



# QUALITY BUILDINGS, QUALITY CARE

Healthcare

How buildings contribute to improved  
patient care and staff wellbeing



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# Foreword

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The last century has seen great leaps in our understanding of the human body and mind.

As we approach the 70th anniversary of the creation of the NHS, we face new challenges: ensuring that we all receive the care we need as medical knowledge advances; facing demographic changes as the elderly make up an increasing proportion of our population, leading to higher demand for the services they need; and the economy returning to growth with a legacy of deficit reduction.

Greater longevity is clearly to be welcomed, but is the healthcare estate ready for these changes? NHS England<sup>1</sup> agrees that investment in healthcare infrastructure will be a vital part of the solution, and the real estate sector stands ready to play its part in providing much-needed new premises – from GP surgeries to hospitals to care homes.

Recently, we showed that investment in primary care could deliver patient benefits and significant savings to the NHS<sup>2</sup>, and that investment in care homes could help to meet the complex care needs of the elderly<sup>3</sup>. The same is true of the wider healthcare estate; fitting treatment rooms for new and novel treatments in existing buildings that were not designed for that purpose presents real difficulties. Simply put, investment in healthcare real estate can help to improve the care that patients receive – and deserve.

In a time of constrained public finances, investing in healthcare real estate also represents value for money. Upfront investment in primary care would lead to significant savings further down the line through reduced reliance on A&E services and walk-in centres. And it is not just patients that will reap the benefits: health workers deserve workplaces that allow them to care for patients as effectively as possible, and working in an environment which aids their own wellbeing helps achieve this.

This report adds to increasing evidence proving the benefits of modern, purpose-built premises, and we look forward to working with all political parties, local authorities and NHS bodies to fully realise these benefits.

*Melanie Leech*

Melanie Leech  
Chief Executive  
British Property Federation



*Simply put,  
investment in  
healthcare real  
estate can help  
improve patient  
care.*



Balhousie Huntly Care Home, Aberdeenshire (below). Funded by Target Healthcare REIT.



# Executive summary

This report shows that:

- In those reviewed to date, services provided from new healthcare premises have been three to four times more likely to be rated “Outstanding” by the Care Quality Commission than services provided from older premises;
- There is lower turnover of staff in newly built hospitals, and staff take fewer sick days. The difference in staff sickness absence is equivalent to 900,000 working days per year if the median sickness absence rate in newer buildings were replicated across all NHS Acute Trusts;
- Modern facilities are safer for patients, with 30% lower fall rates and 10% lower overall patient harm in new hospitals, and similar reductions in new care homes.

To ensure this continues it is critical that:

- Continuous investment in flexible, future-proofed buildings should be encouraged, allowing design innovation to spread across the estate;
- Local plans should consider all healthcare facilities – from hospitals to care homes to health centres – assessing fitness for purpose and future needs;
- Local plans should ensure new healthcare buildings are conveniently located to town centres, transport hubs, and existing medial infrastructure (with care homes prioritised close to hospitals, for example) to facilitate integrated care;
- Evidence based design should continue to be supported, promoting the spread of best practice and achieving maximum benefit from advances in design and technology;
- Building on the work of programmes such as ‘Enhancing the Healing Environment’<sup>4</sup>, commissioned by the Department of Health and led by the King’s Fund, further systematic studies are needed to quantify the wider impact of healthcare environments on quality of care and further define best practice;
- The NHS should recognise, monitor and systematically report on the wider benefits of healthcare infrastructure investment.

So far, we have only seen the above benefits within a proportion of the healthcare estate. Rolling out proven technologies such as anti-microbial surfaces, better lighting and layouts that reduce staff travel time to the rest of the national healthcare portfolio would benefit both patients and healthcare professionals. At present, investment has been undertaken at irregular intervals which means that the portfolio is of varying quality.

Renewing and revitalising the estate will be better for patients, better for the NHS and better for its workers.

# Introduction

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The success of modern healthcare has paradoxically led to an increase in need for services.

Whilst life expectancies have soared, the average person in the UK now spends more than 15 years in poor health<sup>5</sup>. Increasing longevity and pioneering treatments mean that on average, each of us alive today will spend around two and a half years of our lives in a care home<sup>6</sup>.

Across the population, there is a pressing need to support increasing numbers of frail elderly patients, especially those with both mental and physical conditions, and to encourage self-management of long term conditions. This pressure on elderly services must be addressed. Diabetes cases have risen 60% in the past decade and currently affect 3.3 million people<sup>7</sup>; every year, 25% of people in the UK will experience some kind of mental health difficulty<sup>8</sup> and an estimated 25% of people accessing acute hospital care also have dementia<sup>9</sup>. 50% of women and 43% of men now regularly take prescription drugs<sup>10</sup>.

In the 'Five Year Forward View'<sup>11</sup>, the plan for the near future of our health service, NHS England Chief Executive Simon Stevens recognises the challenges of treating longer-term conditions and calls for new models of care to provide more integrated services to patients. As the healthcare sector in the UK seeks to serve these patients, a key question remains: is the healthcare estate in the UK fit for purpose?

Many reports conclude that it is not. In December 2014, Building Magazine reported<sup>12</sup> 20% of 1,545 practices applying for Care Quality Commission (CQC) registration failed on one aspect of their premises' quality and a third were not "safe and accessible". In a 2013 report, 'NHS buildings: obstacle or opportunity?'<sup>13</sup>, the King's Fund concluded that a number of the current buildings are out-of-date and impede the quality of care. Better estate management processes and targeted strategic investment to create flexible future-proofed buildings were recommended to address this.

## Sudbury Community Health Centre

Sudbury Community Health Centre is a state of the art health facility which provides a range of integrated community based services. The town of Sudbury, Suffolk, was previously served by several outdated healthcare buildings which did not meet modern standards. The new building, commissioned by West Suffolk Clinical Commissioning Group and developed by Assura, was designed to bring these services together under one roof to provide a single location for healthcare services and enable integrated working between healthcare professionals.

The new centre houses a wide range of services including a GP surgery and a diagnostic suite including X-Ray and phlebotomy, alongside outpatient and therapy services including paediatrics, dermatology, audiology, gynaecology, rheumatology and physiotherapy. A pharmacy will also shortly open in the building to provide a convenient 'one-stop shop' for patients.

The building has been constructed using a flexible steel frame construction to allow for future adaptability and features a combined heat and power plant and photovoltaic cells to reduce running costs. The interior design has been carefully selected in order to provide a welcoming and therapeutic environment.



## The history of investment in healthcare real estate

Throughout the years the estate has benefitted somewhat unevenly from waves of investments into different sectors.

At the foundation of the NHS in 1948, the service inherited more than 2,000 hospitals from local government and voluntary organisations. One of the early innovations in acute care was the District General Hospital model developed in the 1960s. With the increasing importance of outpatient departments and day cases, the number of overnight hospital beds has been dramatically reduced. In 1988, there were nearly 300,000 overnight beds available in England, and by 2014 this had reduced to less than half that (136,000)<sup>14</sup>. Around 20% of NHS buildings have been built since 2005 – but 15% were built prior to 1948.

Primary care providers have become increasingly consolidated. In 1948, GPs were employed by the NHS on individual contracts and many practised in their own homes. Successive investment programmes have encouraged GPs to form larger practices: in 1966, the NHS began to pay GPs’ rent and business rates, and in the 1970s, local authorities began to build health centres, co-locating GPs with other health services such as dentists and health visitors. Government established the Primary Care Infrastructure Fund in 2014 to accelerate improvements in GP premises and infrastructure.

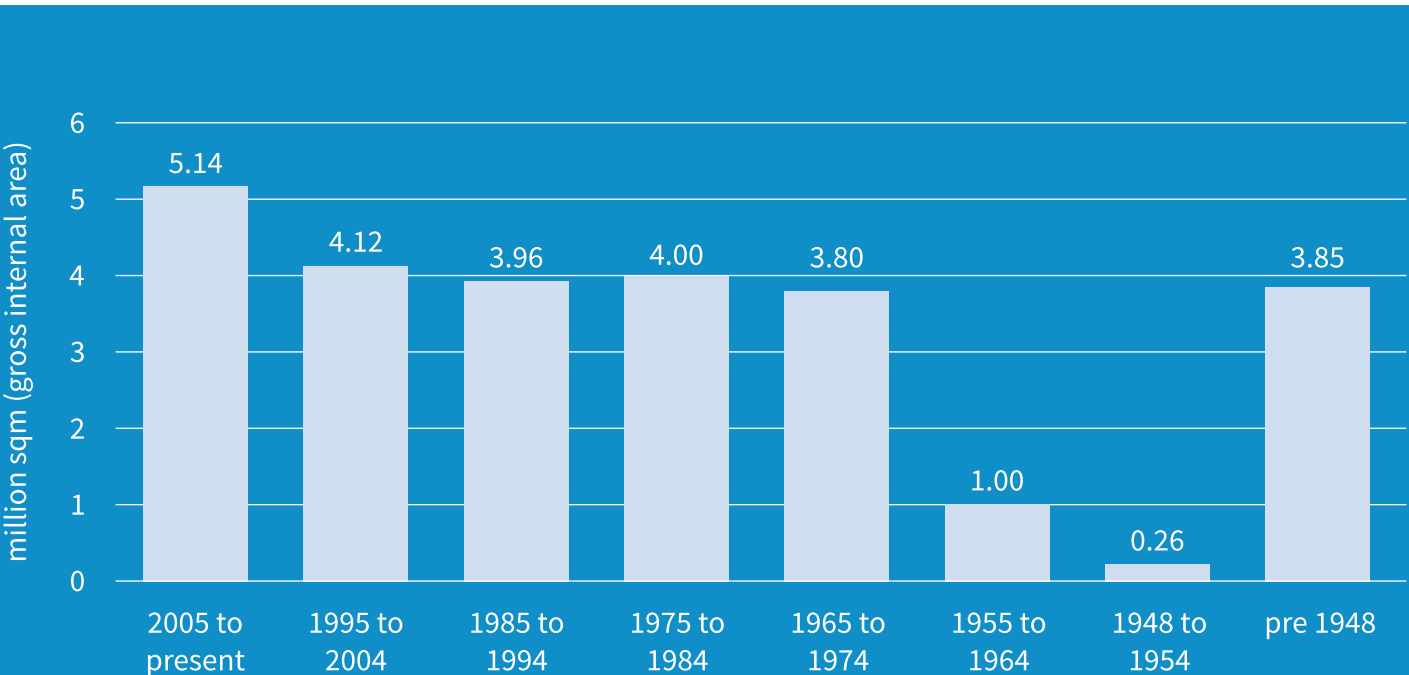
Demand for services to care for the elderly has increased due to changing demographics. Care homes were originally provided by local authorities, and saw a wave of private investment in the 1980s and 1990s. In 1980, local authorities provided 63% of places; but by 2002 this had fallen to 17%<sup>15</sup>. End of life care has also changed: the modern hospice movement started with the foundation of St Christopher’s Hospice by Dame Cicely Saunders in 1967, and today there are over 200 such services. Over two thirds of these are funded by charities.

