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BRE Client Report

BRE Integrated Dwelling Level Housing Stock Modelling and Database for Bristol City Council

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Date: **21 August 2023**

Report Number: **P104088-1169** Issue: Final

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Executive summary

- Bristol City 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 Local Land and Property Gazetteer (LLPG) data, tenure data, benefits data, Tenancy Deposit Scheme (TDS) data, Houses in Multiple Occupation (HMO) data, Selective Licensing records and enforcement records provided by Bristol City Council. The BRE models also integrate Energy Performance Certificate (EPC)[1] data. As a result of this 124,444 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 61.1% of the total stock in Bristol.
- This report describes the work and the results obtained from the integrated model and Housing Stock Condition Database (HSCD). Access to the HSCD 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 Bristol City 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, 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:
    - The percentage of dwellings with the presence of each of the Housing Standards Variables[2] for Bristol overall and broken down by tenure and then mapped by Census Output Area (COA) (private sector stock only), and including an assessment of high category 2 hazards
    - Information relating to LAHS reporting for the private sector stock - category 1 hazards and information on estimated EPC ratings (based on SimpleSAP)
    - Before and After Analysis of the Discretionary Licensing schemes
    - Specialist Analysis of the Private Rented Sector including HMOs and Selective Licensing

[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.

- BRE Housing Stock Models were used to provide such estimates at dwelling level and focussing on private sector housing. The Housing Standards Variables provide Bristol 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 models (v5) have been updated to make use of the results of the 2018 English Housing Survey (EHS)[3]. 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[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[5], 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 Housing Standards Variables. These outputs can then be mapped to provide the authority with a geographical distribution of each of the variables which can then be used to target resources for improving the housing stock.
- Furthermore, Bristol City Council provided LLPG, tenure, benefits, TDS, HM, Selective Licensing and enforcement 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 pages:

[3] 2018 is the latest available data. Prior to the v5 models EHS 2015 data was used.

[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.

[5] Note that the carbon emission factors applied are the updated factors published in the SAP10.1 consultation[5] which take into account the reduction in carbon emissions from grid electricity in recent years. Only the carbon emission factors from SAP10.1 have been used in the modelling; the energy cost prices use the existing SAP12 figures.

Headline results for Bristol

There are 203,722 dwellings in Bristol, 53% are estimated to be owner occupied, 27% private rented and 20% social rented.

20,497 dwellings in the private sector estimated to have category 1 Housing Health and Safety Rating System (HHSRS) hazards. This equates to 13% of properties. *See full results*

7,045 dwellings in the private rented sector have category 1 HHSRS hazards. This equates to 13% of properties in the private rented sector. *See full results*

The highest concentrations of all HHSRS hazards in the private sector are found in Easton, Bishopston & Ashley Down and Bedminster. *See full results*

The highest concentrations of fuel poverty (Low Income High Costs definition) in the private sector are found in Hartcliffe & Withywood, Filwood and Lockleaze and for excess cold the highest concentrations are in Bedminster, Brislington West and Clifton Down. *See full results*

The private rented sector has the highest proportion of high HHSRS category 2 hazards at 64% of dwellings, compared to 39% for the social stock and 35% owner occupied stock. *See full results*

The average SimpleSAP rating for all private sector dwellings in Bristol is 59, which is worse than both England (62) and South West (61). For owner occupied stock the figure is 58 and for private rented stock it is 62. *See full results*

Maps by Census Output Area (COA) have been provided for the above Housing Standards Variables. *See maps*

The total cost of mitigating category 1 hazards in Bristol's private sector stock is estimated to be £101.0 million – with £66.3 million in the owner occupied sector, and £34.7 million in the private rented sector. *See full results*

5.8% (9,439) of *private sector* dwellings and 4.1% (2,293) of *private rented* dwellings in Bristol are estimated to have an EPC (based on SimpleSAP) rating below band E. *See full results*

Summary of private rented sector analysis – HMOs

There are an estimated 13,349 HMOs in Bristol, of which approximately 8,231 come under the mandatory and additional licensing schemes (3,913 additional and 3,085 mandatory from Bristol City Council's data, with the remaining 1,233 resulting from the modelling process). ***See full results***

HMOs in the private rented sector in Bristol have marginally higher levels of fuel poverty (LIHC definition) and the same levels of excess cold, but lower levels of all other variables including all hazards, fall hazard, disrepair, fuel poverty (10% definition) and low income households compared to non-HMOs. HMOs also have lower energy efficiency levels compared to non-HMOs (average SimpleSAP score of 58 compared to 61). *See full results*

Summary of private rented sector analysis – Private Rented Sector

Overall the percentage of dwellings in the private rented sector across Bristol is 27% compared to the national average of 19%. A large proportion of wards (23 out of 35 wards) in Bristol have a percentage of private rented sector dwellings greater than the national average, in particular Hotwells & Harbourside (60%), Central (59%) and Clifton Down (58%). *See full results*

Three types of areas within Bristol were identified based on levels of private rented stock, which were a) 5 wards in excess of 50%, b) 8 wards with over 30 - 50%, and c) 9 wards with 19-30% (i.e. above the national average of 19%). *See full results*

The proportion of HHSRS category 1 hazards in the private rented stock for the 3 areas considered by this report is as follows:

Of the wards with over 50% of the stock being private rented, Cotham has the highest level of category 1 hazards (15%) and Central has the highest level of excess cold (5%). For fall hazards and disrepair Clifton Down, Cotham and Clifton all have similar levels (4% for fall hazards and 6% for disrepair). When compared to Bristol's average, Clifton Down, Cotham and Clifton all have slightly higher category 1 hazards and disrepair than Bristol as a whole. With the exception of Central (5%), all other wards have an average level of excess cold (3%) and all wards have lower than average levels of fall hazard. ***See full results***

Of the wards where over 30-50% of the stock is estimated to be private rented, Bishopston & Ashley Down and Bedminster have the highest levels of all hazards (both 16%), Bedminster also has the highest level of excess cold (3%) as well as having the highest level of fall hazards together with Horfield (both 4%). Bishopston & Ashley Down has the highest level of disrepair (7%). Compared to Bristol's average, all wards had either an average or above average level of category 1 hazards and all wards had either an average or below average level of excess cold, fall hazards and disrepair. *See full results*

For the wards with 19-30% private rented stock, Easton has the highest levels of category 1 hazards (16%) and falls hazards (6%) and disrepair (6%) and Lawrence Hill has the highest levels of excess cold (3%). Compared to Bristol's average, all wards had either an average or below average level of excess cold and fall hazards. With the exception of Frome Vale, all wards had either an average or below average level of disrepair. The picture is slightly different for category 1 hazards, with Easton and Brislington West having higher than average levels, Bishopsworth having a similar level to average and all other wards having a lower than average level. *See full results*

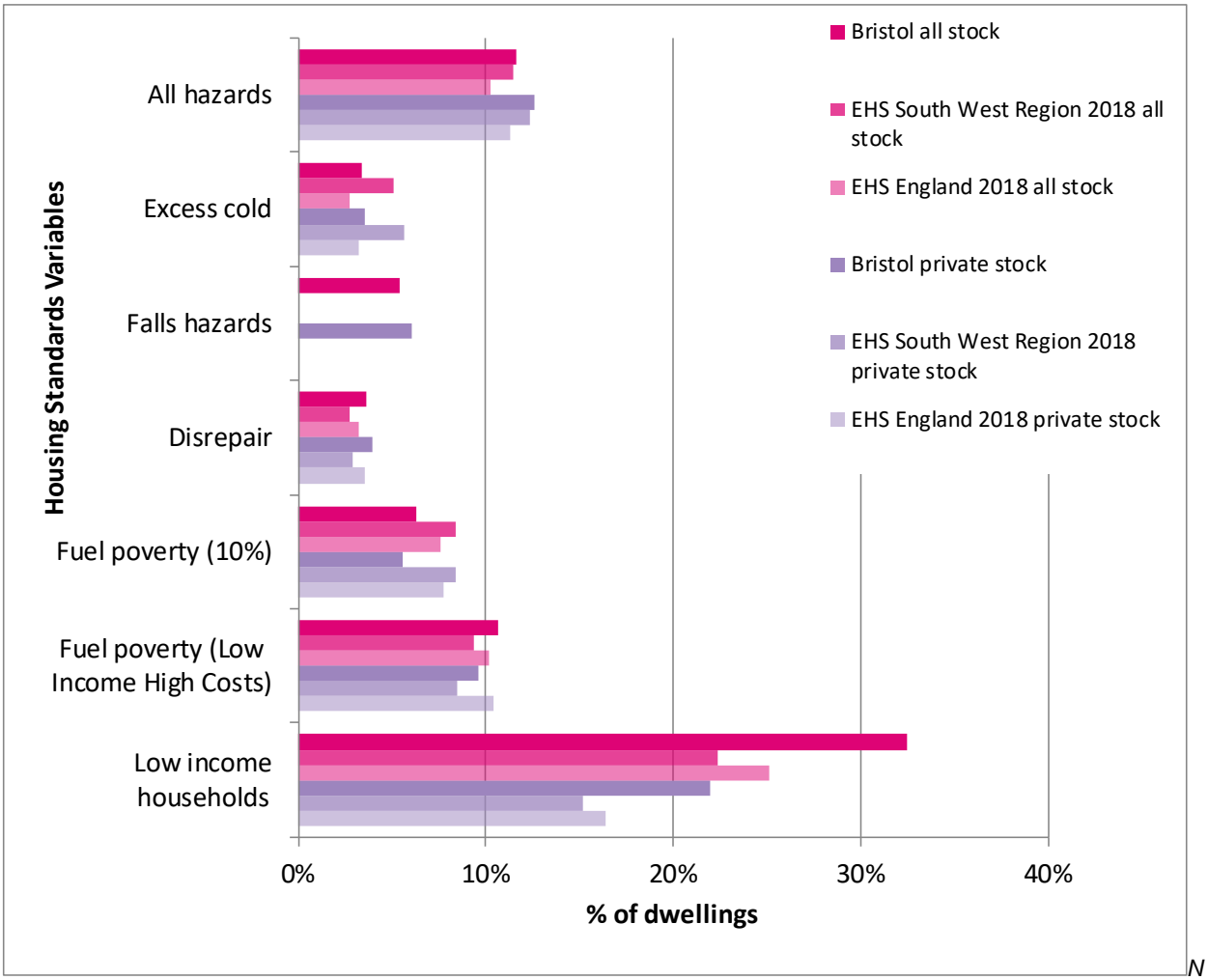
In Hartcliffe & Withywood 94% of private sector dwellings are in the 20% of the most deprived LSOAs in England. For Filwood this figures is 87% and in Lawrence Hill it is 77%. At the other end of the scale, 8 of the 35 wards in Bristol have no dwellings in the 20% most deprived LSOAs. Looking at the two wards with the highest levels of deprivation, Hartcliffe & Withywood has 17% private rented stock and for Filwood this figure is 23%.*See full results*

There are specific areas within the wards identified which have higher levels of private rented stock, deprivation and disrepair which could be considered for targeted interventions. *See full results including maps*

Key illustrations of headline results

- The table below shows the results for 7 of the Housing Standards Variables in Bristol compared to regional data and England (EHS 2018) - split into all stock and private sector stock. The data shows that the performance of the housing stock in Bristol compared to the EHS England average is mixed with Bristol performing slightly worse for all hazards, excess cold, disrepair and fuel poverty (low income high costs) and notably worse for low income households but better for fuel poverty (10% definition). Compared to the regional average the picture is slightly different with Bristol performing marginally worse for disrepair, all hazards, low income households and fuel poverty (low income high costs), but better for fuel poverty (10% definition) and excess cold.

Estimates of the percentage of dwellings with the presence of each of the Housing Standards Variables criteria assessed by the housing stock models and HSCD for all stock and private sector stock – Bristol compared to the South West and England (EHS 2018)



N.B. 2018 Regional & England data no longer includes Falls Hazards as a separate variable

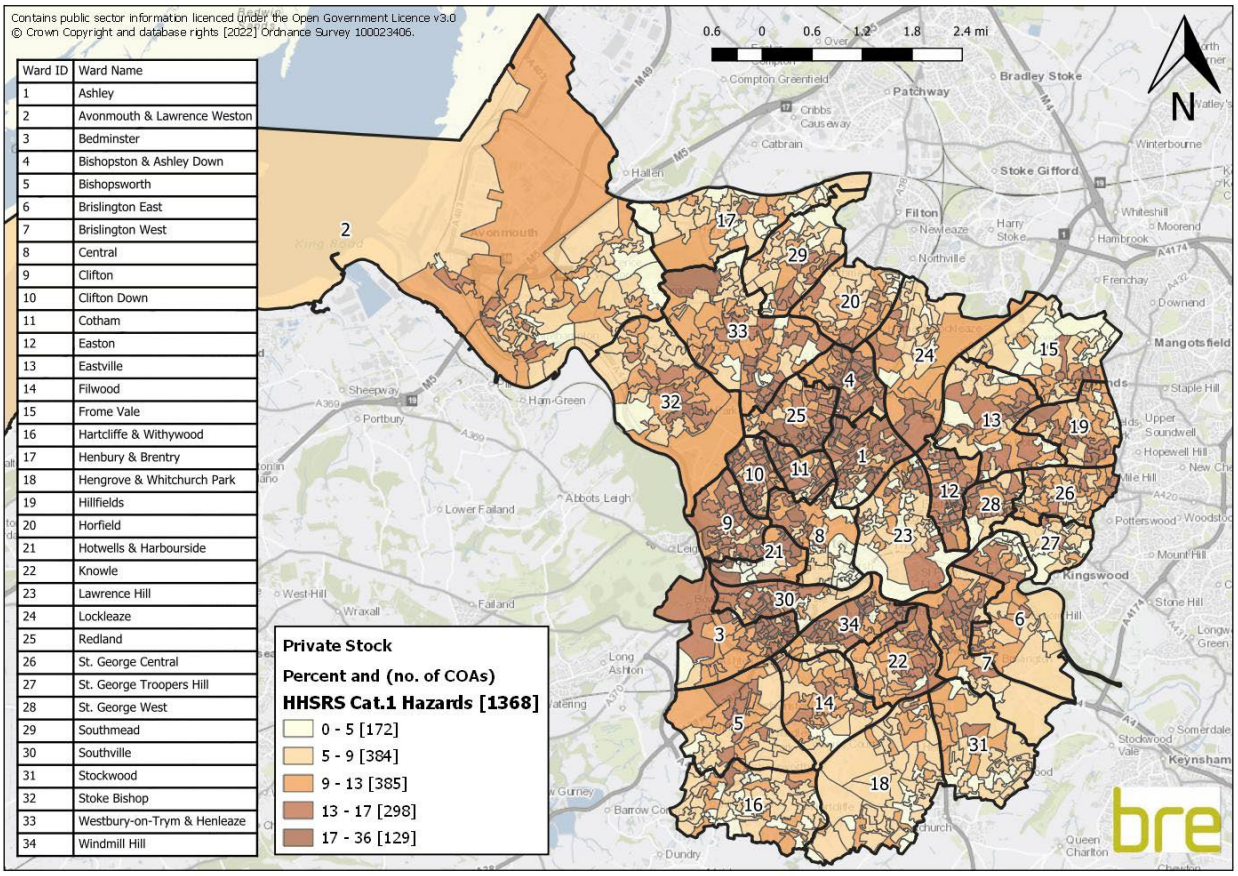
- The table below shows the number and percentage of Bristol's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP). The number of private rented dwellings in Bristol with a rating below band E (i.e. bands F and G), is estimated to be 2,293 (4.1%). Compared to England, there are a greater proportion of dwellings in band D and E, lower proportions in bands C, G and the same in band F.

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

	Bristol		2018 EHS England
	Count	Percent	Percent
(92-100) A	0	0.0%	1.5%
(81-91) B	958	1.7%	
(69-80) C	15,936	28.6%	31.1%
(55-68) D	25,941	46.6%	48.5%
(39-54) E	10,539	18.9%	13.8%
(21-38) F	1,918	3.4%	3.8%
(1-20) G	375	0.7%	1.2%

- The map overleaf shows the distribution of category 1 hazards, as defined by the Housing Health and Safety Rating System (HHSRS). There are higher concentrations scattered throughout Bristol, and the data behind the map indicates that the top three wards with the highest levels are Bedminster, Easton and Bishopston & Ashley Down.

Percentage of private sector dwellings in Bristol with the presence of a HHSRS category 1 hazard. N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

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1 Introduction

Bristol City Council commissioned BRE to undertake a series of modelling exercises on their housing stock. BRE have integrated the data provided by the council 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.

Bristol City Council provided Local Land and Property Gazetteer (LLPG) data, tenure data, benefits data, Tenancy Deposit Scheme (TDS) data, Houses in Multiple Occupation (HMO) data, Selective Licensing records and enforcement records for integration. The BRE Model also integrates Energy Performance Certificate (EPC) data and, as a result of this 124,444 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 records, which account for 61.1% of the total housing stock in Bristol.

The BRE Housing Stock Model data is provided to the council via the online Housing Stock Condition Database (HSCD) to enable them to obtain specific information whenever required.

The BRE Housing Stock Models provide the council with dwelling level information on various Housing Standards Variables, focussing on private sector housing. These variables provide Bristol City 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 variables are split into categories related to house condition, energy efficiency and household vulnerability as shown in **Table 1** (see **Appendix A** for full definitions). Bristol City Council also requested an assessment of high category 2 hazards (also defined in **Appendix A**)

Table 1: Housing Standards Variables split into categories

Housing Standards Variable	House condition variables	Energy efficiency variables	Household vulnerability variables
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% & 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 variables shown in **Table 1** can also be brought together within the HSCD to provide powerful information on the housing stock; for example, dwellings suffering from excess cold and also occupied by households on a low income. This enables council officers to explore the stock and to assess the likely scope of any programmes they might wish to implement.

The information in this report includes estimates relating to the Department for Levelling Up, Housing and Communities (DLUHC, formerly 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 estimated Energy Performance Certificate (EPC) ratings (based on SimpleSAP).

The Housing Standards Variables and other information are derived from the BRE Dwelling Level Stock Models. These Models have been used for many years to provide key Housing Standards Variables to local authorities. The most recent models have been updated to make use of the results of the 2018 English Housing Survey (EHS)[6]. 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 residential dwellings in the authority. OS Mastermap is also linked to OS AddressBase to allow dwelling type and floor area to be determined through geographical modelling[7]. Other national data sources used by the Model 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 dwelling meeting the criteria for each of the Housing Standards Variables. These outputs can then be mapped to provide the authority with a geographical distribution of each of the variables 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 Bristol City Council. These local data sources were incorporated into the stock models to produce the integrated database.

The information in the HSCD 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[8].

Furthermore, having this information available will also help to facilitate the delivery of Bristol City 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 purpose of this project was to provide data on key private sector housing variables for Bristol. The main aims were therefore to provide estimates of:

[6] 2018 is the latest available data. Prior to the v5 models EHS 2015 data was used.

[7] 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.

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

- The percentage of dwellings with the presence of each of the Housing Standards Variables for Bristol overall, broken down by tenure and mapped by Census Output Area (COA) (private sector stock only), and including high[9] category 2 hazards
- Information relating to LAHS reporting for the private sector stock - category 1 hazards and information on estimated EPC ratings (based on SimpleSAP)
- Before and After Analysis of the Discretionary Licensing schemes
- Specialist Analysis of the Private Rented Sector including HMOs and Selective Licensing

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 Bristol covering each of the main aims above.

[9] "High" category 2 hazards refers to hazards of band D or E with the exception of the falls on the level hazard, where only band D is considered (as E is the average rating for falls on the level). This definition is therefore referred to as "high" category 2 hazards as it excludes the lesser hazards. - see **Appendix A** for the full definition.

2 Policy background

The detailed housing stock information provided in this report will facilitate the delivery of Bristol City 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[8] 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

Following the introduction of the Levelling Up agenda and the associated white paper's reference to improving housing conditions, there have been a number of recent reforms to the quality expectations and regulation of the Private Rented Sector. Chief among these is the "Fairer Private Rented Sector White Paper 2022"[10], which details the government's plans to improve the standard of living for tenants. It aims to reduce the number of homes that contain HHSRS Cat 1 hazards through landlord compliance with a legally binding Decent Homes Standard, whilst also providing tenants with a more secure and flexible form of tenure through the abolition of Section 21 'no fault' evictions, the introduction of periodic tenancies and extended grounds for possession rights. These changes will become legally binding through the introduction of the Renters Reform Bill, announced in June 2022.

There has been significant growth in the private rented sector in Bristol in the 10 years between 2001 and 2011 - from 12% of the total stock in 2001 to 25% in 2011[11] - so that 13% of the stock has changed over that time period to now be private rented. This is higher the change of 9% seen in England as a whole. The analysis for this current report estimates that 27% of the stock in Bristol is now privately rented, implying a further increase since 2011.

[10] A fairer private rented sector, DLUHC, 2022

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

2.2.2 Health inequalities

Housing is a key determinant of health and well-being, and poor housing conditions continue to cause preventable deaths and contribute to health inequalities[12]. These inequalities include exposure to cold, damp living conditions which are known to exacerbate health problems, in particular cardiovascular and respiratory illnesses. Furthermore, overcrowding, inaccessibility for those with disabilities and a lack of safety and security are all common problems that lead to health inequality. The government's "Improving health through the home" paper highlights the need for consolidated thinking by people, communities and organisations.[13] This builds on the findings from the government's white paper "Choosing Health"[14], which 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.

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"[15].

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. The Better Care Fund[16] seeks to achieve this through the delivery of health and social care that is centred around the individual. The four partners involved, namely the Department of Health and Social Care, DLUHC, NHS England and the Local Government Association, work in a unique way to help local areas plan and implement integrated health and social care services across the country. By pooling their budgets, they are able to offer three core grant and funding opportunities, which are the Disabled Facilities Grant, the Improved Better Care Fund and the Winter Pressures Funding. Of these, the Disabled Facilities Grant is relevant to housing in that it enables adaptations to be made to the home, such as ramps, stairlifts and suitable heating systems, which allows older and disabled people to maintain independence in their home.

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

[13] Improving health through the home, Public Health England, 2017

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

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

[16] NHS England » Grants and funding

2.2.4 Public Health Outcomes Framework

The Public Health Outcomes Framework "Healthy lives, healthy people: Improving outcomes and supporting transparency"[17] 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

There have been minor indicator changes for 2019-2022, incorporating moderate to severe falls.

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 "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"[18].

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, since 1 April 2018 it became unlawful for landlords to grant a new tenancy or renew an existing tenancy for a property that does not reach a minimum energy efficiency standard (MEES) of Energy Performance Certificate rating band E[19]. While there will be various caveats to these powers, they provide a new minimum standard for rented accommodation. If the EPC rating is an F or G, the landlord must improve the rating to a minimum of EPC E or register an exemption (if applicable) before they are able to let the property. Since 1 April 2020, the regulations also apply to all domestic rented properties regardless of whether there has been a change in tenancy (again exemptions may apply but these must be registered by the landlord on the PRS exemptions register).

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 2017-19 and 6 years prior to that. Between 2012-15, £100

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

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

[19] https://www.gov.uk/government/publications/the-private-rented-property-minimum-standard-landlord-guidance-documents

million of capital funding was available from within the Affordable Homes Programme to tackle problematic[20] empty homes. There is no longer any separate funding for empty homes under the 2015-18 Affordable Homes Programme[21]. Since 2013, councils have been able to charge a 50% premium on the Council Tax bills of owners of homes empty for 2 years or more. 291 out of 326 councils applied an empty homes premium in 2017 to 2018[22]. Furthermore, local authorities have a range of powers and incentives at their disposal to bring empty homes back into use. These include, Empty Dwelling Management Orders, Council Tax exemptions and premiums, and measures to secure the improvement of empty properties[23].

The Affordable Homes Programme was replaced by the Shared Ownership and Affordable Homes Programme (2016-2021), supporting increased home ownership and aiming to expand supply of affordable homes in England. A total of £4.7 billion is available for the development of Shared Ownership and other affordable homes.[24]

There are several issues 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 HSCD would be the logical place for such information to be stored should it be gathered from other sources.

The latest available information for Bristol for 2022, collected by DLUHC[25], identifies 4,914 vacant dwellings across all tenures. This represents a vacancy rate of approximately 2% in Bristol. In 2019 the number of vacant dwellings was 4,004, and 5 years ago in 2017 the figure was 4,422. Furthermore, around 1,625 (0.8%) dwellings are long-term vacant (6 months or more) in Bristol (2022 figures).

2.3 Other policy areas

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

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

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

[22] https://www.gov.uk/government/news/government-boosts-councils-powers-to-help-bring-empty-homes-back-into-use

[23] https://commonslibrary.parliament.uk/research-briefings/sn03012/

[24] https://www.gov.uk/government/collections/shared-ownership-and-affordable-homes-programme-2016-to-2021-guidance

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

2.3.1 The Housing and Planning Act 2016

The Housing and Planning Act 2016[26] introduced legislation for government to implement the sale of higher value local authority homes, starter homes, pay to stay and several other measures, mainly intended to promote home ownership and boost levels of housebuilding in England. The following policy changes will have a significant impact on the way councils deliver their Housing Services:

- 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 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[27] 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 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 several social security benefits

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

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

- 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[28] (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)[29] 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 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

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

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

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, from 1 April 2018 landlords must ensure that their properties meet a minimum energy efficiency standard when they grant a tenancy to new or existing tenants - which has been set at band E [30, 31]. Since 1 April 2020, landlords can no longer continue letting a property which is already let if it has an EPC rating of F or G[32]. Furthermore, since 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 4.3**.

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:

- 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[33, 34] as a transition period between the end of ECO2 and a new scheme.
- ECO3[35]- launched in October 2018 and ended on 31 March 2022, although between 1 April 2022 and 30 June 2022 an 'ECO3 interim delivery period' was devised
- ECO4 – launched in July 2022 and extends until 31 March 2026

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

[31] 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.

[32] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794253/domestic-prs-minimum-standard-guidance.pdf

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

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

[35] https://www.gov.uk/government/consultations/energy-company-obligation-eco3-2018-to-2022

Previous scheme – ECO3

ECO3 had 4 phases, the last of which terminated in March 2022. However, with the exception of new and replacement oil/LPG heating systems, measures were able to continue to be installed under the ECO3 scheme in what the government termed the 'ECO3 interim delivery period' which was designed to bridge the gap between ECO3 officially ending and ECO4 commencing. The scheme focussed on Affordable Warmth (the Carbon Emissions Reduction Obligation – CERO – has been removed) so that low income and vulnerable households were the recipients of the main benefits. The scope of the Affordable Warmth group was expanded to include other benefits (e.g. Child Benefit, Personal Independence Payment, etc.).

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

Energy companies could also use the local authority Flexible Eligibility mechanism to achieve up to 25% of their obligation – allowing councils to outline personal criteria to maximise inclusion of vulnerable people in funding for domestic heating and insulation upgrades.

The results for the basic energy efficiency variables are covered in this report and assist in the identification of dwellings which may benefit from energy efficiency improvements. Such information also provides a valuable contribution to the evidence base increasingly being required to support competitive funding bids to central government for housing improvements.

Current scheme – ECO4

ECO4 aligns with the new Sustainable Warmth Strategy for England, and the Low Income and Low Energy Efficiency (LILEE) metric[36] and will continue to operate as a supplier obligation.

The main objective for this phase of the scheme is to improve the least energy efficient housing stock occupied by low income and vulnerable households. This will contribute to progressing towards the target of improving as many fuel poor homes as reasonably practical to EPC band C by 2030, with an interim milestone of band D by 2025. ECO4 aims to focus more on owner occupied households which aligns better with other policies aimed at decarbonising the housing stock. One aspect of the new scheme, known as ECO4 Flex, allows energy suppliers to achieve up to 50% of their obligation by installing energy saving measures in either owner occupied or private rented homes. Under this process local authorities are able to declare that certain households meet the eligibility criteria of living in a cold home and being on a low income, which helps to identify and support those most at risk of fuel poverty. ECO4 Flex is optional and neither local authorities nor energy suppliers are required to participate.

Additionally, the ECO+ scheme is currently under consultation, with the intention to provide support for households that are not in receipt of any other government assistance to improve the energy efficiency of their homes[37]. The £1 billion scheme will predominantly be for households who are in the lower Council

[36] Fuel poverty trends 2021 – GOV.UK (www.gov.uk)

[37] Government joins with households to help millions reduce their energy bills - GOV.UK (www.gov.uk)

Tax bands and living in inefficient homes (with an EPC rating of D or below) who will benefit from measures including loft insulation and cavity wall insulation. Around a fifth of the funding will be targeted to help the most vulnerable, including those in fuel poverty. In addition to this the government have introduced an £18 million public information campaign, designed to help households save money on their energy bills by promoting the government's advice around reducing the temperature of the water that is used in radiators (boiler flow temperature), turning down radiators in empty rooms and draught proofing windows and doors.

2.6 The Green Homes Grant (GHG)

The Department for Business, Energy and Industrial Strategy (BEIS) launched the Green Homes Grant (GHG) in September 2020 which enables homeowners and residential landlords to apply for up to £5,000 of funding towards the cost of installing energy efficient improvements to the home. Under the GHG, improvements could include insulation to reduce energy use or installing low-carbon heating to reduce the amount of CO_2 produced by a dwelling. The vouchers scheme closed to new applicants on March 2021[38]. Furthermore, £200m of funding is available for the installation of eligible measures under the Local Authority Delivery (LAD) competition[39] to support low income households (an annual income of no more than £30,000) living in the least energy efficient properties (i.e. EPC Bands E, F or G).

2.7 Sustainable Warmth – Local Authority Delivery and Home Upgrade Grant

Sustainable Warmth[40] brings together the two fuel poverty schemes, Local Authority Delivery (LAD) and Home Upgrade Grant (HUG), into a single local authority funding opportunity. The LAD funding provides a total of £200 million and is designed to support low-income homes heated by mains gas. HUG funding totals £150 million for low-income households which are off-gas grid.

2.8 Heat and Buildings Strategy

The Heat and Buildings Strategy[41] was published in October 2021 and outlines the Government's ambition to decarbonise buildings through energy efficiency measures and low-carbon heating technologies in order to support their Net Zero goals.

The Government aims to have no new gas boilers sold by 2035 and plans to work with industry to reduce the cost of heat pumps by 25-50% or more by 2025. By 2030, they hope that heat-pumps will be similar in price to boilers and plan to support early-switchers with Boiler Upgrade Scheme grants of up to £5,000. The Government recognised that we currently do not have the capacity to support such a rapid heating transition and so it announced a £60m heat pump innovation fund to support its reiterated objective to install 600,000 heat pumps per year by 2028. They also plan to invest £336 million over 2022/23 to 2024/25 into a broader Heat Network Transformation Programme to develop low-carbon heat networks and enable local areas to deploy heat network zoning.

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[38] Green Homes Grant: make energy improvements to your home – GOV.UK (www.gov.uk)

[39] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/919905/green-homes-grant-la-delivery.pdf

[40] Apply for the Sustainable Warmth competition – GOV.UK (www.gov.uk)

[41] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1032119/heat-buildings-strategy.pdf

2.9 The Energy Bills Support Scheme

In response to the increasing cost of energy and the corresponding rapid rise in fuel bills the Government have introduced the Energy Bills Support Scheme[42]. This is a discount that provides £400 to eligible households (those with a domestic electricity connection) to help with energy bills over winter 2022 to 2023. Furthermore, the Government has introduced the Energy Price Guarantee[43], which is currently expected to run until 31St March 2024, and caps the amount suppliers can charge per unit of gas and electricity. The initial October 2022 guarantee saw the average annual household energy bill will capped at £2,500 (taking into account the £400 rebate) and from April 2023 the average annual household energy bill will capped at £3,000.

[42] Getting the Energy Bills Support Scheme discount - GOV.UK (www.gov.uk)

43 Government announces Energy Price Guarantee for families and businesses while urgently taking action to reform broken energy market - GOV.UK (www.gov.uk)

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 Housing Standard Variables (and other outputs of interest). These outputs can then be mapped to provide the council with a geographical distribution of each of the variables which can then be used to target resources for improving the housing stock. The process is made up of a variety of data sources, calculations, and models.

The models are principally informed by the DLUHC English Housing Survey (EHS)[44]. The EHS dataset is used to identify patterns in the housing stock for those which fail a given indicator, for example HHSRS. This knowledge can be applied, using statistical methods, to impute Housing Standards Variables and energy characteristics from other data available at dwelling level which cover the whole of England. To model the energy efficiency of dwellings, BRE have developed a variant of the BREDEM[45] software, named "SimpleCO$_2$", that can calculate energy outputs from a reduced set of input variables.

The modelled dwelling level data provided for Bristol makes significant use of the Experian UK Consumer Dynamics Database of dwelling and household indicators, as well as OS datasets as inputs to the models.

Bristol City Council also provided additional sources of local data which were incorporated into the BRE Housing Stock Model and Database, as well as the 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 licensing requirements the EPC data is only used to inform the energy efficiency aspects of the model.
- **LLPG data –** the Unique Property Reference Number (UPRN) from the LLPG was used to uniquely identify all properties, while the address details from the LLPG were used to merge the BRE Models and the EPC data using address matching.

[44] The most recent survey used in the housing stock models is 2018.

[45] 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.

- **Tenure data –** the council provided several sources of tenure data, which included two lists of addresses subject to mandatory and additional HMO licensing, the addresses of private rented properties eligible for city-wide selective licensing, the lists of addresses from the three TDS schemes and a combined list of addresses owned by the council themselves. This data was used to inform the tenure variable. Furthermore, the results of a previous analysis carried out for Bristol City Council to assist in the identification of PRS dwellings in 2020 making use of Land Registry and Council Tax Register data matching was used to assist with assigning tenure at dwelling level. It should be noted that this analysis was carried out for a previous project and therefore may not reflect the current position. Where a dwelling had tenure information from more than one source, an order of precedence was established so that the most recent dataset provided was used first.
- **Benefits data –** this provides a list of addresses in receipt of various benefits. 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 low income households since housing and council tax reductions are only a proportion of total low income households.
- **HMO records –** the council provided a list of mandatory licensed and additional HMOs which were used to inform tenure. These properties are also flagged in the accompanying data set on HSCD so they can be identified by the council.
- **Enforcement data –** the council provided lists of addresses where hazards were found and the council issued an enforcement notice. This was used to inform the 'before' and 'after' analysis, as it was assumed that where an enforcement notice was issued the hazard(s) present at the property, including category 1 and category 2 hazards, excess cold and falls hazards, had been mitigated and the property was also free from disrepair. By taking the 'after' picture of the previous project (i.e. how many hazards existed in the stock after the modelling work in 2020) and using this as the 'before' picture in the current project, it was possible to determine the extent to which category 1 and 2 hazards have reduced through enforcement since the previous project and understand how effective the licensing scheme has been on the condition of Bristol's housing stock.

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 Housing Standards Variables 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.

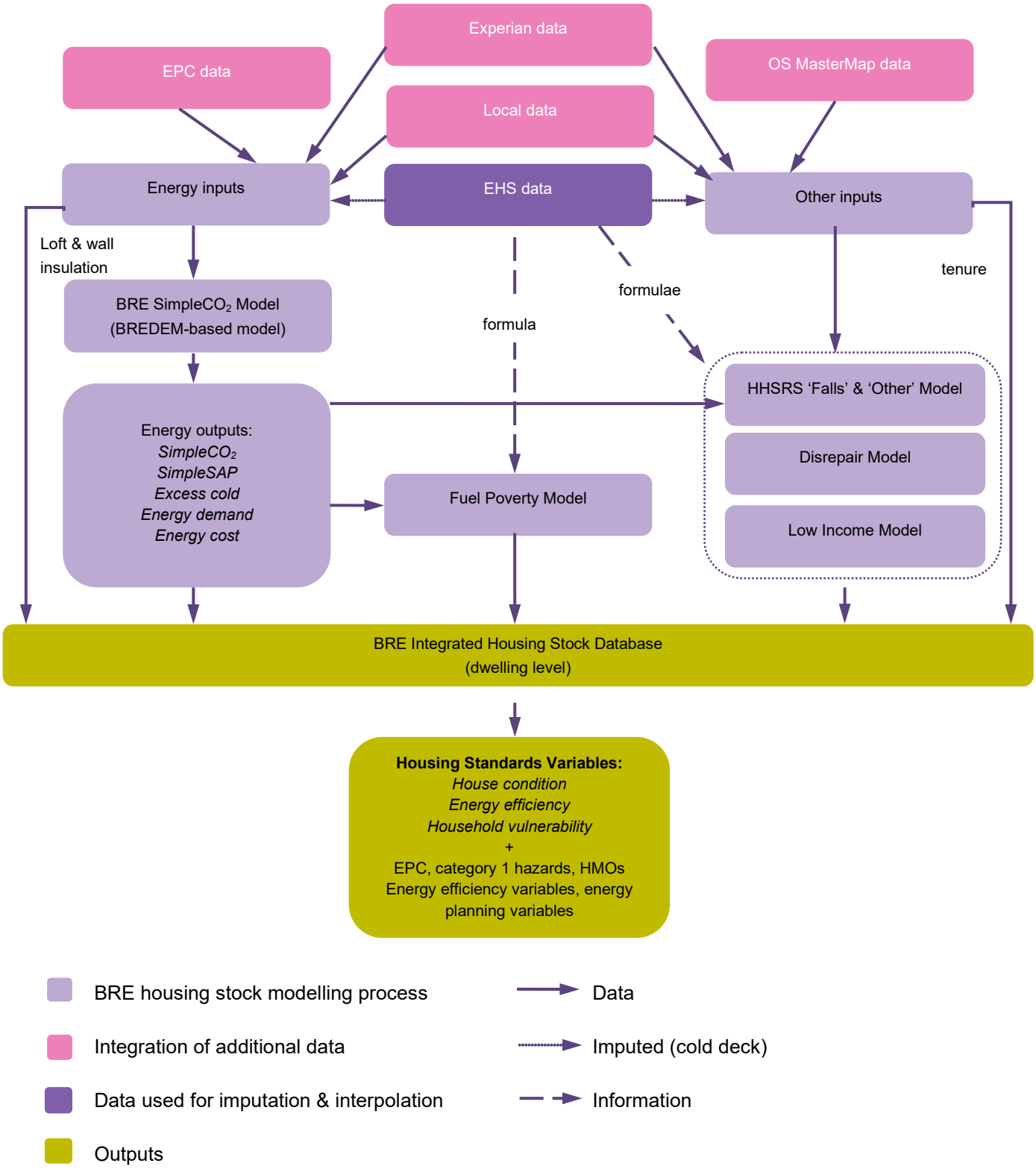
The data sources and models are linked as shown in the flow diagram and the modelling process itself can be divided into “energy inputs” and “other inputs”, which are summarised as follows:

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[46]) 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[46]) 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.

[46] 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)



3.2 Breakdown of the housing stock by tenure - validation

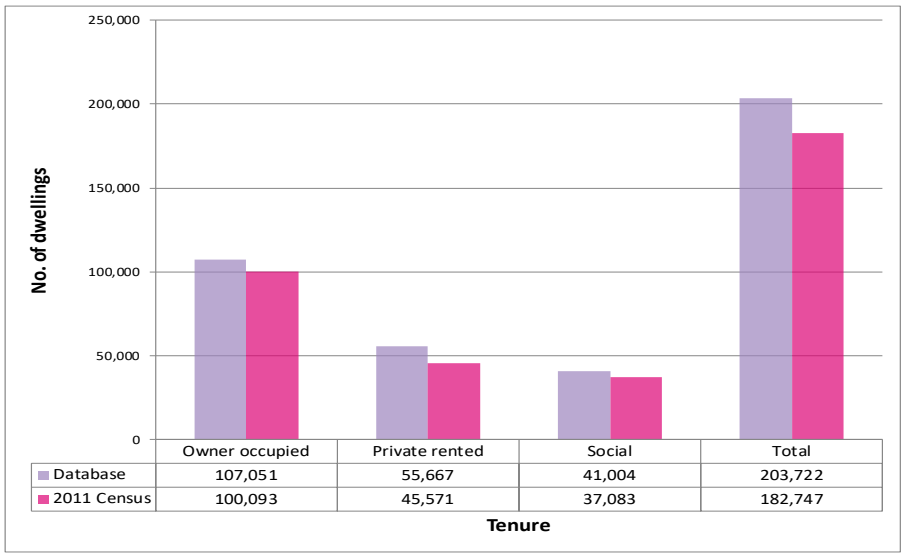
Providing the results split by tenure is useful since it can influence how resources and improvement policies are targeted. This report is particularly focussed on private sector stock which is made up of owner occupied and private rented dwellings. The remainder of the housing stock consists of social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

The total number of dwellings in Bristol from the integrated housing stock condition database is based on LLPG 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[47]. 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 slight increase in the size of the stock, mainly comprised of increases in the size of the private rented and owner occupied tenures (see

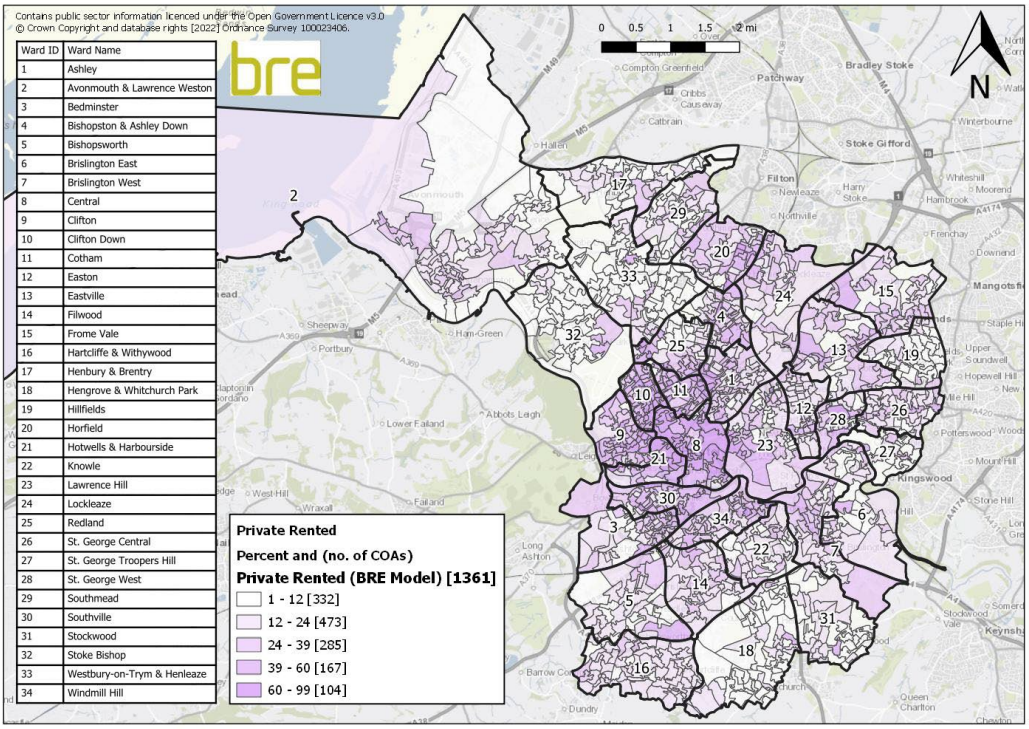
Figure 2). Furthermore, **Maps 1** and **2** show the geographical distributions of the private rented sector which in general look fairly similar, although it is worth noting that the maps appear to show a slight shift in some of the locations with higher proportions of private rented stock since 2011, from very central wards including Clifton Down, Clifton and Cotham towards slightly further afield wards such as Bedminster, Brislington and northern most wards such as Horfield.

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



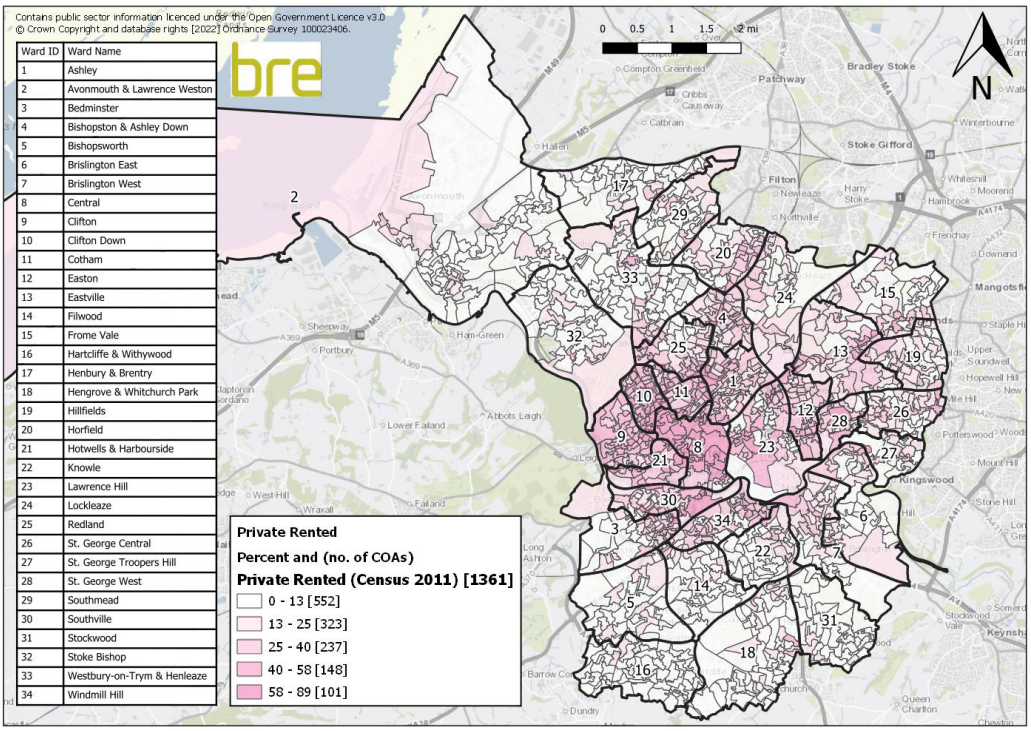
[47] http://www.ons.gov.uk/ons/datasets-and-tables/index.html

Map 1: Distribution of estimated percentage of private rented dwellings in Bristol – based on database. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 2: Distribution of estimated percentage of private rented dwellings in Bristol – based on 2011 Census Data (Neighbourhood Statistics). *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

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 DLUHC returns[48] and Office for National Statistics (ONS) data[49]. These datasets are not used directly in the model but are reported here for the purposes of comparison.

The DLUHC 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[50].

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)[51] which is then benchmarked to the DLUHC 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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[48] https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants

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

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

[51] 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[52] must be used when reproducing the data (note that the "***dwelling stock by tenure***" in the disclaimer refers to the DLUHC returns data).

Table 2 shows the latest tenure splits from the DLUHC data for Bristol. Since the ONS data is benchmarked to the DLUHC returns, the figures for the private sector stock match. The slightly higher levels of private rented stock estimated by the BRE model may be a result of students reporting their parent's address elsewhere as their main residence for the ONS data.

