



CIHI
Snapshot
April 2020

COVID-19 Major Comorbidity Count Algorithm for Long-Term Care Residents

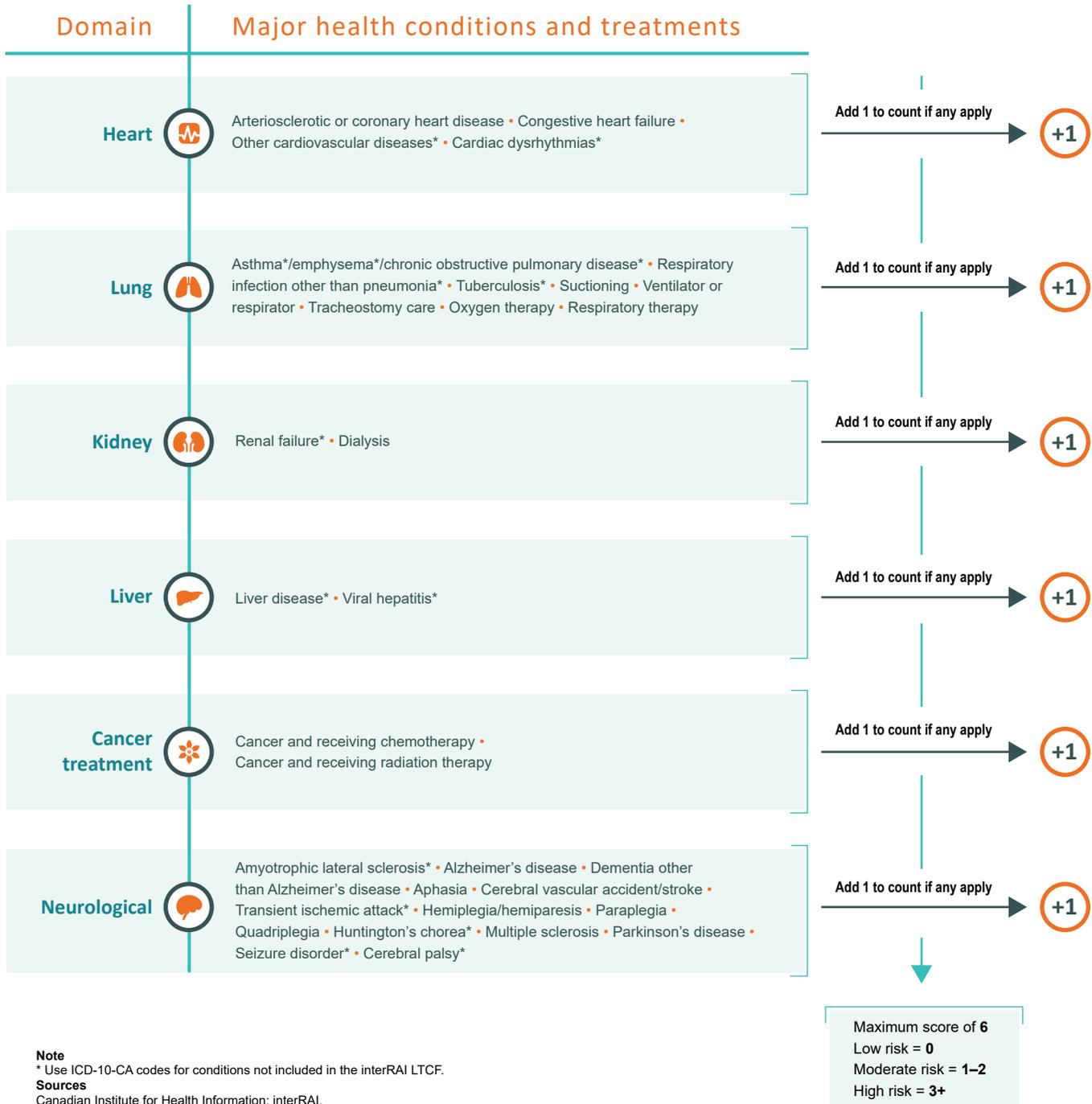
About the algorithm

In March 2020, [interRAI](#) Canada, in collaboration with the Canadian Institute for Health Information ([CIHI](#)), embarked on an initiative to develop an algorithm to identify long-term care residents who may be at increased risk of mortality should they contract coronavirus disease (COVID-19). The algorithm was developed by a multidisciplinary group including researchers and clinicians, and guided by the current literature on COVID-19. A version for home care clients is also available.

