MINI-REVIEW: WELLNESS INDICATOR – BUILT AND NATURAL ENVIRONMENTS

Prepared for MaRS Discovery District

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- OVERVIEW -

Built and natural environments are places that can be developed, used, and repurposed to facilitate health behaviours such as physical activity, healthy eating, and social interactions. As such, a number of interventions targeting **neighbourhood housing**, **vacant and underutilized lots**, **natural, green/blue spaces**, **paths and trails**, and **urban streetscapes** have been implemented and assessed. Included in this mini-review is a brief summary of the academic literature (including, where appropriate, grey literature identified through the search of academic sources) that reported on interventions, services, community initiatives, and policies in relation to the built and natural environments. We also highlighted the possible impact on very vulnerable populations (VVP) as appropriate.

As requested by MaRS Discovery District, the scope of the review was limited to literature reporting on interventions (services, etc.) that: assessed or evaluated (qualitatively and/or quantitatively); focused on inner city/urban communities (i.e., excluding rural and suburban) in high-income countries; and were published in the previous 10 years (or key papers outside that time period) in English. As such, the aim of this review is to provide a broad environmental scan rather than an in-depth assessment of the literature as described. As requested, we also assessed the aforementioned literature according to five political factors: **duration of intervention/assessment** (i.e., long-term or short-term); **governance and conflict resolution models**; **data-sharing processes**; **service delivery models** (i.e., centralized or dispersed); and **integration of a systems-level approach**.

- FINDINGS -

NEIGHBOURHOOD HOUSING

Neighbourhood housing interventions often aim to promote housing security and increase the diversity of residents in particular areas. Examples interventions include mixed-forms of housing tenure (i.e., the financial arrangements under which someone has the right to live in a residence[1–3]), mixed-income developments (i.e., diverse types of housing units[4]), housing voucher programs (i.e., financial assistance to ensure safe, sanitary housing[4]) and neighbourhood regeneration[2]. Assessments of these interventions have varied and produced mixed results. For example, research examining the health impacts of mixed-forms of housing tenure has reported improved mental health and reduced smoking and alcohol-related illnesses[3]. When residents have been re-housed within mixed tenure developments, however, they reported disruption to social networks and increased costs[2]. Similarly, voucher programs, given that they often require VVP to relocate to low-poverty neighbourhoods, have also had negative effects on social networks (for those who relocate as well as those who are left behind[4]). Additionally, discrimination, segregation, and displacement have resulted from mixed-income developments and neighbourhoods that have undergone substantial revitalization (i.e., gentrification[2,4,5]).
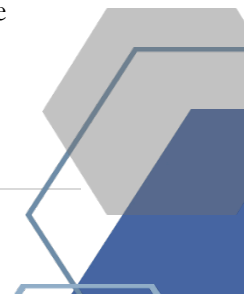
VACANT AND UNDERUTILIZED LOTS

Interventions that aim to repurpose **vacant and underutilized lots** have focused on brownfields[6,7], parcels of open land[7–12], rail corridors[7], and back alleys[7]. These interventions increase the number and accessibility of public spaces, particularly in low-income areas[7,8]. Revitalization programs (i.e., the cleaning and/or greening of vacant and underutilized lots) have been linked to increases in physical activity[7,9,13], stress reduction[9], psychological wellbeing[8], decreases in vandalism[9], and reductions in gun assaults[9]. The primary issues experienced when repurposing vacant and underutilized lots are site maintenance, ownership, and financial constraints for structural enhancements (e.g., trees, fencing, vegetable gardens[6,8,10,14]). Revitalization efforts have also been connected to increased property values, which can force the displacement of low-income residents[7,8].

NATURAL GREEN/BLUE SPACES

Natural, green/blue spaces (e.g., parks, woodland, lakes) located in disadvantaged, urban areas tend to be subject to neglect and underutilization[7,15]. As such, a number of interventions have focused on revitalizing natural, green/blue spaces through activities such as garbage/debris removal, signage, entryways, and 'greening' activities (i.e., adding plants, trees, and shrubs[12,14–19]). The reported benefits of revitalizing natural, green/blue spaces have varied. For example, some interventions found residents perceptions of safety increased[12,15]. Others reported positive associations with mental health[18], leisure-time physical activity[15,18], and social interactions[17,20]. Structural changes (e.g., fitness/playground equipment, seating, fencing, art) have increased the utilization of parks[19,21,22], resulting in increases in physical activity levels[19,21–24] and decreases body weight[23].

