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Health Information for Health Promotion at (Urban) Neighbourhood Level

Weng Ian (Anna) Au
Architecture for Health, Technische Universität Berlin, Germany
Macao Library and Information Management Association, Macau SAR
E-mail address: weng.i.au@campus.tu-berlin.de

Abstract:

Health promotion is the salutogenic approach to health. It focuses on "health" instead of "healthcare"; it creates environments which encourage health promoting lifestyles. Disease prevention, on the contrary, is the pathogenic approach to health. It focuses on healthcare, i.e. after the onset of diseases. As healthcare for non-communicable disease patients is the major burden on health systems worldwide, health promotion is becoming more and more crucial to achieve sustainability of health systems. With increasing urban population, the emphasis on the salutogenic approach to health in urban areas is pivotal since the urban environment shapes dwellers' lifestyle. Providing planners and researchers relevant health data and information of the urban environment at neighbourhood level is thus important to create urban health promoting settings, especially when/if certain health-related outcomes are specific to certain neighbourhoods. However, while these data and information are not uncommon at national level (and sometimes city level), those at neighbourhood level are scarce. Due to the length and time limitation, the author only focuses on the urban built environment. The correlations between some urban built environments and health-related outcomes, e.g. diet, physical activities, social capital, are reviewed. "Walkability for Health", an urban built environment assessment tool is also reviewed. The author concludes that despite the abundance of studies regarding urban built environment and health-related outcomes, the translation of these correlations to health data and information is still challenging. Future studies should focus on developing comprehensive schemes to translate health determinants in the urban built environment into useful health information.

Keywords: health promotion, disease prevention, healthcare, walkability, active transportation

Health, Health System, Health Promotion, and Diesase Prevention

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization (WHO), 2014). This definition of health has remained unchanged since its last amendment in 1948 (WHO, 2017). Achieving health is thus not only treating diseases, but also building positive health.

As also seen in the different meanings of "health system" and "healthcare system", the two approaches to health can be distinguished although they were considered as interchangeable terms in a glossary of terms by WHO in 2004.

As the focus of “healthcare system” is on clinical care, nursing care, and healthcare services, its context is regarded as the pathogenic approach to health. On the other hand, as recognized in its wordings, “health system” focuses on “health”, but not only “healthcare”. In other words, health system encompasses both the pathogenic approach – healthcare – and the salutogenic approach – health promotion – to health. This could be supported by WHO’s (2007) expansion of the definition of health system as a system which “consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health”. Furthermore, Ziglio et al. (2011) also suggested that the scope of health system included disease prevention, health promotion, and developing healthy policies in addition to healthcare.

Health Promotion: How Far Are We Now?

Health promotion, as defined by WHO (1986, 2017b), is “the process of enabling people to increase control over, and to improve, their health”, meaning to empower people to make decisions on their lifestyle which are conducive to positive health. Improving, reinforcing, and sustaining health behaviours (e.g. healthy diet, physical activities, positive social interaction) and reducing risk behaviours (e.g. smoking, excessive alcohol consumption, drug abuse) are thus the ways to achieve positive health.

However, almost 40 years after Antonovsky’s (1979) salutogenesis model was published and 20 years after recommending salutogenesis as a better approach for health promotion (Antonovsky, 1996), health systems nowadays are still inclined to healthcare. This is proven by the fact that over 60% of the total global mortality is caused by non-communicable diseases (NCDs) (WHO, 2017c), meaning people’s lifestyle was not changed or improved to one that could have quenched even the onset (incidence), let alone mortality, of these preventable diseases. As a result, after the incidence, these people depend on healthcare to impede the course of their diseases until they die of them or the complications of them. In addition, NCDs remained to be the biggest contributor of global disability-adjusted life-years (DALYs) (Kassebaum et al., 2016). Health promotion is, therefore, not as progressive as it should have been.

Urban Environment and Health

Though not only urban dwellers are susceptible to NCDs, the development of the urban environment creates more circumstances, e.g. easy access to unhealthy food and limited spaces for physical activities, to mold its inhabitants’ unhealthy lifestyle (UN HABITAT and WHO, 2016). Moreover, with increasing urban population (54% in 2014 and 66% by 2050 (UN Department of Economic and Social Affairs, 2014)), it implies that more people’s lifestyle will be shaped by the urban neighbourhood environment for the better or for the worse.

