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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

ABSTRACT

Introduction: As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), urban health is a growing priority of public and global health. Rapid and unplanned urbanization in LMICs has increased health inequalities, putting the urban poor at increasing risk of ill health due to difficult living conditions in cities. Collaboration with underserved urban communities in research is a key strategy for addressing the diverse challenges they face. The objective of this scoping review is therefore to identify factors that influence the participation of urban communities from LMICs in public and global health research.

Methods and analysis: With the help of a health librarian, we will develop a search strategy to explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, CINAHL, and Google Scholar. We will use MeSH terms and keywords to look at empirical research conducted in French or in English. There will be no restriction in terms of dates of publication. Two independent reviewers will screen and select studies, first based on titles and abstracts, and then on full text. Two reviewers will extract data. We will summarize the results using tables and fuzzy cognitive mapping.

Ethics and dissemination: This scoping review is part of a larger project to be approved by the University of Montréal's Research Ethics Committee for Science and Health in Montréal (Canada), and the Institutional Review Board of the James P. Grant School of Public Health at BRAC University in Dhaka (Bangladesh). Results from the review will contribute to a participatory process seeking to combine scientific evidence with the experiential knowledge of stakeholders in Dhaka to understand how to better collaborate with communities for research. The review could contribute to a shift towards research that is more inclusive and more beneficial for communities.

KEYWORDS

public health, global health, community-based participatory research, stakeholder participation, urban population, urban health, fuzzy logic

STRENGTHS AND LIMITATIONS OF THIS STUDY

- The review will systematize the wide array of factors that influence the participation of urban communities from low-and middle-income countries in public and global health research.

- Reporting on community participation is heterogeneous, and identifying the research approaches, health issues, contexts, and community characteristics that favor participation will be challenging.
- The scoping review will summarize results using fuzzy cognitive mapping, providing a compatible format for contextualizing the literature in the views of local stakeholders.

INTRODUCTION

As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), the health of urban populations is a growing priority of public and global health.[1] Urbanization brings changes to the disease burdens, determinants of health, and patterns of health inequalities.[1,2] Despite the benefits of urban living and progress in population health, rapid and unplanned urbanization in LMICs has worsened health inequalities.[3] Not everyone in cities experiences these improvements equally, as policies and other efforts often fail to reach the most marginalized communities, including those living in informal settlements.[3] The urban poor are therefore at increased risk of ill health due to the difficult living conditions in cities.[3,4]

Several researchers in public and global health have criticized the reproduction of colonial relations in efforts to improve the health of populations in LMICs, as these efforts are often led by foreign researchers with little input from local populations.[5–7] The resulting unequal power dynamics between researchers and communities are among the reasons research makes little or mixed contributions to health.[8] In response, there are increasing calls to decolonize public and global health through community participation in research, to better meet their needs and ensure local relevance of the initiatives put in place to improve their health.[8–10]

Community participation in health research is recognized for building capacity and fostering conditions to enable better community control over determinants of their health.[11,12] Community participation can lead to equitable partnerships between communities and researchers, making research more empowering and effective.[12] However, most health research uses top-down community engagement approaches rather than bottom-up participatory methods.[13] While there is no standard definition of community participation, different uses of the term form a continuum from consulting or informing communities to sharing power with them.[13,14]

Collaborating with marginalized urban communities is a key strategy for addressing the many challenges they face.[3,15,16] Yet, these communities represent a particularly hard-to-reach group, as asymmetries in access to resources and opportunities affect their capacity to fully participate in and benefit from research implement to improve their health.[15,17] There is therefore an urgent need to better understand the barriers and enablers to their participation.[18–20]

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2
3 The objective of this scoping review is to identify factors that influence the participation of
4 urban communities from low- and middle-income countries in public and global health
5 research. Part of a larger project, this scoping review will contribute to a dialogue between
6 scientific and experiential knowledge on the factors that influence community participation
7 in public and global health research. We will contextualize the results from the scoping
8 review in the views of stakeholders in Dhaka (Bangladesh) in a participatory process to
9 reflect their experiences. This contextualization will identify barriers and enablers to
10 participation that are specific to Dhaka, in preparation for a cluster randomized controlled
11 trial testing the effect of a participatory community mobilization intervention for reducing
12 dengue infection.[21]
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15 16 17 **METHODS AND ANALYSIS**

18 This review is part of a larger project aimed at comparing and combining different
19 knowledge sources to provide a knowledge base for decision making, that will be used to
20 inform a cluster randomized controlled trial to reduce dengue infection in Dhaka.[21] The
21 larger project will consider four knowledge sources: 1) the scoping review described in
22 this protocol; 2) the views of Canadian and Bangladeshi public and global health
23 researchers; 3) the views of personnel from community-based organizations in Dhaka; 4)
24 the views of community members from underserved neighbourhoods in Dhaka. We will
25 adapt the *Weight of Evidence* approach [22,23] and use fuzzy cognitive mapping to bring
26 these different knowledge sources into conversation.
27
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30 In this protocol, we focus on describing the procedures to conduct the scoping review and
31 briefly discuss how the results will be used to inform the subsequent phases of the larger
32 project. The proposed scoping review will be conducted in accordance with the PRISMA-
33 ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Extension
34 for Scoping Reviews) guidelines and Joanna Briggs Institute's methodology to ensure
35 accuracy, completeness and transparency.[24–27]
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37

38 **Review questions**

39 This scoping review will seek to answer the following question: What factors influence the
40 participation of urban communities from low- and middle-income countries in research,
41 based on evidence from the public and global health literature?
42
43

44 The review will also seek to answer the following sub-questions:

- 45 1) What are the main barriers and enablers of community participation in public and
46 global health research?
- 47 2) What is the relative influence of these factors on community participation?
- 48 3) What research approaches are most and least favourable to community
49 participation?
- 50 4) What public and global health issues are most and least favourable to community
51 participation?
- 52 5) What contexts are most and least favourable to community participation?
- 53 6) What community characteristics are most and least favourable to community
54 participation?
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Eligibility criteria

Types of sources

This scoping review will consider empirical studies with quantitative, qualitative, and mixed methods designs. We will not include literature reviews and meta-analyses, but we will consider including the empirical studies reported in reviews and meta-analyses if relevant. We will not consider literature reporting on programs, policy or other initiative implemented outside of research purposes.

Participants

This review will look at research participation at the community level rather than at the individual level, therefore excluding studies discussing the participation of individuals in research (*i.e.*, patient engagement, individual motivation to participate). Communities refer to population groups and the locus (*i.e.*, place, venue, or other units) of their actions.[28] Communities can be understood as groups of people with diverse characteristics that are linked by social ties or identities; share common interests or concerns; and engage in joint action in settings, venues or areas that may be physically, geographically, culturally or politically defined.[28–30] The definition of what constitutes a community remains broad for this scoping review but will focus on urban communities in low- and middle-income countries. This is justified by the fact that the larger project is part of a cluster randomized controlled trial on dengue which will be conducted in Dhaka (Bangladesh), and that the factors influencing community participation in research will likely vary between rural and urban communities, and between high- and low- and middle-income countries.

Concept

Community-engaged research is a broad topic, defined in various ways and used for various reasons. It is often an umbrella term for research involving the participation of non-academic stakeholders, with diverse models and conceptual frameworks.[14] There is no standard definition of community participation in research in public and global health.[13,14] The distinction between ‘engagement,’ ‘mobilization’ and ‘participation’ in research is unclear, as these terms are often used interchangeably and with changing definitions.

Various authors discuss the levels of community participation in research as being positioned along a continuum, ranging from information provision and exchange, to consultation, to co-production, and to shared leadership and community control.[14,31–34] For this scoping review, we will not restrict the search to a specific level of participation, but we will examine and compare how different approaches (*i.e.*, community mobilization interventions, partnered research, community-based participatory research designs, etc.) are found to enable or hinder participation. However, research in which there is little community involvement (*i.e.*, health education, consultation efforts in which communities have no decision-making power over some aspects of the research) will be excluded.

Context

This review will focus on communities located in urban settings in low- and middle-income countries. The definition of low- and middle-income countries used for the review will use the World Bank's classification from the 2023 fiscal year, based on countries' gross national incomes per capita.[35] The Cochrane Effective Practice and Organisation of Care (EPOC) group has developed a filter for literature reviews based on the World Bank classification to identify studies relevant to LMICs.[36]

There is no standard international definition of what constitutes an urban setting. Each country has its own definition, following nationally defined criteria on population size, population density, type of economic activity, physical characteristics, level of infrastructure, or other characteristics.[37] Considering the lack of a common definition, the scoping review will consider all studies in LMICs conducted in urban settings or cities as identified by the authors, including neighbourhoods and informal settlements (slums) in cities.

Exclusion criteria

To ensure the selection of relevant studies for the review, we will use the following exclusion criteria:

- Not empirical research
- Discussing community engagement, participation, partnership, or mobilization in contexts other than research (*i.e.*, programs, policy, urban planning)
- Focused on individual engagement in research (*i.e.*, patient engagement, individual motivation)
- Not discussing factors that influence community participation in research
- Conducted in contexts other than urban settings
- Conducted in countries other than low- and middle-income countries
- Full text of the reference is not available

Search strategy

The search strategy will be developed with the help of a health librarian. It will explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, CINAHL, and Google Scholar. We will use MeSH terms and keywords to identify studies reported in English or French. We will not have restrictions in terms of dates of publication. We will not contact the authors of the articles selected to request additional information. Table 1 presents the initial search strategy for MEDLINE, which will be adapted for each database.

Table 1. Search strategy for MEDLINE

Concept 1: Low- and middle-income countries
1. (afghanistan or albania or algeria or american samoa or angola or "antigua and barbuda" or antigua or barbuda or argentina or armenia or armenian or aruba or azerbaijan or bahrain or bangladesh or barbados or "republic of Belarus" or belarus or byelarus or belorussia or byelorussian or belize or british honduras or benin or dahomey or bhutan or bolivia or "bosnia and herzegovina" or bosnia or herzegovina or botswana or bechuanaland or brazil or brasil or bulgaria or burkina faso or burkina fasso or upper volta or burundi or urundi or cabo verde or cape verde or cambodia or kampuchea or khmer republic or

cameroon or cameron or cameroun or central african republic or ubangi shari or chad or chile or china or colombia or comoros or comoro islands or iles comores or mayotte or "democratic republic of the congo" or democratic republic congo or congo or zaire or costa rica or "cote d'ivoire" or "cote d'ivoire" or cote divoire or cote d ivoire or ivory coast or croatia or cuba or cyprus or czech republic or czechoslovakia or djibouti or french somaliland or dominica or dominican republic or ecuador or egypt or united arab republic or el salvador or equatorial guinea or spanish guinea or eritrea or estonia or eswatini or swaziland or ethiopia or fiji or gabon or gabonese republic or gambia or "georgia (republic)" or georgian or ghana or gold coast or gibraltar or greece or grenada or guam or guatemala or guinea or guinea bissau or guyana or british guiana or haiti or hispaniola or honduras or hungary or india or indonesia or timor or iran or iraq or "isle of man" or jamaica or jordan or kazakhstan or kazakh or kenya or "democratic people's republic of korea" or "republic of korea" or north korea or south korea or korea or kosovo or kyrgyzstan or kirghizia or kirgizstan or kyrgyz republic or kirghiz or laos or lao pdr or "lao people's democratic republic" or latvia or lebanon or lebanese republic or lesotho or basutoland or liberia or libya or libyan arab jamahiriya or lithuania or macau or macao or "republic of north macedonia" or macedonia or madagascar or malagasy republic or malawi or nyasaland or malaysia or malay federation or malaya federation or maldives or indian ocean islands or indian ocean or mali or malta or micronesia or "federated states of Micronesia" or kiribati or marshall islands or nauru or northern mariana islands or palau or tuvalu or mauritania or mauritius or mexico or moldova or moldovian or mongolia or montenegro or morocco or ifni or mozambique or portuguese east africa or myanmar or burma or namibia or nepal or netherlands antilles or nicaragua or niger or nigeria or oman or muscat or pakistan or panama or papua new guinea or new guinea or paraguay or peru or philippines or philippines or philippines or philippines or poland or "polish people's republic" or portugal or portuguese republic or puerto rico or romania or russia or russian federation or ussr or soviet union or "union of soviet socialist republics" or rwanda or ruanda or samoa or pacific islands or polynesia or samoan islands or navigator island or navigator islands or "sao tome and principe" or saudi arabia or senegal or serbia or seychelles or sierra leone or slovakia or slovak republic or slovenia or melanesia or solomon island or solomon islands or norfolk island or norfolk islands or somalia or south africa or south sudan or sri lanka or ceylon or "saint kitts and nevis" or "st. kitts and nevis" or saint lucia or "st. lucia" or "saint vincent and the grenadines" or saint vincent or "st. vincent" or grenadines or sudan or suriname or surinam or dutch guiana or netherlands guiana or syria or syrian arab republic or tajikistan or tadjikistan or tadjhikistan or tadjhik or tanzania or tanganyika or thailand or siam or timor leste or east timor or togo or togolese republic or tonga or "trinidad and tobago" or trinidad or tobago or tunisia or turkey or turkmenistan or turkmen or uganda or ukraine or uruguay or uzbekistan or uzbek or vanuatu or new hebrides or venezuela or vietnam or viet nam or middle east or west bank or gaza or palestine or yemen or yugoslavia or zambia or zimbabwe or northern rhodesia or global south or "africa south of the sahara" or sub-saharan africa or subsaharan africa or africa, central or central africa or africa, northern or north africa or northern africa or magreb or maghrib or sahara or africa, southern or southern africa or africa, eastern or east africa or eastern africa or africa, western or west africa or western africa or west indies or indian ocean islands or caribbean or central america or latin america or "south and central america" or south america or asia, central or central asia or asia, northern or north asia or northern asia or asia, southeastern or southeastern asia or south eastern asia or southeast asia or south east asia or asia, western or western asia or europe, eastern or east europe or eastern europe or developing country or developing countries or developing nation? or developing population? or developing world or less developed countr* or less developed nation? or less developed population? or less developed world or lesser developed countr* or lesser developed nation? or lesser developed population? or lesser developed world or under developed countr* or under developed nation? or under developed population? or under developed world or underdeveloped countr* or underdeveloped nation? or underdeveloped population? or underdeveloped world or middle income countr* or middle income nation? or middle income population? or low income countr* or low income nation? or low income population? or lower income countr* or lower income nation? or lower income population? or underserved countr* or underserved nation? or underserved population? or underserved world or under served countr* or under served nation? or under served population? or under served world or deprived countr* or deprived nation? or deprived population? or deprived world or poor countr* or poor nation? or poor population? or poor world or poorer countr* or poorer nation? or poorer population? or poorer world or developing econom* or less developed econom* or lesser developed econom* or under developed econom* or underdeveloped econom* or middle income econom* or low income econom* or lower income econom* or low gdp or low gnp or low gross domestic or low gross national or lower gdp or lower

