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BRE Client Report

BRE Integrated Dwelling Level Housing Stock Modelling and Database for Walsall Metropolitan Borough Council

Prepared for: **Appollo Fonka, Team Leader - Housing Standards**

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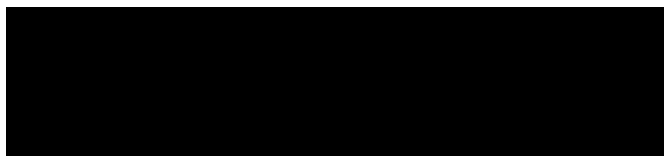
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FOREWORD

Walsall Council has been at the forefront of tackling poor standards in the private rented sector for many years. The private rented sector in Walsall plays an important role in the provision of housing within the borough and has grown significantly over the last decade. This upward trend is expected to continue, largely through the activities of 'buy to let' investors, and landlords who have replaced owner-occupiers in many parts of the borough.

Most landlords in Walsall take their responsibilities seriously and provide the much needed housing within the borough. Whilst this administration is committed to working with all landlords to improve the quality of housing, a significant minority are negligent in their duties and the impact of this neglect can be far reaching. These are criminal landlords who will exploit vulnerable tenants and fail to manage their tenancies and properties effectively. They have no scruples and will often let out unsuitable, cramped - and in some cases dangerous properties.

Given the negative impacts of poor quality housing, poor management practices and the general growth of the private housing sector in general, a rigorous and effective management of these properties is needed. The findings in this report will help us develop strategies and practices to prevent rogue landlord activity, maintain the good standards that support a thriving sector, and ensure that the housing stock is properly managed now and well in the future.

This detailed 'stock condition survey' will give us a robust, comprehensive, and up to date information on the current distribution and condition of private rented housing in the borough. The survey will therefore;

- Support more targeted and efficient enforcement action by partners and ourselves to tackle rogue landlords.
- Enable focused enforcement resources in key geographic areas (specific streets) and or dwellings.
- Inform our housing stock policies and strategies, so they remain fit for purpose and reflect the realities of our communities.
- Further develop evidence-based practice and targeted energy efficiency work in those properties with low EPC ratings.
- Raise the profile of our Housing Standards work.

We are very grateful to the Ministry of Housing, Communities and Local Government (MHCLG) for awarding us the part funding for this report through the 'Rogue Landlord Enforcement Grant'.

Councillor Adrian Andrew
Deputy Leader of the Council and Portfolio Holder for Regeneration and Housing

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Executive summary

- Walsall Council commissioned BRE to undertake a series of modelling exercises on their housing stock which required BRE to produce an integrated stock model which includes tenure, benefits and HMO data provided by Walsall Council. The BRE models also integrate Energy Performance Certificate (EPC)[1] data. As a result of this, 52,769 addresses have had their imputed energy characteristics replaced with observed characteristics from the EPC data for the purposes of the energy model. The use of this observed data will lead to more accurate energy models for these cases, which account for 45.6% of the total stock in Walsall.

- This report describes the work and the results obtained from the integrated model and Housing Stock Condition Database (HSCD). The database is also provided to the council to enable them to obtain specific information whenever required.

- The detailed housing stock information provided in this report will facilitate the delivery of Walsall Council's housing strategy and enable a targeted intervention approach to improving housing. In addition to this there are also several relevant government policies – the Housing Act 2004 (including but not limited to HMOs), Housing Strategy Policy, Local Authority Housing Statistics (LAHS) and the Energy Companies Obligation (ECO).

- The main aims of this work were to provide estimates of:

  o The percentage of dwellings meeting each of the key indicators[2] for Walsall overall and broken down by tenure and then mapped by Census Output Area (COA) (private sector stock only)
  o Information relating to LAHS reporting for the private sector stock - category 1 hazards and Houses in Multiple Occupation (HMOs) as well as information on EPC ratings

- Walsall Council also commissioned the provision of data relating to flats above commercial premises.

- BRE Housing Stock Models were used to provide such estimates at dwelling level and focussing on private sector housing. The key indicators provide Walsall with detailed information on the likely condition of the stock and the geographical distribution of properties of interest.

- A stock modelling approach has been developed and used by BRE for many years and the most recent 2017 models have been updated to make use of the results of the 2014 English Housing Survey (EHS)[3]. The models also make use of Experian and Ordnance Survey (OS) data. OS

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[1] EPCs are an indication of how energy efficient a building is - with a rating from A (very efficient) to G (inefficient). They are required whenever a property is built, sold or rented.

[2] Presence of a HHSRS category 1 hazard, presence of a category 1 hazard for excess cold, presence of a category 1 hazard for falls, dwellings in disrepair, fuel poverty (10% and Low Income High Cost definitions), dwelling occupied by a low income household and SimpleSAP rating.

[3] 2014 is the latest available data. Prior to the 2017 models EHS 2012 data was used.

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AddressBase Plus is used as a basis for the list of all dwellings in the authority, and applying improved geo-modelling[4] is used to determine the dwelling type and floor area from OS Mastermap. The energy model that lies at the heart of the modelling process are based on the 2012 version of SAP, and the methods for imputing the inputs to this model incorporate information sources from additional sources. These include the age of postcodes (to improve dwelling age data) and data from Xoserve to determine whether the dwelling is on the gas network. These dwelling level models are used to estimate the likelihood of a particular dwelling meeting the criteria for each of the key indicators. These outputs can then be mapped to provide the authority with a geographical distribution of each of the key indicators which can then be used to target resources for improving the housing stock.

- Furthermore, Walsall Council provided additional sources of "local data" – tenure, benefits and HMO data. Energy Performance Certificate (EPC) data is also integrated by BRE. These data sets were then incorporated into the BRE Housing Stock Model to produce an integrated Housing Stock Condition Database (HSCD).

- The headline results are provided on the following page:

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[4] The OS data has been used to update a number of the model inputs – the main value of the OS data is the ability to determine the dwelling type with much greater confidence – see **Appendix B** for more information.

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Headline results for Walsall

There are 115,700 dwellings in Walsall, 60% are owner occupied, 16% private rented and 25% social rented.

10,703 dwellings in the private sector have category 1 Housing Health and Safety Rating System (HHSRS) hazards. This equates to 12% of properties. *See full results*

2,463 dwellings in the private rented sector have category 1 HHSRS hazards. This equates to 14% of properties in the private rented sector. *See full results*

The highest concentrations of all HHSRS hazards in the private sector are found in the wards of Pleck, Palfrey and Darlaston South. *See full results*

The highest concentrations of fuel poverty (Low Income High Costs definition) in the private sector are found in the wards of Pleck, Palfrey and Darlaston South and for excess cold the highest concentrations are in St. Matthew's, Paddock and Darlaston South. *See full results*

The average SimpleSAP rating for all private sector dwellings in Walsall is 60, which is the same as England but better than West Midlands (58). For owner occupied stock the figure is 60 and for private rented stock it is 61. *See full results*

Maps by Census Output Area (COA) have been provided for the above key indicators. *See maps*

The total cost of mitigating category 1 hazards in Walsall's private sector stock is estimated to be £29.9 million – with £23.0 million in the owner occupied sector, and £6.9 million in the private rented sector. *See full results*

There is an estimated total of 2,030 HMOs in Walsall, of which approximately 304 would come under the mandatory licensing scheme. *See full results*

3.8% (3,329) of *private sector* dwellings and 4.3% (779) of *private rented* dwellings in Walsall are estimated to have an EPC rating below band E. *See full results*

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Key illustrations of headline results

- The table below shows the results for 7 of the key indicators in Walsall compared to regional data and England (EHS 2014) - split into all stock and private sector stock. The data shows that the performance of the housing stock in Walsall compared to the EHS England average is mixed with Walsall performing slightly better for all hazards and excess cold, but worse for fall hazards, disrepair, fuel poverty (particularly the 10% definition) and low income households. Compared to the regional average Walsall performs better for all hazards and excess cold, and more similarly for the remainder of the indicators but slightly worse for low income households.

Estimates of the percentage of dwellings meeting the key indicator criteria assessed by the housing stock models and database for all stock and private sector stock – Walsall compared to the West Midlands and England (EHS 2014)

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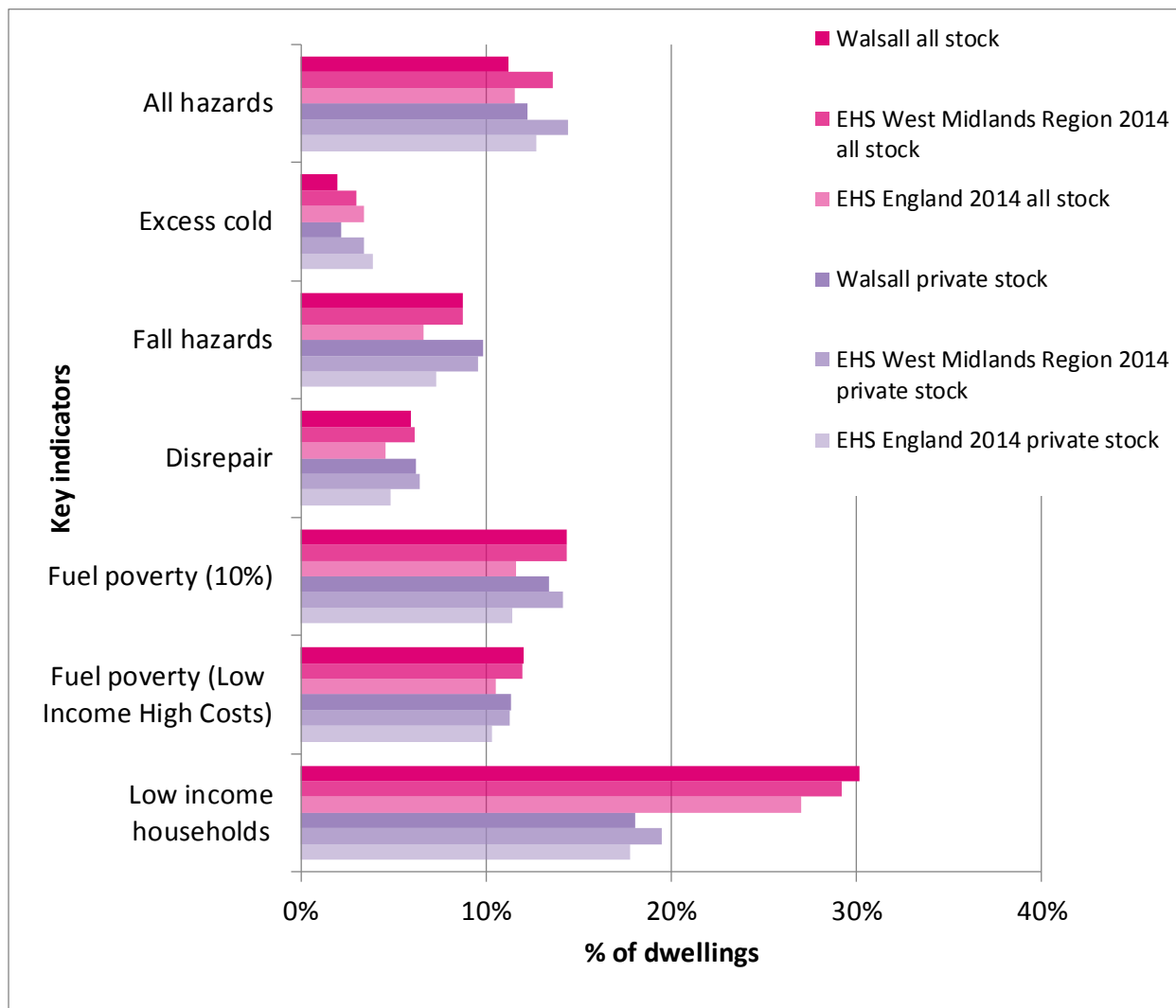
- The table below shows the number and percentage of Walsall's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP). The number of private rented dwellings in Walsall with a rating below band E (i.e. bands F and G), is estimated to be 779 (4.3%). Compared to England, there are a greater proportion of dwellings in bands C and E and similar or slightly lower proportions in the other bands.

Number and percentage of Walsall's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP)

		Walsall		2014 EHS England
		Count	Percent	Percent
(92-100)	A	0	0.0%	1.4%
(81-91)	B	257	1.4%	
(69-80)	C	4,766	26.5%	23.8%
(55-68)	D	8,602	47.9%	48.9%
(39-54)	E	3,566	19.8%	18.3%
(21-38)	F	630	3.5%	5.4%
(1-20)	G	149	0.8%	2.1%

- The map overleaf shows the distribution of category 1 hazards, as defined by the Housing Health and Safety Rating System (HHSRS). The highest concentrations are mainly in central and south western parts of the Walsall Council area, in particular the wards of Pleck, Palfrey and Darlaston South.

Percentage of private sector dwellings in Walsall with the presence of a HHSRS category 1 hazard

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1   Introduction

Walsall Council commissioned BRE to undertake a series of modelling exercises on their housing stock. BRE have integrated data provided by the authority into the models to produce an integrated database and corresponding report. This report describes the modelling work and provides details of the results obtained from the integrated dwelling level model and database.

This current report covers the BRE Integrated Dwelling Level Stock Models and Database. Walsall Council provided benefits, tenure and HMO data. The BRE Model also integrates Energy Performance Certificate (EPC) data and as a result of this, 52,769 addresses have had their imputed energy characteristics replaced with observed characteristics from the EPC data for the purposes of the energy model. The use of this observed data will lead to more accurate energy models for these cases, which account for 45.6% of the total housing stock in Walsall.

This report describes that work and the results obtained from the integrated model and database. The integrated database is also provided to the council to enable them to obtain specific information whenever required. This database is now in an online format.

The stock models and database provide the council with dwelling level information on various key housing indicators, focussing on private sector housing. The key indicators provide Walsall Council with detailed information on the likely condition of the stock and the geographical distribution of properties of interest. These properties are likely to be suitable targets for energy efficiency improvements or other forms of intervention, such as mitigating Housing Health and Safety Rating System (HHSRS) hazards. The key indicators are split into categories related to house condition, energy efficiency and household vulnerability as shown in **Table 1** (see **Appendix A** for full definitions).

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Table 1: Key indicators split into categories

Indicator	House condition indicators	Energy efficiency indicators	Household vulnerability indicators
Presence of HHSRS cat 1 hazard	✓		
Presence of cat 1 hazard for excess cold	✓	✓	
Presence of cat 1 hazard for falls	✓		
Dwellings in disrepair	✓		
Fuel Poverty (10% and Low income, High cost definitions)			✓
Dwellings occupied by low income households			✓
SimpleSAP rating		✓	

N.B. Presence of category 1 hazard for falls does NOT include the hazard of falling between levels

The single indicators shown in **Table 1** can also be combined within the database to provide powerful information on the housing stock, for example dwellings suffering from excess cold and also occupied by households on a low income. The true potential of the database lies in its ability to produce combined indicators such as this, as it allows council officers to explore the stock and to assess the likely scope of any programmes they might wish to implement.

It is also possible to extract other information from the database which is of use to local authorities. This information includes estimates relating to the Ministry of Housing, Communities and Local Government's (MHCLG) Local Authority Housing Statistics (LAHS) reporting of costs of mitigating hazards, numbers of Houses in Multiple Occupation (HMOs) as well as providing information relating to Energy Performance Certificate (EPC) ratings.

The key indicators and other information are derived from the Housing Stock Condition Database (HSCD) which is made up of a series of Dwelling Level Stock Models. The BRE Dwelling Level Stock Models have been used for many years to provide key housing indicators to local authorities. The most recent 2017 models have been updated to make use of the results of the 2014 English Housing Survey (EHS)[5]. The models also make use of Experian and Ordnance Survey (OS) data. OS AddressBase Plus is used as a basis for the list of all dwellings in the authority and applying improved geo-modelling[6] is used to determine the dwelling type and floor area from OS Mastermap. The energy model that lies at the heart of the modelling process is based on the 2012 version of SAP, and the methods for imputing the inputs to this model incorporate information sources from additional sources. These include the age of postcodes

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[5] 2014 is the latest available data. Prior to the 2017 models EHS 2012 data was used.

[6] The OS data has been used to update a number of the model inputs – the main value of the OS data is the ability to determine the dwelling type with much greater confidence – see **Appendix B** for more information.

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(to improve dwelling age data) and data from Xoserve to determine whether the dwelling is on the gas network. These dwelling level models are used to estimate the likelihood of a particular dwelling meeting the criteria for each of the key indicators. These outputs can then be mapped to provide the authority with a geographical distribution of each of the key indicators which can then be used to target resources for improving the housing stock.

As described above, in this particular case, the database was further enhanced by the addition of local data sources which were identified by Walsall Council. These local data sources were incorporated into the stock models to produce the integrated database.

The information in the database can be used to ensure the council meets various policy and reporting requirements. For example, local housing authorities are required to review housing conditions in their districts in accordance with the Housing Act 2004[7].

Furthermore, having this information available will also help to facilitate the delivery of Walsall Council's housing strategy. It will enable a targeted intervention approach to improving housing; therefore allowing the council to concentrate their resources on housing in the poorest condition or with the greatest health impact.

1.1 Project aims

The main aim of this project was to provide data on key private sector housing indicators for Walsall. The main aims of this work were therefore to provide estimates of:

- The percentage of dwellings meeting each of the key indicators for Walsall overall and broken down by tenure and then mapped by Census Output Area (COA) (private sector stock only)
- Information relating to LAHS reporting for the private sector stock - category 1 hazards and HMOs, plus information on EPC ratings

Walsall Council also requested the provision of data relating to flats above commercial premises and further provision of more detailed information at ward and LSOA level.

This report looks firstly at the policy background and why such information is important for local authorities. Secondly, it provides a brief description of the overall stock modelling approach and the integration of the local data sources. Finally, this report provides the modelling results for Walsall covering each of the main aims above.

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[7] http://www.legislation.gov.uk/ukpga/2004/34/contents

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2   Policy background

The detailed housing stock information provided in this report will facilitate the delivery of Walsall Council's housing strategy and enable a targeted intervention approach to improving housing. This strategy needs to be set in the context of relevant government policy and legislative requirements. These policies either require reporting of housing-related data by local authorities, or the use of such data to assist in meeting policy requirements. The main policies and legislative requirements are summarised in the following sub-sections.

2.1   Housing Act 2004

The Housing Act 2004[7] requires local housing authorities to review housing statistics in their district. The requirements of the Act are wide-ranging and also refer to other legislation which between them covers the following:

- Dwellings that fail to meet the minimum standard for housings (i.e. dwellings with HHSRS category 1 hazards)
- Houses in Multiple Occupation (HMOs)
- Selective licensing of other houses
- Demolition and slum clearance
- The need for provision of assistance with housing renewal
- The need to assist with adaptation of dwellings for disabled persons

2.2   Key housing strategy policy areas and legislation

2.2.1   Private rented sector

In the report "Laying the Foundations: A Housing Strategy for England"[8] Chapters 4 and 5 focus on the private rented sector and empty homes.

New measures are being developed to deal with rogue landlords and to encourage local authorities to make full use of enforcement powers for tackling dangerous and poorly maintained dwellings. The report encourages working closely with landlords whilst still operating a robust enforcement regime (e.g. Landlord Forums and Panels across the country).

There has been significant growth in the private rented sector in Walsall in recent years from 4% of the total stock in 2001 to 13% in 2011[9] - so that 9% of the stock has changed over that time period to now being private rented. This is the same as the change of 9% seen in England as a whole. The analysis for this current report estimates that 16% of the stock in Walsall is now privately rented, implying a further increase since 2011.

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[8] Laying the Foundations: A Housing Strategy for England, CLG, 2011

[9] https://www.ons.gov.uk/census#censusdataandbackground

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2.2.2   Health inequalities

The government's white paper "Choosing Health"[10] states that the key to success in health inequalities will be effective local partnerships led by local government and the NHS working to a common purpose and reflecting local needs. Housing is a key determinant of health, and poor housing conditions continue to cause preventable deaths and contribute to health inequalities[11]. An example in this area is the work carried out by Liverpool City Council in partnership with Liverpool Primary Care Trust – the "Healthy Homes Programme". This has identified over 3,800 hazards and led to an estimated £4.8 million investment by landlords, delivering sustainable health improvements and enhancing community wellbeing.

2.2.3   Integrated care

It has been recognised by central government that to fully address the health needs of the population, services need to become more integrated and there needs to be better communication between different providers. Housing is a key aspect of this:

"Many people with mental and physical disabilities, complex needs, long-term conditions and terminal illness also need to access different health care, social care, housing and other services, such as education, and often simultaneously"[12].

It is therefore essential that departments providing or regulating housing work with other council departments and health organisations to provide services that are integrated and take full account of the needs of the individual.

2.2.4   Public Health Outcomes Framework

The Public Health Outcomes Framework "Healthy lives, healthy people: Improving outcomes and supporting transparency"[13] sets out desired outcomes for public health and how they will be measured. Many of the measurements have links to housing, some of the more relevant being:

- Falls and injuries in over 65's
- Fuel poverty
- Excess winter deaths

2.2.5   Joint Strategic Needs Assessment (JSNA) and Joint Health and Wellbeing Strategies

The JSNA and joint health and wellbeing strategy allow health and wellbeing boards to analyse the health needs of their local population and to decide how to make best use of collective resources to achieve the priorities that are formed from these. The Department of Health document "Joint Strategic Needs Assessment and joint health and wellbeing strategies explained - Commissioning for populations" says

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[10] Choosing Health: Making healthy choices easier, Department of Health, 2004

[11] The health impacts of poor private sector housing, LACORS, 2010

[12] Integrated Care: Our Shared Commitment, Department of Health, 2013

[13] Healthy lives, healthy people: Improving outcomes and supporting transparency, Department of Health, 2013

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"This will ensure better integration between public health and services such as housing and education that have considerable impact on the wider determinants of health"[14].

2.2.6   Energy Act 2011

The Energy Act 2011 requires that from 2016 reasonable requests by tenants for energy efficiency improvements will not be able to be refused. Furthermore, from 2018 it has been unlawful for landlords to rent out properties that do not reach a minimum standard of energy efficiency (set at Energy Performance Certificate rating E[15]). While there will be various caveats to these powers, they have provided a new minimum standard for rented accommodation. Part of this current project for Walsall Council includes provision of a private rented sector variable that should assist in identifying such dwellings.

2.2.7   Empty homes

The need to bring empty private sector dwellings back into use is a key government objective that is part of a wider strategy to tackle housing affordability. It is generally accepted that in a time of housing shortage, empty dwellings represent a wasted resource.

