



# Refining estimates of occupational exposures and risk of workplace COVID-19 transmission

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# Acknowledgements

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- This research did not receive any project-specific funding.
- Special thanks to
  - members of the WSIB for facilitating access to the compensation claims data used in this study.
  - employees of Statistics Canada’s Research Data Centre at the University of Toronto for facilitating access to the Labour Force Survey information used in this study.
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# Study Team

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- Qing Liao, Faraz Vahid Shahidi, Aviroop Biswas, Lynda Robson, Victoria Landsman and Cameron Mustard

## Key messages

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- In the next pandemic, if we want to know how many infections are due to work exposures, more effort needs to be made to collect the right information to enable that to happen
- Occupational exposures were associated with increased risk of COVID-19 infections after adjustment for demographic and industry variables
- While the direction of risk for occupational exposures was consistent across waves of the pandemic, the magnitude of risk was not.
- These findings highlight the potentially dynamic nature of occupational exposures and COVID-19 risk across waves of the pandemic in Ontario.

# Background

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- Early in the COVID-19 pandemic, the workplace was identified as an important setting of infection
- Occupational exposures likely to increase risk of COVID-19 infection include working in close proximity to infected individuals, indoor settings with poor ventilation, and where infection control practices were inadequate
- Most studies examining work characteristics have been limited in two ways:
  - Treating all COVID-19 infections as work-related
  - Assuming anyone who has worked was still working, and was working at the workplace (e.g. using the 2016 Census to determine occupation and work status/location in 2020)

# Challenges for estimating work-related risk of COVID-19

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1. Determining which COVID-19 infections are work-related
2. Measuring occupational exposures that might increase risk
3. Identifying who in the labour market was still going to work (versus no longer employed or working from home)

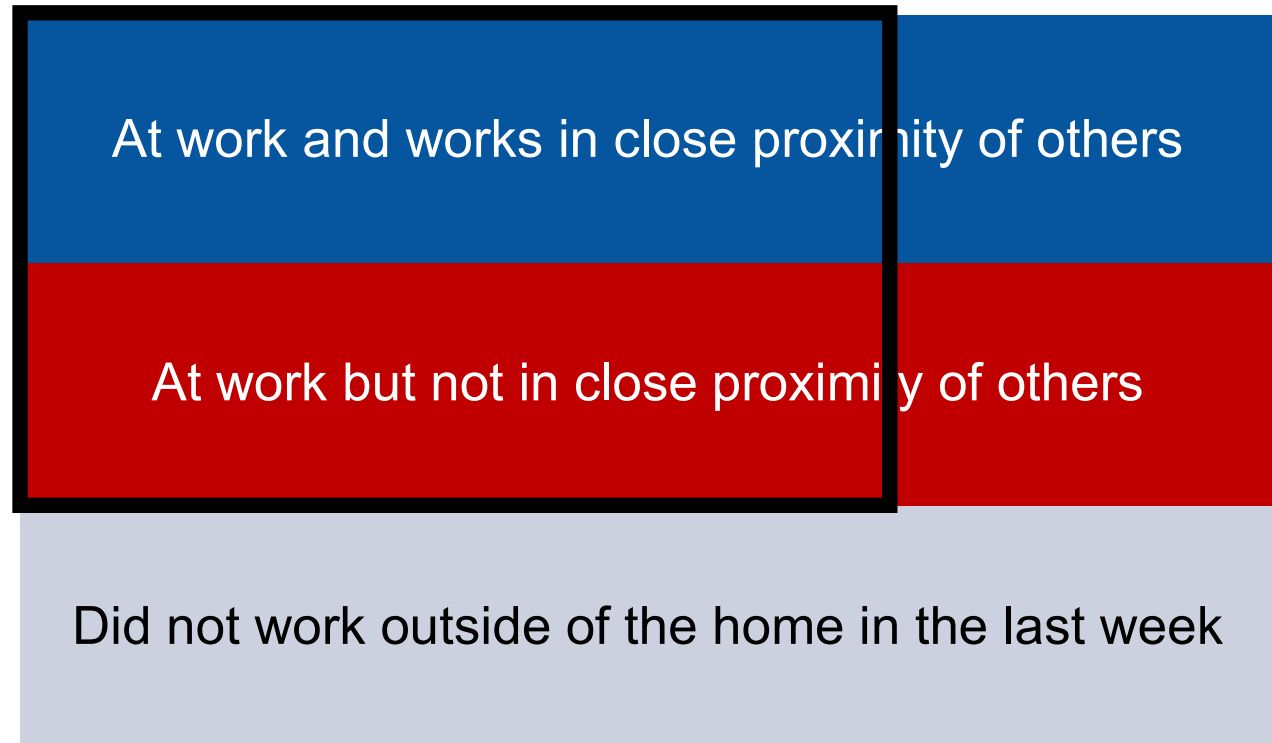
# Workers' compensation claims for COVID-19

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- In Canada, COVID-19 compensation claims were adjudicated for work-relatedness
- For a COVID-19 claim to be accepted, evidence was required that:
  - the risk of contracting COVID-19 at work was greater than the risk of contracting COVID-19 in the community, and
  - that work factors significantly contributed to the COVID-19 infection.
- While all cases of COVID-19 that are work-related may not be captured within workers' compensation claims, those that are, will almost definitely have been acquired through workplace exposure(s).

