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Design & Health
International Academy for Design and Health

Volume 6 Issue 1

PRELIMINARY PROGRAMME & CALL FOR REGISTRATION

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Photo: Brisbane Marketing

BCEC, Brisbane, Australia, 10 - 14 July 2013

Design & Health

9TH WORLD CONGRESS & EXHIBITION

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Contributors

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Pat Young
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Cover Image
The Kinghorn Cancer Centre in Sydney, Australia, designed by BVN Donovan Hill. See pp46-53.

Think positive, be well

The interaction between the mind and the body has been a subject of debate down through the centuries and across civilisations. Whilst the west has put its faith in the medical sciences, underpinned by a strongly pathogenic approach to disease, eastern philosophy has always valued a more holistic understanding of health and wellbeing. Recently however, advances in psychology, neuroscience and the behavourial and environmental sciences is enhancing our knowledge and providing research evidence of how the connections between mind and body manifest themselves. A recent study in *Psychological Science* for example, has shown that people who experience more positive emotions in their everyday lives, will live longer and healthier lives. The study focuses on the vagal nerve as a marker for a person's health status, and how it is impacted by the experience of positive or negative emotions over time. In this issue's 'Standpoint', Prof Alan Dilani, builds on this study to explore how the built environment can positively shape the social, psychological and behavioral patterns of society (p15). His comment sets the scene for the launch of the scientific programme of the 9th Design & Health World Congress in Brisbane, Australia in July (pp 2,3,8,9,10,11). Every year the quality of the programme and the research improves, and this year, the leap forward has been a giant one. It is not to be missed.

Marc Sansom
Editorial director

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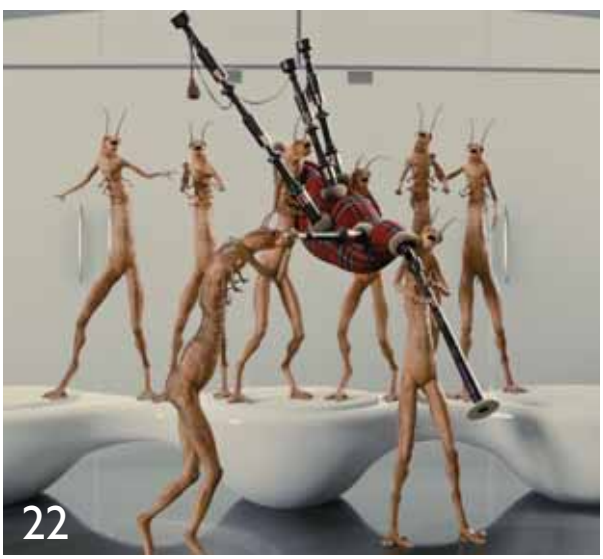

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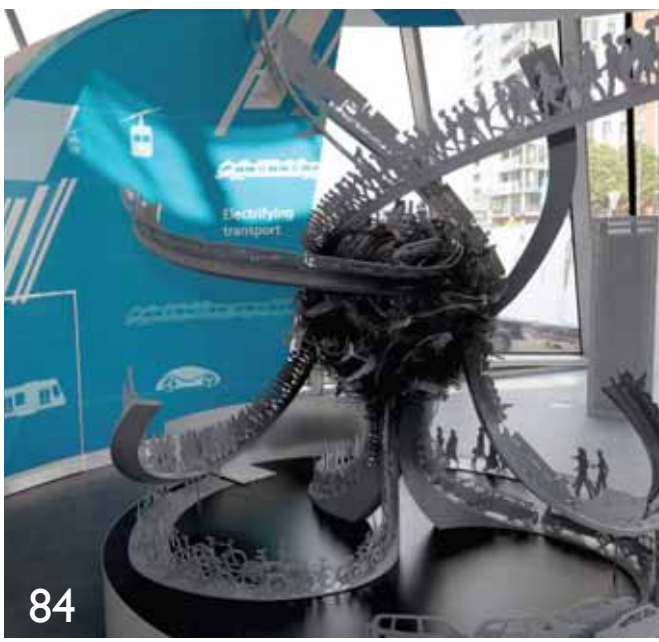

Search for a healthy society

A leading edge scientific programme will bring researchers and practitioners together in Brisbane, Australia in July at the 9th Design & Health World Congress & Exhibition

The health status of people living in Australasia is one of the highest in the world, with rising life expectancies and falling mortality and morbidity rates. But the region's healthcare systems face similar challenges to the rest of the developed world, characterised by increasing cost pressures, an ageing population and a rise in the level of lifestyle diseases, most notably diabetes and obesity. In addition, Australasia faces the challenge of addressing the inequities in health outcomes of its indigenous population and those living in more remote and rural areas.

In recognition that a healthy population is the foundation for social development and economic growth, Australasia is undergoing a policy shift that is addressing the need to redesign its health systems to embrace health promotion and embed a preventative approach based on better education and research. At the same time, the region continues to enjoy one of its most prolific periods of health capital investment, with many new benchmark facilities recently opening or due for completion.

Organised by the International Academy for Design & Health in partnership with the Australian Government and State Health Departments, and supported by world-renowned academic institutions and healthcare industries worldwide, anticipation is rising with the launch of the 9th Design & Health World Congress' scientific programme.

The leading edge programme, which will underpin future professional practice in health promotion by design, will focus on the development of a 'salutogenic approach' to health and public infrastructure investment embedded at the core of a preventative care strategy that will change the emphasis from risk factors and the treatment of disease to a more holistic understanding of a healthy society that promotes wellness.

The scientific programme of the Congress will offer delegates stimulating topics with a broad range of plenary sessions, technical showcases, posters and an exhibition of the latest innovations in the field, providing a unique opportunity for organisations and delegates to network and present their work. Opening the congress as its official patron, Prof Ian Frazer, Australian of the Year in 2006 and internationally renowned for the co-creation of the technology for the cervical cancer vaccines, will present a paper on the need for science and innovation to address the challenges of climate change and chronic disease.

The destination and venue

Brisbane is Australia's fastest growing city and is rated the world's sixth best business destination by the Economist Magazine. The seat of government and commerce in the state of Queensland, Brisbane has a population of 1.8 million. With an all year round idyllic climate, Brisbane is a dynamic, sophisticated and cosmopolitan city with a relaxed, friendly alfresco lifestyle. As Australia's premier tourist state, Queensland is home to some of the world's most magnificent natural attractions and boasts attractions such as the Great Barrier Reef, tropical islands, pristine rainforests, thousand year old rock carvings and rolling surf beaches along its coastline.

The congress itself will be held in the Brisbane Convention & Exhibition Centre (BCEC), Australia's most awarded convention venue, and located centrally on Brisbane's South Bank, which offers a unique riverside cultural and entertainment precinct in the heart of the city of Brisbane with more than 30 restaurants, cafes and bars, stylish shops, symphony orchestras, state opera companies, performing arts theatres and art culture, including Australia's most celebrated Gallery of Modern Art.

Keynote: Dr Ken Yeang calls for authentic ecological design

From left: Prof Clayton Christensen, Harvard Business School; Dr Richard Jackson, UCLA; Chris Liddle, HLM Architects; and Lord Nigel Crisp, House of Lords

In the search for a healthy society, Dr Ken Yeang, respected globally for his authentic approach to ecological design that proposes the benign integration of the built form into the natural environment, will deliver a keynote paper on the intersection between ecological and salutogenic design.

Sessions will include presentations by physicians as well as psychologists, designers, architects, planners, artists, nursing professionals and economists to bring together as wide a range of perspectives on design & health as possible. Topics addressed at the congress will include the latest research findings in the field:

- The salutogenic hospital: The role of the hospital in health promotion
- Case studies of successful healthy built environments
- Salutogenic design for healthy communities and urban planning
- Improving health by design for indigenous communities
- Wellness centres to promote individual, family and community health
- Innovation in procurement and delivery: evolving partnership models
- Indoor environmental quality that improves health and well-being
- Design for healthy lifestyle to prevent non-communicable diseases
- Design innovation in e-health and medical technology

In addition, the technological trends and interdisciplinary influences on design & health will be considered in parallel pre-congress symposiums covering hospital engineering and e-health, with a focus on the digital hospital.

The congress will be concluded with the choice of a range of impressive study tours around Queensland of recently completed state of the art healthcare facilities, including the new Queensland Children's Hospital and other architecturally innovative building types, such as the new Brisbane Supreme & District Court.

The high quality of scientific research presented in combination with a fascinating range of powerful case studies, a trade show displaying the latest innovations and solutions in the field, and a varied social and cultural program, will ensure participants enjoy a unique knowledge-enhancing experience in Brisbane the capital of Queensland, famously known as Australia's "Sunshine State".

To register online and download the preliminary programme, visit www.designandhealth.com

Gala Academy Awards Dinner

Scheduled to be held in the newly restored Brisbane City Hall, the annual Design & Health International Academy Awards 2013 will be presented at a prestigious ceremony and gala dinner on the final evening of the congress (13 July). Enhanced to incorporate twelve award categories, the awards perform a vital advocacy role internationally, rewarding and recognising excellence in design & health amongst researchers and practitioners and helping to benchmark design quality. See pp 16-17 for more information on the awards submission process or visit www.designandhealth.com

Sponsorship and exhibition

More than 50 leading international and Australasian brands will make up the exhibitors and sponsors within the Brisbane Convention & Exhibition Centre. These include architects, engineering firms, art and interior design consultants, as well as suppliers of furniture, furnishings and floor coverings, medical equipment, signage and safety products, and technology and communications. The congress is enriched by the support of its corporate partners, and the global expertise and knowledge that innovation and private enterprise bring. For details of how to sponsor or exhibit, e-mail info@designandhealth.com

Eminent scientist is congress patron

Named Australian of the Year in 2006, Prof Ian Frazer will distinguish the 9th Design & Health World Congress in Brisbane by virtue of his role as the event's official patron

Presenting a paper on how science and innovation can address the modern day challenges of climate change and chronic disease, Prof Frazer will open the event at the Brisbane Convention & Exhibition Centre, from 10-14 July.

Internationally renowned for the co-creation of the technology for the cervical cancer vaccines, Professor Frazer began his career as a renal physician and clinical immunologist in Edinburgh, Scotland before emigrating in 1981 to Melbourne, Australia.

He continued his clinical training and pursued studies in viral immunology and autoimmunity at the Walter and Eliza Hall Institute of Medical Research with Professor Ian Mackay. In 1985, Professor Frazer accepted a teaching post with The University of Queensland and was appointed director of The University of Queensland Diamantina Institute in 1991.

In early 2011, Professor Frazer relinquished directorship of the Institute to commence in-post as CEO and director of research of the Translational Research Institute (TRI) in Brisbane, Australia. When the TRI opens in Brisbane in 2012, it will be the largest institute of its type, with up to 650 researchers in the southern hemisphere — and one of only a handful worldwide that can research, trial treatments and manufacture breakthrough drugs in one location.

Professor Frazer was also awarded the 2005 CSIRO Eureka Prize for Leadership in Science and selected as Queenslander of the Year. Other prestigious awards include the 2008 Prime Minister's Prize for Science, the 2008 Balzan Prize for Preventive Medicine and the 2009 Honda Prize. He was also recently elected as a Fellow of the esteemed Royal Society of London. In 2012, Professor Frazer was appointed a Companion of the Order of Australia (AC) in the Queen's Birthday Honours.

Edelstein joins University of Arizona to research wellbeing

Eve Edelstein, PhD, distinguished for her expertise in the field of neuro-architecture, has joined the University of Arizona College of Architecture and Landscape Architecture (CALA) as associate professor.

Dr Edelstein, who will present a paper on the application of how a practical research-based design approach can inform design innovations to promote health and wellbeing at the 9th Design & Health World Congress in Brisbane, brings a unique background in architecture, anthropology and neuroscience, along with clinical service in neurophysiology at leading medical centres in the US and Europe.

She will establish and develop graduate programmes and professional courses for practitioners in architecture, landscape, environmental and clinical design, in collaboration with faculty in the School of Architecture & Planning, and the University Information Technology Services (UITS) 3D immersive CAVE team. Dr Edelstein will use research-based design methods and emerging technologies to map brain activity and advance the study of neuro-architecture and the design of healthy environments.

Collaborating with Dr Esther Sternberg at the Arizona Center for Integrative Medicine (AZCIM) to launch a major initiative in design, planning and wellness: The Institute for Place and Wellbeing, a joint venture among CALA, AzCIM, the College of Medicine, Tucson, and the Institute of the Environment. The mission of the Institute will be to explore and measure the effects of built space and the physical and green environment on human health, emotions and spirituality.

Kamp awarded honorary fellowship by British university

David Kamp, FASLA, LF, NA, president and founder of Dirtworks Landscape Architecture, USA, an internationally recognised and award-winning landscape architecture firm, has been awarded an Honorary Fellowship by the University College Falmouth in Cornwall, UK.

The Award of Honorary Fellowship, which recognises the efforts and achievements of individuals who have served a discipline area with particular distinction, acknowledges David's distinguished career in the field of landscape architecture.

Building upon the concept that we are all partners in creating and maintaining health, David will speak at the 9th Design & Health World Congress about the importance of design in shaping individual and collective choices that promote health and make our communities more vibrant, resilient and equitable.

Targeting the Asia Pacific

The 9th Design & Health World Congress provides a global stage for sponsors and exhibitors to build their corporate identity, and network with leading thinkers and health strategists and decision makers

Kuala Lumpur Convention Centre, site of 2012's World Congress

A successful partnership with the Australian government and state health departments, universities and private industry has led to the formation of an unrivalled scientific programme for the 9th Design & Health World Congress & Exhibition in Brisbane, the first time it has been held in Australasia.

Up to 1,000 attendees are anticipated to participate from around the world. Chief operations officer of the International Academy for Design & Health, Marc Sansom, says: "Providing a unique experience for delegates, exhibitors and corporate partners, Australia is one of the Asia Pacific's most vibrant economies and an ideal gateway to rapidly developing markets in South East Asia, China and the Far East.

"Sponsors and exhibitors can learn and exchange knowledge, promote their business globally and locally, make new connections and extend the horizons and possibilities for their international marketing and global brand development."

Sponsorship opportunities

Sponsors are taking prestigious positions at different levels of participation and association alongside the Academy and its partners to demonstrate their capability, expertise, innovation and solutions-orientated approach.

"In return for their intellectual and financial support, sponsors enjoy opportunities to develop their knowledge of global markets, increase their exposure to the latest research, engage intellectually, network at the highest level and enhance their domestic, regional or global brand," adds Sansom.

A limited number of sponsorship and exhibition packages are still available to match the strategic and tactical marketing objectives of both international and local companies. All offer a unique combination of brand promotion, positioning, networking and business development across multiple platforms, including the congress, awards, the Academy's journal World Health Design, and online.

For more information, contact Marc Sansom at marc@designandhealth.com or on +44 (0)1277 634176

Corporate partners show support for Academy

Despite continuing global economic uncertainty, private industry and business is showing its support for the International Academy for Design & Health's strategy to focus on the world's growth region, the Asia Pacific market in 2013.

In the Academy's recent round of corporate membership recruitment, corporate partners have recognised the opportunities for ever greater intellectual and marketing exposure since the Design & Health World Congress & Exhibition move to an annual schedule in Kuala Lumpur in June 2012 and Brisbane in July 2013, while the Academy's regional international symposiums in Europe, Australasia and Asia also become more established (visit http://events.designandhealth.com).

Since last autumn, corporate partners that have signed either one or two year arrangements with the International Academy for Design & Health, often engaging their support across multiple research, event and media activities, include:

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In his **mind's eye**

Peter Scher - born 30th October 1932, died 17th October 2012

Ann Noble remembers Peter Scher, a much loved British architect, teacher, researcher and journalist whose critical eye helped to define today's more rigorous approach to healthcare design

Born in the Jewish East End, Peter was the only son of Isaac, an artist and Elizabeth, a seamstress. His grandparents, Israel and Leah had arrived in Britain in 1900 from Lithuania to build a better and safer life. Evacuated from London to a 'safer` Sheffield (which was blitzed heavily on the night of their arrival!), Peter was awarded a scholarship to Christ Hospital Public School in 1943 where he excelled, and which nurtured his lifelong interest in all things. At the age of seventeen he started his studies for an architecture degree at the Bartlett School of Architecture in the University of London. This was interrupted by his call-up to undertake National Service, which he refused as a conscientious objector. This resulted in him being posted as a hospital porter for two years and the loss of his right to vote for five years.

Peter's professional career began as an assistant architect at J M Austin Smith and Partners and A M Gear in 1954. His involvement in healthcare architecture began in 1958, when he became involved with the redevelopment of St Thomas' Hospital in London. He went on to join George Trew and Dunn where he became an associate (1965-1975), working on South Teesside General Hospital and various major healthcare feasibility studies alongside community developments such as Winstanley and Livingstone Neighbourhood developments, incorporating over five hundred dwellings, residential homes for children and the elderly, shops, and churches. He became a partner in the firm in 1975, taking responsibility for central services, research, quality assurance and coordination of all major projects.

In the early 1980s he retired from a daily routine and turned his attention to arts for health and journalism, and was a regular contributor to the International Union of Architects Public Health Group (UIAPHG). He remained a consultant to his practice and was involved in a wide range of activities which included his role as a CABE enabler, membership of the Department of Health Design Review Panel, teaching at Hertfordshire University and conducting research. In pursuing his journalistic interests he made a significant contribution as a consultant editor to the magazine Hospital Development, raising the overall quality of the criticism and review of health buildings and making the journal a household name in this specialist field. In addition, he made an invaluable contribution to the Nuffield Trust book *Fifty Years of Ideas in Health Care Buildings* (1999) to celebrate fifty years of the NHS.

Peter was a remarkable man of considerable modesty that saw possibilities and alternative approaches to design

Peter's most passionate interest, however, was his work on art in healthcare buildings, notably with Peter Senior at Manchester Metropolitan University, where he was appointed as a Visiting Research Fellow (1987-2010). His prolific output and enthusiasm is summarised by Peter Senior who wrote: 'Peter Scher's interest and understanding of the power of the arts to affect people's sensibilities together with his experience of the architecture and design of health buildings were of enormous value to the work of Arts for Health.`

Amongst Peter's many published research works, two particularly stand out: *Patient-focused Architecture for Health Care* (1996), a major study, and *The Exeter Evaluation* (1999), the first professional evaluation of a major hospital arts project (published in the *Journal of Medical Ethics* of the *BMJ*).

Peter was passionate about the architecture of health buildings, wrote beautifully about it and always contributed to the debate. His ability to deliver gentle, constructive criticism of real insight was much admired. In 2010, he received the Building Better Healthcare Lifetime Achievement Award for his contribution to healthcare design. In his private life Peter ploughed his own artistic furrow, being a keen violinist, an interest he pursued to the end. Peter is survived by his wife Anne and two daughters Lucy and Susan and sons Steven and Michael. He is sadly missed.

Anne Noble is president of Architects for Health

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Positively healthy

As more scientific research comes to light that links emotional wellbeing and good physical health, so it becomes even more apparent that our physical environment has tremendous potential to promote positive emotions, says ***Alan Dilani***

As a consequence of our knowledge- and ideas-driven society, fuelled by the internet, it can be argued that diseases are becoming more psychosocial and psychosomatic in nature. Credible research is also finding that people who frequently experience positive emotions are also more likely to be healthier – they have fewer heart attacks, for example, and fewer colds. With the link between a positive outlook and good physical health moving from hypothesis to fact, it is time to recognise that the way we live, where we work, the way we interact with the built environment all have a tremendous impact on our emotions and experiences. These emotions and experiences are central parts of the health process that could be strengthened and supported by the stimuli from design and psychosocial factors.

The growing prevalence of non-communicable diseases (NCDs), or "lifestyle" diseases, is highly related to the quality of infrastructure and the design of the built environment. Suggestions about how we can reduce NCDs such as obesity are one of the primary challenges facing the designer and planner. Ageing populations and urban growth are a further two huge challenges to which design can apply itself to: we must focus on the innovative design and planning of green, sustainable and healthy urban planning around the world. It is the task of the designer and planner to reconsider the value of design and health with a knowledge-driven approach to salutogenic design.

The aesthetic value of our surroundings communicates the value of our society; beautiful places are not only stimulating, but they have also proven to be sources of enjoyment that make us feel less anxious and stressed. A well-designed built environment can positively shape the social, psychological and behavioral patterns of our society: if we bring nature to the built environment, for example, or fill our workplaces with art and culture, then we could optimise brain performance and restore our energies.

The approach of salutogenic architecture promotes a healthy lifestyle by creating a built environment that focuses on wellness factors that promote health, thereby contributing to the realisation of a healthy society. An increase in the consideration of salutogenic architecture leads to social innovation and economic growth, not least through its interdisciplinary approach, mixing sciences such as architecture, medicine, public health, psychology and engineering with culture, art and music.

Our challenge in 2013 is to commit to the innovation and fresh ideas that will inspire architects and planners in demanding economic times

Our challenge in 2013 is to commit to the innovation and fresh ideas that will inspire architects and planners to tackle a demanding economic outlook. The "emotion and experience" perspective should be considered as a tool for designers to be more competitive: by designing highly salutogenic environments, we can reduce the rising burden of healthcare costs, and save and improve lives.

Professor Alan Dilani is chief executive of the International Academy for Design & Health

13 July 2013
WCDH 2013, BCEC, Brisbane

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WORLD HEALTH DESIGN

Raising **the bar**

The 2013 Design & Health International Academy Awards, the leading international advocacy programme recognising professional excellence in the research and practice of designing healthy built environments, has opened for entries

The Design & Health International Academy Awards has a significant influence on the design and development of humanistic environments that support health, wellbeing and quality of life around the world. This year, the programme comprises 12 categories across the key areas of international health delivery.

