

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Hospital Climate Actions and Assessment Tools: A Scoping Review Protocol
AUTHORS	Gan, Connie Cai Ru; Banwell, Nicola; Pascual, Ramon San; Chu, Cordia; Wang, Ying Wei

VERSION 1 – REVIEW

REVIEWER	Kristie L. Ebi University of Washington USA
REVIEW RETURNED	22-Jul-2019

GENERAL COMMENTS	<p>The authors identified an areas where a synthesis review would be helpful. I have several concerns with the protocol:</p> <ol style="list-style-type: none"> 1) Relying only on the peer-reviewed literature means that a significant proportion of actions being undertaken will not be included. There is limited to no incentive for a hospital to publish actions taken on adaptation and mitigation. At least a thorough search of the gray literature is needed. Please include national and regional vulnerability and adaptation assessments, Health components of National Adaptation Plans, and implementation of the WHO Safe Hospital Index, at least. 2) The protocol needs to be clear on weather / climate variability / climate change. The manuscript treats these as the synonyms; they are not. Actions taken to address weather patterns may not be resilient to climate change. If you are only going to look at climate change, then please discuss detection and attribution. 3) The criteria that will be used to evaluate the robustness of studies / reports need to be described. 4) The authors are encourage to be more ambitious with respect to the audience for the review. Ministries of Health, policymakers, national climate change and health teams, amongst others, would be interested. 5) The search strategy omits some obvious concerns re healthcare facilities and a changing climate, particularly storms, typhoons/hurricanes/cyclones, and sea level rise. 6) Climate change is not going to be reversed for decades to centuries. 7) In section 4, how will you decided if a hospital is pro-environment?
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	<p>8) Referencing needs to be improved. There are statements, for example, of the carbon footprint of healthcare (among others), without a citation.</p> <p>9) Please justify why Spanish, Portuguese, and French are not included.</p> <p>10) The language needs improvement. Please have a native English speaker edit before resubmission. There are far too many incomprehensible sentences.</p> <p>11) The long section from the Lancet Countdown on page 6 is unnecessary.</p>
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REVIEWER	Forbes McGain Western Health, Melbourne, Australia.
REVIEW RETURNED	27-Jul-2019

GENERAL COMMENTS	<p>Re: Climate Actions in Hospital: A Scoping Review Protocol.</p> <p>This manuscript is a protocol of how the authors are going to perform a literature search of the impacts of climate change on health care. The research questions are: 1. "Which areas have been studied regarding the hospital impacts of climate change?" This is unclear; do you mean the impacts of climate change upon hospitals?</p> <p>It is unclear to me why a study protocol needs to be published in the BMJ Open. This manuscript was initially interesting to me, but since it only contains the methods it is less so. Yes, publishing the statistical analyses etc. for large randomised trials a priori is important, but do we really require protocols for literature reviews to be published? Why not just publish the methods with the results please? There are no statistical analyses required, and this is not a meta-analysis (or at least there is no mention of either in the manuscript).</p>
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REVIEWER	Paul Chua School of Tropical Medicine and Global Health, Nagasaki University, Japan
REVIEW RETURNED	02-Sep-2019

