine, and caught between the machine and another object (earthen ditch bank).

Machine-related fatal injuries were the cause of 7 of 18 (38.9%) work-related deaths in Agriculture. Tractors were the machines involved in five of the six deaths. The machine involved in the remaining two deaths was a loader/skid steer and front end loader.

The types of machines included tractors, a loader/skid steer, a forklift, a soil screening machine, a molding press, a tree chipper, a paper shredder, front end loader, and a transfer robot.



[Case 63](#). Female forklift driver died when forklift overturned to side

Motor Vehicle

There were 36 motor vehicle related fatalities in 35 fatal crashes. In one incident, two passengers riding in the same vehicle died; the driver survived the crash. Six pedestrians were struck by vehicles; all victims were male. The responding police/sheriff department completes a crash report for motor vehicle-related fatalities. MIFACE utilized both the crash report and written report to gather and summarize data for motor vehicle related fatalities.

In one incident, the decedent was racing a modified snowmobile (skis removed and wheels in place of the skis). The responding police completed a written report but did not complete a crash report for this incident. Information from the written report was included in the motor vehicle fatality data when known.

Motor Vehicle Crash Terminology

A “**unit**” is identified as a motor vehicle, bicycle, pedestrian or train involved in the crash and individually reported; therefore, a car-animal crash or a car-tree crash is categorized as a single-unit crash.

The **crash type** is based on the intended direction of travel, regardless of points of impact or the direction the vehicles ultimately face after the crash.

- ◆ **Single motor vehicle:** cases in which a motor vehicle was (a) the only traffic unit and (b) the only motor vehicle involved collided with a bicyclist, pedestrian, animal, railroad train or any other non-motorized unit.
- ◆ **Head On:** direction of travel of both vehicles must be toward each other.
- ◆ **Angle:** direction of travel is basically perpendicular for both drivers and there is a side impact of approximately 90 degrees.
- ◆ **Rear End:** Vehicles traveling in same direction, one behind the other and no turn is involved.
- ◆ **Sideswipe - Same:** vehicles were traveling in opposite directions and made side contact.
- ◆ **Rear End – Left Turn:** One driver intending to make a left turn and driver was struck by a following vehicle, not necessarily in the same lane.
- ◆ **Other:** crash does not fit in one of the categories.

Highlights of Motor Vehicle Incidents

Driver/Passenger/Pedestrian

- ◆ Drivers: 28 (77.8%) individuals
- ◆ Passengers: 2 (5.6%) individuals (1 incident)
- ◆ Pedestrians: 6 (16.7%) individuals

Number of Units (35 incidents)

- ◆ 1 unit: 10 (28.6%) incidents
- ◆ 2 units: 18 (51.4%) incidents
- ◆ 3 units: 7 (20.0%) incidents
- ◆ 4 units: 1 (2.9%) incidents

Crash Type (35 incidents)

- ◆ Single motor vehicle: 10 (28.6%) incidents (1 pedestrian, 2 passengers)
- ◆ Head On: 4 (11.4%) incidents
- ◆ Angle: 9 (25.7%) incidents
- ◆ Rear End: 3 (8.6%) incidents (1 pedestrian)
- ◆ Sideswipe – Same: 1 (2.9%) incident
- ◆ Rear End – Left Turn: 3 (8.6%) incidents
- ◆ Other: 5 (14.3%) incidents (4 pedestrians)

Number of Roadway Lanes (34 known)

- ◆ 1 lane: 2 (5.9%) incidents
- ◆ 2 lanes: 22 (64.7%) incidents
- ◆ 3 lanes: 7 (20.6%) incidents
- ◆ 4 lanes: 2 (5.9%) incidents
- ◆ 5 lanes: 1 (2.9%) incident

Amount of Light (34 known)

- ◆ Daylight: 29 (85.3%) incidents
- ◆ Dawn/Dusk: 1 (2.9%) incident
- ◆ Dark – Lighted: 1 (2.9%) incident
- ◆ Dark – Unlit: 3 (8.8%) incidents

Speed Limit (34 known)

- ◆ 15 mph: 1 (2.9%) incident
- ◆ 25 mph: 2 (5.9%) incidents
- ◆ 45 mph: 3 (8.8%) incidents
- ◆ 50 mph: 1 (2.9%) incident
- ◆ 55 mph: 17 (50.0%) incident
- ◆ 60 mph: 1 (2.9%) incident
- ◆ 65 mph: 1 (2.9%) incident
- ◆ 70 mph: 8 (23.5%) incidents (2 passengers)

Weather (34 known)

- ◆ Clear: 20 (58.8%) incidents (5 pedestrians, 2 passengers)
- ◆ Cloudy: 6 (17.6%) incidents (1 pedestrian)
- ◆ Snowy: 4 (11.8%) incidents
- ◆ Muddy: 2 (5.9%) incidents
- ◆ Sleet/hail: 1 (2.9%) incident
- ◆ Rain: 1 (2.9%) incident

Surface Conditions (34 known)

- ◆ Dry: 27 (79.4%) incidents
- ◆ Wet: 4 (11.8%) Incidents
- ◆ Icy: 2 (5.9%) incidents
- ◆ Snowy: 1 (2.9%) incident

Type of Trafficway (34 known)

- ◆ Not physically divided (2-way traffic): 22 (64.7%) incidents
- ◆ Divided highway, median strip, without traffic barrier: 4 (11.8%) incidents
- ◆ Divided highway, median strip, with traffic barrier: 6 (17.6%) incident
- ◆ One way traffic: 1 (2.9%) incident (2 passengers)
- ◆ Non-Traffic: 1 (2.9%) incident

Type of Vehicle (35 known)

- ◆ Passenger car: 15 (42.9%) incidents (2 passengers)
- ◆ Truck/Bus: 11 (31.4%) incidents
- ◆ Pickup Truck: 4 (11.4%) incidents
- ◆ Van: 3 (8.6%) incidents
- ◆ Small truck (<10,000#): 1 (2.9%) incident
- ◆ Snowmobile: 1 (2.9%) incident

Seat Belt Use was known for 21 individuals for whom seat belt use was applicable (not applicable for 6 pedestrians, not available for 1 incident, unknown for 8 incidents)

- ◆ Seat Belt Used: 13 (61.9%) incidents
- ◆ Seat Belt Not Used: 8 (38.1%) incidents

Hazardous Action, Driver is Decedent (22 of 28 known)

- ◆ None: 9 (40.9%) incidents
- ◆ Speed Too Fast: 4 (18.2%) incidents
- ◆ Failed to Yield: 3 (13.6%) incidents
- ◆ Improper Turn: 1 (4.5%) incident
- ◆ Unable To Stop: 3 (13.6%) incidents
- ◆ Drove Left of Center: 1 (4.5%) incident
- ◆ Careless: 1 (4.5%) incident

Hazardous Action of Driver, Passenger is Decedent

- ◆ Appeared Normal: 1 (100.0%) incident

Hazardous Action of Driver, Pedestrian is Decedent (5 of 6 known)

- ◆ None: 1 (20.0%) incident
- ◆ Other (not defined): 1 (20.0%) incidents
- ◆ Improper Lane use: 1(20.0%) incident
- ◆ Careless/Negligent: 2 (40.0%) incident

Roadway Area Where Fatal Incident Occurred (34 known)

- ◆ Freeway: 10 (29.4) incidents
 - ◇ Entrance/exit ramp: 1(10.0%) incident (2 passengers)
 - ◇ Median crossing: 1(10.0%) incident
 - ◇ All other freeway areas: 8 (80.0%) incidents
- ◆ Non-Freeway Intersection: 7 (20.6%) incidents
 - ◇ Within Intersection: 7 (100.0%) incidents
- ◆ Other Non-Freeway Areas: 17 (50.0%) incidents
 - ◇ Straight Roadway: 12 (70.8%) incidents
 - ◇ Curved Roadway: 2 (11.8%) incidents
 - ◇ Driveway (not within 150 feet of intersection): 2 (11.8%) incidents
 - ◇ Non-traffic area: 1 (5.9%) incident

Most Harmful Event (34 Known)

- ◆ Non-collision: 7 (20.6%) incidents
 - ◇ Ran off road – left 1 (14.3%) incident
 - ◇ Overtake: 5 (71.4%) incidents
 - ◇ Fire/Explosion: 1 (14.3%) incident
- ◆ Collision with non-fixed object: 22 (64.7%) incidents
 - ◇ Pedestrian: 6 (27.3%) incidents
 - ◇ Motor vehicle in transport: 16 (72.7%) incidents
- ◆ Collision with Fixed object: 5 (14.7%)
 - ◇ Guardrail face: 1 (20.0%) incidents (2 passengers)
 - ◇ Utility pole & house: 1 (20.0%) incident
 - ◇ Tree: 3 (60.0%) incidents

Motor Vehicle Crash Terminology

Sequence of Events records step-by-step regarding what happened during the crash. Up to four Sequence of Events may be recorded.

The event that was considered ***most harmful*** to the human being is identified by the responding police officer. The event that is most harmful is categorized within headings identified as:

- ◆ Non-Collision
- ◆ Collision with Non-Fixed Objects
- ◆ Collision with Fixed Objects

Table 13 shows crash data relating to the different types of vehicles involved in the 29 non-pedestrian crashes. In one passenger car incident, two passengers died.

Table 13. Crash Data Relating to the Vehicles Involved in a Work-Related Death, Michigan 2012						
Description	Passenger Car (N=12)	Truck/Bus (N=10)	Pickup (N=3)	Van (N=3)	Small Truck (N=1)	Snowmobile (N=1)
Average Age	49.3 (range 20-84)	48.0 (range 21-65)	59.3 (range 44-65)	49.7 (range 37-67)	58	22
Occupancy Status						
Driver	10	10	3	3	1	1
Passenger	2	--	--	--	--	--
Seat Belt Use						
Belted	8	3	1	1	--	--
Not Belted	4	1	1	1	1	--
No Restraint Available/Unknown	--	6	1	1		1
Month of Injury						
Jan.-Mar.	3	--	1	1	1	--
April-June	9	2	--	1	--	1
July-Sept.	--	5	1	--	--	--
Oct.-Dec.	--	3	1	1	--	--
Day of Week						
Mon-Thurs	7	6	2	--	1	--
Fri-Sun	5	4	1	3	--	1
Time of Day						
12am-3:59am	--	--	--	--	--	--
4am-7:59am	1	1	1	--	1	--
8am-11:59am	4	4	2	1	--	--
12pm-3:59pm	4	3	--	1	----	--
4pm-7:59pm	3	2	--	1	--	--
8pm-11:59pm	--	--	--	--	--	1

Other Medical

There were four individuals who died due to medical complications of the injury. A postal carrier developed a pulmonary embolism after surgery for a knee injury sustained at work. A university resident director died from medical complications of ethanol abuse, and a volunteer fireman died from a heart attack while enroute to an emergency scene. A farmer died from medical issues as a result of being struck by hay bales which fell from a truck.

Suicide

Twelve individuals committed suicide while at their workplace. Six of the 12 (50.0%) individuals died from a self-inflicted gunshot wound, five (41.7%) individuals died by hanging, and one (8.3%) individual died from a self-inflicted cut by a knife.

Struck By

Fourteen individuals were fatality injured when they were struck by an object. Five individuals were struck by falling trees/tree limbs. One individual died when he was crushed against the payoff mandrel of a slitter line machine by a steel coil that fell from a coil cart. One individual died when the unsupported raised dump bed of a 1988 Ford F-600 dump truck came down unexpectedly, crushing him between the dump bed and the truck frame. One individual died when the tire he was servicing exploded, causing the tire/rim to launch straight up, striking him. One individual died when the guard rail he was carrying was struck by a car, causing him to be propelled into another piece of equipment. One individual died when he was struck by a stop block while lowering a low-boy trailer. One individual died when the car he was working on fell onto his chest. One individual died when an excavation wall collapsed, causing a water tank to move and pin him against an excavation wall. One individual died when he was pinned between a truck tire and the frame of a semi trailer.



Case 113. Sprinkler fitter/pipefitter died when pinned against an excavation wall by a tank which moved due to the collapse of another of the excavation's walls

MIOSHA Fatality Investigations

The 135 individuals who died as a result of a work-related injury in 2012 worked for 131 employers. In 2012, MIOSHA personnel conducted a work-related fatality program-related compliance investigation at 27 (20.6%) of the 131 employers. A fatality is recorded as a MIOSHA "Program-Related" fatality if the deceased party was employed in an occupation included in MIOSHA jurisdiction as defined in Public Act 154 of 1974, as amended, and the fatality appears to be related to one or more of the following conditions:

1. The incident was found to have resulted from violations of MIOSHA safety and health standards or the “general duty” clause.
2. The incident was considered to be the result of a failure to follow a good safety and health practice that would be the subject of a safety and health recommendation.
3. 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 indicates that there is 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 14 shows the number of work-related fatalities in Michigan in 2012 by industry sector and the number of MIOSHA work-related fatality compliance inspections for each industry sector.

