

# Working Youth: Occupational Injuries among Michigan Teens 2018-2023

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## **Introduction**

Working youth are an especially vulnerable group in the workforce, often encountering occupational hazards during their first jobs. From 2018 to 2023, a total of 2,723 work-related injuries among Michigan teens aged 14-17 years were documented, highlighting the risks associated with youth employment across all industries. Through a comprehensive analysis, this document sheds light on the patterns of workplace injuries among teens in Michigan and advocates for stronger protections to ensure better training and awareness of potential hazards and safe work practices and a safer working environment for young employees as they enter the workforce.

## **Methodology**

The sources for the fatal injuries data were death certificates, medical examiner reports, police reports, newspaper clippings and employer reports to Michigan OSHA.

The sources for the non-fatal injuries were medical records submitted by Michigan hospitals for hospitalizations and emergency departments visits with specified ICD-10 codes or where workers' compensation paid for the medical care, the Workers' Disability Compensation Agency, the Michigan Heavy Metals registry, the Michigan Occupational Disease registry, and the Michigan Poison Center. Because of the way the data were requested and submitted, the data on amputations, burns, crushing injuries, skull fractures and heavy metals poisoning is more complete and covers all industries.

## **Description of all Fatal injuries, 2018-2023**

2019: A 15-year-old boy died as the result of a dirt bike crash. He was working at a motor cross off road racetrack and participating in a race when he became separated from his dirt bike. A dirt bike that was behind him ran over his neck. Efforts to resuscitate him were unsuccessful.

2019: A 17-year-old boy died from a motor vehicle crash. He was a pizza deliverer. He had stopped at a stop sign and was proceeding through an intersection when his vehicle was hit on the drivers' side by another vehicle that ran the stop sign, traveling at a high rate of speed.

2020: A 15-year-old male died when he was electrocuted. The decedent was working on a roof of a warehouse when he contacted high voltage electrical lines. He was earning money by cleaning up the warehouse for the tenant of the building. He died at the scene.

2021: A 17-year-old male laborer died from a self-inflicted hanging.

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2023: A 17-year-old male horse trainer died from a self-inflicted wound.

### **Description of a Sample of the Non-fatal injuries, 2018-2023**

A 17-year-old male was struck by a tractor while removing rocks from a farm field. His friend, who was driving the tractor, was unable to stop in time. He required six days of hospitalization.

A 15-year-old male was hospitalized for three days for severe burns of his hand from a deep fat fryer at a restaurant.

A 16-year-old female was cleaning a grill at a restaurant with a heat-activated cleaning substance which spilled on her thumb. The heated cleaning agent caused a burn that required outpatient treatment.



A 16-year-old male farm worker, who was part of a straw mulching crew, was hospitalized for two months for a fracture after he fell six feet off a moving straw trailer.

A 17-year-old male who worked in construction was hospitalized for one day for a laceration after his work truck rolled when he swerved to avoid traffic.

A 17-year-old female was burned while cleaning a greasy hood and vents at a restaurant when a soaking solution in a sink sprayed on her.

A 17-year-old male working in construction was struck by a large metal hook used to lift dumpsters when it slipped off. He sustained fractures.

A 16-year-old female was hospitalized for a fracture after being kicked in the face by a horse while doing chores in a barn.

A 15-year-old male working in agriculture was loading wood with his father when his finger got stuck in a pulley and amputated the tip of his finger.

A 17-year-old female sustained a burn after touching the hot surface of an oven at a restaurant, which burned through her glove. She was treated and discharged the same day.

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A 17-year-old male working in manufacturing, was using a saw to deburr a metal part when his glove got caught in the saw, pulling the glove, and causing amputation of two of his fingers at the proximal interphalangeal (PIP) joint.



A 15-year-old male was competing in a motocross race when he lost control while attempting to pass another rider. He fell and hit his head on the handlebars, sustaining a nasal fracture.

A 17-year-old female sustained a chemical burn after being splashed with Chemco Board Bright cleaner at a restaurant while cleaning cutting boards.

