Derby City Council

DERBYSHIRE County Council

Derbyshire Private Sector Housing

Housing and Health Impact Assessment 2023

Acknowledgements

The Derbyshire Housing and Health Systems Group wishes to sincerely thank Kirsty Logan (Public Health Intelligence Analyst) and Rebecca Jones (Senior Public Health Intelligence Analyst), both Derby City Council, who have produced this ground-breaking report. The group also wishes to thank the Derbyshire County Council Public Health Team, Martin Brown (Senior Public Health Manager) and Andrew Muirhead (Housing Initiatives Manager), both Derby City Council, for their oversight, guidance and steer of this project. We would also like to acknowledge the work and expertise of the many Derbyshire Housing and Health Systems Group members who have been eager to support the development of this evidence-based report.

This report provides clear evidence of the impacts of poor quality housing on both the occupant and wider services and offers clear recommendations to consider how we may effectively target, and address issues associated with poor quality homes and thereby reduce the pressures on other services.

Foreword

The evidence to say that housing is an important determinant of health has long been established, with the quality of housing having major implications for people's health. Good quality, suitable and affordable housing is vital to a person's resilience, health and wellbeing. Improved housing conditions can save lives, prevent disease, increase quality of life, reduce poverty, and help mitigate climate change. Housing is becoming increasingly important to health when considering urban growth, ageing populations and climate change. Conversely, as evidenced in this innovative report, the consequences on both physical and mental health and wellbeing of living in cold, damp, overcrowded and unsafe housing are stark and worrying. This report has provided a clear evidence base for the impacts of living in unsuitable housing for our residents, for the subsequent effect on our wider services and sets out several recommendations to improve housing throughout the County.

Since March 2020, most people in the UK have been spending a lot more time at home. Rarely has the nature of these homes been more important, as houses have also become workplaces, schools, and the only place to spend time if working from home, furloughed or unemployed. This has demonstrated stark inequalities in housing, with some residents enduring the lockdown in large homes with gardens and plenty of living space, while others struggle in overcrowded conditions with no outdoor space. COVID-19 has highlighted and intensified existing problems with housing in England. As a society, we should see it as unacceptable that there are such health and wellbeing disparities based on an individual's income and the conditions of the housing they live in. Addressing housing issues offers public health practitioners an opportunity to address an important social determinant of health.

Housing can contribute positively to people's mental and physical health – but all too frequently it does not. With the ongoing energy price crisis, it is important to note that the impact will be felt more greatly by our more vulnerable residents who often live in the most energy in-efficient homes. Also, at a time when more people are becoming ill, it is imperative that we seek to tackle the causes of ill health, such as poor housing conditions. Housing will become increasingly important to health due to demographic changes, with people worldwide now living longer and the pace of population ageing being much faster than it was in the past. In Derbyshire we acknowledge that we have an ageing population, and therefore as a system we must come together to ensure our housing stock meets this challenge to prevent the increased likelihood that our residents will fall, increasing the risk of injury, stress and isolation.

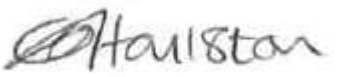
Nationally, Government policy has also reflected the need for affordable, decent and safe housing. For example, the Social Care Reform White Paper recognises that our homes are crucial to our residents having the best possible opportunities to stay healthy and well.

Furthermore, the Levelling Up White Paper states that it is “unacceptable that so many, particularly in the parts of the country most in need of levelling up, are living in non-decent homes, and some in conditions that pose an immediate risk to their health”.

Locally, there is excellent commitment to drive improvements in housing quality across all tenures, working with partners such as health, social care and other public and community organisations. The establishment of the Integrated Care System across Derbyshire, known as Joined Up Care Derbyshire, will allow housing to be discussed by a wide range of partners who can collaboratively tackle the issues which cause poor health and wellbeing. Furthermore, the Derbyshire Housing and Health Systems Group, sub-group of the Derbyshire Health and Wellbeing Board, brings together local partners from a wide range of organisations including health, social care, housing and other community and statutory partners to collaboratively tackle key housing issues in the County and enable health impacts of poor or inadequate housing to be tackled.

The recommendations contained within this report will be vital to seeing improvements in housing conditions across the County. It is essential that partners continue with their recent collaborative commitments to enable these recommendations to be realised, which will lead to positive changes to the lives of many of our most vulnerable residents.

I commend this report and look forward to seeing the developing collaborative efforts of the local system to improve the health and wellbeing of our residents through improved housing conditions.



Ellie Houlston

Director of Public Health, Derbyshire County Council

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Glossary

Chronic Obstructive Pulmonary Disease (COPD) – an umbrella term used to describe a range of common lung conditions including small airways obstruction, chronic bronchitis and emphysema

COVID-19 – disease caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

Housing Health Cost Calculator (HHCC) – a tool used to quantify the health cost benefit to the NHS and society of work undertaken to reduce and mitigate HHSRS hazards

Housing Health and Safety Rating System (HHSRS) – a risk-based assessment tool used by housing and environmental officers to assess the risk (the likelihood and severity) of a hazard in residential housing to the health and safety of occupants or visitors

HHSRS category 1 hazard – a hazard which poses a serious and immediate risk to the health and safety of occupants

Index of Multiple Deprivation (IMD) – a measure of relative deprivation for LSOAs in England

Executive Summary

Housing and Health Inequalities

Health inequalities are avoidable and socially unjust differences in health that exist between different groups of people[1]. The lower an individual's socioeconomic status - as defined by where they live, their home, job, education, income, and wealth - the more likely they are to experience poor health outcomes.

Between 1st January 2003 and 31st December 2018, over a third of premature deaths in England were estimated to be attributable to such wider determinants[2]. Addressing such avoidable inequalities and moving towards a fairer distribution of good health requires action to be taken at all stages of the life course and across the whole of society[3].

The Government's 'Levelling Up' agenda is specifically designed to address these inequalities and disparities[4]. To support the delivery of this agenda, the Office for Health Improvement and Disparities (OHID) was created to help address the unacceptable health disparities that impact our local populations and 'put prevention at the heart to help people live longer, healthier and happier lives'[4]. Preventing illness before it develops will help to reduce pressure on healthcare services, potentially saving significant resources - both money and time. This prevention of ill-health will become increasingly important as our population continues to both increase and age, and the burden of chronic disease increases.

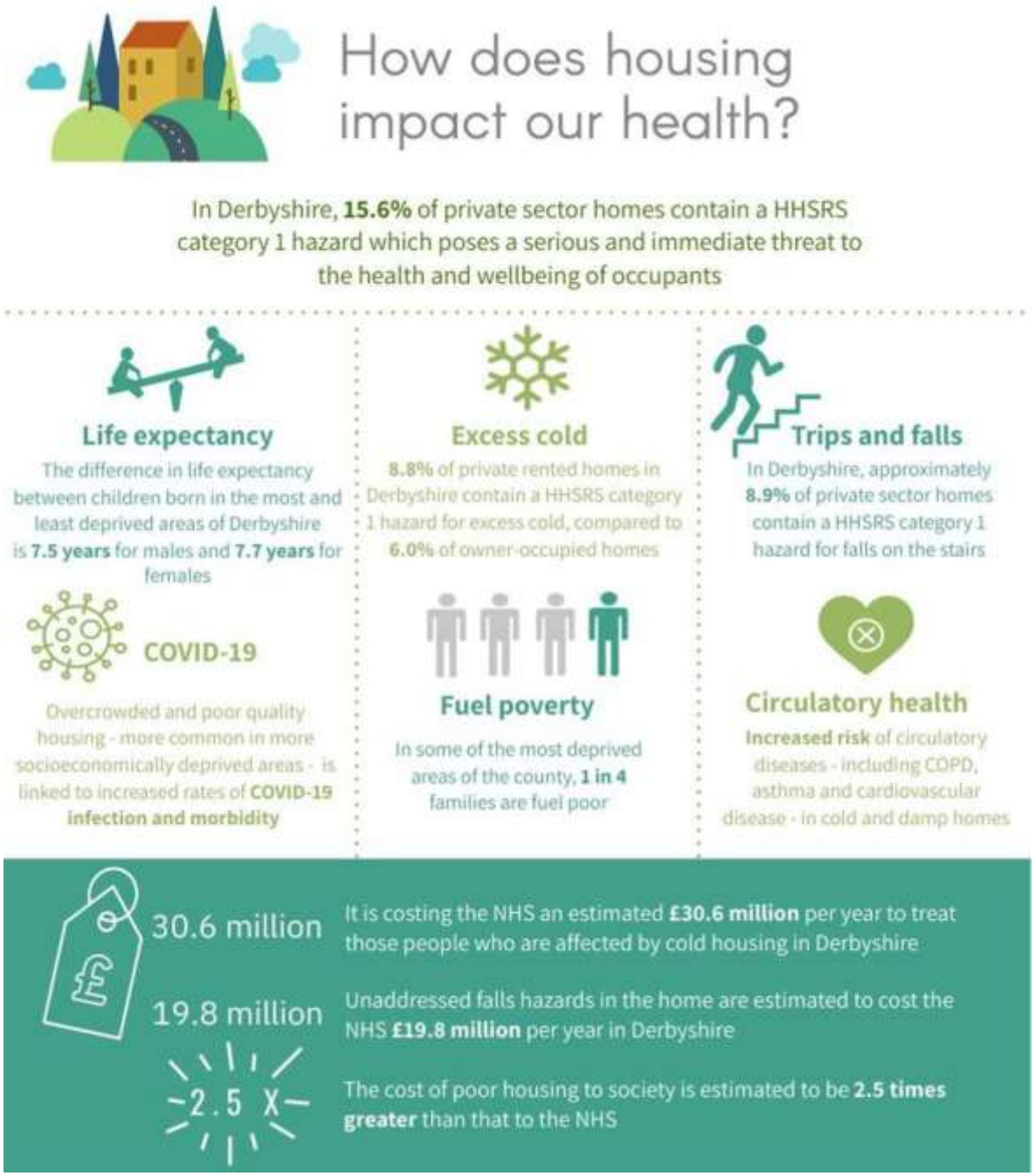
Residence in more socially deprived geographies is associated with reduced mortality and, in Derbyshire, large differences exist in life expectancy and healthy life expectancy between local areas, with people in the poorest areas living about 7.6 years less than those in the most affluent areas.

For many years, research has linked poor quality housing with poor health outcomes and housing is now a well-known wider determinant of health[5]. Poor or unsuitable housing conditions are linked to accidents and injuries, worsening of existing health conditions, poor mental wellbeing and reduced overall quality of life. Housing-related health inequalities follow a social gradient, therefore work to improve population health outcomes must include a focus on improving outcomes for those in the poorest health; those living in insecure, poor quality, unaffordable housing, and those without access to suitable accommodation.

Appropriate support and resource must be prioritised for collaborative working across the health, care and housing agendas. The 2021 'People at the Heart of Care' adult social care reform white paper recognises this and states the requirement for long-term funding along

with “strong leadership and partnerships: no organisation can deliver this change alone… Underpinning them all is the need for strategic leadership that sees the local provision of health, care and housing services not as separate systems, but as a coherent system that seeks to deliver the best outcomes for people, using all the tools available in a joined-up way to deliver the best possible outcomes for their communities”[5].

The 2004 Housing Act introduced the Decent Homes Standard for homes rented from a council or Registered Provider; however, there is currently no decency standard for homes in the private sector (private rented or owner-occupied homes). Therefore, this Health Impact Assessment aimed to investigate the impact of poor quality, private sector housing on the health of residents in Derbyshire.



Literature Review

Housing as a Social Determinant of Health

The home in which we live is the cornerstone of our lives and there is an abundance of evidence demonstrating a correlation between poor quality housing and poor health outcomes.

Introduction

The social determinants of health include education; social and community networks and cohesion; employment and working conditions; income; individual lifestyle factors; and housing[7]. These factors are widely accepted to make a significant contribution to individual health outcomes and health inequalities on a societal level[8]. Estimates place the contribution of the wider social determinants of health towards premature mortality as high as 60%, whilst the influence of healthcare is just 10%[9]. In England, people living in the poorest areas will die, on average, seven years earlier than those in the richest areas[10]. Addressing these wider determinants of health is key to reducing health inequalities.

The home in which we live is the cornerstone of our lives and as such has an important impact on our health. The need for warm, dry, safe and secure housing in essential to allow us to lead healthy independent lives. In Europe, it is estimated that about 65% of time is spent at home, however this increases to as high as 90% in young children[11,12]. This figure is likely to have been considerably higher since the announcement of the first national COVID-19 lockdown in March 2020. The impact of this on wellbeing has not been felt equally, with the greatest impact in those living in poor quality housing in some of the most deprived communities in Derbyshire.

There is a substantial body of evidence demonstrating a correlation between poor quality housing and poor health outcomes[5,13,14]. Such evidence has led to the development of policy such as the Decent Homes Standard in the UK and a drive to promote a focus on and develop the understanding of the intricate relationship between housing quality and health[15]. Despite this, in 2015, 19% of homes in England failed to meet the Decent Homes Standard and in 2019, 24.1% of homes within Derbyshire were found to be substandard and therefore likely contributing to poor health outcomes in their residents[16,17].

Poor housing is not equally distributed within society, with the greatest burden observed in individuals from lower socioeconomic groups and amongst older adults. A strong evidence base demonstrating the effectiveness of housing interventions is required to drive forward necessary policy change and adequate investment to improve the standard of the UK housing stock. There is

also a financial incentive to do so; as a recent briefing paper reported that adequate investment to remove HHSRS category 1 housing hazards (those defined as posing a serious and immediate risk to health or safety) would create savings to the NHS of £1.4 billion in first-year treatment costs alone[18,19].

Lung disease is one of the leading causes of death worldwide and accounted for 20% of all deaths in the UK 2008 – 2012[20]. Although many factors contribute to the prevalence of lung disease, poor housing is known to have a significant negative impact on respiratory health. Within the literature, exposure to cold temperatures has consistently been linked with worsening of respiratory and circulatory conditions[21]. Cold temperatures are known to impair the functioning of the lungs and may trigger bronchoconstriction in patients with asthma and chronic obstructive pulmonary disease (COPD), exacerbating their clinical symptoms[22]. Williamson *et al* found that people with asthma were two to three times more likely to live in a cold and damp homes than non-asthmatics[23]. In addition, research has shown that visits to the GP for respiratory tract infections increases by up to 19% for every degrees Celsius drop in mean temperature below 5 degrees Celsius[24,25]. However, it is also important to consider the many indirect health effects of cold, including increased risk of falls, poor mental health, and reduced education and employment success[20].

A major issue with many of the studies which attempt to show a correlation between poor housing and poor health, is the difficulty in determining or proving the direction of this relationship. However, studies which involve an intervention to improve housing quality and subsequently measure any changes in health outcomes may be valuable in aiding a better understanding of this relationship. They therefore may be used, when the intervention is shown to be effective, to justify spending in this area. This systematic review sought to describe and assess interventions to improve quality of housing and their impact on specified health outcomes.

Methods

The literature search was composed of eight searches of a total of seven databases: Science Direct, Ovid, BNI, CINAHL, Medline, PsycINFO and PubMed. Combinations of the terms ‘housing’, ‘improvement’, ‘intervention’, ‘health’, ‘respiratory’, ‘falls’, ‘cold’ and ‘hazard’ were used to conduct the search. Articles were included or excluded based on whether the title or abstract fulfilled the inclusion criteria. References of the articles which were included in the review were also examined for additional relevant studies.

The quality of each study was then assessed using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies15. The tool evaluates aspects such as study design, selection bias, confounders, data collection methods employed and rates of attrition, to produce a quality score of 1-3, whereby good quality is denoted by a score of 1,

moderate quality scores 2, and low-quality scores 3.

Main Findings

The database search identified 512 studies of which 462 were excluded at the title and abstract stage, with 50 progressing for full-text assessment. Overall, following the study selection process, 20 papers were included in this review (*Appendix 1*).

Several studies have attempted to assess the depth of this relationship to provide an evidence base for the impact of housing intervention on health outcomes[26-34]. These studies focused on differing interventions within the home, including measures to address excess cold by installing double glazing, repairing or replacing heating systems[27,30,31,33,34] or pest management and domestic hygiene[26,28,29,32] to address environmental allergens which might be contributing to respiratory symptoms. Hospital admissions pre and post housing intervention were reported in six of the studies[26,27,30,32,33], statistically significant reductions were seen in general admission[26], respiratory specific admissions[27,30] and amongst older patients[34]. Two of the studies failed to demonstrate significant reductions in healthcare utilisation. Interestingly, three studies[26,27,32] found reduced rates of visits to GP's post housing intervention.

Exposure to poor housing conditions during childhood is also known to adversely affect health outcomes in later life, not only by increasing the risk of poor mental and physical health, but also a result of reduced educational and employment opportunities[35]. A study by Peat *et al* found that children living in damp homes were at 1.5 to 3.5 times greater risk of symptoms of cough and wheezing than children living in non-damp homes[36]. Furthermore, children living in poor quality homes, or homeless, are more likely to have worse school attendance than children from better quality homes due to poorer physical health and the instability of having to move home more frequently during their lifetime[35]. Chapman *et al* reported that housing interventions which reduced the level of cold in homes, reduced the number of school days lost by 1,828 school days per 1,000 participants[33]. Furthermore, a study in Cornwall reported that by installing central heating in the damp, unheated bedrooms of children with asthma, children lost significantly less time from school for asthma (2.1 days compared to 9.3 days per 100 school days)[37].

Older adults and those with existing circulatory health conditions are particularly vulnerable to the negative health effects linked to cold and damp living conditions[38-40]. Research has shown that deaths from cardiovascular disease in England were 22.9% higher in winter months than the average for other times of the year[38]. Meanwhile, Collins *et al* reported that in temperatures below 12°C, short-term increases in blood pressure may increase the risk of stroke and heart attacks[41]. In addition, a study analysing coronary events in people aged 35 to 64 across 21 countries, found that coronary events were more fatal during

colder periods than warmer periods[42]. Furthermore, Zhao *et al* also reported an association between cold indoor temperatures and increased blood pressure[43]. Meanwhile, Lloyd *et al* showed that a complete housing intervention to remove cold, damp and mould hazards in four blocks of flats in Glasgow resulted in a significant fall in blood pressure and a reduction in the use of medication and hospital admissions[44].