# Who is at risk for submitting a workers' compensation claim for COVID-19?

Works for an employer who is registered with the WSIB





## Limitations of full-time equivalent counts available in WSIB administrative data

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- They are tied to payroll estimates and premium payments
- They are not reported for schedule two firms
- They cannot be broken down by other employee characteristics (e.g. age, sex, occupational exposures)
- No information on hours of exposure at the workplace
  
- Many of these limitations can be addressed using information from Statistics Canada's Labour Force Survey

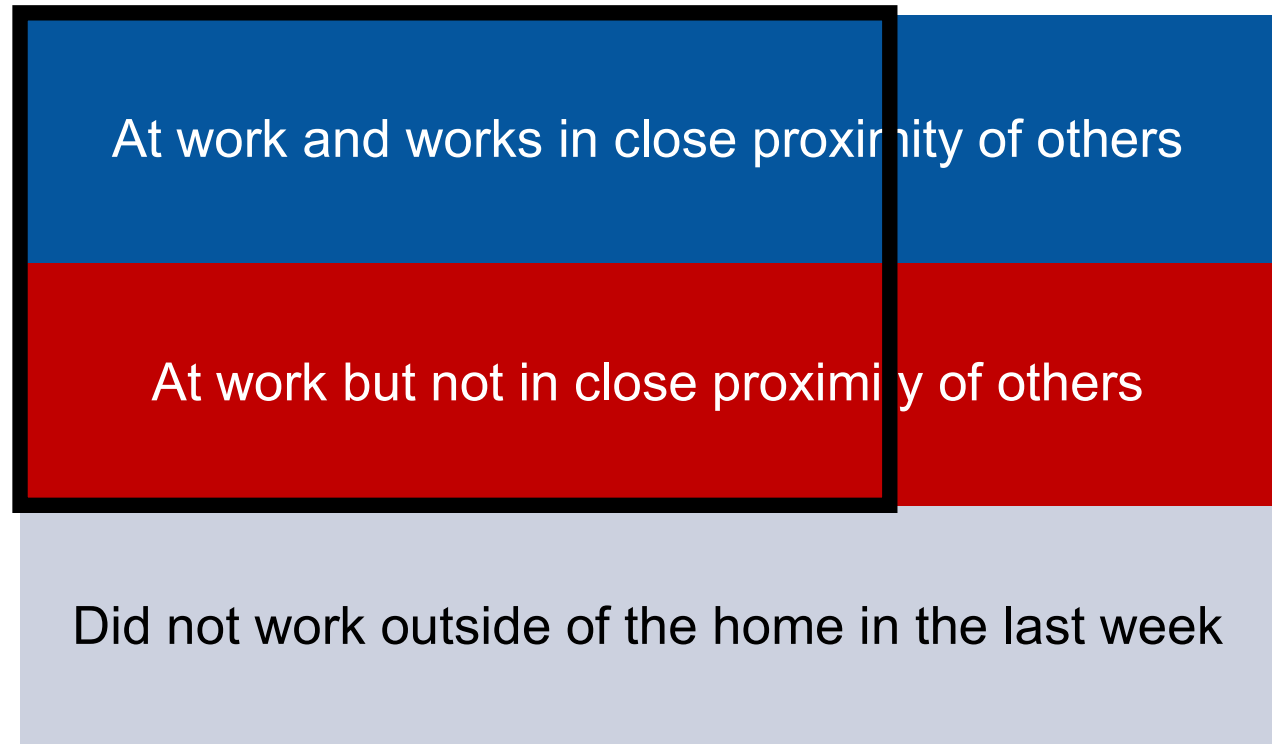
# Statistics Canada's Labour Force Survey

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- Monthly survey conducted by Statistics Canada to estimate labour force changes across occupations and industries in Canada.
- Representative of 98% of non-institutionalized Canadians aged 15 years and over
- Contains detailed information on a respondent's occupation and industry, as well as their sex and age (among other things).
- Starting in April 2020 a Supplement to the Labour Force Survey included COVID-19-relevant content

# Who is at risk for submitting a workers' compensation claim for COVID-19?

Works for an employer who is registered with the WSIB



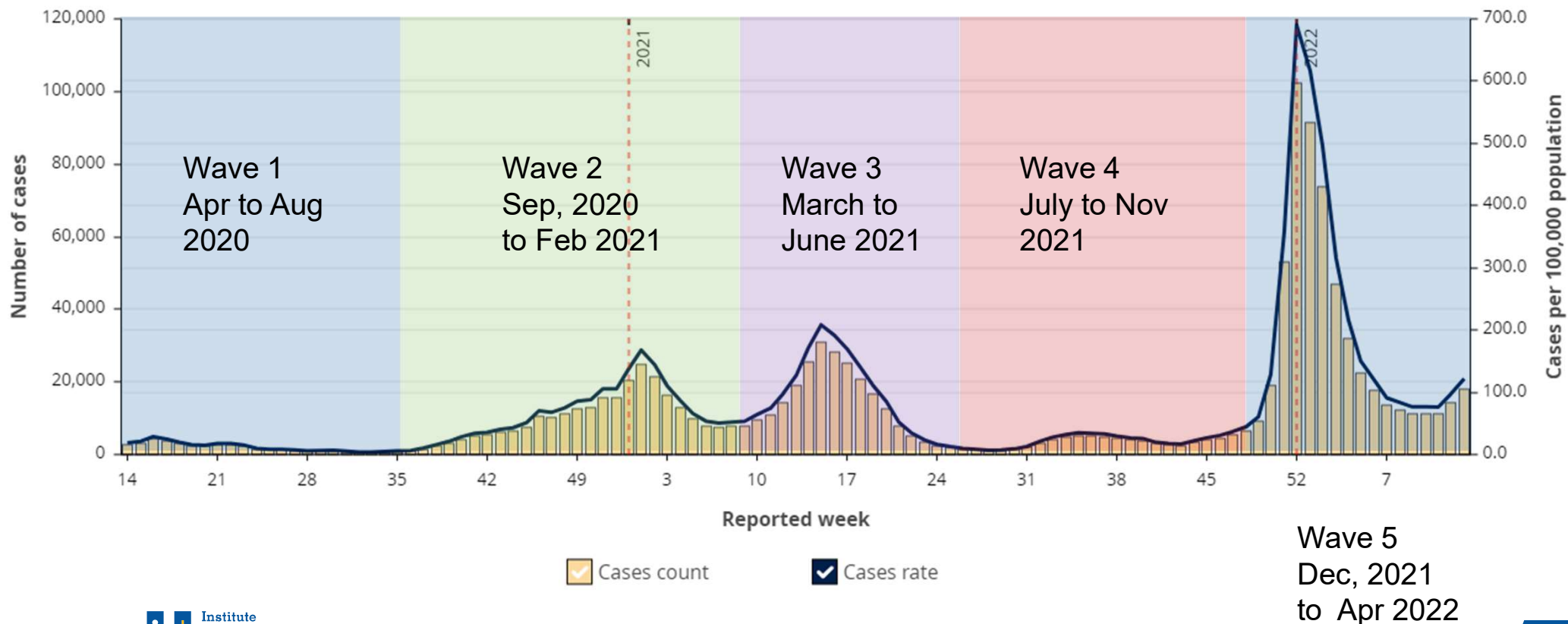
## Occupational exposures and risk of COVID-19 claim