GENERAL COMMENTS	<p>English editing is needed.</p> <p>Considering the topic at hand, it maybe best to consider the inclusion of unpublished materials or grey literature. There maybe reports or similar documents that are quite informative and can possibly contribute to the discussions/evidence.</p> <p>There are sentences that are not factual like in Page 5 Line 52-54. Re-wording of some sentences (considering uncertainty in the future) is needed.</p> <p>The research objective in Page 7 lines 16-20 is the only appropriate objective. More specific objectives can be added (i.e. which aspects of the topic they want to see or get elaborated?)</p>
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	<p>The "identifying of the research question" part does not need to comprise specific questions. Scoping review allows the use of general questions. The first research question in page 7 line 54 is not within the hospital climate actions topic (impacts are something else). The second question can be scrapped. The last two bullets are more appropriate.</p> <p>In page 8 lines 34-36, the researcher decides the final search terms/syntax and should be stated in this protocol already. Consider finalizing them with your librarian and remove the sentence where a librarian has to review it.</p> <p>In "study selection process" part, confirm/state that both independent reviewers are fluent in English, Chinese, and Indonesian.</p> <p>In Page 10 line 56, using PRISMA flow diagram does not ensure replicability.</p> <p>The "synthesis of result" needs more details. Please specify the process, who are involved, and what kind of quantitative and qualitative analyses will be used. Kindly see other scoping review protocols from BMJ Open as reference.</p> <p>In "external consultation with relevant stakeholders" part, please put details the process how the external consultation will be done. What will those people review in the first place? The initial outputs? Or you interview them?</p>
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REVIEWER	Barbara Polivka University of Kansas Medical Center School of Nursing
REVIEW RETURNED	08-Sep-2019

GENERAL COMMENTS	<p>This manuscript nicely outlines the scoping review methods that will be used to determine current knowledge pertaining to "hospital climate actions and tools used to measure its implementation". This review can provide healthcare institutions and advocacy groups with a great deal of information about current efforts and best practices. The strengths of this manuscript are the literature review that supports the need for such a review and clarity of the methods. Although the methods are clear, they fall short of being comprehensive.</p> <ul style="list-style-type: none"> • CINAHL is not included in the databases searched. While there is much overlap between CINAHL and other databases (e.g., Chocrane) – CINAHL tends to include more healthcare specialty journals. • The search terms did not include 'sustainability councils' or similar type of multi-disciplinary groups many healthcare organizations are forming to explore and implement sustainability efforts. • Overall, the review failed to include 'nurses' and 'nursing', Nurses are the largest healthcare provider group in any hospital/healthcare setting and in many cases are taking the lead in climate change efforts. • 'Operating theatre' is not a term used in the US – the term is 'operating room' or 'surgical services' • The team does not include anyone from the US – thus many terms used in the US were not included. Expanding the team to include members from the US and other countries – at a minimum as consultants to assist with search terms – would be advisable. <p>There are multiple English language issues with the manuscript.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Kristie L. Ebi

The authors identified an area where a synthesis review would be helpful. I have several concerns with the protocol:

We are grateful for your positive comments and excellent suggestions for improving this protocol.

5. Relying only on the peer-reviewed literature means that a significant proportion of actions being undertaken will not be included. There is limited to no incentive for a hospital to publish actions taken on adaptation and mitigation. At least a thorough search of the grey literature is needed. Please include national and regional vulnerability and adaptation assessments, Health components of National Adaptation Plans, and implementation of the WHO Safe Hospital Index, at least. The authors agreed with your comments and thanks for bringing them to our attention. We have incorporated the recommended grey literatures and have revised the inclusion criteria stated in table 3 in page 9.

6. The protocol needs to be clear on weather / climate variability / climate change. The manuscript treats these as the synonyms; they are not. Actions taken to address weather patterns may not be resilient to climate change. If you are only going to look at climate change, then please discuss detection and attribution.

Thanks for raising these important points. The reviewer is wise to question this and looking at the detection and attribution will better understand to what extent of the resultant risk to communities is as a result of climate change impacts and no other drivers (e.g. risks and impacts, adaptive capacities across communities). This call for the need to apply 'systems thinking' or 'integrated models' in planning and implementing climate actions.

7. The criteria that will be used to evaluate the robustness of studies / reports need to be described. Due to the dearth of the preliminary search with the proposed databased, the authors hope this review process reaches the maximum inclusiveness with the inclusion and exclusion criteria in table 3.

8. The authors are encouraged to be more ambitious with respect to the audience for the review. Ministries of Health, policymakers, national climate change and health teams, amongst others, would be interested.