As previously mentioned in **Section 2.2.1** the proportion of private rented stock in Bristol from the 2011 Census figures[53] was 25%, and the BRE Database figure of 27% ties in with this given that there is likely to have been an increase in the private rented stock since 2011.

Table 2: Comparison of DLUHC, ONS and BRE Database figures on tenure split for Bristol

Tenure	Number of dwellings			% of all stock		
	2017 DLUHC	2017 ONS	BRE Database	2017 DLUHC	2017 ONS	BRE Database
Owner occupied	157,650	113,540	107,051	80%	58%	53%
Private rented		44,110	55,667		22%	27%
Social	39,690	-	41,004	20%	-	20%

N.B. DLUHC data does not break down private sector into owner occupied and private rented stock and ONS data does not provide an estimate for social stock

[52] ONS Disclaimer: *"We have published these Research outputs to provide an indication of the tenure breakdown of dwellings within the private sector at the subnational level. Research Outputs are produced to provide information about new methods and data sources being investigated. Official statistics on private dwellings by tenure are currently only available at the country level. Statistics on* ***dwelling stock by tenure***[48] *are available for local authorities but do not provide a breakdown of owner-occupied and privately rented dwellings. These statistics are subject to marginal error as they are estimates based on a survey, therefore users should refer to the coefficient of variation (CV) and confidence intervals when making interpretations."*

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

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 HSCD. 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 Bristol. Information at ward level, however, is provided in the maps, in **Section 4.2.4** and can also be obtained from the HSCD which has been supplied as part of this project (see **Appendix C** for instructions). The HSCD 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 Bristol. The results are then displayed in the following sub-sections:

- Housing Standards Variables:
  - Bristol – regional and national comparisons
  - Housing Standards Variables by tenure for Bristol
  - Housing Standards Variables mapped by COA for Bristol private sector stock
  - Ward level results for the Housing Standards Variables

- Information relating to LAHS reporting and EPC ratings:
  - Category 1 hazards
  - Estimated EPC ratings (based on SimpleSAP)

- Before and After Analysis of the Discretionary Licensing schemes

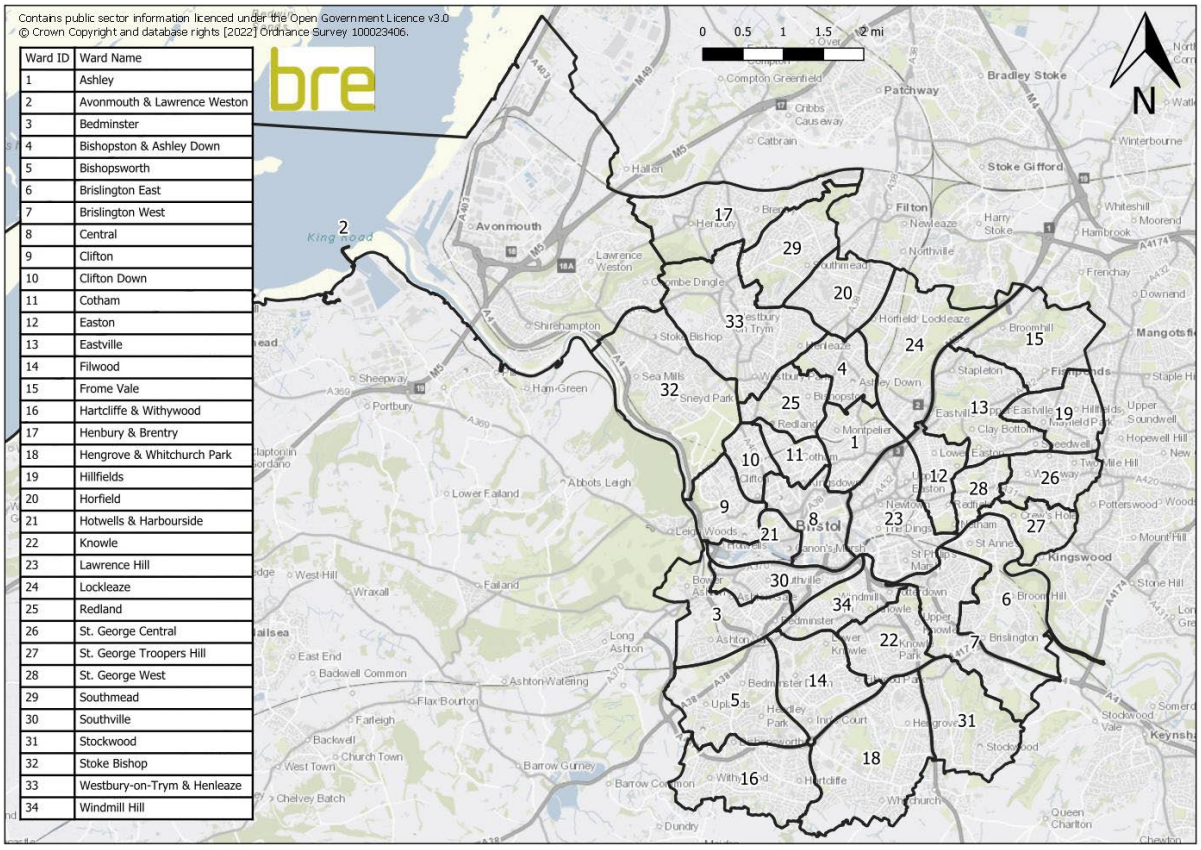
- Specialist Analysis of the Private Rented Sector including HMOs and Selective Licensing

4.1 Overview of Bristol

Map 3 below shows the 34 wards in Bristol. 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 key variables 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 since all c.125 households are made up of caravans for example.

Map 3: The wards in Bristol



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

4.2 Housing Standards Variables

4.2.1 Bristol – regional and national comparisons

Table 3 and **Figure 3** show the results for each of the Housing Standards Variables in Bristol compared to the South West region and to England (EHS 2018) 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 Bristol compared to the EHS England average is, overall, similar with the exception of low income households, where Bristol is worse than average. Bristol performs slightly better for fuel poverty 10% (6% compared to 8%), similarly for excess cold (3%), slightly worse for all hazards (12% compared to 10%) and disrepair (4% compared to 3%), but worse for fuel poverty low income high cost (11% compared to 10%) and notably worse for low income households (32% compared to 25%).

When comparing Bristol to the South West region, the picture is similar with Bristol performing slightly better for fuel poverty 10% definition (6% compared to 8%), disrepair (4% compared to 3%) and excess cold (3% compared to 5%) but worse for all hazards (12 compared to 11%), fuel poverty low income high cost (11% compared to 9%) and low income households (32% compared to 22%).

For private sector stock, much like for all stock, the performance of the housing stock in Bristol compared to the EHS England average is, overall, similar with the exception of low income households, where Bristol is worse than average. Bristol performs slightly better for fuel poverty 10% (6% compared to 8%), similarly for disrepair (both 4%) and fuel poverty (low income high costs) (both 10%) and slightly worse for excess cold (4% compared to 3%), all hazards (13% compared to 11%) and low income households (22% compared to 16%).

Compared with the regional average, the picture is similar with Bristol performing slightly better for excess cold (4% compared to 6%) and fuel poverty 10% (6% compared to 8%), but worse for all hazards (13% compared to 12%), low income households (22% compared to 15%), disrepair (4% compared with 3%) and fuel poverty low income high costs (10% compared to 9%).

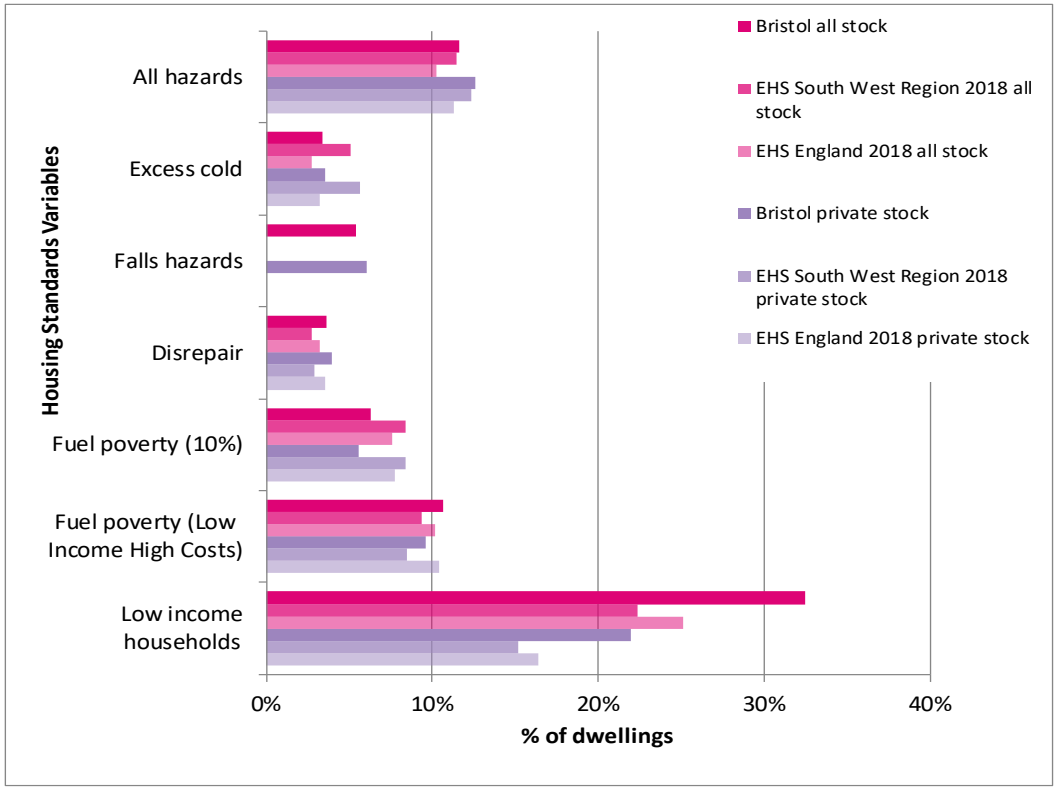
The average SimpleSAP ratings in Bristol (**Figure 4**) are slightly lower than the England averages and the regional averages, for both all stock and the private rented stock.

Table 3: Estimates of the numbers and percentage of dwellings with the presence of each of the Housing Standards Variables assessed by the Housing Stock Models and HSCD for all stock and private sector stock – Bristol compared to the South West and England (EHS 2018)

Variable		All stock				Private sector stock			
		Bristol (no.)	Bristol (%)	2018 EHS Regional (%)	2018 EHS England (%)	Bristol (no.)	Bristol (%)	2018 EHS Regional (%)	2018 EHS England (%)
No. of dwellings		203,722	-	-	-	162,718	-	-	-
HHSRS category 1 hazards	All hazards	23,667	12%	11%	10%	20,497	13%	12%	11%
	Excess cold	6,882	3%	5%	3%	5,769	4%	6%	3%
	Falls hazards	10,950	5%	(-)*	(-)*	9,782	6%	(-)*	(-)*
Disrepair		7,305	4%	3%	3%	6,401	4%	3%	4%
Fuel poverty (10%)		12,889	6%	8%	8%	8,997	6%	8%	8%
Fuel poverty (Low Income High Costs)		21,775	11%	9%	10%	15,641	10%	9%	10%
Low income households		66,143	32%	22%	25%	35,778	22%	15%	16%

*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 falls 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 falls hazards. *2018 EHS Regional & England data no longer includes Falls Hazards as a separate variable.*

Figure 3: Estimates of the percentage of dwellings with the presence of each pf the Housing Standards Variables assessed by the Housing Stock Models and HSCD for all stock and private sector stock – Bristol compared to the South West and England (EHS 2018)



*N.B. *2018 EHS Regional & England data no longer includes Falls Hazards as a separate variable*

Figure 4: Average SimpleSAP ratings for all stock and private sector stock – Bristol compared to the South West and England (EHS 2018)

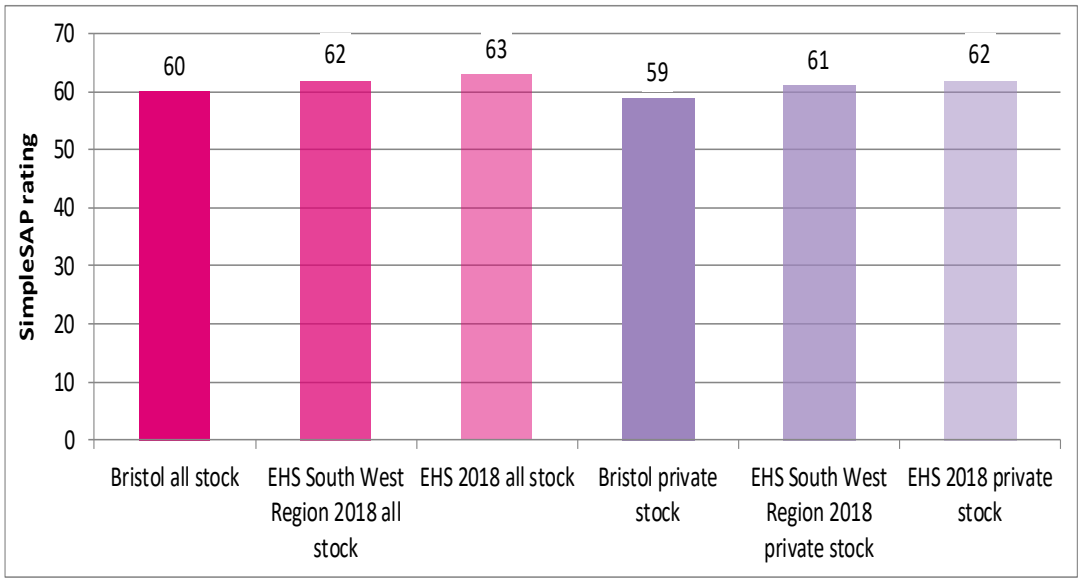


Table 4 shows the numbers and proportions of dwellings with a high category 2 hazard in each tenure. The private rented sector has the highest proportion at 64%.

Table 4: Summary of high category 2 hazards by tenure

Indicator	Private sector stock				Social stock	
	Owner occupied		Private rented			
	No.	%	No.	%	No.	%
No. of dwellings	107,048	-	55,670	-	41,004	-
HHSRS category 2 hazards	47,028	44%	26,781	48%	14,916	36%

Table 5 shows the breakdown of the number and proportions of category 2 hazards by ward. Bedminster has the highest proportions with 3,943 hazards which equates to 65%, followed by Brislington West with 3,158 hazards (59%) and Easton with 3,600 hazards which esquates to 57%.

Table 5: Total number of category 2 hazards by ward and broken down by tenure (percentage indicates the percentage of dwellings within each tenure that have a category 2 hazard)

Ward	Dwellings	Total HHSRS category 2 hazards	HHSRS category 2 hazards		
			Owner occupied	Social	Private rented
Ashley	8,542	4,377	2,113 (25%)	811 (9%)	1,453 (17%)
Avonmouth & Lawrence Weston	9,423	3,800	2,233 (24%)	745 (8%)	822 (9%)
Bedminster	6,023	3,943	2,348 (39%)	204 (3%)	1,391 (23%)
Bishopston & Ashley Down	5,138	2,714	1,670 (33%)	48 (1%)	996 (19%)
Bishopsworth	5,299	2,206	1,593 (30%)	180 (3%)	433 (8%)
Brislington East	5,373	2,087	1,257 (23%)	403 (8%)	427 (8%)
Brislington West	5,313	3,158	2,060 (39%)	181 (3%)	917 (17%)
Central	9,300	3,156	574 (6%)	638 (7%)	1,944 (21%)
Clifton	6,573	3,347	992 (15%)	672 (10%)	1,683 (26%)
Clifton Down	5,381	3,019	1,149 (21%)	46 (1%)	1,824 (34%)
Cotham	4,877	2,536	1,092 (22%)	51 (1%)	1,393 (29%)
Easton	6,329	3,600	1,768 (28%)	898 (14%)	934 (15%)
Eastville	6,407	3,234	1,984 (31%)	299 (5%)	951 (15%)
Filwood	5,582	2,631	1,201 (22%)	791 (14%)	639 (11%)
Frome Vale	5,648	2,351	1,395 (25%)	260 (5%)	696 (12%)
Hartcliffe & Withywood	8,132	2,943	1,257 (15%)	1,164 (14%)	522 (6%)
Henbury & Brentry	5,891	1,488	674 (11%)	629 (11%)	185 (3%)
Hengrove & Whitchurch Park	7,871	1,863	1,314 (17%)	316 (4%)	233 (3%)

Table 5 cont.: Total number of category 2 hazards by ward and broken down by tenure (percentage indicates the percentage of dwellings within each tenure that have a category 2 hazard)

Ward	Dwellings	Total HHSRS category 2 hazards	HHSRS category 2 hazards		
			Owner occupied	Social	Private rented
Hillfields	5,246	2,051	1,265 (24%)	532 (10%)	254 (5%)
Horfield	5,540	2,698	1,389 (25%)	260 (5%)	1,049 (19%)
Hotwells & Harbourside	3,307	1,201	357 (11%)	123 (4%)	721 (22%)
Knowle	5,502	2,169	1,370 (25%)	447 (8%)	352 (6%)
Lawrence Hill	8,246	3,196	634 (8%)	1,723 (21%)	839 (10%)
Lockleaze	5,320	2,388	1,280 (24%)	454 (9%)	654 (12%)
Redland	5,492	2,795	1,854 (34%)	26 (0%)	915 (17%)
Southmead	5,390	2,367	1,176 (22%)	726 (13%)	465 (9%)
Southville	5,916	3,008	1,564 (26%)	265 (4%)	1,179 (20%)
St. George Central	5,987	2,581	1,736 (29%)	210 (4%)	635 (11%)
St. George Troopers Hill	2,680	896	215 (8%)	590 (22%)	91 (3%)
St. George West	3,373	1,601	988 (29%)	135 (4%)	478 (14%)
Stockwood	5,171	1,430	856 (17%)	424 (8%)	150 (3%)
Stoke Bishop	4,653	1,585	1,213 (26%)	251 (5%)	121 (3%)
Westbury-on-Trym & Henleaze	8,511	3,219	2,770 (33%)	141 (2%)	308 (4%)
Windmill Hill	6,286	3,087	1,687 (27%)	273 (4%)	1,127 (18%)

4.2.2 Housing Standards Variables by tenure – Bristol

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 6** and **Figure 5** below show the results for each of the Housing Standards Variables split by tenure and **Figure 6** shows the SimpleSAP ratings by tenure.

The social stock is generally better than the private sector stock across most variables 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 worse than the private sector stock for the low income households variable. 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 significant 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, in general the private rented stock performs similarly to the owner occupied stock, with the exception of fuel poverty (Low Income High Costs) and low income households, both of which are higher in the private rented sector stock.

Table 6: Estimates of the numbers and percentage of dwellings with the presence of each of the Housing Standards Variables assessed by the Housing Stock Models and HSCD by tenure for Bristol

Variable		Private sector stock				Social stock	
		Owner occupied		Private rented			
		No.	%	No.	%	No.	%
No. of dwellings		107,051	-	55,667	-	41,004	-
HHSRS category 1 hazards	All hazards	12,127	11%	6,608	12%	2,758	7%
	Excess cold	4,410	4%	1,359	2%	1,113	3%
	Falls hazards	4,987	5%	2,037	4%	778	2%
Disrepair		3,449	3%	2,601	5%	1,087	3%
Fuel poverty (10%)		6,908	6%	2,888	5%	4,199	10%
Fuel poverty (Low Income High Costs)		10,481	10%	9,480	17%	5,659	14%
Low income households		16,951	16%	18,827	34%	30,365	74%

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 falls 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 falls hazards.

Figure 5: Estimates of the percentage of dwellings with the presence of each of the Housing Standards Variables assessed by the Housing Stock Models and HSCD by tenure for Bristol

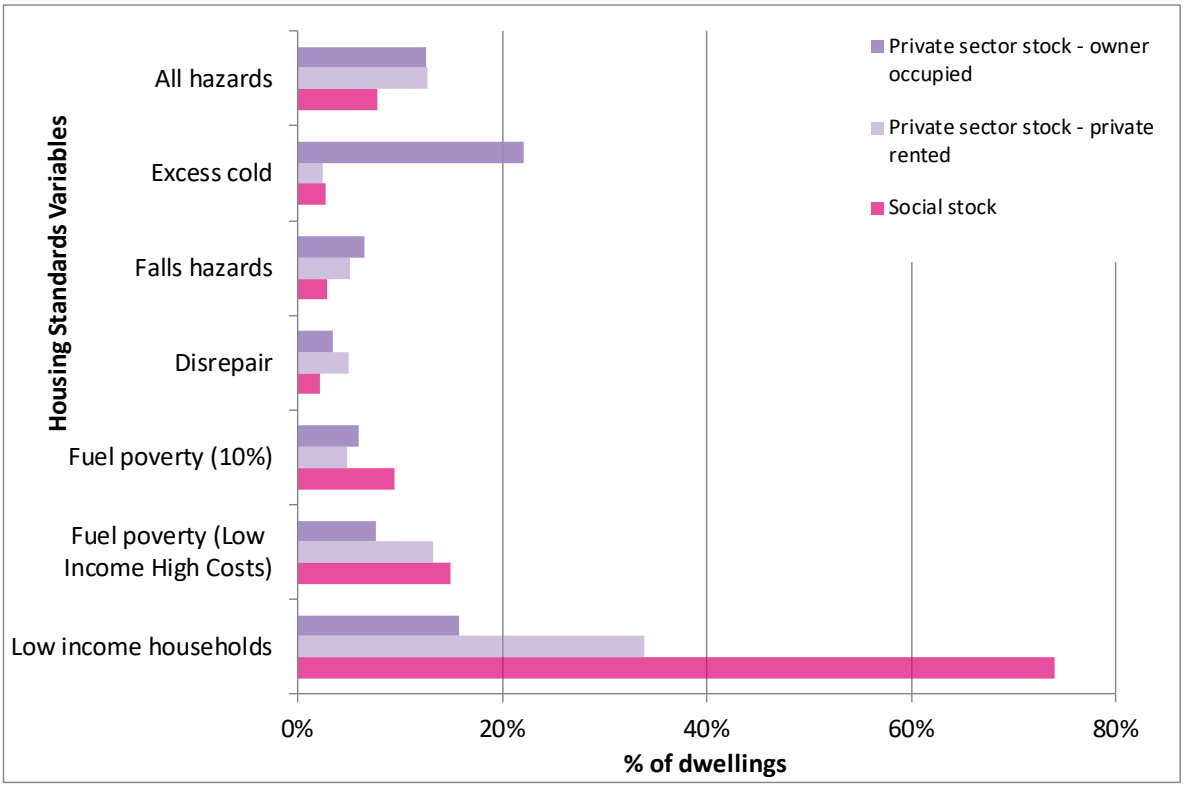


Figure 6: Average SimpleSAP ratings by tenure for Bristol

4.2.3 Housing Standards Variables mapped by Census Output Area (COA) – Bristol private sector stock

Some of the Housing Standards Variables are also provided in map form below along with a brief description of each variable[54], 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 Housing Standards Variables.

The ranges shown in the map keys are defined based on the Jenks' Natural Breaks algorithm of the COA statistics[55]. 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 variables in **Map 4** to **Map 13** 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
  - The presence of a category 2 HHSRS hazard
- **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[56] rating**

In addition, maps have been provided for EPC ratings (based on SimpleSAP)

These maps are extremely useful in showing the geographical distribution for single variables. Maps can also be produced for a combination of variables, such as dwellings with an excess cold hazard which are also occupied by low income households, as shown in **Map 12**. **Appendix D** provides close up maps for each variable, focussing on the north and the south of Bristol.

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

[55] 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.

[56] 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.

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, it can be seen that each ward is split into several COAs and, in this instance there are 129 COAs that have 17 - 36% of private sector dwellings estimated to have the presence of a category 1 hazard. Each COA is assigned to a category corresponding to a colour (the darker the COA, the higher the value). In the legend of the maps, values are greater than the lower bound and less than or equal to the upper bound.

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.

4.2.3.1 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[8] 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[57].

The HHSRS category 1 hazards map (**Map 4**) shows that there are high levels of category 1 hazards across Bristol. The data behind the map shows that the wards with the highest levels overall are Bedminster, Easton and Bishopston & Ashley Down. With the exception of Lawrence Hill, it is the more central wards such as Windmill Hill, Bedminster, Easton, Ashley, Bishopston & Ashley Down, Cotham, Clifton Down, the west of Southville and the north west parts of Central ward that experience high numbers of COAs with high proportions of category 1 hazards. When looking further afield to the more suburban parts of Bristol, such as Avonmouth & Lawrence Weston, Henbury & Brentry and Hengrove & Whitchurch Park, the instances of COAs with high levels of category 1 hazards decrease. **Maps D.1** and **D.2** focus on the north and south of Bristol, respectively, to show more granular detail of the COAs within each ward that have high levels of category 1 hazards.

Looking at the hazard of excess cold in Bristol, although instances of high excess cold are found throughout the city, the number of COAs with especially high levels of excess cold is much lower than the equivalent for category 1 hazards. – see **Map 5**. The data behind the map shows that the highest levels of excess cold overall are Westbury-on-Trym & Henleaze, Stoke Bishop and Redland, although there are also small pockets of high excess cold found in the south of Horfield, the centre of Central ward, the east and west of Hotwells & Harbourside, the north of Knowle and the centre of Avonmouth & Lawrence Weston. **Maps D.3** and **D.4** look more closely at the north and south of Bristol, respectively.

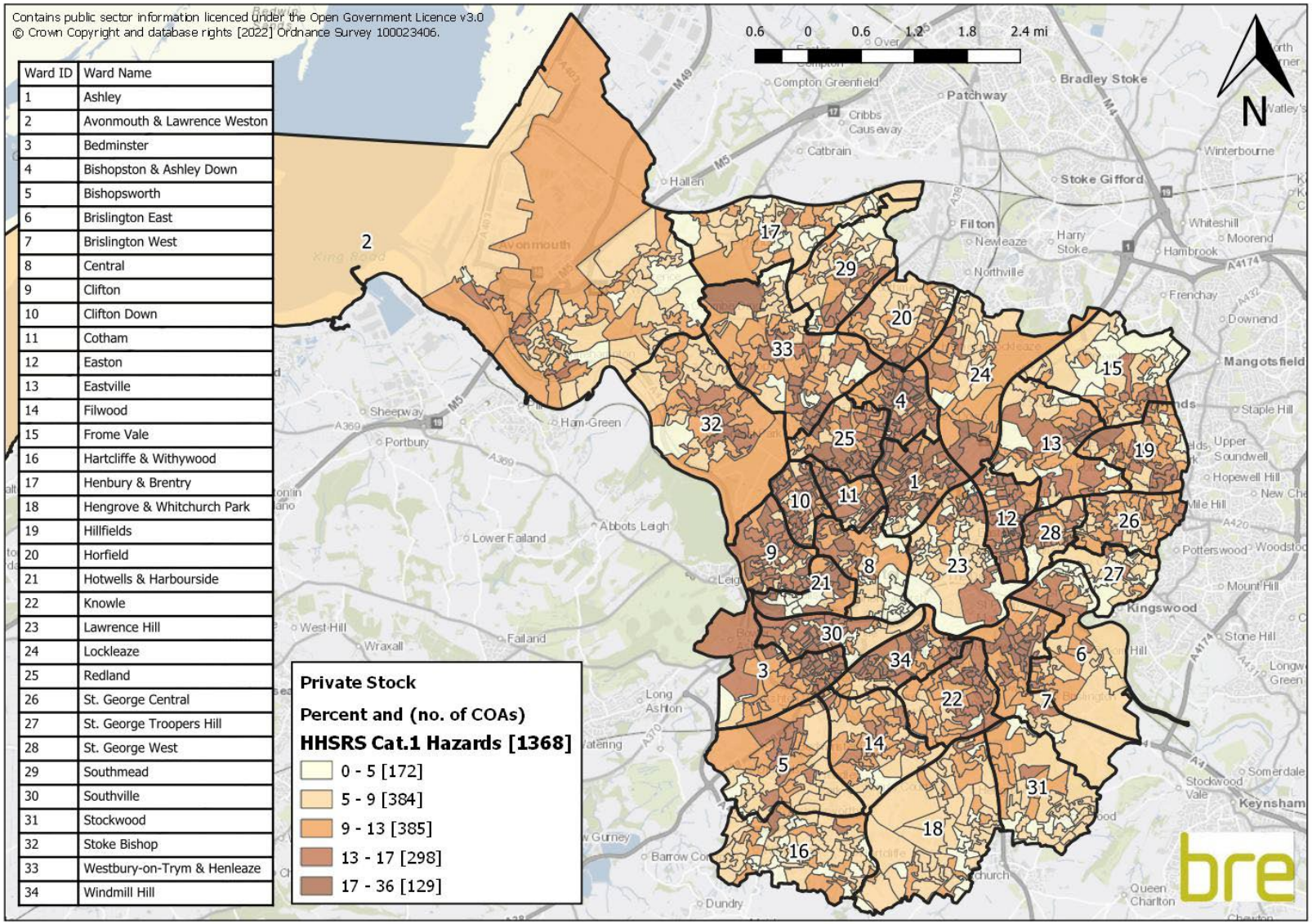
The distribution of fall hazards is shown in **Map 6** which indicates that high concentrations are scattered across the city, especially in areas surrounding the centre of Bristol. The data behind this map shows that the wards with the highest levels of falls hazards are Westbury-on-Trym & Henleaze, Stoke Bishop and Redland. In addition to these areas, large parts of Windmill Hill, Ashely and St. George Central all have

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

high levels of fall hazards. Equally, certain wards have areas with high fall hazards including the north of Redland, Bishopsworth, Knowle and Brislington East, as well as the east of Bedminster and south of Lawrence Hill and Westbury-on-Trym & Henleaze. **Maps D.5** and **D.6** zoom in on the north and south of Bristol respectively.

The HHSRS category 2 hazards map (**Map 7**) shows that there are high levels of category 2 hazards across the central wards of Bristol. The data behind the map shows that the wards with the highest levels overall are Bedminster, Easton and Bishopston & Ashley Down, although there are higher concentrations also found in Cotham, Clifton Down, Ashley and Southville. The distribution and frequency of category 2 hazards is similar to that of category 1 hazards. **Maps D.7** and **D.8** zoom in on the north and south of Bristol, respectively.

Map 4: Percentage of private sector dwellings in Bristol with the presence of a HHSRS category 1 hazard. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
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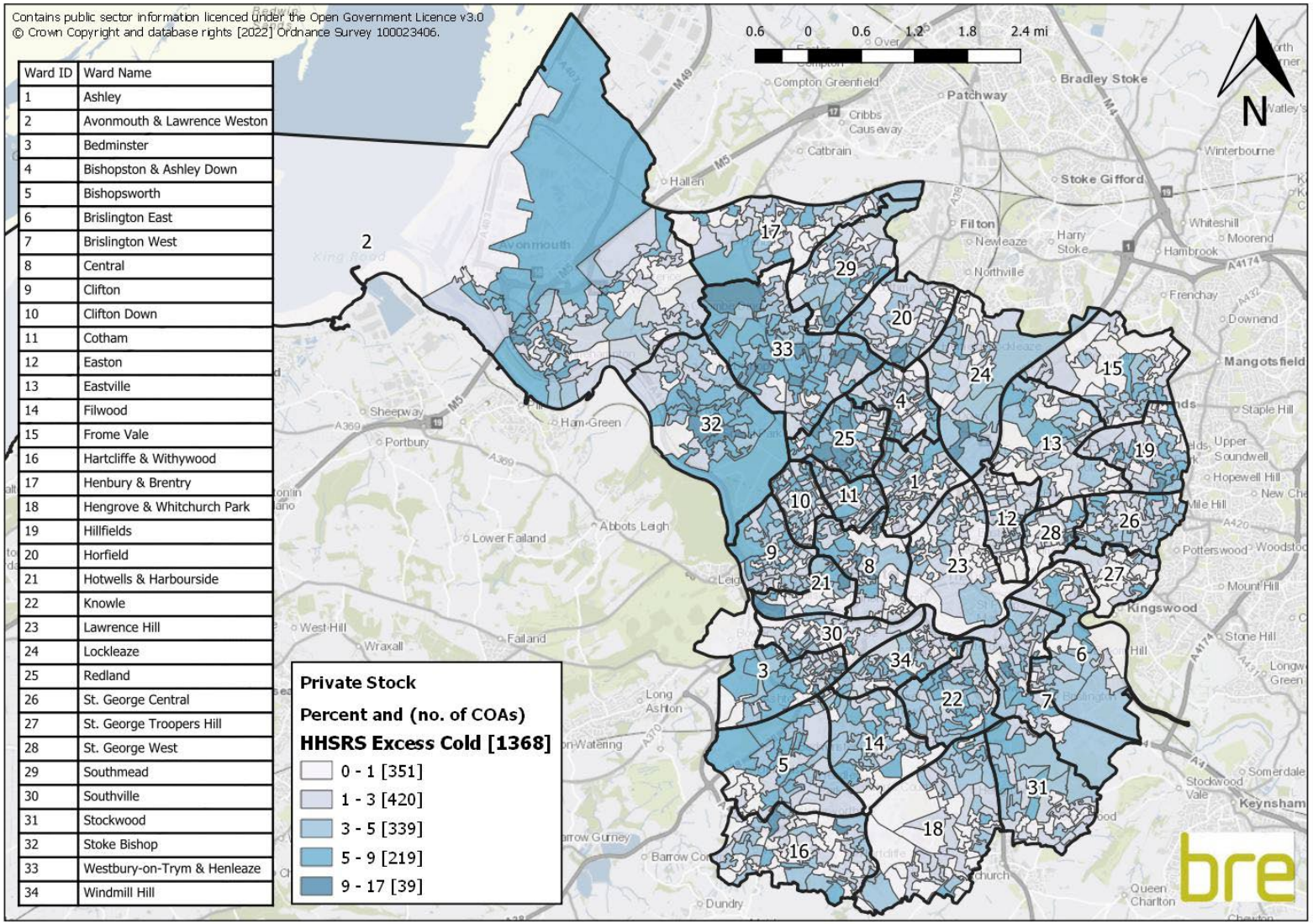
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 5: Percentage of private sector dwellings in Bristol with the presence of a HHSRS category 1 hazard for excess cold. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



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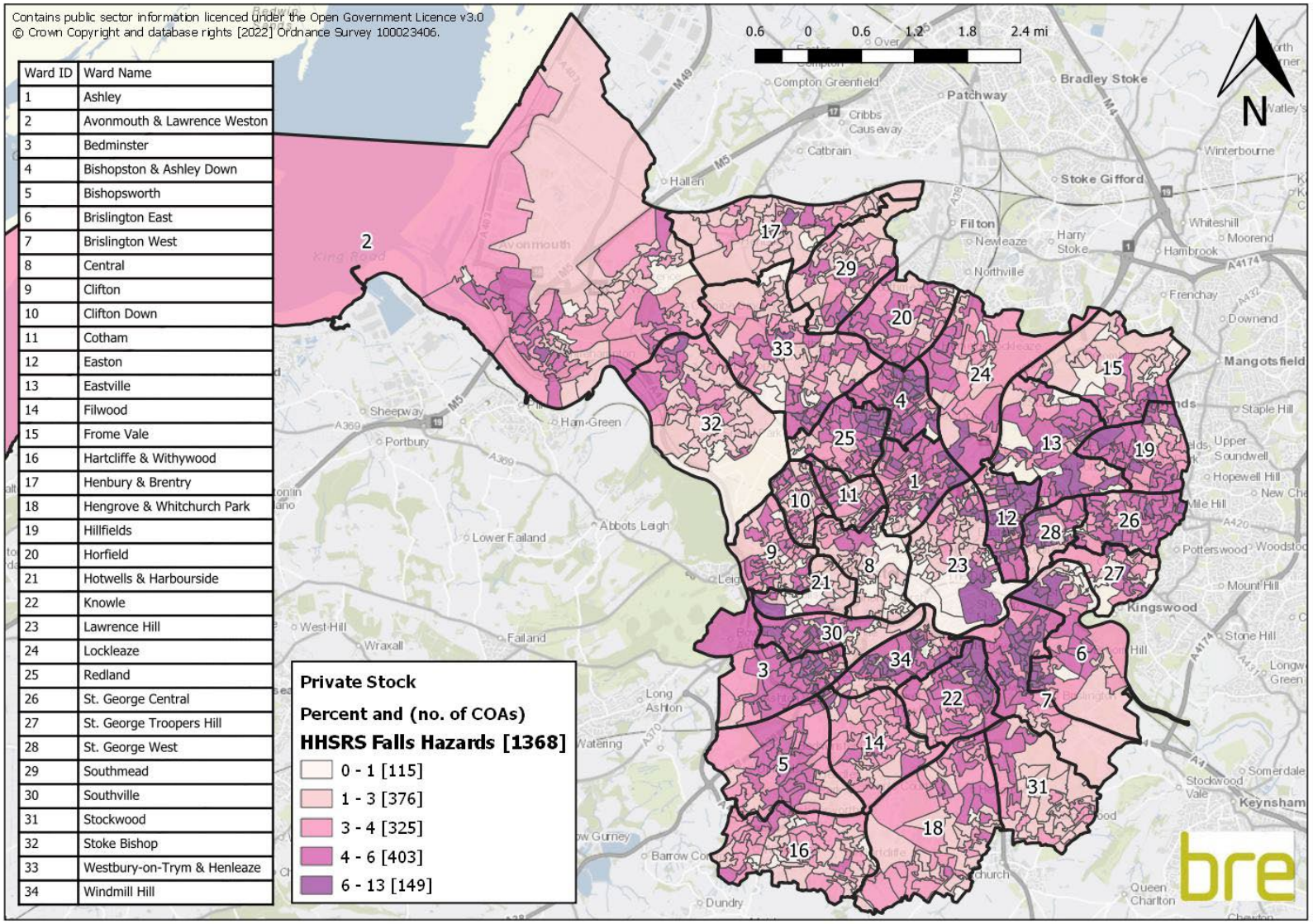
Map 6: Percentage of private sector dwellings in Bristol with the presence of a HHSRS category 1 hazard for falls. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



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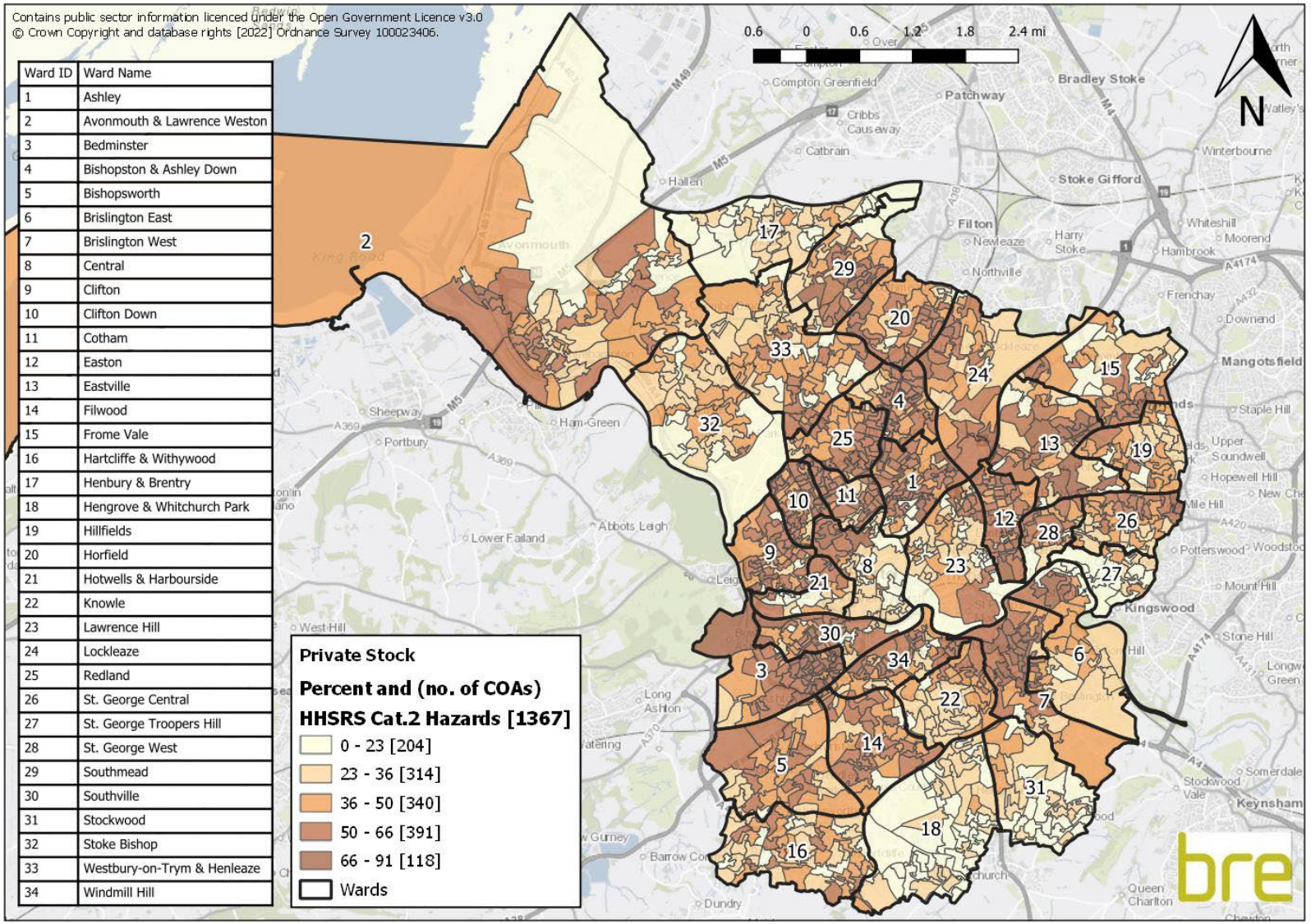
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 7: Percentage of private sector dwellings in Bristol with the presence of a HHSRS category 2 hazard. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



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30	Southville
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32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

4.2.3.2 Disrepair

The disrepair variable used in this report is based on the disrepair component of the Decent Homes Standard[58,59]. 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.

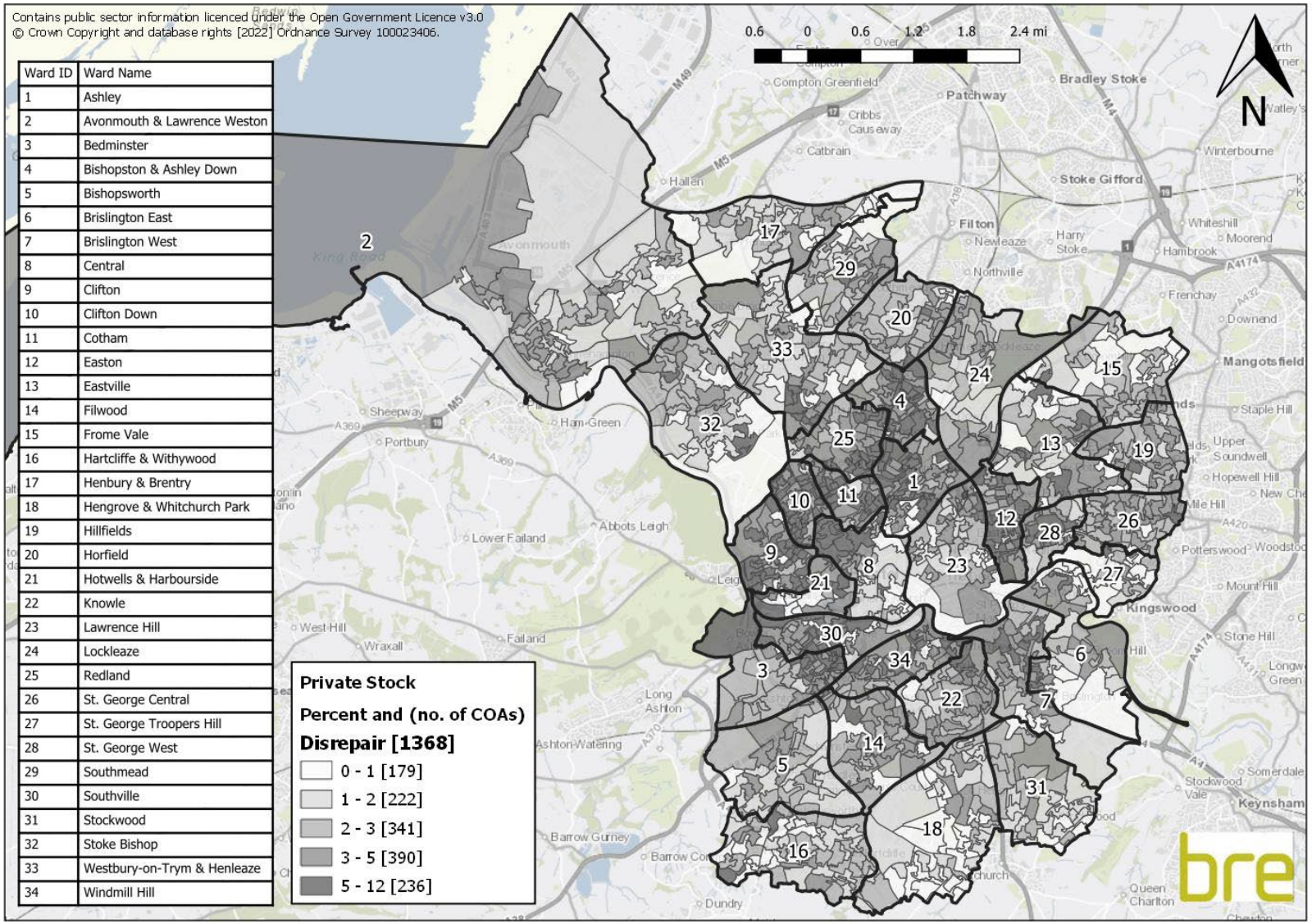
Other building components are those that have a less immediate impact on the integrity of the dwelling. Their combined effect is therefore considered, with a dwelling failing the disrepair standard if two or more elements are old and need replacing or require immediate major repair.

Map 8 shows the distribution of dwellings estimated to be in disrepair in Bristol and indicates that most of the areas with high levels of disrepair are surrounding the city centre. The more suburban parts of Bristol, such as Avonmouth & Lawrence Weston, Hengrove & Whitchurch Park and Stockwood have relatively low levels of disrepair. The data behind the map shows that the highest levels overall are in the wards of Easton, Bishopston & Ashley Down and Brislington West. **Maps D.9** and **D.10** zoom in on the north and south of Bristol and show that the highest levels of disrepair can be found in the east of Bedminster, Hotwells & Harbourside and Clifton, the west of Southville and St. George Troopers Hill, as well as the majority of the COAs in Clifton Down, Easton Cotham and Bishopston & Ashley Down.