	Had a COVID-19 claim	Did not have a COVID-19 claim	Total
Works in close physical proximity to others	a	b	(a + b)
Does not work in close physical proximity to others	c	d	(c + d)
	(a + c)	(b + d)	(a + b + c + d)

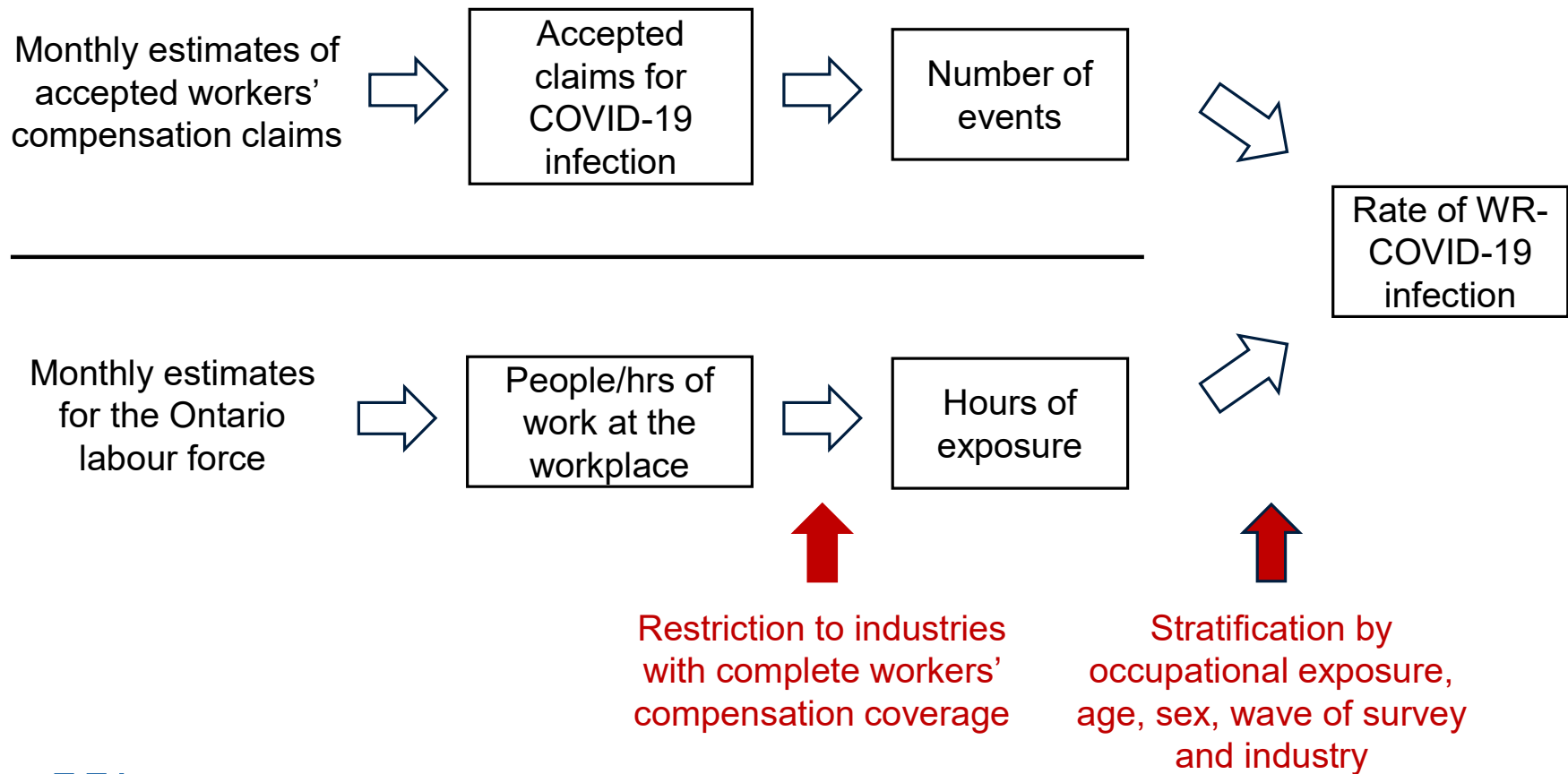
$$\text{Risk Ratio} = \frac{a / (a + b)}{c / (c + d)}$$

