

## COVID-19 Evidence Support Team RAPID REVIEW REPORT

*What is the (case) definition of hospitalization for COVID-19 in similar jurisdictions?*

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Full author statement available at the end of report.

### Key Findings

January 26, 2022

- There exists some ambiguity across jurisdictions and thus there is no clear universal case definition of COVID-19 hospitalization.
- Public Health Ontario measures hospitalization as “the number of confirmed COVID-19 cases that reported ever being hospitalized during their infection” - i.e., all cases reported as ever being hospitalized during their infection.
- The category “incidental COVID-19 hospitalizations” has been proposed. This refers to patients who are primarily admitted for other ailments and test positive as part of routine screening.
- Some jurisdictions and health agencies have started differentiating between those who were admitted for COVID-19-related illness and incidental admissions. Ontario and Saskatchewan have begun using this category in their regular reporting of COVID-19 statistics.
- New data from Australia, New Zealand, the US, and Canada indicate that 30 to 50 percent of COVID-19 hospitalizations are “incidental COVID-19 hospitalization” – 46% of COVID-19 hospitalizations in Ontario (as of January 11<sup>th</sup>, 2022) and 40% in Saskatchewan (as of January 26<sup>th</sup>, 2022)
- Some expert opinions caution that such binary categorization may oversimplify clinical reality, and suggests also employing an ‘indeterminate’ category

## Limitations

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- Evidence is rapidly emerging and largely from news media, government public health agencies, and grey literature sources.

## Strength of Evidence

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- Mature evidence  Emerging Supportive evidence
- Mixed evidence  Weak evidence

## Quality of Evidence Assessment

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- 1. Adequacy of primary studies:** Evidence is rapidly emerging and largely from news media, government public health agencies, and grey literature sources.
- 2. Methodological limitations:** For this review, we included four (4) Government document/report (PHO, SHA, NSWG, ECDC), four (4) News media, and one (1) evidence and summary/rapid review from our updated search report {12 Guidelines, Summaries & Other Grey Literature, and 14 Journal Articles (includes preprints)} from November 19, 2021, to December 3, 2021.
- 3. Relevance to review question:**
- 4. Generalizability of findings:** Due to the rapidly evolving nature of this topic, evidence from this cannot be generalized. As such, very newly emerging evidence from non-peer-reviewed sources will be included to ensure relevancy, and as publications or new evidence emerges, the document will continue to be updated.

## Background/Context

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### 1. Clinical Context

To understand how various public agencies are measuring and reporting COVID-19 hospitalization. Does the definition include only those who tested positive for COVID-19 prior to admission and being treated for COVID-19 related symptoms, or people already admitted to the hospital for other reasons than COVID-19 and tested positive for COVID-19? There are suggestions the latter are not reported as COVID-19 hospitalization, but for some patients, COVID-19 can trigger difficulties with other health conditions and may require longer periods of hospitalization. For some, they may have contracted COVID-19 while in hospital and still need care for the underlying issue they were admitted for. This has led to some ambiguity on the case definition of COVID-19 hospitalization.

### 2. Purpose

To determine the ways hospitalization for COVID-19 are defined and measured in similar jurisdictions for resource optimization.

### 3. Review Question(s)

What is the (case) definition of hospitalization for COVID-19 in similar jurisdictions?

## Method

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For each Rapid Review, the initial question is posed by a decision-maker in the health care system seeking the evidence base for a specific policy decision. According to the subject of the question, the COVID Evidence Support Team (CEST) Intake Committee allocates the question to the appropriate Working Group. Each Working Group may be comprised of a librarian, researcher, 1-2 clinicians, 1-2 subject matter experts, and a group leader. A reference interview is conducted to establish the parameters of the question to ensure it is articulated in a clear, searchable manner. The librarians assigned to the team then conduct a thorough search of the indexed literature, grey literature, news sources, or other sources as agreed upon. Some reference lists for especially pertinent articles are also reviewed. An Evidence Search Report is thereby created. See Appendix for more details on the search strategy. A Rapid Review of the identified literature is then performed by the researcher using the approach of a systematic review, but without a double review, formal assessment of the quality of the reported study, or meta-analysis. Importantly, the review is completed in a time-sensitive manner. Relevant evidence is summarized in both tabular and narrative form, key findings and limitations articulated, and the quality of the body of evidence evaluated using a four-point grading system that assesses the methodologies, adequacy of the included studies, the direct relevance to the question, and the generalizability of the findings related to the question. The draft Rapid Review Report is reviewed and edited by the Working Group clinicians, experts, and leaders. Once revisions are complete, the Rapid Review is submitted to the requesting decision-maker and placed in the COVID-19 repository and database. For certain topics with rapidly changing evidence, after a period of time an updated evidence search is performed, the review process repeated, and an updated Rapid Review released.