Table 14. Work-related Fatalities and Number of MIOSHA Work-related Fatality Compliance Inspections, Michigan 2012		
Industry	Number of Work-related Fatalities	Number of Work-related MIOSHA Compliance Inspections (%)
Agriculture, Forestry, Fishing & Hunting (11)	18	3 (16.7%)
Utilities (22)	1	1 (100.0%)
Construction (23)	20	10 (50.0%)
Manufacturing (31-33)	11	4 (36.4%)
Wholesale Trade (42)	5	4 (80.0%)
Retail Trade (44-45)	12	1 (8.3%)
Transportation & Warehousing (48-49)	19	1 (5.3%)
Information (51)	4	--
Real Estate & Rental & Leasing (53)	1	--
Professional, Scientific, & Technical Services (54)	1	--
Administrative & Support & Waste Management & Remediation Services (56)	11	3 (27.3%)
Education (61)	2	--
Health Care & Social Assistance (62)	7	--
Arts, Entertainment, & Recreation (71)	2	--
Accommodation & Food Services (72)	4	--
Other Services (ex. Public Administration) (81)	11	--
Public Administration (92)	6	--
Total	135	27

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. Ten of the 27 (37.0%) employers having a MIOSHA work-related fatality compliance inspection in 2012 were identified as having a MIOSHA work-related fatality compliance inspection prior to 2012.

Of the 10 companies which had a work-related fatality in 2012 and were previously inspected by MIOSHA, six were in Construction, 2 were in Manufacturing, and 2 were in Wholesale Trade. MIOSHA did not issue a violation citation to the firm at the conclusion of the fatality investigation in 7 (25.9%) of its 27 investigations.

MIFACE contacted 30 employers to request their participation to permit a MIFACE site visit. Twenty-three (76.7%) declined and seven (23.3%) accepted the invitation to participate. MIFACE did not contact due to the nature of the fatality (for example, work-related suicide, incident happened years ago) or was unable to contact (for example, no phone number, invitation letter returned) 105 employers. A copy of five of the seven 2012 MIFACE investigation reports (in addition to all MIFACE educational outreach materials) are on the Michigan State University Occupational & Environmental Medicine [web site](#). Click on the [Traumatic Fatalities](#) link to view the reports and other educational materials.

Hispanic Initiative

The US Department of Labor, Bureau of Labor Statistics (BLS) has analyzed the Census of Fatal Occupational Injury (CFOI) data and reported a higher fatal work injury rate for Hispanic workers than for other racial/ethnic groups. As a result, Federal OSHA is currently collecting additional information during all investigations that includes the primary language and country of origin of the victim. OSHA has also developed several Hispanic safety and health outreach materials that include a compliance assistance web page and information about workplace rights.

In partnership with Federal OSHA, NIOSH has added Hispanic worker fatalities to the list of the current targets for the Federal in-house FACE program. Information gathered will be made available to the OSHA Hispanic Worker Task Force. The Michigan FACE program supports the concept and rationale of this initiative. As a result, we have utilized a draft Immigrant Workers/Limited English Speakers Workers investigation guide during on-site investigations to gather information when it is appropriate.

There were four deaths of Hispanic workers in Michigan in 2012. The BLS Table 14, Michigan [Employment Status of the Civilian Non-institutional Population by Sex, Race, Hispanic or Latino ethnicity, and Detailed Age, 2012 annual averages - Michigan](#) was utilized to calculate work-related fatality rates for Michigan Hispanic/Latino, Caucasian and African-American workers 16 years of age and older. As only males of Hispanic/Latino descent died in 2012, the male population only of Caucasian and African American was utilized in the calculation. In 2012, Hispanic/Latino males died a rate of 4.3 per 100,000 Hispanics, compared to a rate of 0.5 per 100,000 for Caucasians and 9.8 per 100,000 for African-Americans.

Two Hispanics died in Manufacturing-related incidents (fall from height, machine-related), one in Transportation & Warehousing (motor vehicle-related) and one in Accommodation & Food Service (drug overdose). The country of origin for 3 Hispanic individuals was the United States and for one Hispanic individual, the country of origin was Mexico.

Sensitivity of Injury at Work Box on Death Certificate

If the manner of death (Box 39) on the death certificate indicates 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 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. MIFACE determines 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 15 shows a review of the past 12 years of the sensitivity of the Injury at Work box. Data identified that 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.

The injury at work box was misidentified most frequently in the designation of an injury at work in the Agricultural industry (12 deaths) followed by Construction (7 deaths). Work-related deaths involving homicides (18 deaths) and motor vehicle incidents (12 deaths) were the causes of death most misidentified as No in the injury at work box.

Table 15. Sensitivity of Death Certificate Injury at Work Box Predicting Fatal Injury at Work, Michigan 2012			
Year (# Deaths)	DC Coded as WR (%)	DC Coded as Not WR or Unknown (%)	DC Not Reviewed (%)
2001 (174)	133 (79.6%)	34 (20.4%)	7 (4.0%)
2002 (151)	126 (86.9%)	19 (13.1%)	6 (4.0%)
2003 (152)	110 (74.3%)	38 (25.7%)	4 (2.6%)
2004 (131)	93 (74.4%)	32 (25.6%)	6 (4.6%)
2005 (110)	88 (83.0%)	18 (17.0%)	4 (3.6%)
2006 (157)	122 (79.2%)	32 (20.8%)	3 (1.9%)
2007 (120)	99 (85.3%)	17 (14.7%)	4 (3.3%)
2008 (121)	100 (84.0%)	19 (16.0%)	2 (1.7%)
2009 (96)	72 (75.8%)	23 (24.2%)	1 (1.0%)
2010 (147)	102 (70.3%)	43 (29.7%)	2 (1.4%)
2011 (141)	95 (69.3%)	42 (30.7%)	4 (2.8%)
2012 (135)	74 (55.2%)	60 (44.8%)	1 (0.7%)

Number of 2012 Deaths Compared to Michigan CFOI

The Census of Fatal Occupational Injuries (CFOI) is the surveillance system funded in every state by the US Department of Labor, Bureau of Labor Statistics. The Michigan CFOI program reported 137 work-related deaths in 2012 per the BLS website viewed on May 12, 2014. MIFACE had identified two fewer deaths compared to the CFOI number.

The difference in the number of work-related deaths included:

- One individual, who worked as a cook, died from a drug overdose at a restaurant. MIFACE could not establish whether the individual worked as a cook at the restaurant where he died.
- One individual was involved in a motor vehicle crash; she was a paramedic and died at the scene. MIFACE could not confirm she was an individual rendering aid to other crash victims.

Case Narratives

Based on the information collected during MIFACE on-site investigations and/or from source documents, a brief narrative summary organized alphabetically by means of death of each of the 135 acute traumatic work-related deaths in 2012 is included in Appendix I.

Table 16 gives the narrative case number and cause of death by NAICS code found in the Appendix. When the brand name of equipment was known, MIFACE included this information in the narrative.

Unless noted, this does not signify that there was a defect or other problem with the machine.

In Table 16, the Cause of Death is hyperlinked to its corresponding heading in the Appendix. Each case narrative that was a work-related fatality that had a MIOSHA work-related fatality compliance investigation is noted by a specific MIOSHA case number and hyperlinked to its MIOSHA 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 16. Case Number of Work-Related Fatalities by Cause of Death and Industry, Michigan 2012

Industry Sector (NAICS Code)	<u>Drowning</u>	<u>Drug Abuse</u>	<u>Electrocution</u>	<u>Fall</u>	<u>Homicide</u>	<u>Machine</u>	<u>Motor Vehicle</u>	<u>Other Medical</u>	<u>Struck By</u>	<u>Suicide</u>	<u>Unknown</u>
Agriculture, Forestry, Fishing & Hunting (11)	1			9-11		55-61	69-70	105	109-111	123	
Utilities (22)							71				
Construction (23)	2		6-7	12-15	27-28	62	72-78		112-113		135
Manufacturing (31-33)				16-17	29-30	63-66	79			124-125	
Wholesale Trade (42)			8	18		67			114	126	
Retail Trade (44-45)				19-21	31-36				115-116	127	
Transportation & Warehousing (48-49)				22-23	37-39		80-89	106	117	128-129	
Information (51)							90-93				
Real Estate & Rental & Leasing (53)					40						
Professional, Scientific, & Technical Services (54)							94				
Administrative & Support & Waste Management & Remediation Services (56)				24-25	41-44	68			118-121		
Education (61)							95	107			
Health Care & Social Assistance (62)		4			45-46		96-98			130	
Arts, Entertainment, & Recreation (71)							99-100				
Accommodation & Food Services (72)		5			47-48		101				
Other Services (ex. Public Administration) (81)	3				49-52		102-103		122	131-133	
Public Administration (92)				26	53-54		104	108		134	

Discussion

There were 135 traumatic work-related fatalities in Michigan in 2012, a decrease of 6 fatalities compared to 2011. The 2012 work-related fatality rate in Michigan was 3.2/100,000. The major sources for identifying a work-related death were death certificates, the 24-hour MIOSHA hotline, internet notifications, and the Michigan State Police vehicular data reporting system. We coordinated our surveillance with the Census of Fatal Occupational Injuries (CFOI). CFOI is the surveillance system funded in every state by the United States Department of Labor Bureau of Labor Statistics (BLS). CFOI reported 137 deaths in 2012. The reason the number of work-related fatalities differed was because of the non-verification of the workplace where two of the individuals died.

Since MIFACE began surveillance of all traumatic work-related fatalities in 2001, there has been a downward trend. The number of work-related deaths averaged 2.6 fatalities per week although the deaths were not evenly distributed throughout the year. June and March were the most common months for an incident causing a fatal traumatic death and August was the second most common month. Wednesday was the most common day of the week for a fatal traumatic incident and Monday was the second most common day.

The traditional workday (8a.m. – 4p.m.) had 60 (56.6%) work-related fatal incidents when the time of the incident was known. The most common time of the day for an incident causing a work-related death was the afternoon (12p.m. – 3:59p.m.). The second most common time was the morning hours of 8a.m. – 11:59a.m.

Construction had the largest number of acute traumatic WR deaths (20, 14.8%) but the third highest employment-based incidence rate (15.7/100,000). Transportation had the second largest number of WR deaths (19, 14.1%) and the second highest employment-based incidence rate (18.6/100,000). Agriculture had the third largest number of WR deaths (18, 13.3%) but due to the number of workers in the industry, the highest employment-based incidence rate of 20.7/100,000.

Alcohol, illegal drugs, prescription and non-prescription medications were found to have a minimal role as a contributory factor in acute work-related fatalities. Among the non-suicide/non-overdose deaths, 14 individuals had alcohol, illegal drugs or prescription medications in their system at levels that may have been contributory to the occurrence of the traumatic injury.

MIOSHA staff investigated 27 of the 135 deaths. Federal OSHA investigated 1 death. The remaining work-related deaths were not investigated by any regulatory agency other than by the police to exclude a homicide or suicide.

Eight industry sectors had an increase in the number of WR deaths, eight had a decrease in the number of WR deaths, and one had the same number of WR deaths.

The two industry sectors with the largest increase in the number of deaths compared to 2011 were Other Services (Exc. Public Administration (+6 deaths) and Transportation & Warehousing

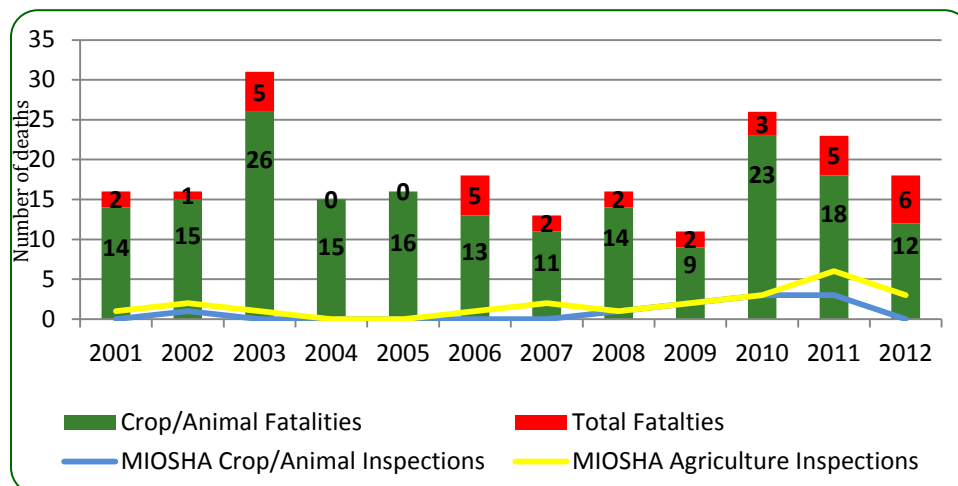
(+5 deaths). Within Other Services, Except Public Administration there was an increase (+2 deaths) in Repair & Maintenance and Religious, Grantmaking, Civic, Professional & Similar Organizations, and Personal & Laundry Services (new industry subsector). Within Transportation & Warehousing, two industry subsectors had no fatalities in 2011 but had three fatalities in 2012: Transit & Ground Passenger Transportation and Support Activities for Transportation.

The three industry sectors with the largest reduction in the number of work-related deaths were Agriculture, Construction and Public Administration (-5 deaths each). Within Agriculture, when the industry subsector was known, Crop Production had 5 fewer deaths. Within Construction, when the industry subsector was known, Specialty Trade Contractors had 3 fewer deaths, and within Public Administration, Justice, Public Order, & Safety Activities had 3 fewer deaths.