The dissemination session has been added as suggested by reviewer, on page 11 line 257-259. The new sentences now read:

"Results may be of interest to ministries of health, policymakers, national climate change and health teams, hospital managers, healthcare practitioners globally who are seeking to improve their understanding of hospitals adaptation and implementation strategy internationally."

9. The search strategy omits some obvious concerns re healthcare facilities and a changing climate, particularly storms, typhoons/hurricanes/cyclones, and sea level rise.

We appreciate the reviewer for pointing out this, the authors have added these suggested terms to the climate-related search term.

10. Climate change is not going to be reversed for decades to centuries.

In this revision, we have deleted the word "reverse" in both line 108 and 111 had been replaced by "mitigate" and "slow the warming trend".

11. In section 4, how will you decided if a hospital is pro-environment?

The characteristic of “pro-environment” in line 209 had been removed, to avoid ambiguity.

12. Referencing needs to be improved. There are statements, for example, of the carbon footprint of healthcare (among others), without a citation.

Thank you for pointing this. We have improved referencing for statements as enclosed:

Line 94: These efforts are particularly important for hospitals as they play a critical role in reducing climate change impacts not only by treating illnesses and injuries but also by being prepared for climate-induced disasters and leading community efforts to adapt climate change (Salas & Solomon, 2019).

Line 99: Healthcare is among the ‘heavy-emitting’ sectors, global health sector had a climate footprint of 2.0GtCO₂e in 2014, equivalent to 4.4% of global net emissions (Karliner, Slotterback, Boyd, Ashby, & Steele, 2019).

13. Please justify why Spanish, Portuguese, and French are not included.

The authors certainly wish to include as many languages as possible, Chinese, English and Indonesian were chosen based of the proficiency of the researchers and languages at our disposal.

14. The language needs improvement. Please have a native English speaker edit before resubmission. There are far too many incomprehensible sentences.

The whole manuscript has been extensively edited by Dr Sima Barmania, MD, PhD, a public health physician, born and raised in England, with regard to the reviewers’ suggestion, including sentence structure and grammar.

15. The long section from the Lancet Countdown on page 6 is unnecessary.

The section from the Lancet Countdown has been deleted as suggested by Reviewer 1, whilst retaining the overall meaning.

Reviewer: 2

Reviewer Name: Forbes McGain

Institution and Country: Western Health, Melbourne, Australia.

16. This manuscript is a protocol of how the authors are going to perform a literature search of the impacts of climate change on health care. The research questions are: 1. “Which areas have been studied regarding the hospital impacts of climate change?” This is unclear; do you mean the impacts of climate change upon hospitals?

We thank reviewer for his feedbacks, the research questions have been extensively revised. The primary intention is to understand both (1) the impacts of climate change upon hospitals; and (2) hospitals contributing impacts on climate change.

17. It is unclear to me why a study protocol needs to be published in the BMJ Open. This manuscript was initially interesting to me, but since it only contains the methods it is less so. Yes, publishing the statistical analyses etc. for large randomised trials a priori is important, but do we really require protocols for literature reviews to be published? Why not just publish the methods with the results please? There are no statistical analyses required, and this is not a meta-analysis (or at least there is no mention of either in the manuscript).

We appreciate your comments and raising these important questions. The authors certainly hope to pursue on obtaining reliable evidence for readers especially to this critical field. Multiple approaches were considered for this review; however, the scoping review methodology considered to be the most appropriate especially since the complex area of hospital climate actions has not been reviewed comprehensively before. To date, there has been no prior attempt to establish a starting point

regarding hospital climate actions and tools to measure its implementation.

A growing literature has point out that scoping reviews are conducted to meet various objectives and are capable to examine the volume, variety, and nature of the evidence on a topic. This is particular helpful to determine the value of undertaking a systematic review and summarize findings from a body of knowledge that is heterogeneous in methods or discipline; and even useful to identify gaps in the literature to aid the planning and commissioning of future research. Furthermore, scoping review makes use of a wide array of knowledge exhibited through empirical research and anecdotal accounts.