Empty homes brought back into use will qualify for the New Homes Bonus where, for the following 4 years, the government will match the Council Tax raised on long term empty properties brought back into use. This was previously set at 5 years in 2017-18 and 6 years prior to that. Between 2012-15, £100 million of capital funding was available from within the Affordable Homes Programme to tackle problematic[16] empty homes. There is no longer any separate funding for empty homes under the 2015-18 Affordable Homes Programme, although they are legitimate forms of Affordable Rent provision that could be included in bids for the 2015-18 Affordable Homes Programme[17].

There are a number of issues in dealing with private sector vacant dwellings including the transient nature of vacant dwellings and their difficulty of identification. Properties are being continually bought and sold, let and modernised, which means that at any given time a proportion of the stock will be naturally vacant. The only dwellings that tend to be of most interest to local authorities are those that are not turning over in the normal way.

Whilst the data provided by this project cannot necessarily assist with the actual identification of empty homes, the database provided would be the logical place for such information to be stored should it be gathered from other sources.

The latest available information for Walsall for 2018, collected by MHCLG[18], identifies 2,651 vacant dwellings across all tenures (a vacancy rate of approximately 2% in Walsall). In 2017 the number of vacant dwellings was slightly lower at 2,381 and 5 years ago in 2013 the figure was higher at 3,386. Furthermore, around 795 (0.8%) dwellings were long-term vacant (6 months or more) in Walsall in 2018.

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[14] Joint Strategic Needs Assessment and joint health and wellbeing strategies explained: Commissioning for populations, Department of Health, 2011

[15] http://www.legislation.gov.uk/uksi/2015/962/contents/made

[16] Properties that are likely to remain empty without direct financial support from government.

[17] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/343896/affordable-homes-15-18-framework.pdf

[18] https://www.gov.uk/government/collections/dwelling-stock-including-vacants

2.3   Other policy areas

The following policy areas, whilst not directly relating to environmental health services, will have an effect on demand and local authorities will need to be aware of the possible impact in their area.

2.3.1   The Housing and Planning Act 2016

The Housing and Planning Act 2016[19] introduces legislation for government to implement the sale of higher value local authority homes, starter homes, pay to stay and a number of other measures, mainly intended to promote home ownership and boost levels of housebuilding in England. Although many of the measures have yet to be implemented or come into effect, the following policy changes will have a significant impact on the way councils deliver their Housing Services:

- The introduction of Pay to Stay where households earning over £31,000 have to pay higher levels of rent for their social housing (policy since dropped)
- Extension of the Right-to-Buy scheme to housing associations through a voluntary agreement, funded by the sale of higher value council properties when they become vacant
- The ending of lifetime tenancies – all new tenants will have to sign tenancies for a fixed term up to 10 years although there will be exemptions for people with disabilities and victims of domestic abuse, and families with children under nine years old can have a tenancy that lasts until the child's 19th birthday
- Changes to planning measures so that the government can intervene where councils have not adopted a Local Plan
- To replace the need for social rented and intermediate housing on new sites with the provision of Starter Homes that are sold at a reduced cost to first time buyers
- Changing the definition of 'affordable homes' to include starter homes
- Increasing the site size threshold before affordable housing can be requested

The Act also includes a package of measures to help tackle rogue landlords in the private rented sector. This includes:

- Allowing local authorities to apply for a banning order to prevent a particular landlord/letting agent from continuing to operate where they have committed certain housing offences
- Creating a national database of rogue landlords/letting agents, which will be maintained by local authorities
- Allowing tenants or local authorities to apply for a rent repayment order where a landlord has committed certain offences (for example continuing to operate while subject to a banning order or ignoring an improvement notice). If successful the tenant (or the authority if the tenant was receiving universal credit) may be repaid up to a maximum of 12 months' rent
- Introducing a new regime giving local authorities an alternative to prosecution for offences committed under the Housing Act 2004, including all HMO offences. Effectively, local authorities will have a choice whether to prosecute or impose a penalty with a maximum fine of £30,000. The local authority can also retain the money recovered, which is not currently the case with fines imposed in the magistrates' court

2.3.2   The Welfare Reform and Work Act 2016 and the Welfare Reform Act 2012

The Welfare Reform and Work Act 2016[20] gained royal assent in March 2016. The Act introduces a duty to report to Parliament on progress made towards achieving full employment and the three million

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[19] http://www.legislation.gov.uk/ukpga/2016/22/contents/enacted/data.htm

[20] http://www.legislation.gov.uk/ukpga/2016/7/contents/enacted

apprenticeships target in England. The Act also ensures reporting on the effect of support for troubled families and provision for social mobility, the benefit cap, social security and tax credits, loans for mortgage interest, and social housing rents. These include the following:

- Overall reduction in benefits – a four year freeze on a number of social security benefits
- Benefit cap reduction – the total amount of benefit which a family on out of work benefits can be entitled to in a year will not exceed £20,000 for couples and lone parents, and £13,400 for single claimants, except in Greater London where the cap is set at £23,000 and £15,410 respectively
- Local Housing Allowance rent cap – this is the locally agreed maximum benefit threshold for a dwelling or household type within a defined geographical area. Therefore, if rises in rent outstrip growth in income, renters may find it increasingly difficult to pay
- A 1% reduction in social rents per year for 4 years to reduce the housing benefit bill

In addition, the Welfare Reform Act 2012[21] (which is in parts amended by the 2016 Act discussed above) covers areas of environmental health services – in particular the sections relating to the under occupation of social housing, and the benefit cap. Whilst this will mainly affect tenants in the social rented sector it will undoubtedly have an impact on private sector services. Social tenants may find themselves being displaced into the private sector, increasing demand in this area, and the tenants of Registered Providers (RP's) and some private landlords may have greater trouble affording rent payments. If tenants are in arrears on their rental payments then authorities may be met with reluctance from landlords when requiring improvements to properties.

2.3.3   Localism Act 2011

The Localism Act allows social housing providers to offer fixed term, rather than secure lifetime, tenancies. As with the Welfare Reform Act, this has a greater direct impact on the social rented sector, however, there is some concern this may lead to greater turnover of tenancies meaning such that some traditional social tenants may find themselves in the private rented sector.

Both of these policy changes above may increase the number of vulnerable persons in private sector properties. If this occurs any properties in this sector in poor condition are likely to have a far greater negative impact on the health of those occupiers.

2.3.4   Potential increase in private rented sector properties

Policies such as the Build to Rent and the New Homes Bonus are aimed at increasing the supply of properties. As the private rented sector is already growing, it is reasonable to assume that many of the new properties being built will be rented to private tenants. Local authorities will need to be aware of the potential impact on the demand for their services and how their perception of their local area may have to change if large numbers of properties are built.

2.4   Local Authority Housing Statistics (LAHS)[22] and EPC ratings

The purpose of these statistics is twofold – firstly to provide central government with data with which to inform and monitor government strategies, policies and objectives as well as contributing to national statistics on housing, secondly, to the local authorities themselves to help manage their housing stock. Local authorities are required to complete an annual return which covers a wide range of housing-related

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[21] http://www.legislation.gov.uk/ukpga/2012/5/contents/enacted

[22] https://www.gov.uk/government/publications/completing-local-authority-housing-statistics-2012-to-2013-guidance-notes

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issues. Of particular relevance to this current project is "Section F: Condition of dwelling stock" which, amongst other things, requests the following information:

- Estimates of the number of HMOs and the number of mandatory licensable HMOs

Whilst the LAHS no longer requires reporting of total number of dwellings and number of private sector dwellings with category 1 HHSRS hazards and the estimated costs of mitigating these, this information is still of use to understand the extent of these hazards within a local authority.

The LAHS no longer requires reporting of average EPC ratings of the private sector stock and the proportion below a certain rating; however, this information remains pertinent due to the Energy Act 2011. Under this act new rules mean that from 2018 landlords must ensure that their properties meet a minimum energy efficiency standard - which has been set at band E - by 1 April 2018[23, 24]. Furthermore, from 1 April 2016, tenants in F and G rated dwellings may legally request an upgrade to the dwelling to a minimum of a band E. Results relating to LAHS statistics and EPC ratings can be found in **Section 4.2**.

2.5   The Energy Company Obligation (ECO)

The Energy Companies Obligation (ECO) requires energy companies to assist in the installation of energy efficiency measures in Great Britain to low income and vulnerable households or those living in hard-to-treat (HTT) properties. Under the ECO, energy companies are obliged to meet targets expressed as carbon or costs saved. There have been several ECO schemes to date, with the latest scheme commencing in December 2018:

- ECO1 - ran from January 2013 to March 2015
- ECO2 - launched on 1 April 2015 and ended on 31 March 2017
- ECO2t - was an 18 month extension to the ECO2 scheme until September 2018[25, 26] as a transition period between the end of ECO2 and a new scheme.
- ECO3[27]- the new scheme commenced on 3 December 2018 and runs until 31 March 2022

2.5.1   Current scheme – ECO3

ECO3 focuses on Affordable Warmth (the Carbon Emissions Reduction Obligation – CERO – will be removed) so that low income, vulnerable and fuel poor households are the recipients of the main benefits. This will be delivered through one obligation, the Home Heating Cost Reduction Obligation (HHCRO) where obligated suppliers must mainly promote measures which improve the ability of low income,

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[23] http://www.legislation.gov.uk/uksi/2015/962/contents/made

[24] Although landlords will still be able to rent out F and G rated properties after this date they will not be able to renew or sign a new contract.

[25] Energy Company Obligation (ECO): Help to Heat: https://www.gov.uk/government/consultations/energy-company-obligation-eco-help-to-heat

[26] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586266/ECO_Transition_Final_Stage_IA__For_Publication_.pdf

[27] https://beisgovuk.citizenspace.com/home-local-energy/eco3-2018-2022/supporting_documents/ECO3%20consultation.pdf

vulnerable and fuel poor households to heat their homes. This includes actions that result in heating savings such as the replacement of a broken heating system or the upgrade of an inefficient heating system. Up to 25% of the obligation can be met through measures delivered under Local Authority Flexible Eligibility, where local authorities are encouraged to use their expertise to identify the most vulnerable households in their areas. Suppliers will also need to meet at least 15% of their obligation by delivering measures in rural areas.

In terms of measures and improvements, the focus will be on replacing electric storage heaters with central heating, improve 17,000 solid wall dwellings every year, replace broken heating systems (maximum of 35,000 per year), encourage the replacement of heating systems only when also installing certain types of insulation. In addition, Renewable Heat Incentive measures would not be eligible under ECO3, and suppliers would be able to meet up to 10 – 20% of their obligation through "innovative measures".

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3 Overview of the BRE Dwelling Level Housing Stock Modelling approach

3.1 Overview

This section provides a simplified overview of the BRE dwelling level housing stock modelling approach. More detail on the methodology is provided in **Appendix B**.

A stock modelling approach has been developed and used by BRE for many years and dwelling level models are used to estimate the likelihood of a particular dwelling meeting the criteria for each of the key indicators (and other outputs of interest). These outputs can then be mapped to provide the council with a geographical distribution of each of the key indicators which can then be used to target resources for improving the housing stock. The process itself is actually made up of a variety of data sources, calculations and models.

The models are principally informed by the Ministry of Housing, Communities and Local Government's (MHCLG) English Housing Survey (EHS)[28]. The survey is not used to supply data for the database, but rather it allows the identification of patterns in the housing stock, so that this knowledge can be applied, in the form of mathematical algorithms, to impute key indicators and energy characteristics from other data available at the national level. The particular approach for Walsall, however, makes significant use of the Experian UK Consumer Dynamics Database of dwelling and household indicators as inputs to the models. One example is the BRE SimpleCO$_2$ Model which is based on dwelling level inputs from Experian and expands on these using imputation techniques to provide sufficient information to calculate the likely energy efficiency of each dwelling in the stock. Some of the key housing indicators, such as HHSRS excess cold category 1 hazards and BRE's SimpleSAP[29], can be directly inferred from this data.

Furthermore, Walsall Council provided additional sources of local data which were then incorporated into the BRE Housing Stock Model and Database, as well as EPC data, to produce an integrated housing stock model and database. The additional data provided and how it was used is as follows:

- **EPC data** – EPCs contain data on key dwelling energy characteristics (e.g. wall type and insulation, loft insulation, heating types etc.) and where these were available they were used in preference to the modelled data. It should be noted that to comply with bulk EPC data licencing requirements the EPC data is only used to inform the energy efficiency aspects of the model.

- **Tenure data –** the council provided lists of addresses from tenancy deposit schemes – these were Tenancy Deposit Scheme (TDS), My Deposits and Deposit Protection Service (DPS) data. This data was used to inform the tenure variable.

- **Benefits data –** this provides a list of addresses in receipt of Housing Benefit and Council Tax Relief. This was matched into the BRE Model using the UPRN and these addresses were assigned to low income households. The BRE Low Income Households Model was then used to assign the remaining

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[28] The most recent survey used in the housing stock models is 2014.

[29] A Simplified version of the SAP model that produces an output broadly comparable to SAP. The SimpleSAP model is distinct from both full SAP and RD SAP in that uses a smaller, simplified set of inputs.

low income households since housing and council tax reductions are only a proportion of total low income households.

- **HMO data –** the council provided a list of HMOs and licensable HMOs which were added to the BRE HMO model. This information was also used to inform the tenure model.

Figure 1 shows a simplified flow diagram of the overall BRE housing stock modelling approach and how the additional data is incorporated to produce the integrated Housing Stock Condition Database (HSCD).

The process is made up of a series of data sources and models which, combined with various imputation and regression techniques and the application of other formulae, make up the final database. The database is essentially the main output of the modelling and provides information on the key indicators and other data requirements (e.g. energy efficiency variables). More detailed information on the data sources and models is provided in **Appendix B**, but to summarise:

The data sources are:
EHS, EPC, Experian, Ordnance Survey (OS) MasterMap, other local data (if available)

The Models are:
SimpleSAP, Fuel Poverty, HHSRS (all hazards, falls hazards and excess cold), Disrepair and Low Income Households.

The data sources and models are linked as shown in the flow diagram and the modelling process itself can be divided into "energy inputs" and "other inputs", which are summarised as follows:

Energy inputs - are developed from Experian, EPC and other local data sources (if available). The EHS data is used to impute (using cold deck imputation[30]) and interpolate where there are gaps in the data. The "energy inputs" are then fed into the $SimpleCO_2$ Model to produce the "energy outputs" for the database plus information on excess cold for the HHSRS Model and information on energy costs for the Fuel Poverty Model.

Other inputs – are developed from Experian, OS MasterMap and other local data sources. The EHS data is used to impute (using cold deck imputation[30]) and interpolate where there are gaps in the data. The "other inputs" are then fed into the HHSRS, Disrepair, and Low Income Models (note that tenure data is fed directly into the database). Information from the EHS also feeds into the Fuel Poverty, HHSRS, Disrepair and Low Income Models.

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[30] Cold deck imputation is a process of assigning values in accordance with their known proportions in the stock.

Figure 1: Simplified flow diagram of overall BRE housing stock modelling approach (N.B. the EHS data is only used to inform the mathematical algorithms of the model – it does not provide data)
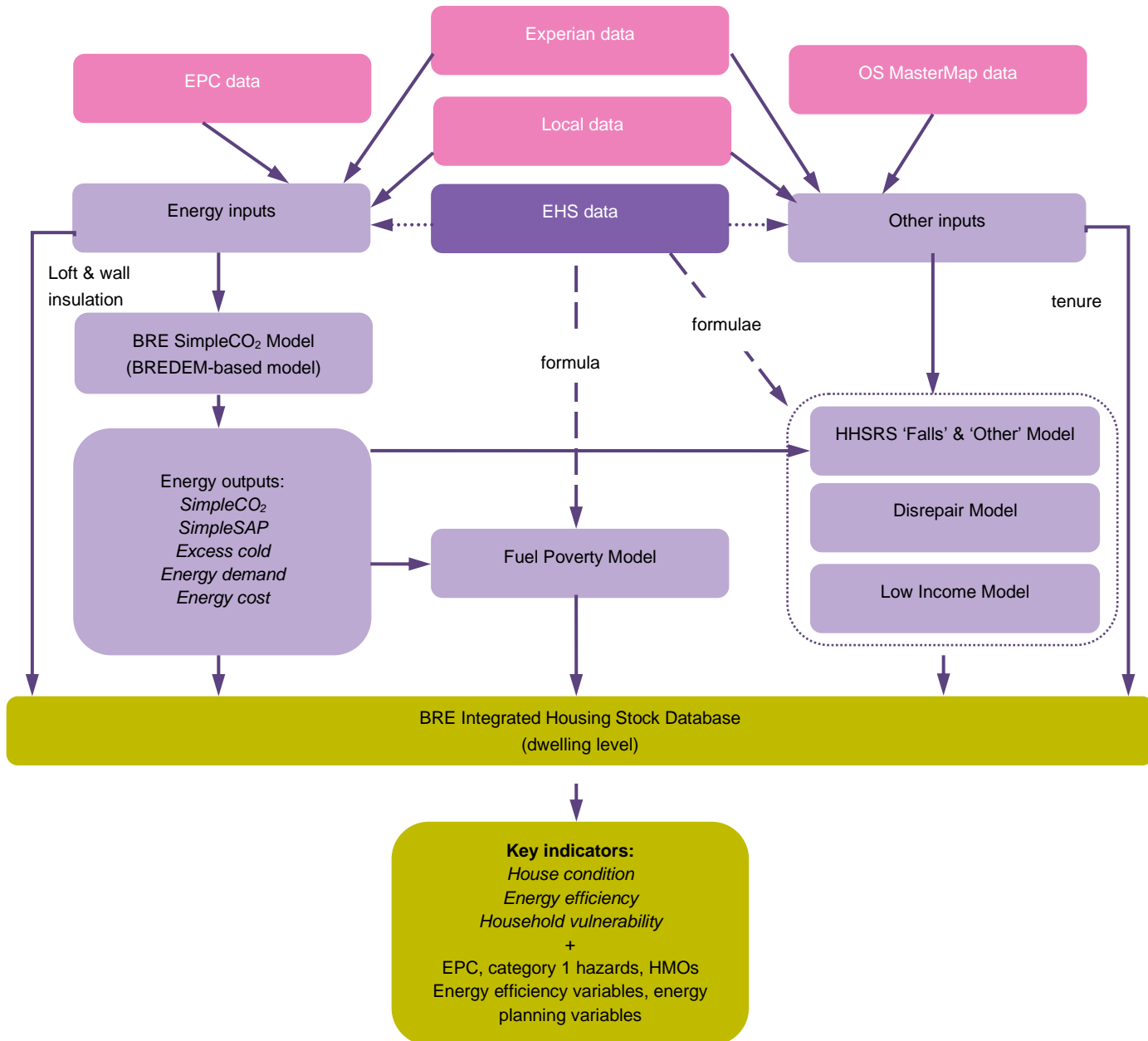
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3.2   Breakdown of the housing stock by tenure - validation

Providing the results split by tenure is useful since it can have an effect on how resources and improvement policies are targeted. This report is particularly focussed on private sector stock which is made up of owner occupied and private rented dwellings. The remainder of the housing stock consists of social housing.

The total number of dwellings in Walsall from the integrated housing stock condition database is based on OS AddressBase data; therefore the model is based on this value. The tenure split within the integrated database is derived from the purchased Experian tenure variable for addresses where tenure has not been supplied by the council.

Since it is possible for private rented dwellings to become owner occupied and vice versa relatively easily, it is difficult to accurately predict the actual tenure split at any given point in time. A validation process was undertaken to compare the tenure split from the database to the 2011 Census figures[31]. The results of the validation exercise show the differences between the tenure split from the database compared to the Census figures. There has been a noticeable increase in the size of the stock, mainly comprised of increases in the size of the private rented tenure from 13% to 16% (2011 Census and BRE database, respectively) creating a percentage difference of 28% (see **Figure 2** and **Table 2**). The previous Private Sector House Condition Survey, carried out for the Council in 2007 *(D Adamson and Partners Ltd March 2008*), indicated that 10% of dwellings were private rented. Furthermore, **Maps 1** and **2** show the geographical distributions of the private rented sector which look similar, again giving confidence that the integrated database provides a good overview of the housing stock in Walsall.

