Reshaping Our Cities for the Vulnerable Elderly To Better Adapt To Urban Extreme Heat in the Future

Design for Climate Adaptation & Design for Health

The Global Challenges of Heat Health and Ageing Under Climate Change

More than half of the world population now live in cities. Increasing urban growth will be mainly concentrated in megacities. The urban population faces more threats from extreme heat exposure due to climate change and the urban heat island effect. Elderly people in particular are more vulnerable to urban extreme heat because of their declining physiology.

In cities, the built environment shapes the mobility, daily habits and social ties of the elderly. Where they can go, what they can do and who they can connect with, are all largely dependent on how the city and their neighbourhood is planned and designed. The architects and building professions should certainly be responsible for constructing a more comfortable and healthier urban environment for the vulnerable elderly under extreme heat in future.

By 2050, more than two-thirds of the world population will live in urban areas.

By 2050, one in five people will be aged 60 or above.

How can this increasing and vulnerable population survive under more frequent hot extremes and prolonged hot days? Do we understand their needs? Do we build and design our cities with considerations for their health and well-being? What should architects do?

A cross-disciplinary framework for architecture solutions

In a high-density, sub-tropical city like Hong Kong, where living spaces are very compacted and outdoor spaces are very important for the physical and mental health of the elderly, it serves as a good demonstration model to test out a potential solution. We have initiated a research project, entitled "Increasing the resilience to the health impacts of extreme weather on elderly people under future climate change" to propose a cross-disciplinary solution for the challenge.

An evidence-based methodological framework has been established, including three objectives: (A) understanding the future local climate; (B) developing a mitigation action plan with better urban planning and building design under extreme weather; and (C) developing an adaptation response plan for supporting services for the elderly.

Correspondingly, the key impacts of the project that contribute to the architecture society will be:

(A) A local-based future climate dataset containing extreme weather conditions for modelling and simulating building performance for achieving better human thermal comfort;

(B) A design guidebook with indoor and outdoor mitigation strategies based on simulation results; and

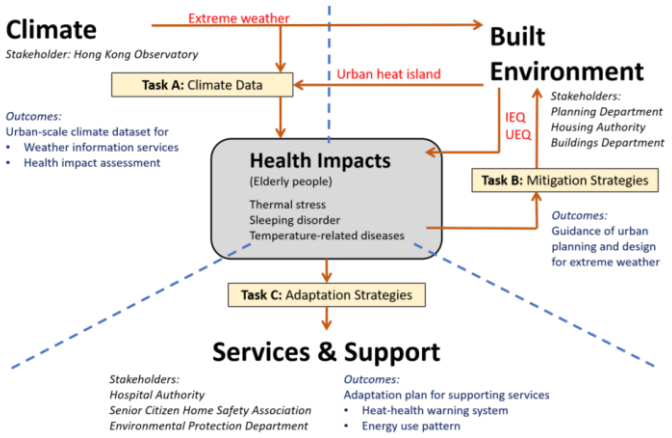
(C) Temperature thresholds of adverse health outcomes to provide an indicator for elderly services under extreme heat, such as building management and property service.

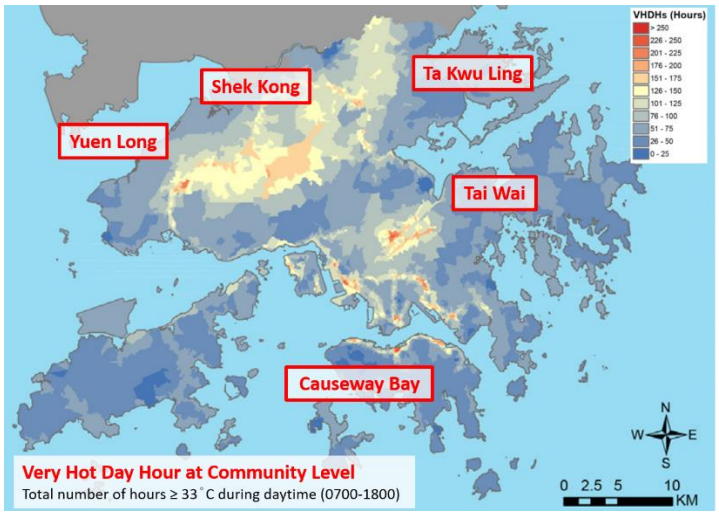
The project lasts for four years from 2019 to 2023. While the design guidebook and analyses of the mental impact of extreme heat on the elderly are still in progress, we could conclude that hot nights are commonly observed in urbanised areas including new towns, and hot nights pose a greater threat to public health, especially for the elderly.

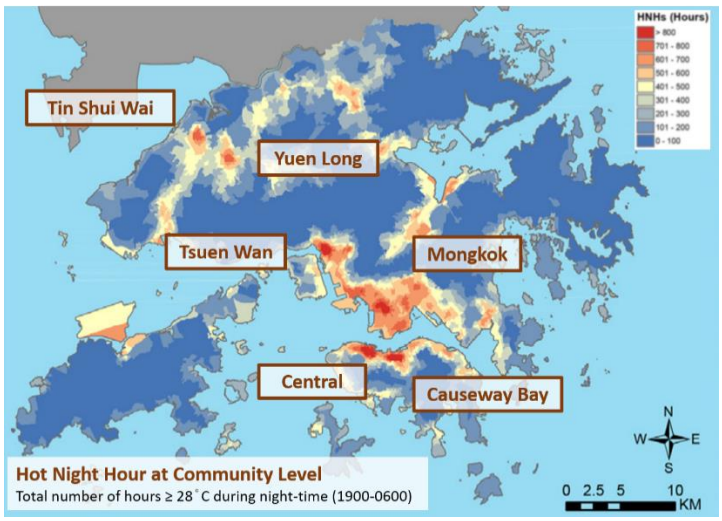
Therefore, based on the initial simulation results under task B, we propose that architects, and the building sector should optimise the built environment and contribute by:

1. **Better city planning and neighbourhood design.** Well-designed outdoor spaces within short walking distance with properly designed greenery and shade for fitness equipment and resting places are desirable for the elderly.
2. **New buildings should meet higher standards.** Good building envelope could achieve better human thermal comfort with satisfactory building performance. Green walls can be provided to reduce façade surface temperature. Building façades should be manipulated to provide shading. In particular, from simulation results, cross ventilation is an extremely effective way to maximise the benefits of natural ventilation and save cooling energy at home.
3. **Existing buildings** should be improved.
4. **Building operation** should respond to good design features and ensure the features are being properly maintained as a continuous effort.
5. **Building management and property service** should respond to the needs and support of the elderly. For example, understanding the discomfort threshold of the elderly under extreme weather, adopting preventative measures and equipping the property staff with heat-health emergency responses.

Cities and built environments must be developed with the needs of the elderly in mind to protect the elderly from extreme heat for their comfort, health and well-being. With this manifesto, we urge architects and building professions all over the world to take actions for the benefit of the increasing vulnerable population and of the society as a whole.







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