To date, BMJ Open published nearly 3500 scoping review protocol in multidiscipline; the peer review process and comments that are made on the protocol increases the rigor of the methods, and thus the result paper, it also increases accountability for such paper. With protocol accepted, authors will also serve to support a grant application and as a point from which gain resources to further translating research findings to practice. Furthermore, the fact that BMJ Open publishes scoping review protocols was one of the reasons why we wished to submit our paper to this journal

Reviewer: 3

Reviewer Name: Paul Chua

Institution and Country: School of Tropical Medicine and Global Health, Nagasaki University, Japan

18. English editing is needed.

The whole manuscript has been extensively edited by Dr Sima Barmania, MD, PhD, a public health physician, born and raised in England, with regard to the reviewers' suggestion, including sentence structure and grammar.

19. Considering the topic at hand, it may be best to consider the inclusion of unpublished materials or grey literature. There may be reports or similar documents that are quite informative and can possibly contribute to the discussions/evidence.

Thank you for your constructive suggestion, we have stated grey literature as one of the inclusion criteria on table 3.

20. There are sentences that are not factual like in Page 5 Line 52-54. Re-wording of some sentences (considering uncertainty in the future) is needed.

Thanks for pointing out, these sentences have been revised. Changes have been made to the manuscript in accordance with these comments.

21. The research objective in Page 7 lines 16-20 is the only appropriate objective. More specific objectives can be added (i.e. which aspects of the topic they want to see or get elaborated?)

The objective section has been edited for clarity, please refer to line 138-144.

22. The "identifying of the research question" part does not need to comprise specific questions. Scoping review allows the use of general questions. The first research question in page 7 line 54 is not within the hospital climate actions topic (impacts are something else). The second question can be scrapped. The last two bullets are more appropriate.

Thanks for pointing this out, we have made the changes as suggested for clarity and specificity.

- To what extent do hospitals address climate change?

- ♣ Mitigation (sustainable policy, improve energy efficiency, shifting to renewable energy, minimising waste, green procurement)

- ♣ Adaptation (disaster risk reduction, health professionals' and community climate awareness and preparedness, vulnerability evaluation, early warning system)

- What measures and tools exist in the scientific literature regarding climate change mitigation and adaptation in hospitals?

23. In page 8 lines 34-36, the researcher decides the final search terms/syntax and should be stated in this protocol already. Consider finalizing them with your librarian and remove the sentence where a librarian has to review it.

Thank you for your observation, we have updated the sentence as suggested.

24. In "study selection process" part, confirm/state that both independent reviewers are fluent in English, Chinese, and Indonesian.

We have reworded the sentence within the "study selection process" section to address the reviewer's input. The new sentence now reads:

"Two independent reviewers who are proficient in English, Chinese and Indonesian will be involved in this step."

25. In Page 10 line 56, using PRISMA flow diagram does not ensure replicability.

Thank you for bringing this point to our attention. We have replaced with PRISMA-ScR checklist as our guidance of this scoping review report. The new sentence line 234-236 now reads:

"The authors will use Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping review (PRISMA-ScR) checklist on the reporting of this scoping review."

26. The "synthesis of result" needs more details. Please specify the process, who are involved, and what kind of quantitative and qualitative analyses will be used. Kindly see other scoping review protocols from BMJ Open as reference.

Thanks for your kind suggestions, we have revised the methodology section in line 217. The revised section now reads:

The primary researcher will conduct a thematic analysis to explore and examine study results, disciplines associated with hospitals climate action and tools used to measure its implementation. The result is presented using tabulated data, and new themes will be included as required.

27. In "external consultation with relevant stakeholders" part, please put details the process how the external consultation will be done. What will those people review in the first place? The initial outputs? Or you interview them?

Thanks for your questions, the answers have been fused within the "external consultation with relevant stakeholders" section.

