

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from BMJ but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open. The paper was subsequently accepted for publication at BMJ Open.

## ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Do school closures and school reopenings affect community transmission of COVID-19? A systematic review of observational studies
<b>AUTHORS</b>	Walsh, Sebastian; Chowdhury, Avirup; Braithwaite, Vickie; Russell, Simon; Birch, Jack; Ward, Joseph; Waddington, Claire; Brayne, Carol; Bonell, Chris; Viner, Russell; Mytton, Oliver

## VERSION 1 – REVIEW

<b>REVIEWER</b>	Beckwith, Tracy Patient Reviewer
<b>REVIEW RETURNED</b>	19-Mar-2021

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review this paper. My comments are as follows:</p> <ul style="list-style-type: none"><li>• The authors set themselves a challenging task in light of the (acknowledged) heterogeneity of the data .</li><li>• Given the findings of the school re-opening studies included in the paper it would perhaps be reasonable to shift focus to school closures only.</li><li>• And, within this shift (given the acknowledged confounding factors) through a carer/teacher/parent/public interest perspective, this paper would be strengthened using a cost benefit approach in terms of whether the impact of school closure on community transmission was offset for example by an increase in demand for mental health services in the geographical areas of the closures</li></ul>
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<b>REVIEWER</b>	Tolliver, Destiny
<b>REVIEW RETURNED</b>	30-Mar-2021

<b>GENERAL COMMENTS</b>	<p>The authors performed a systematic review on the effect of school closures and reopenings on community transmission of COVID-19, following a rapid review that was completed in April 2020, early in the pandemic and prior to much of the evidence that has evolved since then. This is an important and relevant topic as the COVID-19 pandemic continues and clinicians, policymakers, educators, and parents try to understand the risks and benefits of school closures/reopenings. The authors navigate the nuances of the data without overstating the evidence, and instead providing</p>
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	<p>appropriate critiques throughout, which is important for future researchers hoping to contribute to this space, as well as for school districts still navigating these difficult decisions.</p> <p>I would make the following changes to strengthen this piece:</p> <ol style="list-style-type: none"> <li>1. On page 4, in the introduction, I would consider removing the reference to a second pandemic wave in line 15, as the pandemic waves came at different times from country to country with accompanying school closures.</li> <li>2. There are references in the introduction and in the discussion to the inequalities exacerbated by school closures. I think, to emphasize some of the things countries were balancing, it would be worthwhile to name some of these concerns, including educational loss, worsened food insecurity, income loss for families who had to give up work to be home with children. Additionally, the authors use the term “deprived children” (on page 4, line 19), which I believe points to the societal deprivation of these children, however, could be read in a way that attributes negativity to the children themselves. By listing specific things such as food insecurity or poverty, I think it is less likely that someone could misinterpret the phrasing.</li> <li>3. I would consider whether to describe what is being exacerbated by the school closures as inequities vs inequalities. Inequities implies a difference that is unjust, which I believe better describes what the authors are describing.</li> <li>4. For the grey literature search, the search terms appeared to be potentially too broad to find literature about school closures or reopenings in the context of COVID-19 while using “or” terms, given the number of websites focused on COVID-19 at this time. I think a brief description of the rationale or a more focused Google search would be useful to future researchers who might want to replicate this study.</li> <li>5. In the discussion the authors discuss some of the difficulties in estimating the independent effect of school closures/reopenings, which may be an area in which mentioning some of the more local case studies related to school reopenings and closures could add interesting context. These studies are often about the impact of school reopening on within-school transmission, and so rightly are not included in the results, but may offer some insights on the questions the authors discuss related to variables that were harder to ascertain at a national level. <ol style="list-style-type: none"> <li>a. Zimmerman KO, Akinboyo IC, Brookhart A, et al. Incidence and secondary transmission of SARS-CoV-2 infections in schools. <i>Pediatrics</i>. 2021; doi: 10.1542/peds.2020- 048090</li> <li>b. Varma JK, Thamkittikasem J, Whittemore K, et al. COVID-19 infections among students and staff in New York City public schools. <i>Pediatrics</i>. 2021; doi: 10.1542/peds.2021- 050605 (this study was published after the authors’ most recent search, but speaks to community transmission while also providing more detailed information on the context involved around school reopening)</li> </ol> </li> </ol>
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**VERSION 1 – AUTHOR RESPONSE**

Reviewer: 1

Recommendation:

Comments:

Thank you for the opportunity to review this paper. My comments are as follows:

- The authors set themselves a challenging task in light of the (acknowledged) heterogeneity of the data .
- Given the findings of the school re-opening studies included in the paper it would perhaps be reasonable to shift focus to school closures only.
- And, within this shift (given the acknowledged confounding factors) through a carer/teacher/parent/public interest perspective, this paper would be strengthened using a cost benefit approach in terms of whether the impact of school closure on community transmission was offset for example by an increase in demand for mental health services in the geographical areas of the closures

Author Response: We thank the peer reviewer for their comments.

