**DECEASED RECONCILIATION**

**October 14 2022**
Department of Health

# Summary

Background

From March 2020 to January 2022, Public Health New Brunswick (PHNB) conducted investigation and follow-up for all confirmed COVID-19 cases through its case and contact management and testing strategies. During this time, PHNB utilized the national surveillance case definition[1] for a deceased COVID-19 case: *A probable or confirmed COVID-19 case whose death resulted from a clinically compatible illness, unless there is a clear alternative cause of death identified (e.g., trauma, poisoning, drug overdose)*. Prior to classification, each deceased COVID-19 case was reviewed by regional public health with support of the regional medical officers of health in effort to determine if the death met the case definition.

In December 2021, COVID-19 activity began to increase to unprecedented levels with the introduction of the Omicron variant. As a result of this substantial increase in cases, COVID-19 was introduced into vulnerable populations and settings, leading to an increase in both active outbreaks and cases among individuals at high-risk of poor outcomes. In early January 2022, PHNB modified the case and contact management strategy to concentrate on managing vulnerable populations and settings.

Case Definition

During March 2022, guidance shifted towards the self-management or the 'Living with COVID-19' plan. Shortly after, PHNB also updated the case definition of a deceased COVID-19 case to: *A death is determined to be COVID-19 related if the attending physician has identified that COVID-19 was a primary or contributing factor to the cause of death. If the cause of death is unclear, Public Health may request additional clarification from a Medical Officer of Health.* This updated case definition allowed for the classification of COVID-19 deaths under the current surveillance and self-management strategies while accommodating the complicated situations where an individuals' underlying condition(s) may have contributed to the death. Additionally, this updated definition provided further alignment with other provinces and territories who had been using administrative data to assist with their classification of a deceased COVID-19 case.

Data Source

In March 2022, PHNB partnered with the Vital Statistics (VS) branch of Service New Brunswick to establish a procedure whereby C-3 Registration of Death Forms, the precursor to a death certificate, would be retrieved at the request of PHNB. Therefore, when PHNB was notified of a death of a COVID-19 case, the request for the C-3 Registration of Death Form was sent to VS. At the beginning of the pandemic, VS also commenced their own process of noting the C-3 Registration of Death Forms that listed COVID-19. Vital Statistics forwarded these forms to PHNB. It is important to note that the official cause of death coding is completed by Statistics Canada. Under normal circumstances, the lag in New Brunswick from date of death to registration of death is two-months, and the lag from registration to coding is six-months.

Data Analysis and Methodology

In June 2022, PHNB commenced a retrospective analysis to examine the validity of deceased COVID-19 reporting and to reconcile the data with the updated definition. The analysis included deceased COVID-19 cases

[1] https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/national-case-definition.html

reported from March 1, 2020, to May 31, 2022. As of May 31, 2022, 419 COVID-19 deaths were reported in New Brunswick. Vital Statistics provided an additional 142 C-3 Registration of Death Forms that listed COVID-19 from the same time frame. Each death registration form was individually reviewed for cause of death and place of death.