Within the literature, lower housing quality has also been correlated with poorer mental health outcomes[45,46]. Rollings *et al* reported that children living in poorer housing had higher baseline levels of depression, anxiety and learned helplessness[45]. Meanwhile, an evaluation of the Government's 'Warm Front' scheme correlated increases in room temperature with a reduced likelihood of depression and anxiety[47]. Other studies have attempted to quantify the mental health impact of living in a poor home. A study using physical and mental health summary scales to assess the effect of home improvement work on residents in 15 deprived communities in Glasgow, reported significant improvements in mental wellbeing of participants[48]. Barnes *et al* found that 28% of young people lacking affordable warmth, were at risk of multiple mental health symptoms, compared with just 4% of young people living in sufficiently warm homes[49]. Research has suggested that the negative mental health effects associated with low quality housing are long-lasting[46].

Poor housing conditions are also known to increase the risk of trips and falls in the home. Trips and falls are one of the leading causes of injury and injury-related death in older adults, contributing to over 5,000 deaths per year[50]. A survey carried out by Age UK in 2017 found that 36% of older people listed a fear of falling at the top of their list of concerns, and while most falls do not result in serious injury, they present a risk for broken bones and loss of confidence and independence[50]. Unaddressed fall hazards in the home are currently estimated to cost the NHS £435 million annually[51]. Children are also at risk of injury from accidental falls, with windows and balconies posing a particular threat[52]. A recent evaluation of the Child Home Safety Equipment Programme, which was piloted in Derby, by Ripplez Family Nurse Partnership, found that A&E admissions fell by 20% following implementation of the Child Safety Equipment Programme[53].

Housing Policy

National Context

A number of Government laws and policies recognise housing as a wider determinant of health with a significant influence on a person's health and wellbeing. The right home environment can protect and improve health and wellbeing and prevent physical and mental ill health. Examples of these laws and policies are outlined below:

Housing Act 2004

The Housing Act 2004 introduced a system for assessing housing conditions and enforcing housing standards in privately owned and rented homes and housing owned by registered providers. Homes are assessed using The Housing Health and Safety Rating System (HHSRS) which considers the risk, likelihood and severity of a hazard to the health and safety of occupants or visitors. The requirements of the Act are wide ranging and covers:

- Dwellings that fail to meet the minimum standards for housing
- Houses in Multiple Occupation (HMO's)
- The need for provision of assistance with housing renewal
- The need to assist with adaptation of dwellings for disabled persons.

Housing and Planning Act 2016

The Housing and Planning Act 2016 extended the range of enforcement measures to local authorities in England against rogue landlords, including:

- The use of banning orders to prevent the worst landlords or letting agencies from letting or managing housing
- Provision of a database of landlords and agents subject to a banning order
- Extending the circumstances in which a local authority can apply to a First-Tier Tribunal for a Rent Repayment Order including breaches of improvement orders and prohibition notices
- Giving local authorities additional enforcement powers in the form of civil penalties (up to £30,000) which can be imposed as an alternative to prosecuting landlords.

Health and Social Care Bill

The Health and Social Care Bill received Royal Assent at the end of April 2022. It contains measures to tackle health disparities and create safer, more joined-up services.

Health and Social Care Integration White Paper: builds on the Health and Social Care Act to ensure people receive the right care for them in the right place at the right time.

People at the Heart of Care White Paper sets out a 10-year vision for social care funded through the Health and Care Levy, while the **COVID-19 Backlog Recovery**

Plan established NHS targets to tackle waiting lists.

Importantly, within these Government Policy documents, the role of housing is recognised and states, for example: "Getting these housing arrangements right for individuals and communities is one example that requires the joining up of not just health and care partners, but a wider set of local government functions and housing providers. Today, too many people with care and support needs live in homes that do not provide a safe or stable environment. We want people to have choice over their housing arrangements, and we also want to ensure places 'think housing and community' when they develop local partnerships and plan and deliver health and care services".

Levelling Up White Paper

The Levelling Up White Paper makes significant reference to forthcoming reforms of the Private Rented Sector. It reiterates the intention to abolish Section 21 no-fault evictions and confirmed that the Private Rent Reform white paper will be published in Spring 2022. On top of that, it includes the pledge that all homes in the private rented sector will be forced to meet the Decent Homes Standard. Furthermore, Minsters will also consult on introducing a landlords register and will "set out plans for a crackdown on rogue landlords". It will "consult on introducing a legally binding Decent Homes Standard in the private rented sector for the first time ever".

A number of other previously announced policies were also included in the government's Levelling Up White Paper, including the Social Housing Regulation Bill and funding to improve energy efficiency.

Local Context

Locally and nationally, health and wellbeing systems are working together to develop person-centred approaches to health and care that focuses on the needs of the individual.

Joined Up Care Derbyshire partners became an integrated care system in 2022, and prevention and population health management are at the heart of an emerging plan to tackle the main causes of lower life expectancy in Derbyshire. To achieve this, Joined Up Care Derbyshire and the Health and Wellbeing Board will strengthen partnership working between the NHS and other organisations involved in health and care, including local councils, the voluntary and community sector, the fire and rescue service, and the police.

The findings of this report will support and inform the local policy arena, including the aforementioned Derbyshire integrated care system, and many of the Council's housing and health strategies, including the Health and Wellbeing Strategy which will be revised throughout 2023.

Derbyshire Health and Wellbeing Strategy

In light of the pandemic, the Derbyshire Health and Wellbeing Strategy was refreshed and updated mid-way through the strategy cycle to reflect the learning on the impacts of the pandemic to date,

and to make sure it aligned with the aims and ambitions of Joined Up Care Derbyshire whilst also informing the Integrated Care Strategy.

The vision of the strategy has a clear focus on prevention and the wider determinants of health, with an ambition to "reduce health inequalities and improve health and wellbeing across all stages of life by working in partnership with our communities".

Within its five shared priorities, outcome 4, "All vulnerable populations are supported to live in well-planned and healthy homes" highlights the strategy's commitment to understanding and responding to the well-established relationship between housing and health.

The strategy will be fully reworked in 2023 to ensure it is in line with the latest strategic developments across Derbyshire, including supporting the recommendations of the Integrated Care Strategy. It is anticipated that housing will continue be a key theme in the Health and Wellbeing Strategy.

Derbyshire County Council Plan 2022-2025

At the heart of the Council's Plan is an ambition to "work together with our partners and communities to be an enterprising council, delivering value for money and enabling local people and places to thrive". As a result of this ambition, the Council wants Derbyshire to have resilient, thriving, and green communities which share responsibility for improving their areas and supporting each other. An important part of this is residents living in safe, energy efficient and age-appropriate homes.

Housing and accommodation for an ageing population: a strategic vision for Derbyshire to 2035

The Council has ambitious plans to support older people to live independently in their own homes and communities for as long as possible. This strategy recognises that Derbyshire has a growing population of older people which is generating considerable demand for suitable accommodation. Therefore, a range of housing options will be available including support services and specialist housing to support the strategic vision that Derbyshire is a place that meets the housing needs and aspirations of older people, by working in partnership across organisations.

Working Age Adults Housing, Accommodation and Support Strategy 2020 – 2035

The provision of good quality accommodation and support is fundamental to enabling people with care and support needs to live as independently as possible in the community. This strategy is aimed at working age adults who may have care and support needs that may include people with physical or sensory disabilities, mental health conditions, learning disabilities and / or people who are autistic. It also considers the wider population and how housing and communities can be developed to promote independent living for those with disabilities or health conditions.

One of the key ambitions is to significantly increase housing options for people to enable them to access the right home and support at the right time. The strategic vision acknowledges the emergence of place-based approaches to health, wellbeing, care and support that will present new opportunities to enable people to live well and independently in their own home for longer.

Combining our Accommodation Strategies

The Adult Social Care Commissioning team are in the process of updating and combining their Older Adult and Working Age Adult Accommodation Strategies. The new All Age Adults' Housing, Accommodation and Support Strategy will build on the current accommodation strategies, reflecting a desire to work across and in partnership with the whole sector.

Derbyshire County Council's Climate Change Strategy: Achieving Net Zero 2021-2025

This strategy sets out Derbyshire County Council's ambition to be a net zero organisation by 2032, or sooner, and what the Council will do to help the county to be net zero by 2050. The Strategy contains 28 priority targets across five key areas (four county-wide, one concerning the Council's estate and operations) which commits the Council to delivering net zero buildings, expanding local renewable energy generation, changing transport choices, generating green jobs and preventing waste being sent to landfill, and also to benefit the local economy.

Derbyshire County Council will work with partner local authorities and other external stakeholder groups to create low and zero carbon homes that reduce emissions but also provide economic and wellbeing benefits for residents. Through Vision Derbyshire, the Council will develop and implement an approach to support the decarbonisation of homes, recognising the specific opportunities and challenges faced by renters and homeowners and reflecting the need to particularly support those living in fuel poverty.

COVID-19

Poor Housing and the COVID-19 Pandemic

Since March 2020, containment measures aimed at reducing the spread of COVID-19 have led to people spending more time at home than ever before, further amplifying already existing housing-related health inequalities.

Following the announcement of the first national lockdown in March 2020, containment measures aimed at reducing the spread of COVID-19 have led to people spending more time at home than ever before. The experiences of lockdown have been felt unevenly, and in a recent UK survey, 31% of adults reported that housing conditions had a negative impact on their mental or physical health during the pandemic[54].

Older adults, ethnic minority and lower socioeconomic status groups face a disproportionate burden of poor-quality housing and are also at an increased risk of adverse COVID-19 outcomes. This is likely to be related to already existing health-inequalities. While evidence surrounding the role of COVID-19 in the relationship between housing and health remains lacking, increased time spent at home is suggested to have amplified the risks of housing-related inequalities on health in two main ways:

Overcrowding – which is more likely in ethnic minority groups where multi-generational living is common – is linked to increased transmission of infectious diseases (e.g., tuberculosis, bronchiolitis and croup) and has been independently linked with an increased risk of COVID-19 infection and mortality[57]. Household transmission is known to have played a significant role in the spread of COVID-19, even amongst vaccinated individuals[55,56]. Reduced ability to self-isolate or shield in overcrowded homes increases the risk of viral transmission and may have contributed to greater rates of COVID-19 infection and mortality observed in ethnic minority groups[56]. At a time when our homes have had to double-up as educational, work and recreational spaces, living in overcrowded housing has also been linked to increased psychological distress[58].

Exposure to **poor quality housing conditions** is also suggested to have increased the risk of experiencing negative health outcomes. Older adults and those with pre-existing chronic conditions are particularly vulnerable to the negative health effects of cold and damp homes and are also at an increased risk of COVID-19 morbidity and mortality[57]. Therefore, for those living in cold and damp homes, increased time spent at home during the pandemic is likely to have not only contributed to the worsening of existing health conditions, but also increased the risk of experiencing worse COVID-19 related outcomes.

Health Inequalities

The Inequality of Housing

Health inequalities are unfair and avoidable differences in health across the population, and between different groups within society[1].

Health inequalities are a result of the unequal distribution of conditions in which we are born, grow, live, work and age (*Figure 1)*. These conditions influence our opportunities for good health, and how we think, feel and act, which leads to differing trajectories and outcomes over the course of a persons life[1].

In 2018 to 2020, the difference in life expectancy between children born in the least and most deprived areas in Derbyshire was 7.5 years for males and 7.7 years for females[59]. The long-standing trend of steady improvement in life expectancy in Derbyshire stalled in 2011, and the most recent data shows a sharp decline in life expectancy, largely as a result of the impact of COVID-19 on mortality. Moreover, males and females living in the most deprived areas can also expect to spend around 13.5 years fewer in good health compared to those in the least deprived areas[59]. Between 1st January 2003 and 31st December 2018, over a third of premature deaths in England were estimated to be attributable to such wider determinants[2]. Meanwhile, the child death rate of children resident in the most deprived neighbourhoods in England (35.5 deaths per 100,000 children) was more than twice that of children resident in the least deprived neighbourhoods (15.5 deaths per 100,000 children)[60]. Therefore, action to address the social determinants of health has never been more critical.

Housing is a key determinant of health - with poor quality or unsuitable housing intrinsically linked to poor health. Poor or unsuitable housing conditions continue to cause preventable deaths, illness, and accidents; they contribute to health inequalities, impact on how long people can expect to live and the overall quality of their lives. The Index of Multiple Deprivation (IMD) considers 7 domains of deprivation - including income, barriers to housing, and living environment - to rank each Lower Layer Super Output Area (LSOA) in England from the most to least deprived[61]. Lower IMD is closely correlated with a range of negative health outcomes, including higher COVID-19 related morbidity and mortality[57].

Derbyshire is ranked as the 103rd most deprived authority in England, out of 151, however, 12.6% of the population live in the most deprived 20 percent of neighbourhoods in England (*Figure 2*). These LSOAs are concentrated in the right-hand side of the County, with the greatest proportion of homes in the most deprived IMD quintile in Chesterfield (29.7%), Bolsover (22.0%) and Erewash (15.3%).

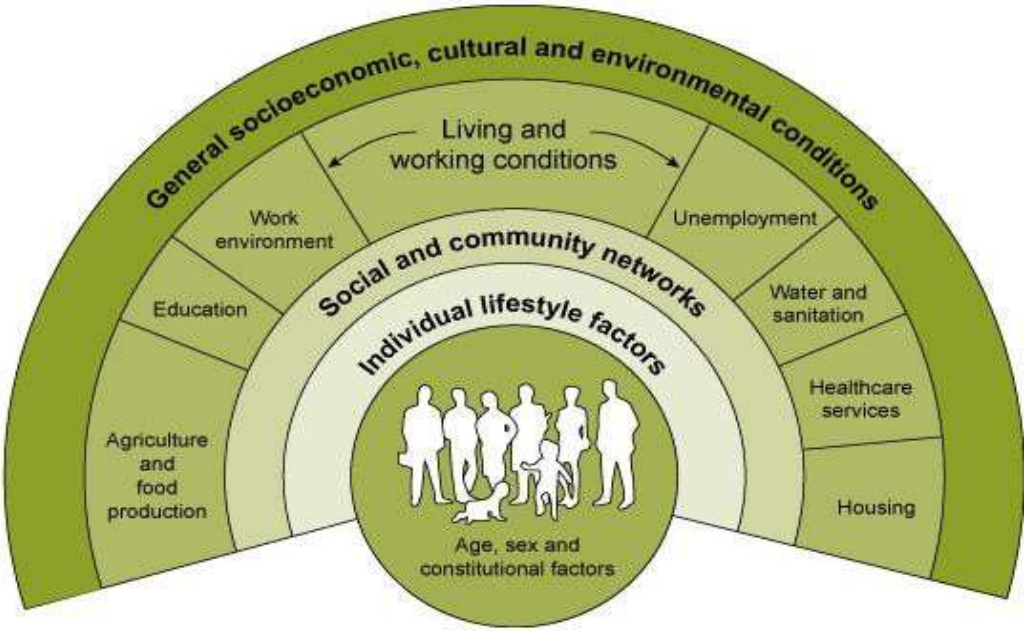


Figure 1: The Dahlgren and Whitehead model of health determinants (1991)

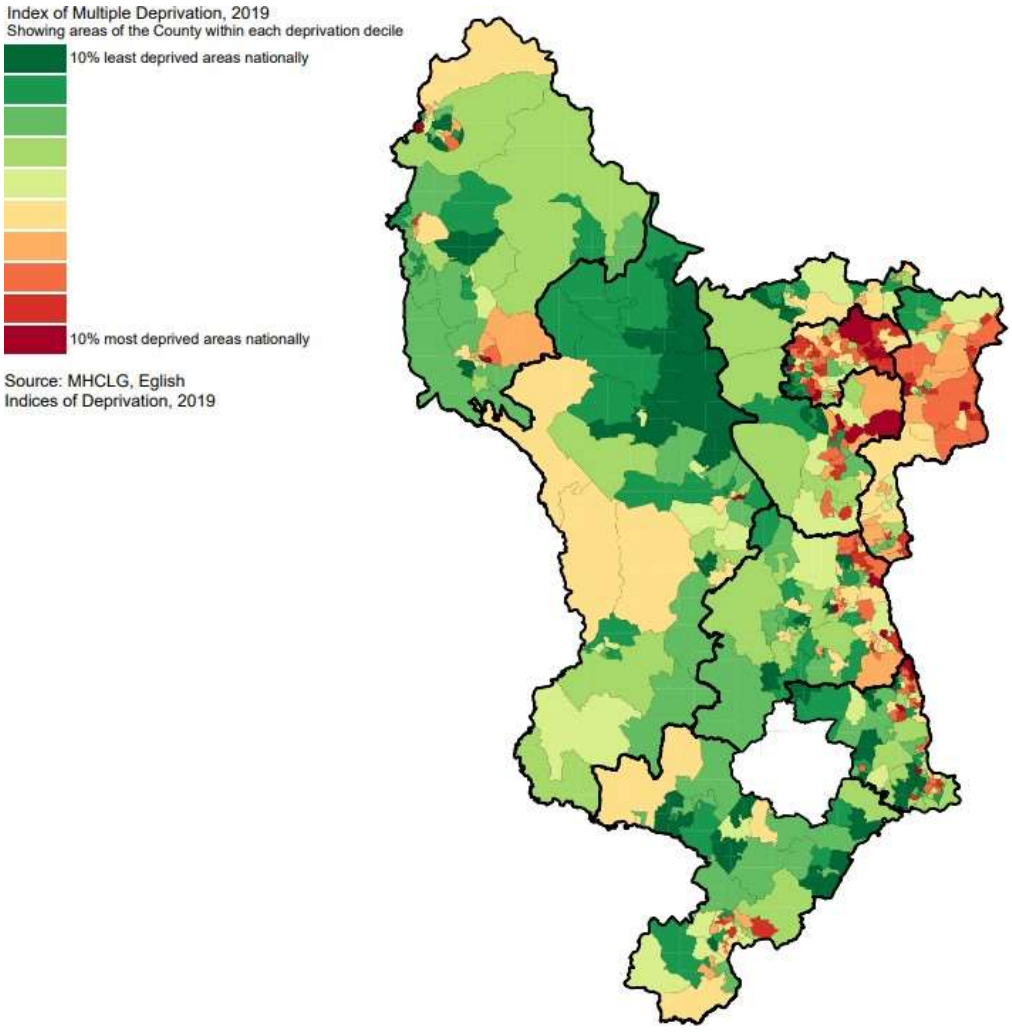


Figure 2: LSOAs in Derbyshire by Index of Multiple Deprivation (IMD) 2019

Figures 3 and *4* show that since the year 2012, life expectancy in Derbyshire for both males and females has been lower than the average for England.

