

**Workers' Compensation Claims in Michigan for COVID-19
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Executive Summary

- Seven thousand four hundred seventy-four (7,474) individuals received workers' compensation for seven or more consecutive days away from work for COVID-19 between 1/1/20 and 7/31/21.
- Eighteen individuals received death benefits from Workers' Compensation for COVID-19.
- Individuals receiving workers' compensation were most likely to have worked in health care including nursing/residential homes (69%) and as correction officers, firefighters or police (20%).
- Workers' compensation claims for COVID-19 were 31.4% of all paid claims for seven or more consecutive days away from work between 1/1/20 and 7/31/21. In the 4th quarter of 2020, COVID-19 paid claims were 53.2% of all paid claims for seven or more consecutive days away from work.
- Forty-one percent of the paid COVID-19 claims for seven or more consecutive days away from work were in the spring (March-May) of 2020 during the first surge of COVID-19 and 33.5% during the second surge in the fall (September-December) of 2021.
- Seventy two percent of COVID-19 claims for seven or more consecutive days away from work were paid; the highest paid claim acceptance was Admin/Support/Waste (NAICS 56) (89.5%), then Other Services (NAICS 81) (80.8%), then Health Care/Social Assistance (NAICS 62) (75.0%), then Real Estate (NAICS 53) (78.1%), and then Public Administration (NAICS 92) (64.1%).
- Using data from the Michigan Department of Health and Human Services (MDHHS), reports to the Michigan Occupational Safety and Health Administration (MIOSHA), and reports from hospitals, there were 23,969 work-related cases of COVID-19 and 163 work-related deaths. There was little overlap between cases from these other sources and cases with paid workers' compensation claims.
- Given the incomplete ascertainment of occupation and industry in communicable disease surveillance including for COVID-19, the lack of information on COVID-19 workers' compensation cases that involved less than seven days away from work and the multiple reasons for workers not to file for workers' compensation, the true burden of COVID-19 that can be attributed to exposure at work is unknown.

Background

The first COVID-19 case identified by the Michigan Department of Health and Human Services in Michigan was on 3/10/20.

On 3/30/20, an emergency rule was promulgated,¹ which was replaced on 6/18/20 by the governor's executive order 128,² which on 10/16/20 was replaced by a new emergency rule.³ The most recent emergency rule was effective through 3/20/21. The exact wording has differed between the two emergency rules and the executive order, but all three orders presumed that the development of COVID-19 in a first responder was work-related.

The wording stated that injuries to COVID-19 first response employees were:

"For purposes of the worker's disability compensation act of 1969, 1969 PA 317, MCL 418.101 to 418.941, and subject to rebuttal by specific facts to the contrary, a COVID-19-first response employee who is confirmed as COVID-19 positive on or after March 18, 2020, either by physician or by test, shall be presumed to have suffered a "personal injury," as that term is defined by section 401(2)(b) of the worker's disability compensation act of 1969, 1969 PA 317, MCL 418.401."

A COVID-19 first responder was defined as: 1) someone who was required to report to work in an ambulance operation, emergency response service, home for the aged, hospice, hospital, nursing home, or home health agency; 2) person working as a physician, physician assistant, licensed practical nurse, registered professional nurse, medical first responder, nurse, emergency medical technician, emergency medical technician specialist, paramedic, or respiratory therapist who is required to provide in-person medical care to patients; 3) law enforcement officer; 4) firefighter 5) motor carrier officer within the State Police; 6) member of an emergency response team; 7) volunteer civil defense worker; 8) on-call member of a life support agency; 9) and state or local government employee of a penal institution who works within the secured perimeter.

All other Michigan workers who developed COVID-19 were not presumed to have a work-related condition but were covered by the regular Michigan workers' compensation criteria if a doctor concluded, within a reasonable degree of medical certainty (51% or more likely) that work caused or was a significant contributor to the development of the patients' COVID-19 infection.

The presumption for first response employees who developed COVID-19 ended on March 20, 2021, and now all workers are required to provide the same proof of work exposure to receive workers' compensation for COVID-19.

Data Source and Type of Data

The Michigan Workers' Disability Compensation Act (WDCA) covers all Michigan workers except:

- Federal employees
- Railroad employees
- Seamen on navigable waters
- Workers who load and unload water vessels
- Private employers with less than three workers or who have one worker with less than 35 hours per week for less than 13 weeks
- Self-employed

The March 2020 Current Employment Estimate for Michigan (prior to COVID-19) was 4.694 million nonfarm employees.⁴ The United States Department of Agriculture (USDA) Census of Agriculture estimates 80,000 farm operators and 77,000 hired farm workers, including migrant/seasonal farm workers in Michigan.⁵ These totals for farm workers include workers listed above who are not covered by the WDCA.

Employers must buy an insurance policy from a private insurance company or be self-insured. Only workers' compensation claims that receive wage replacement are computerized by WDCA and therefore only these wage replacement claims could be accessed for analysis. To receive wage replacement, a worker must be off work seven days or more in a row. The seven days in a row can include normal time off, such as a two-day weekend. Data was only available on 838 claims related to medical care only cases, cases with less than seven days in a row off work. This is a small percentage of the medical care only cases and no analyses were performed on these cases.

