COVID-19 Living Evidence Synthesis 13.1:
Effectiveness of COVID-19 quarantine and isolation for reducing transmission of COVID-19 and other respiratory infections, as well as impacting other individual and social outcomes in non-health care community-based settings

Executive summary

Question

What are the effects of quarantine and isolation (and different durations thereof) on COVID-19 transmissions and other individual/societal outcomes (e.g., mental health)?

Background

- Two key strategies to prevent the spread of COVID-19 are: 1) for individuals who have been in contact with an individual who has tested positive for COVID-19 to quarantine; and 2) for individuals who are symptomatic and/or have tested positive for the disease to isolate.
- During early phases of the pandemic, a duration of 14 days for these physical distancing measures was a common policy. Over time and across jurisdictions, there have been several variations in the duration of quarantine and isolation periods. However, it is unclear if and what effects different quarantine and isolation durations have had on transmission rates.
- Furthermore, though we know that the pandemic has had a notable impact on a variety of individual and societal outcomes, it is unclear what the specific impact of quarantine and isolation has been.

Key points

- There are no primary empirical studies that have explored the effectiveness of different pre-defined[#] lengths of COVID-19 quarantine and isolation periods on transmission.
- The limited number of primary empirical studies (i.e., five studies) that have explored the effectiveness of COVID-19 quarantine and isolation periods, relative to no COVID-19 quarantine/isolation on individual and societal outcomes, found contradictory findings for depressive and anxiety symptoms in individuals in quarantine and isolation, but no difference in psychological well-being and distress.
- One study explored differences in anxiety and quality of life in individuals COVID-19 quarantining for more than 7 days, compared to those quarantining for 7 or less days, and found no differences between the groups in multivariate analyses.
- The lack of empirical studies on pre-defined[#] lengths of these measures necessitate us to rely on modelling studies, which tended to show that *longer COVID-19 quarantine periods reduced transmission* and that COVID-19 isolation reduced transmission in general population situations, compared to situations where people were in constant proximity.

[#] studies that used COVID-19 testing protocol to guide the duration of quarantine or isolation were excluded

Date of Literature Search: 20th March 2023

Suggested citation: Bacon SL, Wu N, Joyal-Desmarais K, Burdick J, Sanuade C, Marques Vieira A, Paquet L, Jagwani M, and the COVID-END PHSM LES Working Group. COVID-19 Living Evidence Synthesis 13.1: Effectiveness of COVID-19 quarantine and isolation for reducing transmission of COVID-19 and other respiratory infections, as well as impacting other individual and social outcomes in non-health care community-based settings. Montreal Behavioural Medicine Centre, CIUSSS-NIM, 22nd March 2023.

Overview of evidence and knowledge gaps

- There is no available primary empirical evidence on the effectiveness of different pre-defined lengths of COVID-19 quarantine or isolation on transmission.
- Overall, the evidence on individual and social outcomes has a serious risk of bias, which likely falls in the direction of greater negative impacts of COVID-19 quarantine and isolation which makes drawing clear conclusions almost impossible. However, this limited evidence would suggest that there may be small increase in negative effects on certain, but not all, aspects of mental health, though this is unlikely to be of clinically significant importance. It is also important to note that outcomes related to mental health will be influenced by the cultural context of the study setting, and that results from one country may not be applicable within others.
- There was a great deal of variability in the assumptions being made across the modelling studies, making it nearly impossible to be confident in the summary of this data.
- There are multiple knowledge gaps within the literature including, but not limited to: an absence of data on transmission in relation to different COVID-19 isolation and quarantine periods; a lack of adjustment for important confounders such as self-reporting of COVID-19 and symptoms experienced during COVID-19 quarantine/isolation; a focus on negative outcomes with no measurement of potential positive aspects of COVID-19 quarantine/isolation; a lack of current data (most studies collected data early in the pandemic, and the situation has rapidly changed subsequently); and a lack of consideration of prior COVID-19 infections, vaccination status, or variants.
- It is important to note that COVID-19 quarantine and isolation is also informed by knowledge of the incubation period, the infectious period, viral load kinetics, the reproductive number and/or secondary attack rate, population susceptibility, adherence levels, and other complimentary public health measures in place. Studies focused on these variables and outcomes were not included in this synthesis.

Please note: This living evidence synthesis (LESs) is part of a suite of LESs of the best-available evidence about the effectiveness of six PHSMs (masks, quarantine and isolation, ventilation, physical distancing and reduction of contacts, hand hygiene and respiratory etiquette, cleaning, and disinfecting), as well as combinations of and adherence to these measures, in preventing transmission of COVID-19 and other respiratory infectious diseases in non-health care community-based setting. This first full version was developed after two interim versions, which are available upon request. The next update to this and other LESs in the series is to be determined, but the most up-to-date versions in the suite are available on the COVID-END website. We provide context for synthesizing evidence about public health and social measures in Box 1 and an overview of our approach in Box 2.

Résumé

Contexte

- Deux stratégies clés pour prévenir la propagation de la COVID-19 sont les suivantes : a) les personnes qui ont été en contact avec une personne qui a obtenu un résultat positif à la COVID-19 doivent se mettre en quarantaine ; b) les personnes qui sont symptomatiques ou qui ont obtenu un résultat positif à la maladie doivent s'isoler.
- Au cours des premières phases de la pandémie, une durée de 14 jours pour ces deux mesures était une politique courante. Au fil du temps et entre les administrations, il y a eu plusieurs variations dans la durée des périodes de quarantaine et d'isolement. Toutefois, il n'est pas clair si et quels effets différentes durées de quarantaine et d'isolement ont eu sur les taux de transmission.
- De plus, même si nous savons que la pandémie a eu des répercussions notables sur divers résultats individuels et sociétaux (p. ex., la santé mentale), nous ne savons pas exactement quelle a été l'incidence particulière de la quarantaine et de l'isolement sur ces résultats.