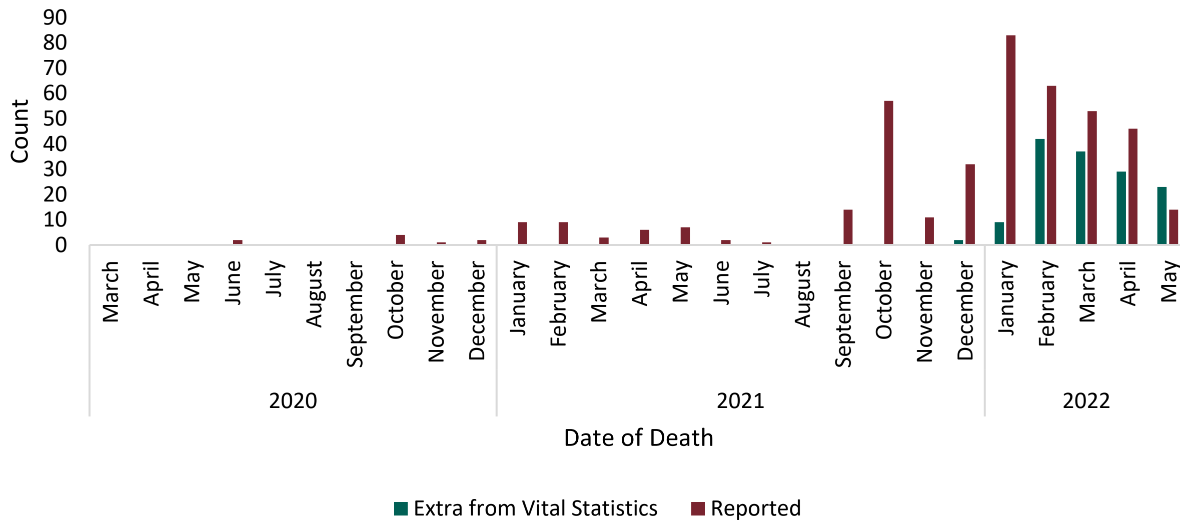
Based on the cause of death recorded on the C-3 Registration of Death Forms, those with COVID-19 listed in Part 1 (primary or antecedent) were classified as COVID-19 related deaths, while those with COVID-19 listed in Part 2 (other) were not classified as COVID-19 deaths. In addition, records that do not list COVID-19 in Part 1 or Part 2 were not classified as a COVID-19 death. Findings from the analysis suggested there were 125 deceased cases that should be added to the total count and 46 that should be removed from the total count, resulting in a final revised total of 498 COVID-19 related deaths[2]. The purpose of this report is to review the findings of the retrospective analysis and to examine trends of deceased COVID-19 cases in New Brunswick.

[2] Counts are subject to change as PHNB receives C-3 Registration of Death Forms for deaths within the specified period. Counts for COVID-19 related deaths will continue to be updated on an ongoing basis.

## DATA COLLECTION

From March 1, 2020, to May 31, 2022, PHNB reported 419 COVID-19 related deaths. Collaboration with VS revealed an additional 142 C-3 Registration of Death Forms that identified COVID-19 as a Part 1 (primary or antecedent) or Part 2 (other) cause of death. The extra C-3 Registration of Death Forms received from VS had a date of death between December 1, 2021, and May 31, 2022.

Figure 1: Deceased COVID-19 cases by reporting stream and date of death (Data from March 1, 2020, to May 31, 2022).



## REVISED DECEASED COUNT

Following the revised case definition for a deceased COVID-19 case, it was found there were 125 COVID-19 related deaths that need to be added to the total count. Additional review determined that records that listed COVID-19 as a Part 2 (other) cause of death would not be classified as a COVID-19 death. There were 46 reported deaths that did not meet the case definition; therefore, these deaths were removed from the total count. The revised total was 498 COVID-19 related deaths, which occurred from March 1, 2020, to May 31, 2022. Discrepancies occurred across all regions and age groups. The largest difference between current count and revised count was observed in region 1 (+33) and among individuals aged 60 and older (+78), specifically, those aged 90 and older (+32).

Figure 2: Deceased COVID-19 cases by region (Data from March 1, 2020, to May 31, 2022).

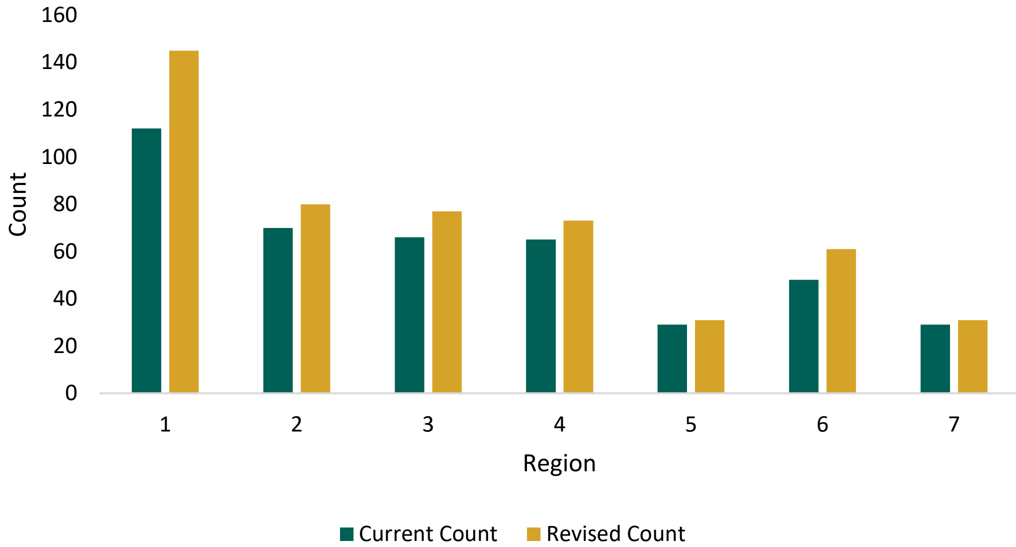



Figure 3: Deceased COVID-19 cases by age (Data from March 1, 2020, to May 31, 2022).