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[31] http://www.ons.gov.uk/ons/datasets-and-tables/index.html

Figure 2: Tenure split – comparison of BRE Housing Stock Condition Database outputs with 2011 Census figures for Walsall

Tenure	Owner occupied	Private rented	Social	Total
Database	69,234	17,970	28,496	115,700
2011 Census	67,866	13,989	25,967	107,822
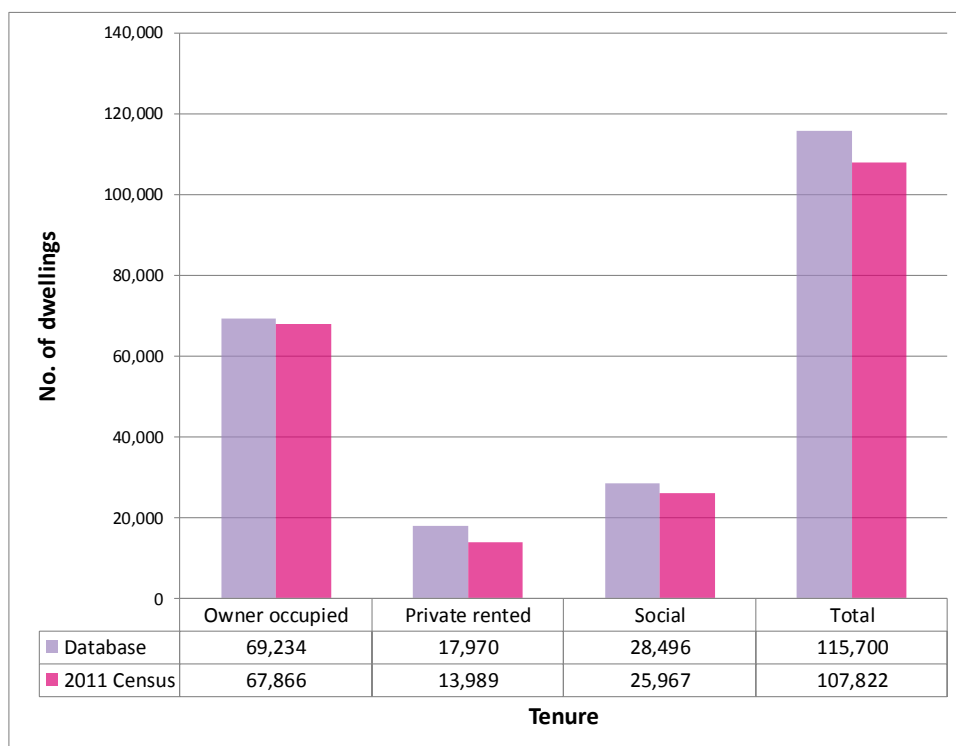
Table 2: Comparison of BRE database and Census 2011 figures for Walsall tenure

Tenure	Number of dwellings			% of all stock		
	Database	2011 Census	% difference	Database	2011 Census	% difference
Owner occupied	69,234	67,866	2%	60%	63%	-5%
Private rented	17,970	13,989	28%	16%	13%	20%
Social	28,496	25,967	10%	25%	24%	2%
Total	115,700	107,822	7%	100%	100%	-

Map 1: Distribution of estimated percentage of private rented dwellings in Walsall – based on database
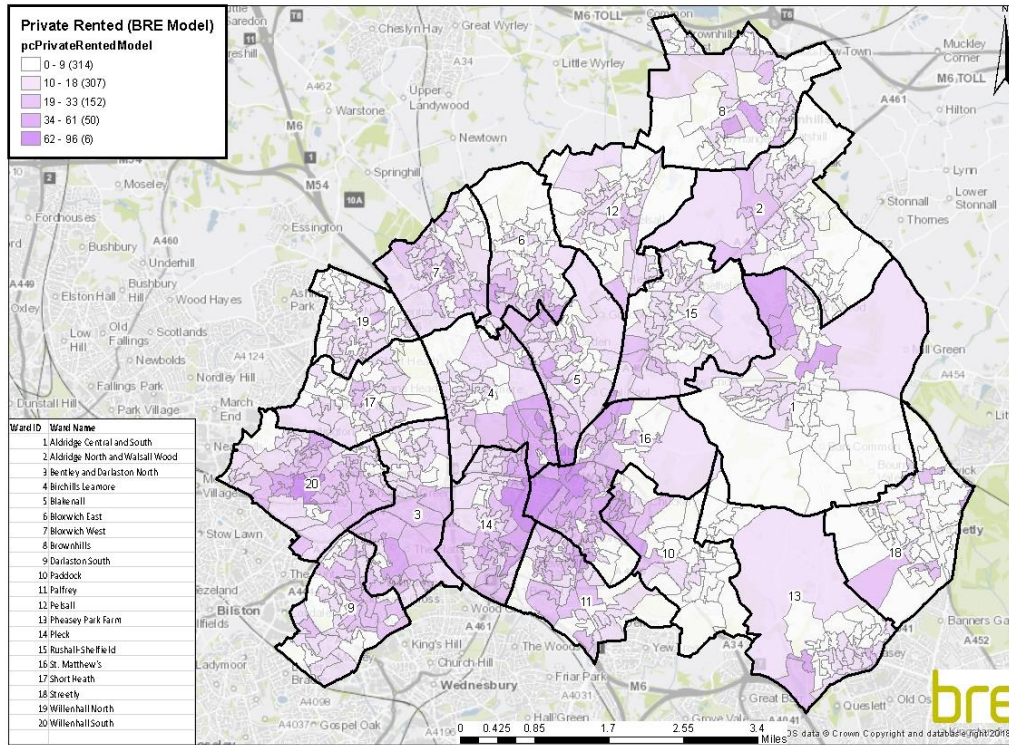
Map 2: Distribution of estimated percentage of private rented dwellings in Walsall – based on 2011 Census Data (Neighbourhood Statistics)

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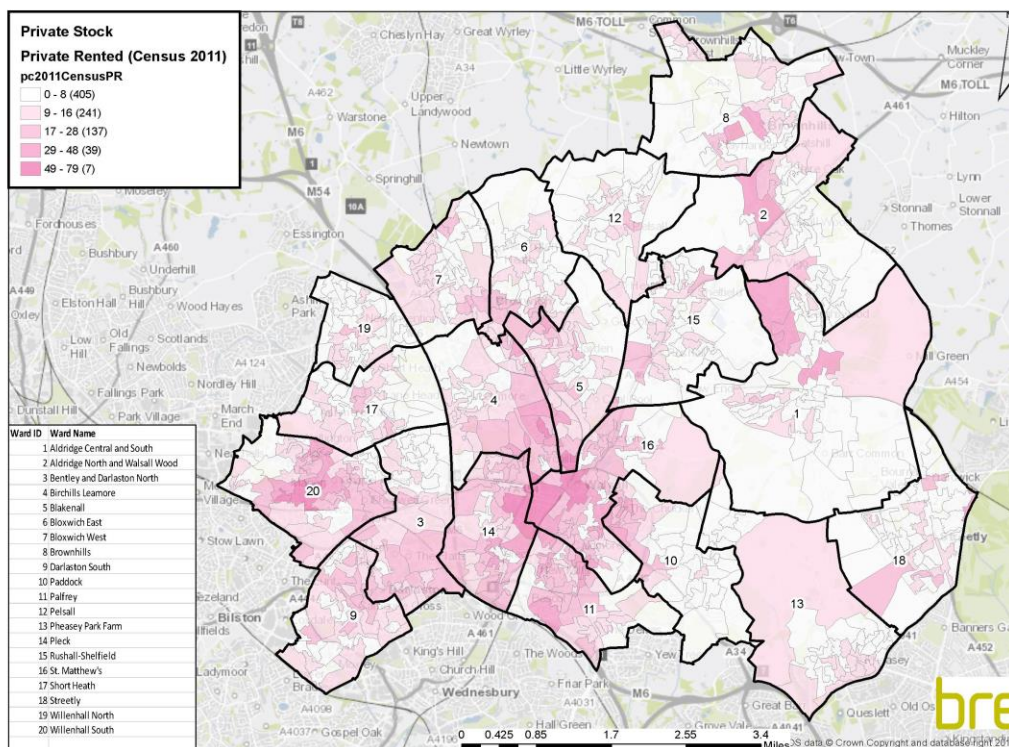
3.2.1 Other national datasets relating to tenure

In addition to the Census data there are other national datasets available which provide information on tenure; these are MHCLG returns[32] and Office for National Statistics (ONS) data[33]. These datasets are not used directly in the model but are reported here for the purposes of comparison.

The MHCLG returns provide estimates of the tenure split by private sector and social sector only, with the former being based on projections from the 2011 census as a starting point, and the latter being based on Local Authority Housing Statistics. The tenure split used in the BRE Housing Stock Model is compared to this at an early stage of the project in order to ensure the tenure split is consistent[34].

The ONS data provides subnational (local authority level) data on the dwelling stock broken down into tenure. The ONS split between owner occupied and private rented stock is based on their Annual Population Survey (APS)[35] which is then benchmarked to the MHCLG returns. The APS is based on "persons who regard the sample address as their main address and also those who have lived in the dwelling for more than 6 consecutive months, even if they do not regard this as their principal dwelling". This methodology may under-estimate the proportion of private rented dwellings for several reasons:

1. By only including those people who have lived in a dwelling for more than 6 consecutive months, the number of private rented households may be under-estimated as there tends to be a higher turnover in this sector.

2. By only including persons who regard the sample address as their main address there are two groups where this may have an impact on the estimated figures:

   a. Students renting away from home who assume their parents' address to be their main residence.

   b. Commuter areas where households may have a city flat during the week and also have a suburban family home which they class as their first residence. Commuter towns close to large cities may also have higher levels of private rented stock with a high turnover of tenants near rail stations for example.

In addition, the ONS dataset uses EHS data but this is limited to using the occupancy rate to allow for vacant dwellings as their APS is based on individuals and therefore does not account for vacant dwellings.

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[32] https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants

[33] https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/researchoutputssubnationaldwellingstockbytenureestimatesengland2012to2015/2017-12-04#methodology

[34] This comparison is checked early on in the project through email correspondence with the authority.

[35] https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/annualpopulationsurveyapsqmi

It is important to note that the ONS data is not an official statistic and that a disclaimer[36] must be used when reproducing the data (note that the "***dwelling stock by tenure***" in the disclaimer refers to the MHCLG returns data).

Table 3 shows the latest tenure splits for the DCLG and the ONS data for Walsall. Since the ONS data is benchmarked to the MHCLG returns, the figures for the private sector stock match. Both the numbers, and the proportions, are very similar to the BRE Model estimates.

Table 3: Comparison of MHCLG, ONS and BRE Database figures on tenure split for Walsall *N.B. DCLG data does not break down private sector into owner occupied and private rented and ONS data does not provide an estimate for social stock*

Tenure	Number of dwellings			% of all stock		
	2015 MHCLG	2015 ONS	BRE Database	2015 MHCLG	2015 ONS	BRE Database
Owner occupied	85,490	68,426	69,234	75%	60%	60%
Private rented		17,064	17,970		15%	16%
Social	27,860	-	28,496	25%	-	25%

[36] ONS Disclaimer: *"We are producing these Research Outputs to provide the tenure breakdown of dwellings within the private sector at the subnational level, which are currently only available at the country level. However, these Research Outputs are not official statistics and must not be reproduced without this disclaimer. Research Outputs are produced to provide information about new methods and data sources being investigated. There are official statistics available on **dwelling stock by tenure**[32] for local authorities, which you should refer to if you require official statistics. These provide the total private sector stock for each area, but do not provide a breakdown of owner-occupied and privately-rented dwellings."*

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4 Results from the BRE Dwelling Level Housing Stock Models and Housing Stock Condition Database (HSCD)

As described in the previous section, the housing stock modelling process consists of a series of different stock models with the main output being the database. The results in this section have been obtained from interrogating the database at the level of the local authority as a whole to give a useful overview for Walsall. Information at ward level, however, is provided in the maps, in **Section 4.2.5** and can also be obtained from the database which has been supplied as part of this project (see **Appendix C** for instructions). The database can be interrogated at local authority, ward, medium super output area (MSOA), lower super output area (LSOA), census output area (COA), postcode or dwelling level.

The first sub-section below provides a map of the wards in Walsall. The results are then displayed in the following sub-sections:

- Key indicators:
  - Walsall – regional and national comparisons
  - Key indicators by tenure for Walsall
  - Key indicators mapped by COA for Walsall private sector stock
  - Ward level results for the key indicators

- Information relating to LAHS reporting and EPC ratings:
  - Category 1 hazards
  - HMOs
  - EPC ratings
  - Flats above commercial premises

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4.1 Overview of Walsall

Map 3 below shows the 20 wards in Walsall. The data in the report is separated into wards and then further divided into Census Output Areas (COAs). These typically comprise around 125 households and usually include whole postcodes, which have populations that are largely similar. Where the COAs are smaller in size on the map this typically represents a more densely populated area since each COA represents a similar number of dwellings.

It should be noted that some residential addresses are not considered suitable for modelling and these have been removed. These include caravans and house boats which, whilst covered by the EHS, are quite uncommon, and the energy models and other housing indicators were not developed with dwellings such as these in mind. Residential institutions (e.g. care homes) have also been removed as it is not entirely appropriate to apply the usual models to these dwellings. The removal of these addresses may result in a COA not appearing to contain any dwellings due to the fact that all c.125 households are made up of caravans for example.

Map 3: The wards in Walsall

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

4.2 Key indicators

4.2.1 Walsall – regional and national comparisons

Table 4 and **Figure 3** show the results for each of the key indicators in Walsall compared to the West Midlands region and to England (EHS 2014) and split into all stock and private sector stock. **Figure 4** shows the results of the SimpleSAP ratings.

For all stock, the performance of the housing stock in Walsall compared to the EHS England average is mixed. Walsall performs slightly better for all hazards (11% compared to 12%) and excess cold (2% compared to 3%), but worse for fall hazards (9% compared to 7%), disrepair (6% compared to 5%) fuel poverty 10% definition (14% compared to 12%), fuel poverty Clow Income High Costs definition (12% compared to 11%) and low income households (30% compared to 27%).

When comparing Walsall to the West Midlands region, the picture is similar with Walsall performing better for all hazards and excess cold, and similarly for the remainder of the indicators except low income households which is higher.

Comparing Walsall to the EHS England average figures for the private sector stock Walsall performs slightly better for all hazards and excess cold, worse for fall hazards, disrepair and fuel poverty, and the same for low income households.

Compared with the regional average, the private stock again has lower levels of all hazards and excess cold, similar levels of the other indicators except low income households which are lower in Walsall.

The average SimpleSAP ratings in Walsall (**Figure 4**) are the same as the England averages and slightly higher than the regional averages, for both all stock and the private sector stock.

Table 4: Estimates of the numbers and percentage of dwellings meeting the key indicator criteria assessed by the Housing Stock Models and Housing Stock Condition Database for all stock and private sector stock – Walsall compared to the West Midlands and England (EHS 2014)

Indicator		All stock				Private sector stock			
		Walsall (no.)	Walsall (%)	2014 EHS Regional (%)	2014 EHS England (%)	Walsall (no.)	Walsall (%)	2014 EHS Regional (%)	2014 EHS England (%)
No. of dwellings		115,700	-	-	-	87,204	-	-	-
HHSRS category 1 hazards	All hazards	12,955	11%	14%	12%	10,703	12%	14%	13%
	Excess cold	2,304	2%	3%	3%	1,919	2%	3%	4%
	Fall hazards	10,168	9%	9%	7%	8,581	10%	10%	7%
Disrepair		6,890	6%	6%	5%	5,457	6%	6%	5%
Fuel poverty (10%)		16,619	14%	14%	12%	11,700	13%	14%	11%
Fuel poverty (Low Income High Costs)		13,930	12%	12%	11%	9,874	11%	11%	10%
Low income households		34,935	30%	29%	27%	15,754	18%	20%	18%

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold and fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

Figure 3: Estimates of the percentage of dwellings meeting the key indicator criteria assessed by the Housing Stock Models and Housing Stock Condition Database for all stock and private sector stock – Walsall compared to the West Midlands and England (EHS 2014)
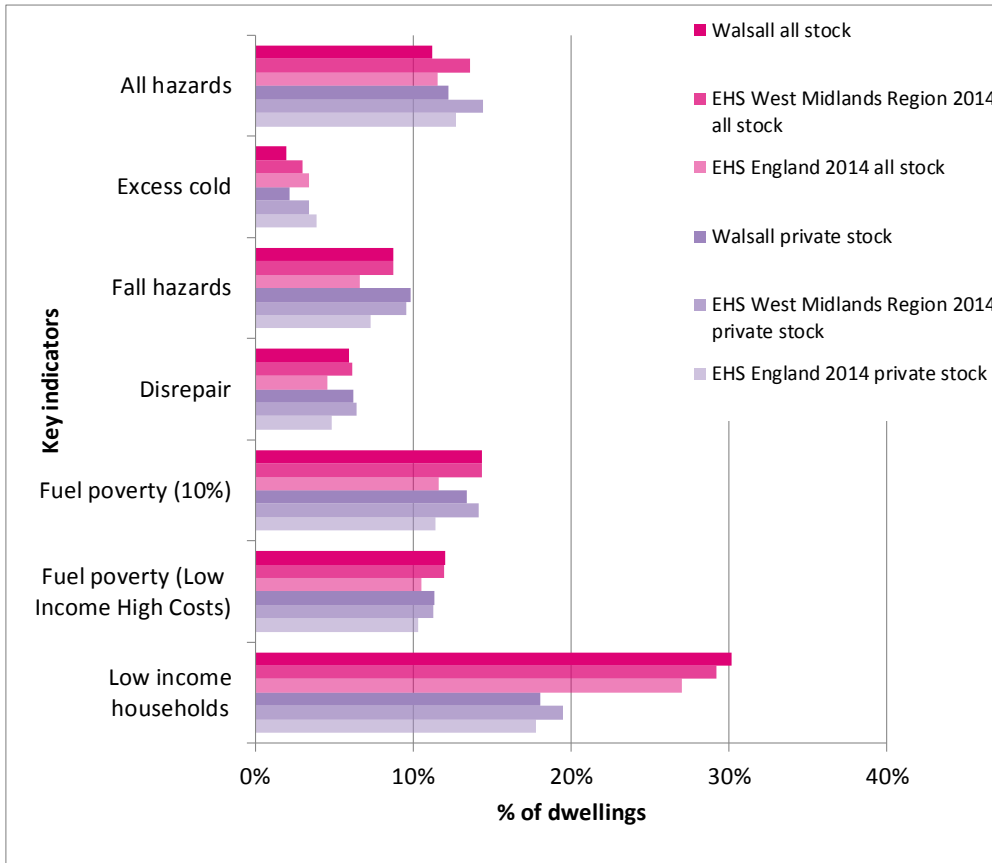
Figure 4: Average SimpleSAP ratings for all stock and private sector stock – Walsall compared to the West Midlands and England (EHS 2014)

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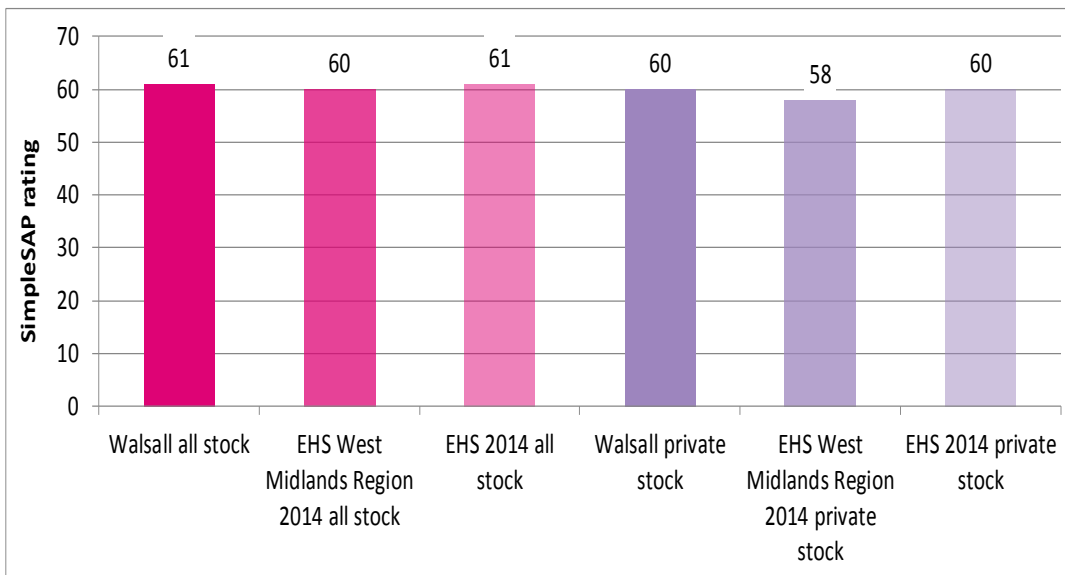
4.2.2   Key indicators by tenure – Walsall

The private sector stock can be further split by tenure – owner occupied and private rented - with the difference between total private sector stock and total housing stock being the social housing stock. **Table 5** and **Figure 5** below show the results for each of the key indicators split by tenure and **Figure 6** shows the SimpleSAP ratings by tenure.

The social stock is generally better than the private sector stock across the majority of indicators including SimpleSAP. Social stock tends be more thermally efficient than the private stock partly due to the prevalence of flats, and partly due to being better insulated owing to the requirements placed on social housing providers, for example through the Decent Homes Programme. As would be expected, the social stock is significantly worse than the private sector stock for the low income households indicator. For fuel poverty, however, the social tenure shows the highest levels for the 10% definition but the private rented tenure shows the highest levels for the Low Income High Costs definition.

The social data should be treated with some caution as the social rented stock, particularly when largely comprising stock owned by a single landlord, is more difficult to model than the private sector. This is because the decisions of an individual property owner usually only affect a single dwelling out of the thousands of private sector stock whereas the policies and decisions of a single landlord can have a very great effect on a large proportion of the social stock. The social rented results are therefore best considered as a benchmark which takes account of the age, type, size and tenure against which the landlord's own data could be compared.

Focussing on the tenures within the private sector stock, the private rented is generally worse than the owner occupied stock, with the exception of falls hazards which are the same.

