RAEB Research, Analysis & Evaluation Branch
Evidence to Action

Ontario

EVIDENCE SYNTHESIS BRIEFING NOTE

TOPIC: PRACTICES FOR CASE AND CONTACT MANAGEMENT OF COVID-19

Information finalized as of September 23, 2021.[a]

This Briefing Note was completed by the Evidence Synthesis Unit (Research, Analysis, and Evaluation Branch, Ministry of Health) in collaboration with a member of the COVID-19 Evidence Synthesis Network. Please refer to the Methods section for further information.

Purpose: To summarize the evidence on case and contact management of COVID-19, particularly regarding the Delta variant, across jurisdictions and in the research literature.

Key Findings:

- Limited jurisdictional information was identified that explicitly noted if jurisdictions' case and contact management was successful in limiting the spread of the Delta variant or COVID-19 generally.
- Studies identified the use of digital technologies (i.e., social media), multimodal methods (i.e., manual/ human-based contact tracing coupled with digital technologies), and requiring contacts of probable cases to self-isolate as strategies for case and contact management. Multimodal case and contact management was generally recommended. Five practices were identified across jurisdictions:
  - Mapping Platforms: The Czech Republic and Taiwan use mapping platforms (i.e., online maps that display hotspots and locations under investigation) to identify and track COVID-19-positive individuals.
  - Public Space Record Keeping: New Zealand (NZ) and Nova Scotia (NS) use public space record keeping in contact management. Administrative controls, including recording visitor details for contract tracing, have been generally successful in avoiding workplace outbreaks.
  - Inclusion of Contacts of Probable Cases: While the World Health Organization (WHO), the United States, Kansas, and Illinois recommend self-isolation for both confirmed and probable COVID-19 cases, Australia, Ethiopia, NZ, and NS only require it for confirmed cases. Alberta does not require contacts of confirmed cases to isolate. Prince Edward Island includes contacts of both confirmed and probable cases in their contact management.
  - Vaccination Status: Australia, BC, New Brunswick, NS, the United Kingdom, and Wales change their case and contact management based on an individual's vaccination status. For example, fully vaccinated and/or recently infected (i.e., within 90 days) contacts are not required to self-isolate in BC and NS.
  - Contact Categorization: Australia and NZ use three tiers (i.e., primary/close contacts, contacts with limited direct exposure with a positive case, and secondary close contacts/casual contacts) of isolation requirements for contacts of positive cases.

Analysis for Ontario: The Government of Ontario manages contacts and cases based on a combination of symptomatic presentation and vaccination status (e.g., if a fully immunized individual is asymptomatic, they are not required to self-isolate while awaiting test results). This parallels the case and contact management processes of some other Canadian provinces.

Implementation Implications: While some evidence suggests that various case and contact management practices may assist in achieving low COVID-19 case rates, limited evidence of best practices for contact and case management specific to the Delta variant suggests more studies are needed.

[a] This briefing note includes current available evidence as of the noted date. It is not intended to be an exhaustive analysis, and other relevant findings may have been reported since completion.

Supporting Evidence

Table 1 below summarizes scientific evidence and jurisdictional information regarding best practices for case and contact management of COVID-19. Additional details are provided in Table 2 in the Appendix. The majority of the information presented is taken directly from the identified sources.

The public health approach to COVID-19 case and contact management to date has largely focused on interrupting chains of transmission through contact tracing by identifying individuals at risk of exposure to SARS-CoV-2 from an identified case.[1] Case management includes a public health unit's initial interaction with a positive case, the investigation to determine how they may have been infected with COVID-19, and the identification of all close contacts.[2] The primary goal of contact tracing is to identify and to quarantine – or to facilitate self-monitoring of – individuals who are potentially exposed to a case to stop future chains of transmission.[1]

The Government of Canada's Interactive Data Visualizations of COVID-19 website was used to identify jurisdictions that have recently had lower COVID-19 case rates per capita than Ontario or jurisdictions that have maintained low COVID-19 case numbers despite the prevalence of the Delta variant. However, information identified from other jurisdictions was also included if available. For information regarding which jurisdictions have recently had lower COVID-19 case rates per capita than Ontario, please see Table 2.

Limited information was identified on case and contact management addressing the transmission of the Delta variant and COVID-19 in general, as well as reported population health outcomes associated with using case and contact management.

Table 1: Summary of Scientific Evidence and Jurisdictional Information regarding Best Practices for COVID-19 Case and Contact Management

Scientific Evidence	• Studies recommend using different digital technologies or multimodal (i.e., digital and non-digital) methods for COVID-19 case and contact management. One review noted the importance of isolation for both confirmed and probable COVID-19 cases.
	  ○ **Digital Technology**: Digital technology is largely used to contact trace/manage cases:
	  ▪ A review (July 2021) from the National Collaborating Centre for Methods and Tools (NCCMT) identified the adoption of information technology (IT) infrastructure that respects data transparency and privacy as an important component found to contribute to the success of COVID-19 mitigation strategies.[3]
	  ▪ A review (January 2021) found that repeated testing assisted in minimizing false COVID-19 diagnoses, while pooled testing was useful in resource-limited circumstances. The use of digital tools for contact tracing and isolation was identified as a best practice.[4]
	  ▪ An article (February 2021) on case and contact management practices in Nigeria, Rwanda, South Africa, and Uganda identified leveraging IT as a best practice. For example, the Nigerian Centers for Disease Control and Prevention actively leveraged platforms such as social media and SMS messaging; and maintained a website replete with information, including locations of testing and isolation centres, informational flyers to post in health facilities and other institutions, and other messaging to counter misinformation.[5]

	○ **Multimodal Methods:** Digital technology can be used in tandem with, or used to enhance, non-digital methods of COVID-19 case and contact management: ▪ A study (May 2020) examining Singapore's contact tracing strategies identified a backward and forward activity mapping process to identify close contacts and examine a patient's digital footprint, such as cloud-based visitor registration systems and mobile Bluetooth applications. The study suggests that digital contact tracing complements human-based contact tracing, and cannot replace the manual tracing.[6] ▪ An article (May 2021) noted that the Vietnamese Ministry of Health (MOH) instituted case-contact tracing from late January 2020, well before the World Health Organization (WHO) advised these measures. In addition, the identification, serial testing, and minimum 14-day isolation of all direct contacts of cases, regardless of symptoms, was central to their response. The MOH also instituted various digital methods. For example, on February 8, 2020, they established a technology-based communication plan, including videos and infographics disseminated through mass media, social networks, and digital platforms such as YouTube.[7] ▪ A study (June 2021) of the effectiveness of manual versus bulletin board contact tracing[b] found that the latter: gives comparable results in terms of the reproductive number, duration, prevalence, and incidence; is less resource intensive; easier to implement; offers a wide range of privacy options; and can improve participation. Using both methods performs significantly better than manual contact tracing alone.[8] ▪ A UK study (August 2021) found that, relative to cases that were initially missed by the contact tracing system because of a data glitch, cases subject to proper contact tracing were associated with a reduction in subsequent new infections of 63% and a reduction in subsequent COVID-19-related deaths of 66% across the six weeks following the data glitch.[c] These findings suggest that contact tracing may be an even more effective tool to fight infectious diseases than was previously thought.[9] ▪ A report from Public Health Ontario (July 2021) noted that strengthened laboratory surveillance, such as surge testing and contact tracing, and genomic sequencing are additional supports being used to suppress Delta variant transmission in England and Italy, which are jurisdictions where Delta is spreading fastest.[32] ○ **Inclusion of Probable COVID-19 Cases:** The July 2021 review from the NCCMT found that comprehensive COVID mitigation strategies generally involved rapid isolation of both confirmed COVID-positive individuals and those with potential exposure.[3]
International Scan	• Five case and contact management practices were identified internationally: mapping platforms (Czech Republic, Taiwan); public space record keeping (New Zealand [NZ]); vaccination status (Australia [AU], Wales); inclusion of probable COVID-19 cases (AU, Ethiopia, NZ); and contact categorization (AU, NZ). ○ **Mapping Platforms:** Two jurisdictions use mapping platforms for case and contact management:

[b] Manual contact tracing relies on reaching individuals who have been in proximity to an infectious person. A bulletin board approach focuses on identifying locations visited by an infectious person, and then contacting those who were at those locations anonymously using a public bulletin board rather than trying to uniquely identify and contact particular individuals.[8]
[c] The glitch, caused by an Excel spread sheet error, resulted in 15,841 positive cases to be missed in both the officially reported figures and the case data that was transferred to the national contact tracing system. This allowed researchers to use the data as a large-scale natural experiment.[9]

