

## Evidence Brief: Neighbourhood walkability and physical activity in urban areas



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### Issue and Research Question

The World Health Organization's physical activity guidelines recommend that adults do at least 150 minutes of moderate-intensity physical activity (e.g. brisk walking) per week.<sup>1-3</sup> Most people do not meet these guidelines, which increases their risk of developing many chronic diseases.<sup>2-7</sup> Public policies are attempting to address this issue through community-level environmental changes that aim to increase physical activities such as active transportation.<sup>8</sup> With the goal of informing such policies, research has increasingly focussed on neighbourhood walkability as a modifiable aspect of the environment that may influence physical activity behaviour.<sup>9,10</sup> Walkability is a measure of how well a neighbourhood promotes walking. For instance, a neighbourhood with a mix of land uses and well-connected streets is considered highly

walkable.<sup>11</sup> Recent studies point to associations between walkability and walking for transport, but evidence on associations between walkability and leisure-time physical activity and total physical activity is inconsistent.<sup>12,13</sup> We therefore sought to compile the evidence on walkability's relationship with each of these three outcomes among urban residents. We did not look at studies of rural residents because associations between walkability and physical activity are likely different in rural populations.<sup>14</sup>

This Evidence Brief asks: Is neighbourhood walkability associated with transport walking, leisure-time physical activity, or total physical activity among non-rural residents who work/attend school?

## Methods

MEDLINE, EMBASE, PsycINFO, CINAHL, Environment Complete, and SocIndex were searched on June 16<sup>th</sup>, 2014 using search strategies developed by a Research Librarian. The search was intended to locate systematic review-level evidence published between January 1<sup>st</sup> 2005 and June 16<sup>th</sup> 2014. English-language systematic reviews were eligible if they examined associations between varying levels of neighbourhood walkability characteristics and walking for transport, physical activity for leisure, or total physical activity among non-rural populations who work or attend school. Titles and abstracts were screened by one PHO staff member and 20% of these were also screened by a second reviewer for verification. Any disagreements on inclusion were resolved by discussion until consensus was reached. Full-text articles that met inclusion criteria after review of the titles and abstracts were retrieved, reviewed as full-text documents, and information was extracted from each relevant article by one reviewer. The full search strategy can be obtained from PHO.

## Main Findings

The search identified 189 articles, from which 11 unique systematic reviews met inclusion criteria. Studies in the included reviews yielded 2207 comparisons relevant to the research question, although it is expected that separate systematic reviews included overlapping studies and therefore some duplicate comparisons.

Seven of the 11 included systematic reviews focused on working-age adults.<sup>15-21</sup> Four of these examined comparisons between walkability or its various components (e.g., population density, land-use mix, utilitarian and recreational destinations, walking facilities, route connectivity) and walking for transport.<sup>15-18</sup> All four found the majority of reported estimates of association between walkability characteristics and transport walking were

statistically significant positive associations. However, all three reviews examining associations between walkability and recreational walking or other leisure physical activities found that the majority of comparisons were not statistically significant.<sup>16-18</sup> Four out of the five reviews that looked at all types of physical activity combined also found that the majority of comparisons were non-significant.<sup>16,18-20</sup> The fifth review did not tabulate the number of statistically significant estimates, but suggested that walkability may be associated with total physical activity.<sup>21</sup>

The following results were reported by the four systematic reviews that examined children: Two reviews found consistent positive associations between distance to school and active school transport.<sup>22,23</sup> Reviews looking at population density and active school transport had mixed results, with one finding that most estimates did not show statistically significant associations and another describing consistent evidence that density is positively associated with active transport.<sup>22,23</sup> For other aspects of walkability, such as land-use mix, street connectivity, and walking facilities, most of the identified associations with active transport were not statistically significant.<sup>21,22</sup> None of the reviews focused specifically on leisure physical activity. Only one review looked at associations between various walkability characteristics and total physical activity, and found that most identified associations were not statistically significant.<sup>24</sup>

One systematic review looked solely at adults over age 65.<sup>25</sup> This review included comparisons between walkability characteristics and each outcome of interest: transport walking, leisure-time physical activity, and total physical activity. For all three outcomes, most associations were not statistically significant.<sup>25</sup>

## Discussion and Conclusions

Our summary of review-level evidence found the majority of primary studies examined by the

reviews that met our inclusion criteria show statistically significant associations between neighbourhood walkability and walking for transportation, but not between walkability and leisure-time physical activity or overall physical activity. A common limitation is that the synthesis method used by most reviews was the vote counting method, which relies solely on statistical significance and does not account for magnitude of association, precision, or study quality. Therefore, while there is consistent evidence that walkability is associated with transport walking, the risk of bias in this evidence was not assessed, nor was the magnitude of the associations. Similarly, while there is little evidence that walkability was associated with leisure-time or total physical activity, study precision was not assessed, so the lack of evidence could be due to underpowered studies. That is, studies may not have included enough participants to identify a statistically significant association.

Regarding the research question, there is consistent evidence of an association between walkability and transport walking, but not for an association between walkability and leisure-time or total physical activity. Most of the primary studies included in the reviews were cross-sectional and were therefore unable to establish a temporal relationship between walkability and physical activity. More research is needed in the form of rigorous and well-powered longitudinal studies before strong conclusions can be made.

## Implications for Practice

Public health and urban planning policy makers should consider evidence from cross-sectional studies that suggests walkability is associated with walking for transport, keeping in mind that more rigorous longitudinal research is needed to establish a causal association. Policy makers should also consider that evidence of associations between walkability and leisure-time or overall physical activity is still lacking.

## Specifications and Limitations

This Evidence Brief presents key findings from the scientific literature. Its purpose is to investigate a research question in a timely manner in order to help inform decision making. This report is not a comprehensive review of the literature, but rather a rapid assessment of the best available research evidence. There may be relevant pieces of evidence that are not included and these may alter the conclusions drawn from the document.

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