The revised section now reads:

"A 1-day scoping study consultation meeting will be held to present preliminary summary of the state of evidence related to hospital climate actions and tools used to measure its implementation. Experts, health practitioners and relevant stakeholders in the field of greening the healthcare will be encouraged to express their ideas as they pertained to the results during the meeting discussion. Sessions will include a combination of structured presentations from experts, small and large group discussion sessions to facilitate knowledge exchange of insights for establishing a common consensus and identifying key considerations for promoting climate actions in hospital settings."

Reviewer: 4

Reviewer Name: Barbara Polivka

Institution and Country: University of Kansas Medical Center School of Nursing

28. This manuscript nicely outlines the scoping review methods that will be used to determine current knowledge pertaining to "hospital climate actions and tools used to measure its implementation". This review can provide healthcare institutions and advocacy groups with a great deal of information about

current efforts and best practices. The strengths of this manuscript are the literature review that supports the need for such a review and clarity of the methods. Although the methods are clear, they fall short of being comprehensive.

We appreciate the reviewer for her thoughtful review and positive comments and believe her input has been invaluable to make improvement to this revision.

29. CINAHL is not included in the databases searched. While there is much overlap between CINAHL and other databases (e.g., Chocrane) – CINAHL tends to include more healthcare specialty journals. Thanks for your recommendation, CINAHL database has now been added, mentioning the strengthen the inclusiveness of more healthcare specialty journals in this scoping review.

30. The search terms did not include 'sustainability councils' or similar type of multi-disciplinary groups many healthcare organisations are forming to explore and implement sustainability efforts. Thank you for flagging the importance on organisation or group of people, which demonstrate good governance in initiating and implementing climate actions. However, we agreed not to include these terms, such as 'councils', 'committees', 'associations', 'interest clubs' is to avoid ambiguity which the scope will cover unlimited range of activities of activities happening at individual's household level to a global striking movement. We will be mindful that climate actions were carried out in hospital settings, will be included in our review.

31. Overall, the review failed to include 'nurses' and 'nursing', Nurses are the largest healthcare provider group in any hospital/healthcare setting and in many cases are taking the lead in climate change efforts.

Thanks for raising this question, and the authors agreed and acknowledged the huge efforts from our nurses. The authors also recognise all climate advocates, including nurses from different background and types of healthcare professionals including physician in various specialties, dentist, dietitian, nutritionist, social worker, physiotherapist, psychotherapy, EMT, public health specialist, etc.

However, in this review, we are focusing on the setting-based actions, which will give more attention on the structural interventions where the efforts are being carry out.

32. 'Operating theatre' is not a term used in the US – the term is 'operating room' or 'surgical services' Two terms 'operating room' and 'surgical service' have been added as suggested.

33. The team does not include anyone from the US – thus many terms used in the US were not included. Expanding the team to include members from the US and other countries – at a minimum as consultants to assist with search terms – would be advisable.

Thanks for raising this concern, the authors have consulted a health professional from the US to ensure the search terms used will capture the relevant literature from the US.

34. There are multiple English language issues with the manuscript.

The whole manuscript has been extensively edited by Dr Sima Barmania, MD, PhD, a public health physician, born and raised in England, with regard to the reviewers' suggestion, including language, sentence structure and grammar.

VERSION 2 – REVIEW

REVIEWER	Kristie L. Ebi University of Washington, USA
REVIEW RETURNED	27-Oct-2019

GENERAL COMMENTS	<p>Thank you for addressing many of the review comments. A few additional changes would increase the clarity of the protocol and the usefulness of the results.</p> <p>1) The protocol does not clearly distinguish between weather, climate variability, and climate change. Most of the literature focuses on weather, not climate change. The authors appear to be making an implicit assumption that associations between weather and some action is predictive in some sense of climate change. This needs to be thoroughly discussed and justified.</p> <p>2) It is the Intergovernmental Panel on Climate Change, not the International Panel...</p> <p>3) Lines 103 and 108 are contradictory, although line 108 is so poorly worded that they may not be. In any case, clarity is needed.</p> <p>4) Line 123 mentions converging crises but only lists one.</p> <p>5) An edit would be helpful to insure clarity and accuracy. For example, line 73 has repeated words. Line 87 also is unclear. There are other instances.</p>
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REVIEWER	Paul Chua Nagasaki University School of Tropical Medicine and Global Health, Japan
REVIEW RETURNED	19-Oct-2019

