

CCHC Call for Evidence

Response ID	Start date	Completion date
[REDACTED]	[REDACTED]	[REDACTED]

1	Title	[REDACTED]
1.a	If you selected Other, please specify:	

2	First Name(s)	[REDACTED]
----------	---------------	------------

3	Surname(s)	[REDACTED]
----------	------------	------------

4	Contact email address	[REDACTED]
4.a	Additional email address (please complete this if you are submitting evidence on behalf of someone else)	[REDACTED]

5	Location	United Kingdom (GB)
5.a	If you selected Other, please specify:	
5.b	City	Manchester

6	Institution/Company/Organisation	APPG for Healthy Homes and Buildings
----------	----------------------------------	--------------------------------------

7	Summary of evidence	<p>1. Governance/decision making processes</p> <p>1.3 - What is the evidence of success or failure of resourcing local government to take decisions locally produces for health and wellbeing? The APPG for Healthy Homes and Buildings' White Paper: Laying the foundations for Healthy Homes and Buildings makes it clear that a more co-ordinated approach to decision making at devolved and local level makes sense. Substantial evidence was received to support more devolved decision making and transfer powers to a more local level. We heard that leadership on housing and building standards is increasingly complex and disjointed. It was felt that any new ministerial positions or committees will need to effectively link into the local decision-making processes and provide co-ordination for the many different local groups. Plans and policies for existing, as well as new housing, should be integral parts of local, regional and combined authorities' strategies for economic and social development.</p>
----------	---------------------	--

In the context of the pandemic and recovery, it is more important than ever that the nation's health and wellbeing is a priority and that national decision making is joined up with local and regional government to build back better and healthier homes and places.

2. The Built Environment, Design and Placemaking (Housing, Planning and Urban Design and Regeneration)

2.A - Is there evidence that changes to urban design and housing quality - including energy efficiency, security, affordability - for both new development and neighbourhood regeneration, will lead to healthier cities?

While there is substantial evidence that poor quality existing homes lead to poor health, there is not good enough data to show that good building design, incorporating improvements for health, positively impacts on health and wellbeing.

The HHB APPG's White Paper recommends that the Government should lead on developing a national housing and buildings health database (perhaps maintained by the ONS), which regularly collects and stores information on UK homes and buildings. This should include key indicators relating to occupants' health and help to strengthen the evidence for improved standards of health and wellbeing in housing and buildings e.g. schools and the link to educational performance.

The NHS England Healthy New Towns initiative demonstrates that it is possible to build healthier and better-connected communities with integrated and high-quality health services throughout England (see: <https://www.england.nhs.uk/ourwork/innovation/healthy-new-towns/>). Modelling estimates have shown that renovating just 2% of homes each year has the potential to halve the number of unhealthy homes by 2050.

However, any move by the Government to bring forward energy efficiency targets to achieve their ambition of net zero emissions by 2050 must be matched by a holistic approach to healthy homes and buildings. The evidence shows that a consideration of other factors such as overheating, poor indoor air quality and the need for adequate ventilation will help avoid potential risks and to increase health and wellbeing. This approach is endorsed by PAS 2035:2019 - a report sponsored by the Department for Business, Energy and Industrial Strategy (BEIS) - which provides a framework of standards on how to conduct effective energy efficiency retrofits in existing buildings and drives the 'whole house approach' to renovation projects.

With energy efficiency targets in mind, it is also crucial that there is a shift towards measuring 'in use' performance standards, not just design performance. This will ensure that improvements made to energy efficiency and other measures like indoor air quality, light, space, noise, thermal comfort are more effective in the long term and do not impinge on health and wellbeing.

'The inside story: Health effects of indoor air quality on children and young people' report published in January 2020 by the Royal College of

Physicians (RCP) and the Royal College of Paediatrics and Child Health (RCPCH), revealed that 3.6 million children are living in poor quality housing. It specifically identified that buildings were becoming more airtight to improve energy efficiency and that improved insulation needed to be matched with adequate ventilation to prevent the build-up of pollutants in the home. To combat this risk, the report recommended ventilation in homes, legislation to assess the safety of building materials, and building regulations that properly consider air quality alongside energy efficiency.

Despite this evidence, fiscal policy incentives exist in relation to the installation of improved energy efficiency measures (EEMs), such as cavity wall insulation and loft insulation, but not for retrofitting health improvements, such as improved ventilation, acoustics or light.

We also need to consider the role of public awareness and education, which will help enhance the health benefits of changes to urban design and housing quality. The BRE highlighted that despite the use of innovative technical systems for heating, cooling and lighting, buildings often do not meet their energy targets because the occupants do not know how to use the systems and behave in ways that actually increase energy use above that expected. The Institute of Acoustics (IoA) and the HEMAC (Health Effects of Modern Airtight Construction) Noise Group have added to this that noise is often not considered properly and standards on noise pollution are low. Incorrectly installed, noisy ventilation systems are often turned off because they are perceived as an inconvenience rather than a key piece of equipment for protecting health. In order to create healthier homes and cities, the Government must consult with and educate building occupants, understanding their needs and behaviours and giving them ownership.

2.B - Can a case be made for the property industry and investors to reset real estate value to include health and wellbeing?

Yes, the HHB APPG believe that a home which has been designed and built with the focus on health and wellbeing will be more attractive to future buyers because of the advantages that it offers in the form of good indoor air quality, light, space, noise, thermal comfort and adaptability rather than a property which does not positively reflect these attributes. To do this however, improved tools need to be developed for the rental (and sale) of properties for assessing health and wellbeing in homes and buildings.

2.C - What evidence is available to support the case for changes to local and national policies for housing and the built environment in the light of the Covid experience?

Before the pandemic we were spending circa 90% of our time indoors. The effects of poor housing on the NHS in 2010, in terms of the first-year treatment costs of specific health hazards, was estimated to be at least £1.4bn per year in the poorest housing in England and to be £2.5bn per year when considering all housing throughout the entirety of the UK. In reality, the associated costs are estimated to add at least two-and a-half

times this number.

Now that so many have been working and staying at home poor living and working environments have heightened awareness of the indoor environment. There will be other losses to society of poor housing, such as the impact on educational attainment and economic performance. Now is the time for the Government to ensure that our homes and buildings do not cause or exacerbate poor health.

The UK Government has spent considerable time recently in emphasising the importance of ventilation in public and private buildings in the fight against Covid and this has been supported by several academic works:

Public Health England

(<https://www.gov.uk/government/publications/covid-19-ventilation-of-indoor-spaces-to-stop-the-spread-of-coronavirus/ventilation-of-indoor-spaces-to-stop-the-spread-of-coronavirus-covid-19>);

Health and Safety Executive

(<https://www.hse.gov.uk/coronavirus/equipment-and-machinery/air-conditioning-and-ventilation/index.htm>);

The Lancet ([https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)00869-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00869-2/fulltext)); Statement from 241 scientists

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7454469/pdf/ciaa939.pdf>);

The BMJ (<https://blogs.bmj.com/bmj/2021/06/29/after-restriction-why-the-public-can-only-fulfill-its-responsibilities-if-the-government-fulfills-theirs/>).

Thus, national policies for housing and the built environment should be changed to further reflect this.

2.1 - Is there evidence that the integration of housing and health in the same government Ministry and/or at the local level, achieves better outcomes?

There are certain municipal areas where both housing and health has been delegated to the local authority to manage, such as Manchester. However, so far Government Department responsibility for healthy homes and buildings has generally been inadequate with policies, such as those relating to energy efficiency, falling between Government Departments leading to poor execution. It is time for the Government to rectify this.

The HHB APPG recommends establishing one Government department responsible for healthy homes and buildings to: ensure our homes and buildings maintain the highest standard of health and wellbeing; identify where homes and buildings are causing health issues; measure the economic and social impact of healthier homes and buildings; reduce health inequalities; oversee implementation via local authorities and communities; provide common definitions and approaches to policy, regulation and standards.

We also recommend creating a Ministerial position with explicit responsibility for co-ordinating and delivering a new approach to housing and how it interacts with other policy areas, such as health. Moreover, a cross departmental committee for health and buildings should be set up.

Our ageing population has increased the number of generations that need to be accommodated in our homes, but it has also led to many older households living in mainstream and unsuitable homes for longer,

creating greater costs in health and care services and reducing the wealth that is passed to future generations. Greater alignment between MHCLG and DHSC would enable a more joined-up approach to tackling this looming crisis.

2.2 - What is the evidence that poor quality housing leads to physical and mental ill health, excess (winter) deaths, accidents in the home, increased hospital admissions and readmissions, premature moves into residential care and fuel poverty?

The evidence that poor quality housing has a negative impact on health is abundant. In the winter of 2014/15 an estimated 43,900 excess winter deaths occurred in England and Wales and the impact of cold housing specifically was estimated to cause a fifth of these excess deaths, claiming more lives than road accidents, alcohol or drug abuse. Children in cold homes are more than twice as likely to suffer a respiratory problem than those living in warm homes. More than 1 in 4 adolescents living in cold homes are at risk of multiple mental health problems, compared to 1 in 20 in warm housing and cold homes are also associated with increased incidence of colds and flu, which as well as killing people, are known to worsen existing conditions such as arthritis and rheumatism.

Poor indoor air quality (IAQ) has been linked to allergy and asthma, lung cancer, chronic obstructive pulmonary disease, cardiovascular disease and dementia. It is reported to have an annual cost to the UK of over 204,000 healthy life years, with 45% of those lost to cardiovascular diseases, 23% to asthma and allergy, and 15% to lung cancer. The Royal College of Physicians (RCP) warned in 2016 that indoor air pollutants cause, at a minimum, thousands of deaths per year and are associated with healthcare costs in the order of 'tens of millions of pounds'.