- In March 2020, the Czech Republic began testing the "smart quarantine" project, which will map contacts of positive individuals using modern information technologies to help regional hygiene stations trace potentially infected people.[10]
- In July 2021, Taiwan's Central Epidemic Command Center launched the Epidemiological Investigation Assistance Platform. The platform integrates and provides functions such as hotspot maps, tracking locations under investigation, and data from contact tracing text messaging service. Access is limited to authorized personnel in local government to conduct epidemiological investigations.[11]

- **Public Space Record Keeping:** In August 2021, NZ introduced mandatory record keeping for busy places and large gatherings. Those responsible for businesses (i.e., restaurants, bars, aged care) and events will need to ensure people keep a record when they visit, either by scanning QR codes with the Tracer App or making a manual record.[12]
- **Vaccination Status:** Australia and Wales (as of August 2021) require confirmed cases to isolate, regardless of vaccination status.[13,14] In Wales, close contacts of confirmed cases that are fully vaccinated or are under 18 years of age are not required to isolate.[15] The United Kingdom also does not require isolation for these individuals, in addition to those who cannot get vaccinated for medical reasons.[16]
- **Inclusion of Contacts of Probable COVID-19 Cases:** The World Health Organization (WHO; June 2021) recommends that all contacts of confirmed or probable SARS-CoV-2 infection quarantine in a designated facility or in a separate household room for 14 days from the last contact with the confirmed or probable case. Local health authorities may consider that contacts who have recent (within past three to six months) SARS-CoV-2 infection or who have received full vaccination may be at lower risk and be exempt from quarantine. While initial data appears to support this, WHO recommends countries adopt a risk-based approach for any decision to exempt individuals from quarantine.[17]
  - Ethiopia (as of January 2021), NZ (as of August 2021), and AU (as of September 2021) only require self-isolation for contacts of confirmed cases.[13,18,19]
  - US: The Centers for Disease Control and Prevention recommends contract tracing be conducted for contacts of both confirmed or probable cases.[20] In Kansas and Illinois, isolation for contacts of probable cases is recommended.[21,22]
- **Contact Categorization:** Using contact categories to determine isolation requirements was identified in two jurisdictions. As of September and August 2021, AU and NZ, respectively, identified three tiers of isolation requirements for contacts of positive cases:
  - The first tier includes primary close contacts (AU) and close contacts (NZ), who are required to quarantine for 14 days following the last possible contact with a confirmed case, regardless of any negative test result.
  - The second and third tiers differ between the two jurisdictions. The second tier includes contacts who had limited direct exposure with a confirmed case.[d] Contacts are required to isolate and get tested in NZ, but were only required to be informed of their exposure in AU. AU's third tier is a close contact of a close contact, and some Public Health Units may require them to quarantine.[13] NZ's third tier is casual contacts, who have been in the same place as the confirmed case but may not have been near the person, and recommends self-monitoring for symptoms for 14 days.[19]

[d] The second tier of 'limited direct exposure with confirmed case' refers to AU's causal contact and NZ's casual plus contact categories.

Canadian Scan	• Four types of case and contact management practices were identified in Canada: vaccination and infection status (Nova Scotia [NS], British Columbia [BC], New Brunswick [NB], Newfoundland and Labrador [NL]); inclusion of contacts of probable COVID-19 cases (Prince Edward Island [PEI], NS); and public space record keeping (NS, BC). Changing case and contact management based on vaccination status was the most identified practice. ○ **Vaccination and Infection Status:** Most identified Canadian provinces changed their case and contact management based on an individual's vaccination status. The Public Health Agency of Canada (PHAC) recommends that fully vaccinated individuals not be required to self-isolate, unless symptoms occur.[1] ▪ Fully vaccinated and/or recently infected (i.e., within 90 days) contacts are not required to self-isolate in NS and BC. In NB, contacts are not required to self-isolate if fully vaccinated, and if contacts are symptomatic, they are required to get tested. A symptomatic contact is only recommended to get tested in NS.[23–25] As of March 2021, vaccination history does not change case or contact management in NL.[26] ○ **Inclusion of Contacts of Probable COVID-19 Cases:** Some provinces include contacts of probable cases in their contact management, while others only include confirmed case contacts. While PEI includes contacts of both confirmed and probable cases in their contact management,[27] NS only considers contacts of confirmed cases.[24] In Alberta, close contacts of confirmed cases are not required to isolate, and contact tracers from public health units do not inform them of their potential exposure.[28] ○ **Public Space Record Keeping:** Nova Scotia (no date) uses public space record keeping in their case and contact management. Restaurants and liquor licensed establishments are required to collect contact information (i.e., date/time of visit, phone number) for all dine-in patrons for 30 days for contact tracing. Patrons can be fined $2,000 for providing false information.[29] A literature review from the BC Centre for Disease Control (June 2021) notes that administrative controls, including recording visitor details, have been generally successful in avoiding workplace outbreaks.[30]
Ontario Scan	• Ontario's case and contact management strategies include: isolation requirements being determined by vaccination status and symptom presentation; and multimodal methods. ○ **Vaccination Status and Symptom Presentation:** The Government of Ontario (August 2021) manages potential COVID-19 cases based on vaccination status and symptom presentation. ▪ Isolation for fully vaccinated and/or previously positive individuals[e] is recommended if symptomatic and is not required if asymptomatic. If living with a symptomatic individual, household members are required to self-isolate until the symptomatic individual receives a negative COVID-19 test result, unless the household member is asymptomatic and fully immunized or previously positive. ▪ If not fully immunized nor previously positive, asymptomatic individuals with high-risk exposure to a confirmed or probable case should self-isolate while test results are pending and complete their full 10-day self-isolation in the event of negative test result(s). Household members of asymptomatic individuals who do not have a high-risk exposure do not need to self-isolate while the asymptomatic individual is awaiting screening testing results.[31]

[e] Cleared of COVID-19 infection and within 90 days of their positive specimen result.[31]

	○ **Multimodal Methods:** In March 2021, Toronto Public Health (TPH) transitioned to a new enhanced case and contact management system, allowing lab results to be available more quickly through frequent automatic uploads and for access data in a centralized location. Valuable staff resources are accordingly then focused on critical management functions. In addition, TPH introduced a virtual assistant (VA) tool to administer a rapid-response questionnaire to both cases and contacts, and to gather critical data, including symptoms, onset date, ability to self-isolate, risk factors and contacts. TPH built the infrastructure such that from June 2-4, 2021, TPH successfully reached 97.2% of newly reported confirmed cases of COVID-19 within 24 hours and 83.7% of newly reported contacts within 24 hours.[33]

Methods

The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic continues. The following member of the Network provided an evidence synthesis product that was used to develop this Evidence Synthesis Briefing Note:

- Ontario Health (Cancer Care Ontario), COVID-19 Case and Contact Management: Jurisdictional Scan Results, 10 September 2021.

For more information, please contact the Research, Analysis and Evaluation Branch (Ministry of Health).

APPENDIX

Table 2: Research Literature and Jurisdictional Information regarding Best Practices for COVID-19 Case and Contact Management

NOTE: In the first column of Table 2, jurisdictions with fewer COVID-19 cases per 100,000 population than Ontario in the last 14 days[f] are bolded.

Reference, Jurisdiction, Theme	Summary
Research Literature	
The National Collaborating Centre for Methods and Tools. (2021). Living Rapid Review Update 3: What is known about the risk of transmission of COVID-19 within post-secondary institutions and the strategies to mitigate on-campus outbreaks? Canada Digital Technology	• **Objective:** This rapid review summarizes evidence from post-secondary institutions that resumed and subsequently sustained on-campus operations in 2020-21, amid the ongoing pandemic, to inform safe and effective campus re-opening plans for 2021-22. It seeks to identify, appraise, and summarize emerging research evidence, to augment the findings of an expert consultation released in December 2020, to support evidence-informed decision making. • **Background:** A rapid expert consultation in the United States found that comprehensive mitigation strategies generally involved: fast, frequent testing with results communicated rapidly; rapid isolation of positive individuals and quarantine of those with potential exposure; contact tracing; masking; physical distancing; environmental management (cleaning, heating, ventilation, and air-conditioning systems); and engagement with local public health officials helped mitigate the spread of COVID-19. Important components found to contribute to the success of mitigation strategies included: daily analysis of data to guide decision making; adoption of an information technology infrastructure that respects data transparency and privacy while rapidly providing accurate information; including students in the development and implementation of the strategy; and fostering a culture of shared responsibility. • **Results:** The certainty of evidence on the risk of transmission in post-secondary institutions is very low (GRADE); findings are very likely to change as new data become available. ○ When reported, mitigation strategies were similar across most studies making it difficult to explain the variation in the percentage of positive cases or identify which combination of strategies resulted in the lowest transmission rates. ○ Generally, studies reporting 3.9% positive cases or lower conducted symptomatic testing with rapid results (< 24 hours), contact tracing, and on-campus isolation for positive cases and close contacts. ○ Many studies also conducted surveillance testing (asymptomatic testing and/or wastewater monitoring). Institutions with the lowest case rates also conducted active screening, and temperature checks. All measures were implemented by internal institutional staff. ○ Some evidence suggests unsafe gatherings were associated with greater transmission, rather than physical living arrangements.
Fetzer, T., & Graeber, T. (2021). Measuring the scientific effectiveness of contact tracing: Evidence from a natural experiment. Proceedings of the National Academy of Sciences, 118(33), e2100814118.	• **Objective:** It has not yet been possible to causally assess the effectiveness of contact tracing using a randomized controlled trial of the sort familiar throughout other areas of science. This study provides evidence that comes close to that ideal. • **Methods:** This study exploits a large-scale natural experiment that occurred by accident in England. An internal investigation revealed that a total of 15,841 positive cases had accidentally been missed in both the officially reported figures and the case data that was transferred to the national contact tracing system – around 20% of all cases during that time. This omission occurred because case information had accidentally been truncated from Excel spreadsheets after a row limit had been reached. According to government reports, the original reporting dates of the missed cases would have been between

