

SYNOPSIS

04/28/2020

Review of “Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility”

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One-Minute Summary

- An **outbreak of coronavirus disease 2019 (COVID-19)** occurred in March in a 116-bed **skilled nursing facility** of four separate units in King County, Washington.
- As of March 26 (23 days after identifying the first resident case), **COVID-19 was diagnosed in 57/89 (64%) residents by real-time reverse transcriptase-polymerase chain reaction (rRT-PCR)**: either during hospitalization (n=8); post-mortem examination (n=1) or point-prevalence surveys (n=48)
- Among residents who tested positive through 2 facility-wide point prevalence surveys, at the time of testing:
 - 17/48 (35%) reported typical symptoms
 - 4/48 (8%) reported atypical symptoms only
 - 27/48 (56%) reported no symptoms at the time of testing, including:
 - **24/27 (89%) who were presymptomatic**; median time to symptom onset = 4 days (IQR 3-5)
 - **3/27 (11%) who were asymptomatic**
- **Viral load was not correlated with the number of days from symptom onset** among 47 residents with available rRT-PCR cycle threshold (Ct) values. The median Ct values were similar for the four symptom status groups (asymptomatic: 25.5; presymptomatic: 23.1; atypical symptoms: 24.2; typical symptoms: 24.8)
- Viral growth was observed for 31/47 (66%) of specimens 1/3 asymptomatic, 17/24 presymptomatic, 3/4 atypical symptoms and 10/16 typical symptoms. **Viable virus was isolated from 6 days before to 9 days after symptom onset.**
- **Among staff, COVID-19 was diagnosed in 26/138 (19%)** as a result of testing among 51 of the 55 staff who reported symptoms by March 26.
- The findings suggest that **sole reliance on symptom-based strategies may not be effective to prevent introduction and spread of SARS-CoV-2** in skilled nursing facilities.

Additional Information

- On March 1, a staff member tested positive for SARS-CoV-2 after having worked in a unit of the facility while symptomatic on February 26 and 28.
- On March 5, a resident of that unit diagnosed with COVID-19 with onset 3 days prior.
- On March 8, 13/15 residents in the same unit were tested; 6 tested positive. Transmission-based precautions were implemented on March 9 in that unit.
- 2 point-prevalence surveys were performed for all assenting available residents of the facility:
 - **24/76 tested positive on March 13**
 - **24/49 tested positive a week later on March 19-20**
- COVID-19 testing included rRT-PCR on nasopharyngeal and oropharyngeal swabs, viral culture and sequencing.
- 11/57 (19%) resident cases had been hospitalized, **15/57 (26%) had died** as of April 3.
- The **doubling time in this outbreak was estimated to be 3.4 days** (95% CI: 2.5-5.3) compared to 5.5 days (95% CI, 4.8 to 6.7) for the surrounding King County.
- Early transmission seemed to occur mostly in the unit where the first case was identified, several days before cases were detected in the other three units.
- The authors suggest that the 26 symptomatic staff members likely contributed to transmission across the four units of the facility. **Asymptomatic staff members were not tested and their role in transmission in this outbreak was not explored.**
- The authors suggest that their findings support universal use of face masks for all healthcare staff in long-term care facilities in addition to screening for symptoms, given the potential for viral shedding from staff during the presymptomatic or mild symptomatic phase of COVID-19.
- Classification of symptom grouping may have been challenged by cognitive impairment in some residents. Multiple sources of symptom data were reviewed (independent assessments by nurses and clinicians, and electronic medical record review by outbreak investigation team) to minimize the extent of misclassification.

PHO Reviewer's Comments

- There is some limited evidence, from epidemiological data and detection of viral RNA, of COVID-19 transmission by asymptomatic and presymptomatic persons. The findings in this paper further support the plausibility of such transmission. However, uncertainties remain regarding the role of such transmission in driving outbreaks in the absence of major droplet-releasing symptoms (e.g., coughing, sneezing).
- As the authors noted, this study reports on an outbreak occurring in a single skilled nursing facility and the results may not be generalizable to other populations or other long-term care settings.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of "Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility". Toronto, ON: Queens's Printer for Ontario; 2020.

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