Building and Thriving


by The New Economics Foundation
Physical environments that stop us from living healthy lives and discourage social and economic activity, are a drag on the economy, society, and all of us as individuals."
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Executive Summary

The way the outside of a building influences health and wellbeing outcomes is an important and comparatively understudied area of research.

A diverse body of research indicates that external building design affects mood and stress levels; mutual trust and willingness to help strangers; exercise and mobility; as well as people's happiness and their physical and mental health.

For example, in one study, pedestrians approached in front of an active façade were five times more likely to offer help and seven times more likely to let a stranger use their phone than people in front of a blank façade.

The burgeoning field of neuroscience and ‘neuroaesthetics’ also highlights the ways in which our emotions are directly affected by specific architectural qualities. These findings favour good design but are ‘style agnostic’; there is no robust evidence linking any specific architectural style to better or worse outcomes.

Wider social and economic research demonstrates the degree to which these positive design features are unevenly distributed, with less affluent neighbourhoods more likely to have fewer well-designed buildings. Spatial inequality is real and pervasive.

Given the likely effects of this uneven distribution, this paper recommends the commissioning of a major new research programme to build on the Marmot Review of health inequalities and fill the gaps in our collective knowledge. This should be a priority for the Economic and Social Research Council within UK Research and Innovation.

It calls for better enforcement of good design through the planning system, underpinned by the evidence we reveal, with policies and practice focused on poorer areas where buildings are more likely to lack visual complexity, natural features and aesthetic quality, all of which directly impact health and wellbeing.

And thirdly, there is a critical need for much more dynamic knowledge sharing among designers, planners, economists and policymakers around the world to promote the role of building design in delivering health and wellbeing outcomes and the commitments made to the UN Sustainable Development Goal 3 (SDG3).

A shared goal of all nations in the 21st Century should be to stop seeing buildings primarily as a lever of economic growth and start creating a more human built environment that puts a premium on people's health, wellbeing and happiness.
Introduction

This literature review examines the evidence that currently exists to support the hypothesis that the external design of buildings is important for the health and wellbeing of individuals and communities who live, work, or more generally interact with and within those buildings.

For centuries we have understood the role buildings play in shaping our emotions and social interactions. Classical architecture that still exists today shows us that since ancient times our ancestors have understood the importance of building design for many reasons, from displaying power and status; to controlling and organising citizens; and to inspire and uplift us. Tourists in our time spend up to 10% of global GDP annually, travelling the world, and seeking inspiration and a sense of shared history and meaning from architecture and place is one of the key known drivers of tourism 1.

Nonetheless, knowing that the external design of buildings has and continues to elicit strong feelings doesn’t help us answer practical questions about how to design buildings today. This applies both to architectural and design questions directly, and to implied economic questions of things like opportunity cost and trade-offs from investing in certain features over others, or bigger questions that are about economics and health policy – such as, how in fact can the external design of buildings impact health and wellbeing? How much should we spend designing buildings in a certain way? And for whom should we prioritise good design?

In psychology and neuroscience, emerging fields such as ‘neuroaesthetics’ are seeking to try and find direct evidence for the link between aesthetic quality in the design of things – art, nature, buildings – and health and wellbeing outcomes for individuals and groups. However, this opens another line of enquiry: Can or should building design be considered in an aesthetic tradition in the same way as paintings, sculpture, or nature?

Building design, in so far as it can be considered aesthetic, is clearly different from nature and other artistic traditions in that it both occupies a physical space in a way that can’t be avoided or ignored, and because it has a practical function – as a home, an office or a shop, which must constrain its design within parameters of human usability.

At one extreme, Gaudi has shown that buildings can be as much ornament as practical space, whilst at the other, some modernists emphasised the maxim of ‘form follows function’, which relegates the direct consideration of aesthetics below assumed benefits of the rational and efficient use of space for economic outcomes.

For others, such the renaissance architect Alberti (who was heavily influenced by the ancient Roman architect Vitruvius) the very fact that a building imposes itself in a physical space, means the building must be considered aesthetically. Materials, dimensions, shape, even without consideration of ornament, directly impact our emotional response to a building. And therefore, a building’s aesthetics is not about a linear trade-off between style and practicality. Both are equally relevant parts of the way in which a building impacts users and the passers-by.
Roger Scruton perceives this debate as thinking about the question from the wrong starting point. For Scruton, the external design of buildings can be driven by aesthetic considerations or practical ones, but in essence the design of a building is our imprint on the world around us. It reflects what we think of ourselves, of each other, of our values, and of our society. How buildings make us feel, and how we design them, should reflect how we want them to make us feel when we are near them.

