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Living Rapid Evidence Synthesis 13.2b: Unintended health and social consequences of isolation and quarantine for respiratory infectious diseases (RIDs: i.e., COVID-19, H1N1, SARS, and MERS)

Executive summary

Question

What are the unintended health and social consequences/outcomes (e.g., mental health, financial circumstances) of isolation* and quarantine** for respiratory infectious diseases (i.e., coronavirus disease 2019 (COVID-19), influenza A virus subtype H1N1 (H1N1), severe acute respiratory syndrome (SARS), and middle eastern respiratory syndrome (MERS)) in non-health care community-based settings?

*Isolation refers to the segregation of individuals who have tested positive for the diseases listed above or have symptoms related to the diseases listed above

**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 the respiratory infectious diseases (i.e., COVID-19, H1N1, SARS, and MERS) or has (have) symptoms related to the diseases listed above.

Background

- Two key strategies to prevent the spread of RIDs are:
  - 1) for individuals who have been in contact with an individual who has tested positive to quarantine; and
  - 2) for individuals who are symptomatic and/or have tested positive for the disease to isolate (isolation).
- During the early phases of the COVID-19 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 and structure of quarantine and isolation periods. In addition, these distancing measures have been used for other RIDs across time.
- While we know that the COVID-19 pandemic has had a notable impact on a variety of individual and societal outcomes, it is unclear what the specific impact of interventions like quarantine and isolation —which have been used for COVID-19 and other RIDs such as MERS, SARS and H1N1

Methods

- We retrieved candidate studies by searching: 1) EMBASE; 2) Medline; 3) PsycINFO; and 4) the National Institute of Health (NIH) iSearch COVID-19 portfolio.
- For this round a total of 2,526 studies were title and abstract screened, 772 were included for full-text appraisal. Of these, 15 studies were included in this report, including 12 empirical studies (4 of which had a serious risk of bias and 8 of which had a critical risk of bias). In addition, 3 modelling studies were also included.

Key points

- The majority of studies included focused on COVID-19 (12/15); however, 1 study focused on H1N1, 1 study focused on SARS, and 1 study focused on MERS.

Data from the empirical studies without a critical risk of bias:

- **Isolation and quarantine**: Overall, from the 3 COVID-19 and 1 H1N1 empirical studies with a non-critical risk of bias there was - *with one exception* - *no evidence of an impact of either isolation or quarantine on varied measures of mental health* (i.e., anxiety symptoms, posttraumatic stress disorder symptoms, stress ratings, general mental health, well-being, and life functioning). One study (COVID-19, Pang et al) found that there was an increase in levels of depressive symptoms during quarantine compared to a non-quarantining comparison group.
- When contrasting different lengths of quarantine, one COVID-19 empirical study with a non-critical risk of bias (COVID-19, Wang et al) *found no difference* in anxiety symptoms or mental and physical measures of quality of life in individuals quarantining for >7 vs. ≤7 days.
- Of note, only 1 study assessed isolation (COVID-19; Aaltonen et al) with all 4 studies providing information on quarantine.

Data from the empirical studies with a critical risk of bias:

- **Isolation (critical RoB):** Overall, there was contrasting evidence about the impact of isolation on a variety of mental health outcomes, though the overall picture supports the notion that there were *minimal impacts*.
  - There were no differences in depressive or anxiety symptoms (COVID-19; Ju et al) assessed at baseline (e.g., the beginning of the COVID-19 isolation period) and depressive and anxiety symptoms assessed at the end of the isolation period. In contrast, there was an increase in the proportion of individuals who reported elevated anxiety and anger symptoms during isolation compared to 4-6 months post-isolation (MERS; Jeong et al) and a decrease in male sexual function during isolation (compared to pre-isolation), which seemed to return to normal 3 months post isolation (COVID-19; Spirito et al).
  - With regards to the duration of COVID-19 isolation, adjusted statistical models found no significant differences in general stress, posttraumatic stress disorder symptoms (COVID-19; Almayahi et al) across differing durations of isolation.
- **Quarantine (critical RoB):** Overall, there was contrasting evidence about the impact of quarantine on a variety of mental health and other outcomes, though the overall picture supports the notion that there were *minimal impacts***.**
  - There were no differences in anxiety symptoms (COVID-19; Aschman et al) assessed at baseline (e.g., the beginning of the COVID-19 isolation period) and the anxiety symptoms assessed at the end of the quarantine period. In addition, the majority of people were not worried about the financial consequences of quarantine, did not perceive quarantine as difficult, and did find it provided them with more time to relax (COVID-19; Aschman et al). In contrast, there was a general increase in depressive symptoms (COVID-19; Aschman et

al) from the start of the quarantine to the end of the quarantine period and there was a increase in anxiety and anger symptoms during quarantine compared to 4-6 months post-quarantine (MERS; Jeong et al).
    - In comparison to those that didn't quarantine, there were no differences in psychological well-being (COVID-19; Muhamad et al) in those who quarantined.
    - With regards to the duration of COVID-19 quarantine, adjusted statistical models found a significant increase in general psychological distress and decrease in well-being between no quarantine and >7 days of quarantine (COVID-19; Chen et al). However, there was no difference between 1-7 days and >7 days of quarantine.
    - Finally, in a school setting, a modified quarantine protocol, where students could attend school if a series of COVID-19 preventions measures were in place (e.g., mask mandate, physical distancing, etc.), was associated with a lower level of parental-reported stress in students when compared to a standard 7-14 day at home quarantine (COVID-19; Worrell et al).

Data from the modelling studies:

- **Isolation:**
    - A US-based cost simulation model including testing, medical, and productivity costs, investigated various isolation protocols. A protocol involving a 10-day isolation with rapid antigen test on day 6 where a negative test would end isolation—otherwise the isolation would continue to day 10—was deemed to be the most effective and cost-effective method to avert future infections (COVID-19; Maya & Khan) compared to other variations in length and testing protocols.
- **Quarantine**:
    - In a COVID-19 US-based cost simulation model including testing costs, quarantine time, and deaths, there were minimal differences in deaths per 1000 index cases with varying lengths of quarantines, testing protocols, and using risk-based quarantine rules. To reduce quarantine time, a combination of testing individuals at the start of the quarantine period once and if negative releasing them or if they test positive, they remain for 14 days seem to be optimal. However, with increased complexity of testing there was an increase in testing cost (COVID-19; Perrault).
    - In a SARS Canadian-based cost simulation model including individual productivity cost during quarantine and lifetime productivity cost for someone who dies, a 14-day quarantine demonstrated to be cost saving compared to no quarantine (even if initial costs of setting up quarantine were quite high). For a population with the density of a city like Toronto, the total savings were estimated to be between 232-279 million CAD (SARS; Gupta et al.).

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 unintended health and social consequences/outcomes of quarantine and isolation in response a variety of RIDs, with only 4 included studies having a non-critical risk of

bias. Furthermore, the evidence that is available had notable biases (e.g., lack of statistical adjustments, lack of consideration of calendar time, measurement tools used) 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 quarantine and isolation.

- Overall, the current evidence would suggest that there is *not an impact of either isolation or quarantine on varied measures of mental health*. There were some studies and sub-analyses in studies which tended to show that quarantine and isolation were associated with some increases in mental health symptoms, but it would seem that these increases were unlikely to be of great clinical significance. This coupled with the number of studies which found no changes in mental health symptoms leads us to the conclusion of no noted impact.
- From a cost perspective, modelling studies suggested that *quarantine had a significant financial benefit to society* over the long-term, but with high initial costs, and that a combination of isolation with strategic testing was the most cost effective short-term strategy that could be employed.
- Importantly, most of these COVID-19-related 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 will translate to future pandemic or outbreak situations. From a *public health preparedness perspective*, it would seem that should there be an increase in COVID-19 transmission rates or the emergence of an infectious disease threat that would warrant isolation and/or quarantine measures within the population, the isolation of infected individuals, or quarantining of contacts coupled with targeted testing to vary the isolation or quarantine length, would likely have minimal mental health or psychological impacts However, if such a scenario should occur, then this would be an opportune time to capture much need empirical evidence, with a low risk of bias, to provide important inputs for the continued development of RID isolation and quarantine policies and guidance.

Suggested Tweet

Considering the lack of high-quality evidence in this area, no tweet is suggested.

Date of Literature Search: February 27, 2024

Suggested citation: Bacon SL, Wu N, Paquet L, Burdick J, Marques Vieira A, Joyal-Desmarais K, Léger C, Deslauriers F, and Sanuade C. COVID-19 Living Evidence Synthesis 13.2b: Unintended health and social consequences of isolation and quarantine for respiratory infectious diseases (RIDs: i.e., COVID-19, H1N1, SARS, and MERS). Montreal Behavioural Medicine Centre, Concordia University/UQAM/CIUSSS-NIM, 8 May 2024.