*Today, around 20% of NHS buildings have been built since 2005, but 15% were built prior to 1948.*

Over the past 15 years, 10% of the total of all premises have been new builds. These new premises are devoted to the latest techniques and technologies, providing a significant benefit to the health and wellbeing of patients, thereby improving outcomes and experience directly and indirectly through staff morale and other factors on which this report will expand. The continued investment in healthcare premises to create flexible sustainable premises will enable the current and developing models of care and deliver immediate benefits to both patients and staff.

Age of the NHS estate

Source: Department of Health



# The impact of investment in healthcare real estate

While the impact of specific aspects of design on care provision has been extensively investigated by academic reports, their accumulated effect has been analysed in less depth.

There is a large amount of data available on the quality of care provided to patients, covering both NHS and non-NHS facilities, for example the NHS Safety Thermometer and the CQC ratings. The NHS also regularly publishes information on staff experience, for example the NHS Staff Survey. Quality of care can therefore be approached and analysed from many different perspectives.

To understand the impact of investment on quality of care, this data must be matched against data on the age, quality and investment in premises. The NHS publishes comprehensive data sets through Estates Return Information Collection (ERIC) and the Patient-Led Assessments of the Care Environment (PLACE) programme. Data for non-NHS facilities is not

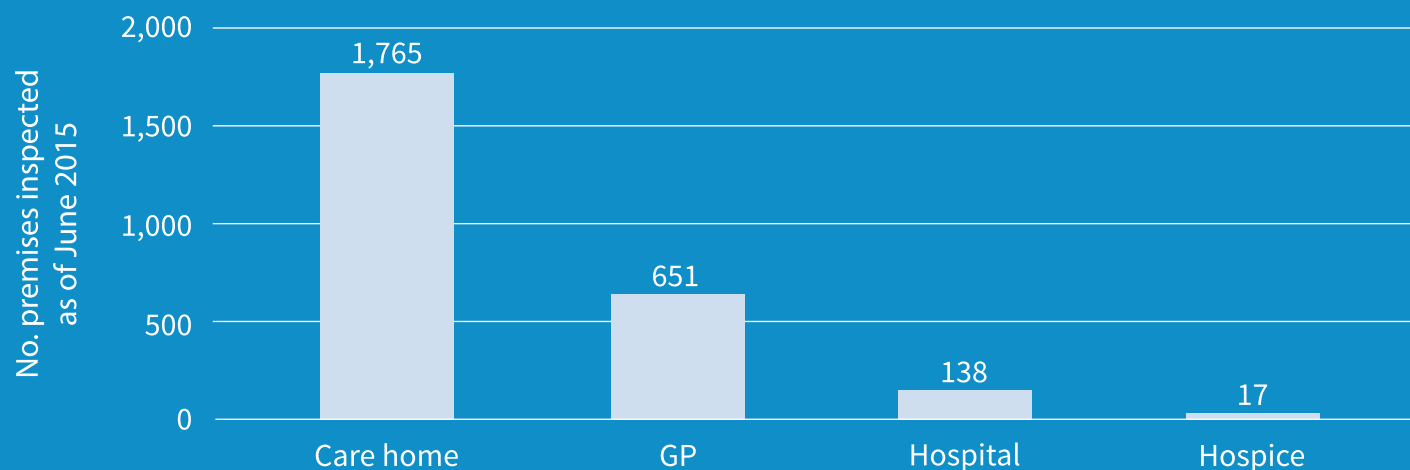
standardised and so a sample of facilities has been analysed for this report.

Data has been collected for over 2,500 healthcare premises across England. The 10% of buildings constructed since 2000 have been grouped together to compare to older sites. Comparing services provided in new buildings to older buildings, there is a noticeable impact on the overall quality of care, clinical outcomes and staff engagement.

## Measuring quality of care

While many metrics exist to measure aspects of care, the CQC in England and the devolved inspectorates are tasked with setting the required standards. In the CQC's own words, "we set out what good and outstanding care looks like and we make sure services meet fundamental standards below which care must never fall." CQC ratings therefore provide a consistent and comparable starting point to investigate the impact of the healthcare estate on quality of care.

Types of premises reviewed by the new CQC regime to June 2015



Willesden Medical Centre (right). Recently refurbished by Primary Health Properties (full case study on page 22).



Healthcare service providers in England are required to register with the CQC, which periodically inspects services and assigns a rating to the care provided. From October 2014, the CQC introduced a new ratings system that classifies services provided as “outstanding”, “good”, “requires improvement” and “inadequate”.

In June 2015, the number of services inspected under this new regime with published ratings on the CQC website stood at 4,939 services. Excluding services that are not premises-specific (e.g. homecare agencies), over 2,571 healthcare premises had been inspected across England. The services provided from these premises are varied, but fall into four broad categories:

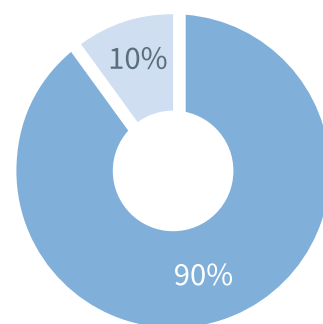
- **GPs:** Primary care and community facilities (health centres). These are mainly GP surgeries providing NHS services.
- **Hospitals:** Acute services, mainly general hospitals with some specialist facilities (eg. mental health, children’s hospitals, and orthopaedics). These are mainly provided by NHS Trusts.

- **Hospices:** End of life and palliative care facilities mainly provided by voluntary organisations.
- **Care homes:** Nursing and residential care generally focused on elderly care and mainly provided by private companies.

253 (10%) of these premises have been newly built. Investment rates have varied between the different sectors, with more than twice as many GP surgeries than care homes built since the year 2000 (17% compared to 7%), reflecting different historic cycles of investment.

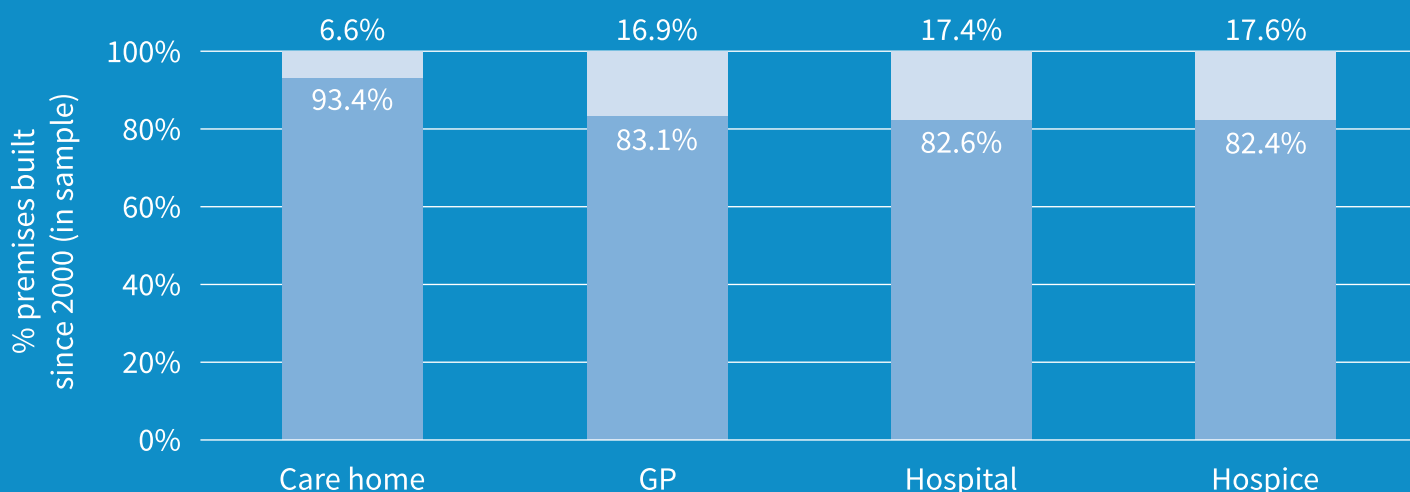
**Total premises reviewed by the new CQC regime to June 2015, new vs. old.**

Just 10% of premises were built since 2000.



**% premises built since 2000 by type (in sample)**

● Old (built before 2000) ● New (built since 2000)

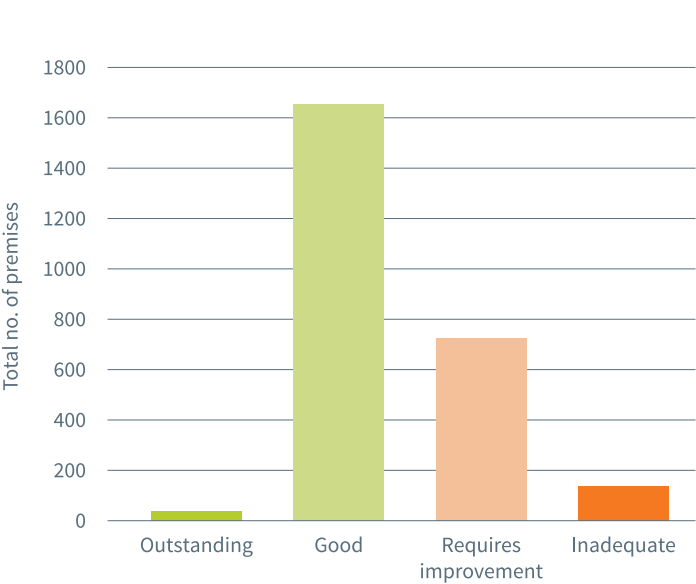




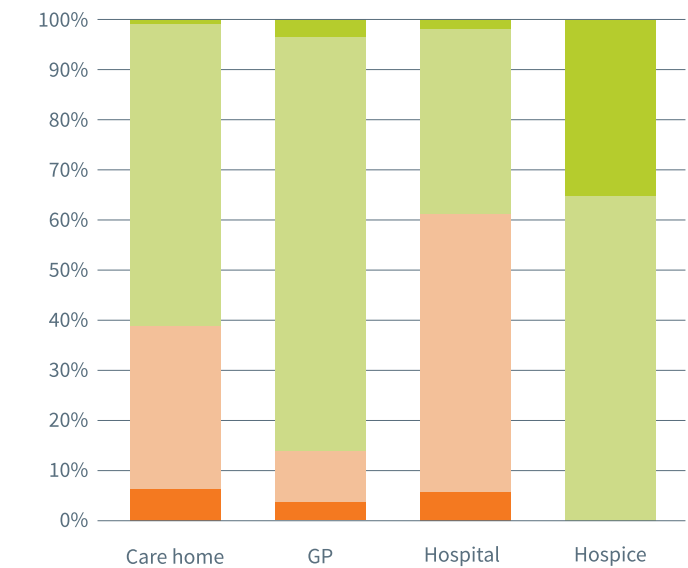
## Impact of age of building on CQC rating

Since October 2014, only 1.5% of premises have been rated “outstanding” with a majority (65%) rated “good”. The proportion of services rated “outstanding” varies significantly by the type of service provided, with GP services and hospices typically receiving better ratings than care homes and hospitals.

