Is wood good for your health?

The choice of materials we surround ourselves with could affect our well-being. **Ed Suttie** discusses research that suggests wood really is good.

Maggie's Centre, Oxford, by WilkinsonEyre Architects. Photo: © WilkinsonEyre

"A study found that, as visual wood surfaces in a room increased, sympathetic nervous system activation was lowered, which is responsible for physiological stress responses."

It is incredible to think that a material as ancient and widely used in our built environment as wood could have qualities that we are only just beginning to quantify. The significant impact that the built environment has on our well-being has caused us to look more closely at the materials surrounding us in our everyday lives.

There is no doubt that forests are tremendous recreational assets that can contribute to our nation's health. Exposure to nature is proven to lower blood pressure, heart rate and levels of aggression. In Japan, the medical profession has for decades prescribed *shinrin-yoku* (taking a walk in the forest, sometimes called 'forest bathing') as part of the recovery process for a number of mental health complications.

Closer to home, NHS Forest is a project that aims to improve the well-being of patients recovering from surgery by increasing access to outdoor green spaces and woodlands. Memory walks are helping dementia sufferers spend time in woodlands surrounded by nature, which has a profoundly positive effect on their condition.

The Woodland Trust estimates that £2.1bn would be saved from the NHS England budget in healthcare costs if every household in England was provided with good access to quality green space.[1] Forests, woodlands and trees can improve our well-being even before we consider the ecosystems services provided for free, such as cleaning water and scrubbing particulates out of polluted city air. Woods can make us better, but what about the forest product, wood?

Biophilia

In 1984,[2] Edward Wilson expressed how humans are inherently and inextricably connected to nature; he termed it 'biophilia'. This developed into 'biophilic design' as interior architects delivered a connection to nature through the design and selection of materials for interior spaces. Biophilic design proposes that a more human-centred approach to our built environment can improve many of the spaces in which we live and work, with numerous health benefits. The desire for connection to naturalness is not a romantic, anti-urbanisation campaign, it is a scientifically evidenced means of achieving psychological restoration and of maintaining positive well-being.[3] >>

Bringing trees and green space into urban areas is a direct connection and the indirect connection is by using natural elements in interiors (for example, colours and patterns that reflect nature, plants and natural materials). The materials used play an important role as a 'proxy for nature' through colour, texture, diversity, variation, sheen and natural form – all things that are readily associated with natural materials such as wood.

Research findings

The link between wood and human health has been demonstrated clearly in studies from Japan, the US, Canada and are also emerging in Europe. A study conducted by the University of British Columbia[4] refitted similar offices with different materials and measured health aspects of the occupants. It found that, as visual wood surfaces in a room increased, sympathetic nervous system activation was lowered, which is responsible for physiological stress responses.

Further research from this team focused on healthcare environments and aspects of views of nature, natural lighting, indoor plants and wood in interiors.[5] The research found that patients recovering from surgery in rooms with views to nature recovered faster, required less medication and felt less pain.[6] Natural materials and views were connected with better patient outcomes. What is really exciting is whether wood could provide the connection to nature in parts of healthcare buildings where windows and views are not possible or are compromised. Wood in structural elements, wall panels and furniture could all make an impact in non-clinical areas. The move towards greater use of wood in healthcare environments is one practical way of connecting with the health benefits of exposure to nature.

Similar improvements have been observed in schools with benefits to students, staff, the education establishment and the economy. Results included:

- Children learning faster in natural light.
- Classrooms with plants see improved performance in spelling, mathematics and science.
- Reduction of absenteeism was recorded in schools where biophilic design principles, including wood, had been deployed.

The use of wood in interior design has been linked to improvements in mental well-being. Photo: © Oliver Heath Design

Office environments

We spend 90% of our lives in buildings, which means our health is influenced significantly by the built environment. In our typical office environment in the UK, up to 60% of staff don't have sufficient access to daylight. The well-being of office workers is currently quantified as aspects of air quality, lighting, ventilation and thermal comfort. For example, the health and well-being credits in BREEAM are connected to volatile organic compounds and formaldehyde along with aspects of user control for light and thermal comfort. Missing from current measures is a quantification of the physiological and psychological influencing factors, which in an office environment – for occupants and the business – trigger as improved productivity, reported wellness and a reduction in days absent due to illness.