The final awards, which will be presented at a prestigious ceremony to be held on 13 July 2013 in Brisbane, Australia during the 9th Design & Health World Congress & Exhibition, will reflect important aspects of the exceptional work undertaken by researchers and practitioners at the forefront of the field. Recipients of the awards will be those teams and individuals who, through outstanding efforts, have contributed to the progress of knowledge and demonstrated vision and leadership in exemplary initiatives within the field.

The 12 categories include: Health Project (over 40,000sqm); Health Project (under 40,000sqm); Future Health Project; Research Project; Mental Health Design; Elderly Care Design; Salutogenic Design; Sustainable Health Project; Interior Design; Use of Art in the Patient Environment; Product Design; and the prestigious Lifetime Leadership Award.

Eligibility

Built projects or research programmes completed between 1 January 2012 and 1 April 2013 are eligible to enter. The exception is the Sustainable Design Award, which allows submissions of projects completed after 1 January 2007, and the Future Health Project Award, which only allows submissions of unbuilt projects or conecptual designs. Projects may be entered into multiple categories, provided they are tailored to meet the specific requirements for the judging criteria of each award. Previous entrants are not eligible to enter the same category but may enter other categories. The closing date for each entry is 28 March 2013.

Judging panel, criteria and submission process

The judging panel consists of a group of independent experts from Europe, Asia, Africa, Oceania and the Americas. Experts in their field, the judges come from multidisciplinary backgrounds in research and practice. There are four different submission forms, each of which has its own criteria, so please ensure the correct form is used for the correct award category. Complete the entry form and the 750-word submission statement relevant to the category being entered, and send to the address on the form together with a maximum of 10 powerpoint slides. To download the awards entry form and submission statement, visit www.designandhealth.com.

The judging panel:


Alan Dilani


Jan Golembiewski


Warren Kerr


Anthony Capon


Ian Forbes


Steve Trevenar


Gunther de Draeve


Christopher Liddle


Marily Cintra


Yeunsook Lee


Alice Liang


Mungo Smith

Judging process and timetable

The judging process consists of a two-phase process:

20 December Call for Entries / Awards open for submissions.

28 March Deadline for receipt of submissions.

1 April Phase 1: Entries are scored remotely by each judging panel against the approved criteria. The scores are forwarded to the category chairs who make a recommendation on the shortlisted entries and award winners.

13 May Awards shortlist announced. Shortlisted projects are expected to register and attend the 9th Design & Health World Congress in Kuala Lumpur, from 10-14 July 2013 to present their project in a poster display and receive their award, either as a category winner or as a commended project. They may be required to elaborate on the project to the judges or submit further information as required.

May/June Phase 2: Members of the judging teams will meet to make their final award decisions.

13 July Awards Ceremony & Gala Dinner at the 9th Design & Health World Congress & Exhibition in Brisbane

Suspended sanctuaries

Inspired by a propeller-shaped seed pod, Farrow's dynamic tree-houses for a Canadian eco-resort aim to promote health via their integration with nature

Canada is a country singly blessed with natural beauty, but Ontario's Georgian Bay stands out for its combination of beaches, cliffs and pine forests. Hidden among one such forest, part of the UNESCO World Biosphere reserve, E'Terra Samara is an eco resort whose accommodation – suspended from and wrapped around the trees, creating a semi-open pod – is as integrated with the landscape as possible

The 12 villas have been designed by Farrow Partnership, which has taken the maple samara, the propeller-shaped seed carrier, as inspiration for their dynamic form. Rather than being intrusively nailed to each tree, each one-bedroom villa is suspended from a steel shoulder and cable system. They are irregularly placed among the trees, and face a direction that optimises views and natural light levels. Covering each prefabricated wooden frame – whose design draws on manufacturing techniques used in boat-building – is a fibreglass and TiO_2 (titanium dioxide) self-cleaning "bonnet" that helps to provide shade.

As well having a light physical connection to the trees themselves, the villas will be low impact in many other ways. There are composting toilets, a greywater system that filters the water from showers and feeds it back into the forest, and a decentralised PV power grid to generate electricity.

Through this combination of biophilia, sustainable building techniques and the serenity of the surroundings themselves, it is hoped that the resort will offer a completely restorative, revitalising experience for its visitors.

The freedom to choose

Hopkins Architects' Macmillan Cancer Centre, part of London's University College Hospital, reflects today's more flexible approach to treatment as well as being a sustainable, stimulating building in its own right. The facility aims to offer the most advanced cancer-care service in the UK. Based on an ambulatory care model – a first for a UK cancer centre – it means that patients can choose how and where to have their treatment, part of a wider "patients first" philosophy that has permeated every stage of the building programme.

Patient groups had a strong input on the building's design, including its choice of furniture – several options were trialled within other facilities before a final decision was made. Inside, a series of naturally lit stacking atriums feature trees, a cafe, meeting points and seating areas, while a roof garden provides some protected outdoor space. The ground-floor foyer is dominated by a large multicoloured chandelier by Stuart Haygarth, made from an "explosion" of everyday detritus, including spades, bottles, gloves and tennis balls, all objects found while beachcombing with cancer patients, their friends and families. Creating a humanising environment also extends to service delivery – information staff don't wear uniforms, for example, as a result of further patient research.

Exceeding Building Regulations' energy consumption standards by 38 percent, the centre is well ahead of the NHS's own environmental targets, in part thanks to its green roof, photovoltaic panels and a glazing system that maximises natural light. Prefabricated elements, including the bronze alloy facade and the service-riser modules, helped to reduce waste, minimise disruption and save labour costs on the constrained urban site.

University College Hospital Macmillan Cancer Centre, London, UK

Client: University College London Hospitals NHS Foundation Trust
Architect: Hopkins Architects
Cost: £63m
Size: 14,700sqm
Completed: 2012

Archimage

Inspired by adversity

Kurdish-born, Swedish-based product designer Jangir Maddadi spent the first 13 years of his life at an Iraqi refugee camp. Having not just survived, but adapted and prospered, his deep-rooted ideas about freedom and social contact now inspire his work

Describe your early life and memories, and how your experiences have shaped your view of the world. How have they influenced and inspired your work?

My family and I lived through two wars: the Iran-Iraq War throughout the 1980s, and the Iraq-Kuwait War in the early 1990s, as well as the subsequent coalition force. It kind of strengthens the bond that you have with your family; ours was sealed for life after all those years. My knowledge of the world was so little in my early life. My schooling was very poor: no teachers, no books, and most people – including my parents – couldn't read or write. We were never made to feel welcome at the refugee camp. Even at my young age, with such a lack of worldly knowledge, I could feel it in my bones, the hostility towards my family. I'm so grateful that we got out.

The best memories from my childhood were in helping my parents to build our own house, which was constructed by combining a sand and water mixture with bamboo. I am still very proud to have been a part of that. The hard work was a wonderful way to connect with my parents and also a way for me to provide something real and true for our home. I often compare my childhood to those of the children that I met once I moved to Europe, and that puts a smile on my face. Those children had things effortlessly handed to them, but I feel that being given the appreciation for diligence and strong family values was worth much more in the long run.

When did you first show signs of a talent for design?

I was very interested in knowing how things functioned or were manufactured. When I was six, I designed and assembled a mousetrap

A series of connected hemispheres, the Union Family bench encourages sociable sitting

for my grandpa; made from a can, it was actually a very clever construction, capturing the mouse without hurting it. My first real design was produced during my final year at design school. The students could volunteer to manufacture their own designs and sell them at a Christmas market. I designed an advent candle holder – and my record still holds for the most sales made at that market.

What are the philosophies behind your work?

My style of design evolved quite naturally through my interest in people, and the way that they interact both socially and with the world surrounding them. Being one of 11 kids, it's easy to understand why these types of social interactions are so important to me – I was never alone! I have also always believed quite strongly in introducing a strong sense of freedom into all of my productions. For example, my first collection of benches, Union Family, breaks with conventional bench design; its spherical form gives the users the freedom to choose their own view, or to sit comfortably in large groups, facing each other, or to share the bench with strangers while still feeling comfortable and free. They also offer the opportunity to integrate flower pots within the bench, allowing for the vegetation that we subconsciously crave in urban settings. I carried forward that idea of freedom into another bench series, the Compound Collection; it comes in four separate but similar shapes that can connect with one other, making endless possibilities.

The Droid lamp, inspired by Maddadi's "boyish fascination with the Space Age"

Everything our company makes must be beautiful in its simplicity and impeccable in its function. The Droid Lamp, for example, was created as a result of my boyish fascination with the Space Age, and the world beyond our own, and I put my heart and soul into every detail of building it. For me, beauty does not follow function, nor function follow beauty: they are equally vital. If something cannot be simultaneously unique, appealing and functional, why design it at all?

I've had some amazing commissions from all around the world. In 2009, I was asked to design a set of my Union Flowerpots for the Kennedy Green House in upstate New York, an eco-housing blueprint that Robert and the late Mary Kennedy had created. That was really incredible to be a part of that, and the Kennedys' efforts in increasing environmental awareness. Another amazing commission came from Hollywood – the set designers for Men in

‘Designing for well-being’

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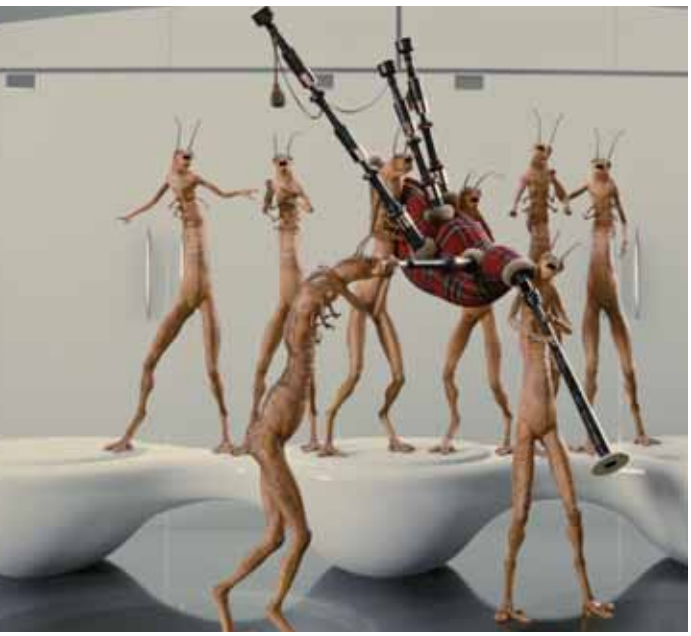

The Union Family bench – as seen in Men in Black III

The robot-like Droid lamp: "I put my heart and soul into building it"

Black III contacted me to use my white fibreglass Union Family Panorama bench. The cool thing was that the film takes place in two eras, the 1960s and today, so the fact that they were able to use the bench in both set designs is a testament to the fact that these pieces are not made with the inspiration of any specific era. I also have pieces at Aruba airport, which ordered ten red fibreglass benches, and also asked me to custom-design a flower pot, which became the 1.5m-high Flight Pot, inspired by the shape of an encased jet engine. Finally, I have just received a commission from Unibail-Rodamco, the king of shopping-centre developers in Europe – they had already used my Union benches in many of their shopping centres, and now they have asked me to custom-design their own exclusive brand of seating. I'm very much looking forward to this one!

What role can design play in meeting the challenges of the world today, particularly to support and promote health and wellbeing?

The whole world is a design – beautiful and complex, with the common function to continue moving. My designs mimic the natural flow of the world, of humans in action. People don't walk in a straight line. They curve naturally, walking through crowds, jumping over hurdles. And when they do stop to rest, it is important that they create a foundation that allows them to interact with one another in a completely effortless way. People should be brought together in a way that is not stiff or cold, but fun and free.

As far as promoting health and wellbeing, you can see the success of good design in the works of people like Baron Haussmann in Paris, and Frederick Law Olmsted, in Boston and in New York's Central Park. These men saw a true need for incorporating nature into urban settings, and knew about creating the respites of greenery that humans so subconsciously crave. When I was designing Union Family and the Compound Collections, I knew I had to create pieces that people could use outdoors, that would encourage interaction with others, and that would cherish their busy lives in this frenetic modern world.

What's next for you?

I want to develop more objects in the line with the rest of our products and philosophy. I am never content with the ordinary. One of my highest goals is to design a hotel from scratch – or better still, a whole city…

Jangir Maddadi is the founder of Jangir Maddadi Design Bureau. For more information on his designs, visit www.jangirmaddadi.se

Butler, borne of the idea that a waste-bin could be beautiful

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Never too old

As populations age, the Design & Health Asia 2013 International Symposium in Singapore will explore how salutogenic perspectives can help to create a healthy society in Asia

The rapid growth of Asian economies over the past half century has helped to lift billions of people out of poverty and indigence. Singapore, in particular, has been to the fore of social and economic development in the region, and has been recognised by the World Health Organisation as possessing the 6th best health system in the world, despite spending just 4% of GDP on health compared to 10-12% in Europe and 18-20% in the USA.

In the 21st century, however, health systems are facing a new set of challenges, characterised by rising costs pressures, ageing populations, low fertility rates, increasing public expectations, new technology and changing patterns of disease, most notably a rise in the level of lifestyle or non-communicable diseases (NCDs), such as diabetes and obesity.

The climatic domes at the Gardens by the Bay, Singapore – awarded World Building of the Year at the World Architecture Festival.

By 2030, Asia will account for over half of the world's elderly population and about half of the global burden of NCDs. By 2040, Singapore, South Korea and Hong Kong, which have the highest ageing rates in the world, will have fewer than two people of working age to support every person aged 65 or more. A steep decline in fertility rates also means that South Korean women can now expect to give birth to only 1.39 children, whilst in Hong Kong and Singapore the rate is just 1.14 and 1.37 respectively.

New and innovative ways will need to be pioneered to lighten the cost burden, keep people healthy and support more active living for the elderly. Redesigning its health systems to better integrate care with an emphasis on policies that promote health and wellbeing will be needed in Singapore and across Asia.

In 1997, the World Health Organisation identified that the "Health Arena", including priority settings and frequently used spaces such as the workplace, schools, hospitals, correctional institutions, commercial offices, public spaces within our towns and cities, and indeed our homes, should be at the centre of health promotion activities in the 21st century.

Salutogenic research, an increasingly influential research perspective, is based on identifying wellness factors that maintain and promote health, rather than investigating factors that cause disease. A focus on salutogenic design in Asian countries can be used to inspire innovative infrastructure solutions that facilitate an active lifestyle and enable the successful management of physical, psychological and emotional stress in our daily lives.

The Design & Health Asia Pacific 2013 International Symposium & Exhibition will be held at the double Academy Award winning Khoo Teck Puat Hospital from 14-15 March, where delegates will explore how global 'salutogenic' perspectives on the planning and design of public and health infrastructure can help to improve health, wellbeing and quality of life. Delegates will also learn about the latest design solutions and innovations from around the world in an exhibition that complements the symposium, and be able to attend the Gala Dinner on Thursday 14 March, which will be held at the iconic Marina Bay Sands Hotel.

To register and download the programme: www.designandhealth.com

Design & Health Asia Pacific 2013

Global Perspectives. Local Identities.
www.designandhealth.com
Khoo Teck Puat Hospital, Singapore - 14-15 March, 2013

Design & Health Asia Pacific 2013 is an international symposium and exhibition that will explore global salutogenic perspectives on integrated and aged care policy and practice in the region, including the planning and design of health infrastructure.

The symposium's objectives are to:

1. Evaluate different international models of care, theories and perspectives
2. Reflect on the socio-economic factors impacting on health and public infrastructure
3. Report on case studies of building types that are improving health outcomes
4. Recommend intiatives to improve the design quality and sustainability of health infrastructure
5. Discuss greater clinical engagement in the design process
6. Increase awareness of the available research base

CPG and HOK's Jurong Community Hospital will act as a step-down facility to the adjacent general hospital

Balanced care

In the grip of momentous changes both economic and demographic, Asia may be at a health crossroads, but it has no shortage of excellent healthcare facilities on which to create a blueprint for the future, finds ***Emily Brooks***

The "silver tsunami" is not a term that was invented in Asia, but its phraseology makes it a particularly apt way to describe the increasingly ageing population of this region. It portrays the enormous wave of change to come in an emotive and disquieting way – but unlike a real tidal wave, Asia's healthcare policy-makers can see the silver tsunami coming, and are starting to plan accordingly.

Many Asian countries have achieved great things over the past 30 years, both in an economic sense and in their efforts to achieve health equity. Now, there are worries that those gains could be wiped out by the huge potential costs of looking after an ageing population.

There is a strong tradition across the region for younger family members to look after their relatives in the home, and such duties are held in high regard. However, as the "dependency ratio" shifts, so that there are not enough younger people to look after the older ones, the status quo cannot continue. In China the problem will be particularly acute when those born in the one-child-per-family era could find themselves caring for two parents and four grandchildren. Greater demand for trained care workers and nursing facilities is inevitable, even is it not yet fully socially acceptable, and one of the results of China's relaxation of laws about foreign investment in healthcare at the beginning of 2012, is an influx of overseas companies in search of a business opportunity. Last October the New York Times reported that New York Hedge Fund Fortress had said it wants to invest US$1bn in senior care in China, with companies in Singapore also looking to expand.[1]

Age-centric facilities

What does this shift mean for hospital facilities? The World Heath Organisation's South-East Asia Regional Office (SEARO) published a report last year highlights one potential issue: "As most hospitals in the region cater to the acutely ill, older patients with less acute or chronic health problems find themselves as 'misfits' or 'neglected' in a hyper-dynamic acute-care hospital which is preoccupied with events and precision clinical procedures, deaths and bed occupancies."[2] Now, healthcare is stepping towards facilities solely geared for ageing patients, such as SAMOO's Seoul Seonam Hospital in South Korea (see case study), or those that integrate acute, sub-acute and rehabilitation care, with the balance of beds shifting away from the former. B+H's Changi General Hospital in Singapore (see case study) is an example of this.

"What's interesting to note with the Changi model and other hospitals [in Singapore] is that they're really focusing on continuum of care within one campus," says Peter Lambur, principal at B+H. "So it's not just

Sime Darby Medical Centre ParkCity, Malaysia

Architect: CPG
Client: Trekker Avenue Sdn Bhd
Number of beds: 300
Cost: MYR144m (£29m)
Size: 32,360sqm
Completion: 2012

Malaysian multinational Sime Darby's third hospital is built in a desirable planned suburb of Kuala Lumpur, Desa Parkcity. It includes dedicated specialist outpatient clinics for paediatrics, obstetrics and gynecology, a general medical and surgical clinic, plus daycare and in-patient services. "Patient-centric, hassle free, and having that warm, healing environment" is how Elaine Cheong Pek Yim, CEO of Sime Darby Healthcare describes the brief given to CPG, which has accordingly delivered a light and bright environment with a central green courtyard that is, according to Cheong Pek Yim, a first for Malaysia. The facility is notable for its VIP and even VVIP wards, where a refined level of service – private nursing and even butlers – is combined with a more hotel-like ambience, better quality finishes and a private garden (pictured left). "We still have to allow flexibility in the design, though," says CPG's principal Jerry Ong. "All the wards are designed in modules – a basic module could house one or two bays, but a VIP room could take up as much as three modules. But it allows the hopsital to flex, because what's relevant now might not be in a few years' time." Ong says the requirement for a 700-bay car park (which could not be located undergound, for cost reasons) was the greatest design challenge on this tight site; in the end the multi-storey car park has been built to the same height as the main podium so that they feel more in harmony, with multiple links between the two to increase convenience for patients.

a matter of having single-purpose facilities; there are these broader range facilities with a significant rehabilitation component built into the model of care."

The same integrated model is being introduced in Jurong, Singapore, where Ng Teng Fong General Hospital and Jurong Community Hospital, designed by CPG and HOK and due for completion in 2015, will sit side by side. The community hospital acts as a step-down facility, with a single admission and discharge for patients. Similarly, a new 500-600-bed general hospital for Sengkang, due to open in 2018, will work with the nursing homes, GPs and home-care providers near it, so that healthcare will be seamless for patients moving, for example, from hospital to nursing home.

Health crossroads

Ageing is just one of the health issues facing Asia. It is at a "health crossroads", with rising levels of chronic disease coupled with, in the region's poorer countries, the continued grip of communicable diseases such as TB and cholera, as well as maternal and child health problems.

Older assets are not able to keep up with the population growth

Asia doesn't need great architects to solve these issues, according to Beau Herr at RTKL, but it does need help with clinical programming side in order to maximise staff and operational efficiency: "Korea has fantastic designers – there's an enormous amount of skill there," he says of his firm's work on the forthcoming trauma centre. "What they don't have the experience is with the guts of it." John McGuire, director of global health (building systems) for AECOM, is in agreement: "In Asia, older assets are not able to keep up with population growth and age profile; there's a burning need for upgrade. One of the key things that Asian healthcare services could and should learn is, rather than just building hospitals, you need to use technology as your mechanism for building efficient, effective assets. They have a population basis that will overwhelm them if they just rely on traditional means."