## Summary of Evidence

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The Centre for Evidence-Based Medicine reports ambiguity on the definition of COVID-19 hospitalization in the UK from the caption by UK government daily briefings on April 1<sup>st</sup>, 5<sup>th</sup>, and 9<sup>th</sup> 2021. The April 1<sup>st</sup> and April 5<sup>th</sup> briefings stated “COVID-19 hospital admissions” and “Hospitalizations for COVID-19” respectively. The April 9<sup>th</sup> briefing changed to ‘People in hospital beds with COVID-19,’ and included the “number of people in hospital with confirmed COVID-19”. The report also stated some ambiguity as to whether some or all were already in the hospital, as none of this mentioned hospitalization or admission or infer that the numbers only relate to patients in the hospital because of COVID-19.<sup>1</sup>

In the core protocol for ECDC studies of COVID-19 vaccine effectiveness against hospitalization with Severe Acute Respiratory Infection (SARI) laboratory-confirmed with SARS-CoV-2, hospitalization is defined as a “SARI patient who has been admitted to one of the participating hospitals during the study period and has not been discharged to their home or home equivalent within 24 hours”- with a respiratory sample positive for SARS-CoV-2 by PCR either on admission to hospital or documented within 14 days prior to hospital admission.<sup>2</sup> However, Public Health Ontario COVID-19 data tool measures hospitalization as “the number of confirmed COVID-19 cases that reported ever being hospitalized during their infection”. It includes cases that are currently hospitalized as well as cases that have been discharged from the hospital. It also includes confirmed cases hospitalized due to COVID-19, cases that were in the hospital prior to acquiring the disease, and confirmed cases in an intensive care unit (ICU). But emergency room visits are excluded in the number of reported hospitalizations.<sup>3</sup> In the “In focus COVID-19 hospitalizations” report by the New South Wales (NSW) Government, Australia, hospital admissions are counted in the report where the COVID-19 diagnosis was made “at least two weeks before or six weeks after the onset of illness”, during the in-patient hospital stay. Which meant not all the hospitalizations could be primarily attributed to COVID-19. Hospitalization counts in

the report exclude day-only hospitalizations, assisted living facilities providing in-house medical care, and those only in emergency departments or ward types not routinely used for COVID-19 admission.<sup>4</sup>

With the changing definition of COVID-19 hospitalization in various jurisdictions, has come a rise in what health experts call incidental COVID-19 hospitalizations – “referring to patients who are primarily admitted for other ailments and test positive as part of routine screening”.<sup>10</sup> The Australian and New Zealand Health Ministries have reported that many of the counts in hospitals as COVID-19 hospitalization listed in the daily statistics are simply testing positive in routine checks after being admitted for Covid symptoms or complications, or for something completely unrelated such as broken bones, labor pains, or even mental health issues.<sup>5,6</sup> The NSW Health Minister reported that up to half of NSW ‘COVID-19’ hospital patients went in for something totally different and were positive in routine testing as of January 3<sup>rd</sup>, 2022.<sup>5</sup> Data from the New South Wales COVID-19 hospitalization statistics found 37% of reported hospitalizations in children under 18 years were for “social and vulnerable” reasons rather than medical ones. A Californian study found 40% of kids in hospital with COVID-19 had no symptoms, and 45% of admissions were unlikely to be because of COVID-19.<sup>6</sup> The Irish Chief Medical Officer has also stated the number of patients with COVID-19 in hospital but who have been admitted for other reasons is around 30%. The Health Service Executive (HSE) of Ireland has been undertaking a “big piece of work” to analyze how many people in hospitals with COVID could be classified as ‘incidental’ COVID patients.<sup>7</sup>

