Research and Best Practice

Toward “Climate-Smart” Hospitals: Taiwanese Experience

Cai Ru Connie Gan¹, Cordia Ming-Yeuk Chu¹, Hong-Fang Song²

Abstract

Hospitals must become “climate-smart” in the era of extreme climate patterns because they generate massive and harmful environmental footprints that worsen climate change; and they need to avoid interrupted health services at a time when it is crucially needed. The alarming climate crisis calls for urgent actions to mitigate carbon and a collective state-wide and regional response. This paper presents a series of green hospital initiatives and the preliminary results of an 11-year cohort study of Taiwan’s Health Promoting Hospitals (HPH) Network. In 2017, 72 HPH member hospitals collectively reduced 6% of total carbon emissions per hospital bed compared to baseline year 2007.

About the AUTHORS

¹ Griffith University Centre for Environment and Population Health (CEPH), Queensland, Australia

² Aging and Chronic Disease Control Division, Health Promotion Administration, Ministry of Health and Welfare, Taiwan

Contact:

Cai Ru Connie Gan
connie.gan@griffithuni.edu.au

Introduction

In light of the increasing recurrence and magnitude of extreme weather events, human-induced climate change presents an unprecedented global challenge that poses serious social and health risks (1–4). Hospitals are one of the greatest emitters of greenhouse gases (GHGs). Their massive energy consumption often lead to dangerous levels of pollution (5–8). In addressing these issues, the World Bank and Health Care Without Harm developed the “Climate-smart Healthcare” concept in 2017 that urges hospitals to become part of the solution by increasing climate awareness and fostering low-carbon health services (9). Noteworthy initiatives have been implemented by individual hospitals (10–13), but evidence on “climate-smart” initiatives at national and regional levels remains limited. This paper aimed to investigate the feasibility and potential impact of the concept by examining available evidence from Taiwan’s Health Promoting Hospitals Network, which has adopted a series of low-carbon hospital initiatives for more than a decade.

Climate health risk and hospital adaptation

Similar to other island states, Taiwan is facing alarming climate health risks

(14;15). Hospitals that offer critical resources are also massive resource users that have become a public health concern (16–18). According to the 2018 Global Climate Risk Index (CRI) (19), Taiwan ranked seventh in vulnerability when facing climate-related disasters. Evidence showed an increase in outbreaks of dengue, leptospirosis, and melioidosis after typhoons, and mental health and psychosocial consequences of disasters (20). Moreover, healthcare institutions represented approximately 4%–10% of country’s total national GHG emissions in England, Australia and United States, (5;6) that cause a detrimental impact on health, impelling an urgent multi-level response in the era of climate change.

Globally, international organizations and the health-related network support the adoption of mitigation strategies by hospitals worldwide to reduce energy consumption associated with carbon emissions. Global Green and Healthy Hospitals advocates for renewable energy, plant-based diet, sustainable procurement, and better waste management. The World Health Organization initiated “Network of Health Promoting Hospitals and Health Services” (HPH) as a settings-based approach to holistically and sustainably implement preventive strategies (21–24). In its regional network, Tai-

Research and Best Practice

wan has had the largest number of member hospitals since 2005 and currently chairs the Task Force on HPH and Environment, which is dedicated to addressing the climate crisis from a healthcare setting perspective.

Addressing climate change in hospital setting

Since 2009, the Task Force on HPH and Environment has initiated a series of interventions to facilitate the process of greening hospitals. Policymakers and researchers have worked together to develop guidelines and self-assessment tools for hospitals to prioritize climate and health issues under the HPH model. The “International Environment-Friendly Hospital Teamwork Best Practice Award” recognizes best practices and facilitates an experience sharing network among participating hospitals. The project entitled “Health Promotion in Healthcare Facilities” strengthens

the link between low-carbon projects and other health promotion programs to create sustainable change. For the first time, the integrated hospital accreditation model incorporates eco-friendly indicators including green purchasing, waste management, and energy efficiency to serve as guiding standards toward sustainable development for hospitals.

With supportive government policy, more than one-quarter (n=174) of Taiwanese hospitals pledged to achieve 13% reduction of total carbon emissions relative to the baseline year of 2007 by 2020. Figure 1 shows a preliminary analysis of 72 self-reported total carbon emissions including annual electricity, water, fuel consumptions; generated general and infectious waste per hospital bed (kg.CO₂e) consecutively between year 2007 to 2017. This cohort includes three types of hospitals with a total of 2,511 beds on average per year. The consolidated results show promising projections

Figure 1. Total carbon emissions per hospital bed (kg.CO₂e) between year 2007 to 2017

Total of carbon emissions per hospital bed from year 2007 (992,802kg.CO₂e) to 2017 (933,055 kg.CO₂e) of 72 hospitals.

Research and Best Practice

toward lower carbon emissions, but further examination and higher quality data are needed to verify precise evidence in practice.

For further facilitating the development of “climate-smart” hospitals, government bodies established a climate-smart working group in 2018 to analyze ground practices that include hospital corporate social responsibility, green building certification, and disaster preparedness. Through a series of public forums and opportunities to engage stakeholder, the working group drafted and introduced the Taiwan Climate-Smart Framework with associated guidelines. Through this initiative, HPH-accredited hospitals are encouraged to participate in the pilot project to generate practice-based evidence that will be inserted into the policy formulation process.

Conclusion

On the basis of this Taiwanese experience, hospitals have demonstrated a collective effort to reduce 6% of total carbon emissions per hospital bed relative to baseline year. The findings revealed their promising capability for enhancing carbon emissions management for reducing environmental impact in a warming world. Hospital “greening” initiatives often may feel like a low priority among the numerous pressures in a busy hospital setting, but these efforts could be hospitals’ most vital contribution to patients’ health. As the harmful impact of climate change becomes apparent, hospitals indeed play a vital leadership role by achieving “climate-smart healthcare” and develop towards a sustainable future.