<p>gnp or lower gross domestic or lower gross national or lmic or lmic or third world or lami countr* or transitional countr* or emerging economies or emerging nation?).ti,ab,sh,kf. 2. Developing countries/ 3. 1 or 2</p>
<p>Concept 2: Community participation in research</p> <p>4. (((participat* or communit* or partner*) adj3 research) or (communit* adj3 (participat* or engage* or mobili?ation or intervention*)) or participatory or CBPR).ti,ab,sh,kf. 5. Community-based participatory research/ 6. Community participation/ 7. 4 or 5 or 6</p>
<p>Concept 3: Urban settings</p> <p>8. (urban* or city or cities or metropol* or megacit* or megalop* or municipalit* or "informal settlement" or "informal settlements" or slum* or favela* or "shanty town" or "shanty towns" or ghetto* or bustee*).ti,ab,sh,kf. 9. Urban Health/ 10. Urban Population/ 11. Cities/ 12. Urbanization/ 13. Poverty Areas/ 14. 8 or 9 or 10 or 11 or 12 or 13</p>
<p>Final search strategy</p> <p>15. 3 and 7 and 14</p>

The search strategy will be developed with the input from a librarian and the research team to identify new keywords.[38] After our initial screening in MEDLINE, we will search the included articles for new keywords. A new search will then be conducted combining the newly found MeSH terms and keywords to the existing search. A librarian will assess whether these new terms should be included in the final search strategy. When all articles are screened, we will search the reference lists of selected studies to identify additional studies meeting our inclusion criteria.

Study selection

Following the search, all identified citations will be collated and uploaded into Covidence,[39] and duplicates will be removed. Study selection will be conducted in two phases by two independent reviewers, who will reconcile differences by consensus. A third independent reviewer will help resolve any further disagreement.

The initial screening of the retrieved sources will use titles and abstracts. The second phase of selection will use full text. Reasons for excluding sources at full text that do not meet the inclusion criteria will be recorded and reported in the review. The results of the search and the study selection process will be reported in the flow diagram developed by PRISMA-ScR.[27,40]

Data extraction

Two reviewers will develop and pilot a data extraction form, and extract the data in Covidence.[39] The form will include:

- a. Details on the study (title, names of the authors, year of publication, study objectives, research design, and data collection and analysis methods)

- b. The country and the urban contexts in which studies were conducted
- c. The communities targeted
- d. The participation approach used and the extent of community participation
- e. The findings regarding the factors (barriers, enablers, and other factors) influencing the participation of urban communities in public and global health research
- f. If available, the relative influence (qualitative or quantitative) of the factors identified on community participation
- g. If available, other relations among the factors identified, and their relative influence on community participation
- h. Explanation of the relationships between factors (quotes from the articles)

We will not systematically extract data on the results of the studies since this is outside the scope of the review objectives and research question.

The data extraction form will be piloted before beginning the study selection process with a random sample of 5 studies among all the studies to be reviewed. The pilot test will help identify missing data and will contribute to ensuring that the reporting of participation approaches and factors influencing community participation is coherent across studies and between the two reviewers. The data extraction form will be modified and revised as necessary, in an iterative manner, during the data extraction process. Modifications will be detailed in the report of the review.

Any disagreements on data extraction that arise between the two reviewers at the pilot or data extraction stages will be resolved through by consensus, or by discussion with a third independent reviewer if necessary.

Data analysis and presentation

The presentation of results will follow the PRISMA-ScR guidelines.[27] We will present the results in tables and use fuzzy cognitive mapping (FCM) to illustrate how the different factors identified influence community participation in research, adapting the *Weight of Evidence* approach.[22,41] A narrative summary will also accompany the tabulated and mapped results, describing how the results relate to the review objectives and questions.

FCM uses graph theory and fuzzy logic to generate soft models of how change could happen based on assumed causal relationships.[42–44] These soft models are illustrated through graphs called fuzzy cognitive maps (Figure 1), which are used to represent assumed causal relationships between concepts.[45,42] The maps use nodes (factors affecting the issue) and edges (arrows representing the relationships between factors), weighted by the relative strength of their influence on the issue of interest.[46,42,22] Depending on the knowledge source of the maps, edges can have different values (hence the term *fuzzy*) to quantify their influence in a relative way.[44]

FCM will be the cornerstone for the presentation of the scoping review, through the creation of fuzzy cognitive maps to represent: 1) each article included in the review; and 2) a composite map for the whole review. FCM will allow to summarize in a composite map the relative influence that each factor might have on community participation, in

1
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3 relation to all the other factors identified in the review.[22,23,42] We will go through several
4 steps (detailed below) to create the composite literature-based fuzzy cognitive map of the
5 barriers and enablers to community participation (Figure 2).
6

7
8 First, we will create one fuzzy cognitive map for each article selected in the scoping
9 review. In each individual map, community participation will be the outcome of interest.
10 We will include each barrier and enabler of community participation mentioned in the
11 article (point e in the data extraction form) as a node in the map, which we will organize
12 in a table. This table will have two initial columns indicating the origin factor (from) and the
13 consequence factor (to). Additional columns will present the evidence supporting the
14 relationship between both factors from the article (point h in the data extraction form).
15 Each relationship identified will be a row in the table.[44]
16

17
18 Second, once all the individual tables are created, we will standardize the names of the
19 factors across the individual articles so that they can be comparable.[41] On each
20 individual map reporting the relationships identified in each study, we will calculate fuzzy
21 transitive closure in the open access CIETmap 2.0.[47] Fuzzy transitive closure is a
22 mathematical model used to calculate the influence of each relationship on community
23 participation, considering all the possible relationships represented in the map.[48,49]
24 After transitive closure, each relationship will have a value between 0 (having no influence)
25 and 1 (having the strongest influence) to represent the relative strength of their influence
26 on community participation, with positive and negative signs indicating whether the
27 relationship is stimulative or inhibitive.[22,48]
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30
31 Third, we will create a composite map for the whole review. To create this composite map,
32 we will attribute weights to each node using Harris' discourse analysis, an analytical
33 approach developed in the 1950s based the frequency of occurrence of discourse
34 elements sharing similar meanings in a body of text, such as a literature review.[50,41]
35 We will consider the frequency of occurrence of each relationship across the maps
36 developed for each article in the scoping review. This means that a factor that is repeated
37 in multiple maps would have a stronger causal meaning for community participation than
38 a factor only mentioned in one or two maps.[41] We will establish the relative frequency
39 of factors by dividing each occurrence by the highest frequency across all the maps. We
40 will therefore obtain a value between 0 for the relationships that did not exist and 1 for the
41 relationship most frequently mentioned.[41] These different steps will allow us to create a
42 composite map representing all the factors identified in the scoping review, weighted
43 according to their relative frequency.
44
45

46 Patient and public involvement

47
48 We will include a consultation phase in the scoping review, as Arksey & O'Malley (2005)
49 recognize the benefit of discussing the results of a review with experts.[51] The *Weight of*
50 *Evidence* approach, which we will adapt for this scoping review, advocates for experiential
51 knowledge to be considered on an equal footing with the evidence synthesized from the
52 literature.[22] Therefore, in the context of the larger project, which adopts a participatory
53 methodology and involves a community advisory board, people concerned with the issue
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of interest (*i.e.*, participation of urban communities in health research) will be invited to contextualize the scoping review.

After conducting the scoping review, stakeholders in Dhaka will develop their own fuzzy cognitive maps on the factors that they believe can influence community participation in the Bangladeshi context. After developing their maps, they will interpret the literature-based map from the scoping review by comparing the results with their own maps. We will seek the perspectives of three stakeholder groups, namely public and global health researchers, community-based organizations, and community stakeholders.

Finally, we will use the composite map from the scoping review and the various maps from these three stakeholder groups to generate a final map incorporating these two knowledge sources. The literature-based map, the stakeholder maps and this final map will be reviewed through deliberative dialogue with stakeholders in Dhaka.[52] The maps and discussions with stakeholders will inform decision-making for the cluster randomized controlled trial on dengue testing a participatory community mobilization intervention, where communities in Dhaka will develop their own solutions to reduce dengue infection. These steps will be conducted and reported separately.

ETHICS AND DISSEMINATION

This scoping review does not require ethics approval. However, the consultation process is part of a larger project which will need to be approved by the University of Montréal's Research Ethics Committee for Science and Health in Montréal (Canada), and the Institutional Review Board of the James P. Grant School of Public Health at BRAC University in Dhaka (Bangladesh). We will share the results from the scoping review with the scientific community through scientific articles and presentations at conferences, and with local stakeholders in Dhaka through a participatory process involving fuzzy cognitive mapping and deliberative dialogue. Results from this process will directly inform the implementation of the cluster randomized controlled trial on dengue in Dhaka.[21]

CONCLUSION

This protocol described a scoping review which will seek to identify and map the factors that can influence the participation of urban communities from low- and middle-income countries in public and global health research. The review will contribute to the understanding of how to foster the participation of these communities in research, so that it can better respond to local needs. Given that marginalized urban communities represent a particularly hard-to-reach group in research and that urban health is a growing priority of public and global health, findings from this review will be useful for researchers and communities who wish to collaborate to improve population health.

The use of the *Weight of Evidence*, an innovative approach to knowledge synthesis whereby scientific and experiential knowledge are brought into conversation, will allow for the contextualization of the scoping review in the lived experience of stakeholders in Dhaka.[22,41,53] The use of fuzzy cognitive mapping to synthesize the results from the

1
2
3 scoping review offers an operator-independent way to analyze and communicate the
4 relative influence of the factors identified on community participation. The literature-based
5 map will in turn inform a mapping process involving stakeholders from Dhaka
6 (Bangladesh), as part of the larger project. This scoping review offers an example of the
7 contextualization of scientific evidence in the views of stakeholders through the *Weight of*
8 *Evidence* [22,23,53], which opens the possibility for contextualizing other literature
9 reviews in lived experience anywhere.
10
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12 Better understanding the factors that influence the participation of communities in
13 research could support a shift from researcher-driven health research towards research
14 that is more inclusive of community voices and needs. Fostering authentic community
15 participation in research can contribute to the movement for decolonizing public and global
16 health. This can also bring benefits to marginalized communities through interventions
17 that are more relevant to their contexts and needs.
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20 21 22 **ACKNOWLEDGEMENTS**

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29 30 31 **AUTHORS CONTRIBUTIONS**

32 MCGD developed the scoping review protocol, the search strategy and wrote the first
33 version of the manuscript. KZ and NA contributed to the development of the larger project
34 to be conducted in Dhaka, as part of the COESA cluster randomized controlled trial. GF
35 contributed to drafting the scoping review protocol. IS and NA provided expertise on fuzzy
36 cognitive mapping, Harris' discourse analysis and the *Weight of Evidence* approach. All
37 authors read, provided feedback, and approved the final manuscript.
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39

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47 play a role in the development of this protocol.
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50 51 52 **COMPETING INTERESTS**