'The Inside Story' from the RCP and RCPCH found that poor indoor air quality could cause health problems in children, from birth and infancy, to pre-school, and then school-age, including respiratory problems, eczema and reduced cognitive performance. Professor Hazim B. Awbi predicted that by 2050, when the Government aims to realise its ambition of net zero emissions, without action to tackle indoor air pollution, there could be an 80% rise in those suffering asthma symptoms. Around a third of people in the UK report suffering from mould in their homes despite warnings from the World Health Organisation that people living or working in damp or mouldy buildings are at an increased risk of respiratory symptoms, respiratory infections, allergic symptoms and exacerbations of asthma.

Allergy UK have raised concerns that increased airtightness caused by energy efficiency improvements, have not been met by equal improvements in ventilation, leading to a rise in allergic reactions amongst the 21 million allergy sufferers in the UK as well as people who had not previously suffered. Research supports this position too. Exeter University published a study in 2019 which demonstrated that a unit increase in mean energy performance rating was associated with increases of around 0.5% in asthma and cardio-vascular disease emergency hospital admissions and 1% higher COPD (respiratory disease) admission rates. A 2015 study carried out by the same

university studied the link between energy efficiency of dwellings (evaluated in terms of the Standard Assessment Procedure - SAP rating) and the prevalence of asthma. The study found that a unit increase in SAP rating was associated with a 2% increased risk of asthma symptoms.

In the winter of 2014/15, an estimated 43,900 excess winter deaths occurred in England and Wales and the impact of cold housing specifically was estimated to cause a fifth of these excess deaths, claiming more lives than road accidents, alcohol or drug abuse. Children in cold homes are more than twice as likely to suffer a respiratory problem than those living in warm homes. More than 1 in 4 adolescents living in cold homes are at risk of multiple mental health problems, compared to 1 in 20 in warm housing and cold homes are also associated with increased incidence of colds and flu, which as well as killing people, are known to worsen existing conditions such as arthritis and rheumatism.

BRE have identified problems with overheating (particularly in new airtight homes) in urban areas, emphasising that excess heat morbidity/mortality does happen. Moreover, while the Decent Homes Standard exists, it has been reported that one third of all homes in the private rental sector fail to meet those standards.

A 2019 WIP Strategy report for Homes for Later Living notes that by 2032 there will be five million people over 80 living in the UK. But as the number of older people in the UK goes up, we are experiencing a shortage of homes specifically designed for later living. Many older people are finding themselves with little option but to stay put in properties that are remote from shops and services, ill-equipped for changing mobility needs, hard to maintain and potentially hazardous to grow old in. The lack of opportunities to access suitable housing in retirement means that, when it finally comes, their next move is to a care or residential home. (McCarthy Stone)

Overcrowded homes are linked with impaired educational attainment; child health and development issues, including meningitis, respiratory conditions and slow growth rate; accidents in the home; stress, anxiety and depression; and poor adult health. Using the Bedroom Standard as a measure, there are more than half a million overcrowded households, affecting one child in ten in England, with over one-third in London.

2.3 - Can the gains from improved housing be quantified financially?

Whilst it is difficult to quantify the gains from improved housing, we can quantify the costs of poor housing. The Building Research Establishment (BRE) estimate that the effects of poor housing on the NHS in 2010, in terms of the first-year treatment costs of specific health hazards, was estimated to be at least £1.4bn per year in the poorest housing in England and to be £2.5bn per year when considering all housing throughout the entirety of the UK. BRE told us that they estimate that the total 'social and economic cost of leaving people in poor housing' is in the region of £18bn per annum.

Each person living in a home for later living enjoys a reduced risk of health challenges, contributing to fiscal savings to the NHS and social care services of approximately £3,500 per year. Meanwhile, building 30,000 more retirement housing dwellings every year for the next 10

years would generate fiscal savings across the NHS and social services of £2.1bn per year.

2.7 - What changes to mandatory Building Regulations (e.g. in relation to standards for accessibility) can be shown to improve health and wellbeing?

There are currently very few standards in the Approved Documents, particularly part F, to ensure the delivery of effective energy efficiency and ventilation measures that protect the health and wellbeing of occupants. This is because the Building Regulations have no consideration for health and wellbeing despite there being a clear responsibility on the Government to acknowledge and act on this. Additionally, there needs to be better knowledge and skills to facilitate improved health and wellbeing in the indoor environment, which should be complemented by a quality mark – this is particularly important for ensuring correctly designed buildings and correctly installed systems.

Many have argued that ventilation is rarely a consideration when energy efficiency measures are installed, despite it leading to increased airtightness and poorer indoor air quality – this has led to an industry call to ‘Ventilate when you Insulate’ to ensure health and wellbeing is protected. Moreover, competency issues (caused by a lack of standards required of installers) are leading to unintended consequences, such as noise, poor performance and poor indoor air quality.

If the Government does wish to bring forward its energy efficiency targets, it is also crucial that there is a shift towards measuring ‘in use’ performance standards, not just design performance. This will ensure that improvements made to energy efficiency are effective in the long term and do not impinge on health and wellbeing. More monitoring, compliance testing and better enforcement is needed to ensure that we close the gap between design and actual performance.

4. Health & Wellbeing (public health, social prescribing, food and exercise, health creation)

4.B - How can our highly centralised and illness-orientated health service be transformed to achieve more responsive, more preventative, more holistic and more personalised outcomes?

The NHS should be empowered to prescribe, or order, home health checks by qualified entities when a patient presents with symptoms that might be caused or exacerbated by a poor home environment. The National Institute for Health and Care Excellence (NICE) published new 2020 guidelines demonstrating the importance of improved indoor air quality, recommending the adoption of a whole house approach to heating and ventilation, and balancing indoor air quality with standards for energy use – these should be deployed and enforced in healthcare settings nationwide.

4.1 - What evidence supports the case for investment in public health and prevention?

In a 2016 survey of 3,000 UK homeowners and renters, 90% said they

wanted a home that would not compromise their health and wellbeing and 30% said they would be willing to pay for a healthy home.

Our White Paper stated that investment in services which are critical to ensuring healthy homes should be increased, including funding for greater numbers of Environmental Health Officers to increase enforcement and better training for Building Control Officers.

We heard many concerns about the under-resourcing of Environmental Health Teams by Local Authorities. Environmental Health Officers have a key role to play in assessing and monitoring local housing conditions as part of the regular review of local housing requirements, inspecting and enforcing housing standards, and to encourage and support the improvement of housing quality. BRE reported that Local Authorities environmental health teams are often under-resourced and that Local Authorities do not have sufficient resources to monitor housing quality effectively. The CIEH called for greater resourcing of enforcement teams, a point supported by the Energy Savings Trust, who have stated that 'Environmental Health Officers working in housing carry out the statutory function of local authorities under the 2004 Housing Act to ensure that private sector homes are free from hazards, including excess cold, damp and overheating. Numbers of EHOs have been cut substantially'.

4.2 - Does the evidence suggest the most cost-effective improvements in health and wellbeing will come from encouragement of healthier lifestyles and diets, combatting obesity, inactivity and tobacco/alcohol/substance abuse? How big a part can education play - from early years throughout the life course - to make a significant difference?

The evidence shows that improvements to housing and building can be a cost-effective way of improving health and wellbeing (as listed above), particularly in relieving the burden on the NHS and in the long term

According to BRE (and as noted previously), modern homes are expected to last 1000 year and the socio-economic problems arising from poor housing in England cost £18.6bn per annum so the savings would make the investment in the renovation of existing homes good value-for-money. Education and public awareness campaigns are critical to informing people about the impact the indoor environment can have on their health

4.3 - Are there further fiscal incentives (e.g. like the sugar tax) that have been shown to affect behaviour positively?

Regarding housing specifically, fiscal policy incentives exist in relation to the installation of improved energy efficiency measures (EEMs), such as cavity wall insulation and loft insulation, but not for retrofitting health improvements, such as improved ventilation, acoustics or light. While the Green Homes Grant was poorly executed, it revealed a clear demand and need for retrofits in the UK. There were more than 123,000 applications for the grant by the end of February 2021, but only 28,000 vouchers had been issued and only 5,800 energy efficiency measures had been installed. A new and improved grant scheme which also incorporates measures to improve XYZ should be adopted to ensure a holistic scheme

that protects health and wellbeing.

4.7 - Is there evidence on what health-related activities are best done at a national scale and what should be further devolved to local (or regional) government?

While a general framework for housing and building standards needs to be established across the UK to improve health and wellbeing, it is critical that local authorities implement these standards and that the detail of this is adapted at the local authority level dependant on context and need. For example, solutions and conditions for tackling indoor air pollution will be completely different in London compared to Cornwall.

Moves by a number of local authorities and regions to drive increased building and energy efficiency standards provides an opportunity to engage on the health and wellbeing agenda and gather data and reliable evidence, as well as learn from best practice and aim to achieve better standards across the UK. In addition, putting health and wellbeing at the heart of city deals and local growth plans offers major potential to meet local needs and build healthier, better-quality homes and buildings.

4.8 - What has the Covid pandemic taught us in terms of health inequalities? What are the lessons in respect of residential care homes and the need for age-friendly, independent accommodation within the community?

The pandemic has shone a harsh light on the way in which we treat and support older demographics and there are clear inadequacies in our health and housing system, which has struggled to cope under the strain of the virus. Retirement communities have thankfully seen much lower levels of infection from Covid-19 than wider society and residential care homes.

For example, the retirement communities of McCarthy Stone saw infection levels from Covid-19 that are a third of the general population, and a quarter of those experienced by the over 80s in wider society. They were able to keep older people safe and well.

It is therefore essential that as a society we learn the lessons about how we can better support them, and central to this is housing. Just as retirement communities have played a central role in protecting people through this crisis, so too can better housing for our ageing population play a central role in turbo-charging the UK's housing market and ensuring older people are better protected against future pandemics.

8

Please select which exposure(s) your evidence relates to. Further explanation on these exposures can be found on a PDF file here. Please select all that apply.

