

Integrating health into urban planning towards sustainability in Asian cities: Workshop summary

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ABSTRACT

The developing countries in Asia are going through rapid urbanization, and integrating health considerations in the early stage of urban planning is important for sustainable development. This project was aimed at capacity building of participants from developing countries in Asia to enhance their awareness on this topic, and to introduce assessment tools that are available to generate evidence that can inform public policymaking in urban planning. A total of 38 participants comprising academics, policymakers, practitioners and civil society from the Asian region attended the workshop. Issues on climate change and air pollution, and examples of good practices on physical activity promotion and mental health in the urban areas of Asian countries were presented. Collaboration across sectors and community engagement were emphasized in ensuring effective policy implementation. The assessment tools that were introduced included Health Impact Assessment (HIA), Low Carbon Living Co-benefits Calculator, Integrated Transport and Health Modelling, and Participatory System Dynamics thinking (PsD). The key concepts and data needed in the tool operations were explained. These tools need to be applied in the early decision-making phase to produce evidence that justifies the inclusion of health in policy later.

1. INTRODUCTION

Urban planning is a general term that can encompass several different fields in a city, depending on the contemporary needs of the respective country (Levy, 2017). From housing, town planning, landscaping, design, transport infrastructure, waste management, to biodiversity and forestry, agriculture, and disaster response, urban planning can have important implications across a country's economy, sustainability, resilience and human wellbeing (de Leeuw, & Simos, 2017; Levy, 2017). To that end, indicators have also been developed to measure a city's liveability such as safety, walkability, availability of public spaces, etc., which are closely related to many planning parameters (Badland et al., 2014; Pineo et al., 2018). For the present paper, we refer to urban planning as the planning of physically built environments in cities.

KEYWORDS

Developing countries, Health impact assessment tools, Participatory, Policy integration, Urban planning

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HIGHLIGHTS

- » The workshop trained 38 participants from nine Asian countries.
- » Guidelines and good practices for integrating health in urban planning were shared.
- » Intersectoral and community engagement are essential for program sustainability.
- » Low data quality may complicate the use of assessment tools in developing countries.

Following rapid urbanization worldwide, sustainable development has been a pivotal global change concept that is incorporated in the foundations of all urban governing sectors, including urban planning (Wheeler & Beatley, 2014). On the other hand, sustainable development and population health are mutually reinforcing elements in urban systems (Webb et al., 2017). Sustainable development promotes an environment that induces healthy behaviour, reduces population exposure to harmful environmental health determinants that are fundamental to disease prevention, and ensures a healthy population, which is the central driving force to the sustainable development (Acharya, Lin, & Dhingra, 2018).

Urban planning in relation to sustainability and public health has been studied extensively in the past two decades (Mueller et al., 2017). A large amount of evidence points out that urban design such as high density and mixed land use, together with transit oriented development (TOD) could create an enabling environment for reducing traffic emissions and increasing

population physical activity through alternative transport (Stevenson et al., 2016). Early incorporation of health in urban planning, especially during the development phase as in the Asian low and middle income countries (LMICs), could avoid the need for costly transformative urban restructuring for health mitigation and adaptation later (Chan & Li, 2016). To facilitate

policy integration from multiple government sectors in a holistic perspective, approaches such as co-benefits and Health in All Policies (HiAP) have also been introduced (refer to Box 1).

This paper presents a workshop summary of “Integrating Health into Urban Planning towards Sustainable Development Goals in Developing Countries” on the presentations conducted to enhance awareness and knowledge of integrated assessment tools that can facilitate the integration of health in urban planning, from policymaking to implementation. In public policy making, sustainability strategies are usually prioritized and carried out based on their socio-economic values and returns (Macmillan et al., 2014). In the Asian cities of LMICs, poor health information caused by lack of system infrastructure and training has rendered limited quantifiable health evidence that can be used to inform policies from the public health perspective (Walsham, 2019). Integrated health assessment tools are useful to facilitate measurements of health progress and subsequently, the impacts of potential development projects. This can be undertaken qualitatively or quantitatively and can enhance negotiations, and inform policy decision making (WHO, 2014). Established integrated health assessment tools that have combined reliable data such as standard emission factors and disease relative risks sourced from robust systematic reviews of studies in developed countries can bridge evidence gaps in developing countries, and facilitate the quantification of health impacts to be fed into the policymaking process. By identifying policies that may help or hinder their objectives, trade-offs can be minimized to achieve the most beneficial results from the limited resources in developing countries (Hutton et al., 2018).