This means that whilst external building design should be considered for its direct aesthetic effects on health and wellbeing, including the psychological impact of ‘neuroaesthetics’, it must also go beyond this. It has to consider how the design of the building helps or hinders myriad other ways in which we live our lives as individuals and communities.

Unlike the modernist focus on productivity, which still dominates mainstream economic thinking, a contemporary view must be cognisant of wider relationships between external building design and how individuals and societies function. This means thinking about how a building resonates with the existing built and natural environment; how it protects and nurtures – for example from pollution or extremes of temperature; how it encourages positive interactions between people; how it makes us feel and how our behaviour responds to what contemporary philosopher Alain de Botton, quoting John Ruskin, describes as ‘how buildings speak to us’; and how all of these things impact our overall health and wellbeing.

From a new economic thinking perspective, it is in fact this holistic thinking about health and wellbeing which will drive greater economic prosperity over the long-term, rather than utilitarian considerations of short-term efficiency. Physical environments which hinder us from living healthy lives, which discourage place-based social and economic activity, are a drag on the economy, society, all of us as individuals. Instead, we need buildings which, in the words of the book by Thomas Heatherwick, humanise. These are buildings which provide elements that appeal to human senses, like visual complexity, which prioritise human relationships, and which enhance the ability of individuals and communities to lead meaningful, happy and healthy lives.

“What Matters Most to You?”

In 2011, the Office for National Statistics asked a large number of people a very simple question – “What matters most to you?” The question was asked as part of the National Well-being Debate which sought to explore alternative indicators beyond traditional economic measures to better understand, measure, and help improve the overall quality of life and happiness in the UK.

The results showed that there are a broad range of things which people say matter to them, including having good relationships in family and community, having adequate income or wealth to cover basic needs, and the environment. But at the top of the list came health.
The importance of certain aspects of the built environment for health and wellbeing outcomes is well documented. In particular, there is a long history in the UK and all over the world, of working to improve housing conditions in order to improve health. While advances have been made over the course of the last century, the inequality in housing conditions – including overcrowding and exposure to dangerous damp and mould – in the UK nowadays is shocking. Tragically, this was thrown into sharp relief recently by the death of Awaab Ishak, a two-year-old child who died as a result of prolonged exposure to black mould in his home. The scientific evidence of the effect of housing conditions on health and wellbeing and related inequalities is robust, and was authoritatively reviewed in the 2010 and 2020 Marmot Reviews of health inequality.

As well as in housing conditions, there has been considerable interest in a broader set of neighbourhood and city-level built environment factors on health and wellbeing outcomes. For example, it is well documented that poorer communities in the UK and beyond are exposed to higher concentrations of air pollution which leads to a higher prevalence of cardio-respiratory and other diseases, or that living in proximity to a park improves our physical and mental health, and that places which encourage and enable walking promote better health due to higher levels of physical activity. Many of these points were brought to national attention also when highlighted within Marmot.

The importance of neighbourhood-level factors has also come to prominence since the COVID-19 pandemic and the unequal impact that lockdown policies had on different communities. Scientific evidence published since the beginning of the pandemic has shown that long-term air pollution exposure was linked to a greater risk of COVID-19 hospitalisation, and that individuals who lived close to green spaces experienced much less mental distress during lockdown periods than those who lived farther away.

However, against this well studied wider context, the main focus of this literature review is neither the interiors of buildings and how fit they are for human habitation nor the neighbourhood-scale considerations like: access to parks and amenities; mix of uses; or how walkability or car-dependency are built into the neighbourhood fabric. Rather, this review focuses on the intermediate scale of the exterior design of buildings and the impact that an individual building’s exterior design can have on the mental and physical health and wellbeing of residents and local communities who interact with that building.

Given the importance of the built environment and the quality of internal building design for health and wellbeing outcomes, the impact of external building design is a legitimate and important area for greater consideration. If the external design quality of buildings is indeed important for health and wellbeing outcomes, then there will be policy implications for local and central government that should flow from this.
Focus and Constraints

Nonetheless, despite attempting to constrain the review to individual building design, it is important to recognise that there is an inevitable overlap in much of the literature between the effects of individual buildings on health and wellbeing, the effects of multiple buildings collectively, and the effects of the wider built environment operating as a whole of many buildings and other urban features. We have tried as far as possible to constrain the focus of this literature review to the external design of individual buildings, but in some cases we have included the impacts of the design of ‘buildings and places’ where the impact of the building is inseparable or in other ways contingent on, or multiplied by, its contextual environment.