The COVID-19 Major Comorbidity Count Algorithm — Long-Term Care Residents (Figure 1) is to be applied to data from interRAI's long-term care assessments (Resident Assessment Instrument–Minimum Data Set 2.0 ©, or RAI-MDS 2.0, and interRAI Long-Term Care Facilities ©, or interRAI LTCF). The algorithm focuses on pre-existing health conditions and diagnoses that the World Health Organization, Centers for Disease Control and Prevention, and other health organizations have identified as putting people at increased risk of mortality due to COVID-19.

When developing the algorithm, each major health condition and treatment was tested individually for its association with mortality. A model was created that combined the appropriate conditions and treatments to predict mortality. Sensitivity analysis confirmed that the algorithm was relevant for multiple subpopulations, including those with pneumonia — a potential health condition proxy for COVID-19.

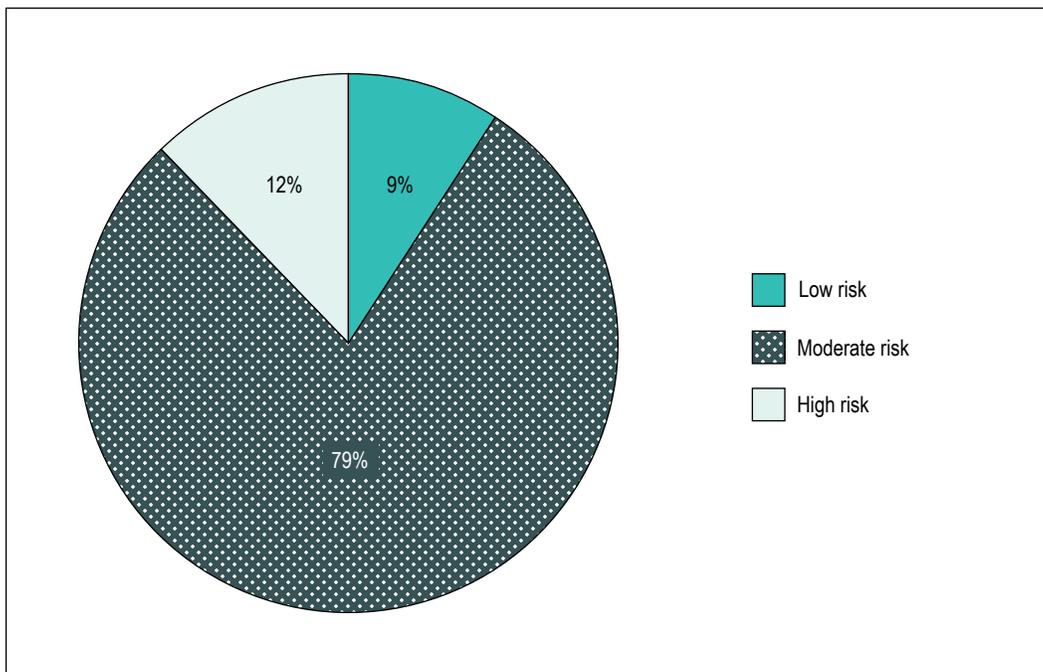
Figure 1 COVID-19 Major Comorbidity Count Algorithm — Long-Term Care Residents



Results for long-term care populations

Figure 2 shows the distribution of risk levels for long-term care residents using the COVID-19 Major Comorbidity Count Algorithm. The majority (79%) of residents fall within the moderate risk group. About 1 in 8 (approximately 20,000) long-term care residents in Canada are identified as being at high risk of mortality from COVID-19. These results do not represent all long-term care residents in Canada (see notes below Figure 2).

Figure 2 Levels of risk of mortality due to COVID-19 for long-term care residents, Canada, 2019



Notes

Data is based on the latest assessment in the 2019 calendar year.
Excludes residents not assessed with interRAI long-term care assessments.