Put simply, we mostly work and live disconnected from nature. More than 130 million days are lost to sickness absence every year in Great Britain and working-age ill health costs the national economy £100bn a year.[7] A 1% reduction in absenteeism would convert to a saving in lost days alone of £1bn to the economy. In addition, an increase in operational productivity enabled by the way you internally fit out your office would add further benefits.

Biophilic office design

In a global study of the relationship between psychological well-being, work environments and employee expectations, data was collected from nearly 8,000 employees in 16 countries to quantify the effect of biophilic design in the workplace.[8] The results show that 47% of workers have no natural light and 58% have no plants. Yet, in offices with these features, workers report a 15% higher level of well-being and are 6% more productive with reduced absenteeism rates. In the UK responses, natural elements of light, wood and stone all had positive impacts on happiness, creativity and productivity.

In a study by the World Green Building Council,[9] the combination of health, well-being and productivity in offices was examined; the results suggested that office design has a significant impact on occupants and that a move beyond 'green' is needed to create truly sustainable buildings. As staff costs typically account for 90% of a business's costs, the human benefits of green buildings can be quantified through:

- high levels of health and well-being in staff
- better retention rates
- less absenteeism, and
- increased business.

A high-level framework for measuring a building's impact on staff was created and is now being piloted. Elsewhere, the WELL Building Standard® in the US provides a means of monitoring the performance of building features that affect health and well-being.[10] >>

Interior materials

BRE conducted a study measuring the well-being benefits of interior materials;[11] the study was stimulated by a latent demand from construction professionals as a lack of clarity and guidance existed. Groups from healthcare, education and offices confirmed the significant positive impacts associated with design and materials used in refurbishment.

On-going research in the European project Wood2New[12] looks at creating a more compelling case for the use of wood-based materials in interiors. The work is exploring the many added benefits of using wood in interiors, including its ability to buffer fluctuations in relative humidity and temperature, and also the material's sense of naturalness and calm that delivers health benefits for occupants. The growing empirical evidence of these qualities should enable future refinement of well-being measures in sustainability decision-making, such as BREEAM and LEED.

A new project is being formulated at BRE to create a major office refurbishment programme to generate UK-based empirical evidence of the impacts of design and material choices on occupant health. The participation of office owners are crucial to this work. According to Debbie Hobbs, sustainability manager at Legal & General Property, the marketing of office, retail and residential property 'will need to talk the language of health and well-being' as part of the move beyond green – 'the trick is not to get left behind'.

In practice

Where practical, we should bring natural elements into our indoor environment. When considering an interior refurbishment we might typically consider changing the floor covering, furniture, wall covering, and in deeper refurbishments, the windows, doors and lighting. Therefore many opportunities exist for wood to be used. Increasing the use of wood in interiors to contribute to health benefits for occupants is very exciting, and is not the exclusive domain of top-end developments and refurbishment projects. There is no more basic intervention on refurbishing a room than the simple choice of materials.

The natural progression from considering the sustainability of buildings is to measure their impact on human well-being. Many of us are drawn to use wood, and in the future many more will understand why they are drawn to use wood through an inherent link to nature and the associated benefits to our physical and mental health. ■

About the author

Ed Suttie *is the Research Director in the Centre for Sustainable Products at BRE. He works in a team delivering consultancy and research programmes on material sustainability sponsored by industry, UK Government and the European Commission. Ed has worked with the timber industry for 20 years on innovative products, optimising supply chains and service life prediction. He has published widely in the field of timber, service life, sustainability, construction and bio-based materials. He sits on the Executive Committee of Grown in Britain and convenes the European Standards committee CEN/TC38/WG28 Performance Classification of wood in construction.*

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