The number of Agricultural fatalities and the Agriculture's employment-based incidence rate has stayed substantially the same for the past 10 years. Although the number of Agricultural fatalities decreased from the previous year (due to a decrease in the number of deaths in Crop and Animal Production), the number of work-related deaths in the Forestry & Logging subsector was stayed the same, but was an increased percentage of the total number of Agricultural work-related deaths. There have been 25 Forestry and Logging work-related fatalities; one-half (13 of 25, 52.0%) of all Forestry and Logging fatalities that have occurred since 2001 have occurred during the past 3 years (3 in 2010, 5 in 2011 and 5 in 2012).

The majority of agricultural work-related deaths in Michigan have occurred on family farms involved in Crop Production and Livestock Production. There have been few MIOSHA work-related fatality inspections on family farm operations and limited MIOSHA CET personnel onsite consultative services requested by family farm owners. **Figure 6** shows the total number of Agricultural fatalities with the Crop/Animal fatalities and the number of MIOSHA Agricultural work-related compliance inspections for all Agricultural fatalities and for Crop/Animal work-related fatalities. From 2001 to 2012, MIOSHA has conducted 22 Agricultural work-related fatality inspections; 10 of the inspections were in Crop Production and Animal Production.

Figure 6. Number of Agriculture Work-related Fatalities and MIOSHA Inspection, Michigan



MIOSHA Consultation, Education and Training Division initiated an Agricultural Educational Outreach program that began in 2014. The goal of the consultative and educational outreach to the crop, animal and logging subsectors is to reduce the rate of injuries, illnesses and fatalities by 15% over 5 years. This educational outreach will be beneficial to address the gap in knowledge about MIOSHA, health and safety regulations, and best safety practices for these small agricultural businesses. Additionally, MIOSHA CET has for many years provided grant dollars to Michigan Farm Bureau to provide safety and health training and services to the Agricultural community.

When known, the height of the fatal fall in Michigan in 2012 most often occurred at heights of 10-20 feet (43%). Nationally, 45% of falls to lower level involved falls of 20 feet or less. In Michigan, falls of 20 feet or less comprised 78.5% (11 of the 14 known heights).

The second lowest number of Construction deaths occurred in 2012; only 2009 had a lower number of deaths (19 deaths). Both nationally and in Michigan, falls are typically the leading cause of death in Construction. The Campaign to Prevent Falls in Construction is a joint effort by government-labor-management to address the top cause of construction industry fatalities. In 2012, in the US, 36% of all construction fatalities were due to a slip, trip or fall (290 of 806 fatalities). Of the 20 work-related fatalities in Construction, 4 (20.0%) deaths were due to a fall incident – a historic low for both number of falls and the percentage of work related deaths in Construction. **Table 17** shows the number of fatal falls in Construction by year and the percentage of work-related deaths the fatal falls represented.

Table 17. Number of Construction Deaths and Number and Percent of Fatal Falls by Year, Michigan					
Year	Number of Construction Deaths	Number of Fatal Falls (%)	Year	Number of Construction Deaths	Number of Fatal Falls (%)
2001	37	15 (40.5%)	2007	18	7 (38.9%)
2002	37	12 (32.4%)	2008	28	11 (39.3%)
2003	35	9 (25.7%)	2009	19	5 (26.3%)
2004	32	12 (37.5%)	2010	22	7 (31.8%)
2005	24	14 (58.3%)	2011	26	11 (42.3%)
2006	42	13 (31.0%)	2012	20	4 (20.0%)

Between 2001 and 2012, the number of fatal falls in Construction ranged from a low of 4 falls in 2012 to a high of 15 falls in 2005. The percentage of fatalities in construction secondary to a fall ranged from 20.0% in 2012 to 58.3% in 2005. More 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.

In 2012, Michigan mirrored the national rise in the number of work-related homicides. The number of WR homicides in Michigan increased by nearly 90% (28 in 2012 compared to 15 in 2011). Similar to national data, shootings were the most frequent manner of death in the 28 homicide and 12 work-related suicides. A STOP Work-Related Homicides hazard alert was developed. The Hazard Alert can be found [here](#).

Contrary to national data, the number of fatal injuries among Hispanic or Latino workers in Michigan decreased from 5 individuals in 2011 to 4 individuals in 2012. National data showed the number of Hispanic or Latino workers was about the same (749 in 2011 and 748 in 2012). Additionally, unlike the national data, 75% of the Hispanic workers who died in Michigan were born in the US, not foreign born; nationally, 35.3% are born in the US.

BLS uses the number of hours worked in an industry and profession to calculate an hours-based fatality incidence rate. The 2012 annual national hours-based fatality rate was 3.4/100,000 FTE. MIFACE could not calculate an hours-based rate for Michigan for 2012 due to insufficient data from the Michigan Office of Labor Market Information.

Importance of Using Multiple Data Sources

MIFACE uses many data sources to ascertain if a fatal injury occurs “on the job”. Accurate reporting of work-related deaths in Michigan depends upon the completeness of the data. Reliance on just the information in the Injury at Work box on the individual’s death certificate would have missed 60(44.8%) of WR deaths in Michigan in 2012.

MIFACE Contact with Employers and Families

The MIFACE research program relies on the voluntary cooperation of employers, the self-employed and family members. In calendar year 2012, MIFACE requested to conduct a MIFACE site visit at 43 companies, encompassing 2011 (31 employers) and 2012 (13 employers) work-related deaths. Thirty four companies declined to participate, and three agreed to participate. One company indicated they would participate when litigation was completed. For four companies, MIFACE was unable to contact the employer to request participation. In calendar year 2013, MIFACE attempted to contact 20 employers that had a work-related fatality; 15 declined to participate, four gave permission for a site visit, and one could not be contacted. Five of the six 2012 MIFACE investigation reports are completed and posted on the MIFACE website.

Prevention Material Dissemination

On the MSU OEM website (www.msu.oem.edu/) are copies of the completed MIFACE Investigation Reports, Hazard Alerts, and MIFACE Summaries of investigations conducted by the MIOSHA program.

In 2012, 8 Investigation Reports, 31 MIFACE Summaries of MIOSHA Investigations and 1 Hazard Alert were posted on the MSU OEM website and distributed to stakeholders. Hazard Alerts are 1-page documents that review WR fatalities and provide prevention recommendations that target specific industrial sectors or repeated WR fatality incidents (such as trench wall collapse).

MIFACE Summaries of MIOSHA Investigations include a summary of the WR fatality AND the citations issued to the employer by MIOSHA compliance personnel at the conclusion of the fatality investigation.

For each MIFACE Investigation Report and Hazard Alert there was a dissemination plan to maximize awareness of the Report and Alert. Investigation Reports and Hazard Alerts were sent 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.

A special effort in conjunction with the Michigan Farm Bureau to provide educational safety sessions to farmers was ongoing. In 2012, more than 700 individuals attended the training sessions.

Acknowledgement

We are extremely appreciative of the support of the Department of Licensing and Regulatory Affairs MIOSHA 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 provide constructive comments on each MIFACE Report and Hazard Alert, who assist us by providing thoughts on developing MIFACE policies and educational outreach activities, and their promotion of the MIFACE program to their employees/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 2015 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.

Traumatic occupational fatalities are an important public health issue in Michigan as they are throughout the United States. There were 6 less deaths in 2012 as compared to 2011. Traumatic occupational deaths are not random events. Information about the settings and circumstances in which work-related deaths occur is necessary to prevent their occurrence in the future.

Understanding the root cause of these tragic events and then sharing that information with stakeholders - from individuals to groups, is what makes these efforts worthwhile. If what we learn from any of these deaths can help prevent another death, then the surveillance program has been successful in its goal. Each of the 135 deaths in this report could have been prevented. 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.

Although acute work-related traumatic fatalities represent only a small percentage of the approximately 87,000 deaths that occur annually in Michigan, WR traumatic fatalities are preventable. The descriptions of the acute traumatic work-related deaths in Appendix I highlight these tragedies and the need despite their relatively small number to take action to prevent

them. Further efforts to investigate the circumstances leading to these deaths and disseminate information from what we learn are necessary to educate and where applicable, recommend change in regulations to prevent similar deaths from occurring in the future.

APPENDIX I

Drowning (3)

Case 1. A male mechanic in his 20s drowned while checking his beaver/muskrat traps along a river. He was found two days later submerged in the river in his vehicle. The vehicle contained items utilized in trapping fur-bearing animals. The sequence of events leading to the decedent and his vehicle becoming submerged in the river was unknown.

Case 2. A male construction worker in his 20s died when the cantenary suspended scaffold platform sheet he was working on collapsed and he fell 140 feet to the water. The engineered cantenary suspended scaffold consisted of a system of 17 steel wire rope cables installed parallel to the suspension bridge roadway and suspended 3.5 feet beneath the bridge deck beams. On top of the cables were 20-gauge steel decking sheets measuring 2 feet 7- 1/2 inches in width and either 5 feet or 11 feet in length (depending on their intended use). The decedent and two coworkers in the process of relocating the cantenary scaffold decking by removing scaffold platform sheets from under the middle portion of the bridge and then reinstalling them on the cables on the north side of the bridge. The decedent was removing the last row of sheets for that section. The crew had already removed the beam flange clamp hangers used to maintain the 3.5-foot distance between the bridge deck beams' lower flange and the deck sheets which caused the cables to sag lower in this area. Once the decedent had removed the last deck clip from the cable under the area where he was working, the cable moved uncontrollably northward towards the center of the sheet where it contacted the middle cable. This caused the end of the sheet, with the decedent on it to sag lower than the end that was still clipped. Then both cables shifted uncontrollably northward towards the third cable. This resulted in the sheet becoming near vertical and the decedent falling approximately 140 feet to the surface of the river. The decedent was not wearing any fall protection and there were no lifesaving boats or ring buoys available at the location. Witnesses reported the decedent surfaced and appeared to be trying to swim to shore. The decedent then went under the water surface and was found deceased several weeks later. ([MIFACE Summary 297](#))

Case 3. A male ship preservation association board of directors' president in his 40s died when he fell into a lake while conducting caretaker activities for the ships. The decedent arrived at the site and spent the night in one of the two ships docked at the marina. After leaving the boat in which he slept, the decedent boarded the other ship by jumping from a 4-foot by 4-foot raised dock. His foot prints in the snow indicated he successfully boarded the ship, but no footprints were found indicating he left the ship. The gangway was not in place. A dive team found the decedent's body in approximately 13 feet of water near a floating dock located close by. The decedent was unable to perform a self-rescue due to a steep breakwater.

Drug Abuse (2)

Case 4. A male janitor in his late teens died of an accidental overdose of morphine.

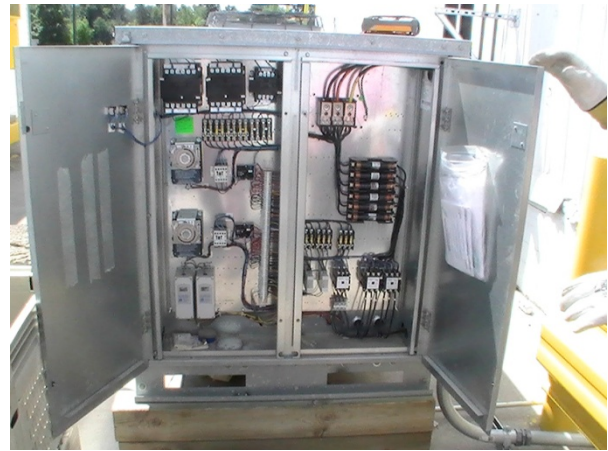
Case 5. A male restaurant cook in his 20s died from an accidental overdose of methadone and alprazolam.