CQC ratings, total premises inspected \*



CQC assessment by type of healthcare premises \*



Outstanding Good Requires improvement Inadequate

\*October 2014 – June 2015

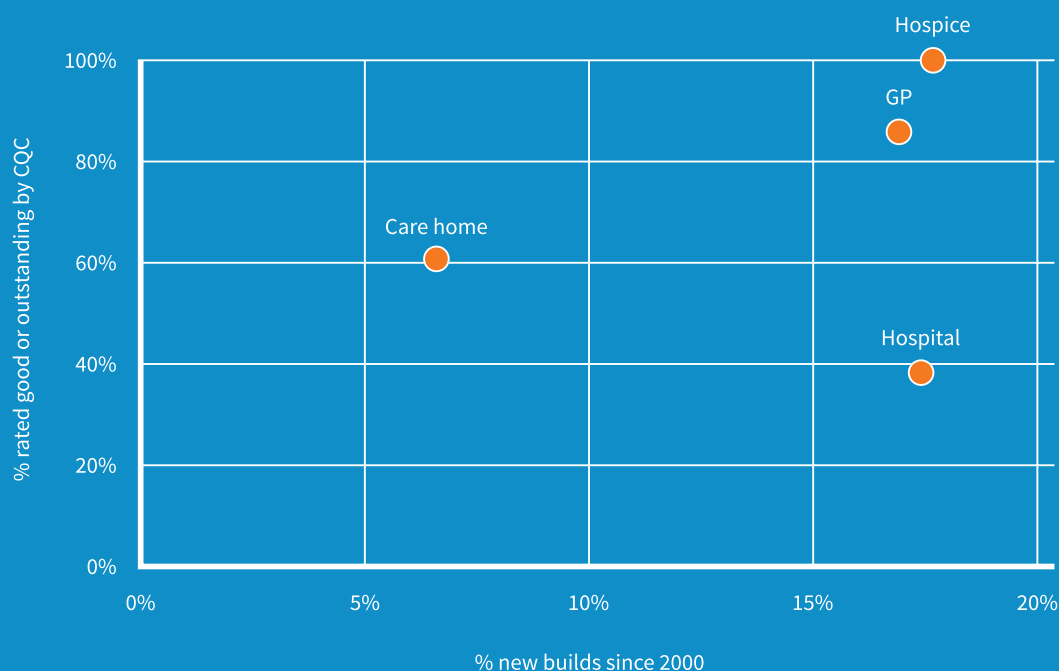


Winchcombe Place, Newbury (below). Operated by Care UK (full case study on page 13).

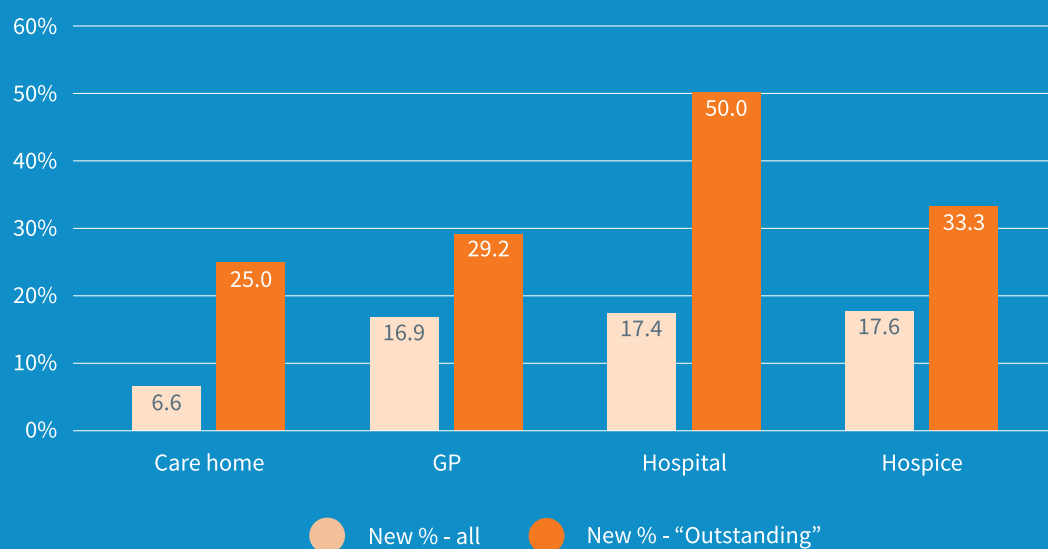
The different proportions of services rated “good” or “outstanding” by the CQC generally increases with those sectors that have seen the largest investments in buildings<sup>16</sup> over the past 15 years.

Looking at the top 1.5% of services rated “outstanding”, for all sectors, the proportion of services provided from newly built premises is significantly higher than expected. For example, only 17% of GP surgeries are newly built, but 29% of GP surgeries rated “outstanding” are newly built<sup>17</sup>.

### Ratings of premises inspected since October 2014



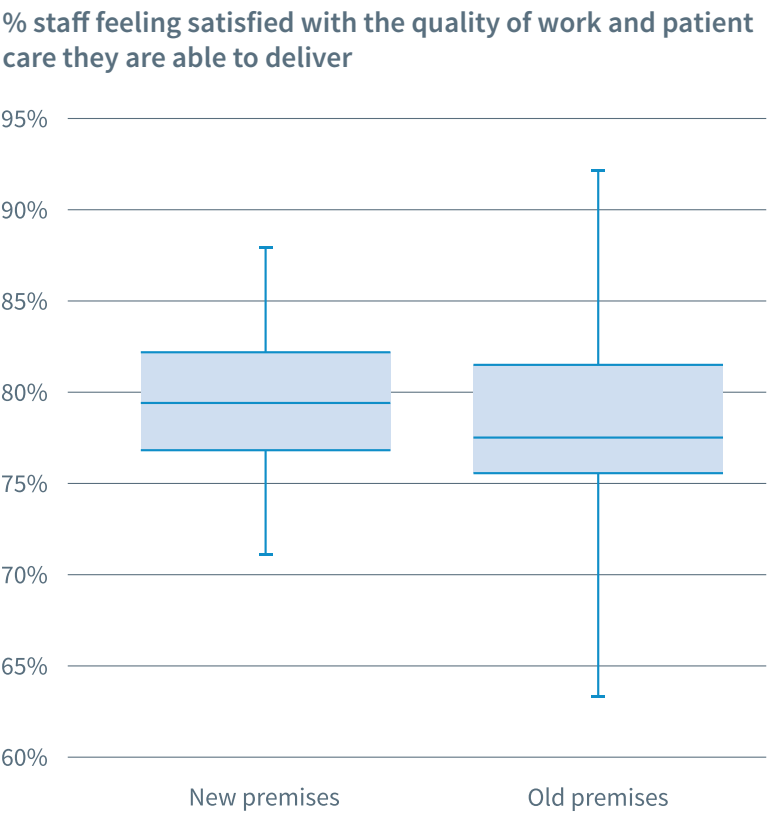
### New buildings: % total vs % services rated “outstanding”



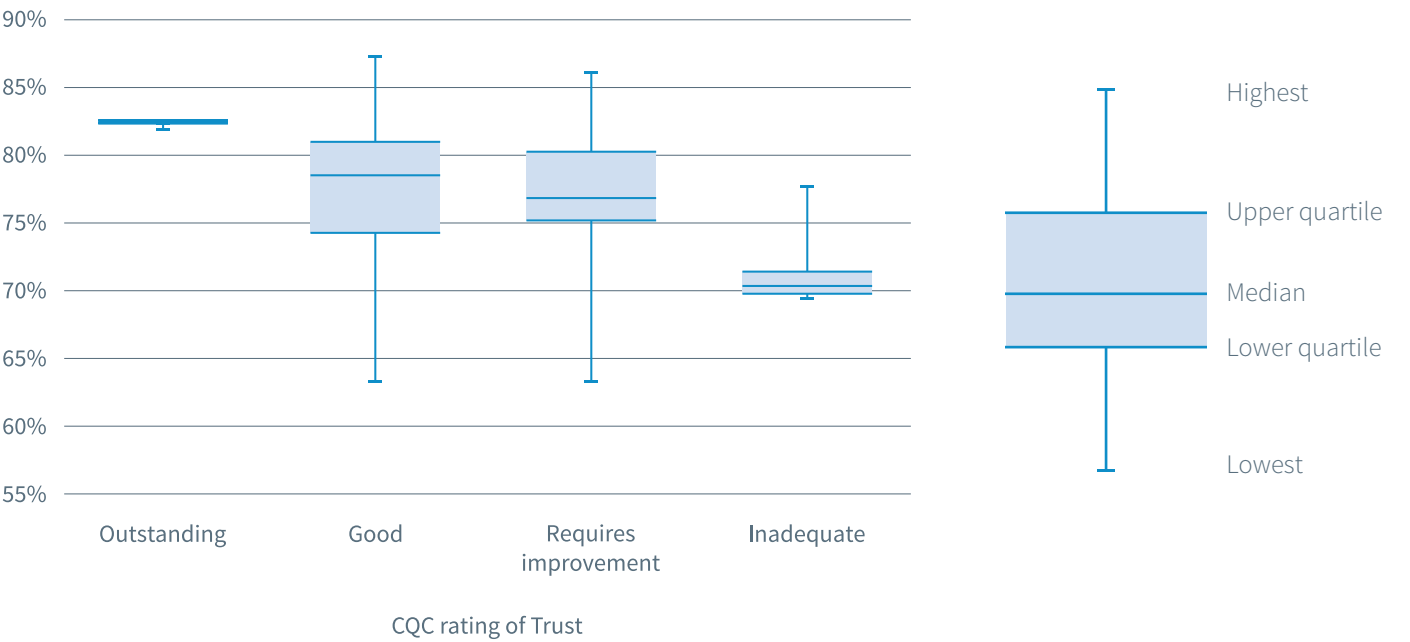
This finding is supported by the results of the NHS Staff survey across Acute Trusts, which manage hospitals in an area. Based on the latest survey from 2014<sup>18</sup>, Trusts with newly built premises<sup>19</sup> had a higher percentage of staff satisfied with the quality of work and patient care they are able to deliver.