53 None declared.
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56 57 58 **LEGENDS OF FIGURES**

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4 **Figure 1. Example of a fuzzy cognitive map and associated concepts**
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7 **Figure 2. Steps of the fuzzy cognitive mapping process for the scoping review.** The
8 icons represent the tools used in the different steps of the process (i.e., the PRISMA-ScR
9 guidelines, Microsoft Excel, the software CIETmap 2.0). The illustrations below each step
10 represent what each step will look like in practice.
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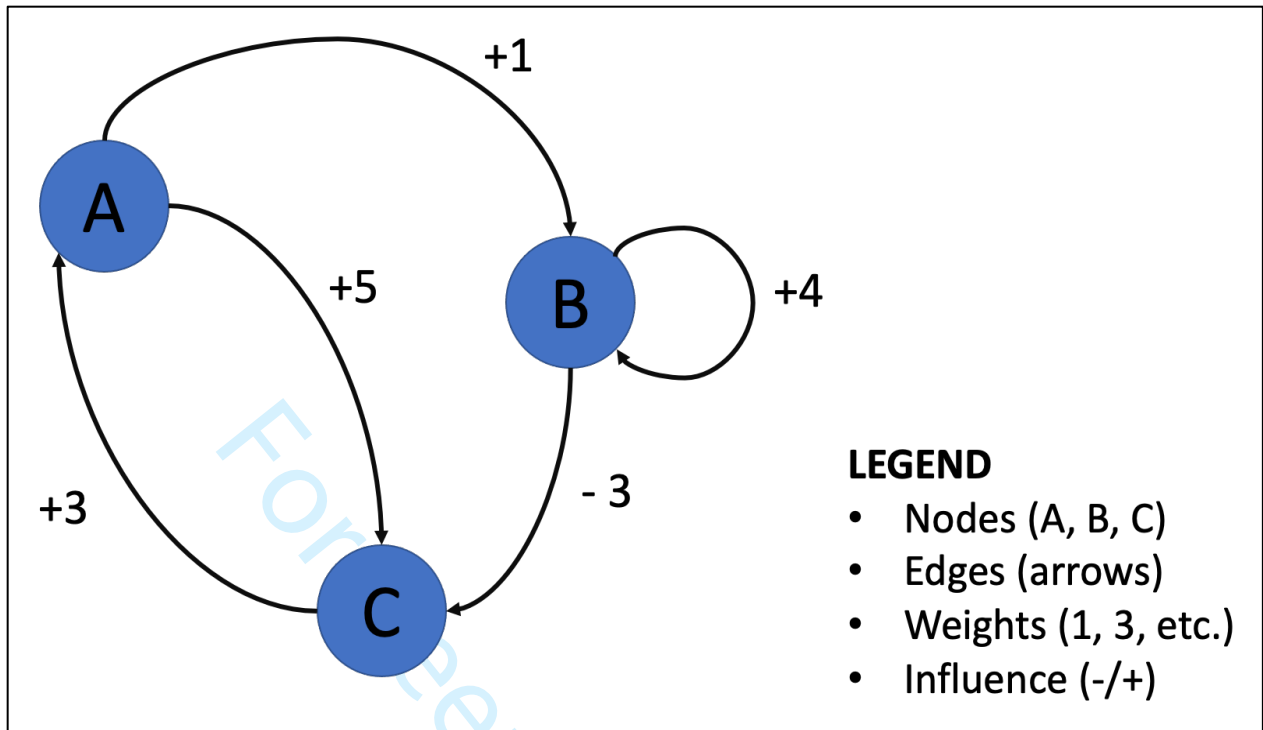
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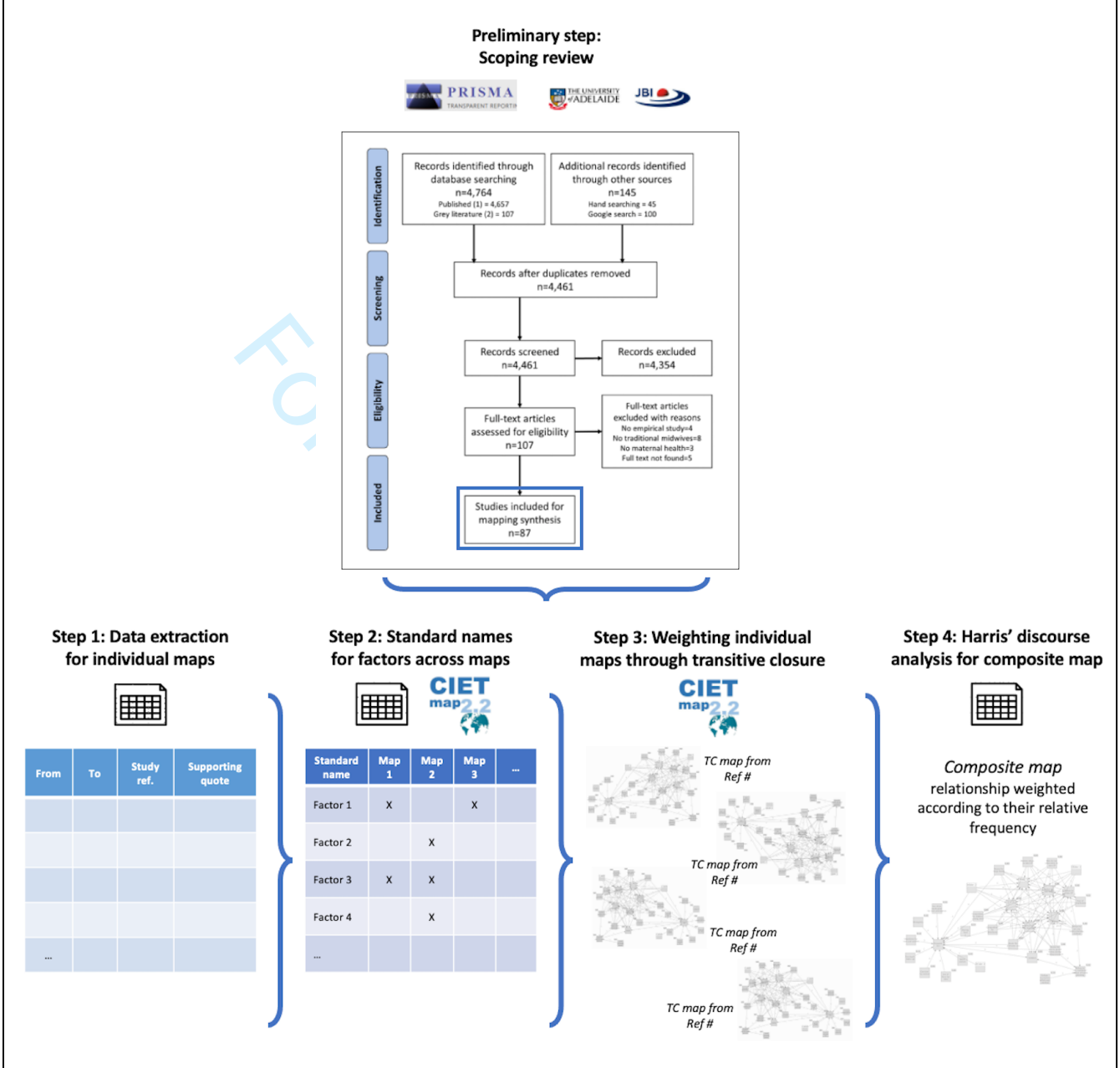
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PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 4:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Sponsor	5b	Provide name for the review funder and/or sponsor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 3 (bottom)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 4 (bottom)
METHODS					

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 5-6
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 5 (top); Page 6 (bottom)
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 6-8
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 9 (point e)
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9 (points of data extraction form)
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2 , Kendall's tau)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 9-10
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A

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BMJ Open

Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

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Secondary Subject Heading:	Global health, Public health
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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

ABSTRACT

Introduction: As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), urban health is a growing priority of public and global health. Rapid unplanned urbanization in LMICs has exacerbated inequalities, putting the urban poor at increasing risk of ill health due to difficult living conditions in cities. Collaboration with communities in research is a key strategy for addressing the challenges they face. The objective of this scoping review is therefore to identify factors that influence the participation of urban communities from LMICs in public and global health research.

Methods and analysis: We will develop a search strategy with a health librarian to explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, and CINAHL. We will use MeSH terms and keywords exploring the concepts of “low- and middle-income countries”, “community participation in research”, and “urban settings” to look at empirical research conducted in French or English. There will be no restriction in terms of dates of publication. Two independent reviewers will screen and select studies, first based on titles and abstracts, and then on full text. Two reviewers will extract data. We will summarize the results using tables and fuzzy cognitive mapping.

Ethics and dissemination: This scoping review is part of a larger project to be approved by the University of Montréal’s Research Ethics Committee for Science and Health in Montréal (Canada), and the Institutional Review Board of the James P. Grant School of Public Health at BRAC University in Dhaka (Bangladesh). Results from the review will contribute to a participatory process seeking to combine scientific evidence with experiential knowledge of stakeholders in Dhaka to understand how to better collaborate with communities for research. The review could contribute to a shift towards research that is more inclusive and beneficial for communities.

KEYWORDS

public health, global health, community-based participatory research, stakeholder participation, urban population, urban health, fuzzy logic

STRENGTHS AND LIMITATIONS OF THIS STUDY

- What constitutes ‘communities’, ‘participation in research’ and ‘urban settings’ can be defined in various ways, so it will be crucial to highlight how these concepts are defined in the literature included in the scoping review.

- Reporting on community participation is heterogeneous, and identifying the research approaches, health issues, contexts, and community characteristics that favor participation will be challenging.
- The scoping review will summarize results using fuzzy cognitive mapping, providing soft models of causality that can be contextualized in the experience of local stakeholders in Dhaka.
- The methods presented in this scoping review protocol could be replicated to compare and combine scientific evidence and experiential knowledge anywhere.

INTRODUCTION

As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), the health of urban populations is a growing priority of public and global health.[1] Urbanization brings changes to the disease burdens, determinants of health, and patterns of health inequalities.[1,2] Despite the benefits of urban living and progress in population health, rapid and unplanned urbanization in LMICs has worsened health inequalities.[3] Not everyone in cities experiences these improvements equally, as policies and other efforts often fail to reach the most marginalized communities, including those living in informal settlements.[3] The urban poor are therefore at increased risk of ill health due to the difficult living conditions in cities.[3,4]

Several researchers in public and global health have criticized the reproduction of colonial relations in efforts to improve the health of populations in LMICs, as these efforts are often led by foreign researchers with little input from local populations.[5–7] The resulting unequal power dynamics between researchers and communities are among the reasons research makes little or mixed contributions to health.[8] In response, there are increasing calls to decolonize public and global health through community participation in research, to better meet their needs and ensure local relevance of the initiatives put in place to improve their health.[8–10]

Community participation in health research is recognized for building capacity and fostering conditions to enable better community control over determinants of their health.[11,12] Community participation can lead to equitable partnerships between communities and researchers, making research more empowering and effective.[12] However, most health research uses top-down community engagement approaches rather than bottom-up participatory methods.[13] While there is no standard definition of community participation, different uses of the term form a continuum from consulting or informing communities to sharing power with them.[13,14]

Some of the world's most populated cities are located in South Asian countries, including Bangladesh, India, and Pakistan.[15] These countries are characterized by high levels of urban poverty, with more than 50% of their urban population estimated to be living in informal settlements.[16,17] Considering that urbanization in these contexts is inextricably linked to complex patterns of discrimination and social exclusion for residents of informal

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3 settlements, it is crucial that public/global health professionals and researchers
4 collaborate with these communities to understand their health priorities and find innovative
5 solutions to improve their health [18,19].

6 Collaborating with marginalized urban communities is a key strategy for addressing the
7 many challenges they face.[3,20,21] Yet, these communities represent a particularly hard-
8 to-reach group, as asymmetries in access to resources and opportunities affect their
9 capacity to fully participate in and benefit from research implement to improve their
10 health.[20,22] There is therefore an urgent need to better understand the barriers and
11 enablers to their participation.[23–25]
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14 The objective of this scoping review is to identify factors that influence the participation of
15 urban communities from low- and middle-income countries in public and global health
16 research. Part of a larger project, this scoping review will contribute to a dialogue between
17 scientific and experiential knowledge on the factors that influence community participation
18 in public and global health research. We will contextualize the results from the scoping
19 review in the views of stakeholders in Dhaka (Bangladesh) in a participatory process to
20 reflect their experiences. This contextualization will identify barriers and enablers to
21 participation that are specific to Dhaka, in preparation for a cluster randomized controlled
22 trial testing the effect of a participatory community mobilization intervention for reducing
23 dengue infection.[26]
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27 **METHODS AND ANALYSIS**

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29 This review is part of a larger project aimed at comparing and combining different
30 knowledge sources to provide a knowledge base for decision making, that will be used to
31 inform a cluster randomized controlled trial to reduce dengue infection in Dhaka.[26] The
32 larger project will consider four knowledge sources: 1) the scoping review described in
33 this protocol; 2) the views of Canadian and Bangladeshi public and global health
34 researchers; 3) the views of personnel from community-based organizations in Dhaka; 4)
35 the views of community members from underserved neighbourhoods in Dhaka. We will
36 adapt the *Weight of Evidence* approach [27,28] and use fuzzy cognitive mapping to bring
37 these different knowledge sources into conversation.
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40 In this protocol, we focus on describing the procedures to conduct the scoping review and
41 briefly discuss how the results will be used to inform the subsequent phases of the larger
42 project. The proposed scoping review will be conducted in accordance with the PRISMA-
43 ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Extension
44 for Scoping Reviews) guidelines and Joanna Briggs Institute’s methodology to ensure
45 accuracy, completeness and transparency.[29–32]
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48 **Review questions**

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50 This scoping review will seek to answer the following question, developed according to
51 the PCC method (Participants, Concept, Context) recommended by the Joanna Briggs
52 Institute [29]: What factors influence the participation of urban communities from low- and
53 middle-income countries in research, based on evidence from the public and global health
54 literature?
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The review will also seek to answer the following sub-questions:

- 1) What are the main barriers and enablers of community participation in public and global health research?
- 2) What is the relative influence of these factors on community participation?
- 3) What research approaches are most and least favourable to community participation?
- 4) What public and global health issues are most and least favourable to community participation?
- 5) What contexts are most and least favourable to community participation?
- 6) What community characteristics are most and least favourable to community participation?

Eligibility criteria

Types of sources

This scoping review will consider empirical studies with quantitative, qualitative, and mixed methods designs. We will not include literature reviews and meta-analyses, but we will consider including the empirical studies reported in reviews and meta-analyses if relevant. We will not consider grey or scientific literature reporting on programs, policy or other initiative implemented outside of research purposes.

