

Designing for Health & Wellbeing

Home, City, Society

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AMPS

The Interdisciplinary Built Environment



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Acronyms

3CL	Conventional Consumption Calculation
BRE	Building Research Establishment
CALL	Culture Action Llandudno
CEE	Certificats d'Economie d'Energie
CCBC	Conwy County Borough Council
DCFW	Design Commission for Wales
D-I-Y	Do It Yourself
DNUH	National Directorate of Housing
DPE	Diagnostic de Performance Energétique
EDF R&D	Electricité de France Research and Development
EHCS	English Housing Condition Survey
EHS	English Housing Survey
EPC	Energy Performance Certificate
Eurofound	European Foundation for the Improvement of Living and Working Conditions
FFH	National Housing Fund
GDP	Gross Domestic Product
HES	Hospital Episode Statistics
HHSRS	Housing Health and Safety Rating System
IPEL	Indice de Performance Energétique du Logement
LBW	Low Birth Weight
LDP	Local Development Plan
LSHTM	London School of Hygiene and Tropical Medicine
NCD	Non-Communicable Disease
NICE	National Institute for Health and Care Excellence
NIMBY	Not in my backyard
ONPE	Observatoire National de la Précarité Energétique
PHEBUS	Performance de l'Habitat, Equipements, Besoins et Usages de l'énergie
PMSI	Medical Programme Information System
PPP	Public-private partnerships
Rénovons	Initiative Rénovons
RTPI	Royal Town Planning Institute
SAP	Standard Assessment Procedure
SAS	Statistical Analysis System (a statistical package)
SWOT	Strengths, Weaknesses, Opportunities and Threats

UFPel	Federal University of Pelotas
UN	United Nations
US	United States
WHO	World Health Organization

Introduction

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This book presents critical thinking from practicing architects, academics, scholars, public health professionals, urban planners, designers, artists and activists from around the world to provide perspectives on design for health. The book reflects a broad set of interrelated concerns about health and the *design* of the spaces we inhabit. It seeks to better understand the interconnectedness and potential solutions to the problems associated with health and the built environment. To that end, it presents emerging research on healthy homes, walkable cities, design for ageing, dementia, health equality and urban poverty, community health services, neighbourhood support and wellbeing, urban sanitation and communicable disease, transport infrastructures and the cost implications of 'unhealthy' environments. Through a series of research chapters based on 'real world' research, it seeks to facilitate joined-up thinking about health and the built environment across disciplines, across scales and across countries. Divided into three key themes, home, city and society, each section presents chapters that explore global processes, transformative praxis and emergent trends in architecture, urban design and healthy city research. The first section explores how the design of *homes* and housing has an effect on human health and wellbeing. The second section examines the implications for health at a much larger scale - that of the *city*. The third section explores issues at the level of *society*, such as community engagement, participatory design and collective action. Through exploration across these scales, the book aims to reveal insights into how designers across disciplines are addressing issues of health in the built environment.

Health and wellbeing defined

Health is defined in the World Health Organisation (WHO) Constitution as "a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity"¹. The interrelationships between

physiological, psychological and social factors are important in leading a healthy life; the WHO definition links health with wellbeing, a concept often associated with the idea of flourishing: “the experience of life going well... feeling good and functioning effectively”². As the Office for National Statistics describe, “Wellbeing, put simply, is about ‘how we are doing’ as individuals, communities and as a nation and how sustainable this is for the future”³. Wellbeing is seen as consisting of five elements: positive emotions, engagement, relationships, meaning and accomplishment⁴. Here, mental health is equally as important as physical health; health is a positive aspiration, a means to living well⁵: an everyday resource that enables people to lead individually, socially and economically productive lives.

Health issues and the built environment

The urban health threat

While health and wellbeing are influenced by a wide range of factors, an increasing body of research demonstrates that the *design of the built environment* is linked to our health⁶. The World Health Organisation identifies worldwide urbanisation as representing a major threat and challenge to personal and public health. In 1990, fewer than four in ten people lived in urban areas; by 2010, more than half lived in cities and by 2050 this proportion will grow to seven out of every ten people⁷. The ‘urban health threat’ is three-fold: infectious diseases; violence or injury (particularly road traffic); and non-communicable diseases⁸. Infectious diseases are more of an issue in the global south where one billion urban residents live in slums and squatter settlements, while countless others suffer from unsuitable living conditions and overcrowding⁹. In these informal settlements, the poor design and maintenance of sanitary systems and urban environments are linked with tuberculosis, pneumonia and diarrhoeal disease. In both the Global North and South, the quality and affordability of homes affects the health of inhabitants¹⁰. Evidence suggests refurbishing homes is associated with improvements in general health outcomes¹¹; an appropriately designed thermally-efficient home has health and mental health benefits and reduces mortality¹².

