Walking for Transport as a Mediator Between Residential Density and Body Mass Index : Do Effects Vary by Neighbourhood Disadvantage

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INTRODUCTION

The contribution of physical activity has been highlighted as a possible mediator of built environment-body weight associations, but missing from the literature is the longitudinal evidence supporting these associations and an understanding of whether these relationships vary across different neighbourhood socio-economic contexts. One such built environment feature is residential density, which has attracted growing interest from researchers and policymakers alike. This interest stems not only from residential density's potential for accommodating rapid population growth but also from its possible health-promoting effects in lowering BMI and reducing obesity.

OBJECTIVE

To examine the longitudinal mediating role of walking for transport in the association between residential density and body mass index; determine whether this association is moderated by neighbourhood disadvantage.

- *There is a complex interplay between residential density, WfT, and BMI with results varying across neighbourhood socio-economic contexts.*
- *Anticipated health benefits of density is context-specific; one size fits all policy approach might not be applicable.*

METHODS

Study data and population

- a multilevel longitudinal study
- examines changes in physical activity, sedentary behaviour, associated health comes and relative contributions of environmental, social, psychological, sociodemographic factors

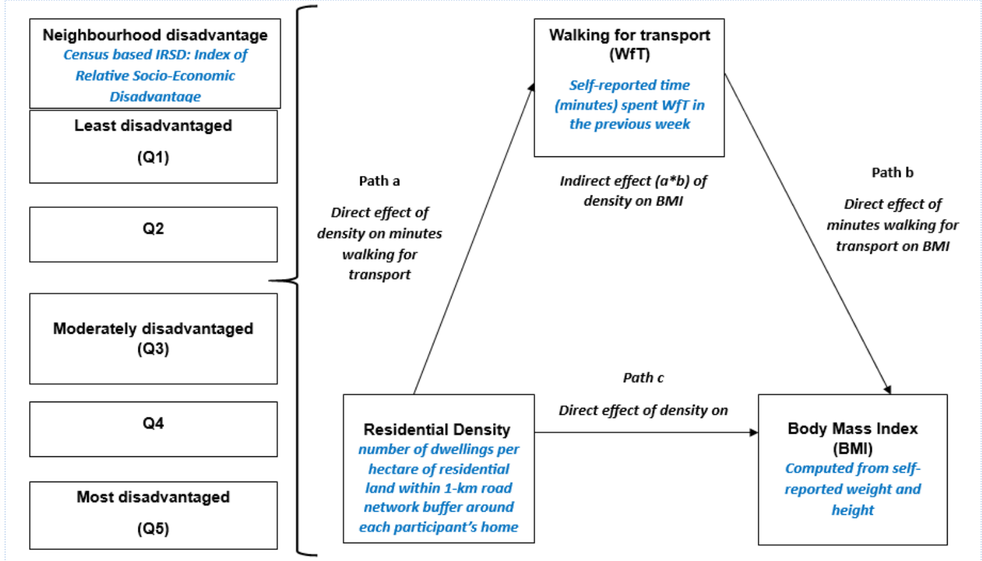
Study area

200 randomly selected neighbourhoods in Brisbane

- **Target population:** mid-age adults (40-65 years)
- **Five waves:** 2007 (11,035 participants at baseline), 2009, 2011, 2013, and 2016

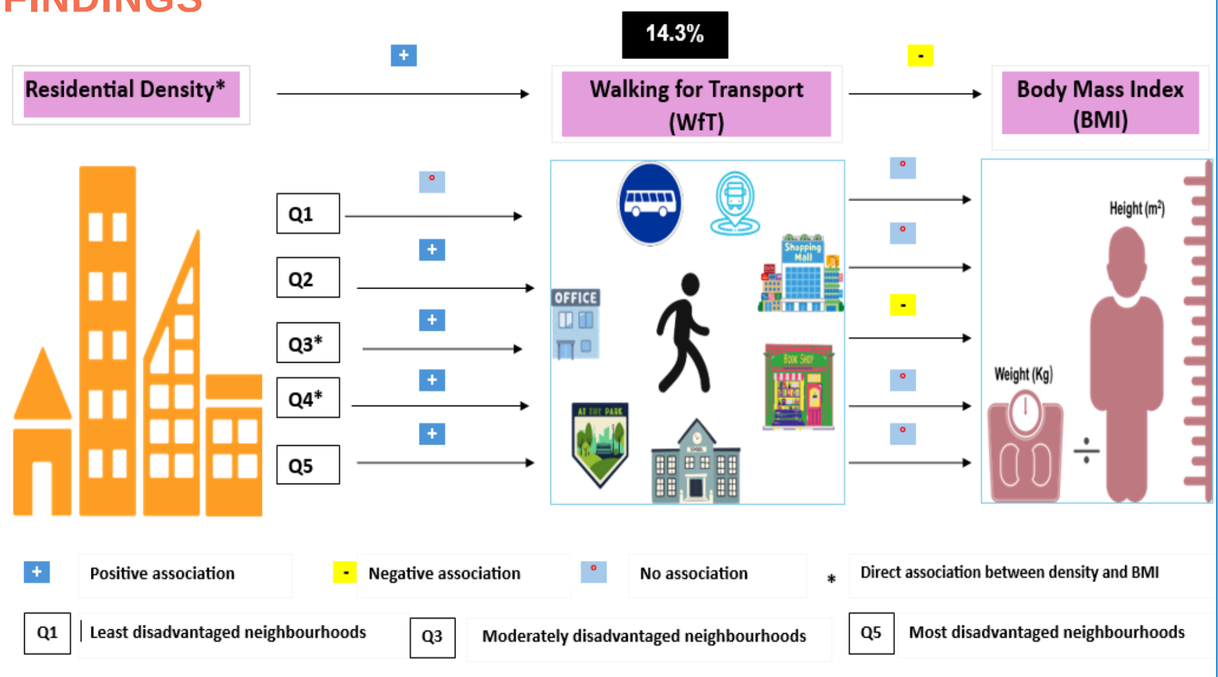
ANALYTIC APPROACH

N=25334 observations, 8161 individuals



Path diagrams representing effects (direct and indirect) of residential density on BMI assessed using generalised structural equation models adjusted for age, sex, education level, occupation, household income, neighbourhood disadvantage, residential self-selection, distance to Brisbane Central District

FINDINGS



Main model results:

- Living in highly dense residential neighbourhood was associated with greater WfT and lower BMI.
- WfT explained about 14.3 % of residential density-BMI association.

Stratified model results:

- Density facilitated WfT in all neighbourhoods except in wealthy neighbourhoods (Q1)
- Greater WfT was associated with lower BMI in Q3 only and mediated 13.8% of the density-BMI association.