WDCA provided MSU an electronic file of all workers' compensation claims from 1/1/2020 through 8/10/2021. COVID-19 cases were determined using the Michigan WDCA injury code 83, which was assigned to all COVID-19 claims. The first COVID-19 claim submitted to WDCA had a date of injury of 2/28/2020.

Methods

COVID-19 cases were determined using the Michigan WDCA code 83 that was assigned to all COVID-19 claims. The first COVID-19 claim submitted to WDCA had a date of injury of 2/28/2020.

Data available for all COVID-19 paid and non-paid claims were:

- Name
- Patient Zip Code
- Claim status (see Appendix1)
- Date of injury
- Nature of injury
- Body part
- Age/Date of Birth

- Gender
- Company name and address including county
- Employer Class Code
- Vital status
- SSN

A dataset of paid and non-paid COVID-19 cases from 1/1/2020 through 8/10/2021 was extracted for our analyses from the WDCA files. The following codes (see appendix 1 for codes) were used to determine paid claims; 01-04, 11-14, 21-24, 31-34, 41-44, 51-54. All other codes were considered non-paid claims. NAICS codes were assigned to each employer. To determine geographic location, the location of the company was used for single establishment employers and the residence of the employee was used for multi-establishment employers.

The analysis consisted of a frequency count of paid and non-paid COVID-19 claims. We compared paid vs. non-paid COVID-19 claims. Within each COVID-19 claim status, counts by month, ten year age categories, gender, industry type, county and vital status were calculated. Because we were unable to obtain recent unemployment insurance data, we were unable to analyze the COVID-19 claims by number of employees at a company. Because the last day of work was missing on 35.6% of the COVID-19 claims and return to work was missing on 70.9% of the COVID-19 claims we were unable to conduct analysis by days away from work. We calculated the percentage of COVID-19 paid claims by quarter of paid claims for all injury types. The percent of COVID-19 claims among different industries was compared using logistic regression. We compared gender, age, date of injury by industry distribution as well as these characteristics by paid vs. non-paid COVID-19 claims. Time series analyses were employed to examine trends (upward/downward/peaks) in number of COVID-19 paid claims by month and further separated by industry.

Results

There were 7,474 paid COVID-19 cases and 2,909 non-paid COVID-19 cases.

The average age of those with paid COVID-19 claims was 42.4 years and those with non-paid COVID-19 claims was 41.4 years ($p=0.0007$). Table 1 shows ten year age categories, gender, distribution of two digit NAICS codes and whether the person died by COVID-19 claim status. Seventy one percent were women. Sixty-nine percent worked in health care, and 20 percent in governmental administration. Only 0.28% of paid claims were for a COVID-19 related death. No paid or unpaid claims were identified in agriculture.

Table 1. Gender, Age distribution and Industry of Paid and Non-Paid COVID-19 Claims with Seven or More Days Away from Work, Michigan March 2020-July 2021.

	Category	Not Paid (N=2,909)		Paid (N=7,474)		p-value
		N	%	N	%	
Age Group	Missing	12	0.41	15	0.20	
	<=20	62	2.1	85	1.1	<0.01
	21-30	631	21.7	1547	20.7	
	31-40	711	24.4	1862	24.9	
	41-50	740	25.4	1778	23.8	
	51-60	545	18.7	1519	20.3	
	61-70	185	6.4	611	8.2	
	71-80	22	0.8	54	0.7	
	>80	1	0.0	3	0.0	
Gender						
	Female	1860	63.9	5316	71.1	<0.01
	Male	1046	36.0	2155	28.8	
	Unknown	3	0.1	3	0.0	
Industry (2 digit NAICS)						
	Construction (23)	16	0.6	5	0.1	
	Manuf.-food/textiles (31)	2	0.1	2	0.0	
	Manuf.-wood/chemicals (32)	28	1.0	31	0.4	
	Manuf.-metal/vehicles (33)	49	1.7	17	0.2	
	Wholesale Trade (42)	20	0.7	9	0.1	
	Retail Trade (44)	10	0.3	17	0.2	
	Retail Trade (45)	23	0.8	6	0.1	
	Transport./Warehousing (48)	42	1.4	3	0.0	
	Transport./Warehousing (49)	1	0.0	1	0.0	
	Information (51)	1	0.0	0	0.0	
	Finance/Insurance (52)	11	0.4	1	0.0	
	Real Estate (53)	7	0.2	25	0.3	
	Prof/Sci/Tech Services (54)	5	0.2	8	0.1	
	Admin/Support/Waste (56)	68	2.3	579	7.8	
	Education (61)	20	0.7	23	0.3	
	Health Care/Social Assist. (62)	1727	59.4	5184	69.4	
	Arts/Entertainment/Rec. (71)	10	0.34	1	0.01	
	Accommodation/Food (72)	17	0.58	16	0.21	
	Other Services (81)	10	0.34	42	0.56	
	Public Administration (92)	840	28.88	1498	20.04	
Add data Fatal Status	No	2891	99.38	7453	99.72	0.011
	Yes	18	0.62	21	0.28	
Total		2,909		7,474		

To assess more detail where the paid COVID-19 claims occurred within healthcare/services and public administration, Table 2 shows the paid and non-paid COVID-19 cases within three digit and four-digit NAICS within healthcare/services and public administration.