It is not just firms from outside Asia looking to export such expertise, however: Asian architects

RTKL and Baum's Yangpyung Auto-Accident Rehabilitation Hospital, a 304-bed specialist hospital in Korea that will treat the victims of road accidents

Yum Seung Hoon

Seoul Seonam Hospital, Seoul, South Korea
Architect: SAMOO Architects and Engineers
Client: Seoul Metropolitan Government
Completed: 2011
Size: 39,000sqm

Built to cope with increased demand for specialised elderly care, Seoul Seonam Hospital uses its sloping site to create two entrances, pedestrian access on the ground floor, and vehicular access one storey below. The landscaped area of the north-south slope on the east side is naturally integrated with a neighbouring park, while a host of courtyards and rooftop gardens are intended to offer easy access to nature no matter how mobile the patient is – five of the gardens are indoors, and two are on the roof. The hospital roughly takes the form of a hollowed-out cube, with a courtyard at the centre, and the two main south-facing podiums are stepped, to let in more natural light. The surface materials used – timber panels and louvres, and terracotta ceramic panels – are intended to be patient-friendly, and are carried through from outside to outside to create a further connection between the two.

building and planning international-standard hospitals are finding themselves in demand in their neighbouring countries. Singapore's CPG designed the newly opened Sime Darby Medical Centre Parkcity, its first healthcare project in Malaysia, and has worked all over the region. Its principal Jerry Ong says that "CPG has worked on overseas healthcare projects in China, Vietnam, Brunei, and as far as Afghanistan and Pakistan, and we have found that there is a huge market for healthcare designers and medical planners. It helps that Singapore is known as a regional leader in terms of healthcare design, and CPG has built most of the hospitals in Singapore, so we are very well placed to export such expertise in the region."

The blueprint that CPG has helped to establish for a "healing" hospital in the south-east Asian context – gardens at every level, natural light and ventilation where possible, outdoor walkways – is starting to be replicated all over the region. SAMOO's Seoul Seonam Hospital has a "green network" of indoor and outdoor gardens, for example, while Changi General Hospital will similarly include multiple gardens; 80 percent of the ward block will be naturally ventilated. This provision for greenery seems particularly surprising given the space restrictions on many sites. Lack of land in cities, where demand is highest, means that in places such as Singapore, Jakarta and Hong Kong, high-rise hospitals are far more common to the more low-slung, campus-style facilities found in the west; it brings extra challenges for architects looking to bring nature to patients and staff. B+H's Peter Lambur notes that "Singaporean architects are innovators in developing elevated gardens in all kinds of buildings, which is kind of unique, but particularly relevant to healthcare buildings. The emphasis on natural ventilation is challenging architects to really try and make this work, and it's yielding some very interesting new design ideas. The practicalities are that you need relatively thin buildings, so that air can flow through them, and that by its nature offers access to daylight and views, one of the fundamental tenets of creating healing environments." CPG's Ng Teng Fong General Hospital

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Hospital in a garden, garden in a hospital

"It does not have the antiseptic look of a hospital and looks more like an airy and open resort hotel. I congratulate the architects and the hospital's planning committee on the design of the hospital."

Former Prime Minister of Singapore
Mr. Lee Kuan Yew
@ Khoo Teck Puat Hospital Official Opening Ceremony

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Khoo Teck Puat Hospital
in collaboration with RMJM Hillier

Ng Teng Fong General Hospital & Jurong Community Hospital
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Changi General Hospital, Singapore
Architects: B+H, RDC Architects
Client: Ministry of Health Singapore
Number of beds: 250 (in the integrated building)
Size: 29,000sqm integrated building, 32,000sqm ambulatory building
Completion: 2014 (phase 1), 2016 (phase 2), 2020 (phase 3)

Eastern Singapore's major hospital is set for a three-phase update over the next seven years, turning the facility from a 750-bed general hospital to a "wellness campus". B+H are working with Singaporean practice RDC to deliver the project; phase one, known as the Integrated Building, will connect the general hospital to the nearby St Andrew's Community Hospital, and broke ground last November. With its emphasis on sub-acute beds and rehabilitation space, this building supports the changing demographic – an ageing population that is more likely to need treatment for complex diseases, rather than acute surgical beds. Designed with a salutogenic approach, the hospital will be inviting for the wider community, with gardens and open spaces combined with amenities such as restaurants and shops. A podium element houses outpatient services, while a tower contains the inpatient wards. "Each inpatient floor will have a series of family and social interaction spaces as well as rehabilitation space, plus access to natural light, views and gardens – places to meet with family and with other patients, and places to get out of bed and partake in rehabilitation therapies on the floor, all to speed up to the healing process," explains B+H's Peter Lambur.

and Jurong Community Hospital will feature a herringbone-like wards where every patient will have a window.

New ways to collaborate

Private hospitals continue to chase overseas patients as well as the ex-patriot population, with hospitality-like environments and VIP wards. "It always comes up [in the brief]," says RTKL's Beau Herr of medical tourism. "My personal opinion is that it's a bit of a fad. Even though facilities want medical tourism they will still need to rely on local clientele to make them viable and sustainable. We've done market studies around it and the numbers never really justify it. I don't know whether, if a first-rate facility like Johns Hopkins opened up a brand-new facility in China, whether it would be more attractive."

In fact this is almost exactly what is happening in Malaysia with the opening of Perdana University, an entirely new graduate school of medicine that is a public-private partnership with Johns Hopkins International (JHI). Malaysia was chosen because it already had a good standard of education, but "a clear need to develop their physician workforce, both quantatively and qualitatively," says Steve Thompson, CEO of JHI. The curriculum will stay largely the same as in Baltimore, but there have been some adaptations: for example, Islam does not allow the use of human cadavers, so they have been replaced by digital and puppet versions, a system that's worked so well that much

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B+H's Changi General Hospital, where more sub-acute and rehabilitation space will better suit the needs of Singapore's ageing population

more of the anatomy course in the US has adopted the same procedure. Thompson also says that the way staff interact with patients will be different in Malaysia: "The generation of people coming into medical school have the more western perspective that patients will be much more informed and involved in their health; but actually we need to teach them that they will be dealing with patients and families who will have much more traditional paternalistic views – the doctor says do something, and you do it."

Perdana University's first intake was in September 2011; at present teaching is in interim facilities, but a 150-acre campus is currently being planned, with a first phase that includes a 600-bed teaching hospital. It is not just the curriculum that is being exported from Baltimore: Perdana's new campus will be planned by Ayers Saint Gross, which has been masterplanning and designing Johns Hopkins' facilities for more than 15 years, with space programming from Jones Lang Lasalle, another long-term partner of JH. Both will work alongside local firms Veritas and Archipac to deliver the campus.

Singaporean architects are innovators in creating elevated gardens

"There is no private teaching hospital that exists here, so it wasn't as if we had a benchmark," says the university's dean Charles Wiener, a senior Johns Hopkins member of staff who moved to Malaysia to set up the new venture. "We visited a lot of hospitals in Malaysia, both private and public, to see how things work, and to gain a better understanding of the patient demographics. But we used the Hopkins model, applying the Baltimore one as an academic model, for example."

Wiener adds that "one of the things that is great, in contrast to the US, is that they are at least thinking about universal healthcare. But what they need to be better at – and the same goes for the US and Britain – is the integration of information, and continuity of care. There is also a deficiency of specialists here in everything from paediatrics, to internal medicine. With an ageing chronic-illness population, they're going to need those specilaists."

RTKL's Beau Herr, meanwhile, sees the army of western-trained clinical staff in Asia as positive messengers: "They bring efficiency to their system. It's an unplanned, invisible network – but it's very welcome." But he also sees problems with the prescriptive, reactive western approach that trys to fix the immediate problem rather than adopting the more holistic Asian view of health. "In Asian culture, there's a strong belief in the search for 'balance', and it's something that the scientific method doesn't always value. To just treat the event is not in-keeping with the way they do things in Asia. But this search for balance is something that is permeating back into the philosophy and architecture of healthcare facilities everywhere."

Emily Brooks is an architectural writer

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Patchwork progress

Investment in enlightened architecture for the elderly is erratic at best, but there are still bold new initiatives exploring how design can enhance quality of life and care. ***Veronica Simpson*** reports

Elderly and dementia-care architecture is blessed with more than its fair share of visionary individuals and organisations. They have made great strides in raising awareness of how design can substantially improve the lives of the elderly, the infirm, and their carers – not just in creating calming, dignified and even delightful residential spaces but also minimising dependence and maximising quality of life.

However, the most brilliant projects and practices still appear to be isolated pockets of enlightenment in a sea of mediocrity – or worse. Professor Richard Fleming sees the sector as fairly static, despite his best efforts as director of the Dementia Training Study Centre (DTSC) at the University of Wollongong. He says: "The main driver in the design of places for people with dementia is still the economic buyer, and there's a view that these people want to have a hotel-like environment for their mum or dad." Surely, hotel-like spaces can also incorporate the latest dementia-related design tools too? "No," says Fleming. "There are a few providers who have the wisdom to look at evidence-based design but the great majority are simply driven by what they think they can sell."

With the backing of Australia's Department for Health and Ageing, Fleming is now able to offer an advisory service through his Study Centre to any organisation planning a new facility. He or one of his staff spend a day with the managers and their architects and take them through the evidence for dementia design initiatives, helping them find ways to implement them. So far, Fleming and his team have advised on 60 facilities, and he now has a representative in every Australian state. "When all's said and done the evidence is there to share," he says. "It leads to some very common sense conclusions. It's about

Sølund Retirement Community, Copenhagen, Denmark

Sølund Retirement Community is situated on a prime slice of Copenhagen real estate, overlooking one of the city's lakes. The competition-winning scheme, from Entasis architects and Witraz Arkitektur sees the complex of 384 apartments broken down into four large townhouses and a "villa", similar in scale to nearby residential blocks, and each designed around their own courtyard garden (left). The blocks are connected to a central entrance point (though there are individual "house" entrances and exits to encourage visits to and from friends and family) and to one other by a walkway at each level which delineates the space, and accommodates safe interaction and "wandering". To assist wayfinding, each block has its own distinctive facade, utilising red brick, pale brick and glazing, with strategic use of wood for enrichment of walkways and doorways. Engagement with the community is ensured through a kindergarten at its centre, and shops, a wellness centre, meeting rooms, a library and a cafe arranged around a ground-floor courtyard. Contemporary, light-filled apartments, nearly all with views either onto the courtyards, surrounding parkland, or the lake itself, are fitted with flexible furniture, designed to accommodate all abilities and disabilities.

Architects: Entasis architects with Witraz Arkitektur
Client: SAB, a social housing society for the Municipality of Copenhagen
Project coordinator: KAB, a social housing society
Cost: DKK1bn
Size: 37,000sqm
Completion: 2018

raising awareness and having that conversation with people." The quality of these "conversations" is key, however. Fleming's recent research, just published in the *Health Services Research Journal,* reveals quite how compromised design initiatives and quality can be – despite any architects' best intentions – unless there is buy-in from centre managers at a very early stage.

New UK funding

In the UK, the picture is, if anything, even less rosy, with quality of care in the sector continuing to draw huge criticism from the UK media. To help address this, the government announced in October 2012 that £300m would be transferred from the NHS to local authorities to build new supported housing or refurbish existing housing to make them fully accessible. Although "high quality" environments are sought, there is no reference in the briefing document to any of the work that has already been done in elderly or dementia-care design and which could be useful in creating genuine improvements. Although Damian Utton of Pozzoni Architects welcomes the government initiative, he is critical of the fact that this initiative excludes the private sector, and that the time-frame given for applications – 10 weeks from announcement to deadline – makes it likely that older schemes (and therefore not ones that have incorporated the most useful or innovative solutions) are more likely to be proposed.

The main driver in the design of places for people with dementia is still the economic buyer

The lack of joined-up thinking between the carers, users and the managers at the sharp end, and those at the policy, research and funding end continues to hold back real progress, says Utton. To which end, he and his colleagues at Pozzoni have joined the recently formed Dementia Action Alliance, set up by a research-driven charity, the Alzheimer's Society. Members include care providers, the Council for Palliative Care, and Age UK. Pozzoni is the only architecture practice, he says. Meeting quarterly, it's very much a "do tank" rather than a "think tank." Says Utton: "All members have to set up an action plan and every quarter we have to say how we are getting on with it."

Procurement slows innovation

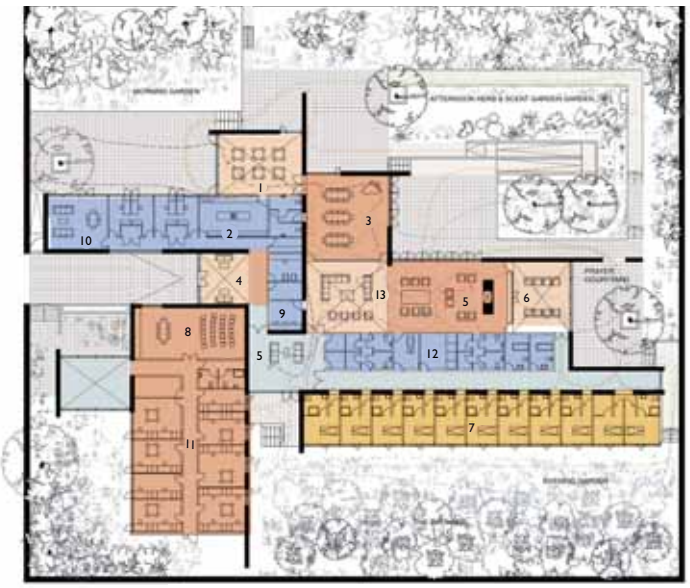
In the meantime, a good deal of money continues to be thrown at the development of technological assistance for facilitating ageing in place, regardless of physical or mental frailty – with IT companies eagerly taking up the challenge – although there is little to indicate that its ultimate deployment won't be focused on cost-savings and staff cuts rather than any enhancement in care or efficiency. And still the UK's laborious procurement processes continue to mitigate against innovation in elderly care buildings – excluding architects not already on NHS approval lists from the bidding process, no matter how appropriate their approach or qualifications otherwise. Architect Niall McLaughlin railed against this bureaucratic buffer at a recent Design Council forum, praising the unique opportunity his practice was given in creating the Alzheimer's Respite Centre in Dublin (see case study). The client – at that time a secular voluntary organisation – wanted to start from first principles, liked McLaughlin's ideas and approach, and despite their then lack of healthcare experience, set them the task of engaging in exploratory research before devising the final scheme. The design team spent weeks sitting in on sessions at the existing respite centre, interviewing carers and the cared-for, and building up a picture of what could both inspire, calm and contain the residents. The resulting building has been garlanded with awards since it opened in 2009.

McLaughlin is hoping to conduct a formal post-occupancy evaluation, but so far, informal interviews have revealed some unexpected outcomes. For example, one of the key elements in the design are the various meandering

Air Force Villages I and II, San Antonio, Texas, USA

San Antonio, a major military hub, has enjoyed its own retirement campus for military officers since the 1960s, adding another site five miles across town some 15 years later. Perkins Eastman was charged with bringing both complexes up to the latest standards in desirable retirement living, upgrading existing facilities, adding new residences and creating a unified campus ethos. Following extensive research with existing and future residents, a vastly improved and more diverse range of dining facilities were added to each campus, to encourage visitors and cross-sampling. The underutilised top floor of a 16-storey residential block is now a sophisticated piano bar and formal restaurant, called The Sky Lounge. Nearby, new Hill Country residences offer high-quality independent living apartments, while The Mission is a new skilled care home broken down into six households of 12 rooms each and connected by a service spine. A new rehabilitation facility takes advantage of the sloping site, with separate entrance/exit points for residents and non-residents at two levels. Short-term rehab households on the lower level connect directly to the therapy services. A "rustic modern" aesthetic across the campus sees generous use of timber and stone, outside and inside the buildings, with views and/or access to gardens, patios and landscaping wherever possible.

Architect/interior designer: Perkins Eastman
Client: Air Force Villages, Inc
Size: Independent living 6,400sqm, skilled nursing and short-term rehab, 6,600sqm
Cost: $50m
Completion: July 2011



GROUND FLOOR PLAN The Alzheimers Respite Centre

Dining Room	1	Meeting Room	8
Kitchen	2	Hairdressing/	
Activity Room	3	Therapeutic Remedies	9
Reception	4	Staff Room	10
Sitting Room	5	Offices	11
Quiet Room	6	Medical	12
Bedrooms	7	Central Space	13

paths that weave around the facilities and gardens, always ending back at the heart of the building. Post-occupancy interviews found that "people had significantly diminished their wandering" says McLaughlin. "Wandering is clearly an anxiety-driven activity, so the assumption is that anxiety had diminished. Another interesting outcome concerned a man who used to spend all day by the previous centre's front door, wondering when his wife was coming to get him. In the new building he is mostly content, sitting in the social spaces and doesn't hover by the door any more – "because we had removed the triggers that told him where the front door was," says McLaughlin.

McLaughlin is now working with neuroscientists at University College London Hospital to explore further "how we learn to understand and use space as children and then how we lose that facility in old age or illness". He would like to apply a more phenomenological perspective to the design of spaces for dementia sufferers – "not to see people with dementia as a broken-down version of our normal capacities" but to work with their specific world view, to create buildings that respond to "the state of perception that the people with dementia are in… There is a dignity you can give back to people by perceiving that what they are doing is a version of normality."

Alzheimer's Respite Centre, Dublin, Republic of Ireland

Niall McLaughlin Associates' brief in creating a new care environment for Alzheimer's sufferers was to produce calm, coherent spaces that reduce distraction and enhance orientation and mobility. Set within an 18th-century walled kitchen garden, granite is used on the north and east facades and warm brick stocks on the south and west facades. The building is placed to frame views of the gardens created between new building and old enclosure. Each garden is different – courtyard, orchard, allotment and lawn – and designed to be experienced at different times of day so that the resident can move around to enjoy the light as it changes, while enjoying a diversity of outdoor space.

To encourage social interaction (between residents and also with visitors) and mobility, the building is arranged around a series of social spaces that are completely secure and yet avoid feeling institutional. Wandering paths naturally loop back on themselves, and guiding walls are stacked at heights that facilitate views at all points. Flooded with natural light throughout, and with resting points at the end of corridors, residents and visitors are aware of the days and seasons progressing. The project has won numerous awards including the RIAI's Best Health and Leisure Project 2010 and a 2010

Architect: Niall McLaughlin Associates
Client: The Alzheimer's Society of Ireland
Size: 1,500sqm
Cost: €4.5m
Completion: 2009

Scandinavian inspiration

It's in the Nordic countries that many visionary examples of state provision – and joined-up thinking – emerge. One such project is an ambitious scheme to create the ultimate user-centric and future-forward elderly housing development, launched in 2012 by the Municipality of Copenhagen, together with one of the biggest elderly care social housing providers. Entries were invited from some of Scandinavia's most innovative architecture practices – including Norway's global "starchitects" Snøhetta – regardless of healthcare experience. They were challenged to resolve eight "dogmas" that the client team had identified for the scheme, which placed emphasis on dignity, comfort and community engagement for the residents alongside the use of cutting-edge care technology. Andreas Lauesen, partner at Force4 Architects, was the main adviser to the client group and says: "There is a huge pot of money from the government to use new technology in healthcare, empowering staff to spend more time being with the elderly rather than running around after them and cleaning."

By perceiving that what people are doing is a version of normality, you can give back some dignity

Perkins Eastman's Air Force Villages, a military retirement community

The winning scheme, from Entasis architects and Witraz Architects is now undergoing a three-month review period where the client team, the user group, their technical and nursing home advisers and the architects refine it to its most workable form. Once construction starts in August 2014, the project will have to meet the challenge of incorporating not just the latest in cutting edge care technology but also ensure current systems will be compatible with future developments. The scheme will be monitored throughout by research partners who will identify the most successful elements and practices and implement new methods and technologies as soon as they are identified as desirable or successful.

Meanwhile, over in Oslo, the Norwegian government is ahead of its Danish counterparts, and light years ahead of its British ones, with the development of Alma's House, a "test apartment" for dementia-friendly design and technology, placed within a new and inspiringly refurbished geriatric wing at Oslo University Hospital, part of its Clinic of Innovation. In an enviable piece of joined-up thinking, it has been developed in collaboration with Geria, Oslo's resource centre for dementia and age psychiatry, with products designed in conjunction with the Norwegian Design Council.

Air Force Villages' housing is complemented by fine dining and a piano bar, as well as rehabilitation facilities

Private initiatives drive US quality

In the US, a different kind of test residence is under construction. The result of a 2005 competition by Perkins Eastman to have its architects design a desirable, marketable, efficient and affordable single-family residence that would allow a couple to age in place "with dignity, hopefulness and a higher quality of life," the winning scheme, called A House for Betty, incorporates around 300 design elements that aid navigation, independence and wellbeing for even the most frail elderly, from lighting to views into and through rooms, to materials and furniture adjustability. It will hopefully be completed in 2013.

Architect: Pozzoni
Client: Community Integrated Care (CIC) housing
Cost: £5m
Area: 3,755sqm
Completed: 2012

EachStep, Manchester, UK

EachStep Blackley is a 60-bed care home, with five households of 12 en-suite bedrooms each, one of which is suitable for respite care. The building and model was developed by Pozzoni Architects together with client CIC's own dementia-care experts in order to create the best possible environment and quality of life for residents. Specialist lighting, furnishings and assistive technologies are employed throughout for the comfort and safety of residents. Facilities include large, dedicated activity and reminiscence areas, a gym, library, cinema and garden. Domestic kitchens and laundry facilities enable residents to continue helping out with household tasks. On the ground floor there is a 25-person day care centre along with a bistro and cafe, facing onto the street to encourage use by residents, families and the wider community. Predominantly brick, accent materials of render and cedar differentiate the angled window bays, which provide sheltered and pleasing seating areas with views of the gardens. At the rear, south-facing balconies extend household lounge areas, overlooking the enclosed gardens. A continuous feeling of space with long views is provided by the interior plan, with clear and secure circulation paths.