# COVID-19 cases in Ontario

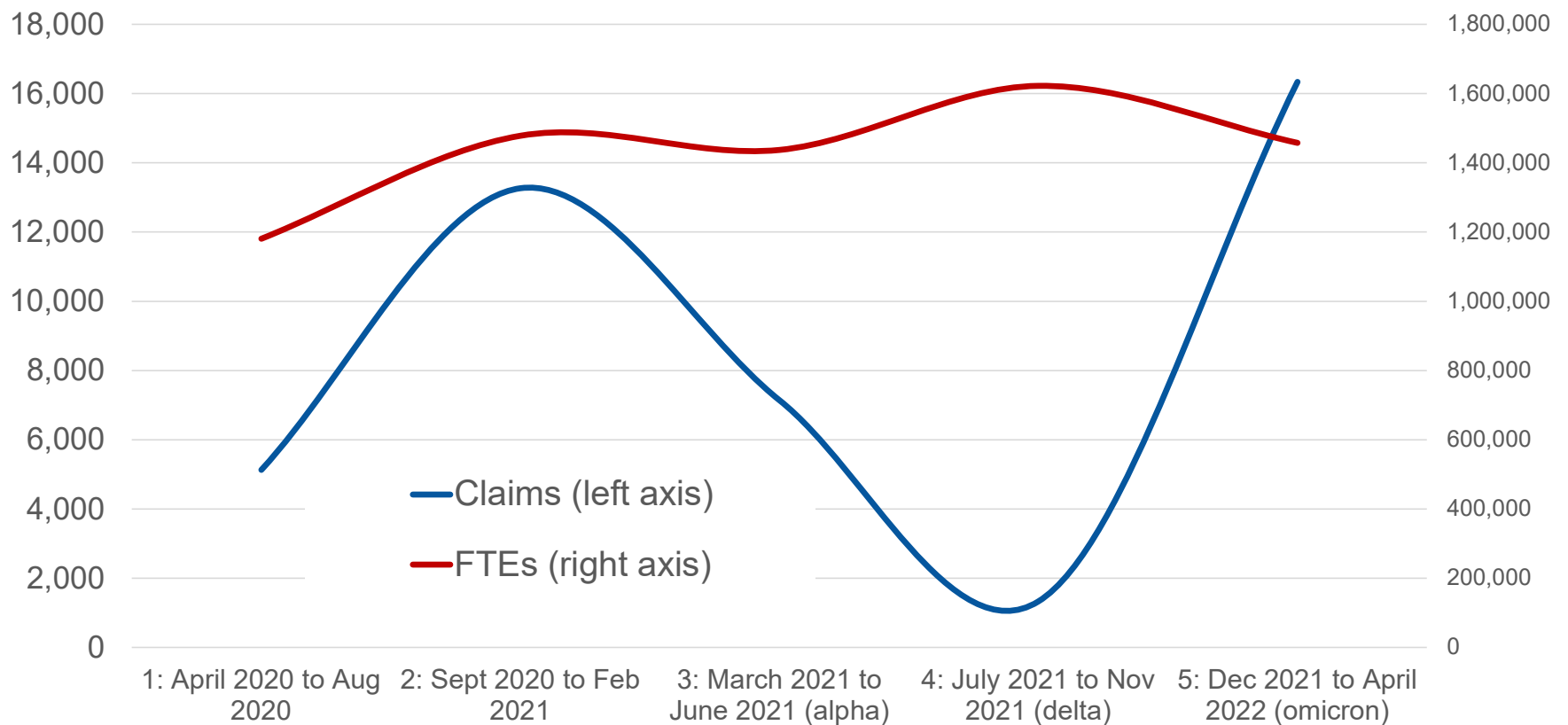
Laboratory confirmed COVID-19 weekly case counts and rates by reported date in Ontario



