

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.

ARTICLE DETAILS

TITLE (PROVISIONAL)	The impact and variability of social determinants of health on the transmission and outcomes of COVID-19 across the world: a systematic review protocol
AUTHORS	Abedin, Minhazul; Wahab, Abrar; Rahman, Farah Naz; Omi, Fardina; Shareen, Saadia; Rakhshanda, Shagoofa; Islam, Labida; Mayaboti, Cinderella; Saha, Uttam; Faruque, Fazlay; Fletcher, Lauren; Mashreky, Saidur

VERSION 1 – REVIEW

REVIEWER	McManus, Sally National Centre for Social Research, London, SRU
REVIEW RETURNED	11-Jun-2021

GENERAL COMMENTS	<p>BMJ Open protocol review</p> <p>This protocol sets out an ambitious systematic review of quantitative evidence on the distribution of social determinants of health (SDOH), their associations with COVID-19 outcomes (infection, hospitalisation, death), and whether these associations vary geographically. The focus on summarising the evidence on social determinants in the context of COVID is welcome. The potential scale of work is substantial: covering all countries, age groups, populations, and focusing on studies that include any SDOH. However, the review team is substantial (10 reviewers) and so the programme of work potentially feasible.</p> <p>Given that different SDOH tend to be closely related, could the authors discuss how confounding will be addressed in the review. For example, given people in poverty often also have poorer access to healthcare, will the review be able to clarify to what extent an increased prevalence of COVID infection or mortality may be attributable to poverty and what proportion to poor access to healthcare? Further, when people and communities face multiple SDOH these are likely to interact so that effects are not just cumulative, even to the extent of forming a syndemic. Do the authors intend to address interactions or take an intersectional approach?</p> <p>My comments relate to points of clarification:</p> <ul style="list-style-type: none">• The inclusion criteria for outcome measures states that 'studies will be included if they use a measure for SDOH that affect the transmission and outcomes of COVID-19'. To avoid the appearance of second-guessing the review findings, I suggest this is reworded as: 'studies will be included if they use a measure for SDOH that could be hypothesised to affect the transmission and outcomes of COVID-19'.
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	<ul style="list-style-type: none"> • Could the list of individual SDOH be provided? For example, 'relationships' is stated as a category of SDOH that will be included, would this include marital/ cohabitation/ relationship status? And if so, should it be included in the search terms? Likewise, the search terms seem to focus on studies that are labelled as being about 'SDOH'. For example, while ethnicity is named in the protocol as a SDOH, this is not included as a search term. • 'We will consider any population that has tested positive for COVID-19': should this read 'We will consider any population that has been tested for COVID-19' (i.e., analyses need to focus on the whole population, not only on those testing positive). • Most surveys use self-report measures indicating perceived infection and/or whether the participant reports that they have previously received a positive COVID result – would these studies be included, or only studies that directly tested participants as part of the research? • 'Studies that include laboratory measures and radiologic findings of COVID-19 diagnosis' would be excluded – some studies may embed a test and that is fine. I think some of the inclusion/exclusion criteria are really about the study population/sampling. Could it be stated that you are interest in general population samples, ideally those that are representative of the general population they are generalised to? • Inclusion criteria states 'Studies that cover all geographical locations', I think this should read 'Studies that cover any geographical location'.
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REVIEWER	Lundon, D. J. Univ Coll Dublin, School of Medicine
REVIEW RETURNED	03-Sep-2021

GENERAL COMMENTS	<p>Parts of the paper are written in the future tense and other parts are written in the past tense, as though all data has already been collected; of course the journal states if data collection is complete, they will not consider the manuscript, and the methods make clear that the search strategy is to include articles published until December 31st 2021.</p> <p>There are a number of limitations to the methods outlined- including the exclusion of articles not published in the English language, and the authors search strategy to examine unpublished literature.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1:

Dr. Sally McManus, National Centre for Social Research, London, City University

Comments to the Author:

This protocol sets out an ambitious systematic review of quantitative evidence on the distribution of social determinants of health (SDOH), their associations with COVID-19 outcomes (infection, hospitalisation, death), and whether these associations vary geographically. The focus on

summarising the evidence on social determinants in the context of COVID is welcome. The potential scale of work is substantial: covering all countries, age groups, populations, and focusing on studies that include any SDOH. However, the review team is substantial (10 reviewers) and so the programme of work potentially feasible.

Response to Reviewer 1:

Thank you very much for your valuable suggestions, and time. We believe your comments will increase the standard of the manuscript. We have tried our best to address your comments as follows-

- Given that different SDOH tend to be closely related, could the authors discuss how confounding will be addressed in the review. For example, given people in poverty often also have poorer access to healthcare, will the review be able to clarify to what extent an increased prevalence of COVID infection or mortality may be attributable to poverty and what proportion to poor access to healthcare? Further, when people and communities face multiple SDOH these are likely to interact so that effects are not just cumulative, even to the extent of forming a syndemic. Do the authors intend to address interactions or take an intersectional approach?

Ans: The review will address the potential interaction effect or intersectional approach only if the analysis reports such findings, which is generally found in predictive modeling. Any hypothetical interaction or intersectional findings will be excluded from this review. For further clarification of the readers, we have included this in the revised manuscript. Please find the added text in the "Type of studies" section in lines 166-168 of page 8 (number presented bottom of the page) of the document.