Additionally, in defining buildings, the literature covers many types of buildings and uses for them. We have tried as far as possible to consider universal features of buildings and be ambivalent to different typologies or uses of buildings, although there is a notable bias in the literature to discussing housing design, especially in relation to inequality of health and wellbeing impacts. With housing making up over 50% of all building stock, this is a logical predisposition within the literature.

In terms of the parameters of an individual building – where it starts and ends – the literature makes clear that the effects of a building derive from more than just the physical space that the building itself occupies, but the whole extent of the land on which it sits and how it interacts with its wider built environment. For example, building frontages and any natural features, including component green space within its plot, are relevant considerations for assessing the overall impact of any external building design.

Finally, we have tried as far as possible to consider objective features of building design when considering impacts. This means in particular that the review takes a neutral view of any particular architectural styles and subjective views of beauty in the built environment that are not supported by scientific research.

Research Questions

Given the context set out, this literature review focused on two overarching research questions:

1) To what extent does the literature show that the external design of buildings has an impact on health and wellbeing for individuals and communities, including physical and mental health?

2) To what extent does the spatial distribution of well-designed buildings disadvantage less affluent communities?

These questions are answered respectively in Sections A and B below. Section C then summarises the views of the NEF research team on potential policy implications emerging from the findings.
Pedestrians approached in front of an active façade were five times more likely to offer assistance, seven times more likely to let the ‘tourist’ use their phone, and four times more likely to offer to lead them to their destination.”
Section A

How building design affects health and wellbeing
Mapping Building Design Features to Outcomes for People

In order to examine the effects of external building design on physical and mental health outcomes for individuals and communities, we reviewed the literature for known ways that external building design can impact health and wellbeing outcomes. These 'outcomes' of external building design are the benefits that are realised by individuals and communities who interact with well-designed buildings.

Many of these outcomes draw upon David Halpern's conceptual framework which identifies several plausible 'intermediate outcomes' for health and wellbeing from building design, including building design's impact on environmental stressors (e.g., heat, noise), social stressors (e.g., crime, fear of crime), social support (e.g., social interactions, neighbourly relationships), or the symbolic function of design as an indicator of social status.

Taking into account Halpern's framework and the evidence from existing research, this literature review considers the following plausible overall outcomes that good external building design can deliver for physical and mental health:

1. **Thermal comfort** – High temperatures in cities lead to poor health and premature deaths. A recent study by the Barcelona Institute for Global Health drawing on data from 93 cities estimates that over 4% of summer mortality in European cities is caused by urban heat island effects.

2. **Crime and fear of crime** – Crime and fear of crime may have substantial impact on health and wellbeing, both directly and indirectly by preventing us from engaging in healthy, social and physical activities.

3. **Social interactions** – A number of studies have linked social ties between individuals, groups, and the larger community with better mental and physical health.

4. **Positive emotions** – Numerous studies suggest that immediate emotional experiences have long-term effects – both negative and positive – on mental and physical health.

5. **Physical activity** – Active travel (walking and cycling) and physical activity in general is associated with better physical and mental health. A growing amount of evidence shows a causal link between active travel and mental health in particular.

Following the setting out of this framework of outcomes, we searched the literature for specific qualities or features of external building design that might deliver these outcomes. This was achieved through an iterative process, drawing on existing evidence syntheses and further desktop research to identify relevant features and qualities, whilst excluding those that are beyond the scope of this review (e.g., building interiors and fitness for habitation, wider neighbourhood and built environment considerations).

The following features and qualities of external building design were ultimately included...
Humanise Building and Thriving

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in the review as elements which could plausibly help deliver the outcomes set out above. These were:

1. Treatment of building edges
2. Integration of natural features
3. Perceived aesthetic quality
4. Natural surveillance and security

For ease of reading and interpretation, the rest of this evidence review is organised by a detailed analysis of these specific features and qualities of buildings, rather than the outcomes. However, the summaries below discuss both studies that measure the impact of external design of buildings on health and wellbeing directly, and some studies that demonstrate impact on the outcomes.

Methodological Challenges – Interpreting the Data

Researchers are now able to access a wealth of data on population health, including granular geographical data. Due to large population surveys such as the Census, and NHS data, researchers are able to show how health and wellbeing of residents varies from town to town, neighbourhood to neighbourhood, even street to street.

With the ubiquity of smartphone cameras, geo-referenced social media content, technologies such as Street View and high-resolution satellite imagery, researchers can also access more and more data about the physical characteristics of places.

Some existing academic studies use such data, but they need to grapple with considerable difficulties. These are not necessarily related to data availability, but rather its legibility and interpretation. Above all, this is due to the fact that many relevant characteristics of places and buildings are difficult to measure, quantify, and compare, and some – for example, aesthetic quality – include personal judgement.

