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## OBJECTIVES

The purpose of this study was to use administrative data to estimate provincial incidence of health care-associated COVID-19 infection (HAI COVID) rates across pandemic waves in acute care settings in British Columbia.

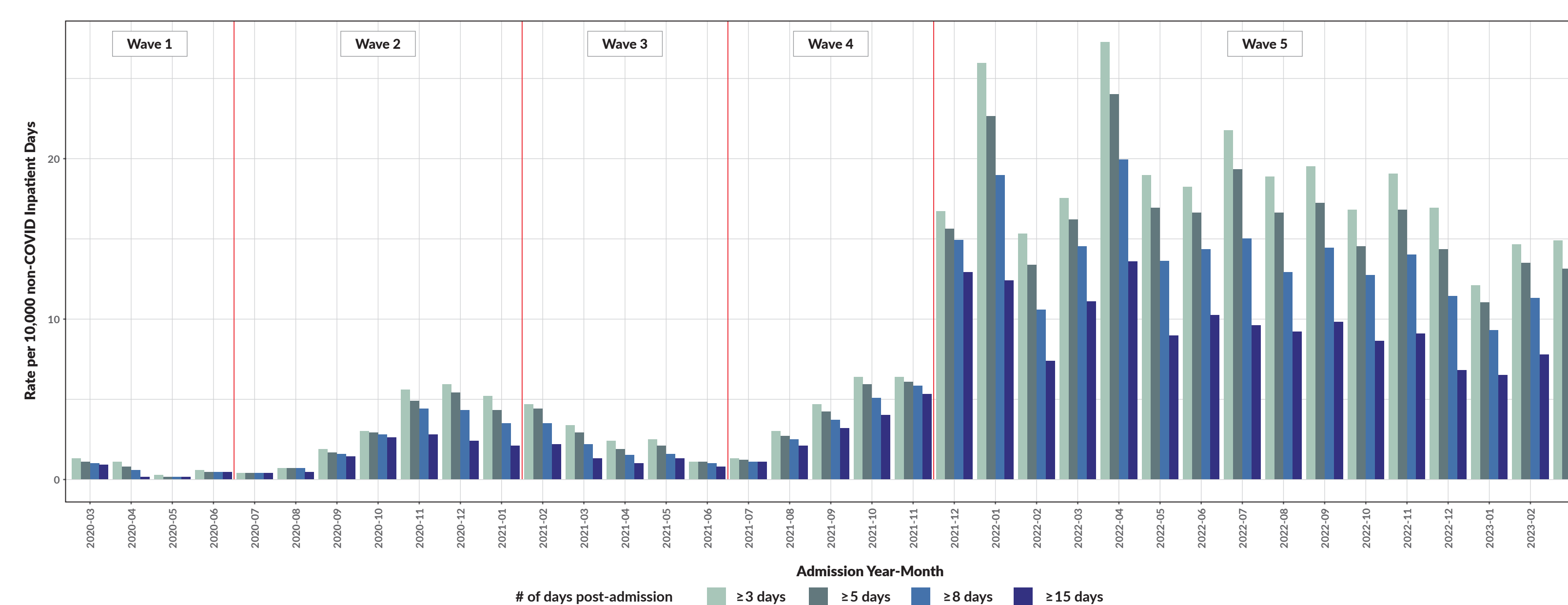
## METHODS

- **Acute care admissions** from the provincial Discharge Abstract Database from March 1, 2020 to March 31, 2023 were linked with Polymerase Chain Reaction COVID-19 test results from the Provincial Laboratory Information System.
- **COVID-19 admissions** were grouped into four categories of increasingly likely HAI COVID based on testing positive “days post-admission” as follows: a positive COVID-19 test  $\geq 3$  days,  $\geq 5$  days,  $\geq 8$  days, and  $\geq 15$  days after admission, including up to 2 days post-discharge.
- **Rates per 10,000 non-COVID inpatient days** (includes all inpatient days for patients who never tested positive for COVID and all inpatient days for patients prior to testing COVID-positive) were calculated for each HAI COVID category, overall and by pandemic wave.
- **Rate ratios for each wave** relative to the fifth (Omicron) wave were calculated using Poisson regression.

## RESULTS

- The Omicron wave had significantly higher HAI COVID rates compared to all previous waves for each HAI COVID category – (see Figure 1 and Table 1).
- The greater number of days post-admission that a case was considered an HAI, the lower the rate of infection (see Figure 1). For example, during the Omicron wave, there were 19 HAI COVID cases per 10,000 non-COVID patient days for the  $\geq 3$  days post-admission category, whereas there were 10 HAI COVID cases per 10,000 non-COVID patient days for the  $\geq 15$  days post-admission category.
- Administrative data allowed for the capture of cases that tested positive up to 2 days post discharge, where 9%, 7%, 6%, and 5% of HAI cases were identified post-discharge in the  $\geq 3$  days,  $\geq 5$  days,  $\geq 8$  days, and  $\geq 15$  days post-admission categories, respectively.

**Figure 1:** Monthly Rates of HAI COVID by ‘days post-admission’ category



**Table 1:** Rates of HAI COVID by ‘days post-admission’ category and wave

HAI Rate per 10,000 non-COVID patient days	Wave 1 (Mar 01, 2020 – July 04, 2020)	Wave 2 (July 05, 2020 – Feb 06, 2021)	Wave 3 (Feb 07, 2021 – July 03, 2021)	Wave 4 (July 04, 2021 – Dec 04, 2021)	Wave 5 (Dec 05, 2021 – Apr 30, 2023)	Overall (Mar 01, 2020 – Mar 31, 2023)
$\geq 3$ days post-admission	0.6	3	2.7	2.6	19	9.7
Rate Ratio [95% CI]	0.03 [0.03, 0.04]	0.16 [0.14, 0.17]	0.14 [0.13, 0.16]	0.14 [0.12, 0.15]		
$\geq 5$ days post-admission	0.5	2.7	2.4	2.3	17	8.6
Rate Ratio [95% CI]	0.03 [0.02, 0.04]	0.16 [0.14, 0.17]	0.14 [0.13, 0.16]	0.13 [0.12, 0.15]		
$\geq 8$ days post-admission	0.4	2.3	1.9	1.9	14.3	7.2
Rate Ratio [95% CI]	0.03 [0.02, 0.04]	0.16 [0.15, 0.18]	0.13 [0.12, 0.15]	0.13 [0.12, 0.15]		
$\geq 15$ days post-admission	0.3	1.6	1.2	1.4	10.1	5.1
Rate Ratio [95% CI]	0.03 [0.02, 0.04]	0.16 [0.14, 0.18]	0.12 [0.11, 0.14]	0.14 [0.12, 0.16]		

## CONCLUSIONS

- Omicron had significantly higher HAI COVID rates in each ‘days post admission’ category compared to other rates. Potential reasons for this are:
  - Increased transmissibility
  - Increased community prevalence
  - Potentially lower vaccine effectiveness against the Omicron variant
- As expected, the more conservative the HAI definition used, the fewer cases are captured, with higher confidence in those cases being HAI.
- Use of provincial administrative data for HAI surveillance allows for:
  - Standardized HAI definitions to be used across health authorities
  - Application of various HAI definitions based on timeframes, corresponding to increasing/decreasing probability of HAI
  - The ability to detect cases post-discharge that were most likely acquired in the acute care setting. By contrast, traditional surveillance for HAI COVID in the acute care setting does not typically follow patients post-discharge.

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