

# Reconnecting urban planning with health: a protocol for the development and validation of national liveability indicators associated with noncommunicable disease risk behaviours and health outcomes

Billie Giles-Corti<sup>a,b,c,m</sup>, Hannah Badland<sup>a,c</sup>, Suzanne Mavoa<sup>a,c</sup>, Gavin Turrell<sup>c,d</sup>, Fiona Bull<sup>b,c</sup>, Bryan Boruff<sup>b,c</sup>, Chris Pettit<sup>c,e</sup>, Adrian Bauman<sup>f</sup>, Paula Hooper<sup>b,c</sup>, Karen Villanueva<sup>a,c</sup>, Thomas Astell-Burt<sup>c,g,h</sup>, Xiaoqi Feng<sup>c,g,i</sup>, Vincent Learnihan<sup>j</sup>, Rachel Davey<sup>j</sup>, Rob Grenfell<sup>c,k</sup> and Sarah Thackway<sup>l</sup>

<sup>a</sup> McCaughey VicHealth Centre for Community Wellbeing, University of Melbourne, Victoria, Australia

<sup>b</sup> Centre for the Built Environment and Health, University of Western Australia, Perth, Australia

<sup>c</sup> National Health and Medical Research Council Centre for Research Excellence in Healthy, Liveable Communities, Melbourne, Victoria, Australia

<sup>d</sup> School of Public Health and Social Work, Queensland University of Technology, Brisbane, Australia

<sup>e</sup> Australian Urban Research Infrastructure Network, University of Melbourne, Victoria, Australia

<sup>f</sup> School of Public Health, University of Sydney, NSW, Australia

<sup>g</sup> School of Science and Health, University of Western Sydney, NSW, Australia

<sup>h</sup> Centre for Health Research, School of Medicine, University of Sydney, NSW, Australia

<sup>i</sup> School of Geography and Geosciences, University of St Andrews, Scotland

<sup>j</sup> Centre for Research and Action in Public Health, University of Canberra, ACT, Australia

<sup>k</sup> National Heart Foundation, Melbourne, Victoria, Australia

<sup>l</sup> NSW Ministry of Health, Sydney, Australia

<sup>m</sup> Corresponding author: [b.giles-corti@unimelb.edu.au](mailto:b.giles-corti@unimelb.edu.au)

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## Abstract

**Aim:** Liveable communities create the conditions to optimise health and wellbeing outcomes in residents by influencing various social determinants of health – for example, neighbourhood walkability and access to public transport, public open space, local amenities, and social and community facilities. This study will develop national liveability indicators that are (a) aligned with state and federal urban policy, (b) developed using national data (where available), (c) standard and consistent over time, (d) suitable for monitoring progress towards creating more liveable, equitable and sustainable communities, (e) validated against selected noncommunicable disease risk behaviours and/or health outcomes, and (f) practical for measuring local, national and federal built environment interventions.

**Study type:** Protocol.

## Key points

- Liveable communities create the conditions to optimise health and wellbeing outcomes in residents
- We will develop national liveability indicators aligned with state and federal urban policy that can be used for measuring local, national and federal built environment interventions
- When national liveability indicators are developed and validated, we will explore the creation of a national database of built environment spatial indicators that can be linked to health survey data

**Method:** Over two years, the National Liveability Study, funded through The Australian Prevention Partnership Centre (TAPPC), will develop and validate a national set of spatially derived built environment liveability indicators related to noncommunicable disease risk behaviours and/or health outcomes, informed by a review of relevant policies in selected Australian state and territory governments. To create national indicators, we will compare measures developed using national data with finer-grained state-level data, which have been validated against a range of outcomes. Finally, we will explore the creation of a national database of built environment spatial indicators.

**Results:** A national advisory group comprising stakeholders in state and federal government, federal nongovernment organisations and state-based technical working groups located in the ACT, Victoria, NSW, Queensland and WA has been established; a policy analysis is under way and work programs are being prepared.

**Conclusion:** This project seeks to build the capacity for built environment and health systems research by developing national indicators to monitor progress towards creating healthy and liveable communities. This ambition requires multisector engagement and an interdisciplinary research team.

