

FOCUS ON

(ARCHIVED) Options for Shortened Quarantine Period for Asymptomatic Close Contacts

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Key Highlights

- There is some emerging evidence that Alpha and Delta variants of concern (VOCs) may have shorter mean incubation periods and serial intervals than the wild-type SARS-CoV-2.
- In the context of this emerging evidence and high vaccination coverage in the population, there is some support for a shortened quarantine period (with testing during quarantine) for unvaccinated high risk contacts.
- There is limited evidence on post-quarantine risk of transmission that accounts for impacts of the more transmissible Delta and higher population-level vaccination coverage. Some modelling studies have shown that testing during the quarantine period can reduce this risk.
- More stringent quarantine measures may need to be considered in populations with lower vaccine coverage and vulnerable populations, if a shortened quarantine period results in increased post-quarantine transmission risk.
- The jurisdictional scan did not identify any known evaluation of the impact and relative risk of a shortened 10-day quarantine period (compared to 14 days) for unvaccinated close contacts.

Introduction

Self-isolation and quarantine measures have been a pillar throughout the pandemic response, containing and limiting the spread of SARS-CoV-2. However, these measures have also been linked to many negative individual and societal impacts, including worsening physical and mental health, and reduced economic productivity. With increasing vaccination coverage in Ontario, there is a need to consider options for reducing the quarantine period for individuals at low-risk of acquiring and spreading the virus.

This Focus On will review the evidence and considerations for shortening the quarantine period for asymptomatic close contacts.

Background

As of August 11, the Management of Cases and Contacts of COVID-19 in Ontario advises that close contacts of SARS-CoV-2 who are not fully vaccinated should self-isolate for 10 days from last exposure to a case and seek testing.¹ The isolation period is based on the upper estimate of the incubation period of SARS-CoV-2, which can take up to 14 days (median 5-6 days).²

With the mass delivery of vaccines to the adult community in April 2021 and expanded eligibility to youth between the ages of 12 and 17 years old at the end of May, the provincial guidance has been revised to exempt fully vaccinated individuals from self-isolation but continues to advise testing as per the provincial testing guidance.^{3,4} Evidence from vaccine effectiveness (VE) studies and epidemiological summaries of case counts following mass vaccination roll-out demonstrate that receiving a full vaccination series provides a high degree of protection from SARS-CoV-2 infection.⁵

However, the emergence of variants of concern (VOCs), particularly those capable of vaccine escape, has prompted further considerations for contacts exposed to VOCs. The Delta variant is currently the predominant circulating SARS-CoV-2 strain in Ontario and has been found to be about 40-60% more transmissible than the Alpha variant, and have a lower post-dose one VE compared to Alpha.⁶ Rapid spread among populations that are not fully vaccinated has already occurred in the province.⁵

There is some limited evidence for a shortened incubation period for the Alpha and Delta variants; however, most studies pre-date widespread Delta circulation. This Focus On highlights the evidence regarding the incubation period of recent variants of concern compared to earlier variants, and discusses options for a shortened quarantine period for asymptomatic close contacts based on this evidence, as well as the current context of high vaccination coverage in the population.

Methods

A rapid literature review was conducted on the incubation period and serial intervals of the Alpha and Delta VOCs and the residual risk of transmission with different quarantine options (duration of quarantine with and without testing during quarantine) for close contacts. A rapid jurisdictional and organizational scan was also conducted to identify recommendations for contact management with respect to guidance for quarantine period and testing during quarantine. The scan reviewed recommendations from Canada (BC Centre for Disease Control, Alberta, and Manitoba), US Centers for Disease Control and Prevention (CDC), European Centre for Disease Prevention and Control (ECDC), Australia, Germany, Public Health England (PHE), and Northern Ireland. The search strategy focussed on literature published this year and in the English language.

Findings

Incubation Period and Serial Intervals of VOCs

There is some emerging evidence that Alpha and Delta VOCs may have slightly shorter mean incubation periods and serial intervals than wild-type SARS-CoV-2. A shorter incubation period and serial interval would imply that more secondary cases among contacts would occur within a shortened quarantine period. There was no evidence found regarding the maximum incubation period of these VOCs compared to wild-type.

- Based on 30 patients with Alpha variant infections and 42 patients with other strains, one study found that the incubation period for Alpha infections was 3.5 days compared to 4.3 days for other strains when transmission occurred in '3C' environments (closed spaces, crowded places, and close-contact settings).⁷
- A technical briefing from the UK found that the median intervals between index case and secondary case onset for household contacts, and between exposure date and secondary case onset for non-household contacts are both 4 days for both Alpha and Delta.⁸
- A study from China followed 167 Delta variant infections, all of which were traced to a single index case, found that Delta has a shorter serial interval compared to other VOCs earlier in the pandemic.⁹
 - Using time interval analysis of intra-family transmission, the time from the exposure to a PCR positive case in the quarantined period was 6 days during the 2020 pandemic. This is compared to only 4 days during the 2021 pandemic, when Delta was in circulation.
 - Incubation periods using symptom onset was difficult to ascertain, as more than half of transmissions occurred during the pre-symptomatic period. Instead, time between exposure to the first detection of Delta was analyzed which showed a peak of approximately 3.7 days.
- A study from Singapore investigated possible drivers of Delta variant growth by studying the serial intervals (i.e., symptom onset-to-onset delay, a proxy for the generation interval) between pairs of a primary case and a secondary case occurring among household members.¹⁰ There were 32 pairs with Delta infection and 63 pairs with infections occurring before April 2020 (i.e. with wild-type SARS_CoV-2 infections). Both groups had a serial interval of 3 days. The study found no evidence to support a large difference (i.e., greater than one day) in serial intervals among the samples studied.