Participants

This review will look at research participation at the community level rather than at the individual level, therefore excluding studies discussing the participation of individuals in research (*i.e.*, patient engagement, individual motivation to participate). Communities refer to population groups and the locus (*i.e.*, place, venue, or other units) of their actions.[33] Communities can be understood as groups of people with diverse characteristics that are linked by social ties or identities; share common interests or concerns; and engage in joint action in settings, venues or areas that may be physically, geographically, culturally or politically defined.[33–35] The definition of what constitutes a community remains broad for this scoping review but will focus on urban communities in low- and middle-income countries. This is justified by the fact that the larger project is part of a cluster randomized controlled trial on dengue which will be conducted in Dhaka (Bangladesh), and that the factors influencing community participation in research will likely vary between rural and urban communities, and between high- and low- and middle-income countries.

Concept

Community-engaged research is a broad topic, defined in various ways and used for various reasons. It is often an umbrella term for research involving the participation of non-academic stakeholders, with diverse models and conceptual frameworks.[14] There is no standard definition of community participation in research in public and global health.[13,14] The distinction between ‘engagement,’ ‘mobilization’ and ‘participation’ in research is unclear, as these terms are often used interchangeably and with changing definitions.

Various authors discuss the levels of community participation in research as being positioned along a continuum, ranging from information provision and exchange, to consultation, to co-production, and to shared leadership and community control.[14,36–39] For this scoping review, we will not restrict the search to a specific level of participation, but we will examine and compare how different approaches (i.e., community mobilization interventions, partnered research, community-based participatory research designs, etc.) are found to enable or hinder participation. However, research in which there is little community involvement (i.e., health education, consultation efforts in which communities have no decision-making power over some aspects of the research) will be excluded.

Context

This review will focus on communities located in urban settings in low- and middle-income countries. The definition of low- and middle-income countries used for the review will use the World Bank's classification from the 2023 fiscal year, based on countries' gross national incomes per capita.[40] The Cochrane Effective Practice and Organisation of Care (EPOC) group has developed a filter for literature reviews based on the World Bank classification to identify studies relevant to LMICs.[41]

There is no standard international definition of what constitutes an urban setting. Each country has its own definition, following nationally defined criteria on population size, population density, type of economic activity, physical characteristics, level of infrastructure, or other characteristics.[42] Considering the lack of a common definition, the scoping review will consider all studies in LMICs conducted in urban settings or cities as identified by the authors, including neighbourhoods and informal settlements (slums) in cities.

Exclusion criteria

To ensure the selection of relevant studies for the review, we will use the following exclusion criteria:

- Grey literature
- Not empirical research
- Discussing community engagement, participation, partnership, or mobilization in contexts other than research (i.e., programs, policy, urban planning)
- Focused on individual engagement in research (i.e., patient engagement, individual motivation)
- Not discussing factors that influence community participation in research
- Conducted in contexts other than urban settings
- Conducted in countries other than low- and middle-income countries
- Full text of the reference is not available

Table 1 summarizes the inclusion and exclusion criteria used to select articles for the scoping review.

Table 1. Inclusion and exclusion criteria for the scoping review

Inclusion criteria	Exclusion criteria
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<ul style="list-style-type: none"> • Empirical qualitative, quantitative, and mixed methods research • Discussing community engagement, participation, partnership or mobilization in research • Focused on community-level engagement • Discussing factors that influence community participation in research • Conducted in urban settings • Conducted in low- and middle-income countries 	<ul style="list-style-type: none"> • Not empirical research • Grey literature • Discussing community engagement, participation, partnership, or mobilization in contexts other than research • Focused on individual-level engagement • Not discussing factors that influence community participation in research • Conducted in contexts other than urban settings • Conducted in countries other than low- and middle-income countries • Full text of the reference is not available
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Search strategy

The search strategy will be developed with the help of a health librarian. It will explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, and CINAHL. We will use MeSH terms and keywords to identify studies reported in English or French. We will not have restrictions in terms of dates of publication. We will not contact the authors of the articles selected to request additional information. Table 2 presents the initial search strategy for MEDLINE, which will be adapted for each database.

Table 2. Example of a potential search strategy for MEDLINE

Concept 1: Low- and middle-income countries
<p>1. (afghanistan or albania or algeria or american samoa or angola or "antigua and barbuda" or antigua or barbuda or argentina or armenia or armenian or aruba or azerbaijan or bahrain or bangladesh or barbados or "republic of Belarus" or belarus or byelarus or belorussia or byelorussian or belize or british honduras or benin or dahomey or bhutan or bolivia or "bosnia and herzegovina" or bosnia or herzegovina or botswana or bechuanaland or brazil or brasil or bulgaria or burkina faso or burkina fasso or upper volta or burundi or urundi or cabo verde or cape verde or cambodia or kampuchea or khmer republic or cameroon or cameron or cameroun or central african republic or ubangi shari or chad or chile or china or colombia or comoros or comoro islands or iles comores or mayotte or "democratic republic of the congo" or democratic republic congo or congo or zaire or costa rica or "cote d'ivoire" or "cote d'ivoire" or cote divoire or cote d ivoire or ivory coast or croatia or cuba or cyprus or czech republic or czechoslovakia or djibouti or french somaliland or dominica or dominican republic or ecuador or egypt or united arab republic or el salvador or equatorial guinea or spanish guinea or eritrea or estonia or eswatini or swaziland or ethiopia or fiji or gabon or gabonese republic or gambia or "georgia (republic)" or georgian or ghana or gold coast or gibraltar or greece or grenada or guam or guatemala or guinea or guinea bissau or guyana or british guiana or haiti or hispaniola or honduras or hungary or india or indonesia or timor or iran or iraq or "isle of man" or jamaica or jordan or kazakhstan or kazakh or kenya or "democratic people's republic of korea" or "republic of korea" or north korea or south korea or korea or kosovo or kyrgyzstan or kirghizia or kirgizstan or kyrgyz republic or kirghiz or laos or lao pdr or "lao people's democratic republic" or latvia or lebanon or lebanese republic or lesotho or basutoland or liberia or libya or libyan arab jamahiriya or lithuania or macau or macao or "republic of north macedonia" or macedonia or madagascar or malagasy republic or malawi or nyasaland or malaysia or malay federation or malaya federation or maldives or indian ocean islands or indian ocean or mali or malta or micronesia or "federated states of Micronesia" or kiribati or marshall islands or nauru or northern mariana islands or palau or tuvalu or mauritania or mauritius or mexico or moldova or moldovian or mongolia or montenegro or morocco or ifni or mozambique or portuguese east africa or myanmar or burma or namibia or nepal or netherlands antilles or nicaragua or niger or nigeria or oman or muscat or pakistan or panama or papua new guinea or new guinea or paraguay or peru or philippines or philipines or philippines or philippines or poland or "polish people's republic" or portugal or portuguese republic or puerto rico or romania or russia or russian federation or ussr or soviet union or "union of soviet socialist republics" or rwanada or ruanda or samoa or</p>

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2. Developing countries/

3. 1 or 2

Concept 2: Community participation in research

4. (((participat* or communit* or partner*) adj3 research) or (communit* adj3 (participat* or engage* or mobili?ation or intervention*)) or participatory or CBPR).ti,ab,sh,kf.

5. Community-based participatory research/

6. Community participation/

7. 4 or 5 or 6

Concept 3: Urban settings

8. (urban* or city or cities or metropol* or megacit* or megalop* or municipalit* or "informal settlement" or "informal settlements" or slum* or favela* or "shanty town" or "shanty towns" or ghetto* or bustee*).ti,ab,sh,kf.

9. Urban Health/

10. Urban Population/

11. Cities/

12. Urbanization/

13. Poverty Areas/

14. 8 or 9 or 10 or 11 or 12 or 13

Final search strategy

15. 3 and 7 and 14

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4 The search strategy will be developed with the input from a librarian and the research
5 team to identify new keywords.[43] After our initial screening in MEDLINE, we will search
6 the included articles for new keywords. A new search will then be conducted combining
7 the newly found MeSH terms and keywords to the existing search. A librarian will assess
8 whether these new terms should be included in the final search strategy. When all articles
9 are screened, we will search the reference lists of selected studies to identify additional
10 studies meeting our inclusion criteria.
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13 **Study selection**

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15 Following the search, all identified citations will be collated and uploaded into
16 Covidence,[44] and duplicates will be removed. Study selection will be conducted in two
17 phases by two independent reviewers, who will reconcile differences by consensus. A
18 third independent reviewer will help resolve any further disagreement.
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21 The initial screening of the retrieved sources will use titles and abstracts. The second
22 phase of selection will use full text. Reasons for excluding sources at full text that do not
23 meet the inclusion criteria will be recorded and reported in the review. The results of the
24 search and the study selection process will be reported in the flow diagram developed by
25 PRISMA-ScR.[32,45]
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28 Because the aim of scoping reviews is to map the available evidence on a specific topic,
29 we will not perform an assessment of the methodological quality or risk of bias of the
30 articles included in the review [29]. However, the data extraction form will report the
31 research design as well as the data collection and analysis methods of selected articles.
32 This will allow us to dress a portrait of the available evidence on the factors influencing
33 the participation of urban communities in research.
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36 **Data extraction**

37 Two reviewers will develop and pilot a data extraction form, and extract the data in
38 Covidence.[44] The form will include:
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- 41 a. Details on the study (title, names of the authors, year of publication, study
42 objectives, research design, and data collection and analysis methods)
- 43 b. The country and the urban contexts in which studies were conducted
- 44 c. The communities targeted
- 45 d. If available, the definitions of 'community' used by the authors
- 46 e. The participation approach used and the extent of community participation
- 47 f. The findings regarding the factors (barriers, enablers, and other factors) influencing
48 the participation of urban communities in public and global health research
- 49 g. If available, the relative influence (qualitative or quantitative) of the factors identified
50 on community participation
- 51 h. If available, other relations among the factors identified, and their relative influence
52 on community participation
- 53 i. Explanation of the relationships between factors (quotes from the articles)
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We will not systematically extract data on the results of the studies since this is outside the scope of the review objectives and research question.

The data extraction form will be piloted before beginning the study selection process with a random sample of 5 studies among all the studies to be reviewed. The pilot test will help identify missing data and will contribute to ensuring that the reporting of participation approaches and factors influencing community participation is coherent across studies and between the two reviewers. The data extraction form will be modified and revised as necessary, in an iterative manner, during the data extraction process. Modifications will be detailed in the report of the review.

Any disagreements on data extraction that arise between the two reviewers at the pilot or data extraction stages will be resolved by consensus, or by discussion with a third independent reviewer if necessary.

Data analysis and presentation

The presentation of results will follow the PRISMA-ScR guidelines.[32] We will present the results in tables and use fuzzy cognitive mapping (FCM) to illustrate how the different factors identified influence community participation in research, adapting the *Weight of Evidence* approach.[27,46] A narrative summary will also accompany the tabulated and mapped results, describing how the results relate to the review objectives and questions.

FCM uses graph theory and fuzzy logic to generate soft models of how change could happen based on assumed causal relationships.[47–49] These soft models are illustrated through graphs called fuzzy cognitive maps (Figure 1), which are used to represent assumed causal relationships between concepts.[50,47] The maps use nodes (factors affecting the issue) and edges (arrows representing the relationships between factors), weighted by the relative strength of their influence on the issue of interest.[51,47,27] Depending on the knowledge source of the maps, edges can have different values (hence the term *fuzzy*) to quantify their influence in a relative way.[49]

FCM will be the cornerstone for the presentation of the scoping review, through the creation of fuzzy cognitive maps to represent: 1) each article included in the review; and 2) a composite map for the whole review. FCM will allow to summarize in a composite map the relative influence that each factor might have on community participation, in relation to all the other factors identified in the review.[27,28,47] We will go through several steps (detailed below) to create the composite literature-based fuzzy cognitive map of the barriers and enablers to community participation (Figure 2).