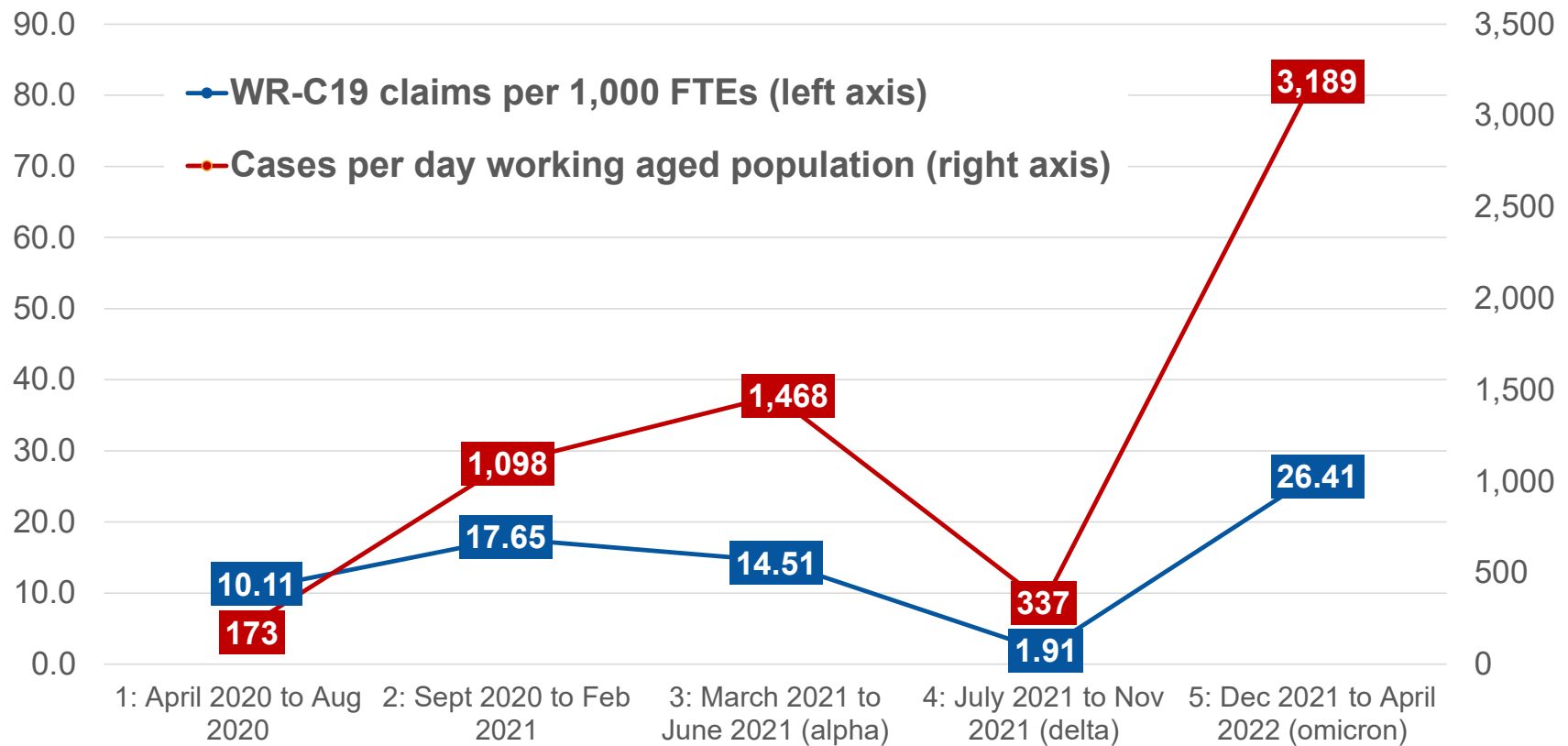
# Study information and methods



# Estimates of claims and full-time equivalents during different phases of the COVID-19 pandemic

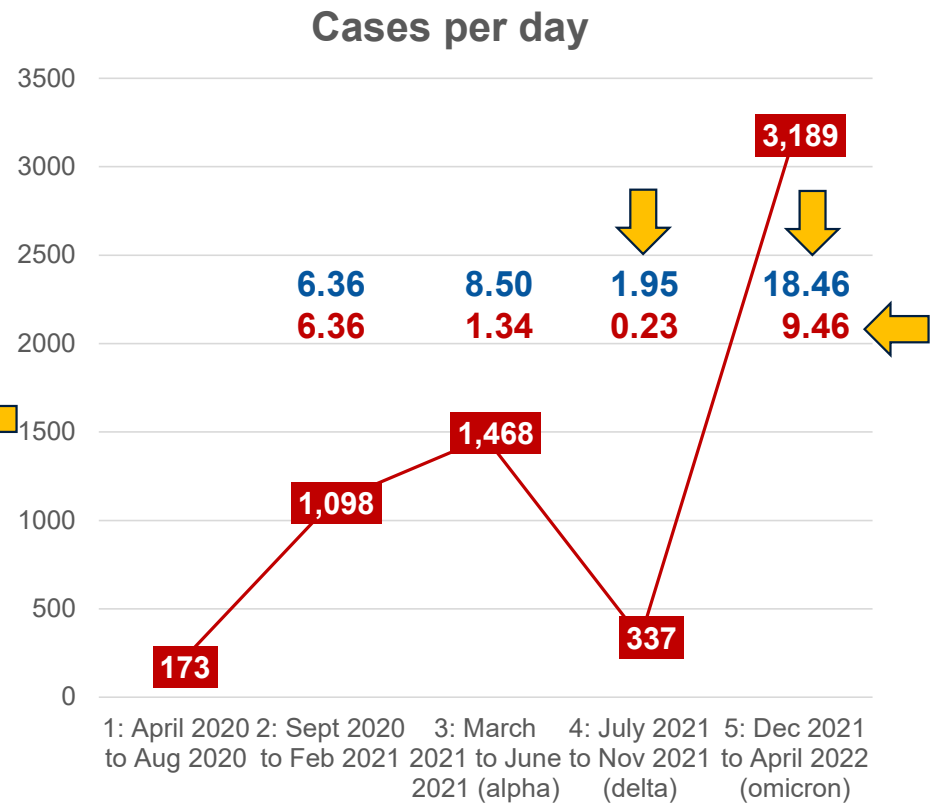
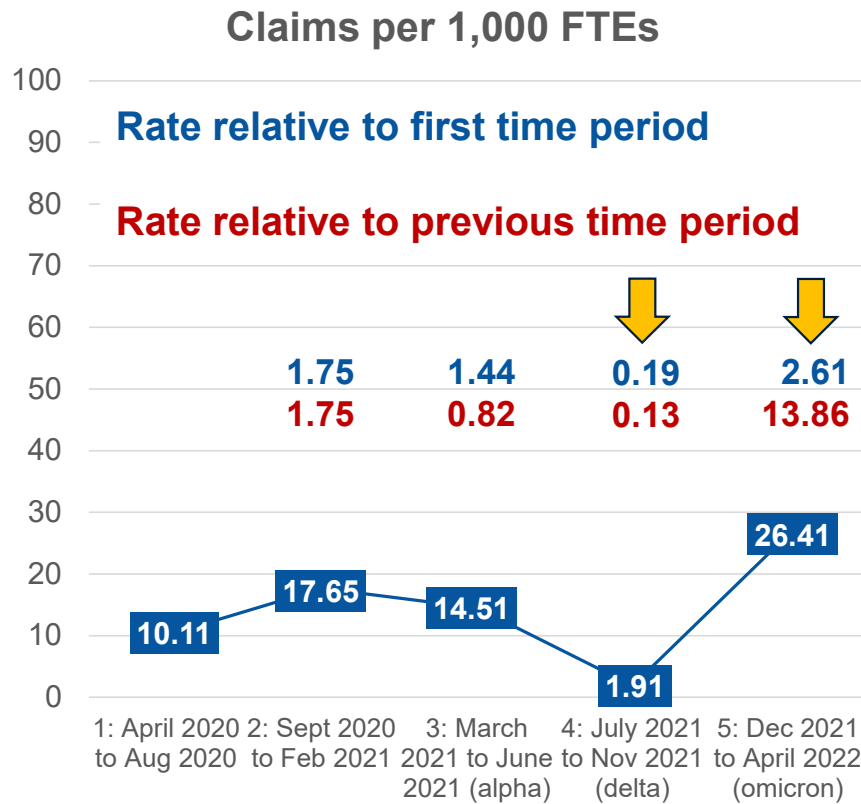