Table 2. Health Care and Social Assistance and Public Administration Industry of Paid and Non-Paid COVID-19 Claims with Seven or More Days Away from Work, Michigan March 2020-July 2021.

	Not Paid Claims (N=2,567)		Paid Claims (N=6,682)	
	N	%	N	%
Industry (NAICS 3 and 4 Digits)				
Physician Offices (621)	167	9.7	617	11.9
All Hospitals (622)	893	51.7	2815	54.3
General Med/Surg (6221)	880	51.0	2710	52.3
Nursing/Resident Facilities (623)	597	34.6	1547	29.8
Skilled Nursing (6231)	401	23.2	1012	19.5
Social services (624)	70	4.1	205	4.0
Exec. Services (921)*	108	12.9	995	66.4
Corrections/Fire/Police (922)	690	82.1	475	31.7
Human Resources (923)	36	4.3	25	1.7
Admin. Regulations (926)	6	0.7	3	0.2

*NAICS 921 had the employer listed as the state of Michigan so this category could also include correction officers and police

Table 3 and Figure 1 show the number of paid and non-paid COVID-19 claims by month and year. Figure 2 shows the number of paid and non-paid COVID-19 claims by month and year separately for health care/social services, public administration and all other industries combined.

Table 3. Number/Percent of Paid and Non-Paid COVID-19 Claims with Seven or More Days Away from Work by Month, Michigan March 2020-July 2021.

Month of Injury	Not Paid (N=2,909)		Paid (N=7,474)	
	N	%	N	%
Missing	2	0.1	1 (Feb 2020)	0.0
20-Mar	190	6.5	995	13.3
20-Apr	229	7.9	1640	21.9
20-May	94	3.2	455	6.1
20-Jun	44	1.5	145	1.9
20-Jul	108	3.7	220	2.9

20-Aug	90	3.1	238	3.2
20-Sep	87	3.0	184	2.5
20-Oct	245	8.4	591	7.9
20-Nov	415	14.3	1082	14.5
20-Dec	120	4.1	594	8.0
21-Jan	295	10.1	548	7.3
21-Feb	110	3.8	154	2.1
21-Mar	273	9.4	294	3.9
21-Apr	496	17.1	278	3.7
21-May	106	3.6	53	0.7
21-Jun	5	0.2	2	0.0
21-July	0	0.0	0	0.0

Figure 1. Number of Paid and Non-Paid COVID-19 Claims with Seven or More Days Away from Work by Month, Michigan March 2020-July 2021.

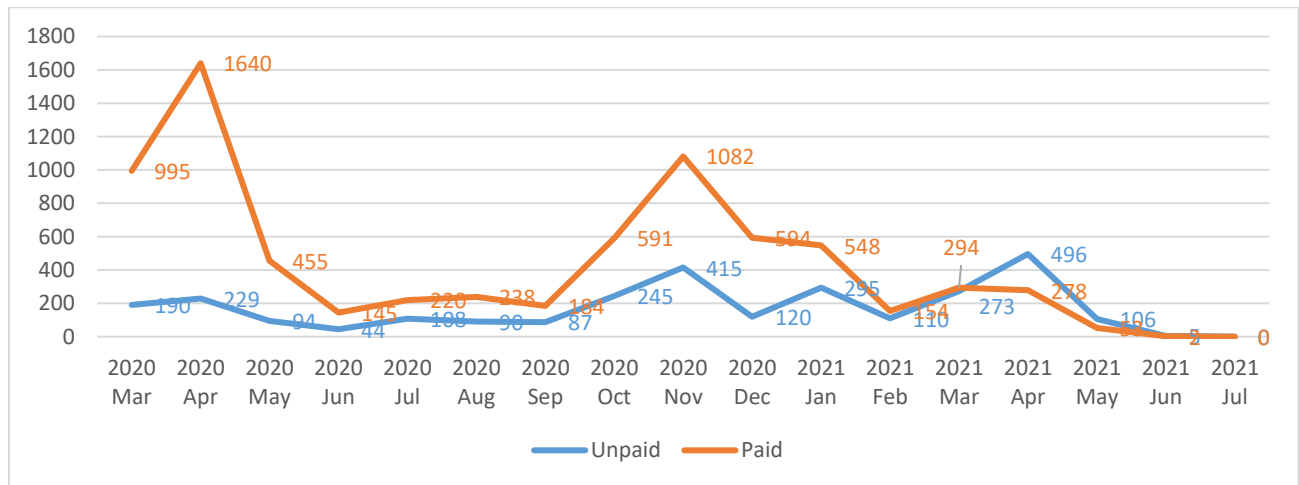


Figure 2. Number of Paid COVID-19 Claims with Seven or More Days Away from Work by Three Industry Groups and Month, Michigan March 2020-July 2021.