Résumé

Question

Quelles sont les conséquences inattendues sur la santé et la société (p. ex. santé mentale, circonstances financières) de l'isolation* et de la quarantaine** en lien avec les maladies respiratoires infectieuses (c.-à-d. maladie à coronavirus (COVID-19), sous-type H1N1 de l'influenza A (H1N1), syndrome respiratoire aigu sévère (SARS) et syndrome respiratoire du Moyen-Orient (MERS)) dans un contexte communautaire et non de soins?

*Isolation réfère à la ségrégation des individus ayant testé positif à l'une des maladies citées ci-haut ou ayant des symptômes liés aux maladies citées ci-haut.
** Quarantaine réfère à la ségrégation des individus ayant été en contact proche (ou suspecté) avec une ou plusieurs personnes ayant testé positif à l'une des maladies citées ci-haut ou ayant des symptômes liés aux maladies citées ci-haut.

Contexte

- Deux stratégies clés pour prévenir la propagation des maladies respiratoires infectieuses sont les suivantes :
  - 1) pour les personnes qui ont été en contact avec une personne qui a obtenu un résultat positif doivent se mettre en quarantaine
  - 2) pour 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 de COVID-19, 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 et la structure des périodes de quarantaine et d'isolement. De plus, ces méthodes de distanciation physique ont été utilisé auparavant.
- De plus, même si nous savons que la pandémie de COVID-19 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 – des interventions ayant été utilisé pour la COVID-19 et autre maladies respiratoires infectieuses tel que MERS, SARS et la H1N1.

Méthode

- Nous avons collecté les études potentielles en cherchant : 1) EMBASE; 2) Medline; 3) PsycINFO; et 4) le portfolio iSearch sur la COVID-19 de l'institut National de la santé (NIH).
- Pour ce premier tour, 2 526 titres et résumés d'article ont été examinés, 772 de ces articles ont été inclus pour l'examen du texte intégral. Parmi ces derniers, 15 études ont été inclues dans ce rapport, incluant 12 études empiriques (4 ayant un risque de biais élevé et 8 ayant un risque de biais critique) et 3 études de modélisation.

Points clés

La majorité des études sont au sujet de la COVID-19 (12/15); il y a tout de même une étude au sujet de la H1N1, une étude au sujet du SARS et une étude au sujet de MERS.

Données provenant d'études empiriques n'ayant pas un risque de biais 'critique'

- **Isolation et quarantaine**: Selon les 3 études empiriques au sujet de la COVID-19 et l'étude empirique au sujet de la H1N1 n'ayant pas un risque de biais 'critique', - avec une exception - *il n'y a pas de preuve démontrant l'impact de l'isolation ou de la quarantaine sur les diverses mesures de la santé mentale* (c.-à-d., symptômes d'anxiété, symptômes du trouble du stress post-traumatique, mesures du stress, santé mentale générale, bien-être, fonctionnement dans la vie quotidienne. Une étude dur la COVID-19 (Pang et al.) a trouvé que durant la période de quarantaine il y avait une augmentation des symptômes dépressifs en comparaison avec le groupe qui n'était pas en quarantaine.
- En comparant les différentes durées de quarantaine, une étude empirique au sujet de la COVID-19 et n'ayant pas un risque de biais 'critique' (Wang et al.) *n'a pas trouvé de différences* pour ce qui est des symptômes de l'anxiété ou des mesures physiques et psychologiques de la qualité de vie chez les individus en quarantaine pour >7 ou ≤7 jours.
- Il est bon de noter qu'une seule de ces études a évalué l'effet de l'isolation (COVID-19; Aaltonen et al), mais que les 4 ont évalué l'effet de la quarantaine.
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Données provenant d'études empiriques ayant un risque de biais 'critique'

- **Isolation (risque de biais 'critique'):** De manière générale, il y avait des données contradictoires au sujet de l'effet de l'isolation sur une variété de mesures de la santé mentale, mais généralement, elles soutiennent l'idée que l'isolation à un *impact minimal*.
  - Il n'y avait pas de différence par rapport aux symptômes de dépression et d'anxiété (COVID-19; Ju et al) mesuré au début de la période d'isolation et ceux mesuré à la fin de la période d'isolation. En revanche, il y avait une augmentation de la proportion d'individu ayant rapporté une augmentation de leurs symptômes d'anxiété et de colère pendant l'isolation en comparaison avec 4-6 mois après l'isolation (MERS; Jeong et al). Il y avait aussi une diminution de la fonction sexuelle masculine pendant l'isolation (en comparaison à avant l'isolation), celle-ci semble être retourné à la normale 3 mois après l'isolation (COVID-19; Spirito et al).
  - En ce qui a trait à la durée de l'isolation en lien avec la COVID-19, un modèle statistique ajusté n'a trouvé aucune différence au niveau du stress en général et des symptômes du trouble du stress post-traumatique (COVID-19; Almayahi et al.) selon la durée de l'isolation.

- **Quarantaine (risque de biais 'critique'):** De manière générale, il y avait des données contradictoires au sujet de l'impact de la quarantaine sur une variété de mesures de la santé mentale et autres mesures. En revanche, elles semblent tout de même soutenir l'idée qu'il y aurait un *effet minimal*.

- Il n'y avait pas de différence en ce qui à trait aux symptômes d'anxiété (COVID-19; Aschman et al) mesuré au début de la période d'isolation et ceux mesuré à la fin de la période d'isolation.. De plus, la majorité des gens n'étaient pas inquiet des possibles conséquences financières de la quarantaine et n'ont pas perçu la quarantaine comme étant difficile et plusieurs ont même trouvé qu'ils avaient plus de temps pour relaxer (COVID-19; Aschman et al). D'un autre côté, il y aussi eu une augmentation des symptômes dépressifs (COVID-19; Aschman et al) entre le début de la quarantaine et la fin de celle-ci. Il y avait aussi une augmentation des symptômes d'anxiété et de colère pendant la quarantaine en comparaison avec les niveaux 4-6 mois après la quarantaine (MERS; Jeong et al).
- En comparaison avec ceux qui n'étaient pas en quarantaine, il n'y avait pas de différence au niveau du bien-être (COVID-19; Muhamad et al) de ceux qui étaient en quarantaine.
- En ce qui à trait à la durée de la quarantaine en lien avec le COVID-19, des modèles statistiques ajustés indiquent une hausse significative de la détresse psychologique en générale et une diminution du bien-être entre les individus qui n'étaient pas en quarantaine et ceux qui l'était pour >7 jours (COVID-19; Chen et al). En revanche, il n'y avait pas de différence entre 1-7 jours et >7 jours de quarantaine.
- Pour finir, dans un contexte scolaire, un protocole de quarantaine modifié où les étudiants pouvaient aller à l'école si certaines mesures étaient en place (p. ex., port du masque, distanciation physique, etc.) a été associé à un niveau de stress signalé par les parents inférieur à une quarantaine standard à la maison de 7-14 jours (COVID-19; Worrell et al).

Données provenant d'études de modélisation:

- **Isolation:**
  - Une étude de simulation de coût basée sur les États-Unis investiguant divers protocoles d'isolation et incluant les coût associés aux tests, les coûts médicaux, et les coûts liés à la productivité. Un protocole d'isolation de 10 jour avec un test à antigène au jour 6 où un test négatif marque la fin de l'isolation et un test positif signifie que l'isolation continuera jusqu'au jour 10 a été démontré comme étant la méthode la plus efficace et la plus rentable pour éviter les infections futures (COVID-19; Maya & Khan) en comparaison avec d'autres variations de la longueur du protocole de test.

- **Quarantaine**:
  - Une étude de simulation de coût basée sur les États-Unis et incluant les coûts associés aux tests, les coûts associés au temps passé en quarantaine et les morts, a démontré qu'il y avait une différence minimale au niveau du nombre de mort pour chaque 1000 cas primaire entre les différentes durées de quarantaine, protocoles de test et diverses règles de quarantaine basée sur les risques. Pour diminuer la durée de la quarantaine, tester les individus au début de la quarantaine et les libérer s'ils sont négatifs, mais les mettre en quarantaine pour 14 jours s'ils sont positifs semble être la méthode optimale. Cependant, en augmentant la complexité des protocoles de test, il y avait aussi une augmentation des coûts (COVID-19; Perrault).

- Dans une étude de simulation de coût lié au SARS, basée sur le Canada et incluant les coûts associés à la productivité des individus pendant la quarantaine et pendant leur vie s'ils meurent, une quarantaine de 14 jours a été démontré comme étant moins couteuse en comparaison a l'absence de quarantaine (même si les coûts initiaux de la quarantaine étaient élevés). Pour une population ayant la même densité que Toronto, la somme des économies était estimée à 232-279 million de dollars Canadien (SARS; Gupta et al.).