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

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

Map 8: Percentage of private sector dwellings in Bristol in disrepair. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*

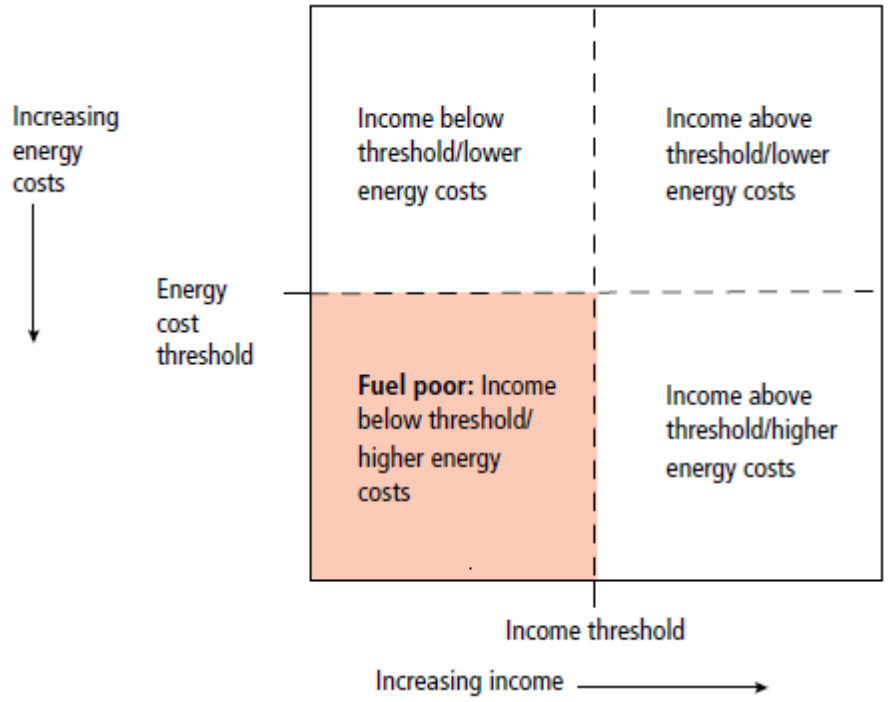


4.2.3.3 Fuel poverty

The current fuel poverty definition is known as the Low Income High Costs variable. This is a dual variable 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[60].

A household is said to be in fuel poverty if they have required fuel costs that are above average (the national median level[61]) 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[62]



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

[61] The national median level is calculated by taking the required fuel costs for a household from the most recent English Housing Survey: Fuel Poverty Dataset (available from the UK Data Service website) and applying an equivalisation factor, taken from the government's Fuel Poverty Methodology Handbook, to allow for comparison between households. There are five different equivalisation factors of between 0.82 and 1.32, which is dictated by the number of occupants (between 1 and 5+) within the household. The median of each of these five groups is calculated, and subsequently indexed to the two-person household. This provides the median whereby half of all thresholds will have 'high costs' (above this threshold) and half will have 'low costs' (below this threshold). The following link provides more information: Fuel poverty methodology handbook 2020 LIHC (publishing.service.gov.uk).

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

As the Low Income High Cost fuel poverty variable 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.

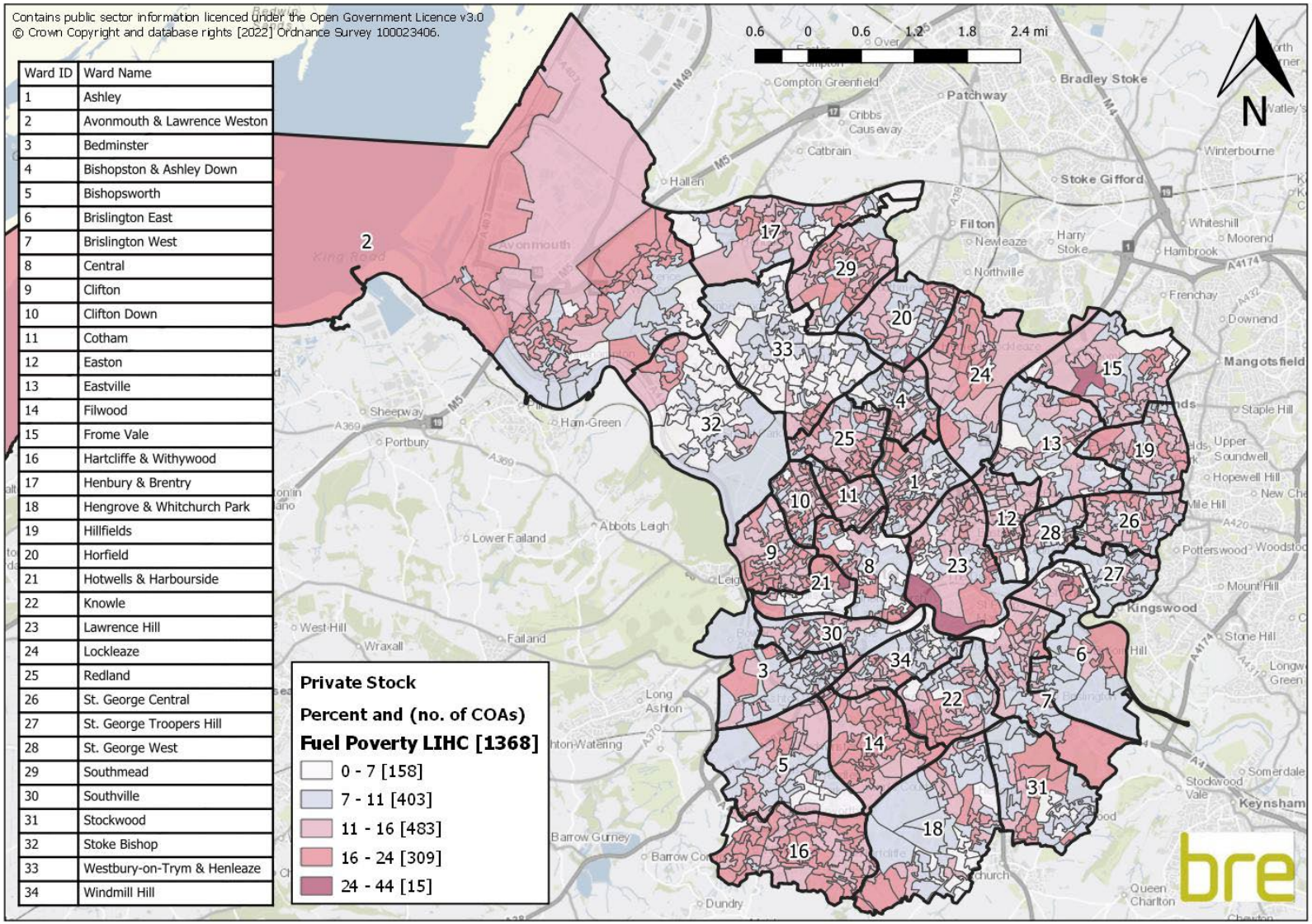
In contrast, the fuel poverty gap is more responsive to changes in energy prices and the economy, therefore providing a clearer measure of the depth of fuel poverty among those fuel poor households. This measure is therefore more useful for identifying trends in fuel poverty over time.

Map 9 shows that, based on the Low Income High Costs definition, most of the areas with the highest levels of fuel poverty (LIHC) are found in the more suburban parts of Bristol. The wards with the highest concentrations overall are Filwood, Hartcliffe & Withywood and St. George Troopers Hill. **Maps D.11** and **D.12** focus in on the north and south of Bristol, respectively. There are high concentrations of fuel poverty in Hartcliffe & Withywood across the ward, as well as in Filwood. In Avonmouth & Lawrence Weston, higher concentrations are seen across the north, east and west. There are also areas in the north of Bishopsworth and Brislington East and West, east of Bedminster, the majority of Lockleaze and the north of St. George Central that have high levels of fuel poverty (LIHC).

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^{o}C for the main living area, and 18^{o}C for other occupied rooms in the 2012 Hills Fuel Poverty Review[62]). For the purposes of this report this is referred to as “fuel poverty (10% definition)”.

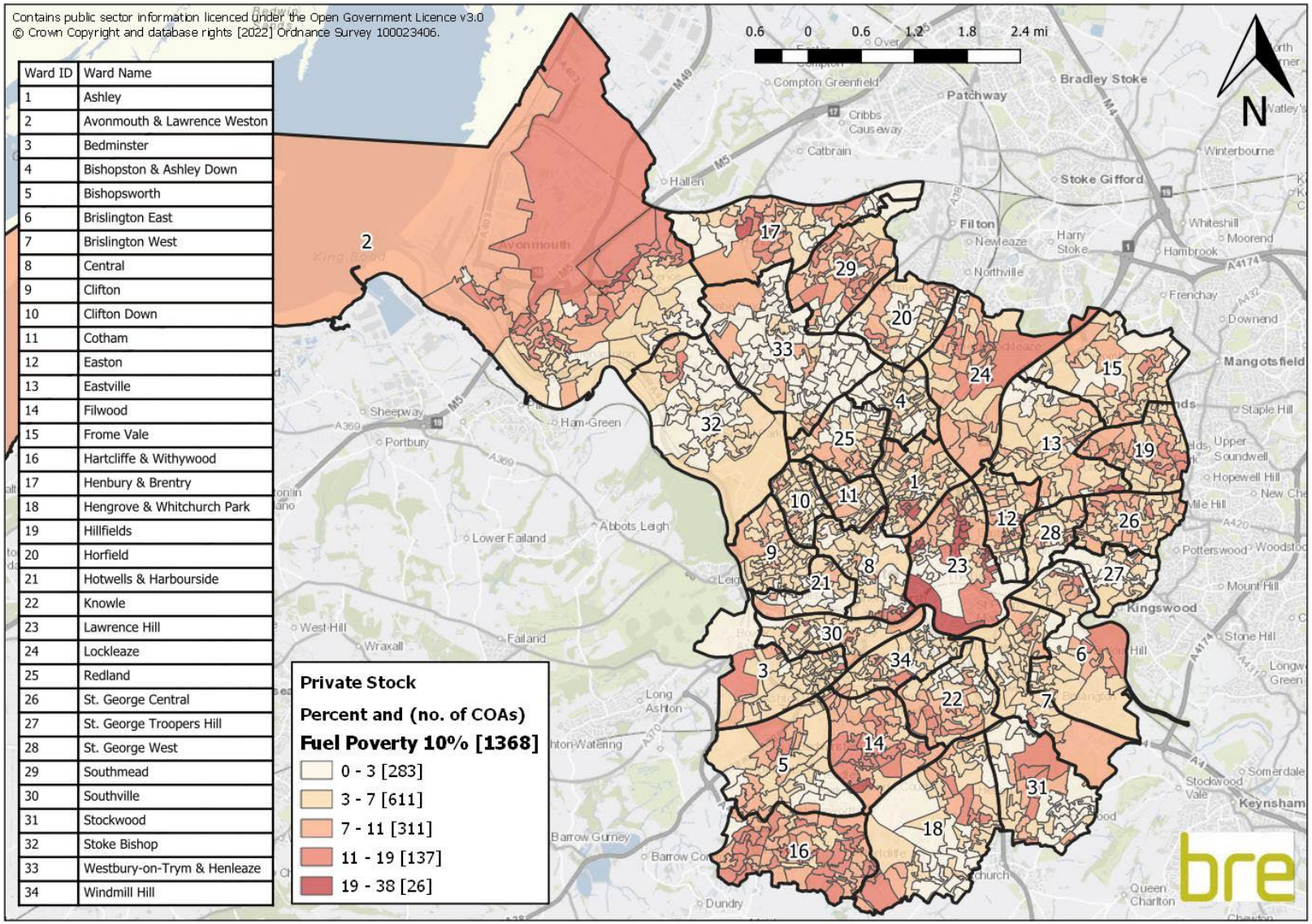
Map 10, **Maps D.13** and **D.14** show the distribution of households in fuel poverty using the 10% definition. The wards with the highest percentages are Hartcliffe & Withywood, Filwood and Lawrence Hill, there is a very similar pattern to the distribution of fuel poverty using the Low Income High Costs definition, although the south of Lawrence Hill shows much higher levels of the 10% definition.

Map 9: Percentage of private sector dwellings in Bristol occupied by households in fuel poverty - Low Income High Costs definition. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 10: Percentage of private sector dwellings in Bristol occupied by households in fuel poverty – 10% definition. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

4.2.3.4 Low income households

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

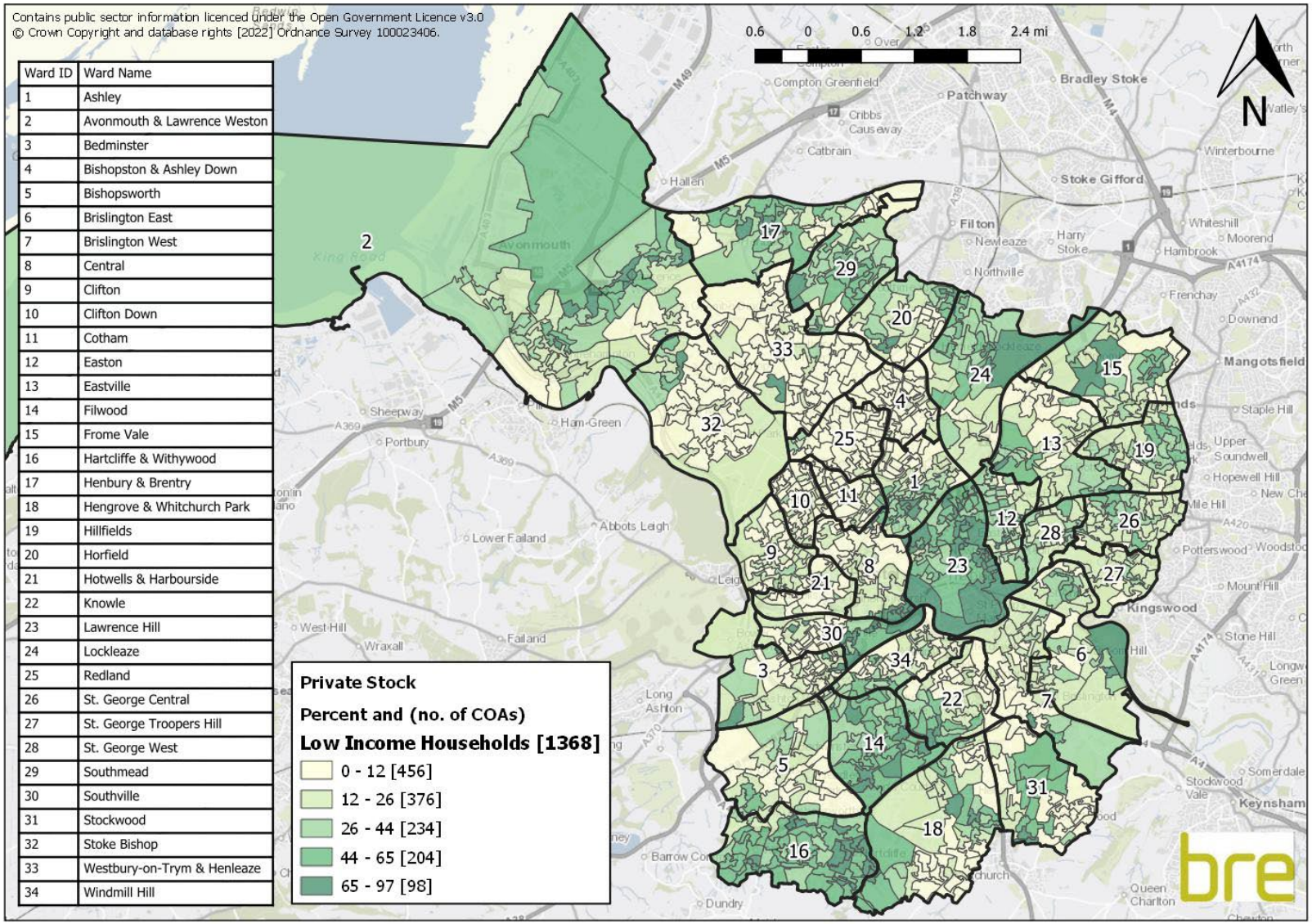
- Means tested benefits or tax credits with a relevant income below the threshold of £16,105
- Attendance allowance
- Disability living allowance
- Personal Independence Payment
- Industrial injuries disablement benefit
- War disablement pension
- Income support or income based Job Seekers Allowance/incapacity benefit that included an income support component
- Income based Employment and Support Allowance
- Universal Credit
- Housing related benefits that help pay towards rent
- Any household on a low income that has had their income imputed up to their basic income support entitlement
- Pension credit
- Child tax credit
- Working tax 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 £18,725.

Map 11 clearly shows that concentrations of low income households are found in the suburban parts of Bristol, especially to the west. The highest levels overall are found in Filwood, Hartcliffe & Withywood and Clifton. However, there are other areas which also have high concentrations of low income households; for example, towards the east of Avonmouth & Lawrence Weston and the north of both Lockleaze and Horfield as well as the majority of Southmead. **Map D. 15** and **Map D. 16** provide more detail.

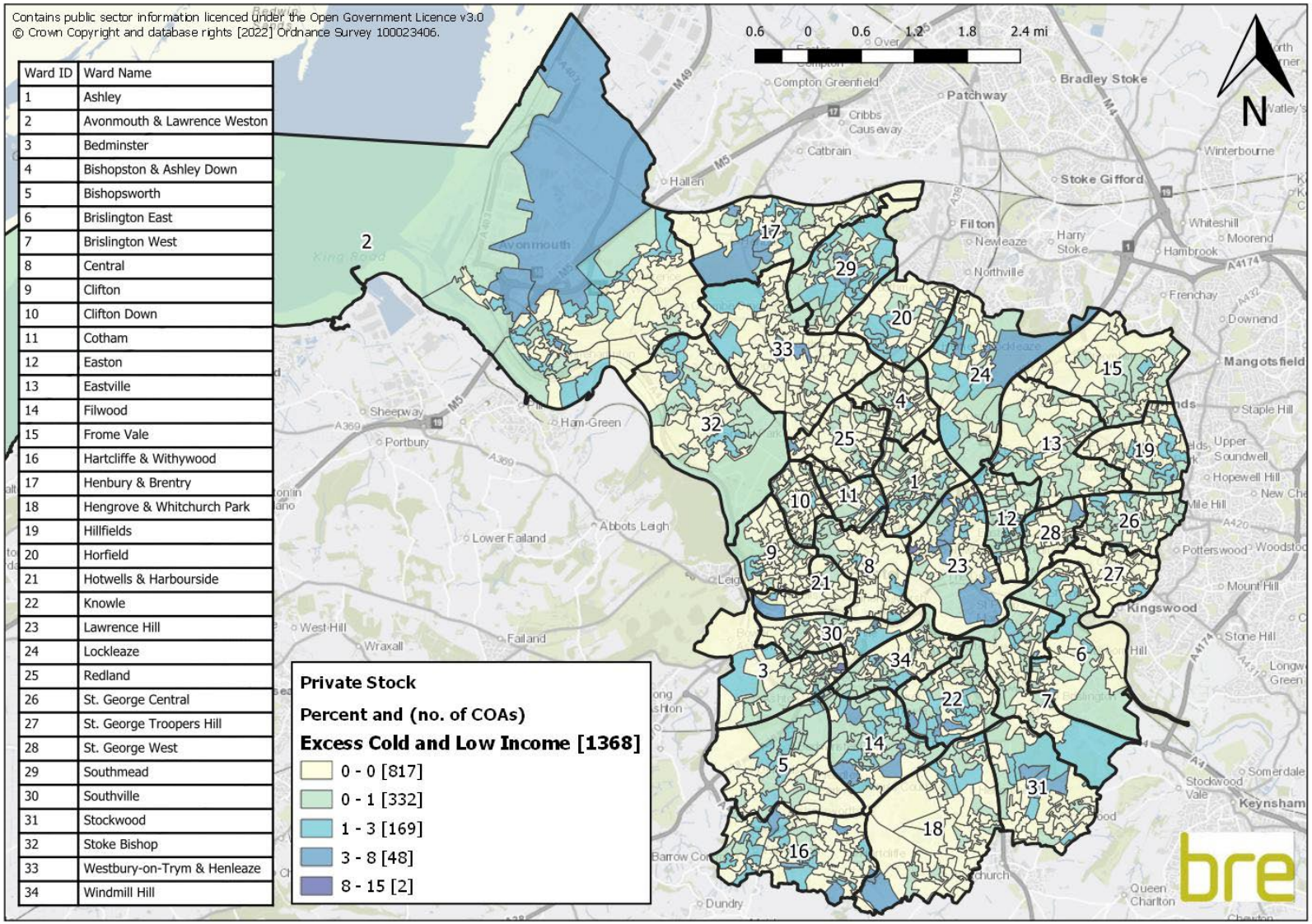
Map 12 provides an additional layer of information, with the data for low income households being combined with HHSRS excess cold data. This provides a vital picture of where vulnerable people are likely to be living in poor housing. The map indicates that there are individual COAs with high levels of low income and excess cold scattered throughout Bristol, for instance in the centre of Southmead, but the vast majority of COAs in all wards do not suffer from a combination of low income and high levels of excess cold. **Maps D.17** and **D.18** zoom in to provide more detail.

Map 11: Percentage of private sector dwellings in Bristol occupied by low income households. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 12: Percentage of private sector dwellings in Bristol with both the presence of a HHSRS category 1 hazard for excess cold and occupied by low income households. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



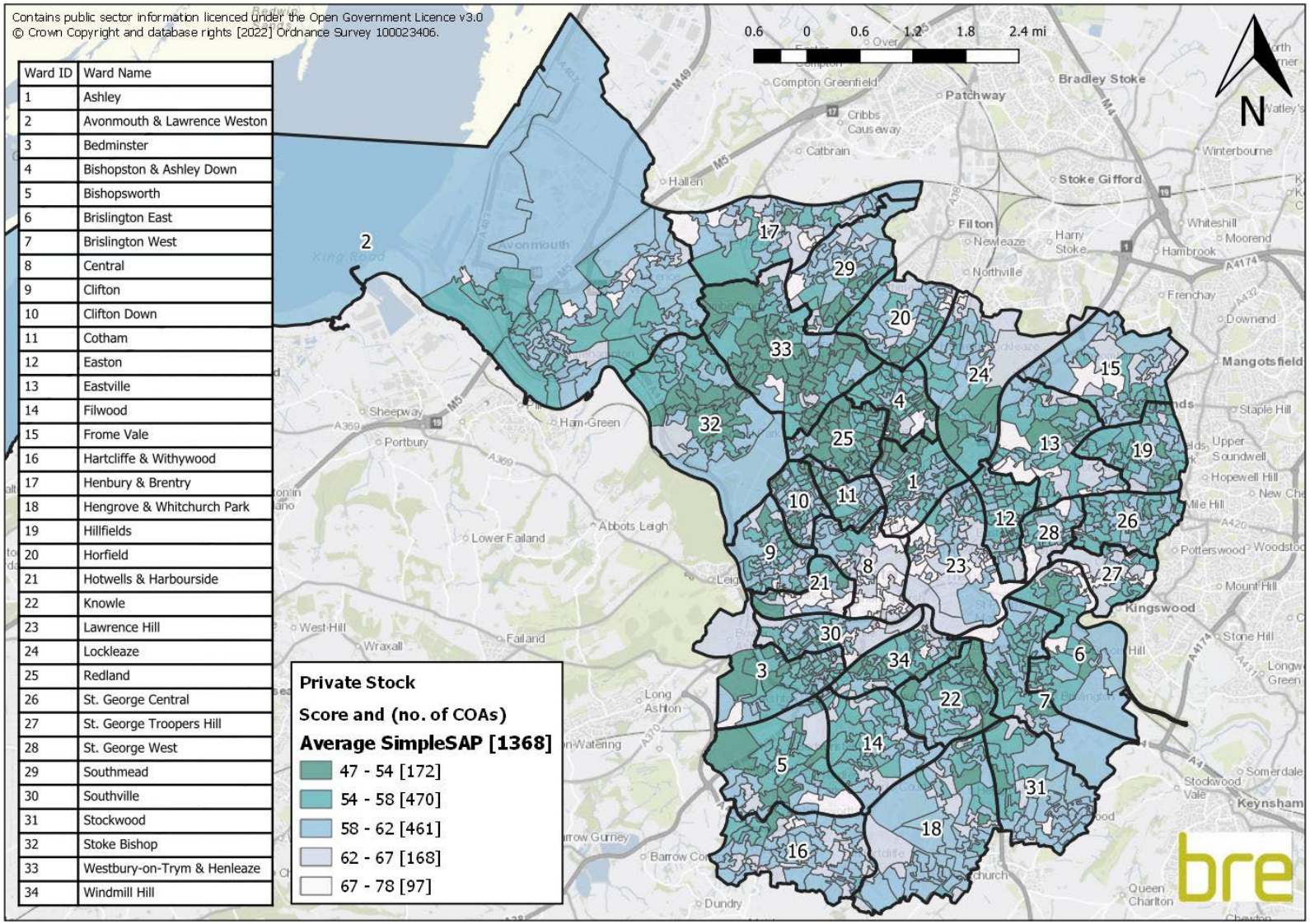
Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

4.2.3.5 SimpleSAP

The average SimpleSAP map (**Map 13**) shows that areas with low average SimpleSAP ratings are found throughout the area, especially in areas slightly outside the city centre. Whilst no particular ward obviously dominates, the data behind the map shows that the wards with the lowest average SimpleSAP ratings are Redland, Westbury-on-Trym & Henleaze and Knowle. **Maps D.19** and **D.20** provide more details for the north and south of Bristol, respectively, indicating that there are high levels of low SimpleSAP ratings in the majority of Redland and Westbury-on-Trym & Henleaze and parts of the wards surrounding them, including north of Ashley, central Stoke Bishop, south of Southmead and Horfield and north of Clifton Doan and Cotham. Equally, wards further south have high levels of low SimpleSAP ratings, in particular Windmill Hill, Bishopsworth, Knowle and Bedminster.

This can be typical in areas with an older housing stock that contains a high number of traditional (built pre-1919) homes. These types of dwelling are characteristically less thermally efficient than newly constructed homes, as a consequence this tends to increase the number of COAs that have low SimpleSAP ratings. Furthermore, 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 13: Average SimpleSAP ratings per dwelling in Bristol private sector stock. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

4.2.4 Ward level results for the Housing Standards Variables

The previous maps have provided a visual representation of the Housing Standards Variables at Census Output Area (COA) level. The following tables provide the complete set of figures at ward level for each of the variables; firstly, for the total stock (**Table 7**) and secondly, for the private sector stock (**Table 8**), owner occupied sector stock (**Table 9**) and private rented sector stock (**Table 10**). This allows a direct comparison between the wards in Bristol.

Table 7: *Total stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Ashley	8,542	1,067 (12%)	248 (3%)	356 (4%)	394 (5%)	610 (7%)	1,062 (12%)	3,047 (36%)	60
Avonmouth & Lawrence Weston	9,423	758 (8%)	280 (3%)	309 (3%)	254 (3%)	798 (8%)	1,266 (13%)	4,064 (43%)	61
Bedminster	6,023	871 (14%)	265 (4%)	301 (5%)	279 (5%)	367 (6%)	664 (11%)	1,437 (24%)	58
Bishopston & Ashley Down	5,138	765 (15%)	164 (3%)	304 (4%)	269 (5%)	243 (5%)	640 (12%)	435 (8%)	58
Bishopsworth	5,299	491 (9%)	202 (4%)	207 (4%)	141 (3%)	329 (6%)	592 (11%)	1,209 (23%)	59
Brislington East	5,373	488 (9%)	154 (3%)	219 (4%)	148 (3%)	332 (6%)	638 (12%)	1,711 (32%)	60
Brislington West	5,313	659 (12%)	186 (4%)	287 (5%)	205 (4%)	328 (6%)	672 (13%)	1,295 (24%)	59
Central	9,300	810 (9%)	343 (4%)	177 (2%)	290 (3%)	613 (7%)	1,056 (11%)	2,490 (27%)	66
Clifton	6,573	857 (13%)	246 (4%)	227 (3%)	334 (5%)	455 (7%)	1,033 (16%)	1,225 (19%)	59
Clifton Down	5,381	758 (14%)	219 (4%)	204 (4%)	299 (6%)	298 (6%)	748 (14%)	585 (11%)	59
Cotham	4,877	691 (14%)	205 (4%)	197 (4%)	252 (5%)	280 (6%)	704 (14%)	664 (14%)	58
Easton	6,329	923 (15%)	155 (2%)	376 (6%)	317 (5%)	451 (7%)	811 (13%)	2,251 (36%)	57
Eastville	6,407	675 (11%)	168 (3%)	266 (4%)	217 (3%)	372 (6%)	713 (11%)	1,971 (31%)	61
Filwood	5,582	559 (10%)	202 (4%)	200 (4%)	190 (3%)	593 (11%)	939 (17%)	3,506 (63%)	60
Frome Vale	5,648	465 (8%)	148 (3%)	190 (3%)	141 (2%)	354 (6%)	649 (11%)	1,848 (33%)	61
Hartcliffe & Withywood	8,132	555 (7%)	201 (2%)	205 (3%)	193 (2%)	890 (11%)	1,277 (16%)	5,576 (69%)	62
Henbury & Brentry	5,891	370 (6%)	122 (2%)	145 (2%)	126 (2%)	430 (7%)	690 (12%)	2,632 (45%)	63
Hengrove & Whitchurch Park	7,871	590 (7%)	207 (3%)	267 (3%)	149 (2%)	455 (6%)	862 (11%)	2,393 (30%)	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 and falls 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 falls hazards.

Table 7 cont.: *Total stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Hillfields	5,246	579 (11%)	202 (4%)	246 (5%)	181 (3%)	438 (8%)	719 (14%)	1,835 (35%)	58
Horfield	5,540	540 (10%)	158 (3%)	215 (4%)	184 (3%)	292 (5%)	639 (12%)	1,643 (30%)	60
Hotwells & Harbourside	3,307	299 (9%)	87 (3%)	75 (2%)	109 (3%)	118 (4%)	332 (10%)	456 (14%)	67
Knowle	5,502	653 (12%)	239 (4%)	269 (5%)	203 (4%)	392 (7%)	778 (14%)	1,766 (32%)	57
Lawrence Hill	8,246	670 (8%)	219 (3%)	193 (2%)	237 (3%)	955 (12%)	1,223 (15%)	5,905 (72%)	63
Lockleaze	5,320	506 (10%)	176 (3%)	195 (4%)	158 (3%)	460 (9%)	771 (14%)	2,434 (46%)	60
Redland	5,492	758 (14%)	280 (5%)	264 (5%)	254 (5%)	325 (6%)	773 (14%)	491 (9%)	55
Southmead	5,390	458 (8%)	180 (3%)	171 (3%)	155 (3%)	477 (9%)	787 (15%)	2,898 (54%)	60
Southville	5,916	715 (12%)	157 (3%)	258 (4%)	259 (4%)	362 (6%)	675 (11%)	1,862 (31%)	60
St. George Central	5,987	616 (10%)	201 (3%)	284 (5%)	214 (4%)	455 (8%)	805 (13%)	1,855 (31%)	59
St. George Troopers Hill	2,680	197 (7%)	79 (3%)	85 (3%)	55 (2%)	124 (5%)	312 (12%)	579 (22%)	60
St. George West	3,373	391 (12%)	82 (2%)	160 (5%)	143 (4%)	222 (7%)	364 (11%)	1,107 (33%)	61
Stockwood	5,171	389 (8%)	136 (3%)	160 (3%)	111 (2%)	330 (6%)	618 (12%)	1,782 (34%)	60
Stoke Bishop	4,653	502 (11%)	273 (6%)	142 (3%)	130 (3%)	209 (4%)	372 (8%)	870 (19%)	57
Westbury-on-Trym & Henleaze	8,511	989 (12%)	494 (6%)	339 (4%)	263 (3%)	268 (3%)	734 (9%)	820 (10%)	55
Windmill Hill	6,286	879 (14%)	204 (3%)	309 (5%)	283 (5%)	370 (6%)	702 (11%)	1,501 (24%)	58

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 falls 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 falls hazards.

Table 8: *Private sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Ashley	6,934	939 (14%)	216 (3%)	319 (5%)	337 (5%)	440 (6%)	853 (12%)	1,746 (25%)	59
Avonmouth & Lawrence Weston	6,911	627 (9%)	230 (3%)	271 (4%)	194 (3%)	547 (8%)	923 (13%)	2,001 (29%)	60
Bedminster	5,478	820 (15%)	242 (4%)	291 (5%)	261 (5%)	307 (6%)	598 (11%)	1,018 (19%)	58
Bishopston & Ashley Down	5,020	757 (15%)	163 (3%)	302 (6%)	265 (5%)	240 (5%)	629 (13%)	371 (7%)	57
Bishopsworth	4,763	453 (10%)	182 (4%)	198 (4%)	127 (3%)	272 (6%)	520 (11%)	801 (17%)	59
Brislington East	4,118	399 (10%)	114 (3%)	195 (5%)	119 (3%)	224 (5%)	460 (11%)	896 (22%)	60
Brislington West	4,780	622 (13%)	168 (4%)	278 (6%)	193 (4%)	271 (6%)	603 (13%)	872 (18%)	59
Central	7,507	721 (10%)	307 (4%)	156 (2%)	251 (3%)	385 (5%)	857 (11%)	1,404 (19%)	66
Clifton	5,176	711 (14%)	180 (3%)	193 (4%)	280 (5%)	309 (6%)	819 (16%)	768 (15%)	59
Clifton Down	5,283	744 (14%)	212 (4%)	202 (4%)	295 (6%)	290 (5%)	741 (14%)	562 (11%)	59
Cotham	4,749	681 (14%)	203 (4%)	195 (4%)	247 (5%)	277 (6%)	699 (15%)	603 (13%)	58
Easton	4,907	759 (15%)	113 (2%)	323 (7%)	255 (5%)	345 (7%)	623 (13%)	1,512 (31%)	57
Eastville	5,550	627 (11%)	152 (3%)	252 (5%)	198 (4%)	313 (6%)	636 (11%)	1,314 (24%)	60
Filwood	3,638	391 (11%)	127 (3%)	154 (4%)	130 (4%)	388 (11%)	641 (18%)	1,803 (50%)	59
Frome Vale	4,688	427 (9%)	139 (3%)	179 (4%)	121 (3%)	272 (6%)	544 (12%)	1,054 (22%)	60
Hartcliffe & Withywood	4,435	360 (8%)	124 (3%)	148 (3%)	112 (3%)	484 (11%)	757 (17%)	2,249 (51%)	61
Henbury & Brentry	3,793	277 (7%)	96 (3%)	111 (3%)	75 (2%)	234 (6%)	408 (11%)	1,019 (27%)	62
Hengrove & Whitchurch Park	6,533	518 (8%)	173 (3%)	246 (4%)	125 (2%)	342 (5%)	683 (10%)	1,327 (20%)	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 and falls 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 falls hazards.

Table 8 cont.: *Private sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Hillfields	3,957	473 (12%)	156 (4%)	214 (5%)	140 (4%)	307 (8%)	517 (13%)	950 (24%)	57
Horfield	4,586	498 (11%)	147 (3%)	200 (4%)	163 (4%)	218 (5%)	533 (12%)	896 (20%)	59
Hotwells & Harbourside	2,955	280 (9%)	81 (3%)	70 (2%)	100 (3%)	100 (3%)	304 (10%)	313 (11%)	67
Knowle	4,325	555 (13%)	200 (5%)	240 (6%)	166 (4%)	264 (6%)	574 (13%)	884 (20%)	56
Lawrence Hill	3,994	383 (10%)	105 (3%)	118 (3%)	130 (3%)	336 (8%)	554 (14%)	2,178 (55%)	63
Lockleaze	3,919	415 (11%)	136 (3%)	168 (4%)	119 (3%)	325 (8%)	574 (15%)	1,314 (34%)	59
Redland	5,395	751 (14%)	278 (5%)	263 (5%)	251 (5%)	318 (6%)	764 (14%)	443 (8%)	55
Southmead	3,530	326 (9%)	121 (3%)	132 (4%)	102 (3%)	285 (8%)	508 (14%)	1,398 (40%)	60
Southville	5,097	672 (13%)	139 (3%)	247 (5%)	240 (5%)	264 (5%)	571 (11%)	1,161 (23%)	59
St. George Central	5,228	564 (11%)	58 (3%)	564 (5%)	193 (4%)	383 (7%)	712 (14%)	1,277 (24%)	58
St. George Troopers Hill	1,170	85 (7%)	21 (2%)	44 (4%)	24 (2%)	41 (4%)	113 (10%)	206 (18%)	63
St. George West	2,928	368 (13%)	72 (2%)	153 (5%)	130 (4%)	184 (6%)	318 (11%)	754 (26%)	60
Stockwood	3,854	319 (8%)	109 (3%)	139 (4%)	83 (2%)	172 (4%)	399 (10%)	715 (19%)	60
Stoke Bishop	3,978	438 (11%)	233 (6%)	126 (3%)	111 (3%)	132 (3%)	264 (7%)	396 (10%)	56
Westbury-on-Trym & Henleaze	7,941	955 (12%)	477 (6%)	332 (4%)	251 (3%)	227 (3%)	673 (8%)	503 (6%)	55
Windmill Hill	5,598	820 (15%)	178 (3%)	294 (5%)	262 (5%)	300 (5%)	589 (11%)	1,070 (19%)	58

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 falls 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 falls hazards.

Table 9: *Owner occupied sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Ashley	4,159	560 (13%)	161 (4%)	214 (5%)	179 (4%)	313 (8%)	417 (10%)	746 (18%)	57
Avonmouth & Lawrence Weston	5,210	452 (9%)	178 (3%)	208 (4%)	131 (3%)	414 (8%)	570 (11%)	1,124 (22%)	59
Bedminster	3,537	516 (15%)	180 (5%)	198 (6%)	146 (4%)	212 (6%)	299 (8%)	450 (13%)	56
Bishopston & Ashley Down	3,345	485 (14%)	132 (4%)	213 (6%)	155 (5%)	171 (5%)	323 (10%)	194 (6%)	56
Bishopsworth	3,702	357 (10%)	165 (4%)	161 (4%)	92 (2%)	221 (6%)	347 (9%)	430 (12%)	57
Brislington East	3,109	307 (10%)	102 (3%)	156 (5%)	86 (3%)	173 (6%)	292 (9%)	460 (15%)	58
Brislington West	3,381	432 (13%)	141 (4%)	205 (6%)	121 (4%)	204 (6%)	349 (10%)	361 (11%)	57
Central	2,002	143 (7%)	59 (3%)	43 (2%)	50 (2%)	116 (6%)	144 (7%)	313 (16%)	69
Clifton	1,864	259 (14%)	97 (5%)	76 (4%)	88 (5%)	136 (7%)	175 (9%)	134 (7%)	57
Clifton Down	2,188	315 (14%)	133 (6%)	87 (4%)	100 (5%)	154 (7%)	191 (9%)	183 (8%)	57
Cotham	2,158	313 (15%)	130 (6%)	96 (4%)	96 (4%)	155 (7%)	225 (10%)	155 (7%)	55
Easton	3,449	530 (15%)	92 (3%)	239 (7%)	165 (5%)	268 (8%)	350 (10%)	942 (27%)	57
Eastville	3,763	430 (11%)	118 (3%)	183 (5%)	121 (3%)	229 (6%)	344 (9%)	584 (16%)	59
Filwood	2,381	255 (11%)	101 (4%)	103 (4%)	75 (3%)	285 (12%)	352 (15%)	844 (35%)	58
Frome Vale	3,333	301 (9%)	113 (3%)	128 (4%)	75 (2%)	199 (6%)	293 (9%)	607 (18%)	59
Hartcliffe & Withywood	3,026	238 (8%)	95 (3%)	105 (3%)	68 (2%)	347 (11%)	439 (15%)	1,088 (36%)	60
Henbury & Brentry	3,036	219 (7%)	85 (3%)	89 (3%)	53 (2%)	179 (6%)	271 (9%)	586 (19%)	61
Hengrove & Whitchurch Park	5,659	448 (8%)	161 (3%)	216 (4%)	101 (2%)	282 (5%)	518 (9%)	847 (15%)	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 and falls 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 falls hazards.

Table 9 cont.: *Owner occupied sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Hillfields	3,384	410 (12%)	149 (4%)	188 (6%)	113 (3%)	283 (8%)	418 (12%)	717 (21%)	57
Horfield	2,719	282 (10%)	108 (4%)	123 (5%)	78 (3%)	133 (5%)	213 (8%)	340 (13%)	58
Hotwells & Harbourside	975	79 (8%)	27 (3%)	24 (2%)	23 (2%)	35 (4%)	62 (6%)	62 (6%)	66
Knowle	3,393	441 (13%)	182 (5%)	197 (6%)	120 (4%)	215 (6%)	381 (11%)	467 (14%)	55
Lawrence Hill	1,741	169 (10%)	39 (2%)	64 (4%)	54 (3%)	207 (12%)	211 (12%)	794 (46%)	61
Lockleaze	2,582	277 (11%)	109 (4%)	114 (4%)	70 (3%)	235 (9%)	300 (12%)	565 (22%)	58
Redland	3,718	532 (14%)	242 (7%)	204 (5%)	158 (4%)	236 (6%)	444 (12%)	210 (6%)	53
Southmead	2,562	245 (10%)	108 (4%)	101 (4%)	69 (3%)	223 (9%)	309 (12%)	784 (31%)	59
Southville	2,698	380 (14%)	86 (3%)	158 (6%)	118 (4%)	150 (6%)	240 (9%)	263 (10%)	57
St. George Central	3,897	423 (11%)	150 (4%)	213 (5%)	132 (3%)	312 (8%)	462 (12%)	742 (19%)	57
St. George Troopers Hill	795	60 (8%)	20 (3%)	31 (4%)	14 (2%)	33 (4%)	64 (8%)	109 (14%)	61
St. George West	1,910	256 (13%)	60 (3%)	114 (6%)	78 (4%)	142 (7%)	180 (9%)	404 (21%)	58
Stockwood	3,247	271 (8%)	98 (3%)	121 (4%)	66 (2%)	138 (4%)	283 (9%)	364 (11%)	59
Stoke Bishop	3,585	383 (11%)	212 (6%)	112 (3%)	94 (3%)	108 (3%)	197 (5%)	275 (8%)	56
Westbury-on-Trym & Henleaze	7,058	848 (12%)	447 (6%)	301 (4%)	211 (3%)	187 (3%)	531 (8%)	371 (5%)	54
Windmill Hill	3,482	511 (15%)	130 (4%)	202 (6%)	149 (4%)	213 (6%)	286 (8%)	435 (12%)	56

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 falls 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 falls hazards.

Table 10: *Private rented sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Ashley	2,775	379 (14%)	55 (2%)	105 (4%)	158 (6%)	127 (5%)	436 (16%)	1,000 (36%)	62
Avonmouth & Lawrence Weston	1,701	175 (10%)	52 (3%)	63 (4%)	63 (4%)	133 (8%)	353 (21%)	877 (52%)	61
Bedminster	1,941	304 (16%)	62 (3%)	93 (5%)	115 (6%)	95 (5%)	299 (15%)	568 (29%)	60
Bishopston & Ashley Down	1,675	272 (16%)	31 (2%)	89 (5%)	110 (7%)	69 (4%)	306 (18%)	177 (11%)	61
Bishopsworth	1,061	96 (9%)	17 (2%)	37 (3%)	35 (3%)	51 (5%)	173 (16%)	371 (35%)	65
Brislington East	1,009	92 (9%)	12 (1%)	39 (4%)	33 (3%)	51 (5%)	168 (17%)	436 (43%)	64
Brislington West	1,399	190 (14%)	27 (2%)	73 (5%)	72 (5%)	67 (5%)	254 (18%)	511 (37%)	61
Central	5,505	578 (10%)	248 (5%)	113 (2%)	201 (4%)	269 (5%)	713 (13%)	1,091 (20%)	65
Clifton	3,312	452 (14%)	83 (3%)	117 (4%)	192 (6%)	173 (5%)	644 (19%)	634 (0%)	60
Clifton Down	3,095	429 (14%)	79 (3%)	115 (4%)	195 (6%)	136 (4%)	550 (18%)	379 (12%)	60
Cotham	2,591	368 (14%)	73 (3%)	99 (4%)	151 (6%)	122 (5%)	474 (18%)	448 (17%)	59
Easton	1,458	229 (16%)	21 (1%)	84 (6%)	90 (6%)	77 (5%)	273 (19%)	570 (39%)	59
Eastville	1,787	197 (11%)	34 (2%)	69 (4%)	77 (4%)	84 (5%)	292 (16%)	730 (41%)	62
Filwood	1,257	136 (11%)	26 (2%)	51 (4%)	55 (4%)	103 (8%)	289 (23%)	959 (76%)	61
Frome Vale	1,355	126 (9%)	26 (2%)	51 (4%)	46 (3%)	73 (5%)	251 (19%)	447 (33%)	61
Hartcliffe & Withywood	1,409	122 (9%)	29 (2%)	43 (3%)	44 (3%)	137 (10%)	318 (23%)	1,161 (82%)	62
Henbury & Brentry	757	58 (8%)	11 (1%)	22 (3%)	22 (3%)	55 (7%)	137 (18%)	433 (57%)	65
Hengrove & Whitchurch Park	874	70 (8%)	12 (1%)	30 (3%)	24 (3%)	60 (7%)	165 (19%)	480 (55%)	62

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 falls 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 falls hazards.

Table 10 cont.: *Private rented sector stock* – number and percentage of dwellings for each of the Housing Standards Variables, and average SimpleSAP ratings by ward

Ward	Dwellings	HHSRS category 1 hazards			Disrepair	Fuel poverty		Low income households	Average SimpleSAP
		All hazards	Excess cold	Falls hazards		10%	LIHC		
Hillfields	573	63 (11%)	7 (1%)	26 (5%)	27 (5%)	24 (4%)	99 (17%)	233 (41%)	62
Horfield	1,867	216 (12%)	39 (2%)	77 (4%)	85 (5%)	85 (5%)	320 (17%)	556 (30%)	61
Hotwells & Harbourside	1,980	201 (10%)	54 (3%)	46 (2%)	77 (4%)	65 (3%)	242 (12%)	251 (13%)	68
Knowle	932	114 (12%)	18 (2%)	43 (5%)	46 (5%)	49 (5%)	193 (21%)	417 (45%)	60
Lawrence Hill	2,253	214 (9%)	66 (3%)	54 (2%)	76 (3%)	129 (6%)	343 (15%)	1,384 (61%)	64
Lockleaze	1,337	138 (10%)	27 (2%)	54 (4%)	49 (4%)	90 (7%)	274 (20%)	749 (56%)	61
Redland	1,677	219 (13%)	36 (2%)	59 (4%)	93 (6%)	82 (5%)	320 (19%)	233 (14%)	60
Southmead	968	81 (8%)	13 (1%)	31 (3%)	33 (3%)	62 (6%)	199 (21%)	614 (63%)	62
Southville	2,399	292 (12%)	53 (2%)	89 (4%)	122 (5%)	114 (5%)	331 (14%)	898 (37%)	62
St. George Central	1,331	141 (11%)	25 (2%)	58 (4%)	61 (5%)	71 (5%)	250 (19%)	535 (40%)	61
St. George Troopers Hill	375	25 (7%)	1 (0%)	13 (3%)	10 (3%)	8 (2%)	49 (13%)	97 (26%)	66
St. George West	1,018	112 (11%)	12 (1%)	39 (4%)	52 (5%)	42 (4%)	138 (14%)	350 (34%)	63
Stockwood	607	48 (8%)	11 (2%)	18 (3%)	17 (3%)	34 (6%)	116 (19%)	351 (58%)	64
Stoke Bishop	393	55 (14%)	21 (5%)	14 (4%)	17 (4%)	24 (6%)	67 (17%)	121 (31%)	60
Westbury-on-Trym & Henleaze	883	107 (12%)	30 (3%)	31 (4%)	40 (5%)	40 (5%)	142 (16%)	132 (15%)	60
Windmill Hill	2,116	309 (15%)	48 (2%)	92 (4%)	113 (5%)	87 (4%)	303 (14%)	635 (30%)	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 and falls 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 falls hazards.