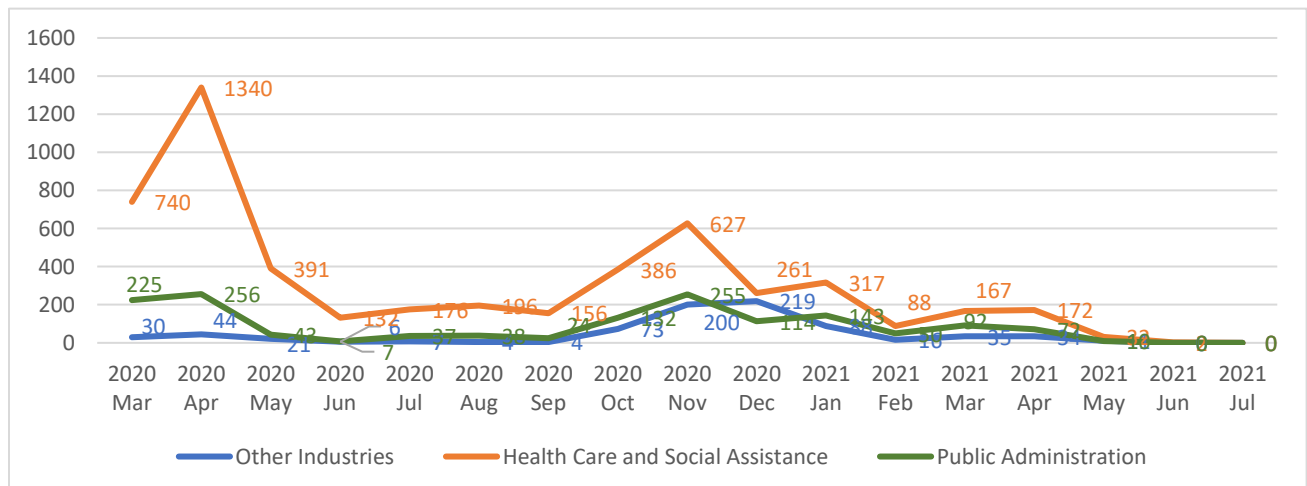


Table 4 shows the number of paid and non-paid COVID-19 claims by county. Seventy-eight of the 83 Michigan counties had at least one paid COVID-19 claim and 81 of 83 had at least one non-paid COVID-19 claim. There was a wide variation in the percent of paid claims in the different counties.

Table 4. Number and Percent of Paid and Non-Paid COVID-19 Claims with Seven or More Days Away from Work by County, Michigan March 2020-July 2021.

County	Not Paid (N=2,909)		Paid (N=7,474)		Percent of COVID- 19 Claims Paid
	N	%	N	%	%
Alcona	3	0.1	0	0.0	0.0
Alger	5	0.2	0	0.0	0.0
Allegan	8	0.3	10	0.1	56.6
Alpena	8	0.3	8	0.1	50.0
Antrim	2	0.1	1	0.0	33.3
Arenac	2	0.1	5	0.1	71.4
Baraga	11	0.4	13	0.2	54.2
Barry	9	0.3	11	0.2	55.0
Bay	46	1.6	230	3.1	83.3
Benzie	3	0.1	6	0.1	66.7
Berrien	35	1.2	99	1.3	73.9
Branch	15	0.5	20	0.3	57.1
Calhoun	17	0.6	58	0.8	77.3
Cass	2	0.1	5	0.1	71.4
Charlevoix	15	0.5	24	0.3	61.5
Cheboygan	2	0.1	5	0.1	71.4
Chippewa	34	1.2	23	0.3	40.4
Clare	5	0.2	10	0.1	66.7
Clinton	30	1.0	23	0.3	43.4
Crawford	21	0.7	24	0.3	53.3
Delta	17	0.6	19	0.3	52.8
Dickinson	1	0.0	3	0.0	75.0
Eaton	38	1.3	53	0.7	58.2
Emmet	3	0.1	29	0.4	90.6
Genesee	107	3.7	609	8.2	85.1
Gladwin	8	0.3	10	0.1	55.6
Gogebic	4	0.1	45	0.6	91.8
Grand Traverse	127	4.4	106	1.4	45.5

