

Low yield of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) asymptomatic routine screen testing, despite high community incidence

Dylan C. Kain MD¹, Nathan M. Stall MD^{1,2}, Allison J. McGeer MD³, Gerald A. Evans MD⁴, Vanessa G. Allen MD^{3,5} and Jennie Johnstone MD, PhD^{3,6}

¹Department of Medicine, University of Toronto, Toronto, Canada, ²Division of General Internal Medicine and Geriatrics, Sinai Health, Toronto, Canada,

³Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Canada, ⁴Department of Medicine, Queens University, Kingston, Canada,

⁵Public Health Ontario, Toronto, Canada and ⁶Department of Infection Prevention and Control, Sinai Health, Toronto, Canada

To the Editor—Serial asymptomatic screen testing of staff with reverse-transcriptase polymerase chain reaction (RT-PCR) has been used in some jurisdictions as one strategy to help prevent severe acute respiratory coronavirus virus 2 (SARS-CoV-2) outbreaks in high-risk settings.¹ Results from other serially screened populations during periods of low community SARS-CoV-2 incidence demonstrated very low percent positivity (<0.5%)^{2,3}; the yield in settings with high SARS-CoV-2 community incidence is less well understood. We investigated the percent positivity of routine asymptomatic screen testing in nursing-home staff during periods of both low and high SARS-CoV-2 incidence.

Methods

Beginning July 1, 2020, all nursing-home staff in Ontario, Canada, were required to undergo serial asymptomatic screen testing for SARS-CoV-2 by nasopharyngeal RT-PCR twice per month,¹ which then increased to once per week on November 22, 2020, in regions with weekly SARS-CoV-2 incidence of >25 per 100,000 population.⁴ Staff with a history of coronavirus disease 2019 (COVID-19) were exempt from testing. Data were collected centrally and included reporting from all 623 nursing homes in the province. Staff tested while symptomatic and homes experiencing COVID-19 outbreaks were excluded from the analyses. The study period was June 28, 2020, until March 13, 2021. Analysis and graphing were conducted using Microsoft Excel (Microsoft, Redmond, WA). The study was approved by the University of Toronto Research Ethics Board.

Results

In total, 705,370 SARS-CoV-2 screen tests were collected during the study period; of these, 1,147 were positive (positivity rate, 0.16%). During July and August 2020, when the weekly SARS-CoV-2 incidence in Ontario was <10 cases per 100,000 individuals, the positivity rate in asymptomatic nursing-home staff was <0.1%. During December 2020–January 2021, when weekly SARS-CoV-2 incidence in Ontario was >100 cases per 100,000, the asymptomatic screening positivity rates in nursing-home staff peaked at 0.36%.

Author for correspondence: Dr Jennie Johnstone, E-mail: jennie.johnstone@sinaihealth.ca

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Discussion

Our study confirms previous work showing that, during times of low SARS-CoV-2 incidence, the yield of routine asymptomatic screen testing is very low. We further show that in times of high SARS-CoV-2 incidence, positivity rose only modestly to a peak of 0.36% in contrast to the rise in percent positivity observed in symptomatic individuals. This finding contrasts an earlier study showing 13.7% positivity in systematically screened pregnant women in New York in late March and early April of 2020.⁵ This finding may be explained by the fact that, at the time, access to SARS-CoV-2 testing for the general public was limited. Also, without reporting on previous COVID-19-compatible illness associated with this testing, positive cases may have in fact had recovered illness with prolonged viral RNA persistence. Thus, staff in the study underwent serial symptomatic screening and screen testing and also had access to symptomatic testing. Although SARS-CoV-2 vaccination of nursing-home staff began December 14, 2020, the roll out was slow, with only 55% of staff receiving their first dose by February 23, 2021. Vaccination would not have impacted the results at peak in December 2020.⁶

Our findings demonstrate that outside an outbreak or high-risk contact setting, the pretest probability of routine asymptomatic SARS-CoV-2 screen testing remains low, even in settings with high SARS-CoV-2 incidence. When pretest probability is low, the rate of false positives increases, further increasing the opportunity costs of such testing strategies (eg, unnecessary isolation of residents). Although routine screen testing has theoretical benefits, the low yield seen in our study, even during high SARS-CoV-2 incidence, means that in sectors with limited resources, these costs must be weighed against the limited benefit of such testing. The yield in those fully vaccinated against SARS-CoV-2 will be even further reduced, suggesting that any benefit from asymptomatic screen testing in fully vaccinated individuals unlikely apart from high-risk exposures and outbreaks.

