

Incidence of COVID-19 and Worker's Compensation Utilization Among Food Manufacturing Workers in Wisconsin, October 1, 2020 – December 31, 2021

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ABSTRACT

Background: The food manufacturing industry is a critical economic sector and has been a high-risk industry for COVID-19. This analysis aimed to describe COVID-19 cumulative case incidence rates among Wisconsin food manufacturing workers and their worker's compensation utilization.

Methods: This was a descriptive analysis of COVID-19 cases among food manufacturing industry workers in Wisconsin from October 1, 2020, through December 31, 2021.

Results: Occupations with the highest cumulative case incidence rate (per 1000 workers) were Packers and Packers, Hand (275; 95% CI, 252–300), Packaging and Filling Machine Operators and Tenders (266; 95% CI, 254–277), and Laborers and Freight, Stock and Material Movers, Hand (261; 95% CI, 247–276). Two worker's compensation claims were paid to food manufacturing workers.

Discussion: Wisconsin food manufacturing workers were disproportionately affected by COVID-19, with a high cumulative case incidence rate exceeding that of the manufacturing industry overall, statewide non-institutionalized working-age adults, and the ambulatory health care industry. There was also a disproportionately low use of worker's compensation benefits in Wisconsin compared to the high COVID-19 disease incidence. Improved worker protections for occupational infectious diseases with high risk of transmission are needed as well as improvements to the worker's compensation system.

BACKGROUND

The food manufacturing industry represents approximately 15% of the total manufacturing workforce, 1% of US non-farm workers, and has been a major contributor to the economy.^{1,2} Many workers in the food manufacturing industry are at high risk of exposure to respiratory pathogens given that tasks are often performed in close proximity to other workers and in poorly ven-

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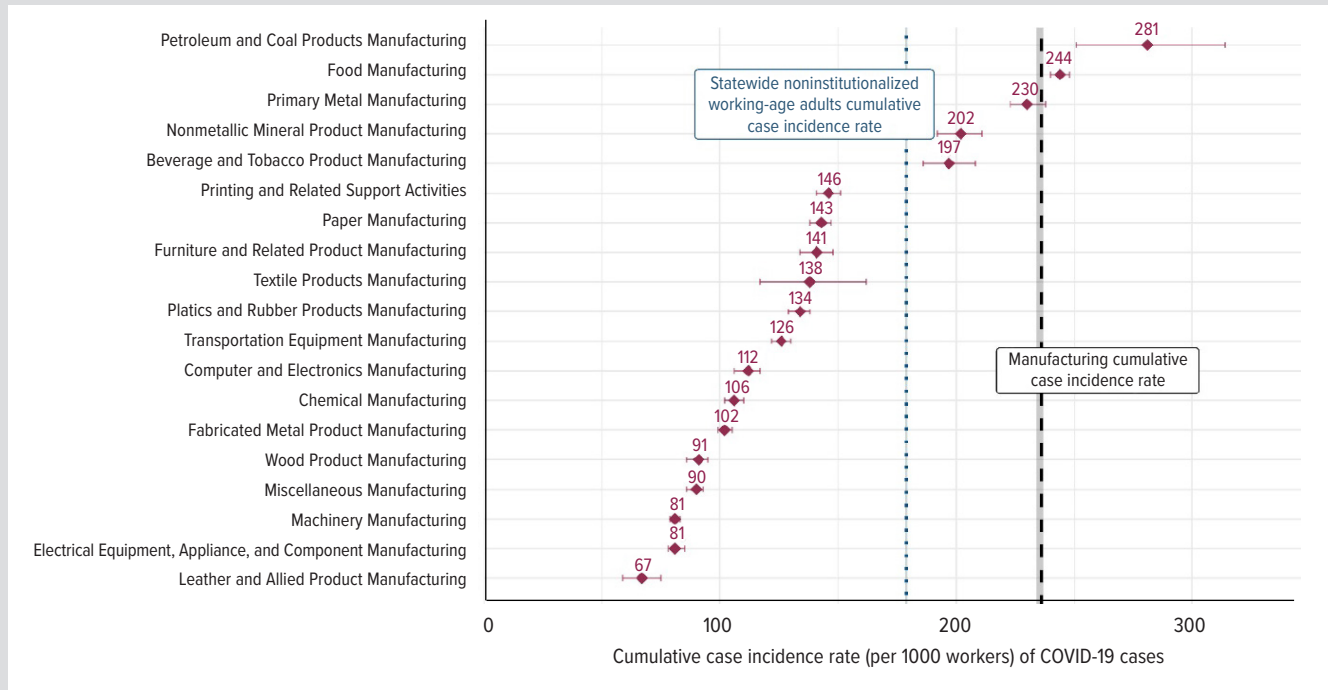
tilated environments without respiratory protection measures.³ During the COVID-19 pandemic, workers in the food manufacturing sector were categorized as “essential” to maintain operations without the accompanying benefits (paid leave, worker's compensation presumption) and testing privileges afforded other occupations, such as health care workers.