4.3 Information relating to LAHS reporting and EPC ratings

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

Table 11 shows the total number of dwellings with HHSRS category 1 hazards in Bristol'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 2018 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 11: Estimated costs to mitigate all category 1 hazards in private sector stock, split into tenure

Tenure	No. of hazards	Total cost (£)
Private Sector	20,497	100,968,222
Owner occupied	13,452	66,264,552
Private rented	7,045	34,703,670

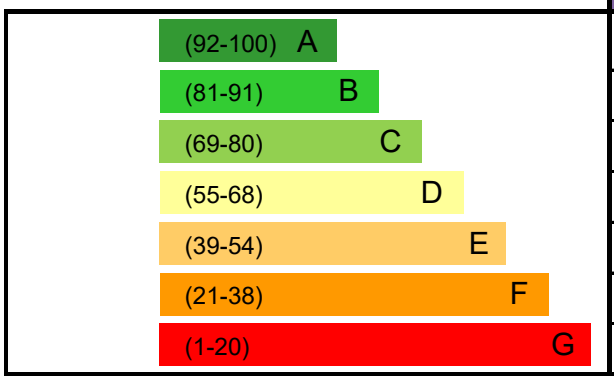
4.3.2 EPC ratings in the Bristol private sector stock

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 8 below shows the bands A – G and corresponding SAP ratings in brackets. The first two columns show the number and percentage of Bristol'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 Bristol is 59 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 9,439 (5.8%). Bristol has a higher proportion of dwellings in band E, F and G and lower proportions in bands C and D.

Figure 8: Number and percentage of Bristol'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*



	Bristol		2018 EHS England
	Count	Percent	Percent
(92-100) A	0	0.0%	1.2%
(81-91) B	1,625	1.0%	
(69-80) C	33,384	20.5%	28.9%
(55-68) D	79,641	48.9%	51.7%
(39-54) E	38,629	23.7%	13.6%
(21-38) F	7,726	4.7%	3.7%
(1-20) G	1,713	1.1%	0.9%

Under the Energy Act 2011, since 1 April 2018 landlords must ensure that when they grant a tenancy to a new or existing tenant, their properties must meet a minimum energy efficiency standard – this is currently set at band E[19, 63]. Since 1 April 2020, landlords can no longer continue letting a property which is already let if it has an EPC rating of F or G[64].

Figure 9 shows 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 Bristol with a rating below band E (i.e. bands F and G), is estimated to be 2,293 (4.1%). Compared to England, Bristol's private rented stock has are a greater proportion of dwellings in bands D and E, a similar proportion in band F and lower proportions in bands C and G.

The distribution of dwellings with EPC ratings below band E is shown in **Map 14** and maps zooming in on each of the areas of Bristol are provided in **Map D. 21** and **Map D. 22**. These are for the private rented stock only, since this is affected by the new rules on minimum standards. Under the legislation these properties are not eligible to be rented out under new or renewed tenancies, and existing tenancies from 1 April 2020.

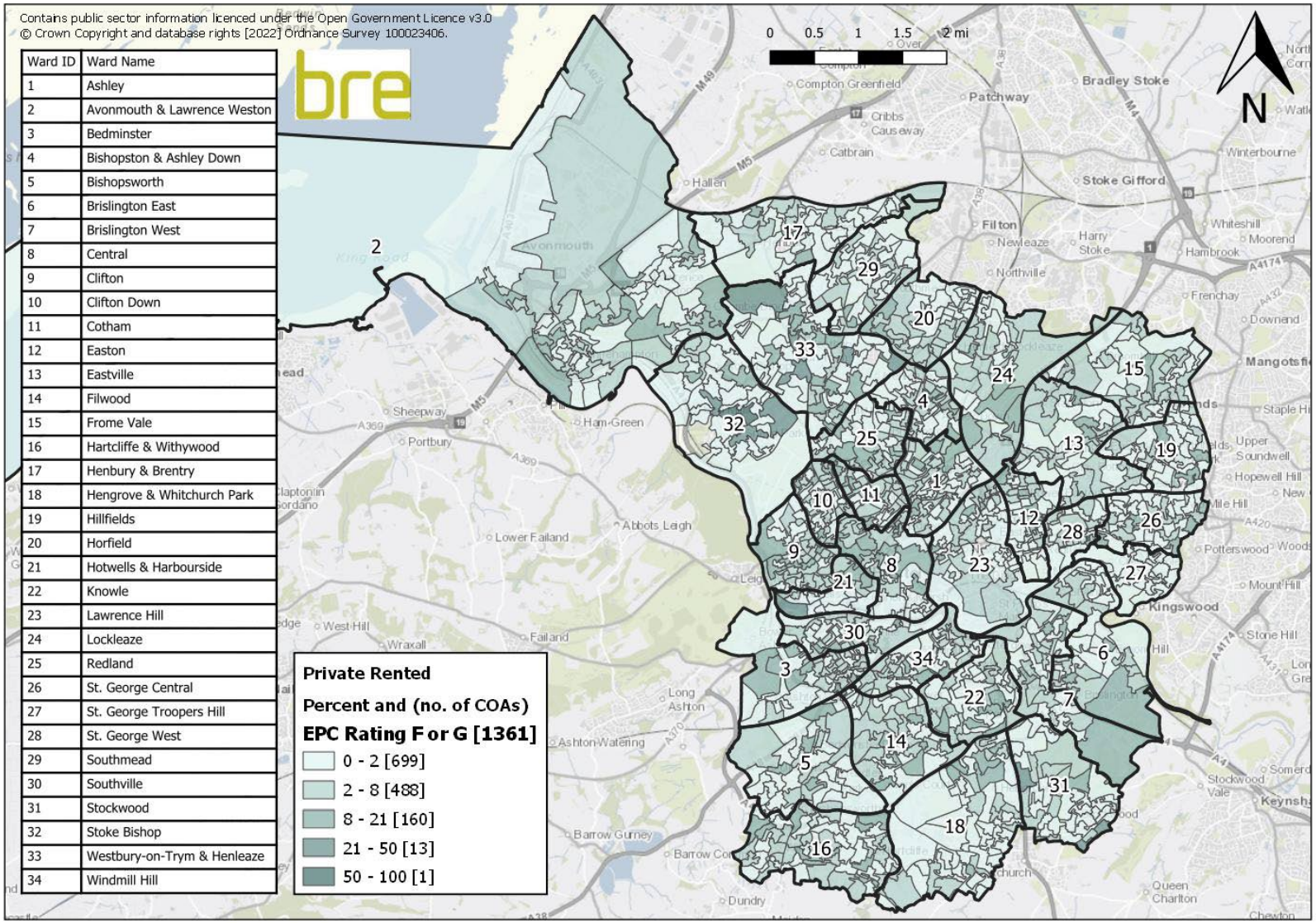
[63] Although landlords will still be able to rent out F and G rated properties after this date, they will not be able to renew or sign a new contract.

[64] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794253/domestic-prs-minimum-standard-guidance.pdf

Figure 9: Number and percentage of Bristol'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*

	Bristol		2018 EHS England
	Count	Percent	Percent
(92-100) A	0	0.0%	1.5%
(81-91) B	958	1.7%	
(69-80) C	15,936	28.6%	31.1%
(55-68) D	25,941	46.6%	48.5%
(39-54) E	10,539	18.9%	13.8%
(21-38) F	1,918	3.4%	3.8%
(1-20) G	375	0.7%	1.2%

Map 14: Distribution of dwellings with F or G EPC ratings in the private rented stock. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

5 Private rented sector analysis

This section provides additional analysis for the private rented sector in Bristol. It covers the following analysis:

- Houses in Multiple Occupation (HMOs), this data has been reviewed and an assessment made of category 1 hazards and disrepair in HMOs in Bristol.
- Analysis of the private rented sector, including size of the sector and distribution of private rented dwellings, assessment of category 1 hazards and disrepair and analysis of social factors and their distribution, including deprivation and migration.

5.1 Houses in Multiple Occupation (HMOs) in the Bristol private sector stock

The Housing Act 2004 introduced a new set of definitions for HMOs in England from 6 April 2006[65]. The definition is a complex one and the bullet points below, which are adapted from web pages provided by the National HMO Network[66], 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 government publication “Houses in Multiple Occupation and residential property licensing reform”[67] provides guidance to local authorities on changes to rules on licensing HMOs. From 1 October 2018, mandatory 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

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

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

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

HMO to be occupied by five or more persons in two or more households will remain[68]. From 1 October 2018, the extension came into effect and those dwellings that falls under the new definition will require a licence.

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.[69]
    - Purpose built flats where there are up to two flats in the block and one or both have 4 or more bedrooms.

In order to help derive the HMO estimates and improve accuracy of the model, two HMO datasets were provided by the council and integrated into the BRE model. After validation of the data, there were 3,085 mandatory HMOs and 3,913 additional HMOs (totalling 6,998 HMOs) taken from the data supplied by the council and used in the modelling process. This data was subsequently integrated into the BRE model, at which point additional addresses that the model suggests have the potential to be an HMO based on various criteria were identified, there were a total of 1,233 addresses of this kind. Therefore, as **Table 12** shows, there are an estimated 8,231 licensable HMOs identified across Bristol, where 6,998 of these are known HMOs from council data and 1,233 are modelled potential HMOs from BRE data. **Table 13** shows the numbers of HMOs (total and licensable) by ward as well as the percentage of private sector dwellings

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

[69] While there is no available information on shared criteria to inform the model, the Experian data sources and the information derived from the SimpleCO_2 model give an indication of household characteristics and energy demand, which is subsequently used to infer the number of occupants and hence the likelihood of a dwelling being an HMO.

which are HMOs at ward level. Bishopston & Ashley Down has the highest percentage of HMOs, followed by Cotham and Clifton Down ward.

Table 12: Summary of HMOs within the Bristol private sector stock.

Bristol	
No. of private sector dwellings	162,718
Total no. of HMOs*	13,349
Total no. of licensable HMOs**	8,231

*This figure is comprised of the 8,231 licensable HMOs and 5,118 HMOs that are estimated to have the potential to be a non-mandatory licensable HMO based on BRE modelling

**This figure is comprised of 3,085 known mandatory HMOs and 3,913 known additional HMOs from data supplied by Bristol City Council. The remaining 1,233 are dwellings that have the potential to be a mandatory HMO modelled by BRE.

bre

Table 13: Number (and % of private rented stock) of HMOs and licensable HMOs by ward

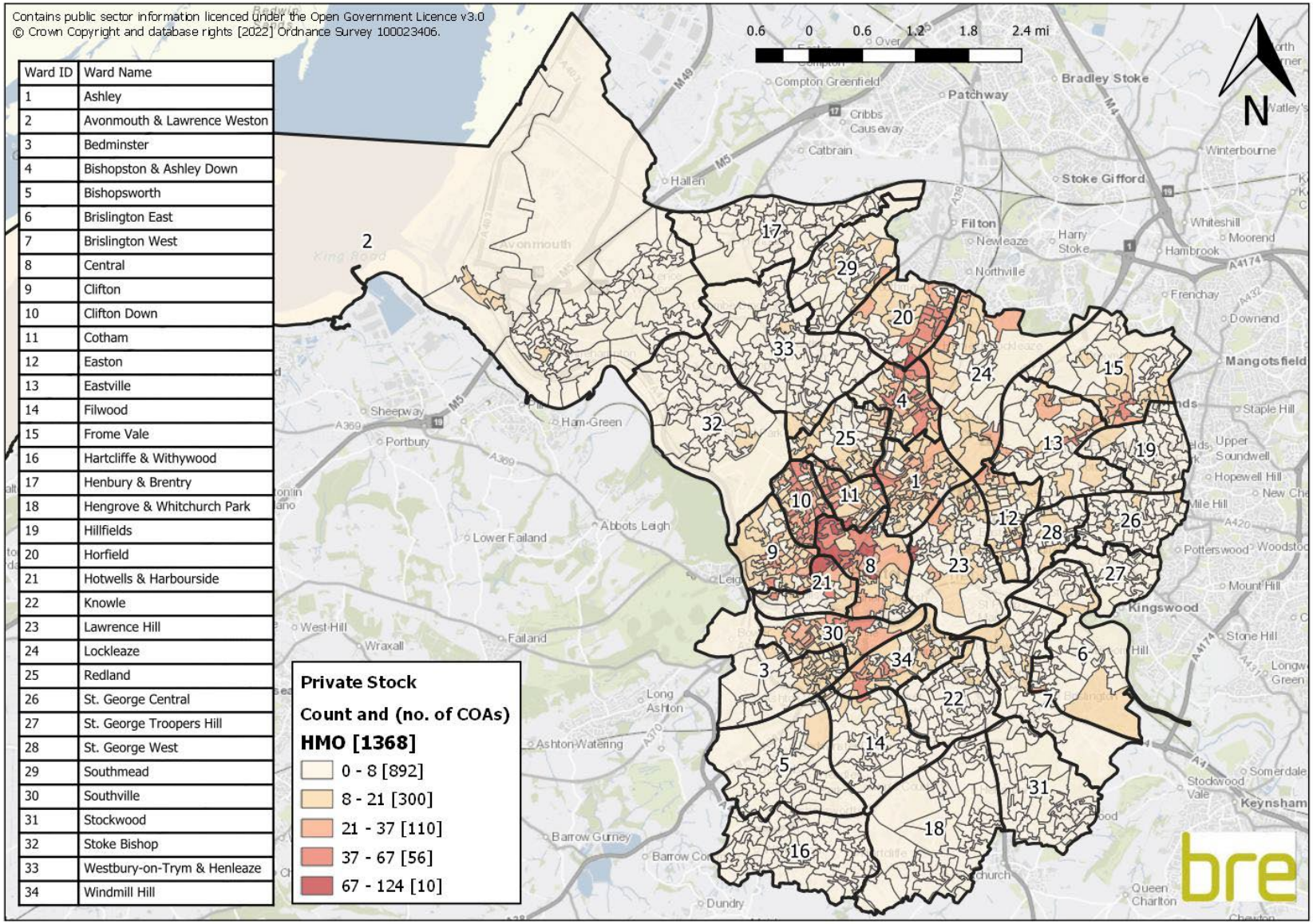
Ward	Dwellings - private rented stock	HMOs	Mandatory Licensable HMOs
Ashley	2,775	935 (34%)	726 (26%)
Avonmouth & Lawrence Weston	1,701	195 (11%)	67 (4%)
Bedminster	1,941	340 (18%)	217 (11%)
Bishopston & Ashley Down	1,675	816 (49%)	582 (35%)
Bishopsworth	1,061	76 (7%)	7 (1%)
Brislington East	1,009	121 (12%)	29 (3%)
Brislington West	1,399	181 (13%)	90 (6%)
Central	5,505	1,129 (21%)	734 (13%)
Clifton	3,312	762 (23%)	552 (17%)
Clifton Down	3,095	1,091 (35%)	882 (28%)
Cotham	2,591	984 (38%)	839 (32%)
Easton	1,458	478 (33%)	297 (20%)
Eastville	1,787	444 (25%)	279 (16%)
Filwood	1,257	133 (11%)	11 (1%)
Frome Vale	1,355	377 (28%)	202 (15%)
Hartcliffe & Withywood	1,409	100 (7%)	13 (1%)
Henbury & Brentry	757	60 (8%)	21 (3%)

Table 13 cont.: Number (and % of private rented stock) of HMOs and licensable HMOs by ward

Ward	Dwellings - private rented stock	HMOs	Mandatory Licensable HMOs
Hengrove & Whitchurch Park	874	62 (7%)	20 (2%)
Hillfields	573	136 (24%)	61 (11%)
Horfield	1,867	869 (47%)	560 (30%)
Hotwells & Harbourside	1,980	306 (15%)	220 (11%)
Knowle	932	148 (16%)	50 (5%)
Lawrence Hill	2,253	606 (27%)	236 (10%)
Lockleaze	1,337	405 (30%)	104 (8%)
Redland	1,677	521 (31%)	397 (24%)
Southmead	968	197 (20%)	54 (6%)
Southville	2,399	716 (30%)	433 (18%)
St. George Central	1,331	173 (13%)	61 (5%)
St. George Troopers Hill	375	38 (10%)	9 (2%)
St. George West	1,018	108 (11%)	64 (6%)
Stockwood	607	53 (9%)	17 (3%)
Stoke Bishop	393	54 (14%)	18 (5%)
Westbury-on-Trym & Henleaze	883	137 (16%)	78 (9%)
Windmill Hill	2,116	598 (28%)	301 (14%)

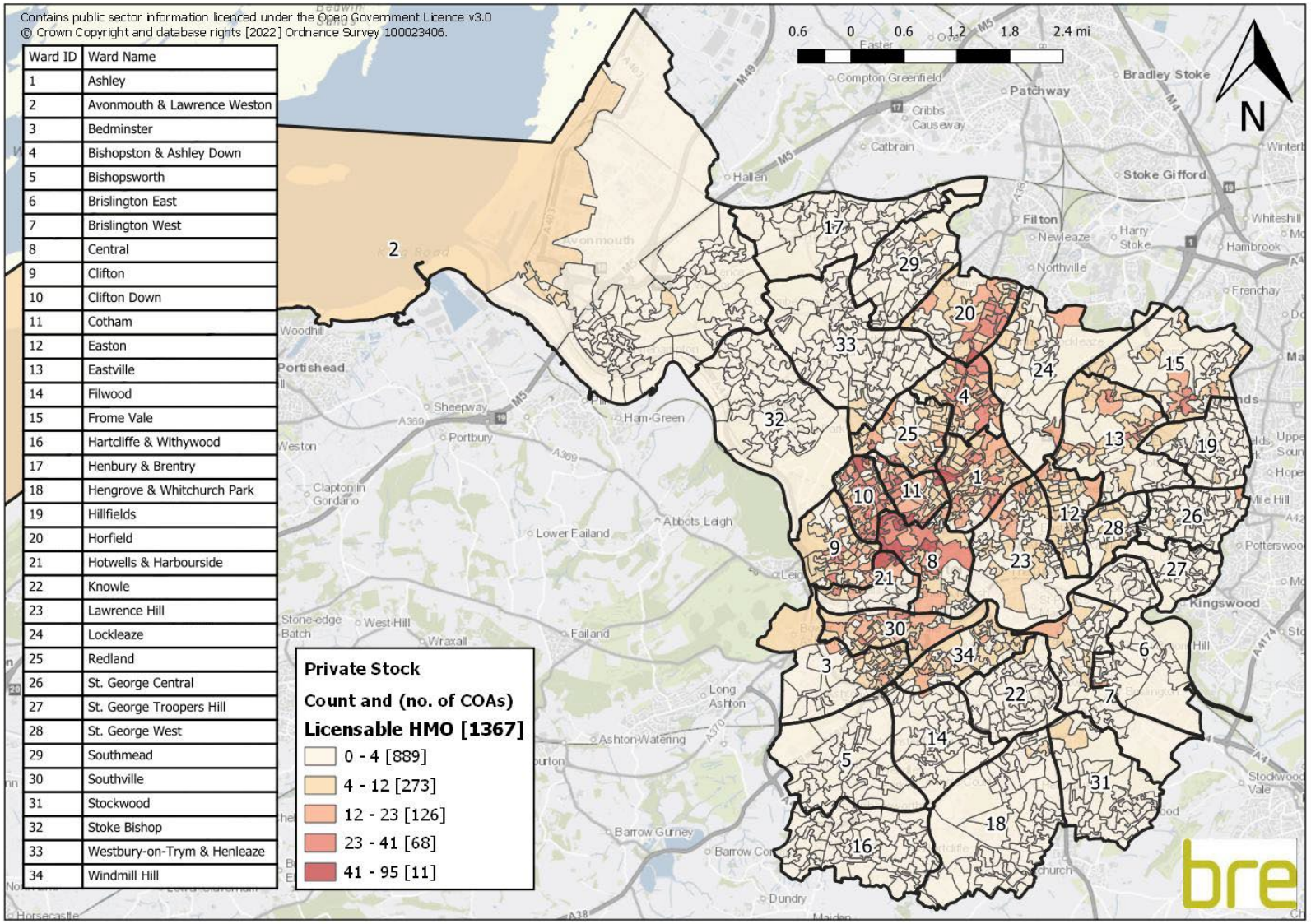
Map 15 shows the geographic distribution of HMOs and **Map 16** shows the distribution of mandatory licensable HMOs. The maps show that the majority of HMOs are located towards the central and northern parts of Bristol, with notable concentrations to the north west of Centre ward, the north of Hotwells & Harbourside, the eastern side of Horfield and the east of Bedminster, as well as the majority of Clifton Down, Bishopston & Ashley Down and Cotham. Additionally, there are pockets within Eastville and Frome Vale that have high levels of HMOs. The picture is very similar for Licensable HMOs, which are mainly found in Central ward, Clifton Down, Bishopston & Ashley Down and Cotham, as well as the eastern side of Horfield and the north of Hotwells & Harbourside. **Maps D.23** to **Map D. 26** zoom in on the north and south areas of Bristol for HMOs and licensable HMOs, respectively. 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.

Map 15: Count of HMOs. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 16: Count of mandatory licensable HMOs. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

5.1.1 Housing standards variables for HMOs

HMOs compared to non-HMOs

Table 14 and **Figure 10** show the results for each of the housing standards variables in Bristol for the private rented sector split into non-HMOs and HMOs. HMOs have higher levels of fuel poverty (LIHC) (23% compared to 15%), disrepair (6% compared to 4%), excess cold (3% compared to 2%), fall hazards (5% compared to 3%) and similar levels of all hazards (12%) and fuel poverty 10% (5%), but lower levels of low income households (18% compared to 39%).

Figure 11 compares the average SimpleSAP ratings for HMOs compared to non-HMOs and shows that HMOs have lower energy efficiency levels compared to non-HMOs (average SimpleSAP score of 58 compared to 61).

Table 14: Estimates of the percentage of private rented dwellings meeting the housing standards variables assessed using HMO data provided by Bristol City Council and the Housing Stock Models – HMOs compared to non-HMOs

Housing Standards Variable		Private rented sector stock			
		Non HMOs		HMOs	
		No.	%	No.	%
No. of dwellings		42,321	-	13,349	-
HHSRS category 1 hazards	All hazards	5,087	12%	1,521	11%
	Excess cold	1,011	2%	348	3%
	Fall hazards	1,371	3%	666	5%
Disrepair		1,861	4%	740	6%
Fuel poverty (10%)		2,237	5%	651	5%
Fuel poverty (Low Income High Costs)		6,413	15%	3,068	23%
Low income households		16,484	39%	2,344	18%

Figure 10: Estimates of the percentage of private rented dwellings meeting the housing standards variables assessed using HMO data provided by Bristol City Council and by the Housing Stock Models – HMOs compared to non-HMOs

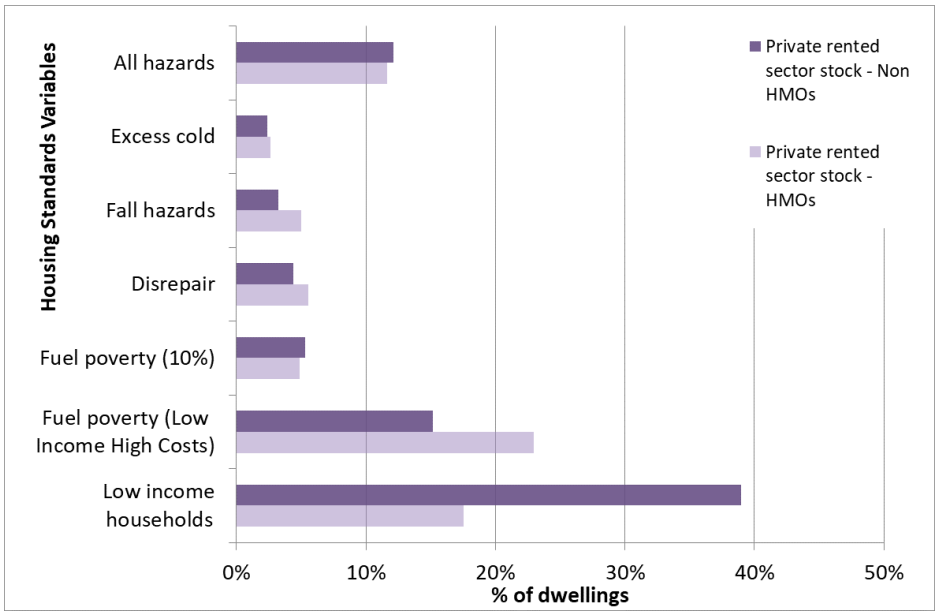
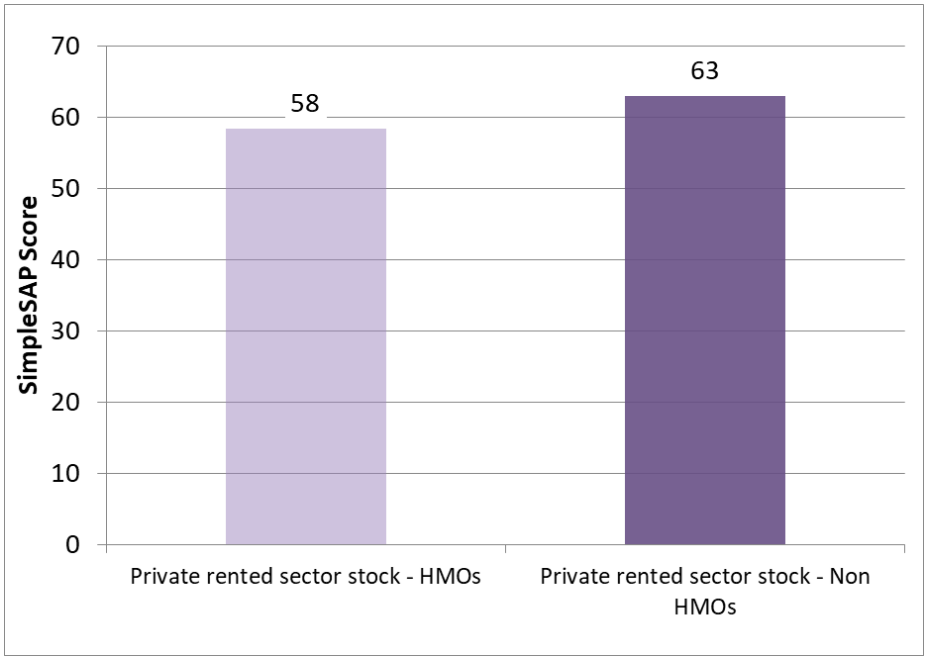


Figure 11: Average SimpleSAP ratings for HMOs compared to non-HMOs in Bristol (assessed using HMO data provided by Bristol City Council and the Housing Stock Models)



5.1.2 Non-licensable HMOs compared to licensable HMOs

Table 15 and **Figure 12** show the results for each of the housing standards variables in Bristol for HMOs split into other HMOs and mandatory HMOs. Mandatory HMOs have lower levels of low income households (14% compared to 23%) and similar levels of excess cold (both 3%), but higher levels of all hazards (13% compared to 9%), fall hazards (7% compared to 2%), fuel poverty (10%) (6% compared to 4%) and fuel poverty (LIHC) (27% compared to 17%).

Figure 13 compares the average SimpleSAP ratings for other HMOs and mandatory HMOs and shows that mandatory HMOs have slightly lower energy efficiency levels compared to other HMOs (average SimpleSAP score of 57 compared to 60).

Table 15: Estimates of the percentage of dwellings meeting the housing standards variables (assessed using HMO data provided by Bristol City Council and the Housing Stock Models) - other HMOs compared to mandatory HMOs

Housing Standards Variable		Other HMOs		Mandatory and Additional	
		No.	%	No.	%
No. of dwellings		5,118	-	8,231	-
HHSRS category 1 hazards	All hazards	450	9%	1,102	13%
	Excess cold	135	3%	213	3%
	Fall hazards	116	2%	550	7%
Disrepair		266	5%	474	6%
Fuel poverty (10%)		194	4%	457	6%
Fuel poverty (Low Income High Costs)		848	17%	2,220	27%
Low income households		1,177	23%	1,167	14%

Figure 12: Estimates of the percentage of dwellings meeting the housing standards variables (assessed using HMO data provided by Bristol City Council and the Housing Stock Models) - other HMOs compared to mandatory and additional HMOs

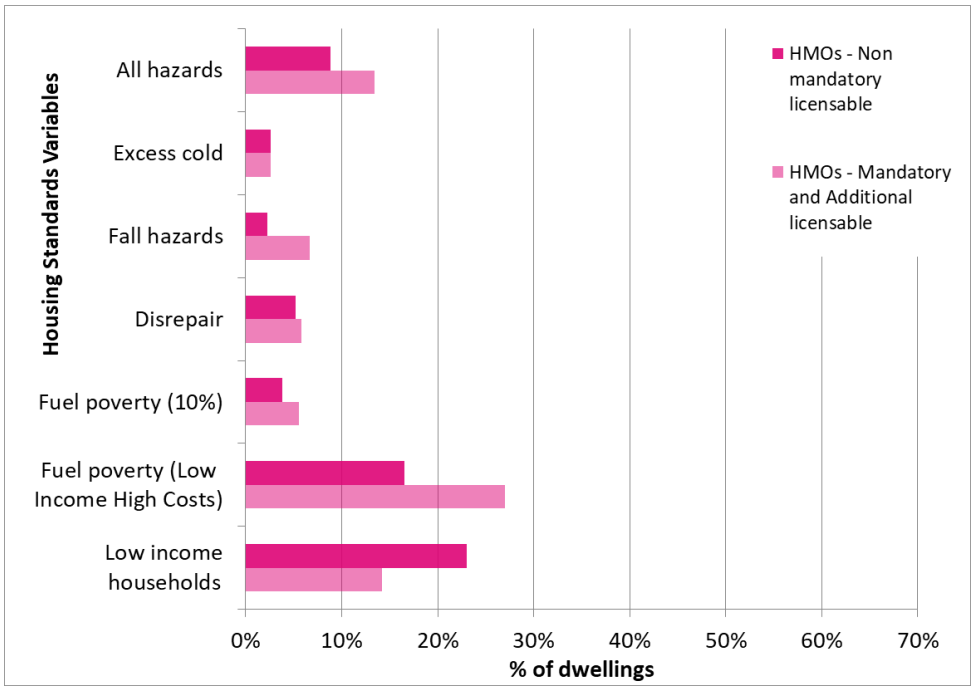
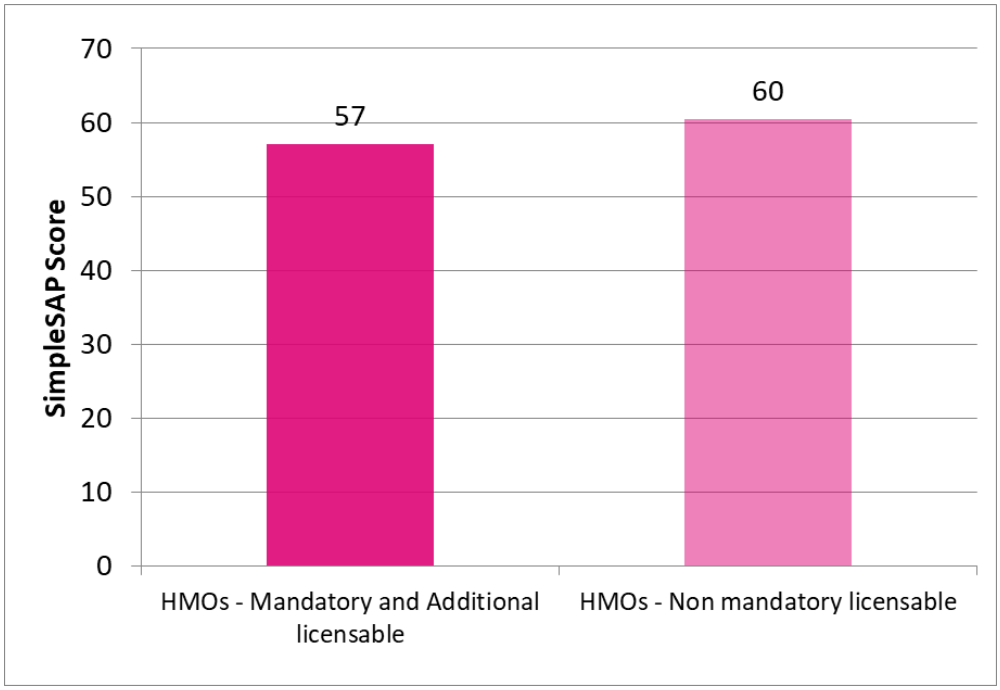


Figure 13: Average SimpleSAP ratings for other HMOs compared to mandatory and additional HMOs in Bristol (assessed using HMO data provided by Bristol City Council and the Housing Stock Models)



5.1.3 Potential areas for investigation within Bristol's HMOs

Table 16 shows the number of HMOs in each ward as well as the proportion of those HMOs containing a category 1 hazard or being in disrepair. Wards with high levels of HMOs and with high proportions of hazards or in disrepair may be a starting point when considering which areas to be targeted for improvement. For example, Ashley has a relatively high number of HMOs (935) and of these 14% are estimated to have a category 1 hazard, 7% to have fall hazards and 3% to be in disrepair. Central has 1,129 HMOs and high hazard levels, including all hazards (12%), excess cold (5%), fall hazard (3%) and disrepair (6%). Equally Clifton Down and Cotham both have high levels of HMOs (1,019 and 984 respectively) as well as high levels of all hazards (11% and 14%%), excess cold (3% and 4%) and fall hazards (4% and 6%).

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Table 16: Number of HMOs (including data from Bristol City Council which was integrated into the dataset and percentage of those HMOs containing a category 1 hazard or being in disrepair, by ward)

Ward	HMOs	HHSRS category 1 hazards			Disrepair
		All hazards	Excess cold	Fall hazards	
Ashley	935	124 (13%)	18 (2%)	68 (7%)	32 (3%)
Avonmouth & Lawrence	195	10 (5%)	4 (2%)	7 (4%)	11 (6%)
Bedminster	340	44 (13%)	7 (2%)	20 (6%)	31 (9%)
Bishopston & Ashley Down	816	136 (17%)	15 (2%)	70 (9%)	49 (6%)
Bishopsworth	76	6 (8%)	1 (1%)	4 (5%)	3 (4%)
Brislington East	121	11 (9%)	1 (1%)	3 (2%)	2 (2%)
Brislington West	181	20 (11%)	3 (2%)	9 (5%)	20 (11%)
Central	1,129	132 (12%)	61 (5%)	39 (3%)	65 (6%)
Clifton	762	81 (11%)	19 (2%)	36 (5%)	83 (11%)
Clifton Down	1,091	118 (11%)	30 (3%)	48 (4%)	38 (3%)
Cotham	984	131 (13%)	35 (4%)	57 (6%)	47 (5%)
Easton	478	61 (13%)	7 (1%)	21 (4%)	20 (4%)
Eastville	444	39 (9%)	6 (1%)	20 (5%)	5 (1%)
Filwood	133	10 (8%)	3 (2%)	6 (5%)	6 (5%)
Frome Vale	377	23 (6%)	3 (1%)	10 (3%)	13 (3%)
Hartcliffe & Withywood	100	14 (14%)	5 (5%)	6 (6%)	6 (6%)
Henbury & Brentry	60	3 (5%)	1 (2%)	1 (2%)	3 (5%)

Table 16 cont.: Number of HMOs (including data from Bristol City Council which was integrated into the dataset and percentage of those HMOs containing a category 1 hazard or being in disrepair, by ward)

Ward	HMOs	HHSRS category 1 hazards			Disrepair
		All hazards	Excess cold	Fall hazards	
Hengrove & Whitchurch Park	62	5 (8%)	0 (0%)	4 (6%)	0 (0%)
Hillfields	136	12 (9%)	1 (1%)	7 (5%)	3 (2%)
Horfield	869	92 (11%)	19 (2%)	42 (5%)	48 (6%)
Hotwells & Harbourside	306	37 (12%)	9 (3%)	16 (5%)	34 (11%)
Knowle	148	15 (10%)	2 (1%)	6 (4%)	14 (9%)
Lawrence Hill	606	72 (12%)	29 (5%)	16 (3%)	16 (3%)
Lockleaze	405	28 (7%)	6 (1%)	11 (3%)	15 (4%)
Redland	521	66 (13%)	15 (3%)	35 (7%)	19 (4%)
Southmead	197	16 (8%)	4 (2%)	6 (3%)	11 (6%)
Southville	716	93 (13%)	17 (2%)	43 (6%)	75 (10%)
St. George Central	173	12 (7%)	3 (2%)	4 (2%)	6 (3%)
St. George Troopers Hill	38	1 (3%)	0 (0%)	2 (5%)	4 (11%)
St. George West	108	9 (8%)	2 (2%)	6 (6%)	6 (6%)
Stockwood	53	1 (2%)	0 (0%)	1 (2%)	0 (0%)
Stoke Bishop	54	4 (7%)	1 (2%)	2 (4%)	1 (2%)
Westbury-on-Trym &	137	20 (15%)	7 (5%)	12 (9%)	5 (4%)
Windmill Hill	598	75 (13%)	14 (2%)	28 (5%)	49 (8%)

5.2 Selective licensing

Selective licensing is different to additional licensing as it covers all private rented sector properties (excluding any HMOs already licensed under HMO schemes). Selective licensing must be part of the overall strategic approach taken by an authority. The main aim of selective licensing is to address the problems caused by poor quality private rented accommodation[70].

Section 80 of the 2004 Housing Act[71] gives powers to Local Housing Authorities (LHAs) to designate geographical areas to be licensed, provided certain conditions are met. The power does not permit LHAs to require licensing of houses that have been exempted under the Selective Licensing of Houses (Specified exemptions) (England) Order 2006, or a property that is subject to a tenancy or licence granted by a body which is registered as a social landlord under Part 1 of the Housing Act 1996. Furthermore, a local housing authority will need to apply to the Secretary of State for confirmation of any scheme which covers more than 20% of their geographical area, or that would affect more than 20% of privately rented homes in the local authority area. Prior to the introduction of a licensing scheme, there must be a consultation with residents, landlords and tenants and any others likely to be affected. If the selective licensing scheme is adopted, then landlords who rent out properties in that area will be required to obtain a licence from the local authority for each of their properties. Failure to do so, or if they fail to achieve minimum standards the authority can take enforcement action. More details can be found in the DCLG document "Selective licensing in the private rented sector: A guide for local authorities"[72].

The conditions which apply to Selective licensing areas are split into 3 "sets", each of which has several conditions. Any of the three sets needs to be met in order for a local authority to designate a selective licensing area. The requirements of each of the sets are summarised as follows:

Set one:

- The area has low housing demand (or is likely to become such an area)
- Selective licensing will contribute to the improvement of the social or economic conditions in the area, when combined with other measures taken in the area

Set two:

- The area has a significant and persistent problem cause by anti-social behaviour
- Some or all of the private landlords letting dwellings in the area are failing to take appropriate action to combat the problem
- Selective licensing will lead to a reduction/elimination of the problem, when combined with other measures taken in the area

[70] http://researchbriefings.files.parliament.uk/documents/SN04634/SN04634.pdf

[71] http://www.legislation.gov.uk/ukpga/2004/34/pdfs/ukpga_20040034_en.pdf

[72] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/418551/150327_Guidance_on_selective_licensing_applications_FINAL_updated_isbn.pdf

Set three:

- The area has a high proportion of properties in the private rented sector, compared to the total number of properties in the area – this is suggested as being the national average as reported in the latest available English Housing Survey (currently 19%)[73]
- These properties are occupied under either assured tenancies or licences to occupy
- One or more of the following conditions is satisfied:

  - **Housing conditions** – the authority has reviewed housing conditions in the area and that it considers it would be appropriate for a significant number of properties in the area to be inspected to determine presence of category 1 or 2 hazards, or the authority intends to carry out inspections with a view to carrying out enforcement action; selective licensing, combined with other measures, will contribute to an improvement in general housing conditions in the area.

  - **Migration** – the area has recently or is experiencing high levels of migration, a significant number of properties in the area are occupied by migrants; selective licensing will contribute to an improvement in the social or economic conditions in the area and ensuring that properties are properly managed, and overcrowding is prevented.

  - **Deprivation** – the area has high levels of deprivation which affects a significant number of the occupiers; selective licensing, combined with other measures, will contribute to a reduction in deprivation levels in the area. To determine if an area has high levels of deprivation the authority can look at: employment status, average income, health, access to education, training and services, housing conditions, physical environment, crime levels.

  - **Crime** – the area has high levels of crime which affects those living in the area; selective licensing, combined with other measures, will contribute to a reduction in crime levels in the area for the benefit of those living in the area.

5.2.1 Indicators for investigation

As detailed, there are various criteria which can be used to designate areas for selective licensing. The criteria which were investigated in more detail are:

- The proportion of dwellings that are privately rented

- Information on property condition - proportion of dwellings:

  - With a category 1 Housing Health and Safety Rating System (HHSRS) hazard – this is the presence of one or more of the 29 hazards covered by the HHSRS[74]

[73] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860076/2018-19_EHS_Headline_Report.pdf

[74] For a full list of hazards see - Housing Health and Safety Rating System Operating Guidance, ODPM, 2006 - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

- With a category 1 HHSRS hazard for excess cold
- With a category 1 HHSRS fall hazard – these include those fall hazards where the vulnerable person is 60 or over i.e. the presence of falls associated with baths, falling on the level and falling on stairs
- In disrepair – this is based on the former Decent Homes Standard criteria for disrepair which 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 dwellings and the condition of a range of building components including walls, roofs, windows, doors, electrics and heating systems)

- Information on deprivation based on the 2019 Indices of Multiple Deprivation (IMD)[75]
- Information on crime - Anti-Social Behaviour (ASB)
- Information on migration

5.2.2 Proportions of dwellings that are privately rented overall and by ward

The percentage of stock in Bristol which is privately rented is estimated to be 27%. This is considerably higher than the figure for England – 19%[76].

There are 22 (of a total of 34) wards with private rented proportions in excess of the national average (19%) – these are depicted in **Table 17** by the thick dashed line. Those wards with over 19% private rented stock have been further divided into 3 groups for analysis (depicted by the thin dashed lines in the table). These groups are as follows:

Wards with PRS of over 50%

- Hotwells & Harbourside
- Central
- Clifton Down
- Cotham
- Clifton

[75] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

[76] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860076/2018-19_EHS_Headline_Report.pdf

Wards with PRS over 30 - 50%

- Southville
- Horfield
- Windmill Hill
- Bishopston & Ashley Down
- Ashley
- Bedminster
- Redland
- St. George West

Wards with PRS between over 19 - 30% (above national average of 19%)

- Eastville
- Lawrence Hill
- Brislington West
- Lockleaze
- Frome Vale
- Easton
- Filwood
- St George Central
- Bishopsworth

Map 17 shows the location of these three analysis groups within Bristol.

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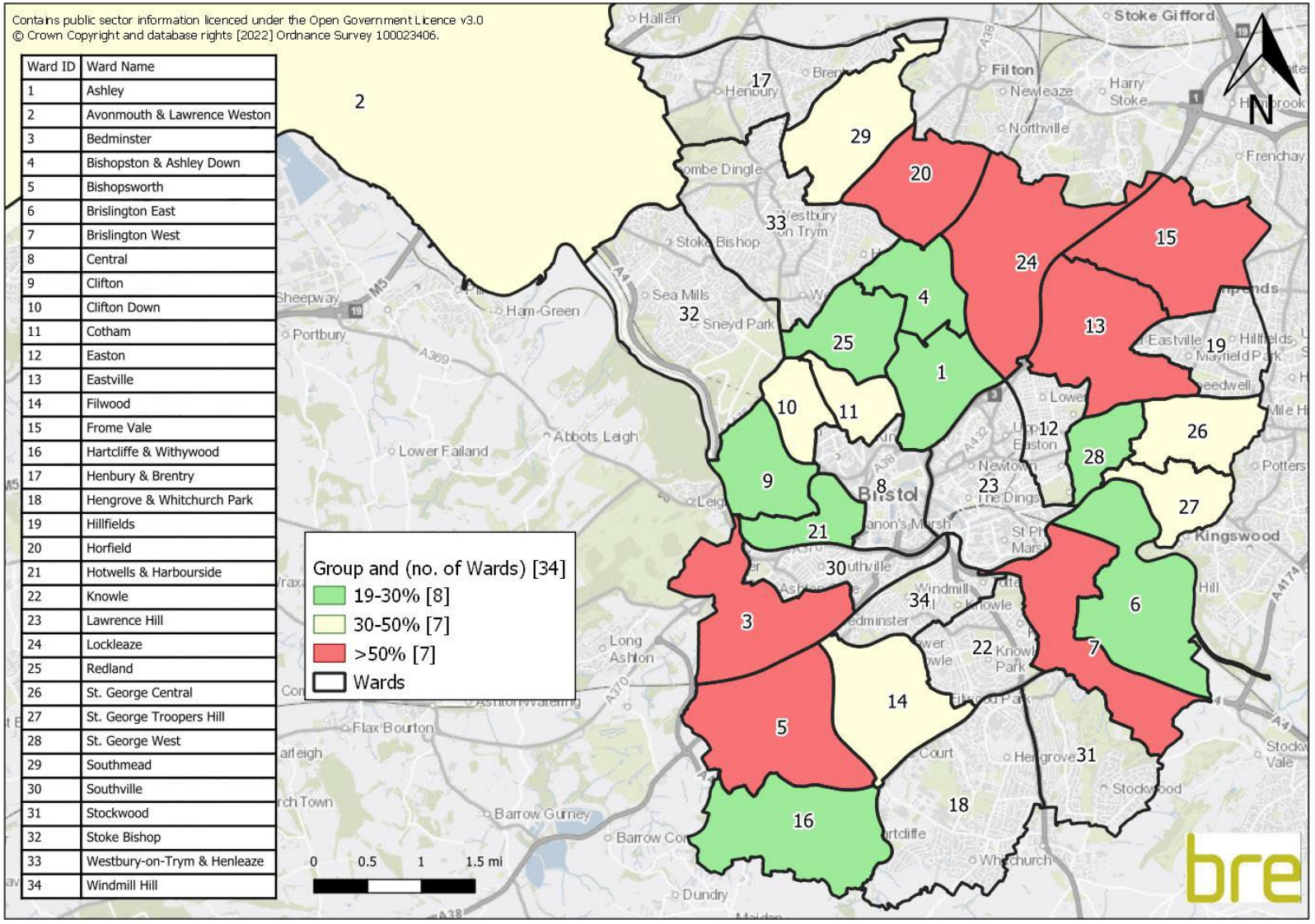
Table 17: Count and percentage of estimated privately rented dwellings by ward in Bristol (sorted by descending private rented proportion)

Ward	Dwellings - all stock	Dwellings - private rented	
		Count	%
Hotwells & Harbourside	3,307	1,980	60%
Central	9,300	5,505	59%
Clifton Down	5,381	3,095	58%
Cotham	4,877	2,591	53%
Clifton	6,573	3,312	50%
Southville	5,916	2,399	41%
Horfield	5,540	1,867	34%
Windmill Hill	6,286	2,116	34%
Bishopston & Ashley Down	5,138	1,675	33%
Ashley	8,542	2,775	32%
Bedminster	6,023	1,941	32%
Redland	5,492	1,677	31%
St George West	3,373	1,018	30%
Eastville	6,407	1,787	28%
Lawrence Hill	8,246	2,253	27%
Brislington West	5,313	1,399	26%
Lockleaze	5,320	1,337	25%
Frome Vale	5,648	1,355	24%
Easton	6,329	1,458	23%
Filwood	5,582	1,257	23%
St. George Central	5,987	1,331	22%
Bishopsworth	5,299	1,061	20%
Brislington East	5,373	1,009	19%
Avonmouth & Lawrence Weston	9,423	1,701	18%
Southmead	5,390	968	18%
Hartcliffe & Withywood	8,132	1,409	17%

Table 17 cont.: Count and percentage of estimated privately rented dwellings by ward in Bristol (sorted by descending private rented proportion)

Ward	Dwellings - all stock	Dwellings - private rented	
		Count	%
Knowle	5,502	932	17%
St George Troopers Hll	2,680	375	14%
Henbury & Brentry	5,891	757	13%
Stockwood	5,171	607	12%
Hengrove & Whitchurch Park	7,871	874	11%
Hillfields	5,246	573	11%
Westbury-on-Trym & Henleaze	8,511	883	10%
Stoke Bishop	4,653	393	8%

Map 17: Location of the three analysis groups with proportions of private rented stock which are greater than the national average (19%)



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

5.2.3 Information on property condition

Information on property condition is based on the presence of a category 1 HHSRS hazard (one or more of the 29 covered by the HHSRS[77]), a category 1 hazard for excess cold and a category 1 hazard for falls (these are fall hazards where the vulnerable person is over 60 and includes falls associated with baths, falling on the level and falling on stairs). Property condition also includes proportions of dwellings in disrepair. This is based on the former Decent Homes Standard and assesses the age of the dwelling and the condition of a range of building components – e.g., walls, roofs, electrics and heating systems.