[f] Fewer than 67 cases per 100,000 population in the two weeks prior to September 23, 2021 (September 8-22), according to the Government of Canada's (GC) Interactive Data Visualizations of COVID-19. Case rates for Illinois, Kansas, Toronto, and Wales were not available through the GC website.

Reference, Jurisdiction, Theme	Summary
United Kingdom (UK) Multimodal Methods	September 25 and October 2, 2020.While the data glitch did not affect the individual dissemination of test results to people who tested positive, an anticipated 48,000 close recent contacts had not been traced in a timely manner and had therefore not been ordered to self-quarantine. • **Results:** This study found that the random breakdown of contact tracing led to more illness and death. Conservative causal estimates imply that, relative to cases that were initially missed by the contact tracing system, cases subject to proper contact tracing were associated with a reduction in subsequent new infections of 63% and a reduction in subsequent COVID-19-related deaths of 66% across the six week following the data glitch. • **Conclusion:** The robust and quantitatively large effects estimated under conservative assumptions across the analyses suggest that contact tracing may be an even more effective tool to fight infectious diseases than was previously thought.
Lai, S. H. S., Tang, C. Q. Y., Kurup, A., & Thevendran, G. (2021). The experience of contact tracing in Singapore in the control of COVID-19: highlighting the use of digital technology. International Orthopaedics, 45(1), 65–69. Singapore Multimodal Methods	• **Objective:** This article seeks to examine the forms of contact tracing that Singapore, a highly dense city-state, adopts with a focus on new innovations including the use of digital technology. • **Methods:** A search of published literature in PubMed, MEDLINE and EMBASE was undertaken to include publications published between December 31, 2019 and May 6, 2020. • **Results:** Contact tracing in Singapore is overseen by the Ministry of Health (MOH). COVID-19 cases are interviewed on their whereabouts during a backward and forward activity mapping process to identify close contacts. Extensive contact tracing even involving the police and serological tools have helped to establish links between cases and closed several local clusters. Examination of patients' digital footprints have helped in contact tracing. Other digital technology introduced includes SafeEntry and TraceTogether. SafeEntry is a cloud-based visitor registration system while TraceTogether is a mobile phone application which operates by exchanging anonymized identifiers between nearby phones via Bluetooth connection. • **Conclusion:** Digital contact tracing is likely to expand and continue to complement human-based contact tracing for the current and future pandemics. However, at this juncture, it is reportedly not ready to replace the manual and meticulous work that only Singapore contact tracers can achieve.
Thai, P. Q., Rabaa, M. A., Luong, D. H., Tan, D. Q., Quang, T. D., Quach, H.-L., et al. (2021). The First 100 Days of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Control in Vietnam. Clinical Infectious Diseases, 72(9), e334–e342. Vietnam Multimodal Methods	• **Objective:** This article describes the control measures used by the Vietnam government and their relationship with imported and domestically acquired case numbers, with the aim of identifying the measures associated with successful SARS-CoV-2 control. • **Methods:** Clinical and demographic data on the first 270 SARS-CoV-2 infected cases and the timing and nature of government control measures, including numbers of tests and quarantined individuals, were analyzed. • **Results:** A national lockdown was implemented between April 1 and 22, 2020. Approximately 200,000 people were quarantined and 266,122 reverse transcription polymerase chain reaction (RT-PCR) tests conducted. Population mobility decreased progressively before lockdown. In total, 60% (163/270) of cases were imported; 43% (89/208) of resolved infections remained asymptomatic for the duration of infection. The serial interval was 3.24 days, and 27.5% of transmissions occurred pre-symptomatically. Limited transmission amounted to a maximum reproduction number of 1.15. No community transmission has been detected since April 15. The government acted quickly, educating and engaging the public, placing restrictions on international flights, closing schools and universities, and instituting exhaustive case-contact tracing from late January, well before these measures were advised by WHO. Second, they placed the identification, serial testing, and minimum 14-day isolation of all direct contacts of cases, regardless of symptom development, at the heart of the response.

Reference, Jurisdiction, Theme	Summary
	• **Conclusion:** Vietnam has controlled SARS-CoV-2 spread through the early introduction of mass communication, meticulous contact tracing with strict quarantine, and international travel restrictions. The value of these interventions is supported by the high proportion of asymptomatic and imported cases, and evidence for substantial pre-symptomatic transmission.
Pokharel, A., Soulé, R., & Silberschatz, A. (2021). A case for location-based contact tracing. Health Care Management Science, 24(2), 420–438. Israel Multimodal Methods	• **Objective:** To evaluate the effectiveness of manual contact tracing compared to bulletin board contact tracing, by comparing their effects on the overall reproductive number as well as the incidence and prevalence of disease. • **Context:** Classical contact tracing relies on reaching individuals who have been in proximity to an infectious person. A bulletin board approach focuses on identifying locations visited by an infectious person, and then contacting those who were at those locations anonymously using a public bulletin board rather than trying to uniquely identify and contact particular individuals. The main weakness of classical contact tracing is that it depends entirely on the ability of an individual to accurately remember and identify people they contacted. Israel uses a bulletin board style approach for contact tracing. ○ On a smaller scale, schools use a similar approach to notify parents of classroom infections while preserving the privacy of the individual infected. • **Methods:** Approaches were evaluated using repeated agent-based simulations (that combine a location-based model of disease spread with models of contact tracing) and the CDC's "best estimate" scenario. Effectiveness was measured in terms of: 1) the time between first infection and the end of the last infection; 2) the maximum number of people infected during this time period; and 3) the average effective reproduction number. • **Results:** Bulletin board contact tracing gives comparable results in terms of the reproductive number, duration, prevalence and incidence; is less resource intensive; easier to implement; offers a wider range of privacy options; and possibly improves participation. • **Conclusion:** The experiments show that location-based bulletin board contact tracing can improve manual contact tracing. Hybrid contact tracing using both manual and bulletin board methods performs significantly better than manual contact tracing alone.
Nachega, J. B., Atteh, R., Ihekweazu, C., Sam-Agudu, N. A., Adejumo, P., Nsanzimana, S., et al. (2021). Contact Tracing and the COVID-19 Response in Africa: Best Practices, Key Challenges, and Lessons Learned from Nigeria, Rwanda, South Africa, and Uganda. The American Journal of Tropical Medicine and Hygiene, 104(4), 1179–1187. **Nigeria**, **Rwanda**, South Africa, **Uganda** Digital Technology	• **Objective:** This article discusses selected best practices and challenges with COVID-19 contact tracing in Nigeria, Rwanda, South Africa, and Uganda. • **Methods:** The information presented draws from a webinar hosted by the African Forum for Research and Education in Health and Fogarty International Center, National Institutes of Health. • **Results:** Best practices from these country case studies include sustained, multi-platform public communications; leveraging of technology innovations; applied public health expertise; deployment of community health workers; and robust community engagement. ○ Nigeria: A best practice was the use of multiple communication platforms to engage, inform, and educate communities. The Nigerian Centers for Disease Control and Prevention (CDC) actively leveraged platforms such as social media (including Twitter), SMS messaging, and radio. It also maintained a website replete with information for different populations, including locations of testing and isolation centers, informational flyers to post in health facilities and other institutions, and other messaging to counter myths and misinformation. ○ Rwanda: A notable best practice was leveraging information technology (IT) to complement traditional contact tracing methods, accommodate the increased workload, and maintain efficiency. Specifically, Rwanda is using cellphone tower data to augment contact tracing efforts.