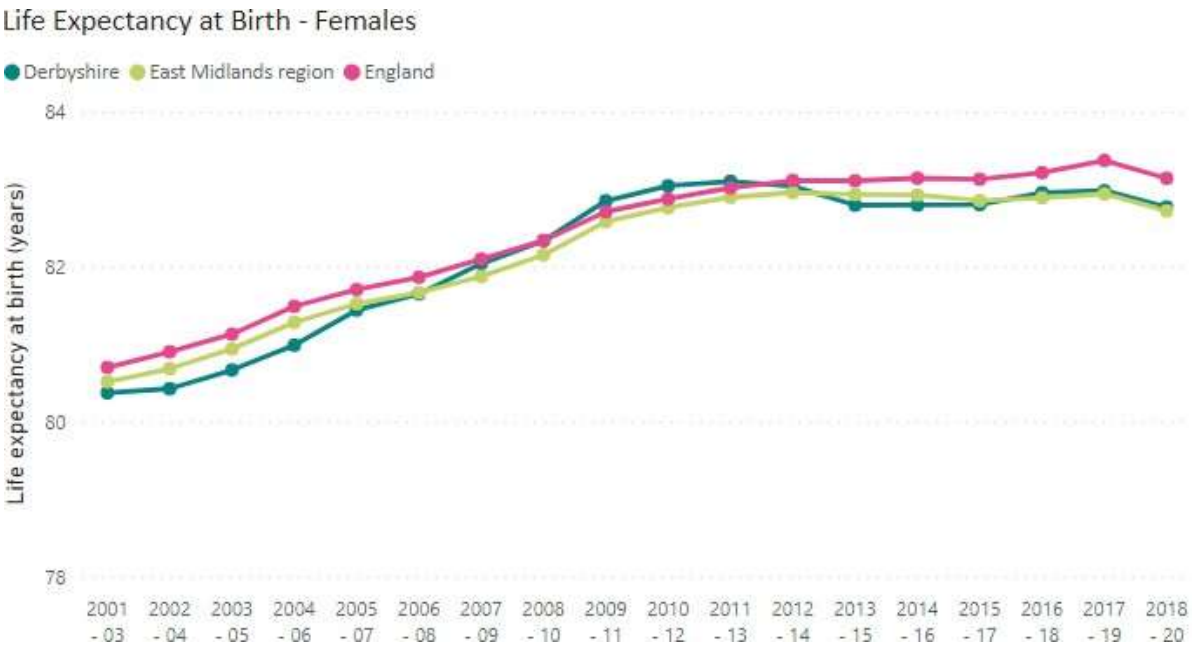


Figure 3: Life expectancy at birth for females between 2001 - 2003 and 2018 - 2020

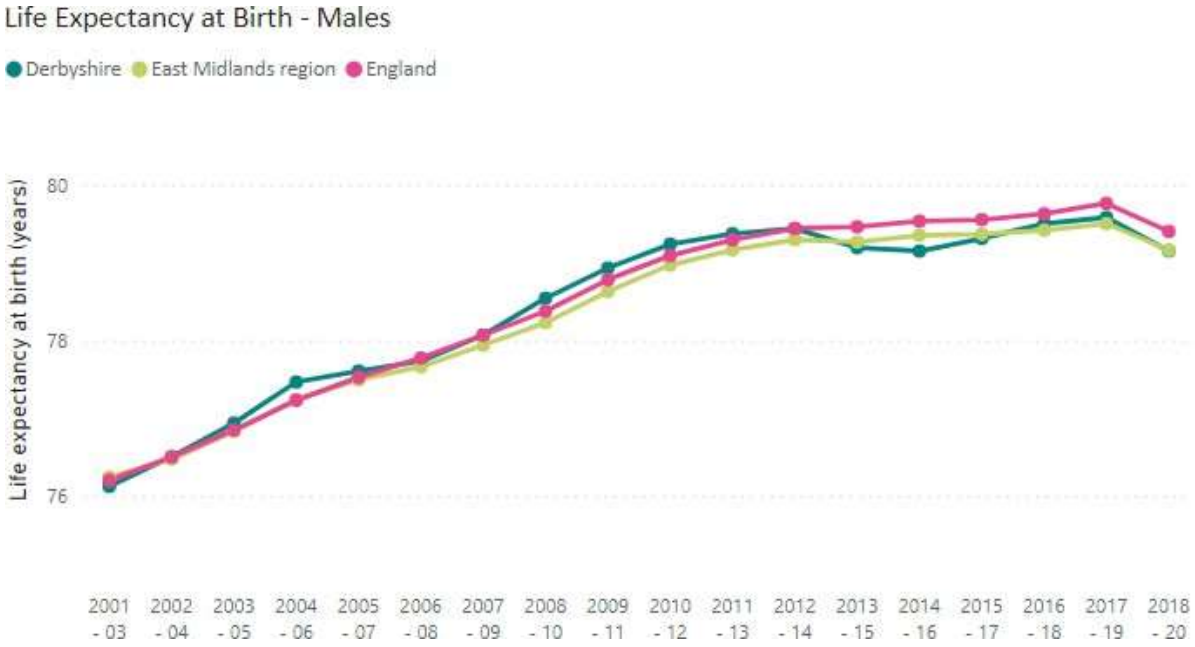


Figure 4: Life expectancy at birth for males between 2001 - 2003 and 2018 - 2020

Methods

The number of homes with a HHSRS category 1 hazard in Derbyshire has been modelled using the English Housing Survey data 2017. The propensity for different property types, ages, tenures and deprivation levels to have a HHSRS category 1 hazard have been modelled and applied to the Derbyshire Housing Stock Condition Database. This gives each residential private sector address (owner-occupied or private rented) in Derbyshire a likelihood of it containing a HHSRS category 1 hazard.

In 2019, Derby City Council developed a four-stage methodology to model private sector (owner occupied and private rented) housing conditions across Derby and Derbyshire. The methodology developed utilised address-level modelling to estimate the likelihood of each home to be decent/ non decent and the likelihood of each home to contain a HHSRS category 1 hazard. The four-stage methodology is described in detail below:

Stage 1: Creation of a property characteristics database

Multiple local and national data sources were utilised to develop an address-level database of housing characteristics within the city and county. Combining local and national administrative data sources enables an accurate picture to be compiled of the characteristics of individual properties within the local area. The use of multiple data sets enables the probable characteristics to be identified with a higher degree of accuracy, allowing for natural errors within the data sources, by triangulating property characteristics across several data sources.

All datasets were address-matched, against the Local Land and Property Gazetteer (LLPG), to match each piece of address data to the correct address and Unique Property Reference Number (UPRN). The individual datasets could then be combined into a single database, utilising the UPRNs, and triangulated to identify the most probable characteristics for each home.

Unmatched addresses were investigated and, where possible, matched manually to a UPRN. Following this rigorous process, unmatched homes resulting from inaccuracies in the source datasets were omitted from the housing characteristics database and have been excluded from this analysis.

This property level database has been referenced through this report as the "Derby stock condition database, 2021."

Stage 2: Analysis of the English Housing Survey, April 2016 – March 2018 (EHS 2017)

The English Housing Survey, April 2016 – March 2018, was analysed to identify the propensity for different property types, ages and tenures to:

- Be decent/ non-decent (according to the Decent Homes Standard)
- Pass / fail the four criteria underpinning the DHS

- Contain a HHSRS Category 1 hazard (propensities were calculated for each hazard).

Stage 3: Application of propensities identified in Stage 2 to the local property characteristics database created in Stage 1

The propensities for different types, ages and tenures of homes to be decent/ non-decent and their likelihood to contain a HHSRS category 1 hazard (calculated in Stage 2) were then applied at an individual property level to the property level database (created in Stage 1).

This process identified the likelihood of each individual home to be decent / non-decent and to possess HHSRS Category 1 hazards.

Stage 4: Analysis of health-related data

For NHS hospitals in England, Hospital Episode Statistics (HES) are the national repository of:

- Admissions to hospital
- A&E attendances
- Outpatient appointments.

HES data, along with data from the Office for Health Improvement and Disparities Public Health Profiles, was analysed in association with the results of the Derbyshire Stock Condition database to identify any correlations between poor housing and health outcomes.

The English Housing Survey

The English Housing Survey (EHS) is a continuous national survey commissioned by the Department for Levelling Up, Housing and Communities (DLUHC). It collects information about people's housing circumstances and the condition and energy efficiency of housing in England. The EHS comprises two surveys:

- A household interview
- A physical inspection of a sub-sample of homes.

The physical surveys are undertaken by a qualified surveyor and include both an internal and external assessment of the home. Critically, the physical surveys provide evidence about energy efficiency, the Housing Health and Safety Rating System and the decency of homes. Results from the EHS are used by the Government to understand housing and issues affecting householders across England and are used to:

- Inform and monitor the development of housing policy
- Monitor the condition and energy efficiency of English homes
- Support the targeting of policies and resources.

Between April 2016 and March 2018, 13,300 household interviews were conducted. From these households, 6,200 homes were physically surveyed with rented homes being over-sampled within the survey (21.1% of the homes surveyed were within the PRS, compared to 20% of the national housing stock).

HHSRS Hazards in Derbyshire

What are the HHSRS Hazards?

In Derbyshire, 48,677 households are living in a home with at least one Category 1 HHSRS hazard. These are hazards that pose an immediate and serious threat to the health and well-being of occupant.

The Housing Health and Safety Rating System (HHSRS) was introduced under the Housing Act 2004[62]. It is a risk-based assessment tool used by housing and environmental officers to assess the risk (the likelihood and severity) of a hazard in residential housing to the health and safety of occupants or visitors[63]. The HHSRS identifies 29 hazards in total which can be sub divided into four main groups according to the nature of the hazard.

Physiological hazards - Damp and mould growth, excess cold.

Accident hazards - Falls associated with baths, falling on stairs, falls on the level, falls between levels, electrical hazards, fire, hot surfaces and collision and entrapment.

Psychological hazards - Crowding and space and entry by intruders.

Infection Hazards - Domestic hygiene, pests and refuse, food safety, personal hygiene, sanitation and drainage.

Dwellings are assessed by an inspector who will look at the whole building, assessing each potential hazard against the likelihood of an occurrence that could lead to harm to a member of the vulnerable group and the range of potential outcomes from an occurrence, occurring within the next 12-months. From these two judgements, a HHSRS hazard score is calculated. Hazards which provide a serious and immediate risk to the health and safety of occupants are category 1 hazards. Less serious or less urgent hazards are category 2 hazards.

The full HHSRS includes 29 different hazards which pose a risk to the health and well-being of residents. However, this report will focus only on those hazards for which there is sufficient local data for analysis to be meaningful (*Table 1*).

For more detailed information around the calculation of hazard scores, the HHSRS operating guidance contains a full breakdown of the hazards and identifies the groups which are most at risk of harm from each individual hazard, together with a summary of the known health impacts of living in a home with each hazard[63].

Table 1: HHSRS hazards, health and vulnerable groups

HHSRS Hazard	Impact on Health	Vulnerable Groups	Actions to Mitigate the Hazard
Excess cold	Increased risk and exacerbation of cardiovascular and respiratory conditions e.g. stroke, heart attack, asthma and chronic obstructive pulmonary disease (COPD) Increased blood pressure Poorer mental health Increased risk of falls Excess winter deaths Loss of work and school days (reduced educational attainment)	Older adults Pregnant women Babies and young children Low income Disabled	Improving heating and thermal efficiency
Damp and Mould	Exacerbation of asthma and allergies Susceptibility to lower respiratory tract infections Social isolation and poor mental health	Children Older adults	Improving heating and ventilation; and addressing any structural problems in external walls/ roof
Falls	Accidents and injuries Fractures Loss of independence	Children Older adults	Window locks, security lighting, barriers and hand rails
Entry by intruders	Fear of burglary Emotional stress	All	Window and door locks, security lighting and key safes
Other hazards e.g. flames and hot surfaces; electrical hazards; collision and entrapment	Physical injury, electrocution, severe burns and scalds	Children Older adults	Encasement of radiators and pipes; certification and regular checks of electrical appliances; and suitable lighting

The number of private sector homes with a HHSRS category 1 hazard in Derbyshire has been modelled using the English Housing Survey data 2017. The propensity for each property type, age, tenure and IMD quintile to have a HHSRS category 1 hazard was modelled and applied to the Derbyshire Housing Stock Condition Database. This allowed us to calculate the likelihood of each residential, private sector (owner-occupied or private rent) address in Derbyshire to contain a HHSRS category 1 hazard.

In Derbyshire, approximately 48,677 (15.6%) private sector homes contain at least one HHSRS category 1 hazard (*Table 2)*. Category 1 hazards are defined as those which pose a serious and immediate risk to the health and safety of occupants. It is important to acknowledge that many of these homes will contain more than one HHSRS category 1 hazard. Nationally, the 2020 English Housing Survey estimated that 9% of the total housing stock (including social housing) in England contained a HHSRS category 1 hazard, compared to 21% in 2009[64].

It is well understood that, in general, private rented homes are in poorer condition than owner-occupied homes, with a greater prevalence of category 1 hazards. In Derbyshire, 20.1% of private rented homes contained a HHSRS category 1 hazard, compared to 14.9% of owner-occupied homes. The national figures also show the same pattern, with 12% of private rented properties containing a HHSRS category 1 hazard, compared to 10% of owner-occupied homes.

In Derbyshire, Derbyshire Dales (20.7%), High Peak (18.4%) and Amber Valley (16.4%) had the highest proportion of homes with at least one HHSRS category 1 hazard (*Figure 5)*.

Table 2: HHSRS Category 1 hazards in Derbyshire

Local Authority	Owner Occupied homes with Category 1 HHSRS hazard		Private Rented homes with Category 1 HHSRS hazard		Total Private Sector homes with Category 1 HHSRS hazard	
	n	*%*	*n*	*%*	*n*	*%*
Amber Valley	7,017	15.6%	1,386	22.2%	8,403	16.4%
Bolsover	3,288	13.3%	1,148	20.8%	4,435	14.6%
Chesterfield	4,305	13.2%	1,044	17.1%	5,348	13.8%
Derbyshire Dales	5,238	20.2%	1,014	23.8%	6,252	20.7%
Erewash	5,816	14.8%	1,394	19.9%	7,210	15.6%
High Peak	5,771	17.9%	1,076	21.5%	6,847	18.4%
North East Derbyshire	4,345	12.9%	708	18.6%	5,053	13.5%
South Derbyshire	4,286	11.9%	842	17.4%	5,128	12.5%
Total Hazards	***40,066***	***14.9%***	***8,611***	***20.1%***	***48,677***	***15.6%***

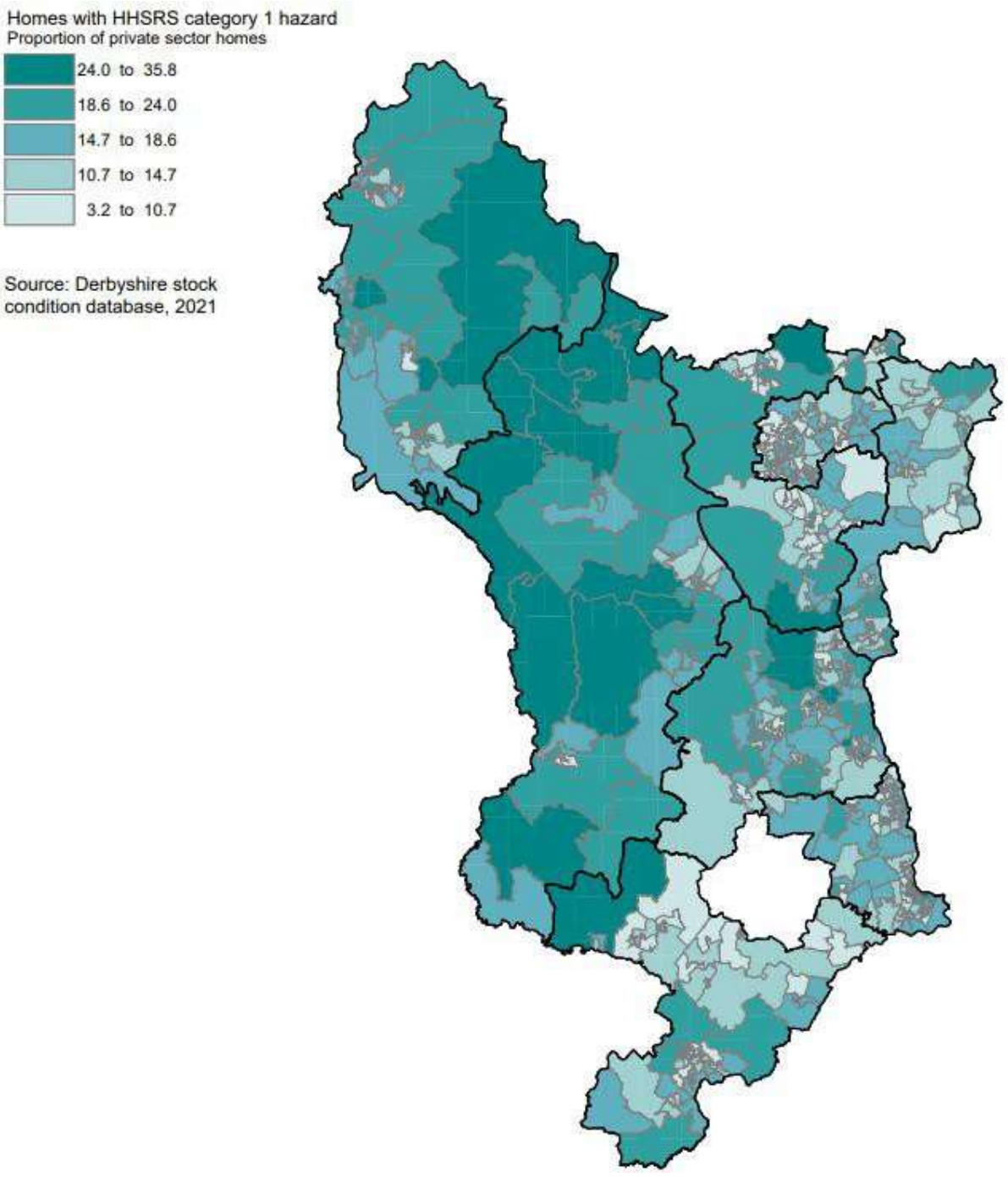


Figure 5: Proportion of private sector homes in Derbyshire with a HHSRS category 1 hazard

Physiological Conditions

Cold Homes

Mortality during winter increases more in England compared to other European countries with colder climates which suggests that many more winter deaths could be prevented.