Maps at COA level are provided for the private rented sector for the following housing standards variables in **Map 18** to **Map 21** below:

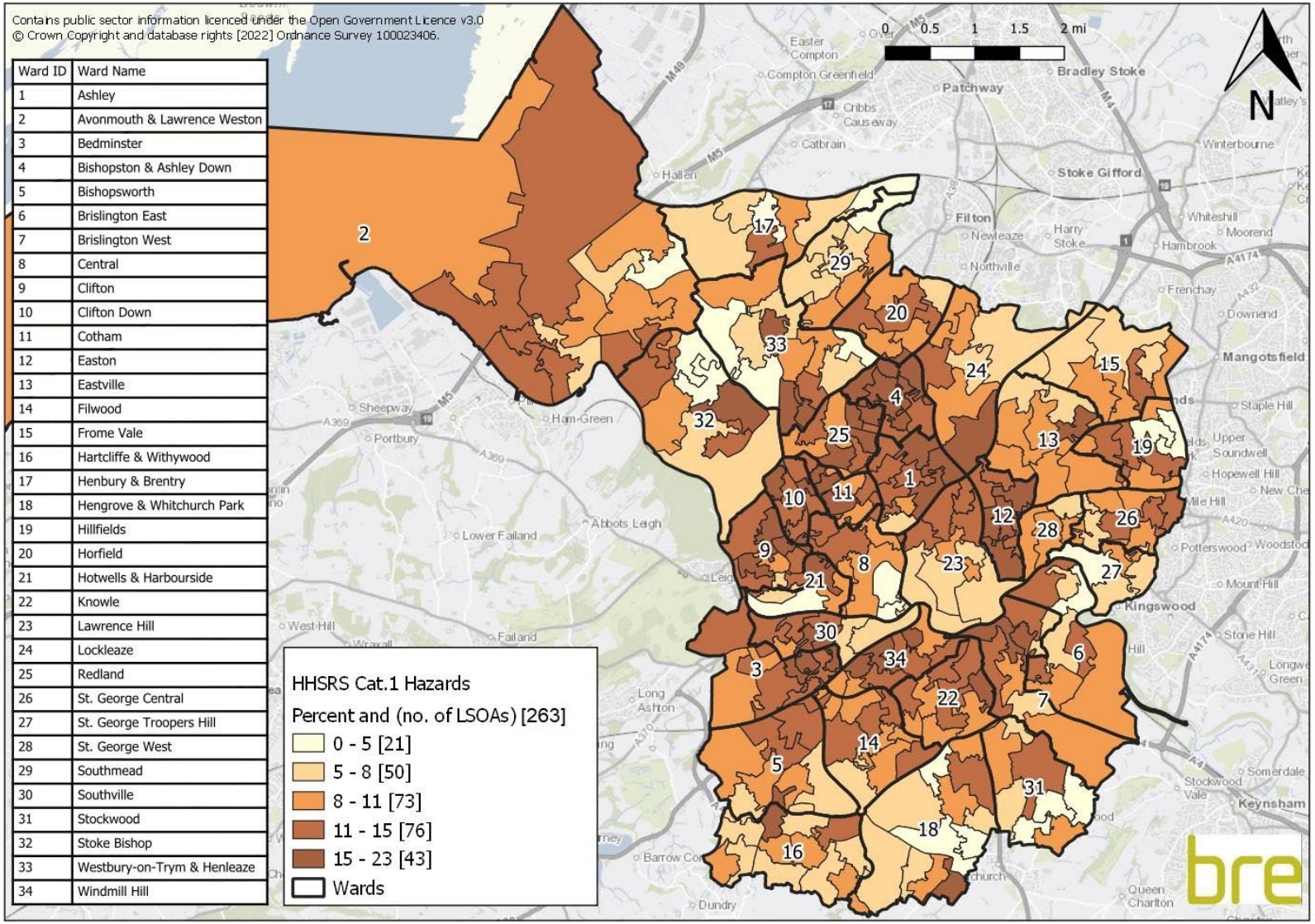
- **HHSRS**
  - The presence of a category 1 HHSRS hazard
  - The presence of a category 1 hazard for excess cold
  - The presence of a category 1 hazard for falls

- **Levels of disrepair**

Table 18 provides a summary of property condition at ward level and is split into the groups described above based on the proportion of private rented stock in each ward. This table shows that the highest levels of all hazards (16%) are in Bedminster and Bishopston & Ashley Down, the highest levels of excess cold are found in Central (5%), the highest levels of fall hazards are found in Easton (6%) and the highest levels of disrepair (7%) is in Bishopston & Ashley Down.

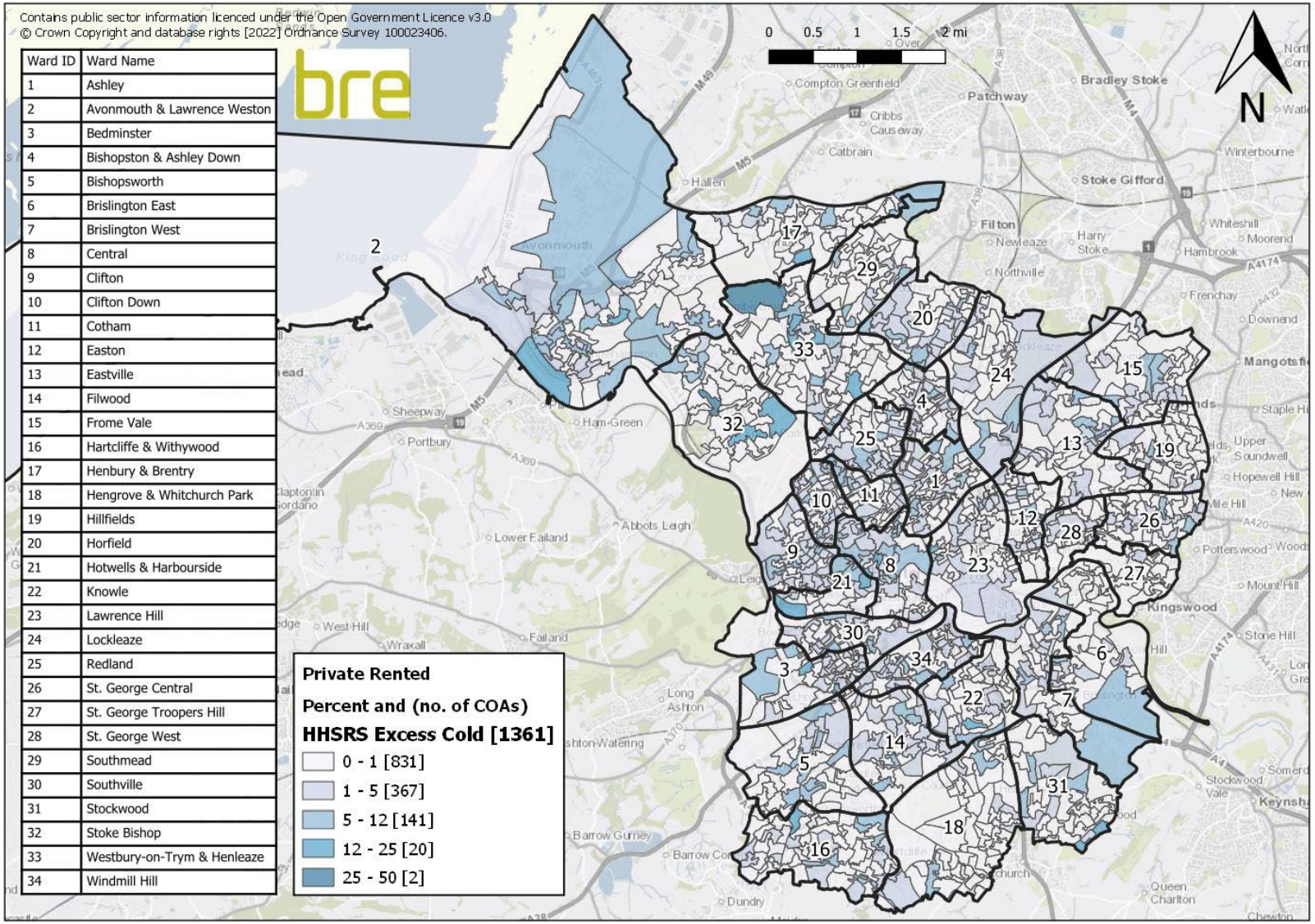
[77] For a full list of hazards see - Housing Health and Safety Rating System Operating Guidance, ODPM, 2006 - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

Map 18: Percentage of private rented sector dwellings in Bristol with the presence of a HHSRS category 1 hazard



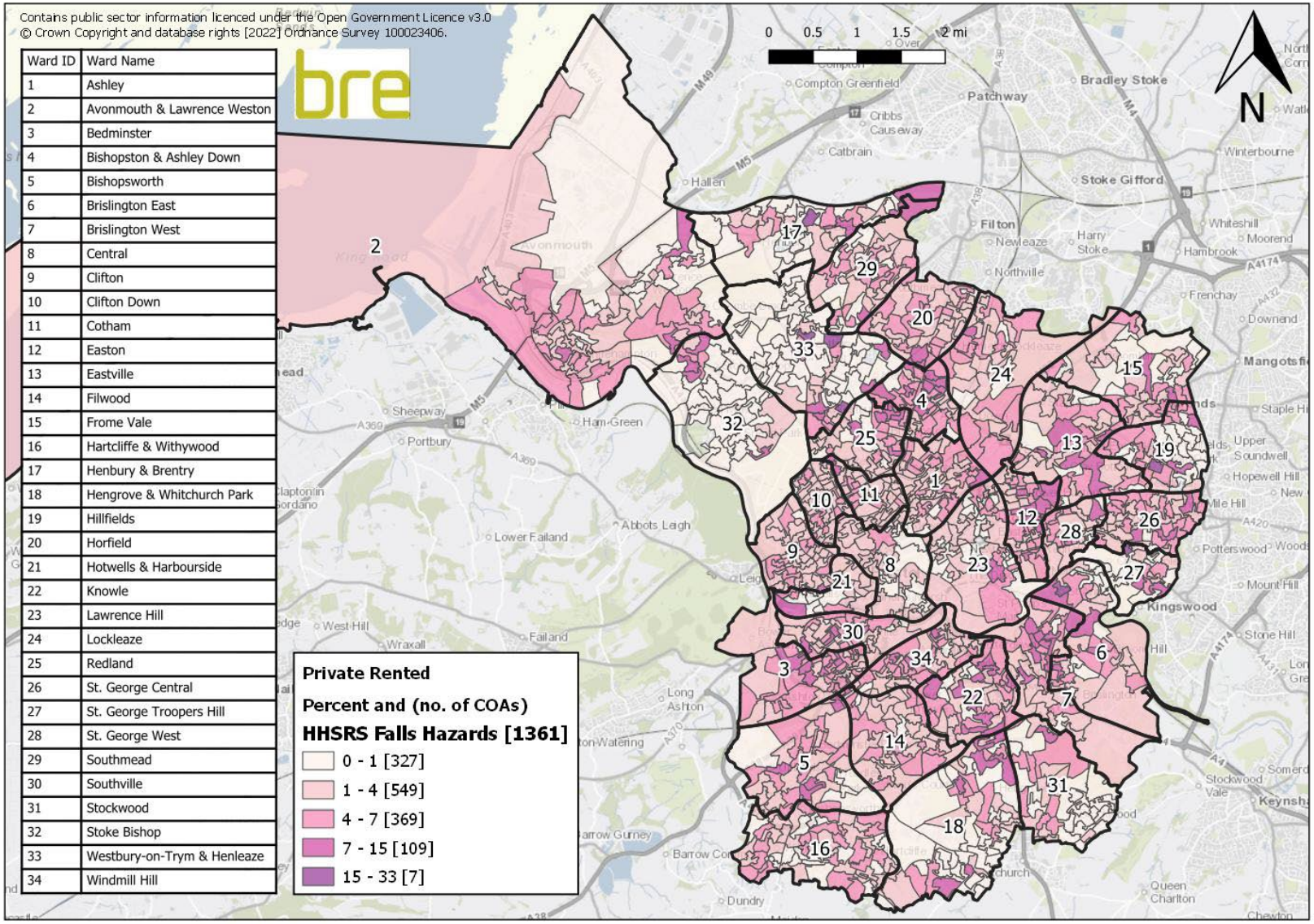
Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 19: Percentage of private rented sector dwellings in Bristol with the presence of a HHSRS category 1 hazard for excess cold



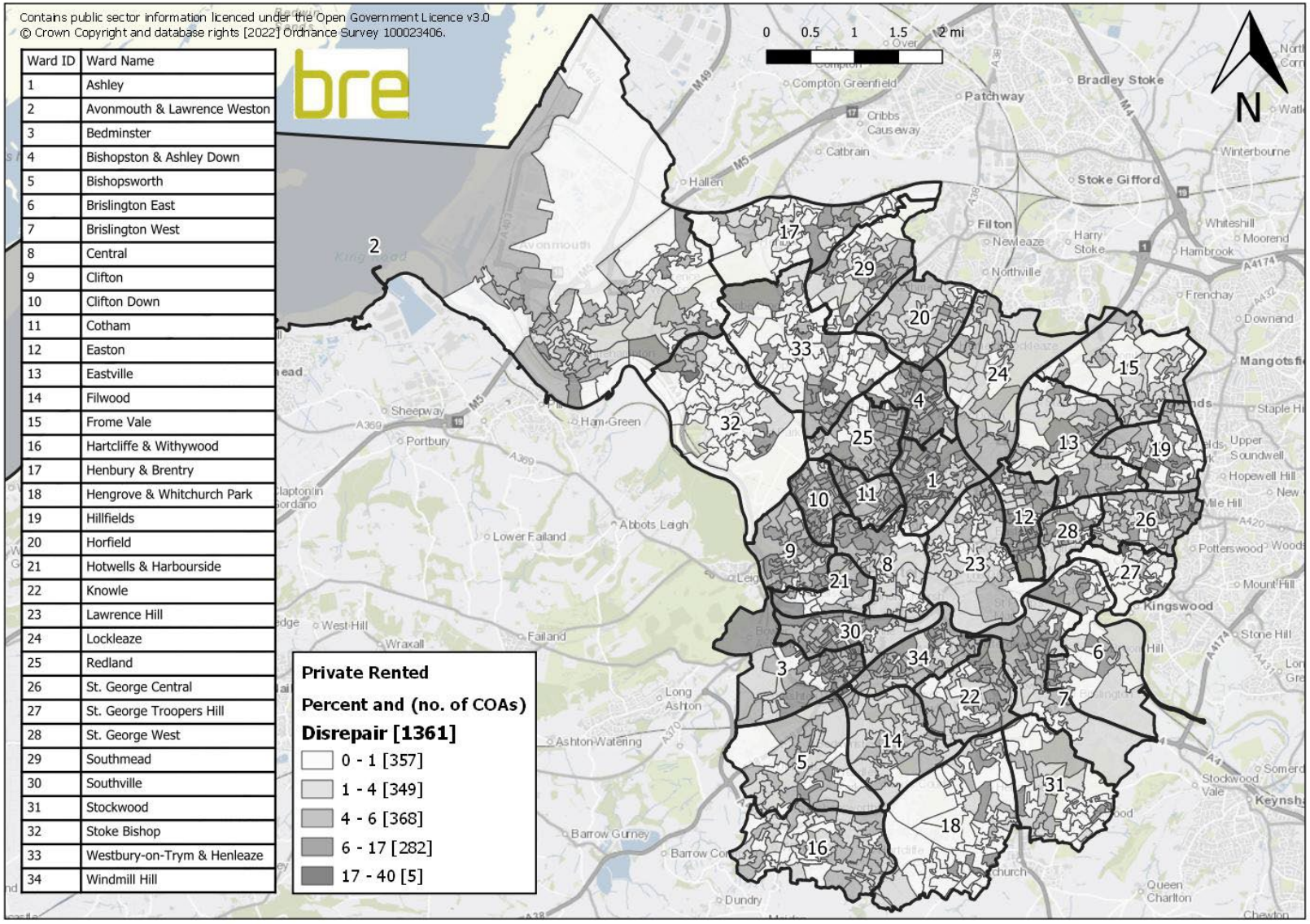
Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 20: Percentage of private rented sector dwellings in Bristol with the presence of a HHSRS category 1 hazard for falls



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 21: Percentage of private rented sector dwellings in Bristol in disrepair



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Table 18: Count and percentage of dwellings failing each of the HHSRS indicators and disrepair by ward, split into the 3 analysis groups, *private rented stock*

Ward	No. of dwellings private rented stock	HHSRS category 1 hazards			Disrepair
		All hazards	Excess cold	Fall hazards	
Hotwells & Harbourside	1,980 (60%)	201 (10%)	54 (3%)	46 (2%)	77 (4%)
Central	5,505 (59%)	578 (10%)	248 (5%)	113 (2%)	201 (4%)
Clifton Down	3,095 (58%)	429 (14%)	79 (3%)	115 (4%)	195 (6%)
Cotham	2,591 (53%)	368 (14%)	73 (3%)	99 (4%)	151 (6%)
Clifton	3,312 (50%)	452 (14%)	83 (3%)	117 (4%)	192 (6%)
Southville	2,399 (41%)	292 (12%)	53 (2%)	89 (4%)	122 (5%)
Horfield	1,867 (34%)	216 (12%)	39 (2%)	77 (4%)	85 (5%)
Windmill Hill	2,116 (34%)	309 (15%)	48 (2%)	92 (4%)	113 (5%)
Bishopston & Ashley Down	1,675 (33%)	272 (16%)	31 (2%)	89 (5%)	110 (7%)
Ashley	2,775 (32%)	379 (14%)	55 (2%)	105 (4%)	158 (6%)
Bedminster	1,941 (32%)	304 (16%)	62 (3%)	93 (5%)	115 (6%)
Redland	1,677 (31%)	219 (13%)	36 (2%)	59 (4%)	93 (6%)
St. George West	1,018 (30%)	112 (11%)	12 (1%)	39 (4%)	52 (5%)
Eastville	1,787 (28%)	197 (11%)	34 (2%)	69 (4%)	77 (4%)
Lawrence Hill	2,253 (27%)	214 (10%)	66 (3%)	54 (2%)	76 (3%)
Brislington West	1,399 (26%)	190 (14%)	27 (2%)	73 (5%)	72 (5%)
Lockleaze	1,337 (25%)	138 (10%)	27 (2%)	54 (4%)	49 (4%)
Frome Vale	1,355 (24%)	126 (9%)	26 (2%)	51 (4%)	46 (3%)
Easton	1,458 (23%)	229 (16%)	21 (1%)	84 (6%)	90 (6%)
Filwood	1,257 (23%)	136 (11%)	26 (2%)	51 (4%)	55 (4%)
St George Central	1,331 (22%)	141 (11%)	25 (2%)	58 (4%)	61 (5%)
Bishopsworth	1,061 (20%)	96 (9%)	17 (2%)	37 (3%)	35 (3%)
Brislington East	1,009 (19%)	92 (9%)	12 (1%)	39 (4%)	33 (3%)

Table 18 cont.: Count and percentage of dwellings failing each of the HHSRS indicators and disrepair by ward, split into the 3 analysis groups, *private rented stock*

Ward	No. of dwellings - private rented stock	HHSRS category 1 hazards			Disrepair
		All hazards	Excess cold	Fall hazards	
Avonmouth & Lawrence Weston	1,701 (18%)	175 (10%)	52 (3%)	63 (4%)	63 (4%)
Southmead	968 (18%)	81 (8%)	13 (1%)	31 (3%)	33 (3%)
Hartcliffe & Withywood	1,409 (17%)	122 (9%)	29 (2%)	43 (3%)	44 (3%)
Knowle	932 (17%)	114 (12%)	18 (2%)	43 (5%)	46 (5%)
St George Troopers	375 (14%)	25 (7%)	1 (0%)	13 (3%)	10 (3%)
Henbury & Brentry	757 (13%)	58 (8%)	11 (1%)	22 (3%)	22 (3%)
Stockwood	607 (12%)	48 (8%)	11 (2%)	18 (3%)	17 (3%)
Hengrove & Whitchurch Park	874 (11%)	70 (8%)	12 (1%)	30 (3%)	24 (3%)
Hillfields	573 (11%)	63 (11%)	7 (1%)	26 (5%)	27 (5%)
Westbury-on-Trym & Henleaze	883 (10%)	107 (12%)	30 (3%)	31 (4%)	40 (5%)
Stoke Bishop	393 (8%)	55 (14%)	21 (5%)	14 (4%)	17 (4%)

5.2.4 Analysis of property conditions in the private rented sector for the analysis groups

This section analyses the proportion of private rented dwellings:

- With a category 1 Housing Health and Safety Rating System (HHSRS) hazard – this is the presence of one or more of the 29 hazards covered by the HHSRS (see **Appendix A** for more information)
- With a category 1 hazard for excess cold
- With a category 1 HHSRS fall hazard – these include those fall hazards where the vulnerable person is 60 or over, i.e. the presence of falls associated with baths, falling on the level and falling on stairs
- In disrepair – this is based on the former Decent Homes Standard criteria for disrepair which 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 dwellings and the condition of a range of building components (including walls, roofs, windows, doors, electrics and heating system)

Figure 14 to **Figure 16** compare these property condition indicators across the three analysis groups. For wards with over 50% of the stock being private rented, Cotham has the highest level of category 1 hazards (15%) and Central has the highest level of excess cold (5%). For fall hazard and disrepair Clifton Down, Cotham and Clifton all have similar levels (4% for fall hazards and 6% for disrepair). When compared to Bristol's average, Clifton Down, Cotham and Clifton all have slightly higher category 1 hazards and

disrepair than Bristol as a whole. With the exception of Central (5%), all other wards have an average level of excess cold (3%) and all wards had slightly lower than average levels of fall hazard.

Of the wards where over 30-50% of the stock is estimated to be private rented, Bishopston & Ashley Down and Bedminster have the highest levels of all hazards (both 16%), Bedminster also has the highest level of excess cold (3%) as well as having the highest level of fall hazards together with Horfield (both 4%). Bishopston & Ashley Down has the highest level of disrepair (7%). Compared to Bristol's average, all wards had either an average or above average level of category 1 hazards and all wards had either an average or below average level of excess cold, fall hazards and disrepair.

For the wards with 19-30% private rented stock, Easton has the highest levels of category 1 hazards (16%) and falls hazards (6%) and disrepair (6%) and Lawrence Hill has the highest levels of excess cold (3%). Compared to Bristol's average, all wards had either an average or below average level of excess cold and fall hazards. With the exception of Frome Vale, all wards had either an average or below average level of disrepair. The picture is slightly different for category 1 hazards, with Easton and Brislington West having higher than average levels, Bishopsworth having a similar level to average and all other wards having a lower than average level.

Figure 14: Comparison of percentage of private rented dwellings failing the Housing Standards Variables for wards with PRS of 50% and above

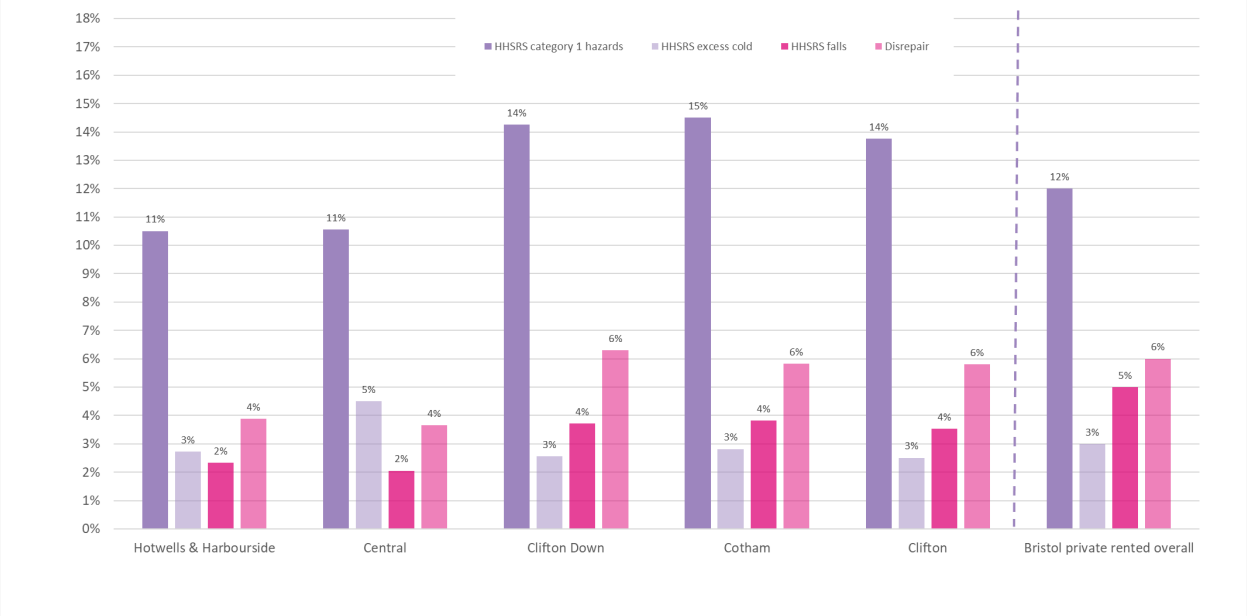


Figure 15: Comparison of percentage of private rented dwellings failing the Housing Standards Variables for wards with PRS over 30 - 50%

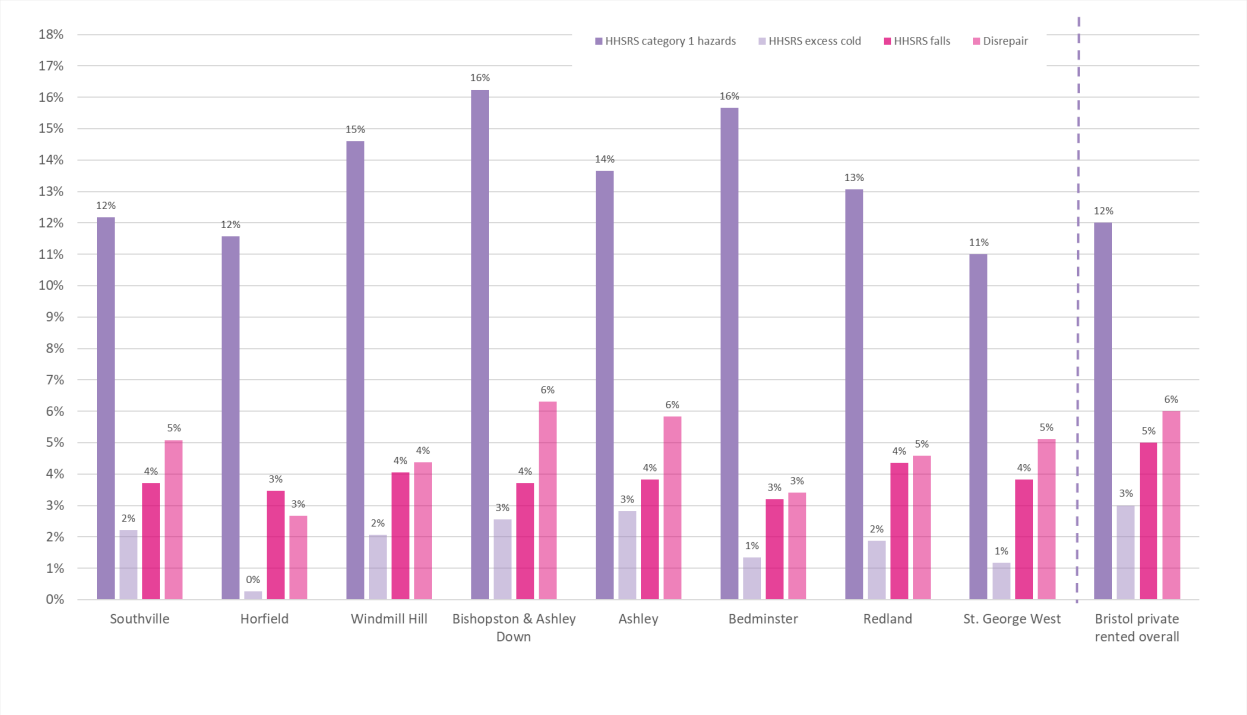
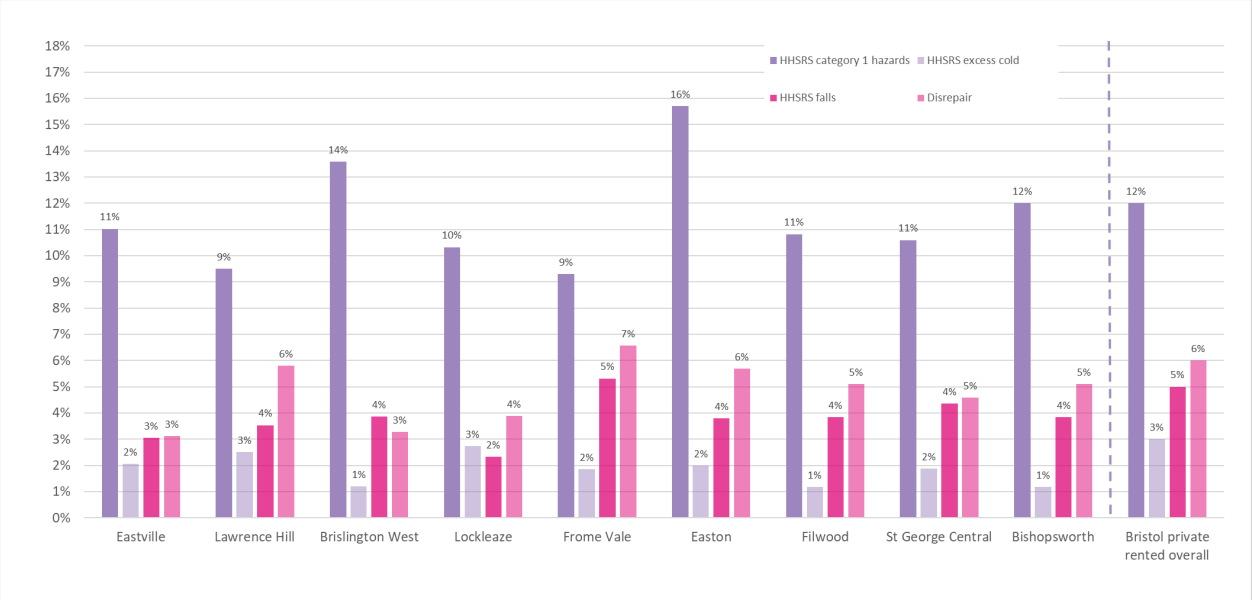


Figure 16: Comparison of percentage of private rented dwellings failing the Housing Standards Variables for wards with PRS over 19-30%



5.2.5 Information on crime - Anti-Social Behaviour (ASB)

The term anti-social behaviour (ASB) covers a range of activities which negatively affect people on a daily basis[78]. ASB is defined as "behaviours by a person which causes or is likely to cause harassment, alarm or distress to one or more persons not of the same household as the person" and is classified under 3 headings:

- Personal – ASB is perceived to be targeted at an individual or group rather than the community at large
- Nuisance – ASB is causing trouble, annoyance or suffering to the community at large rather than an individual or group
- Environmental – the incident is not aimed at an individual or group but targets the wider environment e.g. public spaces/buildings

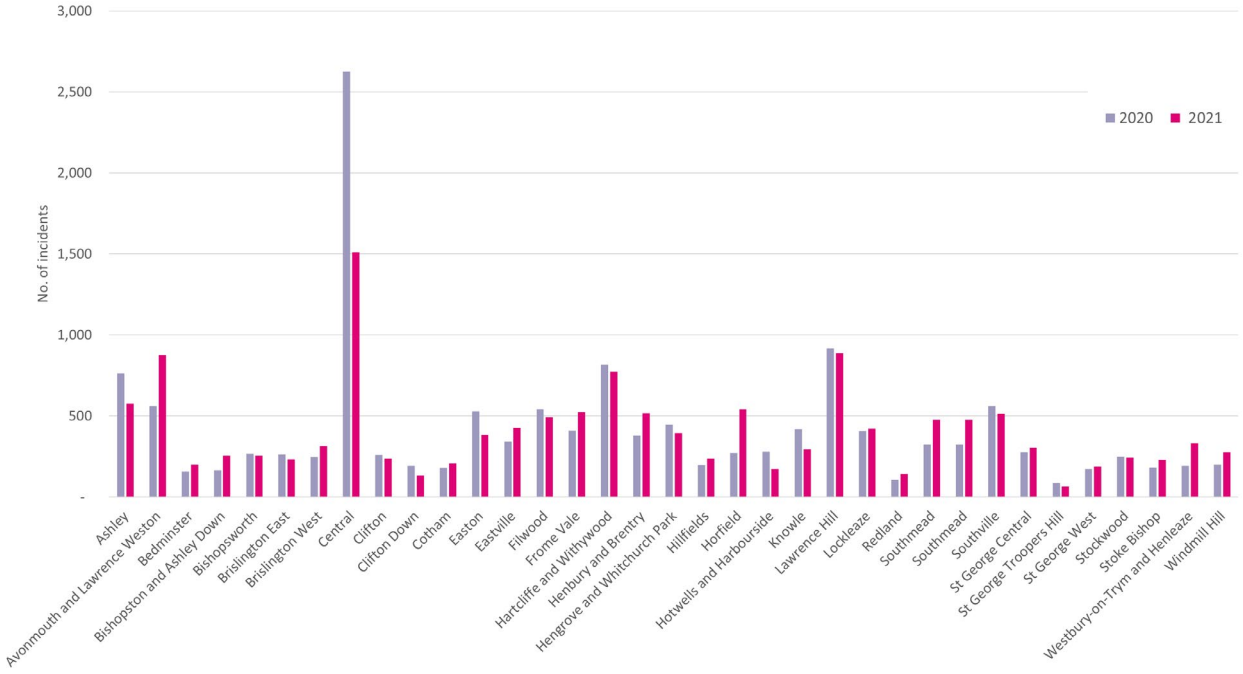
Information was sourced from *data.police.uk* for 2020 and 2021, and this is summarised in **Figure 17** which shows incidents of ASB by ward for both years. This period covers the Covid-19 pandemic, encompassing the lockdowns, where instances of ASB increased across the country as a result of a breach in restrictions being legally enforced by anti-social behaviour orders[79]. For both years Central ward has a much higher number of incidents than all other wards (2,625 incidents in 2020 and 1,510 incidents in 2021). Within this ward there has been a very large decrease in the number of incidents between the two years, much more so than any of the other wards in Bristol. This could be due to breaches in Covid-19 restrictions that lead to increases in ASB in 2020, which subsequently reduced in 2021 when the lockdowns eased. Equally, Avon and Somerset Police have been increasing their engagement with younger people who are considered to be likely to engage in ASB, this has led to them observing reductions in the number of offences.[80] **Map 22** shows the figures at LSOA level for 2020, indicating higher levels of ASB incidents in the centre of Bristol.

[78] Antisocial Behaviour Act 2003 & Police Reform and Social Responsibility Act 2011

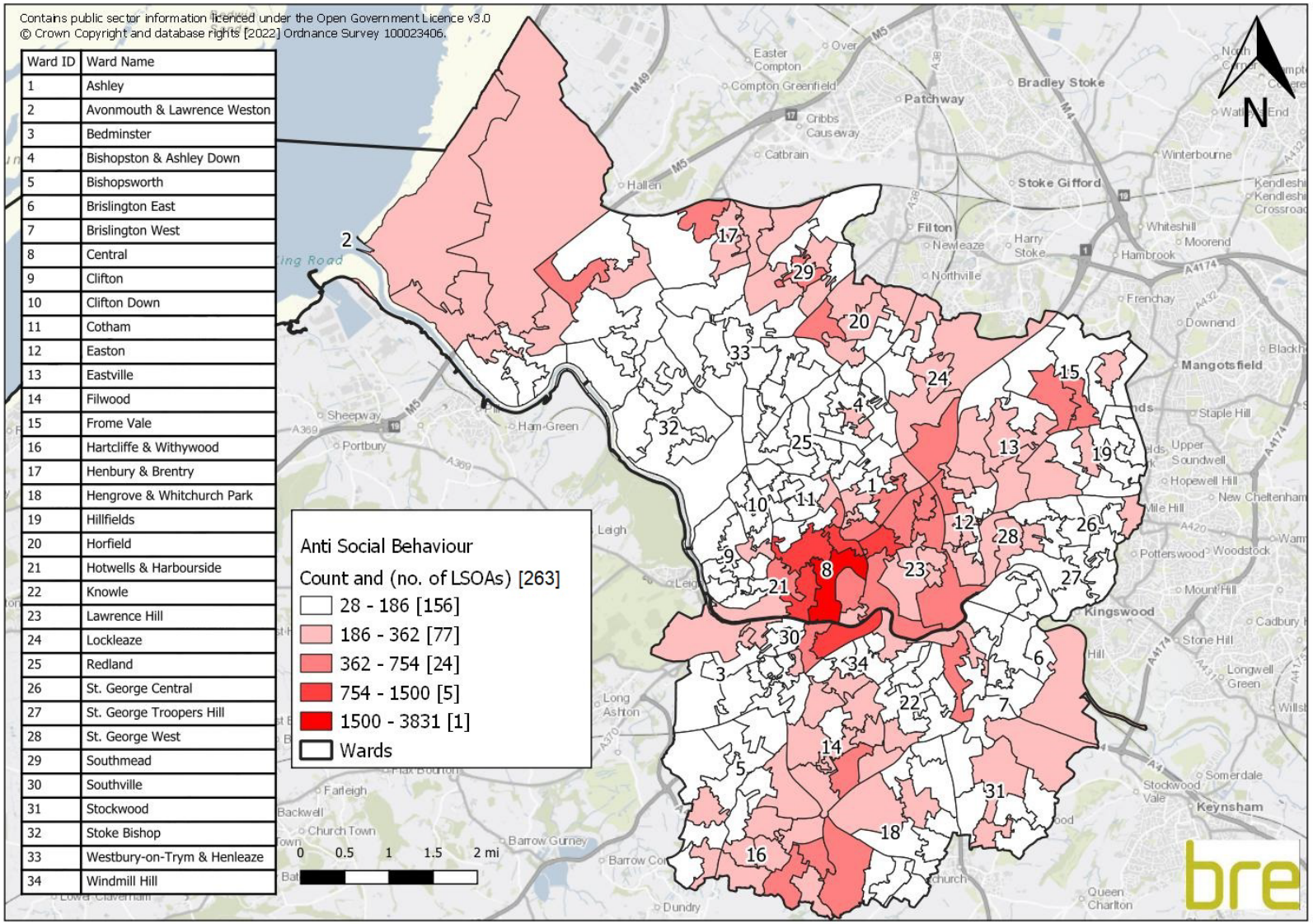
[79] (PDF) Anti-social behaviour in the coronavirus pandemic (researchgate.net)

[80] https://www.avonandsomerset-pcc.gov.uk/wp-content/uploads/2021/02/VRU_Annual_Report_Jan_2020.pdf

Figure 17: Incidences of ASB by ward, 2020 and 2021 *(Source: data.police.uk)*



Map 22: Distribution of ASB by LSOA - 2021 figures *(Source: data.police.uk)*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

5.2.6 Information on deprivation

The 2019 Indices of Multiple Deprivation (IMD)[81] take account of seven "domains" to produce an overall relative measure of deprivation. The domains and their weighting are as follows:

- Income deprivation (22.5%)
- Employment deprivation (22.5%)
- Education, skills and training deprivation (13.5%)
- Health deprivation and disability (13.5%)
- Crime (9.3%)
- Barriers to housing and services (9.3%)
- Living environment deprivation (9.3%)

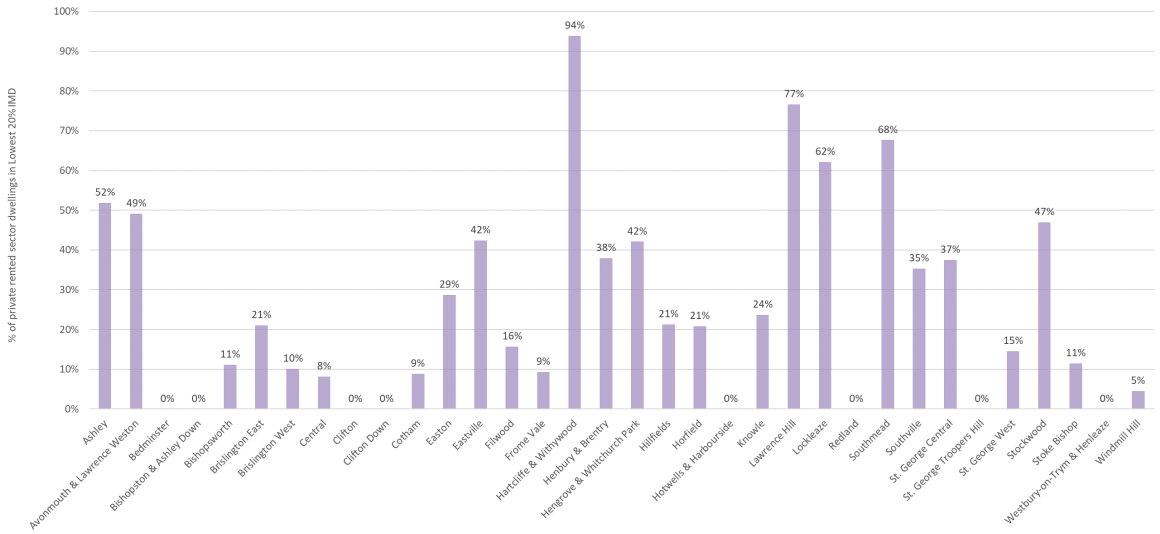
The indices are produced at Lower Super Output Area (LSOA) and provide statistics on relative deprivation in England by ranking every LSOA from 1 (most deprived) to 32,844 (least deprived). To determine whether an area is deprived or not for the purposes of this study, the 20% most deprived LSOAs have been used.

Map 23 shows the distribution of deprivation across Bristol at LSOA level with the wards shown over the top. The darker colours indicate the most deprived areas, for example, looking at the key there are 79 LSOAs which fall into the 20% most deprived areas in England. Overall, in Bristol 27% of privately rented properties are in the 20% most deprived areas.

Figure 18 shows the results of this analysis of IMD data at ward level. In Hartcliffe & Withywood 94% of private sector dwellings are in the 20% of the most deprived LSOAs in England. For Filwood this figures is 87% and in Lawrence Hill it is 77%. At the other end of the scale, 8 of the 35 wards in Bristol have no dwellings in the 20% most deprived LSOAs. Looking at the two wards with the highest levels of deprivation, Hartcliffe & Withywood has 17% private rented stock and for Filwood this figure is 23%.