Reference, Jurisdiction, Theme	Summary
	○ South Africa: South Africa's key best practices for contact tracing include deployment of community health workers and intensive involvement of public health specialists to appropriately manage different aspects of the response, including case finding and contact identification, epidemiology, and surveillance, and to upgrade central electronic databases. ○ Uganda: A best practice in Uganda was robust community engagement through building capacity of community health systems to foster trust, contain stigma, and support the contact tracing process, especially as activities were decentralized to local health teams. Of note, the Community Engagement Strategy for COVID-19 Response (launched by the Prime Minister on October 20, 2020) requires the establishment of a village COVID-19 task force in every village in the country and served as a catalyst for improved coverage and efficiency of contact tracing. • **Conclusion:** Important lessons learned include the need for decentralization of contact tracing to the lowest geographic levels of surveillance, rigorous use of data and technology to improve decision-making, and sustainment of both community sensitization and political commitment. ○ Further research is needed to understand the role and importance of contact tracing in controlling community transmission dynamics in African countries, including among children. Implementation science will be critically needed to evaluate innovative, accessible, and cost-effective digital solutions to accommodate the contact tracing workload.
Chung, S.-C., Marlow, S., Tobias, N., Alogna, A., Alogna, I., You, S.-L., et al. (2021). Lessons from countries implementing find, test, trace, isolation and support policies in the rapid response of the COVID-19 pandemic: a systematic review. BMJ Open, 11(7), e047832. Digital Technology	• **Objective:** To systematically learn lessons from the experiences of countries implementing find, test, trace, isolate, support (FTTIS) in the first wave of the COVID-19 pandemic. • **Methods:** Authors searched MEDLINE (PubMed), Cochrane Library, SCOPUS and JSTOR, initially between May 31, 2019 and January 21, 2021. Research articles and reviews on the use of contact tracing, testing, self-isolation and quarantine for COVID-19 management were included in the review. • **Results & Conclusion:** The systematic review identified the following relevant key components of an FTTIS system: ○ Repeated testing to minimize false diagnoses and pooled testing in resource-limited circumstances; and ○ Extended quarantine period and the use of digital tools for contact tracing and self-isolation.
Canada Jurisdictional Information	
Government of Ontario. (2021, August 11). Management of Cases and Contacts of COVID-19 in Ontario. Ontario	**Management of prospective cases (individuals awaiting testing results):** ○ Preliminary positive results: "Preliminary positive" results from a molecular point-of-care (POC) assay should be considered sufficient laboratory evidence to initiate case and contact management as appropriate as a probable case, while awaiting confirmatory parallel testing. Assays that have been approved to provide final results will report results as "positive" if positive. ○ Symptomatic Individuals: ▪ All fully immunized individuals (≥14 days after a complete vaccine series) and previously positive individuals (cleared and within 90 days of their positive specimen result) who have symptoms of COVID-19 should self-isolate and be tested for SARS-CoV-2 as soon as possible. ▪ Public Health Units (PHUs) may initiate public health case and contact management of symptomatic individuals with high-risk exposures who are awaiting test results, depending on the context of the symptoms, exposures, and exposure settings. For surveillance purposes, symptomatic individuals awaiting test results are not considered probable cases and will not need to be entered into the case and contact management system (CCM). Test results should be obtained before determining case classification. ▪ Symptomatic individuals should self-isolate while their test results are pending.

Reference, Jurisdiction, Theme	Summary
	▪ All household members of symptomatic individuals are required to self-isolate until the symptomatic individual receives a negative COVID-19 test result or is provided an alternative diagnosis by a health care professional. If the household member is asymptomatic and fully immunized or previously positive within 90 days, they are not required to self-isolate. If the symptomatic individual does not seek COVID-19 testing, all household members advised to self-isolate by the PHU should self-isolate for 10 days from last exposure to that symptomatic individual. Household members do NOT include those living in separate units in congregate living settings (e.g., those who live in a separate unit within the same retirement home, or a separate self-contained basement suite in a house). PHUs should apply the specific congregate living advice guidance to individuals in self-isolation in those settings. ○ Asymptomatic Individuals: ▪ Fully immunized or previously positive individuals are not required to self-isolate while awaiting test results, unless otherwise instructed by local public health. For surveillance purposes, asymptomatic individuals awaiting test results are not considered probable cases and should not be entered into CCM. Test results should be obtained before determining case classification. ▪ Asymptomatic individuals with high-risk exposure to a confirmed or probable case who are not fully immunized nor previously positive, should self-isolate while test results are pending and complete their full 10-day self-isolation in the event of negative test result(s). A positive result would require self-isolation until cleared. ▪ Asymptomatic individuals participating in approved screening/surveillance testing (as per the Provincial Testing Guidance) and who did not have a high-risk exposure do not need to self-isolate while their screening results are pending, but must self-isolate and obtain confirmatory testing immediately in the event of a positive screening test. ▪ Fully immunized individuals and previously positive individuals may be excluded from asymptomatic surveillance testing. ▪ Household members of asymptomatic individuals participating in screening/surveillance testing who do not have a high-risk exposure do not need to self-isolate while the asymptomatic individual is awaiting screening testing results. ○ Virtual Assistant tool: ▪ The Virtual Assistant (VA) is a case and contact management tool embedded in the CCM solution. The VA helps to support rapid notification of a positive result or an recent exposure to a COVID-19 positive case. It supports the distribution and collection of information regarding self-isolation, symptoms, and other details to support risk assessment. ▪ For cases, the VA can additionally be used to gather information on exposures and close contacts. Clients receive a text message with a link to the online tool. When they proceed, the VA offers a conversational flow, presenting cases and contacts with information and questions on COVID-19, self-isolation, symptoms and other important information. Responses are fed into CCM. ▪ The VA can effectively support case investigators and contact tracers by reducing the CCM data entry requirements, supporting the initial case or contact phone call by priming the client in advance and providing automated support throughout the self-isolation period. ▪ The VA can be used by PHUs at different stages of the investigation – at the beginning, to send rapid notification and collect information to support further prioritization and outreach; and during the case or contact's isolation period for ongoing monitoring of symptoms, provide reinforcement of isolation guidelines and additional support. The VA should be used by PHUs wherever possible and should be integrated into existing workflows. **Case management**

Reference, Jurisdiction, Theme	Summary
	• Initial case reporting: the PHU must enter the case into CCM within 24 hours. The initial contact to a confirmed case (by phone, or through VA) is to ensure the case is isolating and to gather information for entry into CCM. PHUs need to enter a minimum data set as dictated by the most recent Enhanced Surveillance Directive for each confirmed case (and probable cases where feasible). Virtual Assistant may be deployed as initial contact with a case, prior to the case investigator phone call, to prime the case for management; cases will be sent a text message to complete an online tool which provides information on COVID-19, self-isolation and includes a portal for contact identification, feeding into CCM. • PHUs must assess for the most relevant acquisition exposure(s) in the 14 days prior to symptom onset or 14 days prior to positive specimen collection date if never symptomatic. The most relevant acquisition exposures (after household members) for entry are settings where the case spent the most time outside of the house, and where acquisition is most likely to have occurred based on the "3 C's" (close contact where physical distancing cannot be maintained, crowded spaces, and closed environments with poor ventilation). • Case exposure assessment should be completed for travel history out of the province, and history of close contact with someone who travelled out of the province. • Cases should be monitored for assessment of the illness, to ensure the ability to comply with self-isolation, and to determine when they can be cleared from self-isolation. At a minimum, cases must be called on the phone where feasible (or through VA) within 24 hours from when the PHU was notified of the case and should be contacted on day 5 and day 10 of the isolation period. In situations where a case is required to isolate for 20 days, follow-up contact is required (e.g., day 5, day 10, day 15, and day 20) provided the case is discharged from hospital.

Government of Canada. (2021). Public health management of cases and contacts associated with COVID-19.
 	
Canada
 	
Vaccination Status
	• **Context:** The Public Health Agency of Canada (PHAC), in collaboration with Canadian public health experts, has developed this guidance for federal/provincial/territorial (FPT) public health authorities (PHAs) to support the management of individuals infected with or who may have been infected with the SARS-CoV-2 virus (i.e., "cases") and contacts of COVID-19 cases within their jurisdictions.
	  ○ PHAs should report confirmed cases of COVID-19, as well as probable cases where feasible, to the PHAC within 24 hours of receipt of their own notification.
	• **Contact management:** Recommendations by exposure risk level:
	  ○ High-risk exposure (close contact):
	  ▪ Recommendations: Quarantine at home for 14 days from last exposure or for the recommended period determined by the local PHA; follow PHA directions related to testing requirements.
	  ▪ Description:
	  • Health care worker (HCW) who is not fully vaccinated;
	  • Anyone who is not fully vaccinated and:
	  ○ Lives with a case, has direct physical contact with a case or is exposed to their infectious body fluids (e.g., the case's caregiver, intimate partner);
	  ○ Shared an indoor space (e.g., same room) with a case for a prolonged period of time without adhering to appropriate individual-level and setting-specific risk mitigation measures; and
	  ○ Had a close-range conversation with a case or has been in settings where a case engaged in singing, shouting, or heavy breathing (e.g., exercise), without adhering to appropriate individual-level and setting-specific risk mitigation measures.