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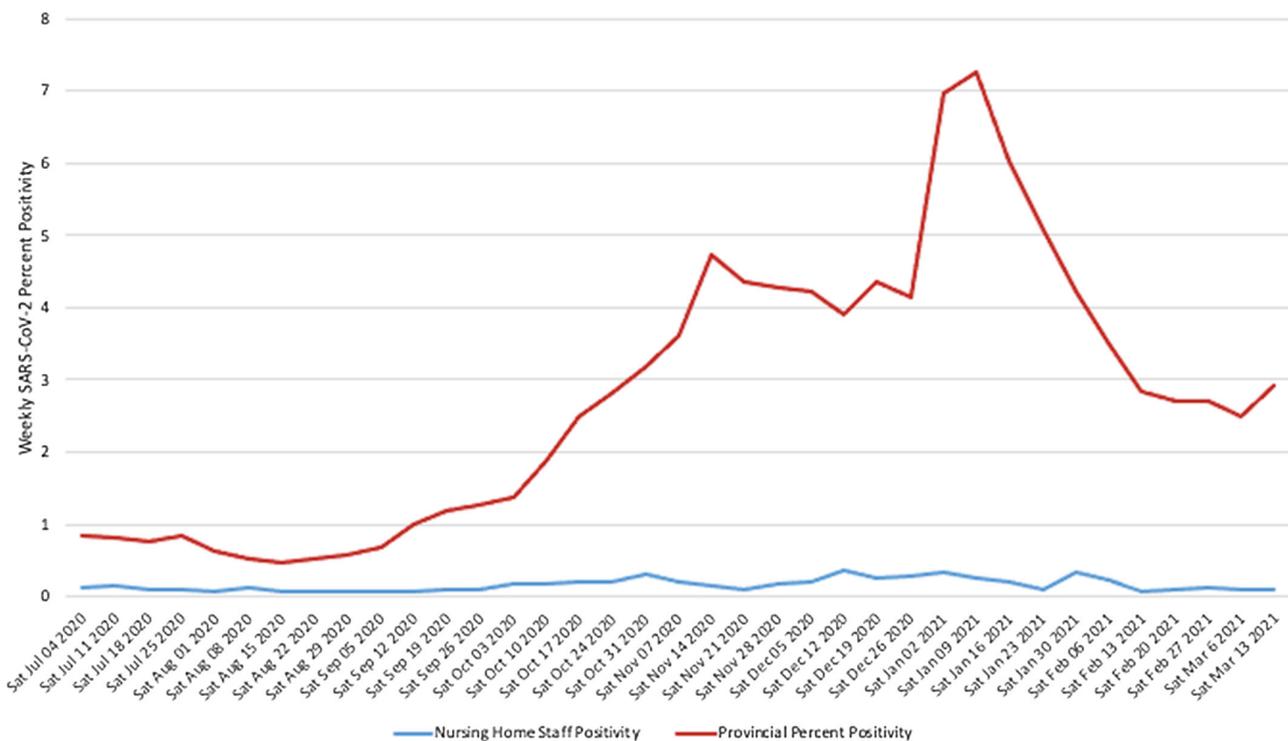


Fig. 1. Ontario nursing-home staff screen testing SARS-CoV-2 percent positivity compared to provincial percent positivity, from June 28, 2020, to March 13, 2021. Line graph showing percent SARS-CoV-2 test positivity for routine asymptomatic nursing-home staff screening compared to provincial test positivity between June 28, 2020, and March 13, 2021. During the low SARS-CoV-2 incidence summer months of 2020, test positivity rates were consistently <0.1%. There was a small increase in SARS-CoV-2 test positivity during the second wave (September 1, 2020–March 14, 2021) peaking at 0.36% in December 2020.

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Rostered routine testing for severe acute respiratory coronavirus virus 2 (SARS-CoV-2) infection among healthcare personnel—Is there a role in a tertiary-care hospital with enhanced infection prevention and control measures and robust sickness-surveillance systems?

Angela Chow PhD^{1,2,3} , Huiling Guo MPH¹, Win Mar Kyaw MPH¹, Anthony Lianjie Li MD¹, Rachel Hui Fen Lim MPH¹ and Brenda Ang MPH^{4,5}

¹Department of Clinical Epidemiology, Office of Clinical Epidemiology, Analytics, and Knowledge, Tan Tock Seng Hospital, Singapore, ²Saw Swee Hock School of Public Health, National University of Singapore, ³Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore, ⁴Department of Infectious Disease, Tan Tock Seng Hospital, Singapore and ⁵Department of Infection Prevention and Control, Tan Tock Seng Hospital, Singapore

Author for correspondence: Angela Chow, E-mail: angela_chow@ttsh.com.sg

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To the Editor—Active surveillance allows (1) early identification and isolation of individuals infected with severe acute respiratory coronavirus virus 2 (SARS-CoV-2), (2) tracing and quarantining close contacts, and (3) prevention of further transmission.