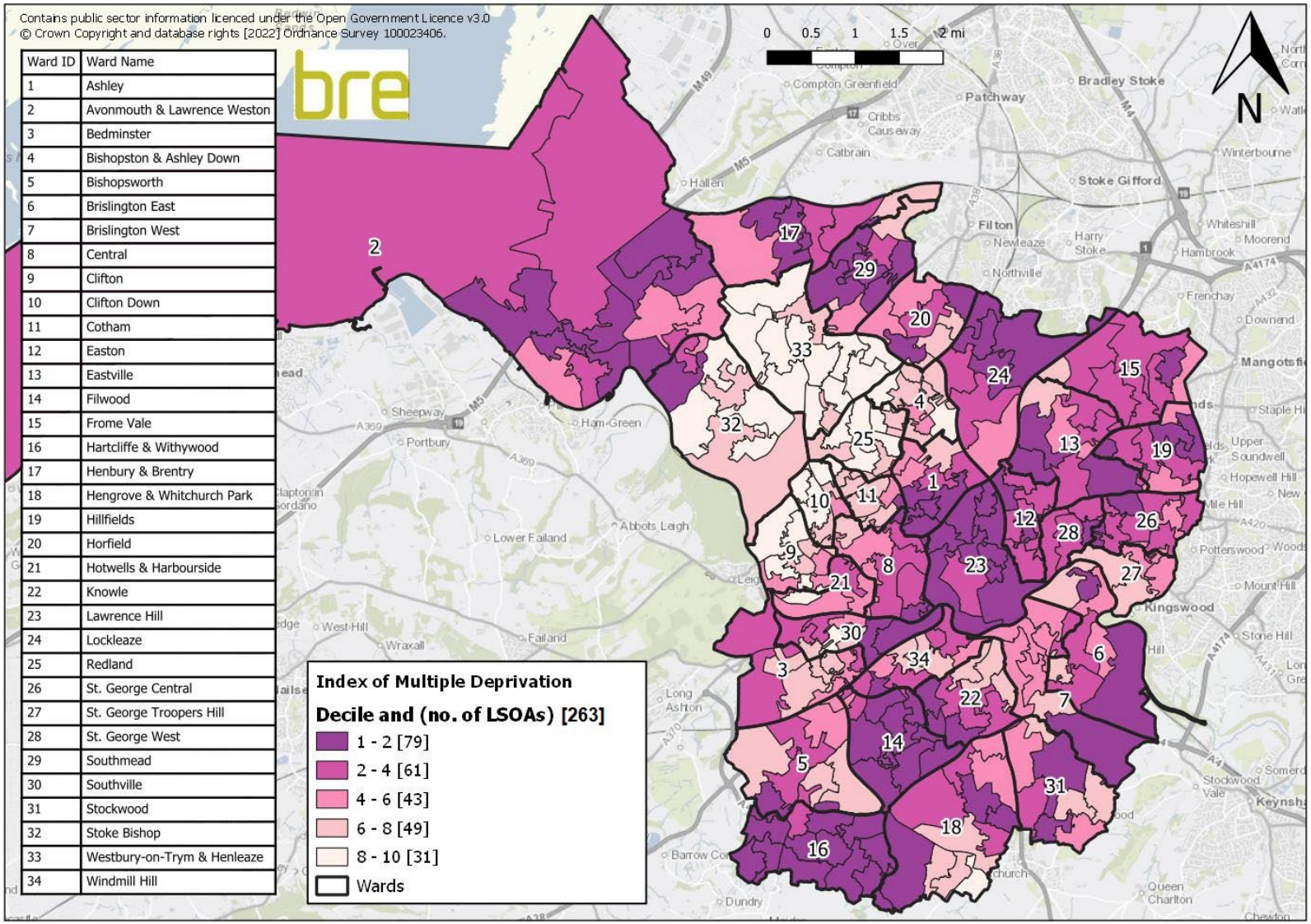
[81] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

Figure 18: Percentage of privately rented dwellings in each ward in Bristol which are in the 20% most deprived areas in England (IMD 2019)



N.B. where no IMD exists on the graph for an area, this is due to there being no properties within the 20% most deprived LSOAs for England

Map 23: Distribution of deprivation in Bristol (1 - 2 = the 10% and 20% deciles (i.e. the most deprived), 3 = the 30% decile, etc.) (source: DLUHC, Indices of Deprivation 2019)

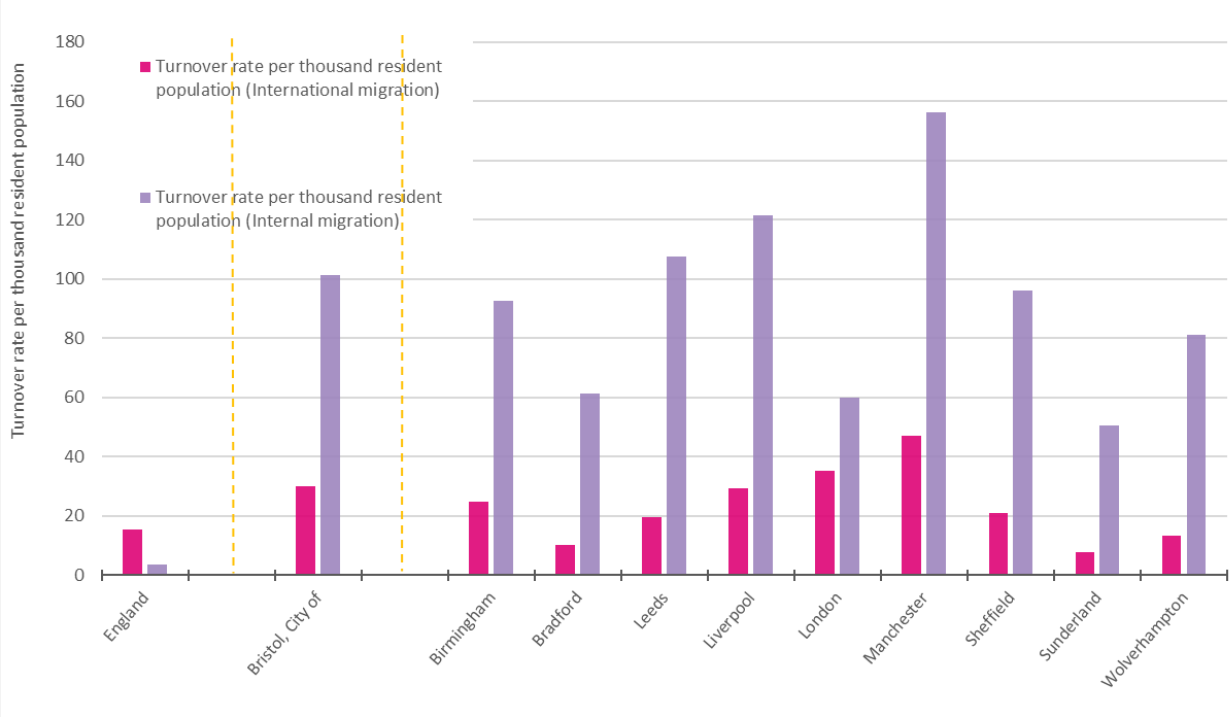


Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

5.2.7 Information on migration

Data on migration is only available at the local authority level[82], therefore migration figures for Bristol have been compared to the remaining 10 largest cities in England and England overall for the latest year available (mid-2019 to mid-2020) – see **Figure 19**. The data uses the long-term[83] international and internal (within UK) migration component of population change data to calculate the rates for turnover and is therefore split into international migration and internal migration. The data shows that for international migration the greatest turnover rate is in Manchester, with Bristol having the third highest turnover of the analysed cities. Looking at internal migration, Bristol has the fourth highest levels, with Manchester, Liverpool and Leeds having a greater level of internal migration.

Figure 19: Comparison of migration figures (international and internal) for Bristol, the 10 largest cities in England, and England overall - mid-2019 to mid-2020 (Source: ONS82)



82 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/migrationwithintheuk/datasets/localareamigrationindicatorsunitedkingdom

83 A person who moves from their country of usual residence for a period of at least 12 months - https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/methodologies/migrationstatisticsfirsttimeuserguideglossaryandlistofproducts

5.2.8 In-depth analysis on specific areas

Areas with proportions of private rented stock above the national average (19%) were examined more closely. **Table 19** shows the numbers and percentages of dwellings for each of the HHSRS indicators, dwellings in disrepair and the most deprived 20% of LSOAs in England (IMD 2019) by ward. The table is divided into the previously identified three analysis groups (all above the national average of 19% private rented stock), and also provides the figures for the remaining wards for completion of information.

Looking at the analysis group with over 50% of the stock being private rented, Hotwells & Harbourside has the highest proportion of private rented sector dwellings (60%). Within the analysis group Hotwells & Harbourside has relatively low proportions of the variables. In fact, Cotham has the highest level of category 1 hazards (15%) and Central has the highest level of excess cold (5%). For fall hazard and disrepair Clifton Down, Cotham and Clifton all have similar levels (4% for fall hazards and 6% for disrepair). When compared to Bristol's average, Clifton Down, Cotham and Clifton all have slightly higher category 1 hazards and disrepair than Bristol as a whole. With the exception of Central (5%), all other wards have an average level of excess cold (3%) and all wards had slightly lower than average levels of fall hazard. In relation to homes in the 20% most deprived areas, Cotham has 9% and Central 8%, with all other wards at 0%, so generally the wards with high levels of PRS do not also have high levels of deprivation.

For the analysis group with over 30 – 50% private rented stock, there is no single ward that has consistently higher levels of each variable compared to the other wards. Bishopston & Ashley Down and Bedminster have the highest levels of all hazards (both 16%) as well as having the highest level of fall hazards (both 5%), Bedminster also has the highest level of excess cold (3%). Bishopston & Ashley Down has the highest level of disrepair (7%). Compared to Bristol's average, all wards had either an average or above average level of category 1 hazards and all wards had either an average or below average level of excess cold, fall hazards and disrepair. Within this analysis group Ashley has quite high levels of deprivation (52%), followed by St. George West (35%) and Horfield (21%).

Looking at the analysis group with 19 – 30% private rented stock, Easton stands out as being the worst performing in three of the variables. Easton has the highest levels of category 1 hazards (16%) and falls hazards (6%) and disrepair (6%) and Lawrence Hill has the highest levels of excess cold (3%). Compared to Bristol's average, all wards had either an average or below average level of excess cold and fall hazards. With the exception of Frome Vale, all wards had either an average or below average level of disrepair. The picture is slightly different for category 1 hazards, with Easton and Brislington West having higher than average levels, Bishopsworth having a similar level to average and all other wards having a lower than average level. This analysis group has wards with quite high levels of deprivation, the highest being Filwood (87%) and Lawrence Hill (77%). Additionally, all wards within this group have some degree of deprivation.

Table 19: Number and percentage of dwellings for each of the HHSRS indicators, disrepair and the most deprived 20% of LSOAs in England (IMD 2019) by ward – private rented stock split into the three analysis groups with over 19% private rented stock (remaining wards included for completeness)

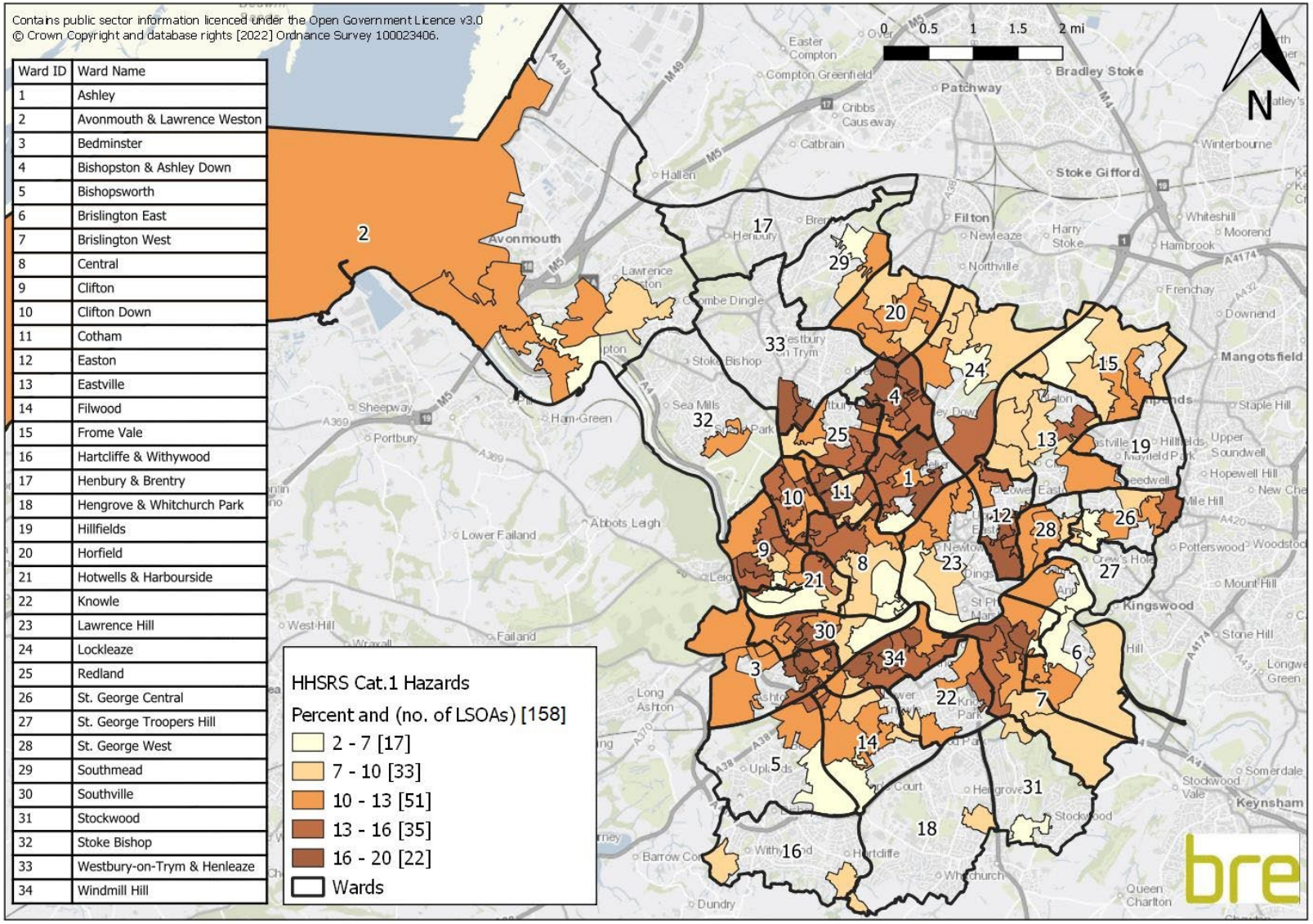
Ward	No. of dwellings private rented stock	HHSRS category 1 hazards			Disrepair	Index of Multiple Deprivation (20%)
		All hazards	Excess cold	Fall hazards		
Hotwells & Harbourside	1,980 (60%)	201 (10%)	54 (3%)	46 (2%)	77 (4%)	0 (0%)
Central	5,505 (59%)	578 (10%)	248 (5%)	113 (2%)	201 (4%)	450 (8%)
Clifton Down	3,095 (58%)	429 (14%)	79 (3%)	115 (4%)	195 (6%)	0 (0%)
Cotham	2,591 (53%)	368 (14%)	73 (3%)	99 (4%)	151 (6%)	229 (9%)
Clifton	3,312 (50%)	452 (14%)	83 (3%)	117 (4%)	192 (6%)	0 (0%)
Southville	2,399 (41%)	292 (12%)	53 (2%)	89 (4%)	122 (5%)	846 (35%)
Horfield	1,867 (34%)	216 (12%)	39 (2%)	77 (4%)	85 (5%)	388 (21%)
Windmill Hill	2,116 (34%)	309 (15%)	48 (2%)	92 (4%)	113 (5%)	96 (5%)
Bishopston & Ashley Down	1,675 (33%)	272 (16%)	31 (2%)	89 (5%)	110 (7%)	0 (0%)
Ashley	2,775 (32%)	379 (14%)	55 (2%)	105 (4%)	158 (6%)	1,438 (52%)
Bedminster	1,941 (32%)	304 (16%)	62 (3%)	93 (5%)	115 (6%)	0 (0%)
Redland	1,677 (31%)	219 (13%)	36 (2%)	59 (4%)	93 (6%)	0 (0%)
St. George West	1,018 (30%)	112 (11%)	12 (1%)	39 (4%)	52 (5%)	148 (15%)
Eastville	1,787 (28%)	197 (11%)	34 (2%)	69 (4%)	77 (4%)	757 (42%)
Lawrence Hill	2,253 (27%)	214 (10%)	66 (3%)	54 (2%)	76 (3%)	1,727 (77%)
Brislington West	1,399 (26%)	190 (14%)	27 (2%)	73 (5%)	72 (5%)	141 (10%)
Lockleaze	1,337 (25%)	138 (10%)	27 (2%)	54 (4%)	49 (4%)	830 (62%)
Frome Vale	1,355 (24%)	126 (9%)	26 (2%)	51 (4%)	46 (3%)	126 (9%)
Easton	1,458 (23%)	229 (16%)	21 (1%)	84 (6%)	90 (6%)	418 (29%)
Filwood	1,257 (23%)	136 (11%)	26 (2%)	51 (4%)	55 (4%)	1,097 (87%)
St George Central	1,331 (22%)	141 (11%)	25 (2%)	58 (4%)	61 (5%)	206 (15%)
Bishopsworth	1,061 (20%)	96 (9%)	17 (2%)	37 (3%)	35 (3%)	118 (11%)
Brislington East	1,009 (19%)	92 (9%)	12 (1%)	39 (4%)	33 (3%)	212 (21%)

Table 19 cont.: Number and percentage of dwellings for each of the HHSRS indicators, disrepair and the most deprived 20% of LSOAs in England (IMD 2019) by ward – private rented stock split into the three analysis groups with over 19% private rented stock (remaining wards included for completeness)

Ward	No. of dwellings - private rented stock	HHSRS category 1 hazards			Disrepair	Index of Multiple Deprivation (20%)
		All hazards	Excess cold	Fall hazards		
Avonmouth & Lawrence Weston	1,701 (18%)	175 (10%)	52 (3%)	63 (4%)	63 (4%)	835 (49%)
Southmead	968 (18%)	81 (8%)	13 (1%)	31 (3%)	33 (3%)	655 (68%)
Hartcliffe & Withywood	1,409 (17%)	122 (9%)	29 (2%)	43 (3%)	44 (3%)	1,322 (94%)
Knowle	932 (17%)	114 (12%)	18 (2%)	43 (5%)	46 (5%)	221 (24%)
St George Troopers	375 (14%)	25 (7%)	1 (0%)	13 (3%)	10 (3%)	0 (0%)
Henbury & Brentry	757 (13%)	58 (8%)	11 (1%)	22 (3%)	22 (3%)	287 (38%)
Stockwood	607 (12%)	48 (8%)	11 (2%)	18 (3%)	17 (3%)	285 (47%)
Hengrove & Whitchurch Park	874 (11%)	70 (8%)	12 (1%)	30 (3%)	24 (3%)	368 (42%)
Hillfields	573 (11%)	63 (11%)	7 (1%)	26 (5%)	27 (5%)	122 (21%)
Westbury-on-Trym & Henleaze	883 (10%)	107 (12%)	30 (3%)	31 (4%)	40 (5%)	0 (0%)
Stoke Bishop	393 (8%)	55 (14%)	21 (5%)	14 (4%)	17 (4%)	45 (11%)

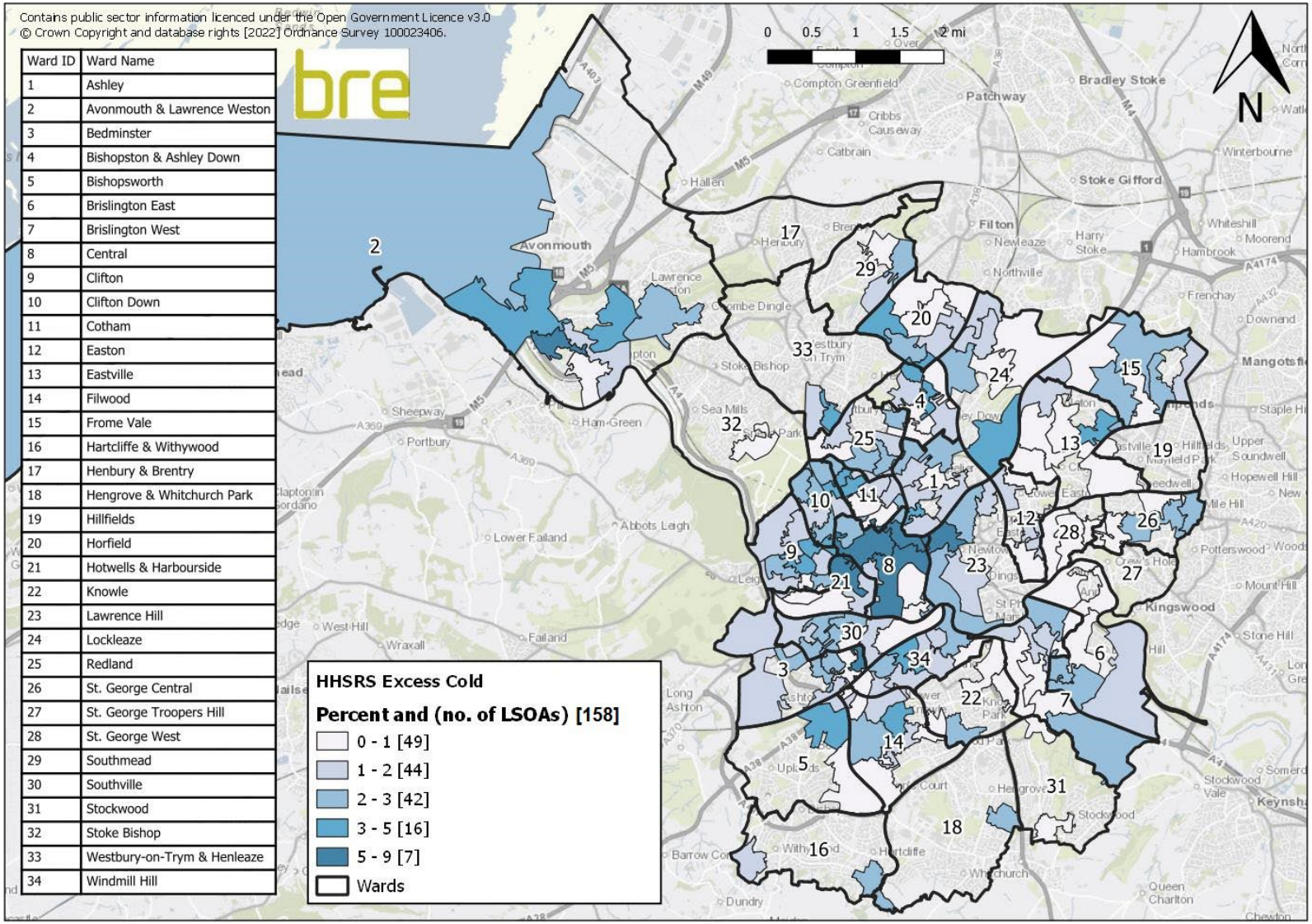
To provide a more detailed picture of the HHSRS category 1 all hazards, HHSRS category 1 excess cold, HHSRS category 1 fall hazards and disrepair, **Map 24** to **Map 27** provide information at LSOA level where only LSOAs with a proportion of private rented dwellings greater than the national average (19%) are shown. The rest of the map is blank, showing it is not an LSOA with >19% private rented stock. This provides more focus on smaller geographical areas where private rented stock is high, and the proportion of hazards is also high. The maps show Bedminster, Bishopston & Ashley Down and Easton to consistently be the worst performing across these maps and therefore potential areas to target for improvements.

Map 24: Distribution of category 1 HHSRS hazards where the proportion of private rented stock is above the national average



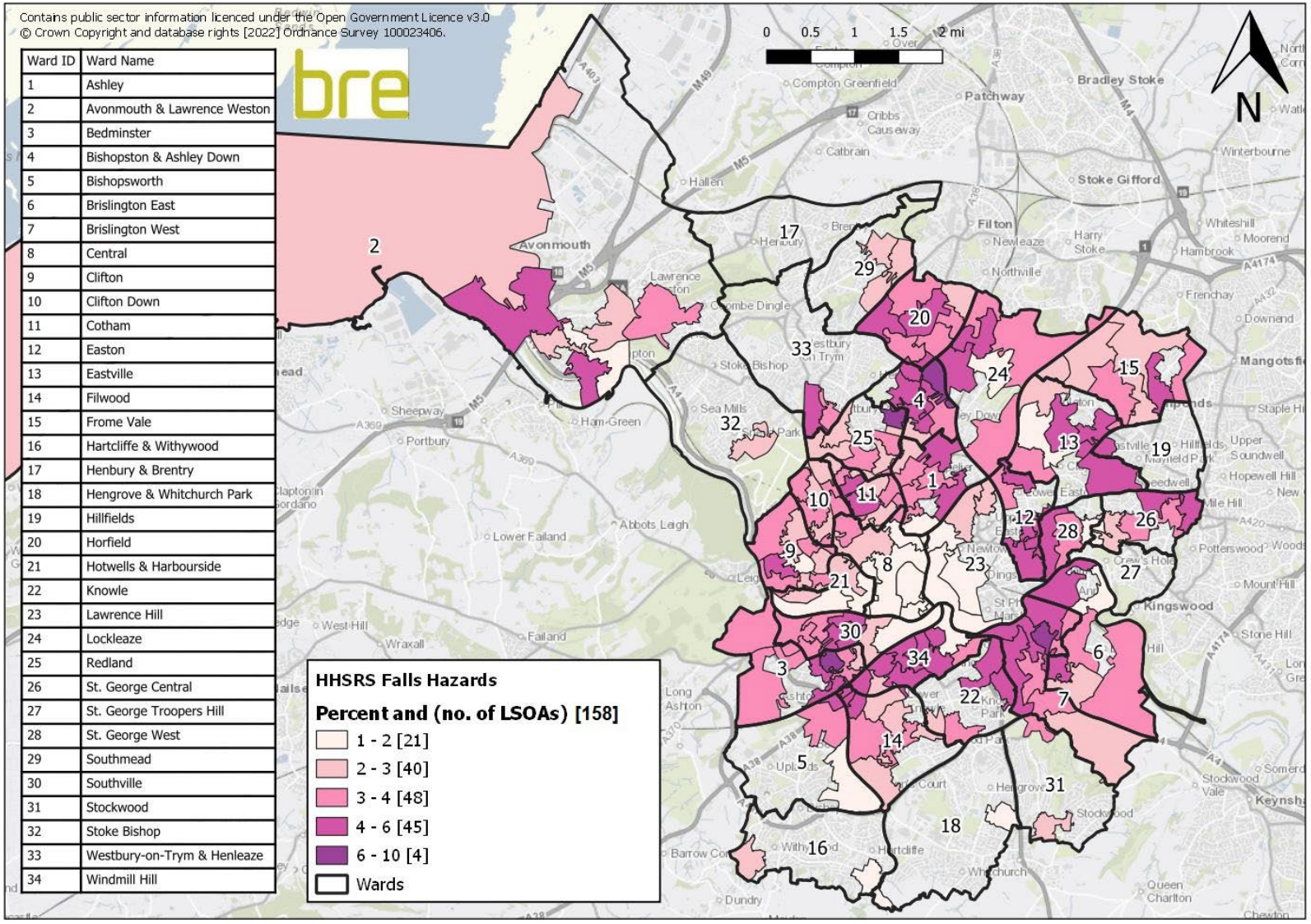
Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 25: Distribution of excess cold hazards where the proportion of private rented stock is above the national average



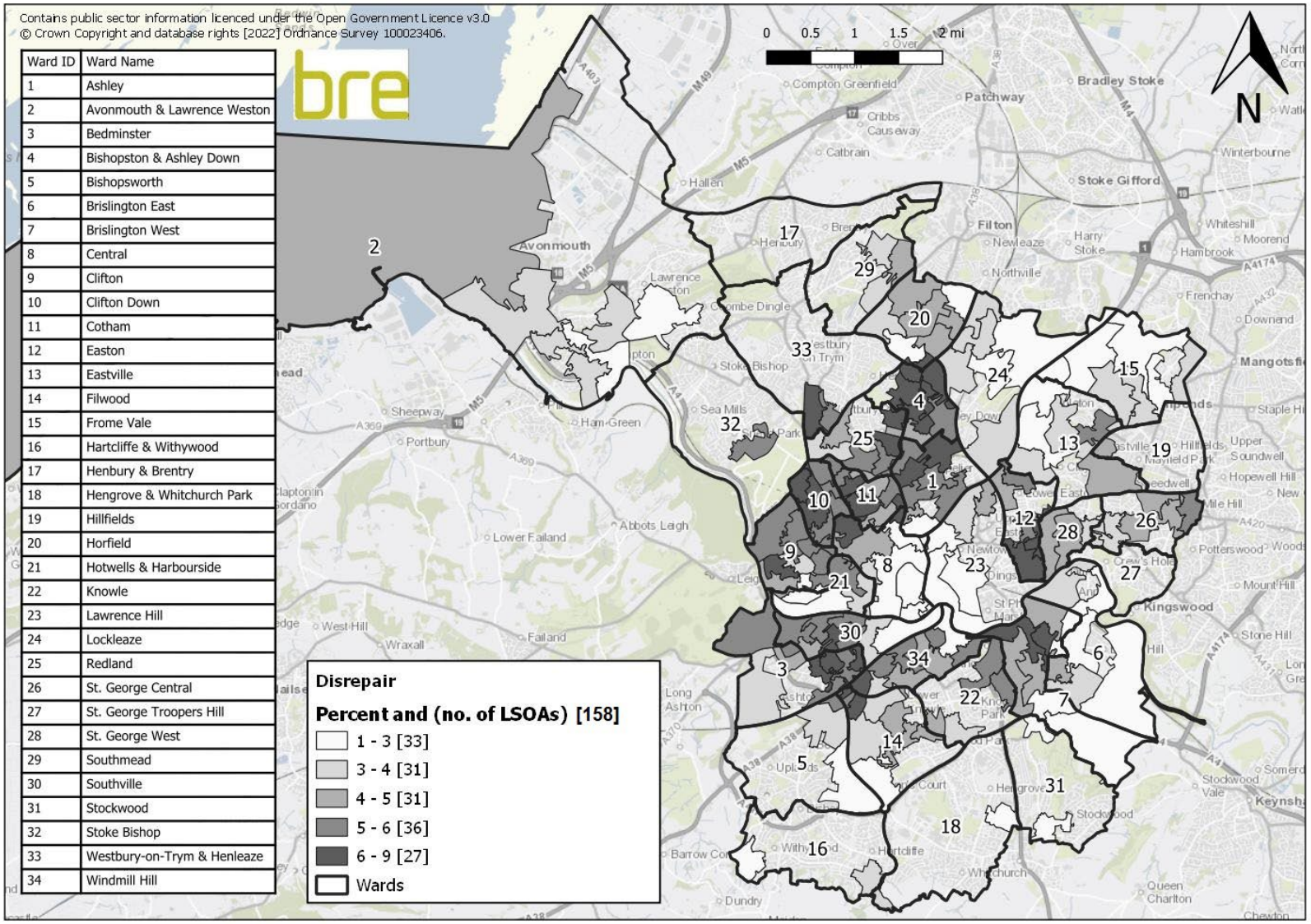
Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 26: Distribution of fall hazards where the proportion of private rented stock is above the national average



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map 27: Distribution of dwellings in disrepair where the proportion of private rented stock is above the national average



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

6 Conclusion and recommendations

6.1 Conclusion

Bristol City 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 (LLPG, tenure, benefits, TDS, HM, Selective Licensing and enforcement 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 124,444 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 61.1% of the stock in Bristol.

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 with the presence of each of the Housing Standards Variables for Bristol overall and broken down by tenure and then mapped by COA (private sector stock only), and including high category 2 hazards
- Information relating to LAHS reporting for the private sector stock - category 1 hazards as well as information on estimated EPC ratings (based on SimpleSAP)
- Before and After Analysis of the Discretionary Licensing schemes
- Specialist Analysis of the Private Rented Sector including HMOs and Selective Licensing

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

- The performance of the housing stock in Bristol compared to the EHS England average is mixed with Bristol performing slightly worse for all hazards, excess cold, disrepair and fuel poverty (low income high costs) and notably worse for low income households but better for fuel poverty (10% definition). Compared to the regional average the picture is slightly different with Bristol performing marginally worse for disrepair, all hazards low income households and fuel poverty (low income high costs), but better for fuel poverty (10% definition) and excess cold.
- Focussing on the tenures within the private sector stock, in general the private rented stock is slightly worth than the owner occupied stock, with the exception of fuel poverty (10% definition) which is similar in both tenures, and HHSRS category 1 excess cold hazards which is slightly higher in the owner occupied sector.
- 4.1% 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 renewal tenancies. From 1 April 2020 this will also apply to existing tenancies.

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 Bristol 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 responses to government initiatives such as DLUHC's Housing Strategy Policy and ECO.

6.2 Conclusion from HMOs and private rented sector analysis

HMOs

There are an estimated 13,349 HMOs in Bristol, of which approximately 8,231 come under mandatory and additional licensing schemes. Of this 8,231 there are 3,913 known additional HMOs and 3,805 mandatory HMOs.

Wards with high levels of HMOs and with high proportions of hazards or in disrepair may be a starting point when considering which areas to be targeted for improvement. For example, Ashley has a relatively high number of HMOs (935) and of these 14% are estimated to have a category 1 hazard, 7% to have fall hazards and 3% to be in disrepair. Central has 1,129 HMOs and high hazard levels, including all hazards (12%), excess cold (5%), fall hazard (3%) and disrepair (6%). Equally Clifton Down and Cotham both have high levels of HMOs (1,019 and 984 respectively) as well as high levels of all hazards (11% and 14%%), excess cold (3% and 4%) and fall hazards (4% and 6%).

Private rented sector analysis

Overall the percentage of dwellings in the private rented sector across Bristol is estimated to be 27%, which is considerably higher than England's overall average of 19%. A large proportion of wards (22 of a total of 34) have a percentage of private rented proportions in excess of the national average.

Of the wards with over 50% of the stock being private rented, Cotham has the highest level of category 1 hazards (15%) and Central has the highest level of excess cold (5%). For fall hazards and disrepair Clifton Down, Cotham and Clifton all have similar levels (4% for fall hazards and 6% for disrepair). When compared to Bristol's average, Clifton Down, Cotham and Clifton all have slightly higher category 1 hazards and disrepair than Bristol as a whole. With the exception of Central (5%), all other wards have an average level of excess cold (3%) and all wards have slightly lower than average levels of fall hazard.

Of the wards where over 30-50% of the stock is estimated to be private rented, Bishopston & Ashley Down and Bedminster have the highest levels of all hazards (both 16%) as well as the highest level of fall hazards (both 5%)., Bedminster also has the highest level of excess cold (3%) Bishopston & Ashley Down has the highest level of disrepair (7%). Compared to Bristol's average, all wards had either an average or above average level of category 1 hazards and all wards had either an average or below average level of excess cold, fall hazards and disrepair.

For the wards with 19-30% private rented stock, Easton has the highest levels of category 1 hazards (16%) and falls hazards (6%) and disrepair (6%) and Lawrence Hill has the highest levels of excess cold (3%). Compared to Bristol's average, all wards had either an average or below average level of excess cold and fall hazards. With the exception of Frome Vale, all wards had either an average or below average level of disrepair. The picture is slightly different for category 1 hazards, with Easton and Brislington West having higher than average levels, Bishopsworth having a similar level to average and all other wards having a lower than average level.

In Hartcliffe & Withywood 94% of private sector dwellings are in the 20% of the most deprived LSOAs in England. For Filwood this figures is 87% and in Lawrence Hill it is 77%. At the other end of the scale, 8 of the 35 wards in Bristol have no dwellings in the 20% most deprived LSOAs. Looking at the two wards with the highest levels of deprivation, Hartcliffe & Withywood has 17% private rented stock and for Filwood this figure is 23%.

There are specific areas within the wards identified which have higher levels of private rented stock and deprivation and disrepair which could be considered for targeted interventions.

6.3 Recommendations

The table below (**Table 20**) shows the three analysis groups for the PRS sector together with housing standards and household insight variable percentages and simple SAP scores. These findings could be combined with local intelligence to help identify additional areas for targeting assistance for the private rented sector stock and the environment. For instance, generally the average simple SAP scores are high, with only Cotham and Easton scoring below the equivalent of an EPC Band C, therefore these areas could benefit from targeted funding to improve the thermal performance of the dwellings, such as insulation or boiler upgrades.

Additionally, areas such as Filwood in particular, but also Lockleaze, St George Central, Frome Vale and Easton have high levels of fuel poverty and low income households, so these areas might benefit from funding sources that are predominantly targeted towards those on low incomes and fuel poverty, such as:

- Social Housing Decarbonisation Fund – a 10 year £3.8bn fund to improve the energy performance of social rented homes. The scheme funds a fabric first approach to ensure participating homes achieve an EPC of Band C, after which a low carbon heating system can be installed.
- Energy Company Obligation (ECO) and LA Flex – energy suppliers must promote measures that improve the ability of low income, fuel poor and vulnerable households to heat their homes. This includes measures that result in heating savings, such as the installation of insulation or the upgrade of an inefficient heating system. Local Authorities can use LA Flex to help homeowners and tenants in the private rented sector who are in fuel poverty or on low incomes to improve the energy efficiency of their homes.
- Local Authority Delivery (LAD) Scheme – this includes £500 million funding allocated to local authorities to improve the energy efficiency of homes occupied by low-income households, helping reduce fuel poverty and contribute towards the UK's commitment to net zero by 2050.This is done through improving the energy performance of homes with EPCs of E, F or G.
- Home Upgrade Grant (HUG) – the second wave of this scheme has recently been introduced and aims to provide grants to Local Authorities for either improving the energy performance of fuel poor homes and to allow for a transition to low carbon heating systems in owner occupied and private rented sector fuel poor homes that are not connected to the gas grid.

In relation to hazards, Bishopston & Ashley Down, Bedminster, Easton and Windmill Hill have notably high levels of Category 1 hazards, although Clifton Down, Cotham and Clifton are all also relatively high. Levels of excess cold are higher within the over 50% PRS analysis group, so this group could be an area to investigate further. For the falls hazards Easton, Brislington West and Bishopston & Ashley Down could be targeted, and with disrepair the majority of both the Over 50% PRS and the Over 30% - 50% PRS groups have relatively high levels and could be considered for interventions. However, it is important to also take into account the detailed understanding of the area held by those working at the council to help inform strategies to reduce problems in the PRS. Programmes designed to tackle disrepair for example group repair schemes, regeneration or enforcement interventions could be considered. 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.

Additionally, further programmes designed to retrofit homes could be considered, as this would help decarbonise the existing stock and assist in Bristol's ambition of being carbon neutral by 2030 whilst also making homes more comfortable and/or cheaper to heat to a suitable temperature that maintains the health of those living there.

Table 20: Housing Standards and household insight variable percentages and simple SAP scores and coded severity for the three PRS analysis groups.

	Ward	HHSRS category 1 hazards	Excess cold	Fall hazards	Disrepair	Fuel poverty 10	Fuel poverty LIHC	Low income households	Average SimpleSAP
Over 50% PRS	Hotwells & Harbourside	10%	3%	2%	4%	3%	12%	13%	68
	Central	10%	5%	2%	4%	5%	13%	20%	65
	Clifton Down	14%	3%	4%	6%	4%	18%	12%	60
	Cotham	14%	3%	4%	6%	5%	18%	17%	59
	Clifton	14%	3%	4%	6%	5%	19%	0%	60
Over 30% - 50% PRS	Southville	12%	2%	4%	5%	5%	14%	37%	62
	Horfield	12%	2%	4%	5%	5%	17%	30%	61
	Windmill Hill	15%	2%	4%	5%	4%	14%	30%	61
	Bishopston & Ashley Down	16%	2%	5%	7%	4%	18%	11%	61
	Ashley	14%	2%	4%	6%	5%	16%	36%	62
	Bedminster	16%	3%	5%	6%	5%	15%	29%	60
	Redland	13%	2%	4%	6%	5%	19%	14%	60
	St. George West	11%	1%	4%	5%	4%	14%	34%	63
	Eastville	11%	2%	4%	4%	5%	16%	41%	62
Over 19% - 30% PRS	Lawrence Hill	9%	3%	2%	3%	6%	15%	61%	64
	Brislington West	14%	2%	5%	5%	5%	18%	37%	61
	Lockleaze	10%	2%	4%	4%	7%	20%	56%	61
	Frome Vale	9%	2%	4%	3%	5%	19%	33%	61
	Easton	16%	1%	6%	6%	5%	19%	39%	59
	Filwood	11%	2%	4%	4%	8%	23%	76%	61
	St George Central	11%	2%	4%	5%	5%	19%	40%	61
	Bishopsworth	9%	2%	3%	3%	5%	16%	35%	65

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Appendix A Definitions of the Housing Standards Variables

1. **Housing Standards Variables:**
   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 variables.

   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 variables:**
   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 lowest 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 variables:

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^{o}C for the main living area, and 18^{o}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:

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

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 more recent definition of fuel poverty - the Low Income High Costs (LIHC) definition[84]. Under this 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 £16,105.

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

4. High category 2 hazards:

According to the strict definitions of the HHSRS a category 2 hazard is any hazard that is not a category 1 hazard. This definition, however, would identify all dwellings without a category 1 hazards, even those that were generally considered safe. Instead, the definition used here is restricted to hazards of band D or E (see 1.a above), with the exception of the falls on the level hazard, where only band D is considered (as E is the average rating for falls on the level). This definition is therefore referred to as “high” category 2 hazards as it excludes the lesser hazards. The hazards included are as follows:

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

Hazard / hazard group	Details of hazards
Excess cold	SimpleSAP ≤ 48 but excluding category 1 excess cold hazards which are ≤ 33
Overcrowding	Using stock model definition and removing outliers/extremes
Hazards in "Falls" Model	Falls on stairs Falls on the level Falls associated with baths
Hazards in 'Other' Model	Damp Excess Heat Carbon monoxide and fuel combustion products Uncombusted fuel gas Volatile Organic Compounds Entry by Intruders Lighting Noise Domestic hygiene, Pests and refuse Food Safety Personal hygiene, Sanitation and Drainage Water Supply Falling between Levels Electricity hazards Fire Flames and hot surfaces Collision and entrapment Explosions Position and operability of amenities Structural collapse and falling elements

Appendix B Methodology for the BRE Integrated Dwelling Level Housing Stock Modelling approach

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 Housing Standards Variables 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.

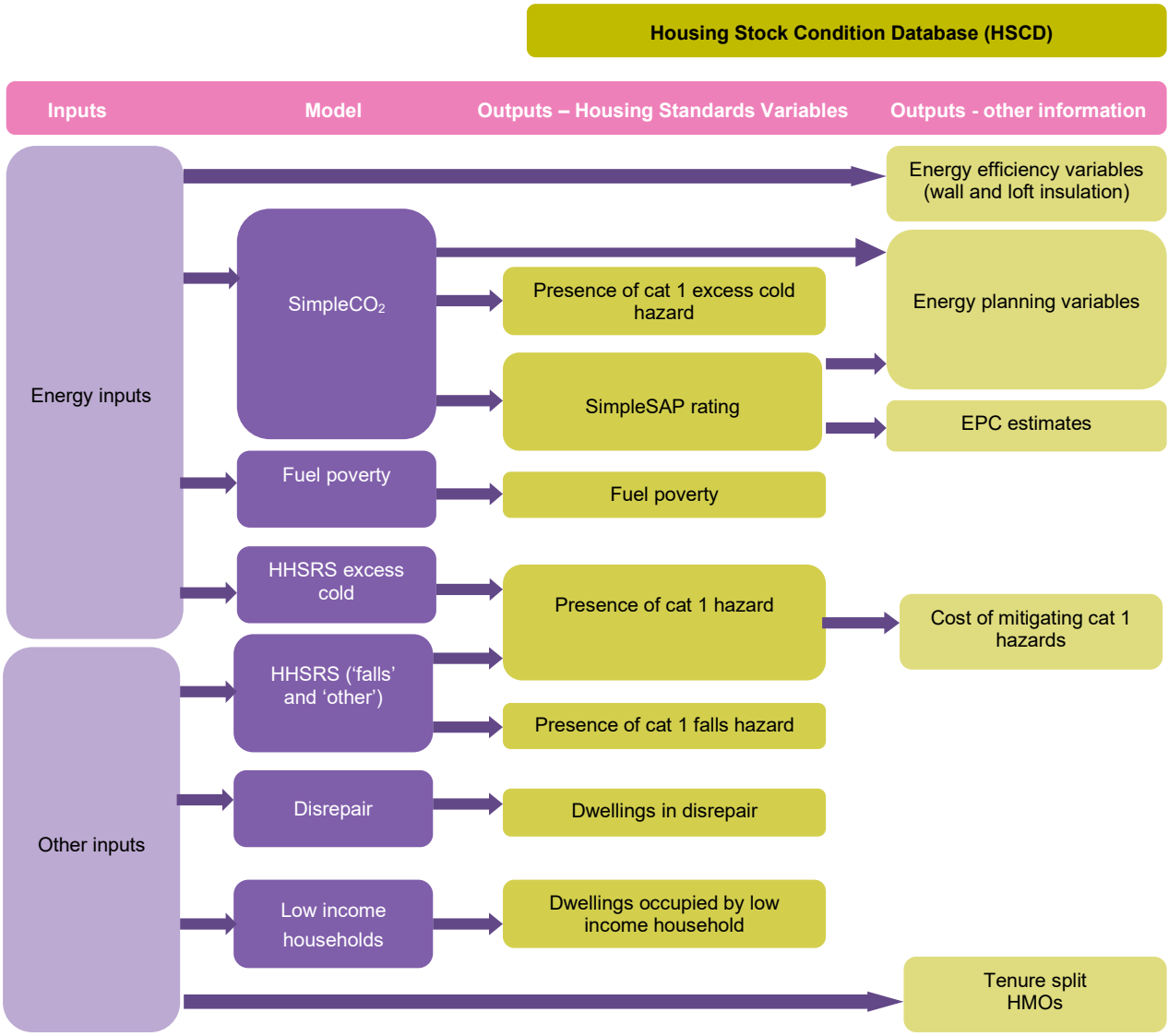
The models making up the overall housing stock modelling approach are:

- 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 Housing Standards Variables 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[85] 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[86] 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 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.

[85] 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.

[86] 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 must 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 d2021 Tools 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 always kept in mind 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 variable 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.

The presence of a category 1 hazard failure is the only exception to this as it is found by combining excess cold, falls 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, Bristol 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 several 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 data sources provided by Bristol and the resulting impact on the modelling process.

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

Data source		No. (and %) of addresses matched	Notes / impact on the modelling process
EPC data	189,096 – total records available	127,974 (82.6% of de-duplicated)	Data de-duplicated for multiple EPCs – 154,982 remaining Final number matched to modelled data and useable – 124,444
LLPG data	212,647 – total received	208,921 (98.2% of records provided)	BLPU classes checked and duplicate UPRNs removed – 209,068 remaining Remaining cases once address fields checked – 208,921
TDS data	34,884 – total received	13,840 (50.7% of de-duplicated and non-student accommodation)	Remaining cases once duplicate UPRN's removed -29,544 Remaining cases once student accommodation removed – 27,275
Enforcement data	938 – total received	742 (79.1% of records provided)	Remaining cases once duplicate UPRN's removed - 742
Benefits data	56,398 – total received	34,398 (61% of records provided)	Remaining cases once duplicate UPRNs removed – 34,398
HMO data	7,331– total received	7,304 (99.6% of records provided)	Remaining cases once duplicate UPRNs removed – 7,304
Council-owned data	26,986 – total received	26,985 (99.9% of records provided)	Remaining cases once duplicate UPRNs removed – 26,985
MEES Data	374 – total received	373 (99.7% of records provided)	Remaining cases once duplicate UPRNs removed - 373
Cat. 2 Hazard data	1,782 – total received	1,292 (72.5% of records provided)	Remaining cases once duplicate UPRN's removed – 1,292
Selective Licensing data	2,165 – total received	2,163 (99.9% of records provided)	Remaining cases once duplicate UPRN's removed – 2,163

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 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. 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 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

OS AddressBase was then linked to the OS MasterMap Topography Layer. OS MasterMap provides a detailed geographical representation of the landscape in Great Britain, including buildings. Once the OS AddressBase is linked to OS MasterMap it is possible to extract the relevant geographical information for

the residential buildings– this involves looking at information about individual dwellings or blocks of flats such as footprint area and attachment to other dwellings.