Electrocution (3)

Case 6. A male roofer in his 50s was fatally electrocuted when the 40-foot aluminum extension ladder he and a coworker were extending contacted a 7,600-volt overhead power line. The decedent and his coworker were present at the site to install metal flashing on a two-story brick building. The building was situated on the corner of an intersection. On the south side of the building was the driveway leading to a fire station. On the north side of the building was a roadway and on the west side of the building was an open space. When the employees arrived they parked the vehicle on the east side of the building, between the building and the roadway. Eight feet away from the building were 7,600-volt overhead power lines running in a north-south direction. Prior to the incident, the general contractor arranged with the electricity supplier to reroute the power lines and to have them blanketed/sleeved. Additionally, the general contractor provided a man lift for workers to use to access the roof. The decedent's employer could not accommodate the time schedule for work. The lift remained at the site for 1½-2 weeks to accommodate the decedent's employer's work schedule, but when the decedent's employer did not begin work, the general contractor removed the man lift. The electrocution occurred as the decedent and his coworker were in the process of extending the ladder to place it against the east wall of the building to reach the roof. They lost control of the ladder and it tilted back contacting the overhead power line. Both individuals received an electrical shock. The decedent had been holding the ladder with both hands and his coworker was holding the ladder with one hand. The electrocution hazard of the overhead power lines had previously been discussed with the decedent. A passerby witnessed the incident and called for emergency response. Emergency responders transported the decedent to a local hospital where he was declared dead. ([MIFACE Summary 300](#))

Case 7. A male carpenter in his 20s was electrocuted when the 20-foot aluminum extension ladder he was using to lift low hanging cable lines contacted an energized 7,600 KV power line. Co-owners 1 and 2 were on site and were concerned that a material truck delivering supplies to the work site would not pass under low hanging cable wires located 11.5 feet above the ground. The employee and the two co-owners each took a separate position to guide the truck under the cable wires. Co-owner 1 guided the truck from the front while Co-owner 2 stood on the bed of the truck. The decedent stood to one side of the truck and used a 20-foot aluminum extension ladder to lift the low hanging cable wires as the material truck passed under them. The decedent lifted the cable wires up and into an overhead 7,600 KV power line, which was 18.5 feet above from the ground and directly over the cable wires. After the material truck had passed under the wires, the material truck driver and the co-owners noticed that the decedent was lying on the ground. The truck driver indicated to the responding police that the aluminum ladder the decedent was using was still hanging from energized line. Emergency response was called and the decedent was transported to a local hospital where he was declared dead. The decedent had only been employed by the company for three weeks. ([MIFACE Summary 317](#))

Case 8. A male produce broker in his 40s was electrocuted by 480 volts when he was reaching in and adjusting the temperature on a digital thermostat located inside a Knack 480-volt electrical control cabinet. The electrical control cabinet was located outside of a cooler warehouse. A concrete block barrier on a wood pallet was positioned 18 inches in front of the electrical control cabinet to protect the cabinet from forklift traffic in the area. To access the thermostat in the interior of the cabinet, the decedent was required to open both of the electrical cabinet doors. The thermostat was electric and required power to operate. The electrical cabinet was powered by



Case 8. Incident scene

480 volts and was further reduced to 230 volts by step down transformers. The fuse block and terminal screws were unguarded. Additionally, other exposed 110 volt contacts on internally mounted switches were exposed. The decedent, who was wearing a metal ring, was found by another employee lying on his back on top of the concrete barrier. This employee contacted emergency response while other employees administered CPR. The decedent was transported to a local hospital by emergency responders, where he died. ([MIFACE Summary 307](#))

Fall (18)

Case 9. A male laborer in his 50s died after falling 18-20 feet from a fiberglass ladder while trimming a 100-foot tall, 4-foot diameter oak tree. The decedent had propped the ladder against the tree and began to cut a 10- to 12-inch diameter branch on the opposite side of the tree. The decedent partially cut through the limb. The limb began to break and snap. He stopped cutting the branch, waiting for it to fall. Instead of falling, the limb "ripped" and when it ripped, it swung back toward the decedent. The decedent was knocked off the ladder by the swinging limb. He struck his head on fire log size pieces of wood approximately 8-10 inches in diameter and 18-24 inches in length. The ladder did not fall.

Case 10. A male farmer in his 80s died from complications of a 12-15 foot fall from a barn roof. The decedent was performing repairs and removing shingles from the roof at the time of the fall.

Case 11. A male farmer in his 70s died when he fell approximately 12 feet from a hayloft to packed dirt outside of his barn. The decedent and his wife were in the process of feeding their horses. While his wife started to feed the horses their allotment of grain, the decedent climbed the ladder to the hayloft and began to throw hay bales out of the loft door. Unbeknownst to him, his coat sleeve had become tangled in the baling twine on one of the hay bales. The momentum of his throw caused him to fall to the ground with the bale. His wife heard a "thump", but thought it was a bale of hay. When she went to investigate, she found her husband on the ground, unconscious. She called for emergency response, and he was transported to a nearby hospital. He died the following day as a result of the fall.

Case 12. A male house remodeler in his 50s died after falling 8-10 feet from a roof edge/ladder to a concrete step. The decedent had placed a ladder against the roofline to gain access to the roof to use a leaf blower to blow out leaves from the gutters. Individuals who were working on nearby residences heard the leaf blower. One of the individuals heard a "bang sound from what seemed to be a ladder leaning up against the residence". Approximately 10 minutes later, this individual still heard the leaf blower, and then decided to check on the decedent. This individual found the decedent lying on the cement, unconscious and not breathing. He alerted the other individual to the incident. While emergency response was enroute, the two individuals performed CPR. The decedent was declared dead at the scene.

Case 13. A male steel erection worker in his 30s died when he fell 26 feet to a concrete floor during the removal and replacement of approximately 6000 square feet of a low-sloped roof. The incident occurred in the northeast corner of the roofing project which abutted a taller penthouse structure. The existing roof consisted of a rubber membrane, 1" insulation and a wooden 2" x 6" tongue-and-groove plank deck. Because the facility was in full operation directly below the roof needing to be replaced, the firm stated they did not get a good look at the underside of the roof and its supporting structure or go up on the roof before the start of construction. Three days prior to the incident, roof demolition began. The decedent was not present on this date. MIOSHA indicated some of the firm's employees wore fall protection and some did not. Demolition began in the southwest corner and progressed north, then east. To demolish the roof, a two-man crew was plunge-cutting the roof planks with a circular saw along the beam supports and then prying them out with pry bars. New sheet metal was flown in by crane, shook out and screwed and welded in place. On the day of the incident, the decedent was a member of an eight-person crew. One crew member ran the crane from the ground on the north end of the jobsite. A second crew member rigged the loads. Coworkers 3 and 4 continued scoring the wood deck planks with a saw and removed the old deck using pry bars. The decedent and another coworker were shaking out, screwing down, and welding the new steel decking. Another crew member worked from the building interior, and used a JLG aerial lift, grinder, and reciprocating saw to cut off any remaining old wood from the structural steel. When the equipment inside the structure no longer allowed the crew member working inside the building to maneuver the aerial lift, he resumed demolition from the roof. The owner was painting welds on the west end of the new deck while standing on a lower low-sloped roof adjacent to the new construction. The owner had been present at the beginning of the day and left to attend meetings. Old wood deck planks had been plunge cut with a circular saw along the south side of the penthouse. The planks had not been removed. The decedent walked from where he was working to the area just plunge cut. Unbeknownst to the decedent, the old plank decking was not supported and was essentially free-floating at the penthouse's steel column. When the decedent stepped on the planking, it gave way creating an opening of approximately 19" wide by 5'6" long. He fell approximately 26 feet to the concrete floor below. Crew members rushed to his side and called 911. The decedent was declared dead at the scene. No engineering survey of the structure was performed before the start of demolition. No daily inspections were performed to detect hazards and unsafe conditions during the progress of the demolition work. ([MIFACE Summary 311](#))

Case 14. A male home remodeler in his 40s died as a result of complications when the scaffold he was working on collapsed and he sustained a 10-foot fall to the ground. He sustained leg injuries as a result of the fall requiring hospitalization. While in the hospital, he had a cardiac

arrest, causing brain injury, which ultimately led to his death several weeks later.

Case 15. A male master plumber and sole owner of a plumbing firm in his 60s died when he fell from a 6-foot stepladder while prepping the second floor ceiling area for the installation of a water line in a condominium under construction. It was the decedent's second day on the site. The decedent was using a Milwaukee Hole Hog, heavy duty ½-inch drive drill. It appears that the decedent was drilling a hole through a piece of 2-x6-inch lumber when it appears that the bit possibly got bound/snagged on a metal identification plate that was located on the opposite side of the lumber where the decedent was drilling. When the drill bit hit a metal joist hanger, the torque of the drill housing kicked and was a possible factor in throwing the decedent from/off the ladder. Another contractor employee, who was on the site/project, found the decedent lying on his side. After speaking with him, the contractor found his co-worker and both returned to the incident scene, rendered aid and called for emergency response. The decedent was transported to a local hospital where he was declared dead. ([MIFACE Summary 299](#))



Case 15. Incident site

Case 16. A male machine operator in his 40s died from complications of a fall which occurred in 2009. He had worked in a foundry.

Case 17. A male journeyman pipefitter in his 70s died from complications of a fall that occurred in December 1971. He had worked at an automobile manufacturer. As he was trying to pass a colleague on a catwalk in the shop, the catwalk's railing gave way.

Case 18. A male truck porter in his 60s died when he sustained blunt force head trauma to the back of his head while working around a rear-load, 53-foot long semi trailer loaded with empty kegs. The semi trailer was a standard 2-door trailer, with the ICC bumper 24 inches above the ground. The trailer deck was 48 inches above the ground. The semi trailer held 25 stacks of kegs; each stack had four pallets containing 16 kegs. The empty kegs were placed on their side, four to a pallet and stacked 4 pallets high. The pallets were specifically designed to hold the kegs and the last two pallet stacks were shrink-wrapped to prevent them from falling when the doors were opened. Each pallet weighed approximately 468 pounds. The pallet stacks at the rear of the trailer were positioned at least 12-18 inches from the doors. The decedent had pulled another truck to the fuel island nearby and was in the process of fueling this truck. In addition to other job responsibilities as a truck porter, the decedent was responsible for placing the shipping



Case 18. Incident site

manifest in the rear of the trailer for the driver. The decedent opened the right side door (as looking at the rear of the trailer). Generally, there was not a need to climb into the trailer, but infrequently, employees must enter the trailer to measure and to identify which products may be in the front of the trailer. The incident was unwitnessed. It is unknown if the kegs fell, striking and knocking the decedent to the ground when he opened the trailer door to place the shipping manifest in the trailer or if he attempted to climb into the rear of the trailer using the pallets to pull himself up. A coworker noticed empty kegs on the ground near the trailer. He walked to the location to assist in reloading the kegs back into the truck and found the decedent lying unconscious on the ground, face up. The coworker ran to a nearby building on the jobsite, and notified another employee to call for help and emergency response. A registered EMT was on-site and performed CPR while awaiting the arrival of emergency responders. The decedent was transported to a nearby hospital, where he died several days later.

Case 19. A male in his 70s who had a medical history of lightheadedness and was taking anticoagulants died from head injuries sustained in a fall from an unknown height at the retail store where he worked.

Case 20. A male business owner in his 60s died from a 16-foot fall from the roof of his 2-story business. A 14-foot aluminum ladder had been placed against the wall of the business, approximately 8 inches to the right of an energized 240-volt power line mast that housed the power line entering the building. Witnesses indicated that as he was exiting the roof, he paused with one foot on the top rung of the ladder. For balance, the decedent grabbed the energized electrical mast. The contact with the electricity appeared to cause him to fall from the roof to the concrete sidewalk below.

Case 21. A male fireworks company truck driver in his 40s fell 10-15 feet from the rafters of a barn to a concrete floor. He died approximately one month later from complications of a leg injury sustained at the time of the fall.

Case 22. A male semi truck driver in his 50s died as a result of falling from the semi cab and striking his head on the pavement of the loading dock. The decedent arrived at the facility to pick up his load. One of the shipping clerks checked his truck to determine if there was enough room in the truck for his load. There were two trucks to be loaded ahead of the decedent's semi tractor-trailer. After the other trucks were loaded, the decedent pulled into the loading dock and chocked his tires. Soon thereafter, the decedent was found on his back on the ground, bleeding from a head injury. The semi cab's door was open. It is unknown if a previous medical condition was contributory. The decedent was transported to a nearby hospital where he died the following day.

Case 23. A male postal service mechanic in his 50s died from injuries sustained when he fell 10 feet from a ladder. He struck his head on a railing as he fell to the floor. He died in the hospital several days later from the injuries sustained at the time of the fall.

Case 24. A male design engineer in his 40s was working as a tree trimmer. He was 30 feet above the ground, tied off in the tree as he was topping it. The witness to the event indicated that as the decedent was cutting the tree, it began to sway, and then the tree broke. Both the tree

section and the decedent fell 30 feet to the ground. The tree section landed on top of the decedent. The decedent was declared dead at the scene.

Case 25. A male heavy machine operator in his 40s died as a result of falling 35+ feet from a tree he was removing limbs. He worked for a brush control company. The decedent and a coworker were in the process of felling an 80-foot tall pine tree at a residence. Tree limbs had been cut from the ground up approximately 60 feet and several limbs were scattered around the base of the tree. The decedent was using a tree climbing harness with a white colored rope. Also in the tree was a blue colored rope. The decedent had been in the tree cutting branches from the south side of the tree. His coworker watched him lower himself down the trunk and position himself on the north side of the tree. He began cutting branches on the north side. His coworker estimated the decedent was at least 35 feet above the ground when he inadvertently cut the rope that secured him to the tree. The coworker, who was speaking with the property owner, saw him fall and immediately called 911. The decedent was declared dead at the scene.

Case 26. A male crossing guard in his 70s died due to head injuries sustained when he lost consciousness, collapsed, which caused his head to strike the cement street while helping a student cross the street.

Homicide (28)

Case 27. A male construction laborer in his 40s died from a gunshot wound to the head.

Case 28. A male owner of a home improvement company in his 30s died from a gunshot wound to the head.

Case 29. A male assembly worker in his 20s was shot by his coworker after a fight that began at the job site.

Case 30. A male assembly worker in his 40s died from multiple stab wounds inflicted by a coworker.

Case 31. A male mechanic at a tire store in his 30s died from multiple gunshot wounds sustained during an argument.

Case 32. A male store owner in his 60s died from complications of a stab wound that occurred in 1999. The decedent was attempting to break up an argument between customers when he was stabbed.

Case 33. A male liquor store owner in his 60s died from a gunshot wound during a robbery.

Case 34. A male gas station clerk in his 50s died from gunshot wounds sustained during a robbery.

Case 35. A male antique store owner in his 60s died from blunt force injuries sustained during a robbery.