Implications potentielles pour la prise de décisions en lien avec les systèmes de soins de santé:

- Il est clair selon les données présentées dans la présente revue de littérature *qu'il y a un manque significatif de données empiriques* présentant les conséquence inattendues de l'isolation et de la quarantaine en lien avec divers maladie infectieuses respiratoires, avec seulement 4 études ayant un risque de biais non critique. De plus, les données qui sont disponible comportent de nombreux biais (par exemple, le manque d'ajustement statistique, le manque de considération du temps de calendrier et les outils de mesure utilisés), rendant ainsi l'interprétation problématique. Il y a tout de même une corrélation parmi les études inclues permettant d'avoir une idée des effets potentiels de l'isolation et de la quarantaine.
- De manière générale, les données suggèrent que *l'isolation et la quarantaine n'ont pas d'effet sur les diverses mesures de la santé mentale*. Certaines études et sous-analyses ont démontré que la quarantaine et l'isolation étaient associées à une augmentation des symptômes liées à la santé mentale, or, il est peu probable que celle-ci soit d'une grande importance clinique. Cela en combinaison avec le nombre d'étude ayant trouvé aucun changement associé à l'isolation et la quarantaine en ce qui à trait à la santé mentale nous pousse à conclure que l'isolation et la quarantaine n'ont pas eu d'impact marqué.
- Du point de vue du coût, les études de modélisation suggèrent que la *quarantaine a engendré un bénéfice financier significatif à la société* sur le long-terme malgré un coût initial élevé. Elles suggèrent aussi qu'une combinaison d'isolation et de protocole de test était la méthode réalisable la plus rentable sur le court-terme.
- Il est important de noter que la plupart de ces études n'ont pas été conduite dans ou n'ont pas pris en compte des scénarios où il y avait une grande proportion de la population qui a été vacciné, où il y avait un variant très virulent (c.-à-d., Omicron) ou encore où il y avait un très faible taux d'infection dans la population. Ainsi, il n'est pas clair à quel point ces données pourront se transmettre à une pandémie ou éclosion future.
- De la *perspective de la préparation en matière de santé public*, il semblerait que s'il y avait une augmentation du taux de transmission de la COVID-19 ou l'émergence d'une maladie infectieuses nécessitant des mesures de quarantaine ou d'isolation dans la population, l'isolation des individus infectés, ou la quarantaine des contacts en combinaison avec un protocole de test pour faire varier la durée de l'isolation et de la quarantaine seraient probablement des méthodes ayant un impact minimal sur la santé mentale et psychologique. Par contre, si un tel scénario devait ce produire, cela représenterais une opportunité de collecté des données empiriques ayant

un risque de biais faible. Cela permettrait d'informé le développement continuel de lignes directrices et politique d'isolation et de quarantaine.

Suggestion de gazouillis

Les données limitées ne permettent pas de suggérer un gazouillis.

Methods

This living evidence synthesis (LES) was designed and executed by the Montreal Behavioural Medicine Centre, a collaborative Université du Québec à Montréal, Concordia University, and CIUSSS-NIM research centre, and in collaboration with a network of evidence-support units supported by a secretariat housed at the McMaster health forum.

This LES is also part of a suite of LESs of the best-available evidence about the effectiveness of PHSMs (public health safety measures, i.e., quarantine and isolation, masks, ventilation, hand hygiene, cleaning, and disinfecting) in preventing transmission of respiratory infectious diseases. This is the 2nd version of this LES (LES 13), which has now been split into three separate reports about the effects of isolation (LES 13.2a), and quarantine (LES 13.2c) on secondary transmission, and the unintended consequences of isolation and quarantine (LES 13.2b). Beyond separating the reports, the LESs include enhancements in scope from the first version by expanding the primary outcomes from COVID-19 transmission to include transmission or residual transmission post confinement for other prioritized respiratory infectious diseases (H1N1, SARS, MERS). 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. The findings of previous round are available on the McMaster Health Forum.

General considerations for identifying, appraising, and synthesising evidence about PHSMs

- PHSMs are population-level interventions and typically evaluated in observational or modeling 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 (ROB).
- To date, there are no instruments for appraising the risk of bias in modeling studies; however, given that all modeling studies work on a series of key assumptions to infer effects, it is assumed that all these studies have a critical risk of bias.

Implications for synthesising evidence about PHSMs

- Decision-making with the best available evidence requires synthesising 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 epidemics and pandemic, such as before and after availability of COVID-19 vaccines). As such, there are a number of critical aspects that differ across studies that can't be fully accounted for in any synthesis, meaning that summary results need to be interpreted with some degree of caution.

Of note, ROB (and GRADE, which was not used for this report) 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.

Study selection:

We retrieved candidate studies by searching: 1) EMBASE; 2) Medline; 3) PsycINFO; and 4) the National Institute of Health (NIH) iSearch COVID-19 portfolio. Searches were conducted for studies reported in English, published since January 1, 2009, for H1N1, January 1, 2003, for SARS, January 1, 2012 for MERS and January 1, 2020 for COVID-19. Our detailed search strategy is included in **Appendix 8**.

Studies that report on empirical data as well as modelling studies were considered for inclusion in the main report, with case reports, case series, and press releases excluded. Modelling and empirical studies were screened and extracted. A full list of included empirical studies is provided in **Table 1.1-2, 2.1-2, 3.1-2, 4.1-2 and Appendix 1**. Studies excluded at the full-text stage of reviewing are provided in **Appendices 4, 5 and 6**. A full list of included modelling studies is provided in **Table 1.3, 2.3, 3.3, 4.3 and Appendix 2**.

The PRIMSA flow chart of included studies, including separate details for this round, can be found in **Appendix 3.**

Population of interest:

- All individuals who have COVID-19, SARS, MERS, or H1N1 related symptoms and/or have tested positive for one of these diseases and who have been asked to isolate; or
- All individuals who have been in close contact with someone who has tested positive for COVID-19, SARS, MERS, or H1N1 but haven't contracted the disease necessarily and are asked to quarantine.

Intervention:

- Isolating for any period of time (this can include discrete measures of isolation as well as continuous measures of isolation, includes study using testing to modify the duration of isolation)
- Quarantining for any period of time (this can include discrete measures of quarantine as well as continuous measures of quarantine, includes study using testing to modify the duration of quarantine)

Comparison: Any other form of isolation and quarantine, including individuals who were not confined, were confined for a different length of time or who used various testing strategies to variably alter isolation or quarantine time. Intervention comparison could be across populations (different countries), settings (e.g., different location for isolation), or time periods (e.g., before/after a policy change, different time periods).

Primary outcomes: Changes in individual and social measures, i.e., mental health (such as: anxiety, depression, post-traumatic stress disorder (PTSD), etc.) 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 assessed using a version of the ROBINS-I which was validated for COVID-19. Revisions and subsequent iterations of this version of the ROBINS-I was decided by consensus within the synthesis team as needed. Our detailed approach to critical appraisal is provided in **Appendix 9**. Additional details about the approach to critical appraisal are provided here.

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.

Summaries: Data is reported by RID and then by the ROB of the studies identified (empirical studies without critical risk of bias, empirical studies with a critical risk of bias, and then modelling studies).

Results 1: Summary of studies about the impact of COVID-19 isolation and quarantine on individual and social outcomes

Table 1.1: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of COVID-19 **isolation** on individual and social outcomes, 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</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 isolation.

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.</td>
<td>Univariate analyses: There were no statistical 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>
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</td>
<td>Serious</td>
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</table>

			VOCs: Not considered. **Vaccination status**: Not considered.		