In Canada, new data indicates that 46% of people currently in Ontario hospitals with COVID-19 were admitted for reasons other than the virus but tested positive for the virus as of January 11<sup>th</sup>, 2022.<sup>8</sup> As of January 26<sup>th</sup>, 2022, the Saskatchewan Health Authority (SHA) dashboard reports 315 hospitalizations: 282 residents are inpatient of which 121 inpatient hospitalizations are a COVID-19-related illness, 127 (40%) are incidental COVID-19 infections, and 34 have not yet been determined.<sup>9</sup>

There have also been some expert opinions on the adaptation of primary and incidental COVID-19 hospitalization by various jurisdictions and health agencies. Expert opinion suggests that while the conversation on primary versus incidental COVID-19 hospitalizations is important to understand the overall state of the pandemic and disease severity, the distinction may be of limited value, especially in the context of hospital capacity and labor shortages. In various hospitals, entering the room of a COVID-19 patient requires the same supply of personal protective equipment, as all COVID-19-positive patients are isolated whether admitted primarily for the virus or as an incidental case.<sup>10</sup> Also, primary versus incidental COVID-19 hospitalization case definition may imply the number of people who are admitted to the hospital at the time of infection. This means some patients who enter the hospital or critical care as a COVID-19 patient may no longer be counted as COVID-19 patients once they are no longer infectious, even though they remain in hospital with complications from COVID-19 such as renal failure and cardiac complications. COVID-19 is a multisystem infection with a variable presentation that can worsen care and complicate existing conditions, whether it's the primary reason for hospitalization or acquired during hospital admission for other ailments.<sup>10</sup> In some instances it may be unclear if a diagnosis of COVID-19 contributed to the patient’s course in hospital and may not fit neatly into either of the two categories; such cases may require the use of an ‘indeterminate’ category.<sup>11</sup>

## Conclusions

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Almost 2 years into the COVID-19 pandemic, there exists no clear and consistent international case definition for COVID-19 hospitalizations. Most jurisdictions have been reporting COVID-19 hospitalization as any person in hospital with COVID-19 (confirmed positive test for COVID-19), irrespective of the person being admitted due to COVID-19 symptoms and/or complications, or for something completely unrelated. Epidemiologically, the case definition of COVID-19 based on a confirmed positive test for COVID-19 has been thought to inflate the number of COVID-19

hospitalization and does not shed light on the overall state of the pandemic and disease severity. Hence the adaptation by several health agencies in distinguishing between primary and incidental cases in recent statistical reports. However, in terms of Hospital resources and capacity, other experts have also suggested we may go wrong with the incidental case reporting as COVID-19 is a multisystem infection, complicate care, worsen existing conditions, and require the same resources and labor needed for both primary and incidental cases.

## Table 1: Summary of Evidence

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Consult the Summary of Evidence table using the following link:

- <https://covid19evidencereviews.saskhealthauthority.ca/en/permalink/coviddoc441>

This link provides access to the database where it is possible to view the spreadsheet for review.

## Reference List

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1. Centre for Evidence-Based Medicine. Are COVID-19 patients in hospital or admitted to hospital?. April 13, 2020. <https://www.cebm.net/covid-19/are-covid-19-patients-in-hospital-or-admitted-to-hospital/>
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8. Global News (Canada). 46% of those currently hospitalized with COVID in Ontario were admitted for other reasons: new data. January 11, 2022. <https://globalnews.ca/news/8502714/ontario-incidental-covid-hospitalizations-january-11/>
9. SHA. Hospitalized cases. <https://dashboard.saskatchewan.ca/health-wellness/covid-19-cases/hospitalized>
10. Becker's Hospital Review. Where people go wrong with 'incidental' COVID-19 hospitalizations. <https://www.beckershospitalreview.com/public-health/where-people-go-wrong-with-incidental-covid-19-hospitalizations.html>

11. The Atlantic. COVID-Hospitalization Numbers Are as Bad as They Look.  
<https://www.theatlantic.com/health/archive/2022/01/for-covid-with-covid-hospitals-are-mess-either-way/621229/>