<p>9 Please select which outcome(s) the submitted research relates to. Please select all that apply.</p>	<ul style="list-style-type: none"> • Wellbeing • Health (physical): (e.g. non-communicable diseases, communicable diseases, behaviours etc.) • Mental Health • Quality of Life • Lived experiences: (e.g. social health, social wellbeing, social behaviour etc.)
<p>10 Method of evidence submission: If you need to provide further evidence, please submit this either digitally via email or hard copy via post.</p>	<p>Digital (via email to gchu@kellogg.ox.ac.uk)</p>
<p>11 How did you hear about the Commission on Creating Healthy Cities and the associated call for evidence?</p>	<p>Via the TCPA</p>



all party parliamentary group
for healthy homes and buildings

Building our Future
**Laying the Foundations for
Healthy Homes and Buildings**

WHITE PAPER

OCTOBER 2018



Contents

Foreword from Jim Shannon MP	3
Executive Summary of Recommendations	4
Scope of the Paper	7
The Cost of Unhealthy Homes	8
Evidence and Findings	
- Recommendation 1: Governance	9
- Recommendation 2: New Build	14
- Recommendation 3: Renovation	18
Acknowledgements	22
Appendix and References	23

Foreword from Jim Shannon MP

The All-Party Parliamentary Group for Healthy Homes and Buildings was created to shed light on the many problems caused to our nation's health and economy as a result of people living and working in unhealthy homes and buildings.



Our Green Paper set out the political, economic and business case for healthy homes and buildings and made three overarching recommendations for policy change. Over 50 organisations, representatives and individuals responded to our Green Paper and I would like to personally thank all those who submitted evidence and gave their views on what needs to be done to make sure that our homes and buildings do not exacerbate or lead to health problems. Our White Paper is the output of considerable hard work and thorough consultation. I am confident that it lays the foundations for healthy homes and buildings, sets out solid recommendations and makes an overwhelming case for change.

We must ensure that the homes and buildings we work and live in are healthy and positively contribute to our physical and mental health instead of diminishing it. The exact cost to the public purse, and the human cost, in terms of health, wellbeing, educational attainment and social care is unfathomable.

Our White Paper makes it clear that healthy homes and buildings would contribute to:

- Lower costs to the NHS and a healthier population;
- Better educational attainment and workplace productivity;
- Reduced emissions, lower energy bills and a lower carbon footprint;
- Improved health, wellbeing and comfort;
- Greater life chances, independent living and care.

We are calling for Government to provide a public health focus that considers the indoor environment as much as the external environment, consistent with the fact that most people spend 90% of their time indoors. We heard compelling evidence from respondents to our Green Paper about the health problems caused as a result of poor-quality housing including poor indoor air quality, noise pollution, damp, cold, inefficient, poorly lit, inaccessible and cramped living conditions.

The Government and my colleagues from across both Houses of Parliament need to acknowledge and support our call for action. Ultimately the recommendations made in our White Paper provide the basis for a step-change in policy which will drive-up standards and help to reduce health problems caused or made worse by living and working in unhealthy homes and buildings. Our White Paper is testament to the need to build better quality homes and buildings as well as upgrade existing housing stock, which comprises the vast majority of the homes people live in today.

I hope that Government will provide the necessary leadership and take forward our recommendations. The cost benefit and rewards are significant and the economic burden and sheer human misery created by poor homes and buildings simply too great to ignore.

Jim Shannon MP
Chairman of the All-Party Parliamentary Group for Healthy Homes and Buildings



About the All-Party Parliamentary Group for Healthy Homes and Buildings

The All-Party Parliamentary Group (APPG) for Healthy Homes and Buildings provides a forum to bring together MPs, Peers and stakeholders to discuss the key health problems being caused through poor quality, damp, noisy, poorly ventilated and inefficient homes and buildings.

The APPG provides a strong platform within Parliament to demonstrate robust, holistic and innovative solutions to make our homes and buildings both fit for purpose and healthy.

To find out more about the work of the All-Party Parliamentary Group for Healthy Homes and Buildings visit:
healthyhomesbuildings.org.uk

Contact details

Email us:
hbappg@devoconnect.co.uk
Follow us on Twitter:
[@APPGHBB](https://twitter.com/APPGHBB)
Secretariat: DevoConnect

Executive Summary of Recommendations

Houses and buildings that cause or exacerbate health conditions cost the economy and our society each and every year: in healthy life years, reliance and use of healthcare services, educational attendance and attainment and work productivity and absenteeism. However, it is only by taking a holistic approach to delivering healthy homes and buildings that the real benefits can be realised; otherwise we risk making gains by tackling one issue, simply to lose them again by failing to tackle another. It is essential we continue to strive for energy efficient homes that reduce carbon emissions and energy bills, as well as ensuring that we are reducing the health burden too.

By tackling the numerous health and wellbeing issues in UK homes and buildings, we have a real opportunity to create and use buildings to promote positive health and wellbeing, make savings in healthcare costs, increase educational attainment, improve productivity and allow our citizens to lead longer, healthier and happier lives.

This White Paper lays out a list of recommendations that detail how, as a nation, healthy homes and buildings can and should be delivered:

Recommendation 1:

Government need to establish a cross departmental committee for health and buildings to champion change; recognising the interaction between buildings, health, education and the economy.

Recommendation 1.1

There should be one Government department responsible for healthy homes and buildings to:

- Ensure our homes and buildings maintain the highest standard of health and wellbeing
- Identify where homes and buildings are causing health issues
- Measure the economic and social impact of healthier homes and buildings
- Reduce health inequalities
- Oversee implementation via local authorities and communities
- Provide common definitions and approaches to policy, regulation and standards.

Recommendation 1.2

There should be an inter-departmental Government Committee involving all Government departments and agencies responsible for construction, the devolved administrations and all those with an interest in creating better homes and buildings including but not limited to; the Department of Health and Social Care, the Department for Education and Public Health England, to ensure that health and wellbeing is a key policy consideration in existing and future housing provision.

Recommendation 1.3

The responsible Government department should be tasked with promoting public awareness of the health problems exacerbated by unhealthy homes and buildings and delivering public education on the built environment and its impact on health. The public need to be better informed and aware about the health benefits to be gained through improvements that can be made to homes and buildings. This should drive change via consumer demand and occupant behaviour.

Recommendation 1.4

Government funding is required to support independent research and development of healthy homes and buildings. Specifically, the Government needs to focus on the renovation of homes which are detrimental to health and wellbeing for the vulnerable and those in poverty.



Recommendation 1.5

The Government should ensure the competency of installers is improved, for example by requiring that all installers are members of a registered competent person scheme, and ensuring they have the necessary skills and knowledge to take a more holistic approach to renovation for improving health and wellbeing.

Recommendation 1.6

Investment in services which are critical to ensuring healthy homes should be increased, including funding for greater numbers of Environmental Health Officers to increase enforcement and better training for Building Control Officers.

Recommendation 2:

Grow the research and evidence base, starting with a focus on housing and schools, to develop a clear case for further Government action to improve standards for new build.

Recommendation 2.1

Government needs to commit to the construction of larger numbers of healthy new homes, including greater numbers of quality social and affordable housing, which can help to alleviate issues of overcrowding and poor physical and mental health.

Recommendation 2.2

Priority must be given to ensuring people's health and wellbeing is foremost when building new homes. There should be increased focus on delivering quality and performance alongside delivery of greater numbers of new homes.

Recommendation 2.3

The Government should develop a specific healthy homes policy, to support its Housing White Paper, to ensure that new homes are built to protect health and enhance wellbeing both now and in the future. This strategy should give due consideration to population projections of vulnerable people, especially the ageing population. Future reviews of Building Regulations should require that the health of a building's occupants is fully considered alongside the necessary technical measures included to protect health and enhance wellbeing.

Recommendation 2.4

All housing and building standards (relating to health and wellbeing) should be consistent across the UK. There should be a national optimum standard, which is not just the lowest common denominator of the devolved authorities. Maximising the occupant's health and wellbeing must be placed at the centre of housing and building design and a holistic approach should be taken including elements

of safety, space, energy efficiency, ventilation, heating, noise, air quality and lighting.

Recommendation 2.5

There should be a national housing and buildings health database (perhaps maintained by the ONS), which regularly collects and stores information on UK homes and buildings. This should include key indicators relating to occupants' health and help to strengthen the evidence for improved standards of health and wellbeing in housing and buildings e.g. schools and the link to educational performance.

Recommendation 2.6

The Healthy New Towns initiative and other relevant schemes should be extended to assess the impact of the internal built environment on health and wellbeing and strive to go beyond standards set out in the Building Regulations and associated documents.



Recommendation 3:

Make renovation of current housing stock and infrastructure a Government priority and develop plans for retrofitting that takes a holistic approach to maximising health and wellbeing.

Recommendation 3.1

The Government should develop a national renovation strategy to improve homes for health and performance and end the practice of improving energy efficiency without due consideration to the consequences for health.

Recommendation 3.2

The Government should adopt a holistic approach and ensure that future renovation of homes and buildings, in addition to making them energy efficient, improves other elements vital for health and wellbeing, such as ventilation and air quality, lighting and acoustics. This approach should, for example, be adopted in Building Regulations.

Recommendation 3.3

The Government should publish a national league table of housing standards by Local Authorities, regularly recording information such as: spend on Environmental Health Officers, the number of home improvements made and the number of prosecutions undertaken or avoided by intervention, to encourage the protection of people and the improvement of the housing stock.

Recommendation 3.4

Private Rental Sector landlords should be required to ensure their properties meet the Decent Homes Standard, a minimum level of energy efficiency and are not detrimental to the occupant's health and wellbeing. To ensure they are, a Housing Health and Safety Rating System (HHSRS) assessment should be undertaken on a property when a new tenancy agreement is issued or within a specified time period.

Recommendation 3.5

A new national registration system for the Private Rented Sector in England should be introduced in order to improve standards, prevent landlords from providing poor quality housing and ensure remedial work is carried out within a specified timescale.

Recommendation 3.6

Improved tools should be developed for the rental and sale of properties for assessing health and wellbeing (not simply energy performance) in homes and buildings and making recommendations for improvement, e.g. the development of a new energy and health performance certificate or a full building renovation passport.

