

## REVIEW PROTOCOL

### Review title and timescale

1 Review title

Give the working title of the review. This must be in English. Ideally it should state succinctly the interventions or exposures being reviewed and the associated health or social problem being addressed in the review.

Systematic literature review of built environment effects on physical activity and active transport – an update and new findings on health equity

2 Original language title

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

N/A

3 Anticipated or actual start date Give the date when the systematic review commenced, or is expected to commence.

01/06/2015

4 Anticipated completion date Give the date by which the review is expected to be completed.

31/05/2017

5 Stage of review at time of this submission Indicate the stage of progress of the review by ticking the relevant boxes.

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

## Review team details

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10 Organisational affiliation of the review

The University of Auckland, Auckland, New Zealand

11 Review team members and their organisational affiliations

Title	First name	Last name	Affiliation
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12 Funding sources/sponsors

This research was funded by the New Zealand Ministry for Business, Innovation and Employment (grant number 29898). MS is supported by a Health Research Council of New Zealand Sir Charles Hercus Research Fellowship (grant number 17-013).

13 Conflicts of interest

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review. Are there any actual or potential conflicts of interest?

No

14 Collaborators

Give the name, affiliation and role of any individuals or organisations who are working on the review but who are not listed as review team members.

N/A

## Review methods

15 Review question(s) State the question(s) to be addressed / review objectives.

1. To identify which environmental interventions increase physical activity in residents at the local level

2. To build on the limited evidence base on the effectiveness of built environment interventions for influencing health inequalities by systematically exploring the effectiveness of these interventions by ethnicity and socio-economic status.

16 Searches

Give details of the sources to be searched, and any restrictions (e.g. language or publication period). The full search strategy is not required, but may be supplied as a link or attachment.

A systematic search of Scopus, Ovid (all journals), ProQuest Science, ProQuest Social Science, and the Transport Research International Documentation database (comprising the US Transportation Research Board's Transport Research Information Services database and the Organisation for Economic Co-operation and Development Joint Transport Research Centre's International Transport Research Documentation database). Searches were limited to English-language articles that were published or in press, with no date restrictions. Keyword searches of article abstracts and titles were conducted using three categories: 1) environments, 2) physical activity or travel modes, and 3) natural experiments, or prospective, retrospective, experimental, or longitudinal. Search terms were identified from MeSH subject headings in PubMed, previous similar reviews, and the knowledge and expertise of the research team.

17 URL to search strategy

N/A, aside from current document and pending publication.

18 Condition or domain being studied

Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.

Physical activity (self-reported, observed, or objectively assessed), active transport (self-reported or observed), and visitation to or use of a setting (e.g., counts of riders on new cycleways; counts of playground users).

19 Participants/population

Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.

Children and adults. No age limits were employed.

20 Intervention(s), exposure(s)

Give full and clear descriptions of the nature of the interventions or the exposures to be reviewed.

For the purposes of this examination, a relatively broad definition of built environment (intervention/exposure) was used, with the aim of identifying and understanding the range of modifiable factors in the external neighbourhood environment that may impact people's physical activity or travel behaviours. Accordingly, 'built environment' encompassed either interventions or changes occurring at the individual level (e.g., due to moving), or at the local, neighbourhood, or town scale. Measures were all objective and included geographic information systems-derived variables (e.g., dwelling density, distance to destinations), community infrastructural or streetscape

intervention typologies (e.g., shared spaces, naked streets), natural or built aesthetic factors in the neighbourhood environment (e.g., tree planting, signage, wayfinding), and measures of other relevant environmental supports for physical activity or active travel (e.g., playground features). Recognising the contribution that public transport use can make to physical activity accumulation, studies assessing changes in access to public transport (e.g., distance to closest public transport stop, park-and-ride interventions) were also eligible. As the focus was on being able to isolate the effect of built environment features or interventions, studies investigating aggregate measures (e.g., walkability, walk score), or studies combining infrastructural and “soft” (e.g., awareness programmes, social media, organised programmes) interventions where the effect of the infrastructural intervention could not be isolated were not included. Conversely, studies that included infrastructural and soft interventions but where findings enabled the effect of the infrastructural intervention to be isolated were included.

21 Comparator(s)/control

Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group).