It is widely understood that living in a cold home is significantly detrimental to health, contributing to increased excess winter mortality and reduced mental wellbeing of residents (*Figure 6*). Current trends of the ageing population, higher levels of unemployment and an increase in the number of people working from home, make the need for a sufficiently warm home even more important to health[40].

Older adults and those with long-term conditions are particularly vulnerable to the negative health effects of living in a cold home. People living in the coldest homes are three times more likely to die from a cold-related illness, compared to those living in warmer homes[40]. An estimated 28,300 excess deaths occurred in England and Wales during winter 2019 to 2020 (excluding all deaths that mentioned COVID-19 on the death certificate)[65]. This figure is 19.6% higher than the previous winter[65].

During winter 2019 to 2020, respiratory diseases were the leading cause of excess winter mortality, accounting for 39.6% of all excess winter deaths in England[65]. Cardiovascular diseases accounted for 21.1% of all excess winter deaths in the same year[65]. Research has shown exposure to cold indoor or outdoor air temperatures suppresses the immune system - diminishing the lungs capacity to fight off infection - and increases bronchoconstriction and mucus production[40]. These factors are associated with an increased risk of bronchitis and pneumonia[40]. It has been estimated that GP visits for respiratory illness increase by up to 19% for every 1°C drop below 5°C in mean temperature[66]. A study by Webb *et al* found that older people living in fuel poor households, or those who did not own their home, had significantly worse respiratory health (measured by peak expiratory flow rates) than those not living in fuel poverty or who owned their own homes[67]. Moreover, indoor temperatures of 12°C or less have been linked to increased blood pressure, via increased cold-induced vasoconstriction[41]. can cause a constriction in the blood vessels, resulting in a rise in blood pressure. Thickening of the blood further increases the risk of clots. If these clots form in the heart and brain vessels, they can lead to heart attack and stroke.

A separate study reported a link between a 1°C lowering of temperature in the living area of an older persons home with a rise in systolic blood pressure, due to cold extremities and a lower core body temperature[68].

Reducing excess winter mortality is a key indicator of the public health outcomes framework. Research carried out by the Eurowinter group found that mortality during winter increases more in England and Wales compared to other European countries with colder climates, suggesting that many more deaths could be prevented[69].

Individuals living in cold conditions are known to have greater calorific needs, and lower income households who are more likely to live in cold homes, are at a greater risk of experiencing food insecurity[70]. For infants, exposure to cold conditions and the associated impact on weight gain, during a critical period of development, is likely to cause the greatest detriment to long-term health outcomes[70].

Moreover, living in a cold home is linked to reduced mobility and an increased likelihood of falls and injuries, particularly among older adults[51]. Symptoms of arthritis are also known to worsen in cold homes, while strength and dexterity decrease, increasing the risk of injuries[40].

In addition to the direct consequences of cold homes, there are also significant indirect impacts on health. Within the literature, cold and damp housing has been associated with an increased likelihood of mental health problems, including depression and anxiety. For some, the impact of living in a cold and damp home can lead to increased social isolation by creating a reluctance to invite friends and family over to a cold and damp home[71]. The mental health of children and younger adults is also negatively impacted by living in a cold home. Studies have suggested that more than one in four adolescents living in cold housing is at risk of developing mental health problems, compared to one in 20 adolescents who have never lived in cold housing[72]. Cold homes can also impact on education, due to the lack of a warm place to study, and worse school attendance due to poorer physical and mental health[35].

Moreover, a recent report estimated that treatment of the health impacts of cold homes, costs the NHS £857 million per year, meaning there is also a significant financial incentive to reducing the number of cold homes nationally[18].

The HHSRS hazard for excess cold covers the threats to health which exist from sub-optimal indoor temperatures. The HHSRS assessment, which assumes the home is occupied by the most vulnerable population group (for excess cold this is adults aged over 65 years), takes into account the property characteristics (e.g. property age, disrepair), energy efficiency rating and the effectiveness of the heating system. As a result, HHSRS category 1 hazards for excess cold are more likely in older properties which are less likely to be energy efficient and harder to heat to an adequate standard.

A dwelling with a HHSRS category 1 hazard is considered to fail the minimum statutory standard for housing

Figure 6: Impact of cold homes on health

Table 3: Proportion of homes with a HHSRS category 1 hazard for excess cold in Derbyshire

Local Authority	Total Private Sector homes	Number of homes with HHSRS Category 1 hazard for Cold	Proportion of homes with HHSRS Category 1 hazard for Cold
Amber Valley	51,158	3,277	6.4%
Bolsover	30,287	1,492	4.9%
Chesterfield	38,781	1,656	4.3%
Derbyshire Dales	30,253	3,955	13.1%
Erewash	46,212	2,546	5.5%
High Peak	37,252	2,910	7.8%
North East Derbyshire	37,458	2,036	5.4%
South Derbyshire	40,973	1,945	4.7%
Total	***312,374***	***19,816***	***6.3%***

In Derbyshire, approximately 6.3% (*n=19,816*) of households contain a HHSRS category 1 hazard for excess cold (*Table 3)*. Homes with this level of hazard are thought to pose a serious risk to the health and safety of residents.

The areas with the greatest proportion of homes with a HHSRS category 1 hazard are Derbyshire Dales (13.1%), High Peak (7.8%) and Amber Valley (6.4%) (*Figure 7)*. In Derbyshire, a greater proportion of private rented homes contain a HHSRS category 1 hazard for excess cold (8.8%) than owner occupied homes (6.0%), a pattern that is replicated nationally (*Figure 8)*.

There are many measures that can be put in place which can help reduce the risk of cold on the health and well-being of the residents. These measures include:

- Appropriate levels of thermal insulation
- Adequate heating, which can be controlled by a resident and sufficient to allow the whole dwelling to be adequately heated
- Low level background ventilation

Although cold homes are found throughout the County, it is cold homes in the most deprived areas which are likely to have the greatest impact on health.

6.3%

In Derbyshire, **6.3%** of private sector homes contain a HHSRS category 1 hazard for excess cold

Case Study

Mr and Mrs S were referred to the Healthy Home Programme (HHP) via the Citizens Advice Bureau. Mrs S lives with a number of chronic health conditions including asthma, arthritis and fibromyalgia. Mr and Mrs S are both disabled and rely entirely on benefits for income. Unfortunately, a large debt repayment makes their disposable income extremely small and, at the time of the HHP visits, they were surviving on £12 a month after living expenses. The couples home was heated by two inefficient, wall-mounted heaters and an expensive immersion heater to supply hot water. The heaters were also difficult to control. As a result, the house was under-heated which made Mrs S's health conditions very painful.

The HHP team helped install a new condensing boiler, modern radiators, and a mobile timer/ thermostat which enables the couple to control the heating and move freely around the house. The team also installed a carbon monoxide monitor and contacted Derbyshire Fire and Rescue Service to undertake a Home Fire Safe and Well Check.

Mrs S has already noticed a marked improvement in her health since the intervention as the change in temperature between rooms previously worsened her joint pain and wheeziness.

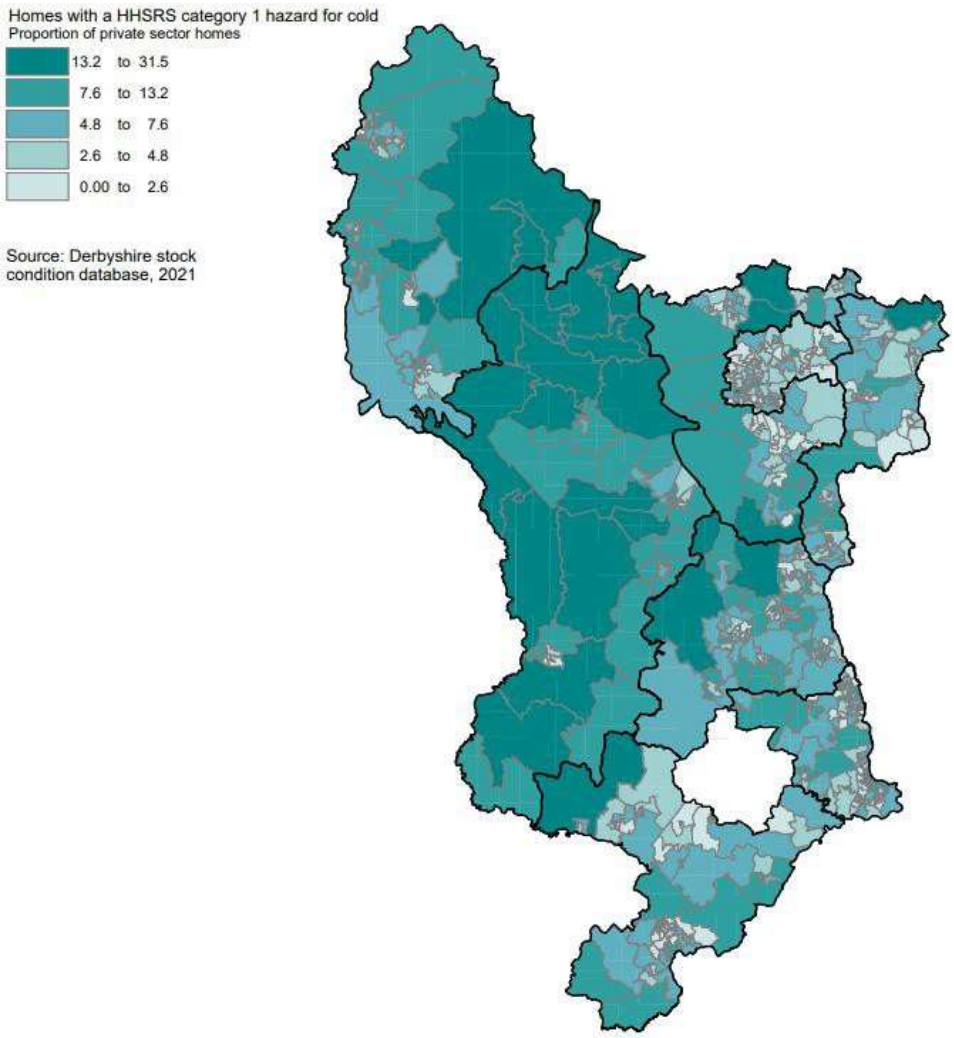


Figure 7: Proportion of private sector homes in Derbyshire containing a HHSRS category 1 hazard for excess cold

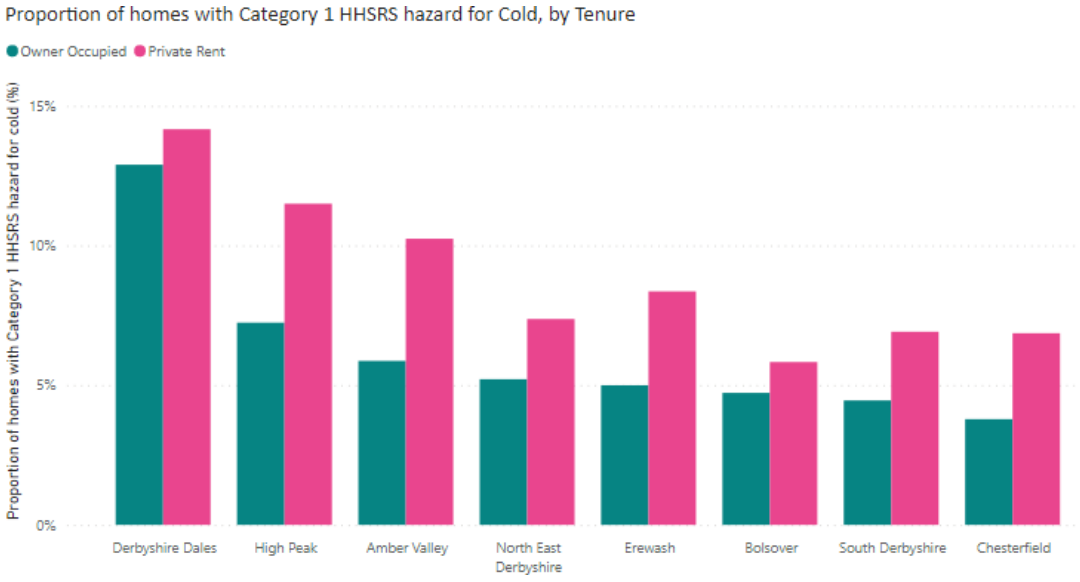


Figure 8: Proportion of private sector homes with HHSRS category 1 excess cold hazard by tenure

In England, respiratory disease affects one in five people and is the third largest cause of death. Respiratory diseases are a major factor in winter pressures faced by the NHS, with the number of respiratory admissions doubling in the winter months. Hospital admissions for lung disease have risen over the past seven years at three times the rate of all admissions generally. Although respiratory disease is a complex medical issue, there is a growing body of evidence linking cold homes with worse disease outcomes. It is also widely acknowledged that incidence and mortality from respiratory diseases are higher in disadvantaged groups and in areas of social deprivation. The mortality rate for respiratory diseases in Derbyshire is higher than the figure for England. Derbyshire also has considerably more homes containing at least one HHSRS category 1 hazard than the average for England (15.6% compared to 9%).

In areas where higher levels of poor-quality homes combine with high levels of deprivation, deaths from respiratory disease are estimated to be above those seen in less deprived areas. Between 2015 and 2019, Bolsover and Chesterfield had the highest rates of death from respiratory disease in Derbyshire (*Figure 9)*. Bolsover and Chesterfield also have the highest mortality rate from respiratory disease in under 75s considered preventable, in the County. The rates of 27.9 and 23.5 per 100,000 population are significantly higher than the average rate of 18.1 per 100,000 for Derbyshire. These deaths are considered preventable and could mainly be avoided through effective public health and primary prevention interventions. Furthermore, it is also important to acknowledge that the association between respiratory disease, health inequality and cold homes will be compounded by smoking, however this is likely to have a multiplicative effect. 13.3% of adults in Derbyshire are estimated to be current smokers, and the distribution follows a social gradient with the greatest prevalence in Chesterfield (17.6%), Erewash (16.1%) and Bolsover (*Appendix 2*)[59].

Deaths from respiratory diseases, all ages, standardised mortality ratio 2015 - 19

Indirectly standardised ratio - per 100

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	-	344,055	100.0	99.7	100.3
Derbyshire	-	5,961	108.5	105.7	111.3
Bolsover	-	671	134.5	124.5	145.1
Chesterfield	-	943	128.3	120.2	136.7
North East Derbyshire	-	893	115.9	108.4	123.8
South Derbyshire	-	647	112.1	103.6	121.1
High Peak	-	637	106.1	98.0	114.6
Amber Valley	-	903	101.2	94.7	108.1
Erewash	-	748	93.8	87.2	100.7
Derbyshire Dales	-	519	83.2	76.2	90.7

Figure 9: Death rate from respiratory diseases at all ages in Derbyshire between 2015-2019. Data sourced from OHID Fingertips Public Health Profiles, available from: https://fingertips.phe.org.uk/search/respiratory%20disease#page/3/gid/1/pat/402/par/E10000007/ati/401/iid/93260/age/1/sex/4/cat/-1/ctp/-1/yrr/5/cid/4/tbm/1/page-options/car-do-0

Research has shown that people whose main living areas are heated to 21°C for more than 9 hours a day, have significantly better respiratory health than those in colder homes[73]. In addition, it has also been shown that patients living with COPD are particularly vulnerable to the negative health impacts of cold homes. COPD is a serious, disabling condition associated with significant morbidity and mortality. The prevalence of COPD diagnosis in Derby and Derbyshire CCG in 2019/2020 was 2.2%, this is significantly above the prevalence seen in England as a whole, which for the same period was 1.9%. The levels of COPD diagnosis in Derby and Derbyshire CCG have steadily increased over the previous 10 years from a prevalence of 1.8% in 2009/2010. For these people, living in a home with a hazard for cold will be having a serious negative impact on their respiratory health and quality of life. Homes with a hazard for cold are located throughout the county, typically following a pattern of older homes which are traditionally single skinned and with limited insulation. When these homes are also located in areas of the county which are among the most deprived, the rate of hospital admission for COPD increases (*Figures 10 and 11)*. The rate of emergency hospital admissions for COPD in Derbyshire is similar to the average levels for England (403 vs 415 admissions per 100,000). However, in Chesterfield, this figure is significantly higher than the regional and national average, with 537 admissions per 100,000 population. Chesterfield also contains a greater percentage of people living in the 20% most deprived areas in England, than the average for Derbyshire (29.5% versus 18.3%), and the greatest proportion of private sector homes built before 1918 in the county (17.4%). Although the relationship between housing and the development and exacerbation of COPD is not causative, there is a clear link between deprivation, poor housing and worsening health outcomes for those living with COPD and other respiratory conditions.