In Wisconsin, the COVID-19 pandemic placed a heavy burden on the food manufacturing industry. It had the highest case incidence (14 cases per 100 full-time equivalents) among manufacturing subsectors,⁴ and several fatal cases of COVID-19 occurred among food industry workers, which resulted in Occupational Safety and Health Administration investigations and fines to employers.⁵

Wisconsin did not enact a rebuttable presumption law covering food manufacturing workers who filed worker's compensation (WC) claims for COVID-19, which left the burden of proof on workers to establish the work-relatedness of any infections. Despite widespread attention to COVID-19 risks among food manufacturing workers, no studies have quantified COVID-19 incidence at the detailed occupation level or number of WC claims associated with this specific industry. Understanding which workers within this broader industry were most affected is necessary to advance targeted prevention measures in future outbreaks and also can generate a better understanding of respiratory disease risks in industrial settings more generally.

This analysis aimed to describe COVID-19 case incidence rates among these workers as well as their WC utilization.

Figure 1. Cumulative Case Incidence Rates of COVID-19 by Manufacturing Subsector, October 1, 2020 – December 31, 2021



The blue dotted line represents the statewide noninstitutionalized working-age adults cumulative case incidence rate and the shaded area around the line represents the 95% CI.

The black dashed line represents the cumulative case incidence rate in the manufacturing industry and the shaded area around the line represents the 95% CI.

METHODS

This was a descriptive analysis of COVID-19 cases (positive molecular or antigen-based tests) among food manufacturing workers during October 1, 2020 – December 31, 2021, reported in the Wisconsin Electronic Disease Surveillance System (WEDSS). In WEDSS, we collected industry and occupation information as free text that we coded through the National Institute for Occupational Safety and Health (NIOSH) Industry and Occupation Computerized Coding System (NIOCCS) to obtain standardized industry and occupation codes. For industry, we retained the North American Industry Classification System (NAICS), and for occupation, we retained Standard Occupational Classification (SOC) code. Unemployment insurance data were used to supplement missing standardized industry codes in the surveillance data. Food manufacturing workers were defined by the corresponding NAICS code (311), which represents food manufacturing workers alone without including agricultural workers.