Table 1.2: Summary of empirical studies that were rated as having a *critical risk of bias*, reporting on the impact of COVID-19 **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
Almayahi et al. 2022	**Accepted:** 15 April 2022 **Published:** 8 May 2022	Oman (South Batinah Governorate – Barka, Rustaq, Musanaa, Nakhal, Wadi Mawel and Awabi) November 16 – December 22, 2020.	**Design**: Cross sectional survey of individuals who isolated due to a PCR confirmed COVID-19 infection. **Sample**: 400 adults (aged 18+ years) were randomly selected from 11,223 adults with a PCR confirmed COVID-19 infection prior to November 6, of which 379 answered all questionnaires. **Intervention**: Individuals who had a PCR-confirmed COVID-19 infection and were isolating for either less than or greater than 14 days. **Comparison**: Individuals who isolated for 14 days. **Key Outcomes**: • The Kessler 10 Psychological Distress (K10) test containing 10 questions evaluating the frequency of different symptoms experienced in the preceding 4 weeks on a scale of 1–5 where 1=none at all and 5=all the time, leading to a score ranging from 10 to 50. A high or very high score was defined as a score of 22 or more.	**Binary logistic regression** **K10 score** / **<14 days (n=40)** / **14 days (n=201)** / **>14 days (n=138)** **OR (95%CI)**: 0.396 (0.158-0.991), p=0.048 / Reference / 1.398 (0.887-2.204), p=0.149 **aOR* (95%CI)**: 0.88 (0.145-1.034), p=0.058 / Reference / 1.208 (0.735-0.985), p=0.456 *Adjusted (only statistically significant covariates in the bivariate analyses were included in the multivariable model. **Proportion of participant** **K10 score** / **<14 days (n=40)** / **14 days (n=201)** / **>14 days (n=138)** **Low (10-15)**: 62.5% / 38.3% / 37.7% **Moderate (16-21)**: 22.5% / 30.8% / 23.9% **High (22-29)**: 7.5% / 20.9% / 20.3% **Very high (30-50)**: 7.5% / 10.0% / 18.1%	Critical

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The impact of the event scale-revised (IES-R) test. Contains 22 items assessing symptom frequency on a five-point Likert scale, where 0=Not at all and 4=extremely. The results range from 0 to 88 and has three sub-scale domains (avoidance, intrusion, and hyperarousal). A cut-off of 25 was used to define high stress.

Terminology: Refers to “isolation” as individuals who had a PCR confirmed COVID-19 infection and isolated mostly at home (93.1%), others isolated in a governmental, work or another separated isolation setting.
VOCs: Not considered.
Vaccination status: Not considered.
</td>
<td>
Participants who isolated for over 14 days experienced more “very-high” stress (18.1%) as compared to those who spent exactly 14 days (10%), p=0.016.
The multivariate analysis of the association with high stress (K10) was significant for women (OR=2.482, 95% CI: 1.532–4.021), patients with financial problems (OR=2.332, 95% CI: 1.270–4.282) and those who lacked essential supplies (OR=4.920, 95% CI: 2.524–9.590).
Relationship between IES-R mean (SD) score and isolation duration

<14 days (n=40): 13.37 (10.34)
14 days (n=201): 20.63 (16.60)
>14 days (n=138): 24.50 (19.36)

p=0.002
Binary logistic regression
<table>
<tr><th>IES-R score</th><th><14 days (n=40)</th><th>14 days (n=201)</th><th>>14 days (n=138)</th></tr>
<tr><td>OR (95%CI)</td><td>0.448 (0.196-1.024), p=0.057</td><td>Reference</td><td>1.505 (0.967-2.341), p=0.070</td></tr>
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<tr>
<td>Ju et al. 2021</td>
<td>Accepted: January 16, 2021

Published: January 19, 2021</td>
<td>China (Hunan)

February 10 - April 2, 2020</td>
<td>Design: Longitudinal survey of patients admitted at the first hospital of Changsha (COVID-19 hospital)

Sample: 95 adults (aged 18+ years and one adolescent aged 15 whose parents consented) who were admitted at the first hospital of Changsha (COVID-19 hospital) and diagnosed with COVID-19 according to the national</td>
<td>
<table>
<tr><th></th><th>Total (n=95)</th><th>Hotel (n=50)</th><th>Home (n=45)</th></tr>
<tr><td colspan="4">Median (IQR) PHQ score</td></tr>
<tr><td>Baseline</td><td>3 (1-7)</td><td>3 (1-5.25)</td><td>3 (1-7)</td></tr>
<tr><td>Follow-up</td><td>2 (0-7)</td><td>3 (0-7)</td><td>2 (0-4)</td></tr>
</table>
</td>
<td>Critical</td>
</tr>
</table>

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<td>clinical guidelines of the China National Health Commission. Individuals were then asked to either isolate at home or in a hotel and were surveyed right after discharge from the hospital and at the end of the 14 days isolation.

Intervention: Individuals diagnosed with COVID-19 were then asked to isolate for 14 days.

Comparison: Individuals baseline results were compared to their post isolation results

Key Outcomes:
• Symptoms of depression were measured by 9-item Patient Health Questionnaire (PHQ-9; Range, 0–27).
• Symptoms of anxiety were measured by 7-item Generalized Anxiety Disorder scale (GAD-7; Range, 0–21)

Terminology: Refers to isolation as individuals who were diagnosed with COVID-19 according to the national clinical guidelines of the China National Health Commission and who were isolated for 14 days either at home or in a hotel.

VOCs: Not considered.

Vaccination status: Not considered.</td>
<td><table>
<tr><td colspan="4">Median (IQR) GAD-7 score</td></tr>
<tr><td>Baseline</td><td>4 (0-7)</td><td>3 (0-7)</td><td>4 (0-7)</td></tr>
<tr><td>Follow-up</td><td>2 (0-6)</td><td>3 (0-7)</td><td>1 (0-5)</td></tr>
</table>
There was no significant difference in depressive symptoms, anxiety symptoms, nor self-rated health between baseline and follow-up. There were also no significant differences in these measures between the hotel and home isolated groups.

Thirty-eight (40.6%) reported at least mild depression symptoms at baseline while it was 29 (31.2%) at follow-up.

Forty-one (43.7%) reported at least mild anxiety symptoms at baseline while it was 36 (38.5%) at follow-up.

There was a significant interactive effect of time by isolation location on depression levels ($p = 0.014$). Post hoc analysis showed that there was a significant decrease of depression scores in the home group ($p= 0.001$) but not in the hotel group ($p = 0.73$).</td>
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<tr>
<td>Spirito et al. 2022</td>
<td>Accepted:
May 3, 2022

Published:
May 8, 2022</td>
<td>Italy

May -October 2020</td>
<td>Design: Monocentric longitudinal study of male patients with a PCR confirmed COVID-19 infection

Sample: 22 consecutive adult (aged 18+) male in a steady relationship (of at least 6 months with vaginal sexual intercourse) with a PCR confirmed COVID-19 infection and attending a urology clinic.</td>
<td>SDS scores<table>
<tr><td></td><td>Median SDS score (IQR)</td></tr>
<tr><td>Time 1</td><td>27 (24.0-32.2)</td></tr>
<tr><td>Time 2</td><td>37.5 (34.2-45.5)</td></tr>
<tr><td>Time 3</td><td>28 (24.0-31.0)</td></tr>
</table></td>
<td>Critical</td>
</tr>
</table>

			Intervention: Participants were asked to fill in a questionnaire once they tested positive to COVID-19 and were asked to self-isolate (time 2). **Comparison**: The answers to the questionnaires during the self-isolation/quarantine period were compared to the ones they gave before they tested positive (time 1), during isolation (time 2), 1 month after testing negative (time 3) and 3 months after testing negative (time 4). **Key Outcomes**: Sexual function • 15-item international index of erectile function (**IIEF-15**) questionnaire: Answers vary from 0 to 5, where "0" is no sexual activity. The final score ranges from 5 to 25. • Sexual distress schedule (**SDS**): 12 items ranging from 0 to 4 (with "0" corresponding to never). The maximal score of 48 is associated with a higher level of sexual distress. • **Impact of COVID-19**: 10-items questionnaire (4 domains: sexuality, relationships, physical health, and mental health). **Terminology**: "Self-isolation" and "quarantine" both refer to the isolation of individuals who tested positive to COVID-19. **VOCs**: Not considered. **Vaccination status**: Not considered.	From Time 1 to Time 2, overall SDS score increased significantly ($p < 0.001$). From Time 2 to Time 3, overall SDS score decreased significantly ($p < 0.001$) **IIEF-15 scores** **Median SDS score (IQR)** **Time 1**: 45 (38.0–50.2) **Time 2**: 28.5 (19.5–38.0) **Time 3**: 39.5 (35.5–44.2) **Time 4**: 42 (36.0–48.0) From Time 1 to Time 2, overall IIEF score decreased significantly ($p < 0.001$). From Time 2 to Time 3, overall IIEF score increased significantly ($p < 0.001$). From Time 3 to Time 4, overall IIEF score increased significantly ($p < 0.01$). From Time 1 to Time 3, overall IIEF score decreased significantly ($p < 0.001$). **Impact of COVID (proportion of participant during self-isolation):** • Impact on their physical health: 15 (68.2%) • Impact on their mental health: 14 (63.6%) • Negative impact on their relationship: 15 (68.2%) • Negative impact on their sexuality: 20 (90.9%) It is important to note that during time 2, 9 men (40.9%) were admitted to the ICU for a median (IQR) duration of 10 (8-13) days.	