Diet

In a study in Spain, it was found that people were more inclined to obtain food available in the proximity of their living area (Gracia and Miguel Albisu, 1999), meaning the quality of diet was correlated to availability of certain food and accessibility to particular food environments in their neighbourhoods. It was also concluded by Macdiarmid et al. (2013) in their study on challenges of sustaining healthy dietary that an improved food environment with more ready healthy meals would encourage people to choose healthy food, especially those who did not have time cook for themselves. Moreover, provision of unhealthy food, e.g. fast food, in neighbourhoods was found to be correlated to obesity of the inhabitants in a systematic review (Papas et al., 2007). Higher level of school-community engagement in obesity prevention targeting healthy diet and physical activity of schoolchildren was found to be more effective than those with lower level in the U.S. (Krishnaswami et al., 2012). Another systematic review and meta-analysis on effectiveness of diet interventions performed by Adriannse et al. (2011) observed that promoting healthy diet was more effective to some degree than reducing consumption of unhealthy food.

Physical activities

A correlation was found between easy access to parks in neighbourhoods and higher total moderate to vigorous physical activity (MVPA) in adults in Mexico (Jáuregui et al., 2016). Moreover, inhabitants of neighbourhood with low level of walkability, high level of sprawl, insufficient recreational facilities in the neighbourhood, etc. were also found to be associated with overweight or obesity according to Papas et al.'s systematic review (2007). A sustained MVPA was observed in secondary-schoolers in disadvantaged areas in New South Wales, Australia after two years of implementation of "Physical Activity 4 Everyone" programme, which involved the input efforts of schools, teachers, community, and parents (Sutherland et al., 2016). An increase in walking behaviour was reported in female elderly by the end of their participation in a 2-year volunteering programme in a public elementary school in Baltimore City, Maryland, U.S.A. (Varma et al., 2016). It implied a correlation between being socially active and physically active.

Social interactions / social capital

After a participatory urban renewal project, the City Repair Project, to reinvent public open spaces in three neighbourhoods in Portland, Oregon, U.S.A., more than half of the surveyed residents increased affection towards their neighbourhood and 30% responded more social interactions than before (Semenza and March, 2008). It was concluded by Semenza and March (2008) that "community involvement in urban design can enrich social networks with direct benefits for social capital and well-being". People living a more walkable neighbourhood tends to possess a higher degree of social capital, and vice versa (Leyden, 2003). In "Urban Sprawl and Public Health", Frumkin et al. (2004) found a link between social capital and physical health and mental health. Lower mortality, morbidity, and a more resilient body are a few benefits connected to high social capital (Frumkin et al., 2004).

Above all, numerous evidence from studies found out that urban green spaces were conducive to physical, mental, and environmental health as WHO (2016) reviewed researches published in the last decade regarding this matter. It helps relaxation and restoration, enable social interaction, improve immune system, increase physical activity and reduce obesity, buffer urban noise and produce natural sounds, reduce exposure to air pollution, reduce heat-island effect, etc. (WHO, 2016).

Therefore, while the different urban environments reflect different health-related outcomes specific to different neighbourhoods, these environments can be planned and developed to support health promoting behaviours which are conducive to urban dwellers' positive health. By emphasizing this salutogenic approach to health in the urban environment, health systems will be assuaged from the burden of costly healthcare in the long run.

Information Gap at Neighbourhood Level

As advised in WHO's "Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies" (2010), health information system should provide information on health determinants, inputs to the health system, output of the health system, health outcomes, and health inequities with the involvement of stakeholders to guarantee users' accessibility to health information. The timely provision of relevant health information is thus critical to enable researchers, health professionals, planners, etc. to discover health-related issues, conceive strategies to tackle the problems, and improve health-related outcomes.

However, while aggregated health data and information at national level, and sometimes city level, are not uncommon in the databases of statistics or health departments, those at neighbourhood level are scarce. Tackling health determinants then becomes especially difficult because health information at national level or city level may or may not represent the actual health-related outcomes at neighbourhood level. Although projects like WHO's Healthy Cities emphasize interventions at local level, the data and information collected as grounds for plans and implementations are usually only cross-sectional; longitudinal data and information which shows the changes in health-related outcomes are not always available. To fill in this information gap, the information community needs to develop a system or framework for ongoing collection of health data and information at the neighbourhood level so as to facilitate scholars' and practitioners' researches and/or intervention plans. Addressing this gap and reviewing current tools designed to obtain health information in the urban environment for health promotion are thus the purpose of this article. Despite the various aspects of health determinants, the author focused on health information on the urban built environment for health promotion due to the limitation of time and resources.