Comparison/control groups were not required for articles to be included in the review.

22 Types of study to be included

Give details of the study designs to be included in the review. If there are no restrictions on the types of study design eligible for inclusion, this should be stated.

Natural experiments, or prospective, retrospective, experimental, or longitudinal studies.

23 Context

Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.

There is a dearth of systematic reviews where the ability to isolate the effect of the built environment from other intervention types is assessed.

24 Primary outcome(s)

Give the most important outcomes.

Physical activity, active transport, visitation to or use of a setting.

25 Secondary outcomes

List any additional outcomes that will be addressed. If there are no secondary outcomes enter None.

None

26 Data extraction (selection and coding)

Give the procedure for selecting studies for the review and extracting data, including the number of researchers involved and how discrepancies will be resolved. List the data to be extracted.

Titles and abstracts of articles were screened by the lead author and included if they met the eligibility criteria. Where it was unclear whether articles met the inclusion and exclusion criteria from the abstract and title, full-text articles were sourced. Where bibliography searches identified article titles as possibly relevant, article abstracts were sourced and screened using the above criteria. All processes (i.e., identification of articles, data extraction, quality assessment) were duplicated by a co-author (JH) with a random selection of 10% of each dataset. Any disagreement was resolved

through discussion, and any necessary amendments made to each process. A study-specific data extraction form was generated from a previous systematic review of health impacts of new roads and the Effective Practice and Organisation of Care data collection form. Data were extracted for all included articles across seven categories: general information, population and setting, methods, participants, intervention groups, outcome measures, and results. In addition, data were extracted on whether the effect of the built environment differed by ethnicity or socio-economic status.

27 Risk of bias (quality) assessment

State whether and how risk of bias will be assessed, how the quality of individual studies will be assessed, and whether and how this will influence the planned synthesis.

Strength of evidence for each article was determined using the Evaluation of Public Health Practice Projects Quality Assessment Tool (EPHPP). Findings were also summarised in the context of study quality to gauge risk of bias and understand the strength of evidence provided.

28 Strategy for data synthesis

Give the planned general approach to be used, for example whether the data to be used will be aggregate or at the level of individual participants, and whether a quantitative or narrative (descriptive) synthesis is planned. Where appropriate a brief outline of analytic approach should be given.

We will provide a narrative synthesis of the findings from the included studies, structured around the type of intervention/study type (active transport infrastructure, parks and playgrounds, walkability components), target population (child, adult, all), and outcome (physical activity, active transport, visitation to or use of setting). We anticipate that there will be limited scope for meta-analysis because of the range of different measurement approaches employed to generate dependent and independent variables, and the substantial variation in intervention/study type.

29 Analysis of subgroups or subsets

Give any planned exploration of subgroups or subsets within the review. 'None planned' is a valid response if no subgroup analyses are planned.

Data were extracted on whether the effect of the built environment differed by ethnicity or socio-economic status (SES). Studies were eligible for the latter if they reported effect estimates stratified by ethnicity or SES, or examined effect modification/interactions between the intervention or exposure variable and ethnicity or SES. Eligible measures of ethnicity included self-reported or objectively assigned ethnicity or race. Eligible measures of SES included income, educational level, occupation and home ownership, as well as composite indices of SES such as deprivation index, measured at individual or neighbourhood level.

**Review general information**

30 Type and method of review

Systematic review, Public health (including social determinants of health)

31 Language

English

Will a summary/abstract be made available in English?

Yes

32 Country

New Zealand

33 Other registration details

N/A

34 Reference and/or URL for published protocol

Give the citation for the published protocol, if there is one. Give the link to the published protocol, if there is one. This may be to an external site or to a protocol deposited with CRD in pdf format. I give permission for this file to be made publicly available

Yet to be published.

35 Dissemination plans

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

We intend to publish this systematic review in a scientific, peer-reviewed, academic journal and at scientific conferences.

36 Keywords

Give words or phrases that best describe the review.

Built environment

Physical activity

Active transport

37 Details of any existing review of the same topic by the same authors

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

N/A

38 Current review status

Review status should be updated when the review is completed and when it is published.

Completed but not published 21/12/2017

39 Any additional information

Provide any further information the review team consider relevant to the registration of the review.

N/A