Gratiot	40	1.4	24	0.3	37.5
Hillsdale	13	0.5	37	0.5	74.0
Houghton	6	0.2	2	0.0	25.0
Huron	17	0.6	31	0.4	64.6
Ingham	205	7.1	400	5.4	66.1
Ionia	46	1.6	30	0.4	39.5
Iosco	22	0.8	25	0.3	53.2
Iron	3	0.1	16	0.2	84.2
Isabella	9	0.3	25	0.3	73.5
Jackson	66	2.3	105	1.4	61.4
Kalamazoo	75	2.6	118	1.6	61.1
Kalkaska	2	0.1	0	0.0	0.0
Kent	124	4.3	378	5.1	75.3
Keweenaw	0	0.0	1	0.0	100.0
Lake	3	0.1	3	0.0	50.0
Lapeer	21	0.7	118	1.6	84.9
Leelanau	0	0.0	0	0.0	--
Lenawee	46	1.6	126	1.7	73.3
Livingston	44	1.5	50	0.7	50.5
Luce	6	0.2	1	0.0	14.3
Mackinac	2	0.1	1	0.0	33.3
Macomb	153	5.3	616	8.2	80.1
Manistee	13	0.5	7	0.1	35.0
Marquette	24	0.8	34	0.5	58.6
Mason	7	0.2	6	0.1	46.2
Mecosta	2	0.1	4	0.1	66.7
Menominee	6	0.2	26	0.4	81.3
Midland	17	0.6	45	0.6	72.6
Missaukee	0	0.0	4	0.1	100.0
Monroe	21	0.7	42	0.6	66.7
Montcalm	47	1.6	21	0.3	30.9
Montmorency	1	0.3	1	0.0	50.0
Muskegon	124	4.3	98	1.3	44.1
Newaygo	3	0.1	3	0.0	50.0
Oakland	285	9.8	1459	19.5	83.7
Oceana	3	0.1	3	0.0	50.0
Ogemaw	2	0.1	3	0.0	60.0
Ontonagon	1	0.0	1	0.0	50.0
Osceola	1	0.0	1	0.0	50.0
Oscoda	2	0.1	2	0.0	50.0
Otsego	19	0.7	20	0.3	51.3
Ottawa	43	1.5	76	1.0	63.9

Presque Isle	1	0.0	1	0.0	50.0
Roscommon	12	0.4	30	0.4	71.4
Saginaw	120	4.1	219	2.9	64.6
St Clair	22	0.76	98	1.31	81.7
St Joseph	22	0.76	51	0.68	69.9
Sanilac	3	0.1	6	0.08	66.7
Schoolcraft	2	0.1	0	0.0	0.0
Shiawassee	29	1.0	112	1.5	79.4
Tuscola	34	1.2	72	1.0	67.9
Van Buren	6	0.2	19	0.3	76.0
Washtenaw	91	3.1	284	3.8	75.7
Wayne	360	12.4	1070	14.3	74.8
Wexford	27	0.9	21	0.3	43.8
Unknown	78	2.7	77	1.0	49.7
Out of State	0	0.0	2	0.0	100.0
All Locations	2,909		7,474		72.0

Table 5 shows paid COVID-19 claims and all paid workers' compensation claims by quarter for calendar year 2020 and the first two quarters of 2021.

Table 5. Number and Percent of COVID-19 and All Non-COVID-19 Paid Workers' Compensation Claims with Seven or More Days Away from Work in Each Quarter 2020 and First Two Quarters 2021, Michigan.

	Number of COVID-19 Paid Claims	Number of all Paid Claims	%
2020 Q1	996	4,568	21.8
2020 Q2	2,240	4,778	46.9
2020 Q3	642	3,846	16.7
2020 Q4	2,267	4,260	53.2
2021 Q1	996	4,227	23.6
2021 Q2	333	2,121	15.7
All Six Quarters	7,474	23,800	31.4

Table 6 shows the proportion of claims by industry. Three industries (Real Estate (NAICS 53), Admin/Support/Waste (NAICS 56), and Other Services (NAICS 81) had a higher proportion of paid to non-paid claims than Public Administration (NAICS 92) and two had a greater proportion of paid to non-paid claims than Health Care/Social Assistance (NAICS 62). Logistic analysis controlling for age, county and gender did not appreciably change the results, although now Real Estate (NAICS 53) also had a higher proportion of paid to non-paid claims than Health Care/Social Assistance (NAICS 62) (Table 7).

Table 6. Proportion of Paid COVID-19 Claims with Seven or More Days Away from Work among all COVID-19 Claims by Industry (2 Digit NAICS), Michigan March 2020-July 2021.

Industry (NAICS 2 Digits)*	Proportion of COVID-19 Claims Paid	P Value	[95% Conf. Interval]	
Construction (23)	0.238	0.01	0.056	0.420
Manuf.-food/textiles (31)	0.500	0.046	0.010	0.990
Manuf.-wood/chemicals (32)	0.525	<0.01	0.398	0.653
Manuf.-metal/vehicles (33)	0.258	<0.01	0.152	0.363
Wholesale Trade (42)	0.310	<0.01	0.142	0.479
Retail Trade (44)	0.630	<0.01	0.447	0.812
Retail Trade (45)	0.207	0.006	0.059	0.354
Transport./Warehousing (48)	0.067	0.073	-0.006	0.140
Transport./Warehousing (49)	0.500	0.157	-0.193	1.193
Finance/Insurance (52)	0.083	0.296	-0.073	0.240
Real Estate (53)	0.781	<0.01	0.638	0.924
Prof./Sci./Tech. Services (54)	0.615	<0.01	0.351	0.880
Admin/Support/Waste (56)	0.895	<0.01	0.871	0.919
Education (61)	0.535	<0.01	0.386	0.684
Health Care/Social Assist. (62)	0.750	<0.01	0.740	0.760
Arts/Entertainment/Rec. (71)	0.091	0.294	-0.079	0.261
Accommodation/Food (72)	0.485	<0.01	0.314	0.655
Other Services (81)	0.808	0.09	0.701	0.915
Public Administration (92)	0.641	<0.01	0.621	0.660
All Industries	0.720	--	0.711	0.728