To overcome this challenge, the majority of the research studies reviewed here use primary data collected by researchers on the ground who assess places against the presence or absence of specific qualities. Other studies teased out information about place quality from residents, visitors, or the wider public through surveys and other crowdsourcing technologies.

However, the principal methodological challenge in answering the research questions set out above is not, in fact, a lack of data. Rather, the main challenge is the inability to draw conclusions of a causal character from the data. In practice, we actually learn very little about the impact of building design on mental and physical health from observing, for example, that people who live in or near well-designed buildings live healthier or longer lives than people who live in or near poorly designed buildings. This is because people who live in or near well-designed buildings might be very different to people who live in or near poorly designed buildings.
For instance, they might be, on average, older or younger, have different kinds of jobs, different incomes, and different habits. Since all of these factors likely influence physical and mental health, we would be unable to tell if the observed differences in health are, in fact, caused by building design at all.

This is a very common challenge in all research into the causes and effects of things, and researchers use different strategies outlined below to address it. All studies included in this review are rigorous and address this challenge one way or another through their research design.

The gold standard in causal research is an experiment where two alike groups are exposed to different ‘treatments’, or a natural experiment, where a randomly occurring event creates experiment-like conditions in real life.

One such example is a random allocation of university accommodation, which has been used to study the effects of living in differently designed student halls on students. As long as the allocation of accommodation is completely random, students living in different halls are, on average, alike, and any differences in outcomes can be attributed to the effect of the halls themselves.

However, with a few similar exceptions, there is nothing random about who lives where. For this reason, the majority of the studies included in this review use an alternative strategy, ensuring that while the different groups included in the research might not be completely alike, they are sufficiently similar to make a comparison meaningful. In quantitative research, this can be achieved by using sufficiently large samples and accounting for other important characteristic variables – for example, age or income – in the analysis.

Four Key Themes:

1) Treatment of Building Edges

One of the widely covered themes in the existing literature is the treatment of building ‘edges’ – the visual or physical transitions between the outside and the inside. A number of studies, some of them well known, have demonstrated the positive impact of soft edges (e.g. façades with articulated windows and doors, outside storefront displays, a variety of functions, visual interest and complexity, semi-public front gardens) on mental and physical health as well as intermediate outcomes including positive emotions and social interaction. These features offer visual complexity in a way that provides a humanising and sociable element to buildings, by encouraging potential interaction between individuals.
The positive impact of soft edges on mood was studied by the BMW Guggenheim Lab in a series of urban experiments developed by research psychologist Colin Ellard and carried out in New York, Berlin and Mumbai. During the experiment, a group of participants went on a tour of different locations in respective cities, carrying smartphones programmed to ask location-specific questions about their mood. Participants also wore bracelets that measured skin conductivity, a standard physiological measure of mood. The findings indicated that individuals exhibited higher levels of positive mood in locations with see-through façades and façades that open onto the street, for example high tables in a restaurant at its open windows, compared to locations with closed or blank façades. On average, participants reported a 0.5 point difference in mood and arousal on a five-point scale at locations with see through and open façades.

Famously, Jan Gehl conducted a number of studies in different cities including Madrid, Melbourne and Stockholm examining pedestrian behaviour in front of different types of façades. Active façades, characterised by features such as many doors, visual contact between outside and inside, and diverse functions, were found to lead to slower pedestrian traffic and higher levels of interaction. Gehl also argues that front gardens, forecourts and porches in residential streets support social life, and presents studies that demonstrate higher levels of social activity in front of houses with such features.

Another urban experiment conducted by Happy Cities in Seattle showed that active façades have the power to influence sociability and helpful behaviour. During the experiment, ‘undercover’ volunteers acting as lost tourists approached pedestrians on two sites in the same neighbourhood, one with an active and one with a closed façade. When surveyed, pedestrians approached in front of an active façade reported a considerably higher level of trust in strangers. Even more remarkably, pedestrians approached in front of an active façade were five times more likely to offer assistance, seven times more likely to let the ‘tourist’ use their phone, and four times more likely to offer to lead them to their destination.

A 2008 study focused on physical and mental health of ageing people confirms the relationship between soft edges and health directly. The study was carried out over a period of three years in Miami and found that architectural features theorised to promote social interaction such as porches and stoops had strong positive effect on perceived ‘social support’ (the extent to which friends, neighbours or family members are perceived as available to provide functional and overall support during times of need), physical functioning (the ability to perform basic and instrumental activities of daily living), and mental wellbeing. During the period of the study, people living on blocks marked by low levels of positive front entrance features were 2.7 times more likely to develop physical functioning difficulties.
2) Integration of Natural Features

A large body of literature that is not covered in this evidence review demonstrates the positive impact of access to parks and green spaces in neighbourhoods. However, existing research also shows strong positive effects of integrating trees, pocket parks and natural features on a much smaller scale, including in front of buildings or as part of building façades. This includes some studies that show a direct impact on health and wellbeing, and other studies that feature intermediate outcomes – thermal comfort and positive emotions.