Table 5: Estimates of the numbers and percentage of dwellings meeting the key indicator criteria assessed by the Housing Stock Models and Housing Stock Condition Database by tenure for Walsall

Indicator		Private sector stock				Social stock	
		Owner occupied		Private rented			
		No.	%	No.	%	No.	%
No. of dwellings		69,234	-	17,970	-	28,496	-
HHSRS category 1 hazards	All hazards	8,240	12%	2,463	14%	2,252	8%
	Excess cold	1,450	2%	469	3%	385	1%
	Fall hazards	6,710	10%	1,871	10%	1,587	6%
Disrepair		3,880	6%	1,577	9%	1,433	5%
Fuel poverty (10%)		9,110	13%	2,590	14%	4,919	17%
Fuel poverty (Low Income High Costs)		6,982	10%	2,892	16%	4,056	14%
Low income households		10,553	15%	5,201	29%	19,181	67%

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold <u>and</u> fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

Figure 5: Estimates of the percentage of dwellings meeting the key indicator criteria assessed by the Housing Stock Models and Housing Stock Condition Database by tenure for Walsall
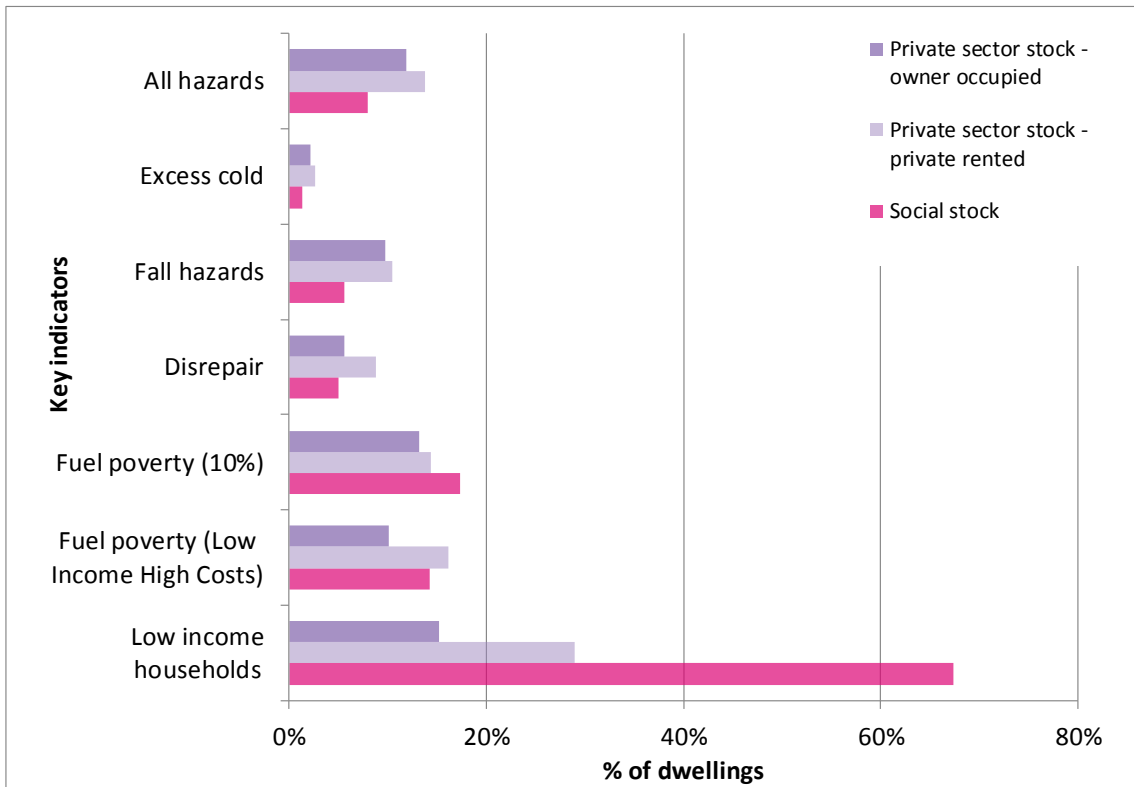
Figure 6: Average SimpleSAP ratings by tenure for Walsall

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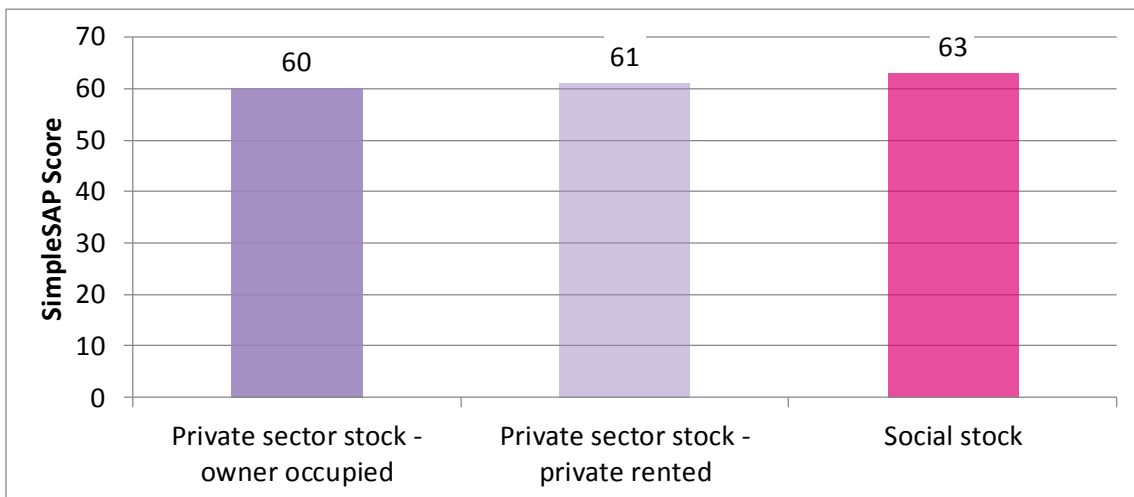
Results from previously commissioned survey

The council had previously commissioned a Private Sector house Condition Survey in 2007 (published in 2008 by D Adamson and Partners Ltd.[37]). This highlighted the following summary for private rented dwellings:

- Private rented dwellings – 8,385 (10.3% of all stock)
- Category 1 hazard – 2,528 (30.1% of private rented dwellings)
- Category 2 hazard – 650 (7.8% of private rented dwellings)
- Unfit (Section 604 definition) – 1,059 (12.6% of private rented dwellings)
- Failed decent homes standard – 1,050 (12.5% of private rented dwellings)
- Average SAP rating – 56
- Decent homes failure for heating – 1,466 (17.5% of private rented dwellings)

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https://go.walsall.gov.uk/Portals/0/Uploads/Housing/View%20our%20stock%20condition%20survey%20%28PDF%20 6_5MB%29.pdf

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4.2.3 Key indicators mapped by Census Output Area (COA) – Walsall private sector stock

Some of the key indicators are also provided in map form below along with a brief description of each indicator[38], thus enabling quick observation of the geographical distribution of properties of interest. The maps show the percentages of private sector dwellings in each Census Output Area (COA) that are estimated to have each of the key indicators.

The ranges shown in the map keys are defined based on the Jenks' Natural Breaks algorithm of the COA statistics[39]. The outputs in the lightest and darkest colours on the maps show the extreme ends of the range, highlighting the best and the worst areas.

Maps at COA level are provided for the following key indicators in **Map 4** to **Map 12** below:

- **HHSRS**
  - The presence of a category 1 HHSRS hazard
  - The presence of a category 1 hazard for excess cold
  - The presence of a category 1 hazard for falls

- **Levels of disrepair**

- **Levels of fuel poverty** (Low Income High Costs and 10% definitions)

- **Low income households**
  - Dwellings occupied by low income households
  - Dwellings with a category 1 excess cold hazard that are occupied by a low income household

- **The average SimpleSAP[40] rating**

In addition, maps have been provided for HMOs and EPC ratings.

These maps are extremely useful in showing the geographical distribution for single key indicators. Maps can also be produced for a combination of indicators, such as dwellings with an excess cold hazard which are also occupied by low income households, as shown in **Map 11**.

The maps are produced at COA level, which is typically made up of 125 households, usually including whole postcodes and having similar sized populations. Using the first map below (**Map 4**) as an example,

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[38] See **Appendix A** for full definitions.

[39] The natural breaks classification method is a data clustering method determining the best arrangement of values into different classes. It is achieved through minimising each class's average deviation from the class mean while maximising each class's deviation from the means of the other groups. The method seeks to reduce the variance within classes and maximise variance between classes thus ensuring groups are distinctive.

[40] Important note: Whilst it is possible to provide "SimpleSAP" ratings from the "SimpleCO$_2$" software, under no circumstances must these be referred to as "SAP" as the input data is insufficient to produce an estimate of SAP or even RdSAP for an individual dwelling that meets the standards required by these methodologies.

it can be seen that each ward is split into several COAs and, in this instance there is 1 COA that has 40 - 67% of private sector dwellings estimated to have the presence of a category 1 hazard.

The maps also highlight the differences between areas, showing that the results for some areas are much worse than for others and these are the specific areas which might warrant attention. The maps also show that even within wards there can be large differences between the results at COA level.

4.2.4   HHSRS

The Housing Health and Safety Rating System (HHSRS) is a risk-based evaluation tool to help local authorities identify and protect against potential risks and hazards to health and safety from any deficiencies identified in dwellings. It was introduced under the Housing Act 2004[7] and applies to residential properties in England and Wales.

The HHSRS assesses 29 categories of housing hazard. Each hazard has a weighting which will help determine whether the property is rated as having a category 1 (serious) hazard[41].

In short, a dwelling should be able to supply the basic needs for the everyday life of the range of households who could normally be expected to live in a dwelling of that size and type. The dwelling should not contain any deficiency that might give rise to a hazard which interferes with, or puts at risk, the health or safety, or even the lives, of the occupants.

The council is under a duty to take action in the case of category 1 hazards and if necessary it may carry out any necessary remedial work and reclaim the costs. The council has a power (discretion) to take action in the case of all category 2 hazards (i.e. those which carry lower risks).

The HHSRS category 1 hazards map (**Map 4**) shows that there are concentrations of high levels of category 1 hazards scattered across the area but with higher concentrations towards central and south western parts of the area around the urban areas of Walsall town and Darlaston The data behind the map shows that the wards with the highest levels overall are Pleck, Palfrey and Darlaston South. In Pleck ward the highest levels are in mainly southern COAs, in Palfrey ward COAs with the highest levels of hazards are to the north and west. In Darlaston South ward, COAs with higher levels are to the north and east of the ward. There are still pockets with higher levels elsewhere in the borough, such as to the south of Birchills Leamore and Bentley & Darlaston North wards.

Looking at the hazard of excess cold in Walsall there are higher concentrations scattered across the area but with slightly higher levels towards the south with a tendency towards the less built up areas – see **Map 5**. The data behind the map shows that the highest levels overall are in St. Matthew's, Paddock and Darlaston South but there are also higher concentrations elsewhere – for example in the wards of Pheasey Park Farm and Willenhall South.

The distribution of fall hazards is shown in **Map 6** which indicates that the high concentrations are scattered across the borough with some of the higher concentrations found across central and south western parts particularly the urban areas of Walsall town and Darlaston – reflecting the distribution of the category 1 hazards map. The data behind this shows that the wards with the highest levels of fall hazards are Pleck, Palfrey and Darlaston South. Some of the highest levels are to the south east of Pleck ward, to the north and west of Palfrey ward and across much of Darlaston South ward. There are COAs with

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[41] Housing Health and Safety Rating System Operating Guidance, ODPM, 2006

higher levels of fall hazards elsewhere; for example to the south of Bloxwich East ward and the north of Paddock ward.

Map 4: Percentage of private sector dwellings in Walsall with the presence of a HHSRS category 1 hazard

HHSRS Cat. 1 Hazards
Percent and (no. of COAs)
- 0 - 7 (125)
- 8 - 12 (316)
- 13 - 18 (283)
- 19 - 39 (104)
- 40 - 67 (1)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

Map 5: Percentage of private sector dwellings in Walsall with the presence of a HHSRS category 1 hazard for excess cold

Private Stock

HHSRS Excess Cold
Percent and (no. of COAs)

- 0 - 1 (371)
- 2 - 4 (351)
- 5 - 9 (96)
- 10 - 17 (10)
- 18 - 67 (1)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

Map 6: Percentage of private sector dwellings in Walsall with the presence of a HHSRS category 1 hazard for falls

HHSRS Falls Hazards
Percent and (no. of COAs)
- 0 - 5 (94)
- 6 - 9 (276)
- 10 - 12 (271)
- 13 - 17 (138)
- 18 - 27 (50)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.2.4.1   Disrepair

The disrepair indicator used in this report is based on the disrepair component of the Decent Homes Standard[42,43]. A dwelling fails the disrepair component if:

- One or more key building components are old and, because of their condition, need replacing or major repair; or
- Two or more other building components are old and, because of their condition, need replacement or major repair.

Key building components are those which, if in poor condition, could have an immediate impact on the integrity of the building and cause further deterioration in other components. They are the external components plus internal components that have potential safety implications and include:

- External walls
- Roof structure and covering
- Windows/doors
- Chimneys
- Central heating boilers
- Electrics

If any of these components are old, and need replacing or require major repair, then the dwelling is not in a reasonable state of repair.

Other building components are those that have a less immediate impact on the integrity of the dwelling. Their combined effect is therefore considered, with a dwelling failing the disrepair standard if two or more elements are old and need replacing or require immediate major repair.

Map 7 shows the distribution of dwellings estimated to be in disrepair in Walsall and indicates that there are higher levels of disrepair across more urban areas to the south and south west of the borough, particularly in and around Walsall town. The data behind the map shows that the highest levels overall are in the wards of Pleck, Palfrey and St. Matthew's. The highest levels of disrepair are seen in southern parts of Pleck ward, to the north west of Palfrey ward and to the south west of St. Matthew's ward. There are COAs with high concentrations of disrepair elsewhere, for example around the Bloxwich area and to the north east of Willenhall South ward.

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[42] https://www.gov.uk/government/publications/a-decent-home-definition-and-guidance

[43] There are 4 components to the Decent Homes Standard – HHSRS, disrepair, modernisation and thermal comfort

Map 7: Percentage of private sector dwellings in Walsall in disrepair

Disrepair
Percent and (no. of COAs)

	0 - 3 (345)
	4 - 7 (220)
	8 - 12 (150)
	13 - 18 (77)
	19 - 25 (37)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

4.2.4.2   Fuel poverty

The current fuel poverty definition is known as the Low Income High Costs indicator. This is a dual indicator which firstly provides an indication of the number of households in fuel poverty and secondly an indication of the cost (in £) to remove households from fuel poverty – this cost is referred to as the Fuel Poverty Gap[44].

A household is said to be in fuel poverty if they have required fuel costs that are above average (the national median level) and were they to spend that amount they would be left with a residual income below the official poverty line (see the shaded area in **Figure 7** below). For the purposes of this report this is termed "fuel poverty (Low Income High Costs)".

Figure 7: A representation of the Low Income High Costs definition of fuel poverty[45]
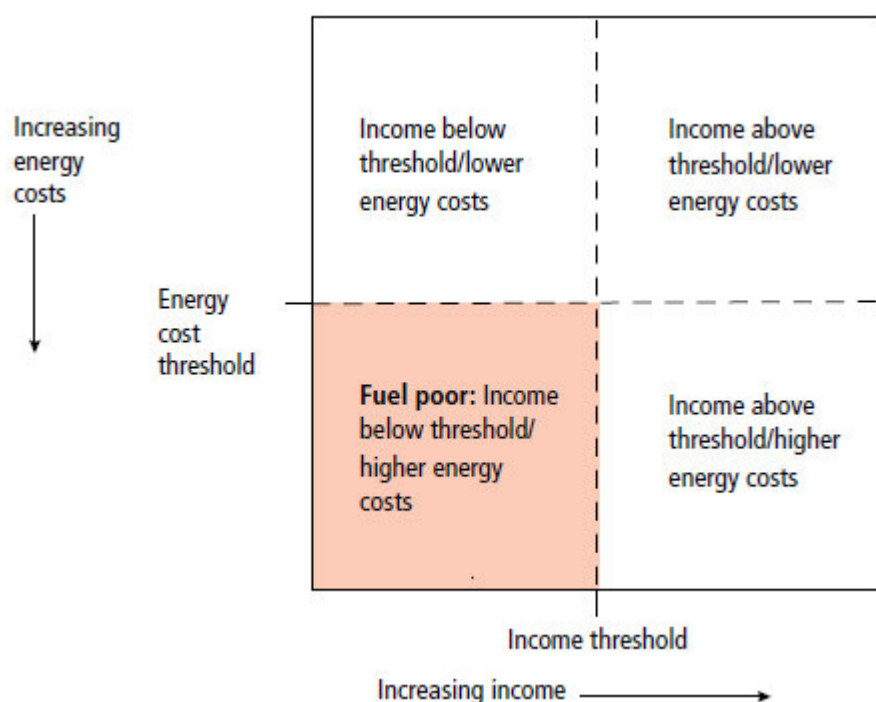
As the Low Income High Cost fuel poverty indicator is a relative measure, it provides a steady trend in the number of fuel poor households over time. A change in income will only have an impact on fuel poverty if households with low incomes and high costs see relatively larger income changes (increases or decreases) than the overall average change in income.

In contrast, the fuel poverty gap is more responsive to changes in energy prices and the economy, therefore providing a clearer measure of the depth of fuel poverty among those fuel poor households. This measure is therefore more useful for identifying trends in fuel poverty over time.

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[44] DECC, Annual Fuel Poverty Statistics Report, 2016 – England (National Statistics), 20 June 2016

[45] 43 Hills, J. Getting the measure of fuel poverty - Final Report of the Fuel Poverty Review, London: LSE., 2012

Map 8 shows that, based on the Low Income High Costs definition, areas of higher concentrations are to the west of the borough, again particularly Walsall town and the Darlaston areas. The wards with the highest concentrations overall are Pleck, Palfrey and Darlaston South. In Pleck and Darlaston South wards there are high levels throughout, in Palfrey the higher levels towards central and western parts of the ward.

The national indicators for the fuel poverty gap are expressed as the average fuel poverty gap, which is the average amount of money required to lift a fuel poor household out of fuel poverty (£371 in England in 2014). The aggregated fuel poverty gap – i.e. the total amount of money required to lift *all* fuel poor households out of fuel poverty in England is £882 million (in 2014).

Figure 8 provides the national average fuel poverty gap figures by SAP band for private sector stock. By using the bandings based on the SimpleSAP model it is possible to estimate the aggregated fuel poverty gap within each band for the fuel poor households in Walsall. **Figure 9** shows similar estimates for the private rented sector. The estimated aggregated fuel poverty gap for fuel poor households in the private sector in Walsall is £4.75 million, of which £1.20 million is from the private rented sector.

The 400 private rented households living in dwellings with a SimpleSAP rating of F or G would require increases in income totalling £413,200 per year to lift them out of fuel poverty.

Figure 8: Aggregated fuel poverty gap figures for the private sector stock in Walsall by SAP band

| | Avg fuel poverty gap (England 2014) | Walsall | |
| | | Fuel poor households | Aggregated fuel poverty gap |
	£	Count	£
(92-100) A			
(81-91) B	215	1	215
(69-80) C			
(55-68) D	217	3,108	674,436
(39-54) E	481	5,414	2,604,134
(21-38) F	1,090	1,350	1,471,500
(1-20) G			

Figure 9: Aggregated fuel poverty gap figures for the private rented sector stock in Walsall by SAP band

	Avg fuel poverty gap (England 2014)	Walsall	
		Fuel poor households	Aggregated fuel poverty gap
	£	Count	£
(92-100) A			
(81-91) B	192	1	192
(69-80) C			
(55-68) D	188	891	167,508
(39-54) E	387	1,598	618,426
(21-38) F	1,033	400	413,200
(1-20) G			

For completeness of information, and comparison with previous data, this report also includes an analysis of fuel poverty using the original definition. This states that a household is said to be in fuel poverty if it spends more than 10% of its income on fuel to maintain an adequate level of warmth (defined as 21°C for the main living area, and 18°C for the occupied rooms in the 2012 Hills Fuel Poverty Review[46]). For the purposes of this report this is referred to as "fuel poverty (10% definition)".

Map 9 shows the distribution of households in fuel poverty using the 10% definition. There is a similar pattern to the distribution of fuel poverty using the Low Income High Costs definition, although levels to the south west of Walsall town do not stand out so much under this definition.

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[46] Hills J, Getting the measure of fuel poverty – Final Report of the Fuel Poverty Review, London: LSE, 2012

Map 8: Percentage of private sector dwellings in Walsall occupied by households in fuel poverty - Low Income High Costs definition

Fuel Poverty LIHC
Percent and (no. of COAs)
- 0 - 6 (145)
- 7 - 11 (236)
- 12 - 15 (201)
- 16 - 19 (166)
- 20 - 43 (81)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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Map 9: Percentage of private sector dwellings in Walsall occupied by households in fuel poverty – 10% definition

Private Stock

Fuel Poverty 10%

Percent and (no. of COAs)

	0 - 10 (250)
	11 - 17 (295)
	18 - 25 (206)
	26 - 43 (71)
	44 - 86 (7)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.2.4.3   Low income households

A low income household is defined as a household in receipt of:

- Income support
- Housing benefit
- Attendance allowance
- Disability living allowance
- Industrial injuries disablement benefit
- War disablement pension
- Pension credit
- Child tax credit
- Working credit

For child tax credit and working tax credit, the household is only considered a low income household if it has a relevant income of less than £15,860.

The definition also includes households in receipt of Council Tax reduction and income based Job Seekers Allowance.

Map 10 clearly shows that concentrations of low income households are to the west of the borough. The highest levels overall are found in Darlaston South, Palfrey and Pleck. However, there are other wards which also have high concentrations of low income households; for example, parts of Bloxwich west, St. Matthew's and Blakenall.

Map 11 provides an additional layer of information, with the data for low income households being combined with HHSRS excess cold data. This provides a vital picture of where vulnerable people are likely to be living in poor housing. The map indicates that there are pockets of both low income and excess cold mainly towards western parts of the borough.

Map 10: Percentage of private sector dwellings in Walsall occupied by low income households

Low Income Households
Percent and (no. of COAs)

	0 - 11 (258)
	12 - 21 (208)
	22 - 31 (186)
	32 - 46 (153)
	47 - 71 (24)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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Map 11: Percentage of private sector dwellings in Walsall with both the presence of a HHSRS category 1 hazard for excess cold and occupied by low income households

Excess Cold and Low Income
Percent and (no. of COAs)

	0 (558)
	1 (175)
	2 - 4 (88)
	5 - 8 (7)
	9 - 14 (1)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.2.4.4 SimpleSAP

The average SimpleSAP map (**Map 12**) shows that areas with lower average SimpleSAP ratings are clustered throughout the borough with again a noticeable tendency towards Walsall town. Whilst no particular ward obviously dominates, the data behind the map shows that the wards with the lowest average SimpleSAP ratings are Paddock, Palfrey and Pleck.

Lower SimpleSAP ratings can occur in areas with larger, older homes where little work has been done by the occupiers to improve energy performance. The size of the home itself is not a factor in SimpleSAP, but these homes are more likely to be semi-detached or detached, and therefore have larger heat loss areas.

Map 12: Average SimpleSAP ratings per dwelling in Walsall private sector stock

Average SimpleSAP
Score and (no. of COAs)

	29 - 55 (84)
	56 - 58 (210)
	59 - 62 (375)
	63 - 67 (142)
	68 - 78 (18)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.2.5   Ward level results for the key indicators

The previous maps have provided a visual representation of the key indicators at Census Output Area (COA) level. The following tables provide the complete set of figures at ward level for the key indicators; firstly, for the total stock (**Table 6**) and secondly, for the private sector stock (**Table 7**), owner occupied sector stock (**Table 8**) and private rented sector stock (**Table 9**). This allows a direct comparison between the wards in Walsall.