Table 1.3: Summary of modelling studies reporting on the impact of COVID-19 **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome

Maya & Khan, 2023	Published online May 2023	Based on 100 individuals in the US who had COVID-19 and were on day 5 of isolation	**Model**: Customized decision tree analysis
			
			Goal: Evaluate six different protocols to determine when to end COVID-19 isolation. These varied the default duration of the isolation (5, 8, 10 days), and the rule for ending isolation early (symptom check, or antigen/PCR test)).
			
			Key outcomes: Costs in US dollars, including:
			• Testing costs
			• Medical costs (for secondary infections)
			• Cost for productivity loss for index infection
			• Net costs (with and without productivity loss)
			• Incremental cost *per* infection averted.
			
			Accounts for: Health/infectivity factors, test sensitivity, intervention adherence.
			
			Key assumptions: For base model:
			• Only modeled asymptomatic & mild COVID-19 cases
			• Base sensitivity of tests:
			  ○ Symptom check: 23.8%
			  ○ Antigen test: 79.3%
			  ○ PCR test: 89.0%
			• 90% still infectious on day 5
			• 22% drop in infectiousness from day 5-6
			• Secondary reproduction number: 1.2
			• Intervention adherence: 100%
			• 100% testing access/coverage
			
			VOCs: Models used parameters according to Omicron variant when available; otherwise used data for Alpha or Delta.
			
			Vaccination status: Not considered
				All outcomes given per 100 persons. Results under the 6 intervention conditions are as follow:
				
				Option 1: 5-day isolation, without possibility to end early (i.e., no tests):
				• Testing cost: $0
				• Medical cost: $33,086
				• Productivity cost: $0
				• Net cost: $33,086
				• *Net cost (without productivity loss): $33,086
				• Incremental cost per infection averted: Not applicable (this is the baseline)
				
				Option 2: 10-day isolation, with symptom check on day 5. If asymptomatic, end isolation, otherwise continue to day 10.
				• Testing cost: $0
				• Medical cost: $25,605
				• Productivity cost: $19,368
				• Net cost: $44,973
				• *Net cost (without productivity loss): $25,605
				• Incremental cost per infection averted: $2,282
				
				Option 3: 10-day isolation, with rapid antigen test on day 5. If negative, end isolation, otherwise continue to day 10.
				• Testing cost: $1,000
				• Medical cost: $8,159
				• Productivity cost: $64,273
				• Net cost: $73,432
				• *Net cost (without productivity loss): $9,159
				• Incremental cost per infection averted: $2,324
				
				Option 4: 10-day isolation, with PCR test on day 5. If negative, end isolation, otherwise continue to day 10.
				• Testing cost: $15,000
				• Medical cost: $5,112

			Terminology: "Isolation" refers to confinement of persons with confirmed COVID-19.	• Productivity cost: $72,099 • Net cost: $92,211 • *Net cost (without productivity loss): $20,112 • Incremental cost per infection averted: $3,035 *Option 5:* 10-day isolation, with rapid antigen test on day 6. If negative, end isolation, otherwise continue to day 10. • Testing cost: $1,000 • Medical cost: $4,132 • Productivity cost: $58,056 • Net cost: $63,189 • *Net cost (without productivity loss): $5,132 • Incremental cost per infection averted: $1,493 *Option 6:* 8-day isolation, with rapid antigen test on day 5. If negative, end isolation, otherwise continue to day 8. • Testing cost: $1,000 • Medical cost: $14,391 • Productivity cost: $38,564 • Net cost: $53,954 • *Net cost (without productivity loss): $15,391 • Incremental cost per infection averted: $1,603 *Net cost without productivity loss assumes a scenario in which individuals keep working (e.g., from home) at usual capacity. *Note*. The most cost-effective de-isolation protocol was deemed option 5 (10-day isolation with an antigen test on day 6).

Table 1.4: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of COVID-19 **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
Aaltonen et al., 2023	**Accepted:** March 25, 2022	Finland	**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.	• **Univariate analyses:** There were no analyses that directly compared the quarantine group to the comparison group. Analyses explored differences between the	Serious

<table>
<tr>
<td></td>
<td>Published:
January, 2023</td>
<td>May 12 – June 25, 2020</td>
<td>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>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>
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<tr>
<td>Pang et al., 2021</td>
<td>Accepted: September 2, 2021

Published:</td>
<td>Malaysia

April 1-14, 2020.</td>
<td>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</td>
<td>Base rates: 20.2% of students had “moderate or above” scores for depressive symptoms, 25% for anxiety symptoms, and 14.2% for stress. Most of the sample had “normal” scores (i.e., lowest category of distress) for all three variables.</td>
<td>Serious</td>
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</table>

	September 14, 2021		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	**Multiple regression** (adjusting for limited sociodemographic variables): • Quarantine status was significantly associated with a higher depressive symptoms (standardized β = .103, p = .020). • Quarantine status was not significantly associated with either anxiety symptom (β = .052, p = .234) or stress scores (β = .070, p = .112). **Bivariate Results** (without adjustments) • Significantly higher levels of depressive symptoms (7.75 vs 4.96, p=.025). • No significant difference in anxiety symptoms (5.75 vs 4.44, p=.375) or stress (7.50 vs 5.67, p=.110) between quarantined students and not quarantined students.	
Wang et al., 2022	**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	**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 anxiety symptoms (Model A: β = -1.50, p = .13; Model B: β = -0.37, p = .61).	Serious

			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 symptoms**, 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.	Effects of quarantine on PCS was not evaluated in these models **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 symptom scores (29.67 vs 31.71, p=.04) • No significant difference in PCS (51.66 vs 51.21, p=.62).	

Table 1.5: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of COVID-19 **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
Aschman et al. - 2023	**Preprint posted:** September 5, 2023	Switzerland (Canton of Zurich) August 7, 2020 - January 15, 2021	**Design**: Prospective, observational population-based study based on the Zurich SARS-CoV-2 Cohort. **Sample**: 395 adults in mandated quarantine identified through contact tracing. **Intervention**: Adults (aged 18+) in mandated quarantine after an exposure to SARS-CoV-2 identified through contact tracing. Most quarantined at home or at someone else's home (96%). **Comparison**: Close contacts were invited to complete a baseline questionnaire upon enrolment. A second questionnaire was sent on the second to last day of quarantine. They were invited to receive a PCR test at the beginning of quarantine and at the end. Those testing positive were invited to participate in a separate arm. **Key Outcomes**: German version of short form of the Depression, Anxiety, and Stress Scale (DASS-21), subset of questions from the COVID-19 Pandemic Mental Health Questionnaire. **Terminology**: Quarantine refers to individuals who were exposed to SARS-CoV-2 and were identified through contact tracing. Individuals who tested positive for COVID-19 were put in a different arm of the study. **VOCs**: Not considered	**DASS-21** • Depressive symptoms and stress scores significantly increased, anxiety symptoms did not: • Depressive symptoms: +1.70 (95% CI: 1.19–2.22) • Stress score: +1.06 (95% CI: 0.47–1.66) • Anxiety symptoms: +0.13 (95% CI: -0.14–0.40) Change in proportion of persons with various levels of depressive or anxiety symptoms and stress scores **DASS-21** / **Change (amongst those who replied to both questionnaires)** **Depressive symptoms**: Across all categories: +9.5%; • Mild: +5.7%; • Moderate: +0.5%; • Severe: +3.2% **Anxiety symptoms**: Across all categories: +1.4%; • Mild: -0.5%; • Moderate: +1.9%; • Severe: +0% **Stress score**: Across all categories: +3.5%; • Mild: +1.4%; • Moderate: +0.8%; • Severe: +1.4% *Linear regression*: Change in depressive symptoms (during quarantine minus before) OR (95%CI)	Critical

			Vaccination status: Not considered	• Quarantine duration (per additional day): 1.01 (0.81-1.27)
				• Baseline depressive symptom score (per additional point): 1.23 (1.10-1.36), p<0.05
				
				62 of 390 participants were worried about financial consequences (e.g., job loss, getting into financial difficulties, income loss)
				• Reduced income: 14% (53 of 390)
				  ○ Partial compensation (n=20)
				  ○ No compensation (n=25)
				
				Quarantine measures were perceived as difficult or very difficult by some participants:
				• During quarantine: 84 participants (21.5%)
				• At the end of quarantine: 65 participants (17.5%)
				• Either time points: 109 participants (27.9%)
				
				In direct comparisons (during quarantine compared to two weeks prior), some participants reported:
				• Feeling more isolated: 22.0%
				• Increased trouble sleeping: 14.0%
				• Feeling more impatient or angry, consuming more alcohol, having more nightmares, feeling more worried, nervous, or depressed: 8.3% to 11.0%
				• More time to relax: 68.0%
				
				By the end of quarantine, 74 participants (19.9%) had left their house or met people during quarantine.	

