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Title: SARS-CoV-2 outbreak in a Canadian suburban tertiary hospital necessitating full facility closure: a descriptive observational study

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Reviewer 1: Clayton MacDonald, Vancouver Coastal Health Authority

This is a well written and thorough manuscript. While most institutions continue to dealwith COVID outbreak and have developed their own local management strategies, this manuscript will be a benefit to those looking to complement their strategies.

Summary: Kanji et al presents a descriptive analysis of an institute wide COVID-19 outbreak at a tertiary hospital facilitating a hospital closure in Edmonton, Alberta, Canada.As the pandemic continues most institutes have had their experience in managing outbreaks and developing local guidelines. A strength of the manuscript is the thorough epidemiology description of case linkage as well as providing the local guideline they developed for outbreak management and specifically those for dealing with dementia.
Such a complete description of the management of a single site will contribute to the literature and benefit those working to develop or strengthen their own guidelines through comparison.

Recommendations: This manuscript should be accepted for publication when the minor comments presented below are addressed.

Major Comments:
The Misericordia Hospital in Edmonton is an older facility (Est 1969, Coventanthealth.ca) and designed prior to the consideration for Infection Control Practices. This is true to mostof the aging facilities in Canada and presents a barrier to managing outbreak in older infrastructure.

Could the authors elaborate more on the challenges specifically at this site that they eludeto in the limitation component of the conclusion.

Response: The limitations paragraph of the Discussion/Interpretation was modified to better highlight the challenges faced with the older infrastructure design of the facility.*Location in revised manuscript: 435-437; 441-444*

Minor Comments:
Introductions
#1: SARS-CoV-2 (Line 6) and COVID-19 (Line 21 is not defined prior to its use in the Introduction
Response: This has been clarified in the opening of the introduction of the manuscript.
Location in revised manuscript: 108.

#2: The introductory line (Line 6) would benefit from a comment on the addition of R0 values from listed reference
Response: A sentence regarding the R0 values has been added.
Location in revised manuscript: 110-113.

Methods
#3: On page 5, Line 6 a description of the distance between beds and other IPAC precautions would be beneficial
Response: This has been corrected.
Location in revised manuscript: 169-171.

Results
#4: On Page 8, Line 56, could the location of the rehabilitation unit be clarified as being onor off site?
Response: This has been indicated.
Location in revised manuscript: 329.

#5: On Page 9, Line 11, add common after 2020
Response: I took this to mean to add a ‘comma’. This has been added.
Location in revised manuscript: 187.

#6: On Page 9, Line 25, Department is misspelled
Response: This has been corrected.

Location in revised manuscript: 340.

#7: On Page 10 Line 12: Could the authors add how many of the multi-bed rooms became positive.
Response: This information has been added to the text.
Location in revised manuscript: 361.

Conclusion
#8: On Page 13 Line 60: Formatting error needs corrections
Response: The correction has been made.
Location in revised manuscript: 466.

Table 1
#9: What symptoms were screening for? Response:
This has been clarified as a foot-note. *Location in revised manuscript: Box 1, footnote 'a'.*

#10: Who provided the dual sign off?
Response: This has been clarified as a foot note.
Location in revised manuscript: Box 1, footnote 'b'.

Figure 1:
#11: The contrast is hard to read in black and white; could this be adjusted to make the figure clearer?
Response: The colours have been adjusted to be discernible when printed in black andwhite.
Location in revised manuscript: Figure 1.

Methods S2
#12: In the background section, there are two hanging lines (Line 17, 21)
Response: This has been corrected.
Location in revised manuscript: Methods S2 (Supplementary information).

Table S1
#13: The values in the third column are not always clear which variable they represent
Response: Table S1 has been adjusted to define the variables more clearly.
Location in revised manuscript: Table 1 (the original Table S1 was merged with the newTable 1).

Table S2
#14: Could the Unit vs hospital wide screening be indicated for each screening period if available
Response: Unfortunately due to the risk of identifying staff or patients, we were onlypermitted to provide facility-based screening results (ethics approval).

Table S3
#15: For Column 4, could the "N" value be provided with the positivity rate?

Response: The requested amendment has been made to Table S3.
Location in revised manuscript: Table S2 (formerly Table S3; Supplementary information).

Table S4
#16: In the table description there is a formatting error
Response: The identified correction has been made.
Location in revised manuscript: Table S3 (formerly Table S4; Supplementary information).

#17: Could the unit description be provided (Medical, Surgical, other)
Response: The requested amendment has been made. Further identification of the type ofsurgical unit cannot be provided due to risk of identifying staff and/or patients.
Location in revised manuscript: Table S3 (formerly Table S4; Supplementary information).

Reviewer 2: Dr. Daniel Ricciutto, Lakeridge Health

Great job in describing what was likely an extremely complex outbreak with multiple interacting factors. Our experience has been similar with several outbreaks being associated with wandering, unmasked patients and transfer to other units before symptoms/exposure are identified.

I have a few questions for clarification:
1) How many, if any, patients were considered HAI during this during the outbreak usingthe definition of testing positive within 7 days after admission testing is negative? HAI cases may be underestimated if they were a possible exposure on an outbreak unit for instance as it's not uncommon to see cases with a shorter incubation period than the median.
Response: The first paragraph of the Results has been amended to indicate the numbers of community- and hospital-acquired cases. We agree with the point made, and a sentence has been added to the limitations section.
Location in revised manuscript: 310-311; 448-451.

2) Were discharged patients followed up for the development of symptoms or diagnosis of COVID after hospitalization? I believe so, as secondary cases were documented. I didn't see this specified.
Response: Yes, cases were followed up in the community and at other healthcare facilities. Ihave added this to the Methods section.
Location in revised manuscript: 237-242.

3) Were patients masked during interaction and was this considered an intervention during the outbreak for interactions with staff members?
Response: Continuous masking for patients when they were off-unit was required from May21, 2020. We had added this to the manuscript. Masking during interaction with staff members was not required at that time, and was implemented after the outbreak on October 30, 2020 after multiple organisational procedure reviews.
Location in revised manuscript: 189-190; 250-252.

4) Did you see transmission to patients from masked staff? Was this possible to evaluate? Our experience is that masking is not completely protective as source control ifonly source is masked.
Response: Unfortunately, this was not possible to evaluate. However, all staff were required to carry out continuous masking using a surgical mask as per policy of the regionalhealth authority.

5) What PPE were utilized by HCWs? Were contact/droplet precautions used exclusively outside of AGMPs? Or did some staff utilize N95?
Response: The type of PPE used (i.e. contact/droplet precautions) has been clarified in the Methods and situations where N95's were advised.
Location in revised manuscript: 214-219.

6) Were the HVAC systems assessed and can you comment on the fresh air supply/exhaust(air exchanges) in impacted units and rooms? I think that we need to acknowledge that aerosol transmission, although not likely an important mode of transmission in well- ventilated areas, can be a factor if ventilation is poor, sources are unmasked, and there is a high viral load/shedding.
Response: We are in agreement with this point. We have listed these items as potentiallimitations in the discussion.
Location in revised manuscript: 441-444.

7) Do you know the sensitivity of testing used at this hospital? It may be worth commenting. Our experience is that for symptomatic patients the sensitivity of testing ifvery high with very few if any false negative tests.
Response: A sentence on the estimated sensitivity and false-negative rate of our PCR assayhas been included in the discussion, based on a paper published earlier in 2021 evaluating these values.
Location in revised manuscript: 153-155.

8) The supplement on the management of wandering patients is excellent and will be a valuable resource for others.
Response: Thank you.