First, we will create one fuzzy cognitive map for each article selected in the scoping review (Step 1 in Figure 2). In each individual map, community participation will be the outcome of interest. We will include each barrier and enabler of community participation mentioned in the article (point e in the data extraction form) as a node in the map, which we will organize in a table. This table will have two initial columns indicating the origin factor (from) and the consequence factor (to). Additional columns will present the evidence supporting

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3 the relationship between both factors from the article (point h in the data extraction form).
4 Each relationship identified will be a row in the table.[49]
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7 Second, once all the individual tables are created, we will standardize the names of the
8 factors across the individual articles so that they can be comparable (Step 2 in Figure
9 2).[46] On each individual map reporting the relationships identified in each study, we will
10 calculate fuzzy transitive closure in the open access CIETmap 2.0 (Step 3 in Figure 2).[52]
11 Fuzzy transitive closure is a mathematical model used to calculate the influence of each
12 relationship on community participation, considering all the possible relationships
13 represented in the map.[53,54] After transitive closure, each relationship will have a value
14 between 0 (having no influence) and 1 (having the strongest influence) to represent the
15 relative strength of their influence on community participation, with positive and negative
16 signs indicating whether the relationship is stimulative or inhibitive.[27,53]
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20 Third, we will create a composite map for the whole review (Step 4 in Figure 2). To create
21 this composite map, we will attribute weights to each node using Harris' discourse
22 analysis, an analytical approach developed in the 1950s based the frequency of
23 occurrence of discourse elements sharing similar meanings in a body of text, such as a
24 literature review.[55,46] We will consider the frequency of occurrence of each relationship
25 across the maps developed for each article in the scoping review. This means that a factor
26 that is repeated in multiple maps would have a stronger causal meaning for community
27 participation than a factor only mentioned in one or two maps.[46] We will establish the
28 relative frequency of factors by dividing each occurrence by the highest frequency across
29 all the maps. We will therefore obtain a value between 0 for the relationships that did not
30 exist and 1 for the relationship most frequently mentioned.[46] These different steps will
31 allow us to create a composite map representing all the factors identified in the scoping
32 review, weighted according to their relative frequency.
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35 **Patient and public involvement**

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37 We will include a consultation phase in the scoping review, as Arksey & O'Malley (2005)
38 recognize the benefit of discussing the results of a review with experts.[56] The *Weight of*
39 *Evidence* approach, which we will adapt for this scoping review, advocates for experiential
40 knowledge to be considered on an equal footing with the evidence synthesized from the
41 literature.[27] Therefore, in the context of the larger project, which adopts a participatory
42 methodology and involves a community advisory board, people concerned with the issue
43 of interest (*i.e.*, participation of urban communities in health research) will be invited to
44 contextualize the scoping review.
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48 After conducting the scoping review, stakeholders in Dhaka will develop their own fuzzy
49 cognitive maps on the factors that they believe can influence community participation in
50 the Bangladeshi context. After developing their maps, they will interpret the literature-
51 based map from the scoping review by comparing the results with their own maps. We
52 will seek the perspectives of three stakeholder groups, namely public and global health
53 researchers, community-based organizations, and community stakeholders.
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3 Finally, we will use the composite map from the scoping review and the various maps from
4 these three stakeholder groups to generate a final map incorporating these two knowledge
5 sources. The literature-based map, the stakeholder maps and this final map will be
6 reviewed through deliberative dialogue with stakeholders in Dhaka.[57] The maps and
7 discussions with stakeholders will inform decision-making for the cluster randomized
8 controlled trial on dengue testing a participatory community mobilization intervention,
9 where communities in Dhaka will develop their own solutions to reduce dengue infection.
10 These steps will be conducted and reported separately.
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14 **ETHICS AND DISSEMINATION**

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16 This scoping review does not require ethics approval. However, the consultation process
17 is part of a larger project which will need to be approved by the University of Montréal's
18 Research Ethics Committee for Science and Health in Montréal (Canada), and the
19 Institutional Review Board of the James P. Grant School of Public Health at BRAC
20 University in Dhaka (Bangladesh). We will apply for ethics approval for the larger project
21 at both universities by August 2023. We will share the results from the scoping review with
22 the scientific community through scientific articles and presentations at conferences, and
23 with local stakeholders in Dhaka through a participatory process involving fuzzy cognitive
24 mapping and deliberative dialogue. Results from this process will directly inform the
25 implementation of the cluster randomized controlled trial on dengue in Dhaka.[26]
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30 **DISCUSSION**

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32 This protocol described a scoping review which will seek to identify and map the factors
33 that can influence the participation of urban communities from low- and middle-income
34 countries in public and global health research. The review will contribute to the
35 understanding of how to foster the participation of these communities in research, so that
36 it can better respond to local needs. Given that marginalized urban communities represent
37 a particularly hard-to-reach group in research and that urban health is a growing priority
38 of public and global health, findings from this review will be useful for researchers and
39 communities who wish to collaborate to improve population health.
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42 One of the main challenges that we anticipate for the realization of our scoping review is
43 the time necessary to screen articles, as we expect that our search will yield a large
44 number of studies. Discussions on the inclusion and exclusion criteria between the two
45 reviewers and the research team prior to starting the screening process will contribute to
46 ensuring our efficiency. We also recognize potential limitations of our scoping review.
47 First, it is possible that we miss studies that could have been relevant to our scoping
48 review objectives if they were published outside the scientific literature (e.g., grey
49 literature, reports from international or community organizations). Because we focus on
50 articles written in English or French, we could also miss studies relevant to our objectives
51 published in other languages. Our rigorous screening approach conducted by two
52 independent reviewers will facilitate greater inter-reviewer reliability and maximize our
53 chance of identifying all relevant studies. Second, the representation of the barriers and
54 enablers of community participation as causal relationships through fuzzy cognitive
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3 mapping is meant to illustrate soft models of causality needing empirical testing. The use
4 of fuzzy cognitive mapping to synthesize the results from the scoping review however
5 offers an operator-independent way to analyze and communicate the relative influence of
6 the factors identified on community participation [28]. The literature-based map will in turn
7 inform a mapping process involving stakeholders from Dhaka (Bangladesh), as part of the
8 larger project.
9

10
11 The use of the *Weight of Evidence*, an innovative approach to knowledge synthesis
12 whereby scientific and experiential knowledge are brought into conversation, will allow
13 for the contextualization of the scoping review in the lived experience of stakeholders in
14 Dhaka.[27,46,58] The procedures described in this scoping review protocol open the
15 possibility for contextualizing literature reviews in lived experience in any context.
16

17
18 Better understanding the factors that influence the participation of communities in
19 research could support a shift from researcher-driven health research towards research
20 that is more inclusive of community voices and needs. Fostering authentic community
21 participation in research can contribute to the movement for decolonizing public and global
22 health. This can also bring benefits to marginalized communities through interventions
23 that are more relevant to their contexts and needs.
24

25 26 27 **ACKNOWLEDGEMENTS**

28
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32 their expertise with us.
33

34 35 36 **AUTHORS CONTRIBUTIONS**

37
38 MCGD developed the scoping review protocol, the search strategy and wrote the first
39 version of the manuscript. KZ and NA contributed to the development of the larger project
40 to be conducted in Dhaka, as part of the COESA cluster randomized controlled trial. GF
41 contributed to drafting the scoping review protocol. IS and NA provided expertise on fuzzy
42 cognitive mapping, Harris' discourse analysis and the *Weight of Evidence* approach. All
43 authors read, provided feedback, and approved the final manuscript.
44

45 46 47 **FUNDING**

48
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53 play a role in the development of this protocol.
54

COMPETING INTERESTS

None declared.

LEGENDS OF FIGURES

Figure 1. Example of a fuzzy cognitive map and associated concepts

Figure 2. Steps of the fuzzy cognitive mapping process for the scoping review. The icons represent the tools used in the different steps of the process (i.e., the PRISMA-ScR guidelines, Microsoft Excel, the software CIETmap 2.0). The illustrations below each step represent what each step will look like in practice.

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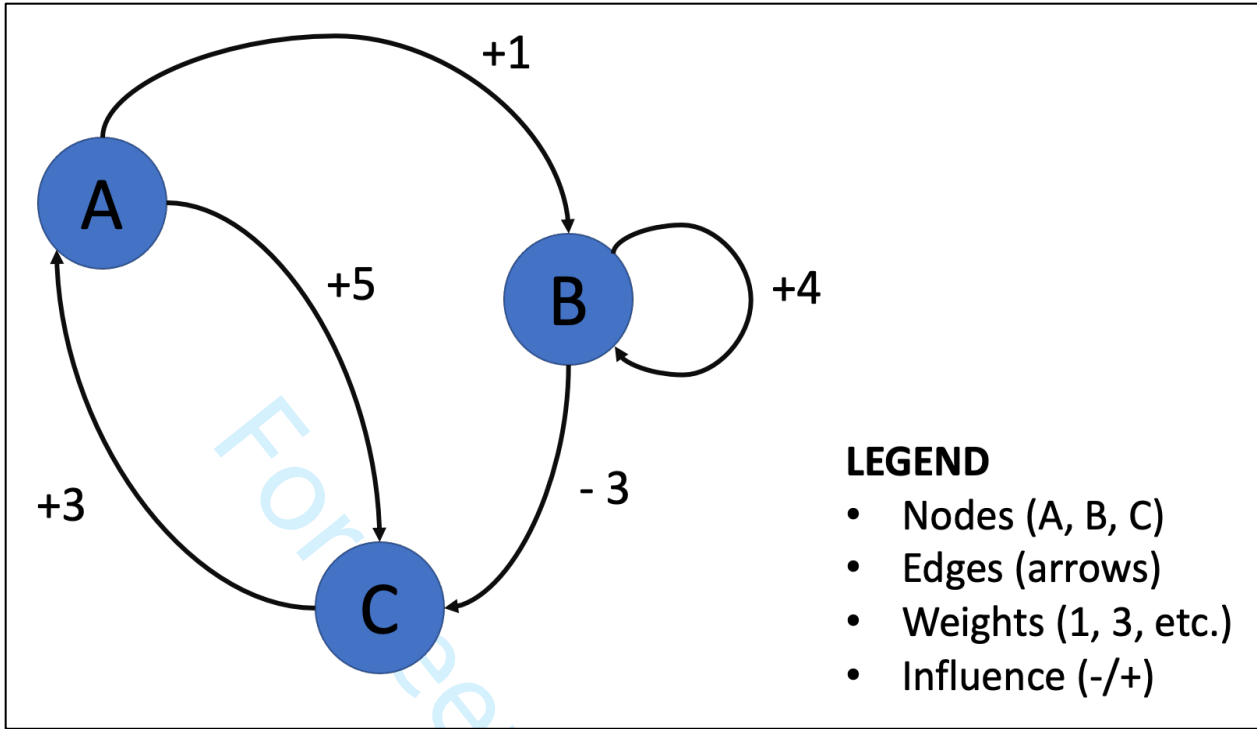
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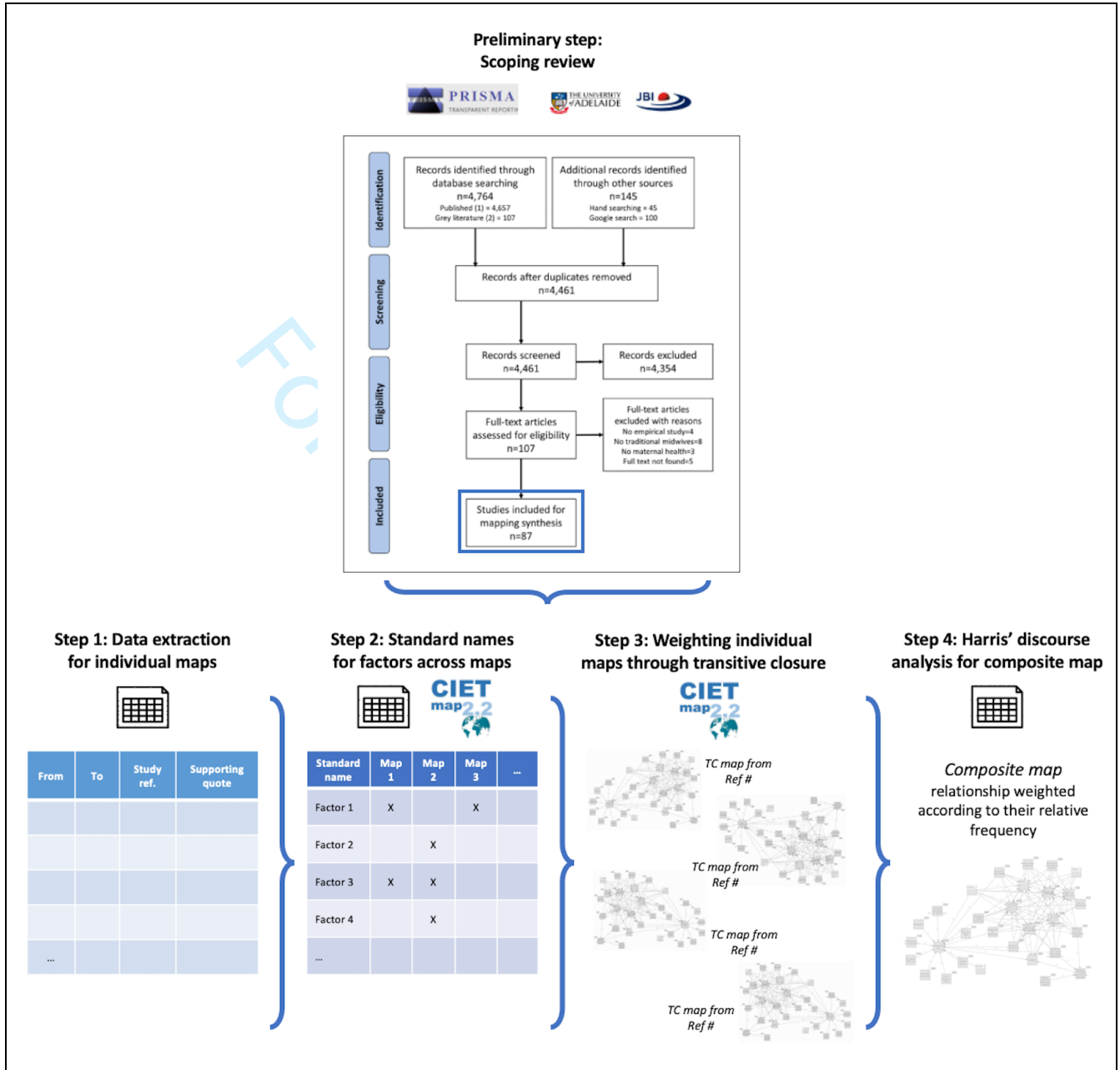
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PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 4:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Sponsor	5b	Provide name for the review funder and/or sponsor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 3 (bottom)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 4 (bottom)
METHODS					

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 5-6
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 5 (top); Page 6 (bottom)
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 6-8
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 9 (point e)
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9 (points of data extraction form)
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2 , Kendall's tau)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 9-10
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A

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BMJ Open

Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

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Primary Subject Heading:	Public health
Secondary Subject Heading:	Global health, Public health
Keywords:	PUBLIC HEALTH, PREVENTIVE MEDICINE, QUALITATIVE RESEARCH

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4 2 **participate in public and global health research: Protocol for a scoping**
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35 27 **WORD COUNT**

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Why urban communities from low- and middle-income countries participate in public and global health research: Protocol for a scoping review

ABSTRACT

Introduction: As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), urban health is a growing priority of public and global health. Rapid unplanned urbanization in LMICs has exacerbated inequalities, putting the urban poor at increasing risk of ill health due to difficult living conditions in cities. Collaboration with communities in research is a key strategy for addressing the challenges they face. The objective of this scoping review is therefore to identify factors that influence the participation of urban communities from LMICs in public and global health research.