RESIDUAL POST-QUARANTINE TRANSMISSION RISK

The US CDC published a scientific review of shortened quarantine options, however the review was based on information prior to the widespread circulation of Delta and high vaccine coverage in the population.¹¹ It summarizes the residual post-quarantine transmission risk from shortened quarantine options (after day 7 vs. day 10 compared to standard 14 days) with and without testing.

• The median estimated residual post-quarantine risk at 14 days without a test (0.1%, range 0.0-3.0%) was lower compared to 10 days with a PCR test within 48 hours before day 10 (0.3%, range 0.0-2.4%), but upper ranges were similar. • The median estimated residual post-quarantine transmission risk at 10 days without a test (1.4%, range 0.1-10.6%) had a lower median but higher upper range compared to 7 days with a PCR test within 48 hours before day 7 (4.0%, range 2.3-8.6%)

Three relevant studies in 2021 further corroborate the scientific review of shortened quarantine options by the CDC. However, these studies also pre-date widespread Delta circulation and high population-level vaccination coverage.

- One modelling study showed that the risk of post-quarantine transmission following a 14-day quarantine with no testing was not different than that following a 7-day quarantine with testing the day before exit from quarantine.¹² The researchers assumed an incubation period of 8.29 days, a latent period (days from infection to testing) of 2.9 days, with 30.8% of infections being asymptomatic, and perfect self-isolation of symptomatic infections.
- Another modelling study which evaluated the performance of quarantine strategies when one or more SARS-CoV-2 tests were administered during the quarantine found that "SARS-CoV-2 testing can effectively reduce the length of a quarantine without compromising safety. A single RT-PCR test performed before the end of quarantine can reduce quarantine duration to 10 days.
- Two tests can reduce the duration to 8 days, and three highly sensitive RT-PCR tests can justify a 6-day quarantine."¹³ They had concluded that more strategic testing schedules and longer quarantines are needed if tests are administered with less sensitive RT-PCR tests or antigen tests. Shorter quarantines can be utilized for applications that tolerate a residual post-quarantine transmission risk comparable to a 10-day quarantine.
- A shortened quarantine protocol following SARS-CoV-2 exposure was implemented on a college campus in the US, predicated on contacts remaining asymptomatic and test negative at days 4 and 7 following last exposure.¹⁴ The study assessed data on exposures, symptoms and tests on 1,152 individuals released from quarantine on Day 7 and found no evidence of additional transmission attributed to these individuals (that is, these individuals were not identified as probable sources of exposure based on contact tracing interviews). In this study, only 4 (0.3%) of these 1,152 individuals tested positive within 14 days of their exposure without either identifying new exposures or developing symptoms after being released from quarantine.

Jurisdictional Scan

A rapid scan of jurisdictions and organizations was conducted on Aug 19, 2021, to review quarantine period recommendations for asymptomatic close contacts, and differential guidance for vaccinated and previously positive contacts. With the exception of the BC Centre for Disease Control (BCCDC), no other jurisdiction provided a rationale for implementing a 10 day quarantine period (e.g., whether the change was due to shortened incubation period of Delta)

14-Day Quarantine Period

CANADA (MANITOBA)

- Asymptomatic contacts are advised to self-isolate for 14 days from last exposure, regardless of test results:¹⁵
 - Testing recommended 10 days (earlier testing at day 7 or later is also acceptable) after last exposure to a confirmed case.

- If tested on day 6 or earlier, repeat testing is recommended at day 10. If tested at day 7 or later, repeat testing is not required.
- Household close contacts who are unable to isolate from the case or who do not get tested must isolate for 10 days (same duration as case) and a further 14 days to account for transmission at the end of the case's isolation period.
- Asymptomatic close contacts are exempt from isolation if they are fully immunized (i.e., at least two weeks since last dose) and do not have a medical condition (e.g., immunocompromised) OR were recently infected (i.e., previous infection in the last 3 months).

US CDC

- Asymptomatic close contacts are advised to isolate for 14 days after last contact with a confirmed case.¹⁶
- Individuals may be able to shorten their quarantine period, depending on local context and needs:
 - After day 10 without testing.
 - After day 7 after receiving a negative test result (test must occur on day 5 or later).

