早稲田大学審査学位論文

博士（スポーツ科学）

概要書

Activity-Friendly Built Environment and Cardiovascular Disease

アクティビティに配慮した建築環境と心血管疾患

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Thesis overview

Emerging research from Asian and Western counties demonstrates the potential impact of urban design on cardiovascular disease. While motivating individual lifestyle changes (e.g., targeting individuals through behaviour change strategies) remains essential in preventing these diseases, sustainable built environment interventions that can impact a high percentage of the population are needed. Nevertheless, the science of modifying the built environment to enhance cardiovascular health outcomes is still in its infancy, with several challenges. This PhD thesis identified the key conceptual, methodological, and policy-relevant issues on the activity-friendly built environment and cardiovascular disease. It discussed how two built environment tools, Walk Score® and space syntax, can address some of this topic's methodological and policy-relevant issues. This PhD thesis is presented through six chapters. Chapter one introduces the research problem, aims, and the significance of this research. Chapter two provides a critical literature review of the previous studies on the activity-friendly built environment and cardiovascular disease. This chapter identifies the critical research gaps and next steps in research on this topic. Chapter three describes the validity of using Walk Score® as a practical, easy-to-use tool for measuring walkability in the context of Japan. The first study examined the concurrent validity of the Walk Score® compared with objectively measured walkable built environment variables. The second study in this chapter explored whether there are also associations between Walk Score® and people's perceived walkable built environment attributes or not. Chapter four describes the concept and theory of space syntax and

explains how space syntax could be relevant to research on (re)designing activity-friendly built environment. Notably, it discussed the space syntax theory of natural movement in detail and identified the pathways through which this theory can be linked to active and sedentary behaviours. Chapter five provides empirical evidence on the role of Walk Score® and space syntax in promoting cardiovascular health. This chapter comprises four studies. The first study explored the associations between Walk Score® and active and sedentary behaviours in Japan. The second study applied space syntax theory to examine how street layouts were associated with active and sedentary behaviours. The third study examined the association between space syntax walkability, a newly-developed index, with sedentary behaviours, as the first study to our knowledge. The fourth study explored how activity-friendly built environment attributes are associated with objectively-assessed cardiovascular risk factors. Chapter six summarises the main findings of this PhD research and discusses the main findings. It also provides the next issues that need to be considered to move research in this field forwards.