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Niall McLaughlin Associates' Alzheimer's Respite Centre, Dublin, is arranged around a series of social spaces

Accommodation for couples that will enable them to stay together and in place, through sickness or health, is one major US trend, says Perkins Eastman principal-in-charge Daniel Cinelli and his colleague, principal Jerry Walleck. Another is inserting attractive, viable dining options into elderly communities to encourage cross-fertilisation between residents and visitors. The firm's Air Force Villages in San Antonio, Texas, has been hugely successful at the latter (see case study). And although this degree of care and attention to lifestyle is currently only available to those with the means to buy it, Cinelli remains optimistic that the trickle-down effect into affordable (if not social) housing is inevitable. He says: "I use the analogy of the big flat-screen TV. When they first came out they cost $10,000. Now you can pick them up for $250.

"I always tell people you can experiment with this stuff that's more middle-upper income but that doesn't mean you can't translate that information into affordable housing." Small, incremental, community-minded improvements can make a big difference. For example, Cinelli cites a client in St Louis that wanted to build a 200-room elderly care home. Cinelli and Walleck persuaded them to build four blocks of 50 rooms, and put attractive and different dining options in each one. It makes sense, says Walleck: "because people at that age are more likely to become friends with 50 people than 200."

Small, incremental, community-minded improvements can make a big difference

Veronica Simpson is an architectural writer

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PRIVATE HEALTH CARE

PROJECT: BELLVILLE HOSPITAL
CAPE TOWN, SOUTH AFRICA

INTERNATIONAL AIRPORT

PROJECT: ABUJA INTERNATIONAL AIRPORT
ABUJA, NIGERIA

REGIONAL AIRPORT

PROJECT: ENUGU REGIONAL AIRPORT
ENUGU, NIGERIA

COMMUNITY LIBRARY AND CLINIC

PROJECT: ALBOW GARDENS
CAPE TOWN, SOUTH AFRICA
COMPLETED 2000

PRIMARY HEALTH CARE FACILITIES

PROJECT: OPOLLO HOSPITAL
BAYELSA, NIGERIA
COMPLETED 2009

TERTIARY HEALTH CARE FACILITIES

PROJECT: CHRIS HANI BARAGWANATH HOSPITAL
JOHANNESBURG, SOUTH AFRICA
COMPLETED 2009

Hitting the target

Recent advances in clinical treatment for cancer, as well as pioneering architectural initiatives, have given rise to some impressive new specialist care buildings across the globe. ***Veronica Simpson*** reports

The Norwegian Radium Hospital in Oslo, Henning Larsen's game-changing 2006 facility

An elderly man sits in a cathedral-like wood-panelled hall, with light flooding down onto a parquet floor from windows that span the space two and three storeys above him. Speaking to camera, he enthuses: "The good thing is that the building is so bright and does not feel cramped… And you never doubt the calming effect of this building, because suddenly people stop talking about their illnesses and begin to talk about something different. This owes very much to this room." The room he is referring to is the entrance hall and waiting area of the Norwegian Radium Hospital in Oslo. The speaker, Thorbjørn Holtan, a pensioner and long-term cancer sufferer, is there for radiation treatment. He concludes, with a smile: "I feel like saying you almost get well just by sitting here."[1]

This facility, designed by Henning Larsen Architects, was completed in 2006. But it has become for many architects the benchmark against which contemporary cancer centres are measured. In the view of the leading British health architect John Cooper, for example, few cancer buildings, if any, have bettered it.

The design, says architect Lars Steffensen, was inspired less by the excellence of other facilities than the awfulness of Oslo's existing ones, situated in the basement of the oldest, 19th-century part of the main hospital nearby. "They were frightening, dark, with no daylight," he says. "You entered through heavy lead doors so you felt sealed off from everything. It must have been a terrifying experience."

For Steffensen, inserting daylight into every corner of the new facility became his mission. Light penetrates right into radiation treatment areas – seven metres below ground – thanks to the lofty ceiling height and ample glazing of the adjacent entrance hall as well as the replacement of lead doors with secure glass ones. The quality of light in this building as well as its sense of connection with the surrounding landscaping have inspired many new cancer buildings over the last few years, including those that Cooper, now director of John Cooper Architecture, worked on as a former practice director at Anshen + Allen (now Stantec). With far less promising sites and budgets, the practice still managed to achieve high-quality buildings

enhancing staff and patient experiences at Leeds (The Bexley Wing, St James Institute of Oncology, St James University Hospital), Newcastle (Northern Centre for Cancer Care, Freeman Hospital), Liverpool (Clatterbridge Cancer Clinic) and in the London Clinic.

"Leeds is probably the largest cancer centre in Europe," says Cooper. "We managed to get 12 linac [linear accelerator] units into a vast floor with waiting areas overlooking courtyards. It's a 66,000sqm facility, yet we've managed to bring daylight into all relevant areas. All bedrooms have a view over the Leeds skyline, which helps the patient to feel connected to the world they've left. It's about bringing daylight in as much as you possibly can, 'dehospitalising' it and creating a concourse of some comfort, which immediately calms people."

Maggie's influence

In cancer care architecture, the pinnacle of patient-centred design has to be the Maggie's Cancer Caring Centres. Over the last decade and a half, the charity has commissioned a series of carefully crafted, bespoke, award-winning buildings, designed by the cream of international architecture practices, which have demonstrated time and again the benefits to cancer patients of smaller, welcoming, eclectic and personal buildings filled with texture, colour and views onto nature.

The Norwegian Radium Hospital, Oslo, Denmark

Denmark's Henning Larsen Architects has completed a masterplan, a research institute and a cancer clinic for Oslo's leading hospital. With the original buildings going back nearly 200 years, the bulk of recent additions had been 1960s and 1970s buildings, most of which are no longer fit for purpose. Their first intervention was to create a state-of-the-art cancer clinic, making maximum use of the site's adjacency to one of Norway's most beautiful valleys to create a building that "has a positive effect on both the personnel and patients". Despite the steep hilly perimeter and complex geometry, the architects managed to throw substantial daylight into the radiation treatment area, seven metres below ground level, by allowing light to penetrate via the cathedral-like entrance hall and waiting area. Patient waiting and examination rooms have views out over the valley. The choice of materials further humanises the space, with parquet floors in all the public areas, and a striking red vinyl flooring in the laboratory, teaching and office facilities on the upper floors. Timbered walls and sloping ceilings in the entrance areas and treatment rooms – including the radiation chambers – reflect daylight far into the rooms and add warmth and comfort.

Client: Rikshospitalet University Hospital
Architect: Henning Larsen Architects
Size: 8,500sqm
Completion: 2006
Project consultants: Bjorbekk & Lindheim, Okaw Arkitekter, MEK-Consult, Multiconsult, Ramboll Norge, Trine Mauritz Eriksen

Guy's & St Thomas' Cancer Centre, London; expected to be completed in 2015, the building will be broken down in to human-scale "villages"

Although they have no requirement for clinical facilities, these buildings have nonetheless raised awareness across the healthcare sector of the need to consider the patient experience at every point. Stantec's UK healthcare lead Catherine Zeliotis says that "Maggie's has been amazingly catalytic, because the discussion has really shifted in the last three years. In a competition that we just completed, for example, the [healthcare] Trust was referring to Maggie's and saying: 'This is what we like. How can we bring some of this into our building?' Before, it was down to us as a competitive team saying: 'We think you should bring some of that into your building.' And I don't think we can go back from here." There is, she feels, a discussion to be had about whether the quality and atmosphere of a Maggie's Centre can ever be achieved on the available healthcare sector budgets and via the current procurement systems, "but you can definitely see that clients now feel this is the language they have to be using."

A "hub" cancer hospital can be working on diagnostics and treatment programmes while "spoke" facilities administer the treatment

Promoting patients' interests

The forthcoming Guy's and St Thomas Cancer Centre in London is a case in point. Although it will be a large, multi-storey facility, the competition-winning scheme was the one that best resolved the issues of marrying world-class clinical and research facilities with a humane and patient-centred environment. Stantec was one of the competition-winning practices, together with Rogers Stirk Harbour + Partners, designers of the Maggie's Centre at Charing Cross Hospital in London. To humanise and clarify the space, the 14-storey building will be broken down into discrete "villages", each offering a range of clinical and complementary care spaces, both public and private. An open, daylight-filled atrium forms the welcome space, for example, with a cafe and appropriate retail, which will be street-facing. Counselling, a rehabilitation gym and drop-in facilities will all be found

within this welcome zone, with circulation pathways clearly visible from this point. "The exciting thing with Guy's Trust is that they have a very vocal patient group and they were in all our meetings [from] a very early stage. It makes staff aware that the patient is there so they can promote their interests," says Zeliotis.

Similarly, when designing Clatterbridge Cancer Centre in Liverpool, Stantec was put in touch with a committed and enthusiastic group of centre users who helped the architects by flagging up which areas and experiences cause most stress. "The design became very much how we could map the emotional journey of the patient," says Zeliotis. "We tried to match the [areas of greatest stress] to views out to the landscape, creating seating alcoves with viewing areas and, if possible, opening doors and access to the garden – even allowing the patient to sit and wait in the garden until they're called."

Clatterbridge is one of a series of new satellite treatment centres that also reflect changes in architecture in response to medical advances. Thanks to the now-pinpoint accuracy of MRI and 3D imaging, those blunt instruments of chemotherapy and radiotherapy have become far more targeted, with less collateral damage to a patient's health. Massive advances in genetics, in addition to the development of cancer-specific drugs, means that individual cancers can be targeted far more effectively. Patients can often be treated in one day and return home – chemotherapy can even be administered in the home. It's therefore possible for a central "hub" cancer hospital to be working on diagnostics and treatment programmes while smaller "spoke" facilities administer the treatment, minimising travelling times and stress for patients. More of these satellite centres are being rolled out in the UK, says John Cooper, with obvious benefits for building quality: "A building of 3-4000sqm can provide cancer care for a population of

Client: AtlantiCare
Architect: EwingCole
Size: 40,000sqm
Completion: 2009

AtlantiCare Cancer Care Institute, Egg Harbor Township, New Jersey, USA

When EwingCole designed the AtlantiCare Cancer Care Institute, a state-of-the-art facility housing outpatient medical oncology, infusion and radiation oncology services, the goal was to create a series of uplifting and therapeutic experiences to help relieve the stress of cancer on patients and their carers. Situated in AtlantiCare's 25-acre Health Park, the design team worked to bring nature indoors via daylight, materials and imagery – rippled sand, clouds and sky, dune grasses, stones and pebbles, blues and greens and beach-weathered wood echo the facility's coastal location. Patients receiving chemotherapy have views of a balcony garden, green roof and the woods beyond. Waiting patients overlook indoor trees and fountains in the sunlit lobby. Patients have a choice of eight private infusion bays for chemotherapy, in which they can control the temperature and lighting and watch television; or a "buddy bay", an open infusion bay for patients who prefer the company of other patients. Psychosocial support programmes for patients and families enhance the treatment programmes, while conference rooms and classrooms house programmes in health education and cancer prevention. The building has achieved LEED Gold certification and was awarded 2010 Best Healthcare Design Award by the International Interior Design Association.

Kinghorn Cancer Centre, Sydney, Australia

A joint venture between the acclaimed Garvan Institute of Research and top-ranking teaching hospital St Vincent's, run by the Sisters of Charity, Kinghorn Cancer Centre is designed to be something of a "game changer" both in the quality of its environment and the excellence, innovation and speed of treatment. BVN Architects was charged with creating "a non-hospital environment that encourages a sense of hope and wellness." Their solutions for this 13-storey building include a chemotherapy suite that looks out onto a bamboo garden. At the heart of the design is the feeling of community and interconnectivity. Architect James Grose explains: "The building is organised sectionally with the research areas on the lower-ground floor and the public interface floors on the ground and on the lower floors. These give direct access from the street to adjacent cafes to the vibrant street life of Darlinghurst, enveloped by the gardens that support the intrinsic expression of wellness of the building. As one travels further up the building the translational effect becomes quite clear as the major laboratories, write-up spaces, collaborative spaces and meeting rooms all intersect with the atrium."

Client: St Vincent's Hospital and the Garvan Institute
Architect: BVN Architects
Size: 11,500sqm
Cost: AUS$110m
Completion: 2012

maybe half a million people." And making a building of that size humane, welcoming and naturally lit is far less of a challenge than finding ways to provide daylighting, views and inspiring landscaping in a 60,000sqm hospital.

Incorporating local flora and fauna as inspiration for interiors and architecture, as well as landscaping, has also proven its worth in facilities created by EwingCole in the US, among them the AtlantiCare facility in Egg Harbor, New Jersey (see case study). "Patient satisfaction surveys conducted by Press Ganey [an independent healthcare survey organisation] for our clients have shown soaring levels of patient appreciation for these facilities: 95 percent and higher," says EwingCole principal Andrew Jarvis. "One woman commented about a building we designed for Memorial Sloan-Kettering Cancer Center: 'When I am here, I feel like I don't have cancer.' Many cancer care providers understand that a cancer patient's positive and optimistic outlook is critical for achieving good outcomes. Caregivers, too, appreciate the efficiency of the layouts we create for them. This has helped retain staff and attract the best new talent."

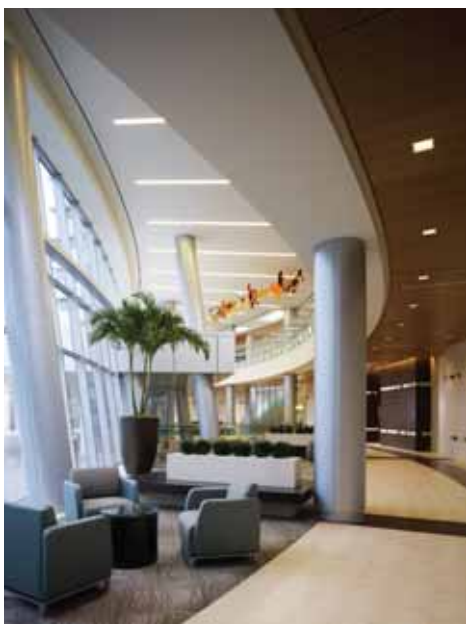
Mixing treatment with research

New "translational" facilities – state-of-the-art cancer centres that combine treatment with research and education – are proliferating across the globe. In Australia, a handful of world-class translational facilities have either just opened or are under construction. These include the AUS$1bn cancer research, treatment,

care and education facility the Victoria Comprehensive Cancer Centre in Melbourne (due to complete in 2015) and the Flinders Centre for Innovation in Adelaide (see case study).

One of the most striking of those completed is Sydney's AUS$110m Kinghorn Cancer Centre (see case study). The 13-floor, 11,500sqm hybrid facility is sandwiched between the Victor Chang Cardiac Research Institute, St Vincent's Hospital and the world-class Garvan Institute – the last two being the main partners in this venture. Garvan chairman Bill Ferris says that Australia has always fallen behind its US peers in the translation of cutting-edge ideas into treatments, despite the excellence of its medical researchers. But more than simply providing a facility that could accelerate connections and innovation, Ferris knew that a really prestigious building would help in attracting some of the world's leading cancer experts to lead their teams. Australia's *Financial Review* magazine recently ran a front-cover feature on Kinghorn's key players, including architect James Grose of BVN. The article praised the pre-cast concrete atrium, and the "Escher-style staircase, like a twist of DNA, backed by a monumental eight-by-thirty-four-metre artwork tailor-made for the space by Turner prizewinning British artist Richard Long." Ferris declares that a building of this quality "helps you enormously to attract and keep the very best."

The best brains are being wooed with outstanding architectural spaces



Baylor Charles A Sammons Cancer Center, Dallas, USA

Baylor University Medical Center had evolved over its 100-year history without a masterplan. In creating the first dedicated cancer hospital along with the largest outpatient cancer centre in North Texas, architects Perkins + Will were asked to address the need for a defined sense of place within a scheme that embraced and supported patients, staff and visitors throughout the journey of cancer treatment. The formal solution is a large, semi-circular plan with a circular connecting bridge between the new 43,000sqm outpatient cancer center and two existing 23,000sqm inpatient care buildings. The welcoming glazed entrance provides a clear sense of arrival and establishes a south gateway to the campus. Flooded with natural light, the crescent-shaped entrance links the visitor to the second-level concourse that ties inpatient and outpatient centres together, with patients making a literal and metaphorical journey along the curving walkway towards the outpatient centre. Services include radiation and medical oncology, pharmacy, laboratory, full service dining, radiology, retail and office space. The outer shell of the building mass is a series of concentric rings that step back as the building rises, allowing for a series of terraced gardens.

Client: Baylor University Medical Center
Architects: Perkins + Will
Cost: US$127m
Size: 43,000sqm
Completed: 2011

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We are proud to have been part of the team for the design and construction of this significant project.

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Flinders Centre for Innovation in Cancer, Adelaide, Australia

Twenty minutes out of Adelaide toward the beaches, a striking new building has joined the region's main university and hospital campus. South Australia's first integrated cancer treatment and research facility, the Flinders Centre for Innovation in Cancer (FCIC), designed by Woodhead Architects, is visible from the road. Its four-storey, curved glass and copper-coloured aluminium facade welcomes visitors and staff into a light and airy atrium reception, with a single wide, glass-balconied timber staircase as the circulation point between floors. The north wing consists of research laboratories and office accommodation for clinical trials nurses and oncologists. These are largely open plan, with a joint coffee/breakout area at one end facilitating professional brainstorming and connectivity. FCIC's Professor Ross McKinnon says: "We're taking integration to another level. Medical staff now see the people they are treating around the building in general – there's a continual public interface." The south wing accommodates the cancer clinic and day treatment suites, while the ground floor encompasses a multi-purpose lecture/function area with patient education facilities. Timber and white walls provide a high-quality, calming environment throughout the building.

Client: Flinders Medical Centre Foundation and Flinders University
Architect: Woodhead
Size: 6,000sqm
Cost: AUS$29m
Completion: 2012

This trend will only be further driven by the architectural one-upmanship that currently exists between top class academic and research centres – from Oxford to Harvard, the best brains are currently being wooed with outstanding architectural spaces that can compete aesthetically and functionally with any global pharmaceutical HQ.

But ultimately such collaborative buildings help to engender a feeling among all elements in the community that they are working towards the same end (rather than patients feeling they are being helplessly shunted through the medical machinery). "Because of the sectional transparency of the building the translational mode of research to patient is writ large," says BVN's James Grose. "Not only operationally do the spaces link but notionally the gesture of translation underpins the conceptual arrangement of the building. By this we mean that direct sight lines, direct perambulation lines, the air that's breathed, the light that's taken is common to all occupants of the building whether they are translational researchers or participants in treatment trials."

Veronica Simpson is an architectural writer

References

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Civic pride

Following on from the Design & Health Academy Award-winning The Waldron, Henley Halebrown Rorrison's (HHbR) has completed another healthcare centre, the practice's fourth in London. Akerman Health Centre in Lambeth builds on the firm's experience in creating healthcare environments that benefit staff, patients and visitors alike, aiming to express the values of the NHS to the local community, as well as raise the bar in terms of creating a building that is an expression of civic responsibility. The new health centre has some recognisable echoes of The Waldron, including its distinctive use of external signage; two artists collaborated on the project, Daniel Sturges working on abstract-patterned Corten panels on the exterior, and Paul Morrison providing an interior ceiling frieze. The £12m building contains four GP surgeries (spread over the first and second floors) along with dentistry, midwifery, paediatric care and other community health services; these are clustered around a central foyer to ensure easy wayfinding and short journey times for patients. The top floor consists of open plan office accommodation, staff showers and changing rooms, small meeting rooms, a library/training space, a staff room and a roof terrace.

Ioana Marinescu

UAE flagship on track

One of the Middle East's flagship medical building projects will be ready for patients by the end of the year. The state-of-the-art Cleveland Clinic Abu Dhabi is a multi-speciality hospital that, according to its developers, will be the largest structural steel building in the UAE. Architect HDR has designed the facility along LEED Gold principles, utilising a double glass curtain wall that will carry used, cool air up through the building and out at the roof, creating a buffer between outside and in. The interior of the 364-bed hospital (expandable to 490 beds) aims for a luxurious hospitality-like look, and employs colours and motifs suitable for its location, including Arabesque patterns that reflect the local vernacular, and a turquoise and neutral colour palette that echoes the desert and the surrounding Gulf waters. HDR's lead on the project, Mohammed Ayoub, describes the building as a place "that blends cutting-edge technology, evidence-based design, world-class care and Arabic culture with elegant architecture. Our goal is to deliver a building that is beyond state of the art. It will provide a standard of care and service that is simply not available anywhere in the region. And it will do so in an iconic facility that is sure to stop people in their tracks."

Manchester cancer centre built on strong partnership

A new specialist cancer centre planned for Manchester has broken ground. The £28.5m Manchester Cancer Research Centre (MCRC) will be a state-of-the art research facility for the city, and is a partnership between the University of Manchester, The Christie NHS Foundation Trust, and leading charity Cancer Research UK. The building will focus entirely on laboratory-based cancer research, turning laboratory discoveries into new tests and treatments for patients. Its work will be further aided by the immediate proximity of its partners, such as The Christie's clinical trials unit. Capita Symonds is cost- and project-managing the build, which is expected to be finished in summer 2014.

Wellness centre for north London

Replacing an older facility on the same site, north London's Finchley Memorial Hospital is Murphy Philipps Architects' latest healthcare project The £28m community hospital has been heralded as an exemplar "healthy building" by the RIBA and has achieved a BREEAM Excellent rating. Its clinical elements have been blended with community facilities, including outdoor spaces, playing fields and a cafe, with the aim of creating a "wellness centre" rather than a mere hospital. Murphy Philipps' design meets the Department of Health's latest guidelines, incorporating strategies for future flexibility while providing an exemplary environment for patients and staff; double- and triple-height spaces and extensive glazing bring a sense of light and space, while the same shades of green and blue used on the exterior also form the basis of the wayfinding scheme within.