Recommendation 3.7

The NHS should be empowered to prescribe, or order, home health checks by qualified entities when a patient presents with symptoms that might be caused or exacerbated by a poor home environment.

Recommendation 3.8

The Government should incentivise the public to improve the current housing stock to high levels of energy efficiency, health and wellbeing by offering tax incentives, for example varying Council Tax or Stamp Duty in line with building performance and offering reduced rates of VAT for spending on qualified products and services that improve the energy efficiency and health of a home.

Recommendation 3.9

There should be greater enforcement and quality control of home renovation standards with a shift towards measuring 'in use' performance standards, not just design performance, to ensure that improvements made are effective for the long term and do not negatively impact on health and wellbeing.



Scope of the Paper

In July 2017 the All-Party Parliamentary Group for Healthy Homes and Buildings published a Green Paper¹ entitled 'Building our Future: Laying the Foundations for Healthy Homes and Buildings'. The Green Paper set out the political, economic and business case for healthy homes and buildings, summarised the problems and solutions identified by the members and made three key recommendations for policy makers on how best to achieve healthy homes and buildings in the UK. A consultation on the paper called for additional views and evidence. The APPG received an enormous response from over 50 organisations, representatives and individuals including experts from across industry, academia, the charitable sector, public health professionals and key stakeholders in the built environment and health policy through written submissions and during oral hearings.

This White Paper is a product of that consultation and discussion, and aims to provide Government, policy makers, industry and stakeholders with recommendations on how, as a nation, healthy homes and buildings can and should be delivered.

The Paper is written with reference to the following considerations:

Homes and Buildings

The scope of the APPG covers all building types, however the evidence received and submissions made were overwhelmingly from those concerned with domestic dwellings, as such the vast majority of the recommendations in this paper are focused on UK homes. The APPG believes that better, healthier housing is a national priority and that improvements made in homes will go a long way to improving the health of the nation. The APPG looks forward to undertaking future work which focuses more specifically on non-residential buildings.

Technology Agnostic

The APPG believes that the key to solving healthy homes and buildings is to bring policy makers, industry, academics and interested parties together to unite around the right approach; not by advocating one technology over another. The APPG remains unbiased towards the use of any specific technology.

The Outdoor Environment

The APPG was formed with the purpose of promoting the importance of health and wellbeing inside homes and buildings and determining steps that should be taken to improve it. The APPG recognises the importance of improving the outside environment but believes that it is not within the scope of the APPG's work and that other APPGs are working hard to deliver

improvements in the outside environment. We remain open and willing to work jointly with other groups and organisations to deliver improvements in both the outdoor and indoor environments.

Health and Healthy Buildings

The APPG considers the definition of health used in this document to be the same as that defined by the World Health Organisation², "a state of complete physical, mental and social wellbeing". Where health is referred to throughout this paper, it is meant as defined here. Therefore, healthy homes and buildings are not simply those where there is a lack of ill health, but homes and buildings that maximise the occupants physical, mental and social wellbeing.

Building upon Existing Systems

The APPG considers that there are many good pieces of legislation, existing policies, systems, processes and best practice that already exist. Our recommendations, where possible, should be used to build upon, better utilise or refocus these in order to help deliver healthy homes and buildings. For example, we recommend the development of a National Homes and Health Database and we consider that the English Housing Survey would help to populate the required information in such a database.



The Cost of Unhealthy Homes

The effects of poor housing on the NHS in 2010, in terms of the first-year treatment costs of specific health hazards, was estimated to be at least £1.4bn per year in the poorest housing in England and to be £2.5bn per year when considering all housing throughout the entirety of the UK³. In reality, the associated costs are estimated to add at least two-and-a-half times this number. There will be other losses to society of poor housing, such as the impact on educational attainment and economic performance.

But the economic cost is only half of the story, the true cost lies in human misery and lives lost. For example, in the winter of 2014/15 an estimated 43,900 excess winter deaths occurred in England and Wales⁴ and the impact of cold housing specifically was estimated to cause a fifth of these excess deaths⁵, claiming more lives than road accidents, alcohol or drug abuse⁶. Children in cold homes are more than twice as likely to suffer a respiratory problem than those living in warm homes⁴. More than 1 in 4 adolescents living in cold homes are at risk of multiple mental health problems, compared to 1 in 20 in warm housing and cold homes are also associated with increased incidence of colds and flu, which as well as killing people, are known to worsen existing conditions such as arthritis and rheumatism⁴.

Poor quality homes and buildings also suffer from indoor air pollution which is a growing public health concern. Poor indoor air quality (IAQ) has been linked to allergy and asthma, lung cancer, chronic obstructive pulmonary disease, cardiovascular disease^{7,8} and more recently even investigated for its links to dementia⁹. It is reported to have an annual cost to the UK of over 204,000 healthy life years¹⁰, with 45% of those lost to cardiovascular diseases, 23% to asthma and allergy, and 15% to lung cancer. The Royal College of Physicians warned in 2016 that indoor air pollutants cause, at a minimum, thousands of deaths per year and are associated with healthcare costs in the order of 'tens of millions of pounds'¹¹. In 2015, Professor Hazim B. Awbi predicted that by 2050, without action to tackle indoor air pollution, there could be an 80% rise in those suffering asthma symptoms¹².

Around a third of people in the UK report suffering from mould in their homes despite warnings¹³ from the World Health Organisation¹⁴ that people living or working in damp or mouldy buildings are at an increased risk of respiratory symptoms, respiratory infections, allergic symptoms and exacerbations of asthma¹⁵.

Overcrowded homes are authoritatively linked with impaired educational attainment; child health and development issues, including meningitis, respiratory conditions and slow growth rate; accidents in the home; stress, anxiety and depression; and poor adult health⁴. Using the Bedroom Standard as a measure, there are more than half a million overcrowded households, affecting one child in ten in England, with over one third in London⁵.

But the issues do not stop there. Poor quality houses and buildings have restricted daylight and suffer from noise pollution. In offices, natural light has been shown to improve quality of life measures, quality and quantity of sleep, and reduce sick leave. In healthcare settings, it has been shown to improve recovery times of long-stay patients and reduce anxiety and medication⁵. There is also evidence that the presence of noise pollution, reported to be suffered by 37% of the population, can cause long-term health issues: increasing levels of stress hormones, and increasing the risk of cardiovascular effects (heart disease and hypertension)⁵.

In short, living, working or occupying unhealthy homes and buildings directly and negatively impacts human health – causing serious health effects, aggravating existing conditions and in the extreme, leading to unnecessary deaths.



Evidence and Findings

Recommendation 1:

Government need to establish a cross departmental committee for health and buildings to champion change; recognising the interaction between buildings, health, education and the economy.

The need for effective leadership

It is widely recognised that leadership over the issue of healthy homes and buildings is disjointed within Government. For example, Building Regulations are controlled by the Ministry of Housing, Communities and Local Government and energy efficiency and renovation schemes by the Department for Business, Energy and Industrial Strategy, whereas many of the benefits such as improved health outcomes are of consequence to the Department of Health and Social Care, the Department for Education and others.

This not only means that much of the policy-making for the construction sector is done without full consideration of the implications to health and wellbeing, but also that the economic case for improved housing and buildings is not fully realised.

Many we heard from felt there was a need to appoint a new Ministerial position with explicit responsibility for co-ordinating and delivering a new approach to housing and in particular how it interacts with other policy areas, such as health, and the creation of a cross departmental committee for health and buildings. Such a Ministerial role, and cross-departmental committee, would need to recognise the interaction between buildings, health, education and the economy. It was felt that Public Health England could play a leading role in making this happen and provide a common goal to improve health through our homes and buildings.

Indoor environments expert Professor Derek Clements-Croome pointed out that there are 'many disparate bodies but no unified one on health and well-being in buildings and for architecture overall. Public Health England covers a very broad remit covering the health of the nation like food, exercise, environment (for example air pollution) and health trends

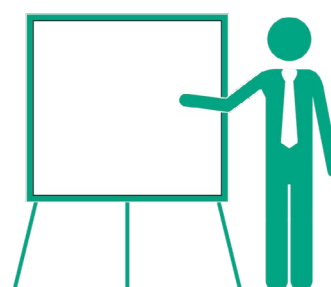
or dangers (e.g. flu epidemic). The Health and Safety Executive is mainly concerned with extremes...'

The Leeds Sustainability Institute (LSI) at Leeds Beckett University, said they believed that the health issues caused by poor homes and buildings were such that the NHS should 'take ownership' but the United Kingdom Indoor Environments Group (UKIEG) recommended that there should be a Government Department lead to co-ordinate cross Government department work on the issue of the indoor environment, health and wellbeing.

Allergy UK also supported the proposal for a cross-departmental committee for health and buildings to champion change in the sector and would like it to include non-government organisations such as patient organisations.

We heard from the Chartered Institute of Environmental Health (CIEH) that they would 'strongly support the creation of a cross-departmental committee for housing and health or an additional responsibility being given to the Housing Minister to work with other Departments to improve housing-related health outcomes'.

The Faculty of Public Health suggested it would be 'useful to effectively integrate health into other departments' policies'. One way to achieve this, might be to have a housing minister with explicit responsibility for co-ordinating housing and health'.



The Institute of Acoustics explained that there are many areas where the shared responsibility of different Government departments can impinge on the noise environment of people's homes.

The Department for the Environment, Food and Rural Affairs (DEFRA) has the overall policy responsibility for noise management but there appear to be times when their voice is over-ridden when policy is developed. One example is the granting of Permitted Development Rights when converting office accommodation to residential. This has led to homes being located in poor acoustic environments without any obligation to include appropriate building envelope insulation. The noise-related consequences of the policy have also adversely affected some nearby businesses, although an amendment to the relevant regulation¹⁶ last year has helped to address that particular issue.