Case 36. A male antiques dealer in his 70s died when he was beaten with a baseball bat during a robbery.

Case 37. A male cab driver in his 40s died from a gunshot wound.

Case 38. A male cab driver in his 40s died from a shotgun wound sustained during an attempted robbery. The decedent was cleaning out his cab waiting to go on his next run when he was approached by two armed males who attempted to rob him. After the robbery failed, the suspects shot him.

Case 39. A male chauffeur in his 40s was found shot. He had been driving a client.

Case 40. A female landlord in her 50s died from complications of burns sustained during an argument with a tenant.

Case 41. A male security guard in his 80s died from a gunshot wound while performing security services at a church.

Case 42. A male security guard in his 20s died from multiple gunshot wounds while performing his duties at a nightclub.

Case 43. A male security guard in his 30s died from a gunshot wound during a drive-by shooting at a nightclub.

Case 44. A male security guard in his 40s died from a stab wound while providing security for a nightclub.

Case 45. A male medical administrator in his 40s died from a gunshot wound while walking in the parking lot to his vehicle.

Case 46. A male security guard in his 20s died when he was shot while on duty at a dialysis center. The dialysis center was his employer.

Case 47. A male club manager in his 30s died from a gunshot wound while trying to break up a fight between patrons.

Case 48. A male disc jockey in his 30s died from a gunshot wound while at work at a bar.

Case 49. A male automotive transmission shop manager in his 50s died from multiple gunshot wounds while on a test drive with customers to diagnose a mechanical problem with the vehicle.

Case 50. A male auto mechanic in his 30s died from multiple gunshot wounds.

Case 51. A male handyman in his 60s who volunteered at his church died of a beating that occurred while he was checking on a vacant home owned by the church.

Case 52. A male Masonic Temple leader in his 50s died from a gunshot wound while preparing the Temple for a convention.

Case 53. A male police officer in his 30s died from a gunshot wound during a police action concerning a barricaded individual.

Case 54. A male police officer in his 60s died in 2012 from complications of a gunshot wound sustained in the line of duty in 1972.

Machine (14)

Case 55. A male farmer in his 40s died when the 1965 300 McCormick utility tractor he was operating overturned while he was mowing a drainage ditch. The responding police agency indicated that the tractor became stuck as the decedent was mowing. The decedent placed the tractor in reverse and tried to back out but one of the wheels spun and the tractor tipped to the side, pinning the decedent. The tractor was not equipped with a rollover protection structure (ROPS).

Case 56. A male farmer in his 60s died when he was run over by the right rear wheel of a Ford 8N tractor with an attached brush hog. Responding police found the tractor in gear, the ignition turned on, the alternator switch turned on and the throttle in the position of full throttle.

Case 57. A male farmer in his 70s died when he was pinned by a Massey Ferguson tractor's scoop bucket while in a ditch tying a rope around weeds/small trees to clear a field drain. His work practice was to drive the tractor, equipped with the bucket to the ditch, lower the bucket, leave the tractor in Neutral, dismount the tractor, enter the drain, and using a rope attached to the bucket, tie the rope around the weeds/trees to be pulled. The decedent would then exit the drain, mount the tractor and, raising the bucket, pull the weeds/trees. The decedent was in the drain when the tractor moved forward and the bucket pinned him against the floor of the drain, face down. His spouse noted the tractor in the drain and called for help. A neighbor heard her cries for help. The neighbor called 911 and another resident of the home to help. When the neighbor arrived, he found the tractor idling and the decedent pinned against the wall of the drain. The tires were not spinning. He mounted the tractor and applied the brakes until emergency responders arrived. Responding police found the tractor in Neutral. ([MIFACE Investigation 12MI059](#))



Case 57. Incident scene

Case 58. A male farmer in his 60s died when he was pinned between the frame and bucket of a skid steer loader. The skid steer was running and under full throttle when he was found by his spouse with the cross arm of the bucket across his chest.

Case 59. A male farm hand in his 60s died when he was struck by a 2006 Komatso WA 250 front-end loader with a 4-yard bucket measuring approximately 8 feet 10 inches in width while he was bent down cutting the strings on a bale of hay. The incident occurred prior to sunrise. A skid steer loader was positioned near his work area. The decedent turned the skid steer's lights "on" to partially illuminate his work area. He was wearing dark clothes and a dark hat. There was an 18-foot driveway between a bunker silo, known as the "H" bunker and the 300-foot long silage pile where the decedent was cutting the strings on the hay bale. In the area where the decedent was working, the silage protruded approximately 7 feet, placing the decedent in the shadows. The Komatso front-end loader operator was rounding the corner of the "H" bunker with "high moisture corn" in the bucket, transporting the feed to another area of the farm when he struck the decedent with the corner end of the bucket. The impact knocked the decedent to the ground and he was run over by the front-end loader. Emergency response was called and the decedent was transported by helicopter to the hospital where he died the next day. ([MIFACE Investigation 12MI008](#))



Case 59. Incident scene

Case 60. A male logger in his 40s died when the 1950's era McCormick Farmall tractor overturned and pinned him. The tractor had two axles, with two smaller wheels in front and four large double "dually" wheels on the rear axle (two on each side). The tractor was not equipped with a roll over protection structure and seat belt. The decedent was using the tractor as a skidder to haul logs away from the logging site. Attached to the tractor were two logs; a chain was attached to a large log, and another, separate chain was attached to a smaller log. It appeared to the responding police department that the smaller log that was being pulled down the trail became caught on a live tree, causing the tractor to overturn backwards, pinning the decedent beneath it. The decedent's coworker contacted emergency response. The decedent was declared dead at the scene.

Case 61. A male tree service business owner in his 50s died when he was pinned under an International Harvester 354 series tractor, which was not equipped with a rollover protection structure. The tractor had a three point hitch. The decedent had been cutting down trees in a wooded area. Responding police noted a rope coming from the rear of the tractor which was tied to a large log. The decedent was attempting to pull the log from the woods when the tractor overturned to the rear and pinned him to the ground. The responding police noted the ground showed indentations where the three-point hitch had dug into it as the tractor overturned to the rear.

Case 62. A male carpenter in his 30s was severely injured in 2007 when he was pulled into the drive shaft of an unguarded post hole drill auger at a new home construction activity. He died in 2012 from complications of the injury.

Case 63. A female forklift driver in her 50s died when the Toyota forklift Model 8FDU30 carrying two paper bales overturned to the side. The Toyota forklift had a 6,000-pound lifting

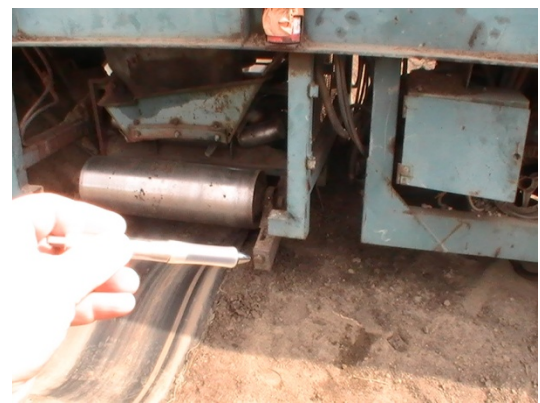
capacity and had a mounted, 2,000-pound Turn A Fork attachment. The bales were stored in an outdoor storage area exposed to the environment. The paper bales were vertically stacked four high and in two rows out from the wall. The top of the first bale was approximately 41 inches from ground, the top of second bale was approximately 81 inches from the ground, the top of the third bale was approximately 112 inches from the ground and the top of fourth bale was approximately 160 inches from ground. Bale dimensions were approximately 44 inches wide by 44 inches high by 58 inches long. The decedent was using the Turn A Fork attachment in the side position to transport the third and fourth stacked bales from the outside storage area to another location for further processing. It had been raining hard for two days. She picked up the third and fourth stacked bales, which together weighed at least 4,108 pounds, 108 pounds over the maximum lifting capacity of the forklift. Without lowering the attachment to the ground, she backed the forklift approximately 12 feet while turning the forklift to the right. The concrete had cracks, holes and low areas. As the decedent was backing, the tires of the forklift fell into a low area in the concrete that was approximately 1 1/8" deep. The forklift tipped to the left, and then to the right, causing the top bale to fall. The forklift tipped to the left again and tipped over. The decedent, who was not wearing the functioning safety restraint system, was thrown outside of the top rail of the overhead guard of the forklift. The forklift landed on its side and the decedent's head was crushed between the guard and the ground. Two employees inside the building noticed that the processing area was empty so they went to look for the decedent. Finding her, they called for emergency response. The decedent was declared dead at the scene. When the forklift was set upright, the distance from the ground to the bottom of the forks was 112 inches. ([MIFACE Summary 303](#))

Case 64. A male recycling facility manager in his 20s was discovered missing shortly after lunch following a meeting where the company operations manager told all the employees that the decedent was in charge of assigning job status. The decedent and another line operator had a verbal altercation the previous day. Approximately 30 minutes after the employee meeting, the decedent was missing and his forklift was parked at the location where he had previously argued with the line operator. The search of the area revealed that the decedent fell into the upper level shredder hopper and was killed by the rotating blades and knives. No witnesses observed the decedent walking up the conveyor to the feed hopper or going up to the operator platform.

Case 65. A male plastic recycling facility foreman in his 40s died when his torso was crushed by the platens of a closing horizontal expansion molding press. The press operator requested the decedent to come to the area because parts were sticking in the mold. He reached into the open die area to remove and check parts. While doing so, the press, which was running in automatic mode, cycled automatically and closed on him. He could not be removed because the press was in auto-cycle mode. Another employee removed the rear hydraulic line from the press and pried the platens open with a wrench. Emergency response was called and he was declared dead at the scene. Inspection of the molding press after the death found that the press's safety interlock on the front gate was taped off with duct tape at two areas and the rear gate safety interlock was tied up with a shoe string. The back gate on this press was also open and would not close due to lines going into the die from the outside. The front gate was observed to be fully opened and it was hard to slide open/shut due to rust. MIOSHA interviews with employees indicated the molding press had been operated in this condition for some time. ([MIFACE Summary 304](#))

Case 66. A male robot weld technician in his 30s died when he was pinned by the clamping mechanism of a transfer robot against a part in a buffer rack. The automotive part assembly line was segmented into three areas – the A side, the B side and the West End, each with their own assigned robot weld technician. The decedent was assigned to the A side. Robot cells along the assembly line contained both welding robots and transfer robots (robots that transfer parts from one welding robot to either a buffer rack or to another welding robot). The buffer fixture could accumulate parts when there was a hold up further down the line. Parts for assembly originated at the West End, and then were directed to either the A side or the B side (mirror images performing the same function). Stoppages on the line were frequent. When the line was “down”, an alarm sounded, indicating an issue that must be addressed by the robot weld technician. The transfer robot involved in this incident was described by coworkers as “having issues if the sensors are not detecting a part on the buffer rack”. The buffer rack contained one part at its lowest storage area. The decedent could access this transfer robot by entering either of two robot cell gates. It appeared that the decedent entered through a robot cell gate that, when opened, should have activated two light curtains, shutting down the applicable robot cells. The decedent did not place his lock on the interlock gate key. The decedent was kneeling on the floor, facing the buffer rack when the transfer robot activated. Coworkers heard the alarm sounding. When he was found, the gate thought to have been entered was closed with the interlock gate key inserted and the cycle in automatic. Coworkers using a teach pendant could not reposition the robot. The decedent was extracted by unbolting the buffer rack from the floor and pulling it away from the robot. The decedent was declared dead at the scene. ([MIFACE Summary 318](#))

Case 67. A male Trommel l screening machine operator in his 20s died when he became entangled as he accessed an unguarded area to clean debris and/or adjust a conveyor belt. The mobile trailer-mounted Trommel screening machine was used to separate incoming dyed wood chips and to screen soils into different sized materials. Material to be screened was loaded into a hopper by a front end loader. The material was separated by size or removed from one another, such as rocks from dirt, by a screening drum. The screened material then fell onto designated conveyor belts that placed the screened material into separate piles. The decedent was working on the conveyor



Case 67. Incident scene

located on the north side of the machine. He did not turn off the machine prior to beginning work. The opening to permit access to the conveyor and its supporting equipment was approximately 3 feet tall by 4.5 feet long and approximately 4 feet high. It appears the decedent was attempting to make an adjustment to the conveyor to allow for less debris buildup at the idler roller when the incident occurred. The decedent’s arm became caught in between the belt and the idler roller and was pulled into the machine frame causing his death. On the conveyor, the pillow block bearing was loose on one side and a wrench was found on the ground near the other pillow block. When he did not answer his cell phone, his coworker went looking for him. When his coworkers found him, the unit was running. Coworkers had to turn off the motor prior to cutting his clothing and releasing him from the belt idler conveyor pulley. ([MIFACE Summary 313](#))

Case 68. A male tree trimming company manager in his 40s died when he was pulled into a wood chipper while hand pushing brush into the chipper. The decedent moved a truck and its attached chipper to a pile of brush. While his coworker cleaned up another work area, the decedent fed tree tops and limbs to the chipper. A witness noted the decedent push the brush and branches into the chipper by hand, leaning over to do so. This witness also noted that the decedent was “staggering” and was proceeding to the area to speak with the decedent. The decedent’s hand became caught in the chipper, and he was pulled into the machine. The witness began to yell and the decedent’s coworker ran from her work area and turned the chipper off. The decedent’s blood alcohol level was 0.33%. ([MIFACE Investigation 12MI069](#))



Case 68. Chipper in incident

Motor Vehicle (36)

Case 69. A male farmer in his 60s died when the semi truck with a lead trailer and a pup trailer loaded with soybeans he was driving struck a pickup truck whose driver disregarded an intersection Stop sign. The incident occurred on a dry, two-lane roadway with an un-posted speed limit of 55 mph. The decedent was traveling eastbound. The southbound pickup was struck on its passenger side. The collision caused the decedent’s cab and lead trailer to overturn. The decedent was pinned in the semi cab. The decedent was transported to a nearby hospital where he died several days later. It is unknown if the decedent was wearing a seat belt.