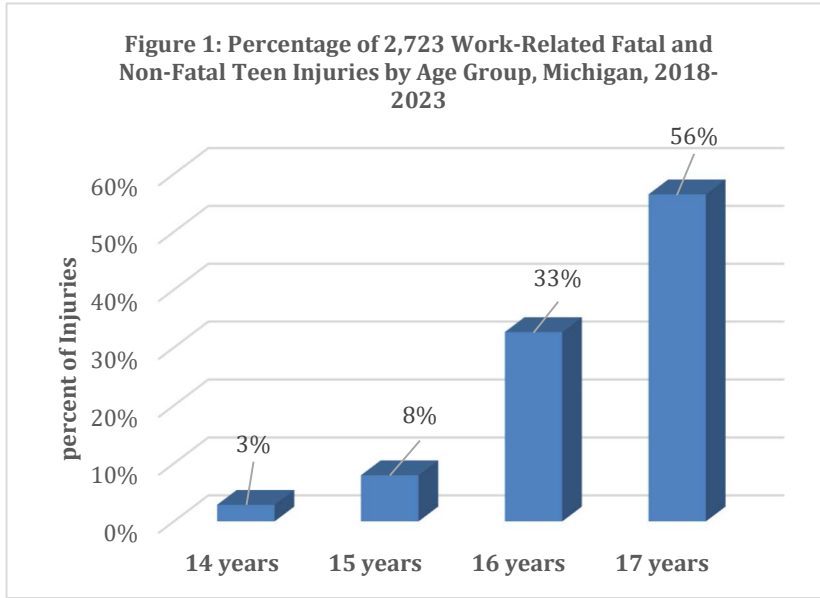
A 17-year-old male sustained a laceration after being pushed into a gate by a cow while helping on his grandfather's farm.

A 17-year-old male sustained a sprain after a cow stepped on his foot while he was trying to put her in a pen for milking. He required outpatient medical attention.

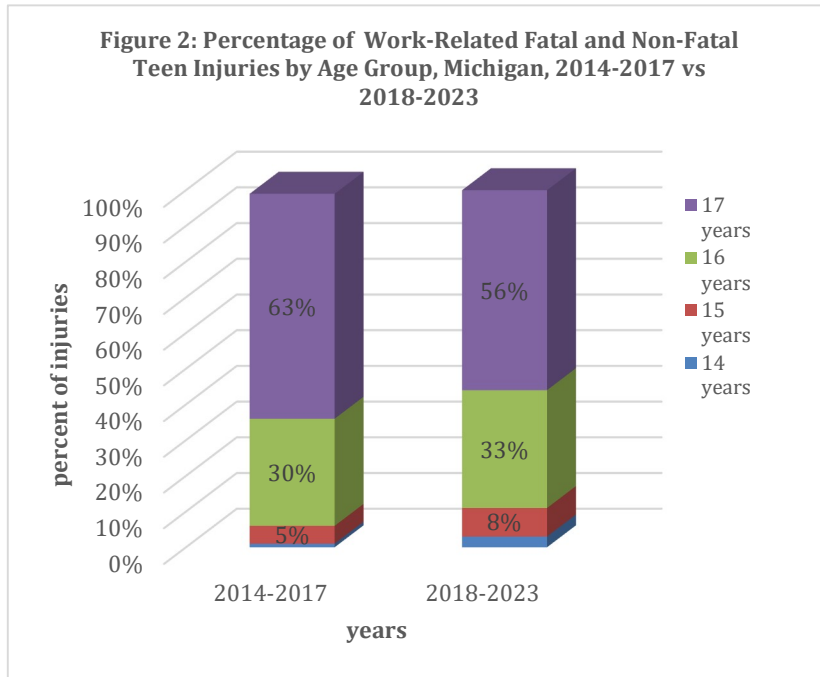


# Data Summary: Occupational Injuries Among Teens in Michigan, 2018-2023

## Section 1: Age-Related Analysis in Occupational Injuries Among Michigan Teens



The figures in this report are based on five work-related fatal and 2,718 non-fatal injuries among Michigan teens aged 14-17 years, occurring in 2018 to 2023. A larger portion of the injuries affected older teens, with 56% occurring among 17-year-olds and 33% among 16-year-olds. The number of injuries was less in the younger age groups, with 8% of injuries among 15-year-olds and 3% among 14-year-olds.



Seventeen-year-olds experienced the highest proportion of injuries among all age groups with 63% in 2014-2017, and 56% in 2018-2023. The increased number of injuries in older teens over the two periods may reflect the larger number of teens who work when they are older and that older teens work in more hazardous jobs. The percentage of injuries among younger teens (14, 15, 16 years) increased from 37% in 2014-2017 to 44% in 2018-2023. In 2014-2017, there were 1,501 work-related injuries to teens.