Health Information for Health Promotion

Health determinants, or the factors that affect individual and/or community health, include mainly the social and economic environment, the physical environment, and individual characteristics (WHO, 2017d). Since different urban neighbourhood settings are contributive to different lifestyles and health-related outcomes, a systematic and continuous effort to gather information on the characteristics of these health determinants is the key to generate neighbourhood health profiles, reveal disadvantaged neighbourhoods and their health-related issues, provide scientific reasoning for intervention plans, and evaluate implementation effectiveness. An example of common practices of utilizing health information for formulation of intervention plans is using disease rates, e.g. incidence, prevalence, mortality, to allocate resources for disease prevention and track changes in population health. However, the orientation of this type of health information inclines to disease prevention instead of health promotion, meaning the strategies of intervention tackle risk factors, but not accentuate protective factors.

Protective factors for positive health in the urban built environment are not unknown; they are in fact profusely studied. Several systematic reviews and books show the correlation between active transportation (i.e. walking and biking) and different aspects of health (Cervero, 2003; Ewing and Cervero, 2010; Frank et al., 2012; Frumkin et al., 2004; Leyden, 2003; Papas et al., 2007; Speck, 2012). They all concluded that a more walkable and bikeable neighbourhood creates a better physical connection between its residents and its health promoting settings, thereby is a more health promoting neighbourhood. Evaluating neighbourhood walkability and bikeability is therefore the gist of acknowledging features which are health promoting or health detrimenting.

Existing Frameworks for Assessing Active Transportation

Across the years, several studies produced different frameworks, guidelines, and checklists as guidance to assess the level of support which the urban built environment offers for health behaviours (e.g. healthy diet, sufficient physical activities, positive social interaction). Some examples are Ewing et al.'s (2006) qualitative and quantitative evaluation of urban designs for walkability, Walk Score (Walk Score, 2007), Rattan et al.'s (2012) automated method to assess walkability at macro level, Park's (2008) measurement of walkability indicators at micro level, O'Hanlon and Scott's (2010) survey checklist for assessing community walkability, Nourian Ghadikolaee and Sariyildiz's (2012) assessment model based on network distance metrics and topographic features, Stockton et al.'s (2016) walkability index for London, UK, and Valera Sosa's (2016) "Walkability for Health" assessment framework for urban built environment at neighbourhood level. Moreover, some scholars, like Moudon and Lee (2003), Maghelal and Capp (2011), and Vale et al. (2015), etc., also conducted systematic reviews on many of these evaluation and/or audit frameworks. These reviews showed that (i) the focused variables and scales of the existing evaluation tools varied largely; (ii) these evaluation tools included objective and/or perceptual measures; and (iii) a comprehensive and concise scheme is still yet to be identified.

To the best of the author's knowledge, Valera Sosa's (2016) "Walkability for Health" exhibits a relatively higher level of comprehensiveness among other evaluation frameworks. This framework is thus reviewed in the following.

Walkability for Health

As of June 2017, the latest version of "Walkability for Health" assessment framework is comprised of 19 assessment sheets (see Appendix) which was developed after extensive literature review as a tool to evaluate the factors for active transportation at three levels: macro factors, meso-level patterns, and micro variables. It is noted that these factors should not be considered individually as a determinant for active transportation, but collectively as a group of factors which compensate, complement, or add value to each other.

At macro level, demographic characteristics, uses and health-related services, transportation provision and coverage, and building layout were recognized and mapped. These assessment attributes are categorized into (i) density (population density, density of uses and services, and street density), (ii) diversity (public transportation provision and coverage), and (iii) design (street layout and building layout).

At meso level, street networks, block connectivity, and path continuity were assessed. Street networks in the study site are identified at both motorized transportation scale (street hierarchy) and pedestrian scale (street classification). Block connectivity is determined by assessing pedestrian crossings between blocks. Path continuity is determined by assessing street elements and spatial allocation of each street of the site. All these data are colour-coded and mapped accordingly.

At micro level, safeness, comfort, and visual structure are assessed. Assessment of Safeness is performed by looking into universal access (e.g. ramps), signage and signalization (e.g. traffic lights), and sightline (i.e. determining whether pedestrian view of the street at 1.5 m and 1 m was obstructed). Level of Comfort is assessed by spatial comfort, respite area, noise levels (day and night), and light quality (day and night). Visual structure is gauged by levels of enclosure, transparency (i.e. openings on the building strip and pedestrian strip), complexity (e.g. design and pattern of the buildings on the street), and human scale (e.g. urban furniture, street lamps for pedestrians).