Case 70. A male beekeeper in his 20s died when the semi cab and trailer loaded with bees struck an oncoming pickup truck that had crossed the centerline. The decedent and his coworker were traveling southbound on a dry, 2-lane roadway with an un-posted speed limit of 55 mph. The responding police officer noted the following conditions on the oncoming pickup truck: “the tires were somewhat worn and almost ready to be replaced. The front driver’s side tire was bald on the inside which suggested that it had an alignment problem. I also noted that it had a broken tie-rod that appeared to have been welded at one point in time”. It is unknown if these conditions were contributory. After impact, the decedent’s semi tractor-trailer went off the road, and just prior to coming to rest, overturned onto the driver’s side of the vehicle. The semi cab began to fill with smoke. The coworker was unable to help the decedent out of the vehicle due to the decedent being pinned against the ground by the cab. The cab was soon engulfed in flames. The decedent’s use of a seatbelt is unknown. The semi cab was not equipped with an airbag.

Case 71. A male lineman in his 50s died when he was struck by an oncoming vehicle while setting up a work zone. There was a report of a downed power line. The two-lane roadway was dry and had a posted speed limit of 45 mph. The bucket truck, with its flashing lights activated, was parked partially in the southbound lane of the roadway due to the narrowness of the road shoulder. Approximately 0.2 miles north of the truck’s location was a hill. The decedent’s

coworker had left the truck to check on a nearby meter. The decedent exited the truck and walked to the rear of the truck to get the traffic control devices to set up the roadway work zone. The oncoming vehicle driver stated to responding police that he observed the truck but did not see the decedent until the decedent was in front of him in the roadway. The driver attempted to avoid striking the decedent by moving into the northbound lane. The front of passenger side of this vehicle struck the decedent, pushing him into the rear of the bucket truck. The truck's global positioning device indicated that the crew had been on site for only two minutes when the incident occurred. It is unknown if the decedent was wearing a reflective vest. His coworker heard a "thump" and the decedent scream. The coworker pushed the "emergency" button on the truck and emergency response was summoned. The decedent was transported to a nearby hospital where he died.

Case 72. A male self employed carpenter in his 60s died when he did not stop his vehicle at a Stop sign, entered the roadway intersection and struck the driver's side of an oncoming eastbound vehicle. The decedent was driving a pickup truck hauling a utility trailer southbound on a 2-lane roadway with a posted speed of 55 mph. The decedent failed to stop for the Stop sign and struck a car that was traveling eastbound through the intersection. The eastbound vehicle had the right-of-way. Both drivers died at the scene. The decedent was not wearing a seatbelt/shoulder harness. The pickup truck was not equipped with an airbag.

Case 73. A male road surveyor in his 20s died when he was struck by a vehicle entering a work zone. The work area was a freeway entrance ramp lane on a three-lane eastbound expressway (Freeway 1). The entrance ramp lane and the right lane of the expressway had been closed via traffic cones leaving the middle and left eastbound lanes open. The entrance ramp from another freeway (Freeway 2) entering onto the incident freeway had been tapered, but no advanced warning signs for upcoming road construction had been placed either on Freeway 2 or its entrance ramp to Freeway 1. Advanced warning signs were placed 1 ½ miles west of the work area on Freeway 1. The decedent and his coworker had parked their work truck east of their work area on shoulder of the highway. The truck's flashing light was activated. The decedent and his coworker were in the process of measuring catch basins in the entrance ramp lane under a bridge when the incident occurred. A vehicle driving down the Freeway 2 entrance ramp tried to enter Freeway 1 by pulling in front of a semi tractor-trailer traveling in the middle lane, which was slowing due to the slowed traffic. The semi's driver attempted to avoid the collision but could not do so. The back of the merging vehicle was struck by the semi cab, propelling the vehicle to the right and into the work zone. The decedent's coworker heard a braking sound and dove over the bridge pier. The decedent's coworker observed the vehicle come through the cones into the work zone and strike the decedent. The vehicle then struck their work truck and pushed it forward. The vehicle continued on and struck the bridge pier and came to a stop. The decedent was transported to a nearby hospital where he was declared dead. ([MIFACE Summary 302](#))

Case 74. A male road commission truck driver in his 50s died when his Peterbilt tandem dump truck spreading recycled asphalt at a “T” intersection tipped over onto its right side. The bed was raised approximately 1.5 to 2 feet and contained approximately 7,000 to 10,000 pounds of recycled asphalt. The work crew’s foreman went to the job site to provide an overview of the job tasks for the day. The decedent and a coworker were tasked with preparing the intersection of two dirt roads (Road 1 and Road 2) by leveling the intersection and spreading millings (recycled asphalt product) in preparation for a gravel haul. The decedent and his coworker did not get out of their trucks and walk the intersection to



Case 74. Incident scene

inspect for potentially troublesome areas. His coworker was at the yard obtaining another load of millings when the incident occurred. The decedent was navigating the turn to head eastbound on Road 1 while spreading millings on the shoulder when his dump truck tipped over onto the passenger side. The responding police department determined that the decedent was not operating the vehicle at an excessive speed and that there was no mechanical failure of any truck component. The decedent was not wearing a seatbelt. The investigating sheriff officer mentioned to MIOSHA that if the decedent had been wearing his seat belt the fatality would not have occurred. ([MIFACE Summary 314](#))

Case 75. A male roofing contractor in his 50s died when the vehicle he was driving left the roadway and overturned. It was raining heavily at the time of the crash. The decedent was traveling southbound on a slightly curved, wet, 3-lane roadway with a posted speed limit of 70 mph. The decedent lost control of the vehicle, left the roadway, and struck the median ditch, which was very wide and grassy and rolled the vehicle. He was not wearing a seatbelt and was partially ejected from the vehicle as it rolled. The police report indicated that three of the four tires appeared to be in very poor condition/depth.

Case 76. A male electric company owner in his 50s died when a semi tractor-trailer struck his pickup truck on the driver's side. The decedent was traveling northbound on a three-lane roadway with a speed limit of 55 mph. The driver of the semi tractor-trailer was traveling eastbound. It was raining at the time of the incident. The incident occurred at an intersection; the decedent had a Stop sign and the driver of the semi tractor-trailer had the right-of-way. It was dark, but there was a light at the intersection. The decedent did not come to a complete stop at the Stop sign. Witnesses indicated to the responding police that the decedent suddenly accelerated out in front of the semi tractor, apparently trying to beat the approaching vehicles. As he did so, his pickup truck was struck by the oncoming semi cab on the driver's side. The decedent's vehicle was not equipped with a seat belt. The vehicle's airbags did not deploy.

Case 77. A male plumber in his 40s died when the box truck he was driving was struck from behind by Vehicle 1 and pushed into the path of an oncoming semi tractor-trailer. The decedent was traveling eastbound on a dry, two-lane roadway with a posted 55 mph speed limit when he stopped to wait for oncoming traffic to clear to make a left turn. The driver of the vehicle which

struck the decedent's vehicle stated to the responding police department that "he was changing the station on his radio and when he looked up saw a white van in front of him." When Vehicle 1 struck the decedent's vehicle, Vehicle 1 veered to the left and pushed the decedent's vehicle into the path of the oncoming semi tractor-trailer. The decedent's vehicle was struck head-on. The decedent's use of a seatbelt/shoulder harness was unknown. The box truck was not equipped with airbags. The decedent was transported to a local hospital where he died the next day from the injuries sustained in the crash.

Case 78. A male co-owner of a concrete company in his 60s died when he was struck and dragged approximately 100 feet by a vehicle backing out of a garage at a high speed. The decedent and his 4-person work crew were performing concrete flat work that consisted of sidewalk, approaches and driveway replacement in a condominium subdivision. A series of boulders lined the roadway across the street from the condominiums to protect the grass and to keep vehicles from going down an embankment to a retention pond. The incident site was a condominium driveway. One area of the driveway



Case 78. Incident scene

had been removed and work was being performed on the driveway's sidewalk area. The homeowner wanted to back his vehicle out of the garage and the decedent indicated he would guide the driver out of the garage. The decedent walked over to a coworker operating a skid steer loader to tell him to move the skid steer out of the driveway so the vehicle could exit. The decedent turned his back to the vehicle and driver. Without warning, the vehicle driver backed the vehicle out of the garage at a high speed. The decedent was unable to get out of the way of the backing vehicle. He was caught by the vehicle and dragged down the driveway and across the street, approximately 100 feet. He was dislodged from under the vehicle when the vehicle struck one of the roadway boulders, which caused the vehicle to become airborne. The vehicle traveled another 50 feet down the embankment before coming to rest in the pond. Emergency response was called and the decedent was declared dead at the scene. ([MIFACE Summary 320](#))

Case 79. A male automotive engineer in his 40s died when the automobile he was driving struck a tree, causing the car to burst into flames. Road conditions were wet due to sporadic rain, but there was no standing water on the roadway. The two-lane roadway had an un-posted 55 mph speed limit. The decedent was traveling westbound. For reasons unknown, the vehicle crossed the roadway centerline, across the northbound lane, and then left the roadway striking a tree on the south side of the roadway. After the impact, the vehicle burst into flames. The decedent was trapped in the burning vehicle. Responding police observed a set of skid marks on the south side of the roadway in the grass. The decedent was wearing a seatbelt/shoulder harness. The vehicle airbag deployed.

Case 80. A male semi tractor-trailer driver in his 30s died when his semi tractor-trailer rear-ended the trailer of another semi tractor-trailer (Truck A) that had stopped at an intersection to make a left turn. Both semi units were traveling westbound on a dry, two-lane

roadway with a posted speed limit of 55 mph. The responding police indicated that Truck A's left blinker and truck brakes were activated and functioning appropriately. As Truck A was beginning to make its left turn, the decedent's vehicle rear-ended Truck A. A witness traveling behind the decedent's vehicle stated that the decedent's vehicle had been crossing the centerline and moving back into the travel lane. This witness also stated that he did not see the decedent apply his brakes prior to impact with Truck A. After impact, the decedent's vehicle traveled off the right shoulder and jack-knifed as it rolled over and caught fire. The decedent's restraint use was unknown. The semi cab was not equipped with airbags.

Case 81. A male semi tractor-trailer driver in his 60s died when the semi cab struck the trailer of a semi tractor-trailer that had stopped on the roadway due to roadway construction. The northbound, right travel lane of a dry, three-lane expressway was closed due to construction having orange barrels blocking off the lane. The posted speed limit in the construction zone was 60 mph. The incident occurred in the construction area where the middle lane was being closed by orange barrels, forcing traffic to the left travel lane. The incident involved three vehicles. Operator 1 was traveling in the middle travel lane at a slow speed as there were vehicles in front of him who were trying to merge into the left travel lane. Operator 2 was stopped behind Operator 1. As Operator 2 looked into his mirrors, he noted the decedent's semi tractor-trailer coming up behind him in the middle travel lane at a high rate of speed. Operator 2 saw the decedent veer to the right in an attempt to avoid the collision. The decedent's cab struck the right rear of Operator 2's trailer. The decedent was wearing his seatbelt/shoulder harness. The semi cab's airbag did not deploy.

Case 82. A male semi tractor-trailer driver in his 20s died after being pinned between a backing semi tractor-trailer and the trailer of his semi tractor-trailer. The decedent had pulled away from a loading dock and made a slight right turn before stopping, applying the parking brake, exiting and walking to the back of the trailer to close the trailer doors. A second driver (Operator 2) sitting parallel to the dock observed the decedent pull away from the dock and pass him. Operator 2 began to turn and back into another dock area. It appeared that Operator 2 assumed that the decedent had left the area. As the truck was backing, the decedent was crushed between the rear of his trailer and the side of the backing semi tractor-trailer. The decedent died several weeks after the incident.

Case 83. A male in his 50s died when the pickup he was driving was struck by an oncoming car and overturned to the side, landing on him. The decedent was traveling southbound, driving a black pickup truck, which was towing a trailer of evergreen trees on a dry, unlit, three-lane expressway with a posted speed limit of 70 mph. While traveling southbound, a vehicle (Vehicle 1) struck the trailer. The collision caused the decedent to lose control of the truck/trailer. The truck stopped sideways on the expressway blocking the far right and middle lane. The trailer was blocking the middle and left expressway lane. The decedent had called for emergency response, and a responding police officer was on scene. The officer positioned his vehicle with the flashing lights activated and the police vehicle's headlights illuminating the pickup. The decedent was standing on the driver's side of the vehicle when an oncoming car, whose driver was under the influence of alcohol, struck the pickup on the passenger side, causing the truck to roll onto its side, trapping the decedent underneath it.