Reference, Jurisdiction, Theme	Summary
	○ Low-risk exposure: ▪ Recommendations: Self-monitor for symptoms for 14 days following their last exposure; if symptoms occur, isolate away from others as quickly as possible, put on a medical mask, and contact the PHA for further direction; follow PHA directions related to testing requirements. ▪ Description: • HCW (regardless of vaccination status) who provided direct physical care to a case, or a laboratory worker handling COVID-19 specimen, with consistent and appropriate use of recommended personal protective equipment and infection prevention and control practices. • Anyone (regardless of vaccination status) who has: ○ Shared an indoor space (e.g., same room) with a case, including closed spaces and crowded places (e.g., social gatherings, workplaces, etc.), with adherence to appropriate individual-level and setting-specific risk mitigation measures; and ○ Had a close-range conversation with a case or has been in settings where a case engaged in singing, shouting, or heavy breathing (e.g., exercise), with adherence to appropriate individual-level and setting-specific risk mitigation measures. ○ Fully vaccinated individuals in the above-mentioned high-risk exposure (close contact) situations would be considered to have a low-risk exposure and be managed accordingly.
City of Toronto. (2021). Toronto Public Health (TPH) case and contact management key to limiting COVID-19 transmission and preparing for re-opening. Toronto Multimodal Methods	• On February 1, 2021, TPH transitioned to a new mandatory and enhanced provincial case and contact management (CCM) system. This new technology tool modernizes data management, is a central source for COVID-19 data in Ontario and is integrated with the Ontario Laboratory Information System. This integration permits lab results to be available faster through frequent automatic uploads, allowing TPH to quickly access important data in a centralized location. Valuable staff resources are then focused on critical case and contact management functions, especially during Toronto's third wave of COVID-19 when case volumes were the highest in the city. • Since May 2020, as part of its COVID-19 monitoring indicators, the province set a target of 90% of newly reported cases and newly reported high-risk contacts successfully being reached within 24 hours. TPH built the infrastructure such that between June 2 and June 4, 2021, TPH successfully reached 97.2% of newly reported confirmed cases of COVID-19 within 24 hours and 83.7% of newly reported contacts within 24 hours. • In March 2021, TPH introduced a virtual assistant (VA) tool to administer a rapid-response questionnaire to both cases and contacts. The VA gathers key data critical to case management including symptoms and onset date, ability to safely self-isolate, potential source of infection, risk factors and contacts. TPH also remains focused on following up on the highest risk scenarios, which include investigation of outbreaks in health care facilities, schools, childcare facilities, workplaces, and congregate settings such as shelters and group homes. • As of June 1, the TPH Community Case and Contact team of approximately 1,000 skilled staff, investigate cases in hospitals, long-term care, workplaces, congregate settings, child care facilities, and schools. When case volumes peak, TPH leverages the support of the Ministry of Health's Provincial Workforce, which includes approximately 200 case managers. The strategies, resources, built capacity and innovative use of technology have strengthened TPH's case and contact management function and have been critical to reducing spread as we prepare to reduce public health restrictions.

Reference, Jurisdiction, Theme	Summary

Department of Health and Wellness. (2020, March). Prince Edward Island (PEI) Guidelines for the Management and Control of COVID-19.
 	
Prince Edward Island
 	
Inclusion of Probable Cases
	Contact management:
	• Contact tracing and counselling are to be completed for all reported cases. A close contact is defined as:
	  ○ Those who provided care for the case, including health care workers, family members or other caregivers, or who had other similar close physical contact without consistent and appropriate use of personal protective equipment; OR
	  ○ Those who lived with or otherwise had close prolonged contact (within 2 metres) with a probable or confirmed case while the case was ill; OR
	  ○ Those who have had direct contact with infectious body fluids of a probable or confirmed case (e.g., was coughed or sneezed on) while not wearing recommended personal protective equipment.
	• Those who are identified as a contact of a case will be instructed to self-isolate and monitor for symptoms for 14 days. Public Health Nursing (PHN) will be following up with the close contacts daily. If symptoms occur, testing will be arranged.
	• No additional information was identified in the 2020 report, and no updated information was identified.

Government of New Brunswick. (2021, August 19). COVID-19 Contact Tracing.
 	
New Brunswick
 	
Vaccination Status
	• **Contact management:**
	  ○ Contacts through public exposure notifications:
	  ▪ One or no doses: Self-monitor for symptoms. If symptomatic, isolate and get tested.
	  ▪ Two doses: Self-monitor for symptoms. No isolation required. If symptoms develop testing is recommended.
	  ○ Direct contacts are sorted into two risk categories:
	  ▪ High-risk (One or no doses): Isolation for 14 days; testing on days three to five and day 10; 14 days isolation period may end upon receipt of negative day 10 test.
	  ▪ Low-risk (Two doses):
	  • One or more symptoms: Isolation and testing; Public Health to determine next steps based on test results.
	  • No symptoms: No isolation; self-referral for testing on days three to five and day 10.
	  ○ Contact risk level will be determined based on a combination of factors, such as (but not limited to) an individual's vaccination status, personal health status, amount of time in contact with the case, what type of contact occurred, and the location where the contact occurred. Case and contact management remains at the discretion of the Medical Officer of Health.

Department of Health and Community Services. (2021, March 2). Public Health Management of Cases and Contacts of COVID-19 in Newfoundland and Labrador.
 	
Newfoundland and Labrador
 	
Vaccination Status
	• At this time, vaccination history will not change the case or contact management process, or time required to self-isolate. This guidance will be updated as the evidence around COVID-19 vaccinations evolves.
	• All COVID-19 cases should be contacted by public health within 24 hours to initiate the case investigation and complete the contact tracing interview. Each case should receive a minimum of three contacts from public health (day 0, day 5, and day 10).
	• **Case management: criteria for recovering positive cases of COVID-19:**
	  ○ Public health officials will provide clearance to individuals diagnosed with COVID-19 to discontinue self-isolation. Repeat laboratory testing as the basis for discontinuing isolation is not recommended, as such, a non-test-based approach should be applied. Once recovered/resolved, the case details must be updated in the COVID-19 Tracker within 24 hours. A case can be cleared from isolation and considered "resolved" once they meet the criteria below:
	  ○ Mild to moderate illness AND no severe immune compromise:
	  ▪ Ten days have passed since symptom onset, afebrile, and improving clinically.
	  ▪ Absence of cough is not required for those known to have a chronic cough or who are experiencing reactive airways post-infection.
	  ▪ If symptoms remain after 10 days, isolation should continue for an additional four days.

Reference, Jurisdiction, Theme	Summary
	▪ If symptoms remain by day 14, recovery will be determined on a case-by-case basis in consultation with the Regional Medical Officer of Health. ▪ A COVID-19 case which is classified as resolved may still have ongoing clinical indications and symptoms, but should no longer require isolation measures or public health follow up. ○ Asymptomatic: ▪ Discontinue isolation 10 days from positive test collection date. ○ Severe illness OR severe immune compromise: ▪ Discontinue isolation 20 days from symptom onset (or 20 days from positive test collection date if asymptomatic and severe immune compromise), provided that the individual is afebrile (without the use of fever-reducing medications) and symptoms are improving for at least 24 hours. ▪ The absence of cough is not required for those known to have a chronic cough or who are experiencing reactive airways post-infection.
Department of Health and Wellness. (2021, September 3). Nova Scotia Interim Guidance: Public Health Measures of Cases and Contacts Associated with Novel Coronavirus (COVID-19). **Nova Scotia** Inclusion of Probable Cases & Vaccination Status	**Case management:** • Public Health will follow all new laboratory confirmed cases of COVID-19 to conduct the activities below: ○ Interview the case to determine case details (onset and severity of symptoms, risk factors, vaccine status) and provide clear information and instructions about isolation requirements and what to do if symptoms worsen. ○ Identify susceptible contacts and investigate risk factors. ○ Monitor cases for a minimum of 10 days (ideally on day five and 10) after the onset of symptoms or for asymptomatic cases, 10 days after the test results. ○ Provide advice to the case and household contracts on individual measures including personal hygiene and how to care the case as safely as possible. ○ Cases should isolate for a minimum of 10 days after onset of symptoms or for 10 days after test result if asymptomatic. **Contact management advice by susceptibility status:** • Susceptible:[g] ○ Isolation: Self-isolate for 14 days from last unprotected exposure. If day six or seven test negative, contact may exit self-isolation after seven full days of isolation. After negative day six/seven test, contact would be excluded from high-risk/congregate care settings, specifically long-term care, shelters, visiting acute care facilities, and corrections. Contacts who do not receive a day six/seven test would continue their self-isolation period to day 14. ○ Testing: Test on notification by Public Health of exposure. Recommend a test on day six or seven. A negative test is required to exist self-isolation. Recommend a day 14 test. Contacts who test positive would be managed as a case. • Non-Susceptible:[h] ○ Isolation: Symptomatic contacts must self-isolate until a negative test is obtained. Individuals can discontinue self-isolation if they receive a negative result but should be excluded from high-risk/congregate settings until their symptoms have resolved. Asymptomatic contacts are not required to isolate.