2. METHODOLOGY

A workshop on “Health in Urban Planning” was held at the University Selangor, Shah Alam Campus, Malaysia from 3-5 April 2019. There were 25 applicants from 17 cities and five local Malaysians who were screened and selected based on their background to join the workshop under the sponsorship of Asia Pacific Network for Global Change CAPaBLE Program (Box 2). The international participants were from Phnom Penh (Cambodia); Xiamen, and Guangzhou (China); Bathinda, and Gurgaon (India); Padang, Bangka, Andalas, Bandung (Indonesia); Vientiane (Lao PDR); Davao, Quezon City, Batangas (Philippines); Bangkok and Ayutthaya (Thailand); Hanoi and Ho Chi Minh (Viet Nam) (Figure 1). Other local participants included two staff from the Ministry of Health Malaysia, a representative from Kuala Lumpur City Hall, and five academics from University Selangor.

Box 1. Definition of terms

- » Sustainable development – “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations General Assembly, 1987, p. 43).
- » Co-benefits – “The benefits of policies that are implemented for various reasons at the same time—including climate change mitigation—acknowledging that most policies designed to address greenhouse gas mitigation also have other, often at least equally important rationales (e.g. related to objectives of development, sustainability, and equity). The term co-impact is used in a more generic sense to cover both positive and negative side of benefits.” (IPCC, 2001).
- » Health in All Policies (HiAP) – “An approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity.” (WHO, 2014).

Box 2. Asia-Pacific Network for Global Change Research’s CAPaBLE programme (APN, 2020) aims to:

- » “enhance the capacities of scientists, policy-makers and other relevant stakeholders in the Asia and Pacific region to identify and assess global change issues at local, national and regional levels”, and
- » “identify appropriate solutions to resolve the issues and achieve sustainability”.



FIGURE 1. Workshop participants and speakers.

Besides, 10 local and international experts on urban planning, environmental health, and sustainability from Kuala Lumpur, Jakarta, Bangkok, Sydney, Melbourne, Christchurch, Dunedin, Tokyo, and Cambridge were invited as speakers (Table 1). The speakers were invited based on their expertise and experiences in urban planning and health (No.1-7), and the application and development of tools for integrated assessment and decision making (No. 8-11) (Figure 2).

The workshop participants consisted of academics, policymakers, practitioners and a media reporter to have representatives of different roles in the workshop. The backgrounds of the participants included environmental science, public health, urban governance, climate change, urban geography, hydrology, urban ecology, disaster rehabilitation, health systems, and economy. Such diversity complemented the need for interdisciplinary and intersectoral communications in tackling planning in the complex urban systems in developing countries.

3. RESULTS AND DISCUSSION

3.1 Urban sustainability, health and urban planning good practices

Climate change and air pollution are the most common topics that are being emphasized in many urban sustainability discussions as the emissions of greenhouse gas often come together with air pollutants such as particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), and hydrocarbons (HCs) emissions from sources such as power plants and vehicle tailpipes (Driscoll, Stettler, Molden, Oxley, & ApSimon, 2018; Winkler et al., 2018). Air pollution is known to have caused a high burden of diseases, especially from cardiovascular and respiratory diseases. Based on the IPCC report, urban areas accounted for 67–76% of energy use and three-quarters of carbon emissions globally (IPCC, 2014). As urban growth accelerates, especially in Asian megacities, urban areas become the focus for mitigating carbon and air pollutant emissions through urban infrastructures that shape the energy use patterns in human and transport activities (Creutzig, Baiocchi, Bierkandt, Pichler, & Seto, 2015).

Non-communicable diseases (NCDs) accounted for 71% (41 million people) of global mortality in 2016, mainly from cardiovascular diseases, chronic respiratory diseases, cancers and diabetes (Bennett et al., 2018). In particular, a large proportion of preventable premature mortality from NCDs (40%) was contributed by the low and middle income countries, including Southeast Asia (Martinez et al., 2020). Although the risk factors for



FIGURE 2. Topics of invited presentations from each country.