# Comparing trends in workers' compensation claims and overall rates of COVID among the working aged population

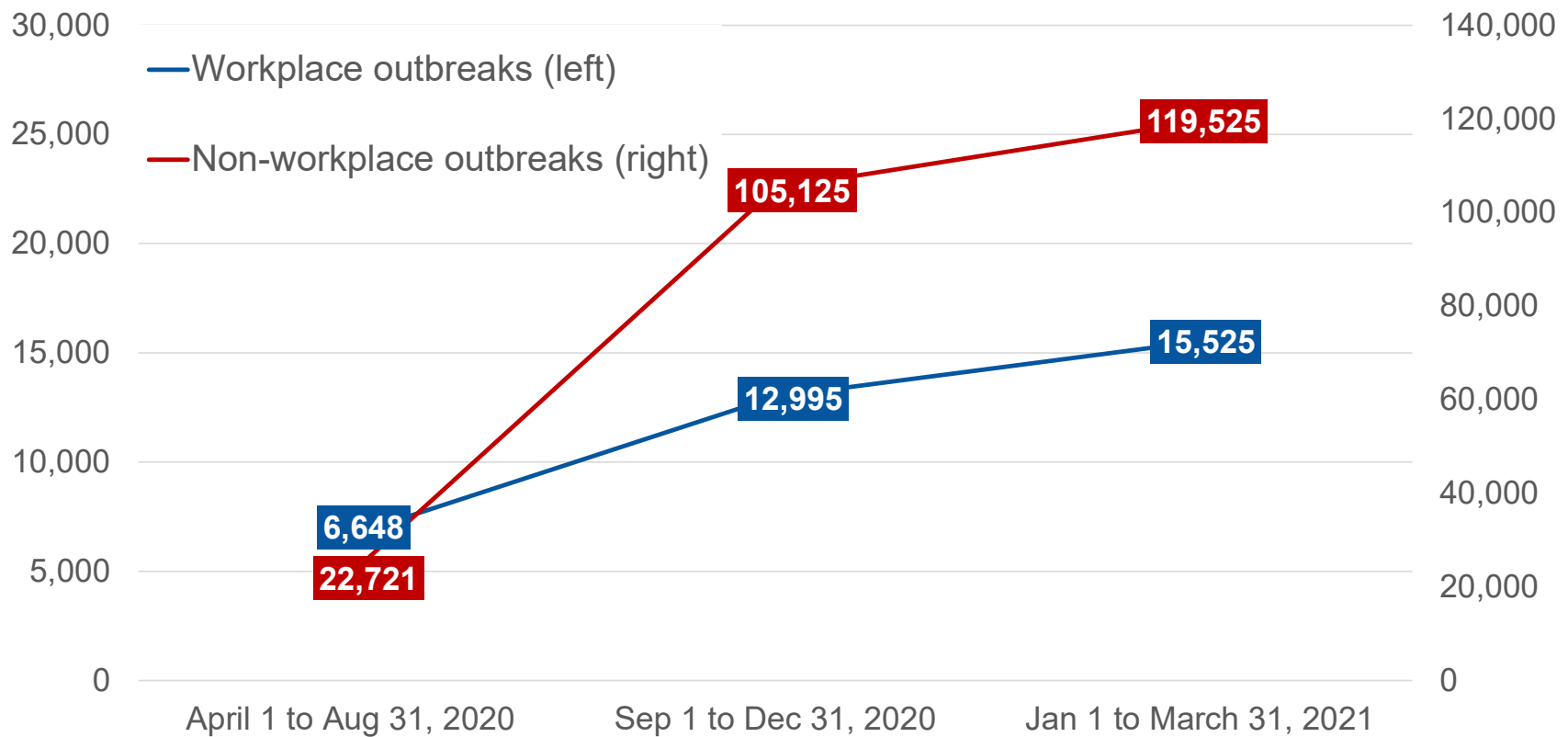




# Comparing trends in workers' compensation claims and overall rates of COVID among the working aged population



# COVID-19 infections due to workplace outbreaks and not due to workplace outbreaks. Ontario April 1, 2020 to March 31, 2021