Figure B. 2 shows that visual identification of dwelling type can be quite simple. The OS MasterMap of the cul-de-sac 'Prince of Wales Gardens' comprises 10 sets of semi-detached properties. BRE use this type of knowledge to create a model to infer dwelling type, which is described in more detail below.

Figure B. 2: OS MasterMap example (source OS website[87])

By looking at the number of residential address points (from OS AddressBase) it is possible to determine whether a building is a house or a block of flats[88]. The dwelling type is then determined based on the spatial relationship of the individual dwelling/block of flats with other dwellings. These spatial relationships are outlined for each resulting dwelling type below:

Houses - where the dwelling is a house, the number of other buildings it is attached to can be observed and the dwelling types allocated as follows:

Detached – where a single address is within a dwelling footprint and that footprint is not attached to any other building footprint[89].

[87] https://www.ordnancesurvey.co.uk/business-and-government/products/mastermap-products.html

[88] Houses have one residential address point and blocks of flats have two or more

[89] The area of land over which a building is constructed (i.e. the area of the ground floor only, this does not consider the number of floors in a building)

Semi-detached - where a single address is within a dwelling footprint and is joined to one other building footprint.

Terrace - where three or more building footprints are joined to one another.

Mid terrace – where a single address is part of a terrace block and attached to more than one other building footprint.

End terrace – where a single address is part of terrace block and attached to only one other building footprint.

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. The following assumptions are made:

Converted flat –if there are between two and four flats in the block (inclusive) and the dwelling was built before 1980 then it is assumed to be a conversion.

Purpose built flat – all other flats are assumed to be purpose built.

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 several 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 https://hscd.bregroup.com/login.jsp 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 Housing Standards Variables 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

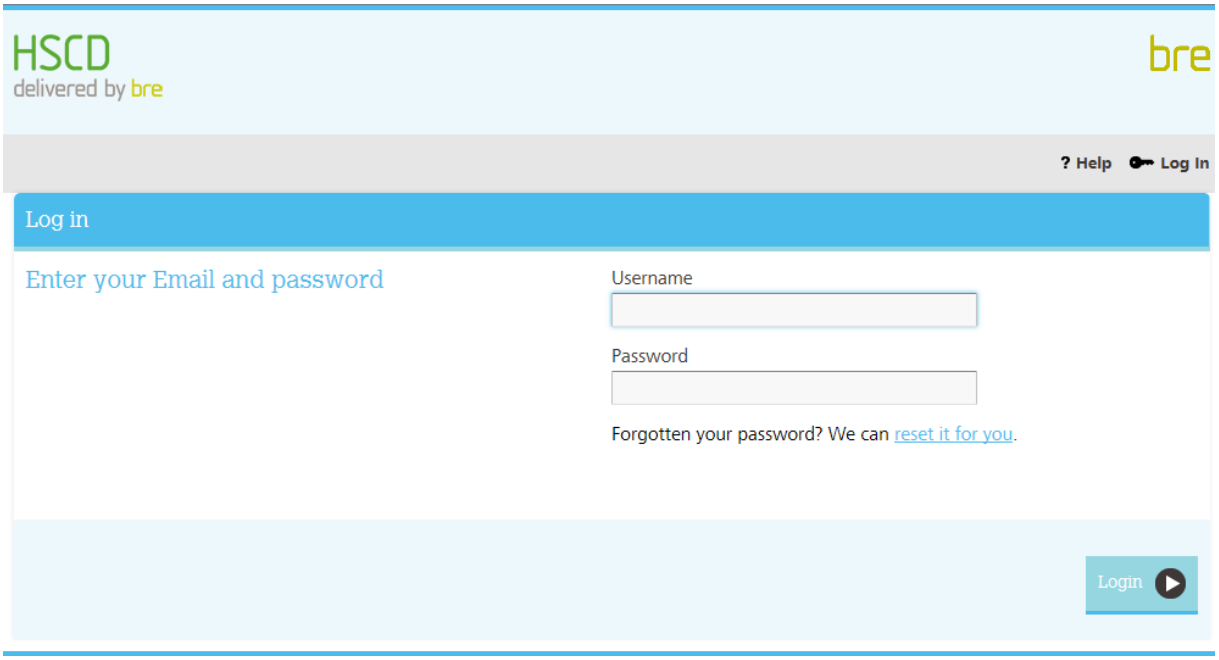


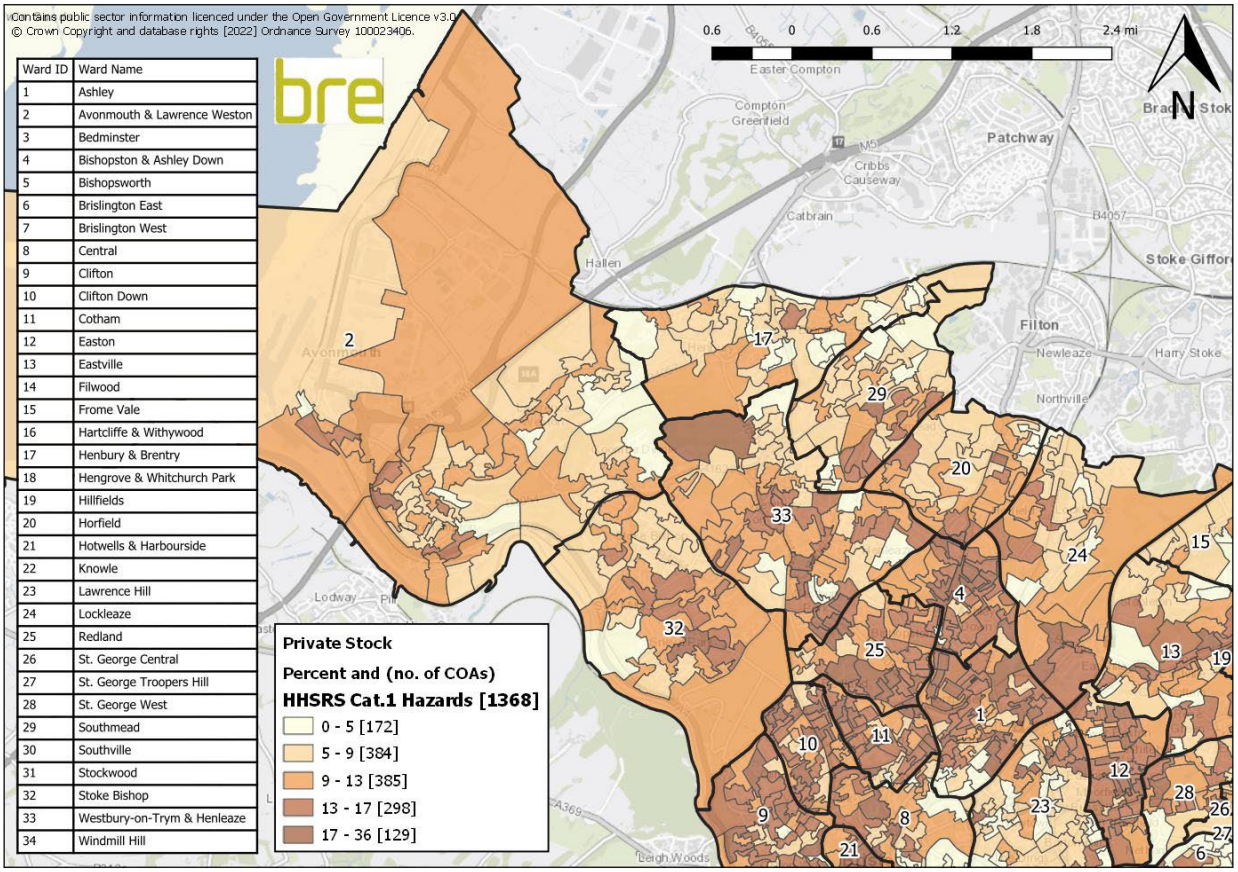
Figure C. 2 Home page (note screenshot below is sample data)

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

Appendix D Additional Maps

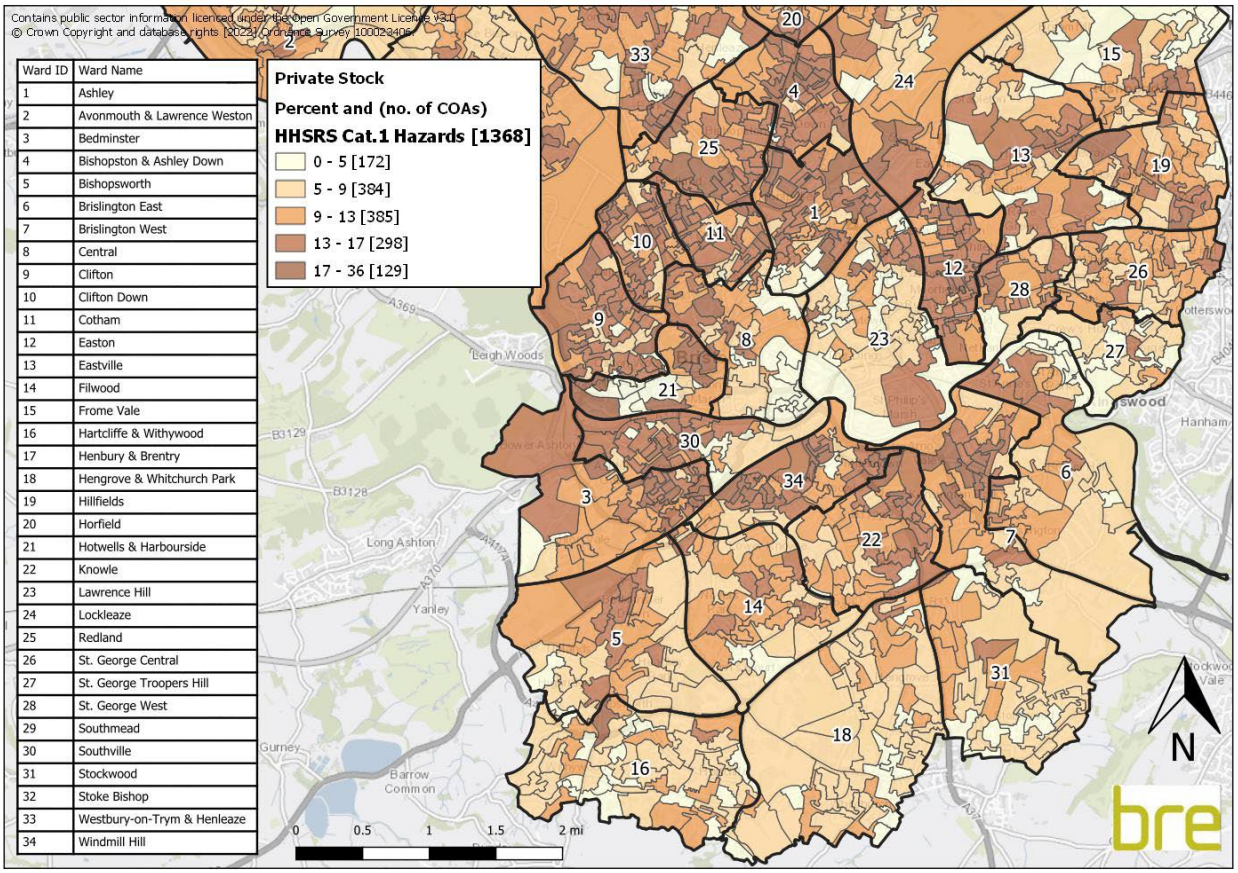
This Appendix provides close up maps for each variable, focussing in on north and south of Bristol. These maps can show the clear urban – rural divide in many of the Housing Standards Variables. The larger maps included above in the report do not always allow for the appreciation that smaller and denser COAs in urban areas are very different in their hazards to the surrounding rural COAs which are larger and are immediately more eye-catching.

Map D. 1: Bristol category 1 hazards – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*

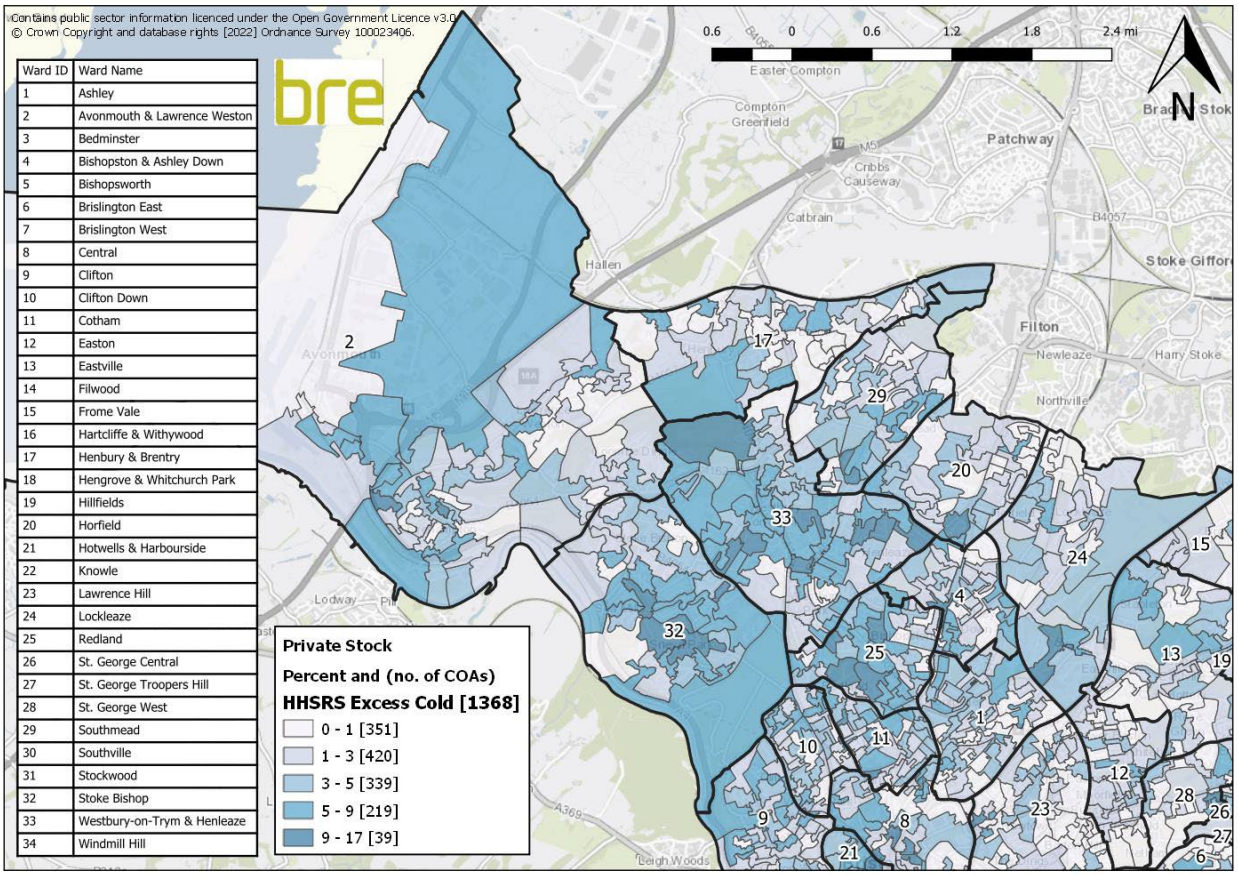


Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 2: Bristol category 1 hazards – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Map D. 3: Bristol households with excess cold – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