Points clés

- Aucune étude empirique primaire n'a exploré l'efficacité de différentes périodes prédéfinies[#] de quarantaine et d'isolement liés à la COVID-19 en cas de transmission.
- Un nombre limité d'études empiriques primaires (c'est-à-dire cinq études) ont exploré l'efficacité des périodes de quarantaine et d'isolement liés à la COVID-19 par rapport à l'absence de quarantaine ou d'isolement liés à la COVID-19 sur les résultats individuels et sociétaux. Des données contradictoires ont été trouvées par rapport aux symptômes de dépression et d'anxiété chez les gens en quarantaine et en isolement, mais aucune différence de bien-être psychologique et de détresse n'a été relevée.
- Une étude a exploré les différences au niveau de l'anxiété et la qualité de vie des personnes mises en quarantaine en raison de la COVID-19 pendant plus de sept jours, comparativement à celles qui le sont pendant sept jours ou moins, et n'a relevé aucune différence entre les groupes dans les analyses multivariées.
- L'absence d'étude empirique explorant l'efficacité de différentes périodes prédéfinies[#] de quarantaine et d'isolement liés à la COVID-19 nécessite que nous nous basions sur des études de modélisation. Celles-ci suggèrent que plus la période de quarantaine en raison de la COVID-19 est longue, plus les risques de transmission diminuent. Elles suggèrent aussi que l'isolation en raison la COVID-19 permet de diminuer les risques de transmission dans un contexte général lorsque comparé avec des situations ou les gens sont constamment à proximité des autres.

[#]les études nécessitant de tester les individus pour la COVID-19 afin de déterminer la longueur de la quarantaine ont été exclues

Aperçu des lacunes dans les données probantes et les connaissances

- Il n'existe aucune preuve empirique primaire de l'efficacité de différentes durées prédéfinies de quarantaine ou d'isolement liés à la COVID-19 pour la transmission de la COVID-19.
- Dans l'ensemble, les données sur les résultats individuels et sociaux présentent un risque grave de biais, ce qui favorise probablement les groupes de comparaison. Cependant, ces preuves limitées suggèrent qu'il peut y avoir une légère augmentation d'effets négatifs au niveau de certains aspects de la santé mentale, mais pas de tous, bien qu'il soit peu probable que cela ait une importance cliniquement significative. Il est aussi important de noter que les résultats liés à la santé mentale peuvent être influencé par le contexte Culturelle de l'étude. Les résultats obtenus dans une autre pays peuvent donc ne pas être applicable à un autre.

- Il y avait une grande variabilité au niveau des hypothèses formulées dans les études de modélisation, ce qui rend presque impossible d'avoir confiance dans le résumé de ces données.
- La littérature comporte plusieurs limites, notamment (mais sans s'y limiter) : un manque de données sur la transmission en ce qui concerne différentes durée d'isolement ou de quarantaine liés à la COVID-19; un manque d'ajustement pour les facteurs de confusion importants, comme les symptômes auto-rapportés de COVID-19 pendant la quarantaine ou l'isolement liés à la COVID-19; un accent sur les résultats négatifs sans mesure des aspects positifs potentiels de la quarantaine ou de l'isolement lié à la COVID-19; un manque de données qui reflètent la situation actuelle liée à la pandémie (la plupart des études ont recueilli des données au début de la pandémie, et la situation a beaucoup changé depuis); et un manque de prise en compte des infections antérieures à la COVID-19, du statut vaccinal ou des variants.
- Il est important de noter que la quarantaine ou l'isolation en raison de la COVID-19 sont aussi influencées par la période d'incubation et d'infection, la cinétique de la charge virale, le taux de reproduction du virus et/ou d'infection secondaire, la susceptibilité de la population, le degré d'adhérence ainsi que par les mesures de santé publique complémentaires mises en place. Les études ayant comme but principal ces variables et résultats n'ont donc pas été inclues dans cette revue.

Box 1: Context for synthesizing evidence about public health and social measures (PHSMs)

This series of living evidence syntheses was commissioned to understand the effects of PHSMs during a global pandemic to inform current and future use of PHSMs.

General considerations for identifying, appraising and synthesizing evidence about PHSMs

- PHSMs are population-level interventions and typically evaluated in observational studies.
  - Many PHSMs are interventions implemented at a population level, rather than at the level of individuals or clusters of individuals such as in clinical interventions.
  - Since it is typically not feasible and/or ethical to randomly allocate entire populations to different interventions, the effects of PHSMs are commonly evaluated using observational study designs that evaluate PHSMs in real-word settings.
  - As a result, a lack of evidence from RCTs does not necessarily mean the available evidence in this series of LESs is weak.
- Instruments for appraising the risk of bias in observational studies have been developed; however, rigorously tested and validated instruments are only available for clinical interventions.
  - Such instruments generally indicate that a study has less risk of bias when it was possible to directly assess outcomes and control for potential confounders for individual study participants.
  - Studies assessing PHSMs at the population level are not able to provide such assessments for all relevant individual-level variables that could affect outcomes, and therefore cannot be classified as low risk of bias.
- Given feasibility considerations related to synthesizing evidence in a timely manner to inform decision-making for PHSMs during a global pandemic, highly focused research questions and inclusion criteria for literature searches were required.
  - As a result, we acknowledge that this series of living evidence syntheses – about the effectiveness of specific PHSMs (i.e., quarantine and isolation; mask use, including unintended consequences; ventilation, reduction of contacts, physical distancing, hand hygiene and cleaning and disinfecting measures), interventions that promote adherence to PHSMs, and the effectiveness of combinations of PHSMs – does not incorporate all existing relevant evidence on PHSMs.
  - Ongoing work on this suite of products will allow us to broaden the scope of this review for a more comprehensive understanding of the effectiveness of PHSMs.
  - Decision-making with the best available evidence requires synthesizing findings from studies conducted in real-world settings (e.g., with people affected by misinformation, different levels of adherence to an intervention, different definitions and uses of the interventions, and in different stages of the pandemic, such as before and after availability of COVID-19 vaccines).