Chen et al. 2022	**Accepted:** February 15, 2022 **Published:**	China January 10-23, 2021	**Design**: Cross-sectional self-reported online anonymous survey **Sample**: 944 adults (aged 18+) Chinese citizens, who gave no incomplete answers during the	**Multivariate analyses (multiple linear regression)** **Quarantine duration: >7 days [reference: 0 days]**	Critical

	March 07, 2022		period of the second outbreak of COVID-19, when people were under state-enforced strict lockdown. **Intervention**: Individuals self-reported if they experienced quarantine and for how long. The quarantine duration was categorized into three groups: • 0 days = 82.8% (n=782) • 1–7 days (without exposure) = 7.3% (n=69) • >7 days (close contact) = 9.4% (n=93) **Comparison**: Participants who did not quarantine (0 days). **Key Outcomes**: • **Psychological distress:** Five questions with a 5-point scale ("does not apply at all" to "strongly applies") focusing on COVID-19 related distress. The total score can range from 5 to 25. • **State of wellbeing:** World Health Organization-Five Wellbeing Index (WHO-5), five positive questions scored on a 6-point Likert scale (ranging 0-5). The total score can range from 0 to 25. **Terminology**: As recommended by their public health centre, people were required to have quarantined for 7 days without exposure and 14 days with close contact. **VOCs**: Not considered **Vaccination status**: Not considered	<table><tr><th></th><th>β (95% CI)a</th><th>β (95% CI)b</th></tr><tr><td>Psychological distress</td><td>1.41 (0.58–2.25), p < 0.01</td><td>1.03 (0.22–1.86), p < 0.05</td></tr><tr><td>Wellbeing</td><td>−1.46 (−2.48–0.44), p < 0.01</td><td>−1.27 (−2.26– -0.29), p < 0.05</td></tr></table>a: Unadjusted model, b: Adjusted for sex, age, residence, marriage, education, income, health status, and chronic diseases. *; The multivariate analysis showed that quarantine for >7 days was associated with a greater probability to have a high level of psychological distress and a low level of wellbeing. <table><tr><th></th><th>Adjusted standardized mean (SE) score compared to 0 days of quarantine</th></tr><tr><td>Psychological distress</td><td>>7 days: 0.08 (0.03), p=0.013</td></tr><tr><td>Wellbeing</td><td>>7days: -0.08 (0.03), p=0.011</td></tr></table>adjusted for gender, age, residence, marriage, education, income, health status, and chronic disease The adjusted standardized mean also showed that quarantine for >7days was associated with increased psychological distress and decreased wellbeing. **Univariate analyses (one-way ANOVA analyses)** <table><tr><td>Psychological distress</td><td>• 0 days: 15.8 ± 3.9 • >7 days: 17.2 ± 3.8</td><td>p=0.003</td></tr></table>	

<table>
<tr>
<td></td>
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<table>
<tr><td>Wellbeing</td><td>• 0 days: 16.6 ± 4.7
• >7 days: 15.2 ± 5.4</td><td>p=0.016</td></tr>
</table>

The ANOVA analyse showed that longer quarantine duration was associated with high psychological distress and lower wellbeing scores.
</td>
<td></td>
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<tr>
<td>Muhamad et al. 2021</td>
<td>Accepted:
March 18, 2021

Published:
April 23, 2021</td>
<td>Malaysia

During the beginning of the Movement Control Order (MCO) starting from March 18, 2020</td>
<td>Design: Retrospective study of data that was collected for operational purposes in the Agricultural Campus of a Bornean university

Sample: 122 participants (>18 years) able to read and converse fluently in Malay language

Intervention: Population of the agricultural campus was largely under MCO, with a small group subjected to quarantine for 14 days, and none under isolation. Quarantined students were not allowed to leave their quarantine centres, (everything was delivered contactless to their doorsteps) and were quarantined because they had symptoms and were under investigation or because they were in contact with a case and were under surveillance.

Comparison: Non-quarantined individuals who were under MCO

Key Outcomes:
• Psychological well-being: 20-item questionnaire adapted from the National Index of Psychological Well-being Malaysia (NIPW).

Terminology:
• Quarantine The current study is considered as a quarantine study in spite of</td>
<td>Mean (SD) psychological well-being score between groups
<table>
<tr><th></th><th>Quarantine (n = 16)</th><th>Non-quarantine (n = 106)</th></tr>
<tr><td>I feel safe</td><td>4.38 (0.806)</td><td>4.05 (1.0720)</td></tr>
<tr><td>I feel happy</td><td>2.81 (1.167)</td><td>2.79 (1.209)</td></tr>
<tr><td>I feel appreciated and protected</td><td>3.88 (1.088)</td><td>3.76 (1.1)</td></tr>
<tr><td>I feel lonely</td><td>3.69 (1.138)</td><td>3.55 (1.164)</td></tr>
<tr><td>I feel negative</td><td>3.13 (1.31)</td><td>3.02 (1.179)</td></tr>
<tr><td>I feel sad</td><td>3.31 (1.078)</td><td>3.27 (1.306)</td></tr>
<tr><td>I feel disappointed</td><td>3.13 (1.025)</td><td>3.13 (1.273)</td></tr>
<tr><td>I feel moody</td><td>3.19 (1.109)</td><td>3.02 (1.28)</td></tr>
<tr><td>I'm feeling worried</td><td>3.56 (1.094)</td><td>3.11 (1.26)</td></tr>
<tr><td>I feel angry</td><td>2.88 (1.258)</td><td>2.89 (1.319)</td></tr>
<tr><td>My life is very good</td><td>3.38 (1.204)</td><td>3.31 (1.072)</td></tr>
<tr><td>I can do daily routines</td><td>2.63 (1.31)</td><td>2.69 (1.334)</td></tr>
<tr><td>I'm satisfied about my life right now</td><td>2.75 (1.238)</td><td>2.86 (1.245)</td></tr>
</table>
</td>
<td>Critical</td>
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</table>

<table>
<tr>
<td></td>
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<td></td>
<td>the fact that some participants had symptoms. Unfortunately, these were not separated in the analyses. Given the lack of a positive test, we decided to consider these as a predominately quarantined group.

VOCs: not considered

Vaccination status: not considered</td>
<td>
<table>
<tr><td>I can accept it as it is</td><td>3.38 (0.957)</td><td>3.27 (1.126)</td></tr>
<tr><td>I have something important in contributing to the country</td><td>4 (0.894)</td><td>3.49 (1.181)</td></tr>
<tr><td>I always involve myself in the community (work around it)</td><td>3.44 (0.892)</td><td>3.32 (1.109)</td></tr>
<tr><td>I understand what happens</td><td>3.88 (0.885)</td><td>4.26 (0.898)</td></tr>
<tr><td>I understand the action that is performed is fair</td><td>3.69 (1.138)</td><td>3.76 (1.192)</td></tr>
<tr><td>Performed is fair I think everyone is good</td><td>3.63 (0.957)</td><td>3.56 (1.196)</td></tr>
</table>
There was no significant difference (all p>0.1) between the mean scores for all 20 questions, between quarantined and non-quarantined groups

In the analysis of the 12 positive scoring items, the raw scores were higher for the quarantined group except for three items (I can do daily routines, I understand what happens, I understand the action that is performed is fair).

For the eight negative scoring items, similarly, all the raw mean scores were higher in the quarantined group, except for “I feel angry”.
</td>
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<tr>
<td>Worrell et al. 2023</td>
<td>Accepted: November 20, 2022

Published: January 17, 2023</td>
<td>United States (Greene and St. Louis Counties, Missouri)

January 25–March 21, 2021</td>
<td>Design: survey conducted as part of a larger investigation of secondary transmission of SARS-CoV-2 in K-12 schools.