Hello to Helix

Helix, a new mental-health facility in a southern suburb of Stockholm, is a high-security environment that also feels light, bright and welcoming. Sweden's BSK architects have made the most of a stunning site in the middle of a pine forest to create a healing environment that is in constant contact with nature, with views in every direction, complemented by the use of natural materials inside. The practice drew on its expertise in creating secure environments (prisons and courts), and despite Helix's complex security needs, its layout feels very open. The space is programmed to encourage staff interaction and therefore sharing of knowledge (previously, staff worked far apart from one another), but it also fulfils a need to separate certain patient groups. Helix opened in December, 2012 and can accommodate 90 patients.

Max Plunger

Bright future for Olympic site

Work has begun to secure a prosperous future for London's former Olympic Park, with a new report suggesting that the east London site could have all the right ingredients to become a thriving new neighbourhood for the capital. The study, by the Centre for Economics and Business Research (CEBR), compared the site's features – transport links, quality of life, local services and access to local employment – with other key residential areas in London, and found it to be closely aligned with desirable areas such as Highbury and Hammersmith. The Olympic Park, now renamed the East Village, will provide more than 2,800 homes for Londoners. "The neighbourhood will suit a range of needs," says CEBR analyst Osman Ismail. "Families who want more space, professionals who want a safe and desirable place to live, and key workers and ex-service personnel who want high-quality homes in a thriving area. It's an outstanding living environment, contributing much to the broader regeneration of east London."

Photography by Sam Noonan

A place of refuge, safety, security and healing

The first stage of Glenside Campus redevelopment has reached completion; a modern 129-bed mental health and substance abuse centre in Adelaide, South Australia, designed jointly by Swanbury Penglase Architects and MA.

The new facilities provide a high quality environment that supports a recovery-focused model of care.

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It's time – let's reach consensus

Dr John Zeisel is chair of the international advisory board of the International Academy for Design & Health and president of Hearthstone Alzheimer Care

Cancer, neurology, autism, and old age – what a mix of conditions! Design programming in one case, post-occupancy evaluations in two others, and design guidelines in a third, all aimed at understanding… what? The needs of users living with such conditions – if old age can be called a "condition"? Characteristics that users prefer in such environments? Sensory conditions that add amenity and health-supporting qualities to environments for these users? How design expectations were met? How different cultures respond to such needs and preferences? Or all of these? And what are the goals of such programming and POE studies? To design better environments – living spaces, treatment centers, gardens, hospital rooms? To develop design guidelines? To provide through detailed analysis? To present objective data? To improve the environments' salutogenic qualities? To better market products? To add to theory regarding what makes a better environment for a particular set of users? Or all of these? And then what is the actual output of such studies? A list of environmental design performance requirements designers can aim for in their designs? Illustrated examples of settings that "work" and don't "work." Categories of characteristics which, if met, are likely to increase users' satisfaction of health? Or all of these? Clearly the more we know about the interaction of environments and users, the better job we as environmental planners – programmers, designers, evaluators – can do. Architectural guru Christopher Alexander years ago taught us that the best environments are those which "fit" the needs of their users, and evidence-based decision making – design based on research information – has the highest likelihood of achieving "fit". Where do we go from here? Have we progressed since the sixties and seventies of the last century in our quest for better fitting, healthier, and more responsive buildings, outdoor spaces and gardens? Yes we have, but we have so much further to go to really make a difference. Designers and researchers dedicated to the ultimate health of users of the environments we plan have to rise to the next plateau of cooperation – to reach consensual answers to these questions? What are we looking for in design research? Why are we looking for it? What methods are best employed to determine the answers to our queries – whether programming or post-occupancy evaluation? How do we expect our findings to be used? What are the ethical questions such studies raise and is there an ethical basis for responding in design? Consensus on answers to these questions would immensely add to the richness of studies like those in this volume and to the exciting contributions made by similar studies carried out every day in universities, research centers, and design offices. They deserve it, the environments studied deserve it, the users of environments deserve it, and so do we.

Salutogenic Design for the Elderly
Healthy residential environments for the elderly in Japan, Korea and Sweden

This study from Korea University uses salutogenic principles to analyse residential facilities for elderly people in three countries, explore how each might benefit from the other, and suggest an optimal direction and design for the elderly in Korea

The issue of elderly people is one of the most important ones in society. Based on UN DESA,[1] as of 2010, the population above 65 years continues to grow at a fast pace. In South Korea, it is estimated that the number of elderly people will account for 14.3 percent of the total population by 2018.[2] The proportion of "elderly person households", in which the household head is an elderly person, is predicted to rise from 17.4 percent in 2010 to 30 percent by 2030. As a result, health problems among the elderly may deteriorate, as well as their socio-psychological isolation and alienation from society. The lowered social position of the aged, combined with reduced support received from their children, result in lost opportunities for inter-generational social contact.

In relation with deterioration of the elderly's health, Yu and Park[3] analysed the health status of 212 seniors over the age of 65 who live alone, as well as the elderly living with family members. The results showed that the emotional and psychological status of those who live alone worsened considerably. Han and Lee[4] studied the mental health of the elderly living in solitude and concluded that they have significant degrees of panic, obsessive compulsive disorder and anxiety. Park et al[5] found that elderly people do feel stabilised within a familiar environment. The elderly are reluctant to leave the accustomed places where they have lived for a long time[6] and exhibit a psychological attachment to the house in which they have lived.[7]

Flickr/USAGYongsan

Figure 1: In Korea, it is predicted that elderly people will make up 14.3% of the population by 2018

The above arguments suggest that the optimal elderly residential environment should be a settlement place where seniors can feel stabilised and reside for a long period of time. Since most elderly activities are carried out at home, in Goh's[8] view, it is essential that elderly people live independently. It becomes necessary for the elderly to adopt residential environments so they can manage their lives while being provided with local services in the existing residential areas if necessary. They may also need supplemental and expanded facilities and service programmes to be assisted in their independent lifestyle.

Among studies that focus upon the health of the elderly is the approach to mental health and wellbeing,[9,10] ages of the aged and residential condition,[11] and adaptation to residential environment.[12] In this study, the residential environments for the elderly from several countries are compared from the salutogenic viewpoint. These studies are expected to present a direction for the optimal design of the elderly residential environments in Korea. The cases selected include Japan, which is a market-oriented case, and Sweden, a welfare-oriented case. An intermediate optimal direction and design for the elderly in Korea is suggested.

In Section 2, we discuss the methodology used. Health-centered viewpoints of salutogenesis and its elements are discussed in Section 3, while Section 4 focuses upon the residential environment for the elderly in Japan, Sweden and Korea. In Section 5, we analyse the selected cases. The final section provides discussion and policy implications.

Method and cases

A number of methods are used. First, we propose the elements of a residential environment for the elderly by examining the salutogenic, health-oriented concept and review the related studies. Second, we analyse representative overseas cases for creating an optimal residential environment for healthy elderly people on the basis of the salutogenic concept in Korea. The cases of Japan and Sweden will be analysed with respect to safety, socio-psychology, the treatment environment, and residence for living aspects. Finally, we present the policy implications of developing a residential environment for the elderly in Korea with the direction surrounding healthful living by using the result from our empirical analysis.

The population in Japan has been ageing earlier than in Korea. Japan has undergone a process of trial and error when it comes to residential facilities for the aged. This led to the systematic and effective development of senior housing by promoting private-sector participation. Sweden has developed – and is continuously improving – its residential ageing facilities through public support. Thus, this study chose Japan and Sweden as the representatively ageing countries of both east and west to gain necessary data

Table 1: A framework for the salutogenic design of residential environments for the elderly

	Basic concept	Main factors	Key viewpoint	Elements
Salutogenic concept of the residential environment for elderly people	Health-disease on one and the same spectrum	•Address stressors and tension •Promote GRRs and SOC	•Ensure privacy •Treating environment •Barrier-free environment	•Convenience •Hygiene •Safety •Pleasantness

Source: authors

and experience to better assess the health orientation of housing facilities for the aged in Korea. By drawing a comparison between Japan and Sweden, private and public driven, this study attempts to find an optimal, intermediate direction for residential accommodation for the aged in Korea.

The concept and elements of salutogenesis

The concept of applied health, which had previously been based on the presence and absence of diseases, is changing to an increasingly "health-orientated concept". The social context of health and diseases has been emphasised,[13,14,15] and the relationship between environments, stressors and diseases has been examined.[16,17] Conceptual frameworks for examining the total conditions for increased healthy living among the elderly have received more attention. The attempt to substitute the disease-centered conceptual frames was made by Antonovsky.[18,19,20] In his view, the existing disease-centered (pathogenic) model, which dichotomised human health into health and diseases, examines human health in the wrong way. On the other hand, the health-oriented (salutogenic) model places health and disease on a continuum.

According to Antonovsky, health was seen as a movement in a continuum, existing on an axis between total ill-health (dis-ease) and total health (ease). Thus, salutogenesis is a stress-resource-oriented concept. It is a combination of peoples' ability to assess and understand their life situation to move in a more health-promoting direction and having the capacity to do so. The disease-based model aims to remove diseases by addressing the symptoms of diseases, but the health-oriented model promotes the elements generalised resistance resources (GRR) and sense of coherence (SOC) removing the diseases.

The residential environment is the aggregate of the physical living environment in a narrow sense, and the social, economic and cultural environment in a broader sense. The contents of the residential environment include things required for safety, hygiene, convenience and pleasantness.[21] Houben[22] suggests that consideration should be taken as to the practical needs required in everyday living and potential necessity, protection, and even psychological support for elderly people who live alone. Dobey[23] defines the collective connection with special, temporal and socio-cultural experiences, along with the connection with places.[24] Carp and Carp[25] lays emphasis on the residential environment for satisfying elderly people's behavioural desires to implement healthy living.

For the salutogenic concept in this study, we will consider the environmental aspects of safety, hygiene, convenience and sustainability in which GRR and the SOC are reflected as elements for the residential environment for elderly people's healthy living (see Table 1). The elements for the salutogenic residential environment are described in three aspects: (i) the environment in which the flexi-care system is implemented as a socio-psychological aspect; (ii) how the houses should be comprised, taking into account hygiene and convenience, and (iii) how the environment should facilitate pleasantness.

Figure 2: In Japan, the elderly-care system has evolved from large accommodation facilities to small-unit living facilities for those who need protection and care

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Figure 3: Sweden's healthcare policy allows people to be cared-for in their homes and remain integrated with other generations, backed up with day-care centres

Figure 4: Korea's elderly-care facilities are often located away from large cities – good for green space, but less good for access to lots of activities

The residential environment for the elderly in selected countries

In South Korea, several factors have contributed to the fast growth of the ageing population. The important contributors include the continuous industrialisation process and changes in society, the long average span of life led by the development of medicine and improved nutrition, and the low birth rate. In 2010, the proportion of populations older than 65 years; households of which the household head is an elderly person; and elderly households were 11 percent, 17.4 percent and 6 percent of the total population, respectively.[26] The number of elderly people living in welfare facilities accounts for 1.19 percent of the entire population of elderly people.

Most of the elderly are living with someone else in their local society such as their adult children (48 percent), living apart from their children in different cities and provinces (18 percent), living in the same cities, counties and districts as their children (12 percent), and living in the same town, township and neighbourhood as their children (10 percent). The housing type of elderly people in the local society includes independent houses (64 percent), large-scale apartments (26 percent), and small-scale apartments/housing with stores (10 percent). A social survey[27] shows that most of the elderly, and in particular those living alone, don't want to live with their children: their own house is the desirable option.

A study by Park and Yu[3] revealed evidence of considerable vulnerability in the environment where most elderly people live in independent houses. First, elderly people who live in an independent house are exposed to danger when they are in an emergency situation. Secondly, aged houses and the structure of homes contribute to fractures and accidents. In many cases, the mobility of most elderly people is physically limited due to diseases and areas for activity (see[28], in the context of USA). The resource environment can positively affect the health of elderly people. The needs of elderly people in Korea and the need for changes in the Korean system are discussed in Lee et al[29] and Yoon[30], with reference to the placement of the elderly and convenience of facilities to reduce negative health effects.

Meanwhile, Japan encountered the aged society 30 years earlier than Korea. It now has a specialised elderly people's home-care system that has been amended from large accommodation facilities to small-unit living facilities for those who need protection and care. In this system, service is provided in the same manner to all the people. This change took place in 2002 so the management of each unit is handled by specialised personnel within each facility, providing individual support services suitable for every resident.[31]

Local support centres were established in Japan to provide comprehensive services to the aged. The aged can continue to live in their familiar areas safely and be provided various services, including protection and care services adapted to their needs and their mental and physical state. The key function of these centres is to plan and manage protection and care, to support comprehensive counselling for the elderly who need it, and to protect the human rights and properties of the aged. The centres have a "human network" consisting of service providers, volunteers and ordinary residents in the community who can be used as social resources required for the welfare service for the aged.[31]

In Sweden, more than 17.3 percent of the population is elderly, which characterises Sweden as a super-aged society. An important policy regarding housing for the elderly is to encourage them to live in an integrated way, with people of all ages. The government has enforced the policy based on the normalisation theory[32,33] that elderly people who should be cared for due to disability are not sent involuntarily to care facilities. The policy implies that if the elderly have to use wheelchairs, the government will support the cost required for modifying the interior structure of their house. For elderly people who need 24-hour care, caregivers are sent to their home to provide the service. The cost is paid for by the pension system and the policy contributes to around 90 percent of the elderly in Sweden who live in their own home.

Exemplary service programmes for elderly people who live in independent houses include installation of safety alarms, day-care centres and day-protection centres. The safety alarms are installed so that the elderly can cope with emergency situations. The day-care centres provide

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Table 2: An overview of elderly-care housing studied in three different countries

Country	Korea	Japan	Sweden
Name of housing	Ilbong Silver Land	Suncity (Ginza)	Teckomatorp Service Center
Year of construction	1996	2006	1978
Residence type for elderly	Housing of intermediate protection level (paid nursing facility)	Housing of intermediate protection level (paid home)	Housing of intermediate protection level (home for pensioners)
Number of homes	133 residences	31-storey building: • 1st-2nd floors: common space • 3rd-6th floors: space for care service • 7th-29th floors: residential space • 30th-31st floors: common space	16 2-bedroom type and 3-bedroom type buildings, plus 50 childcare buildings
Configuration	Dining room, public bathroom, karaoke, gym, medical clinic, physiotherapy, room for seriously ill patients	Public bathroom, swimming pool, massage room, billboard room, hobby room, art learning centre, fitness centre, private dining room, restaurant, lecture hall	Day-care centre for the aged, childcare centre, public library, school, cafeteria

Source: summary by the authors

training, recreation and meals, as well as group activities and treatments that work for elderly people. These centres were established by the local municipalities, and elderly people operate them. The day-protection centres are specialised facilities established for elderly people who are suffering from dementia. When a family member of the elderly needs rest, specially trained supporters protect and care for them. This policy happened at the same time as the elderly-care policy focus moved towards home-based care. The care centres are incorporated in the service houses.[34]

A comparison based on the salutogenic approach

Each of the three countries has a slightly different type of residence for the elderly. The residence types include: independent housing; housing of intermediate protection level; and housing with facilities for the elderly.[35] Korea lacks independent housing, but paid asylum and free asylum and nursing homes are classified as the second and third types. In Japan, public apartments are of the first type; silver housing, paid homes and guarded homes are of the second type; and nursing homes and special nursing homes are of the third type. In the case of Sweden, ordinary housing is of the first type, pensioners' housing is of the second type, and residential homes and nursing homes are of the third type.

Korea does not support the modification of the residential environment for elderly use. Thus, advanced country-type housing is required. A tendency for paid asylums as housing for intermediate protection is emerging as a new residence type after retirement. There is a variety of intermediate protection level housing in Japan and Sweden. The classification of residential facilities for elderly on the basis of their characteristics is divided into residential, and medical/care facilities.[36] In the first case the focus is on residential area and service, while in the latter focus is on special-care services for the elderly suffering from dementia. The intermediate level includes paid and free nursing homes and paid special nursing homes. Thus, residential facilities are classified depending on the health and financial status of elderly people.

While there are various studies related to elderly living in Korea and Japan that are mostly charged-residential facilities, Sweden has few such studies because of free-of-charge residential facilities. In order to examine elderly housing conditions in these countries, we have selected a number of representative case studies based primarily on their charges applied. Since it is impossible to choose identical cases for each country, this study chose one case of a charged facility in the intermediate cost level for Korea,[29] one charged facility in the high price level for Japan,[37] and one public facility for Sweden.[35]

Table 2 compares the residential environment for elderly in the three countries on the basis of the salutogenic concept. It compares the three cases with respect to year of construction, residence type, number of homes and division of the homes. These provide information about their size and scale, which indicate the applied elements of the salutogenic viewpoint – namely safety, convenience, healthiness and pleasantness. We will analyse the basic concept, main element, applied element, and residential environment elements to compare the three cases studied according to the salutogenic concept. It should be noted that the quality of the facilities may be different. This table is the outcome of evolution for the basic and main concepts. In Table 3 each applied element is further expanded into its residential environmental elements.

This analysis reveals a number of important distinguishing characteristics. In the case of Korea, because the residential environment for elderly people is generally

Table 3: A comparison of residential environments for the elderly from a salutogenic viewpoint

Source: summary by the authors

Basic concept[1]	Main elements[2]	Applied elements[3]	Residential environment element	Korea	Japan	Sweden
One spectrum of health-disease (flexi-care system)	Addressing stressors and tension	Convenience	Space for laundry service	●	●	●
			Cleaning service	●	●	❍
			Personal privacy	●	●	●
			Space shared by generations	-	●	❍
		Safety	Safe communication service	●	●	●
			Anti-slip floor material	❍	●	●
			Hand rail, removed threshold	●	●	●
			Sensor system for safety	❍	●	●
			Slope way	●	●	●
		Healthiness	Fitness and health care programme	❍	●	❍
			Medical treatment room	●	●	●
			Health management system	❍	●	❍
			Arrangement of medical personnel	●	●	●
			Exercise training programme	-	●	●
			Medical day-care	●	❍	●
			Regular health examination	-	●	❍
			Physiotherapy service	-	❍	●
	Promoting GRRs and SOC	Pleasantness	Library, theatre	-	●	●
			Art programme	●	●	●
			Spa space	-	●	-
			Socialisation programme	●	●	●
			Green space	●	❍	●
			Private garden	❍	-	●
			Recreation programme	●	●	●
			Diversified food menu	❍	●	●
			Outdoor activity	●	●	●

Key: ● Good, ❍ Not satisfactory, - Not introduced

1 Basic concept: classified into one flexi-care system for elderly people on the basis of "one spectrum of health and diseases"

2 Main elements: classified into addressing stressor and tension and promoting GRRs and SOC

3 Applied elements: the residential environment is classified into convenience, safety and health as elements for addressing stressors and tension

located away from large cities, it has good green space, but is not good in terms of safe communication service for addressing the sudden accidents or diseases, and facilities for activities. In Japan, in general there is not enough green space because the residential environment is located in large cities, but facilities are still evaluated as being of high standard. In particular, they are excellent at addressing stressors and tension. In the case of Sweden, it is not easy to provide services that are fully adapted to the elderly because the infrastructures are shared with other public services. However, a stable residential environment is provided, and the elderly can live in an environment quite similar to one in which they used to dwell.

Suggestions/discussion of results

This study focuses on the health-oriented residential environment for the elderly on the basis of salutogenesis. Such an environment is required to consider the physical and socio-psychological features of the elderly. Analysis of cases was made with respect to addressing stressors and tension and promoting the resource of general resistance and a sense of coherence as major elements. Elements for application included convenience, health, safety, and pleasantness.

For addressing the stressors and tension of elderly people, first it is necessary to provide private areas for establishing an ego identity of the aged, to provide space shared by generations, and to provide convenient facilities that consider the physical change of the elderly. Second, it is necessary to provide safety from dangers by applying the barrier-free concept to cope with physical changes. Third, it is necessary to support services for disease prevention, healthy living and medical support of the elderly. It is also necessary to create pleasant green environment for cultural activities, socialisation and healing loneliness.

Ideally the residential environment for the elderly in Korea could be improved through an enhancement of convenience and safety aspects, while the green environment is necessary to be further ensured in Japan, and convenience in Sweden. In our view the residential environment for elderly people in Korea must be provided with the flexi-care system, which is well developed in Japan and considers both the physical and socio-psychological aspects and the healing environment for the aged.

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Landscape design:
Outdoor environments for adults with autism

Following earlier research exploring housing design for adults with autism, the Royal College of Art's Helen Hamlyn Centre for Design focuses its attentions on how design can create beneficial green spaces for the same community

Katie Gaudion and Chris McGinley, Helen Hamlyn Centre for Design at the Royal College of Art, London

"A garden is a grand teacher. It teaches patience and careful watchfulness; it teaches industry and thrift; above all it teaches entire trust." Gertrude Jekyll (1843-1932)[1]

This UK design research study carried out by the Helen Hamlyn Centre for Design at the Royal College of Art in partnership with The Kingwood Trust aims to improve living environments for adults with autism spectrum disorder (ASD) through better understanding of their needs, aspirations and the environments they experience. This study, the third in a series, explored the positive influence that gardens and outdoor spaces can have on people's lives.