**Table 1: Fatal and Non-Fatal Injury Type Distribution among Teens by Age, Michigan, 2018-2023**

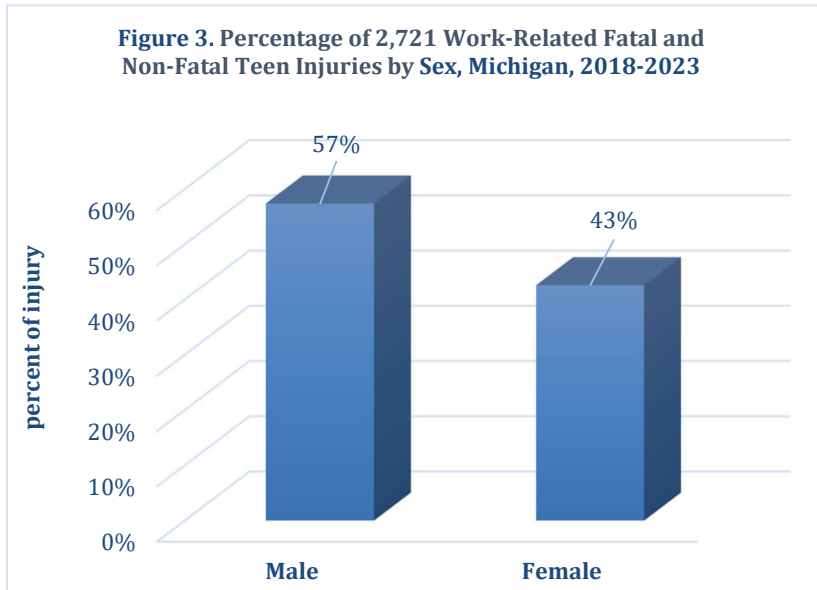
Injury Type	Age in Years				
	14	15	16	17	All Ages
	# (%)	# (%)	# (%)	# (%)	# (%)
<b>Amputation</b>	0 (--)	4 (1.8)	7 (0.8)	18 (1.2)	29 (1.1)
<b>Burn</b>	3 (3.9)	35 (16.1)	142 (16.0)	267 (17.4)	447 (16.4)
<b>Cut/laceration</b>	15 (19.2)	74 (34.1)	318 (35.7)	580 (37.7)	987 (36.2)
<b>Fatality</b>	0 (--)	2 (0.9)	0 (--)	3 (0.2)	5 (0.2)
<b>Fracture</b>	17 (21.8)	17 (7.8)	51 (5.7)	82 (5.3)	167 (6.1)
<b>Heavy metals poisoning</b>	0 (--)	0 (--)	27 (3.0)	22 (1.4)	49 (1.8)
<b>Other*</b>	9 (11.5)	31 (14.3)	105 (11.8)	195 (12.7)	340 (12.5)
<b>Crush</b>	16 (20.5)	22 (10.1)	99 (11.1)	154 (10.0)	291 (10.7)
<b>Sprain</b>	16 (20.5)	29 (13.4)	128 (14.4)	197 (12.8)	370 (13.6)
<b>COVID-19</b>	2 (2.6)	3 (1.4)	13 (1.5)	20 (1.3)	38 (1.4)
<b>Total</b>	78	217	890	1,538	2,723

\*Other injuries included respiratory disorders, injuries to the eye, skin, digestive system and abdomen, exposure to hazardous chemicals and concussions.

There were age-specific patterns in injury types among teenagers in Michigan. The proportion of burns, and cuts/lacerations increased with age, rising from 3.9% and 19.2 %, respectively in 14-year-olds to 17.4%, and 37.7%, respectively in 17-year-olds. Conversely, crushes, fractures, and sprains were highest in 14 -year-olds (20.5%, 21.8%, 20.5%, respectively) as compared to 17-year-olds (10.0%, 5.3%, and 12.8%, respectively).



## Section 2: Sex-Related Analysis in Occupational Injuries Among Michigan Teens



Males accounted for a larger share of the injuries, 57%, while 43% occurred among females. The results for the 2014-2017 period were similar, with 54% of the injuries among males, and 46% among females. The consistent predominance of male injuries across both periods may reflect sex-based job assignments, with males given more hazardous work, a greater number of young workers are males in general, or males may be less likely to follow safety precautions than females.