Table 6: *Total stock* – number and percentage of dwellings failing each of the key indicators, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Aldridge Central and South	6,260	659 (11%)	126 (2%)	521 (8%)	297 (5%)	703 (11%)	527 (8%)	1,191 (19%)	61
Aldridge North and Walsall Wood	5,737	538 (9%)	79 (1%)	442 (8%)	228 (4%)	634 (11%)	596 (10%)	1,222 (21%)	61
Bentley and Darlaston North	5,586	601 (11%)	89 (2%)	487 (9%)	334 (6%)	893 (16%)	773 (14%)	2,185 (39%)	62
Birchills Leamore	6,774	699 (10%)	127 (2%)	533 (8%)	381 (6%)	1,170 (17%)	955 (14%)	2,957 (44%)	62
Blakenall	5,733	663 (12%)	135 (2%)	506 (9%)	439 (8%)	1,030 (18%)	840 (15%)	2,459 (43%)	60
Bloxwich East	5,453	641 (12%)	119 (2%)	501 (9%)	355 (7%)	1,002 (18%)	753 (14%)	2,313 (42%)	60
Bloxwich West	6,021	511 (8%)	73 (1%)	408 (7%)	185 (3%)	948 (16%)	700 (12%)	2,270 (38%)	63
Brownhills	5,633	531 (9%)	97 (2%)	414 (7%)	253 (4%)	770 (14%)	649 (12%)	1,585 (28%)	62
Darlaston South	6,270	812 (13%)	159 (3%)	609 (10%)	503 (8%)	1,203 (19%)	943 (15%)	2,691 (43%)	60
Paddock	4,893	660 (13%)	148 (3%)	496 (10%)	347 (7%)	475 (10%)	433 (9%)	636 (13%)	58
Palfrey	5,615	824 (15%)	133 (2%)	664 (12%)	578 (10%)	856 (15%)	925 (16%)	2,285 (41%)	58
Pelsall	4,985	491 (10%)	88 (2%)	389 (8%)	180 (4%)	564 (11%)	472 (9%)	1,104 (22%)	61
Pheasey Park Farm	4,859	577 (12%)	98 (2%)	473 (10%)	263 (5%)	529 (11%)	397 (8%)	547 (11%)	60
Pleck	5,943	897 (15%)	138 (2%)	713 (12%)	653 (11%)	1,082 (18%)	991 (17%)	2,426 (41%)	59
Rushall-Shelfield	5,358	586 (11%)	109 (2%)	468 (9%)	240 (4%)	733 (14%)	648 (12%)	1,488 (28%)	61
Short Heath	5,117	551 (11%)	79 (2%)	454 (9%)	163 (3%)	693 (14%)	516 (10%)	1,292 (25%)	61
St. Matthew's	7,553	886 (12%)	207 (3%)	627 (8%)	672 (9%)	1,122 (15%)	919 (12%)	2,363 (31%)	62
Streetly	5,693	511 (9%)	81 (1%)	428 (8%)	188 (3%)	407 (7%)	374 (7%)	327 (6%)	60

Table 6 cont.: *Total stock* – number and percentage of dwellings failing each of the key indicators, and average SimpleSAP ratings by ward

| Ward | Dwellings | HHSRS category 1 hazards | | | Disrepair | Fuel poverty | | Low income households | Average SimpleSAP |
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Willenhall North	5,219	450 (9%)	54 (1%)	378 (7%)	152 (3%)	644 (12%)	537 (10%)	1,367 (26%)	62
Willenhall South	6,998	867 (12%)	165 (2%)	657 (9%)	479 (7%)	1,161 (17%)	982 (14%)	2,227 (32%)	61

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold <u>and</u> fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

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Table 7: *Private sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Aldridge Central and South	5,397	609 (11%)	121 (2%)	485 (9%)	269 (5%)	567 (11%)	437 (8%)	539 (10%)	60
Aldridge North and Walsall Wood	4,759	473 (10%)	71 (1%)	393 (8%)	192 (4%)	467 (10%)	446 (9%)	549 (12%)	60
Bentley and Darlaston North	3,761	469 (12%)	71 (2%)	389 (10%)	255 (7%)	631 (17%)	529 (14%)	1,007 (27%)	60
Birchills Leamore	3,987	503 (13%)	91 (2%)	394 (10%)	273 (7%)	699 (18%)	550 (14%)	1,075 (27%)	61
Blakenall	3,480	446 (13%)	80 (2%)	363 (10%)	282 (8%)	645 (19%)	502 (14%)	938 (27%)	60
Bloxwich East	3,442	475 (14%)	91 (3%)	379 (11%)	239 (7%)	612 (18%)	451 (13%)	853 (25%)	59
Bloxwich West	4,020	381 (9%)	57 (1%)	312 (8%)	133 (3%)	563 (14%)	440 (11%)	861 (21%)	62
Brownhills	4,089	411 (10%)	72 (2%)	329 (8%)	188 (5%)	476 (12%)	412 (10%)	584 (14%)	61
Darlaston South	3,921	584 (15%)	114 (3%)	455 (12%)	341 (9%)	773 (20%)	589 (15%)	1,158 (30%)	59
Paddock	4,638	634 (14%)	140 (3%)	482 (10%)	331 (7%)	424 (9%)	394 (8%)	492 (11%)	57
Palfrey	3,812	637 (17%)	98 (3%)	532 (14%)	434 (11%)	605 (16%)	627 (16%)	1,092 (29%)	57
Pelsall	4,124	439 (11%)	82 (2%)	349 (8%)	152 (4%)	436 (11%)	363 (9%)	491 (12%)	60
Pheasey Park Farm	4,712	568 (12%)	97 (2%)	466 (10%)	257 (5%)	518 (11%)	384 (8%)	452 (10%)	60
Pleck	4,261	747 (18%)	117 (3%)	608 (14%)	537 (13%)	801 (19%)	759 (18%)	1,210 (28%)	58
Rushall-Shelfield	4,140	491 (12%)	93 (2%)	402 (10%)	198 (5%)	539 (13%)	463 (11%)	641 (15%)	60
Short Heath	4,131	488 (12%)	74 (2%)	407 (10%)	136 (3%)	533 (13%)	402 (10%)	666 (16%)	60
St. Matthew's	5,670	756 (13%)	179 (3%)	545 (10%)	564 (10%)	738 (13%)	678 (12%)	1,147 (20%)	61
Streetly	5,632	507 (9%)	81 (1%)	425 (8%)	186 (3%)	398 (7%)	365 (6%)	285 (5%)	60

Table 7 cont.: *Private sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Willenhall North	4,048	377 (9%)	46 (1%)	325 (8%)	118 (3%)	446 (11%)	390 (10%)	583 (14%)	61
Willenhall South	5,180	708 (14%)	144 (3%)	541 (10%)	372 (7%)	829 (16%)	693 (13%)	1,131 (22%)	60

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold <u>and</u> fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

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Table 8: *Owner occupied sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

| Ward | Dwellings | HHSRS category 1 hazards | | | Disrepair | Fuel poverty | | Low income households | Average SimpleSAP |
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Aldridge Central and South	4,720	520 (11%)	94 (2%)	425 (9%)	219 (5%)	474 (10%)	350 (7%)	412 (9%)	60
Aldridge North and Walsall Wood	4,155	407 (10%)	60 (1%)	340 (8%)	159 (4%)	408 (10%)	356 (9%)	435 (10%)	60
Bentley and Darlaston North	2,857	359 (13%)	55 (2%)	299 (10%)	183 (6%)	489 (17%)	380 (13%)	695 (24%)	60
Birchills Leamore	2,707	336 (12%)	61 (2%)	265 (10%)	170 (6%)	500 (18%)	327 (12%)	699 (26%)	61
Blakenall	2,571	321 (12%)	59 (2%)	263 (10%)	195 (8%)	506 (20%)	350 (14%)	621 (24%)	60
Bloxwich East	2,692	363 (13%)	61 (2%)	298 (11%)	177 (7%)	479 (18%)	328 (12%)	586 (22%)	59
Bloxwich West	3,211	285 (9%)	36 (1%)	242 (8%)	98 (3%)	430 (13%)	325 (10%)	581 (18%)	62
Brownhills	3,499	355 (10%)	68 (2%)	281 (8%)	150 (4%)	415 (12%)	335 (10%)	446 (13%)	61
Darlaston South	2,928	437 (15%)	88 (3%)	344 (12%)	249 (9%)	625 (21%)	430 (15%)	765 (26%)	58
Paddock	3,817	482 (13%)	93 (2%)	386 (10%)	237 (6%)	285 (7%)	247 (6%)	304 (8%)	57
Palfrey	2,707	438 (16%)	69 (3%)	373 (14%)	286 (11%)	424 (16%)	389 (14%)	711 (26%)	57
Pelsall	3,598	375 (10%)	70 (2%)	302 (8%)	127 (4%)	368 (10%)	287 (8%)	350 (10%)	60
Pheasey Park Farm	4,177	507 (12%)	85 (2%)	418 (10%)	225 (5%)	468 (11%)	318 (8%)	382 (9%)	59
Pleck	2,805	507 (18%)	95 (3%)	403 (14%)	335 (12%)	580 (21%)	470 (17%)	756 (27%)	56
Rushall-Shelfield	3,497	414 (12%)	79 (2%)	339 (10%)	161 (5%)	447 (13%)	356 (10%)	470 (13%)	60
Short Heath	3,576	418 (12%)	63 (2%)	348 (10%)	108 (3%)	457 (13%)	313 (9%)	501 (14%)	60
St. Matthew's	3,410	442 (13%)	96 (3%)	335 (10%)	305 (9%)	410 (12%)	350 (10%)	468 (14%)	60
Streetly	5,145	464 (9%)	74 (1%)	392 (8%)	162 (3%)	355 (7%)	311 (6%)	242 (5%)	60

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Table 8 cont.: *Owner occupied sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Willenhall North	3,515	317 (9%)	40 (1%)	275 (8%)	98 (3%)	374 (11%)	296 (8%)	434 (12%)	61
Willenhall South	3,647	493 (14%)	104 (3%)	382 (10%)	236 (6%)	616 (17%)	464 (13%)	695 (19%)	59

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold and fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

Table 9: *Private rented sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Aldridge Central and South	677	89 (13%)	27 (4%)	60 (9%)	50 (7%)	93 (14%)	87 (13%)	127 (19%)	61
Aldridge North and Walsall Wood	604	66 (11%)	11 (2%)	53 (9%)	33 (5%)	59 (10%)	90 (15%)	114 (19%)	62
Bentley and Darlaston North	904	110 (12%)	16 (2%)	90 (10%)	72 (8%)	142 (16%)	149 (16%)	312 (35%)	62
Birchills Leamore	1,280	167 (13%)	30 (2%)	129 (10%)	103 (8%)	199 (16%)	223 (17%)	376 (29%)	62
Blakenall	909	125 (14%)	21 (2%)	100 (11%)	87 (10%)	139 (15%)	152 (17%)	317 (35%)	61
Bloxwich East	750	112 (15%)	30 (4%)	81 (11%)	62 (8%)	133 (18%)	123 (16%)	267 (36%)	61
Bloxwich West	809	96 (12%)	21 (3%)	70 (9%)	35 (4%)	133 (16%)	115 (14%)	280 (35%)	63
Brownhills	590	56 (9%)	4 (1%)	48 (8%)	38 (6%)	61 (10%)	77 (13%)	138 (23%)	63
Darlaston South	993	147 (15%)	26 (3%)	111 (11%)	92 (9%)	148 (15%)	159 (16%)	393 (40%)	60
Paddock	821	152 (19%)	47 (6%)	96 (12%)	94 (11%)	139 (17%)	147 (18%)	188 (23%)	57
Palfrey	1,105	199 (18%)	29 (3%)	159 (14%)	148 (13%)	181 (16%)	238 (22%)	381 (34%)	57
Pelsall	526	64 (12%)	12 (2%)	47 (9%)	25 (5%)	68 (13%)	76 (14%)	141 (27%)	61
Pheasey Park Farm	535	61 (11%)	12 (2%)	48 (9%)	32 (6%)	50 (9%)	66 (12%)	70 (13%)	62
Pleck	1,456	240 (16%)	22 (2%)	205 (14%)	202 (14%)	221 (15%)	289 (20%)	454 (31%)	60
Rushall-Shelfield	643	77 (12%)	14 (2%)	63 (10%)	37 (6%)	92 (14%)	107 (17%)	171 (27%)	60
Short Heath	555	70 (13%)	11 (2%)	59 (11%)	28 (5%)	76 (14%)	89 (16%)	165 (30%)	61
St. Matthew's	2,260	314 (14%)	83 (4%)	210 (9%)	259 (11%)	328 (15%)	328 (15%)	679 (30%)	63
Streetly	487	43 (9%)	7 (1%)	33 (7%)	24 (5%)	43 (9%)	54 (11%)	43 (9%)	62

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Table 9 cont.: *Private rented sector stock* – number and percentage of dwellings for each of the key indicators, and average SimpleSAP ratings by ward

| Ward | Dwellings | HHSRS category 1 hazards | | | Disrepair | Fuel poverty | | Low income households | Average SimpleSAP |
		All hazards	Excess cold	Fall hazards		10%	LIHC		
Willenhall North	533	60 (11%)	6 (1%)	50 (9%)	20 (4%)	72 (14%)	94 (18%)	149 (28%)	61
Willenhall South	1,533	215 (14%)	40 (3%)	159 (10%)	136 (9%)	213 (14%)	229 (15%)	436 (28%)	61

N.B. the information on hazards refers to the number of dwellings with a hazard of the stated type. Because of this there is likely to be some overlap – for example, some dwellings are likely to have excess cold <u>and</u> fall hazards but this dwelling would only be represented once under 'all hazards'. The number of dwellings under 'all hazards' can therefore be less than the sum of the excess cold plus fall hazards.

bre

4.2.6   Private rented sector analysis for the key indicators

The proportion of the total stock in Walsall which is private rented is 16% - 9 wards have the same or higher proportions of private rented stock – see **Table 10**. St. Matthew's ward has the highest proportion of private rented stock at 30%, followed by Pleck at 24%, Whillenhall South at 22% and Palfrey at 20%. The table also includes a number of additional wards with less than 16% for comparison.

Table 10: Number and percentage of the stock which is private rented dwellings, by ward where the proportion is higher than the figure for Walsall overall (16% and shown by the dotted line). A number of additional wards are shown in descending order for comparison

Ward	Dwelling Total (All Stock)	Private Rented Dwellings	
	Count	Count	%
St. Matthew's	7,553	2,260	30%
Pleck	5,943	1,456	24%
Willenhall South	6,998	1,533	22%
Palfrey	5,615	1,105	20%
Birchills Leamore	6,774	1,280	19%
Paddock	4,893	821	17%
Bentley and Darlaston North	5,586	904	16%
Blakenall	5,733	909	16%
Darlaston South	6,270	993	16%
Bloxwich East	5,453	750	14%
Bloxwich West	6,021	809	13%
Rushall-Shelfield	5,358	643	12%
Pheasey Park Farm	4,859	535	11%
Short Heath	5,117	555	11%
Aldridge Central and South	6,260	677	11%
Pelsall	4,985	526	11%
Aldridge North and Walsall Wood	5,737	604	11%
Brownhills	5,633	590	10%
Willenhall North	5,219	533	10%
Streetly	5,693	487	9%

The percentage of dwellings in the Walsall private rented stock estimated to have a category 1 hazard is 14% - 8 wards have higher levels of category 1 hazards. **Table 11** shows Paddock ward has the highest proportion at 19%; this is 5 percentage points more than the overall figure for Walsall private rented stock.

Table 11: Number and percentage of dwellings with HHSRS category 1 hazards in those wards which have higher levels than Walsall overall (14%) – private rented dwellings

Ward	Private Rented Dwellings	HHSRS category 1 hazards
		All hazards
Paddock	821	152 (19%)
Palfrey	1,105	199 (18%)
Pleck	1,456	240 (16%)
Bloxwich East	750	112 (15%)
Darlaston South	993	147 (15%)
Willenhall South	1,533	215 (14%)
St. Matthew's	2,260	314 (14%)
Blakenall	909	125 (14%)

The proportion of dwellings in the Walsall private rented stock estimated to have an excess cold hazard is 3%, this proportion is exceeded by 8 wards – see **Table 12**. Paddock ward has the highest percentage at 6%; 3 percentage points more than the overall figure for Walsall private rented stock.

Table 12: Number and percentage of dwellings with an excess cold hazard in those wards which have higher levels than Walsall overall (3%) – private rented dwellings

Ward	Private Rented Dwellings	HHSRS category 1 hazards
		Excess cold
Paddock	821	47 (6%)
Aldridge Central and South	677	27 (4%)
Bloxwich East	750	30 (4%)
St. Matthew's	2,260	83 (4%)
Willenhall South	1,533	40 (3%)
Palfrey	1,105	29 (3%)
Darlaston South	993	26 (3%)
Bloxwich West	809	21 (3%)

The proportion of dwellings in the Walsall private rented stock estimated to have a falls hazard is 10% - this proportion is exceeded by 7 wards as shown in **Table 13**. Pleck ward has the highest proportion at 14%; 4 percentage points more than the overall figure for Walsall private rented stock.

Table 13: Number and percentage of dwellings with a falls hazard in those wards which have higher levels than Walsall overall (10%) – private rented dwellings

Ward	Private Rented Dwellings	HHSRS category 1 hazards
		Fall hazards
Pleck	1,456	205 (14%)
Palfrey	1,105	159 (14%)
Paddock	821	96 (12%)
Darlaston South	993	111 (11%)
Blakenall	909	100 (11%)
Bloxwich East	750	81 (11%)
Short Heath	555	59 (11%)

The proportion of dwellings in the Walsall private rented stock estimated to be in disrepair is 9% this level is exceeded by 7 wards as shown in **Table 14**. Pleck ward has the highest proportion at 14%; 5 percentage points more than the overall figure for Walsall private rented stock.

Table 14: Number and percentage of dwellings in disrepair in those wards which have higher levels than Walsall overall (9%) – private rented dwellings

Ward	Private Rented Dwellings	Disrepair
Pleck	1,456	202 (14%)
Palfrey	1,105	148 (13%)
St. Matthew's	2,260	259 (11%)
Paddock	821	94 (11%)
Blakenall	909	87 (10%)
Darlaston South	993	92 (9%)
Willenhall South	1,533	136 (9%)

bre

4.2.7   LSOA level results for the key indicators

Table 15 shows LSOA's with a percentage of private rented dwellings of 30% or more and also includes the figures from the 2011 Census. Whilst this table shows the 11 LSOA's with 30% or more private rented stock, it is worth noting that there are 50 LSOAs which exceed the overall Walsall proportion of 16%. There are a total of 12 LSOA's displaying negative growth in private rented stock and a further 14 LSOA's showing no change, resulting in 16% of LSOA's showing a declining or static private rented stock.

Table 15: Percentage difference in private rented dwellings, by LSOA and including ward distribution for those LSOAs

LSOA Code	BRE Database Private Rented %	2011 Census Private Rented %	Percentage point difference	Ward	No. of dwellings	% of ward
E01010363	54%	31%	24%	Pleck	693	59%
				St. Matthew's	477	41%
E01010330	43%	28%	15%	Paddock	675	100%
E01010371	42%	22%	20%	St. Matthew's	1,123	100%
E01010342	40%	36%	4%	Palfrey	552	100%
E01010368	40%	32%	8%	Birchills Leamore	765	71%
				Blakenall	10	1%
				St. Matthew's	300	28%
E01010269	37%	27%	10%	Birchills Leamore	1	0.2%
				Pleck	614	100%
E01010327	37%	27%	10%	Paddock	602	100%
E01010375	36%	31%	5%	Birchills Leamore	533	69%
				Blakenall	236	31%
E01010369	34%	20%	14%	St. Matthew's	901	100%
E01010406	32%	27%	6%	Willenhall South	1,228	100%
E01010367	30%	22%	7%	Pleck	671	100%

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The proportion of dwellings in the private rented stock in Walsall with a category 1 hazard is 14% and there are 54 LSOAs within Walsall with a higher percentage. **Table 16** shows the 5 LSOAs with the highest proportions - E01010327 and ES1010326 have the highest levels of category 1 hazards in private rented accommodation at 27%; 13 percentage points above the figure for Walsall overall.

Table 16: Number and percentage of private rented dwellings with a HHSRS Category 1 hazard which have higher levels than Walsall overall (14%), by LSOA

	Private Rented	
	HHSRS All Hazards	
LSOA Code	No. of dwellings	% private rented
E01010327	61	27%
E01010326	22	27%
E01010342	55	25%
E01010268	37	24%
E01010408	52	24%

The proportion of dwellings in the private rented stock in Walsall which are estimated to be in disrepair is 9% and there are 46 LSOAs with a higher proportion. **Table 17** shows the top 5 LSOAs, with E01010327 having the highest rate at 24% - 16 percentage points higher than the figure for Walsall overall.

Table 17: Number and percentage of private rented dwellings with levels of disrepair which are higher than Walsall overall (9%), by LSOA

	Private Rented	
	Disrepair	
LSOA Code	No. of dwellings	% private rented
E01010327	53	24%
E01010342	50	22%
E01010367	40	20%
E01010408	42	20%
E01010370	49	19%

The proportion of private rented dwellings which have an EPC of F or G in Walsall is 4% and 62 LSOAs have a higher level than this. **Table 18** shows the 5 LSOAs with the highest proportions with LSOA E01010326 having the highest rate of private rented dwellings which have an EPC of F or G at 23% - this is 19 percentage points higher than the figure for Walsall overall.

Table 18: Number and percentage of private rented dwellings with an EPC rating of F or G, where levels are higher than for Walsall overall (4%), by LSOA

LSOA Code	Private Rented	
	EPC F or G	
	No. of dwellings	% private rented
E01010326	19	23%
E01010317	11	16%
E01010373	10	13%
E01010332	9	11%
E01010368	46	11%

4.3   Information relating to LAHS reporting and EPC ratings

4.3.1   Cost of mitigating category 1 hazards in the Walsall private sector stock

Table 19 shows the total number of dwellings with HHSRS category 1 hazards in Walsall's private sector stock, the average cost of mitigating hazards per dwelling and the total cost for mitigating all hazards within those dwellings. The costs are based on the average cost of mitigating category 1 hazards for the region using EHS 2014 data. The EHS costs are determined following a surveyor's assessment of the hazard. For each hazard the surveyor is given a range of common treatments that they can specify in order to treat the hazard. Where quantities are required the surveyor may specify them. The treatment recommended by the surveyor is then costed using a standard set of prices.

Table 19: Estimated costs to mitigate all category 1 hazards in private sector stock, split into tenure

Tenure	No. of hazards	Total cost (£)	Total cost (£)
Private Sector	10,703	29,863,116	29,863,116
Owner occupied	8,240	22,990,944	22,990,944
Private rented	2,463	6,872,172	6,872,172

4.3.2   Houses in Multiple Occupation (HMOs) in Walsall's private sector stock

The Housing Act 2004 introduced a new set of definitions for HMOs in England from 6 April 2006[47]. The definition is a complex one and the bullet points below, which are adapted from web pages provided by the National HMO Network[48], provide a summary:

- An entire house or flat which is let to 3 or more tenants who form 2 or more households and who share a kitchen, bathroom or toilet
- A house which has been converted entirely into bedsits or other non-self-contained accommodation and which is let to 3 or more tenants who form two or more households and who share kitchen, bathroom or toilet facilities
- A converted house which contains one or more flats which are not wholly self-contained (i.e. the flat does not contain within it a kitchen, bathroom and toilet) and which is occupied by 3 or more tenants who form two or more households
- A building which is converted entirely into self-contained flats if the conversion did not meet the standards of the 1991 Building Regulations and more than one-third of the flats are let on short-term tenancies

The recently published "Houses in Multiple Occupation and residential property licensing reform"[49] provides guidance to local authorities on changes to rules on licensing HMOs. From 1 October 2018, mandatory

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[47] See Sections 254-258 of the Housing Act (http://www.legislation.gov.uk/ukpga/2004/34/contents)

[48] National HMO Network http://www.nationalhmonetwork.com/definition.php

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licensing of HMOs was extended to cover all relevant HMOs regardless of the number of storeys (compared to the previous definition which limited this to buildings of 3 or more storeys). Purpose built flats will only require a licence where there are fewer than 3 flats in the block. The requirement for the HMO to be occupied by five or more persons in two or more households will remain[50].