Methods and analysis: We will develop a search strategy with a health librarian to explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, and CINAHL. We will use MeSH terms and keywords exploring the concepts of “low- and middle-income countries”, “community participation in research”, and “urban settings” to look at empirical research conducted in French or English. There will be no restriction in terms of dates of publication. Two independent reviewers will screen and select studies, first based on titles and abstracts, and then on full text. Two reviewers will extract data. We will summarize the results using tables and fuzzy cognitive mapping.

Ethics and dissemination: This scoping review is part of a larger project to be approved by the University of Montréal’s Research Ethics Committee for Science and Health in Montréal (Canada), and the Institutional Review Board of the James P. Grant School of Public Health at BRAC University in Dhaka (Bangladesh). Results from the review will contribute to a participatory process seeking to combine scientific evidence with experiential knowledge of stakeholders in Dhaka to understand how to better collaborate with communities for research. The review could contribute to a shift towards research that is more inclusive and beneficial for communities.

KEYWORDS

public health, global health, community-based participatory research, stakeholder participation, urban population, urban health, fuzzy logic

STRENGTHS AND LIMITATIONS OF THIS STUDY

- What constitutes ‘communities’, ‘participation in research’ and ‘urban settings’ can be defined in various ways, so it will be crucial to highlight how these concepts are defined in the literature included in the scoping review.

- Reporting on community participation is heterogeneous, and identifying the research approaches, health issues, contexts, and community characteristics that favor participation will be challenging.
- The scoping review will summarize results using fuzzy cognitive mapping, providing soft models of causality that can be contextualized in the experience of local stakeholders in Dhaka.
- The methods presented in this scoping review protocol could be replicated to compare and combine scientific evidence and experiential knowledge anywhere.

INTRODUCTION

As the number of people living in cities increases worldwide, particularly in low- and middle-income countries (LMICs), the health of urban populations is a growing priority of public and global health.[1] Urbanization brings changes to the disease burdens, determinants of health, and patterns of health inequalities.[1,2] Despite the benefits of urban living and progress in population health, rapid and unplanned urbanization in LMICs has worsened health inequalities.[3] Not everyone in cities experiences these improvements equally, as policies and other efforts often fail to reach the most marginalized communities, including those living in informal settlements.[3] The urban poor are therefore at increased risk of ill health due to the difficult living conditions in cities.[3,4]

Several researchers in public and global health have criticized the reproduction of colonial relations in efforts to improve the health of populations in LMICs, as these efforts are often led by foreign researchers with little input from local populations.[5–7] The resulting unequal power dynamics between researchers and communities are among the reasons research makes little or mixed contributions to health.[8] In response, there are increasing calls to decolonize public and global health through community participation in research, to better meet their needs and ensure local relevance of the initiatives put in place to improve their health.[8–10]

Community participation in health research is recognized for building capacity and fostering conditions to enable better community control over determinants of their health.[11,12] Community participation can lead to equitable partnerships between communities and researchers, making research more empowering and effective.[12] However, most health research uses top-down community engagement approaches rather than bottom-up participatory methods.[13] While there is no standard definition of community participation, different uses of the term form a continuum from consulting or informing communities to sharing power with them.[13,14]

Some of the world's most populated cities are located in South Asian countries, including Bangladesh, India, and Pakistan.[15] These countries are characterized by high levels of urban poverty, with more than 50% of their urban population estimated to be living in informal settlements.[16,17] Considering that urbanization in these contexts is inextricably linked to complex patterns of discrimination and social exclusion for residents of informal

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3 117 settlements, it is crucial that public/global health professionals and researchers
4 118 collaborate with these communities to understand their health priorities and find innovative
5 119 solutions to improve their health [18,19].
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7 121 Collaborating with marginalized urban communities is a key strategy for addressing the
8 122 many challenges they face.[3,20,21] Yet, these communities represent a particularly hard-
9 123 to-reach group, as asymmetries in access to resources and opportunities affect their
10 124 capacity to fully participate in and benefit from research implement to improve their
11 125 health.[20,22] There is therefore an urgent need to better understand the barriers and
12 126 enablers to their participation.[23–25]
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14 128 The objective of this scoping review is to identify factors that influence the participation of
15 129 urban communities from low- and middle-income countries in public and global health
16 130 research. Part of a larger project, this scoping review will contribute to a dialogue between
17 131 scientific and experiential knowledge on the factors that influence community participation
18 132 in public and global health research. We will contextualize the results from the scoping
19 133 review in the views of stakeholders in Dhaka (Bangladesh) in a participatory process to
20 134 reflect their experiences. This contextualization will identify barriers and enablers to
21 135 participation that are specific to Dhaka, in preparation for a cluster randomized controlled
22 136 trial testing the effect of a participatory community mobilization intervention for reducing
23 137 dengue infection.[26]
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25 139 **METHODS AND ANALYSIS**

26 140 This review is part of a larger project aimed at comparing and combining different
27 141 knowledge sources to provide a knowledge base for decision making, that will be used to
28 142 inform a cluster randomized controlled trial to reduce dengue infection in Dhaka.[26] The
29 143 larger project will consider four knowledge sources: 1) the scoping review described in
30 144 this protocol; 2) the views of Canadian and Bangladeshi public and global health
31 145 researchers; 3) the views of personnel from community-based organizations in Dhaka; 4)
32 146 the views of community members from underserved neighbourhoods in Dhaka. We will
33 147 adapt the *Weight of Evidence* approach [27,28] and use fuzzy cognitive mapping to bring
34 148 these different knowledge sources into conversation.
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36 150 In this protocol, we focus on describing the procedures to conduct the scoping review and
37 151 briefly discuss how the results will be used to inform the subsequent phases of the larger
38 152 project. The proposed scoping review will be conducted in accordance with the PRISMA-
39 153 ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Extension
40 154 for Scoping Reviews) guidelines and Joanna Briggs Institute’s methodology to ensure
41 155 accuracy, completeness and transparency.[29–32]
42 156

43 157 **Review questions**

44 158 This scoping review will seek to answer the following question, developed according to
45 159 the PCC method (Participants, Concept, Context) recommended by the Joanna Briggs
46 160 Institute [29]: What factors influence the participation of urban communities from low- and
47 161 middle-income countries in research, based on evidence from the public and global health
48 162 literature?
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The review will also seek to answer the following sub-questions:

- 1) What are the main barriers and enablers of community participation in public and global health research?
- 2) What is the relative influence of these factors on community participation?
- 3) What research approaches are most and least favourable to community participation?
- 4) What public and global health issues are most and least favourable to community participation?
- 5) What contexts are most and least favourable to community participation?
- 6) What community characteristics are most and least favourable to community participation?

Table 1 summarizes the eligibility criteria for the scoping review following the PCC (Participants, Concept, Context) method. These criteria will be explained in more detail in the next section.

Table 1. Eligibility criteria for the scoping review, based on the PCC method

PCC element	Correspondence in the scoping review
Participants	Communities in urban settings: <ul style="list-style-type: none"> • Communities are defined as groups of individuals linked by shared social ties or interests who engage in joint actions.[33–35] • Urban settings, as defined by the authors of the articles included in the scoping review.
Concept	Community participation in research <ul style="list-style-type: none"> • Research involving non-academic stakeholder in decision-making over some aspect of the research.[14]
Context	Low- and middle-income countries <ul style="list-style-type: none"> • Countries included in the World Bank's classification of low- and middle-income countries based on gross national incomes per capita.[36]

Eligibility criteria

Types of sources

This scoping review will consider empirical studies with quantitative, qualitative, and mixed methods designs. We will not include literature reviews and meta-analyses, but we will consider including the empirical studies reported in reviews and meta-analyses if relevant. We will not consider grey or scientific literature reporting on programs, policy or other initiative implemented outside of research purposes, since our focus is community participation in *research*.

Participants

Participants for this review will be communities in urban settings. Because this review will look at research participation at the community level rather than at the individual level, we will exclude studies discussing the participation of individuals in research (*i.e.*, patient engagement, individual motivation to participate). The term 'community' generally refers to population groups and the locus (*i.e.*, place, venue, or other units) of their actions.[33]

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3 197 For this scoping review, we define communities as groups of people with diverse
4 198 characteristics that are linked by social ties or identities; share common interests or
5 199 concerns; and engage in joint action in settings, venues or areas that may be physically,
6 200 geographically, culturally or politically defined.[33–35] The definition of what constitutes a
7 201 community will therefore remain broad for this scoping review to ensure that we consider
8 202 all relevant studies discussing the participation of communities in public and global health
9 203 research.

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11 205 We will however focus on communities located in urban settings, excluding rural
12 206 communities. There is no standard international definition of what constitutes an urban
13 207 setting. Each country has its own definition, following nationally defined criteria on
14 208 population size, population density, type of economic activity, physical characteristics,
15 209 level of infrastructure, or other characteristics.[37] Considering the lack of a common
16 210 definition, the scoping review will consider all studies in LMICs conducted in urban settings
17 211 or cities as identified by the authors, including neighbourhoods and informal settlements
18 212 (slums) in cities.

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20 214 Our focus on urban communities in low- and middle-income countries is justified by the
21 215 fact that the larger project is part of a cluster randomized controlled trial on dengue which
22 216 will be conducted in Dhaka (Bangladesh), and that the factors influencing community
23 217 participation in research will likely vary between rural and urban communities, and
24 218 between high- and low- and middle-income countries.

25 219 26 220 *Concept*

27 221 Community-engaged research is a broad topic, defined in various ways and used for
28 222 various reasons. It is often an umbrella term for research involving the participation of non-
29 223 academic stakeholders, with diverse models and conceptual frameworks.[14] There is no
30 224 standard definition of community participation in research in public and global
31 225 health.[13,14] The distinction between ‘engagement,’ ‘mobilization’ and ‘participation’ in
32 226 research is unclear, as these terms are often used interchangeably and with changing
33 227 definitions.

34 228
35 229 Various authors discuss the levels of community participation in research as being
36 230 positioned along a continuum, ranging from information provision and exchange, to
37 231 consultation, to co-production, and to shared leadership and community control.[14,38–
38 232 41] For this scoping review, we will not restrict the search to a specific level of participation,
39 233 but we will examine and compare how different approaches (i.e., community mobilization
40 234 interventions, partnered research, community-based participatory research designs, etc.)
41 235 are found to enable or hinder participation. However, research in which there is little
42 236 community involvement (i.e., health education, consultation efforts in which communities
43 237 have no decision-making power over some aspects of the research) will be excluded.

44 238 45 239 *Context*

46 240 This review will focus on low- and middle-income countries. The definition of low- and
47 241 middle-income countries used for the review is based on the World Bank’s classification
48 242 from the 2023 fiscal year, established following a country’s gross national incomes per
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capita.[36] The Cochrane Effective Practice and Organisation of Care (EPOC) group has developed a filter for literature reviews based on the World Bank classification to identify studies relevant to LMICs.[42]

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Exclusion criteria

To ensure the selection of relevant studies for the review, we will use the following exclusion criteria:

- Grey literature (institutional reports from NGOs, policy documents or other document not reporting on research projects)
- Not empirical research
- Discussing community engagement, participation, partnership, or mobilization in contexts other than research (*i.e.*, programs, policy, urban planning)
- Reports on individual engagement in research (*i.e.*, patient engagement, individual motivation) or on the individual experiences of participants
- Not discussing factors that influence community participation in research
- Conducted in contexts other than urban settings
- Conducted in countries other than low- and middle-income countries
- Full text of the reference not available

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Table 2 summarizes the inclusion and exclusion criteria used to select articles for the scoping review.

Table 2. Inclusion and exclusion criteria for the scoping review

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Empirical qualitative, quantitative, and mixed methods research • Discussing community engagement, participation, partnership or mobilization in research • Focused on community-level engagement • Discussing factors that influence community participation in research • Conducted in urban settings • Conducted in low- and middle-income countries 	<ul style="list-style-type: none"> • Not empirical research • Grey literature, including reports from NGOs or policy documents • Discussing community engagement, participation, partnership, or mobilization in contexts other than research • Focused on individual-level engagement or on individual experiences of participants • Not discussing factors that influence community participation in research • Conducted in contexts other than urban settings • Conducted in countries other than low- and middle-income countries • Full text of the reference not available

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Search strategy

The search strategy will be developed with the help of a health librarian. It will explore the following databases: MEDLINE, Embase, Web of Science, Cochrane, Global Health, and CINAHL. We will use MeSH terms and keywords to identify studies reported in English or French. We will not have restrictions in terms of dates of publication. We will not contact the authors of the articles selected to request additional information. Table 3 presents the initial search strategy for MEDLINE, which will be adapted for each database.