In cities and towns, the design of transport infrastructure tends to prioritise the motor vehicle which invariably leads to elevated levels of road traffic accidents, injuries and mortalities. Furthermore, investment in roads increases pollution which has a deleterious effect on health: respiratory illnesses such as asthma are associated with traffic congestion. The complex interrelationships between city layout, transport infrastructure, employment distribution and social conditions produce the urban living conditions that

can exacerbate anxiety, depression, insomnia and substance abuse¹³. Poverty, unemployment and misuse of alcohol or drugs, lead to increased violence and crime¹⁴.

Whilst infectious diseases and injuries are important urban health threats, Non-Communicable Diseases (NCDs), often referred to as lifestyle diseases, are the primary cause of ill-health in almost all countries globally. Lifestyle diseases are so-called because they are interconnected with the way society lives and behaves and the resultant health outcomes. Lifestyle factors such as: sedentary lives, inactivity, over-eating, eating unhealthily, smoking, insufficient sleep and other unhealthy behaviours, lead to a range of common health issues, including heart disease, cancer, diabetes and mental health issues. Furthermore, lifestyle diseases are impacted by factors such as changing neighborhood patterns that often erode community support systems. The design of the built environment is a factor in exacerbating these issues. As many societies are increasingly elderly, ageing populations are often house-bound partly as a result of the urban layout. What connects all aspects of the urban health threat tripartite is that these health issues are a *political* problem. The provision of healthcare and urban development are both influenced by political decisions.

Health inequalities

One of the outcomes of the urban health threat is the spatial influence of wealth; health inequalities are increasing. The holistic view of health, as defined by the WHO, has been described as difficult to achieve for most people¹⁵. Whilst some people do manage to achieve a high level of physical, social and mental well-being, there are severe inequalities, and many people fail to attain such positive health outcomes. Health inequalities have grown across the globe and are exacerbated depending on where you live, work and with whom you socialize. These are often accredited to systemic, socially produced and unfair factors such as social exclusion in housing, transport and access to facilities¹⁶. Health inequalities continue to persist in many countries despite general improvements in health outcomes¹⁷.

Healthcare strategies: *reactive* and *proactive*

Strategies for addressing healthcare issues can be categorized in two opposing fields¹⁸. The first is a *reactive* strategy, whereby healthcare reacts to health issues once they have already developed. This approach to health planning provides care for those that are ill but ignores the broader

environmental or social factors that might be contributing to the illness¹⁹. The second strategy for health care is more *proactive*; healthcare is targeted towards the prevention of health issues developing in the first place. The reactive strategy describes the approach of most health systems globally; the vast majority of all funding and attention currently deals with problems once they arise. The proactive strategy is perhaps the aim of current public health programmes such as WHO Healthy Cities which aims to promote better health, governance, empowerment and participation to create equitable and prosperous communities²⁰. Designing environments to improve wellbeing is part of a proactive healthcare strategy. Designs for a healthy urban environment might have provision for:

“clean air and pure water, contact with nature... good quality and affordable housing, safe and convenient active travel networks... local facilities, ... outside play, convivial meeting places... , a location that gives excellent access to a wide range of jobs, high-level facilities... without recourse to the car”²¹.

However, despite its significance as a determinant of health, there is scant attention paid by designers to the impact of buildings on health and wellbeing^{22, 23}. While there is some awareness and progress at ‘healthifying’ urban planning, for example with greater inclusion of walking, cycling and green infrastructure, there is less action and less emphasis given to the design of the buildings themselves. There are some nascent attempts to better integrate health and architecture, for example, the Wellcome Trust Living with Health exhibition, the new Design for Health journal or the work of the International Well Building Institute. Nonetheless, in terms of architectural design, very few practitioners can yet demonstrate positive health impacts. This is despite the direct effect on health outcomes as a result of the design of individual buildings. As most of our time is increasingly spent in internal environments, architectural space is an increasingly important context for the consideration of health.