*Information (NAICS 51) had insufficient number of paid/unpaid claims to include

Table 7. Predicted Proportion of Paid COVID-19 Claims with Seven or More Days Away from Work among all COVID-19 Claims by Industry (2 Digit NAICS) with Age, Gender and County Added as Covariates, Michigan March 2020-July 2021.

Industry (NAICS 2 Digits)*	Proportion of COVID-19 Claims Paid	P Value	[95% Conf. Interval]	
Construction (23)	20.4%	0.012	4.6%	36.2%
Manuf.-food/textiles (31)	58.9%	0.011	13.3%	104.5%
Manuf.-wood/chemicals (32)	60.1%	<0.001	48.2%	72.1%
Manuf.-metal/vehicles (33)	24.0%	<0.001	13.9%	34.0%
Wholesale Trade (42)	25.8%	0.001	10.6%	41.1%
Retail Trade (44)	63.9%	<0.001	46.5%	81.3%
Retail Trade (45)	19.9%	0.005	5.9%	33.9%
Transport./Warehousing (48)	7.0%	0.083	-0.9%	14.8%
Transport./Warehousing (49)	57.9%	0.104	-12.0%	127.7%
Finance/Insurance (52)	11.9%	0.272	-9.3%	33.1%
Real Estate (53)	72.7%	<0.001	57.0%	88.4%
Prof./Sci./Tech. Services (54)	71.7%	<0.001	49.4%	94.0%
Admin/Support/Waste (56)	86.5%	<0.001	83.4%	89.7%
Education (61)	56.6%	<0.001	42.4%	70.9%
Health Care/Social Assist. (62)	74.7%	<0.001	73.6%	75.7%
Arts/Entertainment/Rec. (71)	18.6%	0.23	-11.8%	49.1%
Accommodation/Food (72)	46.9%	<0.001	29.9%	63.9%
Other Services (81)	80.3%	0.10	69.7%	91.0%
Public Administration (92)	67.2%	<0.001	65.0%	69.4%
All Industries	72.1%		71.3%	72.9%

*Information (NAICS 51) had insufficient number of paid/unpaid claims to include

Discussion

There were 7,474 paid COVID-19 workers' compensation claims in Michigan since the start of the pandemic. Paid claims were most frequent in health care workers, 69% and correction officers, police and fire (20%). Forty-one percent of the paid claims were in the spring (March-May) of 2020 during the first surge of COVID-19 and 33.5% during the second surge in the fall (September-December) of 2021 in Michigan. Seventy two percent of COVID-19 claims for seven or more consecutive days away from work were paid. There was variation in the percentage of paid COVID-19 claims by both industry (Table 6) and location (Table 4). Although 89% of the paid claims were from the two industry groups (NAICS 62 and 92) whose COVID-19 claims were presumed to be work-related, Other Services (NAICS 81) and Admin/Support/Waste (NAICS 56) had a higher percentage of claims paid than Healthcare/Social Assistance (NAICS 62), and Public Administration (NAICS 92) and Real Estate (NAICS 53) had a higher percentage of claims paid than Public Administration (NAICS

92) (Table 6). However, the end of the presumption for first health care and first responders is reflected in the increase in non-paid claims in April 2021 (Figure 1).

How does the number of workers' compensation paid COVID-19 claims compare to the overall occurrence of COVID-19 in Michigan? As of 8/3/21, there have been 906,538 confirmed and 107,549 probable cases, including 19,947 confirmed and 1,297 probable deaths of COVID-19 in Michigan (https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html). Skilled Nursing, Home for the Aged and Adult Foster Care facilities have reported 25,055 cases and 5,681 deaths among residents and 23,475 cases and 77 deaths among staff (https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173-526911--,00.html). In comparison there were only 597 paid COVID-19 claims in nursing/residential facilities. As of May 2021, there were 331 reported outbreaks in schools, with 8,139 of the individuals associated with the outbreaks involving both students and staff cases, 2,767 of the individuals involving student cases only and 25 of the individuals involving staff cases only. In comparison, there were only 23 paid COVID-19 claims in education.