Emergency hospital admissions for COPD 2019/20

Directly standardised rate - per 100,000

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	→	133,103	415	413	417
Derbyshire	→	2,145	403	386	421
Chesterfield	→	365	537	483	595
Bolsover	→	235	473	414	538
South Derbyshire	→	270	451	399	509
Erewash	–	320	437	390	488
High Peak	→	255	423	372	478
Amber Valley	→	335	389	348	433
North East Derbyshire	→	260	345	304	390
Derbyshire Dales	→	110	187	154	226

Figure 10: Rate of emergency hospital admissions for COPD in Derbyshire between 2019/20. Data from OHID Fingertips Public Health Profiles, available from: https://fingertips.phe.org.uk/search/COPD#page/3/gid/1/pat/402/par/E10000007/ati/401/iid/92302/age/202/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/car-do-0

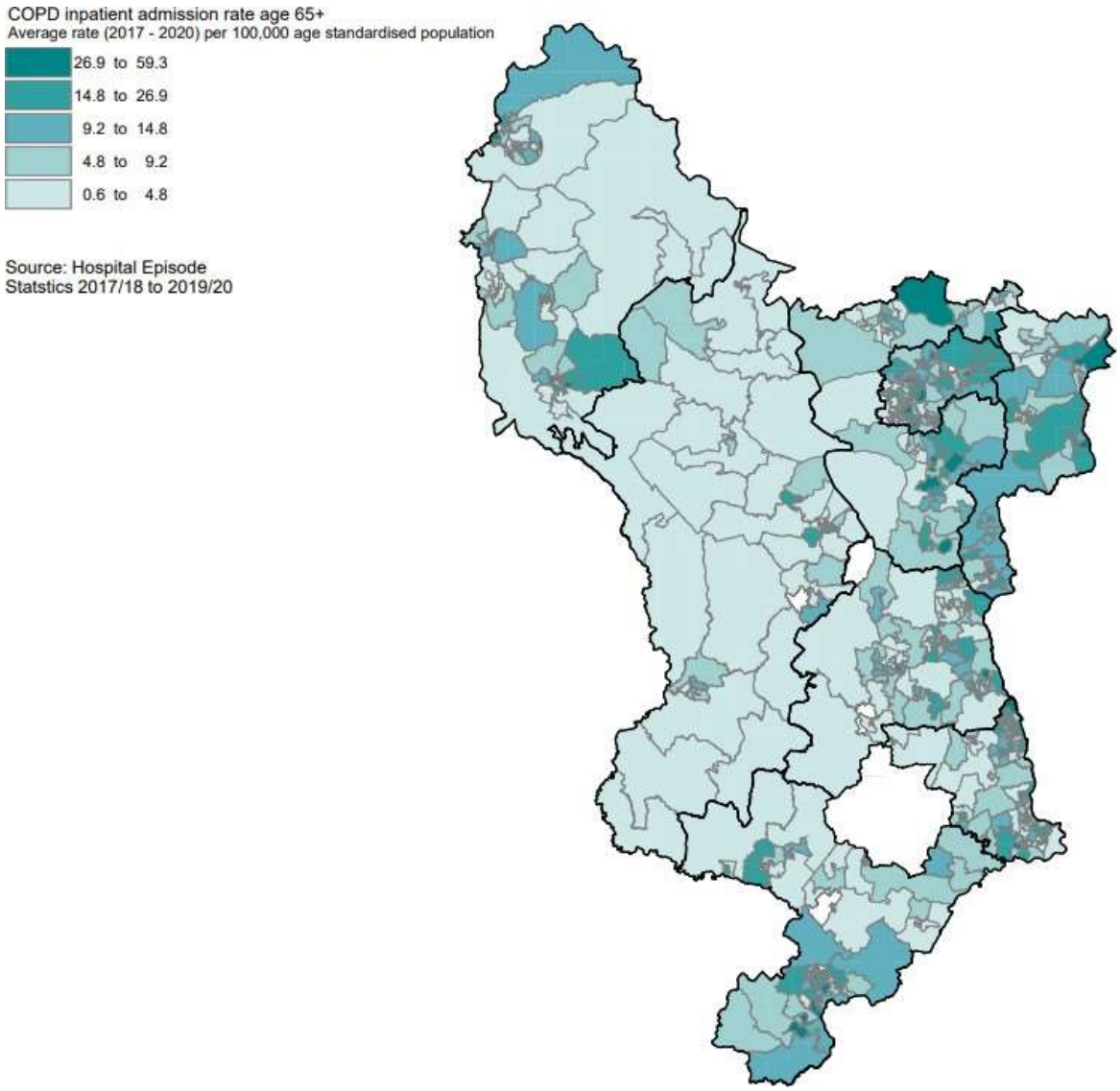


Figure 11: COPD inpatient admission rate in adults aged 65+ years in Derbyshire between 2017 - 2020. Data sourced from Hospital Episode Statistics dataset.

Physiological Conditions

Damp and Mould

Occupants of damp or mouldy homes are at increased risk of experiencing health problems such as respiratory symptoms, respiratory infections, allergic rhinitis, and asthma.

Babies, young children, and older adults are particularly vulnerable to the negative health impacts of living in a damp and mouldy home. This in part due to the increased time spent in the home environment by these groups.

It has been known for some time that occupants of damp indoor environments are at an increased risk of upper and lower respiratory-tract infections, onset and exacerbation of asthma, allergic rhinitis, eczema and bronchitis[74]. Individuals with an existing allergy or diagnosis of asthma are at a greater risk of more severe symptoms when exposed to damp and mould[75].

Within the literature, several studies have shown a significant relationship between living in a damp and mouldy home and exacerbation of asthma symptoms[77]. A meta-analysis of 16 studies, published between 1998 and 2011, found that the risk of developing asthma increases in relation to the level of exposure to dampness and mould in homes[78]. It has been reported that people are 40% more likely to have asthma when living in a damp and mouldy home[79]. Meanwhile, Kercsmar *et al* found that works to fix damp problems in homes of asthmatic children significantly reduced symptom days and healthcare use[80]. In England, approximately 6.4% of the population have a current diagnosis of asthma and received a prescription for asthma related drugs in the previous 12-months[76]. Derby and Derbyshire CCG has a slightly higher prevalence, with 7.1% of the population having a diagnosis of Asthma in 2020–2021[76].

There is also significant evidence suggesting a relationship between damp homes and respiratory infections. This includes a study by Fisk *et al* which reported a statistically significant increase in both respiratory infections and bronchitis in people living in damp homes[81].

However, there are several mitigation measures that can be put in place to reduce the risk of harm from damp and mould, including:

- Installing damp proof courses
- Ensuring exterior fabric of property is in good condition to avoid rain penetration
- Raising indoor air temperatures
- Frost protection for pipes and tanks
- Adequate extraction of moisture during cooking, bathing and laundry
- Continuous low-level ventilation

In Derbyshire, there are estimated to be 801 medical interventions each year which are the result of the impact on health of living in a damp and mouldy home. This is estimated to cost the NHS £1,356,380. However, this can be significantly reduced by carrying out remedial work, which is estimated to cost £7,382 per home[18].

Table 4: Proportion of homes with a HHSRS category 1 hazard for damp and mould in Derbyshire

Local Authority	Total Private Sector homes	Number of homes with HHSRS Category 1 hazard for Damp and Mould	Proportion of homes with HHSRS Category 1 hazard for Damp and Mould
Amber Valley	51,158	465	0.9%
Bolsover	30,287	260	0.9%
Chesterfield	38,781	299	0.8%
Derbyshire Dales	30,253	263	0.9%
Erewash	46,212	320	0.7%
High Peak	37,252	382	1.0%
North East Derbyshire	37,458	211	0.6%
South Derbyshire	40,973	202	0.5%
Total	***312,374***	***2,402***	***0.8%***

In Derbyshire, approximately 0.8% (*n=2,402*) of private sector homes contain a HHSRS category 1 hazard for damp and mould (*Table 4)*. Privately rented homes are more likely to suffer from damp and mould than owner-occupied homes. In Derbyshire, it was estimated that 2.2% (*n=950*) of private rented homes contained a HHSRS category 1 hazard for damp and mould, compared to 0.5% (*n=1,451*) of owner-occupied homes.

Although in terms of raw numbers these figures are relatively small, for each household living in a damp and mouldy home the health risks are very real.

Homes wll h a HHSRS category 1 l and tr f amp, a n dl mo u l d
Proportion ,of pm a t e se c:lOr htlmes

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- 1 0 10 1. 9
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Source: Derbyshfrest.ook condition database, 2021

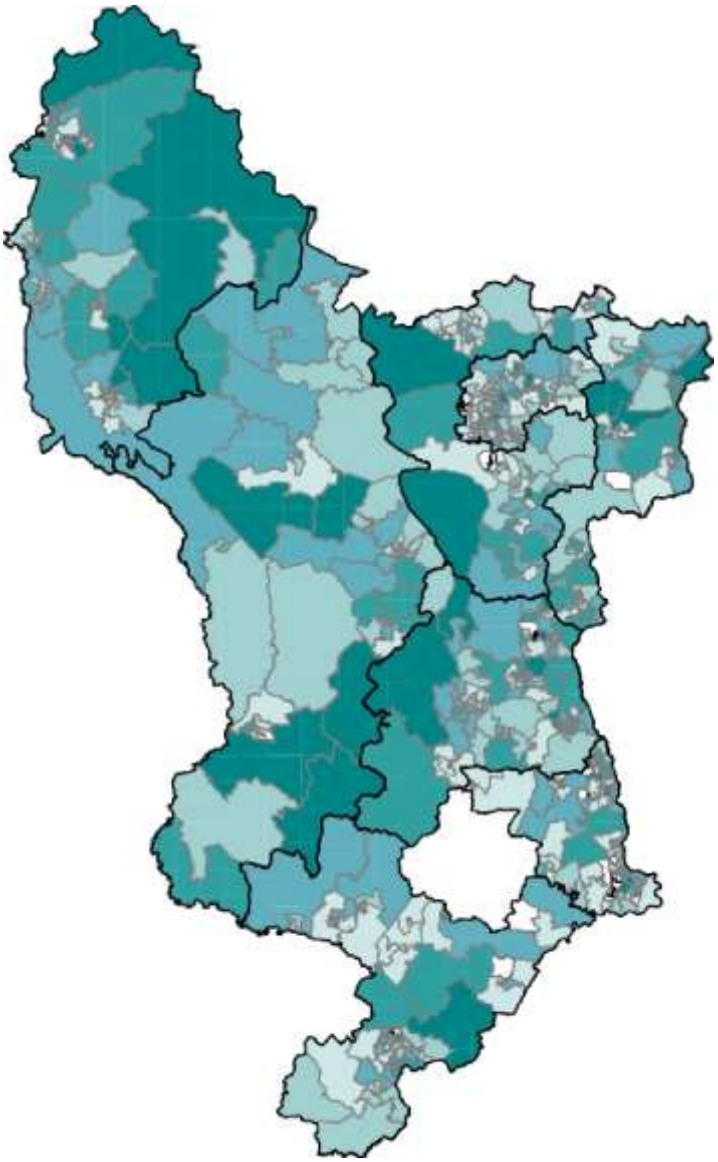


Figure 12: Proportion of private sector homes with a HHSRS category 1 hazard for damp and mould in Derbyshire

Within Derbyshire, the LSOAs with the highest proportion of homes with a HHSRS category 1 hazard for damp and mould, in Chesterfield and Erewash, are also amongst the most deprived areas in the county (*Figure 12*). The homes in these areas are predominately older, terraced properties which, due to construction methods of the time, are less likely to be energy efficient. Insufficient heating and ventilation mean that subsequently, they are harder to heat and more likely to have damp and mould problems.

Homes with a category 1 hazard for damp and mould pose an immediate and serious risk to the health and wellbeing of residents, specifically an increased risk of respiratory infections and exacerbation of asthma and eczema symptoms. This risk is even greater in children, in part due to spending a greater proportion of time in the home environment.

Asthma is a complex disease with numerous environmental and genetic risk factors. However, it is widely accepted that damp and mouldy living conditions are a significant contributor of asthma morbidity. Many children with asthma and other respiratory symptoms will never receive an inpatient admission for asthma as many of the symptoms can be managed by GP's in the community or via outpatient appointments with respiratory specialists. Outpatient paediatric respiratory services cover all respiratory conditions in children that require further treatment than that offered in the community. This outpatient data, broken down by hospital specialty, is available as part of the Hospital Episode Statistics data warehouse. In Derbyshire, for the three-year period covering 2017/18-2019/20, the average number of outpatient paediatric respiratory medicine appointments was 328 appointments per year (*Figure 13*). It is then possible to compare the average number of outpatient paediatric respiratory medicine appointments in each area to the levels of damp and mould hazards. However, in Derbyshire, there did not appear to be any trend between areas with the highest proportions of homes with a hazard for damp and mould and outpatient paediatric respiratory medicine appointments or inpatient admissions at all ages (*Figure 14)*.

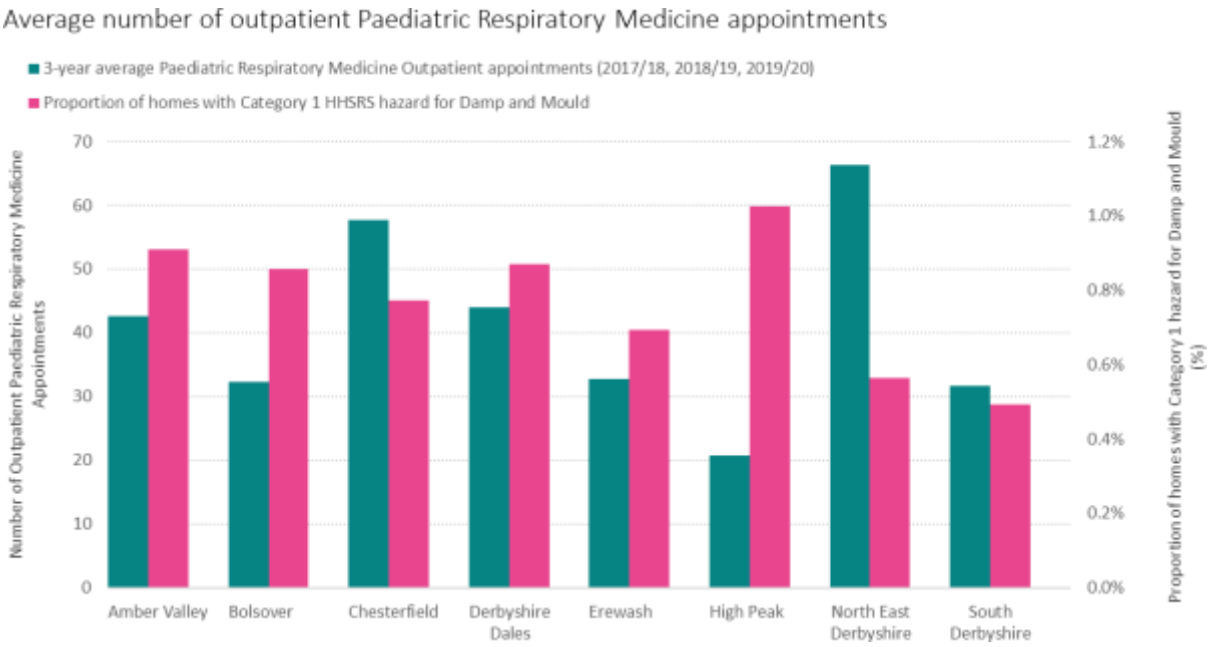


Figure 13: Average number of outpatient respiratory medicine appointments in Derbyshire between 2017/18 – 2019/20 and proportion of homes containing a HHSRS category 1 hazard for damp and mould. Outpatient data sourced from Hospital Episodes Statistics dataset.

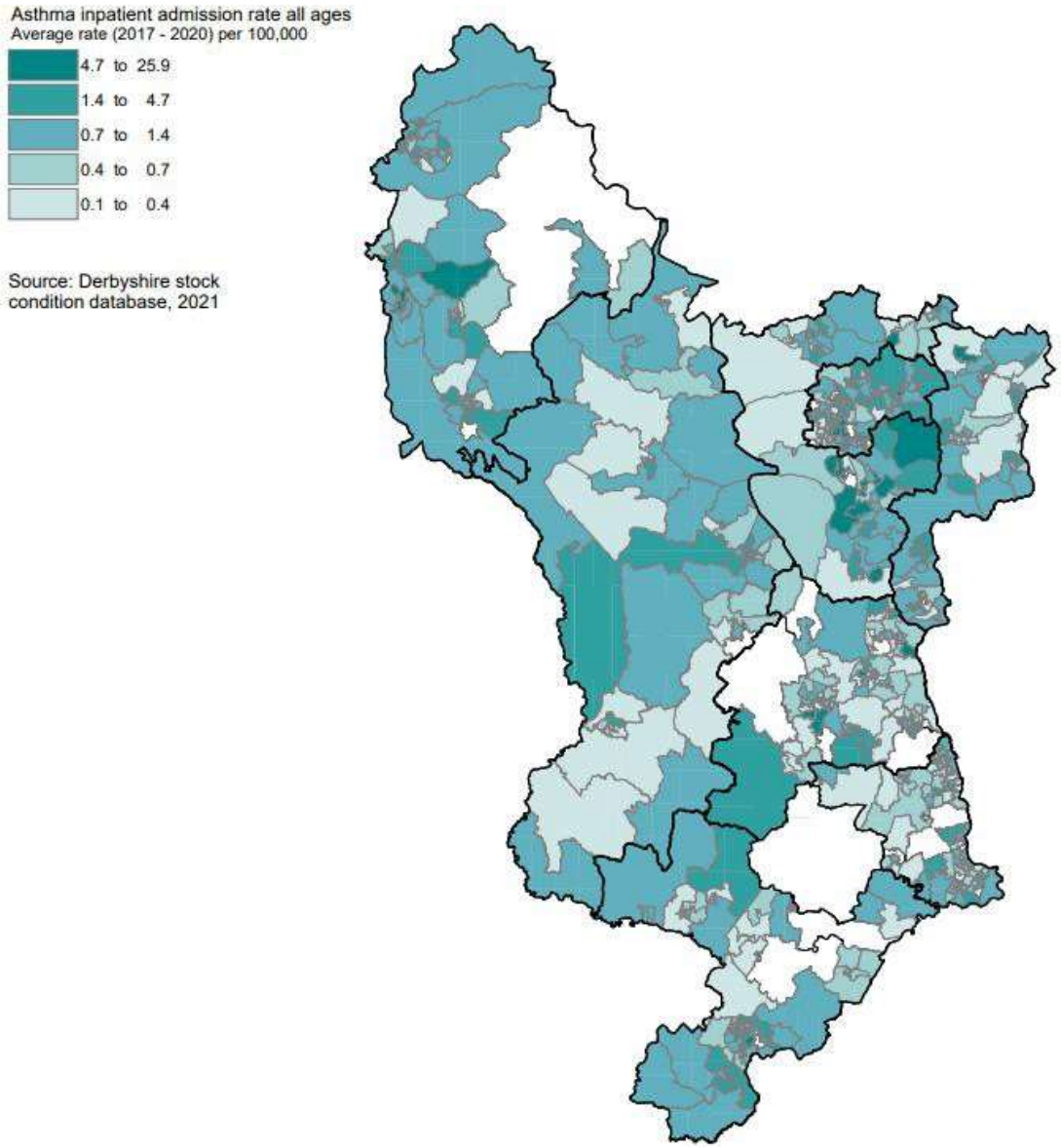


Figure 14: Rate of asthma inpatient admissions at all ages in Derbyshire between 2017-20. Data sourced from Hospital Episode Statistics dataset.