Sample: 586 student close contacts (212 from Greene County, 374 from St. Louis County), of whom, 227 responded to the survey
• 26 from Greene County participated in MQ</td>
<td>Reported quarantine experiences from parents/guardians: How stressful was your child’s day-to-day life during their quarantine period?
<table>
<tr><td></td><td>MQ Greene County N (%)</td><td>SQ Greene County N (%)</td><td>SQ St. Louis County N (%)</td></tr>
</table>
</td>
<td>Critical</td>
</tr>
</table>

			• 201 participants in SQ (165 from St. Louis County, 36 from Greene County) • 27% of the participants were from elementary school, 42% from middle school and 30% from high school. • Most students were white (82%) with only 18% identifying as another race and 3% identifying as Hispanic or Latino. Contacts were eligible to participate if their most recent school-based exposure was within 14 days of recruitment. **Intervention**: **Modified quarantine (MQ):** students who had a low risk exposure to a person with COVID-19 were permitted to attend school in-person during their quarantine if the school: 1) had a mask mandate; 2) classrooms were arranged to maximize physical distancing; 3) had increased hand hygiene practices; 4) screened students and staff members for COVID-19 symptoms; and 5) immediately isolated symptomatic persons. **Comparison**: Standard quarantine (SQ) implemented in St. Louis County, meaning that they must forfeit all in-person activities including in-person instruction for 7–14 days after their last exposure. **Key Outcomes**: • Psychosocial effects were assessed through 11 open- or close-ended questions, assessing both the parent and the child. Some questions were specific to MQ and were not asked to parents of children in SQ. **Terminology**: • **Close contact:** someone who was within 6 feet of an infected person for at least 15 minutes within a 24-hour period starting	<table><tr><td>Much more stressful</td><td>1 (4)</td><td>7 (19)</td><td>31 (19)</td></tr><tr><td>Somewhat more stressful</td><td>8 (31)</td><td>12 (33)</td><td>71 (43)</td></tr><tr><td>Neither more nor less stressful,</td><td>15 (58)</td><td>14 (39)</td><td>49 (30)</td></tr><tr><td>Somewhat less stressful</td><td>0</td><td>2 (6)</td><td>11 (7)</td></tr><tr><td>Much less stressful,</td><td>2 (8)</td><td>1 (3)</td><td>3 (2)</td></tr></table> Parents of both SQ and MQ students in both counties described students as having an array of mental health impacts, including increased social isolation, anxiety, and frustration. 6% (n=10) parents of students in SQ also reported what they described as depression, which was not reported by parent of children in MQ	

			from 2 days before illness onset (or, for asymptomatic cases 2 days prior to positive specimen collection) until the time the patient is isolated. • Low risk exposure: 1) the student was aged 18 years, 2) their only exposure to the person with COVID-19 was in the educational environment, 3) they did not have prolonged (15 minutes) direct physical contact with the person with COVID-19, and 4) the close contact and person with COVID-19 had both been wearing masks appropriately during the time of exposure **VOCs**: not considered **Vaccination status**: not considered		

Table 1.6: Summary of modelling studies reporting on the impact of COVID-19 **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome
Perrault et al., 2020	Paper posted online in November 2020	US-based population is simulated	**Model**: Agent-based branching process model **Goal**: Evaluate a risk-based quarantine (RBQ) procedure based on contact tracing, where individuals who have experienced contact with a case are put in quarantine within a cluster and: • Monitored on day 1, and if no one within the cluster shows symptoms, the entire cluster is then released Compared to approaches that use RT-PCR tests to reduce quarantine duration. The default quarantine duration without early release is 14 days. **Key outcomes**: • **Days of quarantine**: average days of quarantine caused by an index case • **Deaths** per 1000 index cases	**Results according to 9 conditions:** **1. No contact tracing/quarantine** • Quarantine days: 0 • Deaths: 27.4 • Cost: $0 **2. Quarantine only** (of all close contacts for 14 days) • Quarantine days: 62.1 • Deaths: 22.6 • Cost: $189 **3. 1-day RBQ** procedure (no testing) • Quarantine days: 36.1 • Deaths: 23.8

			• **Monetary costs** of tracing, monitoring, and testing per index case **Accounts for**: Test sensitivity/delays, people's age, transmission heterogeneity, dropout from quarantine **Key assumptions**: • "Contacts" with infected are of >15 min to initiate quarantine • The top 20% of index cases report 50% of the close contacts and 80% of infections • 18.8% attack rate among household close contacts; otherwise, 6% attack rate • Model calibration results in R_0 of 1.88 • Mean incubation time = 1.57 days • By default, quarantines last 14 days from last exposure, and isolation of index cases lasts 10 days from symptom onset • Contact tracers paid $20 per hour • Results of tests take 1 day to be available **VOCs**: Not considered **Vaccination status**: Not considered **Terminology**: Uses "quarantine" to refer to individuals in confinement initiated due to contact with an infected individual.	• Cost: $144 **4. RBQ + exit testing**: RBQ, but clusters need negative RT-PCR tests to be released. • Quarantine days: 40.1 • Deaths: 23.2 • Cost: $957 **5. RBQ + 4 extra days for small clusters**: If clusters have 8 or less people, the RBQ period before considering release lasts an extra 4 days. • Quarantine days: 40.5 • Deaths: 23.2 • Cost: $152 **6. RBQ + active monitoring**. RBQ, but non-quarantined contacts are monitored and complete symptom screening each day. • Quarantine days: 36.1 • Deaths: 23.2 • Cost: $208 **7. RBQ + exit testing + 4 extra days + active monitoring**. A combination of the 4 variants of RBQ above • Quarantine days: 42.6 • Deaths: 22.5 • Cost: $970 **8. Single-test release**. Once traced, people are tested. Released if test negative; otherwise, 14-day quarantine • Quarantine days: 14.9 • Deaths: 25.8 • Cost: $1630 **9. Double-test release**. Similar to a single test, but after results of a test are available, another is taken. People are released after they show 2 negative tests or quarantine ends. • Quarantine days: 21.2 • Deaths: 24.8 • Cost: $3500

				Sensitivity analyses show the performance of the conditions with quarantine can each vary importantly based on the time it takes from test administration to results. Overall, RBQ performs only slightly worse than quarantine for everyone, but reduces the average days in quarantine substantially. Procedures only based on testing are more expensive and perform less well to reduce transmissions.

Results 2: Summary of studies about the impact of H1N1 isolation and quarantine on individual and social outcomes

Table 2.1: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of H1N1 **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 2.2: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of H1N1 **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 2.3: Summary of modelling studies reporting on the impact of H1N1 **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 2.4: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of H1N1 **quarantine** on individual and social outcomes, 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>Wang et al. 2011</td>
<td>Accepted:
November 1, 2010

Published:
January - February 2011</td>
<td>China

From August 25, 2009</td>
<td>Design: Cross sectional survey of undergraduate students at the Qiangjian College of Hangzhou Normal University.

Sample: 176 quarantine undergraduate students at the Qiangjian College of Hangzhou Normal University as well as 243 non quarantined students. Participants completed the survey at the end of the quarantine period (7 days after the onset of the pandemic on August 25).

Intervention: Students were quarantined if they had been in close contact to a H1N1 case.

Comparison: Individuals who were not suspected and did not experience quarantine.

Key Outcomes:
• 20-item Self-Report Questionnaire (SRQ-20): assess the general state of mental health; it has 20 items with a ‘yes’ or ‘no’ response and a maximum score is 20.
• Impact of Event Scale–Revised (IES-R): assess the prevalence of posttraumatic stress disorder symptoms; it has 22 items with a Likert rating scale from 0 to 4 and a maximum score is 88.
• Dissatisfaction

Terminology: “Quarantine” refers to individuals that were confined because they were in close contact with a confirmed case of H1N1.

Vaccination status: Not considered.</td>
<td>Multinomial logistic regression
Being quarantine vs non quarantined was not associated with a higher SRQ positive screening risk (OR: 0.80, 95%CI: 0.45-1.41) or IES-R positive screening risk (OR: 0.80, 95%CI: 0.49-1.32), p=0.379

IES-R
Significantly lower screening-positive rate (OR=0.24, 95% CI=0.07–0.83) and significantly lower total scores of IES-R in the overall quarantine group than in the overall non-quarantine group (p=0.49) and in the quarantined female group than in the non-quarantined female group (p=0.47).

Comparisons between quarantined group and non-quarantined
<table>
<tr><th></th><th>Quarantined n=176</th><th>Non-quarantined n=243</th><th>Statistics</th></tr>
<tr><td>IES-R positive screening rate</td><td>10.80% (n=19)</td><td>16.87% (n=41)</td><td>OR=0.60(95%CI 0.33 - 1.07)</td></tr>
<tr><td>Total scores of IES-R</td><td>8.19 ± 7.47</td><td>9.93 ± 9.87</td><td>t= 1.97, p= 0.049</td></tr>
<tr><td>SRQ-20 positive screening rate</td><td>7.95% (n=14)</td><td>13.99% (n=34)</td><td>OR=0.53(95%CI 0.28 - 1.02)</td></tr>
</table>
</td>
<td>Serious</td>
</tr>
</table>

				<table><tr><td>**Total scores of SRQ-2**</td><td>2.12 ± 2.68</td><td>2.62 ± 3.09</td><td>t= 1.74, p=0 .084</td></tr></table> **Dissatisfaction of control measures** Significantly lower ratio of male in the quarantined than in the non-quarantined male group were dissatisfied with the control measures (OR: 0.54, 95% CI: 0.29–0.99).	