This framework requires the use of secondary demographic and geographic data extracted from both public departments and private institutions. Some of them are, but not limited to, statistics and census department, cartography and cadaster department, and transportation department, transit companies, Google Maps, and Open Street Maps. Besides, the generation of primary data is also necessary for the assessment at meso and micro levels. A field study with photo survey is conducted to obtain qualitative data of the study site. Having these data, users fill in the templates of the assessment sheets to visualize the quality and quantity of the factors for walkability of the study site with softwares like Powerpoint, Photoshop, Illustrator, InDesign, AutoCAD, etc.

The adoption of Walkability for Health evaluation framework exhibits several advantages and drawbacks. They are elaborated as follows.

Advantages

- **Comprehensiveness.** The assessment sheets of Walkability for Health provides a systematic and comprehensive view for its users on factors for walkability. It facilitates its users to observe the connection and interaction among factors across macro, meso, and micro scales.
- **Utilization of secondary data.** Parts of this framework require users to obtain secondary data from various credible sources in order to fulfill the assessment sheets. This enables users to allocate more time and resources on collecting data which could not be otherwise retrieved form secondary sources.
- **Generation of primary data.** The field study and photo survey present the current condition of the urban built environment in the neighbourhood. Results of the evaluation reflect the health-related issues at the moment.
- **Graphical display of information** pinpoints locations with features which are contributive and detrimental to active transportation. By revealing disadvantaged neighbourhoods on maps, resources can be prioritized for residents in need.
- **Applicability.** Walkability for Health was used a tool to conduct assessment on urban neighbourhood built environment in cities such as Berlin, Milan, Valletta, Macau SAR, etc. It is thus proven that this framework can be applied to places of different contexts without compromising its objectivity.

Drawbacks

- **Topography** is not considered as a factor in this framework because it was conceptualized and conceived in Berlin, Germany where topographic challenges are negligible. However, in order to apply Walkability for Health in more diverse contexts, the assessment of topography should be included in the framework in the future.
- The **utilization of secondary data** depends on the premise that recent data, e.g. demographics, disease rate, maps, are made available by credible institutions. In cities with limited resources, this poses a barrier to apply this framework to assess the urban built environment.
- It requires **manual retrieval of data** (both qualitative and quantitative) to generate images for the assessment sheets. This process can be time-consuming and susceptive to human errors.
- **Medium user-friendliness.** It requires competence in specific softwares which may not have been acquired by users of the framework. For those who are not experienced users of softwares like AutoCAD or Photoshop, Walkability for Health can be very challenging. To expand its user-base, Walkability for Health should be developed into a software of its own.

In spite of its shortcomings, Walkability for Health shows potential to be a universal assessment tool for urban built environment in the future.

Conclusions

Despite the many studies correlating the urban built environment to health-related outcomes, a comprehensive and adaptable evaluation scheme is still in development. This becomes an important task because the formulation of health promoting spatial intervention plans depends on scientific translation of health determinants of the urban built environment to useful health information. Further studies should continue on developing and testing urban built environment evaluation schemes so as to enable a prompt provision of health information of the urban built environment.

It also calls for more transdisciplinary collaborations between health professionals, information professionals, and urban built environment professionals at neighbourhood level. The combined expertise of these disciplines bridges the knowledge gap among them when regarding health information and the urban built environment. Together these professions can help build health-promoting neighbourhoods for people; alone they cannot proceed as far.

Disclaimer

This article is based on part of the author's Master's thesis. Any resemblance should not be regarded as plagiarism.

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Appendix

Table 1: Walkability for Health Assessment Sheets (Valera Sosa, 2016)

Macro Factors	
Study Area	A_Site Map
Density	A1a_Population Density A1b_Density of Uses and Services (health-related destinations) • Active Environment • Food Environment • Social Environment • Healthcare Settings A1c_Street Density
Diversity	A2a_Public Transportation Provision A2b_Public Transportation Coverage
Design	A3a_Street Layout A3b_Building Layout
Macro Conclusion Map	A4_ Medical Neighborood Geo Map
Meso-level Patterns	
Street Network	B1a_Street Hierarchy & Classification B1b_Blocks & Street Segments
Block Connectivity	B2a_Pedestrian Crossings Analysis B2b_Street Intersections Summary Map
Path Continuity	B3a_Street Main Element Analysis B3b_Street Space Allocation B3c_Street Pattern Summary Map
Meso Conclusion Map	B4_Continuity & Connectivity Map
Micro Variables	
Safeness	C1a_Universal Access C1b_Signage and Signalization C1c_Sightline
Comfort	C2a_Spatial, Respite Areas, Noise Levels & Light Quality
Visual Structure	C3a_Enclosure, Transparency, Complexity & Human Scale
Micro Conclusion Map	C4_ Pedestrian Environment Map