[g] An individual is considered susceptible if they: are not fully vaccinated; or have no documented previous SARS-CoV-2 infection or have previously been infected with SARS-CoV-2 but have been greater than three months (12 weeks) from the start date of their post infectious period.[24]
[h] An individual is non-susceptible if they: are fully vaccinated; or have previously been infected with SARS-CoV-2 and are within three months (12 weeks) from the start date of their post infectious period.[24]

Reference, Jurisdiction, Theme	Summary
	○ Testing: Symptomatic contacts should arrange testing at a minimum of 72 hours following exposure. Asymptomatic contacts are not required to be tested for SARS-CoV-2.
Government of Nova Scotia. (n.d.). Coronavirus (COVID-19): restrictions and guidance. **Nova Scotia** Public Space Record Keeping	**Contact management: contact tracing at liquor licensed establishments and restaurants:** • Restaurants and liquor licensed (drinking) establishments (e.g., bars, wineries, distillery tasting rooms, and craft taprooms) must collect contact information for all table service (dine-in) patrons. Contact information needs to include date and time of visit, name and phone number and must be kept for 30 days from date of visit for contact tracing purposes. Patrons can be fined $2,000 for providing false information.
Government of Alberta. (2021). COVID-19 public health actions. Alberta Inclusion of Contacts of Probable Cases	• **Testing**: ○ Asymptomatic testing is no longer recommended. ○ A wastewater baseline testing program will be launched to provide area trend information and monitor variants of concern. • **Isolation and quarantine requirements**: ○ Isolation is still legally required for people who have COVID-19 symptoms or tested positive. ○ Quarantine is no longer legally required for close contacts positive cases, unless directed to do so by local public health officials. • **Contact tracing and case investigation**: ○ Individuals with positive tests will continue to be notified. ○ Contact tracers will not notify close contacts of positive cases, but will ask that individuals do so when informed of their positive result. ○ Contact tracers will continue to investigate cases in high-risk settings, such as acute and continuing care.
British Columbia Centre for Disease Control. (2021, July 16). Interim Guidance: Public Health Management of Cases and Contacts Associated with Novel Coronavirus (COVID-19) in the Community. British Columbia (BC) Vaccination Status	• **Contact management:** ○ Contacts are mostly managed by the level of risk of the COVID-19 exposure and their immunity against infection. ○ Fully immunized or recent infection: For contacts who are deemed fully immunized or have had a recent prior COVID-19 infection, requirement for quarantine is waived. However, these contacts still need to self-monitor for 14 days after the last exposure. ○ Partially immunized or less recent infection: For contacts with a more distant prior infection, who have received one dose of vaccine more than seven days before the first exposure, quarantine is replaced with self-monitoring for the 14 days after the last exposure. Contacts that are partially immunized, unless they are household-like contacts, can also self-monitor without needing to quarantine.
British Columbia Centre for Disease Control. (2021, June 16). COVID-19 and indoor air: Risk mitigating measures and future-proofing. BC	• **Context:** This document outlines findings from a general literature search of academic and grey literature including an evaluation of quality and synthesis of key findings, consultation with key informants and experts in the field, and external review of this document. • **Contact management: contact tracing through administrative controls:** ○ Administrative controls include changes to how people interact in a space to minimize opportunities for close contact and to reduce interactions with shared spaces, items, or surfaces. Administrative controls include reducing occupancy by shifting to

Reference, Jurisdiction, Theme	Summary
Public Space Record Keeping	remote work or staggering workdays or hours and reducing contact among employees by establishing cohorts, closing unventilated spaces, and having unavoidable group activities outdoors or in larger spaces. ○ These have been generally successful in avoiding workplace outbreaks. ○ Other administrative controls can include the use of signage and visual cues to encourage and provide reminders to wear a mask, observe one-way traffic markers, or follow good hand hygiene, ensuring workplaces have adequate supplies and access to hand washing and hand-hygiene stations, and recording worker and visitor details for contact tracing purposes should it be required.
International Jurisdictional Information	
Department of Health. (2021, September 7). Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units. Australia Inclusion of Probable Cases & Contact Categorization	• **Case management** ○ Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify the central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within one day of notification of a confirmed case. ○ Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing. • **Contact management** ○ Primary close contacts: ▪ A primary close contact is defined as a person who has: had face-to-face contact with a confirmed case during their infectious period; or shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU. ▪ Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result. ▪ PHUs should conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This may include daily contact via SMS. ▪ At minimum, testing of primary close contacts should occur: if COVID-19 symptoms develop; on entry to quarantine; before exit from quarantine; mid-quarantine. ○ Casual contacts: ▪ A casual contact is defined as a person who has been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact. ▪ At a minimum, casual contacts should be provided with information about their exposure and the need to monitor for symptoms and seek testing if symptoms develop. ▪ Depending on the circumstances, PHU may consider the following options for management of casual contacts in different settings: • Monitor for symptoms and test for SARS-CoV-2 if symptoms develop: Applicable for casual contacts who have been in the same vicinity as a case and are considered very low risk for transmission; OR • Test for SARS-CoV-2 at around day five after exposure and isolate until a negative test is returned. Continue to monitor for symptoms out to 14 days post exposure. Applicable for casual contacts who have been in the same setting as a case, considered low risk for transmission and useful for up-stream investigation; OR

Reference, Jurisdiction, Theme	Summary
	• Short term quarantine period and test for SARS-CoV-2 prior to exit from quarantine. Release from quarantine if a negative test is returned and continue to monitor for symptoms out to 14 days post exposure. Applicable for casual contacts who have been in the same setting as a case and are considered medium risk for transmission. ○ Secondary close contacts: A secondary close contact (also known as a close contact of a close contact) is defined as a person who has had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case. Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case. ○ Household secondary close contacts: PHU may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine. ○ Non-household secondary close contacts: PHU may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case. Alternatively, PHU may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g., if the primary close contact tests negative).
Government of the Czech Republic. (2021). Measures adopted by the Czech Government against the coronavirus. **Czech Republic** Mapping Platforms	• As of March 30, 2020, a so-called "smart quarantine" project has started up in test mode. The goal of smart quarantine is to prevent the further spread of SARS CoV-2 coronavirus in the Czech Republic as quickly and effectively as possible. Smart quarantine, which will map the contacts of positively tested individuals for COVID-19 using modern information technologies, is intended to help regional hygiene stations trace any other potentially infected people. • No additional information was identified.
Public Health Ontario. (2021, July 12). Environmental Scan: COVID-19 Public Health Measures Related to the Delta Variant. England and Italy Strategies to Suppress Delta Transmission	• **Context:** The purpose of this document is to describe public health measures that have been implemented in select jurisdictions (i.e., Denmark, England, Finland, France, Germany, Ireland, Israel, Italy, Norway, and the US) in response to Delta variant. This information in anticipated to help inform how best to move forward with the re-opening of Ontario in the context of the Delta variant. • **Strategies to Suppress Delta Transmission:** While some jurisdictions have not implemented any changes to public health measures in response to the Delta variant (i.e., Denmark and US), other jurisdictions have (i.e., England, Finland, France, Germany, Ireland, Israel, Italy, Netherlands, and Norway). In the context of case and contact management, some countries (e.g., England, Italy) have introduced additional resources such as enhanced testing, contact tracing, genomic sequencing, and monitoring. ○ England: Additional supports to suppress Delta variant transmission have been rapidly deployed in areas where is it spreading fastest. Supports include, for example: ▪ Additional resources to help local authorities with testing, logistics, planning, and workforce to assist with testing, door-to-door visits to engage with residents, and other activities. These may come from the Surge Rapid Response Teams, from military aid, or other sources depending on requirements; ▪ Wastewater testing samples being prioritized for sequencing; ▪ Surge testing and enhanced contact tracing; and ▪ Enhanced monitoring (e.g., genomic sequencing, genotype assay testing).