**Table 2. Fatal and Non-Fatal Injury Type Distribution among Teenagers by Sex, Michigan, 2018-2023**

Injury Type	Females	Males	Total
	# (%)	# (%)	# (%)
Amputation	1 (0.1)	28 (1.8)*	29 (1.1)
Burn	217 (18.7)	230 (14.7)	447 (16.4)
Cut/laceration	360 (31.1)	627 (40.1)*	987 (36.3)
Fatal	0 (0.0)	5 (0.3)	5 (0.2)
Fracture	46 (4.0)	121 (7.7)*	167 (6.1)
Heavy metals poisoning	20 (1.7)	29 (1.8)	49 (1.8)
Other**	176 (15.2)*	164 (10.5)	340 (12.5)
Crush	118 (10.2)	172 (11.0)	290 (10.7)
Sprain	194 (16.7)*	176 (11.3)	370 (13.6)
COVID-19	27 (2.3)*	10 (0.6)	37 (1.4)
<b>Total</b>	<b>1,159</b>	<b>1,562</b>	<b>2,721</b>

There were differences in sex-specific patterns of injuries. Females had higher percentages of sprains, COVID-19, and other conditions. Males had a higher percentage of amputations, cuts/lacerations, and fractures. These findings suggest different exposure patterns and/or risk factors by sex, with potential implications for targeted prevention strategies.

\*P < 0.05 Chi square test adjusted for multiple tests. Other injuries included respiratory disorders, injuries to the eye, skin, digestive system and abdomen, exposure to hazardous chemicals and concussions.

\*\* Other injuries included respiratory disorders, injuries to the eye, skin, digestive system and abdomen, exposure to hazardous chemicals and concussions.

### Section 3: Race-Related Analysis in Occupational Injuries Among Michigan Teens

**Table 3. Fatal and Non-Fatal Injury Type Distribution among Teenagers by Black vs. White, Michigan, 2018-2023**

Injury Type	Black	White
	# (%)	# (%)
Amputation	0 (0.0)	17 (1.0)
Burn	33 (21.0)*	174 (10.2)
Cut/laceration	57 (36.3)*	790 (46.3)
Fatal	0 (0.0)	4 (0.2)
Fracture	7 (4.5)	104 (6.1)
Heavy metals poisoning	13 (8.3)*	3 (0.2)
Other**	14 (8.9)	174 (10.2)
Crush	12 (7.6)	189 (11.1)
Sprain	21 (13.4)	244 (14.3)
COVID-19	0 (0.0)	6 (0.4)
<b>Total</b>	<b>157</b>	<b>1,705</b>

\*P < 0.05 Chi square test adjusted for multiple tests.

\*\*Other injuries included respiratory disorders, injuries to the eye, skin, digestive system and abdomen, exposure to hazardous chemicals and concussions.

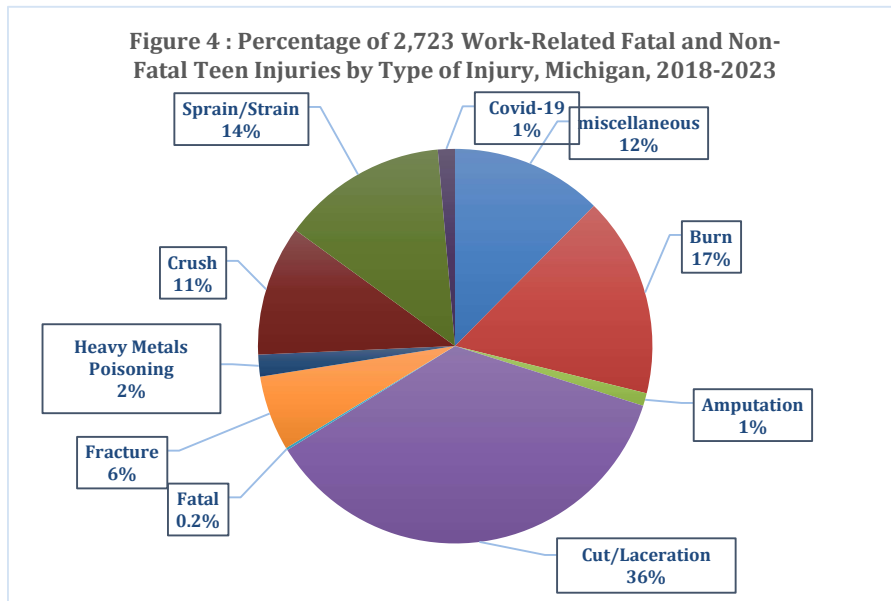
The proportion of burns, cuts/lacerations and heavy metal poisoning cases were significantly larger among Black than White teen workers. This could point to disparities in exposure to heavy metals, burn, cuts/laceration risks.

Injury type for other racial groups were not presented due small numbers; there were 14 youth workers of Asian descent, 9 of American Indian descent, 1 Pacific Islander, 50 listed as other, and 563 with unknown race.