To be classified as an HMO the property must be used as the tenants' only or main residence and it should be used solely or mainly to house tenants. Properties let to students and migrant workers will be treated as their only or main residence and the same will apply to properties which are used as domestic refuges.

The LAHS requires estimates of the number of HMOs and the number of mandatory licensable HMOs.

- Number of private sector HMOs
  - Modelled using specific criteria from a number of Experian data sources and information derived from the SimpleCO$_2$ model. The criteria include privately rented dwellings with 3 or more bedrooms occupied by male/female/mixed home sharers, mixed occupancy dwellings or classified as the following Experian Mosaic classifications:
    - Renting a room
    - Career Builders
    - Flexible Workforce
    - Bus Route Renters
    - Learners and earners
    - Student scene
- Number of mandatory licensable HMOs under the Government's new definition, as of 1 October 2018
  - This has been modelled using the above criteria for HMOs plus the dwelling must have 4 or more bedrooms. This will apply to both houses and converted flats.
  - Purpose built flats where there are up to two flats in the block and one or both have 4 or more bedrooms.

Table 20 summarises the results for the private sector stock in Walsall, while **Map 13** shows the geographic distribution of HMOs and **Map 14** shows the distribution of mandatory licensable HMOs. There are 2030 HMO's (11% of the private rented sector) and 304 licensable HMO's (2% of the private rented sector). The maps show the majority of HMOs to be concentrated towards the town of Walsall, particularly where the University of Wolverhampton has a campus to the south of the town. There are also notable concentrations in the Darlaston area and in Willenhall South ward.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/670536/HMO_licensing_reforms_response.pdf

[50] In addition, new mandatory licence conditions will be introduced relating to national minimum sleeping room sizes and provision of waste disposal.

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Licensable HMOs are also mainly found in and around the town of Walsall, with a small concentration also to the north of the borough in the Brownhills area. As previously mentioned, ward level data on HMOs is available in the accompanying Housing Stock Condition Database (HSCD) and **Appendix C** provides guidance on how to use the database.

Table 20: Summary of HMOs within the Walsall private sector stock

Walsall	No. of private sector dwellings	HMOs	Mandatory Licensing Scheme HMOs
	87,204	2,030	304

Table 21 shows the number and percentage of all hazards, excess cold, falls and disrepair in HMOs and licensable HMOs. Licensable HMO's have a higher percentage excess cold and disrepair and the same levels of all hazards and fall hazards. For comparison, overall levels of disrepair in Walsall all stock are 6% (6,890 dwellings) and levels in the private rented are 9%.

Table 21: Number and percentage of selected house condition variables in Walsall's HMO and licensable HMO dwellings

	Private rented	HHSRS all hazards	Excess cold	Falls	Disrepair
HMO	Count	356	60	282	290
	%	18%	3%	14%	14%
Licensable HMO	Count	55	11	44	49
	%	18%	4%	14%	16%

Overall, 11% of private rented dwellings in Walsall are HMOs. There are 8 wards with a higher proportion as shown in **Table 22**. Palfrey and Pleck have notably higher rates of HMO's at 18% and 17%, respectively, which is up to 7 percentage points higher than the Walsall figure overall. The table also include a number of additional wards in descending order for comparison.

Table 22: Number and percentage of HMOs by ward where the proportion is higher than the figure for Walsall overall (11% and shown by the dotted line). A number of additional wards are shown in descending order for comparison

Ward Name	Private Rented		
	Not an HMO	HMO	
	Count	Count	%
Palfrey	909	196	18%
Pleck	1,209	247	17%
Blakenall	780	129	14%
St. Matthew's	1,952	308	14%
Willenhall South	1,328	205	13%
Bentley and Darlaston North	787	117	13%
Paddock	718	103	13%
Darlaston South	876	117	12%
Birchills Leamore	1,149	131	10%
Brownhills	534	56	9%
Pheasey Park Farm	485	50	9%
Bloxwich East	680	70	9%
Short Heath	516	39	7%
Rushall-Shelfield	599	44	7%
Pelsall	492	34	6%
Aldridge North and Walsall Wood	565	39	6%
Streetly	456	31	6%
Aldridge Central and South	634	43	6%
Bloxwich West	760	49	6%
Willenhall North	511	22	4%

Table 23 shows the LSOAs in which more than 20% of the private rented stock is an HMO. For comparison, there are 49 LSOAs with a higher percentage of HMOs than the overall Walsall figure of 11%.

Table 23: Number and percentage of HMO's above 20% according to LSOA code

LSOA Code	Private Rented Count	Not an HMO Count	HMO Count	HMO %
E01010364	125	85	40	32%
E01010367	198	138	60	30%
E01010366	128	90	38	30%
E01010318	160	116	44	28%
E01010405	218	159	59	27%
E01010263	137	103	34	25%
E01010342	223	168	55	25%
E01010338	86	65	21	24%
E01010372	165	127	38	23%
E01010370	257	200	57	22%
E01010344	112	88	24	21%
E01010316	75	59	16	21%
E01010277	141	111	30	21%
E01010289	148	118	30	20%
E01010375	275	220	55	20%
E01010343	117	94	23	20%
E01010325	194	156	38	20%

Table 24 shows the prevalence of low income households in HMOs (29%) and licensable HMOs (34%). For comparison, **Table 25** shows the proportion of low income households by tenure -15% of owner occupied stock, 29% of private rented stock and 67% of social stock is estimated to be a low income household.

Table 24: Number and percentage of low income households by HMOs and licensable HMOs

	Low Income Households Indicator			
	Not Low Income		Low Income	
	Count	%	Count	%
HMO	1,443	71%	587	29%
Licensable HMO	200	66%	104	34%

Table 25: Number and percentage of low income households by tenure

	Low Income Households Indicator			
	Not Low Income		Low Income	
	Count	%	Count	%
Owner occupied	58,681	85%	10,553	15%
Private rented	12,769	71%	5,201	29%
Social	9,315	33%	19,181	67%

Map 13: Count of HMOs

HMO
Count and (no. of COAs)
- 0 - 2 (617)
- 3 - 7 (149)
- 8 - 15 (43)
- 16 - 27 (16)
- 28 - 41 (4)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

Map 14: Count of mandatory licensable HMOs

Licensable HMO

Count and (no. of COAs)

- 0 (672)
- 1 (100)
- 2 - 3 (37)
- 4 - 7 (19)
- 8 - 20 (1)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.3.3   EPC ratings in the Walsall private sector stock

An Energy Performance Certificate (EPC) is required whenever a new building is constructed, or an existing building is sold or rented out. An EPC is a measure of the energy efficiency performance of a building and is rated from band A – G, with A representing the best performance. The EPC ratings correspond to a range of SAP ratings from 1 – 100, with 100 being the best. It is possible, therefore, to give a dwelling an EPC rating based on the SAP rating.

Figure 10 and **Figure 11** below show the bands A – G and corresponding SAP ratings in brackets. The first two columns show the number and percentage of Walsall's private sector stock falling into each of the EPC ratings bands. The third column shows the comparable figures for the private sector stock in England.

The estimated average SimpleSAP for the private sector stock in Walsall is 60 which corresponds to an EPC rating of D. The number of private sector dwellings with an EPC rating below band E is estimated to be 3,329 (3.8%). Walsall has a slightly higher proportion of dwellings in band D and E, and slightly lower proportions in the other bands.

Figure 10: Number and percentage of Walsall's *private sector stock* falling into each of the EPC ratings bands (based on SimpleSAP), compared to England (EHS) figures *N.B. England figures report band A and B together*

Band	Walsall Count	Walsall Percent	2014 EHS England Percent
(92-100) A	0	0.0%	1.0%
(81-91) B	398	0.5%	
(69-80) C	16,974	19.5%	20.9%
(55-68) D	48,302	55.4%	52.6%
(39-54) E	18,201	20.9%	19.1%
(21-38) F	2,797	3.2%	5.0%
(1-20) G	532	0.6%	1.5%

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Figure 11: Percentage of *private sector stock* falling into each of the EPC ratings bands (based on SimpleSAP), compared to England (EHS) figures *N.B. England figures report band A and B together*
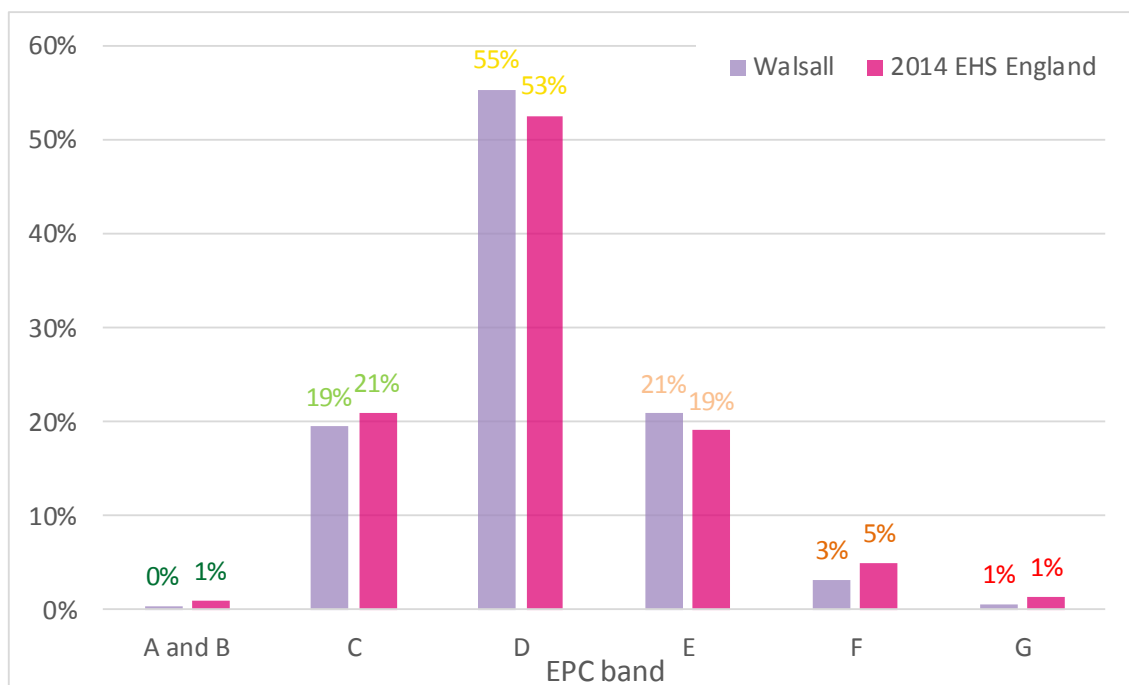

Table 26 shows the prevalence of HMOs with an EPC rating of F or G within the private rented sector. 779 private rented households, and 98 (5%) of the 2,030 HMO's in the private rented sector, have an EPC rating of F or G.

Table 27 shows that within dwellings which also have a low income household, those in the private rented sector have the highest proportions of F or G EPC ratings. Looking at dwellings which are also an HMO, 7% have an EPC rating of F or G – this is equivalent to 43 households.

Table 26: Proportion of HMOs with an EPC of F or G

| | EPC Rating | | |
| | Above F | F or G | |
	Count		% HMO
Not an HMO	15,259	681	-
HMO	1,932	98	5%
Total	17,191	779	-

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Table 27: Number and percentage of dwellings with an EPC of F or G in low income and low income HMO dwellings

		EPC above F		EPC F or G	
		Count	%	Count	%
Low Income	Private Rented	4,951	95%	250	5%
	Owner Occupied	10,100	96%	453	4%
	Social	18,757	98%	424	2%
Low Income HMO	Private Rented	544	93%	43	7%

Under the Energy Act 2011, new rules mean that from 2018 landlords must ensure that their properties meet a minimum energy efficiency standard - which has been set at band E - by 1 April 2018[15, 51].

Figure 12 and **Figure 13** show the breakdown of SimpleSAP results into the A – G bands for the private rented stock only and compared to the figures for this tenure in England as a whole. The number of private rented dwellings in Walsall with a rating below band E (i.e. bands F and G), is estimated to be 779 (4.3%). Compared to England, there are a greater proportion of dwellings in bands C and E and similar or slightly lower proportions in the other bands.

The distribution of dwellings with EPC ratings below band E is shown in **Map 15**. These are for the private rented stock only, since this is affected by the new rules on minimum standards. Under the legislation, which came into force in 2018, these properties would not be eligible to be rented out to new tenancies.

The council has been working in 2018/19 and 2019/20 to remind landlords of their duties related to this recent EPC[52].

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[51] Although landlords will still be able to rent out F and G rated properties after this date they will not be able to renew or sign a new contract.

[52] https://go.walsall.gov.uk/energy_performance_certificates-4,
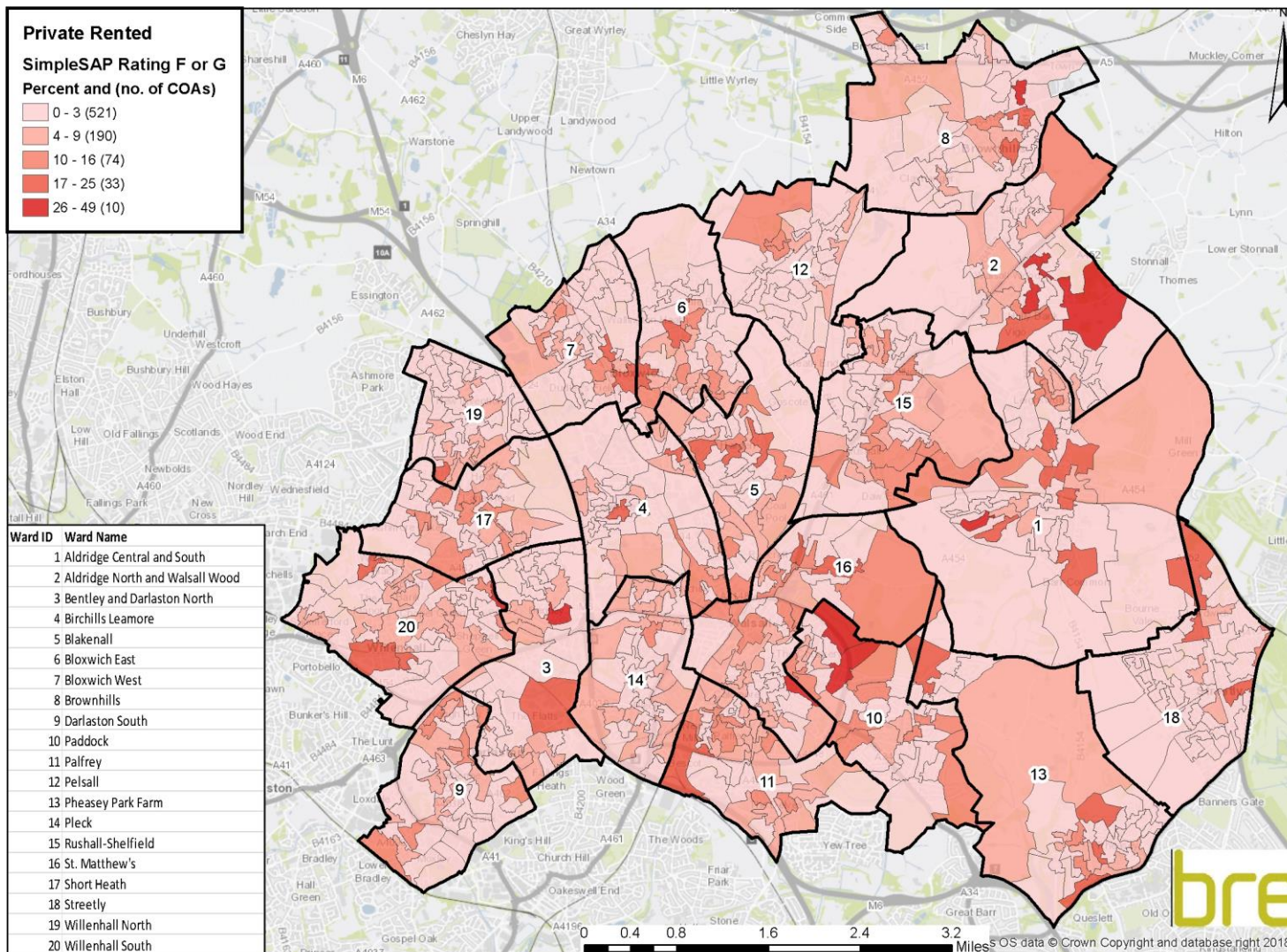https://go.walsall.gov.uk/Portals/0/Uploads/MHJ/60387%20Minimum%20EPC%20Leaflet%20A5%20Web.pdf

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Figure 12: Number and percentage of Walsall's *private rented stock* falling into each of the EPC ratings bands (based on SimpleSAP), compared to England (EHS) figures *N.B. England figures report band A and B together*

	Walsall		2014 EHS England
	Count	**Percent**	**Percent**
(92-100) A	0	0.0%	1.4%
(81-91) B	257	1.4%	
(69-80) C	4,766	26.5%	23.8%
(55-68) D	8,602	47.9%	48.9%
(39-54) E	3,566	19.8%	18.3%
(21-38) F	630	3.5%	5.4%
(1-20) G	149	0.8%	2.1%

Figure 13: Percentage of *private rented stock* falling into each of the EPC ratings bands (based on SimpleSAP), compared to England (EHS) figures *N.B. England figures report band A and B together*
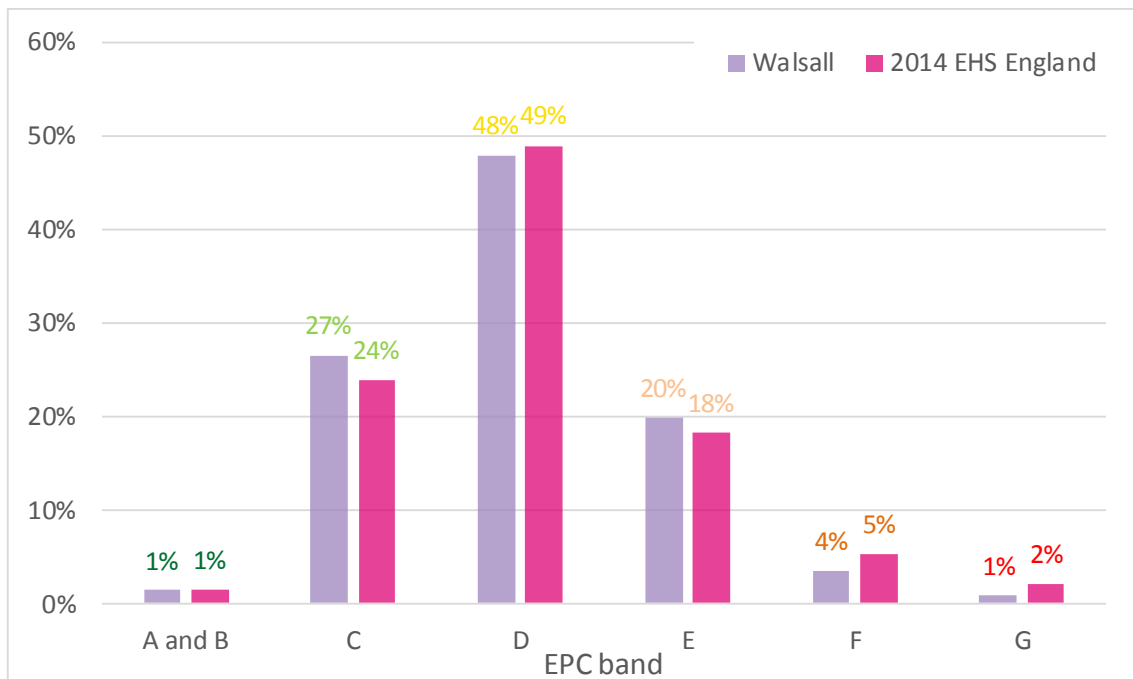
Map 15: Distribution of dwellings with F or G EPC ratings in the private rented stock

Private Rented
SimpleSAP Rating F or G
Percent and (no. of COAs)
- 0 - 3 (521)
- 4 - 9 (190)
- 10 - 16 (74)
- 17 - 25 (33)
- 26 - 49 (10)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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4.3.4   Flats above commercial premises

Walsall Council requested an additional variable to be added to the HSCD - addresses of flats above commercial premises.

Flats were identified as an output from the Dwelling Type Model which uses OS Mastermap to identify any polygons with multiple address points and determines these as blocks of flats. If any address point within a polygon (block) was classified in Mastermap as non-residential then that block contains commercial premises.

A flag has been added within the HSCD to enable the identification of dwellings that are above commercial premises; for example, for a block with 2 flats above a ground floor shop both these flats will have a flag to indicate that they are above commercial premises. Therefore, the HSCD will provide a count of the number of dwellings above commercial premises, rather than providing the numbers of commercial premises themselves.

The distribution of private sector dwellings which are part of a commercial unit is shown in **Map 16** and **Map 17** shows this for the private rented sector. Many of these dwellings are concentrated in and around central parts of Walsall, but there are other areas which stand out – such as the private sector in Streetly. In general, these types of buildings are often concentrated along main roads, such as the A452 in Streetly, as these areas are more likely to have a mix of commercial and residential.