Our approach to presenting findings with an appraisal of risk of bias (ROB) of included studies

To ensure we used robust methods to identify, appraise and synthesize findings and to provide clear messages about the effects of different PHSMs, we:

- acknowledge that a lack of evidence from RCTs does not mean the evidence available is weak
- assessed included studies for ROB using the approach described in the methods box
- typically introduce the ROB assessments only once early in the document if they are consistent across sub-questions, sub-groups and outcomes, and provide insight about the reasons for the ROB assessment findings (e.g., confounding with other complementary PHSMs) and sources of additional insights (e.g., findings from LES 20 in this series that evaluates combinations of PHSMs)
- note where there are lower levels of ROB where appropriate
- note where it is likely that risk of bias (e.g., confounding variables) may reduce the strength of association with a PHSM and an outcome from the included studies

- identify when little evidence was found and when it was likely due to literature search criteria that prioritized RCTs over observational studies.

Implications for synthesizing evidence about PHSMs

Despite the ROB for studies conducted at the population level that are identified in studies in this LES and others in the series, they provide the best-available evidence about the effects of interventions in real life. Moreover, ROB (and GRADE, which was not used for this series of LESs) were designed for clinical programs, services and products, and there is an ongoing need to identify whether and how such assessments and the communication of such assessments, need to be adjusted for public-health programs, services and measures and for health-system arrangements.

Primary questions

1. What is the effectiveness of different pre-defined lengths of COVID-19 quarantine* (e.g., > 10 days, ≤ 10 days) in reducing transmission of COVID-19 in non-health care community-based settings (PICO 1a)?
2. What is the effectiveness of different pre-defined lengths of COVID-19 isolation* (e.g., > 10 days, ≤ 10days) in reducing transmission of COVID-19 in non-health care community-based settings (PICO 1b)?
3. What is the effectiveness of different pre-defined lengths of COVID-19 quarantine* (e.g., > 10 days, ≤ 10 days) in reducing transmission of non-COVID-19 respiratory illnesses (e.g., influenza, respiratory syncytial virus (RSV)) in non-health care community-based settings (PICO 1c)?
4. What is the effectiveness of different pre-defined lengths of COVID-19 isolation* (e.g., > 10 days, ≤ 10days) in reducing transmission of non-COVID-19 respiratory illnesses (e.g., influenza, respiratory syncytial virus (RSV)) in non-health care community-based settings (PICO 1d)?

Secondary questions

1. What is the impact of COVID-19 quarantine* on other individual and societal outcomes (e.g., mental health, financial circumstances) in non-health care community-based settings (**PICO 2a**)?
2. What is the impact of COVID-19 isolation* on other individual and societal outcomes (e.g., mental health, financial circumstances) in non-health care community-based settings (**PICO 2b**)?

Tertiary questions

3. What is the effectiveness of COVID-19 quarantine* vs. no quarantine in reducing transmission of COVID-19 in non-health care community-based settings (**PICO 3a**)?
4. What is the effectiveness of COVID-19 isolation* vs. no isolation in reducing transmission of COVID-19 in non-health care community-based settings (**PICO 3a**)?

* *Quarantine* refers to the segregation of individuals who have been in close contact (or suspected contact) with one or more person(s) who has (have) tested positive for COVID-19. *Isolation* refers to the segregation of individuals who have tested positive for COVID-19 or have COVID-19 related symptoms.

Findings

- A total of 6,653 studies were title and abstract screened, 271 were moved forward for full-text appraisal. 7 studies for PICO 1 (all modelling studies), 7 studies for PICO 2 (2 of them being modelling studies), and 0 studies for PICO 3 were included. All 5 included empirical studies have a serious risk of bias.
- The PRIMSA flow chart, including separate details for this round, can be found in **Appendix 2**.

The findings of previous round are available on the McMaster Health Forum.

PICO 1a: Summary of findings about different pre-defined durations of COVID-19 quarantine on COVID-19 transmission

No studies were included that report on reducing transmission of COVID-19 as an outcome in response to different pre-defined durations of quarantine.

PICO 1b: Summary of findings about different pre-defined durations of COVID-19 isolation on COVID-19 transmission

No studies were included that report on reducing transmission of COVID-19 as an outcome in response to different pre-defined durations of isolation.

PICO 1c: Summary of findings about different pre-defined durations of COVID-19 quarantine on non-COVID-19 respiratory transmission

Box 2: Our approach

We retrieved candidate studies by searching: 1) EMBASE; 2) Medline; 3) Psychinfo; and 4) the National Institute of Health (NIH) iSearch COVID-19 portfolio. Searches were conducted for studies reported in English, conducted with humans and published since 1 January 2020 (to coincide with the emergence of COVID-19 as a global pandemic). Our detailed search strategy is included in **Appendix 9**.