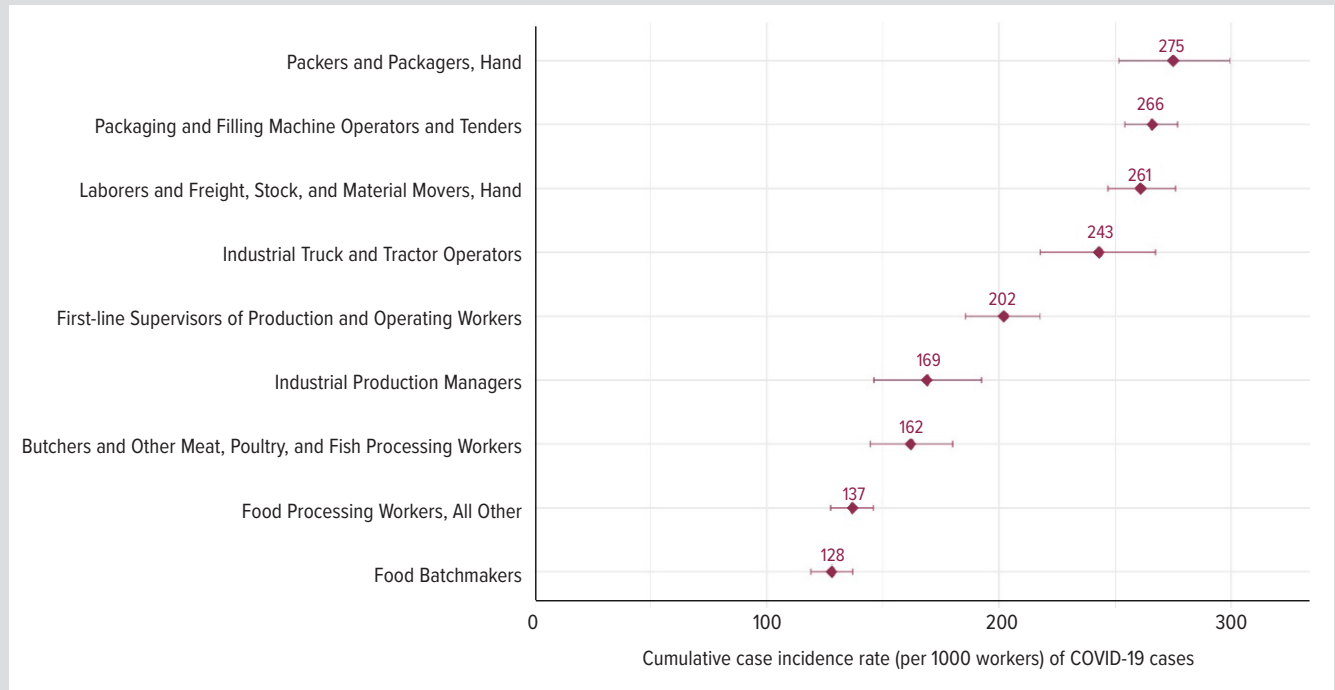
Inverse probability treatment weighting was used to adjust for missing industry and occupation data in a regression model in which the predictors were age, sex, race, ethnicity, jurisdiction, and episode date. We conducted a sensitivity check to verify the quality of the adjustment (Appendix 1). These weights were applied to the total number of cases with known industry and occupation to obtain the adjusted total number of cases by industry and occupation as well as all rates computed in this report. Denominators

were obtained from the 1-year American Community Survey 2020, and unreliable estimates (relative standard error >0.3) were excluded. Cumulative case incidence rates by detailed occupations expressed as cases per 1000 workers were computed along with their 95% confidence intervals. The chi-square test was performed to assess the strength of association with a significance threshold of 0.05. The WC data included indemnity claims reported to the state by the insurers. We linked the WC claim data to the unemployment insurance data by the employer's federal employer identification number or the employer's name to obtain the corresponding industry code for each claim. The claims were filtered down to manufacturing claims only (NAICS codes 31, 32, 33). This claim dataset of manufacturing workers was linked to the COVID-19 surveillance data on full name and date of birth to obtain the number of claims that pertained to manufacturing workers. We suppressed lost work time and payment information if the total number of claims was less than 5. For comparison purposes, we compared the number of claims, cumulative case incidence rate, and paid claims in the food manufacturing industry to the health care industry, which includes ambulatory health care services (NAICS 621), hospitals (NAICS 622), and nursing and residential care facilities (NAICS 623).

RESULTS

After adjustment for missing industry and occupation, among

Figure 2. Cumulative Case Incidence Rates of COVID-19 Among Occupations Within Food Manufacturing Industry, October 1, 2020 – December 31, 2021



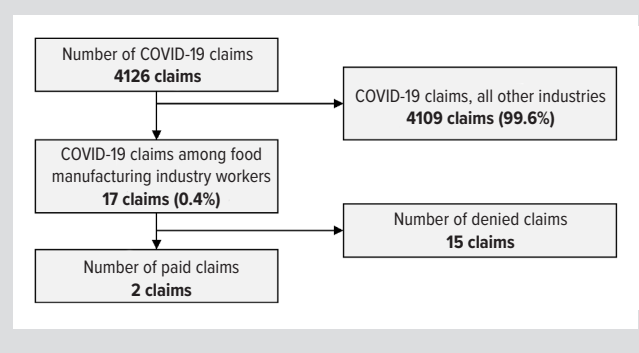
Note: Butchers and Meat Cutters; Slaughterers and Meat Packers; Meat, Poultry and Fish Cutters and Trimmers were grouped into their broad occupation group that is Butchers and Other Meat, Poultry, and Fish Processing workers due to a lack of subcategory denominators for these groups.