1,161 private rented dwellings in Walsall are located above commercial premises. **Table 28** compares the prevalence of HHSRS category 1 hazards, excess cold, falls and disrepair between the private rented stock and private rented properties above commercial premises. It is evident that private rented dwellings above commercial properties have similar rates of excess cold but lower rates of all hazards, falls and disrepair. This is likely to be a result of these dwellings being flats which have lower likelihoods of having a falls hazard.
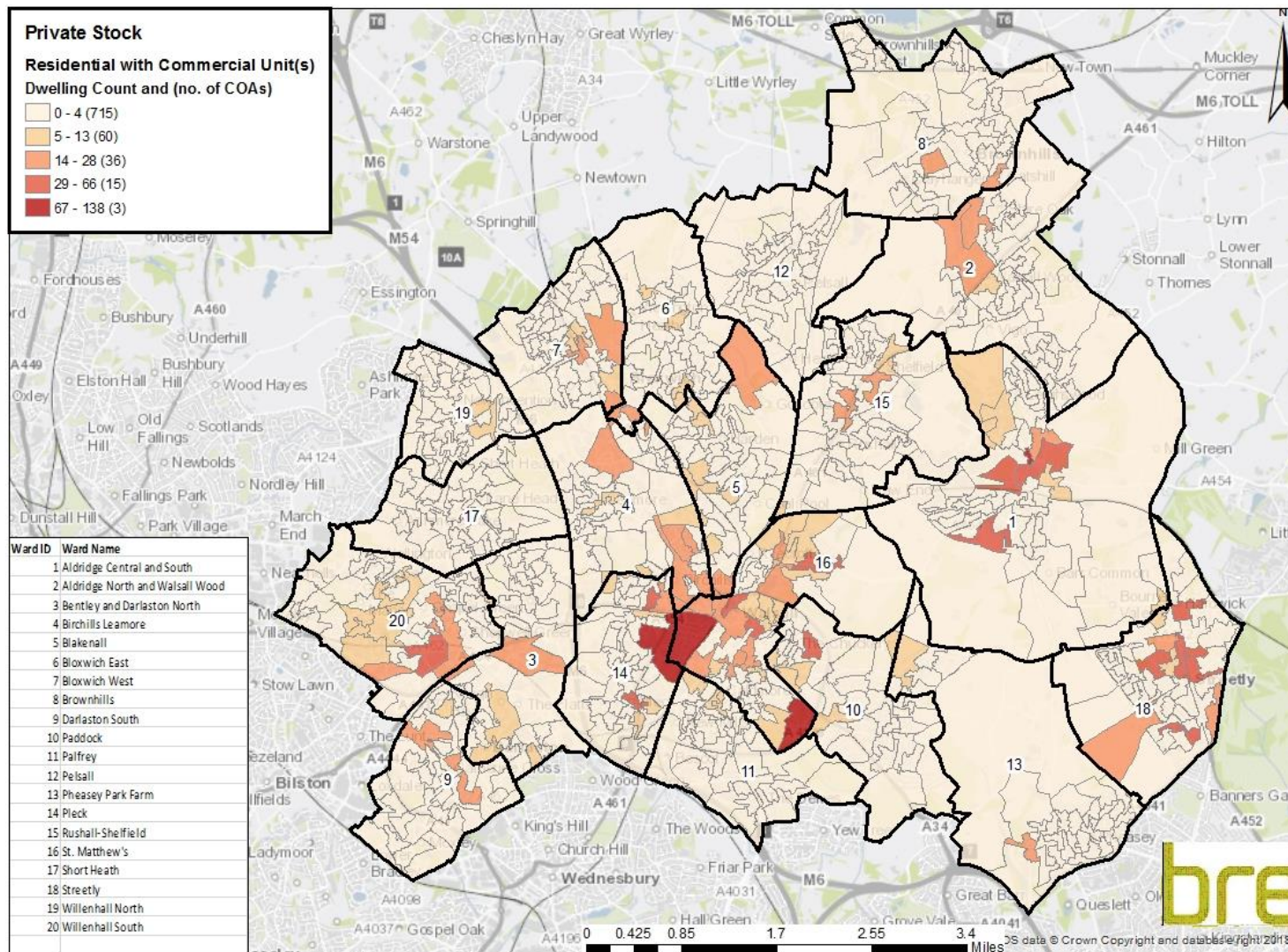
Table 28: Number and percentage of variables in private rented and commercial premises

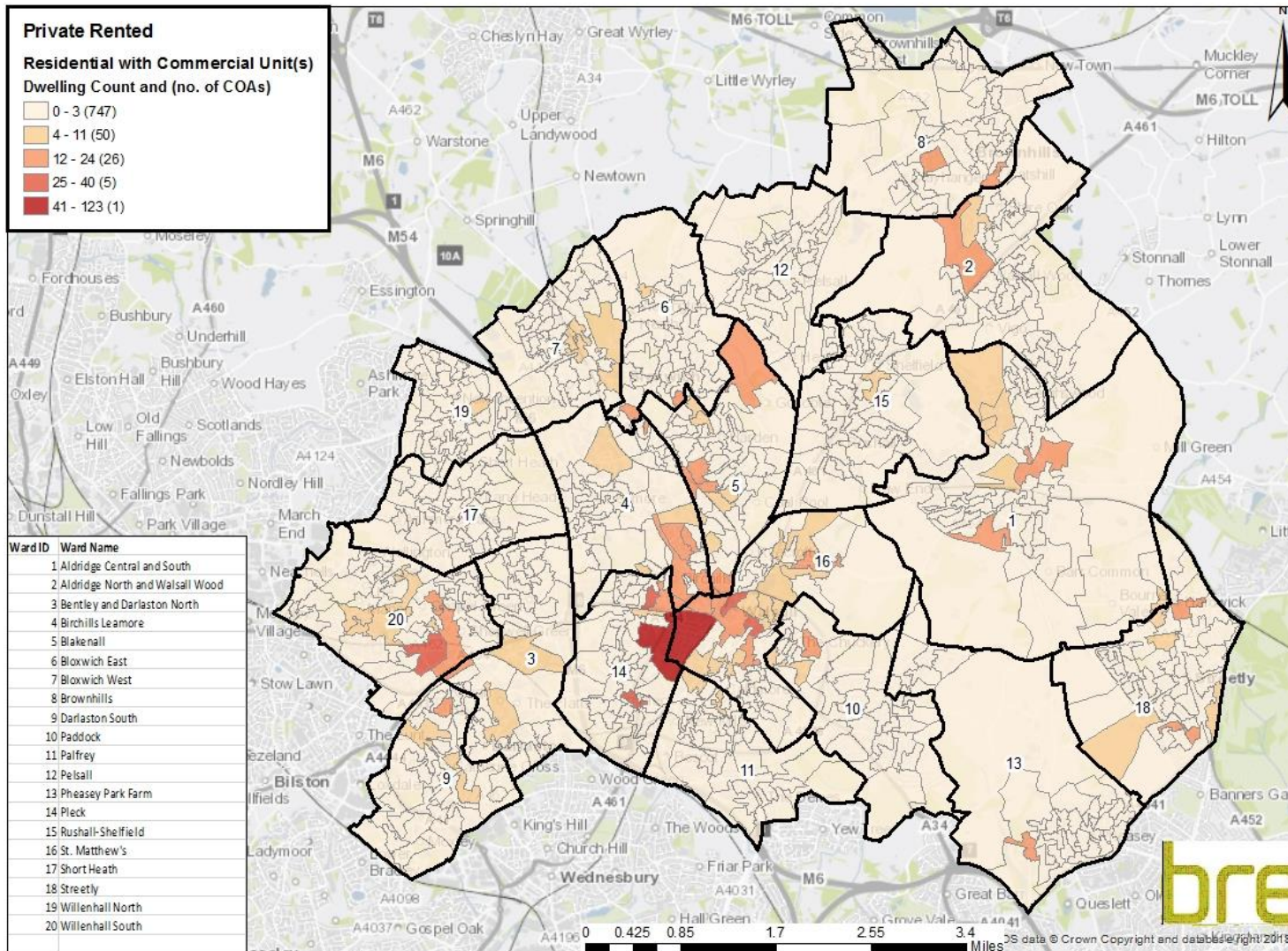|	Private Rented		Private Rented above Commercial Premises	
	Count	% of Private Rented	Count	% of Private Rented above Commercial Premises
All hazards	2,463	14%	49	4%
Excess cold	469	3%	32	3%
Falls	1,871	10%	8	1%
Disrepair	1,577	9%	49	4%

Furthermore, a total of 104 (9%) of the dwellings above commercial premises are estimated to be HMOs.

Of the privately rented dwellings above commercial premises 28% are occupied by low income households. This is slightly lower than the figure of 29% for all private rented properties.

Map 16: Distribution of dwellings which are part of a commercial unit – private stock

Private Stock

Residential with Commercial Unit(s)

Dwelling Count and (no. of COAs)

☐	0 - 4 (715)
☐	5 - 13 (60)
☐	14 - 28 (36)
☐	29 - 66 (15)
☐	67 - 138 (3)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

Map 17: Distribution of dwellings which are part of a commercial unit – private rented stock

Private Rented

Residential with Commercial Unit(s)

Dwelling Count and (no. of COAs)

	0 - 3 (747)
	4 - 11 (50)
	12 - 24 (26)
	25 - 40 (5)
	41 - 123 (1)

Ward ID	Ward Name
1	Aldridge Central and South
2	Aldridge North and Walsall Wood
3	Bentley and Darlaston North
4	Birchills Leamore
5	Blakenall
6	Bloxwich East
7	Bloxwich West
8	Brownhills
9	Darlaston South
10	Paddock
11	Palfrey
12	Pelsall
13	Pheasey Park Farm
14	Pleck
15	Rushall-Shelfield
16	St. Matthew's
17	Short Heath
18	Streetly
19	Willenhall North
20	Willenhall South

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5   Conclusion and recommendations

5.1   Conclusion

Walsall Council commissioned BRE to undertake a series of modelling exercises on their housing stock to provide an integrated housing stock condition database, making use of available local data sources (tenure, benefits and HMO data) plus the EPC data which have been integrated into BRE's standard housing stock condition database. The integration of this data source serves to further increase the accuracy of the models by removing the need to rely on imputed data for the 52,769 cases where EPC data is available, and instead using observed data from the surveys. This leads to more accurate SimpleSAP ratings, more accurate excess cold data (and therefore HHSRS data), and more accurate fuel poverty data for around 45.6% of the stock in Walsall.

This report describes the modelling work and provides details of the results obtained from the dwelling level model and database. The housing stock condition database is also provided to the council to enable them to obtain specific information whenever required. This database is now in an online format.

The integrated stock models and database provide the council with dwelling level information, focussing on private sector housing, for the following:

- The percentage of dwellings meeting each of the key indicators for Walsall overall and broken down by tenure and then mapped by COA (private sector stock only)
- Information relating to LAHS reporting for the private sector stock - category 1 hazards and HMOs as well as information on EPC ratings and flats above commercial premises

Some of the key findings of this report are as follows:

- The performance of the housing stock in Walsall compared to the EHS England average is mixed with Walsall performing slightly better for all hazards and excess cold, but worse for fall hazards, disrepair, fuel poverty and low income households.
- The private rented sector is generally worse than the social sector (excluding fuel poverty 10% definition and low income households), and worse than the owner occupied sector for all indicators.
- 4.3% (779) of dwellings in the private rented sector are estimated to have an EPC below band E. Under the legislation these properties would not be eligible to be rented out to new or renewed tenancies. At the time of this study the Council had issued 90 statutory HMO licences and had received applications for a further 32, giving a total of 122 possible licensable HMOs[53]. This study identifies a possible 304 licensable HMOs, suggesting a possible 60% of HMOs within Walsall which require a licence have neither had one issued nor applied for one.

Such information will facilitate the decision making process for targeting resources to improve the condition of housing and to prevent ill health resulting from poor housing conditions. Furthermore, the results of this project provide Walsall with information which will assist in housing policy and strategy development whether these are inspired locally, arise from obligations under the Housing Act 2004 or as

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[53] https://go.walsall.gov.uk/Portals/0/Uploads/Housing/HMO%20Public%20Register%2005%2006%2019.pdf

responses to government initiatives such as MHCLG's Housing Strategy Policy and ECO. Decision making processes have the potential to focus on:

- Targeted group repair schemes and regeneration and enforcement interventions to tackle disrepair in areas such as Pleck where 11% of all stock has disrepair, and Paddock and Palfrey where 19% and 18% of private rented homes respectively have a Category 1 hazards.
- Tackling the number (779) of privately rented dwellings where EPC ratings for new tenants or tenancy renewals is F or G. This work could include tackling LSOAs E01010326 and E01010317 where 23% and 16% of private rented dwellings have an EPC rating of F and G. Alleviating LSOA level variables, such as some LSOAs containing over a quarter of privately rented properties with a category 1 hazard and others having 20% of private rented dwellings in disrepair

5.2   Recommendations

Programmes designed to tackle disrepair for example group repair schemes, regeneration or enforcement interventions could be considered with a focus on areas of greatest disrepair such as Pleck ward with 13% disrepair and 18% containing category 1 hazards, or Palfrey ward with an estimated 11% of private sector homes in disrepair and 17% with category 1 hazards. These findings could be combined with local intelligence to help identify areas for targeting assistance for physical improvements to private sector stock and the environment. Furthermore, programmes aimed at increasing household income through job creation, benefit entitlement checks and other initiatives should also be considered, with a particular focus on areas containing high proportions of low income households like Darlaston South (30%), Palfrey (29%) and Pleck ward (28%). Other areas of possible action could be to determine which HMOs require a mandatory licence but none has either been secured or applied for; and to identify private rented dwellings where EPCs are below the required level.

The use of additional local data in this project has enhanced the housing stock models and Housing Stock Condition Database (HSCD). The addition of any further local data, were it to become available, would potentially further enhance the models and database.

Examples of such data are:

- **LLPG data**

The Unique Property Reference Number (UPRN) from the LLPG would be used to uniquely identify all properties, while the address details from the LLPG would be used to merge the BRE Models and the EPC data using address matching.

- **Local repair schemes**

Data from any local repair schemes, including the use of repair grants, could be used to enhance the Disrepair Model.

- **Local energy improvement schemes**

Any local schemes to improve the energy efficiency of dwellings, including national schemes for which local data has been made available to Walsall Council, could be used to further enhance the energy models (SimpleSAP, excess cold, fuel poverty).

Furthermore, it would be possible for Walsall Council to commission BRE to carry out an analysis of the condition of the housing stock and its health impact, through a Health Impact Assessment (HIA). The results of this would be provided in a separate report which would provide a cost benefit analysis of mitigating Housing Health and Safety hazards within the stock.

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Appendix A   Definitions of the key indicators

1. **House condition indicators**
   a. **The presence of a category 1 hazard under the Housing Health and Safety Rating System (HHSRS) – reflecting both condition and thermal efficiency**
      Homes posing a category 1 hazard under the HHSRS – the system includes 29 hazards in the home categorised into category 1 – band A to C (serious) or category 2 – band D onwards (other) based on a weighted evaluation tool. Note that this includes the hazard of excess cold which is also included as one of the energy efficiency indicators.

      The 29 hazards are:

1 Damp and mould growth	16 Food safety
2 Excess cold	17 Personal hygiene, Sanitation and Drainage
3 Excess heat	18 Water supply
4 Asbestos	19 Falls associated with baths etc.
5 Biocides	20 Falling on level surfaces etc.
6 Carbon Monoxide and fuel combustion products	21 Falling on stairs etc.
7 Lead	22 Falling between levels
8 Radiation	23 Electrical hazards
9 Uncombusted fuel gas	24 Fire
10 Volatile Organic Compounds	25 Flames, hot surfaces etc.
11 Crowding and space	26 Collision and entrapment
12 Entry by intruders	27 Explosions
13 Lighting	28 Position and operability of amenities etc.
14 Noise	29 Structural collapse and falling elements
15 Domestic hygiene, Pests and Refuse	

   b. **The presence of a category 1 hazard for falls (includes "falls associated with baths", "falling on the level" and "falling on stairs")**
      The HHSRS Falls Model includes the 3 different falls hazards where the vulnerable person is over 60 as listed above.

   c. **Dwellings in disrepair (based on the former Decent Homes Standard criteria for Disrepair)**
      The previous Decent Homes Standard states that a dwelling fails this criterion if it is not found to be in a reasonable state of repair. This is assessed by looking at the age of the dwelling and the condition of a range of building components including walls, roofs, windows, doors, electrics and heating systems).

2. **Energy efficiency indicators:**
   a. **The presence of a category 1 hazard for excess cold (using SAP ratings as a proxy measure in the same manner as the English House Condition Survey)**
      This hazard looks at households where there is a threat to health arising from sub-optimal indoor temperatures. The HHSRS assessment is based on the most low income group for this hazard – persons aged 65 years or over (note that the assessment requires the hazard to

be present and potentially affect a person in the low income age group should they occupy that dwelling. The assessment does not take account of the age of the person actually occupying that dwelling at that particular point in time).

The English Housing Survey (EHS) does not measure the actual temperatures achieved in each dwelling and therefore the presence of this hazard is measured by using the SAP rating as a proxy. Dwellings with a SAP rating of less than 33.52 (SAP 2012 methodology) are considered to be suffering from a category 1 excess cold hazard.

b. **An estimate of the SAP rating which, to emphasise its origin from a reduced set of input variables, is referred to as "SimpleSAP"**
The Standard Assessment Procedure (SAP) is the UK Government's standard methodology for home energy cost ratings. SAP ratings allow comparisons of energy efficiency to be made, and can show the likely improvements to a dwelling in terms of energy use. The Building Regulations require a SAP assessment to be carried out for all new dwellings and conversions. Local authorities, housing associations, and other landlords also use SAP ratings to estimate the energy efficiency of existing housing. The version on which the Average SAP rating model is based is SAP 2012.

The SAP ratings give a measure of the annual unit energy cost of space and water heating for the dwelling under a standard regime, assuming specific heating patterns and room temperatures. The fuel prices used are the same as those specified in SAP 2012. The SAP takes into account a range of factors that contribute to energy efficiency, which include:

- Thermal insulation of the building fabric
- The shape and exposed surfaces of the dwelling
- Efficiency and control of the heating system
- The fuel used for space and water heating
- Ventilation and solar gain characteristics of the dwelling

3. **Household vulnerability indicators:**
    a. **Fuel poverty - 10% definition**
    This definition states that a household is said to be in fuel poverty if it spends more than 10% of its income on fuel to maintain an adequate level of warmth (usually defined as 21°C for the main living area, and 18°C for other occupied rooms). This broad definition of fuel costs also includes modelled spending on water heating, lights, appliances and cooking.

    The fuel poverty ratio is defined as:

    Fuel poverty ratio = $\dfrac{\text{Fuel costs (usage * price)}}{\text{Full income}}$

    If this ratio is greater than 0.1 then the household is in fuel poverty.

    The definition of full income is the official headline figure and in addition to the basic income measure, it includes income related directly to housing (i.e. Housing Benefit, Income Support for Mortgage Interest (ISMI), Mortgage Payment Protection Insurance (MPPI), Council Tax reduction).

Fuel costs are modelled, rather than based on actual spending. They are calculated by combining the fuel requirements of the household with the corresponding fuel prices. The key goal in the modelling is to ensure that the household achieves the adequate level of warmth set out in the definition of fuel poverty whilst also meeting their other domestic fuel requirements.

b. Fuel poverty - Low Income High Costs definition

The government has recently set out a new definition of fuel poverty which it intends to adopt under the Low Income High Costs (LIHC) framework[54]. Under the new definition, a household is said to be in fuel poverty if:

- They have required fuel costs that are above average (the national median level)
- Were they to spend that amount they would be left with a residual income below the official poverty line

c. Dwellings occupied by a low income household

A household in receipt of:

- Income support
- Housing benefit
- Attendance allowance
- Disability living allowance
- Industrial injuries disablement benefit
- War disablement pension
- Pension credit
- Child tax credit
- Working credit

For child tax credit and working tax credit, the household is only considered a low income household if it has a relevant income of less than £15,860.

The definition also includes households in receipt of Council Tax reduction and income based Job Seekers Allowance.

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[54] https://www.gov.uk/government/collections/fuel-poverty-statistics

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This Appendix provides a more detailed description of the models which make up the overall housing stock modelling approach and feed into the housing stock condition database. The process is made up of a series of data sources and Models which, combined with various imputation and regression techniques and the application of other formulae, make up the final Housing Stock Condition Database (HSCD). The database is essentially the main output of the modelling and provides information on the key indicators and other data requirements (e.g. energy efficiency variables). An overview of the approach and a simplified flow diagram are provided in **Section 3** of this report.

The models making up the overall housing stock modelling approach are:

- SimpleCO$_2$ Model
- Fuel Poverty Model
- HHSRS (all hazards, falls hazards and excess cold) Models
- Disrepair Model
- Low Income Households Model

Figure B.1 shows the data flows for the stock modelling approach, showing which models each of the outputs in the database (split into the key indicators and other information) come from. The exception is the energy efficiency variables (if used) which come directly from the energy inputs, and the tenure and HMO data (if used) which come directly from the other inputs.

Section B.1 describes the SimpleCO$_2$ Model in more detail, **Section B.2** provides more information on the other four models and **Section B.3** gives details of the OS MasterMap/geomodelling approach.