# Key messages

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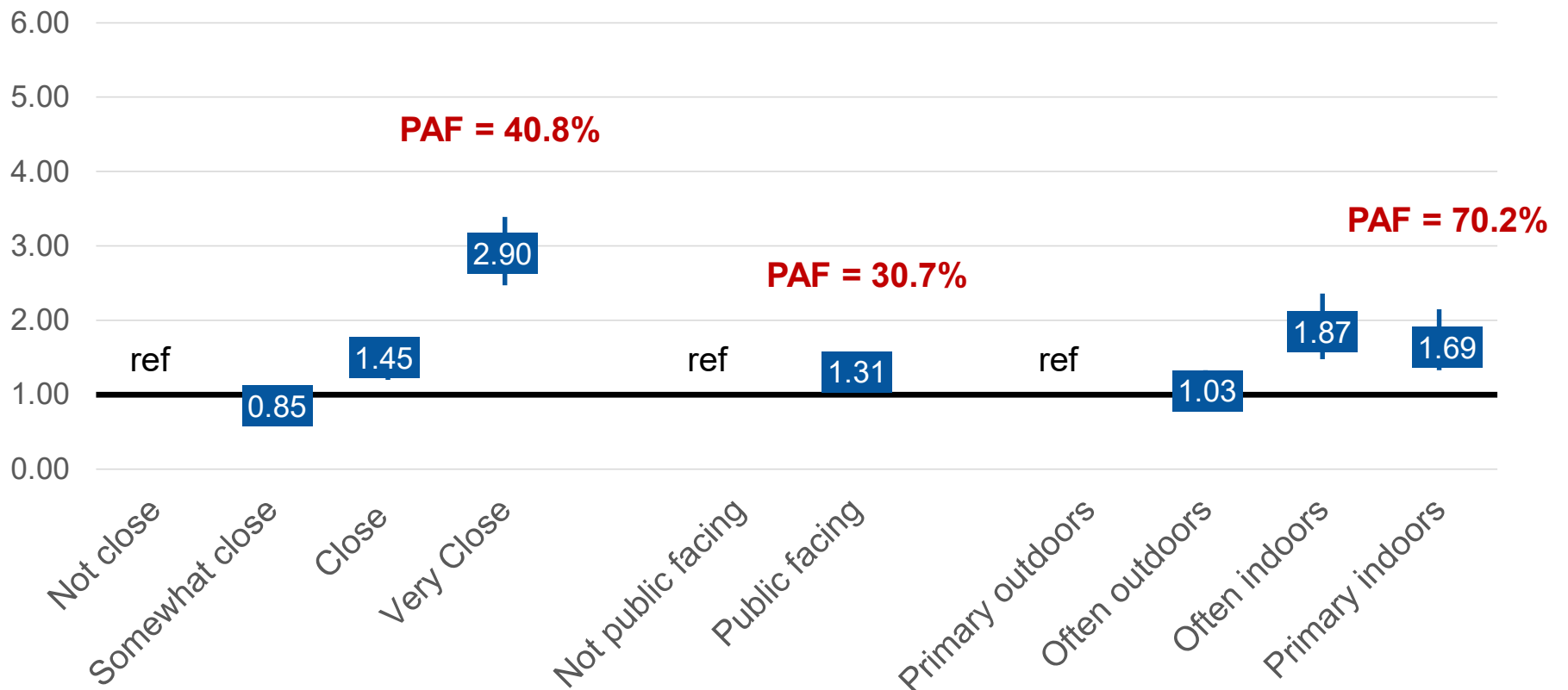
- In the next pandemic, if we want to know how many infections are due to work exposures, more effort needs to be made to collect the right information to enable that to happen.

# Occupational exposures that may increase work-related COVID-19 risk

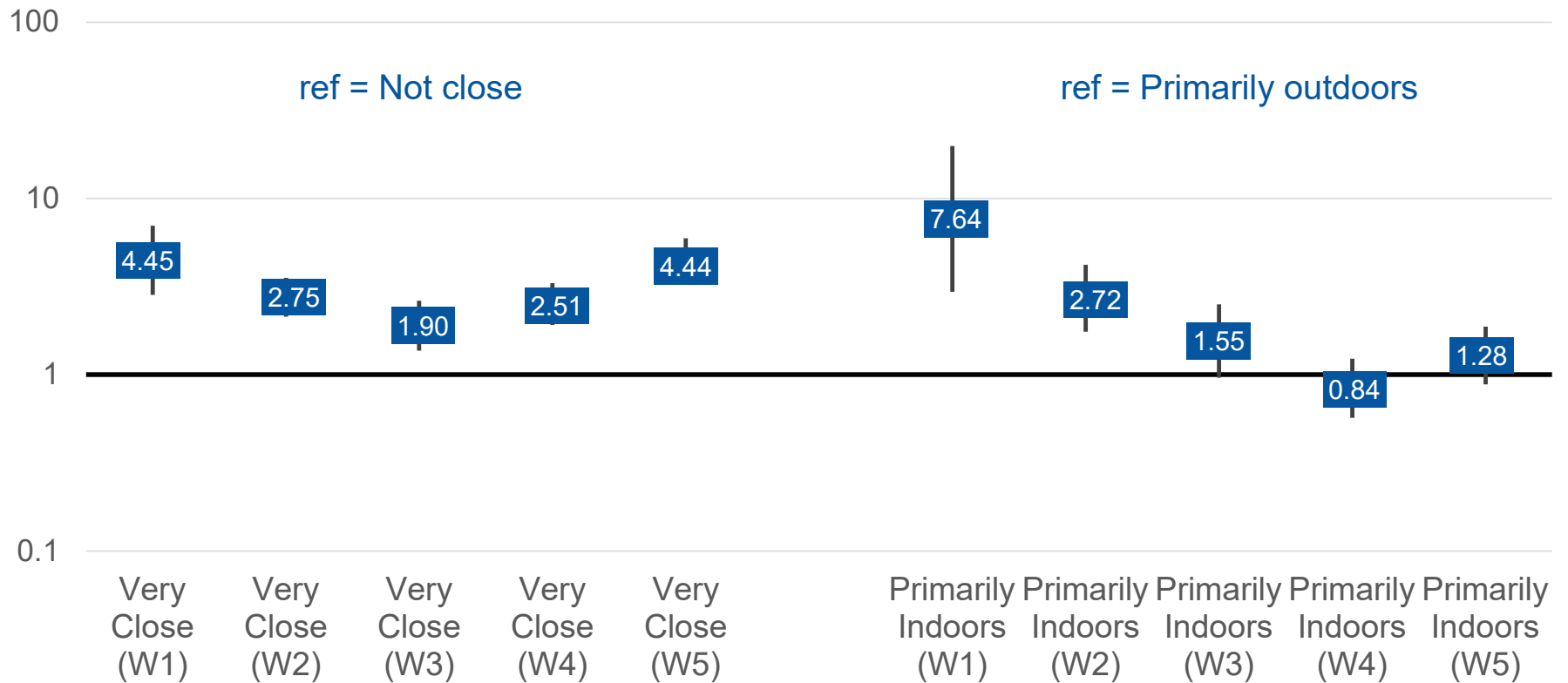
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- Proximity to others at work
- Public facing occupations
- Indoor versus outdoor work environment
- Overall risk (low, medium, high)
  
- Occupational exposures were assigned based on 4-digit occupational code (available in compensation claims and Labour Force Survey estimates), based on a job exposure matrix (JEM) developed by the US Council of State and Territorial Epidemiologists (CSTE) Occupational Health Subcommittee