non-health care industries, manufacturing was the industry sector with the highest case count (n=112733) (Appendix 2), out of which the food manufacturing subsector had the highest case count (n = 17604, 15.6%) and the second highest cumulative case incidence rate of 244 cases per 1000 workers (95% CI, 240 - 247, Figure 1 and Appendix 3). The food manufacturing industry cumulative case incidence rate was higher than that of the overall manufacturing sector (236 cases per 1000 workers; 95% CI, 234-237, Figure 1), non-institutionalized working-age adults (179 cases per 1000 workers; 95% CI, 179-180, Figure 1), and ambulatory health care services (220 cases per 1000 workers; 95% CI, 217 - 222, Appendix 3).

COVID-19 rates varied significantly between occupations within the food manufacturing industry (Figure 2), where 5 occupations had a cumulative case incidence rate exceeding that of the statewide non-institutionalized working-age adults. The top 3 occupations with the highest cumulative case incidence rate per 1000 workers were Packers and Packagers, Hand (275; 95% CI, 252 - 300), Packaging and Filling Machine Operators and Tenders (266; 95% CI, 254 - 277), and Laborers and Freight, Stock and Material Movers, Hand (261; 95% CI, 247 - 276) (Figure 2).

During the study period, 4126 COVID-19 claims were reported for all industries and occupations, out of which 70.5% (n=2909 claims) were denied. The proportion of claims reported by food manufacturing workers represented 0.4% (n=17) of COVID-19 claims, out of which 2 claims were paid for lost work

Figure 3. Worker's Compensation Claims of Food Manufacturing Industry Workers



time (Figure 3). By contrast, 44% (n = 1243) of health care workers' claims were paid for lost work time.

DISCUSSION

We demonstrated that Wisconsin food manufacturing workers were disproportionately affected by COVID-19, with a high cumulative case incidence rate exceeding that of the manufacturing industry overall, statewide non-institutionalized working-age adults, and the ambulatory health care industry. Cumulative case incidence rates varied significantly between occupations within the food manufacturing industry, with the highest rates observed among Packers and Packagers, Hand; Packaging and Filling Machine Operators and Tenders; and Laborers and Freight, Stock

and Material Movers, Hand. These occupations are known to involve close proximity work, as well as group, team, and face-to-face interactions,⁶ which may have increased the risk of COVID-19 transmission.

The extremely low WC utilization of food manufacturing worker cases contrasted with relatively high utilization of WC by health care industry workers, despite both industry subsectors having high COVID-19 cumulative case rates. While our data limit our ability to know why claim filing was so low, differences likely were driven by the fact that health care workers were covered by rebuttable presumption while manufacturing workers were not. In addition, it is possible that food manufacturing workers were discouraged by fears of retaliation from employers, including loss of employment during a pandemic where the likelihood of getting another job was small.⁷ However, during the pandemic, the federal paid sick leave policy implemented by many companies served as an alternative to filing WC claims for lost work time. Regardless, there was a disparity in workers' protection and a need for food manufacturing workers' protection as illustrated by an article in the *Milwaukee Journal Sentinel*.⁸ The underdetection of COVID-19 among food manufacturing workers could also reduce their WC utilization because proof of a positive test result is needed to file a claim. Finally, the low payouts of successful claims may disincentivize lawyers from taking cases disputed by the employer, which during the study period was more likely for food manufacturing workers than those covered by presumption (ie, health care workers and other first responders).

A strength of our analysis was our ability to generate rates at the detailed occupation level, which increases accuracy and allows for cross-occupation comparisons. Another strength was the use of the inverse probability treatment weighting to adjust for missing industry and occupation response in our surveillance data. A limitation was the absence of behavioral data on COVID-19 by industry and occupation, which could affect patterns of exposure, testing, and claiming.