ECDC

- Asymptomatic close contacts are advised to isolate for 14 days after last exposure.¹⁷
- The ECDC has not changed its recommendations on managing vaccinated contacts. Member states are advised to assess exposed vaccinated contacts on a case-by-case basis and classify vaccinated individuals based on risk assessment.¹⁸

AUSTRALIA

- Primary close contacts, defined as persons who have been in contact with confirmed SARS-CoV-2 cases, are required to quarantine for 14 days following the last possible contact.¹⁹
- There is currently no differential guidance for contacts based on vaccination status.

GERMANY

- Close contacts are recommended to quarantine for 14 days from the day after the last contact with the confirmed case. Close contacts are also recommended to self-monitor for SARS-CoV-2 related symptoms for 21 days after last contact.²⁰
- Fully vaccinated individuals, recovered immune-competent individuals (within 6 months) and recovered immune-competent individuals who have received one dose of vaccine are exempt from quarantine following an exposure to a confirmed SARS-CoV-2 case. These individuals are advised to self-monitor for 14 days post exposure.

10-Day Quarantine Period

CANADA (BCCDC)

• Unvaccinated contacts with high-risk exposures to a confirmed case are required to self-isolate for 10 days. The CDC science brief was referenced as evidence for the reduced quarantine period (from 14 days).²¹⁻²²

There are further isolation recommendations depending on vaccination status, prior infection status and risk exposure (i.e., household vs. non-household contact).

ENGLAND (PUBLIC HEALTH ENGLAND)

• Contacts are required to self-isolate for 10 days from last contact with a confirmed case.²³ Fully vaccinated individuals who have come into close contact with a SARS-CoV-2 case are not required to self-isolate.

NORTHERN IRELAND

- Close contacts with no history of prior infection in the last 9 months are advised to seek testing
 on day 0 and day 10. Individuals awaiting test results are advised to "restrict their movements",
 which is defined as "staying home as much as possible to avoid contact with other people." If
 day 10 testing is not completed, contacts are required to restrict their movements for 14 days.²⁴
- Fully vaccinated close contacts and those who have had a recent infection within the previous 9 months are not required to restrict their movements or seek testing. The definition of fully vaccinated varies depending on the type of vaccine administered.

No Quarantine Period

CANADA (ALBERTA)

- Individual management of close contacts is not routinely required and testing is not indicated for asymptomatic close contacts.²⁵
- Asymptomatic close contacts, regardless of vaccination status, are only recommended to follow additional public health measures:
 - Close contacts who are not fully immunized are recommended to avoid public spaces and if they will be interacting with others who may be at risk for SARS-CoV-2 (e.g., individuals who are not fully immunized), they may consider additional precautions (e.g., physical distancing, wearing a mask, washing/sanitizing hands often)
 - Close contacts, regardless of vaccination status, are also recommended to self-monitor for symptoms for 14 days after last exposure.

Discussion

Options for a shortened quarantine period (i.e., less than 14 days with testing during quarantine), for unvaccinated COVID-19 high risk contacts may be supported based on emerging evidence of a slightly shorter incubation period of the predominant Delta variant, as well as evolving risk context with high vaccination coverage in the population.

Epidemiological Considerations of Shortened Quarantine

Current high population-level vaccination coverage might reduce the risk of secondary transmission from a contact that becomes an unrecognized asymptomatic case. The increased risk of a contact becoming an undetected asymptomatic case may be acceptable at the population level; however, may not be acceptable at the individual level. Based on modelling studies, testing during the quarantine period, and particularly towards the end of the quarantine period, can reduce the risk of post-quarantine transmission of contacts.¹¹⁻¹⁴

Settings with lower vaccine coverage and vulnerable populations (e.g. some congregate living settings) would be susceptible to spread in the setting if application of a shortened quarantine option would result in an increased risk of post-quarantine transmission. Consideration should be given to continuing to apply more stringent quarantine measures in settings with vulnerable populations.

Unvaccinated (but eligible) individuals may be more likely to be in contact with other unvaccinated individuals, further increasing the risk of post-quarantine transmission from a shortened quarantine. Consideration should be given to continuing to apply more stringent quarantine measures in settings with low vaccination coverage.

Conclusion

The rapid review of literature in this Focus On does not represent a systematic examination of quarantine periods for close contacts or incubation periods and serial intervals of VOCs, particularly within the context of the more transmissible Delta variant and increasing vaccination coverage. Data on the incubation periods and serial intervals of Delta and other emerging variants are still underway.

There is currently no known evidence of any evaluation of the impact of implementing a shortened quarantine period for unvaccinated close contacts in any jurisidiction. Furthermore, there is limited evidence in settings where an increased risk of post-quarantine transmission is likely to yield a high rate of secondary transmission (e.g., congregate living settings). However, as more jurisdictions opt for shorter quarantine periods, further evidence may become available as to the impact and the relative risk compared to 14-day quarantine periods.

Considerations for a shortened quarantine period should include the epidemiological and local context and particularly vulnerable settings where post-quarantine transmission may lead to substantial secondary transmission.

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