The positive impact of urban greenery on thermal comfort is well established and subject of an extensive body of research. Notably, while some of the studies focus on larger areas of urban greenery, we also identified studies spanning a diversity of continents and climatic conditions that examine the impact of smaller natural features and street tree canopy. Together, these studies clearly show that street-level greening leads to increased thermal comfort, reduces the urban heat island effect, and prevents heat build-up.

Natural features also have a well-known positive effect on mood, emotions and stress relief. In two studies, researchers showed participants photographs with urban scenes with and without green features and water features. The studies found that photographs containing green features led to people reporting feeling happier, friendlier and more attentive (by 0.55, 0.44 and 0.2 points on a five-point scale), and also less angry, less sad and less fearful (by 0.32, 0.19 and 0.14 points on a five point scale). Photographs containing water were associated with positive emotions (increase by 1.26 points on a ten-point scale) and stress relief (increase by 1.68 points on a ten point scale). Findings from these experiments speak to a larger body of evidence which identified that viewing trees, greenery or natural environments from a window was associated with a quicker recovery in hospital, enhanced general wellbeing, better blood pressure, stress relief, or improved mood.

Finally, a remarkable study from London shows directly the positive effect of street trees on the mental health of residents. Using data on the presence of street trees and prescription rates of anti-depressants in local areas, the study shows that an increase in density of street trees is associated with lower anti-depressant prescription rates. Specifically, the results show that for each extra tree per a kilometre of street, there is 1.18 less prescription of anti-depressant medication per 1,000 population.
3) Perceived Aesthetic Quality

Some interesting evidence that the aesthetic quality of buildings affects our mental and physical health comes from ‘neuroaesthetics’ studies in the field of environmental psychology. For instance, experiments have shown that peoples’ emotions are directly affected by specific qualities of architectural interiors that relate to judgements about issues such as coherence, informational richness, or homeliness 43–44, and we know that emotions matter for long term mental and physical health. While many of these specific experiments have focused on architectural interiors, it seems safe to assume that architectural exteriors would have similar impacts.

However, the practical implications and significance for health remains slightly unclear, and more research is needed to provide a solid evidence base. Existing empirical studies do establish a direct link between health and the aesthetic quality of one’s environment more broadly (neighbourhood), but there currently isn’t evidence to show that a single building can affect a person’s health in such a way.

It is worth noting that compared to the presence of soft edges or natural features, the aesthetic quality of buildings is more difficult to conceptualise, measure and compare. For this reason, the existing studies that interrogate aesthetic quality usually focus on aesthetic quality as perceived by residents or the wider public which might significantly differ from the judgement of architects and other built environment professionals 45.

One research study which is well-known for not finding an association between the like or dislike of a specific building and wellbeing is a study of randomly allocated student accommodation at Harvard University 46–47. The study asked first-year students to estimate their own happiness depending on which student hall they will be allocated in years 2 and onwards. The options include 12 different halls in a range of architectural styles – some admired and some generally unloved such as the brutalist Mather House. Researchers then followed up with students one and two years later and found out that despite students’ earlier prediction, their happiness was unrelated to which student hall they ended up being allocated to.

While this and other 48 studies have not shown an effect of liking or disliking a building, estate or street, more recent studies suggest that aesthetic quality of the neighbourhood where one lives does matter. One such study was a survey of a large number of households in Sydney, Australia, which found that perceiving one’s neighbourhood as aesthetically pleasing was one of the factors associated with a greater feeling of happiness among respondents 49.
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Other relevant studies use different measures of aesthetic quality such as “scenicness” or “imageability”. A particularly well-known study from the University of Warwick draws on a large database of geo-located pictures from across urban, suburban and rural areas in Great Britain, rated by the public for their “scenicness” in a large online crowdsourcing exercise. In total, the dataset includes 1.5 million ratings of more than 200,000 pictures. The study then compared these ratings to the self-reported health of residents in small geographic areas from the 2011 Census, and found that the “scenicness” of local environment was significantly associated with health of residents, even after including (like all of the studies in this review) other important factors such as income or employment in the analysis 50.