- The inclusion criteria for outcome measures states that 'studies will be included if they use a measure for SDOH that affect the transmission and outcomes of COVID-19'. To avoid the appearance of second-guessing the review findings, I suggest this is reworded as: 'studies will be included if they use a measure for SDOH that could be hypothesized to affect the transmission and outcomes of COVID-19'.

Ans. Thank you for the suggestion. According to the reviewer's advice, we have made this change to the manuscript. The text now reads; "Studies will be included if they use a measure for SDOH that could be hypothesized to affect the transmission and outcomes (confirmed positive case, hospitalization, and mortality) of COVID-19". Please find the new text in the "Types of outcome measures Section" in lines 183-185 of page 8 (number presented bottom of the page) of the revised document.

- Could the list of individual SDOH be provided? For example, 'relationships' is stated as a category of SDOH that will be included, would this include marital/ cohabitation/ relationship status? And if so, should it be included in the search terms? Likewise, the search terms seem to focus on studies that are labelled as being about 'SDOH'. For example, while ethnicity is named in the protocol as a SDOH, this is not included as a search term.

Ans. Thank you for the suggestion. The list of SDOH has been provided in the manuscript. We have considered the list of SDOH from Healthy People 2020 and PROGRESS-Plus which is broadly mentioned in the "Types of outcome measures" section in lines 185-193 on pages 8-9 (number presented top of the page) and page 9 (number presented bottom of page 8 and top of page 9) of the revised document.

Thank you for your suggestion regarding adding search terms. We feel that some of these terms, e.g. ethnicity, gender, age are not necessary to be added as search terms in the search for the following reasons. First, the terms listed in our string constitute the major factors related to SDOH. Secondly, those terms not listed explicitly in the search term would be able to be determined from the study itself and would most likely not be a keyword or index term listed.

- 'We will consider any population that has tested positive for COVID-19': should this read 'We will consider any population that has been tested for COVID-19' (i.e., analyses need to focus on the whole population, not only on those testing positive).

Ans. Thank you for the suggestion. According to the reviewer's advice, we have made this change to the manuscript. The text now reads; "We will consider any population that has been tested for COVID-19". Please find the new text in the "Types of study population" section in line 180 on page 8 (number presented bottom of the page) of the revised document.

- Most surveys use self-report measures indicating perceived infection and/or whether the participant reports that they have previously received a positive COVID result – would these studies be included or only studies that directly tested participants as part of the research?

Ans: Thank you for bringing this up for our consideration. This review will consider both scenarios: Self-reported measures and directly tested participants as a part of the research. The text now reads; "This review will include studies with both self-reported and directly tested measures". Please find the new text in the "Types of studies" section in lines 168-169 on page 8 (number presented in the middle of the page) of the revised document.

- 'Studies that include laboratory measures and radiologic findings of COVID-19 diagnosis' would be excluded – some studies may embed a test and that is fine. I think some of the inclusion/exclusion criteria are really about the study population/sampling. Could it be stated that you are interest in general population samples, ideally those that are representative of the general population they are generalised to?

Ans. Thank you for mentioning this point along with the valuable suggestion. We do agree that articles that report laboratory measures and radiologic findings should not be excluded. However, as we aim to make the results applicable to the general population, we will revise our strategy to include studies that may or may not report these types of test findings. But, the review will not include or extract any laboratory and radiologic findings. Therefore, we have decided to drop the sentence from the manuscript which was previously mentioned as "Exclusion Criteria" in the table labeled as "Table 1: Inclusion and exclusion criteria for the review" and reflected in the 194 lines of pages 9-10 (bottom of the table) of the revised document.

- Inclusion criteria states 'Studies that cover all geographical locations', I think this should read 'Studies that cover any geographical location'.

Ans. Thank you for the suggestion. According to the reviewer's advice, we have made this change to the manuscript. The text now reads- 'Studies covering any geographical location'. Please find the new text in the "Inclusion Criteria" table labeled as "Table 1: Inclusion and exclusion criteria for the review" in line 194 of page 9 (number presented middle of the page) of the revised document.

Reviewer 2:

Reviewer: 2Dr. D. J. Landon, Univ Coll Dublin, Brigham and Women's Hospital

Comments to the Author:

Parts of the paper are written in the future tense and other parts are written in the past tense, as though all data has already been collected; of course the journal states if data collection is complete,

they will not consider the manuscript, and the methods make clear that the search strategy is to include articles published until December 31st 2021.

There are a number of limitations to the methods outlined- including the exclusion of articles not published in the English language, and the authors search strategy to examine unpublished literature.

Response to Reviewer 2:

- Thank you very much for your valuable suggestions, and time. We believe your comments will increase the standard of the manuscript. We have tried our best to address your comments as follows-

Thank you very much for catching this grammatical mistake. All sections of the manuscript have been changed to the future tense accordingly except for the explanation for search development. Previously, there were some sections written in the past tense as the review of these portions had been completed at the time of submitting the manuscript to the journal, while the later portions (namely screening & data extraction) had not been completed yet.

Thank you for your comment on the exclusion criteria regarding the language of the selected articles of this review. The non-English articles have been excluded as the authors don't have sufficient capacity to translate them into the English language and evaluate them for inclusion in the review.

Thank you for speaking to our search strategy section. This portion of the manuscript has been updated to reflect more appropriate terminology, please see the "Search Strategy" section in lines 197-207 of page 10. We feel that searching the WHO Global Research on Coronavirus Disease database enables us to locate traditionally published literature, grey literature, and pre-prints related to COVID-19.