Across the NHS, responses to this question are very consistent, and the 1.1% difference between new and old buildings (79.4% compared to 78.3%) is significant.

Staff satisfaction with quality of work and patient care is itself correlated with CQC inspection rating. The difference between “requires improvement” and “good” is 0.43% – less than half the difference between staff responses in new and older buildings.



**% staff feeling satisfied with the quality of work and patient care they are able to deliver by Trust**



## Impact of age of building on staff and patients

There are a wide variety of metrics published on the quality of healthcare provision, covering patient experience, staff engagement, clinical outcomes and other metrics that contribute to the quality of service provided. There are relatively few datasets available for non-NHS services such as care homes, whereas NHS Trust statistics are regularly collated and published by the Health & Social Care Information Centre (HSCIC).

*Trusts with newly built facilities are more likely to have low mortality, and are also less likely to have high mortality.*

This analysis into the impact of age of building on staff and patients focuses on hospital care due to the availability of data, despite the complexity of hospital premises. The findings below are likely to be more widely

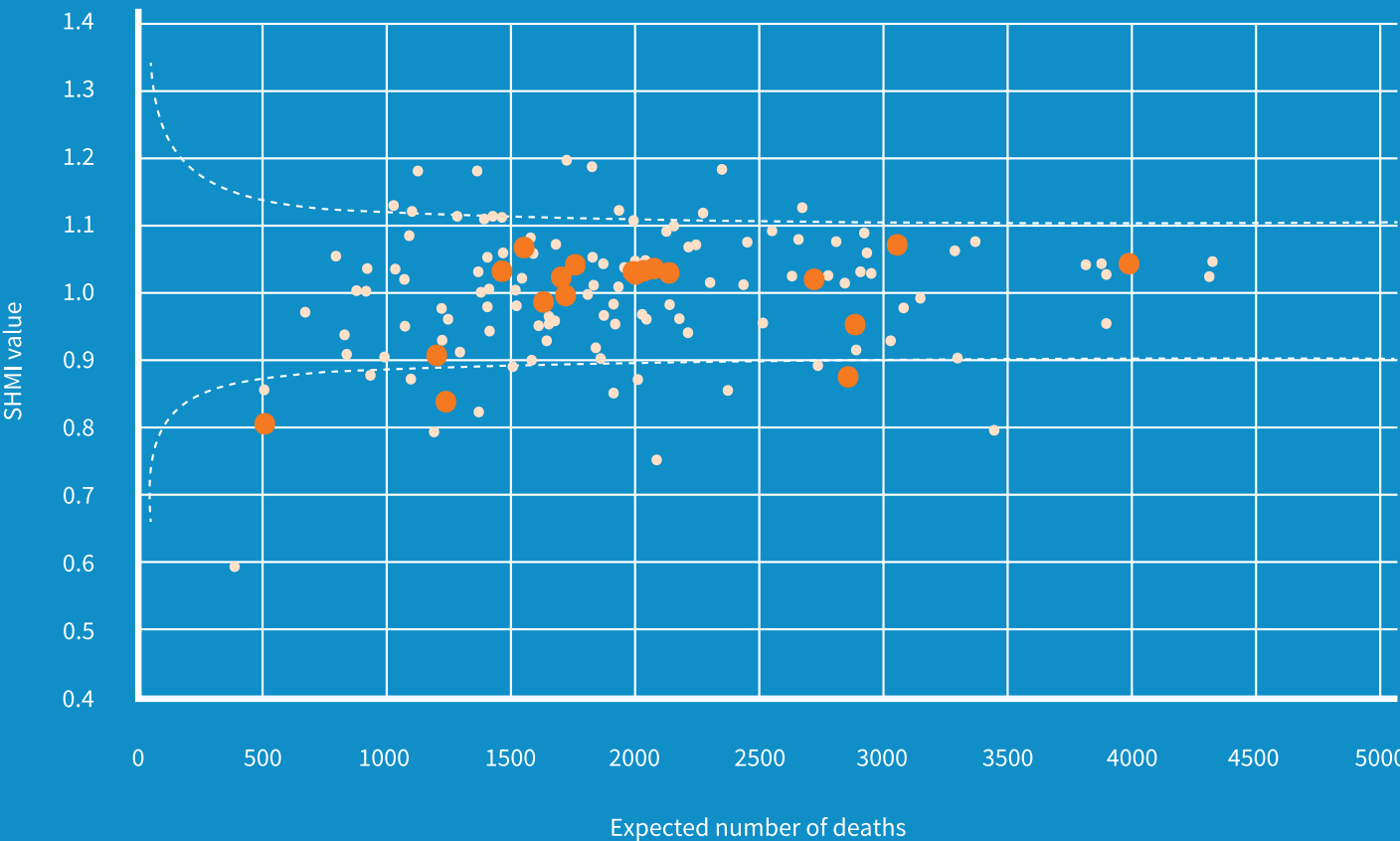
applicable to other healthcare sectors (as seen with the patient safety data available within the NHS Safety Thermometer data available for care homes).

### Clinical benefits

The HSCIC publishes the Summary Hospital-Level Mortality Indicator (SHMI)<sup>20</sup>, which is the ratio between the actual number of deaths following hospitalisation at the Trust (“observed deaths”) and the number of expected deaths on the basis of average figures for England, given the characteristics of the patients treated there (“expected deaths”). The average NHS Trust therefore has a SHMI of 1.00.

The chart below shows the comparison of SHMI for trusts in newly built premises compared to trusts in older premises<sup>21</sup>. The dashed lines marked show the statistically expected variability. Trusts above the upper dashed line exhibit significantly higher than average mortality (more deaths than expected); while Trusts below the bottom grey line exhibit significantly lower than average mortality (lower deaths than average).

SHMI in new vs older premises, year to September 2014





Trusts with newly built facilities are more likely to have low mortality, with three out of the 19 (16%) Trusts incurring “significantly below average” deaths, compared to 13 out of 118 Trusts (11%) with older buildings.

They are also less likely to have high mortality: zero out of the 19 Trusts with newly built facilities included incurring “significantly above average” deaths, compared to nine out of 118 (8%) of Trusts with older buildings.

Whilst caution should be applied to this analysis due to the mix of older and newer buildings at Trusts, there were 121 fewer observed deaths than expected across the 19 Trusts with new buildings (an SHMI of 0.99). Applied across all NHS acute trusts, this 1% reduction in mortality rate would see a reduction in deaths of 2,900 deaths per annum.

The connection between reduced mortality rates and investment in healthcare facilities requires further investigation, but the data suggests there are potentially significant clinical gains.



### Winchcombe Place, Newbury

*“The building, grounds and furnishings have been completed to a high standard. Accommodation is divided over three floors and arranged to create a comfortable and welcoming environment. Shared areas include library, salon, cinema, coffee shop, arts and crafts room, large lounges and smaller themed lounges.”*

– Extract from CQC Inspection report, 10 June 2015

Overall Rating: Good

Opened in April 2014 and operated by Care UK, each floor at Winchcombe Place has its own dining room and lounge, creating a close-knit atmosphere. This layout particularly suits residents living with dementia who prefer peace and quiet and familiar faces, and is also popular with other residents for its intimate community feel.

The home has been designed with flexible, open plan areas, allowing lots of natural light to create a welcoming, non-enclosed ambience. Each room also has direct access to a patio, allowing residents to access the outside and memory boxes outside each room enable personalised room identification. The vintage style café, dining room and lounges are spacious and inviting, encouraging residents to socialise and family and friends to visit.

The design not only creates a happy environment for residents. “Everyone always comments on how beautiful the home is,” says Roseanne Ince, Clinical Lead at Winchcombe. This has a knock-on effect on staff who take pride in their working environment.

*Applied across all NHS acute trusts, this 1% reduction in mortality rate would see a reduction in deaths of 2,900 deaths per annum.*



## Patient safety

The NHS Safety Thermometer is a monthly survey that assesses the percentage of patients receiving “harm-free care” and those incurring various types of harm, such as falls, during care. It collates data from over 1,000 organisations including care homes, private hospitals, Acute Trusts and Community Trusts.

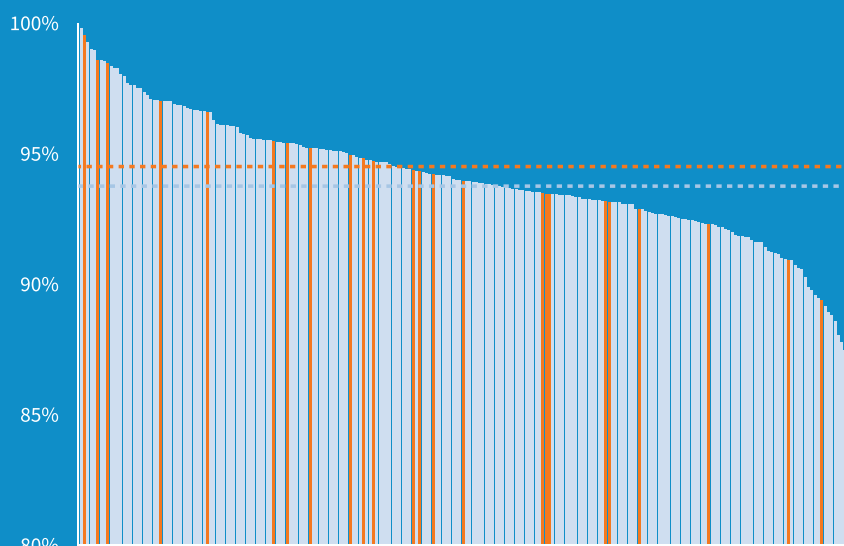
Across 230 NHS Acute Trusts<sup>22</sup> which report on this, between July 2014 and July 2015 94.6% of patients received harm-free care in the Trusts with newly built facilities, compared to 94.0% who received harm-free care in the Trusts with older buildings. This is a reduction in patient harms of 10% from 6.0% to 5.4%.