Design for health

Evidence from the previous subsections suggest that ‘design’ processes might enable healthier environments and lifestyles; but what is meant by ‘design’, in this context, in terms of proactively facilitating better health? “Design can be defined as the human nature to shape and make our environment”²⁴ or “the conception and realization of new things”²⁵. Cross defines ‘design’ as the third field of knowledge; the first field being science, the second being the humanities²⁶. According to this conceptualization of the practice, ‘design’ is thus distinct from other approaches to producing

knowledge. Design is a processual activity or a form of practice and is characterized as “unstable, heterogeneous, multiply oriented, multivalent, multidisciplinary, polydiscursive”²⁷. Design is practiced by various persons, professions and organisations with differing values, ethics, philosophies, contexts, cultures and traditions, using a divergent variety of techniques and methodologies^{28, 29, 30}.

The term ‘design’ has traditionally referred to the activities and outcomes of design professionals, such as graphic designers, interior designers, product designers, and architectural designers. However, the term ‘design’ now incorporates an expanded field of designers including: “enterprise design, instructional design, social design, network design, user experience design, climate design, sound design, business design, applied design, green design, universal design and market design to name a few”³¹. Indeed, there are claims that almost every aspect of the human experience and global environment is impacted by ‘design’. Baudrillard suggests, “everything belongs to design”³²; Latour agrees, saying “the term [design] no longer has any limit... design has been extended from the details of daily objects to cities, landscapes, nations, cultures, bodies, genes, and ... nature itself”³³. The range of design spans all scales: at the global scale, climate-change necessitates a redesign of our planetary climate³⁴, while at the smallest scale, genetic redesign of the human body is occurring^{35, 36}.

Design is thus undertaken at distinct scales^{37, 38}. These scales can be categorised as: individual product/service; integrated products/services; spatial design; and socio-economic systems³⁹. Effective ‘design for health’ should be achieved through action at all of these scales. The implication is two-fold. Firstly, ‘traditional’ designers need to incorporate greater consideration of health and wellbeing within their own practice and professions. At the scale of ‘spatial’ design, architects need to design healthier homes and workplaces and urban designers need to design healthier streets and cities. The second implication is that health professionals are becoming ‘designers’. At the ‘socio-economic’ scale this concerns redesigning issues such as diets, working patterns and the broader ‘choice architecture’ of contemporary life⁴⁰. It is at this broadest scale that the process of ‘design’ is perhaps the most difficult to achieve or undertake. The interventions and policies of the health professions, as they shift from a *reactive* to *proactive* stance, are (arguably) undertaking a process of (re)design of the human health of a population. Few health professionals see themselves as ‘designers’ (at present), most baulk at the suggestion; however, the interventions being proposed to improve the health of the population meet the definition of ‘design’. A logical conclusion of the trend towards greater interdisciplinary working between

professions from all disciplines: sciences, humanities and design, might be the emergence of a new discipline of 'health design' that endeavours to proactively engender healthier human populations. Just as the World Health Organisation promotes the concept of 'health in all policies', a paradigm shift would be required to deliver a 'health in all designs' approach. Might this paradigm shift in ethics and values perhaps even require the adoption of the Hippocratic Oath for built environment designers? Whilst interdisciplinarity in healthcare (at all scales) to proactively improve health is still in its infancy, in this interregnum between the old and new organizational orders it is not yet clear what new disciplines might evolve to enable greater 'design for health'.

Home

The first four chapters are organized around the theme 'home'. The first chapter uses an artistic-research perspective to creatively explore experiences of living with dementia. The artist Anton Kats investigates walking as a non-representative activity within a diversity of institutional agencies. Elderly people experiencing dementia are invited to 'take a walk...'. This process address issues of care work, residential care, care home redevelopment and care in the city. The case study interweaves participatory methods of art practice and academic research to examine questions of access and infrastructure together with those of art and knowledge production in the context of residential care. The research aims to contribute towards the development of collaborative, dementia friendly and interactive design. In the second chapter, Véronique Ezratty and David Ormandy examine the financial implications of poor health related to housing conditions. A number of different health conditions may arise or be exacerbated due to such poor housing. Many houses cannot attain appropriate internal temperatures because they are difficult or too expensive to heat. Firstly, the research explores the financial cost of these illnesses to the healthcare system and secondly describes the financial cost of upgrading the thermal performance of housing. Whilst all households would benefit from improvements to health it is particularly those households on lower incomes with the greatest financial benefit and health outcomes. The research contributes empirical data to support a financially viable healthcare strategy for proactively intervening in the design of the built environment in order to prevent illnesses. In the following chapter, Matthew Huchinson examines the implications of housing shortages. The research is located in Australia but the issues addressed are relevant in many countries worldwide. At present, Australia is facing the prospect of a serious shortage of appropriate housing,