## Introduction

Recognition that city design impacts public health was established in the 19th century in response to outbreaks of infectious disease.<sup>1</sup> Recently, there have been calls for public health and planning disciplines to reconnect<sup>1</sup> to 'create healthy cities' that facilitate healthier lifestyles, which in turn might contribute to reducing the risk of noncommunicable disease.<sup>2</sup> Urban form that promotes walking, cycling and public transport is now being recommended by multiple sectors, including public health<sup>3</sup>, transport<sup>4</sup> and planning<sup>5,6</sup>, and the creation of 'liveable and sustainable' communities is a priority within state<sup>7</sup>, national<sup>8</sup> and international<sup>9</sup> urban policies. For example, Plan Melbourne<sup>6</sup> and the draft Metropolitan Strategy for Sydney<sup>5</sup> encourage active travel (e.g. walking, cycling) as innovative metropolitan planning approaches to transition to more sustainable cities. Similarly, in Western Australia, the Liveable Neighbourhoods Guidelines, first trialled in 1998, replace conventional design codes to facilitate the development of more sustainable suburban communities.<sup>10</sup>

From a population health perspective, a 'liveable' community is one that is safe, attractive, affordable, and environmentally and economically sustainable; socially cohesive; has good access to public open space, employment, education, shops and services; and has effective public transport and walking and cycling infrastructure. As such, many liveable attributes are features of the built environment.<sup>11</sup>

A number of recent reviews and studies demonstrate the association between built environment attributes and various health outcomes, suggesting that community design affects travel mode choices, physical activity levels and vehicle kilometres travelled.<sup>3,4,12,13</sup> Thus, creating safe, pedestrian-friendly and cycle-friendly

neighbourhoods with access to local amenities and well-designed public open spaces benefits health through increased physical activity and reduced levels of obesity.<sup>14</sup> Furthermore, liveable communities have the potential to promote mental health<sup>15</sup>, including reducing the incidence of depression and social isolation, by creating a sense of community and social support.<sup>16,17</sup> These communities also facilitate access to healthier food options to encourage healthy eating<sup>18,19</sup>, and minimise access to alcohol and gambling outlets<sup>20-23</sup>, thereby limiting exposure to, and engagement in, behaviours that damage health.

Liveable communities create conditions that can optimise health and wellbeing outcomes in residents by influencing various social determinants of health<sup>24</sup> through provision of supportive infrastructure: walkable neighbourhoods, public transport, public open space, local amenities, and social and community facilities. The notion of the health benefits of liveable communities is consistent with initiatives such as the World Health Organization's Healthy Cities Movement that, for more than two decades, has promoted the creation of health-enhancing cities.<sup>25</sup> Yet, until recently, limited systematic research has examined the influence of these 'upstream' factors on health outcomes<sup>24</sup>, and even less attention has been paid to how best to measure them within a policy context. To our knowledge, no research has examined how these factors impact people with differing levels of disadvantage, so there is limited understanding about how urban environments can deliver and equitably distribute health benefits.

Over two years, the National Liveability Study, funded through The Australian Prevention Partnership Centre (TAPPC), aims to develop and validate a national set of spatially derived built environment liveability indicators that impact on noncommunicable disease risk

behaviours and/or health outcomes. The work will be done in collaboration with a team recently established through a National Health and Medical Research Council (NHMRC) Centre for Research Excellence (CRE) in Healthy, Liveable Communities, and the Australian Urban Research Infrastructure Network (AURIN) ([www.aurin.org.au](http://www.aurin.org.au)). Liveability indicators will be (a) aligned with state and federal urban policy, (b) developed using national data (where available), (c) standard and consistent over time, (d) suitable for monitoring progress towards creating more liveable, equitable and sustainable communities, (e) validated as being associated with selected noncommunicable disease risk behaviours and/or health outcomes, and (f) developed to provide a practical mechanism for local through to national organisations to measure the impact of activities in their relevant jurisdiction.

This paper describes the protocol for the study. Details of the project can be found on the CRE for Healthy, Liveable Communities website ([www.mccaugheycentre.unimelb.edu.au/research/nhmrc\\_centre\\_for\\_research\\_excellence\\_for\\_healthy\\_liveable\\_and\\_equitable\\_communities](http://www.mccaugheycentre.unimelb.edu.au/research/nhmrc_centre_for_research_excellence_for_healthy_liveable_and_equitable_communities)) at the University of Melbourne's McCaughey VicHealth Centre for Community Wellbeing.

## Method

Geographic information systems (GISs) can process spatially referenced, multilayered spatial data to create objective exposure measures of the built environment, and are increasingly being used in public health research.<sup>26–28</sup> Using a GIS, we propose to develop, trial and validate spatial metrics appropriate for urban environments in metropolitan city regions and major towns across Australia.

The selection of appropriate liveability indicators will be informed by the ongoing work of the Place, Health and Liveability research team (University of Melbourne) at the McCaughey VicHealth Centre, which has recently reviewed the evidence on conceptualising and measuring liveability from a public health perspective.<sup>11,29</sup> Our starting point for measurement will be based on acquiring and deriving data for the five domains of liveability that are potentially associated with chronic disease outcomes (Table 1). We will review relevant plans and policies of selected Australian state and territory governments for each domain, and then create a set of liveability indicators based on the policies and data available.