Recommendation 1.1

One Government department should be responsible for healthy homes and buildings to:

- Ensure our homes and buildings maintain the highest standard of health and wellbeing
- Identify where homes and buildings are causing health issues
- Measure the economic and social impact of healthier homes and buildings
- Reduce health inequalities
- Oversee implementation via local authorities and communities
- Provide common definitions and approaches to policy, regulation and standards

A more co-ordinated approach at devolved and local level makes sense

Substantial evidence was received to support more devolved decision making and transfer powers to a more local level. We heard that leadership on housing and building standards is increasingly complex and disjointed. It was felt that any new ministerial positions or committees will need to effectively link into the local decision-making processes and provide co-ordination for the many different local groups. Plans and policies for existing, as well as new housing, should be integral parts of local, regional and combined authorities' strategies for economic and social development.

Local housing strategies should address how both the existing housing stock and new housing supply can contribute to achieving better health and wellbeing, increased productivity and inclusive growth.

There is a need for comprehensive guidance to help local authorities improve standards and build healthy housing stock. NICE guidelines, such as those being developed for indoor air quality, could be a solution and used to encourage health and wellbeing boards to act. In the future it will be essential to ensure that where policies or regulations are devolved to the four nations and metro mayors, we learn from best practice and aim to achieve better standards across the UK. Moves by a number of local authorities and regions to drive increased building and energy efficiency standards provides an opportunity to engage on the health and wellbeing agenda and gather data and reliable evidence. In addition, putting health and wellbeing at the heart of city deals and local growth plans offers major potential to meet local needs and build healthier, better quality homes and buildings.

In their response to the Green Paper, the Mackintosh Environmental Architecture Research Unit (MEARU) at the Glasgow School of Art raised concerns that - as well as across Government departments - there was also a lack of joined up thinking between Government authors of statutory regulation (Building Standards) and local authority oversight of their implementation, and responsibility for negative consequences (building owners); arguably with 'deep implications to health and wellbeing'.

It was felt that it was important not to underplay the role that local authorities and Directors of Public Health play in providing healthy homes and spaces. The Association of Directors of Public Health stated that 'Local authorities play a vital role in housing as they are responsible for preparing Local Plans, granting planning permission and working with developers. They also enforce standards in rented accommodation and deal with environmental health. Local authorities are responsible for providing suitable accommodation for the homeless, who are often vulnerable and may have specific housing needs'.

Recommendation 1.2

There should be an inter-departmental Government Committee involving all Government departments and agencies responsible for construction, the devolved administrations and all those with an interest in creating better homes and buildings including but not limited to; the Department of Health and Social Care, the Department for Education and Public Health England to ensure that health and wellbeing is a key policy consideration in existing and future housing provision.

There is a need for better public awareness

There is a low public awareness about the link between the built environment and our health and wellbeing. There needs to be a significant improvement and better understanding of what makes a high performing home. We heard that we need to move away from the current model where location and number of rooms defines the quality and value of a home.

In a 2016 survey of 3000 UK homeowners and renters, 90% said they wanted a home that would not compromise their health and wellbeing and 30% said they would be willing to pay for a healthy home¹⁷. Occupants now have access to ever more information on their homes and buildings, through technological advances, which will allow information on poor building quality to be more easily accessed, shared and acted upon.

It was felt that the Government and industry should undertake public awareness campaigns; showcase best building and design practice; develop improved and clear metrics for measuring and rating homes and buildings in relation to their standard of health and wellbeing; and provide informed guidance and information to help homeowners improve their health and wellbeing.

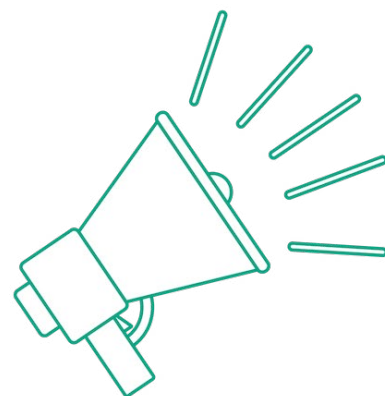
Many of those who responded highlighted the need for better education and guidance. The Association of Noise Consultants recommended, 'that additional guidance is made available to assist in good acoustic design in homes and buildings ...the industry needs technical guidance and information on how to design healthy homes and buildings. Regulators would also benefit from the existence of such guidance to understand better the design issues and how these can be resolved'.

Professor Graham Hughes from Imperial College London believes 'the knowledge and skills required for healthy buildings extends beyond the building phase. The education of occupants, and perhaps access to real-time monitoring, is essential. I suggest that the need for such education be incorporated into any future strategy'. BRE, Property Care Association and Liverpool Mutual Homes also highlighted the importance of occupant behaviour and education.

MEARU agreed that public awareness of the issues and problems must be improved if we are to see effective action. They felt that we needed to see all interested parties and the media playing a stronger part, to impart reliable information by as many routes as possible without 'an attached sales-pitch'.

Recommendation 1.3

The responsible Government department should be tasked with promoting public awareness of the health problems exacerbated by unhealthy homes and buildings and delivering public education on the built environment and its impact on health. The public need to be better informed and aware about the health benefits to be gained through improvements that can be made to homes and buildings. This should drive change via consumer demand and occupant behaviour.



We need the research and evidence base to make the case to Government

Despite the overwhelming evidence linking health and wellbeing to the built environment, there are still gaps in research and knowledge which need to be addressed. It was felt that policymakers were missing the justification for change. The UKIEG called for 'an independent, well-researched and systematic review of critical UK-related evidence on healthy buildings matters', BRE agreed that there are still gaps particularly in terms of cost/benefit evidence and the UK Centre for Moisture in Buildings (UKCMB) stated that the evidence needed to provide proof of causality is not sufficiently strong for policy makers, industry or financial organisations to demand changes in legislation or practice or to penalise wrong doing.

Being able to demonstrate actual building projects which can be linked to measured improvements in health and wellbeing, particularly providing the evidence linking reduced ill-health, increased productivity and economic outcomes, would be a good starting point to engaging policy makers and their advisors and bring about change. The LSI pointed out that there is lots of evidence of a problem with air quality, damp, cold, mould, space, mental health etc., but there is also a need for specific research to investigate the effects of a series of controlled interventions to enhance healthy homes.

We heard that current schemes, like NHS England's 'Healthy New Towns', could be used as an ideal starting point to gather the evidence, demonstrate effectiveness and influence the regulatory framework.

Care and Repair England told us that, increasingly, 'commissioners in the health, care and housing sectors require home improvement agencies and other housing providers to demonstrate through evidence the outcomes resulting from their range of services. The standards required for that validation can be high and represent a real challenge to agency/provider survival. Attempts to fill an evidence gap (through bids for research funding in partnership with academics) have had a very poor success rate. Consequently, there is a disconnect between a recognition at government level of the contribution housing can make to health and wellbeing and the access to research funding that can robustly demonstrate that contribution'.

The CIEH suggested that the Government should make funding available to support the research into the relationships between housing interventions and health outcomes.

MEARU felt that uptake on recommendations arising from academic research tends to be limited, partly due to limited funding and sometimes due to perceived pressures from industry. They also added that multidisciplinary collaborations (particularly between the built environment and medical communities, which is currently lacking) and significant investment at a government level will be needed for this 'enormous task'.

Recommendation 1.4

Government funding is required to support independent research and development of healthy homes and buildings. Specifically, the Government needs to focus on the renovation of homes which are detrimental to health and wellbeing for the vulnerable and those in poverty.

We need better knowledge and skills

To allow us to build homes and buildings to higher levels of health and wellbeing we need to improve the knowledge and skills for the design, construction and delivery of healthy homes. There is a need to educate the next generation of builders in a more holistic approach and knowledge of building physics.

While it is recognised that improved installer standards are necessary, it is important not to blame the many builders who are working in accordance with regulations but to work collaboratively with the sector to understand the difficulties, provide solutions and up-skill the work-force to deliver a current and future building sector which is best able to deliver higher standards and enhanced health and wellbeing.

BRE pointed out that the need to improve regulations is 'all well and good, but you have to ensure that there are an adequate number of people in the system (both private and public surveyors) that understand the issues to ensure that buildings are both designed correctly and built correctly. Currently this is not the case'.

Many felt it was important to have a stronger focus on installer competency. For example, Certsure, who provide certification to the building sector, told us, 'there is an industry perception by installers that ventilation systems are simple installations that need no set up or commissioning, therefore many systems installed may not meet the requirements and performance standards of the relevant Building Regulations and manufacturers installation instructions. This can lead to the deterioration of the building and affect the health of those who use it'.

MEARU told us there was a need to also improve the knowledge and skills of 'architects, their consultants, housing associations and other public, semi-public and private enablers, managers, scrutinisers, and so on, required to complement 'the next generation of builders', which other similar reviews have omitted.

The Mineral Wool Insulation Manufacturers Association (MIMA) would like to see the recommendations of the 'Each Home Counts' review and other related programmes applied and enforced. This should include working with industry to establish the Quality Mark and ensure that all Government funded work is carried out by Quality Marked contractors.

The Passivhaus Trust gave an example of rigorous quality assurance and control improving building performance... 'where the project designs and actual installation practices are scrutinised by an external assessor at key stages, before the completed building is finally certified. Independent research on Passivhaus buildings show that they do not exhibit performance gaps on ventilation, energy use or overheating'.

Recommendation 1.5

The Government should ensure the competency of installers is improved, for example by requiring that all installers are members of a registered competent person scheme, and ensuring they have the necessary skills and knowledge to take a more holistic approach to renovation for improving health and wellbeing.