- We would argue that the inclusion of school re-opening studies alongside school closure studies is imperative to understand the effect of this policy. School closures were generally implemented as a binary measure around the world, whereas reopenings have occurred in a more staggered way, allowing comment on the potential differential effect of primary Vs. secondary for example.

Whilst the secondary review questions that are suggested here are important to the overall policy question, we do not think they represent focussed questions that would be appropriate for inclusion within one systematic review.

Reviewer: 2

Recommendation:

Comments:

The authors performed a systematic review on the effect of school closures and reopenings on community transmission of COVID-19, following a rapid review that was completed in April 2020, early in the pandemic and prior to much of the evidence that has evolved since then. This is an important and relevant topic as the COVID-19 pandemic continues and clinicians, policymakers, educators, and parents try to understand the risks and benefits of school closures/reopenings. The authors navigate the nuances of the data without overstating the evidence, and instead providing appropriate critiques throughout, which is important for future researchers hoping to contribute to this space, as well as for school districts still navigating these difficult decisions.

Author Response: We thank the peer reviewer for their positive comments.

I would make the following changes to strengthen this piece:

1. On page 4, in the introduction, I would consider removing the reference to a second pandemic wave in line 15, as the pandemic waves came at different times from country to country with accompanying school closures.

Thank you, we have made this amendment.

2. There are references in the introduction and in the discussion to the inequalities exacerbated by school closures. I think, to emphasize some of the things countries were balancing, it would be worthwhile to name some of these concerns, including educational loss, worsened food insecurity, income loss for families who had to give up work to be home with children. Additionally, the authors use the term "deprived children" (on page 4, line 19), which I believe points to the societal deprivation

of these children, however, could be read in a way that attributes negativity to the children themselves. By listing specific things such as food insecurity or poverty, I think it is less likely that someone could misinterpret the phrasing.

We have amended the reference to “deprived children” to “children from socioeconomically deprived backgrounds”.

3. I would consider whether to describe what is being exacerbated by the school closures as inequities vs inequalities. Inequities implies a difference that is unjust, which I believe better describes what the authors are describing.

Whilst we follow your logic, it is only unjust if the policies are ineffective. As we are in clinical equipoise in conducting the review, we have used ‘inequalities’.

4. For the grey literature search, the search terms appeared to be potentially too broad to find literature about school closures or reopenings in the context of COVID-19 while using “or” terms, given the number of websites focused on COVID-19 at this time. I think a brief description of the rationale or a more focused Google search would be useful to future researchers who might want to replicate this study.

We developed the search strategy with a specialist medical librarian. Though the peer reviewer considers our google search terms to be broad, this search did identify several relevant articles to the topic of our review – though none met the inclusion criteria. We would therefore standby our search strategy, but would be happy to discuss this further with the editor should they feel a different approach is more appropriate.

5. In the discussion the authors discuss some of the difficulties in estimating the independent effect of school closures/reopenings, which may be an area in which mentioning some of the more local case studies related to school reopenings and closures could add interesting context. These studies are often about the impact of school reopening on within-school transmission, and so rightly are not included in the results, but may offer some insights on the questions the authors discuss related to variables that were harder to ascertain at a national level.

a. Zimmerman KO, Akinboyo IC, Brookhart A, et al. Incidence and secondary transmission of SARS-CoV-2 infections in schools. *Pediatrics*. 2021; doi: 10.1542/peds.2020- 048090

b. Varma JK, Thamkittikasem J, Whittemore K, et al. COVID-19 infections among students and staff in New York City public schools. *Pediatrics*. 2021; doi: 10.1542/peds.2021- 050605 (this study was published after the authors’ most recent search, but speaks to community transmission while also providing more detailed information on the context involved around school reopening)

We agree. We had not included these studies originally due to trying to keep the word count down. But have now added comment on them in the discussion section.