No analysis was done by ethnicity because data on ethnicity was missing on 2,254 (90%) of the injuries.



## Section 4: Type of Injury-Related Analysis in Occupational Injuries Among Michigan Teens



Overall, cuts and lacerations were the most common injury type, accounting for 36% of cases, followed by burns (17%) and sprains/strains (14%). The next most common injury types included crush injuries (11%), fractures (6%), heavy metal poisoning (2%), and amputations (1%).

See Tables 1 and 2 to view this same data in a table format by age, sex, and overall.

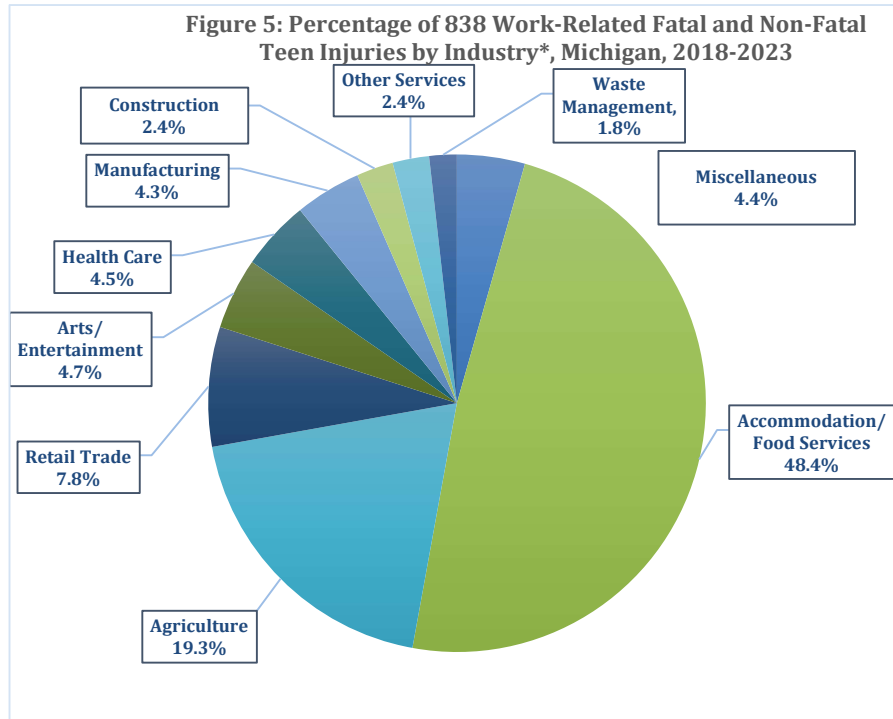
**Table 4. Percentage of Work-Related Fatal and Non-Fatal Teen Injuries by Type of Injury, Michigan 2014-2017 vs. 2018-2023**

Injury Type	2014-2017	2018-2023
	%	%
<b>Amputation</b>	2	1
<b>Cut/laceration</b>	30	36
<b>Burn</b>	19	17
<b>Fatal</b>	<1	<1
<b>Heavy metal poisoning</b>	2	2
<b>Sprain</b>	12	14
<b>Crush</b>	7	11
<b>Fracture</b>	6	6
<b>Other*</b>	23	12

Generally, the proportion of the type of injuries did not differ across the two time periods. While some injury types, such as burns and other injuries decreased, cuts, crushes, and sprains increased.

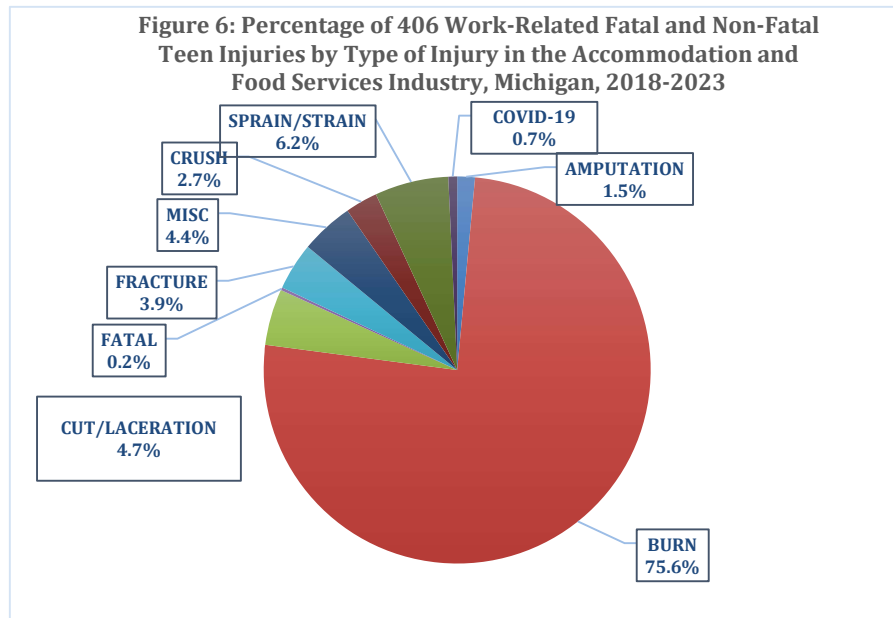
\* Other injuries included respiratory disorders, injuries to the eye, skin, digestive system and abdomen, exposure to hazardous chemicals and concussions.