A different study, from Salt Lake City, found that “imageability – the quality of place that makes it distinctive, recognisable, and memorable” is a significant factor in determining walkability 51, which in turn supports long term mental and physical health. This finding is in line with a RIBA survey from 2013 which found that streets and parks designed to be safer (24%) and more attractive (23%) were the main changes people suggested would encourage them to walk more 52.

4) Natural Surveillance and Security

Finally, further studies consider the impact of design principles aimed at reducing crime or perceived fear of crime. There are two well-known approaches to crime reduction featured in these studies, Crime Prevention through Environmental Design (CPTED) and Secured by Design (SBD), both based on a similar set of principles which include:

- Physical security features of buildings themselves

- Natural surveillance – for example, ensuring that there is sufficient building density, that front doors and windows face onto the street, that areas are well illuminated, and blank walls are avoided

- Movement control – for example, avoiding high levels of through movement

- Maintenance – for example, ensuring that areas look cared after

- Defensible space – for example, clear definition of space ownership and purpose as public (e.g., pavement), semi-public (e.g., front garden), semi-private (e.g., rear garden) or private (e.g., inside home) providing spatial cues for individual to know who should (not) be in a given area and what activities different areas are best suited for

These studies have shown that CPTED and SBD principles can be effective mechanisms that lead to increased social activities and interactions, as well as a reduced fear of crime 53, and in some cases halving the rates of robberies 54 and burglaries 55.
Architectural Style

As outlined above, a significant body of research suggests that specific features and qualities of the external design of buildings can have tangible impacts on mental and physical health. This applies at the level of individual buildings as well as in aggregation, when well-designed buildings contribute to a well-designed neighbourhood. As far as perceived aesthetic quality is concerned, it is the whole neighbourhood rather than individual buildings that seems to matter most.

In relation to architectural style, there is no robust evidence linking any specific architectural style to better or worse health outcomes. However, it is likely that certain architectural styles may be more likely or more readily able to incorporate positive design features set out in this study, such as soft edges, natural features, natural surveillance, and aesthetic quality.

Nonetheless, this is not to disregard the philosophical tradition set out in the Introduction which posits that architecture has the power to 'speak to us' and influence our thoughts, feelings and behaviours. Although difficult to study empirically, the ability of building design to have such an impact on individuals must lead to tangible outcomes for health and wellbeing.

"People living on blocks marked by low levels of positive front entrance features were 2.7 times more likely to develop physical functioning difficulties."
Section B

Spatial inequality and access to well designed buildings
Overview

There are significant differences in life expectancy between the most and least well-off communities in England. The latest Marmot Indicators (from 2015) demonstrate that healthy (also known as ‘disability-free’) life expectancy, or the number of expected years lived without disability, is 54.9 years for men in Blackpool (classified as the most deprived ward in England) and 71.4 years for men living in Wokingham (classified as the least deprived), a 16.5 year difference. For women, the difference in healthy life expectancy is 11.6 years between the same two wards.

Expected Male Life Expectancy (Without Disability) in Poor Versus Affluent Areas

<table>
<thead>
<tr>
<th>Affluent Area</th>
<th>Poor Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wokingham</td>
<td>71.4 years</td>
</tr>
<tr>
<td>Blackpool</td>
<td>54.9 years</td>
</tr>
</tbody>
</table>

Where inequality in access to well-designed buildings is a part of the mix of factors driving these disparities in the UK, this should be uncovered and addressed. This section reviews evidence from the existing literature for connections between unequal access to good external design of buildings and unequal outcomes for health and wellbeing.

Inequality Driven by Implicit Market Valuation

Evidence suggests that places that have a higher volume of positive building design features (as set out in Section A), have higher house prices, with a recent design audit suggesting that housing schemes designated as ‘better’ designed achieve on average a 75% sales value uplift compared to less well-designed schemes, accounting for other factors including location.

This means that in addition to the health and wellbeing effects of good design, individuals operating as actors within a marketplace for property also place a financial value on such benefits. In the field of economics that studies property demand and price effects, the internalisation of such design features into the price of property is known as ‘hedonic’ pricing.

The consequence of market forces in the supply and demand for living in or near well designed buildings and places is therefore to create a self-reinforcing effect that by-definition, on average those with less financial means, will be more likely to live in areas with low quality building design or with fewer buildings with positive design features.
Additionally, for housing specifically, research by UCL in 2020 found that less-affluent neighbourhoods are more likely to see ‘mediocre’ or ‘poor’ design of new housing, in comparison to more-affluent neighbourhoods. The study found that less affluent communities were more likely to receive poorly designed housing by a factor of ten.