In 2020 through 8/3/21, there were 19,947 deaths attributed to COVID-19, 11.3% of all 177,237 Michigan deaths from any cause during this time period (<https://vitalstats.michigan.gov/osr/Provisional/CvdTable2.asp>). Of the 19,947 deaths, 4,004 (20.1%) died from COVID-19 between the ages of 25-64. Although people begin working at an earlier age and may continue working to an older age, and certainly not all COVID-19 deaths within the 25- 64 age group were work-related, this number and percent provide a potential estimate of COVID -19 deaths that might have been work-related. Only 21 death benefits were paid for COVID-19 workers' compensation claims.

A limitation of Michigan's Workers' Compensation data is that only claims eligible for salary reimbursement, seven or more consecutive days away from work, are computerized, so that the number of medical only COVID-19 paid claims was unknown. This limitation presumably explains some percentage of the relatively small numbers of paid COVID-19 claims but does not explain the small number of death benefits for COVID-19 paid by workers' compensation. Of the 2,909 unpaid COVID-19 claims, 838 had less than seven consecutive days away from work. We have no additional information to determine if the unpaid COVID-19 claims were or were not work-related.

From 3/10/20-3/20/21, health care workers and first responders who developed COVID-19 were presumed to develop COVID-19 from work and be eligible for workers' compensation benefits. This presumption is reflected in that 89% of the paid COVID-19 claims were either health care providers or first responders and the that the proportion of paid to non-paid COVID-19 claims were generally greater in these two industries (Tables 6 and 7). Also, the number of unpaid COVID-19 claims increased when the presumption ended in March 2020 (Figure 2).

There are two other sources in addition to Workers' Compensation to examine the association between COVID-19 and work. For 2020 through 05/31/21, there were 454 reports, including 80 fatalities made by employers to Michigan OSHA. The median age was 56 (range 24-83), 62% were women, 79% worked in health care (59% hospitals, 14% long term care facility, 5% outpatient, 1% other), 11% worked in government and 4% in manufacturing. Forty-seven

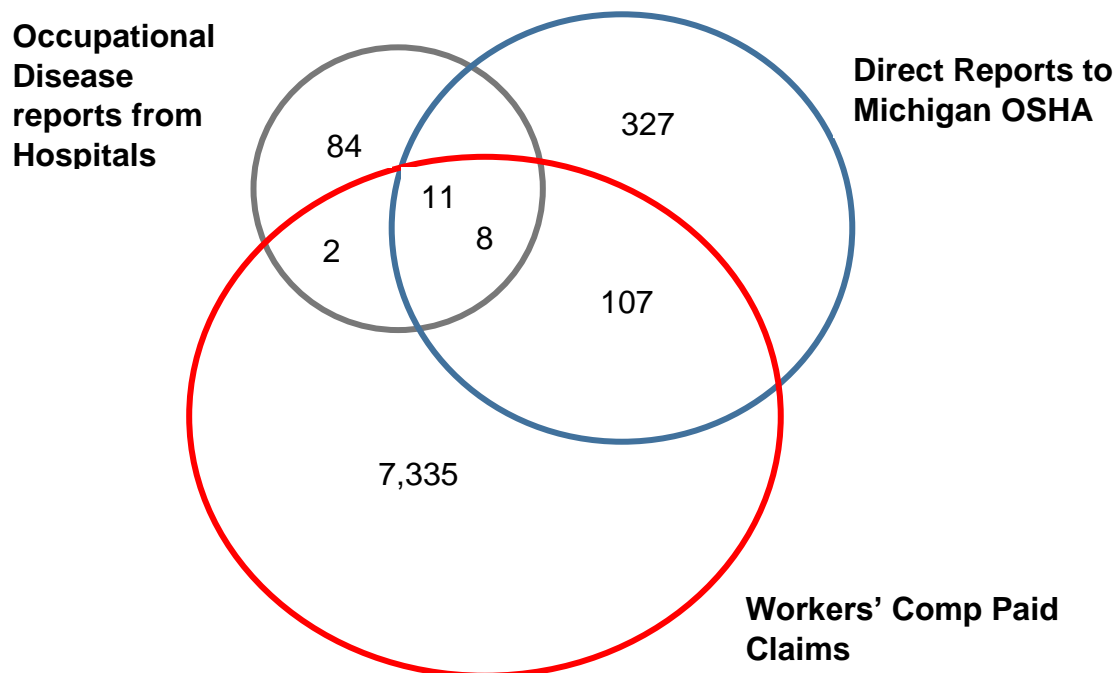
percent of the employer reports were in the spring of 2020 during the first surge of COVID-19 and 30% during the second surge in the fall of 2021.

For 2020 through 03/31/21, hospitals reported 125 work-related COVID-19 cases including six fatalities. The median age was 49 (range 20-77), 67% were women, 76% worked in health care (55% hospitals, 12% long term care facility, 9% outpatient, 1% other), 13% worked in government and 2% in manufacturing. Twenty-one percent of the hospital reports were in the spring of 2020 during the first surge of COVID-19 and 34% during the second surge in the fall of 2021.