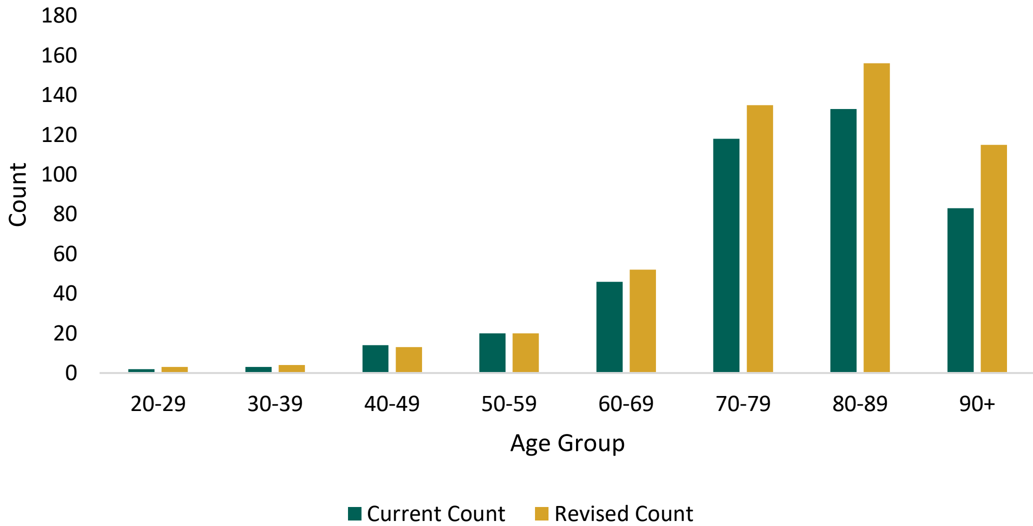


Figure 4: Seven-day moving average of deceased COVID-19 cases by date of death (Data from December 1, 2021, to May 31, 2022).

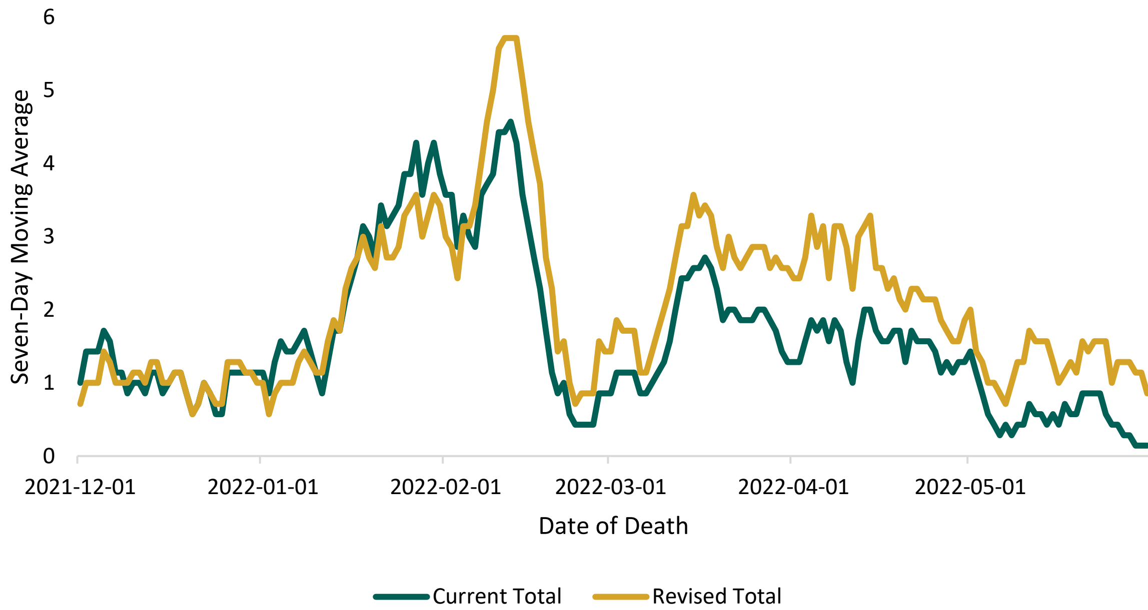



Figure 5: Deceased COVID-19 cases by reconciliation status and date of death (Data from March 1, 2020, to May 31, 2022).