Case Study

Family A self-referred to the Healthy Home Programme (HHP) fowling a targeted letter sent via their GP practice. Mrs B has several health conditions, including chronic fatigue syndrome, sleep apnoea and asthma, while her teenage son is also asthmatic.

Their home was heated by one ageing gas fire and three wall-mounted heaters – one of which was broken. Their home was under-heated with damp and mould spreading as a result. The family were finding it difficult to control the heaters and Mrs B was certain that the ageing gas appliances were faulty and making her health condition worse.

The HHP staff were able to help the family by installing a new condensing boiler, modern radiators, timer and thermostat; topping up the existing loft insulation; and advising on a fuel tariff switch. As a result, their home is now sufficiently warm and the mould spores have disappeared, which is likely to have a significant positive impact on their health conditions.

Fuel Poverty

Fuel Poverty and Cold Homes

Cold homes and fuel poverty are intrinsically linked, with lower income households at a greater risk of fuel poverty than higher income households.

Fuel poverty occurs when a household cannot afford to adequately heat their home or meet basic energy requirements[40]. Households in fuel poverty have to make stark choices between energy and other essential items or falling into debt. For some, the result is living in a cold home with the associated negative impacts on health and wellbeing.

A social gradient in fuel poverty exists, with lower income households more likely to be fuel poor than higher income households, thus contributing to social and health inequalities[40]. Children, older adults and those living with existing health conditions are particularly vulnerable to the health effects of cold housing, thus the impact of fuel poverty is felt unevenly across society.

Fuel poverty is driven by three key factors: household income, the affordability of energy, and the energy efficiency of a home. In England, the method for measuring fuel poverty was updated in 2021 to a methodology which focuses more on the energy efficiency of homes, known as the Low Income Low Energy Efficiency (LILEE) indicator[82,83]. This indicator will find a household to be fuel poor if they are living in a property with an energy efficiency rating below band C and their disposable income (income after housing costs and energy needs) is below the relative poverty line. It has been suggested that this change in definition, which means that households are no longer considered to be fuel poor if they live in a home with an energy performance rating of band C or above, irrespective of whether or not they can afford adequate heating, will result in an underestimate of the number of households experiencing fuel poverty.

Nationally, the rates of fuel poverty have been rising since mid-2021, largely as a result of the rapidly increasing cost of fuel. However, we can not ignore the impact of housing quality and poverty when trying to understand this worsening trend.

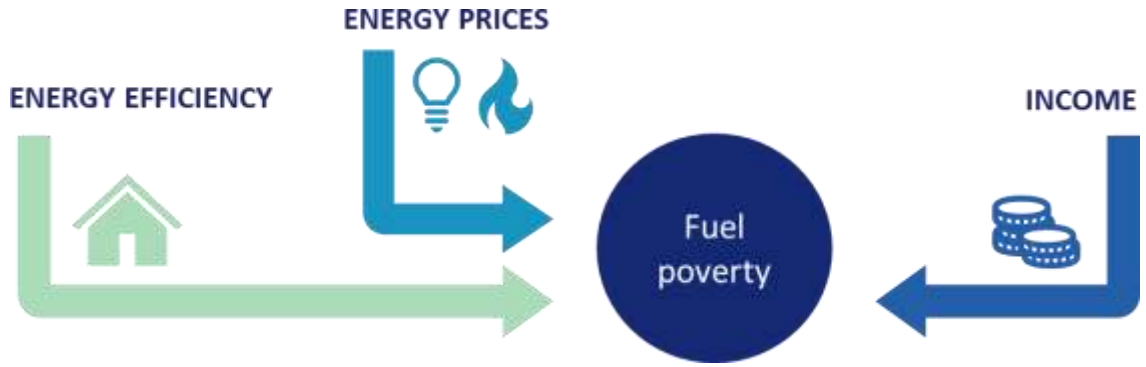


Table 5: Proportion of homes in fuel poverty in Derbyshire

Local Authority	Proportion of homes with HHSRS Category 1 hazard for Cold	Proportion of homes with HHSRS Category 1 hazard for Damp and Mould	Proportion of homes in Fuel Poverty
Amber Valley	6.4%	0.9%	14.0%
Bolsover	4.9%	0.9%	16.2%
Chesterfield	4.3%	0.8%	14.9%
Derbyshire Dales	13.1%	0.9%	13.5%
Erewash	5.5%	0.7%	13.3%
High Peak	7.8%	1.0%	13.1%
North East Derbyshire	5.4%	0.6%	13.5%
South Derbyshire	4.7%	0.5%	11.8%
Total	***6.3%***	***0.8%***	***13.8%***

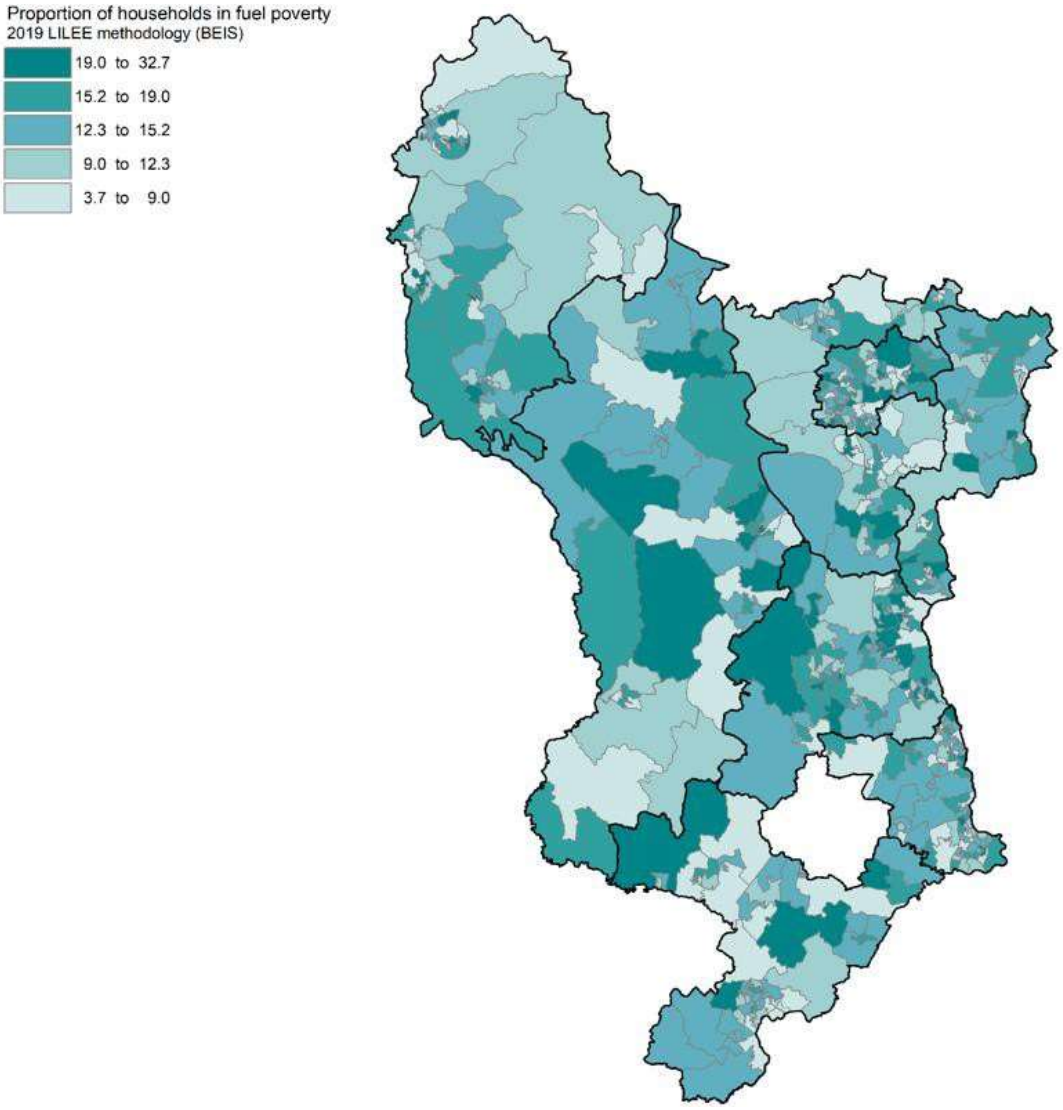


Figure 15: Proportion of households in fuel poverty in Derbyshire

In Derbyshire, 13.8% (*n=49,145*) of households are living in fuel poverty (*Table 5)*. This figure is slightly greater than that for England, where 13.4% of homes are estimated to be in fuel poverty. Bolsover (16.2%), Chesterfield (14.9%) and Amber Valley (14.0%) have the greatest proportion of households living in fuel poverty (*Figure 15)*. These areas are also amongst those with the greatest proportion of homes with a HHSRS category 1 hazard for damp and mould.

Nationally, households living in older properties, especially those of solid wall construction are more likely to be in fuel poverty. This is certainly the case in Derbyshire, where the areas with a greater proportion of families in fuel poverty, are also areas comprised primarily of older homes which are known to be more energy inefficient and harder to heat. Bolsover, Chesterfield and Amber Valley also contain a number of the most deprived LSOAs in Derbyshire, with a greater proportion of lower income households. This accumulation of disadvantage means that lower income groups are more likely to become fuel poor and live in damp and mouldy homes, negatively impacting on their mental and physical wellbeing.

Moreover, the rapid increase in domestic fuel prices seen in recent months, is likely to have resulted in a significantly higher proportion of households experiencing fuel poverty than these estimates suggest. This will have a significant detrimental impact on both the mental and physical health and wellbeing of residents and also a significant impact on demand for health and care services, particularly over colder months.

Table 6: Energy efficiency of homes in Derbyshire

Local Authority	Total Private Sector homes	Number of homes with EPC Certificate	Number of homes with EPC Rating of E, F or G	Proportion of homes with EPC Rating of E, F or G	Number of homes with no EPC Certificate	Proportion of homes with no EPC Certificate
Amber Valley	51,158	27,215	7,110	26.1%	23,943	46.8%
Bolsover	30,287	16,915	3,858	22.8%	13,372	44.2%
Chesterfield	38,781	20,510	4,246	20.7%	18,271	47.1%
Derbyshire Dales	30,253	14,873	5,285	35.5%	15,380	50.8%
Erewash	46,212	24,494	6,973	28.5%	21,718	47.0%
High Peak	37,252	19,867	4,054	20.4%	17,385	46.7%
North East Derbyshire	37,458	18,661	3,908	20.9%	18,797	50.2%
South Derbyshire	40,973	22,414	4,159	18.6%	18,559	45.3%
Total	***312,374***	***164,949***	***39,593***	***24.0%***	***147,425***	***47.2%***

In 2014, the Government put in place a new statutory fuel poverty target for England, to ensure that as many fuel poor households as reasonably practicable achieve a minimum energy efficiency rating of band C by 2030, with interim targets of band E by 2020, and band D by 2025. In Derbyshire, 52.8% of all private sector homes have an EPC certificate, of which 24.0% (*n=39,593*) have an EPC rating of E, F or G (*Table 6 and Figure 16)*. The proportion of homes in the private rented sector with an EPC certificate is higher than the owner-occupied sector (79.0% of private rented versus 48.6% owner-occupied). This is in part due to legislation requiring all private sector landlords to hold a valid EPC for any properties that they let out. In Derbyshire, Derbyshire Dales (35.5%, *n=5,285*), Erewash (28.5%, *n=6,973*) and Amber Valley (26.1%, *n=7,110*) have the greatest proportion of homes with an EPC rating of band E or below. In contrast, in South Derbyshire, only 18.6% (*n=4,159*) of properties have an EPC rating of band E or below. In March 2020, 18% of existing dwellings in England had an EPC certificate rating of band E, F or G. This figure is worse in Derbyshire, where all of the borough and district councils have a larger proportion of properties with an EPC rating of band E or below than the national average. Furthermore, there are approximately 147,425 private sector homes in Derbyshire with no EPC certificate. A smaller proportion of owner-occupied homes have an EPC certificate compared to private rented homes (51.4% versus 21.0%). However, this leaves 9,003 private rented homes in Derbyshire with no recorded EPC.

The current fuel crisis means that an increasing number of households will enter fuel poverty, and action to improve the energy efficiency of homes has never been more critical.

Figure 16: Energy efficiency rating of private sector homes in Derbyshire, by tenure

Case Study

Mr P lives alone and was struggling with a faulty boiler, condensation, a gas leak and fuel poverty when he self-referred to the Health Home Programme (HHP) following a targeted letter from his GP practice. Mr P had several health conditions - including asthma and angina – and at the time was undergoing treatment for lung cancer. Living in a cold home was exacerbating his symptoms of these conditions.

Mr P was reluctant to put his heating on for two reasons: fear of breakdown and inability to pay for fuel. The existing gas central heating was ageing and unreliable and Mr P was concerned about a potential gas leak. As a result of under-heating, the bungalow was cold and suffering from a build-up of condensation and damp, and when the HHP staff first visited, the indoor temperature was only 12°C.

The HHP team were able to help Mr P by providing a dehumidifier to manage the damp and condensation; installing a new boiler with 2-year warranty; completing a benefits check form; and applying to Mr P's electricity supplier for the 'Warm Home Discount' scheme (worth £140) on his behalf. The HHP team also contacted the National Grid, who promptly located and repaired the external gas leak. These interventions have helped improve the thermal comfort of Mr P's home and will likely have a positive impact on his overall health.

Accidents

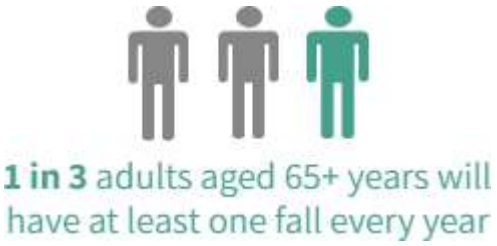
Falls on the Stairs

Falls are a common, but often overlooked, cause of injury. Around one third of adults over 65, and half of those aged over 80, will have at least one fall every year.

Falls are the most common cause of accidents and associated morbidity in older adults, and this risk is shown to increase with advancing age. Around 35% of community-dwelling adults aged over 65 will have at least one fall every year, with 24% resulting in serious injury, 10% in a fracture and 5-10% in a hospital admission[51]. 45% of emergency hospital admissions in adults aged over 65 are associated with a fall, while it is estimated that unaddressed falls hazards in the home costs the NHS £435 million every year[51].

However, even when an injury does not occur, falls can lead to loss of confidence and independence carrying out activities of daily living; social isolation; and increased risk of nursing home admission[84]. Thus, the psychological impact of falling is significant among older people. A survey carried out by the WRVS in 2012 found that 21% of respondents stated that they had lost confidence following a fall[85]. For those aged over 80 years who had fallen in the last 5 years, 14% had lost their independence following a fall[85].

Falls are the one of leading reasons older people are taken to Accident and Emergency departments in England[86]. The rate of emergency hospital admissions due to falls in people aged 65+ was 2,2023 per 100,000 population in 2020/21, increasing to a rate of 5,174 per 100,000 in those aged 80+. The rates of falls among older adults in Derbyshire are broadly similar, with an admission rate of 2,004 and 5,211 per 100,000 in adults aged 65+ and 80+, respectively. Falls on stairs and steps are more likely to lead to serious clinical outcomes, such as hip fractures and head injuries. Hip fractures alone are a significant public health problem, due in part to an ageing population who have an increased susceptibility to fractures following a fall in the home.



The total annual cost of fragility fractures to the UK has been estimated at £4.4 billion, which includes £1.1 billion for social care; while hip fractures account for around £2 billion of this sum[51]. It is estimated that 1% of falls in older adults result in a hip fracture. Short and long-term outlooks for patients are generally poor following a hip fracture, with an increased one-year mortality of between

18-33%[51]. A review of long-term disability found that around 20% of hip fracture patients entered long-term care in the first year after fracture[51]. In England, during 2020/21, the rate of hip fractures in people aged 65 and over was 529 per 100,000. This rate rises to 1,426 per 100,000 in those aged 80+. The rates of hip fractures in older adults are similar in Derbyshire (544 per 100,000 in adults aged 65+ and 1,440 per 100,000 in adults aged 80+). Nationally, the rates of hip fractures in older adults are decreasing in both age-groups however, in there has been no significant change in recent years in Derbyshire.

Homes with HHSRS category 1 hazards for falls pose a significant risk to public health. In Derbyshire, approximately 8.9% (*n=27,879*) of private sector homes contain a HHSRS hazard for falls on the stairs. The greatest proportion of homes containing a hazard for falling on the stairs are found in Bolsover (10.1%) and High Peak (10.0%) (*Figure 17*).