By other metrics as well, people living in poorer areas are likely to enjoy fewer buildings of high design quality. For example, in consideration of heritage assets, a recent study of the location of listed buildings by Historic England found that deprived neighbourhoods in England had significantly fewer listed buildings per 1000 people and per square kilometre than better off neighbourhoods. For example, while the most affluent 40% of neighbourhoods had on average more than 10 listed buildings per 1000 people, the most deprived 20% of neighbourhoods had on average only 1.7 listed buildings per 1000 people.

Inequality Driven by Poorly Targeted Government Spending

Separately, cuts to Local Government funding over the last 13 years, have hit cultural, environmental and planning services particularly hard, which includes local authority responsibilities for spending on public buildings as well as planning and development management. Moreover, a recent study has shown that the areas worst affected by cuts to these services have been those with the highest levels of deprivation. As a consequence, more deprived parts of England have disproportionately suffered from ageing and poorly maintained public buildings. In addition, local councils in areas with high levels of deprivation disproportionately lack the capacity and resources needed to manage private development and successfully work with developers to ensure good design quality outcomes.

In recent years, the cuts to local government funding have been in some areas partially offset by competitive Central Government capital funds for urban regeneration initiatives. However, whilst it may be assumed that such funding would target support to the most deprived areas, a recent study undertaken by Local Government Chronicle finds that this is not the case. In particular, looking across 6 different funding programmes amounting to £3bn since 2019, the study found that 25% of Local Authorities within the list of 100 most deprived Local Authorities did not receive any funding awards at all. This outcome is likely driven by a mixture of political influence for such awards combined with the competitive nature of such funding programmes favouring more affluent Authorities with greater resource available for developing successful bids.
Inequality from a Lack of Good Design

In terms of intermediate outcomes for health and wellbeing from external design features, people living in poorer areas are more likely to be exposed to health impacts from excess heat and excess noise. For example, one study found that black populations in London are 19% more likely to live with excessive noise from railways. Additionally, people in poor areas are also more likely to be exposed to higher levels of pollution. In London, a 2019 study by the GLA found that the most deprived communities had annual NO2 levels 13% higher than the least deprived areas.

Poorer areas also have unequal access to green space. 59% of households in the top 10% of incomes were within 10 minutes walk to greenspace. This compares to only 35% of households in the poorest 10%. A separate study noted that individuals living in areas with mainly white residents had access to 11 times more local green spaces than residents in areas comprising mainly black, Asian and minority ethnic households.

People in poorer areas are also more likely to be exposed to violence. In London in 2022, violence, robbery and sexual offences are 2.1 times more prevalent in the 10% most income-deprived areas, compared to the 10% of least deprived areas. Clearly, as set out in section A, many factors other than building and place design will affect the likelihood of crime, but if it is known that crime can be mitigated by building design, then it strongly suggests that there is a case for investing in good design in poorer areas in order to mitigate the likelihood of crime.

Some of these inequalities in exposure to heat, noise, lack of green space, and violence, will be related to geography and specific location, and some will be related to wider place-based effects, like urban heat island effects from excessive concrete and lack of green space. But poorer areas are more likely not to have buildings designed to mitigate these impacts.

Less affluent communities were more likely to receive poorly designed housing by a factor of ten.
Section C

Implications for policy and recommendations
Central Government needs to get better at fully understanding how investment in one part of the economy, such as place and building design, can offset and lower costs in another part of the economy, such as healthcare, policing, or economic exclusion.”
In the introduction to this report, we framed the philosophical and psychological importance of the external design of buildings for health and wellbeing. In particular, two key channels were identified. The first was ‘neuroaesthetics’ and how the aesthetic quality of external design can deliver positive emotions which will then impact short and long-term mental wellbeing. The second was through explicit features of design which will lead to behaviours and outcomes that improve health and wellbeing.

Section A of this report then set out the significant body of existing literature which explores the external design features of buildings and sets out a framework of features that can have tangible impacts on mental and physical health and wellbeing. This applies at the level of individual buildings as well as in aggregation, when well-designed buildings contribute to a well-designed neighbourhood.

Further, in Section B, evidence was set out showing that since individuals and communities value well designed places and buildings, those with greater means use their purchasing power to gravitate towards places with more well-designed buildings and places, pricing out less affluent communities. This means that poor communities are likely to suffer from a broad range of negative design features, both aesthetic and practical, which directly deliver negative health and wellbeing outcomes.

A clear corollary of these findings is that there is a strong argument for greater delivery of well-designed buildings to improve health and wellbeing, and that policies and practice to increase the amount of good external design should be focused on poorer areas that are more likely to have a dearth of well-designed buildings. The existing supply of such places is constrained, and as a consequence the demand to live in or near them creates price pressures resulting in social stratification.