We need to invest in Environmental Health Teams

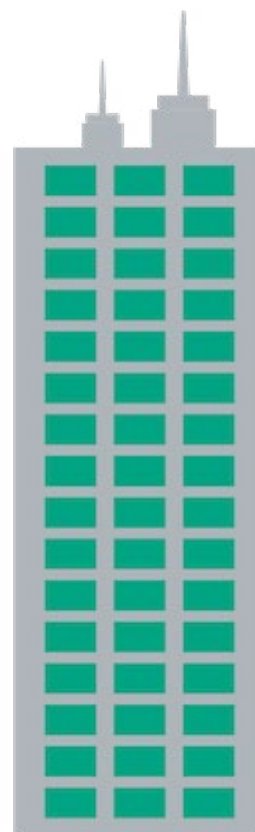
We heard many concerns about the under-resourcing of Environmental Health Teams by Local Authorities. Environmental Health Officers have a key role to play in

assessing and monitoring local housing conditions as part of the regular review of local housing requirements, inspecting and enforcing housing standards, and to encourage and support the improvement of housing quality. BRE reported that Local Authorities environmental health teams are often under-resourced and that Local Authorities do not have sufficient resources to monitor housing quality effectively.

The CIEH called for greater resourcing of enforcement teams, a point supported by the Energy Savings Trust, who told us, 'Environmental Health Officers working in housing carry out the statutory function of local authorities under the 2004 Housing Act to ensure that private sector homes are free from hazards, including excess cold, damp and overheating.... staffing for EHOs has been cut substantially as a result of austerity'.

Recommendation 1.6

Investment in services which are critical to ensuring healthy homes should be increased, including funding for greater numbers of Environmental Health Officers to increase enforcement and better training for Building Control Officers.



Recommendation 2:

Grow the research and evidence base, starting with a focus on housing and schools, to develop a clear case for further Government action on standards for new build.

We need to build more better-performing new homes

The demand for the building of new homes in the UK has never been greater. The Office for National Statistics estimated that in 2017 the UK population exceeded 66 million people, an increase of 3.2 million people since mid-2010¹⁸. In the same period the number of new houses being built amounted to just over 1 million.

The Government has repeatedly committed to building more homes, but the failure to achieve this over recent years has led to many commentators and even the Government describing the UK housing market as broken. In February 2017 the Ministry for Housing, Communities and Local Government published a White Paper entitled 'Fixing our broken housing market' which set out a wide range of measures designed to increase the number of new houses built in the UK to satisfy the increased demand. This calls for between 225,000 and 275,000 new houses to be built every year to keep up with the growth of the population and 'years of under-supply'. The Government is now committed to building an average of 300,000 new homes each year until the mid-2020s.

We heard that it is important for the Government, house builders, developers and providers to be motivated to build affordable homes, which do not compromise on quality and which provide healthy indoor environments. It is clear that an increased volume of quality new homes being built would go a long way to alleviate a wide range of health problems and prove to be a cost benefit to the UK.

It is important to remember that poor quality housing contains within it different elements each having potentially serious effects on an individual's health. For example, the health problems associated with poor indoor air quality are allergy and asthma, lung cancer, chronic obstructive pulmonary disease, and cardiovascular diseases. Yet dampness increases the risk of allergic symptoms such as coughing, sneezing, red eyes, skin rash,

rhinitis and eczema; all conditions which worsen the longer an occupant is exposed to the dangerous environment. Allergy UK call for regulation which ensures suitable heating, ventilation and extraction systems to be installed in all buildings as a means to create a healthier indoor climate.

The Association of Directors of Public Health told us overcrowding in poor quality housing significantly impacts mental health where referencing Shelter's report finding that 1 in 5 English adults (21%) said a housing issue had negatively impacted upon their mental health in the past five years¹⁹. Overcrowding is an element of poor-quality housing which has been proven to be linked to impaired educational attainment; child health and development issues, including meningitis, respiratory conditions and slow growth rate; accidents in the home; stress, anxiety and depression; and poor adult health.

The Residential Landlords Association were concerned about the shortage of new housing. The RLA attribute this to increasing pressures from both public opposition to new housing development and financial burdens associated with high land cost, meaning that if any new housing is built its usually to an inferior quality to cultivate space.

The UK Green Building Council (UKGBC) has recently published a briefing note²⁰ calling for healthy housebuilding and supports the Government's commitment to build 300,000 new homes each year until the mid-2020s.

The UKGBC called for all new homes to be constructed to higher standards and felt that actual performance needed to be measured, rather than just designed. They believe this is essential due to the cost to the NHS of treating medical conditions associated with poor housing. The UKGBC believe that the Government ambition of building 300,000 homes each year until the mid-2020s presents itself as a prime opportunity to address the issue of healthy homes and buildings.

It is clear from the evidence we have received that the need to build more and better-quality new homes remains essential. Homes which factor-in high standards can help alleviate a wide range of health issues caused by living in unhealthy housing, and due to Government housebuilding targets we are currently in a position to vastly improve the quality of health of people across the country.

Many of the respondents referred to the impact of poor-quality housing and the associated health conditions.

Recommendation 2.1

Government needs to commit to the construction of a large number of homes which alleviate, not exacerbate, poor health, including greater numbers of quality social and affordable housing, which can help alleviate issues of overcrowding and poor physical and mental health.

Recommendation 2.2

Priority must be given to ensuring people's health and wellbeing is foremost when building new homes. There should be increased focus on delivering quality and performance alongside delivery of greater numbers of new homes.

We need to develop a healthy homes policy

We heard that there is a very substantial cost to the NHS due to the effects of poor housing which in turn has a much higher cost to the whole economy. BRE estimate that the cost of hazards to the NHS caused by poor housing in the UK could be £2.5bn per annum in first year treatment costs³.

BRE told us that they estimate that the total 'social and economic cost of leaving people in poor housing' is in the region of £18bn per annum and the UK are amongst the highest in the European Union. Given the cost and the fact that the homes that we are building now will (statistically) have to last 1,000 years, at current rates of replacement, it becomes imperative that Government and legislators commit to improving housing standards and to build these to the best quality standards, reaping the rewards to health and society long into the future. BRE also identified problems with excess heat and overheating (particularly in new airtight homes) in urban areas. They wished to emphasise the fact that excess heat morbidity/mortality does happen despite being hard to

measure when compared to winter deaths. BRE also noted an angle of healthy homes policy that must be considered: the fact that many new buildings are designed to be as energy efficient as possible and use innovative technical systems for heating, cooling and lighting. Often these buildings do not meet their energy targets because the users of the building do not know how to use the systems, and behave in ways that actually increase energy use above that expected. In order to create healthier homes policy makers must consult with and engage building occupants, understanding their needs and behaviours and giving them ownership.

Allergy UK highlighted the dangers of emissions from construction materials, products and furnishings in homes, schools, public facilities and workplaces. In their evidence they report that more than 21 million adults in the UK have an allergy, which can be caused by or exacerbated due to poor indoor air quality. They have called for all new buildings and the refurbishment of existing buildings to include 'durable, repairable, recyclable non-toxic material' and have also called for a minimum requirement for ventilation and extraction for all new build and existing properties.

MIND put forward their analysis of the situation, stating that one in three people in the UK live in poor quality housing and the poor physical condition of a property is strongly predictive of mental health problems. There is particularly strong evidence for the negative impact of damp, mould, and cold. These kind of housing issues also make physical health worse and this can impact on mental health and recovery. MIND emphasise that the effect buildings have on physical health is on par with the effect they have on mental health, and that the link between poor quality housing and mental health is too strong to ignore.

The Association of Noise Consultants noted that many modern homes and buildings are located in urban and brownfield sites and 'are affected by significant levels of noise'. They also mentioned the noise impact of solutions designed to reduce overheating in homes can create additional ambient noise and additionally, are not necessarily helpful to the sustainability objectives of new house building.

The Institute of Acoustics noted the importance of acoustics and noise management in securing healthy homes, and suggest that, for better homes, the focus should be on increasing the quality of the policy implementation. These two bodies, along with the Chartered Institute of Public Health, published guidance in 2017 entitled 'ProPG: Planning and Noise'²¹. Good design in brownfield development in relation to noise can make a huge difference to health and wellbeing.

The Institute of Acoustics told us that 'widespread use of such guidance would assist in producing healthier homes'. The Health Effects of Modern Airtight Construction (HEMAC) Noise Group noted that changes to Approved Document E of the Building Regulations: 'resistance to the passage of sound' has made a big difference in relation to the passage of noise across party walls in adjoining properties. Until specific building rules were set out in Approved Document E there were many cases of noise being a significant issue between neighbours with a detrimental health effect.

We heard multiple concerns over ill-health being caused by poor light, ventilation, space, adaptability, building products, over-heating and others issues. The Chartered Institute of Housing highlighted the importance of homes being easily adaptable as people age or encounter mobility problems. Care and Repair England note that the needs of an ageing and more disabled population are not sufficiently considered and accommodated for in our built environment, particularly in domestic dwellings, and assert that far more could be done to increase the accessibility and inclusivity of both new and existing homes. They quote the most recent English Housing Survey where they say that only 7% of homes in England meet the most basic accessibility standard. This is in stark contrast to the growing number of people with restricted mobility and whose lives, health and wellbeing would be transformed by accessible and healthier buildings.

The Good Homes Alliance felt there was a need for an urgent Building Regulations review to deal with the issues highlighted by the Green Paper, in particular the issues created by the off-gassing of materials and products in the indoor environment and also overheating.

Recommendation 2.3

The Government should develop a specific healthy homes policy, to support its Housing White Paper, to ensure that new homes are built to protect health and enhance wellbeing both now and in the future. This strategy should give due consideration to population projections of vulnerable people, especially the ageing population. Future reviews of Building Regulations should require that the health of a building's occupants is fully considered alongside the necessary technical measures included to protect health and enhance wellbeing.

We need better Building Standards and regulations

Currently, building standards can be set by central Government, the devolved governments and many local authorities. This can result in different standards being applied throughout the UK and means that house builders and the supply chain have to change their practices depending on where they are building or supplying. This leads to higher costs and longer development times as house builders and suppliers have to plan accordingly. Many who gave evidence called for consistent standards to be applied across the UK.