particularly for its ageing population. The desire to age at home is not well supported partly due to the configuration of the existing housing stock. The effect is most acute for those on lower incomes and experienced by greater numbers of women. The findings establish a number of factors that contribute to the problem, including the prevalence of homogenous car-dependent suburban developments, an ageing population, changes to care funding and inequalities in wealth. Furthermore, new urban development fails to address this challenge. In light of this, a new conceptual typology of housing that is physically appropriate, socially supportive and financially accessible for this context is developed.

The final chapter of the 'home' section looks at the issue from an African perspective. Ebele R.I. Mogo & Jørgen Eskemose examine how urban development strategies in Africa exacerbate health inequities. Informal settlements are very common. Over one billion people now inhabit informal cities and their inhabitants experience higher levels of health inequalities. The physical environment is one of the factors contributing to this inequality: poor sanitation, crime, unsafe housing and exposure to higher risk of natural disaster. Economic factors are also relevant; inhabitants of the informal settlements are often informally employed and are financially excluded from mortgages, health insurance and loans, partly as a result of their informal status. The key challenge to be addressed in informal development is how to provide housing that deals with the incumbent health issues in this context in an affordable manner. The research involves an innovative and creative mode of action research that physically constructs new housing pilot projects within an informal settlement in Maputo, Mozambique. The pilot study contributes to the evidence-base for supporting development mechanisms through which to achieve affordable, healthier housing. Furthermore, the Pan-African empirical work provides much needed, context-specific, knowledge for this urgent issue. Research relating health, homes and informal settlements is essential for improving health outcomes in these urban environments.

City

The second section of the book examines health at the scale of the 'city'. In the first of these chapters, Sam Kebbell & Jenny Ombler explore the possibilities of redesigning a car-dependent suburb in New Zealand. Suburban development, dependent on the motor car as a means of transport, is a driver of much urban sprawl in countries globally and is a significant contributor to climate change emissions. Such suburbs are also associated with more sedentary lifestyles and increased incidence of non-

communicable diseases such as obesity, heart disease and type two diabetes. Recent city planning policies have attempted to reverse urban sprawl trends by increasing densities and encouraging or mandating greater use of active travel. However, retrofitting existing communities remains a difficult design task. In order to explore this challenge further, a 'design research' methodology is applied to a case-study project. Visualisations of retrofit solutions to make city neighbourhoods more walkable are designed and critically evaluated as part of this exploratory pilot study. The next chapter by Vindhya Kakarla, Anne Niyigena, Pamela Xaverius, Deborah Kiel & Edie Barnard looks at the prevalence of child mortality in the city of St. Louis, USA. There are severe health inequalities in this city, with African American children particularly suffering from higher rates of mortality. Whilst many factors relate to access to, and the quality of, medical care, there are a number of contributing urban and spatial issues that this research focuses on. The research methodology interweaves photos, narratives and the voices of women who live with the experience of infant death to provide a more integrated and holistic approach in considering environmental influences on infant mortality. A number of themes related to the design of the built environment emerge: housing, physical environment, economy, community safety and community engagement. The aim of the research is to provide knowledge that may aid in reducing risk factors and improving infant health outcomes.

The third chapter in the 'city' section explores wellbeing in relation to community-level participatory design. The research is borne from the introduction of the Well-being of Future Generations (Wales) Act (2015). This legislation embeds healthy and sustainable development into the Welsh national political framework, committing all public bodies to improving social, economic, cultural and environmental wellbeing. Accompanying this top-down legislative mechanism is an emerging determination to also increase bottom-up participation of individuals and communities in this process. The research focuses on how wellbeing might be better integrated into the design of the built environment through the participation of the local community. However, there is little guidance or support available for local people in considering the wellbeing of their community. A 'Shape my Town' toolkit is devised to engage local people in considering the health and well-being of their built environments. This research adopts an exploratory 'design research' strategy, merging aspects of the design and governance of the built environment with community-level participatory approaches in order to improve wellbeing. The findings determine that whilst the tool can contribute to community participation and the identification of key health issues for each context, there is still a need for design professionals within

the process in order to fully realize the potential benefits of the wellbeing legislation.