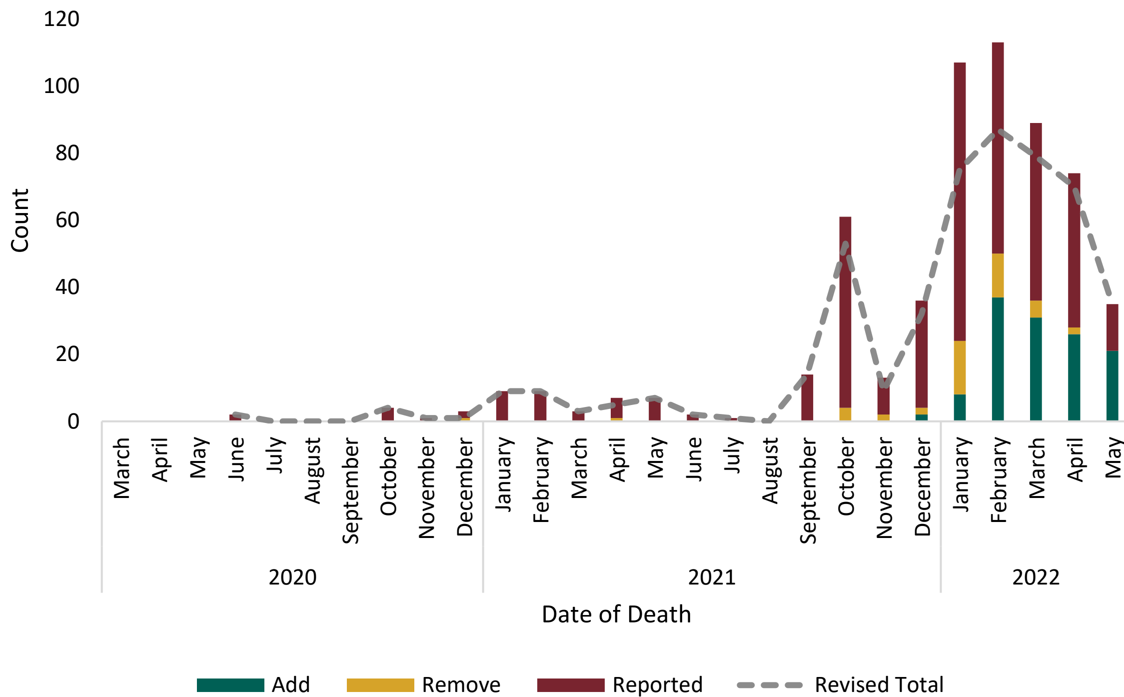


Table 1: Summary of deceased COVID-19 cases by recommended actions.

| Recommended Action | Case count |
|---|---|
| Add | 125 |
| Remove | 46 |
| Reported Total | 419 |
| Revised Total | 498 |

The trend for revised COVID-19 related deaths remains comparable to both confirmed COVID-19 cases and previously reported COVID-19 related deaths (Figure 6). Introduction of the Omicron variant led to an increase in case activity from January 2022 to May 2022, which was accompanied by an increase in COVID-19 related deaths.  The largest difference between current and revised counts occurred between February 2022 and May 2022. The revised counts for 2020 and 2021 decreased compared to previously reported totals (-8). Trends indicated the rate per 100,000 of COVID-19 related deaths increased with age, which remained unchanged with the revised totals (Figure 7).

Figure 6: COVID-19 cases and deaths by report date (Data from March 1, 2020, to May 31, 2022).