Autism is a lifelong and complex neurological condition that affects the way a person communicates and relates to other people and the world around them. As a spectrum condition, it affects people in different ways. People with autism might have rigid routines and special interests; they can be very sociable or find social relations difficult; some have learning disabilities whilst others possess high levels of intellectual ability, and many experience sensory sensitivities. With an estimated prevalence rate of one in 100 people, autism is a relatively common condition.[2]

The positive benefits of garden spaces are well documented; a well-designed garden can enhance focus and attention and reduce anxiety, thereby improving quality of life. Additionally, the garden can be experienced as a dynamic environment offering diverse opportunities for learning. Garden-based experimental and environmental learning has evolved over a number of years, inspired by educational reformers of the past such as John Dewey (1859-1952), Maria Montessori (1870-1952) and Friedrich Froebel (1782-1852), who advocated "learning by doing". The study explored how these positive effects can be translated into the life experiences of adults with autism.

Currently, research into garden design and special interests within autism is limited and tends to focus on children. Here, the research partnership explored how the design of outdoor areas or "green spaces" can be used to support the specific needs of adults with autism and so improve the quality of their lives. The research has also informed the development of the new garden at Kingwood College – a recently opened, residential learning facility for school-leavers with autism in Reading in the UK – resulting in a practical expression of its findings.

Designing a garden for adults with autism

When designing any garden the first question should always be – who is this for? It remains the crucial question when designing outdoor spaces for people with autism. To the usual general considerations of the person's requirements, for example the limitations of budget and plot size, must be added specific consideration of each person's individual and specific needs. Consideration should be given to social interaction, communication, special interests and sensory preferences in an environment that is by nature dynamic and subject to unpredictable elements such as weather, wildlife and seasonal change. The design of

Figure 1: Katie Gaudion (left) facilitating the "Ready-Steady-Make" workshop for Kingwood staff

Figure 2: Parents participating in a co-design workshop

Figure 3: A "Let's Grow" gardening project at Kingwood College

such spaces needs to actively encourage the pursuit of interests while offering the reassurance of comfort, security and a sense of control.

This potential paradox – stimulation and reassurance – lies at the heart of a well-designed garden to be used by someone with autism. Appropriate, evidence-based design can assist in resolving that paradox, although it has to be borne in mind that since a person's experience of autism can vary considerably from person to person there are no one-size-fits-all design rules.

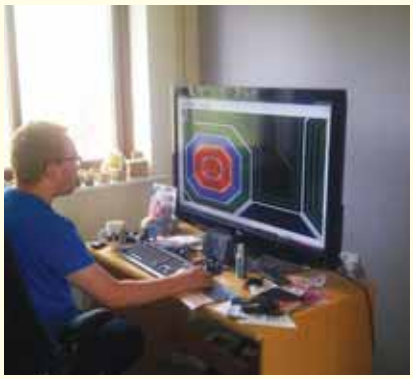
The research has resulted in the development of a collection of spaces that respond to common themes and characteristics of autism, while catering for different, individual needs. When this balance is achieved in the design mix, people with autism are not only able to enjoy the simple pleasures of a garden but also benefit from the improved sense of personal wellbeing conferred by any well-organised green space.

Research methods

The researchers used a variety of methods to understand the needs of residents and support staff. These included: examining the existing timetabled activities of three residences; spending time with adults with autism who have learning and communication difficulties to identify their special interests using interactive profiling tools; conducting workshops with family members and support staff; shadowing a horticulturist who works with adults with autism; identifying best practice by interviewing experts on site; and conducting a workshop called "Ready Steady Make" to enable staff to create stimulating garden activities, props and layouts (Figures 1-3).

Resident timetables were initially examined in order to understand typical day-to-day activities and interests as well as the environments in which these activities take place. This research method resulted in a focus on special interests, one of the defining characteristics of autism, where a person becomes focused upon or strongly attached to, specific objects or phenomena. As a particularly rich area for exploration, special interests were further investigated through interacting with adults with autism, support staff and parents (Figures 4 & 5).

Ways were explored of how to nurture and translate a person's special interests into opportunities for social, emotional, academic and vocational growth within the garden. The garden is an active space capable of hosting a variety of leisure, occupation and exercise activities. The layout of a garden space can be made to reflect and encourage a special interest. Someone who likes to jump up and down may enjoy finding part of a garden set aside for a trampoline. Someone fascinated by moving water is likely to enjoy a water feature. Clearly the starting point for creating a personalised garden is to identify a person's interests and hobbies. This informs the choice of specific features and greatly increases the likelihood of active engagement with the garden.



Figures 4 & 5: Investigating special interests

In order to gain insights into a larger sample group, a series of booklets was produced to help codify the special interests and pastimes of adults with autism, supported by Kingwood. Each booklet was a visual extension of the questionnaire and taxonomy of special interests (Baron-Cohen and Wheelwright 1999[3]) in which 18 topics of popular special interests relating to people with autism were catalogued. The pocket-sized booklets were simple in design, with each page designed to encourage participants to describe or draw their interests with visual prompts that represented the subject of interest. This unobtrusive approach produced insights into the kinds of things that Kingwood clients like to do in their free time. To help identify patterns and correlations, the responses were visually represented using a tree sporting 18 colour-coded branches, each representing a broad area of interest

Figure 6: A "tree of opportunity" representing Kingwood clients' broad range of special interests

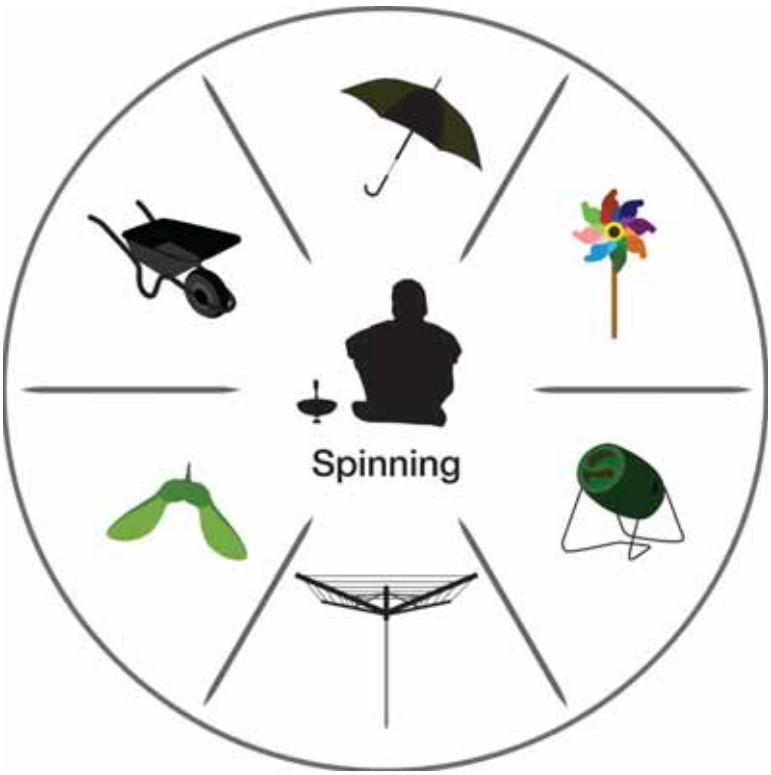


Figure 7: Spinning activities are a popular interest for many adults with autism, and the garden is a good space for this, from twirling an umbrella to turning a composter

Figure 8: Researchers built upon four themes established in a previous project about housing design for adults with autism: Growth, Triggers, Robustness and Support

(Figure 6). Leaves were added to respective branches to help identify more specific points of interest.

From passion to action

Using these insights, opportunities were identified for people with autism to develop new skills such as communication, socialisation and independence. There was a focus on existing special interests as a familiar strand to which new activities and experiences can be added. For example, a popular interest for many adults with autism is that of spinning. The garden is a good space for spinning activities. Not only is there space to move and less chance of injury or breakage than indoors, but wind can be used to power spinning objects. Examples of spinning-themed garden activities that encourage communication, social interaction and motor skills include:

- Composting household waste using a compost tumbler
- Watching sycamore seeds spinning through the air
- Using rotary washing lines to dry clothes
- Spinning an umbrella, as you wander through the garden in the rain.

Design themes

The researchers also built upon the design themes established for the first project in the series, *Living in the Community: Housing Design for Adults with Autism* (2010).[4] There were some significant distinctions to be made between the built and natural environment and accordingly the themes were modified and adapted. There follows a description and examples of each theme in relation to outdoor space design.

Growth

To improve the quality of life for adults with autism, there must be opportunities for them to make free choices, to be independent and to develop skills in communication and social interaction, skills that can be used in the wider community. A garden offers the ideal space for this, enabling adults with autism to take a break from indoor routines and participate in leisure, occupation and exercise activities.

A challenge of growth is to identify a person's special interests and then design a personalised, flexible green space in which those interests can be carefully expanded

to promote better social interaction and personal fulfilment. Important considerations within this theme included:

- **Leisure.** Providing a variety of activity spaces allows a person to engage in social activities on their own terms
- **Occupation.** Offering a spectrum of activities that start at the simplest level and gradually grow in complexity
- **Exercise.** Accommodating vestibular and proprioceptive activities to help calm or activate
- **Special interests.** Introducing new structured activities that relate to personal interests.

Triggers

People with autism can be prone to acute anxiety, resulting in unusual reactions and complex behaviour. Over-sensitive to certain external triggers, people with autism can become overwhelmed as a result of the way they process and interpret sensory information, for example the sound of a lawnmower. Through careful selection, layout and orientation, it is possible to identify and so remove or reduce common triggers that lead to agitation or increased anxiety in a garden setting. Gardens contain predictable patterns of nature interspersed with unpredictable and spontaneous characteristics. With the fifth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5, due to be published in May 2013)[5] likely to include hypo- and hyper-sensitivities as a diagnostic criteria, a person's sensory perceptual experience is a critical design consideration in planning a garden area. Everything possible must be done to introduce structure, order and predictability. Important considerations within this theme included:

- **Sensation.** Designing consistent, low-arousal gardens in which levels of stimulation can be easily calibrated provides a sense of control and empowerment, instead of a feeling of sensory overload
- **Perception.** Many adults with autism find it difficult to distinguish between foreground and background information. It is therefore important to compartmentalise a garden into easy-to-understand units clearly dedicated to different activities, for example exercise, occupation and leisure
- **Refuge.** Offering private and withdrawal spaces alongside communal areas for enjoyment and to allow retreat when group situations become too overwhelming
- **Predictability and control.** Making vistas and paths clear in order that people can see what they are about to encounter. Design for routine and order so that people can predict their progress.

Robustness

The garden provides an excellent space in which to stretch and exercise and in particular in which to assess issues of balance and one's own sense of space and bodily positioning (vestibular and proprioceptive functions). People with autism may experience difficulty with understanding where their bodies are in a given space and this can cause unexpected body movements, collisions with objects or the exertion of inappropriate force.

By their nature, gardens are less susceptible to damage than indoor locations; however, the need for robust design in green spaces should be given careful consideration to ensure features are safe yet not inappropriately focused by considerations of risk.

Personal safety is best achieved by a garden in which all elements are robust. Where robustness leads to durability, this further serves the aim of creating an unchanging setting that will not alter due to frequent replacement or renovation. Ideally this robustness should be inherent in the choice of materials, furniture or planting and not achieved by the use of industrial-style design that can look threatening. Important considerations within this theme included:

- **Safety.** Safety must always come first. This can cover a wide range of initiatives from the installation and monitoring of a water feature to intelligent planting choices that avoid toxins that might be ingested
- **Durability.** Gardens are constantly exposed to the elements and so garden furniture and fixtures should be selected to weather well
- **Ease of maintenance.** A coherent garden maintenance plan should be in place, with designated people responsible for its upkeep in line with established best practice
- **Flexibility.** Since adults with autism have differing needs, garden spaces should have the potential to be modified as required to meet changing interests and aspirations, although arbitrary change is to be avoided.

Support

The garden can be a welcome space that invites everyone to pause and take a break from the demands of the day. It also has the potential to provide an informal setting for the development of meaningful interactions between staff and the people they support. The garden setting may also be of value to those people with autism who have difficulties with social interaction and communication who may use gestures and sounds to communicate. Social preferences will always depend upon the individual and so flexible provision will make for an easy choice between social interaction and remaining private.

Support is about creating good working environments that enable staff to provide good care as well as creating opportunities for rest and relaxation. In this respect the garden can be a powerful setting. Important considerations within this theme included:

- **Communication and social interaction.** Use focal points and shared spaces to hold activities and events – such as barbecues – for group gatherings
- **Personal support**. Make clear plans for activities and routines
- **Unobtrusive monitoring.** Create vistas to enable staff to monitor the people they support from a distance without making them feel they are constantly under observation.

Design concepts

The design themes and research methods informed the creation of an active garden through the prioritisation and negotiation of individual strengths, interests and aspirations. This approach promoted the nurturing of a person's special interests and sought to translate them into meaningful activities to be incorporated into the garden environment. In order to achieve a comfortable space that offers choice, control and independence, the layout, orientation and interaction of the green spaces must evolve with careful consideration of individual sensory perceptual experiences.

The researchers aimed to propose how different outdoor spaces could cater for varying needs and interests of adults with autism. These were illustrated by means of

Figure 9: Researchers' preliminary design for the garden space at Kingwood College, with its different types of outdoor space

"Green Spaces", each of which brings its own unique possibilities and opportunities. Figure 9's concept illustration shows the researchers' preliminary design for the garden space at Kingwood College, which includes seven Green Spaces:

Space 1: Escape. Most people enjoy secluded spaces and areas where they can occasionally hide away. A frequent trait of adults with autism is the challenge of communication and social interaction, so wherever possible it is reassuring to provide the option for escape to re-centre, relax and contemplate. In the resulting design three "escape" spaces were included, positioned in different areas of the garden. In two of these, the researchers took advantage of natural canopies provided by mature trees, simply adding seating underneath. In one instance a circular bench was wrapped around the tree trunk, and in another, a man-made canopy provided additional shelter for chairs. For the third space in a corner of the garden away from noise and activity, the team created an organic den-like structure formed with fast-growing willow. This low-cost structure is large enough to stand up in and features soft lounge seating. Lighting can also be integrated into the structure for use at night.

Space 2: Exercise. Exercise is crucial to good health, improving mood and enhancing a sense of wellbeing. A thoughtfully appointed garden can encourage involvement in a variety of physical activities. Gardening allows opportunities for proprioception through tasks such as pushing a lawnmower or shovelling compost into a wheelbarrow and transporting it to a flower bed. For those people with lower muscle-tone, activities such as weeding, pruning and picking fruit can promote coordination skills.

In the research team's design, a designated exercise area was included with age-appropriate equipment to take full advantage of the outdoor location. Activities such as jumping are encouraged by the provision of a sunken trampoline. The area is floored with rubber mulch and subtly fenced with curved sections that guide the person to the equipment.

Foliage on the fence helps to filter sound from the rest of the garden. Storage arbours in each section and the provision of drinking water encourage rest and refreshment as well as providing an area for support staff to relax while unobtrusively observing those they support.

Space 3: Occupation. Occupation is where special interests have the greatest potential to be incorporated. Identifying activities that incorporate individual special interests into outdoor occupation can lead to positive growth for an adult with autism. Outdoor activities such as gardening can contribute to a sense of achievement, boost self-esteem and improve concentration and communication.

The researchers' design included a horticulture space that offers a host of occupational possibilities. Garden maintenance and embellishment is multi-faceted, offering many opportunities to incorporate people's natural interests and abilities. Indeed, certain traits of autism can be a positive asset in tending a garden: routine, pattern, repetition and attention to detail are all desirable qualities in a gardener. By accurately gauging an individual's inclination towards tasks you can maximise positive and beneficial development based upon their natural interests.

Space 4: Sensory. The garden is a space that makes us keenly aware of our senses. A garden can be an excellent place to explore the senses but care must be taken not to overwhelm people. Prompted by previous research by the Helen Hamlyn Centre for Design (*Exploring Sensory Preferences: Living Environments for Adults with Autism*[6]) the researchers explored hyper- and hypo-sensitivities to sight, sound, touch, smell and taste in the context of outdoor spaces. It is therefore essential to design outdoor spaces flexibly enough to offer a range of experiences that can be enjoyed both by those seeking sensory stimulation and those who wish to minimise it. However, with that

caveat, the garden can become the perfect environment to help adults with autism experience and explore a rich variety of sensory stimuli.

The researchers' considered specific senses in their design and created a divided space into a series of sensory "rooms" that cater to each sense, helping people to focus upon one sense at a time. Paths, signposts and other forms of orientation offer a clear indication of the possibilities for exploration, allowing a person to select the sensory space that appeals to them and avoid those that do not.

Space 5: Social. A garden can help people with autism who experience difficulties with social interaction and communication. A space in the garden that promotes social development is therefore an important design consideration that may help a person to converse, share, play and work with other people. Group activity is one of the greatest potential benefits of garden spaces, so building in visible and accessible opportunities for socialising is important, as is including opportunities to interact or to use space in turn.

In the research team's design, an open area connected to a summerhouse is provided in the centre of the proposed garden. This space would not only be used for crafts and games but also for barbecues, since dining and relaxing can be important garden activities.

To help with arranging additional activities, a section of the summerhouse stores a range of furniture and props to be taken out as needed. A canopy can also be drawn out from the summerhouse and extended over the open area, creating a more intimate communal space in which to enjoy summer meals.

Space 6: Transition. An important consideration in the design of areas for outdoor activities concerns thresholds between different spaces. Allow for gradual acclimatisation to the outdoors by bringing in elements such as houseplants to encourage contact with natural elements in a familiar setting to begin with.

Such transitions are equally important between the different outdoor spaces. There is therefore a need to provide appropriate indicators or signs when a new space is being approached in order to eliminate the possibility of unexpected and unsettling experiences. The goal is to remove unpredictability as far as is possible in such environments. A veranda has been incorporated into the research team's design, facilitating the transition from indoors to outdoors. The layout immediately visible from the window and first experienced when entering the garden is that of an uncluttered space with low stimulation, minimal detail and limited palette. The design of the garden is deliberately graduated, making the entrance serene before progressing to the more stimulating social and activity spaces. The most arousing sensory and wildlife spaces are located at the back and around the perimeter of the garden.

Space 7: Wilderness. The garden is about connecting with the natural environment, something which engages people and awakens their curiosity. A garden that captures and cultivates the more natural elements found in wild spaces brings a new dimension to the garden for exploration and engagement.

The research team made a feature of the space surrounding two mature trees. This area could not be built upon due to the potential risk of damaging their roots. It was therefore the obvious choice for a wilderness area. A group of small hills were introduced as a simple and cost-effective way to add interest to the space. They were left to grow wild, with grasses and wild flowers adding to their appeal as places to lie and relax. A bird's nest swing, big enough to accommodate more than one person, was also included to further reinforce the experience of being in an open space while encouraging vestibular input. Finally, two escape spaces to take advantage of the natural garden were added.

Conclusions

This project took a people-centred approach to the design of gardens for adults with autism. It considered good garden design principles, but also explored individual need through a collection of exploratory research approaches.

The guidance presented in this article is not intended to be mandatory or prescriptive and it should be noted that the research is not representative of the full spectrum of autism. It is intended that the work will build awareness and inspire service providers, support staff, professional designers and family members to consider the many elements that impact upon the experience of adults with autism in terms of their sensory preferences, social communication traits and special interests, and how these combined with a person's hyper- and hypo-sensitivity, can be related to outdoor design.

The guiding concepts within this research have been captured in the publication, *Green Spaces: Outdoor Environments for Adults with Autism*[7] and applied to the design of Kingwood College garden. This garden demonstrates how general principles can be interwoven with personal preferences to create spaces that negotiate a complex range of needs. The garden is the first of its kind and will act as an ongoing test-bed for the research and a space that will continue to be developed to meet the needs of adults with autism.

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Lighting design: **Creating an adaptive healing room for neurology patients**

Informed by the experiences of patients and medical staff, Philips has designed a room for neurology patients that retains a clinical feel when treatment is being carried out, but can flex to create a more tailored, personal ambience

Elke Daemen, Sachin Behere, Roel Cuppen, Joanna Facey, Ingrid Flinsenberg, Evert van Loenen, Roose Rajae-Joordans; Philips research and design, Eindhoven

The Adaptive Healing Rooms project is a joint endeavour between Philips Research, Philips Healthcare: Business Unit Ambient Experiences,[1] and Philips Design.

The aim of this project is to explore opportunities to support the healing and recovery process in single-patient hospital rooms by means of a context-related adaptation of the environment. From the beginning of the project, we chose a patient-centered design approach, because such an approach helps to get a better insight into what would delight or serve the patient, and results in solutions and/or products that better fit the patients' needs.

At the start of our project, many questions popped up. What do we know about patients? What patients are we talking about? Which environment are we talking about? Is there already some scientific evidence in the literature on which factors support the healing process? But most importantly, what is the experience of these patients? What are their needs and issues? What are their feelings and emotions? Therefore, we started the project with a comprehensive desk research study to identify the opportunities, select a patient category, and search the scientific literature.

Healing environments: studying the literature

We reviewed more than 300 scientific publications to gain an insight into various environmental stimuli and their impact on healing and recovery. The field of health-promoting environments is still in its infancy. Substantial evidence has been found that some stimuli (such as daylight and views) possess the ability to be health-promoting, but the health impacts of other types of stimuli, such as fragrance, are less obvious.