	Theme	Presenter/affiliation	Presentation
1.	Empirical knowledge and good practices	Jamal Hisham Hashim, Universiti Selangor, Malaysia	Urban Health Issues in Malaysia
2.		Hj Ihsan Zainal Mokhtar, Malaysian Institute of Planners, Malaysia	Integrating Health Concept into Urban Planning in Malaysia
3.		Budi Haryanto, Research Center for Climate Change, University of Indonesia, Indonesia	Climate Change and Air Pollution: Health Impacts and Alternative Control Strategy
4.		Piyawat Katewongsa, Institute for Population and Social Research, Mahidol University, Thailand	The situation of physical activity promotion and built environment in Thailand
5.		Anna Stevenson, Canterbury District Health Board, Christchurch, New Zealand	Determinants Led Planning in Practice
6.		Alice Covatta, The Architecture and Urban Design at co+labo, Keio University, Tokyo, Japan / The Centre for Urban Design and Mental Health	Density and Intimacy in Public Space: a case study of Jimbocho, Tokyo’s book town
7.		Susan Thompson, City Futures Research Centre, University of New South Wales, Australia	Healthy Built Environments in Action! Experiences in policy and practice implementation
8.	Assessment tools	Jamal Hisham Hashim, Universiti Selangor, Malaysia	Health Impact Assessment as a Planning and Decision-Making Tool
9.		Jason Thompson, Melbourne School of Design, University of Melbourne, Australia	The Development of A Low-Carbon Living Co-Benefits Calculator
10.		James Woodcock, MRC Epidemiology Unit, University of Cambridge, United Kingdom	Modelling Transport Related Health Effects in Low and Middle Income Countries (LMICs)
11.		Alexandra Macmillan, Department of Preventive and Social Medicine, University of Otago, New Zealand	Using Systems Thinking and Modelling to Support Decision-Making for Healthy Sustainable Cities

TABLE 1. List of invited presentations.

NCDs are well established, a review of evidence identifying the targeted reduction of NCD risk factors to impact on several NCDs simultaneously found that the improvement of physical inactivity, diet and air pollution have the strongest protective effects across cardiovascular diseases, cancer, diabetes, and dementia (Peters et al., 2019). These risk factors could be addressed in effective public policies and health interventions to reduce the number of preventable premature mortality (Martinez et al., 2020).

Urban planning can serve as an effective intervention to reduce the risk factors of NCDs by creating contextual defaults that empower behaviours to benefit both health and the environment (Frieden, 2010). Placed in the second tier of the Health Impact Pyramid (Figure 3), urban planning can affect human health and well being at the population level through the provisions of a clean environment and infrastructure. Table 2. shows the extraction of contents on good practices from the workshop presentations. These good practices and approaches could be useful guiding principles in building healthy cities, by integrating various health determinants including physical and mental health in urban planning related policies, funding allocations, implementation strategies, and community empowerment programs.

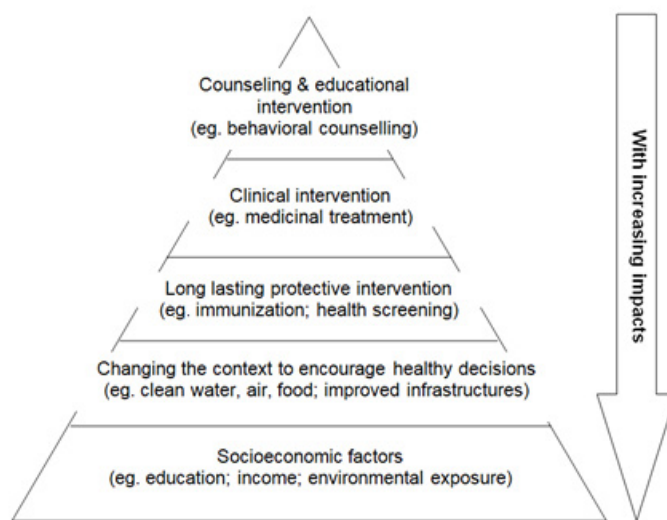


FIGURE 3. Health impact pyramid in public health interventions (Frieden, 2010).