## Section 4: Industry-Specific Analysis in Occupational Injuries Among Michigan Teens



The Accommodation and Food Services sector had the highest proportion of teen injuries, accounting for 48.4% of cases, followed by Agriculture (19.3%) and Retail Trade (7.8%). Teens are highly concentrated in service-oriented industries and accordingly these industries are highly represented among youth occupational injuries.

\*Industry was missing for 1,885 of the injuries



Within the Accommodation and Foods Services industry, burns were the most common type of injury, accounting for 75.6% of cases, likely due to the nature of job assignment and food preparation tasks. It is followed by sprains/strains (6.2%) and cuts/lacerations (4.7%). Other injuries included miscellaneous (4.4%), fractures (3.9%), crush injuries (2.7%), amputations (1.5%), COVID-19 (0.7%), and fatalities (0.2%).

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## Conclusions

From 2018-2023, there were 2,723 (544/year) work-related injuries among youths 14-17 years old in Michigan. These were the most severe injuries since they were mainly identified if the injury required a hospitalization or emergency department visit. They included five fatal injuries. Injuries to youth treated in a clinic or where the youth did not seek medical care were missed. Also, more cuts/lacerations, non-skull fractures, sprains and other conditions were probably missed than amputations, burns, crushing injuries and skull fracture because the three first conditions would have needed to occur on a farm or worker's compensation would have had to be the insurance payer, while the four later conditions were identified regardless of work location and type of insurance.

Work-related injuries to youth are an ongoing public health problem. From 2014-2017, there were 1,501 (375/year) work-related injuries among youths in Michigan. The reason for the increase in the number of injuries per year during the most recent time period is unclear. It would be helpful to work with schools and State and Federal agencies as well as other stakeholders to more fully understand the work practices that place these workers that are new to employment at risk of injuries. Prevention of youth worker injuries should be a priority for workplaces, schools, vocational programs, and other agencies with which these young workers interact.

To raise awareness of work-related injuries among youths and to identify ways to reduce these injuries, this report will be shared with stakeholders who have an educational and/or regulatory interest in the safety of youths who work:

- 1) State and Federal agencies that enforce child labor laws.
- 2) Michigan OSHA including the Consultation, Education and Training Division that funds safety training for young workers.
- 3) Michigan Department of Education, Vocational programs and other groups involved in educating youth.

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## Resources

There are resources available to help educate teens, parents, and employers to keep teen workers safe on the job. Knowing, understanding, and following safe work practices should be made a condition of youth employment. These are just some of the resources available:

- OSHA: Youth Worker Safety in Restaurants ETool.  
<https://www.osha.gov/SLTC/youth/restaurant/index.html>
- MIOSHA Extreme Safety: Youth Worker Safety Restaurant/Fast Food Industry.  
[https://www.michigan.gov/-/media/Project/Websites/leo/Documents/MIOSHA/Fact-Sheets/CET/Fact\\_CET163.pdf?rev=9d1266494f4f466181ad0ca9941eb861](https://www.michigan.gov/-/media/Project/Websites/leo/Documents/MIOSHA/Fact-Sheets/CET/Fact_CET163.pdf?rev=9d1266494f4f466181ad0ca9941eb861)
- PASSES: Parents for Student Safety Employment Standards.  
<https://www.passesedge.com/main.html>
- OSHA: Young Workers You Have Rights!  
<https://www.osha.gov/youngworkers/index.html>
- MIOSHA: Youth Worker Safety  
<https://www.michigan.gov/leo/bureaus-agencies/miosha/cet/initiatives/youth-worker-safety>