Studies were identified up to ten days before the version release date. Studies that report on empirical data with a comparator were considered for inclusion in the main report, with simulation studies, case reports, case series, and press releases excluded. A full list of included studies is provided in **Tables 1-6 and Appendix 1**. Studies excluded at the full-text stage of reviewing are provided in **Appendices 4-7**. Modelling studies were screened and extracted and have been included in **Appendix 3**.

Population of interest: All population groups that report data related to all COVID-19 variants and sub-variants.

Intervention and comparator PICO 1 and 3: Intervention = individuals who have been exposed to people with COVID-19 (quarantine) or have symptoms/a positive COVID-19 test (isolation) and are in confinement for a fixed period of time. Comparison = individuals in quarantine or isolation for a different fixed period of time (PICO 1) or not in quarantine/isolation (PICO 3).

Intervention and comparator PICO 2: Intervention = individuals in quarantine/isolation for a fixed period of time. Comparison = individuals in quarantine /isolation for a different fixed period of time or are not in quarantine/isolation.

Primary outcome: Reduction in transmission of COVID-19 and other non-COVID-19 respiratory infections. **Secondary outcomes**: Changes in individual and social measures, e.g., mental health and financial security.

Data extraction: Data extraction was conducted by one team member and checked for accuracy and consistency by at least one other team member.

Critical appraisal: Risk of Bias (ROB) of individual studies was be assessed using validated ROB tools. For RCTs we used ROB-2, and for observational studies, we used ROBINS-I. Judgements for the domains within these tools will be decided by consensus within synthesis team and undergo revision with subsequent iterations of the LES as needed. Additional ROB tools will be added as needed to fit with other study designs. Once a study was seemed to meet one criterion that made it "critical" risk of bias, it was dropped without completing the full ROB assessment. Our detailed approach to critical appraisal is provided in **Appendix 10**. Additional details about the approach to critical appraisal are provided here.

Summaries: We summarized the evidence by presenting narrative evidence profiles across studies by outcome measure. Future versions may include statistical pooling of results if deemed appropriate.

The next update to this document is to be determined.

No studies were included that report on reducing transmission of non-COVID-19 respiratory diseases as an outcome in response to different pre-defined durations of COVID-19 quarantine.

PICO 1d: Summary of findings about different pre-defined durations of COVID-19 isolation on non-COVID-19 transmission

No studies were included that report on reducing transmission of non-COVID-19 respiratory diseases as an outcome in response to different pre-defined durations of non-COVID-19 isolation.

PICO 2a: Summary of findings about the impact of COVID-19 quarantine on individual and social outcomes

Five studies were included that report on individual and social outcomes in response to COVID-19 quarantine.

One study in public university students from Malaysia found that, when compared to a non-quarantine population, a quarantined population had higher depressive symptom scores. However, they didn't find any group differences for anxiety symptoms or stress. A second study reporting data from adults across seven countries and one territory found that individuals in quarantine were 25% more likely to report having elevated levels of a composite measure of depressive and anxious symptoms, compared to those not in quarantine or isolation. The third study from adults in Finland found no difference in psychological well-being nor distress in individuals under-quarantine compared to individuals who were not in quarantine and had a recent negative PCR test. The fourth study from China evaluated quality of life and anxiety symptoms in individuals who had been quarantined for more than 7 days in an isolation facility compared to those quarantined for ≤ 7 days in an isolation facility, finding no difference in between the populations in adjusted analyses. Finally, the fifth study from adults in China found a 10% increase in the prevalence in both high anxiety and high depressive symptoms in those who were quarantining compared to the general population. In multivariate analyses they didn't directly compare these populations (the reference group was general medical staff), but the odds of having elevated symptoms was higher in the quarantined individuals compared to the general population, though with overlapping confidence intervals.

All studies were at serious risk of bias in a way that likely favoured the no-quarantine comparison group.

PICO 2b: Summary of findings about the impact of COVID-19 isolation on individual and social outcomes

Two studies were included that reported on individual and social outcomes in response to isolation.

Both studies also included data on quarantine (and so are included above as well), with one study including adults across seven countries and one territory. This study found that individuals in isolation, either from a diagnosis of COVID-19 or based on symptoms, were 33% and 38%, respectively, more likely to report having elevated levels of a composite measure of depressive and anxious symptoms, compared to those not in quarantine or isolation. The other study, from adults in Finland, found no difference in psychological well-being nor distress in isolated individuals compared to individuals who were not in quarantine and had a recent negative PCR test.

Both studies were at serious risk of bias in a way that likely favoured the no-quarantine comparison group.

PICO 3a: Summary of findings about the effectiveness of pre-defined COVID-19 quarantine vs. no quarantine on COVID-19 transmission

No studies were included that report on reducing transmission of COVID-19 as an outcome in response to different durations of COVID-19 quarantine.

PICO 3b: Summary of findings about the effectiveness of pre-defined COVID-19 isolation vs. no isolation on COVID-19 transmission

No studies were included that report on reducing transmission of COVID-19 as an outcome in response to different durations of COVID-19 isolation.

Comment on modelling studies

Modelling studies reflect works that use simulations to infer the effects of interventions, based on strict assumptions. As such, we advise caution when interpreting findings from these studies as their results are strongly impacted by these assumptions. This is primarily because the assumptions normally oversimplify scenarios and do not usually reflect the real-world status, e.g., 100 of the population being vaccinated, varying degrees of illness in individuals, etc. Furthermore, the majority of the studies were not consistent with the current status of the pandemic, e.g., all but 1 study failed to account for vaccination, and most studies did not account for recent variants like Omicron and its increased transmission rate (though this is also true for most of the empirical studies captured in this report). Below, we provide a very tentative interpretation of the data obtained from the modelling studies.