Reference

- (1) Qin, Zhang J, ‘The Impacts of Extreme Events of Weather and Climate on Infectious Disease’, *J. Hyg. Res.*, vol. 38, no. 6, pp. 762–764, Nov. 2009.
- (2) McMichael AJ, Lindgren E, ‘Climate Change: Present and Future Risks to Health, and Necessary Responses’, *J. Intern. Med.*, vol. 270, no. 5, pp. 401–413, Nov. 2011.
- (3) Lacobucci G, ‘NHS is Unprepared for Risks Posed by Climate Change, Warn Leading UK Health Bodies’, *BMJ*, vol. 352, p. i1781, Mar. 2016.
- (4) Rossati A, ‘Global Warming and Its Health Impact’, *Int. J. Occup. Environ. Med.*, vol. 8, no. 1, pp. 7–20, 2017.
- (5) Frumkin H, ‘The US Health Care Sector’s Carbon Footprint: Stomping or Treading Lightly?’, *Am. J. Public Health*, vol. 108, no. Suppl 2, pp. S56–S57, Apr. 2018.
- (6) Malik A, Lenzen M, McAlister S, McGain F, ‘The Carbon Footprint of Australian Health Care’, *Lancet Planet. Health*, vol. 2, no. 1, pp. e27–e35, Jan. 2018.
- (7) Eckelman MJ, Sherman JD, ‘Estimated Global Disease Burden from US Health Care Sector Greenhouse Gas Emissions’, *Am. J. Public Health*, vol. 108, no. Suppl 2, pp. S120–S122, Apr. 2018.
- (8) Fourt D, Poirier C, ‘Healthcare and Climate Change: Do No Harm’, *Healthc. Q. Tor. Ont*, vol. 19, no. 3, pp. 37–43, 2016.
- (9) Bouley T, *et al.*, ‘Climate-smart healthcare: Low-carbon and Resilience Strategies for the Health Sector’, The World Bank, 113572, Jan. 2017.
- (10) Dhillon VS, Kaur D, ‘Green Hospital and Climate Change: Their Inter-relationship and the Way Forward’, *J. Clin. Diagn. Res. JCDR*, vol. 9, no. 12, pp. LE01–LE05, Dec. 2015.
- (11) Gerwig K, ‘Greening Health Care: How Hospitals Can Heal the Planet.’ Oxford University Press, 2014.
- (12) Primožic L, ‘Greening Australia’s Public Health System: The Role of Public Hospitals in Responding to Climate Change’, *J. Law Med.*, vol. 17, no. 5, pp. 772–783, May 2010.
- (13) Wyssusek KH, Keys MT, van Zundert AAJ, ‘Operating Room Greening Initiatives – the Old, the New, and the Way Forward: A Narrative Review’, *Waste Manag. Res.*, p. 0734242X18793937, Aug. 2018.
- (14) Lu GY, Chiu LS, Wong DW, ‘Vulnerability Assessment of Rainfall-induced Debris Flows in Taiwan’, *Nat. Hazards*, vol. 43, no. 2, p. 223, Nov. 2007.
- (15) Chan FKS, Chuah CJ, Ziegler AD, Dąbrowski M, Varis O, ‘Towards Resilient Flood Risk Management for Asian Coastal Cities: Lessons Learned from Hong Kong and Singapore’, *J. Clean. Prod.*, vol. 187, pp. 576–589, 2018.
- (16) Achour N, Price ADF, ‘Resilience Strategies of Healthcare Facilities: Present and Future’, *Int. J. Disaster Resil. Built Environ.*, vol. 1, no. 3, pp. 264–276, Oct. 2010.
- (17) The Lancet Haematology, ‘Keeping the blood flowing during times of disaster’, *Lancet Haematol.*, vol. 4, no. 11, p. e497, Nov. 2017.
- (18) Maibach EW, Chadwick A, McBride D, Chuk M, Ebi KL, Balbus J, ‘Climate Change and Local Public Health in the United States: Preparedness, Programs and Perceptions of Local Public Health Department Directors’, *PLoS One*, vol. 3, no. 7, p. e2838, Jul. 2008.
- (19) Eckstein D, Künzel V, Schäfer L, ‘Global Climate Risk Index 2018’. German Watch, Nov-2017.
- [20] Su HP, Chan TC, Chang CC, ‘Typhoon-related Leptospirosis and Melioidosis, Taiwan, 2009’, *Emerg. Infect. Dis.*, vol. 17, no. 7, pp. 1322–1324, Jul. 2011.
- (21) Apaijitt P, Kanchan V, Wiwanitkit V, ‘Infectious Waste from Subdistrict Health Promoting hospital: How about the Amount?’, *Ann. Trop. Med. Public Health*, vol. 9, no. 6, pp. 442–U103, Dec. 2016.
- (22) Whitelaw S, Baxendale A, Bryce C, MacHardy L, Young I, Witney E, ‘“Settings” based Health Promotion: A Review’, *Health Promot. Int.*, vol. 16, no. 4, pp. 339–353, Dec. 2001.
- (23) Poland B, Dooris M, ‘A Green and Healthy Future: The Settings Approach to Building Health, Equity and Sustainability’, *Crit. Public Health*, vol. 20, no. 3, pp. 281–298, Sep. 2010.
- (24) Bloch P *et al.*, ‘Revitalizing the Setting Approach – Supersettings for Sustainable Impact in Community Health Promotion’, *Int. J. Behav. Nutr. Phys. Act.*, vol. 11, p. 118, Sep. 2014.