Although the principles of devolution and localism are entirely valid in many different aspects of laws and regulations in the UK it was felt that this is not currently working to achieve healthier homes and buildings throughout the UK. There needs to be greater consistency and a drive to achieve the optimum agreed standards which are applied and enforced. There are examples of local authorities leading the way and applying more stringent conditions for new build or refurbishment in their areas, e.g. the draft London Plan, published in December 2017, but it remains vital that these local plans also address health and wellbeing. Moreover, there are concerns that the national space standard for new housing is not being enforced.



Recommendation 2.4

All housing and building standards (relating to health and wellbeing) should be consistent across the UK. There should be a national optimum standard, which is not just the lowest common denominator of the devolved authorities. Maximising the occupant's health and wellbeing must be placed at the centre of housing and building design and a holistic approach should be taken including elements of safety, space, energy efficiency, ventilation, heating, noise, air quality and lighting.

We need better evidence and research to achieve healthy homes and buildings

Many commented on the piecemeal research into housing compiled over many years and most felt that there had not been any consistent attempt to measure the health of the occupants in that research. Inevitably this could result in wrong decisions being made about housing and Building Regulations. There was a strong consensus that databases should be extended to include other building types e.g. schools and the link to educational performance. The UK Indoor Environments Group (UKIEG) called for an independent, well-researched and systematic review of the UK evidence on healthy building matters. The UKIEG feel that this should be carried out by the relevant research councils so that all of the necessary contributors can be coordinated to generate a consistent output. The Sustainable Housing and Urban Studies Unit at the University of Salford also called for a strong research and evidence base and said that political leadership is essential in moving the healthy homes and buildings agenda forward.

Another concern is the lack of uptake on recommendations made by academia or working groups that have studied the housing sector. UKIEG reported that they ran a workshop in 2016 which made a number of recommendations, including the development of an effective co-ordinated strategy for improving the indoor environment but very little action has been taken by the Government to adopt or progress this plan. MEARU felt that the lack of uptake of recommendations from academic research carried out may be due to the limited funding being available for such studies which in turn limited their scope and power. MEARU told us that there is not enough data on indoor air quality (IAQ) to fully understand all of the serious health implications in buildings. However, we received an extremely wide-ranging number of submissions which

indicated that poor IAQ is causing real health problems throughout the UK.

The issue of overheating was also raised by many of those who gave evidence. Specifically, ARUP and MEARU called for more research to evaluate the problem. Similarly, on noise there is a lack of evidence according to the Institute of Acoustics and the HEMAC Noise Group called for a review of the evidence base in respect of mechanical ventilation to identify if noise is leading to occupants turning off such devices, leading to a decline in indoor air quality.

Recommendation 2.5

There should be a national housing and buildings health database (perhaps maintained by the ONS), which regularly collects and stores information on UK homes and buildings. This should include key indicators relating to occupants' health and help to strengthen the evidence for improved standards of health and wellbeing in housing and buildings e.g. schools and the link to educational performance.

We need a clear commitment from Government to build healthy homes and buildings

We heard many criticisms of the failure to consider health in current building practice. The Leeds Sustainability Institute at Leeds Beckett University recommends that the NHS should lead the whole healthy homes and buildings debate because the problems identified in the Green Paper are public health problems. Public Health England have led this debate and speak frequently at conferences and meetings on the public health aspects of poor housing. However, it was felt that without a common approach being taken across all Government departments it is difficult to see the necessary changes occurring on any significant or impactful scale. It is clear that there is a greater role for the NHS in this debate as evidenced by the Healthy New Towns Initiative.

The Healthy New Towns initiative aims to promote health and wellbeing and secure high-quality health and care services. The NHS has identified 10 sites to date covering 76,000 homes under this initiative to shape the health of communities, and to rethink how health and care services can be delivered. The programme offers an opportunity to unite public health, NHS providers and commissioners, planning and housing development to plan and build healthier places.

Recommendation 2.6

The Healthy New Towns initiative and other relevant schemes should be extended to assess the impact of the internal built environment on health and wellbeing and strive to go beyond standards set out in the Building Regulations and associated documents.



Recommendation 3:

Make the renovation of current housing stock an infrastructure priority and develop plans for retrofitting that takes a holistic approach to maximising health and wellbeing.

We need a national renovation strategy to improve existing homes

Building design and the renovation of the current housing stock should be holistic; considering elements such as energy efficiency, indoor air quality, ventilation, lighting and acoustics, etc. The health, comfort and wellbeing of residents should be at the heart of good building and infrastructure planning.

There is a risk that leaving the European Union could lead to a reduction in standards and as we define the country's priorities during this transition, both existing and new housing should be treated as critical infrastructure, which strengthens economic development and, through its impacts on health and education, improves productivity. Climate change, air pollution and changing demographics, amongst other factors, are increasing the need for adaptability and flexibility to future proof our built environment. Buildings must be designed for the long-term, and our changing conditions require a plan for renovations that address unforeseen circumstances and unintended consequences, such as overheating and poor indoor air quality in energy efficient homes that lack the necessary ventilation.

Given over 85% of homes in the UK will still exist in 2050, the APPG considered renovation to be critical to achieving healthier homes and buildings and noted that whilst the Government has a strategy for new housing there was nothing available to improve existing homes. This must be addressed.

According to BRE (and as noted previously), modern homes are expected to last 1000 years and the socio-economic problems arising from

poor housing in England cost £18.6bn per annum so the savings would make the investment in the renovation of existing homes good value-for-money. Velux presented modelling estimating that if 2% of homes were renovated every year, we could halve the number of unhealthy homes by 2050.

Professor Chris Watson of the Academic-Practitioner Partnership pointed out that the last review of UK housing occurred 40 years ago. He felt it is now time for a new review, and for a new strategy to be implemented. The UKIEG gave evidence to support the need for a cross-departmental approach to renovation, which aligns local and national policy and is co-ordinated by one lead Government Department (see Recommendation 1). The University of Salford's Sustainable Housing and Urban Studies Unit wanted to see a new focus from Government on improving existing homes, as that is the key to delivering healthier homes and buildings across the UK.

Recommendation 3.1

The Government should develop a national renovation strategy to improve homes for health and performance and end the practice of improving energy efficiency without due consideration to the consequences for health.

We need a holistic approach to building design and renovation

The need for a holistic approach to building design and delivery was considered one of the predominant and most urgent actions required by Government.

It was called for by almost all respondents to the Green Paper, who raised issues of conflict in building policy – where an investment or improvement in one area leads to unintended issues and health consequences elsewhere. It was recognised that this issue has become ever more prevalent due to the focus on energy efficiency without due consideration of healthy homes.

Allergy UK raised concerns that increased airtightness through energy efficiency improvements is not being met by equal improvements in ventilation, which is causing an increase in allergic reactions – both in the 21 million allergy sufferers in the UK and in people who had not previously suffered. This position is backed by BEAMA, the trade association for the UK’s electrical products industry, who argued that ventilation is rarely a consideration when energy efficiency measures are installed and that competency issues (caused by a lack of standards required of installers) are leading to unintended consequences, such as overheating, noise and poor performance.

The Institute of Acoustics (IoA) and the HEMAC Noise Group added that noise is not often considered properly and standards are low, noise pollution is more often circumvented than addressed. Poor installation practice is considered a major problem – incorrectly installed, noisy ventilation systems are often turned off because users do not understand the purpose of the equipment. The IoA also reported that noise pollution seriously annoys 7 million people in the UK.

Dr Marcella Ucci of University College London and on behalf of the UKIEG said a holistic strategy to make homes and buildings healthier, which considers energy efficiency as one of many factors, not in isolation, would be required. ARUP also supported a holistic approach and said that this would need to be reflected in Building Regulations to adequately and equally consider overheating, energy usage, noise, and air quality.

The need for a holistic approach was raised and supported by the majority of those we heard from, including the Residential Landlords Association, the UK Centre for Moisture in Buildings, the HEMAC Network, the Good Homes Alliance, the Glass and Glazing Federation, the UKGBC and MIMA.

Recommendation 3.2

The Government should adopt a holistic approach and ensure that future renovation of homes and buildings, in addition to making them energy efficient, improves other elements vital for health and wellbeing, such as ventilation and air quality, lighting and acoustics. This approach should, for example, be adopted in Building Regulations.

Recommendation 3.3

The Government should publish a national league table of housing standards by Local Authorities, regularly recording information such as: spend on Environmental Health Officers, the number of home improvements made and the number of prosecutions undertaken or avoided by intervention, to encourage the protection of people and the improvement of the housing stock.

Take new steps to get healthy homes in the Private Rented Sector

In some areas, the Private Rented Sector (PRS) has led to a decline in standards of health. The households most affected by this often include vulnerable groups and those in greatest need of secure and healthy housing. Increased capacity to respond to vulnerable households and take the action possible under existing law to deal with unfit homes is necessary.

The Northern Housing Consortium and the Academic-Practitioner Partnership, in their contributions to the APPG, pointed out that one third of all homes in the PRS (1.6 million) fail to meet the Decent Homes Standard. This was backed by the Centre of Urban and Regional Studies at the University of Birmingham, who called for the PRS to become an area of high priority for improvements because of the significant number of poor-quality housing and the likely impact it is having on inhabitants’ health.

In their response, CIEH, called for a national landlord licensing scheme to help achieve better management of private rented properties and greater accountability of landlords and their responsibilities. ARUP reported that they believed the PRS should be held to a higher standard of housing quality than they currently are.

There was widespread support for the introduction of a registration scheme, similar to Scotland and Wales, which early reports have suggested are having a positive impact on housing quality.

Recommendation 3.4

Private Rental Sector landlords should be required to ensure their properties meet the Decent Homes Standard, a minimum level of energy efficiency and are not detrimental to the occupant's health and wellbeing. To ensure they are, a Housing Health and Safety Rating System (HHSRS) assessment should be undertaken on a property when a new tenancy agreement is issued or within a specified time period.

Recommendation 3.5

A new national registration system for the Private Rented Sector in England should be introduced in order to improve standards, prevent landlords from providing poor quality housing and ensure remedial work is carried out within a specified timescale.