A national advisory group comprised of stakeholders in state and federal government, federal nongovernment organisations and state-based technical working groups located in the ACT, Victoria, NSW, Queensland and WA will provide advice during the project. State-based technical working groups will review previously used indicators identified from the literature across the physical activity, urban planning and transportation fields, as well as current urban planning policy, and present their

**Table 1.** Built environment domains to be considered in this project

Domain	Description
Alcohol	Accessibility to licensed and off-licence premises
Local food and other goods	Accessibility to local food outlets (e.g. grocery stores, supermarkets, restaurants, take-away outlets) and a diverse range of local retail outlets and services
Public open space	Accessibility to parks, open spaces and vegetation
Transport	Accessibility to public transport and private motor vehicles, modal share (% of passengers using transport modes), and household travel patterns
Walkability	Accessibility to street connectivity, land use mix and residential density

Source: Badland et al.<sup>11</sup>

recommendations to the national technical team, which will agree on appropriate spatial measures for each indicator. Each state-based technical working group will then identify and source relevant state-level and national-level spatial data to develop and validate each indicator.

## Validating the indicators

Three approaches will be taken to validate and assess the feasibility of the liveability indicators:

1. *Examining the association of the indicators with a range of health behaviours and, where available, noncommunicable disease outcomes*  
 State-based indicators of liveability will be linked to state-based (and where available, national) health behaviour and health outcome data, and cross-sectional associations will be examined.
2. *Comparing indicators developed using national data with finer-grained, state-level data*

Generally, data available at a national scale are less sensitive than the finer-grained data available at city and state levels. Consequently, we will compare indicators developed using national-level data (coarser-grained) with indicators developed using state-level information (finer-grained). For example, previous work by our group reported associations between physical activity and public open space access indicators, developed using nationally available land use data (sourced from the Australian Bureau of Statistics 'mesh block' dataset, which contains broad land use classes).<sup>30</sup> These national-level measures will be compared with public open space indicators developed using finer-grained, state-level datasets, such as POS Tool in WA ([www.postool.com.au](http://www.postool.com.au)), allowing assessment of the validity of using national-level mesh block data to calculate an indicator of public open space. Once the validity of

each data source is confirmed, the national-level GIS indicators will be finalised.

3. *Exploring the potential for creating a national database of built environment spatial indicators that can be used (a) for state and national research, (b) to inform local planning to improve infrastructure access and reduce noncommunicable disease and inequalities, and (c) to monitor changes in urban policy and planning*

The final stage of this project will be to scope the feasibility of developing and maintaining a national built environment spatial database from which liveability indicators could be applied to state and national-level health studies. This will be informed by stakeholder consultation and ongoing national database initiatives such as AURIN<sup>31</sup>, the Australian National Development Index ([www.andi.org.au](http://www.andi.org.au)), Research Data Australia (<https://researchdata.andis.org.au>) and Australian Government datasets ([www.data.gov.au](http://www.data.gov.au)).

## Conclusion

The National Liveability Study aims to build the capacity for systems research relating to the built environment and health, and to develop a set of national indicators that can be used to monitor progress towards creating healthy and liveable communities. It builds on research involving the development of built environment GIS indicators and validation with health behaviours and outcomes conducted by our team and collaborators. Such a program of work requires involvement from many stakeholders and disciplines: an approach well aligned with the shared objectives and aspirations of TAPPC and the CRE in Healthy, Liveable Communities.

Through a national advisory group, stakeholders (such as state and local government, nongovernment organisations, and policy and planning practitioners) will co-create and integrate this research into their practice and monitoring. The national advisory group will provide guidance to assist in the development of the liveability indicator database, as well as being end users of this resource. To facilitate research translation and application, the study results will be disseminated to stakeholders using a range of methods, including policy briefs, and regional (e.g. regional management forums), state and national (e.g. Planning Institute of Australia) planning and policy meetings and workshops, with the intention that the indicators are used in these agencies' regular reporting and monitoring frameworks.

The liveability indicators developed by this study will also be made available to end users, including (but not limited to) the Community Indicators Victoria program (housed in the Place, Health and Liveability Program, McCaughey VicHealth Centre, University of Melbourne), the Sax Institute in NSW, the University of Western Australia's Centre for the Built Environment and Health, the ACT's University of Canberra and the national AURIN portal. Using existing infrastructure and stakeholder partnerships maximises the likelihood that the indicators

will be used in regional and national urban planning policy and related monitoring.

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## Competing interests

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