Reference, Jurisdiction, Theme	Summary
	○ Italy: ▪ The Higher Health Institute of Italy together with other Italian health experts and the European Centre for Disease Prevention and Control have urged for more testing, tracing, sequencing, and renewed efforts to increase the vaccination rate due to Delta. ▪ While not specific to the Delta variant, a recent Ministry of Health webpage notes in order to limit the spread of new variants, Italy has ordered specific public health actions, including: • Strengthening laboratory surveillance against new SARS-CoV-2 variants; • Providing guidance to implement research and contact management activities of suspected/ confirmed COVID-19 cases for variant infection; • Carrying out rapid prevalence surveys to correctly estimate the diffusion of variants; and • Arranging containment measures (red areas) in the most affected areas of the country, including at the municipal level.
The World Bank. (2021, January 14). Acting Early, Fast and Together: Mobilizing Efforts to Prepare and Respond to the COVID-19 Pandemic in Ethiopia. **Ethiopia** Inclusion of Probable Cases	• Toll-free call centers are up and running 24 hours a day, seven days a week, at the national and subnational levels, with an average of 8,000-10,000 calls being responded to daily. Contact tracing and follow-up with persons who had contact with confirmed cases are ongoing. Home-based quarantine is being implemented for contacts of confirmed cases, accompanied by laboratory testing and follow-ups by health professionals.
Ministry of Health. (2021). Contact tracing for COVID-19. **New Zealand (NZ)** Inclusion of Probable Cases & Contact Categorization	• **Contact management:** ○ Close contact: People who may live or work with or have been in the same place at the same time as someone infectious with COVID-19. ▪ Action: Isolate/quarantine, either at home or in a managed facility, for 14 days from last exposure; test immediately (unless it's within one day of the next scheduled test), and on day five after last exposure and day 12 after last exposure. If COVID-19 symptoms develop, get an additional test immediately. ▪ Actions for secondary contacts:[i] Household members should stay at home until the primary close contact returns a negative test result from their day five test. If one or more household members develop symptoms at any time, test and stay at home until negative test result and until 24 hours after symptoms resolve ○ Casual plus contact: People who have been in the same place at the same time as someone infectious with COVID-19, but have not had enough exposure to be a close contact. ▪ Action: Stay at home, get a test immediately and then again around day five after last exposure and remain at home until a negative day five test result is received. Self-monitor for COVID-19 symptoms for 14 days. If COVID-19 symptoms develop after day five, get a test immediately and stay at home until negative test result is received. ▪ Actions for secondary contacts: No action unless the household member develops COVID-19 symptoms. ○ Casual contact: People who have been in the same place at the same time as someone infectious with COVID-19, but may not have been near the person.

[i] A secondary contact is, for example, a household contact or someone that has had significant contact with a close contact.[19]

Reference, Jurisdiction, Theme	Summary
	▪ Action: Self-monitor for COVID-19 symptoms for 14 days. If symptoms develop, get tested and stay at home until a negative test result is received. ▪ Actions for secondary contacts: No action. • **Tracer app notifications:** ○ A yellow notification may be received as a result of scanning QR codes with the NZ COVID Tracer app. A yellow notification means a person has scanned into a location of interest around the same time as a confirmed or probable case of COVID-19 and they may have been exposed to the virus. The notification will tell them what to do and it is important that they follow these instructions. ○ An orange notification may be received if a person has Bluetooth activated in the app. Any person who receives an orange Bluetooth notification via the NZ COVID Tracer app is considered a Close Contact as they have been in close proximity to a confirmed or probable case and may have been exposed to the virus. The alert will tell them what to do.
New Zealand Government. (2021). Record keeping to become mandatory for most events and businesses. **NZ** Public Space Record Keeping	• **Contact management:** ○ Mandatory record keeping is being introduced for busy places and large gatherings to ensure the Government can contact trace quickly. Those responsible for businesses and events will need to ensure people keep a record when they visit, either by scanning QR codes with the COVID-19 Tracer App or making a manual record. ○ This includes cafes, restaurants, bars, casinos and concerts, aged care, health care facilities (excluding patients), barbers, exercise facilities, nightclubs, libraries, courts, local and central government agencies, and social services providers with customer service counters.
Taiwan Centers for Disease Control. (2021). CECC sets up Epidemiological Investigation Assistance Platform to apply information technology to epidemiological investigations. **Taiwan** Mapping Platforms	• On July 24, 2021, the Central Epidemic Command Center (CECC) announced that to prepare for the lowering of the epidemic alert level and easing of restrictions and to provide assistance in precision epidemiological investigations, it has established the Epidemiological Investigation Assistance Platform, which is set to be officially launched on July 26, 2021. The platform integrates and provides functions including showing hotspot maps, tracking locations under investigation, and using data from contact tracing text messaging service, and it is strictly limited to the use by the personnel with authority to conduct epidemiological investigations in local governments in order to provide assistance to them and facilitate their work. • No additional information regarding the Platform was identified.
Government of the United Kingdom. (2021). NHS Test and Trace: what to do if you are contacted. UK	• **Case and contact management**: ○ People should self-isolate as soon as they experience COVID-19 symptoms for at least 10 days, unless a negative PCR test is received. The self-isolation period includes the day the symptoms started and the next 10 full days. ○ Anyone else in the household, unless they are exempt (see below), should also self-isolate for 10 days from when the individual started having symptoms. ○ Failure to self-isolate for the full time period after receiving a positive test can result in a fine, starting from CAD $1,724.[j]

[j] The Government of the UK document reported a figure of GBP £1000. The Canadian Dollar (CAD) amount was calculated using Purchasing Power Parities (PPPs) as published by the Organisation for Economic Co-operation and Development (OECD) for 2020 (1 British Pound [GBP] = 1.724 CAD). PPPs are the rates of currency conversion that eliminate the differences in price levels between countries (OECD, 2021).

Reference, Jurisdiction, Theme	Summary
Vaccination Status	• **Exemptions**: Individuals are not required to self-isolate if they are notified that they have had close contact with someone with COVID-19 and if they: ○ Are fully vaccinated; ○ Are below the age of 18 years and six months; ○ Have taken part in or are currently part of an approved COVID-19 vaccine trial; or ○ Are not able to get vaccinated for medical reasons.
Welsh Government. (2021a). Contact tracing: if you have tested positive. UK (Wales) Vaccination Status	**Case management** • If someone tests positive for COVID-19, they must self-isolate for 10 days from when symptoms started (or if they do not know, from the day they took the test). • They must still self-isolate even if they have been fully vaccinated or are under 18 years of age. There are no exemptions in this case.
Welsh Government. (2021b). Contact tracing: if you are identified as a close contact. UK (Wales) Vaccination Status	**Contact management:** • If an individual is identified as a close contact, from 7 August they will not be asked to self-isolate if they have been fully vaccinated or are under 18 years old. • The individual will still receive a call from contact tracers, but they will not tell the individual to self-isolate. They will offer a PCR test and provide advice and guidance about what can be done to minimize any risks and stay safe. For example, by remaining vigilant for new symptoms, and avoiding contact with vulnerable family and friends in the short-term (e.g., elderly relatives or those who are higher risk of severe COVID-19 infection). • The individual will be strongly advised against any hospital and care home visits for 10 days. **Symptomatic contact management:** • There may be certain circumstances where fully vaccinated and under 18 years old contacts may still be asked to self-isolate. • For example, if an individual develops symptoms of COVID-19, they will be advised to self-isolate and arrange to take a PCR test as soon as possible, even if they've been fully vaccinated or are under 18 years.
Centers for Disease Control and Prevention. (2021). Contract Tracing for COVID-19. United States (US) Inclusion of Contacts of Probable Cases	**Contact management:** • Contact tracing will be conducted and is recommended for close contacts (any individual within six feet of an infected person for a total of 15 minutes or more) of laboratory-confirmed or probable COVID-19 patients. • Those contacts who test positive (symptomatic or asymptomatic) should be managed as a confirmed COVID-19 case. • Asymptomatic contacts testing negative and those who are not tested should self-quarantine for 14 days from their last exposure. • In jurisdictions with testing capacity, symptomatic and asymptomatic close contacts to patients with confirmed and probable COVID-19 should be evaluated and monitored.
Kansas Department of Health and Environment. (2021, September). Coronavirus Disease 2019 (COVID-19) Investigation Guideline. US (Kansas)	**Case and Contact Management:** • If a symptomatic patient or a close contact of a COVID-19 case is being tested for COVID-19, they should be isolated with the assumption that they are infectious. • For contact investigation purposes, immunity may be presumed for an asymptomatic person: ○ During six months after recovery from a COVID-19 infection that was diagnosed by molecular or antigen testing; or ○ Indefinitely for an immunocompetent person who is considered fully vaccinated.