*If the 209 Trusts in older buildings achieved the same fall rate as the newer built hospitals, there would have been over 3,800 fewer falls in this year.*

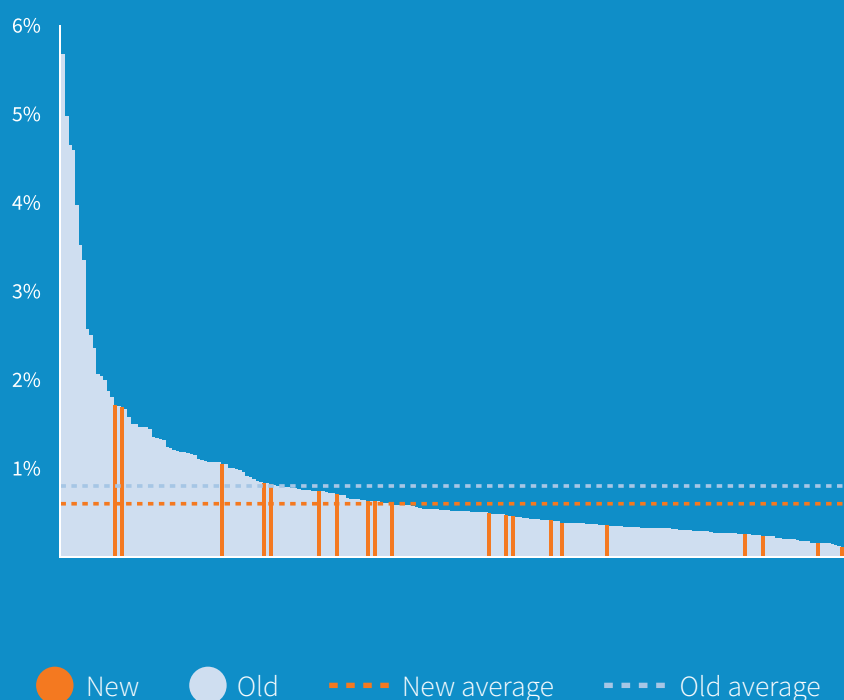
Risk of falls is widely understood to be related to environmental factors. Again, Trusts with newly built premises have lower fall rates than Trusts in older buildings – 0.56% compared to 0.78%, a 30% reduction in falls.

If the 209 Trusts in older buildings achieved the same fall rate as the newer built hospitals, there would have been over 3,800 fewer falls in this year.

## Hospital patients receiving harm-free care \*



## Hospital patient falls \*



\*230 Acute Trusts sampled between July 2014 – July 2015

A similar picture is seen comparing new and older care homes, for which we looked at the NHS Safety Thermometer data on the 33 homes for which building age has been collected (including those built since 2000).

The average percentage of residents receiving harm-free care in the four new builds is 97.3%, compared to 95.2% in older premises. This is a reduction in residents acquiring harms from 4.8% to 2.7% – proportionately a 40% reduction.

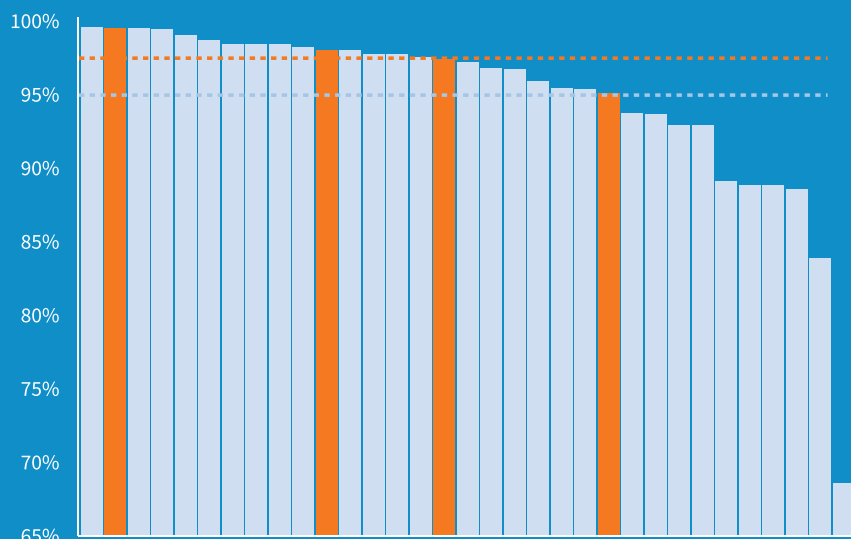
*In newly built care homes there is a reduction in residents acquiring harms from 4.8% to 2.7% – proportionately this is a 30% reduction.*

23 of these homes reported data on falls, and the four newer premises had an average of 1.2% falls rate compared to 1.9% in older premises.

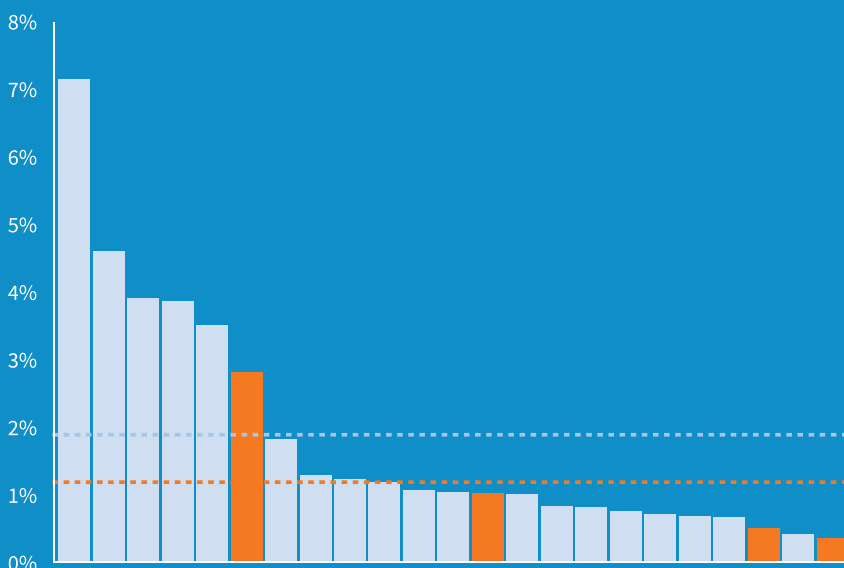
Duke's Court Care Home, Wellinborough (below). Funded by Welltower.



### Care home residents receiving harm-free care \*



### Care home resident falls \*



● New ● Old --- New average --- Old average

\* 33 care homes sampled between July 2014 – July 2015

Workforce benefits

Staff engagement is acknowledged as a key determinant in quality of care. A report for the King’s Fund<sup>23</sup> notes that higher levels of staff engagement are associated with reductions in staff sickness absence rates, lower mortality rates, fewer accidents and greater levels of innovation. Where available, the data suggests that these benefits are also associated with newly built hospitals.

Sickness absence rates are 0.24% lower (4.12% compared to 4.36%) – equivalent to over 900,000 working days or 4,000 full time equivalent staff if replicated across NHS acute organisations<sup>24</sup>. This represents the potential for huge savings to the NHS.

Churn of staff is also typically lower at the Trusts with newly built premises. In the year to April 2015, the median Trust in newly built premises had a staff leaving rate of 7.0% compared to 8.8%<sup>25</sup> for Trusts in older premises.

Recruitment and use of temporary staff is a major cost for healthcare and stability of staffing is especially important in long term care for elderly patients. Focusing on improving the physical healthcare working environment may help reduce this challenge for healthcare providers.

Conclusion

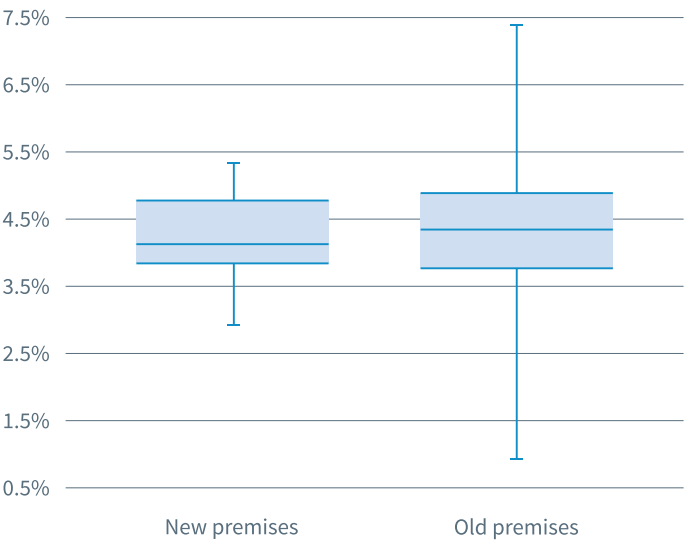
Modern, 21<sup>st</sup> century premises are associated with higher quality patient care. The improvements in care are seen across all healthcare sectors and in multiple aspects of the care provided.

New buildings see safer care provided to patients with lower overall patient harms and reductions in falls, and there are many specific design improvements that have a positive impact on patient outcomes and patient and staff experience.

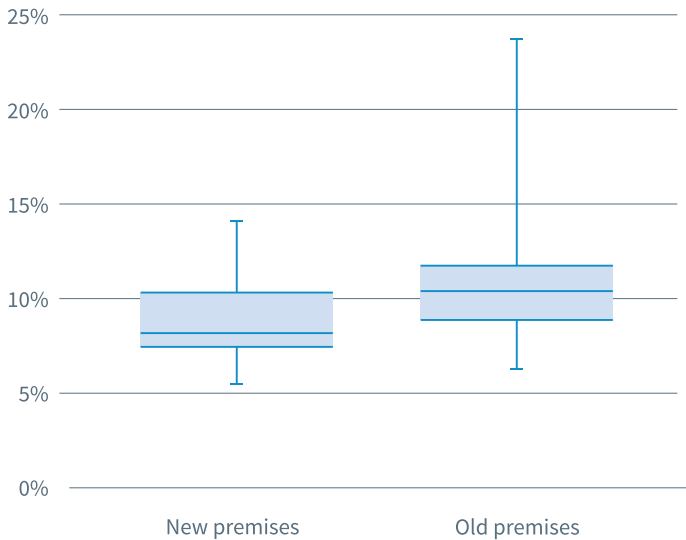
The cumulative effect of these improvements is better quality care for patients that can be seen across the healthcare estate, which will in turn lead to reduced pressure on the NHS.

*New buildings see safer care provided to patients, with lower overall patient harms and reductions in falls.*

Staff sickness absence rate \*



Staff leaving rate \*



\* year to March 2015



# Better care by design

Healthcare design has evolved significantly over the years.

As far back as Florence Nightingale's open ward, there was recognition of the beneficial impact of design on patients and staff. The purpose of design in healthcare has transitioned from that of functional efficiency and effectiveness in the 1950s and 1960s to the idea of "people-centred design" and engaging users in design to improve facilities today.

Academic research has clearly established a link between the physical environment and patient outcomes (for example fewer hospital-acquired infections and

medical errors). While the complex nature of building developments and ongoing changes in operational use can limit the ability to provide pure quantitative evidence of the positive impact of design, the volume of evidence (particularly since 2000) has been increasing.

Spreading design best practice throughout the healthcare estate can be a complex process. Guidance such as the Department of Health's Health Technical Memoranda and Health Building Notes provide advice on best practices and the latest standards. Existing buildings have been retrofitted for some innovations, for example the use of colour to zone buildings.

However, other changes can be costly to incorporate into older buildings. For new buildings, best practice is followed and modern design incorporated into the environment as standard. There is also a focus on flexibility and future-proofing of facilities to allow new innovations to be incorporated at a later date.

Willesden Medical Centre (below). Recently refurbished by Primary Health Properties (full case study on page 22).