	<i>Theme (country)</i>	<i>Key points and good practices</i>
1.	Determinants led planning (Christchurch, New Zealand)	<ul style="list-style-type: none"> » Ensure greater Christchurch liveability through leadership, partnership, resilience, innovation, integration, regeneration, equity » Health Impact Assessment to mainstream health in planning with evidence » Integrated Planning Guide For Health, Sustainability And Resilience (Community and Public Health, 2019) » Examples of good practices: <ul style="list-style-type: none"> → 2007 Greater Christchurch urban development strategy <ul style="list-style-type: none"> • Prepared in response to projected population growth • Voluntary partnership of city, district, environment agency, transport agency • Clear direction for resource management plan • Develop significant public interest and momentum » Our Space (2018-2048) (http://greaterchristchurch.org.nz/background/our-space/): planning for future housing and business development and capacity » Health policy: Take Care New York 2004 (Frieden, 2004) to prioritize on leading preventable cause of illness and deaths » San Francisco Burden of Disease & Injury Study: Determinants of Health (http://www.healthysf.org/) as a resource for guiding development » Health in All Policies: working across sectors and communities on public policies through partnership with key stakeholders (Canterbury Health in All Policies Partnership (CHIAPP)) » Community development based on DEET: determinants, equity, evidence, treaty of Waitangi (3 principles: partnership; participation; protection)
2.	Integrating health in urban planning (Malaysia)	<ul style="list-style-type: none"> » Essentials to healthy built environment: <ul style="list-style-type: none"> → Access to quality foods → Safe and affordable public transport → Pedestrianized road and cycling network → Efficient waste management → Access to natural environment » Strategies: <ul style="list-style-type: none"> → Efficient funding and investment of facilities → Improve the use of existing resources such as transformation of abandoned parking lots, and dilapidated street corners, and public sharing of school fields → Placement of schools, community spaces, and facilities within walking distances » Examples of good practices (Edwards & Sauros, 2008): <ul style="list-style-type: none"> → Walking school buses in Rome, Italy under collaborations of school authorities, parents, police, district and road safety officers → Regeneration of Admiral Park in Liverpool, UK with the involvement of local school children → Greenbelt around the city of Milan, Italy which connects the parks and form green corridors to the inner city → Transformation of a back lane to community garden especially for older people in Shah Alam, Selangor Malaysia

TABLE 2. Key points and examples of good practice from workshop presentations.

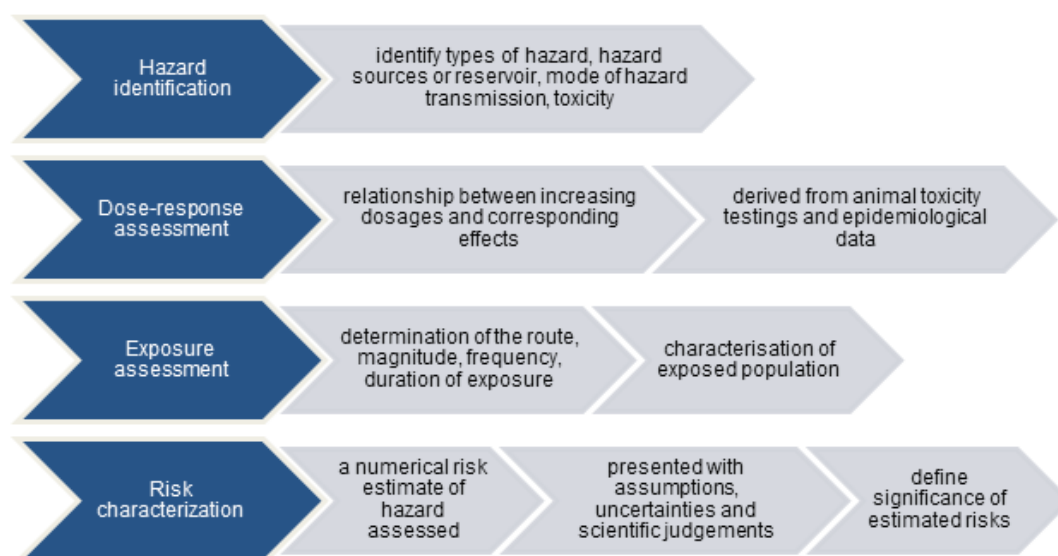


FIGURE 4. Steps in Health Impact Assessment (Department of Environment Malaysia, 2012).