Figure B.1: Simplified data flow for the housing stock modelling approach
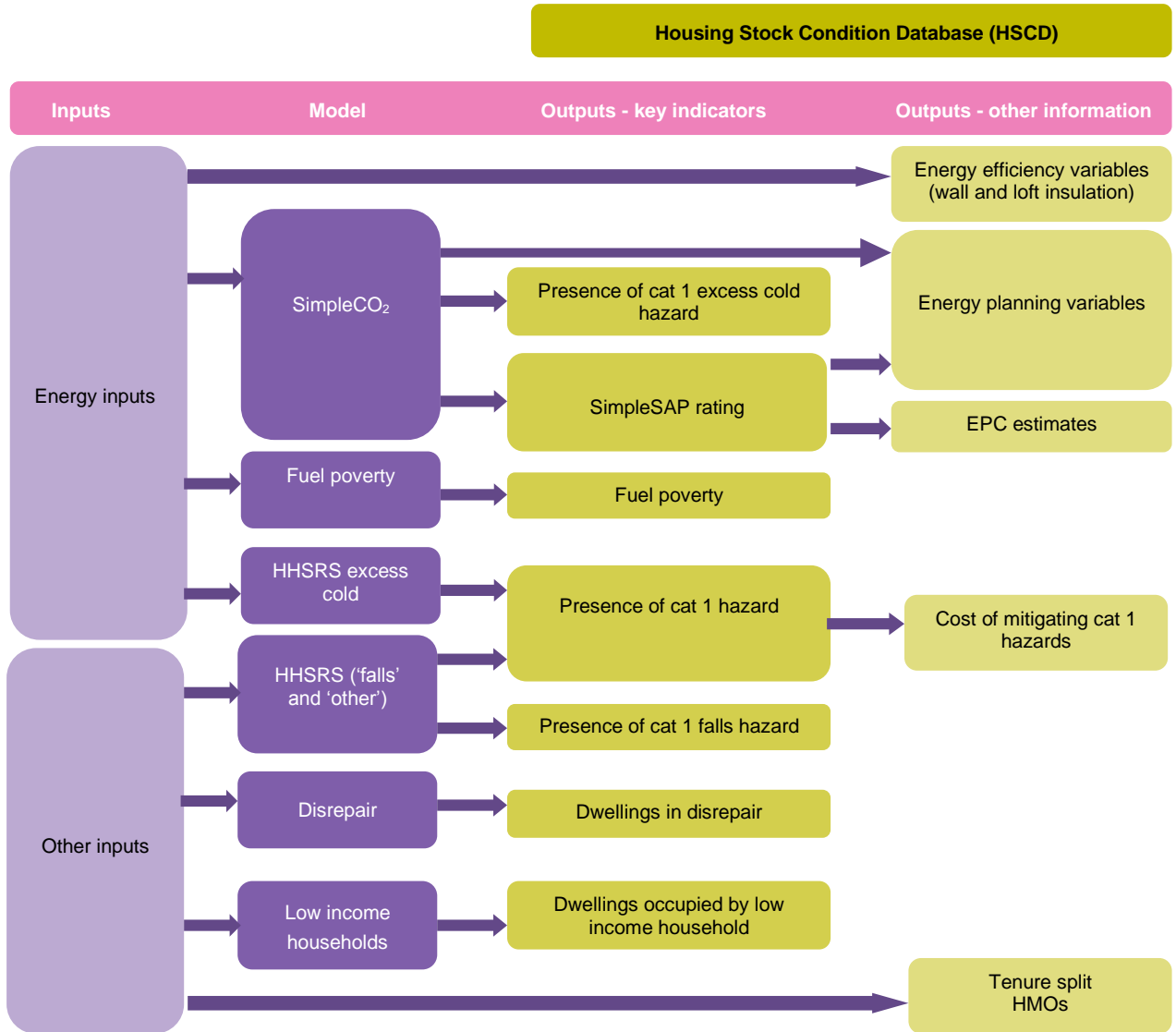
B.1 BRE SimpleCO$_2$ Model

BRE have developed a variant of the BREDEM[55] software, named "SimpleCO$_2$", that can calculate outputs from a reduced set of input variables. These outputs are indicative of the full BREDEM outputs and the minimum set of variables the software accepts is information on:

- Tenure
- Dwelling type
- Location of flat (if a flat)
- Dwelling age
- Number of storeys
- Number of rooms
- Loft insulation
- Level of double glazing
- Main heating type
- Boiler type (if a boiler driven system)
- Heating fuel
- Heating system
- Heating controls
- Water heating
- Hot water cylinder insulation
- Solar hot water
- PV panels
- Internal floor area

The Experian UK Consumer Dynamics Database is used as a source for some of these variables (tenure, dwelling age) and they are converted into a suitable format for the SimpleCO$_2$ software. The dwelling type is derived using information from OS Mastermap and the number of storeys from OS experimental height data. The remaining pieces of data are inferred from the EHS using other tenure, dwelling age and type, other Experian data (number of bedrooms), other OS data (i.e. dwelling footprint) and data from Xoserve[56] which indicates whether the dwelling is in a postcode which is on the gas network. As the characteristics of a dwelling cannot be determined through access to observed data, a technique known as cold deck imputation is undertaken. This is a process of assigning values in accordance with their known proportions in the stock. For example, this technique is used for predicting heating fuels because the Xoserve data only confirms whether a dwelling is on the gas network or not. Fuel used by dwellings not on the gas network is unknown, so in most cases this information will be assigned using probabilistic methods. The process is actually far more complex e.g. dwellings with particular characteristics such as larger dwellings are more likely to be assigned with oil as a fuel than smaller dwellings.

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[55] Building Research Establishment Domestic Energy Model, BRE are the original developers of this model which calculates the energy costs of a dwelling based on measures of building characteristics (assuming a standard heating and living regime). The model has a number of outputs including an estimate of the SAP rating and carbon emissions.

[56] Xoserve is jointly owned by the five major gas distribution Network companies and National Grid's gas transmission business. It provides transportation transactional services on behalf of all the major gas Network transportation companies.

The reason for taking this approach is to ensure that the national proportions in the data source are the same as those found in the stock nationally (as predicted by the EHS or other national survey). Whilst there is the possibility that some values assigned will be incorrect for a particular dwelling (as part of the assignment process has to be random) they ensure that examples of some of the more unusual types of dwelling that will be present in the stock are included.

Whilst this approach is an entirely sensible and commonly adopted approach to dealing with missing data in databases intended for strategic use, it raises issues where one of the intended uses is planning implementation measures. It must therefore be kept in mind at all times that the data provided represents the most likely status of the dwelling, but that the actual status may be quite different. That said, where EPC data has been used, the energy models (which use EPC data) are likely to be more accurate.

It is important to note that some variables have been entirely assigned using cold decking imputation techniques. These include presence of cavity wall insulation and thickness of loft insulation as there is no reliable database with national coverage for these variables.

The "SimpleCO$_2$" software takes the combination of Experian and imputed data and calculates the "SimpleSAP" rating for each dwelling in the national database. The calculated "SimpleSAP" ratings are the basis of the estimates of SAP and excess cold. How the other key variables are derived is discussed later in this Appendix.

Because the estimates of "SimpleSAP" etc. are calculated from modelled data it is not possible to guarantee the figures. They do, however, provide the best estimates that we are aware can be achieved from a data source with national coverage and ready availability. The input data could, however, be improved in its:

- accuracy for example through correcting erroneous values,
- depth of coverage, for example by providing more detailed information on age of dwellings,
- breadth by providing additional input variables such as insulation.

Improving any of these would enhance the accuracy of the output variables and for this reason it is always worth considering utilising additional information sources where they are available. Using EPC data will go some way towards meeting these improvements by providing more accurate data.

B.2 Housing Condition and Low Income Household Models

This section provides further information on the remaining four models – fuel poverty, HHSRS, disrepair and low income households. These models are discussed together since the approach used for each one is broadly the same.

These models are not based solely on the thermal characteristics of the dwelling, and in some cases are not based on these characteristics at all. A top down methodology has been employed for these models, using data from the EHS and statistical techniques, such as logistic regression, to determine the combination of variables which are most strongly associated with failure of each standard. Formulae have been developed by BRE to predict the likelihood of failure based on certain inputs. The formulae are then applied to the variables in the national Experian dataset to provide a likelihood of failure for each dwelling. Each individual case is then assigned a failure/compliance indicator based on its likelihood of failure and on the expected number of dwellings that will fail the standard within a given geographic area. Thus if the aggregate values for a census output area are that 60% of the dwellings in the area fail a particular standard then 60% of the dwellings with the highest failure probabilities will be assigned as failures and the remaining 40% as passes.

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The presence of a category 1 hazard failure is the only exception to this as it is found by combining excess cold, fall hazards and other hazards such that failure of any one of these hazards leads to failure of the standard.

B.3 Integrating local data sources

As mentioned in the main body of the report, Walsall identified a number sources of data which were used to update the BRE dwelling level models to provide an integrated housing stock condition database. Their data sources are shown in **Table B.1**.

To allow these data sources to be linked to the BRE Dwelling Level Stock Models, an address matching exercise was required to link each address to the Experian address key. Address matching is rarely 100% successful due to a number of factors including:

- Incomplete address or postcodes
- Variations in how the address is written e.g. Flat 1 or Ground floor flat
- Additions to the main dwelling e.g. annexes or out-buildings

Experience indicates that, for address files in good order, match rates are around 75% - 95%. **Table B.1** provides the address matching results for the three data sources provided by Walsall and the resulting impact on the modelling process.

Table B.1: Address matching results and impact on the modelling process

Data source	Total no. of records	No. (and %) of addresses matched	Notes / impact on the modelling process
EPC data	71,378 – total records available	54,660 (77% of records available)	Data de-duplicated for multiple EPCs and final number matched to modelled data and useable – 54,660
DPS tenure data	4,492 – total received	3,908 (87% of records provided)	Remaining cases once duplicates removed and address matching – 3,908
My Deposits tenure data	574 – total received	485 (85% of records provided)	Remaining cases once duplicates removed and address matching - 485
TDS tenure data	2,584– total received	2,124 (82% of records provided)	Remaining cases once duplicates removed and address matching – 2,124
Benefits data	31,574 – total received	29,641 (94% of records provided)	Remaining cases once duplicates removed and address matching – 29,641

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The Housing Stock Condition Database (HSCD) was also updated using the Ordnance Survey (OS) MasterMap data which enables the measurement of the footprint of the building and provides information on the number of residential addresses within the building, and to see which other buildings each address is attached to or geographically close to.

The stage at which the local data sources are included in the modelling process depends on whether or not the data includes information which can be used as an input into the SimpleCO$_2$ model. The simplified flow diagram in **Figure 1** in the main report shows how these data sources are integrated into the standard modelling approach.

The following sections consider each of the data sources and how they are used to update the SimpleCO$_2$ inputs and/or stock model outputs.

EPC data

If there are discrepancies in the energy data for the same dwelling case, arising from different energy data sources, then, if available, the EPC data will be used. If no EPC data source is available for that case, then the data with the most recent date will be taken.

Some of the energy data provided includes tenure data, in which case the housing stock condition database has been updated accordingly. However EPC cases do not include tenure data, they only include the reason for the EPC.

Therefore:

- If the reason given was a sale then the dwelling was assumed to be owner occupied.
- If the reason given was re-letting and the tenure of the let was specified (i.e. private or social) then the tenure was changed to that indicated.
- If the reason for the sale did not indicate tenure then the tenure was left unchanged.

It is important to note that the modified tenure created from the EPC data should only ever be used for work relating to energy efficiency and carbon reduction. This is a legal requirement stemming from the collection of the data, and is a licence condition of the data suppliers, Landmark. For this reason the tenure variable supplied in the database is NOT based on EPC data; however, the calculations used to determine the SimpleSAP rating and other energy characteristics of the dwelling do make use of the EPC tenure.

Where the energy data provides information on loft insulation, wall insulation, the location of a flat within a block and floor area this information will be used in favour of any imputed information, as long as the OS data is in agreement with the dwelling type.

Where energy data on wall type is present for a dwelling in a block of flats, terrace or semi-detached, that data is extrapolated to the rest of the block or terrace. If multiple dwellings with energy data are present then the most common wall type is used. Note that where the energy data indicates a wall type that is not the predominant one, this data will not be overwritten with the predominant type – the data reported in the energy database will always be used even if this results in two different wall types being present in a terrace or a block of flats.

For flats it is assumed that all flats in the block will have the same level of double glazing and as the case for which we have energy data for. If there are multiple flats in the block with energy data showing different levels of double glazing, an average will be used.

It is assumed that all flats in a block share the same heating type, boiler type if present, fuel type and heating controls. Where there are multiple types present, the predominant type is used. Flats are

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assumed to have the same hot water source, and if one flat benefits from solar hot water it is assumed that all flats in the block do.

B.4 OS MasterMap information

The OS data has been used to update a number of the SimpleCO$_2$ model inputs. The most valuable use of the OS data is the ability to determine the dwelling type with much greater confidence.

The existing dwelling type is replaced with a new dwelling type derived from OS data. By looking at the number of residential address points it can be inferred whether the building is a house or block of flats (houses have one residential address point and blocks of flats have two or more).

Houses - where the dwelling is a house the number of other buildings it is attached to can be observed and the following assumptions made:

- If there are no other dwellings attached, the house is detached.
- If two dwellings are joined to one another, but not to any other dwellings, they are semi-detached.
- If they are attached to two or more other dwellings, they are mid terraced.
- If they are attached to only one dwelling, but that dwelling is a mid-terrace, they are an end-terrace.

Flats - if the building is a block of flats, its exact nature is determined by its age and the number of flats in the block and the following assumptions made:

- If there are between two and four flats in the block (inclusive) and the dwelling was built before 1980 then it is a conversion.
- Otherwise it is purpose built.

This information can also be used to reconcile discrepancies within blocks of flats, terraced and semi-detached houses. These discrepancies occur in variables such as dwelling age, location of flat in block, number of storeys, loft insulation, wall insulation, wall type and floor area.

Looking at dwelling age, although the OS data does not itself provide any information on age, it does allow reconciliation of age data within semi-detached, terraces and blocks of flats.

Where a group of buildings are all attached in some way, such as a terrace, it is logical to assume that they were built at the same time. Therefore the age of each building is replaced with the most common age among those present. Where the most common age occurs in equal numbers, this is resolved by looking at the average age of houses in the same postcode.

If one dwelling has an age that is notably newer than its neighbours, then the age is not changed, as it is assumed that the original dwelling was destroyed and rebuilt.

Figure B. 2 and **Figure B. 3** below show how the initial base data is adjusted using the OS data to produce more consistent and reliable results.

Considering the number of storeys and the location of a flat in its block, if the OS data reveals that the dwelling type is significantly different from the original value – specifically if a house becomes a flat, or vice versa then the variables are adjusted. If this is the case a new location for the flat within the block or the number of storeys will be imputed using the same method as before, but taking into account the revised dwelling type.

Similarly with floor area, loft insulation and wall type - if the dwelling type or location of a flat within a block changes as a result of OS data then the variables are calculated using the same method of imputation as the original models, but taking into account the new data.

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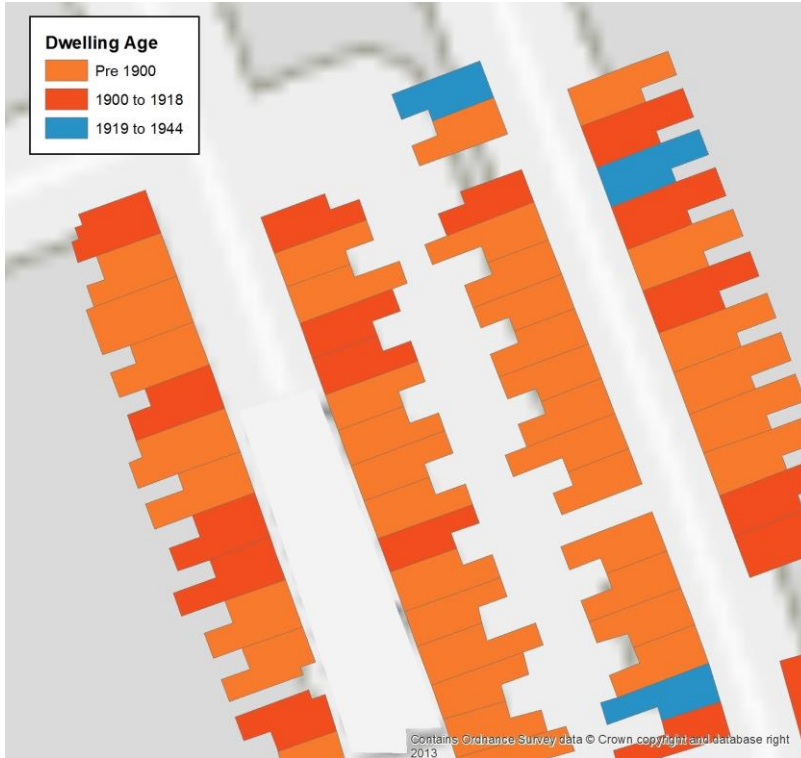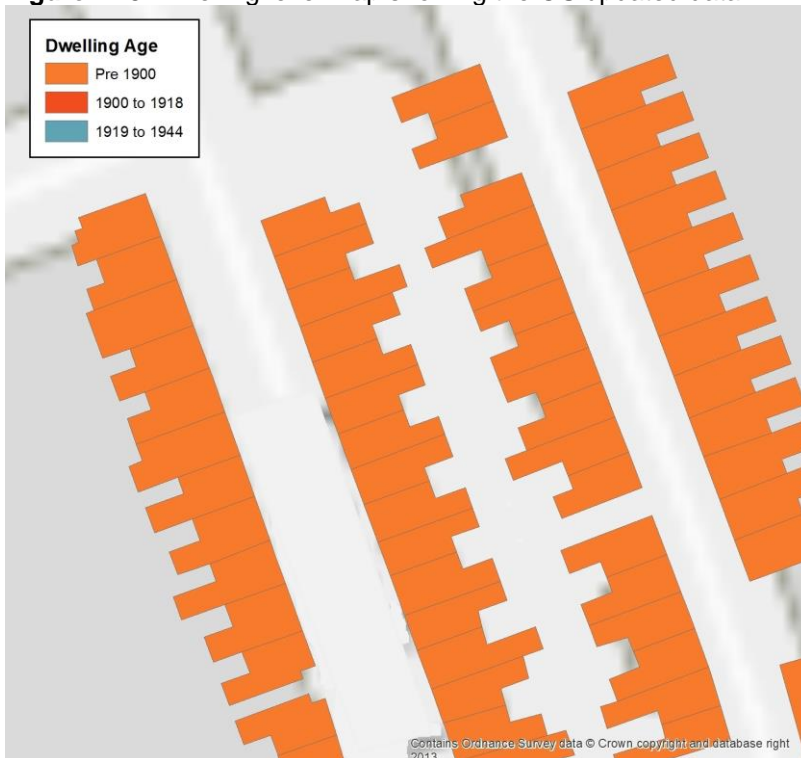**Figure B. 2:** Dwelling level map showing the base data, prior to using the OS data

Figure B. 3: Dwelling level map showing the OS updated data

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Appendix C   Using the BRE Integrated Dwelling Level Housing Stock Database

The BRE Housing Stock Condition Database (HSCD) is the final output of the overall stock modelling approach described in **Section 3** and **Appendix B**. The HSDC has been designed to allow local authorities to access their local area data. There are a number of different options for summarising or investigating the data and generating lists of properties of interest.

C.1 Overview

The Housing Stock Condition Database (HSCD) is now online. You can access it in www.hscd.bre.co.uk with the credentials sent to you by email.

To ensure data security the interface will automatically open on the login page shown in **Figure C. 1**. Should you forget your password details, these can be reset and emailed to you using the function provided on the login page.

Upon login, the home page will open with a dashboard showing the key indicators for your housing stock, similar to that shown in

Figure C. 2.The navigation pane is along the top and is visible on all pages; the options shown on the navigation pane will depend upon the options purchased.

Figure C. 1: Login screen

Figure C. 2 Home page (note screenshot below is sample data)

Please refer to the user guide accessible via the log in page under the help button.

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Glossary of terms

BREDEM	BRE Domestic Energy Model
Category 1 hazard	Hazards with a HHSRS score of > 1,000. A dwelling with a category 1 hazard is considered to fail the minimum statutory standard for housing
CLG	Department for Communities and Local Government
COA	Census Output Area
	Designed for statistical purposes, built from postcode units, approximately 125 households
Disrepair	Based on former Decent Homes Standard criteria which states that a dwelling fails this if it is not in a reasonable state of repair – this is based on the dwelling age and condition of a range of building components including walls, roofs, windows, doors, electrics and heating systems
ECO	Energy Companies Obligation
	Places legal obligations on the larger energy suppliers to deliver energy efficiency measures to domestic energy users
EHS	English Housing Survey
	A continuous national survey commissioned by the Ministry of Housing, Communities and Local Government (MHCLG). It collects information about people's housing circumstances and the condition and energy efficiency of housing in England
EPC	Energy Performance Certificate
	Present the energy efficiency of domestic properties on a scale of A (most efficient) to G (least efficient)
Fuel poverty	The original definition of fuel poverty states that a household is in fuel poverty if it needs to spend more than 10% of their income on fuel to maintain an adequate level of warmth (10% definition). The new definition now adopted by government is that a household is said to be in fuel poverty if they have fuel costs that are above average and were they to spend that amount they would be left with a residual income below the official poverty line (Low Income High Costs definition)
GIS	Geographic Information System
	A system designed to capture, store, manipulate, analyse, manage and present spatial or geographical data
HHSRS	Housing Health and Safety Rating System
	A risk assessment tool to help local authorities identify and protect against potential risks and hazards to health and safety related deficiencies in dwellings, covering 29 categories of hazards

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HIA	Health Impact Assessment
	A formal method of assessing the impact of a project, procedure or strategy on the health of a population
HMO	Houses in Multiple Occupation
	An entire house or flat which is let to 3 or more tenants who form 2 or more households and who share a kitchen, bathroom or toilet
	A house which has been converted entirely into bedsits or other non-self-contained accommodation and which is let to 3 or more tenants who form two or more households and who share kitchen, bathroom or toilet facilities
	A converted house which contains one or more flats which are not wholly self-contained (i.e. the flat does not contain within it a kitchen, bathroom and toilet) and which is occupied by 3 or more tenants who form two or more households
	A building which is converted entirely into self-contained flats if the conversion did not meet the standards of the 1991 Building Regulations and more than one-third of the flats are let on short-term tenancies
	In order to be an HMO the property must be used as the tenants' only or main residence and it should be used solely or mainly to house tenants. Properties let to students and migrant workers will be treated as their only or main residence and the same will apply to properties which are used as domestic refuges
HSM	Housing Stock Model
	Desktop based modelling used to determine the condition of the housing stock
Jenks' Natural Breaks	The natural breaks classification method is a data clustering method determining the best arrangement of values into different classes. It is achieved through minimising each class's average deviation from the class mean while maximising each class's deviation from the means of the other groups. The method seeks to reduce the variance within classes and maximise variance between classes thus ensuring groups are distinctive
JSNA	Joint Strategic Needs Assessment
	An assessment of the current and future health and social care needs of the local community
LACORs	Local Authority Coordinators of Regulatory Services – now renamed Local Government Regulation
LAHS	Local Authority Housing Statistics
	National statistics on housing owned and managed by local authorities
LIHC	Low Income High Cost

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	Measure of fuel poverty, considers a household to be in fuel poverty if required fuel costs are above average, or if they were to spend that amount they would be left with a residual income below the official poverty line
LLPG	Local Land and Property Gazetteer
	An address database maintained by local authorities
LSOA	Lower Super Output Area
	Designed for statistical purposes, built from census output areas, approximately 400 households
MHCLG	Ministry of Housing, Communities and Local Government
MSOA	Medium Super Output Area
	Designed for statistical purposes, built from lower super output areas, approximately 2,000 households
NHS	National Health Service
Older people	People over 65 for the excess cold hazard, people over 60 for the fire and fall hazards (excl. falling between levels)
OS	Ordnance Survey
Poor housing	Dwellings where a category 1 hazard is present
Private sector housing	Housing not owned by the local authority or a housing association
SAP	Standard Assessment Procedure
	Method system for measurement of energy rating of residential buildings.
SimpleSAP	An estimate of a residential dwelling's likely SAP score, it is not based on the full required range of data for a SAP calculation or a reduced data SAP calculation (RDSAP), it should only ever be considered an estimate of the SAP score, and used as a guide
UPRN	Unique Property Reference Number
	A unique 12 digit number assigned to every unit of land and property recorded by local authorities as part of their LLPG
Vulnerable persons	Persons who are more likely to be affected by the particular hazard as defined by the HHSRS Operating Guidance