## Evolution of healthcare premises design

	HOSPICES	CARE HOMES	PRIMARY AND COMMUNITY CARE	HOSPITALS
1950	Few end of life/palliative care specialist facilities.	Many care homes provided in former workhouses.	GP services often provided in domestic premises. Most GPs working single-handed.	Hospitals largely built in Victorian era by voluntary organisations and municipalities.
1960				
1970	St Christopher's Hospice, the world's first purpose-built hospice, was established in 1967.	Central heating, individual rooms and en-suite toilet facilities gradually becoming the norm.	"Cost-rent" scheme encourages GPs to form practices and invest in premises. Local authorities build health centres.	District General Hospital designed. Standardised hospital design aims for efficiency and effectiveness.
1980				
1990	Increasing recognition for end of life care. Hospice design improves autonomy and privacy.	Trend towards larger, more efficient homes able to offer better value for money.	Links to other healthcare providers through, for example, intermediate centres such as Lambeth Community Care Centre.	"Nucleus" hospital design. Increased variety of healthcare in hospitals: mental health, geriatric health.
2000				
2010	Focus on user and staff involvement in design, "de-medicalising" and facilitating friends and family support.	Person-centred design focused on creating home-like environments and extra care living villages.	Focus on patient requirements for easy access and service integration – walk-in centres and GP-led health centres.	Focus on patient engagement and co-design of facilities with hospitals designed for feelings and emotion.

## Better patient experience

Hospitals and other healthcare facilities can be a daunting environment for patients, particularly young or elderly people. The advances in “person-centred” care have highlighted that patient experience is an important factor in healthcare provision.

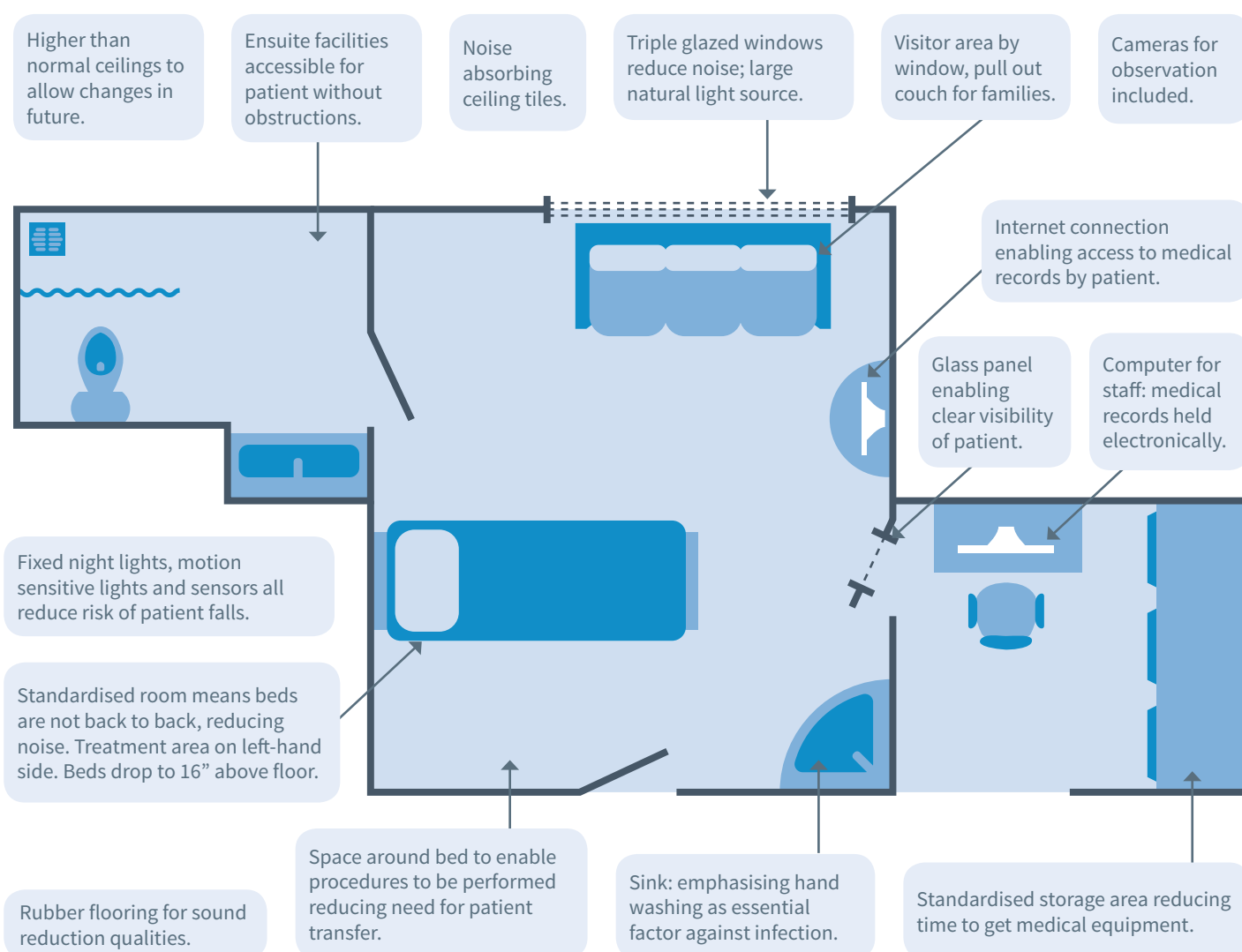
The hospital environment can be a key component of providing good patient experience and making time spent in healthcare premises more comfortable. Environmental satisfaction is second only to the quality of nursing and clinical care in predicting overall satisfaction<sup>26</sup>.

Modern healthcare design aims to create welcoming, supportive care environments that enable the patient to feel calm, engaged, independent and sociable.

Single bed rooms in particular improve patients’ overall satisfaction<sup>27</sup>, as they not only improve confidentiality and privacy, but they are also quieter, family and visitors are found to stay longer and there are lower rates of hospital acquired infection (as single rooms are easier to decontaminate than multi-bed wards).

Academic research has also identified a variety of other of features that can enhance patient experience of healthcare facilities:

### Example model hospital room



- Social areas can promote independence;
- Views of nature can lessen pain and stress for a variety of conditions;
- Access to gardens can improve access to social support and improve patient and family satisfaction with care;
- Brightly lit rooms, especially east-facing with natural early morning light can reduce length of stay, lessen reliance on pain medication and improve outcomes, especially in patients with depression, seasonal affective disorders or dementia;
- Patients in well decorated, well appointed rooms give higher ratings to their doctors, food and overall standard of care than patients in standard rooms.

Advances in materials technology can also improve patient experience, with noise reduction long ago identified as a key concern for patient welfare. As well as sleep loss and awakening, noise is associated with increased heart rate and blood pressure, and using suitable noise reducing materials can positively impact patient care. A 2004 study<sup>28</sup> showed cardiology patients experienced less stress and reported that nurses gave them better care in a ward with sound-absorbing ceiling tiles compared to sound-reflecting ceiling tiles. There were also indications of lower re-hospitalisation rates.

### Better patient outcomes

Alongside better patient experience, there is a considerable body of evidence showing that a good environment can positively impact patient outcomes. One such study<sup>29</sup> found that patients were released 1.5 days earlier in refurbished environments compared to unchanged ones and that time spent in an intensive supervisory care area in a mental health unit was reduced by 70%.

As well as improving recovery, hospital environments can also reduce hospital-acquired infections and other harms. For example, a well designed ventilation system can reduce infection. HEPA filters and laminar airflow rooms can be used to create ultraclean rooms particularly for immuno-compromised patient suites and operating theatres. A combination of single rooms and air filtration has reduced infection and mortality in burn patients and

bone marrow transplant patients. Better use of lighting and colour provides better visibility of obstacles leading to fewer patient falls.

Detail on how design innovations that take into account the specific patients served by a healthcare facility can be found in Appendix 1: Tailoring Facilities to the Needs of Patients.

A more comprehensive list of key design features to improve patient experience is given in Appendix 2: Key design elements for patient experience and outcome.

The Cotton Rooms,  
designed by Llewelyn  
Davies (full case study  
on page 26).



*One study found that patients were released 1.5 days earlier in refurbished environments compared to unchanged ones.*



## Better staff experience

Good colour and lighting can make nurses and clinicians work more efficiently, optimised layouts can reduce staff fatigue, and standardisation can help minimise the risk of human error. Surveys show that staff link the environment with:

- Recruitment and retention;
- Improved morale;
- Accessibility and orientation;
- Privacy and security.

Well designed facilities can also increase productivity and time for patient care. For example, the Virginia Mason Production System increased nurse patient contact time to 90% through reorganisation of working groups including decentralising store cupboards. Steps walked per day fell from 10,000 to roughly 1,200<sup>30</sup>.

Design changes that positively impact patients have a corresponding effect on staff. If the patient feels more secure (through, for example, better visibility of staff), this will reduce nurse call outs or possibly incidents of aggression; design that improves visibility of obstacles will also reduce the number of falls.