In more detail, there is clear evidence for a positive effect of nature on healing, independent of its form factor. Access to (artificial) nature views, including indoor plants, clearly helps to increase the tolerance for pain and reduce the use of pain medication.[2,3,4,5] Contact with nature has, to a certain extent, a positive effect on short-term recovery from stress and mental fatigue,[4,6] and moreover, it also accelerates the physical recovery from illness.[2,6]

Exposure to daylight is an extremely important factor in the recovery process. Patients exposed to sufficient daylight are less stressed, and seem to need less pain medication.[7] An extremely important aspect of the recovery process of patients is a deep restorative and undisturbed sleep. Bright (artificial) daylight exposure during daytime and avoidance of too much light exposure during night-time helps to sleep better at night[8] and to feel more energised during the day.[9] Both patients suffering from depression[10,11] and patients with non-psychiatric medical conditions[12,13] stayed a shorter time in the hospital when exposed to sufficient daylight. Although natural daylight exposure[10,11] and artificial daylight therapy[14] appear to be efficacious in seasonal and non-seasonal depression, feelings of depression in patients hospitalised with other medical conditions was not affected by daylight as measured in a single study.[7] Finally, exposure to (artificial) daylight is not only beneficial to patients but also to staff members. Natural light makes staff members more satisfied with their job,[15] while sufficient bright artificial light causes them to make fewer errors,[16] feel less stressed,[17] and adjust better to night shifts.[18]

For the Adaptive Healing Rooms project, the focus is specifically on neurology patients

Figures 1 & 2: Performing observations, day and night

with the emphasis on stroke, and the inpatient environments that these patients find themselves in during the post-event recovery process. Stroke patients suffer from brain trauma after having experienced a stroke, which typically limits their abilities significantly. Neurology patients typically have a longer stay in the hospital (from several days to three weeks) in comparison with patients that are hospitalised on other wards, such as oncology and cardiology wards, for example.

During their stay, neurology patients go through different phases (from ER to a stroke unit, then a general ward, for example) in which the requirements for the environment differ. Developing solutions for this target group is especially complex because patients can suffer from a range of different disabilities (for example, neglect, limited eyesight). Once a case has been made for neurology, it is expected that the outcomes can be adapted further to meet the needs of other dedicated ward situations.

Contextual research/methodology

Although we performed extensive desk research, we still did not have enough knowledge about stroke patients and their medical environment, the neurology ward. What do these patients and clinical stakeholders experience? What are their feelings and emotions? What do we know about the neurology ward?

To answer these questions, we carried out contextual research in two neurology departments and rehab centres in order to:

- Understand neurology patients, family and caregivers experiences of in-patient care environments
- Understand best practices in neurology clinical care for improving outcomes
- Investigate the aspects of the healing process that can be supported by an adaptive environment.

From similar projects carried out within Philips before, we learned that it is extremely valuable to carry out contextual research, ie visiting leading hospitals and observing on site, alongside doing desk research on the topic.

Our goal was to map out the experience of neurology patients in order to better understand what their daily activities are, and the role the environment plays during the process of being treated for, and recovering from, a Cardio Vascular Accident (CVA). We have approached this experience from three angles:

- From the activities of the patient and other stakeholders over time
- From the relationships and interactions between the patient and stakeholders
- From the environment and the way it is interacted with, and perceived by the patient and other stakeholders.

By looking at the experience from these three angles, it is possible to highlight and understand the links between different aspects of the experience, and achieve a well-balanced view of the CVA care process as well as its most important issues and opportunities.

For this research the main focus was on the neurology department patient rooms and the stroke unit. The neighbouring phases, and connected spaces and processes, have been described less extensively but offer many insights into the context of the patient experience.

The two methods that are most prevalent and most representative for these field studies are contextual inquiry and participant observation.[19] Contextual inquiry is a field research method used in user-centered design. It is also often associated with participatory design methods.[20] Contextual inquiry can be referred to as "apprenticeship compressed in time"[19] wherein the researchers locate themselves within the participant's location in an effort to understand the tasks undertaken by the participant. Participant observation, on the other hand, involves techniques such as interviewing, observing, and cultural material review.

In our contextual research studies, we started with a guided tour, which was then followed by the main field research: shadowing stakeholders, doing observations, environmental analysis, and interviewing stakeholders (see Figures 1 & 2).

Immediately after each activity, the data was analysed (see Figures 3 & 4) and visualised in an experience-flow.[21] We concluded both field studies with a multi-

Figures 3 & 4: Analysis in the Philips "war room" at the hospital

Figures 5 & 6: A multi-stakeholder session

stakeholder session where we confronted the stakeholders our draft experience-flow and asked them for feedback (Figures 5 & 6). The objective of the multi-stakeholder session is to validate and improve the draft patient experience-flow.

Findings of the contextual research

From the patient experience flow composed during the contextual research study, five main conclusions can be drawn.

First, stroke patients have sustained permanent or non-permanent brain damage, which affects the way they behave and respond to their environment. The amount and intensity of stimuli that a patient can handle in this environment is highly dependent on his or her condition. Too many stimuli might lead to aggression and restlessness. This is especially a problem in the morning, when there is a very high stimulus-load due to the clustering of various clinical and auxiliary activities (daily care, therapy, doctor's visit, cleaning, etc). Too few stimuli, on the other hand, might lead to boredom. This is a significant problem in the neurology ward, certainly for patients who are getting better. Currently, the environment of the patient is static during his or her stay, meaning that it typically offers too many stimuli in the beginning of the stay and too few stimuli at the end of the stay. Over- and under-stimulation might, for example, affect the patient's perception of pain, concentration and circadian rhythm. A patient room that can adapt its environment to the condition of the patient is therefore expected to be very beneficial to the patients.

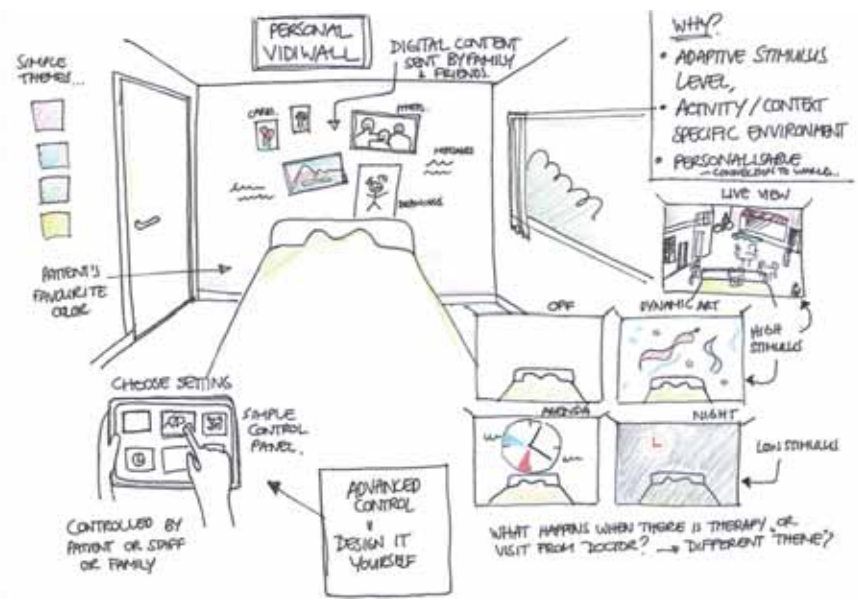

Figure 7: Brainstorm ideas to find ways to support the healing process

Secondly, the right balance between a clinical environment and a personal environment needs to be achieved for all stakeholders in the neurology department. Patients and family need personal spaces for privacy, to escape, re-energise, and relax. Whenever a medical action is performed, however, the room should appear clinical to facilitate an optimal working environment for the hospital staff. A patient room that adapts its environment to the activities of the stakeholders present is therefore expected to be very beneficial to patients, family and staff.

Thirdly, a clear structure of the day is important for stroke patients to decrease the risk of disorientation and confusion, to achieve a healthy sleeping pattern, to avoid

delirium, to better handle rehabilitation therapy, and to consolidate their memories. However, it is difficult to stick to a strict day structure for the nursing staff, due to the unpredictable nature of care. Offering a structured daily rhythm in the environment of the patient is therefore expected to be very beneficial to patients.

Fourthly, stroke patients have a large risk of falling and accidents. The main reason for falling or accidents is the patient's limited understanding of their disease. For example, patients try to get out of bed without realising that they are (partly) paralysed, or they can suffer from neglect. The risk of falling can be reduced by reducing clutter and improving lighting conditions.

Fifthly, patients commonly express a need for information. Insufficient information provision can cause an insecure and unsettling feeling, while too much information can be frightening. Moreover, information should be given in such a way that patients can understand and remember it. Providing the patient with information in a more personalised way is therefore expected to be useful.

Idea development and first evaluation

In total, 11 issues and opportunity areas for health-promotion were identified as a result of the research. Based on the issues and opportunity areas identified in the contextual research and the established health impacts from the literature research, a large number of ideas to support the healing process were generated.

In total 21 concepts were then developed addressing these issue areas. After an internal evaluation of these concepts a subset of about ten concepts were proposed to the staff of four hospitals: artificial nature experience; connected wall; personalised atmospheres; adaptive atmospheres; relaxation experience; sleep support; night night; musical motion; and patient agenda.

The members of staff were asked to rate the concepts with regard to their expected influence on the healing process, as well as their expected influence on the workflow on a five-point Likert scale, where one indicates a very negative impact and five a very positive impact. Moreover, we asked the staff members also to comment on the new concepts.

Figure 8: Developing the concept of an artificial skylight

Figure 9: The Adaptive Daily Rhythm Atmosphere generates light, audio and video for different phases of the day; here it's set to "evening"

Concept development

Based on the input of the staff members in the evaluation phase, three concepts were selected for further development: artificial skylight, adaptive daily rhythm atmosphere (ADRA) and adaptable stimulus dosage.

We developed these concepts and prototyped them in the new hospital area of our Eindhoven-based ExperienceLab.[22,23]

Literature shows that patients lacking sufficient daylight and views of nature have increased length of stay, pain medication use and morbidity, and that daylight also has a strong impact on circadian rhythm, orientation and sleep.

With the artificial skylight (AS) concept, we provide extra light in the patient room that resembles daylight (Figure 8).

The AS is installed in the ceiling above the feet of the patient. It provides sunny white light, yet visually mimics a blue sky.

The AS offers a light boost between 10.30am and 12.30pm. The maximum intensity of the light boost is dependent on the setting (Low stimulus – Medium stimulus – High stimulus).

Patients have a strong need for time and place orientation and a clear daily structure, but nowadays light conditions are typically static in hospitals regardless of the patient's needs or care activity schedule. The adaptive daily rhythm atmosphere (ADRA) supports the daily rhythm of the patient by generating dedicated multi-sensory atmospheres (for example, light, audio, and video) for different phases throughout the day. Where needed, the atmosphere adapts to specific interruptions and visits, for example when a doctor or cleaner is visiting. By using ADRA, the above-mentioned negative effects of the rigid environmental conditions are alleviated, because the system provides a daily rhythm atmosphere in sync with, and optimised for, patient needs and the care agenda, and intelligently adapts to deviations thereof.

The ADRA concept is based on the need of neurology patients for a clear daily rhythm and day/night structure, as confirmed by the medical staff of neurology departments and stroke rehab centres.

In the early phase of the hospital stay, patients are often very stressed and exhausted due to an overload of information and too many visual and auditory stimuli. In the later phases, however, stimuli are needed for recovery, because under-stimulation induces boredom, and subsequently anxiety and stress.

The adaptable stimulus dosage (ASD) adjusts the stimulation level of the room such that it meets the specific needs of the patient. The adaptable room contains an artificial skylight with adjustable light output, a patient wall with adjustable colours and an artificial nature view on screens (the screens can also be hidden away), noise damping, and adjustable sounds.

Figure 10: A low-stimulus room – more compatible with the early stages of a patient's recovery

Stakeholder evaluation

To evaluate the three concepts described above in the new hospital area of our Eindhoven-based ExperienceLab, we invited groups of stakeholders from different institutions (hospital, rehab centre or geriatric department) to our lab for a stakeholder session to evaluate the perceived effect on healing and workflow. Each group consisted of two to five stakeholders. Every stakeholder group was a mix of nurses, neurologists, therapists and department managers with an average length of experience of 13 years.

Every session started with an introduction to the project, an explanation of the issues that had been identified, and the proposed solution to solve these issues. Next, stakeholders were invited in our patient room to experience the concepts we had developed and were asked to rate the concepts with regard to their expected influence on the healing and recovery process and their expected influence on the workflow on a seven-point Likert scale, where one indicates a very negative impact and seven a very positive impact.

Moreover, we asked the stakeholders also to comment on the concepts. After the anonymous written rating and commenting, for each concept a discussion was opened.

During the discussion, two note takers wrote down all the comments. Every session lasted an average of three hours.

In Figure 11, the mean healing and workflow score for each department type (ie Neurology, Rehab and Geriatrics) and each staff member role (ie neurologist, nurse, department manager, rehab specialist, therapist, and geriatrist), averaged over all concepts, is shown. No significant differences were found between the concepts. The error bars in the figure indicate the standard error of the mean. As can clearly be seen, the positive contribution of the concepts to the healing of the patient and the workflow was recognised.

The views expressed by the participating departments were quite consistent, showing no significant differences between the three departments regarding the healing and workflow scores as tested by means of the Kruskal-Wallis test. This strongly suggests that the solution can also be applied to other departments. Moreover, the Kruskal-Wallis test also revealed no significant differences between the different staff roles with regard to the healing and workflow scores, suggesting that we took the requirements of all staff into account.

Finally, the qualitative feedback on identified needs of the patient and/or staff, questions that arose, and design issues and opportunities will be incorporated in the next iteration.

Conclusion and next steps

The contextual research studies revealed that there are needs in neurology departments that may be addressed by intelligent, context-aware systems in order to realise an optimal health-promoting environment. The first evaluation of the ideas with stakeholders showed promising results and as a next step we have prototyped the concepts with the most potential in the new hospital area of our Eindhoven-based ExperienceLab. We evaluated the experience prototypes with medical stakeholders. These results show that stakeholders expect a positive effect of the proposed solution on both healing of the patient and the clinical workflow,

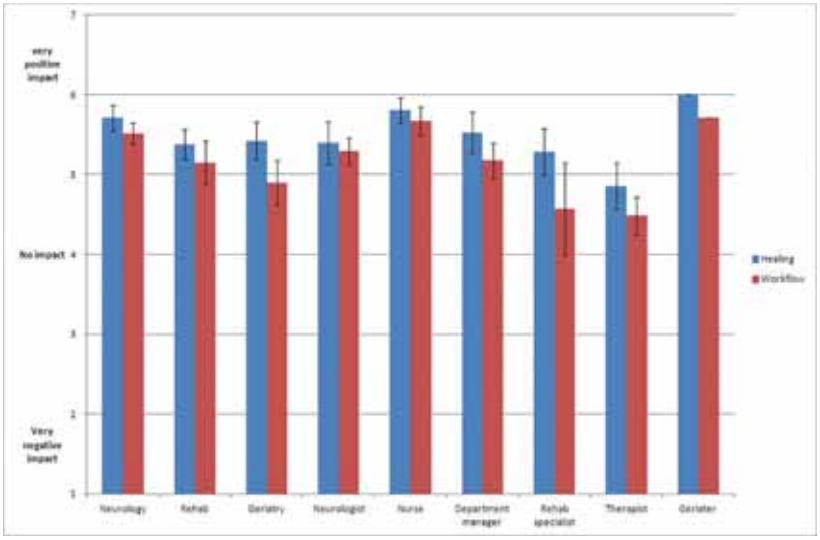

Figure 11: Stakeholders' ratings of the newly developed concepts

and although our solutions have been tailored to neurology patients, many of the identified issues generalise to other departments. Beside quantitative feedback, we also gathered qualitative feedback. This feedback was used to perfect the concepts for the final iteration: the clinical trials.

The first steps, contextual research, idea evaluation and concept evaluation, helped to establish confidence in the chances of success of the final iteration: the clinical trials. The contextual research helped us to identify the real issues of a neurology department. The stakeholder evaluation in the lab gave us an indication of the likely impact of the concepts and feedback on how to perfect the concepts before starting the clinical trials. In addition this helped to make hospitals enthusiastic to participate in a clinical trial because they could experience the concepts first hand and see the added value.

As a next step, selected concepts will be evaluated in clinical trials in a real hospital environment. A first clinical trial has been started. The goal of these trials is to objectively measure the effect of our concepts on (stroke) patients, such as psychological wellbeing, improved emotional state and/or higher satisfaction.

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Authors

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Post-Occupancy Evalution:
Evaluating Macmillan Cancer Centres to improve the physical environment for people with cancer

UK charity Macmillan improves the lives of people affected by cancer, by providing practical, medical, emotional and financial support. This report highlights the recent evaluation of the effectiveness of the design of five of its centres

Patricia Young

Post Occupancy Evaluation (POE) can be defined as the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time. It usually involves a mix of qualitative and quantitative methods using a variety of methodologies. The benefits of a post-occupancy evaluation include:

- Identifying design, performance and operational issues within buildings
- Learning from past issues to improve the delivery of better buildings and spaces
- Responding to user needs
- Informing decision making
- Allowing for built assets adaptation to changing user and business needs
- Understanding and improving building performance
- Informing strategic decision-making
- Developing a bespoke approach to POE to address specific needs
- Developing a more efficient capital briefing process.

Macmillan Cancer Support is a charity that improves the lives of people affected by cancer, by providing practical, medical, emotional and financial support. In 2009 it invested more than £78m in services that directly improved cancer support for people affected by cancer. The main objective of carrying out the evaluation project was to enable Macmillan to inform its approach to engaging with partner organisations in the design of cancer care environments and to continuously develop and improve their quality standard framework.

The research was designed to evaluate the extent to which five cancer care buildings (all major projects completed in the last 12 months) have enhanced service users' experience; the degree to which the process of treatment and support may have been supported; and the capability of staff to deliver high quality services.

Det Norske Veritas (DNV) Healthcare was appointed by Macmillan to evaluate these centres between June and December 2011. Macmillan intended using the results of this research to inform its approach to engaging with partner organisations in the future design of new cancer environments.

In 35 years, more than 200 cancer-care buildings for the National Health Service (NHS) and other providers have been planned and funded by Macmillan. As a result of this there has been a move towards the rationalisation of these projects to ensure that the strongest case of need is placed as a high priority. Macmillan undertakes a continuous post-occupancy evaluation programme providing a continual learning process and robust evidence base to support their development programme.

The evaluation process

The study's aim was to enable Macmillan to:

- Inform its approach to engaging with partner organisations in the design of new cancer environments
- Brief design consultants and architects who work with the charity
- Continuously develop design standards and the quality standard framework.

The study was also designed to evaluate the extent to which the five cancer care buildings have enhanced:

- Service users' experience of the cancer care environment
- The degree to which the process of treatment and support to users may have been assisted
- Staff members' capability to deliver high-quality services.

The methodology used by the research team combined qualitative findings obtained from staff with user surveys and quantitative findings. A total of 140 questionnaires were completed. For each centre, the team had access to all relevant documentation pertaining to the projects and obtained the business case, the brief and the operational policy documents for each of the centres.

Questionnaires Completed	Staff	User focus	Site specific	Service users' positive contribution	Staff's positive contribution	Architects and estates	Total
Site A	3	5	3	2	9	3	25
Site B	3	5	6	3	7	1	25
Site C	12	4	6	3	12	1	38
Site D	12	2	12	1	1	1	29
Site E	1	5	5	3	8	1	23
Total	**31**	**21**	**32**	**12**	**37**	**7**	**140**

Table 1: Qualitative findings obtained from staff. A total of 140 questionnaires were returned

Patricia Young

Figure 1: The Macmillan Cancer Unit (Chemotherapy) at Prince Charles Hospital, Merthyr Tydfil, Wales, one of five facilities that were evaluated

The three key evaluation questions were:

- How do users and staff rate the building environment?
- How has the building made a positive contribution to the treatment and support to users of the service?
- How has the building impacted on staff?

A review of existing literature in relation to post-occupancy evaluation methodology in healthcare settings was conducted. The search revealed that there are relatively few post-occupancy evaluation projects that have been published and so there is not a well-established or recognised methodology for conducting such evaluations. The Department of Health's estates and facilities (2008) also suggests that healthcare design involves complex concepts that are difficult to measure and evaluate. In collaboration with the University of Sheffield it has developed the AEDET (Achieving Excellence Design Evaluation Toolkit) and ASPECT (A Staff and Patient Calibration Toolkit). The AEDET tool was chosen as one way of evaluating the building's functionality, build quality and impact of the centres in this study.

A series of questionnaires was also developed, which aimed to collect quantitative and qualitative data. The questionnaires incorporated questions relating to the general evaluation questions. In addition there was a site-specific questionnaire relating specifically to each centre. Unfortunately, because of the timescale of the project, thorough piloting and testing of the questionnaire was not possible. Some of the questions were adapted after the first visit, and in later visits where repetition was identified the participants were not asked the same thing in a different way.

The results of the questionnaires were input into data analysis tool Questback.

For each centre the researchers had access to relevant documents; as a minimum these included the business case, the brief and the operational policy.

The research team visited the centres in July and August 2011, with the aim of:

- Briefing the centre managers about the project
- Visiting the centre to see it in use
- Taking photographs of the building
- Discussing the history of the building projects, and any significant issues
- Arranging a programme for a second visit
- Organising collection of user feedback
- Reviewing any additional documentation that the centre might have
- Completing the AEDET tool.

In discussion with the managers of the centres, the researchers decided that sending a postal questionnaire to previous users of the service was going to be difficult and agreed that during the second visit the researchers would instead interview users identified by the centre as being suitable.

Between the visits the researchers reviewed any documentation that was available for each of the centres. Although the researchers had access to the business cases, operational policies and architectural brief for each centre, these varied in usefulness to the evaluation. Some of the centres were helpful in supplying additional information such as their annual report, and others were less helpful. The researchers

Patricia Young

Figure 2: The Macmillan unit at Merthyr Tydfil; service users valued centres' non-clinical feel

also reviewed the National Cancer Patient Experience Surveys from 2004 and 2010. This is a survey that is only done in England and there is no equivalent in Scotland and Wales and therefore was only available for three of the five centres. The researchers also reviewed any other documentation that was available, for example letters or minutes of meetings. They also reviewed the websites of the trust or centre.