In the last chapter in the ‘city’ section, Louis Rice develops a new framework and definition for ‘healthy architecture’. The chapter identifies specific issues within the scope of built environment design professionals for creating healthier architectural environments. The research reveals that ‘healthy architecture’ goes beyond the relatively narrow focus of current safety regulations or environmental health legislation. The proposed conceptualisation of ‘healthy architecture’ considers broader social, mental and physical health and wellbeing issues. The methodology is based on a review of research from medical and public health fields to establish evidence-based interrelationships between health and architecture. A ‘health map for architecture’ establishes four domains of architectural design related to health: materials, environments, agency and behaviours. Each of the four domains is considered with respect to the three facets of human health: mental, physical and social. The framework may be used by built environment experts, architects, engineers, clients, user groups, public health professionals and planning and policy makers to inform and improve the design of the built environments to promote and facilitate health and wellbeing.

Society

The final section of the book brings together research that examines health from a ‘societal’ perspective. Rachel Sara & Matthew Jones present the work of the Hands-on-Bristol collective, a platform bringing together community members, architects, trainee architects and academics to work together to empower local communities. The practice of the collective is conceived of as a form of spatial agency to empower communities through involvement in making and re-making their local urban spaces. The research draws on theories for improving community wellbeing through the interrelated processes of empowerment and activism. The chapter describes how the ‘design research’ projects involve an ongoing process of community engagement, participation and co-creation to generate and catalyze possibilities that might otherwise not be unlocked. Empirical case-study projects are evaluated to better understand the impacts on community wellbeing. The research identifies a positive impact for these projects on wellbeing and empowerment, but highlights the complexities of real-world timeframes and negotiating with the structures of power. The next chapter explores creative processes for improving community wellbeing. An interdisciplinary team worked with a local community in Northern Ireland to co-design solutions to local social

and health issues. The case-study area has high levels of mental health problems combined with very low levels of employment. The case-study projects worked with universal design principles to create two physical interventions in the built environment that respond to the community's issues. The approach is particularly innovative in combining a mixture of disciplines, using art practice with architectural interventions and participatory design, anthropology and healthcare research. The findings point to the contribution that built environment solutions might make to social, behavioural and psychological health issues in an urban context.

In the penultimate chapter, Thais Libardoni and Ligia Chiarelli explore urban sociability, particularly for older women, in Brazil. Ageing populations are an emerging issue for many nations and raise a number of health issues and challenges. The project explores the issue from an urban design perspective. The World Health Organisation (2002) describe 'active ageing' as, "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age"⁴¹. In urban settings, this may include greater social participation of the elderly, for example through the design of public space to encourage social interaction. The chapter examines an empirical case-study mapping approach to explore intergenerational issues in urban space. The research focuses on elderly women and points out that despite the majority of the elderly population being female, they are under-represented in publicly accessible city-spaces. The research points to the need to address this spatial asymmetry in order to improve health inequalities. The final chapter of the book ends with an examination of suicidogenic environments. Globally, over 800,000 individuals die due to suicide each year. In Sweden alone, approximately forty adolescents under the age of twenty commit suicide annually. The design of the built environment can be conceived as part of strategic thinking toward the prevention of suicide. Charlotta Thodelius describes the importance of 'place' for suicidal acts; the chapter reveals that by analysing spatial elements, more effective preventive strategies can be developed to help reduce the incidence of suicide.

Critical reflections

The book reveals a body of interdisciplinary research exploring the boundaries of health and built environment design. Such interdisciplinarity is welcome as it enables health issues to be approached from a variety of perspectives through different strategies and tactics. The book brings together healthcare design, community activism, architecture, epidemiology, product design, design anthropology, public health, art

practice, urban planning, criminology, action research, participatory design, environmental science and philosophy. Whilst this interdisciplinarity is creative, innovative and often sheds new light onto these research areas, there are tensions in working across, and within, different methodologies, research practices and sometimes conflicting discourses. There is much work yet to do to better integrate these diverse disciplines and professions; 'design for health' is a relatively young field. Researching through a 'designerly way of knowing', sometimes described as a 'design research methodology', is often unfamiliar to those from a science or humanities background. This book provides substantive evidence of a *designerly* approach to research. This research is timely and urgent; the health issues facing society are burgeoning. The design of homes, cities and societies plays an important role in determining many health outcomes. At present, too many design decisions are (perhaps inadvertently) nudging individuals towards unhealthy lifestyles. A radical paradigm shift in values and ethics may be required to enable the '*health in all policies*' aspiration to be translated into a '*health in all designs*' reality.

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