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## Original Research

# Promotion of a healthy public living environment: participatory design of public toilets with visually impaired persons

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## ABSTRACT

**Objectives:** The principal objective of a healthy living environment is to improve the quality of everyday life. Visually impaired persons (VIPs) encounter many difficulties in everyday life through a series of barriers, particularly in relation to public toilets. This study aimed to explore the concerns of VIPs in accessing public toilets, and identify methods for improvement. Considerations about user participation are also discussed.

**Study design:** Adopting a case study approach, VIPs were invited to participate in the research process.

**Methods:** In addition to in-depth interviews and field visits, models and a simulated full-scale environment were produced to facilitate the VIPs to voice their opinions.

**Results:** The key findings indicate that the design of public toilets for promoting public health should be considered and tackled from a three-level framework: plain, line and point. Governments, professionals and the public need to consider the quality of public toilets in terms of policy, implementation and management.

**Conclusions:** VIPs have the right to access public toilets. Governments and professionals should respect the particular needs and concerns of VIPs. A three-level framework (plain, line and point) is required to consider the needs of VIPs in accessing public toilets, and user participation is a good way to reveal the actual needs of VIPs.

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## Introduction

Due to worldwide population growth and urban development, the number of people living in most modern cities has increased. Among other urban issues, the promotion and maintenance of a healthy public environment is of major concern to many governments, including those of developed and developing countries. Although the World Health

Organization's first World Health Report in 1995, and many of its subsequent annual reports, have identified issues related to, and stressing the importance of, healthy public environments, the situation in many cities is not satisfactory or in line with their economic status.<sup>1,2</sup>

Health is a fundamental human characteristic of social investment. Healthy environments with clean, safe living conditions are therefore extremely important and a critical

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indicator of the success and well-being of mankind.<sup>3,4</sup> Of all the aspects and areas related to public health and the environment, the quality of public sanitation has received most attention since the early 2000s.<sup>2</sup> For example, the percentage of annual government expenditure allocated to public sanitation has increased in many Asian countries and cities, such as Japan, Singapore, Malaysia, Seoul, Beijing and Hong Kong. Moreover, international and regional events related to public sanitation, such as the Annual World Toilet Summit and the International Toilet Expo, attracted thousands of researchers and professionals who exhibited new inventions and expressed opinions on public sanitation. At the World Toilet Summit in Moscow in 2006, experts from a variety of locations further advocated a global approach to the quality of public toilets whereby considerations should be based on four key aspects: comfort, access, safety and hygiene.<sup>5,6</sup> All of these aspects are linked; for example, access to public toilets is directly and indirectly related to the comfort, safety and hygiene of the public.

While numerous governments claim to be making significant improvements in public sanitation, much research and many mass media reports continue to criticize a very apparent and related issue (i.e. the poor quality of public toilets).<sup>7–10</sup> Moreover, although the importance of, and need for, a barrier-free (and universal) public environment has been raised for more than two decades in many countries and cities,<sup>11</sup> it is questionable whether individuals with special needs have equal opportunities and sufficient assistance to access public toilets.<sup>12–15</sup> Whether public toilets improve environmental quality with respect to public health is another key issue. Among the different groups of individuals with special needs, visually impaired persons (VIPs) face greater difficulties in accessing public toilets but have received less attention than those with physical disabilities.<sup>6,16</sup>

As stated by the World Toilet Organization,<sup>17</sup> the fundamental principle of social impartiality is to ensure that individuals with special needs (and disabilities), including VIPs, have access to facilities that are essential for healthy and satisfactory public environments. Governments need to invest resources in policy, implementation and management in order to increase the access of all people with special needs to public toilets.<sup>7</sup> However, recent policies and structures designed to improve the access of VIPs to public toilets are not specific or comprehensive. Some reviews have adopted too broad a concept of barrier-free design, and have been unable to provide specific principles for improvements with regard to the comfort, accessibility, safety and hygiene of public toilets for VIPs.<sup>6</sup> Moreover, existing public facilities, such as Braille symbols, are not appropriately or explicitly indicated for use by VIPs.

## Methods

To explore the issues and improve the quality of public toilets for VIPs, a research and design project has been conducted as a case study in Hong Kong since 2009. Similar to many metropolitan cities, Hong Kong claims to consider the needs of individuals with different capabilities (i.e. those with special needs and disabilities). However, regarding the policy and

legislation for public toilets, Hong Kong still lags behind other cities with high inclusive and universal standards in the public environment and facilities. Besides the most recent barrier-free policy confirmed in 2008 (after more than 10 years of discussion) as a form of code of practice for architects and engineers, Hong Kong lacks a comprehensive review and policy for equal opportunity in accessing public toilets. For example, the ratio of toilets/compartments for men and women is still solely based on the number of users, instead of considering the different physiological needs of men and women (e.g. time taken to use a toilet). In addition, there is still a lack of policy and facility provision for VIPs to access public toilets. According to the Hong Kong Government's statistics, there were 122,600 VIPs (1.8%) in Hong Kong in December 2008. The government officers and related committee members expect this significant percentage of users to use toilets that are mainly provided for people with physical disabilities. As reported by members of the Hong Kong Blind Union, VIPs can get hurt in these types of toilets. The Hong Kong Toilet Association reported that these errors in perception are due to lack of understanding and lack of in-depth exploration on the matters. The presence of these factors made Hong Kong a suitable case for study.

The main objective of this project was to review the government's barrier-free policy and its directions for the development of an inclusive society, to examine the implementation and management of public toilets, and to identify areas for the improvement of public toilets for VIPs, as well as for people with other motion and sensory capabilities.

For a comprehensive overview of all matters related to public toilets, interviews were conducted with government officers, related committee members, professional designers and management company representatives. Adopting inclusive and participatory approaches, the team invited 38 VIPs (20 men and 18 women) to participate in most stages of the project. The research and design workshops were conducted in the offices/centres of the non-governmental organizations (NGOs) that participated in the study and The Hong Kong Polytechnic University. The activities included in-depth interviews and field visits. The interviews were semi-structured in nature, with questions about the VIPs' daily life habits and common difficulties in accessing public toilets. The field visits were conducted in different types of public environments with different types of public toilets, including those in private owned public spaces. During the interviews and field visits, the NGO representatives (e.g. social workers) helped to invite and communicate with the VIPs, as some of the VIPs had reservations about talking to the researchers.

Scaled-down models and full-scale simulated toilet environments at different stages of design were built at The Hong Kong Polytechnic University for VIPs to test and give their comments. The models included three-dimensional tactile maps, models of toilet plans and different types of full-size facilities. The full-scale simulated toilet environments enabled the researchers to observe how VIPs interacted with the overall spatial environment and individual facilities (e.g. how to use a tap, how to open a compartment door, how to dispose of a paper towel).

Throughout the study, the project team adopted the 'plain-line-point' framework in assessing public toilet

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