Recommendations

Below we set out three key recommendations which are targeted at local and national leaders in the UK, as well as community groups and professional and civil society organisations with an interest in the built environment and design. However, many of the recommendations apply to a global audience. Health and wellbeing is a pressing concern in many places around the world and one of the United Nations 17 Sustainable Development Goals.

1) A major new research programme to build on the Marmot Review

In 2020, the 10-year follow-up to the groundbreaking Marmot review, further confirmed to us the shocking findings that for the first time since the start of the 20th century, improvements in healthy life expectancy in England had gone into reverse in some communities and for some demographic groups.

We need to get to the heart of understanding any and all links between the external design of buildings and health and wellbeing outcomes for people.
This literature review has brought together the existing evidence on how building design is already known to impact health and wellbeing, but there are gaps in our collective knowledge. In particular, much research, including major reviews of health and wellbeing such as Marmot, draws explicit connections between differences in neighbourhood ‘quality’ and health and social outcomes for residents. However, there is much less on the role of individual building design.

A range of research questions for which it would be valuable to see empirical research undertaken include how, and through what specific features, does good building design:

- Improve social and community capital?
- Encourage local economic activity?
- Support physical health by encouraging healthy and active lives?
- Promote community safety and cohesion?
- Reduce costs for healthcare, crime, and social care budgets?
- Contribute directly to psychological health and wellbeing through neuro-aesthetics?

We believe this should be a priority for UK Research and Innovation, and the ESRC (Economic and Social Research Council) is well placed to launch a funded call for research projects in this area, alongside charitable trusts and foundations such as Nuffield and Wellcome.

2) Design audits and better enforcement

Building on the findings of Marmot, Local Government should proactively undertake audits of its most deprived areas, particularly those ranking worst in IMD terms, to develop an understanding of how poor design may be contributing to reduced health and wellbeing outcomes in these areas, and to work with communities to develop solutions.

Additionally, given the importance of the wider features of design for health and wellbeing, Local Planning Authorities and Local Highways Authorities need to ensure that they clearly understand the viability scenario on sites and residual land value, and are able to enforce clear design principles and design codes in new developments. This will mean that Local Government will need the appropriate levels of resource in these departments to ensure that good design can be both scrutinised in new development proposals and enforced in practice.

Due to the impact that design has on mental and physical health, poor design needs to be seen as sufficient grounds for rejection of development. The ‘presumption in favour of sustainable development’ with the National Planning Policy Framework should not be used as a workaround excuse for poor design, given that poorly designed places impact on health and wellbeing and necessitate costly intervention or negative economic outcomes later on.
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Additionally, good design should be reframed away from being seen as an additional 'cost' of development. Good design will generally either provide higher end values or longer term 'exchequer benefits' in terms of lower cost of long-term expenditure on healthcare or crime.

Central Government needs to get better at fully understanding how investment in one part of the economy, such as place and building design, can offset and lower costs in another part of the economy, such as healthcare, policing, or economic exclusion.

Where any new research on economic benefits, for example as set out in recommendation 1, is able to monetise the economic benefits of good building design, Central Government should use ‘smart budgeting’ principles to ‘invest to save’ by supporting spending on good design that will reduce budgets in crime, healthcare, and other social and economic costs of low health and wellbeing.

3) Setting a global ambition

The design of buildings for rest, leisure and work is a common requirement of all civilisations on earth. However, at different periods of economic development, or with different economic contexts, a wide variety of building types and qualities have and continue to emerge across the world. For example, the advent of the modern era and highly industrialised processes in western countries coincided with high rates of population and economic growth. These two factors led to the ability to produce housing en masse, but with varying outcomes in design quality. Other factors, like increasing land prices in high-growth urban agglomerations also provided constraints on resources available for design in the construction process.

In the West, population and economic growth appears to be trending towards slower growth rates, but land constraints remain. In other countries, such as rapidly developing countries like China, a similar process is repeating itself, whereby the need to house and employ rapidly growing urban populations is seeing in some cases the creation of poorly designed buildings and neighbourhoods.

A shared goal of all nations in the 21st Century should be to move the focus of the utility of buildings away from economic growth for its own sake, and towards creating great places and built environments that are built for human communities, and that prioritise health, wellbeing and happiness.

Designers, planners, economists, policymakers and other interested professions and thinkers around the world should convene to share best practice in designing buildings to promote health and wellbeing. This same community should work towards researching and developing minimum standards for building design principles to underpin healthy, happy communities regardless of where they exist in the world.
A shared goal of all nations in the 21st Century should be to move the focus of the utility of buildings away from economic growth for its own sake, and towards creating great places and built environments that are built for human communities, and that prioritise health, wellbeing and happiness.”
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