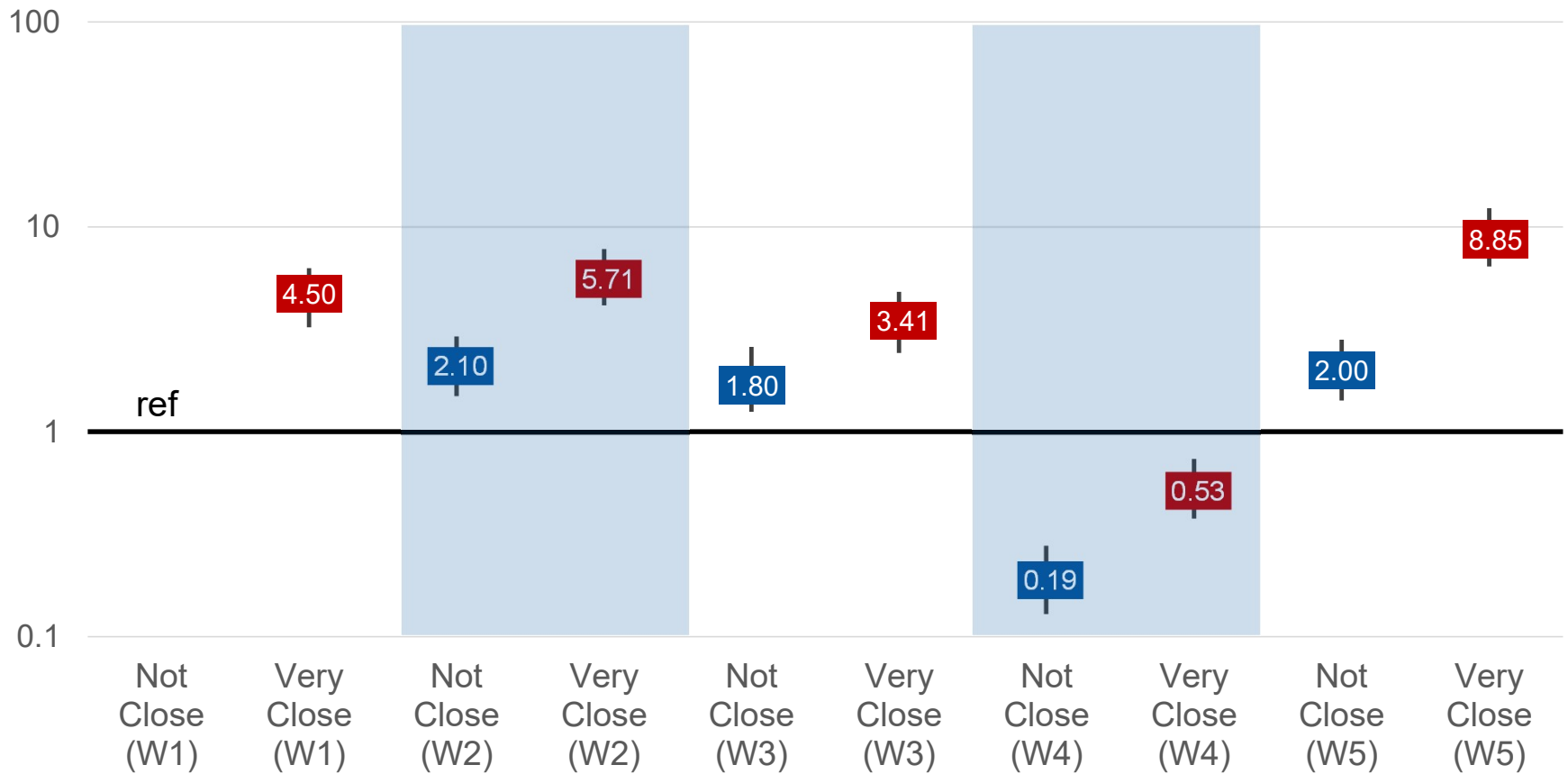
# Adjusted risk ratios for COVID-19 claims by occupational exposures



# Occupational exposures and risk ratios for COVID-19 claims by wave of the pandemic



# Occupational exposures and risk ratios for COVID-19 claims by wave of the pandemic. Very close versus not close



# Strengths and limitations

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## Strengths

- We were able to restrict the population at risk to the actual population at risk
- All COVID-19 infections included were almost definitely work related
- Ability to look at different phases in the COVID-19 pandemic

## Weaknesses

- General weaknesses of workers' compensation data as proxy for work-related injury and illness
- Job exposure matrix to assign exposures
- Inability to further adjust models for variables like race and immigrant status



# Key messages

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# Future Work

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- Develop systems to capture information on occupation and industry when people visit their GP or any other healthcare provider (e.g. emergency department)
- Current work with occupational exposures and COVID-19 can be extended to other types of exposures, and examining different types of claims (e.g. critical incidents)
- This combination of data can also help to understand how changes in industry and occupational distributions impact different types of compensation claims

## Related IWH publications mentioned today

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Saunders et al (2021) Response to COVID-19: Gathering experiences of OHS authorities in developed countries. IWH Issue Briefing. <https://www.iwh.on.ca/plain-language-summaries/response-to-covid-19-gathering-experiences-of-ohs-authorities-in-developed-countries>

Smith et al (2021) The prevalence and correlates of workplace infection control practices in Canada between July and September 2020. *Health Reports*. 32 (11), <https://www.doi.org/10.25318/82-003-x202101100002-eng>

Buchan et al (2022) Incidence of outbreak-associated COVID-19 cases by industry in Ontario, Canada, April 1, 2020- March 31, 2021. *Occupational and Environmental Medicine*, 79 (6), 403 – 411. <https://oem.bmj.com/content/79/6/403>

Smith et al (2021) Lessons from COVID-19 for the next pandemic: We need better data on workplace transmission. *The Conversation* <https://theconversation.com/lessons-from-covid-19-for-the-next-pandemic-we-need-better-data-on-workplace-transmission-170023>

# Thank you

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