PATHS AND TRAILS

The development and improvement of **paths and trails** in urban areas have been widely discussed in the academic literature. Structural improvements that have been assessed include signalized crosswalks[19,25], stairwell improvements[26], paved trails[27], pedestrian bridges[19,27], sidewalk installation and improvements[19], bicycle boulevards and lanes[19], and signage and wayfinding[19]. These structural improvements have been associated with increases in physical activity (e.g., active transportation, walking, commuter cycling[26–28]) and safety related improvements including reductions in traffic speeds[25] and perceptions about neighbourhood safety[26].

URBAN STREETSCAPE

Urban streetscape is the term used to describe the design and quality of urban streets. A number of interventions have focused on improving urban streetscapes through activities such as the installation of furniture and public art[19,20,29], the inclusion of pedestrian plazas[16,30], improvements in street lighting[19,20,31], traffic calming (e.g., reduced parking, speed limits, raised crosswalks[20,32]), incorporation of vegetation and landscaping[20,29,31–33], accessible Wi-Fi networks[29], the addition of closed-circuit television (CCTV)[2,31], and street vendor regulations[34]. Studies examining the impact of these interventions have been mixed. For example, while efforts to increase street safety and attractiveness resulted in an increase in physical activity and pedestrian traffic[32]; improved street lighting and the addition of CCTV only minimally reduced residents' fears related to urban crime[2,31]. Additionally, regulations related to street vendors were found to negatively impact

immigrant populations (financially, emotionally, and physically) because they were unable to obtain the required permits[34].

DURATION

With regards to the **duration** of interventions, the majority we reviewed were implemented over a period of one to twelve years[17,26,27,35,36]. This is most likely due to the nature of the interventions (i.e., modifications to the built and/or natural environments). However, most studies examining the impact of these interventions were cross-sectional, meaning causation could not be determined[20]. Researchers have suggested that longitudinal studies be implemented to provide more nuanced data about the long and short-term benefits and consequences of interventions that focus on the built and natural environments[12,20,25,27,28].

GOVERNANCE AND CONFLICT RESOLUTION MODELS

The importance of collaboration, that is **governance and conflict resolution models**, was discussed in the majority of the reviewed literature[5,8,13,16,26,29,30,33,37,38]. Specifically, diverse, interdisciplinary, cross-departmental collaborations were recommended to ensure mutual benefit, the effective use of community strengths and resources, shared decision-making, and sustainability[5,26,29,30,33,37,38]. Despite the importance of collaboration, however, it was also suggested that stakeholders be cautious about ongoing strategy development as it may substitute or delay the implementation of identified initiatives[33].

DATA-SHARING PROCESSES

End-of-research **data-sharing processes** were not discussed in the reviewed literature. However, a number of studies did included publically available data in their analysis. These public data sources included census data[3,9,27], tax records[9], police records[9], postal service records[9], health records[3]; and national health surveys[3,14,27]. Given the benefit of using publicly available data sources, it was also recommended that researchers develop formal partnerships with agencies that collect large amounts of data (e.g., police departments, hospitals)[12]. Additionally, health impact assessments be conducted to further assess and share the results of interventions that target the built and natural environments[13].

SERVICE DELIVERY MODELS

Service delivery models were not discussed as part of the reviewed interventions. One reason for this may be because urban streetscapes, paths and trails, and natural, green/blue spaces are primarily publically accessible. Some interventions did appear to be implemented according to best practices (e.g., greening practices, lighting practices[19,20,31–33], but there was also recognition that communities should be cautious when using standardized practices, as they risk underestimating the diversity of people and places[39].

SYSTEMS-LEVEL APPROACHES

In reference to **systems-level approaches**, interventions were implemented on case-by-case basis, with funding coming from multiple government and non-government sources[8,16,35,36,38,40]. Even with these multi-level funding approaches, however, authors highlighted a number of indirect and

incidental consequences (e.g., increases in property values resulting in the displacement of low-income residents) when modifying the built and natural environments[7,8,33,34].

KEY MESSAGES

➢ Built and natural environments can be developed, used, and repurposed to facilitate health behaviours such as physical activity, healthy eating, and social interactions.

➢ Community participation is important for the sustainability of interventions. As such diverse, interdisciplinary, cross-departmental community collaborations are recommended to ensure mutual benefit, the effective use of community strengths and resources, shared decision-making, and sustainability.

➢ When planning and implementing changes to the built and natural environments, it is important that the unintended consequences (e.g., displacement of low-income residents) be considered. Changes should therefore be made in tandem with policies that account for, and prioritize, the health inequities among underserved or disadvantaged groups. These policies must also recognize, and account for, the impact of political will, competing interests, and market demand.

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