PICO 1a: We extracted effects from 3 modelling studies that examined the impact of quarantine duration (see **Appendix 3.2**). There was general consensus across studies that longer quarantines would achieve greater reductions in transmissions. Most of these studies also explored the potential of testing in this context, e.g., to determine early release from quarantine. In general, various testing regimens could be used to decrease the overall time people spent in quarantine while maintaining good reductions in transmissions.

PICO 1b: We extracted effects from 4 modelling studies that examined the impact of isolation duration (see **Appendix 3.3**). These found mixed evidence for the benefits of isolation of any length, depending on contextual factors and assumptions built-into the models. For instance, when examining context where individuals were in strongly interconnected networks (e.g., a refugee camp, schools) isolation of any length was not deemed very effective. In more general populations, periods of longer isolation were effective at reducing transmission, but the length of isolation could be reduced if either exit testing or vaccination strategies were also employed.

PICO 2: We extracted effects from 2 modelling studies that examined the impact of quarantine (1 study) and isolation (1 study) (see **Appendices 3.4 and 3.5**). These studies tended to show that coupling monitoring and testing practices with quarantine and isolation could be used to reduce societal costs through the safe early release of individuals from confinement.

Table 1: Summary of studies reporting on effectiveness of pre-defined different lengths of COVID-19 quarantine in preventing COVID-19 transmission (PICO 1a)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Table 2: Summary of studies reporting on effectiveness of pre-defined different lengths of COVID-19 isolation in preventing COVID-19 transmission (PICO 1b)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Table 3: Summary of studies reporting on effectiveness of pre-defined different lengths of COVID-19 quarantine in preventing non-COVID-19 respiratory illness transmission (PICO 1c)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Table 4: Summary of studies reporting on effectiveness of pre-defined different lengths of COVID-19 isolation in preventing non-COVID-19 respiratory illness transmission (PICO 1d)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Table 5: Summary of studies reporting on the impact of COVID-19 quarantine on individual and social outcomes (PICO 2a), presented in alphabetical order of 1st author

<table>
<tr><th>Reference</th><th>Date released</th><th>Setting and time covered</th><th>Study characteristics</th><th>Summary of key findings in relation to the outcome</th><th>RoB Rating</th></tr>
<tr>
<td>Aaltonen et al., 2023[1]</td>
<td>Accepted:
March 25, 2022

Published:
January, 2023</td>
<td>Finland

May 12 – June 25, 2020</td>
<td>Design: Two group parallel cross-sectional survey with individuals in isolation or quarantine vs. a random sample of people who had COVID-19 testing but were negative.

Sample: 110 adults (aged 18+), with 43 (39%) in quarantine, 14 (13) in isolation, and 53 (48%) individuals in the comparison group.

Intervention: Individuals exposed to a person with a SARS-CoV-2 infection and were registered with the infectious diseases control unit in the city of Kerava, Finland. Individuals were contacted around 1 week into quarantine.

Comparison: Symptomatic individuals testing negative at a SARS-CoV-2 laboratory testing facility. Individuals were randomly selected and contacted within 10 days after testing.

Key Outcomes: The Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). Contains an overall score (range 0-40: mean of 34 items multiplied by 10) and 4 subscales: subjective well-being (4 items); problems or symptoms (12 items); life functioning (12 items); and risk or harm (6 items).

Terminology: Refers to “home quarantine” as individuals who are either quarantining or isolating.

VOCs: Not considered.
Vaccination status: Not considered.</td>
<td>

Univariate analyses: There were no analyses that directly compared the quarantine group to the comparison group. Analyses explored differences between the combination of quarantine and isolation and differences between the combination of quarantine and isolation to the comparison group.

The overlapping CIs in the table below would indicate that there is a low probability of a difference between the two groups.

<table>
<tr><th>CORE-OM</th><th>Quarantine (n=43)</th><th>Controls (n=53)</th></tr>
<tr><td></td><td colspan="2">Median (95% CIs)</td></tr>
<tr><td>Total score</td><td>3.53 (1.92-5.29)</td><td>3.24 (1.76-3.82)</td></tr>
<tr><td>Subjective well-being</td><td>2.50 (1.34-5.00)</td><td>5.00 (2.17–5.00)</td></tr>
<tr><td>Problems/ symptoms</td><td>4.17 (2.95–5.83)</td><td>3.33 (2.50–5.83)</td></tr>
<tr><td>Life functioning</td><td>4.17 (2.95–7.89)</td><td>3.33 (0.83–5.00)</td></tr>
<tr><td>Risk/harm</td><td>0.00 (0.00–0.00)</td><td>0.00 (0.00–0.00)</td></tr>
</table>
</td>
<td>Serious</td>
</tr>
</table>

<table>
<tr>
<td>Li et al., 2021[2]</td>
<td>Accepted:
March 01, 2021

Published:
March 26, 2021</td>
<td>China

March 5-19, 2020</td>
<td>Design: Anonymous cross sectional survey conducted through an online questionnaire on members of the general public

Sample: 3,303 adults (≥18 years), of which 115 were quarantined (3.5%). No participant had a confirmed case of COVID-19, an asymptomatic infection or a suspected case.

Intervention: Individuals who were in close contact with a case were asked to quarantine, Contacts and quarantines were self reported by participants.