The researchers also spoke to the architects and a representative from the estates department of all five centres. This again used a questionnaire as a basis for discussion so that as well as identifying issues from each individual centre it would be possible to identify any issues that were common to all the sites.

Between September and mid-November the researchers revisited all five centres. The second visit was generally carried out on a different day(s) of the week from the first visit. The volume of people going through all of the centres varied on a day to day basis, so a second visit allowed the researchers to experience the building in use at varying times of day and on different days of the week. At the initial visit the managers identified when the centre was likely to be working at optimal capacity (for example, if there was a clinic) and the assessors endeavoured to visit on these days.

During the second visits the researchers spoke to as many staff and users as possible, with a structured interview that used the questionnaires as a starting point. At each centre the researchers spoke to a variety of people. The roles of the people interviewed varied depending on the size and function of the centre but included internal staff, clinical nurse specialists, managers at various levels of the organisation, volunteers, medical staff, allied health professionals, counsellors and benefits advisers.

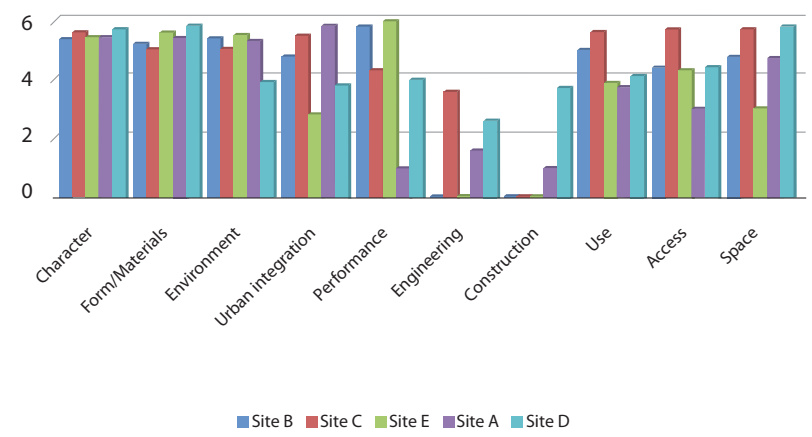


Table 2: Comparison of site results (AEDET analysis)

Findings

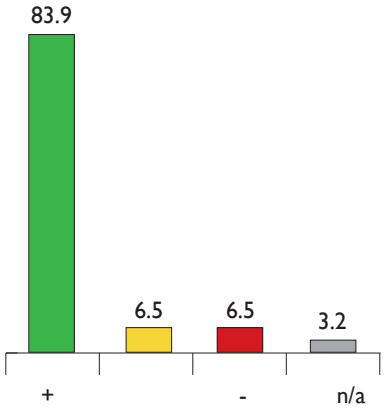
All centres scored highly for Character and Innovation, Form and Materials and Staff and Patient Environment when scored using the AEDET tool. However, variations started to appear when comparing scores for Performance, Engineering and Construction and Use, Space and Access.

Opinions varied about the effectiveness of access to the locations, with only one site providing good access from public transport; all sites felt there was inadequate parking for both staff and users. Integration of signage into the overall wayfinding system on sites was a serious concern.

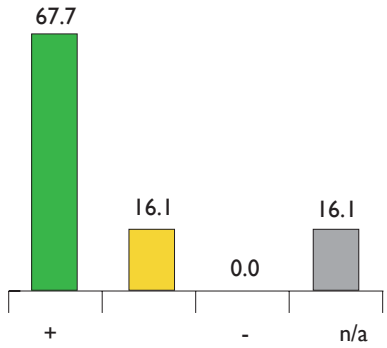
How did users and staff rate the built environment? All the users and staff who contributed to the evaluation were very positive about the built environment, with many of them saying it was hard to believe that they were in a hospital. Of those interviewed, 62 percent did not find the interior institutional or clinical and 76 percent felt that the buildings communicated a strong and positive image of Macmillan. There are issues with access, both when accessing by public transport and by car. Only 43 percent found access easy, and 52 percent thought the entrance was clearly signposted. However, 67 percent felt that the reception was welcoming on arrival and that the waiting area was comfortable and reassuring; 81 percent agreed that the interior felt light and airy and 76 percent thought the reception looked clean and tidy and cared for, but only 57 percent thought there was adequate space for accompanying family members. Ninety-seven percent thought the furniture in all areas was functional and of good quality. Responses included:

- *"Friendly, welcoming, reassuring, supportive at all times. No hesitation to go to the building as it doesn't feel like a hospital."*
- *"The fact you were greeted in a friendly manner when you arrived, and offered a cup of tea, made you feel at home. The surroundings were colourful and attractive. The staff went out of their way to make your stay as comfortable as possible. Being able to watch TV/DVDs made the time pass quickly and pleasantly."*

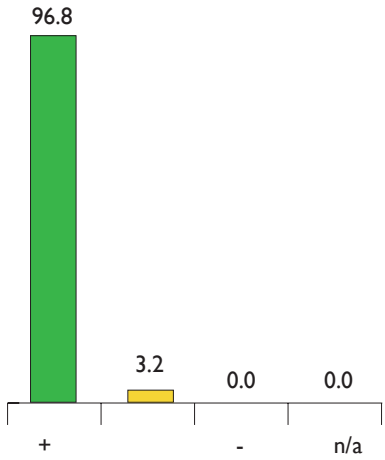
Tables 3-5: Positive, neutral and negative responses regarding the buildings' impact on service users



The layout of the building allows for privacy and confidentiality



The layout of the building facilitates communication with users



There is an improved level of cleanliness

How has the building made a positive impact on service users? Service users were asked to comment on how the building had made a positive contribution to their personal experience. The researchers found that, since service users tend to have experience of only one building, it was difficult to obtain objective views. However, more objective views were obtained from staff as they tended to have experience of other buildings and could therefore offer a comparative opinion.

Service users' comments were mostly positive and specifically mentioned the connection with nature and the non-clinical ambience of the buildings. At all sites they appreciated the connection with nature and the homely appearance of the furniture and furnishings. Those visiting Site A particularly liked the informal layout of the main waiting area. Responses included:

• *"Inclusion of therapies in this space. Men were sceptical but therapies have changed male attitudes. Reflexology brilliant and relaxation therapy works really well."*

How has the building impacted on staff? Sixty-eight percent of staff felt they had sufficient workspace to carry out their work but only 45 percent said there was adequate storage space. Only 23 percent of staff felt that staff changing facilities were good. Eighty-seven percent felt the quality of the building was better and 97 percent felt there was an improved level of cleanliness; 80 percent felt the standard of the building contributed to the organisation's efficiency.

Seventy-four percent of staff interviewed agreed or strongly agreed that their work environment was less stressful than before. Eighty-seven percent agreed that the building enhanced their productivity and their confidence has grown. They agreed that they were working in a better environment and that a nice environment does have an impact on their work. Sixty-one percent felt that their job satisfaction had improved since working in the new building; 92 percent agreed that they were able to do their job to a standard that satisfied them personally and 96 percent felt safe and secure in their workplace. Ninety-two percent felt the design of the building made them look forward to going to work. Sixty-eight percent of staff felt that the layout of the building facilitated communication with service users, 77 percent agreed that the building did not feel cramped or overcrowded but 57 percent felt that the unit's location facilitated communication with other departments.

Privacy and dignity was sometimes compromised due to spatial adjacencies not reflecting patient flow, and in some cases space standards had been reduced for financial considerations, resulting in implications to the operational aspects of the centres that did have an effect on the user experience of the centre. One site in particular clearly reflected new and appropriate models of healthcare provision.

Clarity of a definitive design brief and the involvement of clinical staff during the development of the brief was not experienced by all sites. User contribution, experience and sharing of the business cases and operational policies with the design and facilities management teams during the early stages of the design brief development would influence user experience of the centres.

Operational issues existed as a result of the commissioning and handover procedures adopted by some of the sites. Difficulties were also experienced due to ownership issues resulting from the PFI procurement system previously adopted by the NHS sites. All sites reported problems with levels of comfort and control of mechanical and electrical engineering services. Lack of records describing site conditions caused issues at two locations.

As mentioned, service users tend to have experience of only one building and as a result it is difficult to obtain objective results. However, their comments were mostly positive and they specifically appreciated the buildings' non-clinical ambience and connection with nature. The importance of access to complementary therapies, a broad

Figure 3: Branding and wayfinding were evaluated

Patricia Young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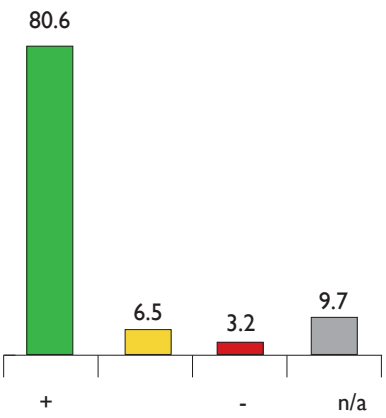
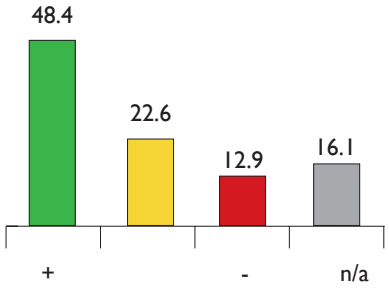
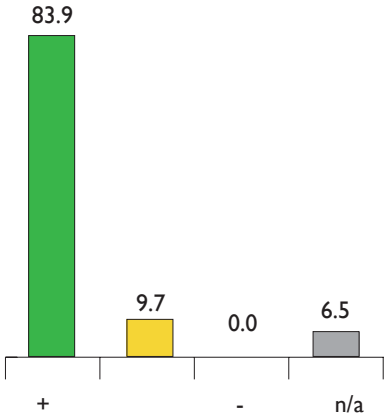
Tables 6-8: Positive (green) neutral (yellow) and negative (red) responses regarding the buildings' impact on staff



The building contributes to the efficiency of the organisation



I am involved in deciding on changes introduced that affect my work area



I am able to do my job to a standard I am personally satisfied with

range of ancillary support services and specialist knowledge were the key issues they felt had benefitted their experience.

Staff generally agreed that working in a better environment enhanced their job satisfaction and that the quality of the building contributed to the efficiency of the organisation. However they felt certain issues hindered their efficiency, including:

- Communication with other sites and departments
- Dispersed teams
- Lack of dedicated workspaces
- Individual control of heating and lighting.

Conclusion

The research and evaluation built upon the current evidence base and combined findings from questionnaires, structured interviews and staff/user workshops. It concluded that evaluation provided essential learning which, when used to inform quality standards and continual assessment of these standards, processes, outcomes and wellbeing are enhanced.

The resulting report provided key recommendations that supported the charity with topics for discussion and further debate as building blocks for future learning and development. The main points indicated that environmental projects should be an integral part of the strategic direction of all organisations involved in the development process, and, where feasible, should consider the future direction of the service at both a local and a higher strategic level. Encouragement should continue to consider new ways of working that will enhance the the environment for its users.

Involvement of the clinical teams working with partner organisations during the early stages of the project development, and continued development of effective channels of communication, encourages a greater understanding of the importance of the physical healthcare environment and the effects of the environment on patient outcomes. Due to the sometimes lengthy duration of construction projects within the healthcare environment, continued consideration and realisation of both functional and financial benefits could be effectively realised by developing risk assessments of the design proposals and operational procedures at strategic milestones during the design development stages of the projects.

The findings indicated that effective vertical and horizontal integration of project teams, comprised of partner organisations and those specifically involved with the delivery of care at a clinical level, provides sufficient influence within organisational structures to effect change and continued improvement. It is evident that environmental projects, and the impact of environmental aspects on outcomes and wellbeing, are successful and progressive when an integral part of the strategic direction of organisations.

Author

Patricia Young is a patient pafety design consultant and was a senior risk adviser at risk-management firm DNV Healthcare UK when the above research was carried out.

Patricia Young

Figures 4 & 5: The The Cornhill Macmillan Unit(Palliative Care Service) Perth Royal Infirmary, NHS Tayside

Curing the city

The Crystal is Siemens' shop window for promoting its work in cities, and a way to open the dialogue about how we'll face up to a future of massive urban migration. ***Emily Brooks*** paid a visit

Visitors are introduced to The Crystal, Siemens' £30m new attraction for London, with a thought-provoking sentence: "Welcome to the city – now home to more than half of mankind". By 2050 that statistic will change to two-thirds of mankind, and such rapid change helps to highlight the need for this exhibition – the chance to take stock of where we are now, share best practice, and raise awareness of the technology that will be crucial if tomorrow's cities are to be pleasant and livable places.

Opened last September, The Crystal is billed as the world's largest urban sustainability centre – part exhibition space, part research hub and part conference facility. Designed by Wilkinson Eyre Architects, it gets its name from its fractured appearance, an angular glass pavilion sandwiched between the Royal Victoria Dock and a concrete flyover. By placing the building at the cutting edge of sustainability – with ground-source heat pumps, photovoltaic and solar thermal panels, water recycling and electric-car charging points – Siemens is making a very clear statement about the role that architecture has to play in creating better cities.

The Crystal's footprint looks like two parallelograms, slightly offset from one another, with a central atrium separating the two. Once inside, visitors turn one way for the exhibition space, which rises the full height of the building, and the other for conference facilities, an auditorium, cafe, and offices for the Center of Competence Cities, which according to Siemens is "a team of multi-disciplinary urban experts, who aim to encourage the growth of sustainable cities through partnerships, research and expert collaboration on solutions."

Macro to micro

The exhibition presents the big ideas first, drilling down to more complex and detailed ideas as visitors progress. At the entrance, the city is boiled down to just three ideas – environment, economics and quality of life – the words displayed as bold three-dimensional signs, before visitors are invited upstairs to enter a giant

pumpkin-shaped auditorium, the Forces of Change Theatre, that pulses with colour-changing LED lighting. Inside, a presentation film expands upon those three ideas, largely through sound and imagery (a crowded tube, a muddy slum) rather than words. This sensory immersion in the city – noisy, crowded, exciting, but also potentially dangerous – sets up the wider themes to be explored downstairs.

Soft sell

Below, the ground floor is divided into smaller thematic zones, their materials echoing the subjects they cover: a living wall for the section on air quality; a galvanized steel shed for the area that deals with safety and security; a working waterfall for the water zone. Information is generally presented either as fixed text on the walls, or via touch-screens that are unlocked by the swipe of the credit-card-sized "Crystal Key" that each visitor is given at the entrance. The exhibits encourage thought about the way that technology can enhance lives, and presents case studies on citywide initiatives that have lead to change, from Vancouver's planning strategy to create more compact communities to Singapore's vision for a "city in a garden". There is equal importance given to the role of personal responsibility in fostering change. Happily, the corporate message here is a soft one – much of the technology showcased in the case studies, and indeed the technology used in the physical exhibits, such as the RFID Crystal Key – is Siemens' own, although you would barely know it.

The case studies presented reinforce an almost relentlessly positive message: this is a feelgood exhibition, and it is in Siemens' interest to present itself as a solver of problems rather than a harbinger of doom. There does not seem to be much mention of the consequences of getting it wrong, and sometimes the positivity feels simplistic: that transport systems will run on renewable energies from the sun and wind, as is suggested, seems an unlikely scenario given just how many wind turbines and photovoltaics it would take to release our reliance on fossil fuels. Countries from the UAE to Turkey see nuclear energy as a substantial part of their energy policy, and yet nuclear power is almost airbrushed out of a large section on the future of energy production. This makes sense if you know that Siemens announced in 2011 that it was withdrawing from the nuclear industry in the wake of the Fukushima disaster.

Health at the crux

The subject of health runs like a thread through the entire exhibition, from the importance of clean air and water to the way our ageing demographic will affect our working lives. It is proof, if any were needed, that good health will be the cornerstone of tomorrow's successful cities. An entire section of the exhibition is explicitly dedicated to "healthy healthcare", and includes case studies where technology has saved lives – how the better placement of CT scanners at the University of Helsinki has sped up stroke diagnosis, for example. The message of taking personal responsibility for our actions is never more important when it comes to health, and the exhibition is at pains to reinforce the idea of participatory medicine, "a new movement in healthcare that takes patients from being idle passengers to active participants in their own health". In one of the many statistics written on the walls – "only 3% of healthcare budgets are spent on prevention" – there is a hint that perhaps governments could be doing more to shift the focus away from disease, and towards wellness.

The Crystal presents a large amount of information in a layered, easy to digest way that has to satisfy a very broad demographic, from schoolchildren to urban planners. Siemens is to be applauded for trying to make sense of a gargantuan topic in a persuasive but largely non-corporate way. All that is left now is for the exhibition itself to keep up with the rapidly shifting subject it explores, and helping to solve the world's health, environmental and economic problems by updating its exhibits as the great rush to urbanise unfolds.

Emily Brooks is an architectural writer

Imperfect Health: The Medicalization of Architecture

Giovanna Borasi and Mirko Zardini (editors)
Lars Müller Publishers, Canadian Centre for Architecture 2012
£45.00/€50.00/US$70.00

Human health and architecture rank highly on social and political agendas and are much debated, although most people are more concerned with their health than the design of the buildings in which they live or work. *Imperfect Health: The Medicalization of Architecture* expands on ideas presented in an exhibition held at the Canadian Centre for Architecture in Montreal (and currently showing at the Miller Gallery at Carnegie Mellon University, Pittsburgh). Edited by the curators Giovanna Borasi and Mirko Zardini, the book publishes nine essays that further explore how problems in everyday life, particularly related to our environment, are increasingly defined in medical terms and handled as medical issues by architects.

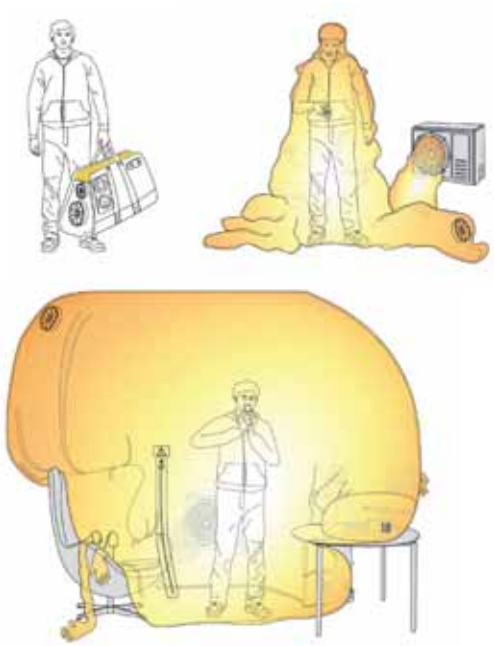
Medicalisation within architecture takes two forms. First, buildings are often described using adjectives selected from a spectrum that ranges between "sick" and "healthy". Secondly, architects incorporate solutions derived from science and medicine to address perceived health issues in proposed buildings or proven health issues within existing buildings. "*Imperfect Health* features architectural projects that acknowledge and engage with – if not always successfully – specific health issues," says Zardini. "We neither promise an ideal solution nor even suggest its possibility; instead we illustrate the complexity of the relationship between human health and architecture, and how this changes over time."

Health issues addressed include allergies and asthma, obesity and lack of exercise, carcinogens and cancer, infectious disease and epidemics, and the world's ageing population. The book's structure allows essayists to develop their ideas on tackling the issues in parallel, rather than presenting their texts in a sequence culminating with overarching conclusions. The intriguingly allusive nature of the book's 365 well selected and striking images allows readers to navigate individual paths through its intellectual territory, rather like visitors to the CCA exhibition wandered at will.

Margaret Campbell's essay Strange Bedfellows: Modernism and Tuberculosis is instructive on how medicine and architecture evolve together. Nineteenth-century patients were isolated in sanatoria, where their recuperation relied on regular exposure to fresh dry air, nutritious diets and plenty of rest. A 1911 photograph shows a patient being treated "at home by the open window" under the Edinburgh Dispensary Scheme. The "light, air and openness" mantra of 20th-century modernism generated hygienically tiled sanatoria, well equipped with reclining chairs for resting patients. Peter Behrens' advocacy for architectural design in alleviating TB was an early influence on Le Corbusier. The introduction of effective antibiotic therapies in the late 1940s practically banished the disease in the developed world; however, recent emergence of multiple drug-resistant strains means that medical researchers are back at their drawing boards regarding treatment. In the developing world, architects have a contemporary role in developing affordable shelter for TB patients.

Environmental pollutants and allergens contribute to public health challenges facing landscape designers, architects and urban planners. In the 19th century, Frederick Law Olmsted in the US and Ebenezer Howard in England advocated establishing parks and gardens as "lungs" for purifying air in congested cities. But hay fever sufferers are troubled by pollen. The use of air-conditioning to reduce exposure to environmental allergens seemed a good solution at the time, but a childhood lack of exposure to mild allergen challenges primes adult immune systems to become hyper-reactive. "Tight housing" to reduce winter heat-loss in cold climates increases the allergen burden inside homes, particularly the faeces of house dust mites, which cause perennial rhinitis and exacerbate asthma. The trick is to strike a balance between prevention and generating unforeseen consequences when implementing architectural interventions designed to improve health.

As Zardini acknowledges, Imperfect Health does not provide simple answers to the complex challenges explored in the book, but the essayists and the data they supply are thought provoking regarding potential synergies between health and architecture.



David Garcia Studio

David Garcia Studio's Domestic Isolation Room (2010) is a design for a transparent enclosure that can inflate to fill a large domestic space – the contaminated person can remain in their home with family, albeit separated inside a bubble

Colin Martin is a writer on art, architecture and design, with a particular interest in their intersection with medicine and science

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