	<i>Theme (country)</i>	<i>Key points and good practices</i>
3.	Experiences in policy and practice implementations (Australia)	<ul style="list-style-type: none"> » A safe city is a healthy city » Guidelines to shade from the sun (http://www.webshade.com.au/) are essential to support physical activity in Australia » Fall prevention strategies to create an age-friendly built environment for health and safety across life course » Strategic communications to practitioners through journals » Incorporating health in federal policies » 3 key domains of built environment and health: <ul style="list-style-type: none"> → Getting people active (footpath, bike path, open spaces) → Connecting and strengthening communities (community gardens) → Providing healthy food options (retain prime agricultural land close to cities) » Engagement of multi-sectors, researchers, practitioners, and community is essential. » Example programs: <ul style="list-style-type: none"> → Abountiful harvest: Community gardens and neighbourhood renewal in Waterloo (Bartolomei, Corkery, Judd, & Thompson, 2003): gardens are important for physical and mental health → Men's Shed (https://mensshed.org/): a community program that encourages men's involvement in community projects to improve social well being → Cool Streets (https://www.coolstreets.com.au/): an initiative to empower communities to cool the streets → Cooling the City Strategy (Penrith City Council, 2015): response to urban heat through community engagements and stakeholder partnerships → Think city (https://thinkcity.com.my/): a Malaysian organization that works on place-making and urban rejuvenation (e.g. George Town, Penang)
4.	Built environment and physical activity (Bangkok, Thailand)	<ul style="list-style-type: none"> » Major issue: to ensure good conditions of bike and walk lanes, playground » Active place targets: <ul style="list-style-type: none"> → To increase access and affordability of public space for low income communities → To transform unused/wasteland to healthy open space for all population → To expand healthy city models to other cities outside Bangkok » Example projects in Bangkok, Thailand: <ul style="list-style-type: none"> → Transformation of Lumpini park by closing off the roads inside the park from vehicle traffic → Transformation of space under expressways to recreational and cycling space, especially for the use of the low income community (air and noise pollution mitigated by increased tree planting) → Design of activities at the community space by engagement of parents, children, and elderly to understand their needs and wants (interactive learning through actions) → Transformation of old buildings near Chinatown to museum and learning centres → Skywalk connecting shopping malls within the city centre of Bangkok → Bike city project to increase biking in the city → GoodWalk project at Thong Lor-Ekkamai and Ari-Pradiphat, and Klong San (Wancharoen, 2018) <ul style="list-style-type: none"> → To improve walkability and connectedness of areas → To boost sales of shops along the routes → To improve physical and mental well being of residents » Future Plan: Transformation of the riverfront of Chao Phraya River by increasing walkability and participation of community activities » Collaboration and partnerships with civic groups, and active participation of the community by giving information about the projects, and community leadership are key to the sustainability of projects
5.	Mental health: Density and intimacy in public space (Tokyo, Japan)	<ul style="list-style-type: none"> » Environmental factors to mental health: <ul style="list-style-type: none"> → Overstimulated public space (noise, sights, smell, crowding) → Diminished protective factors (exposure to nature and exercise) » Extreme intimate space within highly dense areas (Tokyo): e.g. Love Hotel, Manga Kissa, Karaoke Box » Space connected to every transport station has its own subculture created by the local community » Case study of Jimbocho, Tokyo's book town's design for intimate reading space for mental health (Covatta, 2017): <ul style="list-style-type: none"> → Bookshop layout allows people to read inside and outside of shops → Shops can accommodate no more than four people → The layout of book racks allows flexible browsing of the books → Decoration of book shops based on the unique taste of bookshop owners → Parasite economy grows around the bookshops, e.g. eateries and coffee shops customized for reading → People develop personal routes around the book shops area → People of all social levels and backgrounds can visit the area » Urban design action points: <ul style="list-style-type: none"> → Facilitate social interaction while considering privacy → Compact and walkable neighbourhoods with mixed land use to encourage natural interactions → Multilayered street fronts for flexibility of visitors → Space for community participation and volunteering, e.g. street benches, chess tables

TABLE 2 (cont.). Key points and examples of good practice from workshop presentations.