Case 84. A male gravel train truck driver in his 50s died when the truck left the roadway and struck multiple trees and then burst into flames. The decedent was in the left lane traveling westbound on a dry, two-lane expressway with a posted speed limit of 65 mph. The police accident investigation found that there was a tire mark in the left lane, followed by a heavy wavy tire mark indicating a deflated tire with evidence of the rubber cap of the tire detaching from the tire. The decedent lost control of the tractor and gravel train. The vehicle left the roadway, traveled down an embankment, struck several trees and then stopped. Due to the damage sustained when the tractor struck the trees, the driver was trapped in the tractor when it burst into flames. The decedent's restraint use was unknown. The semi cab was not equipped with an airbag.

Case 85. A male semi tractor-tanker driver in his 30s died when his semi tractor-tanker was struck by a vehicle that did not stop at an intersection with a posted Stop sign. The decedent was hauling approximately 85,000 gallons of milk in the tanker. The decedent was traveling eastbound and had the right-of-way. The vehicle which struck him was traveling northbound. As the decedent's vehicle entered the intersection, the semi cab struck the driver's side of the oncoming vehicle, killing the vehicle's driver. The collision caused the decedent's semi tractor-tanker to exit the roadway to the left and then overturn. The decedent was wearing a seatbelt/shoulder harness. The semi's air bags did not deploy.

Case 86. A male semi tractor-trailer driver in his 20s died when a distracted driver, who was using a cell phone, ran a Stop sign and struck his semi, causing the semi to overturn and then catch fire. The decedent was traveling westbound on a dry, two-lane roadway with an un-posted speed limit of 55 mph. The decedent had the right-of-way. The second driver was driving a pickup truck and was traveling southbound on a dry, two-lane roadway with an un-posted speed limit of 55 mph. The police report indicated that there were multiple signs warning driver of the Stop sign at the intersection. Attached to the Stop Ahead signs were two signs indicating cross traffic does not stop. When the pickup struck the semi, the semi overturned to its side and burst into flames. The decedent was trapped inside of the cab. A Good Samaritan attempted to get him out of the cab but was unsuccessful. It is unknown if the decedent was wearing a seatbelt.

Case 87. A male trucking company master mechanic in his 40s died when his pickup truck struck a semi tractor-trailer that had stopped on the roadway. A semi tractor-trailer was traveling southbound in the center lane of a dry, three-lane expressway with a posted speed limit of 70 mph when his unit airline lost air pressure. Due to the loss of air pressure, the driver slowed down and eventually stopped in the center lane. The semi driver did not activate his emergency flashers. The decedent was traveling approximately 70 mph in the center lane. He did not appear to apply the vehicle brakes or take evasive action prior to striking the rear of the semi-trailer. The decedent was wearing a seatbelt/shoulder harness. The pickup's air bags did not deploy.

Case 88. A male semi tractor-trailer driver in his 60s died when his semi caught fire after being struck by another vehicle while crossing freeway lanes in an attempt to use an emergency vehicle turnaround. The decedent had pulled his tractor-trailer to the shoulder on the dry, two-lane expressway with a posted speed limit of 70 mph. The decedent activated his emergency flashers as he pulled off the shoulder. Traffic moved from the right lane to allow the truck to

merge. The decedent then continued driving the semi tractor-trailer across the freeway in attempt to use the emergency vehicle access turnaround. A pickup truck was unable to avoid a collision with the semi as it crossed over the freeway lanes. The collision caused the semi to catch fire, and then explode. The decedent died of thermal burns. The decedent's restraint use was unknown.

Case 89. A male postal service truck driver in his 20s died when the vehicle he was driving left the roadway and struck a tree. The incident occurred while it was snowing and the roadway was snow-covered. The roadway speed limit was 70 mph and the speed limit was posted. The decedent was driving a cargo-style truck southbound on a two-lane roadway. The driver's side tire and passenger side front tire were measured by responding police and found to have low tread depth. The vehicle's calculated minimal speed was 52 mph. The decedent was driving the vehicle down a hill when the vehicle veered off the roadway and overturned onto its passenger side, and then struck a tree. The decedent was wearing a seatbelt. The vehicle was not equipped with an airbag.

Case 90. A male newspaper carrier in his 20s died when the vehicle he was driving was struck head on by a vehicle which had crossed the centerline. The two-lane roadway was dry and had a posted speed limit of 55 mph. At the time of the incident there were high winds. Evidence at the scene indicated the oncoming driver, who was traveling southbound, fell asleep, which caused the vehicle to cross the centerline into the northbound lane, striking the decedent's vehicle. The decedent was not wearing a seat belt/shoulder harness and was ejected from the vehicle. The vehicle airbags deployed.

Case 91. A female newspaper carrier in her 30s died when she lost control of her SUV causing it to run off the north shoulder of the roadway, overturn, and strike a tree. The incident occurred on a dark, unlit, dry, two-lane roadway with an un-posted speed limit of 55 mph. The crash occurred in the early morning. The decedent was ejected when the vehicle overturned and was pinned under the overturned vehicle. The decedent was not wearing a seatbelt/shoulder harness. The vehicle's airbags did not deploy.

Cases 92 & 93. A female sales manager in her 30s (Decedent 1) and a female administrative assistant in her 50s (Decedent 2) died when the automobile they were passengers in ran off an exit ramp and overturned. Decedent 1 was a rear seat passenger and Decedent 2 was a front seat passenger. The vehicle was exiting from a freeway with a posted speed limit of 70 mph. The freeway ramp was dry. The vehicle driver was traveling too fast and was unable to negotiate the ramp's curve. The vehicle ran off the ramp to the left, overturned and came to rest on its roof on another freeway ramp atop a guardrail. Decedent 1 was wearing her seatbelt. Decedent 2 was not wearing her seatbelt/shoulder harness. The vehicle's airbags deployed.

Case 94. A male vehicle test driver in his 60s died when his automobile was struck by an oncoming driver who was driving a pickup truck under the influence of alcohol. The decedent was traveling eastbound on a dry, two-lane roadway with a posted speed limit of 50 mph. The pickup truck driver was traveling westbound with his pickup truck loaded with mulch. The pickup entered a slight downhill grade with a curve. The driver entered the curve with "a little too much speed" and lost control of the truck. The truck veered into the eastbound lane, striking

the decedent's vehicle head on. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags deployed.

Case 95. A female education administrator in her 50s died when she lost control of the vehicle she was driving, causing the vehicle to fishtail, and then overturn. The posted speed limit on the dry, two-lane freeway was 70 mph. Responding police noted that the driver's side rear tire left the roadway while the vehicle fishtailed. The vehicle overturned several times at a high rate of speed. Witnesses attempted to provide emergency assistance but were unable because they could not get the vehicle's doors open. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags did not deploy.

Case 96. A female home health care aide in her 30s died when she lost control of the van she was driving and the vehicle was struck by an oncoming vehicle. Weather conditions were sleet/hail, causing the two-lane roadway with a posted speed limit of 55 mph to be icy. The decedent was traveling eastbound when she lost control of her vehicle, crossed the centerline and swerved so the van's passenger side was facing the oncoming traffic in the westbound lane. The decedent's vehicle was struck on the passenger side by an oncoming car. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags deployed.

Case 97. A female social worker in her 30s died when the vehicle she was driving was rear-ended by another vehicle (Vehicle 2), causing the decedent's vehicle to turn sideways and be struck by an oncoming vehicle (Vehicle 3). The decedent's vehicle was stopped on the westbound, dry, two-lane roadway with a posted speed limit of 45 mph waiting to make a left turn. Vehicle 2 was traveling westbound and struck the rear of the decedent's vehicle, causing the decedent's vehicle to angle into and cross the centerline. Vehicle 3, traveling eastbound, struck the passenger side of the decedent's vehicle. The decedent was wearing a seatbelt/shoulder harness. The vehicle airbags did not deploy.

Case 98. A female office supervisor in her 50s died when her vehicle, which was idling in a parking lot, was struck by another vehicle that left the roadway. The decedent was approaching the juncture of a parking lot and a dry, 2-lane curved roadway with a posted speed limit of 25 mph. The driver of the oncoming vehicle stated to responding police that he "blackened out", causing him to leave the roadway onto the right shoulder. The vehicle collided with the decedent's vehicle on the driver's side, propelling her vehicle over the curb and over a small tree. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags deployed.

Case 99. A male modified snowmobile racer in his 20s died when the modified snowmobile crashed into a retaining wall at the racetrack. The front skis of the snowmobile had been removed and two wheels added. The decedent and another racer were in a drag race against each other. The opponent indicated he witnessed smoke coming from the decedent's sled just prior to his crashing into the right side retaining wall. The decedent collided with the wall, and then the sled bounced to the left, and collided with the left side retaining wall.

Case 100. A male author in his 50s died when he lost control of the vehicle he was driving, crossed the center line and into the path of an oncoming semi-truck. The posted speed limit on the two-lane, asphalt roadway was 55 mph. At the time of the incident, it was snowing and

blowing snow. The roadway was icy. The oncoming semi driver applied the vehicle's brakes and moved to the right-hand shoulder of the road, but was unable to avoid the collision. The decedent's vehicle was struck on the passenger side. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags did not deploy.

Case 101. A male in his 20s died while delivering pizza to a residence when he crossed over the center lane and crashed into an oncoming vehicle. At the time of the incident, there was heavy rain causing a rain saturated road surface. The incident occurred on a five-lane roadway with a posted speed limit of 55 mph. The decedent was westbound driving a compact vehicle. The eastbound vehicle, a Yukon, did not have time to react as the decedent's vehicle entered his lane. After the collision, the decedent's vehicle struck a third vehicle. The decedent was transported to a local hospital where he died. The decedent was not wearing a seatbelt/shoulder harness. The vehicle was not equipped with airbags.

Case 102. A male area senior center volunteer in his 80s died when he did not stop at a Stop sign, and the car he was driving entered the intersection and was struck by an oncoming vehicle. The dry, two-lane roadway had a posted speed limit of 55 mph. The decedent was traveling southbound. The oncoming vehicle was traveling westbound. The oncoming vehicle attempted evasive maneuvers, but was unable to avoid striking the left rear fender of the decedent's vehicle. The impact caused the decedent's vehicle to spin around and strike a utility pole. The decedent's vehicle was struck again by the southbound vehicle. The decedent's vehicle slid across the ground and came to rest after striking the side of a home. The decedent's injuries required hospitalization. He died three months later from the complications sustained at the time of the crash. The decedent was wearing a seatbelt/shoulder harness. The vehicle was not equipped with airbags.

Case 103. A male volunteer in his 60s died when the vehicle he was driving struck an oncoming vehicle head-on. The roadway consisted of two travel lanes and a turn lane. The roadway was dry and had a posted speed limit of 45 mph. The collision occurred in the center of the turn lane. The decedent's vehicle was traveling eastbound. The decedent was braking at the time of the incident. The brake marks travel in a leftward arc toward the center turn lane. The vehicle the decedent's vehicle struck was traveling in the center turn lane, preparing to turn to the south when the incident occurred. The decedent was not wearing a seatbelt. The vehicle's airbags deployed.

Case 104. A male State of Michigan courtesy patrol worker in his 50s died when he was struck by a vehicle while providing assistance to a stranded driver. The incident occurred on a dry, three-lane roadway with a posted speed limit of 70 mph. The decedent exited his courtesy van which was parked on the freeway shoulder and spoke with the stranded driver. He went back to his van, and was standing on the shoulder retrieving jumper cables from the van when the oncoming vehicle left the roadway, drove on the shoulder and struck the decedent. The vehicle's driver indicated he was trying to not hit the courtesy patrol van. The decedent died several days later as a result of the injuries sustained at the time of the incident.

Other Medical (4)

Case 105. A male farmer in his 60s died from a medical condition as a result of being struck by hay bales that had fallen from a truck. The decedent and his coworkers were transporting hay back to the farm when they lost a portion of their hay on the road. The vehicles stopped and the decedent and his coworkers were in the process of cleaning up the bales that had fallen off the truck and were loading them back onto the trailer when, according to coworkers, and additional 50-70 bales of hay fell from the trailer onto the decedent. The coworkers removed the bales covering the decedent and carried the decedent to the truck cab. One of the coworkers drove to the family farm in an attempt to get help while the other coworker stayed with the vehicles and continued to clean hay. An off-duty fireman drove by and began CPR while waiting for emergency response. Emergency response transported the decedent to a local hospital where he was declared dead.

Case 106. A female postal carrier in her 40s sustained a knee injury while at work requiring surgical treatment. The decedent developed a pulmonary embolism shortly after surgery. The medical examiner opined that there was a correlation between her injury and the development of the embolism.

Case 107. A male university resident director in his 30s died from medical complications of ethanolism.

Case 108. A male volunteer fireman in his 70s died from a heart attack while enroute to an emergency scene.

Struck By (14)

Case 109. A male logging company owner in his 30s died when he was struck by and partially pinned under a dead tree that fell after it was struck by another tree cut down by the decedent. The decedent had felled a tree, causing Tree A to fall to the south. Tree A struck a large dead tree (Tree B). Unexpectedly, Tree B fell toward the north, striking and pinning the decedent.