Although the cumulative COVID-19 incidence rate among food manufacturing workers was high, this rate is likely underestimated given that statewide testing goals were not met, and throughout the pandemic, testing priority was given to frontline workers—especially health care workers.⁹ Additionally, economic disadvantages and linguistic barriers of this disproportionately temporary, immigrant, and undocumented workforce are well documented barriers to WC claiming and public health outreach.¹⁰ Therefore, it is more likely to result in lower completion of case interviews where industry and occupation are collected.

Overall, our study showed a disproportionately low use of WC benefits in Wisconsin compared to the high COVID-19 disease incidence. There is a need for improved worker protections for occupational infectious diseases with high risk of transmission and the need to strengthen the worker safety net through improvements to the WC system.

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Ethics Approval: The University of Wisconsin Institutional Review Board (UW-IRB) provided written approval for the Wisconsin Fundamental-Plus Occupational Health Surveillance Program (Submission ID number: 2013-0331-CR010) under which this study was performed. The UW-IRB determined that this study met the requirements of public health surveillance as defined in the US Department of Health and Human Services regulations for the protection of human subjects (45 CFR 46.102(l)(2)). This analysis did not require the informed consent of cases as these were administrative data reported to statewide public health surveillance databases.

Appendices: Available at www.wmjonline.org.

REFERENCES

1. Dong X, Zachary JC. Food and beverage manufacturing. Economic Research Service, U.S. Department of Agriculture. Updated September 27, 2023. Accessed May 23, 2023. <https://www.ers.usda.gov/topics/food-markets-prices/processing-marketing/manufacturing>
2. Kassel K, Martin A. Ag and food sectors and the economy. Economic Research Service, U.S. Department of Agriculture. Updated September 26, 2023. Accessed December 1, 2022. <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy>
3. De Matteis S, Heederik D, Burdorf A, et al. Current and new challenges in occupational lung diseases. *Eur Respir Rev*. 2017;26(146):170080. doi:10.1183/16000617.0080-2017
4. Pray IW, Grajewski B, Morris C, et al. Measuring work-related risk of coronavirus disease 2019 (COVID-19): comparison of COVID-19 incidence by occupation and industry-Wisconsin, September 2020 to May 2021. *Clin Infect Dis*. 2023;76(3):e163-e171. doi:10.1093/cid/ciac586
5. Perez M. Meatpacking plants tied to more COVID-19 cases than known before, new business outbreak data shows. November 25, 2020. *Milwaukee Journal Sentinel*. Accessed November 24, 2021. <https://www.jsonline.com/story/news/2020/11/25/meatpacking-plants-tied-more-covid-19-cases-than-known-new-business-outbreak-data-shows/6376197002/>
6. Work Group on Essential Workers - Exposure Measures Team, Council of States and Territorial Epidemiologists (CSTE). Characterizing the risk of exposure to SARS-CoV-2 among non-health care occupations based on three workplace risk factors: public facing work, working indoors, and working in close physical proximity to others. April 8, 2021. Updated August 18, 2021. Accessed September 12, 2022. <https://resources.cste.org/SARS-CoV-2-Occupational-Exposure-Matrix-Industry-Extension/>
7. Miller L. COVID-19: workers face retaliation for demanding safety. August 15, 2020. Los Angeles Times. Accessed November 1, 2022. <https://www.latimes.com/california/story/2020-08-15/coronavirus-workers-retaliation-claims>
8. Perez M. 'Please do something': as COVID-19 swept through Wisconsin food plants, companies, government failed to protect workers. *Milwaukee Journal Sentinel*. July 31, 2020. Updated January 22, 2021. Accessed November 24, 2021. <https://www.jsonline.com/story/news/2020/07/31/wisconsin-food-plants-failed-protect-workers-covid-19-smithfield-birds-eye-diversified-meats-calumet/5334812002/>
9. Gov. Evers announces \$1 billion statewide effort to support COVID-19 testing, contact tracing, operations, and resources for local communities. News release. Tony Evers, Office of the Governor, State of Wisconsin. May 19, 2020. Accessed January 13, 2023. <https://content.govdelivery.com/accounts/WIGOV/bulletins/28c6a35>
10. Kyung M, Lee SJ, Dancu C, Hong O. Underreporting of workers' injuries or illnesses and contributing factors: a systematic review. *BMC Public Health*. 2023;23(1):558.

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