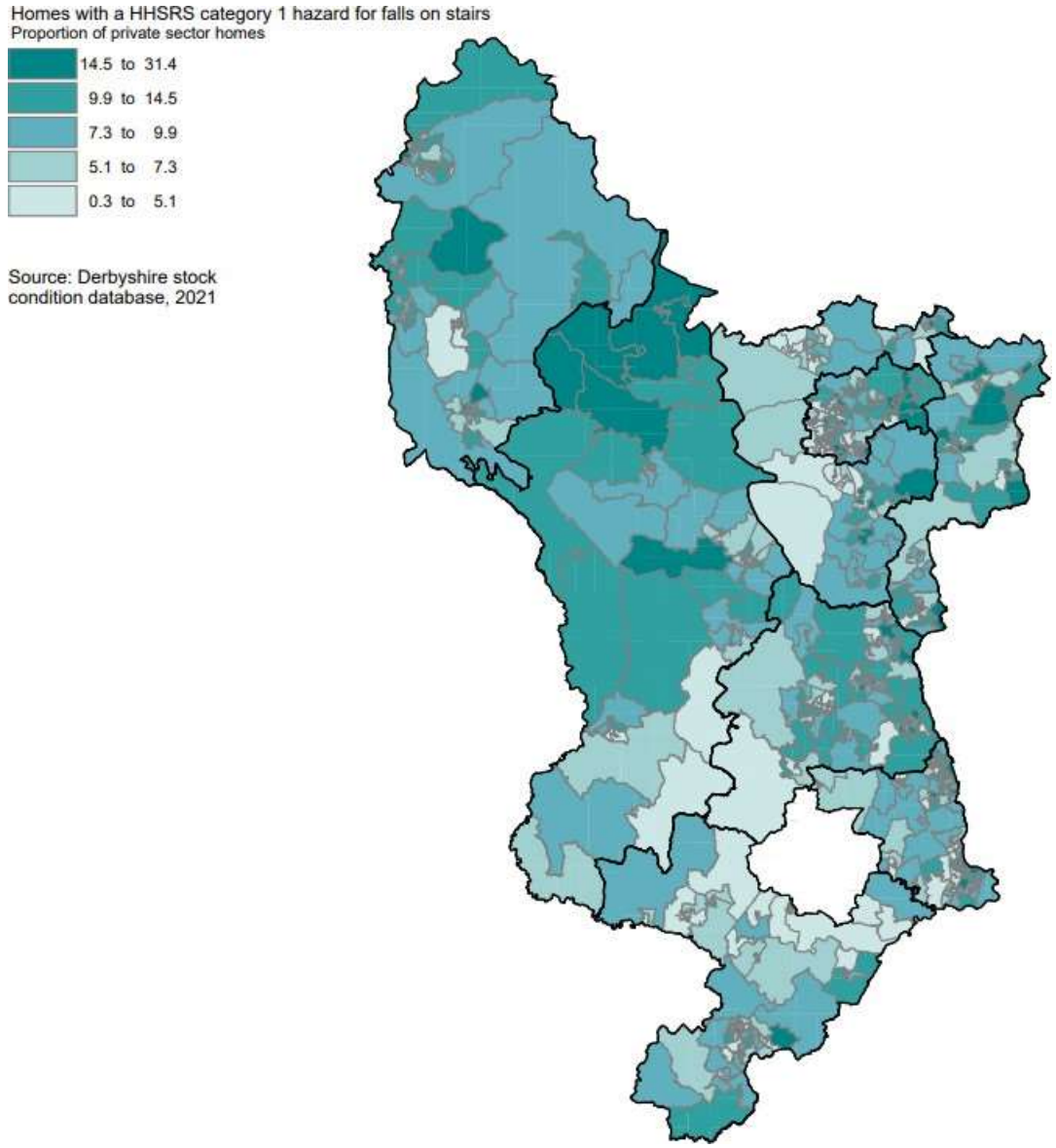


Figure 17: Proportion of private sector homes with a HHSRS category 1 hazard for falls on stairs

Age is one of the greatest risk factors for falls, and this greater incidence correlates to increased susceptibility to injuries and more serious clinical outcomes. Therefore, when implementing measures to reduce or mitigate the risk of falling, it is important to take into consideration the age of residents, in addition to the hazard present. Using the Derbyshire Housing Stock Condition Database combined with population data, it is possible to estimate the number homes in Derbyshire with a HHSRS category 1 hazard for falls on the stairs which are likely to be occupied by a resident aged over 65 years. It is estimated that 6,151 people aged over 65, in Derbyshire, are living in a home with stairs that pose an immediate and serious threat to their health and wellbeing (*Table 7*). Many falls in older people can be prevented, and with the right support, those who have fallen can be supported not to fall again. Targeting actions to mitigate falls in older people, especially those living in homes with specific risks can improve the long-term health and wellbeing of residents. It also allows them to maintain independence and potentially reduces the risk of premature entry into long-term care[84]. The average cost to mitigate against a HHSRS category 1 hazard for falls on the stairs is estimated to be £857 per property[87]. The cost to repair all 6,151 homes in Derbyshire with a hazard for falling on the stairs occupied by someone over 65, is estimated to be £5,271,407. Using the BRE Housing and Health Cost Calculator (HHCC), the annual saving to the NHS of carrying out these repairs, is estimated to be £2,458,948[87]. Within 2 years, the repairs would have paid for themselves in savings to the NHS alone. The additional savings of allowing an older person to remain independent in their own home, by preventing premature entry to residential care, are substantial to both the system and individual.

Table 7: Estimated number of HHSRS category 1 falls on stairs hazards contained in homes occupied by adults aged 65+ years

Local Authority	Proportion of population aged 65+	Proportion of homes with HHSRS Category 1 Hazard for Falls on Stairs	Estimated number of homes with HHSRS Category 1 Hazard for Falls on Stairs occupied by adults aged 65+
Amber Valley	22.4%	9.4%	1,071
Bolsover	20.2%	10.1%	617
Chesterfield	21.5%	9.5%	790
Derbyshire Dales	27.5%	9.5%	792
Erewash	20.6%	9.1%	864
High Peak	21.6%	10.0%	802
North East Derbyshire	24.8%	7.9%	735
South Derbyshire	18.3%	6.4%	480
Total	***21.9%***	***8.9%***	***6,151***

Falls are also one of the main causes of injury and premature death in children, and every year in England, one in twelve of all deaths in children aged between 1-4 years are the result of an injury sustained in the home[88]. The distribution of child injuries follows a strong social gradient, with the greatest burden in lower income groups, and it has been estimated that hospital admission rates for injuries in children are 45% higher in children from the most deprived areas, compared to the least deprived[88]. In Derbyshire, between 2015-16 and 2019-20, 2,160, there were 2,160 emergency hospital admissions in children aged under 5 years following unintentional injuries (crude admission rate 10.6 per 10,000 population) (*Figure 18*)[89]. The highest admission rates were seen in High Peak (15.5 admissions per 10.00 population), Chesterfield (14.7 admissions per 10,000 population) and North East Derbyshire (13.1 admissions per 10,000 population)[89].

Emergency hospital admissions for injuries in under 5 years old, crude rate 2015/16 - 19/20

Crude rate - per 10,000

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	–	208,539	12.3	12.3	12.4
Derbyshire	–	2,160	10.6	10.2	11.1
High Peak	–	355	15.5	14.0	17.2
Chesterfield	–	405	14.7	13.3	16.2
North East Derbyshire	–	315	13.1	11.8	14.7
Bolsover	–	260	11.9	10.4	13.4
South Derbyshire	–	280	9.6	8.4	10.7
Derbyshire Dales	–	135	9.5	7.9	11.1
Erewash	–	230	7.2	6.2	8.1
Amber Valley	–	180	5.7	4.9	6.6

Figure 18: Rate of emergency hospital admissions for injuries in children under 5 years in Derbyshire between 2015/16-2019/20. Data sourced from OHID Fingertips Public Health Profiles, available from: https://fingertips.phe.org.uk/search/injuries#page/3/gid/1/pat/402/par/E10000007/ati/401/iid/93114/age/28/sex/4/cat/-1/ctp/-1/yrr/5/cid/4/tbm/1/page-options/car-do-0

Costs of Poor Housing

The cost to mitigate poor housing

There are recognised health cost benefits to mitigating HHSRS category 1 hazards in homes. Using the HHCC, it is possible to quantify the health cost benefit to the NHS and wider society of housing improvements.

The Housing and Health Cost Calculator (HHCC) tool was produced by BRE Group to quantify the health cost savings of housing improvements in all homes with a HHSRS hazard[87]. The tool was designed to provide local authorities with information to support public health interventions and help reduce costs.

Local data, collected through housing inspections, is taken to produce a HHSRS hazard score for each property and hazard. All hazards are then assigned a health cost, based on the likelihood of each level of harm occurring (4 levels). These modelled health costs have been developed based on real estimates of incidents occurring as a result of each of the hazards, and represent the first-year treatment costs alone.

Using the HHCC tool, it has been possible to quantify the cost to mitigate each HHSRS category 1 hazard, the cost to the NHS before mitigation work is carried out, and the savings to the NHS after works have been completed in Derbyshire. Using data published in the briefing paper "The Cost of Poor Housing to the NHS", the average cost to remediate each HHSRS category 1 hazard and bring all homes in Derbyshire up to the standard of an "average home", has been calculated[18]. In Derbyshire, it is estimated to cost £90.6 million to mitigate all category 1 hazards for excess cold, while it would cost £37.5 million to mitigate all HHSRS category 1 hazards for falls (*Table 8*).

Table 8: Costs to mitigate HHSRS category 1 hazards in Derbyshire

Hazard	Average cost of repair per dwelling	Cost to repair all hazards	Cost to repair hazards in Owner Occupied homes	Cost to repair hazards in Private Rented homes
Damp and mould growth	£7,382	£17,728,139	£10,711,880	£7,016,259
Excess cold	£4,574	£90,638,480	£73,429,853	£17,208,628
Falls on the level	£780	£6,373,791	£5,242,770	£1,131,021
Falls associated with steps and stairs	£857	£23,892,123	£20,452,921	£3,439,202
Falls between levels	£927	£7,263,825	£6,608,663	£655,162
Crowding and space	£16,100	£1,920,827	£0	£1,920,827
Entry by intruders	£1,063	£177,534	£171,804	£5,730
Domestic hygiene, pests and refuse	£1,921	£318,062	£155,251	£162,811
Food safety	£2,461	£827,841	£827,841	£0
Personal hygiene, sanitation and drainage	£1,154	£513,545	£481,451	£32,094
Electrical hazards	£2,360	£553,665	£78,404	£475,262
Fire	£3,632	£11,101,891	£8,806,830	£2,295,061
Flames, hot surfaces and materials	£2,436	£2,385,884	£2,108,653	£277,231
Collision and entrapment	£692	£304,466	£245,624	£58,842
Total		***£164,000,072***	***£129,321,945***	***£34,678,128***

The costs to the NHS, applied by BRE Group into the HHCC, are based on real estimates of the costs to the NHS caused by incidents occurring as a result of each hazard[90]. These figures represent the first-year treatment costs of health conditions which may be attributable to each of the HHSRS hazards. Each HHSRS hazard is assessed in terms of the severity of the hazard, and the possible harm to health which may arise from the hazard[90]. Health outcomes are categorised into 4 classes – each with an associated health cost (*Appendix 3*)[90]. These costs are then applied to each hazard in the HHCC.

The estimates below represent the average cost to the NHS for each individual HHSRS category 1 hazard from the HHCC for Derbyshire, for category 1 hazards recorded between September 2012 and May 2021. These averages represent the cost to the NHS over 12-months as a result of harm caused by each hazard.

The savings to the NHS of mitigating poor housing have been calculated by multiplying the number of HHSRS category 1 hazards, from the Derbyshire Housing Stock Condition Database, with NHS treatment cost data.

Table 9: Costs to the NHS of unaddressed HHSRS category 1 hazards in Derbyshire

Hazard	Number of Category 1 HHSRS hazards	Cost to NHS before work	Cost to NHS after work	Savings to the NHS if hazard fixed	Payback period (years)
Damp and mould growth	2,402	£1,356,380	£2,552	£1,353,828	13.1
Excess cold	19,816	£30,576,200	£1,417,520	£29,158,680	3.1
Falls on the level	8,172	£6,045,228	£262,170	£5,783,058	1.1
Falls associated with steps and stairs	27,879	£11,882,173	£737,239	£11,144,934	2.1
Falls between levels	7,836	£1,833,900	£3,134	£1,830,766	4.0
Crowding and space	119	£182,839	£267	£182,571	10.5
Entry by intruders	167	£89,045	£1,962	£87,083	2.0
Domestic hygiene, pests and refuse	166	£28,061	£0	£28,061	11.3
Food safety	336	£138,916	£0	£138,916	6.0
Personal hygiene, sanitation and drainage	445	£285,111	£17	£285,094	1.8
Electrical hazards	235	£171,219	£245	£170,974	3.2
Fire	3,057	£1,112,652	£5,889	£1,106,763	10.0
Flames, hot surfaces and materials	979	£182,173	£5,387	£176,787	13.5
Collision and entrapment	440	£572,728	£2,263	£570,465	0.5
Total	***72,048****	***£54,456,623***	***£2,438,645***	***£52,017,978***	

*Some dwellings will contain more than one HHSRS category 1 hazard

In Derbyshire, the greatest cost to the NHS, related to poor housing, is estimated to be first-year treatment costs associated with incidents which are the result of HHSRS category 1 hazards for excess cold. Serious hazards for excess cold are estimated to cost the NHS £30.6 million over 12-months (*Table 9)*. The average cost to mitigate against a HHSRS category 1 hazard for cold is estimated to be £4,574 per property, however, if all HHSRS category 1 hazards for cold were removed, the savings to the NHS could be in the region of £29.2 million per year.

Furthermore, the estimated cost to the NHS resulting from trips and falls when combined, totals £19.8 million over 12-months. This high cost is due in part to the high costs of treating the health conditions linked to falls. These outcomes and associated costs range from £115 to treat a bruise or cut in class 4, to a class 1 harm of full paralysis with 12-month treatment costs estimated at £92,490.

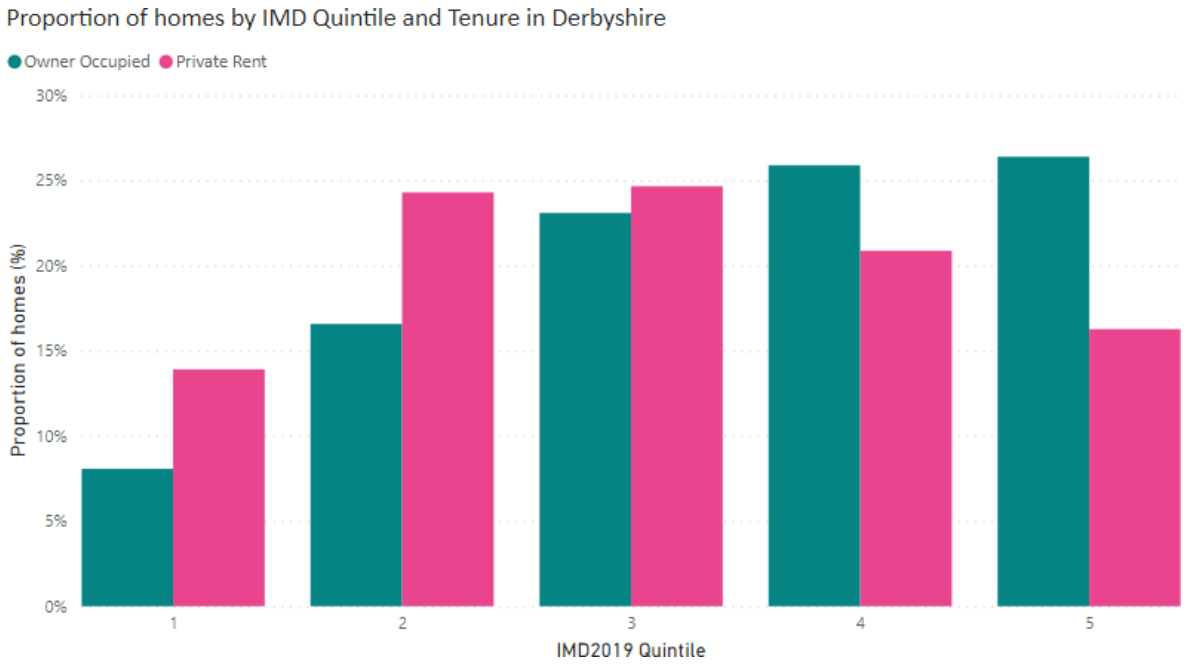


Figure 19: Proportion of private sector homes by IMD quintile and tenure in Derbyshire

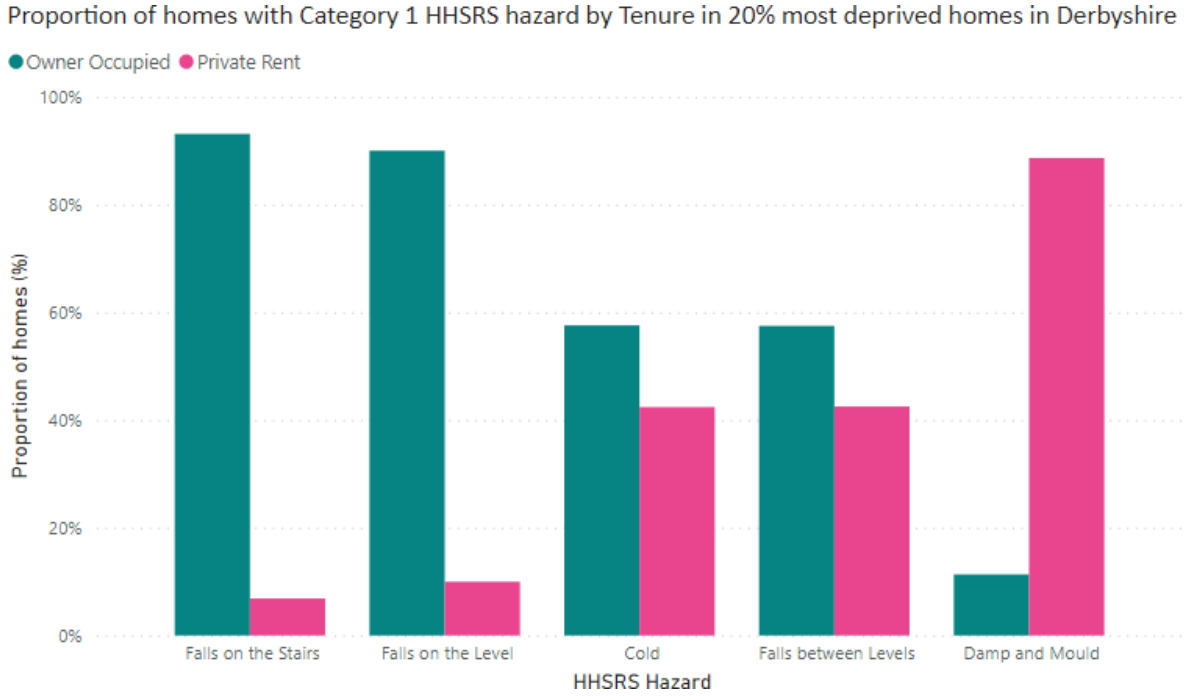


Figure 20: Proportion of private sector homes with a HHSRS category 1 hazard by tenure in the lowest IMD2019 quintile in Derbyshire

Evidence demonstrates that people living in the most deprived areas often face worse health outcomes, lower life expectancy, and often lack the financial means to improve their home environment. The costs to mitigate all HHSRS category 1 hazards and improve housing conditions, in Derbyshire, are

extensive and prohibitive in many areas. It can therefore be suggested that targeting resources towards improving the homes of families in the most deprived areas of the county is likely to have the greatest impact on health outcomes, whilst also providing a real cost benefit to the NHS and wider society.