Recommendation 3.6

Improved tools should be developed for the rental (and sale) of properties for assessing health and wellbeing (not simply energy performance) in homes and buildings and making recommendations for improvement, e.g. the development of a new energy and health performance certificate or a full building renovation passport.

We need greater interventions and incentives in the PRS

While the broader policy framework, including national strategy, needs to be set by Government, there was widespread recognition of the importance of empowering occupants to take action on their own through intervention and incentivisation.

The Leeds Sustainability Institute (LSI) drew attention to the fact that occupants can have a large impact on their indoor environment and that interventions designed to help the occupant understand how their home may affect their health, and the positive behaviour changes they can make, are crucial to delivering improved home health. The LSI also called for the NHS to have some responsibility and ownership in helping to deliver healthier homes: 'the NHS need to ensure that they include data capture

on patients' homes as standard procedure'. This view was supported by the Association of Directors of Public Health, who reported that a 2017 survey by the Royal College of Paediatrics and Child Health (RCPCH) and Child Poverty Action Group (CPAG) showed up to 40% of paediatricians have not been able to discharge a child for lifestyle factors including the patient's poor housing.

The Residential Landlord's Association raised the issue of cost burden for landlords looking to improve their stock, which is equally applicable to householders. It was also identified that energy efficiency measures are incentivised through VAT relief but the same is not true of home improvements designed to make the population and the housing stock healthier. The question of funding improvements was also made by Liverpool Mutual Homes, and many other respondents, including Barratt Homes.

MIMA recommended incentives, based on findings in the 'Affordable Warmth, Clean Growth' report (2017) commissioned by the Energy Efficiency Infrastructure Group, the idea of financial incentives for improvements, such as low interest loans, changes to stamp duty and tax allowances. The UKGBC published a report in 2013 showing how tax incentives could be implemented in practice, without prejudicing different sections of society²².

Velux said that their Healthy Homes Barometer showed that 6 out of 10 homeowners in the UK were planning expenditure on home improvements, estimated to be worth, in total, £56bn. This is a staggering amount but that these improvements were not based on improving health of the property, but more for energy efficiency or aesthetics. Velux suggested there was a need to better direct and focus private investment in home improvements to achieve healthier homes.

Recommendation 3.7

The NHS should be empowered to prescribe, or order, home health checks by qualified entities when a patient presents with symptoms that might be caused or exacerbated by a poor home environment.

Recommendation 3.8

The Government should incentivise the public to improve the current housing stock to high levels of energy efficiency, health and wellbeing by offering tax incentives, for example varying Council Tax or Stamp Duty in line with building performance and offering reduced rates of VAT for spending on qualified products and services that improve the energy efficiency and health of a home.

Ensure quality control over property renovations

Building Regulations for new and renovation of existing buildings should be reviewed to ensure they reflect the best standards to enable improved health and wellbeing, rather than minimum safety levels. More robust standards are required. More monitoring, compliance testing and better enforcement is needed to ensure that we close the gap between design and actual performance.

The APPG heard and received numerous representations regarding the lack of alignment between what a home's performance is supposed to be in theory, and what is achieved in practice. This was described as a huge risk for health in the home, especially in the long term. Evidence received suggested that improved enforcement, testing and better-quality control would help to rectify this issue.

The Passivhaus Trust highlighted the issue of discrepancies between theory and practice, which was echoed by the UKGBC, saying that there needs to be a change to an outcomes focus.

MEARU also supported this position and reported that research shows there is a large gap between design expectations (as per building regulations) and in-use results; compliance is often not actually achieved. The HEMAC Noise Group said that this issue was pertinent to compliance on noise levels and BEAMA reported this was an issue with ventilation installation.

The Association of Directors of Public Health (ADPH) said linking skilled people to developers would be key to achieving better standards. This was a view which was supported by the UKIEG.

Certsure argued the importance of competency of installers, which, if raised across the industry through competent persons schemes, would help to achieve higher quality renovation and better compliance, more akin to what is supposed to be delivered.

In order to achieve this, BRE said that a review of building regulations would be required, a suggestion supported by the majority of the APPG contributors.

Recommendation 3.9

There should be greater enforcement and quality control of home renovation standards with a shift towards measuring 'in use' performance standards, not just design performance, to ensure that improvements made are effective for the long term and do not negatively impact on health and wellbeing.



Acknowledgements

We would like to thank the numerous organisations, representatives and individuals who contributed to this White Paper. Whether through oral or written evidence submissions, participation in the meetings, panel discussions or expert consultation – this paper would not be possible without you.

Airflow
Airtopia
Allergy UK
The Academic-Practitioner Partnership
ARUP
Alliance for Sustainable Building Products (ASBP)
Association of Directors of Public Health (ADPH)
Association of Noise Consultants
Barratt Homes
BEACON, Institute of Biological, Environmental and Rural Sciences, Aberystwyth University
BEAMA Ventilation Group
Bickerdike Allen Partners
British Lung Foundation (BLF)
Building Research Establishment (BRE)
Care and Repair England
Centre for Sustainable Planning and Environments, University of West England (UWE)
Certsure
Chartered Institute of Environmental Health (CIEH)
Chartered Institute of Housing (CIH)
Department of Civil and Environmental Engineering, Imperial College London (ICL)
EDF
Energy Efficiency Infrastructure Group
Energy Saving Trust
EnviroVent
Faculty of Public Health
Generation Rent
Glass and Glazing Federation
Good Homes Alliance
Habinteg
The Health Effects of Modern Airtight Construction (HEMAC) Network
Heatrae Sadia
HEMAC Noise Group
Hoare Lea
IBI Group
Indoor Air Quality Consulting Ltd.

Institute of Acoustics
Johnson and Starley
Leeds Sustainability Institute (LSI), Leeds Beckett University
Liverpool Mutual Homes
Mackintosh Environmental Architecture Research Unit (MEARU)
Glasgow School of Art (GSA)
MIND
Mineral Wool Insulation Manufacturers Association (MIMA)
National Energy Foundation
NIBE
Northern Housing Consortium
Nuaire
Passivhaus Trust
Property Care Association (PCA)
Rachel Bevan Architects
Redring Xpelair
Residential Landlords Association (RLA)
Saint-Gobain
School of Construction Management and Engineering, University of Reading
School of Engineering and Materials Science, Queen Mary, University of London
Shelter
Sustainable Energy Association
Sustainable Homes
Sustainable Housing and Urban Studies Unit (SHUSU), University of Salford
Titon
UK Centre for Moisture in Buildings (UKCMB)
UK Green Building Council (UKGBC)
UK Indoor Environments Group (UKIEG)
Velux
Vent Axia
Verdextra
West Midlands Association of Directors of Public Health
What Works Centre for Wellbeing
Whitecode Design Associates Ltd.
Wirral Older People's Parliament
Zehnder

The work of the APPG would not be possible without the support of our sponsoring partners:



Appendix and References

APPENDIX I: LIST OF USEFUL REPORTS, RESOURCES AND PAPERS

During the course of our hearings and in many of the written submissions to our Green Paper, we received an enormous number of useful documents and reports that support the building of healthy homes and buildings, either through evidence of the cost of poor-quality homes and buildings on society or through innovative solutions. This appendix is available at www.healthyhomesbuildings.org.uk

References:

1. The All-Party Parliamentary Group for Healthy Homes and Buildings. Building our Future: Laying the Foundations for Healthy Homes and Buildings. Green Paper. 2017
2. World Health Organisation. WHO Definition of Health. 1948. Accessed 2018: <http://www.who.int/suggestions/faq/en>
3. BRE. Briefing Paper: The Cost of Poor Housing to the NHS. 2011.
4. Academic-Practitioner Partnership, Housing and Communities Research Group, School of Social Policy University of Birmingham. Good Housing: Better Health. July 2016.
5. UK Green Building Council. Health and Wellbeing in UK Homes. July 2016.
6. UK Association for the Conservation for Energy. Chilled to Death: The human cost of cold homes. March 2015.
7. Allergy UK. Work Fever: Report by Allergy UK into Allergies in the Workplace. 2012.
8. EnVIE. Co-ordination Action on Indoor Air Quality and Health Effects. 2009.
9. Manivannan, et al. Role of Environmental Contaminants in the Etiology of Alzheimer's Disease: A Review. Current Alzheimer's Research. 2015.
10. National Institute for Health and Welfare. Efficient reduction of indoor exposures. Health benefits from optimizing ventilation, filtration and indoor source controls. 2013.
11. Royal College of Physicians. Every breath we take: the lifelong impact of air pollution. Report of a working party. 2016.
12. Awbi, Hazim B. The Future of Indoor Air Quality in UK Homes and its Impact on Health. BEAMA. 2015.
13. Energy Saving Trust. Cold, draughty, mouldy, damp: What the UK public think about their homes. 2014. Accessed 2017: <http://www.energysavingtrust.org.uk/about-us/news/colddraughty-mouldy-damp-what-uk-public-thinkabout-their-homes>
14. World Health Organisation. WHO guidelines for indoor air quality-dampness and mould. WHO Regional Office for Europe. 2009.
15. NHS Choices. Can damp and mould affect my health? Accessed 2017: <http://www.nhs.uk/chq/Pages/Can-damp-and-mould-affect-my-health>
16. The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016.
17. Saint-Gobain. Feel Good, Live Well: The UK Home, Health and Wellbeing Report. 2016.
18. Office for National Statistics. Population estimates for UK, England and Wales, Scotland and Northern Ireland: mid-2017. 2018.
19. Shelter. The Impact of Housing Problems on Mental Health. 2017.
20. UKGBC. Healthy Housebuilding: Making 300,000 New Homes a Year Better Places to Live. 2018.
21. Institute of Acoustics. ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise. New Residential Development. 2017.
22. UKGBC. Retrofit Incentives: Task Group Report. 2013.

This is not an official publication of the House of Commons or the House of Lords. It has not been approved by either House or its committees. All-Party Parliamentary Groups are informal groups of Members of both Houses with a common interest in particular issues. The views expressed in this report are those of the group.