Comparison: Members of the general public (n=2,413, 73.1%), community workstation staffs, policemen and volunteers (n= 316, 9.6%), general medical staff (n=255, 7.7%), front-line health workers (n=204, 6.2%)

Key Outcomes: The Chinese versions of the Zung's self-rating anxiety scale (SAS) and the self-rating depression scale (SDS)
Both these scales contain 20 items measured using a four-point Likert scale (raw score range: 20 to 80, standardized total score range: 25 to 100).

Terminology: Individuals were "quarantined" following a close contact with a COVID-19 case.

VOCs: Not considered.
Vaccination status: Not considered.</td>
<td>Univariate analyses: The raw prevalence data indicates that there is a 10 % increase in those with high anxiety and high depressive symptoms in those quarantined vs. the general public.

<table>
<tr><th>Population</th><th>Anxiety Symptoms</th><th>Anxiety Symptoms</th></tr>
<tr><td></td><td colspan="2">Prevalence (%)</td></tr>
<tr><td>General Medical Staff</td><td>7.8%</td><td>18.4%</td></tr>
<tr><td>General Public</td><td>9.1%</td><td>30.7%</td></tr>
<tr><td>Quarantined People</td><td>19.1%</td><td>40.9%</td></tr>
<tr><td>Front-line Health Workers</td><td>13.2%</td><td>27.5%</td></tr>
<tr><td>Community workstation staff, Policemen and Volunteers</td><td>13.9%</td><td>36.4%</td></tr>
</table>

Multiple logistic regression (adjusted for demographics, epidemic-exposure variables and epidemic-concern variables), OR (95% CI) in comparison to general medical staff:
● Anxiety
● Quarantined people = 2.33 (1.17-4.65)
● General public = 1.09 (0.66-1.80)
● Depression
● Quarantined people = 2.52 (1.51-4.21)
● General public = 1.70 (1.20-2.41)
There were no direct comparisons between quarantined individuals and the general public. However, in comparison to the general medical staff, the point estimates are larger for the quarantined group, but there are overlapping CIs with general public.</td>
<td>Serious</td>
</tr>
</table>

Pang et al., 2020[3]	**Accepted**: September 2, 2021
	
	Published: September 14, 2021
		Malaysia
		
		April 1-14, 2020.
			Design: Cross-sectional survey distributed via email to a convenience sample of students.
			
			Sample: 515 public university students (aged 18+), during the national movement control order. There were 503 (97.7%) students in the comparison group and 12 (2.3%) students in the quarantined group.
			
			Intervention: Students in mandatory quarantine for 14 days after a close contact with a COVID-19 case. Contacted on day 7 of quarantine.
			
			Comparison: Students under campus lockdown who were not further quarantined. Students were allowed to move within the vicinity of their hostels and nearby cafeteria. Also allowed social interactions with others on campus under the condition that they followed strict standard operating procedures.
			
			Key Outcomes: The Depression Anxiety Stress Scale-21 (DASS-21). Contains three scales assessing: (a) depressive symptoms; (b) anxiety symptoms; and (c) stress. Scores range from 0-42 on each scale.
			
			Terminology: Refers to students under quarantine as being under "compulsory quarantine". Others are referred to as "non-quarantined".
			
			VOCs: Not considered
			Vaccination status: Not vaccinated
				• **Base rates**: 20.2% of students had "moderate or above" scores for depression, 25% for anxiety, and 14.2% for stress. Most of the sample had "normal" scores (i.e., lowest category of distress) for all three variables.
				
				• **Bivariate Results** (without adjustments)
				  ◦ Significantly higher levels of depression (7.75 vs 4.96, p=.025).
				  ◦ No significant difference in anxiety (5.75 vs 4.44, p=.375) or stress (7.50 vs 5.67, p=.110) between quarantined students and not quarantined students.
				
				• **Multiple regression** (adjusting for limited sociodemographic variables):
				  ◦ Quarantine status was significantly associated to a higher depression score (standardized β = .103, p = .020).
				  ◦ Quarantine status was not significantly associated with either anxiety (β = .052, p = .234) or stress scores (β = .070, p = .112).
					Serious

Schluter et al. 2022[4]	**Published**: August 1, 2022	Canada, USA, England, Switzerland, Belgium, Philippines, New Zealand and Hong Kong November 6-18, 2020.	**Design**: Cross-sectional survey using representative samples across 8 countries. Conducted online via polling firms with quota-based sampling. **Sample**: 9,027 adults. Quarantine group N = 566 (6.5%); No confinement N = 5753 (66.2%) **Intervention**: Individuals self-reported whether they were in "home quarantine or self-isolation" or in "non-home quarantine" (e.g., at a quarantine centre). Then indicated their reasons for quarantine. Reasons were used to delineate intervention groups: ● **Quarantine**: in confinement due to exposure to a case of COVID-19 **Comparison**: ● **No confinement**: Individuals who reported not being in quarantine or isolation (note: persons engaging in confinement for travel or any health-related purposes are also excluded from the comparison group). **Key Outcomes**: A composite dichotomous score from people score 10+ on either the Generalized Anxiety Disorder-7 (GAD-7) and/or the Patient Health Questionnaire-9 (PHQ-9). **Terminology**: The terms isolation and quarantine are sometimes used interchangeably. We defined intervention groups according to reasons stated for confinement. **VOCs**: Not considered. **Vaccination status**: Not considered.	● Prevalence of probable GAD or MDE (based on threshold scores of 10+) by group was: ● No confinement: 26.0% ● Quarantine: 44.7% ● Risk ratios (RRs) [with 95% confidence intervals] for probable GAD/MDE by intervention group was as follows (comparison is the no confinement group)*: ● Quarantine: 1.25 (1.11, 1.41) *Used adjusted multilevel logistic models (nested within country) with multiple imputation to handle missing data.	Serious