Another measure of the connection of COVID-19 to work is the number of complaints and referrals received by Michigan OSHA about COVID-19. Since March 2020, Michigan OSHA processed a total of 16,871 complaints and referrals for COVID-19. In 2021 an estimated 85% of this year's complaints/referrals were COVID-related. MIOSHA mailed 4,387 recommendation letters, conducted 3,131 letter investigations, and conducted 1,876 COVID-19 onsite inspections, issuing 370 citations. In comparison, for the five preceding years 2015-2019, the agency processed 15,415 total complaints and referrals, which amounts to approximately 3,100 complaints and referrals per year.

Figure 3 shows a Venn diagram of the overlap of cases from the three sources. The total unique number after accounting for reports from more than one source was 7,894 cases, including 86 fatalities. This number is presumed to be a marked undercount as these 7,894 cases, which included first responders, all health workers and correction officers is smaller than just the 23,475 COVID-19 cases on the MDHHS website among staff from long term care facilities, all of whom met the workers' compensation criteria that their COVID-19 was presumed to have developed from a work exposure unless proven otherwise.

Figure 3. Venn Diagram of Sources of Work-Related COVID-19 Cases, Michigan. Total 8,050 Cases Representing 7,894 Unique Individual Cases



As has been shown with other conditions the number of workers who apply for workers' compensation despite their eligibility to apply is a marked underestimate of the disease burden. Workers' compensation however remains a valuable source of data as one part of a multi-source surveillance system. Plans are to continue to collect this data as we continue to monitor the COVID-19 pandemic and also assess the occurrence of the long term effect of a COVID-19 infection.

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Appendix 1

CLAIM STATUS

The claim status is displayed when the line item is a "claim". The status is calculated by the system based on current activity of the claim.

When the status "CONVERTED" is displayed, the SSN/DOI was converted and there has been no activity on WORCS for the claim. Otherwise, the contested activity status is displayed before the slash, payment status of the claim following the slash. When the claim has been redeemed, the status field will begin with "RD" in addition to the following scheme.

BEFORE SLASH:

A: (appealed) the DOI has been involved in some type of litigation that is currently active in an appeal to a higher court.

C: (contested) indicates that the DOI has been alleged on a hearing application (104A or 104C) and is currently involved in some type of litigation with the bureau.

C-A: (contested-appealed) the DOI is currently involved in some type of litigation with the bureau and an active appeal simultaneously.

CVT: (converted claim) the DOI was converted from COMPMAS. When displayed before the slash, WORCS payment activity is also displayed. When displayed after the slash, WORCS payment activity does not exist.

NC: (non-contested) there has been a claim form filed establishing the injury date.

R: (resolved) the DOI has been involved in some type of litigation (or appeal) which has a final disposition.

AFTER SLASH:

CLOSED: the claim was converted with an outstanding Notice of Dispute and no further activity has been entered on WORCS after 60 days. WORCS does not know whether payments were reported before conversion.

NLT: (no lost time) insufficient time was lost as a result of the injury; compensation benefits are not due.

NPC: (non-paid closed) there is no record of benefits having been paid as a result of the claim, no further activity is expected.

NPO: (non-paid open) there is no record of benefits having been paid as a result of the claim, however filing is expected to report payment of benefits due. (i.e., the receipt of an F106, F100 indicating lost time or specific loss benefits due, order issued directing payment of benefits.

PD (paid) benefits are not currently being paid on the claim but have been in the past.

PAY (paying) payment of weekly compensation benefits are currently being made. (When CVT is before slash, the 'paying' status may indicate that COMPMAS had an 'outstanding' 101 at the time of conversion. The Compensation Benefit Summary screen (SEL 124) will display the payment activity updated since implementation of WORCS)

70% (paying 70% appeal benefits) payment of weekly compensation benefits are currently being paid for an open award which is on appeal.

<60 (pending less than 60 days) a notice of dispute was filed, no benefits have been reported and the status is pending for 60 days awaiting further activity. (After 60 days with no activity status is reset to NPC)

CLAIM STATUS

CODE	DESCRIPTION	CODE	DESCRIPTION	CODE	DESCRIPTION
00	CONVERT	23	C/70%	43	R/70%
01	CVT/PAY	24	C/NPO	44	R/NPO
02	CVT/PD	25	C/NPC	45	R/NPC
03	CVT/70%	26	C/NLT	46	R/NLT
04	CVT/NPO	27	C/< 60	47	R/P<60
05	CVT/NPC	28	C/CLS	48	R/CLS
06	CVT/NLT	30	A/CVT	50	C-A/CVT
07	CVT/<60	31	A/PAY	51	C-A/PAY
08	CVT/CLS	32	A/PAID	52	C-A/PAID
11	NC/PAY	33	A/70%	53	C-A/70%
12	NC/PAID	34	A/NPO	54	C-A/NPO
14	NC/NPO	35	A/NPC	55	C-A/NPC
15	NC/NPC	36	A/NLT	56	C-A/NLT
16	NC/NLT	37	A/< 60	57	C-A/<60
17	NC/< 60	38	A/CLS	58	C-A/CLS
20	C/CVT	40	R/CVT		
21	C/PAY	41	R/PAY		
22	C/PAID	42	R/PAID		