A Health and Hygiene Index for Buildings

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The recent outbreak of Severe Acute Respiratory Syndrome (SARS) in Hong Kong has aroused public concern about environmental health and hygiene. Both the Department of Health and the World Health Organization identified several environmental factors (e.g. dried-up U-traps, re-entrant’s stack effect) as the possible causes of mass infection at the Amoy Gardens housing estate. Since the transmission route concerned “workplace” (home), “people” (residents) and “work process” (habitation), SARS is not only a medical problem, but also a facility management problem. In fact, many infectious diseases and health problems (e.g. building-related illness, sick building syndrome) are related to the built environment. Therefore, facility managers have a significant role in achieving a healthy community.

This short article makes reference to a building health research project of the Faculty of Architecture at the University of Hong Kong to illustrate how information can be used for public health management. The project develops an indicator, called the Building Health and Hygiene Index (BHHI), to inform the public of the healthiness of their living environment. The idea of the BHHI is, in some sense, similar to the Air Pollution Index (API), as both indexes serve a classification purpose – the API classifies districts in respect of their air pollution levels, whereas the BHHI classifies buildings in respect of their health and hygiene conditions. With more health and hygiene information, building owners and facility managers can make more informed decisions on whether improvement is needed for their buildings. The BHHI assessment scheme will be briefly introduced below.

What is the BHHI?

The BHHI is a benchmarking tool used to classify buildings in respect of health and hygiene. It is presented in the form of grades (A, B, C & U). The higher the grade, the better is the health and hygiene condition of a building.

What does the BHHI assess?

The BHHI assesses a building’s attributes that directly affect the health of its occupants,
users, and visitors (e.g. infectious diseases, chronic diseases, and various types of stress). The assessment framework is shown below, which breaks down the BHHI into two areas (design and management) and five categories (architecture, building services, external environment, operations and maintenance, and building management). On the operational level, the five categories are further divided into 24 factors and 52 indicators (which are not shown). The advantage of conceptualizing the BHHI into a hierarchy is that it allows the breakdown of the overall BHHI score into specific components (e.g. design score and management score) for further analysis.

**Building Health & Hygiene Index (BHHI)**

- **Design**
  - Architecture
  - Building Services
- **Management**
  - External Environment
  - Operations & Maintenance
  - Building Management

**How the BHHI operates?**

To have the widest possible coverage for buildings within the shortest possible time, the BHHI follows a low cost, objective, quick, and yet balanced approach to building assessment. Only data that can be easily acquired, measured, and graded is used so that a quick assessment is feasible. For example, building information is retrieved from general building plans, documentary records of property management companies, and data published by the government (e.g. population density, the Area Ovitrap Index, Fresh Water Plumbing Quality Maintenance Recognition Certificate). On-site inspection is also carried out to evaluate a building’s basic configurations and conditions at the time of assessment. It is confined to common areas and the external environment so that individual flats are not inspected. The BHHI of a building will be updated if it or its external environment has undergone major changes that affect its health and hygiene.

**Initial BHHI findings**

A pilot scheme of the BHHI was carried out from June to September 2003. A sample of 57 private residential buildings was selected from various districts in Hong Kong. In the sample, building ages ranged from 1 to 47 years old, whereas flat sizes ranged
from 19 to 198m². The distribution of the BHHI in the sample is shown in the chart. Most buildings are classified as grades B and C, while a few qualified for grades A and U (unclassified). One major characteristic that differentiates Grade A buildings from Grade B buildings is that the former have good documentary records of property management. On the other hand, buildings with grades C and U are usually characterised by a) the lack of property management companies; b) the lack of Deed of Mutual Covenants; c) the lack of an owners’ agent; and d) poor drainage maintenance, refuse handling, and cleaning.

The other major finding of the pilot scheme is that the variation of design scores was low when compared to the variations of management scores (see the distribution graph for their scores). The graph shows that management is the decisive factor in separating buildings with a high BHHI grade from buildings with a low BHHI grade. This gives a positive message to owners: they may enhance the health and hygiene conditions of their buildings by improving management.

The above research project demonstrates how more information (i.e. the BHHI) can help building owners and facility managers make more informed decisions on the health and hygiene conditions of their living environments. Once a database for building health information is set up, it can also provide an incentive for developers to supply healthy buildings and help government bodies prioritize resources to areas that need urgent attention (e.g. urban renewal and rehabilitation).

Please visit the web site of the BHHI project at [http://fac.arch.hku.hk/bhhi/index.htm](http://fac.arch.hku.hk/bhhi/index.htm) for more details.