Case 110. A male logger in his 20s died when a 20-inch diameter, 80- to 90-foot tall red pine fell onto him. The two-person work crew was cutting red pines. The decedent's job responsibilities were to limb the trees and provide spotting services. He was not wearing a hard hat or safety glasses. At the time of the incident, the decedent was removing limbs from trees. He was positioned east, approximately 40 feet away from the 20-inch diameter, 80- to 90-foot tall red pine. The faller was felling this red pine and purposely made the undercut and back cut to limit the amount of hinge wood so more of the tree could be saved for the tree's end use. The intended fall direction was north. Wind speed at the time of the incident was approximately 5 mph. While falling, the tree twisted on its stump and fell to the east. The faller did not provide a verbal warning prior to the back cut. In the area, there was dense Balsam underbrush, which made it difficult for the faller to see the decedent's location. When the faller saw the tree falling in the unintended direction, he noticed the decedent's location and yelled a warning. The decedent was bent over removing limbs from a tree with his chain saw and did not hear the warning. The tree struck the decedent on his back. The faller cut the tree off the decedent and then called for

emergency response. There were many skid trails into the 77 acre parcel, which made it difficult for the emergency responders to locate the incident scene. The decedent was declared dead at the scene. ([MIFACE Summary 312](#))

Case 111. A male logging business co-owner in his 30s died when he was struck by a previously cut 22-inch diameter, 40-foot long tree limb. The decedent was felling white pine trees with a chainsaw. The decedent unsuccessfully attempted to fell Tree 1. In an attempt to assist Tree 1 to fall, using a “domino effect”, the decedent cut a limb from Tree 2. This 22-inch diameter, 40-foot long, curved limb on Tree 2 was approximately 2 feet off the ground. The limb was dropped onto Tree 1 but did not cause Tree 1 to fall. The decedent returned to Tree 1. He again began to make cuts on the tree while positioned under the limb. When Tree 1 finally fell, the decedent was struck by the limb from Tree 2. His



Case 111. Incident scene

coworker (co-owner) was operating a skid steer dragging trees and clearing brush and had not checked on decedent for 10-15 minutes. His coworker heard the decedent’s chainsaw idling. He ran to the decedent’s work area and found him under the limb. The co-owner’s cell phone was unable to connect with emergency response so he ran to a nearby residence and used the home’s land line. Emergency response arrived and the decedent was declared dead at the scene. ([MIFACE Summary 319](#))

Case 112. A male carpenter in his 40s died when the steel guardrail he was carrying was struck by a vehicle, causing him to be propelled into an outrigger of a nearby piece of equipment. The incident occurred on a bridge construction site. The roadway was appropriately signed for the construction work. A concrete barrier separated the travel lanes from the construction area. The decedent was carrying a 36-foot long piece of 2- by 2-inch steel guardrail. Unbeknownst to him, the guardrail swung into the travel lane, extending approximately 3 feet over the concrete barrier and into the traffic lane. The guardrail was struck by the mirror and the windshield of an



Case 112. Incident scene

oncoming vehicle traveling approximately 25-30 mph. When the end of the guardrail was hit by the vehicle, the decedent was catapulted into the equipment’s outrigger. The decedent was wearing a hard hat. He died several days later due to head injuries sustained at the time of the incident. ([MIFACE Summary 310](#))

Case 113. A male sprinkler fitter/pipe fitter in his 40s died when he was struck by the wall of an excavation which collapsed. The excavation was dug by another contractor, who was the designated competent person. The soil was clay/hard soil. It rained the night prior to the incident. The excavation was approximately 40 feet long, by 14 feet wide by 14 feet deep. The

excavation walls were nearly vertical. The excavation was dug the day prior to the incident. On the day of the incident, the excavator operator lowered a 20,000-gallon, 10-foot wide by 37-foot long by 8-foot high water tank weighing approximately 5,700 pounds onto concrete (dead man) slabs. The decedent and another coworker, who worked for a fire protection company, were working on the east side of the excavation installing tank tie down straps to the concrete slabs the tank was resting upon. The northwest corner of the excavation collapsed into the excavation and pivoted the 20,000 gallon tank in a clockwise direction. The decedent was pinned by the movement of the tank against the east wall of the excavation, causing internal injuries and subsequently death. His coworker was working to his southeast, so when the tank pivoted in a clockwise direction, the tank moved away from him. ([MIFACE Investigation 12MI121](#))

Case 114. A male steel mill supervisor in his 30s died when he was crushed against the payoff mandrel of a slitter line machine by a 7,397-pound, 53 inches high, 14.4 inches wide with a 20-inch center “rewind” steel coil that fell from a coil cart. Another coworker was using a pendant to operate an overhead crane equipped with a C hook. The crane was moving four steel coils with a combined width of approximately 59 inches (including gaps between the coils) from the coil payoff of the splitting line to a 48-inch wide Paxson coil car (cart). The decedent was raising and lowering the cart in an attempt to center the four coils of steel on the cart. The decedent raised the coil car just high enough to partially lift the steel coils from the hook. The steel coil on the east end of the car was overhanging the coil car by approximately 11 inches (approximately 57% of the coil weight extended beyond the cart edge). Although each individual coil was banded with a center 1 ¼” band, the four coils were not tied or secured together for added security. The crane operator noticed the coil tip from the cart and crane C hook and warned the decedent, who only had time to look up to his left towards the coil before being struck and caught between the coil of steel and payoff mandrel. Passing between the coil car and the payoff mandrel was a common work practice. Emergency response was called and his coworkers administered CPR. The decedent was declared dead at the scene. ([MIFACE Summary 305](#))

Case 115. A male automotive mechanic in his 30s died when a car he was working on fell on his chest and pinned him.

Case 116. A male tire company service technician in his 20s died when the manure spreader tire he was servicing at a farm exploded, striking him in the head and neck. The decedent was dispatched to install a semi-tire inter-tube on the manure spreader. The decedent removed the single-pieced rim semi tire from the manure spreader and placed the tire flat on the ground on a work mat. To fill the tire, the decedent leaned over the tire which placed him in the path of trajectory. He was holding the tire stem with a pair of pliers in one hand and the air hose in the other hand when either the inter-tube or the tire burst, causing the rim on the bottom to slip past the tire and rise up. The tire company did not have an inline valve with a gauge or a pressure regulator preset to the desired pressure available. The air compressor was set at 180 pounds per square inch. The escaping pressures caused the tire/rim to launch straight up, striking him in the neck, head and shoulder



Case 116. Incident scene

area. Both the tire and the decedent's body were found several feet away from the mat where the tire had been placed to perform the work. When the decedent did not answer his cell phone, a coworker traveled to the job site. The coworker called emergency response upon finding the decedent. The decedent was declared dead on the scene. ([MIFACE Summary 308](#))

Case 117. A male aircraft mechanic in his 80s died from complications of injuries sustained an unknown number of years ago when an airplane propeller struck him.

Case 118. A male handyman died when a 3-4 foot diameter box elder tree growing at a 45-degree angle "barber chaired", and the vertically split section of the tree came away from the tree and struck him. The decedent had been hired by a farmer to cut down the tree because it was growing over and into the field. Using a chainsaw to fell the tree, the decedent made a horizontal 6-inch cut near the base of the tree to the top part of the tree. He did not make a cut to the underside of the tree. The tree split vertically at the location of the cut. The split piece came away from the tree, striking the decedent causing him to fall to the ground. The



Case 118. Incident scene

wood came to rest on his back, pinning him face first to the ground. The remainder of the tree was still standing. The farmer, who was working in the field at the time of the incident, came to investigate when he saw the tree move unexpectedly. He noted the decedent's position and called for emergency response. The decedent was declared dead at the scene. ([MIFACE Investigation 12MI033](#))

Case 119. A male tree trimmer in his 60s died when the oak tree branch he was cutting had an uncontrolled fall, knocking the decedent upside down and then crushing him between the branch and the main trunk of the tree. The decedent was a member of a four-person crew felling the oak tree in a residential yard. The oak tree had three forks with two near vertical branches and one branch at approximately 20-degrees from vertical. He climbed the tree using spurs and an appropriate saddle and tied off to the 20-degree branch approximately 35 feet above ground. The crown had been removed from one of the near vertical branches leaving an approximate 20-foot section. The deceased positioned himself between the branch he was tied off to and the one he was planning to cut. The decedent was turned to the right approximately 135 degrees making his cut in the 14-inch branch at approximately chest high. The rope secured to the branch



Case 119. Incident scene

being cut was improperly placed as well as improperly attached to the rear bumper of the owner's car. The ground man was instructed to keep tension on the rope. As the decedent finished the cut, the ground man, who was inexperienced, pulled the top section of the branch.

Instead of falling away from the decedent, the branch fell toward him, causing him to be knocked from the branch where he was positioned. The branch crushed him against the tree and then fell to the ground. His coworkers attempted rescue by placing a ladder against the tree, but could not reach him. The decedent was positioned upside down until emergency response arrived. The decedent was transported to a local hospital where he was declared dead. ([MIFACE Summary 306](#))

Case 120. A male co-owner/operator of a small tree removal company in his 30s died when the unsupported raised dump bed of a 1988 Ford F-600 dump truck came down unexpectedly, crushing him between the dump bed and the truck frame. The decedent and an employee were delivering a load of firewood to a customer. After backing the 1988 Ford F-600 dump truck into position, the firewood was unloaded without incident. The employee who was operating the vehicle then attempted to lower the bed and it would not lower to its full down position. The decedent instructed the employee to pull forward a few feet and raise the bed all the way up while he attempted to find the cause of the problem. His coworker stayed in the truck cab while the decedent exited the truck and stood under the raised truck bed. He did not utilize a secondary means of support prior to standing underneath the raised truck bed. For reasons unknown, a few moments later, the bed fell, crushing the decedent's head between the truck frame and dump bed. When his coworker heard the resultant loud crash of the bed falling to the frame, he exited the truck and found the decedent. The Michigan State Police Motor Carrier Division could not find a reason for the bed failure. ([MIFACE Summary 315](#))

Case 121. A male landscaping company mechanic in his 30s died when he was struck by a trailer's 20-pound stop block while lowering the trailer height. The decedent had previously unloaded a Caterpillar 416b backhoe from a Talbert Hydroneck low boy heavy haul trailer. The decedent and the truck's driver were unhooking the low boy from a Peterbilt 357 truck and lowering the front of the trailer onto some 4x4 cribbing so that the truck could be uncoupled from the trailer. The decedent told the driver that the cribbing was not high enough on the right side and asked the driver to



Case 121. Incident scene

hydraulically raise the trailer. After inserting another piece of wood, the decedent told the driver to lower the trailer. As the trailer was again being lowered the driver heard a "pop". As he walked around the gooseneck, he observed the deceased laying on the ground. The approximately 20-pound stop block located between the gooseneck and the trailer frame had dislodged from its mount and had struck the decedent in the chin causing fatal injuries. The 3-inch diameter steel pin that contacted the block was slightly bent suggesting the inboard side of the block was pinched causing outward pressure and may account for the block being dislodged from its mount with tremendous force. The stop block was found approximately 15 feet away from the truck. No cotter pin was found on scene. ([MIFACE Summary 316](#))

Case 122. A male part-owner of a truck repair company in his 50s died when he was pinned between a truck tire and the frame of a semi's trailer. The truck driver was having difficulty

releasing the trailer from the semi tractor. The landing gear was lowered and the decedent climbed under the trailer to release it from the tractor and check for mechanical issues with the second set of tires. While the decedent was under the trailer near the second set of tires, he motioned with his hand to the truck driver to pull the truck slightly forward, and then backward. When the truck was pulled forward, only the front tires rotated but the second set of tires did not. After the truck driver moved backward, he kept his foot on the truck brake to keep the truck in this position. Another truck driver was standing near the decedent while the decedent was under the trailer, and then he left for a few minutes. When he returned, he found the decedent pinned between the second set of tires and the trailer frame.

Suicide (12)

- Case 123.** A male cowboy in his 40s died from a self-inflicted gunshot wound.
- Case 124.** A male heat and frost insulator in his 40s died from a self-inflicted hanging.
- Case 125.** A male automotive laborer in his 40s died from a self-inflicted gunshot wound.
- Case 126.** A male warehouse worker/volunteer firefighter in his 40s died of a self-inflicted hanging.
- Case 127.** A male automotive restoration specialist in his 20s died from a self-inflicted hanging.
- Case 128.** A male tow operator in his 50s died of a self inflicted gunshot wound.
- Case 129.** A male automotive maintenance worker in his 40s died from a self-inflicted hanging.
- Case 130.** A male dentist in his 60s died from a self-inflicted knife wound.
- Case 131.** A male funeral director in his 60s died from a self-inflicted hanging.
- Case 132.** A male garment cleaner in his 60s died from a self-inflicted gunshot wound.
- Case 133.** A male industrial sales representative/volunteer for a social service organization in his 50s died from a self-inflicted gunshot wound.
- Case 134.** A male border agent in his 40s died from a self-inflicted gunshot wound.

Unknown (1)

- Case 135.** A male heavy equipment mechanic in his 50s was found dead of a gunshot wound at his place of employment. Police could not ascertain if this was an accident, self-inflicted gunshot wound or a homicide.