Reference, Jurisdiction, Theme	Summary
Inclusion of Contacts of Probable Cases	• Presumed immunity should not alter: ○ The need to isolate symptomatic (or recently SARS-CoV-2-positive) persons; ○ The use of any non-pharmaceutical interventions recommended for specific settings; or ○ Additional precautions, including testing in certain situations to identify exposed persons that may be infected even if symptoms are not present. • This document also provides information on how the Kansas Department of Health and Environment manages contacts through the EpiTrax, a disease surveillance system for case and contact management.
Illinois Department of Public Health. (2021). COVID-19 Pandemic Health Navigator Regional Coordinators. US (Illinois) Inclusion of Contacts of Probable Cases	• **Context:** The COVID-19 Pandemic Health Navigator Program (PHNP) is considered to be an integral part of the State's response to COVID-19. This Program will use Pandemic Health Navigators (PHNs) to help prevent transmission of COVID-19 through education and outreach to vulnerable communities, coordinate resources for those infected or exposed, and provide contact tracing support to the Illinois Contact Tracing Collaborative. • **Contact management**: The PHNP will be a part of the Illinois Contact Tracing Collaborative, which is a program designed to build capacity to contact every person who tests positive with SARS-CoV-2 and to interview, trace, and provide follow up for close contacts of those cases. The Collaborative includes contact tracers at Local Health Departments and community-based organizations, as well as Illinois Department of Public Health (IDPH) employees who coordinate and fund the statewide response strategy. All contact tracers use IDPH-supported technology systems to perform their tracing duties. ○ Exposed individuals must be subsequently contacted, made aware of their exposure, asked to self-quarantine, and follow public health instructions including being tested for the virus that causes COVID-19. ○ Organizations funded under the COVID-19 Pandemic Health Navigator Program will work in collaboration with local health departments in their region, who will complete case investigations on all persons who test positive for SARS-CoV-2.
World Health Organization. (2021, June 25). Considerations for quarantine of contacts of COVID-19 cases. Inclusion of Probable Cases	• **Context:** The purpose of this document is to offer guidance to Member States on quarantine measures for individuals in the context of COVID-19. • **Contact management:** ○ A contact is a person who has experienced any one of the following exposures during the two days before and the 14 days after the onset of symptoms of a probable or confirmed case: face-to-face contact with someone who has a confirmed or probable SARS-CoV-2 infection within one metre and for more than 15 minutes; direct physical contact with someone with a confirmed or probable SARS-CoV-2 infection; direct care for an individual with a confirmed or probable SARS-CoV-2 infection without using appropriate personal protective equipment; or other situations and conditions, as indicated by local risk assessment. ○ For all contacts of individuals with confirmed or probable SARS-CoV-2 infection, WHO continues to recommend quarantine in a designated facility or in a separate room in the household for a duration of 14 days from the last contact with the confirmed or probable case to minimize risk of onward transmission. ○ WHO continues to recommend that quarantine should be supported. This includes individuals in quarantine receiving adequate food, water, protection, hygiene, and communication provisions, including access to education for children and paid leave or remote work options from jobs; adequate ventilation and infection prevention and control (IPC) measures are implemented and maintained; and the requirements for monitoring the health of quarantined persons can be met during quarantine period.

Reference, Jurisdiction, Theme	Summary
	○ Health authorities may consider that contacts who have recent (within past three to six months) SARS-CoV-2 infection or who have received full COVID-19 vaccination may be at lower risk of further infection and therefore may be exempt from quarantine. While initial data appears to support these assumptions, the lower risk of infection following full COVID-19 vaccination likely varies by COVID-19 vaccine. Given the paucity of data for all available COVID-19 vaccines, WHO recommends countries adopt a risk-based approach for any policy decision to exempt individuals from quarantine.

REFERENCES

1. Government of Canada. (2021). Public health management of cases and contacts associated with COVID-19.

2. Government of Ontario. (2021). Case and contact management strategy.

3. The National Collaborating Centre for Methods and Tools. (2021). *Living Rapid Review Update 3: What is known about the risk of transmission of COVID-19 within post-secondary institutions and the strategies to mitigate on-campus outbreaks?*

4. Chung, S.-C., Marlow, S., Tobias, N., Alogna, A., Alogna, I., You, S.-L., et al. (2021). Lessons from countries implementing find, test, trace, isolation and support policies in the rapid response of the COVID-19 pandemic: a systematic review. *BMJ Open*, *11*(7), e047832.

5. Nachega, J. B., Atteh, R., Ihekweazu, C., Sam-Agudu, N. A., Adejumo, P., Nsanzimana, S., et al. (2021). Contact Tracing and the COVID-19 Response in Africa: Best Practices, Key Challenges, and Lessons Learned from Nigeria, Rwanda, South Africa, and Uganda. *The American Journal of Tropical Medicine and Hygiene*, *104*(4), 1179–1187.

6. Lai, S. H. S., Tang, C. Q. Y., Kurup, A., & Thevendran, G. (2021). The experience of contact tracing in Singapore in the control of COVID-19: highlighting the use of digital technology. *International Orthopaedics*, *45*(1), 65–69.

7. Thai, P. Q., Rabaa, M. A., Luong, D. H., Tan, D. Q., Quang, T. D., Quach, H.-L., et al. (2021). The First 100 Days of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Control in Vietnam. *Clinical Infectious Diseases*, *72*(9), e334–e342.

8. Pokharel, A., Soulé, R., & Silberschatz, A. (2021). A case for location based contact tracing. *Health Care Management Science*, *24*(2), 420–438.

9. Fetzer, T., & Graeber, T. (2021). Measuring the scientific effectiveness of contact tracing: Evidence from a natural experiment. *Proceedings of the National Academy of Sciences*, *118*(33), e2100814118.

10. Government of the Czech Republic. (2021). Measures adopted by the Czech Government against the coronavirus.

11. Taiwan Centers for Disease Control. (2021). CECC sets up Epidemiological Investigation Assistance Platform to apply information technology to epidemiological investigations.

12. New Zealand Government. (2021). Record keeping to become mandatory for most events and businesses.

13. Department of Health. (2021, September 7). Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units.

14. Welsh Government. (2021). Contact tracing: if you have tested positive.

15. Welsh Government. (2021). Contact tracing: if you are identified as a close contact.

16. Government of the United Kingdom. (2021). NHS Test and Trace: what to do if you are contacted.

Date: 01-Oct-2021; Version: 2.0

17. World Health Organization. (2021, June 25). Considerations for quarantine of contacts of COVID-19 cases.
18. The World Bank. (2021, January 14). Acting Early, Fast and Together: Mobilizing Efforts to Prepare and Respond to the COVID-19 Pandemic in Ethiopia.
19. New Zealand Ministry of Health. (2021). Contact tracing for COVID-19.
20. Centers for Disease Control and Prevention. (2021). Contract Tracing for COVID-19.
21. Kansas Department of Health and Environment. (2021, September). Coronavirus Disease 2019 (COVID-19) Investigation Guideline.
22. Illinois Department of Public Health. (2021). COVID-19 Pandemic Health Navigator Regional Coordinators.
23. Government of New Brunswick. (2021, August 19). COVID-19 Contact Tracing.
24. Department of Health and Wellness. (2021, September 3). Nova Scotia Iterim Guidance: Public Health Measures of Cases and Contacts Associated with Novel Coronavirus (COVID-19).
25. British Columbia Centre for Disease Control. (2021, July 16). Interim Guidance: Public Health Management of Cases and Contacts Associated with Novel Coronavirus (COVID-19) in the Community.
26. Department of Health and Community Services. (2021, March 2). Public Health Management of Cases and Contacts of COVID-19 in Newfoundland and Labrador.
27. Department of Health and Wellness. (2020, March). Prince Edward Island Guidelines for the Management and Control of COVID-19.
28. Government of Alberta. (2021). COVID-19 public health actions.
29. Government of Nova Scotia. (n.d.). Coronavirus (COVID-19): restrictions and guidance.
30. British Columbia Centre for Disease Control. (2021, June 16). COVID-19 and indoor air: Risk mitigating measures and future-proofing.
31. Government of Ontario. (2021, August 11). Management of Cases and Contacts of COVID-19 in Ontario.
32. Public Health Ontario. (2021, July 12). Environmental Scan: COVID-19 Public Health Measures Related to the Delta Variant.
33. City of Toronto. (2021). Toronto Public Health case and contact management key to limiting COVID-19 transmission and preparing for re-opening.