Wang et al., 2022[5]	**Preprint available online:** January 2, 2023	China April 20 – May 10, 2020	**Design**: Cross-sectional survey distributed via social media (Wechat). **Sample**: Adults, N = 279 quarantined individuals used in analyses (of 497 recruited). **Intervention**: Individuals who had close contacts and were quarantined at an isolation shelter, but had a negative nucleic acid test and were in quarantine for > 7 days (maximum of 15 days), n = 184 (66%). **Comparison:** Individuals who had close contacts and were quarantined at an isolation shelter, but had a negative nucleic acid test and were in quarantine for ≤ 7 days (minimum of 2 days), n = 95 (34%). **Key Outcomes**: ● **Quality of life**, using a Chinese version of the SF-12, reports as the two subscales: physical component summary (PCS) score; and a mental component summary (MCS) score. Scores ranged from 0-100, with higher scores indicating better quality of life. ● **Anxiety**, using the Zung Self-Rating Anxiety Scale; SAS. The score ranged from 0-80, with higher scores indicating more anxiety symptoms. **Terminology**: Article uses "quarantine" and "isolation" interchangeably to refer to individuals who were confined following close contact with infected individuals. **VOCs**: Omicron was the dominant strain at the time of the study. **Vaccination status**: Not considered.	**Bivariate results** (without adjustments) using independent t tests. Overall, individuals under quarantine for longer (> 7 days vs. ≤ 7 days) showed**:** ● Significantly *higher* levels of MCS (51.13 vs 47.61, p=.01) ● Significantly *lower* anxiety scores (29.67 vs 31.71, p=.04) ● No significant difference in PCS (51.66 vs 51.21, p=.62). **Generalized linear regression results** (also modelling factors like age, education, marital status). A longer duration quarantine (>7 vs. ≤7 days): ● Was not significantly associated with MCS (unstandardized β = 2.04, p = .22) ● Was not significantly associated with SAS (Model A: β = -1.50, p = .13; Model B: β = -0.37, p = .61). ● Effects of quarantine on PCS was not evaluated in these models	Serious

Table 6: Summary of studies reporting on the impact of COVID-19 isolation on individual and social outcomes (PICO 2b), presented in alphabetical order of 1st author

<table>
<tr><th>Reference</th><th>Date released</th><th>Setting and time covered</th><th>Study characteristics</th><th>Summary of key findings in relation to the outcome</th><th>RoB Rating</th></tr>
<tr>
<td>Aaltonen et al., 2023[1]</td>
<td>Accepted:
March 25, 2022

Published:
January, 2023</td>
<td>Finland

May 12 – June 25, 2020</td>
<td>Design: Two group parallel cross-sectional survey with individuals in isolation or quarantine vs. a random sample of people who had COVID-19 testing but were negative.

Sample: 110 adults (aged 18+), with 43 (39%) in quarantine, 14 (13) in isolation, and 53 (48%) individuals in the comparison group.

Intervention: Individuals who had a laboratory-confirmed SARS-CoV-2 infection and were registered with the infectious diseases control unit in the city of Kerava, Finland. Individuals were contacted around 1 week into quarantine.

Comparison: Symptomatic individuals testing negative at a SARS-CoV-2 laboratory testing facility. Individuals were randomly selected and contacted within 10 days after testing.

Key Outcomes: The Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). Contains an overall score (range 0-40: mean of 34 items multiplied by 10) and 4 subscales: subjective well-being (4 items); problems or symptoms (12 items); life functioning (12 items); and risk or harm (6 items).

Terminology: Refers to “home quarantine” as individuals who are either quarantining or isolating.

VOCs: Not considered.
Vaccination status: Not considered.</td>
<td>

Univariate analyses: There were no analyses that directly compared the isolation group to the comparison group. Analyses explored differences between the combination of quarantine and isolation and differences between the combination of quarantine and isolation to the comparison group.

The overlapping CIs in the table below would indicate that there is a low probability of a difference between the two groups.

<table>
<tr><th>CORE-OM</th><th>Isolation (n=14)</th><th>Controls (n=53)</th></tr>
<tr><td></td><td colspan="2">Median (95% CIs)</td></tr>
<tr><td>Total score</td><td>3.38 (2.06-5.53)</td><td>3.24 (1.76-3.82)</td></tr>
<tr><td>Subjective well-being</td><td>2.50 (2.09–7.91)</td><td>5.00 (2.17–5.00)</td></tr>
<tr><td>Problems/ symptoms</td><td>4.58 (2.50–6.52)</td><td>3.33 (2.50–5.83)</td></tr>
<tr><td>Life functioning</td><td>3.75 (2.36–8.47)</td><td>3.33 (0.83–5.00)</td></tr>
<tr><td>Risk/harm</td><td>0.00 (0.00–0.00)</td><td>0.00 (0.00–0.00)</td></tr>
</table>
</td>
<td>Serious</td>
</tr>
</table>