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276**Table 3. Example of a potential search strategy for MEDLINE**

Concept 1: Low- and middle-income countries
<p>1. (afghanistan or albania or algeria or american samoa or angola or "antigua and barbuda" or antigua or barbuda or argentina or armenia or armenian or aruba or azerbaijan or bahrain or bangladesh or barbados or "republic of Belarus" or belarus or byelarus or belorussia or byelorussian or belize or british honduras or benin or dahomey or bhutan or bolivia or "bosnia and herzegovina" or bosnia or herzegovina or botswana or bechuanaland or brazil or brasil or bulgaria or burkina faso or burkina fasso or upper volta or burundi or urundi or cabo verde or cape verde or cambodia or kampuchea or khmer republic or cameroon or cameron or cameroun or central african republic or ubangi shari or chad or chile or china or colombia or comoros or comoro islands or iles comores or mayotte or "democratic republic of the congo" or democratic republic congo or congo or zaire or costa rica or "cote d'ivoire" or "cote d'ivoire" or cote divoire or cote d'ivoire or ivory coast or croatia or cuba or cyprus or czech republic or czechoslovakia or djibouti or french somaliland or dominica or dominican republic or ecuador or egypt or united arab republic or el salvador or equatorial guinea or spanish guinea or eritrea or estonia or eswatini or swaziland or ethiopia or fiji or gabon or gabonese republic or gambia or "georgia (republic)" or georgian or ghana or gold coast or gibraltar or greece or grenada or guam or guatemala or guinea or guinea bissau or guyana or british guiana or haiti or hispaniola or honduras or hungary or india or indonesia or timor or iran or iraq or "isle of man" or jamaica or jordan or kazakhstan or kazakh or kenya or "democratic people's republic of korea" or "republic of korea" or north korea or south korea or korea or kosovo or kyrgyzstan or kirghizia or kirgizstan or kyrgyz republic or kirghiz or laos or lao pdr or "lao people's democratic republic" or latvia or lebanon or lebanese republic or lesotho or basutoland or liberia or libya or libyan arab jamahiriya or lithuania or macau or macao or "republic of north macedonia" or macedonia or madagascar or malagasy republic or malawi or niasaland or malaysia or malay federation or malaya federation or maldives or indian ocean islands or indian ocean or mali or malta or micronesia or "federated states of Micronesia" or kiribati or marshall islands or nauru or northern mariana islands or palau or tuvalu or mauritania or mauritius or mexico or moldova or moldovian or mongolia or montenegro or morocco or ifni or mozambique or portuguese east africa or myanmar or burma or namibia or nepal or netherlands antilles or nicaragua or niger or nigeria or oman or muscat or pakistan or panama or papua new guinea or new guinea or paraguay or peru or philippines or philippines or philippines or philippines or poland or "polish people's republic" or portugal or portuguese republic or puerto rico or romania or russia or russian federation or ussr or soviet union or "union of soviet socialist republics" or rwanada or ruanda or samoa or pacific islands or polynesia or samoan islands or navigator island or navigator islands or "sao tome and principe" or saudi arabia or senegal or serbia or seychelles or sierra leone or slovakia or slovak republic or slovenia or melanesia or solomon island or solomon islands or norfolk island or norfolk islands or somalia or south africa or south sudan or sri lanka or ceylon or "saint kitts and nevis" or "st. kitts and nevis" or saint lucia or "st. lucia" or "saint vincent and the grenadines" or saint vincent or "st. vincent" or grenadines or sudan or suriname or surinam or dutch guiana or netherlands guiana or syria or syrian arab republic or tajikistan or tadjikistan or tadjhikistan or tadjhik or tanzania or tanganyika or thailand or siam or timor leste or east timor or togo or togolese republic or tonga or "trinidad and tobago" or trinidad or tobago or tunisia or turkey or turkmenistan or turkmen or uganda or ukraine or uruguay or uzbekistan or uzbek or vanuatu or new hebrides or venezuela or vietnam or viet nam or middle east or west bank or gaza or palestine or yemen or yugoslavia or zambia or zimbabwe or northern rhodesia or global south or "africa south of the sahara" or sub-saharan africa or subsaharan africa or africa, central or central africa or africa, northern or north africa or northern africa or magreb or maghrib or sahara or africa, southern or southern africa or africa, eastern or east africa or eastern africa or africa, western or west africa or western africa or west indies or indian ocean islands or caribbean or central america or latin america or "south and central america" or south america or asia, central or central asia or asia, northern or north asia or northern asia or asia, southeastern or southeastern asia or south eastern asia or southeast asia or south east asia or asia, western or western asia or europe, eastern or east europe or eastern europe or developing country or developing countries or developing nation? or developing population? or developing world or less developed countr* or less developed nation? or less developed population? or less developed world or lesser developed countr* or lesser developed nation? or lesser developed population? or lesser developed world or under developed countr* or under developed nation? or under developed population? or under developed world or underdeveloped countr* or underdeveloped nation?</p>

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2. Developing countries/

3. 1 or 2

Concept 2: Community participation in research

4. (((participat* or communit* or partner*) adj3 research) or (communit* adj3 (participat* or engage* or mobili?ation or intervention*)) or participatory or CBPR).ti,ab,sh,kf.

5. Community-based participatory research/

6. Community participation/

7. 4 or 5 or 6

Concept 3: Urban settings

8. (urban* or city or cities or metropol* or megacit* or megalop* or municipalit* or "informal settlement" or "informal settlements" or slum* or favela* or "shanty town" or "shanty towns" or ghetto* or bustee*).ti,ab,sh,kf.

9. Urban Health/

10. Urban Population/

11. Cities/

12. Urbanization/

13. Poverty Areas/

14. 8 or 9 or 10 or 11 or 12 or 13

Final search strategy

15. 3 and 7 and 14

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278 The search strategy will be developed with the input from a librarian and the research
279 team to identify new keywords.[43] After our initial screening in MEDLINE, we will search
280 the included articles for new keywords. A new search will then be conducted combining
281 the newly found MeSH terms and keywords to the existing search. A librarian will assess
282 whether these new terms should be included in the final search strategy. When all articles
283 are screened, we will search the reference lists of selected studies to identify additional
284 studies meeting our inclusion criteria.

285 286 Study selection

287 Following the search, all identified citations will be collated and uploaded into
288 Covidence,[44] and duplicates will be removed. Study selection will be conducted in two
289 phases by two independent reviewers, who will reconcile differences by consensus. A
290 third independent reviewer will help resolve any further disagreement.

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292 The initial screening of the retrieved sources will use titles and abstracts. The second
293 phase of selection will use full text. Reasons for excluding sources at full text that do not
294 meet the inclusion criteria will be recorded and reported in the review. The results of the

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3 295 search and the study selection process will be reported in the flow diagram developed by
4 296 PRISMA-ScR.[32,45]

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6 298 Because the aim of scoping reviews is to map the available evidence on a specific topic,
7 299 we will not perform an assessment of the methodological quality or risk of bias of the
8 300 articles included in the review.[29] However, the data extraction form will report the
9 301 research design as well as the data collection and analysis methods of selected articles.
10 302 This will allow us to dress a portrait of the available evidence on the factors influencing
11 303 the participation of urban communities in research.
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13 304 14 305 **Data extraction**

15 305
16 306 Two reviewers will develop and pilot a data extraction form, and extract the data in
17 307 Covidence.[44] The form will include:

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20 309 a. Details on the study (title, names of the authors, year of publication, study
21 310 objectives, research design, and data collection and analysis methods)
22 311 b. The country and the urban settings in which studies were conducted
23 312 c. Characteristics of participating communities
24 313 d. If available, the definitions of 'community' and 'urban setting' used by the authors
25 314 e. The participation approach used and the extent of community participation
26 315 f. The findings regarding the factors (barriers, enablers, and other factors) influencing
27 316 the participation of urban communities in public and global health research
28 317 g. If available, the relative influence (qualitative or quantitative) of the factors identified
29 318 on community participation
30 319 h. If available, other relations among the factors identified, and their relative influence
31 320 on community participation
32 321 i. Explanation of the relationships between factors (quotes from the articles)
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35 323 We will not systematically extract data on the results of the studies since this is outside
36 324 the scope of the review objectives and research question.
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38 325
39 326 The data extraction form will be piloted before beginning the study selection process with
40 327 a random sample of 5 studies among all the studies to be reviewed. The pilot test will help
41 328 identify missing data and will contribute to ensuring that the reporting of participation
42 329 approaches and factors influencing community participation is coherent across studies
43 330 and between the two reviewers. The data extraction form will be modified and revised as
44 331 necessary, in an iterative manner, during the data extraction process. Modifications will
45 332 be detailed in the report of the review.
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48 334 Any disagreements on data extraction that arise between the two reviewers at the pilot or
49 335 data extraction stages will be resolved by consensus, or by discussion with a third
50 336 independent reviewer if necessary.
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52 337 53 338 **Data analysis and presentation**

54 338
55 339 The presentation of results will follow the PRISMA-ScR guidelines.[32] We will present
56 340 the results in tables and use fuzzy cognitive mapping (FCM) to illustrate how the different
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3 341 factors identified influence community participation in research, adapting the *Weight of*
4 342 *Evidence* approach.[27,46] A narrative summary will also accompany the tabulated and
5 343 mapped results, describing how the results relate to the review objectives and questions.
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8 345 FCM uses graph theory and fuzzy logic to generate soft models of how change could
9 346 happen based on assumed causal relationships.[47–49] These soft models are illustrated
10 347 through graphs called fuzzy cognitive maps (Figure 1), which are used to represent
11 348 assumed causal relationships between concepts.[50,47] The maps use nodes (factors
12 349 affecting the issue) and edges (arrows representing the relationships between factors),
13 350 weighted by the relative strength of their influence on the issue of interest.[51,47,27]
14 351 Depending on the knowledge source of the maps, edges can have different values (hence
15 352 the term *fuzzy*) to quantify their influence in a relative way.[49]
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18 354 FCM will be the cornerstone for the presentation of the scoping review, through the
19 355 creation of fuzzy cognitive maps to represent: 1) each article included in the review; and
20 356 2) a composite map for the whole review. FCM will allow to summarize in a composite
21 357 map the relative influence that each factor might have on community participation, in
22 358 relation to all the other factors identified in the review.[27,28,47] We will go through several
23 359 steps (detailed below) to create the composite literature-based fuzzy cognitive map of the
24 360 barriers and enablers to community participation (Figure 2).
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26
27 362 First, we will create one fuzzy cognitive map for each article selected in the scoping review
28 363 (Step 1 in Figure 2). In each individual map, community participation will be the outcome
29 364 of interest. We will include each barrier and enabler of community participation mentioned
30 365 in the article (point e in the data extraction form) as a node in the map, which we will
31 366 organize in a table. This table will have two initial columns indicating the origin factor (from)
32 367 and the consequence factor (to). Additional columns will present the evidence supporting
33 368 the relationship between both factors from the article (point h in the data extraction form).
34 369 Each relationship identified will be a row in the table.[49]
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38 371 Second, once all the individual tables are created, we will standardize the names of the
39 372 factors across the individual articles so that they can be comparable (Step 2 in Figure
40 373 2).[46] On each individual map reporting the relationships identified in each study, we will
41 374 calculate fuzzy transitive closure in the open access CIETmap 2.0 (Step 3 in Figure 2).[52]
42 375 Fuzzy transitive closure is a mathematical model used to calculate the influence of each
43 376 relationship on community participation, considering all the possible relationships
44 377 represented in the map.[53,54] After transitive closure, each relationship will have a value
45 378 between 0 (having no influence) and 1 (having the strongest influence) to represent the
46 379 relative strength of their influence on community participation, with positive and negative
47 380 signs indicating whether the relationship is stimulative or inhibitive.[27,53]
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50 382 Third, we will create a composite map for the whole review (Step 4 in Figure 2). To create
51 383 this composite map, we will attribute weights to each node using Harris' discourse
52 384 analysis, an analytical approach developed in the 1950s based the frequency of
53 385 occurrence of discourse elements sharing similar meanings in a body of text, such as a
54 386 literature review.[55,46] We will consider the frequency of occurrence of each relationship
55 387 across the maps developed for each article in the scoping review. This means that a factor
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3 388 that is repeated in multiple maps would have a stronger causal meaning for community
4 389 participation than a factor only mentioned in one or two maps.[46] We will establish the
5 390 relative frequency of factors by dividing each occurrence by the highest frequency across
6 391 all the maps. We will therefore obtain a value between 0 for the relationships that did not
7 392 exist and 1 for the relationship most frequently mentioned.[46] These different steps will
8 393 allow us to create a composite map representing all the factors identified in the scoping
9 394 review, weighted according to their relative frequency.
10 395

11 396 **Patient and public involvement**

12 397 We will include a consultation phase in the scoping review, as Arksey & O'Malley (2005)
13 398 recognize the benefit of discussing the results of a review with experts.[56] The *Weight of*
14 399 *Evidence* approach, which we will adapt for this scoping review, advocates for experiential
15 400 knowledge to be considered on an equal footing with the evidence synthesized from the
16 401 literature.[27] Therefore, in the context of the larger project, which adopts a participatory
17 402 methodology and involves a community advisory board, people concerned with the issue
18 403 of interest (*i.e.*, participation of urban communities in health research) will be invited to
19 404 contextualize the scoping review.
20 405

21 406 After conducting the scoping review, stakeholders in Dhaka will develop their own fuzzy
22 407 cognitive maps on the factors that they believe can influence community participation in
23 408 the Bangladeshi context. After developing their maps, they will interpret the literature-
24 409 based map from the scoping review by comparing the results with their own maps. We
25 410 will seek the perspectives of three stakeholder groups, namely public and global health
26 411 researchers, community-based organizations, and community stakeholders.
27 412