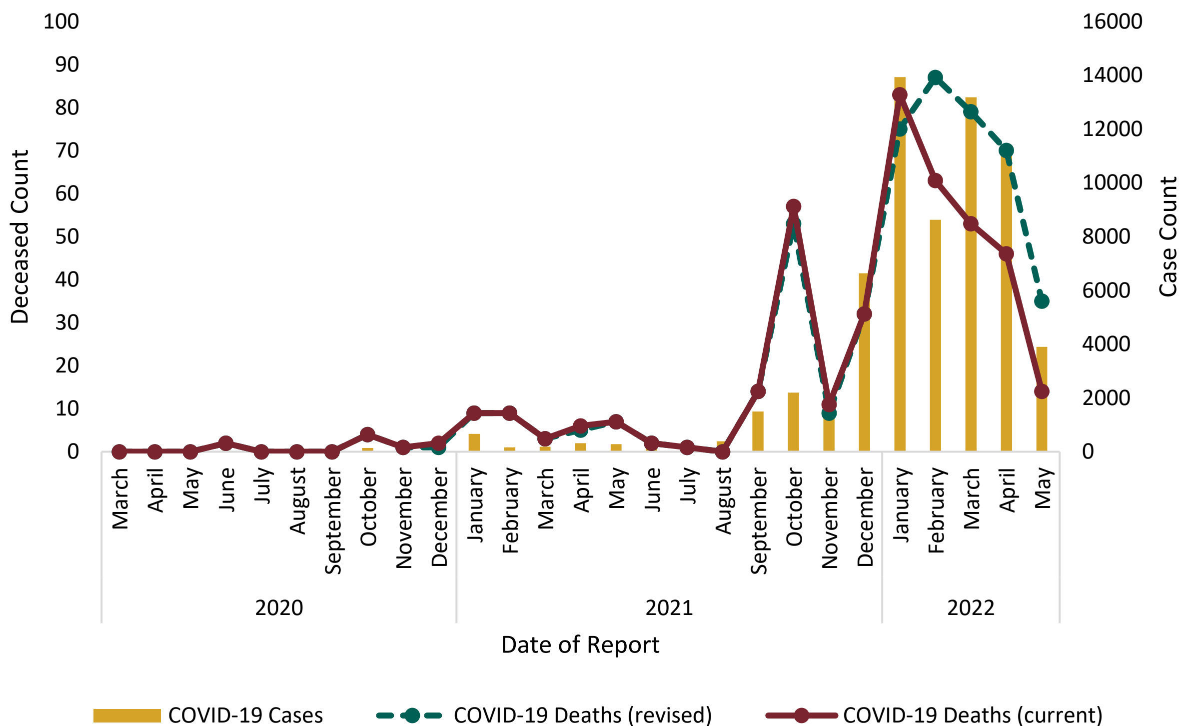
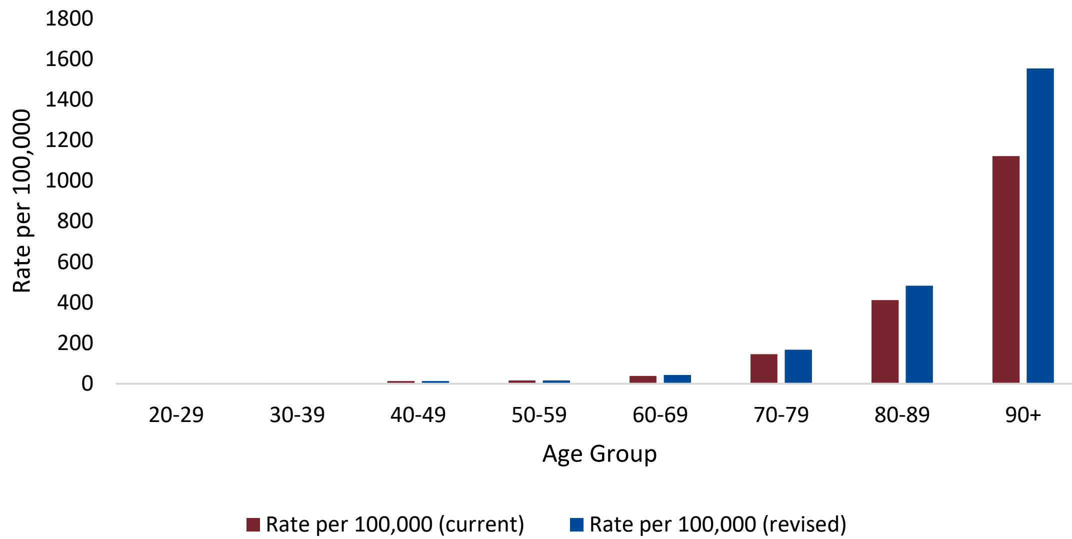