## Appendix 1: Evidence Search Details

**Note:** To view full search strategy details, please consult the associated Evidence Search Report.

<b>Filters, Limits &amp; Exclusions:</b>	English only 20200301:20221231
<b>Sources Searched:</b>	<ul style="list-style-type: none"> <li>• CDC</li> <li>• CEP COVID-19</li> <li>• Cochrane Library</li> <li>• COVID-19 Best Evidence Front Door</li> <li>• COVID-END</li> <li>• ECRI</li> <li>• Evidence Check (Australia)</li> <li>• Embase</li> <li>• Google Advanced Search</li> <li>• HSE Library Covid19 Summaries of Evidence</li> <li>• L-OVE</li> <li>• Medline</li> <li>• medRxiv</li> <li>• National COVID-19 Clinical Evidence Taskforce (Australia)</li> <li>• NCCMT</li> <li>• Trip Pro</li> <li>• WHO COVID-19 Website</li> <li>• WHO Global Research Database</li> </ul>
<b>Librarian(s):</b>	Brianna Howell-Spooner, Clinical Librarian, Saskatchewan Health Authority Catherine Young, Clinical Librarian, Saskatchewan Health Authority

## Appendix 2: Evidence Search Strategies

### Medline

#	Searches	Results
1	COVID-19/ or SARS-CoV-2/	132823
2	(coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)	40111
3	(nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2).ti,ab,kf,nm,ot,ox,rx,px.	208401

4	((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)).ti,ab,kf,ot.	61047
5	(longCOVID* or postCOVID* or postcoronavirus* or postSARS*).ti,ab,kf,ot.	24
6	((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).ti,ab,kf,ot.	11005
7	((Wuhan or Hubei) adj5 pneumonia).ti,ab,kf,ot.	380
8	or/1-7	218693
9	hospitalization/ or patient admission/	147701
10	(hospitalization? or admitting or ((patient or hospital) adj2 admission?)).tw,kf.	219777
11	9 or 10	308305
12	8 and 11	12697
13	limit 12 to dt=20200301-20220112	12653
14	public health/ or government regulation/ or policy/ or health policy/	177813
15	((public health adj2 (measure? or guidance or ordinance?)) or government regulation?).tw,kf.	5696
16	14 or 15	182376
17	(case definition? or case count?).tw,kf.	7118
18	13 and 16	212
19	13 and 17	50
20	18 or 19	261

#### Embase

#	Searches	Results
1	COVID-19/ or SARS-CoV-2/	74933
2	(coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)	10352
3	(nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory	214649

	Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2).ti,ab,kf,ot,ox,px.	
4	((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)).ti,ab,kf,ot.	59344
5	(longCOVID* or postCOVID* or postcoronavirus* or postSARS*).ti,ab,kf,ot.	61
6	((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).ti,ab,kf,ot.	10564
7	((Wuhan or Hubei) adj5 pneumonia).ti,ab,kf,ot.	436
8	or/1-7	222802
9	hospitalization/ or patient admission/	626490
10	(hospitalization? or admitting or ((patient or hospital) adj2 admission?)).tw,kf.	369647
11	9 or 10	746340
12	8 and 11	26884
13	limit 12 to dd=20200301-20220112	6038
14	public health/ or government regulation/ or policy/ or health policy/	459232
15	((public health adj2 (measure? or guidance or ordinance?)) or government regulation?).tw,kf.	6418
16	14 or 15	463004
17	(case definition? or case count?).tw,kf.	9238
18	13 and 16	169
19	13 and 17	23
20	18 or 19	192
21	limit 20 to medline	27
22	20 not 21	165

**Search terms for other resources used in various combinations:**

- covid
- definition or case count or calculation
- hospitalization or hospitalisation



## Authorship & Contact

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<b>Authors:</b>	Gideon Asamoah, University of Saskatchewan  Andrea Badea, Researcher, University of Saskatchewan  Dr. Gary Groot, University of Saskatchewan  Catherine Young, Health Sciences Librarian, Saskatchewan Health Authority,  Brianna Howell-Spooner, Health Sciences Librarian, Saskatchewan Health Authority,
<b>Peer Reviewers:</b>	Dr. Gary Groot, University of Saskatchewan  Dr. Bruce Reeder, University of Saskatchewan  Dr. Nazeem Muhajarine, University of Saskatchewan
<b>For questions about this review:</b>	Dr. Gary Groot <a href="mailto:gary.groot@usask.ca">gary.groot@usask.ca</a>



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