28 413 Finally, we will use the composite map from the scoping review and the various maps from
29 414 these three stakeholder groups to generate a final map incorporating these two knowledge
30 415 sources. The literature-based map, the stakeholder maps and this final map will be
31 416 reviewed through deliberative dialogue with stakeholders in Dhaka.[57] The maps and
32 417 discussions with stakeholders will inform decision-making for the cluster randomized
33 418 controlled trial on dengue testing a participatory community mobilization intervention,
34 419 where communities in Dhaka will develop their own solutions to reduce dengue infection.
35 420 These steps will be conducted and reported separately.
36 421

37 422 **ETHICS AND DISSEMINATION**

38 423 This scoping review does not require ethics approval. However, the consultation process
39 424 is part of a larger project which will need to be approved by the University of Montréal's
40 425 Research Ethics Committee for Science and Health in Montréal (Canada), and the
41 426 Institutional Review Board of the James P. Grant School of Public Health at BRAC
42 427 University in Dhaka (Bangladesh). We will apply for ethics approval for the larger project
43 428 at both universities by August 2023. We will share the results from the scoping review with
44 429 the scientific community through scientific articles and presentations at conferences, and
45 430 with local stakeholders in Dhaka through a participatory process involving fuzzy cognitive
46 431 mapping and deliberative dialogue. Results from this process will directly inform the
47 432 implementation of the cluster randomized controlled trial on dengue in Dhaka.[26]
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3 4344 435 **DISCUSSION**

6 436 This protocol described a scoping review which will seek to identify and map the factors
7 437 that can influence the participation of urban communities from low- and middle-income
8 438 countries in public and global health research. The review will contribute to the
9 439 understanding of how to foster the participation of these communities in research, so that
10 440 it can better respond to local needs. Given that marginalized urban communities represent
11 441 a particularly hard-to-reach group in research and that urban health is a growing priority
12 442 of public and global health, findings from this review will be useful for researchers and
13 443 communities who wish to collaborate to improve population health.

14 444
15 445 The use of the *Weight of Evidence*, an innovative approach to knowledge synthesis
16 446 whereby scientific and experiential knowledge are brought into conversation, will allow for
17 447 the contextualization of the scoping review in the lived experience of stakeholders in
18 448 Dhaka.[27,46,58] The procedures described in this scoping review protocol open the
19 449 possibility for contextualizing literature reviews in lived experience in any context.

20 450
21 451 One of the main challenges that we anticipate for the realization of our scoping review is
22 452 the time necessary to screen articles, as we expect that our search will yield a large
23 453 number of studies. Discussions on the inclusion and exclusion criteria between the two
24 454 reviewers and the research team prior to starting the screening process will contribute to
25 455 ensuring our efficiency. We also recognize potential limitations of our scoping review.
26 456 First, it is possible that we miss studies that could have been relevant to our scoping
27 457 review objectives if they were published outside the scientific literature (e.g., grey
28 458 literature, reports from international or community organizations). Because we focus on
29 459 articles written in English or French, we could also miss studies relevant to our objectives
30 460 published in other languages. Our rigorous screening approach conducted by two
31 461 independent reviewers will facilitate greater inter-reviewer reliability and maximize our
32 462 chance of identifying all relevant studies. Second, the representation of the barriers and
33 463 enablers of community participation as causal relationships through fuzzy cognitive
34 464 mapping is not meant to illustrate probability, but rather to represent soft models of
35 465 causality that need empirical testing. In addition, our identification and classification of
36 466 barriers and enablers of community participation rest on our subjective interpretation of
37 467 the evidence. However, the use of fuzzy cognitive mapping and Harris' discourse analysis
38 468 to synthesize the results from the scoping review offers an operator-independent way to
39 469 analyze and communicate the relative influence of the factors identified on community
40 470 participation.[28] The literature-based map will in turn inform a mapping process involving
41 471 stakeholders from Dhaka (Bangladesh), as part of the larger project. Third, we recognize
42 472 that most research conducted in urban settings in LMICs focus on urban poor populations.
43 473 It is therefore possible that most of the studies included in our review discuss underserved
44 474 or marginalized populations, which is not necessarily representative of all communities
45 475 living in cities in LMICs.

46 476
47 477 Better understanding the factors that influence the participation of communities in
48 478 research could support a shift from researcher-driven health research towards research
49 479 that is more inclusive of community voices and needs. Fostering authentic community

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3 480 participation in research can contribute to the movement for decolonizing public and global
4 481 health. This can also bring benefits to marginalized communities through interventions
5 482 that are more relevant to their contexts and needs.
6 483
7 484

9 485 **ACKNOWLEDGEMENTS**

10 486 The authors would like to thank the health librarians Sylvie Fontaine and Viviane Angers
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12 488 like to thank members of the CIET/PRAM research lab at McGill University for sharing
13 489 their expertise with us.
14 490

15 491 **AUTHORS CONTRIBUTIONS**

16 492
17 493 MCGD developed the scoping review protocol, the search strategy and wrote the first
18 494 version of the manuscript. KZ and NA contributed to the development of the larger project
19 495 to be conducted in Dhaka, as part of the COESA cluster randomized controlled trial. GF
20 496 contributed to drafting the scoping review protocol. IS and NA provided expertise on fuzzy
21 497 cognitive mapping, Harris' discourse analysis and the *Weight of Evidence* approach. All
22 498 authors read, provided feedback, and approved the final manuscript.
23 499
24 500

25 501 **DATA AVAILABILITY**

26 502 Not applicable
27 503
28 504

29 505 **FUNDING**

30 506 This work was supported by the Fonds de recherche du Québec – Santé (FRQS) through
31 507 a doctoral research scholarship awarded to the first author. This scoping review is part of
32 508 a larger project supported by the Canadian Institutes of Health Research through the
33 509 Project Grant program 201803PJT-400444-RC2-CFCA-120159. These institutions did not
34 510 play a role in the development of this protocol.
35 511
36 512

37 513 **COMPETING INTERESTS**

38 514 None declared.
39 515
40 516

41 517 **LEGENDS OF FIGURES**

42 518
43 519 **Figure 1. Example of a fuzzy cognitive map and associated concepts**
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46 522 **Figure 2. Steps of the fuzzy cognitive mapping process for the scoping review.**
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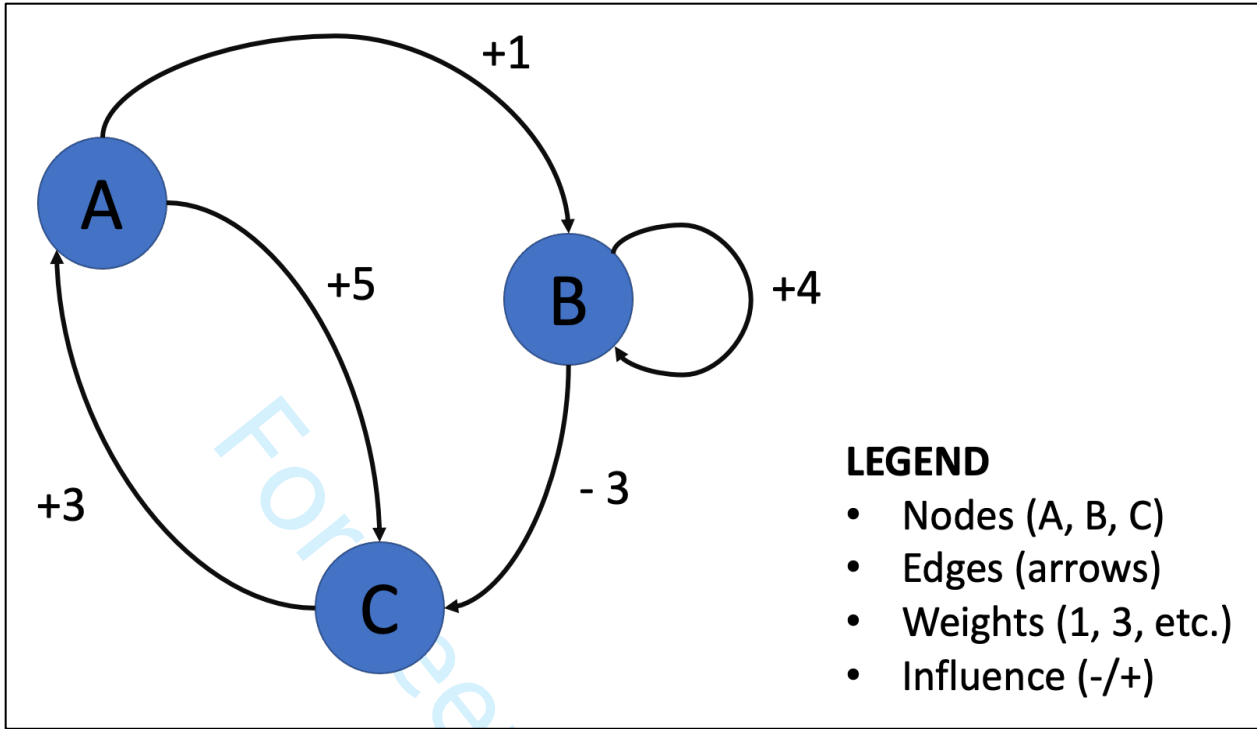
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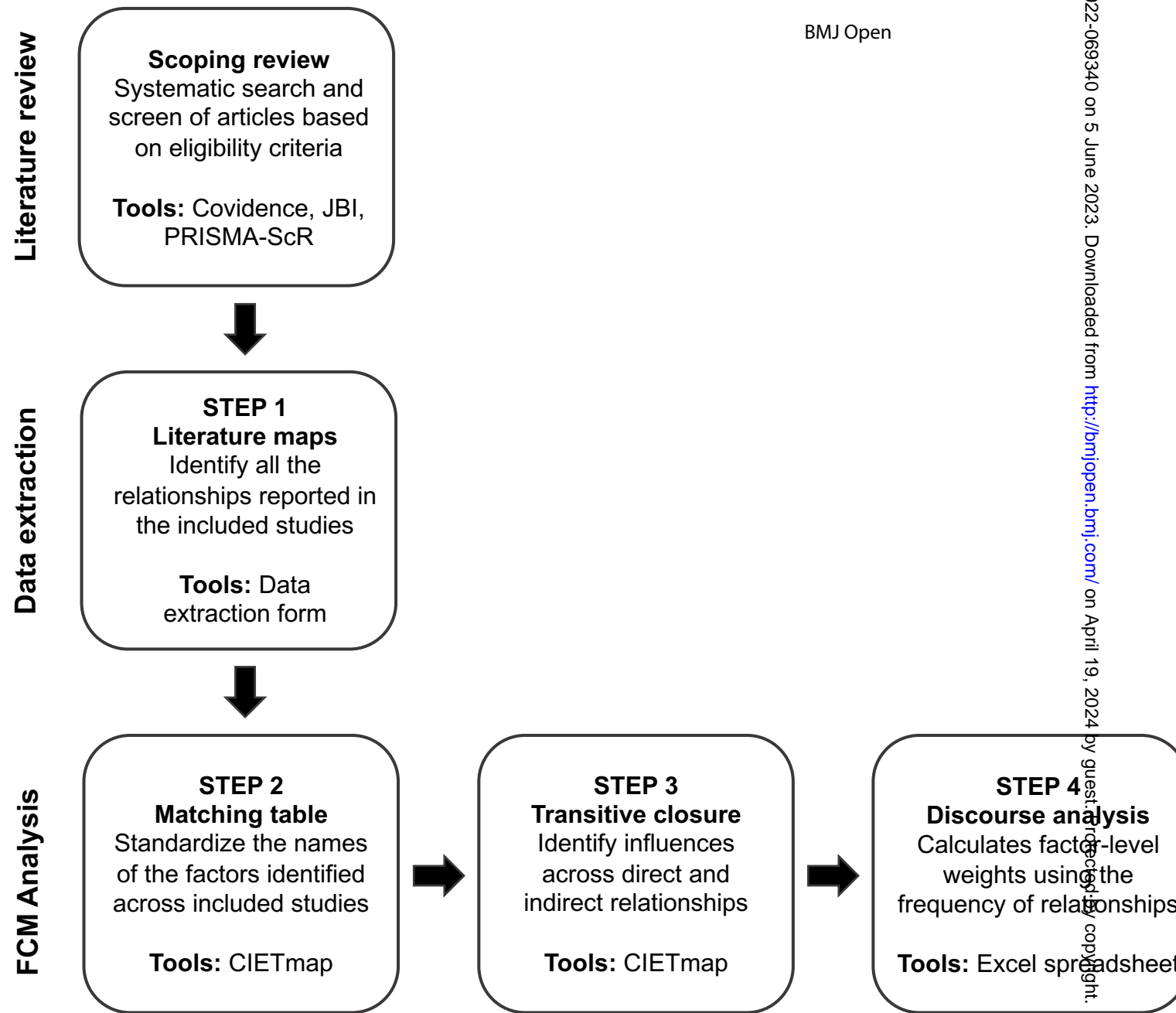
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Figure 2. Steps of the fuzzy cognitive mapping process for the scoping review.

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PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 4:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Sponsor	5b	Provide name for the review funder and/or sponsor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 12
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 3 (bottom)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 4 (bottom)
METHODS					

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 5-6
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 5 (top); Page 6 (bottom)
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 6-8
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 8
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 9 (point e)
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 8-9 (points of data extraction form)
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2 , Kendall's tau)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pages 9-10
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A

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