Schluter et al. 2022[4]	**Published**: August 1, 2022	Canada, USA, England, Switzerland, Belgium, Philippines, New Zealand and Hong Kong November 6-18, 2020.	**Design**: Cross-sectional survey using representative samples across 8 countries. Conducted online via polling firms with quota-based sampling. **Sample**: 9,027 adults. Isolation - diagnosis N = 457 (5.3%); Isolation - symptoms N = 720 (8.3%); No confinement N = 5753 (66.2%) **Intervention**: Individuals self-reported whether they were in "home quarantine or self-isolation" or in "non-home quarantine". Then indicated their reasons for quarantine. Reasons were used to delineate intervention groups: ● **Isolation - diagnosis**: in confinement due to a COVID-19 diagnosis ● **Isolation - symptoms**: in confinement due to having COVID-19 symptoms (without a diagnosis). **Comparison**: ● **No confinement**: Individuals who reported not being in quarantine or isolation. **Key Outcomes**: A composite dichotomous score from people score 10+ on either the Generalized Anxiety Disorder-7 (GAD-7) and/or the Patient Health Questionnaire-9 (PHQ-9). **Terminology**: We defined intervention groups according to reasons stated for confinement. **VOCs**: Not considered. **Vaccination status**: Not considered.	● Prevalence of probable GAD or MDE (based on threshold scores of 10+) by group was: ● No confinement: 26.0% ● Isolation - diagnosis: 59.4% ● Isolation - symptoms: 50.2% ● Risk ratios (RRs) [with 95% confidence intervals] for probable GAD/MDE by intervention group was as follows (comparison is the no confinement group)*: ● Isolation - diagnosis: 1.33 (1.18, 1.49) ● Isolation - symptoms: 1.38 (1.21, 1.57) *Used adjusted multilevel logistic models (nested within country) with multiple imputation to handle missing data.	Serious

Table 7: Summary of studies reporting on effectiveness of COVID-19 quarantine vs. no quarantine in preventing COVID-19 transmission (PICO 3a)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Table 8: Summary of studies reporting on effectiveness of COVID-19 isolation vs. no isolation in preventing COVID-19 transmission (PICO 3b)

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
No studies				●	

Potential implications for health systems decision-making: It is clear from the evidence reported in the current review that there is a *significant dearth of empirical evidence* on the impacts of both COVID-19 quarantine and isolation. Furthermore, the evidence that is available had notable biases, which make interpretation problematic. That being said, there are some trends across the included studies which can provide some initial insights into the potential effects of COVID-19 quarantine and isolation. It should also be noted that the studies included are only studies that compared pre-defined lengths of quarantine and isolation and didn't include studies that used testing to guide duration of quarantine or isolation.

Modelling studies tended to show that *longer COVID-19 quarantine periods reduced transmission* and that isolation reduced transmission in general population situations, compared to situations where people were in constant close proximity, e.g., schools. Furthermore, the inclusion of testing to reduce quarantine and isolation time can be done without negatively impacting transmission and reducing costs.

The empirical studies tended to show that COVID-19 *quarantine and isolation were associated with increases in depressive and anxious symptoms* but not other general psychological aspects or well being. It would seem that these increases in symptoms were unlikely to be of great clinical significance.

Importantly, most of these studies were not conducted or accounted for scenarios where there is a relatively high level of vaccination across populations, with a variant that is highly transmissible, i.e., Omicron, and a very low infection level within the population. As such, it is unclear how well this data translates to the current pandemic situation.

From a *public health preparedness perspective*, it would seem that should there be an increase in the transmission rates within the population, the *isolation of COVID-19 infected individuals, or quarantining of contacts,* coupled with COVID-19 testing to vary the isolation or quarantine length, would be the most effective way to reduce overall transmission, with minimal mental health or psychological impacts.

Land Acknowledgements
The Montreal Behavioural Medicine Centre, Concordia University, UQAM, and the CIUSSS-NIM are located on unceded Indigenous lands. The Kanien'kehá:ka Nation is recognized as the custodians of the lands and waters on which these institutions stand today. Tiohtiá:ke commonly known as Montreal is historically known as a gathering place for many First Nations. Today, it is home to a diverse population of Indigenous and other peoples. We respect the continued connections with the past, present, and future in our ongoing relationships with Indigenous and other peoples within the Montreal community.

SPOR Evidence Alliance operates from the St. Michael's Hospital, Unity Health Toronto which is located on the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island.

COVID-END is housed within McMaster University which is located on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "Dish With One Spoon" wampum, an agreement to peaceably share and care for the resources around the Great Lakes.

We are grateful to have the opportunity to work on these lands.

Acknowledgements: To help Canadian decision-makers as they respond to unprecedented challenges related to the COVID-19 pandemic, COVID-END in Canada is preparing evidence syntheses like this one. This living evidence synthesis was commissioned by the Office of the Chief Science Officer, Public Health Agency of Canada. The development and continued updating of this living evidence synthesis has been funded by the Canadian Institutes of Health Research (CIHR) and the Public Health Agency of Canada. The opinions, results, and conclusions are those of the team that prepared the evidence synthesis, and independent of the Government of Canada, CIHR, and the Public Health Agency of Canada. No endorsement by the Government of Canada, Public Health Agency of Canada or CIHR is intended or should be inferred.

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Appendices

Appendix 1: Summary of included empirical studies

Appendix 2: Flow chart of empirical and modelling studies included

Appendix 3: Details of modelling studies

Appendix 4: Empirical studies excluded following full-text review, for PICO 1

Appendix 5: Empirical studies excluded following full-text review, for PICO 2

Appendix 6: Empirical studies excluded following full-text review, for PICO 3

Appendix 7: Modelling studies excluded following full-text review

Appendix 8: PICOs and eligibility criteria

Appendix 9: Databases and search strategy

Appendix 10: Approach to critical appraisal