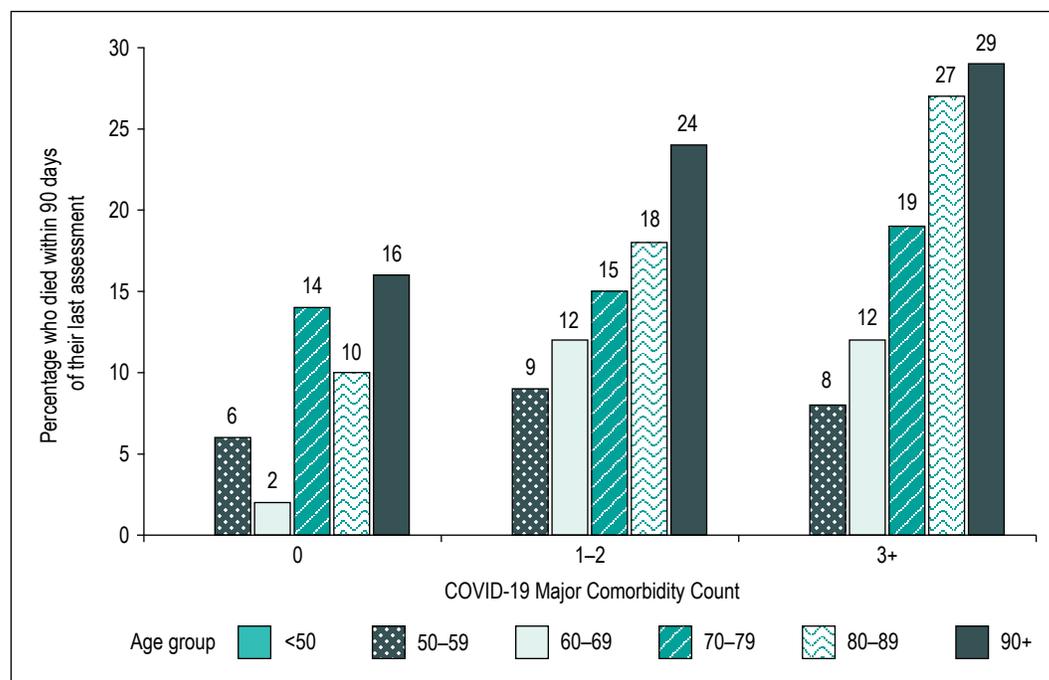
Source

Continuing Care Reporting System, Canadian Institute for Health Information.

Figure 3 shows the overall 90-day mortality rates for 2018 among persons with pneumonia in long-term care settings, by age and algorithm category. Pneumonia was used as a proxy for COVID-19 in the algorithm due to the prominence of respiratory symptoms associated with COVID-19. The figure shows that when the COVID-19 Major Comorbidity Count Algorithm is applied to historical data for long-term care residents, mortality rates rise with increasing age in all 3 risk levels. Among those in the high-risk group (score of 3+), about 1 in 4 residents age 80 to 89 and 1 in 3 residents age 90 and older died within 90 days of their last assessment.

This information is intended to help identify residents in long-term care facilities who are at particularly high risk of mortality due to COVID-19.

Figure 3 Overall 90-day mortality rates among long-term care residents with pneumonia, by age and algorithm category, Canada, 2018



Note

Data is based on the latest assessment in the 2018 calendar year.

Sources

Continuing Care Reporting System and Discharge Abstract Database, Canadian Institute for Health Information; interRAI.

How to use the algorithm

The COVID-19 Major Comorbidity Count Algorithm can be used to identify current long-term care residents who may be at increased risk of mortality due to COVID-19, with information already available from their most recent RAI-MDS 2.0 or interRAI LTCF assessment. This identification may support advanced care planning, resource allocation and system planning. Other assessment outputs, such as the Changes in Health, End-Stage Disease, and Signs and Symptoms (CHESS) Scale, are also available to help inform decision-making.

For more information

For questions or to request detailed specifications for the COVID-19 Major Comorbidity Count Algorithm — Long-Term Care Residents, email help@cihi.ca. Specifications are available for the RAI-MDS 2.0, interRAI LTCF, Resident Assessment Instrument—Home Care © (RAI-HC) and interRAI Home Care © (interRAI HC).

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