In Derbyshire, a greater proportion of private rented homes are located in the 20% most deprived LSOAs in the county, compared to owner-occupied homes (*Figure 19).* Of these homes which are in the lowest IMD quintile, owner-occupied homes contain a greater proportion of HHSRS category 1 hazards for falls and excess cold, while private rented homes contain a greater proportion of homes with a HHSRS category 1 hazard for damp and mould (*Figure 20)*.

It is estimated to cost the NHS £80,200 per year to treat people in homes affected by damp and mould in areas of the county which are in the most deprived quintile of homes in England (*Table 10)*. Remedial work to remove all HHSRS category 1 hazards for damp and mould in the same area is estimated to cost £1.0 million, however would create savings to the NHS of £80,050 per year.

In addition, the cost savings from remedial work to mitigate all HHSRS category 1 hazards for excess cold in the most deprived 20% of homes in Derbyshire, is estimated to be £980,000 annually.

Furthermore, HHSRS category 1 hazards for falls on the stairs in the most deprived quintile of homes in Derbyshire, cost the NHS £1.83 million annually. The cost to remedy this hazard is estimated to be in the region of £3.67 million, subsequently creating annual savings to the NHS of an estimated £1.72 million.

BRE Group estimate the costs of poor housing to wider society to be approximately 2.5 times than those to the NHS[18]. These 'societal costs' take into consideration costs associated with care, poorer educational attainment and employment success, loss of productivity, and the impact on mental wellbeing. Therefore, the societal impact of improvements to the private sector housing stock in areas of the county with a high density of poor housing, is likely to be significant.

Table 10: Costs to mitigate HHSRS category 1 hazards in 20% most deprived homes

Hazard	Number of Category 1 HHSRS hazards	Cost to repair all hazards	Cost to NHS before work	Savings to the NHS if hazard fixed
Damp and mould growth	142	£1,048,244	£80,201	£80,050
Excess cold	666	£3,046,284	£1,027,641	£979,999
Falls on the level	270	£210,903	£200,031	£191,356
Falls associated with steps and stairs	4,301	£3,686,140	£1,833,213	£1,719,470
Falls between levels	757	£701,332	£177,066	£176,763
Total	***6,136***	***£8,692,902***	***£3,318,151***	***£3,147,638***

Discussion

Health inequalities are unfair and avoidable differences in health which exist across the population, and between different groups within society. Our experiences throughout life, from the conditions in which we are born, grow, live, work and age, have a powerful impact on our health. However, the distribution of these conditions – which influence how we think, feel and act – follows a strong social gradient, leading to the development of health inequalities. The findings of this report highlight large differences in the likelihood of homes to contain serious hazards to health and wellbeing between different areas of the county.

The difference in life expectancy between children born in the least and most deprived areas in Derbyshire was 9.4 years for males and 7.6 years for females in 2018-2020. Males and females living in the most deprived areas can also expect to spend nearly 20 fewer years in good health compared to those in the least deprived areas.

Research has consistently highlighted a relationship between poor quality housing and poorer health outcomes and while it remains difficult to determine the direction of this relationship, it is clear that lower income groups face a disproportionate burden of the problem. Addressing such avoidable inequalities and moving towards a fairer distribution of good health requires action to be taken at all stages of the life course and across the whole of society[3].

The Government's 'Levelling Up' agenda is specifically designed to address these inequalities and disparities[4]. To support the delivery of this agenda, the Office for Health Improvement and Disparities (OHID) was created, to help address the unacceptable health disparities that impact our local populations and 'put prevention at the heart to help people live longer, healthier and happier lives'[4].

In Derbyshire, it was estimated that 15.6% (*n=48,677*) of private sector homes contain at least one HHSRS category 1 hazard - these are hazards which pose an immediate risk to the health and wellbeing of residents. Private rented homes contained a greater proportion of HHSRS category 1 hazards than owner-occupied homes.

In Derbyshire, 13.8% of households are estimated to be fuel poor, however, large variation exists based on levels of deprivation. In areas of Chesterfield, Bolsover, Erewash and North East Derbyshire - which are amongst the most deprived in England - over a quarter of households are estimated to live in fuel poverty. Furthermore, it is important to highlight that the current energy crisis and rising cost of living mean that an increasing number of homes are likely to enter fuel poverty, where they have to make stark choices between heating their homes and other essential items. These causes of fuel poverty, exacerbated by

poor housing conditions, will have an increasingly detrimental impact on the health of occupants.

Moreover, the findings of this report also estimated that 6.3% of private sector homes in Derbyshire contained a HHSRS category 1 hazard for excess cold. Private rented homes contained a greater proportion of hazards for excess cold than owner-occupied homes. With the responsibility for mitigating the hazard falling to the landlord, private renters are less able to remedy their situation. Mortality during winter increases more in England, compared to other European countries with colder climates, suggesting that many more winter deaths could be prevented. The research is clear that living in a cold home can have serious negative impacts on mental and physical health. Moreover, those suffering from respiratory and cardiovascular conditions – such as COPD, asthma, and cardiovascular disease – are at an increased risk of these negative health impacts of cold homes. Derby and Derbyshire CCG has a significantly higher prevalence of COPD than the England average - a figure that has continued to increase over the past 10 years. Within the county, Chesterfield and Bolsover have the highest rates of emergency hospital admissions for COPD and respiratory disease mortality. The same areas also have the lowest life expectancy in Derbyshire and contain a number of LSOAs which are amongst the 20% most deprived in England. Moreover, in areas of the county where higher proportions of homes with a HHSRS category 1 hazard for excess cold, combine with higher levels of deprivation and increased fuel poverty, the rate of emergency hospital admissions for asthma also increases. The average cost to mitigate a cold hazard in a home is £4,574, with measures including ensuring adequate heating (repairing and installing boilers) and improved insulation and ventilation. However, the direct cost to the NHS as a result of people living in damp and mouldy housing is significant, and measures to remove all HHSRS category 1 hazards could save the NHS in Derbyshire around £29.2 million per year.

The findings of this report also showed that 0.8% of households in Derbyshire contain a HHSRS category 1 hazard for damp and mould growth. Despite this hazard affecting a smaller proportion of homes in the county, exposure to damp and mouldy living conditions is likely to have a significant negative impact on the health of occupants. Asthma is a serious long-term condition which can be exacerbated by living in a damp and mouldy home. In Derbyshire, around 7.0% of residents have a diagnosis of asthma, which is slightly higher than the figure for England as a whole.

However, the most common hazard contained in private sector homes in Derbyshire was for falls on the stairs, with an estimated 8.9% of homes containing a HHSRS category 1 hazard. Falls are a common but often overlooked cause of injury and it is estimated that 1 in 3 adults over 65 will have at least one fall a year. In Derbyshire, unaddressed hazards for falls on the stairs are estimated to cost the NHS £11.9 million annually. The consequences of falling for the individual

can be significant, not only in terms of immediate physical health impacts, but also wider impacts to mental and social wellbeing. Derbyshire has an older population than is seen in much of the East Midlands, and nationally, and this population are particularly vulnerable to serious negative health outcomes arising from falls. In Derbyshire, it is estimated that 6,151 of the households containing a serious hazard for falls on the stairs, are occupied by residents aged 65+. The cost to mitigate falls on the stairs is estimated to be £857 per property, however, removing all serious hazards for falls in the homes of residents aged 65+ is estimated to create savings to the NHS of around £2.5 million per year. Therefore, the impact of housing improvement work targeting hazards for falls is likely to be significant for the individual, NHS and wider society.

Recommendations

This report has highlighted the issue of poor quality housing in Derbyshire and the direct effect that living conditions can have on health and wellbeing.

It is recommended that the Derbyshire Housing and Health Systems Group develop the following recommendations into actions which are tangible, to address these health inequalities brought on by poor quality housing in the county.

1. Encourage collaborative working across the health, care, and housing agendas.

The best way to address ill health due to poor quality housing is for the NHS and both upper and lower tiers of local government to work closely together to pool budgets and make the best use of available resources to meet joint objectives. Discussions between partners should take place to explore possible avenues of funding to further strengthen collective budgets given the current housing challenges facing the system as highlighted in this report.

In April 2022, Joined Up Care Derbyshire (JUCD), also known as Derbyshire's Integrated Care System (ICS) was established which brings together health and social care organisations across Derby and Derbyshire. The ambition is to provide the best care and services for people and make them as efficient and effective as possible.

The formation of JUCD gives partners the opportunity to coordinate health, social care and housing policy and ensure that housing quality is a key consideration when addressing the wider determinants of health and health equity.

Additionally, the Derbyshire Housing and Health Systems Group, which is a sub-group of the Derbyshire Health and Wellbeing Board, should continue to grow and maximise opportunities to drive further collaborative outcomes between housing, health, care, and other partners to improve housing conditions in Derbyshire. Examples of collaborative pieces of work should include:

(a) Adopting a place-based approach to target action on Category 1 Hazards.

i. Adopting a place-based approach to target work in localities with high numbers of homes with Housing Health and Safety Rating System (HHSRS) hazards. These hazards are often disproportionately located in the most deprived areas; thus, providing an opportunity to significantly reduce health inequalities. This will require systemwide action to identify and mitigate against Category 1 issues including (but not limited to) mould and damp, excess cold, infection hazards, and falls. It will bring together partners in health, care, housing, community and financial hardship support systems to work on common aims.

ii. In particular, the findings of this report indicate that falls, given the higher-than-average age of the population in Derbyshire, is an issue which needs specific attention. The Enhanced Falls Recovery Service (EFRS) pilot, led by JUCD, taking place in Derby City, Chesterfield, and South Derbyshire, should enable the commissioning of a longer term EFRS that works to the Ageing Well agenda. However, robust clinical oversight from Health, is required, to enable links into a wider community response that could review medications, the suitability of the property and link into other services like Strictly No Falling.

iii. The development of Derbyshire discretionary housing grants for Category 1 hazards in owner occupied housing should be explored. Cash poor owner occupiers have limited opportunity to access funding to address Category 1 hazards within their households, exacerbating health inequalities. Re-mortgaging or seeking loans may not be an attractive option, particularly for elderly and low-income households who may then choose to live with a hazard for purely financial reasons. Grant funding for clearly defined purposes to address housing hazards could be directed towards the key priorities identified in this report. If applied uniformly and consistently across Derbyshire, then the uptake and impact is likely to be maximised.

(b) Simplify referral routes from health and care services to council and community services to address the wider determinants of health.

Consider how to develop simple referral routes for all health and housing professionals to ensure vulnerable patients and residents receive advice and support around the wider determinants of health. To help inform future developments, an understanding is required of how effective the Winter Pressure Single Point of Access concept in Derbyshire has been in offering simple referral routes for all professionals in the system. This may also provide a way of finding and targeting Derbyshire residents experiencing poor housing conditions and fuel poverty which cause and exacerbate health issues.

(c) Maximise opportunities to address excess cold and meet net carbon zero.

A better focus on the current and future climate change policy and how it will impact on domestic energy efficiency is required, to understand how well excess cold can be addressed in Derbyshire. Funding opportunities exist to combine both health and carbon reduction funding to achieve multiple positive outcomes. Various funding streams are currently available to enable energy efficiency measures to be installed in residential properties to both reduce exposure to excess cold, reduce fuel poverty and reduce carbon emissions. However, for large parts of Derbyshire where there are planning restrictions and practical

challenges that mean that interventions such as energy saving retrofit is not an option and subsidised gas boilers for low-income households are increasingly rare, many vulnerable households will remain difficult to keep warm.

2. Maximise opportunities which come about because of the Decent Homes Standard Review.

In 2022, the Government published a fairer private rented sector White Paper. The white paper aims to redress the balance between landlords and 4.4 million private rented tenants. Measures being considered include:

i. Expansion of the Decent Homes Standard so that is also applies to the Private Rented Sector. This will make it a requirement for all rented homes to be free of serious hazards and that repairs should be made to ensure homes are in a reasonable condition.

ii. Requirement for landlords to register with a new property portal, which will bring together information about properties in one place. This will support enforcement by Local Authorities.

iii. Abolishing Section 21 evictions and the introduction of a private rented sector ombudsman, covering all Private Rented Sector landlords.

It is recommended that every opportunity is taken to determine at a local level how new powers and opportunities can be maximised to improve property conditions and tackle the worst offenders backed by enforcement pilots and increasing fines for serious offences.

3. Provide readily available information to private tenants and landlords on their rights and responsibilities.

Information on local standards, examples of good practice, promoting awareness of responsibilities and advice on repairs through the development of a web page on the Council website.

4. Maintain and refresh the Private Sector Housing Condition Survey analysis.

The private sector housing condition analysis undertaken in collaboration with Derby City Council Public Health, should be maintained and refreshed on a five yearly basis to ensure the evidence base is kept up to date. As part of this, practical support should be given to local councils to optimise the use of the database to make it more appealing. This will support targeting of interventions, monitoring of progress, measurement of impacts on both housing and health and to best support funding bids and licensing applications.

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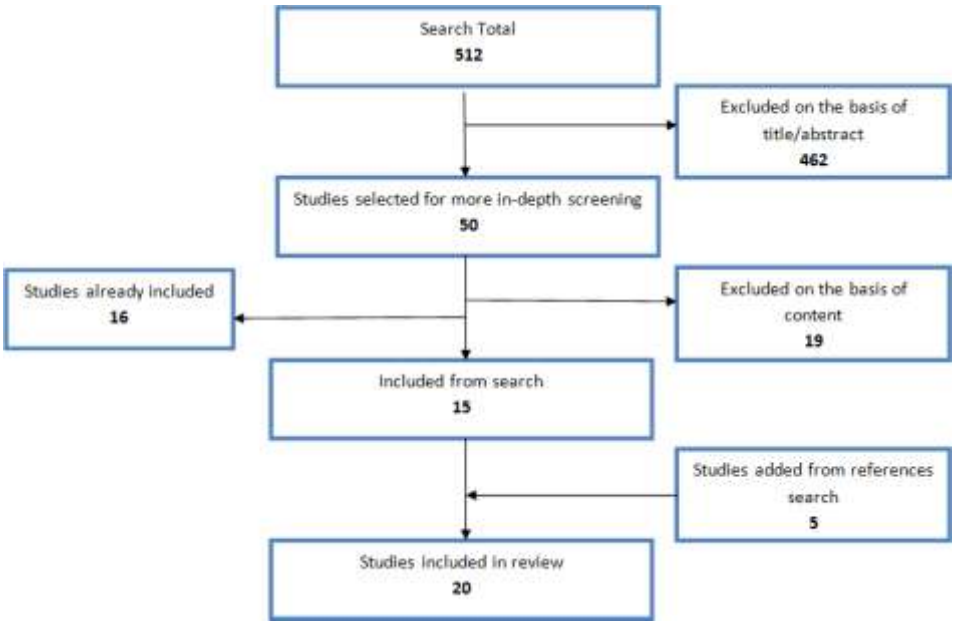
Appendix

Appendix 1: PRISMA flow diagram of study selection process



Appendix 2: Smoking prevalence in adults aged 18+ years, in Derbyshire[59]

Smoking prevalence in adults (18+) - current smokers (GPPS) New data 2019/20 Proportion - %

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	-	-	14.3	14.2	14.4
Derbyshire	-	-	13.3	12.7	14.0
Chesterfield	-	-	17.6	15.2	19.9
Erewash	-	-	16.1	14.3	18.0
Bolsover	-	-	15.4	13.4	17.5
High Peak	-	-	14.3	12.5	16.1
South Derbyshire	-	-	12.1	10.2	14.0
Amber Valley	-	-	11.5	10.0	13.1
Derbyshire Dales	-	-	9.7	8.1	11.2
North East Derbyshire	-	-	9.1	7.7	10.5

Appendix 3: Health outcomes and cost for each class of HHSRS hazard[90]

	HHSRS Outcome			
Hazard	**Class 1**	**Class 2**	**Class 3**	**Class 4**
Damp and mould growth	Not applicable	Type 1 allergy (£2,034)	Severe asthma (£1,027)	Mild asthma (£242)
Excess cold	Heart attack, care, death (£19,851)	Heart attack (£22,295)*	Respiratory condition (£519)	Mild pneumonia (£84)
Radon (radiation)	Lung cancer, then death (£13,247)	Lung cancer, survival (£13,247)*	Not applicable	Not applicable
Falls on the level	Quadriplegic (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)*	Treated cut or bruise (£115)
Falls on stairs and steps	Quadriplegic (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)*	Treated cut or bruise (£115)
Falls between levels	Quadriplegic (£92,490)*	Head injury (£6,464)*	Serious hand wound (£2,476)*	Treated cut or bruise (£115)
Fire	Burn, smoke, care, death (£14,662)*	Burn, smoke, care (£7,435)*	Serious burn to hand (£1,879)	Burn to hand (£123)
Hot surfaces and materials	Not applicable	Serious burns (£7,378)	Minor burn (£1,822)	Treated very minor burn (£123)
Collision and entrapment	Not applicable	Punctured lung (£5,152)	Loss of finger (£1,698)	Treated cut or bruise (£115)

*Modelled value only includes first-year treatment costs