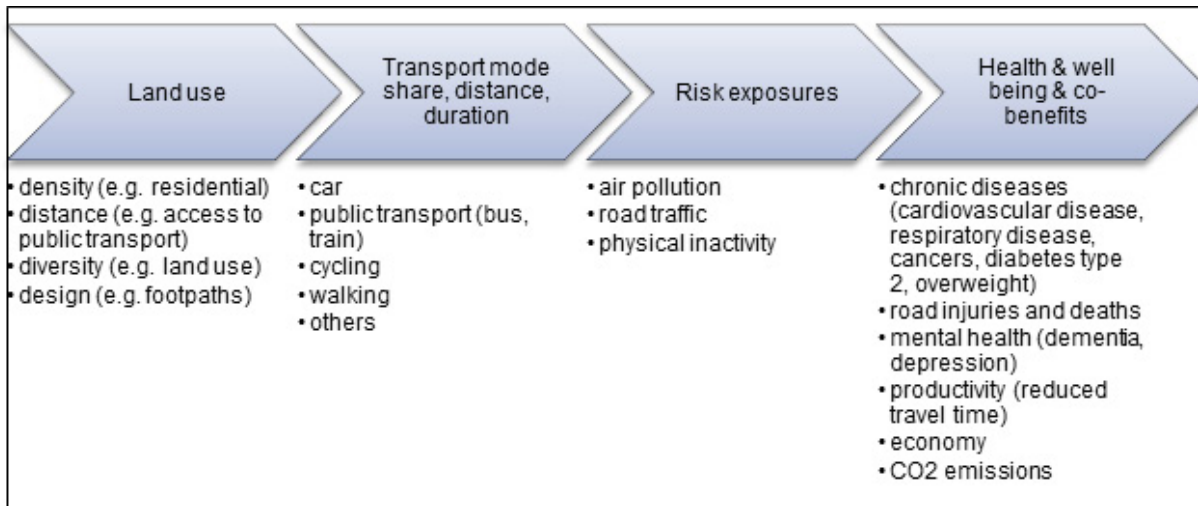


FIGURE 5. Data inputs and flow of connections between factors in Low Carbon Living Co-Benefits Calculator (Stevenson and Thompson, 2019).

3.2 Tools

3.2.1 Health impact assessment (HIA)

Health impact assessment (HIA) is a combination of procedures, methods and tools that are used to estimate the potential impacts (physical, chemical, biological, social) on a specified human population system under a specific set of conditions (a policy, program or a project) within a certain timeframe (enHealth, 2001). It is useful to inform and influence decision making by weighing in the evidence of health impacts from alternative development plans (Lock, 2000). In Malaysia, HIA is mandatory for many detailed Environmental Impact Assessment (EIA) project under prescribed activities. Figure 4 shows the steps involved in the HIA guidance document of Malaysia (Department of Environment Malaysia, 2012). An example of HIA application was given on the case of Kim Kim River in Pasir Gudang, Johor, where toxic chemical dumping (hazard identification) caused elevated levels of methane, benzene, and acrylonitrile (dose-response assessment) in the river, and hospitalization of poisoned victims among school children (exposure assessment) (“Pasir Gudang chemical spill”, 2019).

3.2.2 Low carbon living co-benefits calculator

The model was built on the deterministic model of compact cities and health model connecting land use, transport mode, risk exposures and health outcomes (Stevenson et al., 2016) (Figure 5). Using 1.2 million of household land parcels with specific land use variables from the Australian Urban Research Infrastructure Network (AURIN), counts of features such as household density, public transport stops, number of intersections were captured. These variables were then used to develop a set of regression equations with the data of socio-demography, economy, productivity, and health from the Department of Health and Human Services Victorian

Population Health Survey to estimate the co-benefits (Stevenson & Thompson, 2019). On the website interface of the calculator (<https://thud.msd.unimelb.edu.au/>), data can be input directly to generate performance outputs such as BMI and life satisfaction based on land use clusters. Although this tool applies in the Australian context, it presents a useful example of the methods and data needed to calculate co-benefits of specific land use planning in other cities.