### Silvermere Care Home, Cobham

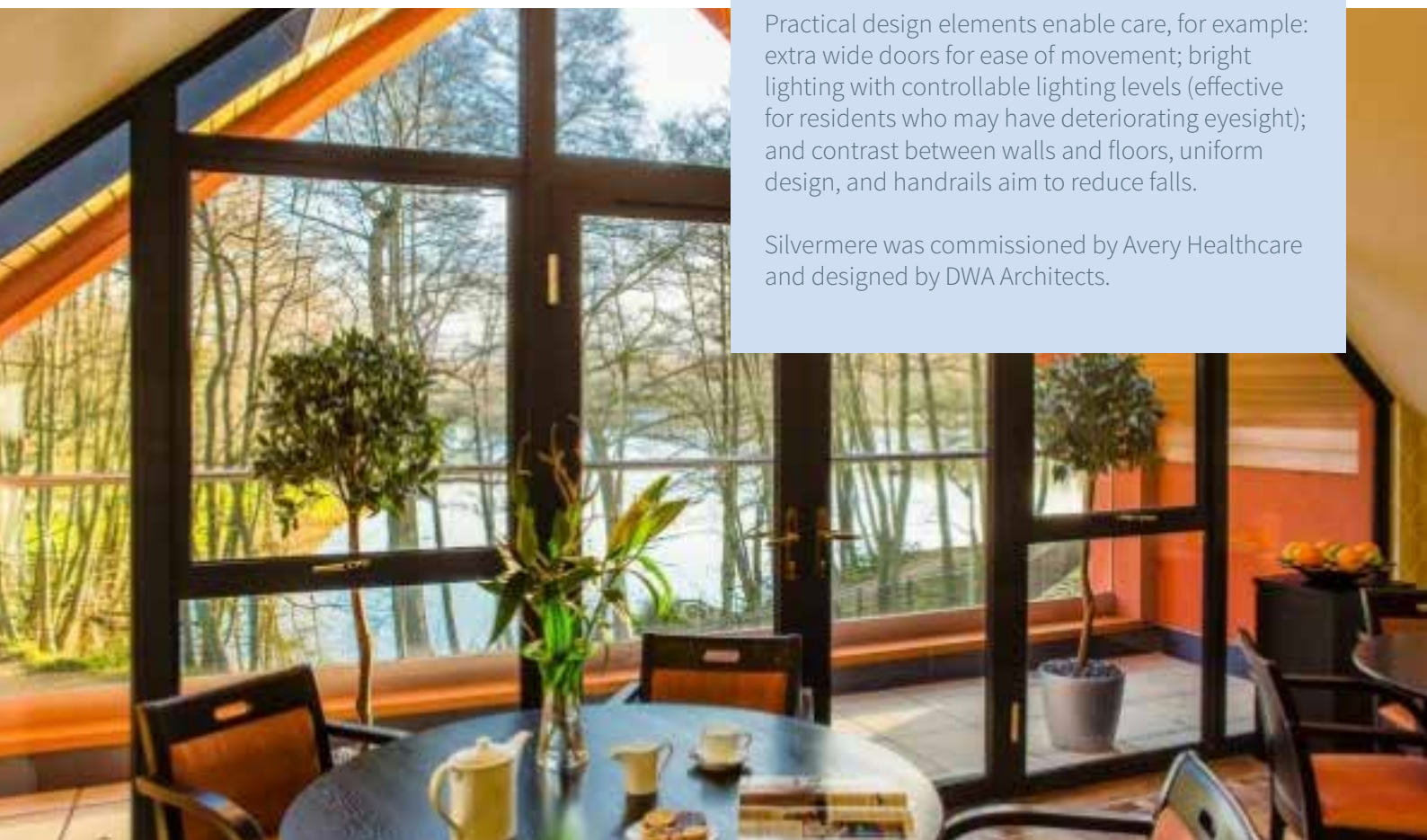
Providing residential, respite, convalescence and dementia care, the original brief for Silvermere was to design a facility with resident's dignity in mind that creates a welcoming and uplifting environment with a homely feel for residents, staff, visitors and the wider community.

A large atrium gives a grand first impression and hotel-like experience; high ceilings, high, large windows create a light and airy environment. Activities to engage patients are designed into the building with a café, conservatory, and hobby and activity rooms to encourage social interaction. Balconies on all floors provide access to outdoors and the outside spaces have points of interest and raised flower beds to promote interaction and provide talking points.

Residents' rooms are designed to recreate the experience of home with couples rooms and space for a double bed in single rooms. The interior decoration scheme uses warm colours and domestic materials such as wood and wallpaper to create a homely feel. Assisted bathrooms use hotel-like materials such as chrome handrails to provide a more luxurious and less clinical environment.

Practical design elements enable care, for example: extra wide doors for ease of movement; bright lighting with controllable lighting levels (effective for residents who may have deteriorating eyesight); and contrast between walls and floors, uniform design, and handrails aim to reduce falls.

Silvermere was commissioned by Avery Healthcare and designed by DWA Architects.



# Sustainable impact

A healthcare facility is an important component of a community; it can be a hub that serves to integrate the community.

The Design Commission for Wales reviews developments against three qualities<sup>31</sup>: the ability to meet users' needs; the structural soundness and longevity of the building; and delight: "the cultural value and pleasure that a development gives to the sense of those who use the building and to the community in which it is sited."

New developments can be a catalyst for local regeneration, setting a benchmark in design that creates buildings of which the community can be proud.

## Sustainable development

The NHS estate has a significant environmental impact, with an estimated carbon footprint of 25MtCo2e in 2012 – 3% of the total UK carbon footprint. In that year, it used 11,732 GWh of energy, 34.4 billion litres of water and generated 374,000 tonnes of waste<sup>32</sup>. With low sustainability reporting by providers and commissioners, clearly more can be done to meet environmental targets.

The Sustainable Development Strategy for the Health, Public Health and Social Care System 2014-2020<sup>33</sup> set a target of 34% reduction in greenhouse gas emissions by 2020 across the sector. This would require a 4% annual reduction between 2013 and 2020. Modern buildings can play a significant part in achieving this, as they are generally more energy efficient.

### Willesden Medical Centre renovation

A major refurbishment at Willesden Medical Centre by Primary Health Properties has created a modern-feeling building with a bright and welcoming atmosphere. Improved signage makes the building more recognisable from the street and improved disabled access has had a significant impact for wheelchair users in particular. After the renovation, staff felt greater pride in the facility and services were perceived as being improved. Patients were also pleased with the changes and felt services had improved as a result.

The new design opens up the practice to enable delivery of a more diverse range of services within the building with the opportunity for closer working with colleagues in other medical disciplines.

Extra rooms are available for physiotherapy, dietetics, and counselling, and new services such as ophthalmology may be enabled. A survey found that staff agreed the new medical centre is adaptable and capable of meeting the plans of the practice to provide additional services in the future.



# Conclusions

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The buildings from which healthcare is provided are important community assets that can contribute positively or negatively to the care provided in them.

Much academic research has demonstrated that good design in healthcare premises can assist diagnosis, reduce medical errors, reduce patient harms, improve staff morale, reduce patient stress and improve recovery times.

The quantitative analysis of healthcare premises in England presented here shows that investments in new build healthcare premises have had a significant, measurable impact on the quality of care provided to patients. They are also associated with reducing staff sickness and turnover, reducing patient harms (particularly falls), and reducing mortality. At an overall level, services are significantly more likely to be rated “outstanding” by the CQC.

In conclusion, it is clear from our findings that investment in healthcare real estate brings a wide range of clinical benefits to patients. It also helps improve their experience during what is often an extremely difficult time, and helps doctors, nurses and other medical staff to work more effectively by improving their wellbeing and working environment.

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*The private sector stands ready to play its part in creating flexible, future-proofed healthcare premises, with billions of pounds of capital ready to be invested.*

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Continued investment in healthcare premises across the UK is needed to ensure the creation of flexible, future-proofed premises from which to provide excellent care going forward. The private sector stands ready to play its part in building these, with billions of pounds of capital ready to be invested to help work with the NHS and politicians from all parties to create these premises, and result in the UK’s healthcare infrastructure being truly fit for the 21<sup>st</sup> century.





Willesden Medical Centre (below). Recently refurbished by Primary Health Properties (full case study on page 23).

*Investments in new build healthcare premises have had a significant, measurable impact on the quality of care provided to patients. They are also associated with reducing staff sickness and turnover, reducing patient harms, particularly falls and reducing mortality.*





## Appendix 1: Tailoring facilities to the needs of patients

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Person-centred care has led to design innovations which take into account the specific patients served by a healthcare facility. These can be relatively minor changes, such as softer lighting for young children and new born babies who can find bright lights stressful and even cause retinal damage. Some patient groups benefit from more extensive environmental adaptation.

Autism spectrum disorders (ASDs) affect around 700,000 people in the UK, and dementia around 850,000. Extensive research has been undertaken to understand how to tailor environments to the needs of these groups.

### Design for autism

ASDs are complex developmental conditions that can cause social, communication and behavioural challenges. One of the first studies on this was first featured in 'Autism Design' in 2008<sup>34</sup>, and published a sensory design matrix linking sensory characteristics of a built environment to sensory issues experienced by autistic individuals. This provided design guidelines tailored to individuals' specific needs, for example, a focus on designs emphasising order, sequence and routine.

In 2009, Dr Sherry Ahrentzen and Dr Kimberley Steele published a research study<sup>35</sup> providing an approach to design and development of homes for people with ASDs, identifying design guidelines including:

- Space planning to encourage choice, autonomy and independence;
- Provision of separate sensory rooms allowing users to control the atmosphere, leading to decreased stress and anxiety;
- Minimising visually distracting elements; individuals with ASDs often experience attention difficulties and stimulus over-selectivity;

- Providing a range of lighting options with non-glare surfaces, no-flicker bulbs, and lots of natural light as autistic people's visual perceptual problems are exacerbated by lighting conditions.

### Design for dementia

As part of the 'Enhancing the Healing Environment' (EHE) programme, commissioned by the Department of Health, 26 schemes in acute, community and mental health hospitals were launched to focus on specific improvements in design for dementia patients.

An estimated 25% of people accessing acute hospital services have dementia, which causes changes in memory and other cognitive abilities. Normal age-related deterioration in sight and hearing is exacerbated by some forms of dementia, such as Alzheimer's disease.

The schemes undertook similar improvements and found that small changes in colour, lighting and layout can make a significant difference to the ambience of an area and encourage patient engagement, helping patients maintain a level of independence. These changes included:

- Redesign of space to provide interlinking multi-purpose flexible areas that offered choice to patients and visitors. In several schemes, the large, central nurses' station was replaced by a smaller reception desk. Small "work pods" for nurses and clinical staff to complete paperwork were located near patients and the space recovered from the station was used for additional social areas, therapy, assessment and dining areas;
- Artwork was central to many schemes providing not only an attractive setting but also facilitating orientation for patients (by identifying rooms with relevant art work); and creating opportunities for greater interaction between patients, staff

and visitors, with historical images providing opportunities to reminisce;

- New garden developments, encouraging patients to engage more in activities and maintain a connection to the outside world as well as a level of independence.