Table 2.5: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of H1N1 **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 2.6: Summary of modelling studies reporting on the impact of H1N1 **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

Results 3: Summary of studies about the impact of SARS isolation and quarantine on individual and social outcomes

Table 3.1: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of SARS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 3.2: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of SARS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 3.3: Summary of modelling studies reporting on the impact of SARS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 3.4: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of SARS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 3.5: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of SARS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 3.6: Summary of modelling studies reporting on the impact of SARS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome

Gupta et al., 2005	Accepted August 1st, 2004, available online September 22nd, 2004	Using the population density of Toronto, modeled the spread of SARS throughout a population.	**Model:** Modeled the spread of SARS throughout a population **Goal:** Compared two outbreak scenarios to investigate whether or not the use of quarantine is justified by either cost-saving, lifesaving or both: • Scenario A: SARS transmits itself throughout a population without any significant public health interventions. Individuals infected are isolated and treated as is the standard of care. • Scenario B: Quarantine is implemented early in an attempt to contain the virus, including the quarantine of first-degree contacts of the index case. **Key Outcomes:** total cost of quarantine, total cost of SARS/person **Accounts for:** number of contacts, variability of transmission, quarantine, total cost of quarantine, total cost of SARS/person **Key Assumptions:** • All of the costs were calculated in Canadian dollars unless otherwise noted. • The indirect costs of SARS were measured by calculating lost productivity, or the opportunity cost of illness. • Using the average daily wage of workers in Toronto **VOCs:** Not considered. **Vaccination Status:** Not considered. **Terminology:** Quarantine is defined as the separation and/or restriction of movement of persons who are not ill but are believed to have	**Cost of unchecked outbreak:** • Individuals staying home ill or being hospitalized as a result of SARS are assumed to miss 14 days of work. Opportunity cost of about $1600/person • Mortality related to SARS results in a loss of productivity values at approximately $460 530 per life lost. Under the assumption that each individual will work until the age of 71. **Cost of quarantine:** • Estimate the direct cost of the epidemic to be $12 million. • Indirect costs were measured as productivity lost due to exposed individuals being unable to work for at least 10 days. They estimated a loss of productivity valued at $1140/person quarantined. Quarantine is cost saving when compared to not implementing a widespread containment mechanism. For a population with the density of a city like Toronto, the total savings were estimated to be between 232-279 million CAD.

			been exposed to infection to prevent transmission of diseases.	

Results 4: Summary of studies about the impact of MERS isolation and quarantine on individual and social outcomes

Table 4.1: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of MERS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 4.2: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of MERS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
Jeong et al.	**Accepted:** 5 Nov, 2016 **Published:** 5 Nov, 2016	Seoul, Gyeonggi, Chungcheong, and Gangwon - South Korea. End of May to mid-June of year 2015	**Design**: Cohort study of individuals who came into contact with a MERS patient, identified through the epidemiological investigation section of the centre for disease control **Sample**: 1,692 individuals who came into contact with a MERS patient. 36 isolated MERS cases: • Hospital (91.7%) • At home with family (8.3%) 1,656 isolated contacts: • Hospital (6.3%) • Alone at home or in a hotel (25.3%) • At home with family (68.4%) **Intervention**: Individuals who were verified to have been in direct contact with a confirmed	**Prevalence of individuals experiencing elevated anxiety or anger symptoms** **MERS cases** **During isolation** **Anxiety** 47.2% (30.9-63.5) **Anger** 52.8% (36.5-69.1) **4-6 months after release from isolation** **Anxiety** 19.4% (6.5-32.3) **Anger** 30.6% (15.6-45.7) Data presented as proportion of patients (95%CI) No statistical analyses were presented for this data. However, the lack of overlapping CIs for anxiety would suggest that there was a reduction in the proportion of individuals with elevated	Critical

			case of MERS during the 14 days period and had a confirmed case of MERS. All were isolated for 2 weeks **Comparison**: Answers to the questionnaire 4-6 months after release from isolation were compared to the one obtained for the isolation period **Key Outcomes**: • Anxiety symptoms using the 7-item Generalized Anxiety Disorder Scale (GAD-7), using a 4-point Likert scale from 0 to 3, giving a total score ranging from 0 to 21. • Anger using the Korean version of the State-Trait Anger Expression Inventory (STAXI), with 10-item with 4-point Likert scale and a total score ranging from 10 to 40. **Terminology**: • **Isolation**: In the current study patients who were in close contact with MERS cases and then had a confirmed case were referred to as "MERS cases". • **Quarantine**: In the current study patients who were in close contact with MERS cases and then underwent quarantine case were referred to as "Isolated people". • A "Contact" was defined as an individual who, without wearing appropriate self-protective equipment such as gown, gloves, N95 mask, goggles, or face mask, stayed within 2 m of a MERS patient, stayed in the same room or the ward as a MERS patient, or came in direct contact with respiratory secretions of a MERS patient. **VOCs**: Not considered.	symptoms 4-6 months after isolation. In contrast, it is unlikely that the proportion of individuals with elevated anger symptoms was diminished at 4-6 months.	

			Vaccination status: Not considered (at that time, preventive vaccine and treatment options were not clearly established).		

Table 4.3: Summary of modelling studies reporting on the impact of MERS **isolation** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 4.4: Summary of empirical studies that were rated as *not having a critical risk of bias*, reporting on the impact of MERS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

Table 4.5: Summary of empirical studies that were rated as *having a critical risk of bias*, reporting on the impact of MERS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

Reference	Date released	Setting and time covered	Study characteristics	Summary of key findings in relation to the outcome	RoB Rating
Jeong et al.	**Accepted:** 5 Nov, 2016 **Published:** 5 Nov, 2016	Seoul, Gyeonggi, Chungcheong, and Gangwon - South Korea. End of May to mid-June of year 2015	**Design**: Cohort study of individuals who came into contact with a MERS patient, identified through the epidemiological investigation section of the centre for disease control **Sample**: 1,692 individuals who came into contact with a MERS patient. 36 isolated MERS cases: • Hospital (91.7%) • At home with family (8.3%)	**Prevalence of individuals experiencing elevated anxiety or anger symptoms** **Quarantined individuals** **During isolation** **Anxiety**: 7.6% (6.3-8.9)	Critical

			1,656 isolated contacts: • Hospital (6.3%) • Alone at home or in a hotel (25.3%) • At home with family (68.4%) **Intervention**: Individuals who were verified to have been in direct contact with a confirmed case of MERS during the 14 days period but did not have a confirmed case of MERS. All were quarantined for 2 weeks **Comparison**: Answers to the questionnaire 4-6 months after release from isolation were compared to the one obtained for the isolation period **Key Outcomes**: • Anxiety symptoms using the 7-item Generalized Anxiety Disorder Scale (GAD-7), using a 4-point Likert scale from 0 to 3, giving a total score ranging from 0 to 21. • Anger using the Korean version of the State-Trait Anger Expression Inventory (STAXI), with 10-item with 4-point Likert scale and a total score ranging from 10 to 40. **Terminology**: • **Isolation**: In the current study patients who were in close contact with MERS cases and then had a confirmed case were referred to as "MERS cases". • **Quarantine**: In the current study patients who were in close contact with MERS cases and then underwent quarantine were referred to as "Isolated people".	<table><tr><td>Anger</td><td>16.6% (14.8-18.4)</td></tr><tr><td colspan="2">4-6 months after release from quarantine</td></tr><tr><td>Anxiety</td><td>3.0% (2.2-3.9)</td></tr><tr><td>Anger</td><td>6.4% (5.2-7.6)</td></tr></table> Data presented as proportion of patients (95%CI) No statistical analyses were presented for this data. However, the lack of overlapping CIs for both anxiety and anger would suggest that there was a reduction in the proportion of individuals with elevated symptoms 4-6 months after isolation.	

			• A "Contact" was defined as an individual who, without wearing appropriate self-protective equipment such as gown, gloves, N95 mask, goggles, or face mask, stayed within 2 m of a MERS patient, stayed in the same room or the ward as a MERS patient, or came in direct contact with respiratory secretions of a MERS patient. **VOCs**: Not considered. **Vaccination status**: Not considered (at that time, preventive vaccine and treatment options were not clearly established).		

Table 4.6: Summary of modelling studies reporting on the impact of MERS **quarantine** on individual and social outcomes, presented in alphabetical order of 1st author

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

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.

McMaster University 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.

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The opinions, results, and conclusions are those of the team that prepared the evidence synthesis, and independent of the Government of Canada, the Public Health Agency of Canada, CIHR, or FRQS. No endorsement by the Government of Canada, the Public Health Agency of Canada, CIHR, or FRQS is intended or should be inferred.

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Appendices