3.2.3 Integrated transport and health impact model

Compared to the low carbon living co-benefits calculator, the model emphasizes on estimates of health impacts from different transport scenarios through distinctive models for air pollution, injuries and physical activity (Woodcock, Givoni, & Morgan, 2013). The primary data are from travel surveys, physical activity surveys (for non-travel physical activity), and police records of injury. In order to be a globally applicable tool, prototype models are being tested in countries such as India, Latin America and Africa with different traffic mix and background air pollution, injury and physical activity levels (Sá et al., 2017). In this model, both ambient and mode-specific in-vehicle exposure of air pollution are accounted for in the dose-response relation to health outcomes (Cepeda et al., 2017). The risks of traffic injuries are calculated by accounting for vehicle modes and distance travelled by both victims and vehicles. Previous studies have shown that the largest benefits can be reaped from the increase in physical activity (Mueller et al., 2015). For modelling scenarios in low and middle income countries, the challenges lie in the quality of data such as injury records and underreporting of short trips in travel surveys, which make uncertainty analysis important. Thus, a new method of data collection, such as using Google Street View, is being developed (Goel et al., 2018).

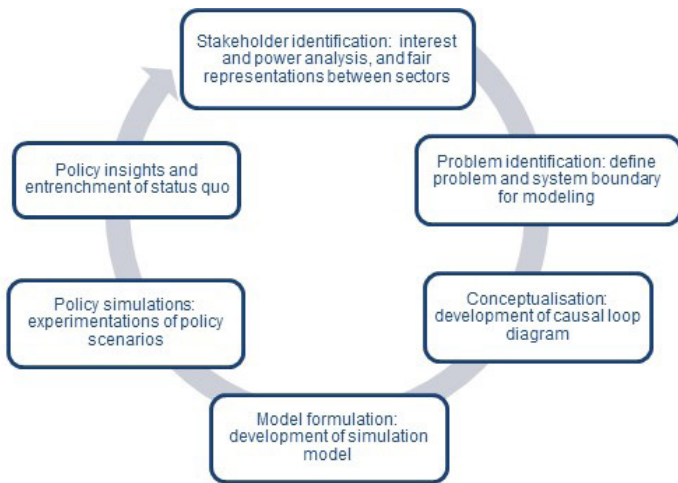


FIGURE 6. Process of participatory systems dynamic modelling (Macmillan et al., 2016; Videira et al., 2017).

3.2.4 Participatory systems dynamic modelling (PsD)

Participatory systems dynamic modelling (PsD) is a method that aims to bring changes both at the policy and the ground level through a shared learning process involving stakeholders from all relevant sectors (Macmillan et al, 2014). It facilitates understanding of the endogeneity in a complex system through feedback loops, stocks and flows process, and ensure fair representations of various sectors in public policy decision making (Eker, Zimmermann, Carnohan, & Davies, 2017). However, this process needs to take place in the early stage of policymaking; particularly at recognizing the problem to justify the inclusion of health in policy in the later stage (Macmillan et al., 2016). Figure 6 shows the general process of PsD.

4. CONCLUSION

In conclusion, the workshop has achieved the objectives of increasing awareness and introducing the policy assessment tools for integrating health in urban planning among the 38 international workshop participants from the Asian region. The workshop has clearly demonstrated that urban planning has great influence in determining population health, and the sustainability of cities through air quality, traffic, active living, and a population's well being. Given the complex relationships between the environmental and health determinants in cities, the integrated health impact assessment tool, carbon calculators, and system thinking are tools that could be used to layout a clearer picture of the co-benefits of healthy urban planning with a scientific basis, and for lobbying urban planning policies that are supportive of the development of a healthy and sustainable environment for the citizens. Besides, the workshop has provided many guidelines, good practices and examples of management and implementation strategies extracted from both developed and developing countries for the

reference of city planners. These examples show that the local cultures and experiences also need to be considered when incorporating health aspects in urban plans. Therefore, it is important to consult multiple stakeholders, including the local community, with a participatory approach to ensure that the programs that are carried out are sustainable to the future by themselves. In an additional note, the availability of reliable data is vital to be able to employ the assessment tools with confidence in cities, especially of developing countries where data is often lacking. These tools need to be employed early in the policymaking process to give the most significant effects. Therefore, further studies on how to utilize these tools in practice with the available data need to be explored for the planning of cities in the developing countries.

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