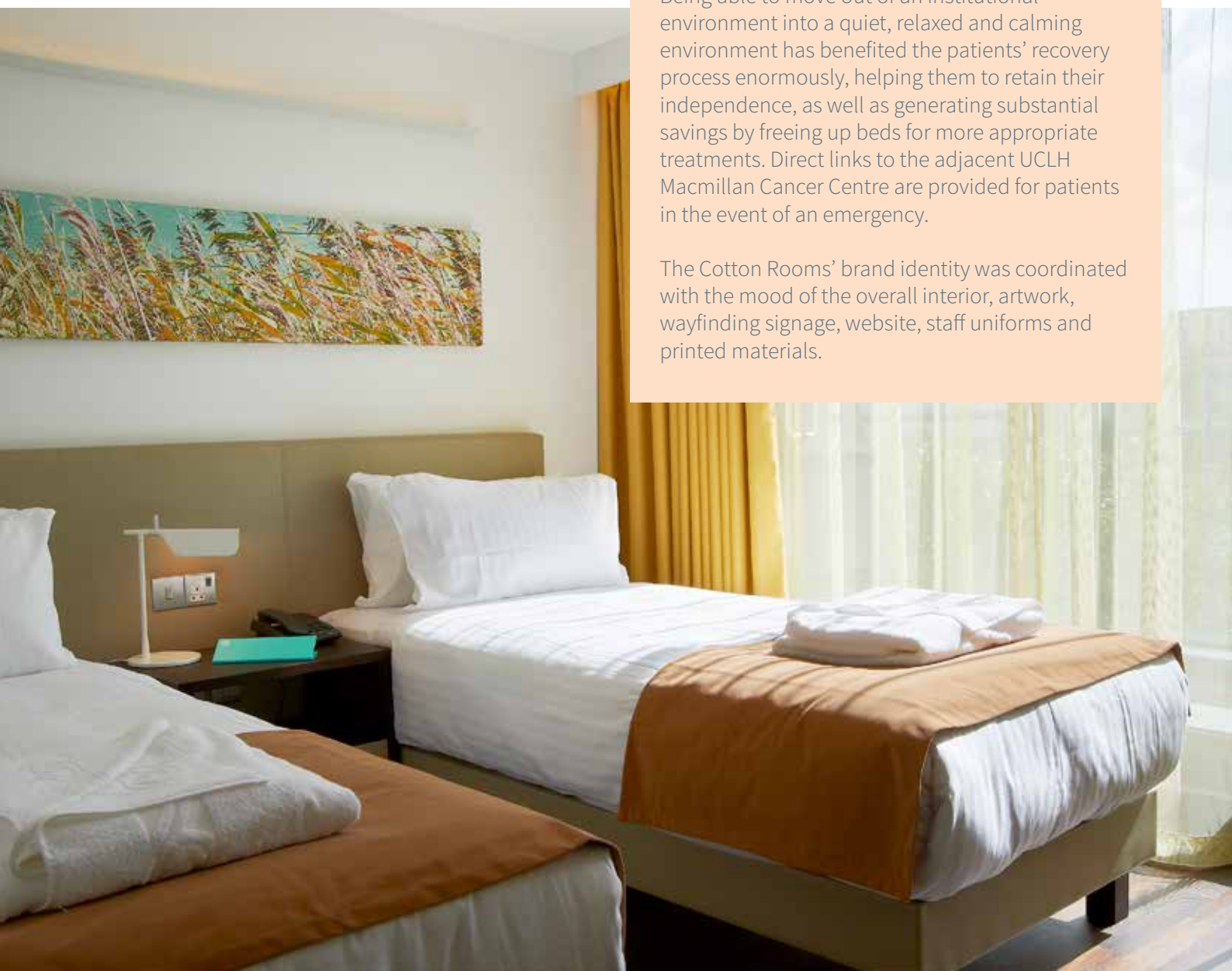
Quantitative evidence of the impact of the EHE programme on fall reduction and incidents of aggression and violence was inconclusive, but qualitative data indicates there are benefits.

### **Making a difference for patients with cancer: The Cotton Rooms**

The Cotton Rooms is the first purpose designed “hotel for patients” (most of whom have cancer) in the UK, commissioned by UCLH Charity and designed by Llewelyn Davies. The refurbishment, within two floors of an existing office building in central London, provides a 35 room, four star hotel environment for patients who undergo clinical tests and treatment in a modern ambulatory setting but who do not need clinical supervision overnight.

Being able to move out of an institutional environment into a quiet, relaxed and calming environment has benefited the patients’ recovery process enormously, helping them to retain their independence, as well as generating substantial savings by freeing up beds for more appropriate treatments. Direct links to the adjacent UCLH Macmillan Cancer Centre are provided for patients in the event of an emergency.

The Cotton Rooms’ brand identity was coordinated with the mood of the overall interior, artwork, wayfinding signage, website, staff uniforms and printed materials.



Appendix 2: Key design elements for patient experience and outcome

Design element	Impact	Patient experience			Patient outcome					Examples, evidence
		Reduced stress, fear and agitation	Engagement and independence	Greater privacy and dignity	Reduced falls	Improved infection control	Reduced length of stay	Reduced medication	Reduced human error	
Improved Layout and Standardisation										
Creation of adequate space around patient bed enabling more procedures to be carried out	Fewer patient transfers required reducing risk of falls	✓		✓	✓	✓				‘Patient Safety and Quality’. US Department of Health and Human Services; 2008
Use of same layout in single bed rooms or theatres	Reduces risk of human error								✓	St Joseph’s Community Hospital Wisconsin designed in conjunction with National Learning Labs programme. Institute of Medicine. ‘To Err is human: building safer health system’. Washington DC: National Academy Press, 1999
	Improves productivity as each room is familiar									
	Reduces staff fatigue									
Creation of single bed rooms with variable acuity	Variable acuity rooms enable a wider range of procedures to be conducted at the bedside	✓		✓	✓	✓	✓	✓	✓	Centre for Heath Design sponsored Pebble project review of US hospitals including Methodist Hospital, Indianapolis, Bronson Methodist Hospital, Michigan and Barbara Ann Karmanos Cancer Institute
Removal of central nurses station, replaced with distributed areas within patient area (work pods) for nurses/clinical staff to complete paperwork	Increased visibility between staff and patients resulting in fewer falls, less nurse calls and improved patient satisfaction	✓			✓					Royal Wolverhampton Hospitals NHS Trust dementia ward. Ipswich Hospital NHS Trust 27 bed medical ward. Gadbois C, Bourgeois P, Goeh-Akue-Gad MM, et al. ‘Hospital design and the temporal and spatial organisation of nursing activity’, 1992
Creation of social areas encourages patients to be active during the day	Encourages independence and engagement of patients providing choice for patient location, diet, and activities	✓	✓				✓			Derbyshire County NHS Care trust – created inter-linked social spaces. Leicester Partnership NHS trust - created kitchens for patients, staff and visitors
Creation of multisensory environments (MSE), eg. sensory rooms	Provides calm environment, engaging for dementia and autistic patients	✓	✓					✓		Maseda et al, 2014; Riley-Doucet & Dunn, 2013; Collier et al, 2010
Provision of patient accessible gardens and greenery visible from ward beds	Keeps patients connected to outer world: improves sense of wellbeing; relieves boredom;facilitates moves back home	✓	✓				✓			Several UK dementia facilities created access to garden areas including Derbyshire County NHS Care Trust, Mersey Care NHS Trust
Technology Adoption & Material Science Improvements										
Include internet access/TVs in room	Patients are shown to require less medication when they take a positive interest in their health		✓				✓	✓		Douglas CH, Douglas MR. Patient-friendly hospital environments, 2004
Noise controlling measures such as triple glazing; soft flooring, dividing panels	Reduced noise pollution has been found to improve patients rest and can shorten patient’s stay	✓		✓			✓	✓		Nelson C, West T, Goodman C. ‘The hospital built environment: what role might funders of health services research play’, 2005
Use of natural colours and materials, eg. use of wood effect flooring/panels	Improved environment ambience, less “institutionalised feel”	✓								‘Principles of Hospice design’, Prince’s Foundation/King’s Fund
Adequate provision of ventilation and filtration systems	Improved environment and infection control					✓				Henriksen K, Isaacson S, Sadler BL et al. ‘The role of the physical environment in crossing the quality chasm’, 2007
Use of Colour and Light										
Creating a better more supportive care environment	Reduces stress, fear and agitation of patients	✓	✓							Varni JW, Burwinkle TM, Dickinson P et al. Evaluation of the built environment at a children’s convalescent hospital; development of the paediatric quality of life inventory parent and staff satisfaction measures for paediatric health care facilities. 2004
	Increased satisfaction for users of space, including families and staff									
Use of colour coding and appropriate lighting to improve signage and navigation	Improves orientation and wayfinding, meaning fewer missed appointments and staff are not required to direct	✓	✓		✓					‘Lighting and colour for hospital design’. NHS Estates, 2004. Implemented at Taunton and Somerset NHS Foundation Trust
Use of colour contrast to improve visibility of obstacles, corridors, stairs toilets etc.	Reduces falls	✓	✓		✓					‘Lighting and colour for hospital design’. NHS Estates, 2004
	Reduces wear and tear (trolleys hitting walls)									
	Improves patients navigation and orientation									
Appropriate use of colour to improve clinical treatment	Blue makes diagnosis more difficult in cardiology	✓					✓		✓	‘Lighting and colour for hospital design’. NHS Estates, 2004
	Reds and oranges make patients feel itchy in dermatology									
	Yellow hinders diagnosis of jaundice in maternity									

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- <sup>14</sup> 'Bed Availability and Occupancy Data – Overnight', NHS England, 2014
- <sup>15</sup> 'The changing role of care homes', Centre for Policy on Ageing and Bupa, 2011
- <sup>16</sup> Hospitals in the sample are those with more than 50% of gross internal area built since 2000. For GP premises, hospices and care homes only full new builds are included.
- <sup>17</sup> While we cannot say with certainty this is purely down to correlation, as there may be other influences (newer buildings receiving newer medical equipment, for example), it is clearly a significant contributing factor.
- <sup>18</sup> 'NHS Staff Survey 2014', National NHS Staff Survey Co-ordination Centre, 2014
- <sup>19</sup> Of the 21 Trusts surveyed, 11 Acute/specialist Trusts had greater than 50% gross internal area built since 2005 and a further 10 had greater than 50% gross internal area estimated to be built since 2000, based on ERIC returns.
- <sup>20</sup> Further detail on the SHMI can be found at <http://www.hscic.gov.uk/SHMI>
- <sup>21</sup> Of the 19 Trusts included, 11 Acute Trusts had greater than 50% gross internal area built since 2005 and a further 10 had greater than 50% gross internal area estimated to be built since 2000, based on ERIC returns
- <sup>22</sup> Over 300 acute care organisations were included in the survey data. 230 of these report ERIC data.
- <sup>23</sup> 'Improving NHS Care by Engaging Staff and Devolving Decision-Making', King's Fund, 2014
- <sup>24</sup> In calculating this, we have used the median staff sickness rate as the most reliable method of calculation, as there are significant outliers in the "old" data set with standard deviation being half as big again as the "new" data set. There is also a very large skew on the "new" properties, meaning the average is larger than the median for these buildings but a less reliable finding. Ideally we would compare sickness rates per site before build and after, but given that data is unavailable we have compared existing rates in older and newer buildings.
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Centre, Gloucester.  
Developed by Assura.

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This report was produced by the British Property Federation and researched by Bolt Partners.

## About the British Property Federation

The British Property Federation (BPF) represents companies owning, managing and investing in real estate. This includes a broad range of businesses comprising commercial real estate owners, the financial institutions and pension funds, corporate landlords, residential landlords, as well as all those professions that support the industry.

The BPF represents the principal organisations engaged in the development of, or investment in, healthcare property and real estate, including primary care premises, specialist facilities, acute care, and care homes.

## About Bolt Partners

Bolt Partners is a healthcare advisory firm with over 10 years' experience of working across all health sectors in the UK. Focused on delivering better use of resources and quality of care to patients, Bolt has advised many of the largest healthcare organisations including both the public and private providers.



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