GENERAL COMMENTS	<p>Under search strategy section, online databases mentioned can only cover for published articles. To truly capture grey literature, inclusion of search engines like Google Scholar/Google, OpenGrey etc. may be considered. In this case, syntax or search terms can be more flexible than syntax in online databases. Dissertations are grey literature so it may be good to consider them as well. Otherwise, the authors may need to be more explicit with what kind of grey literature (e.g. international or national reports) they want to include.</p>
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REVIEWER	Barbara Polivka University of Kansas, USA
REVIEW RETURNED	27-Oct-2019

GENERAL COMMENTS	The authors have been very responsive to reviewer suggestions and edits.
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Kristie L. Ebi

Thank you for addressing many of the review comments. A few additional changes would increase the clarity of the protocol and the usefulness of the results.

We are grateful for your positive comments and excellent suggestions for improving this protocol.

4. The protocol does not clearly distinguish between weather, climate variability, and climate change.

Most of the literature focuses on weather, not climate change. The authors appear to be making an implicit assumption that associations between weather and some action is predictive in some sense of climate change. This needs to be thoroughly discussed and justified.

Thank you for bringing this point to our attention. The focus on climate change has been made more explicit in the protocol.

5. It is the Intergovernmental Panel on Climate Change, not the International Panel ...

Thank you for point this out, the word has been revised in Line 89.

6. Line 103 and 108 are contradictory, although line 108 is so poorly worded that they may not be. In any case, clarity is needed.

We have reworded the sentence in line 103 and 106, the new sentence now reads:

"Hospitals play a critical role in reducing health impacts by 1) treating illnesses and injuries, 2) being prepared for climate-induced disasters, 3) effectively engage the community on adaptation activities and 4) stepping up to minimise healthcare carbon emissions."

7. Line 132 mentions converging crises but only lists one.

Thank you for bringing this point to our attention. The new sentence line 132 now reads:

"As the converging crisis of health and climate change, we require much more radical climate action."

8. An edit would be helpful to insure clarity and accuracy. For example, line 73 has repeated words. Line 87 also in unclear. There are other instances.

Thanks for pointing out, these sentences have been revised. Changes have been made to the manuscript in accordance with these comments.

Reviewer: 3

Reviewer Name: Paul Chua

Institution and Country: School of Tropical Medicine and Global Health, Nagasaki University, Japan

3. Under search strategy section, online databases mentioned can only cover for published articles. To truly capture grey literature, inclusion of search engines like Google Scholar/Google, OpenGrey etc. may be considered. In this case, syntax or search terms can be more flexible than syntax in online databases. Dissertations are grey literature so it may be good to consider them as well. Otherwise, the authors may need to be more explicit with what kind of grey literature (e.g. international or national reports) they want to include.

Thank you for bringing this to our attention. As recommended by Griffith librarian Ms Wendy Summers-Penny, we include Google Scholar as one of the search engine, by targeting organisations recommended by stakeholders, limiting file type (pdf. / .doc), site: .gov, site: .org, and "topic" theses: site .edu

These include related international and national reports, corporate sustainability reports, conference papers or proceedings.

Reviewer: 4

Reviewer Name: Barbara Polivka

Institution and Country: University of Kansas Medical Center School of Nursing

9. The authors have been very responsive to reviewer suggestions and edits.

We appreciate the reviewer for her thoughtful review and positive comments and believe her input has been invaluable to make improvement to this revision.

VERSION 3 – REVIEW

REVIEWER	Kristie L Ebi University of Washington USA
REVIEW RETURNED	27-Nov-2019
GENERAL COMMENTS	Thank you for addressing my comments.