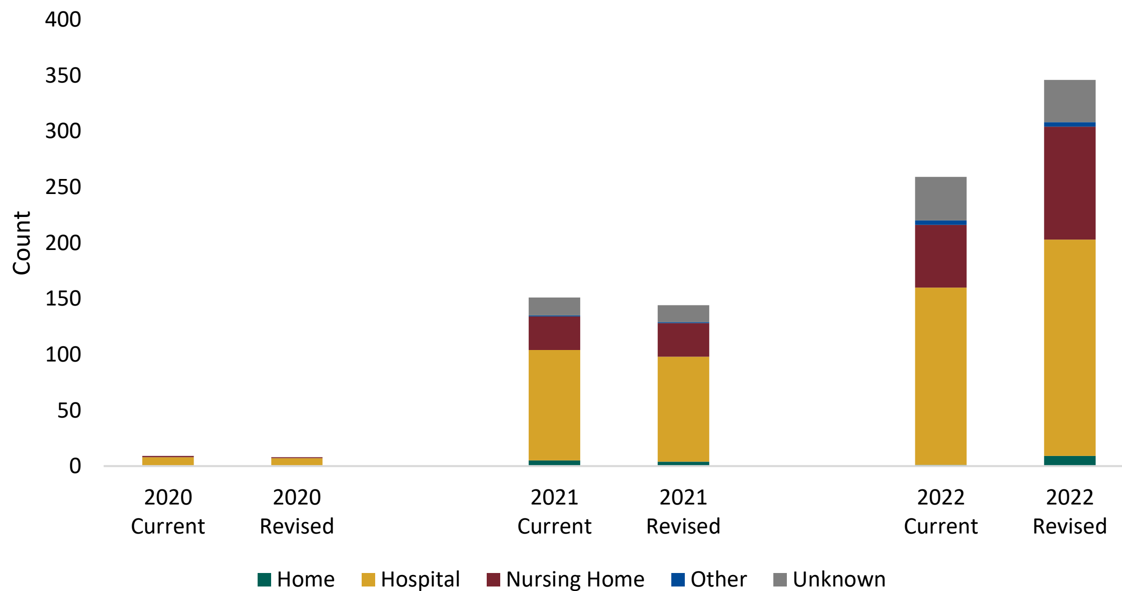
Figure 7: Rate of deceased COVID-19 cases per 100,000 population by age.




## PLACE OF DEATH

Place of death was grouped into five categories (as found on the C-3 Registration of Death Form): home, hospital, nursing home, other, and unknown. In this context, "nursing home" can include Adult Residential Facilities (ARF). Of the 498 COVID-19 related deaths, the majority occurred in hospital or nursing home (59% and 27%, respectively). There was a similar distribution of COVID-19 related deaths that occurred in hospital and nursing home in 2021 and 2022. In 2020, approximately 88% of COVID-19 related deaths occurred in hospital and 22% occurred in nursing homes. Of the 125 cases that are recommended to be added to the total count, 53% occurred in hospital and 39% occurred in nursing home.

Figure 8: Deceased COVID-19 cases by place of death.



# CONCLUSION

It is our recommendation to revise the number of reported COVID-19 related deaths to account for the results of this retrospective analysis, adjusting the total number of COVID-19 related deaths from March 1, 2020, to May 31, 2022, to be 498. Moving forward, the reporting of COVID-19 related deaths will include a reporting lag as we continue to work with VS to receive C-3 Registration of Death Forms that list COVID-19. Using administrative data to classify deceased cases is consistent with the approaches used by other provinces and territories; however, the method of receiving death notifications may differ by jurisdiction.

New Brunswick has the highest COVID-19 death rate compared to the other Atlantic provinces; however, as of May 28, 2022, the COVID-19 total death rate in NB is lower than several other provinces and territories. There are many factors that could cause variability in reporting COVID-19 deaths across the country. Namely, the case definition that is utilized; including whether jurisdictions report deaths where COVID-19 is a primary or contributing factor to the cause of death, or exclusively the primary cause of death. Additionally, there are some jurisdictions that have incorporated a time-based component to their classification of a deceased COVID-19 case. Differing surveillance systems and testing and case management strategies could also influence the capability of a jurisdiction to detect and report COVID-19 deaths. New Brunswick will continue to collaborate with provincial and territorial partners to compare methodologies with the goal of increased alignment.