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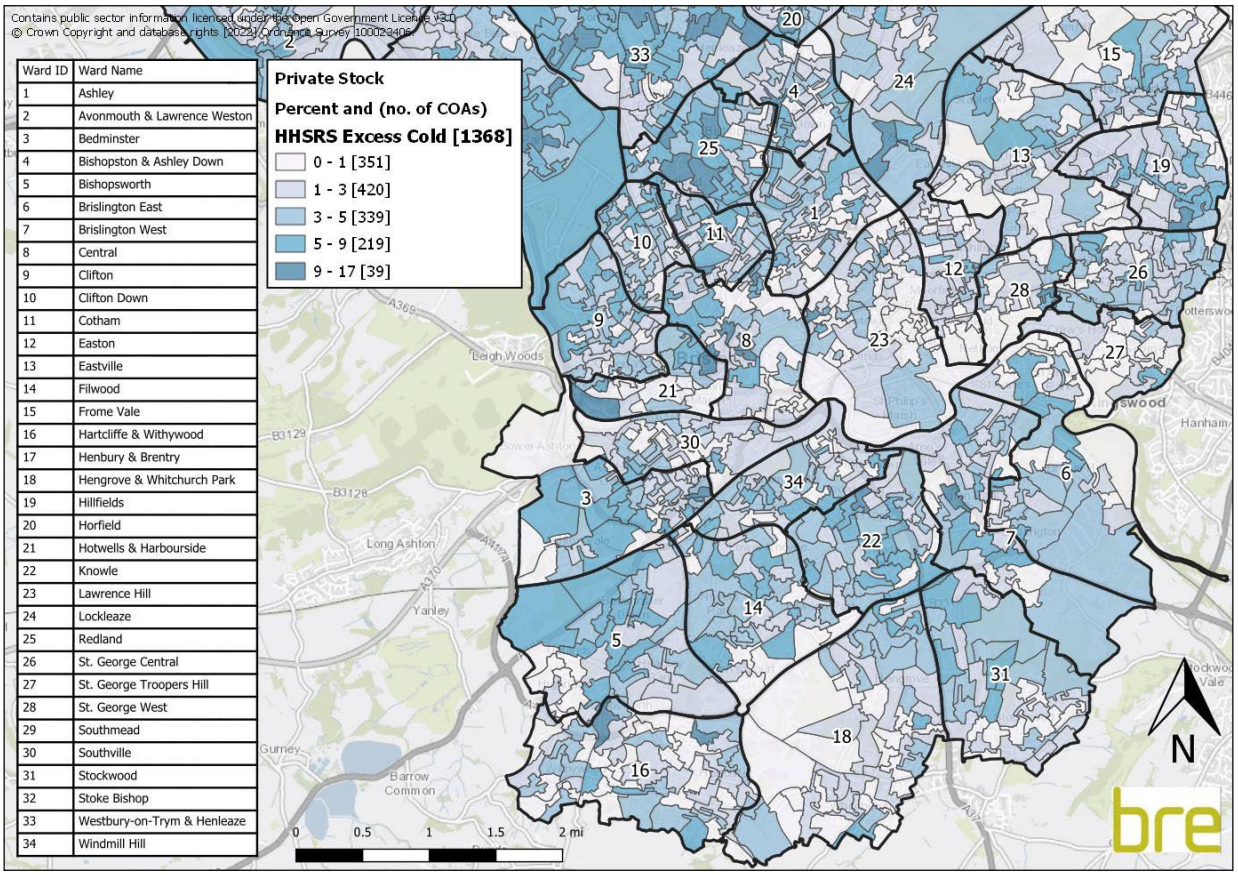
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 4: Bristol households with excess cold – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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3	Bedminster
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5	Bishopsworth
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8	Central
9	Clifton
10	Clifton Down
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12	Easton
13	Eastville
14	Filwood
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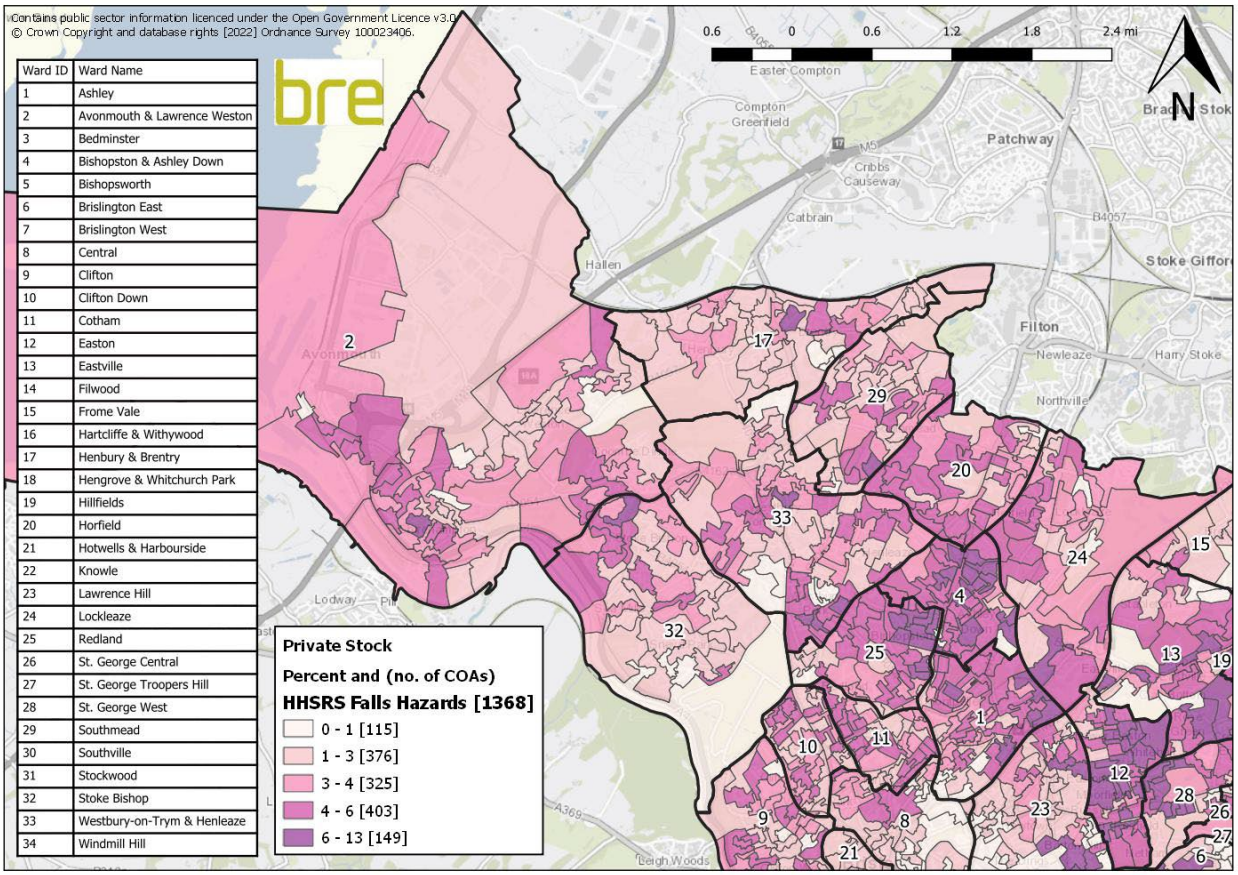
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 5: Bristol households with falls hazards – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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6	Brislington East
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17	Henbury & Brentry
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22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
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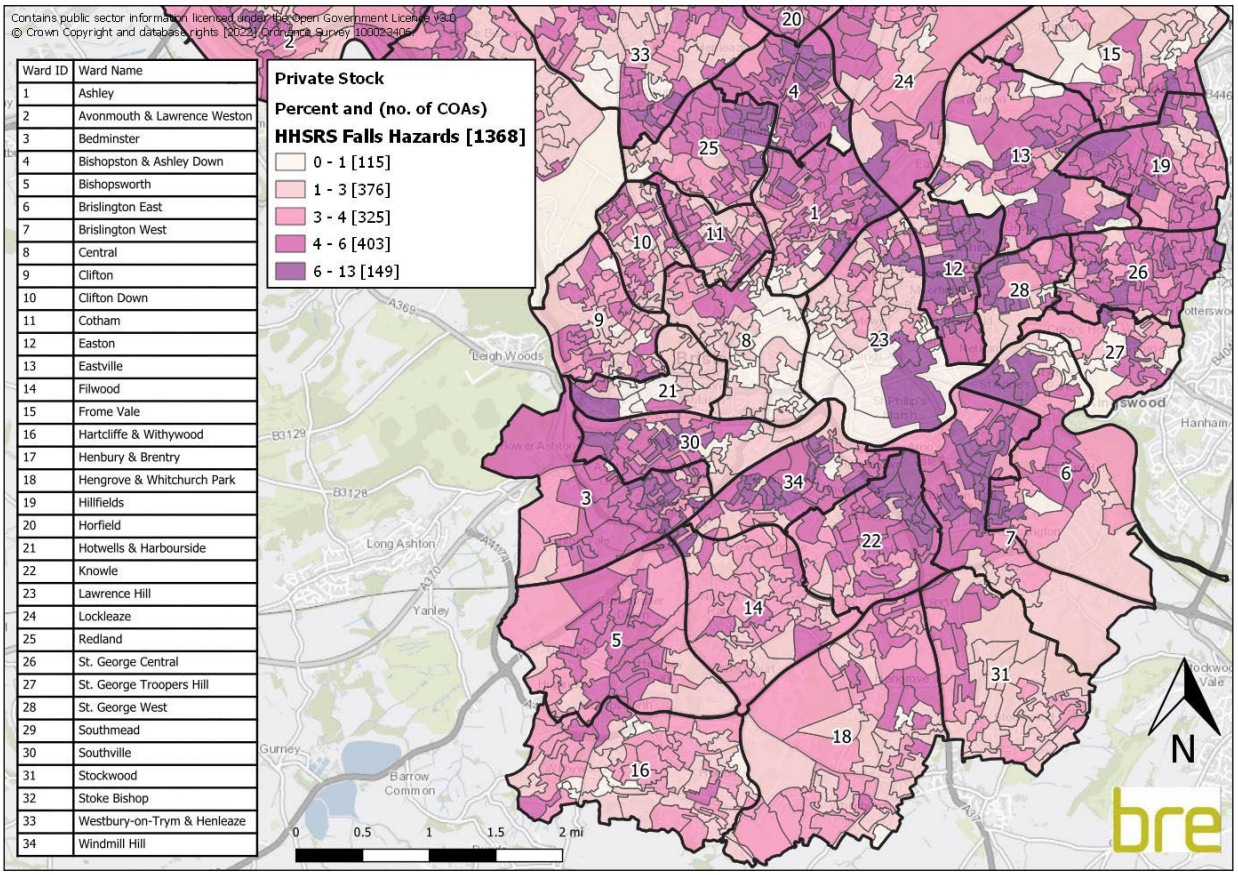
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 6: Bristol households with falls hazards – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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18	Hengrove & Whitchurch Park
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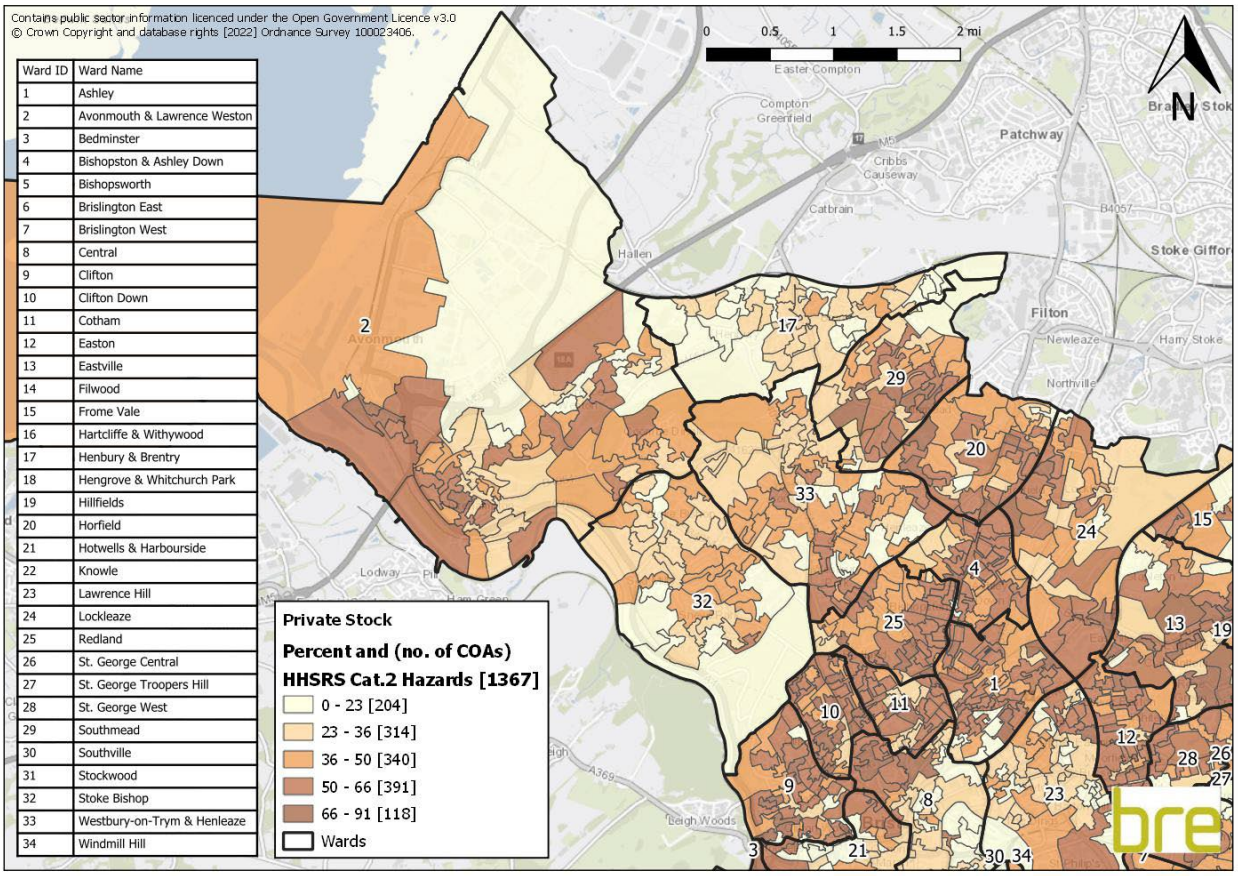
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 7: Bristol category 2 hazards – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
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18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
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22	Knowle
23	Lawrence Hill
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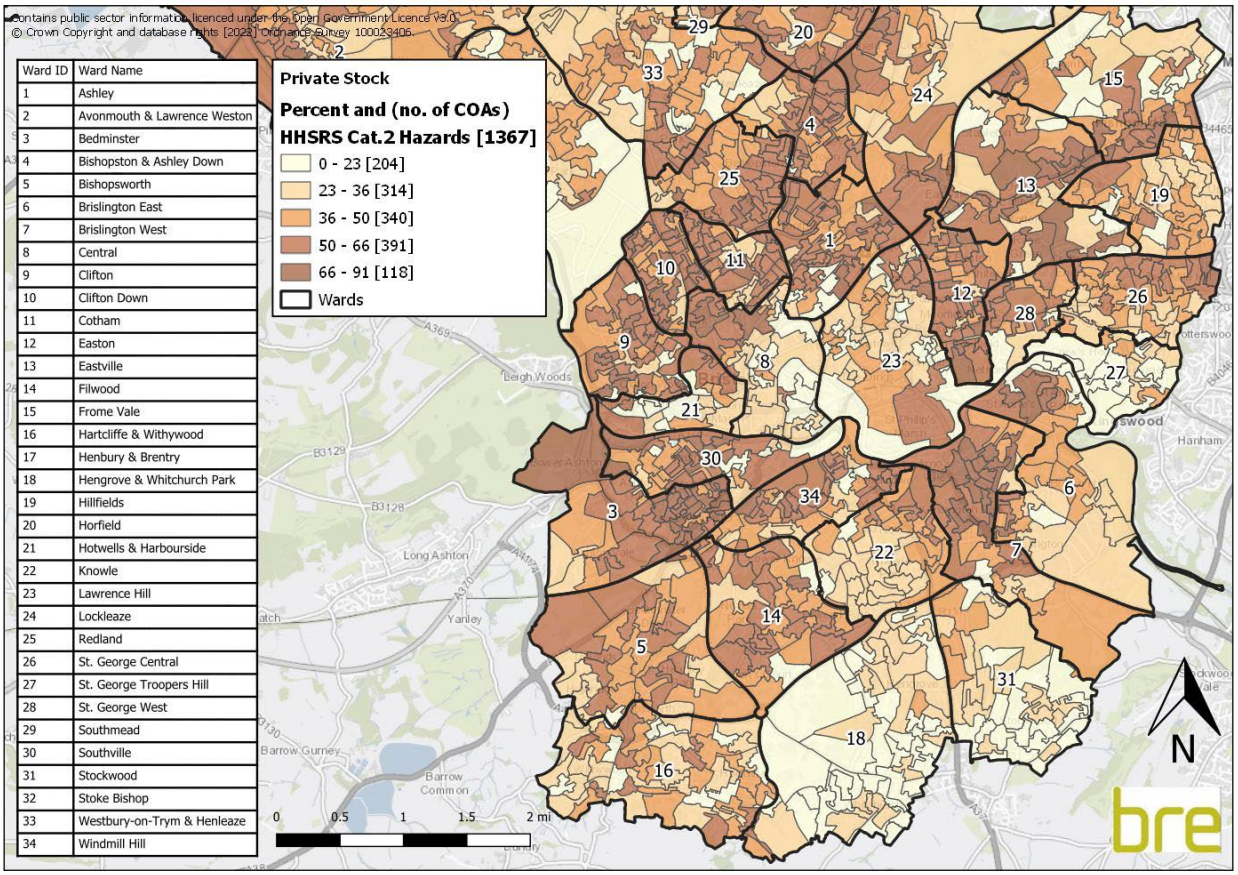
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 8: Bristol category 2 hazards – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
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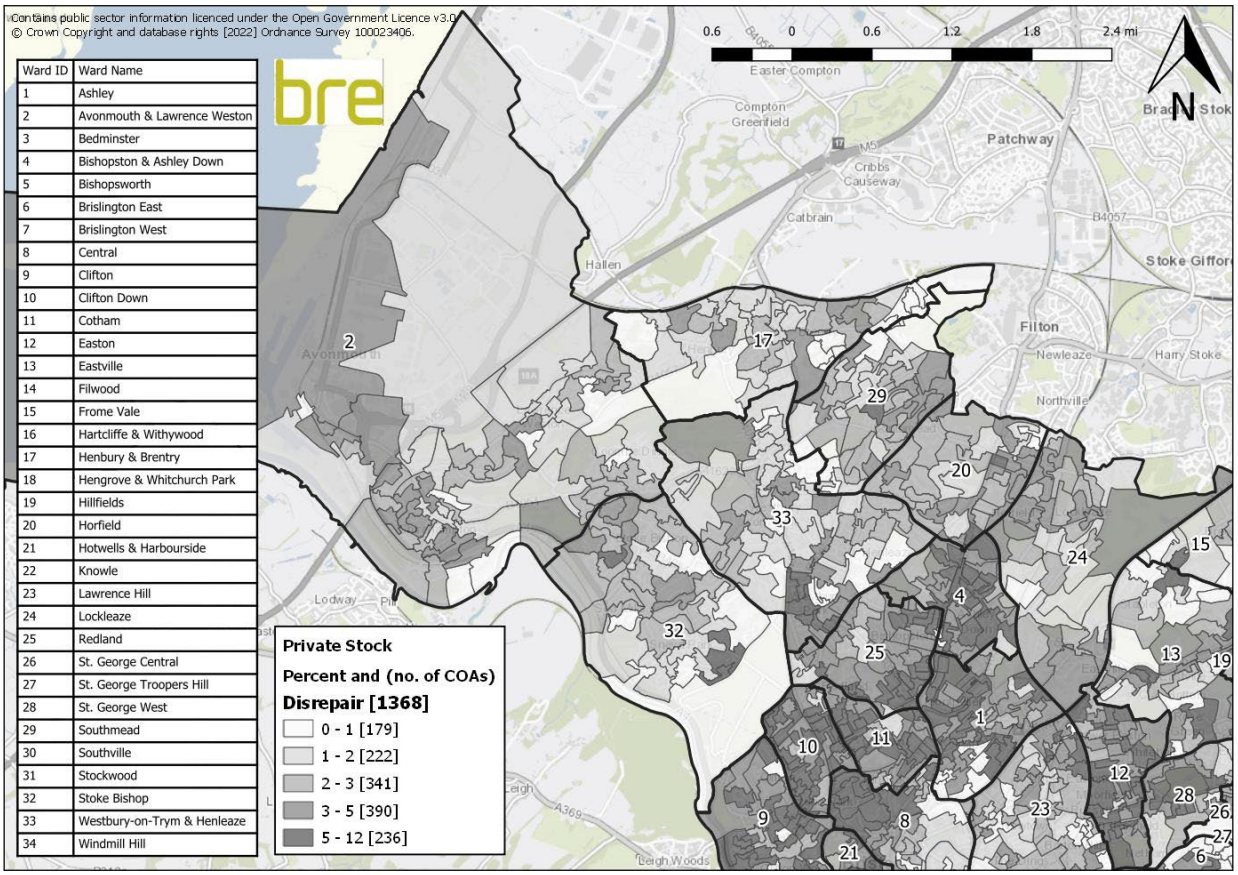
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 9: Bristol households in disrepair – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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12	Easton
13	Eastville
14	Filwood
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17	Henbury & Brentry
18	Hengrove & Whitchurch Park
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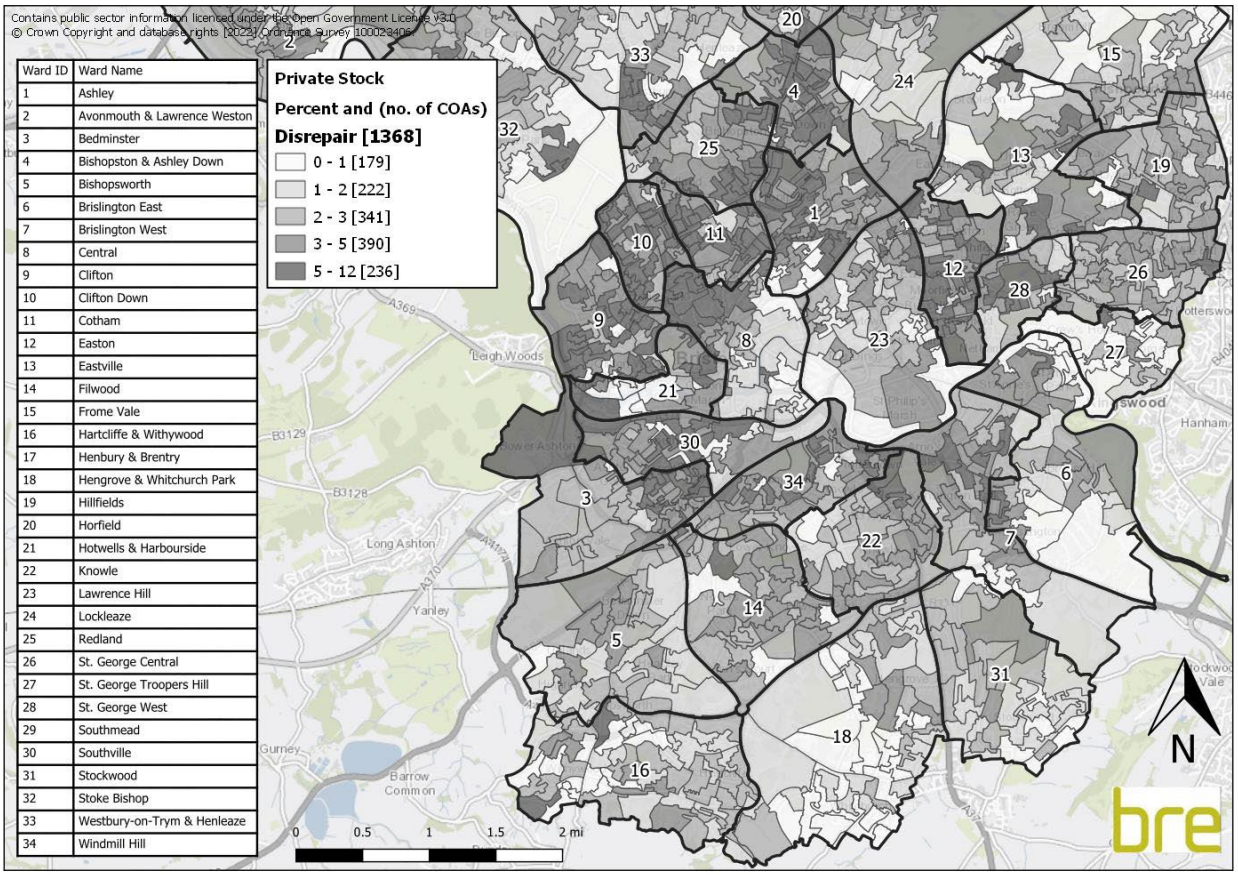
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 10: Bristol households in disrepair – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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6	Brislington East
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14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
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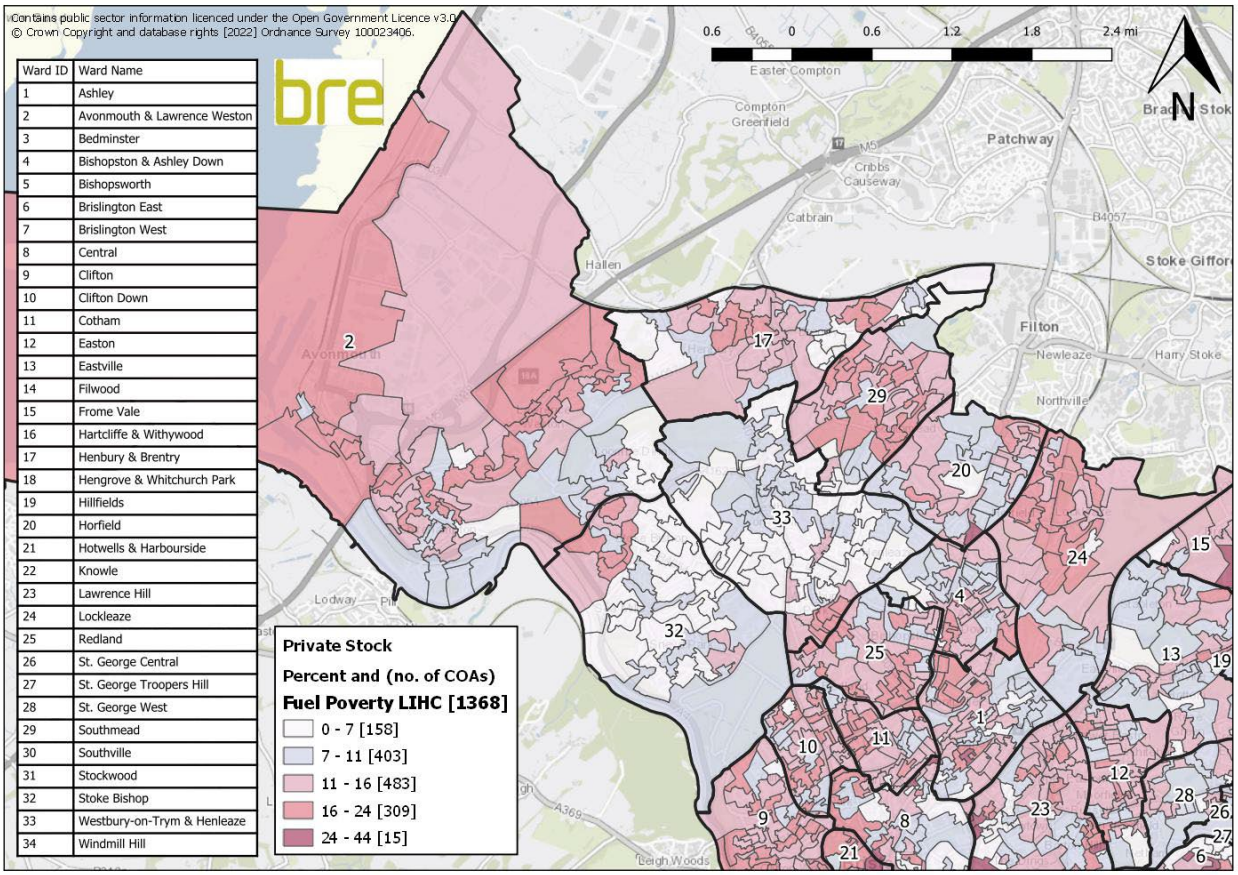
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 11: Bristol households in fuel poverty (LIHC definition) – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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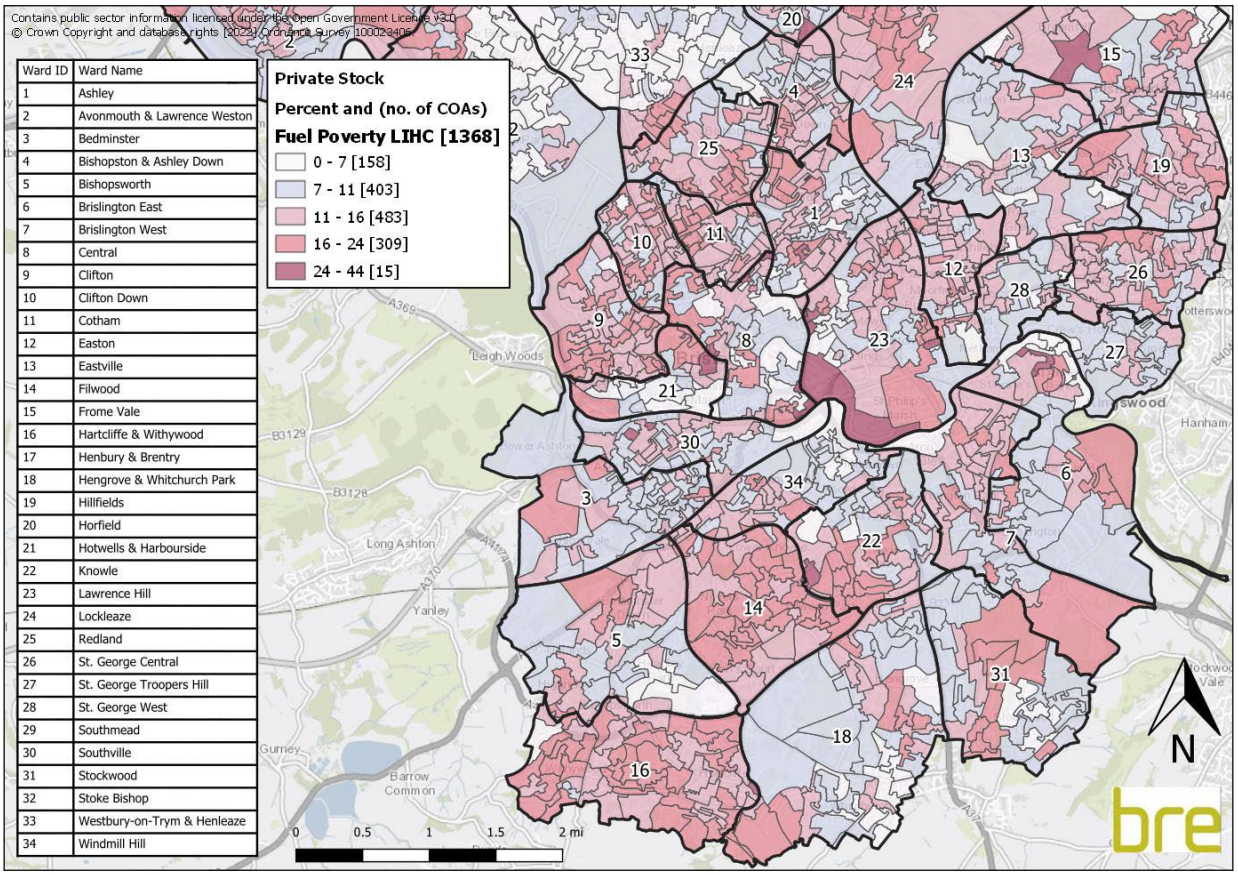
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 12: Bristol households in fuel poverty (LIHC definition) – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
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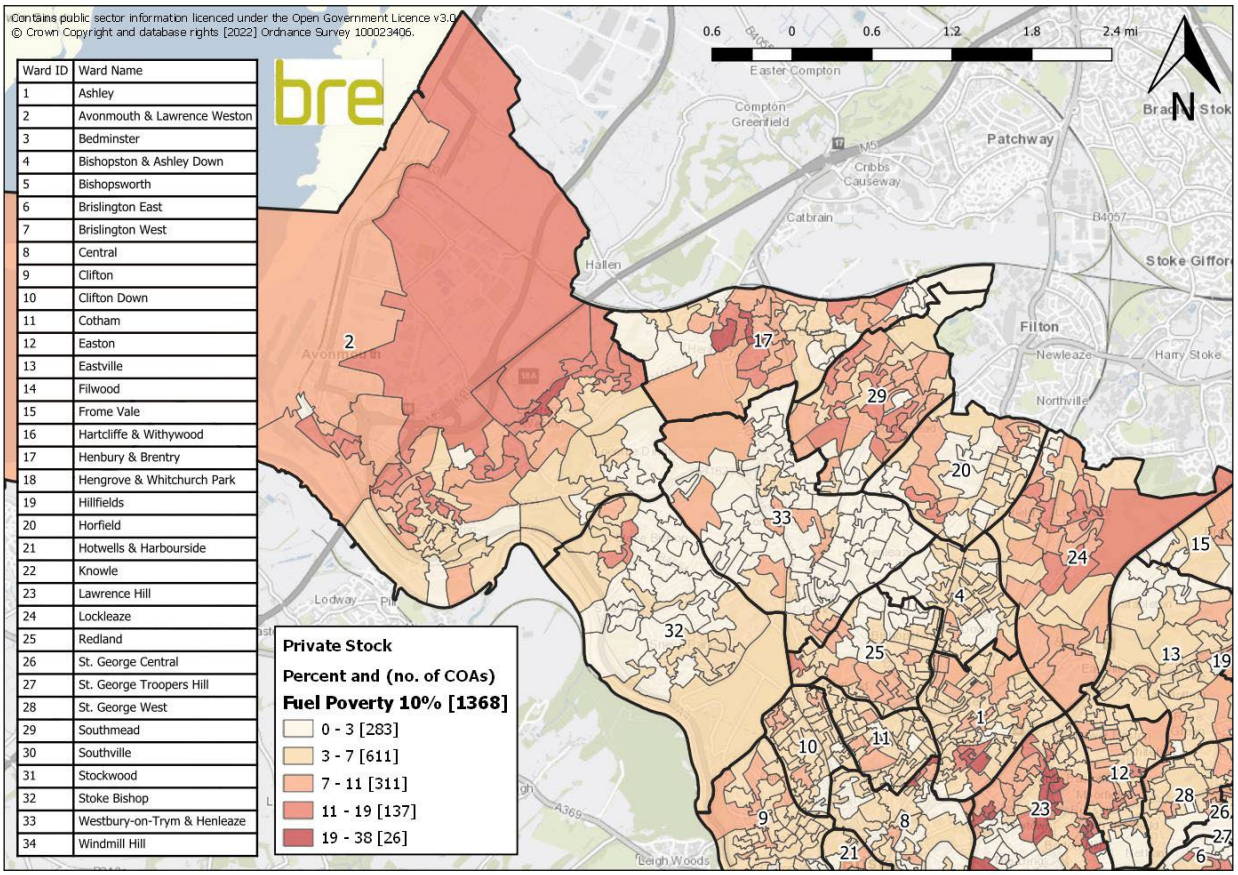
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 13: Bristol households in fuel poverty (10% definition) – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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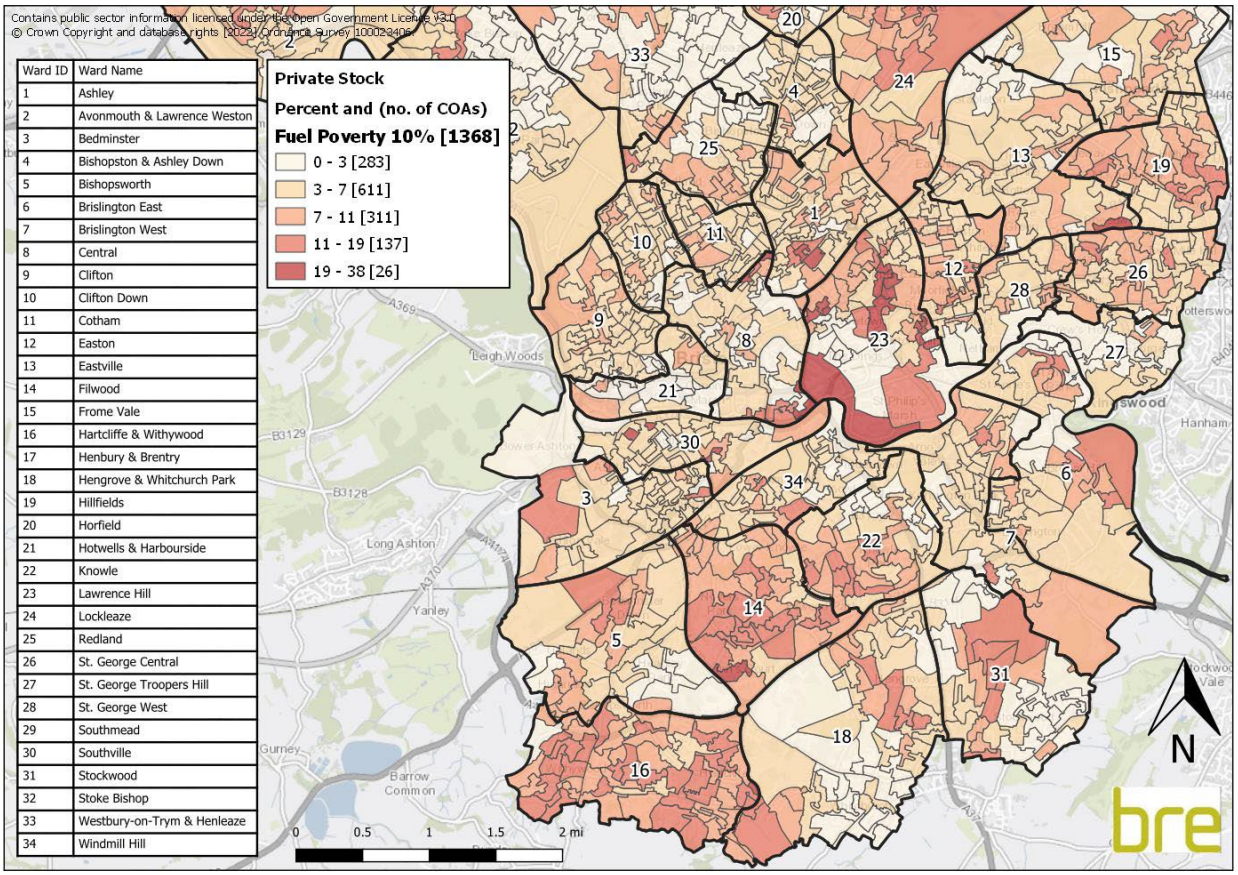
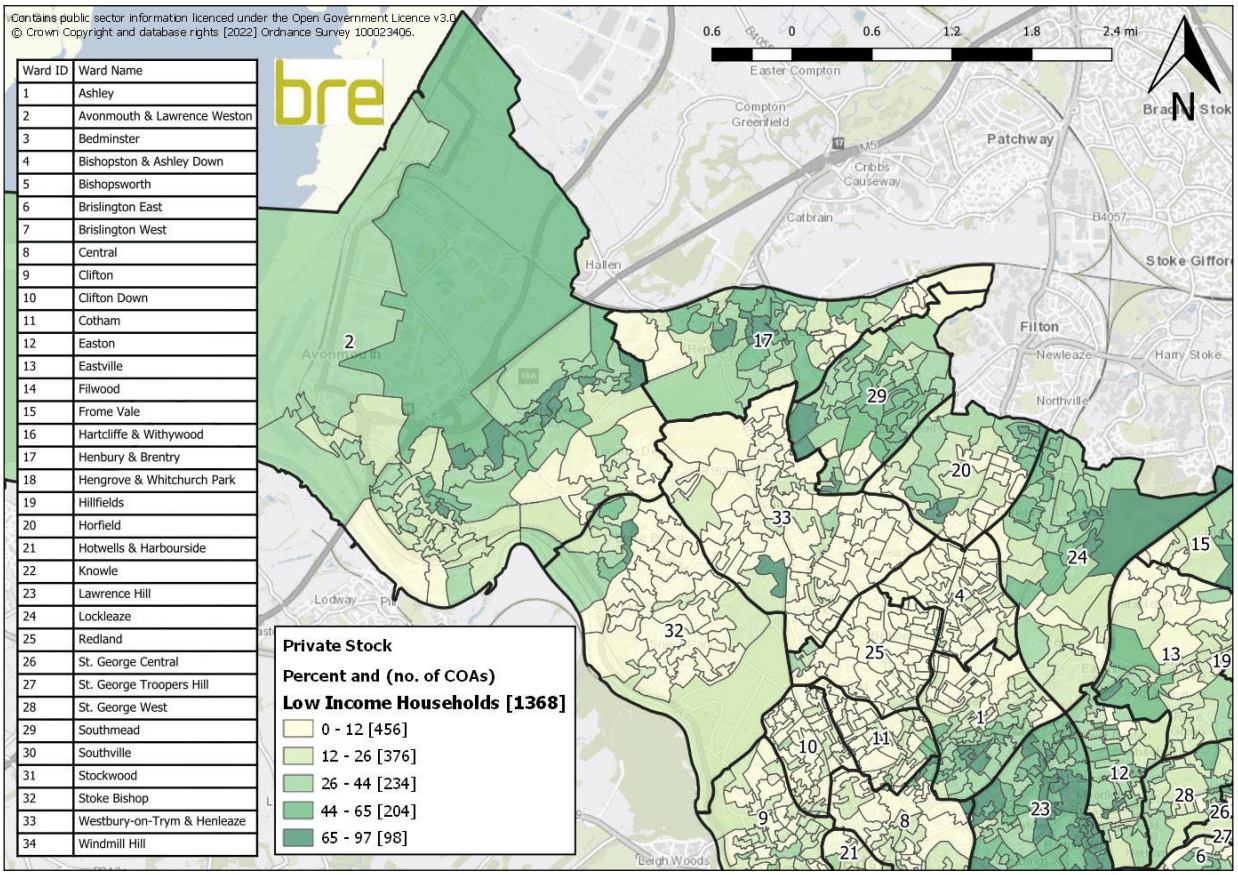
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 14: Bristol households in fuel poverty (10% definition) – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Map D. 15: Bristol households in low income – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
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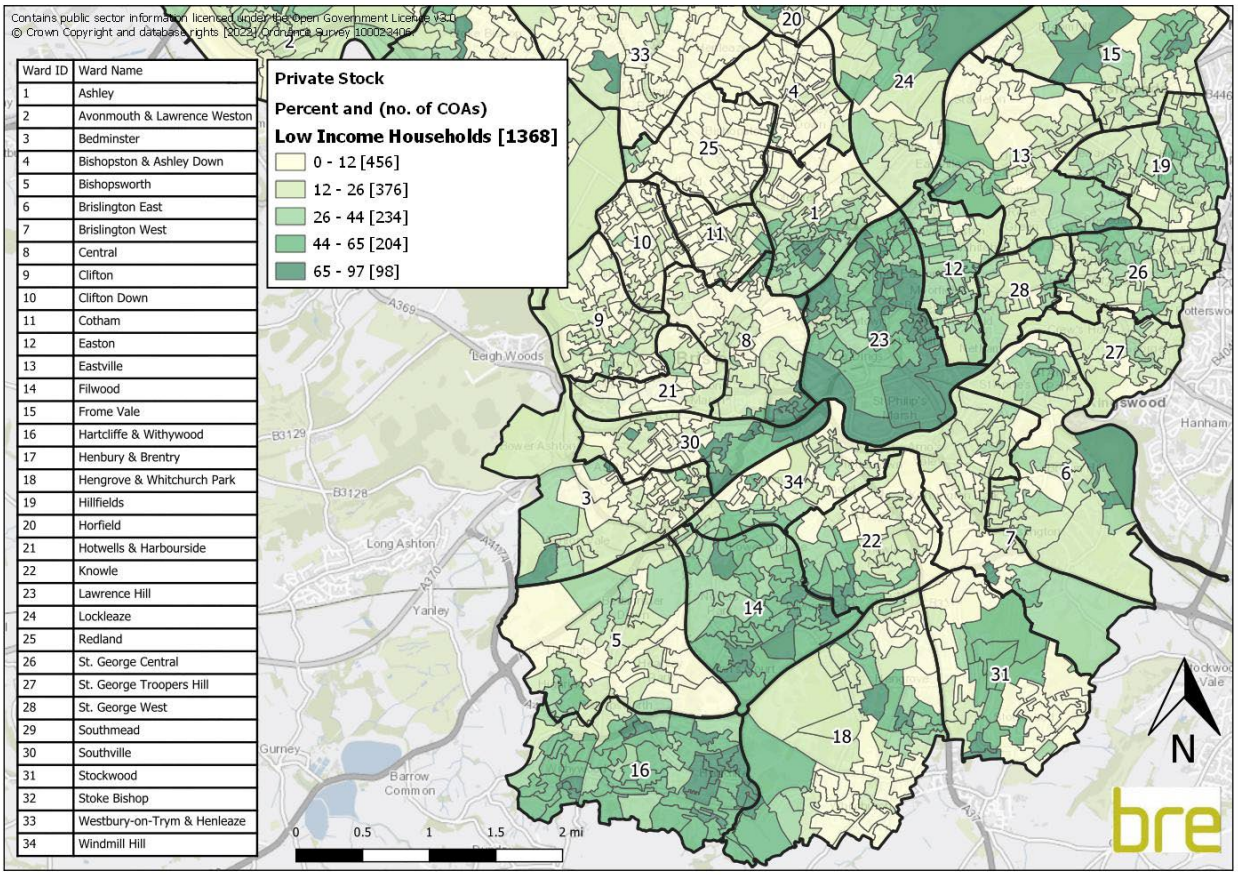
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 16: Bristol households in low income – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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3	Bedminster
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5	Bishopsworth
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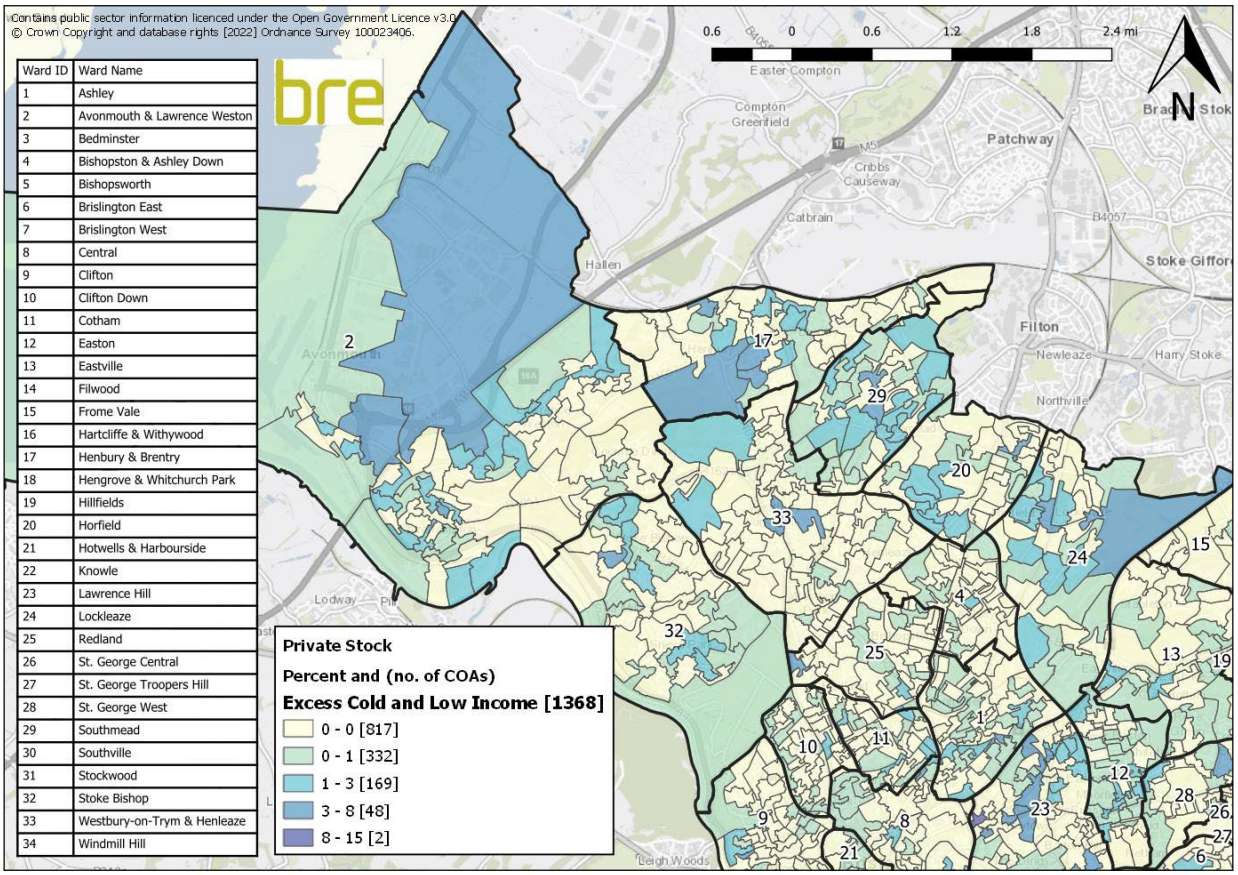
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 17: Bristol households with excess cold and in low income – private stock in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
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10	Clifton Down
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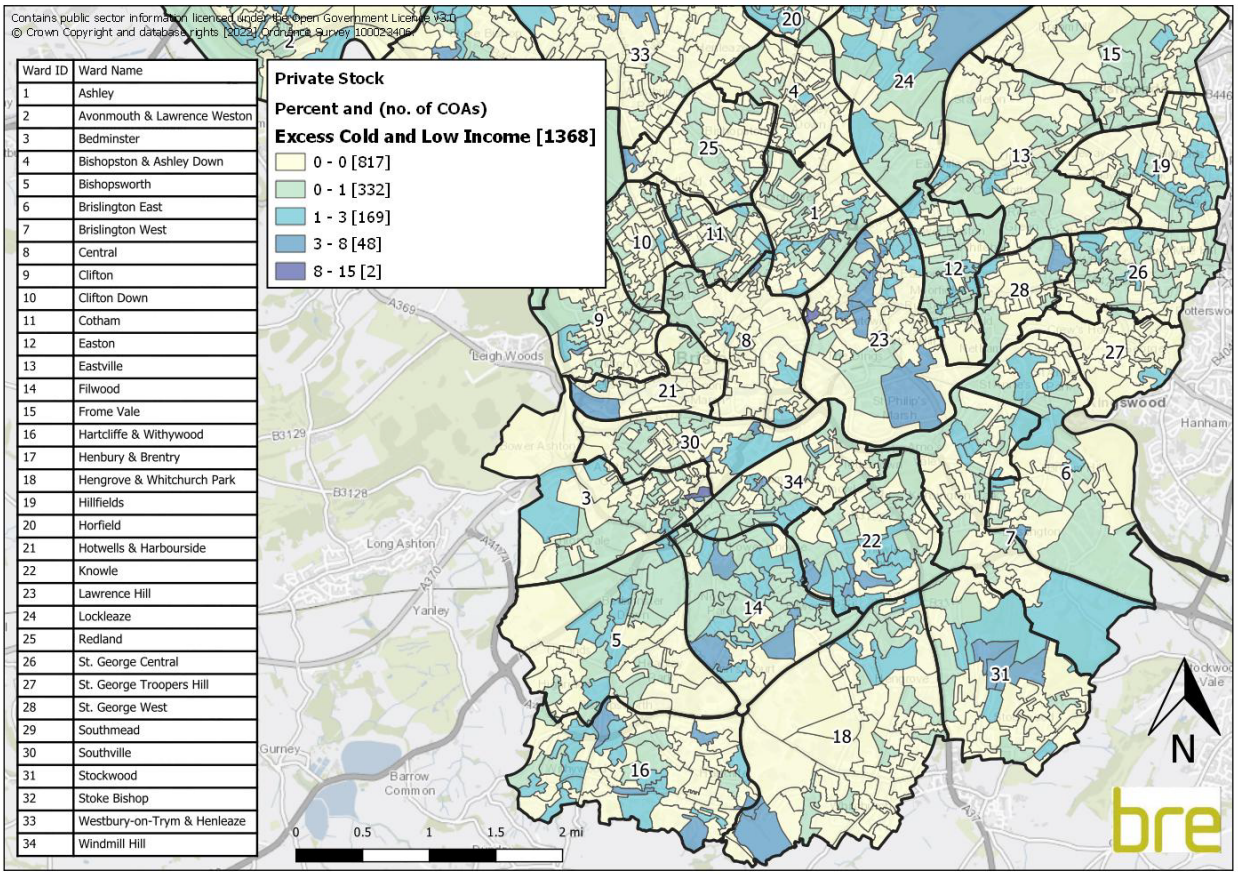
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 18: Bristol households with excess cold and in low income – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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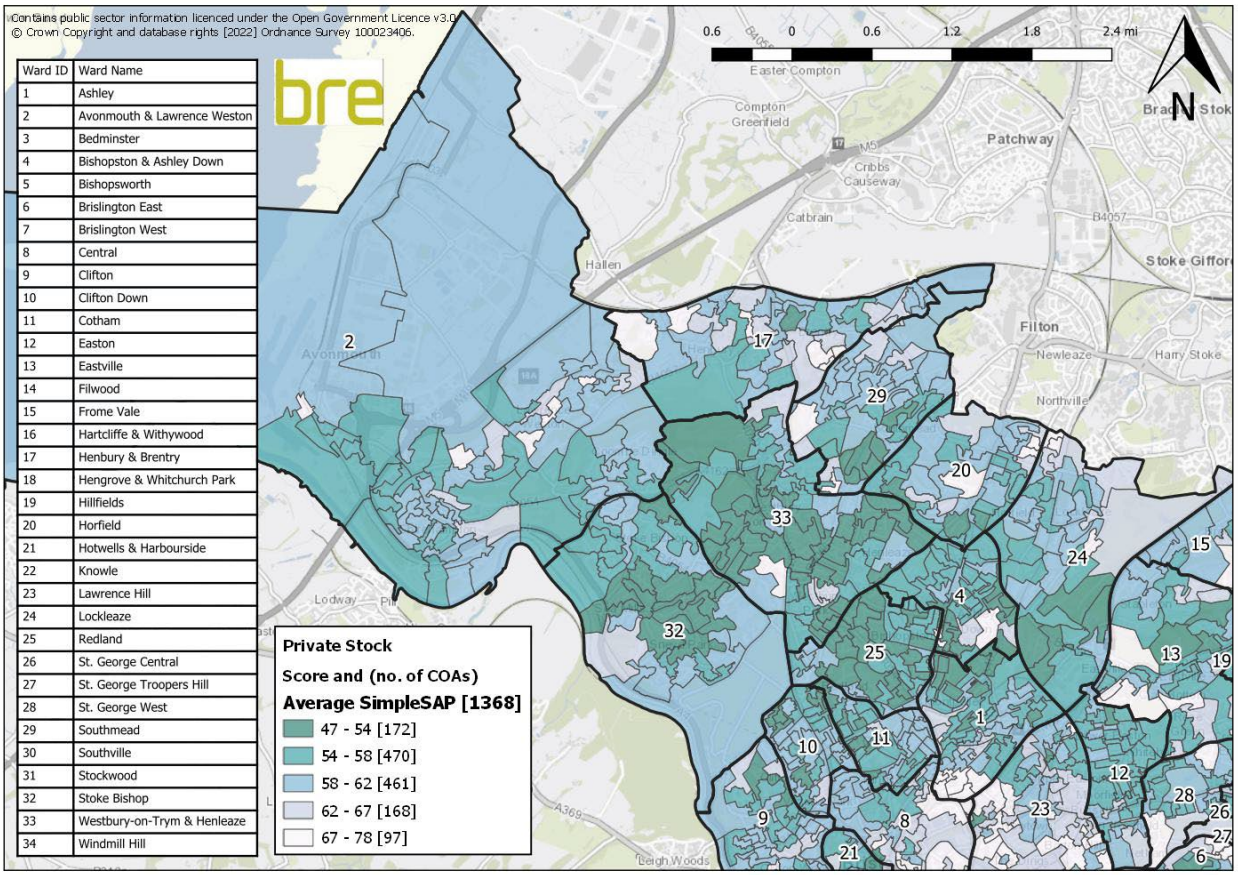
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 19: Bristol average SimpleSAP households – private stock in the north. *N.B. in the legend, values vbare greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
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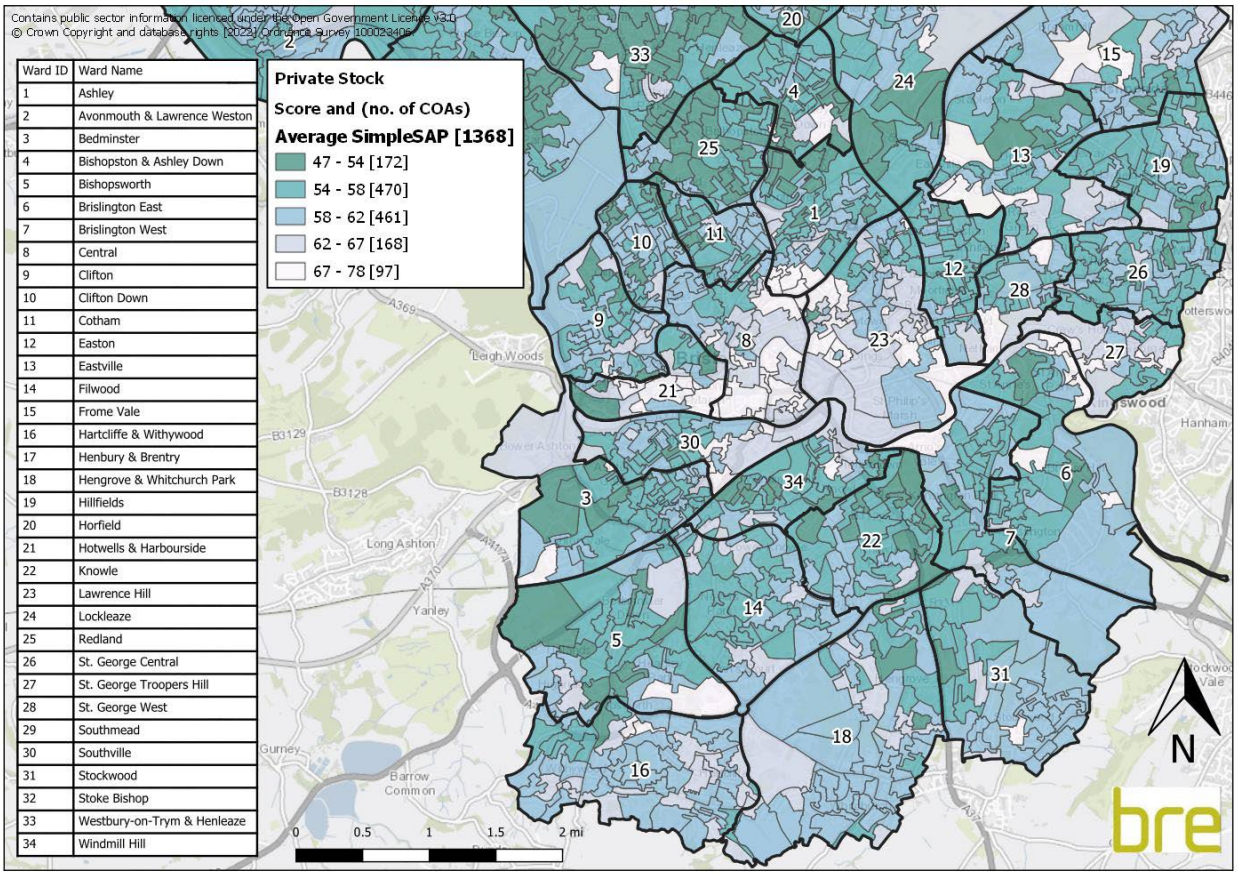
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 20: Bristol average SimpleSAP households – private stock in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
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2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
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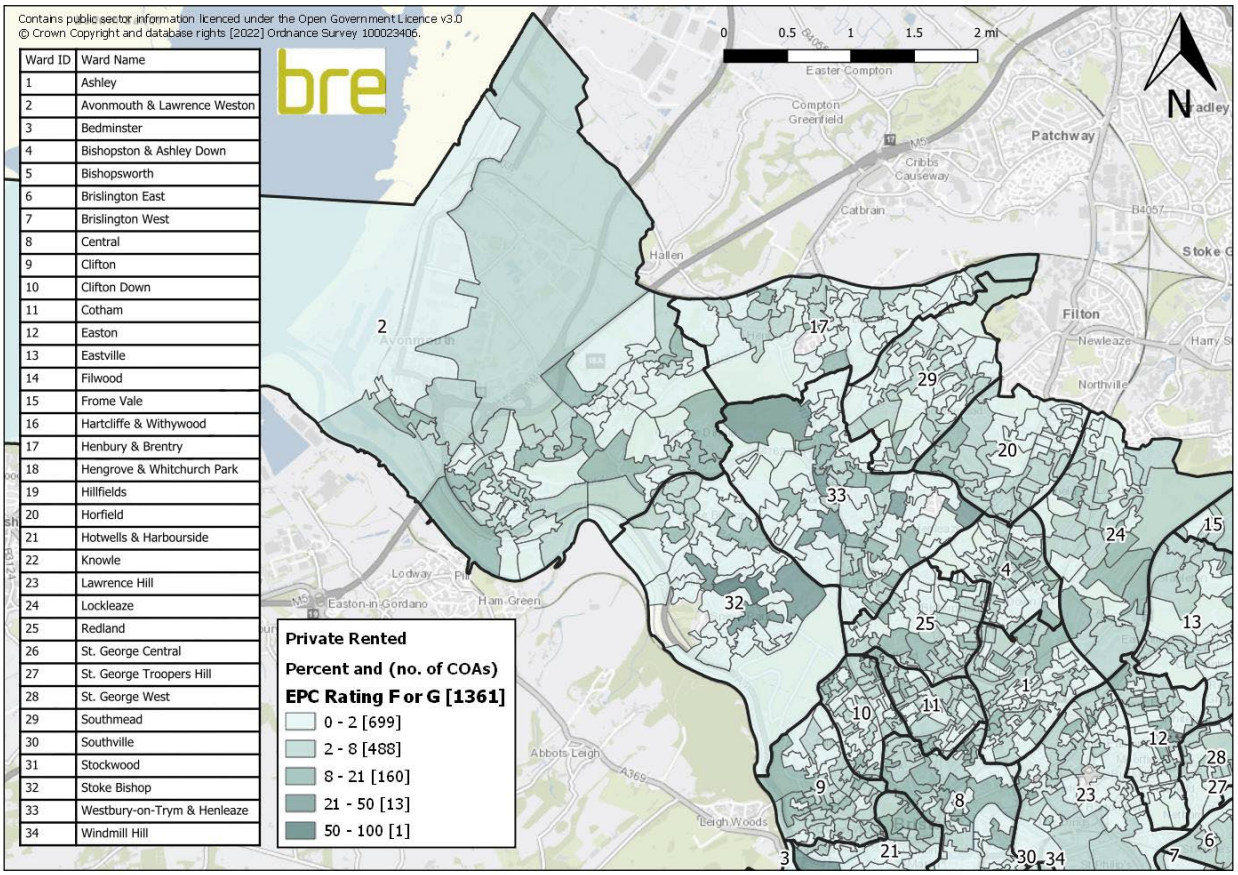
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 21: Bristol households with EPC ratings F or G – private rented in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* Return to main report



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
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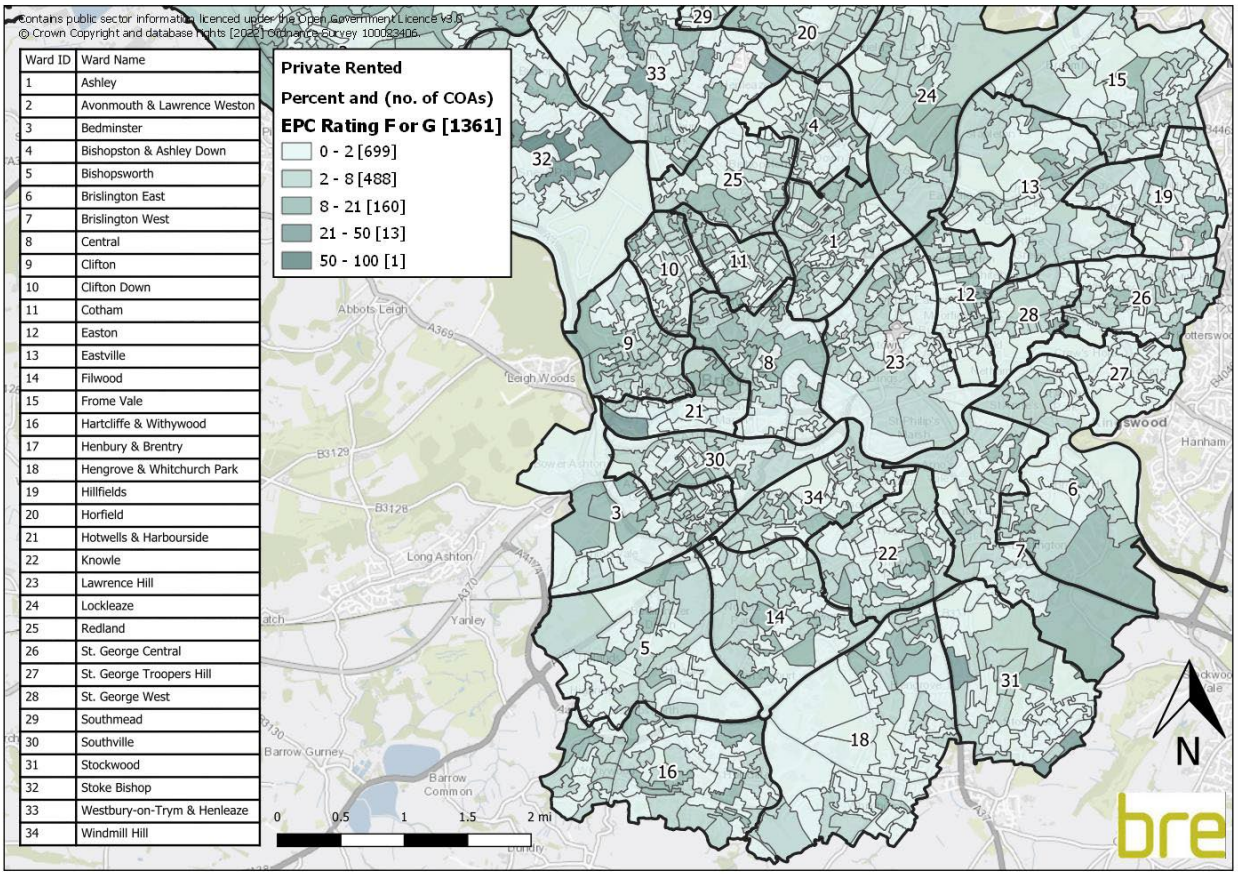
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 22: Bristol households with EPC ratings F or G – private rented in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
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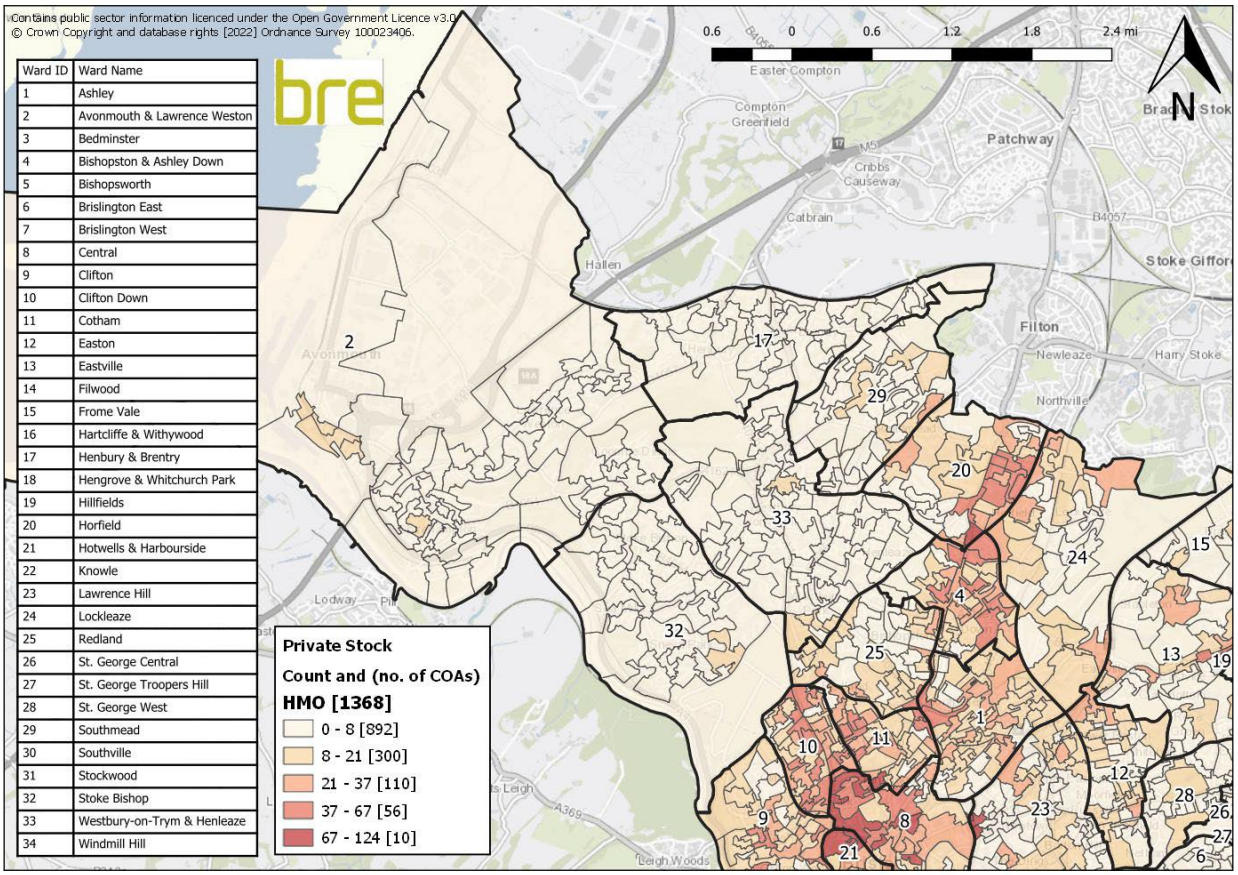
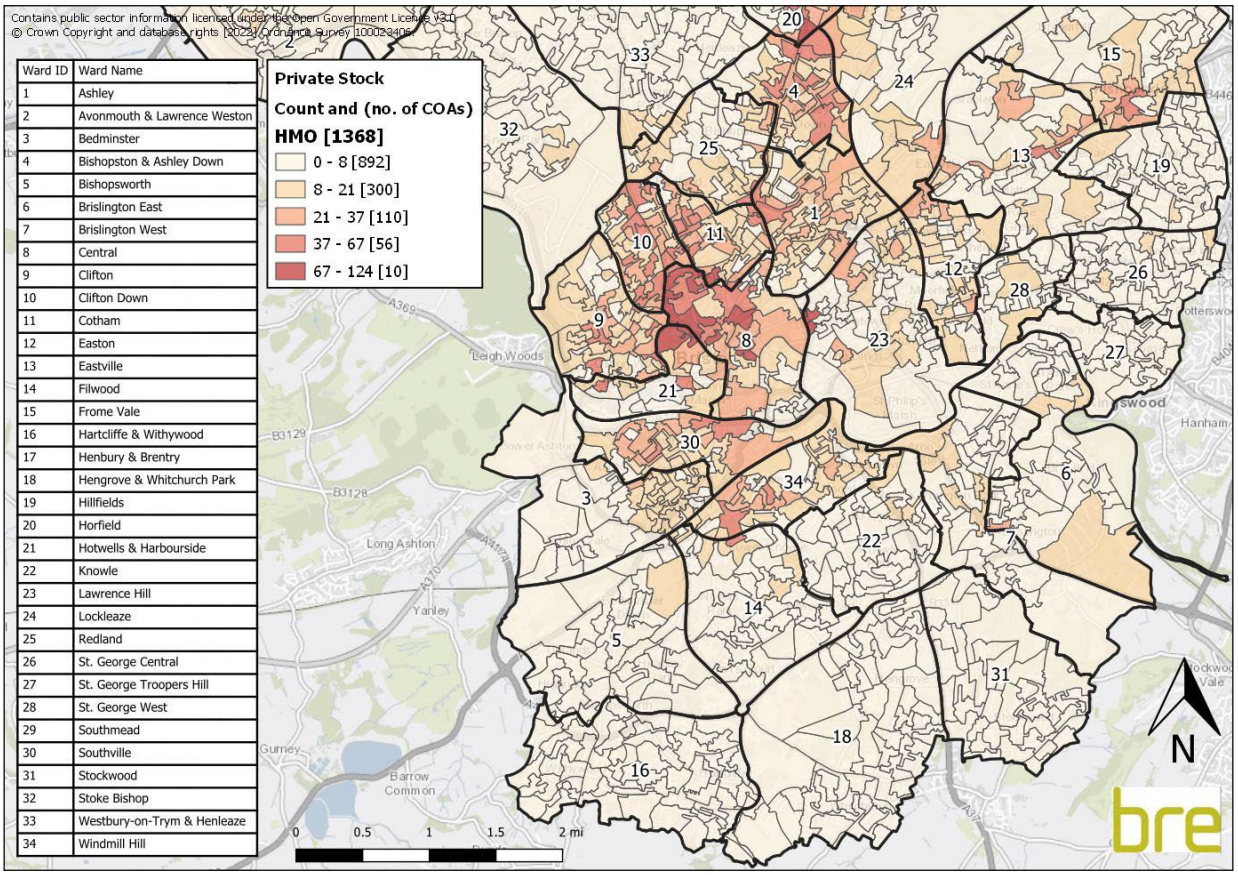
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 23: Bristol HMOs in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Map D. 24: Bristol HMOs in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
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2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
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10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
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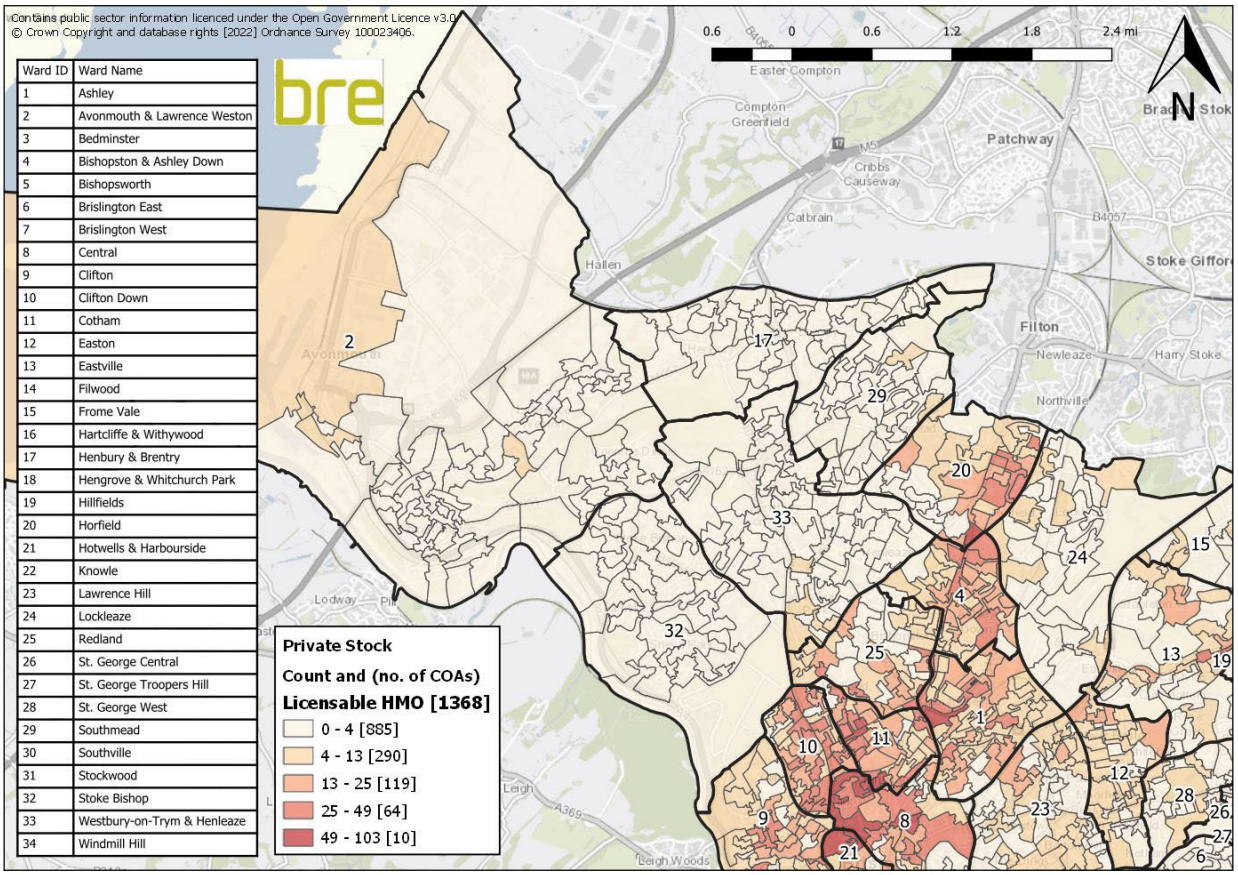
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 25: Bristol mandatory licensable HMOs in the north. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
21	Hotwells & Harbourside
22	Knowle
23	Lawrence Hill
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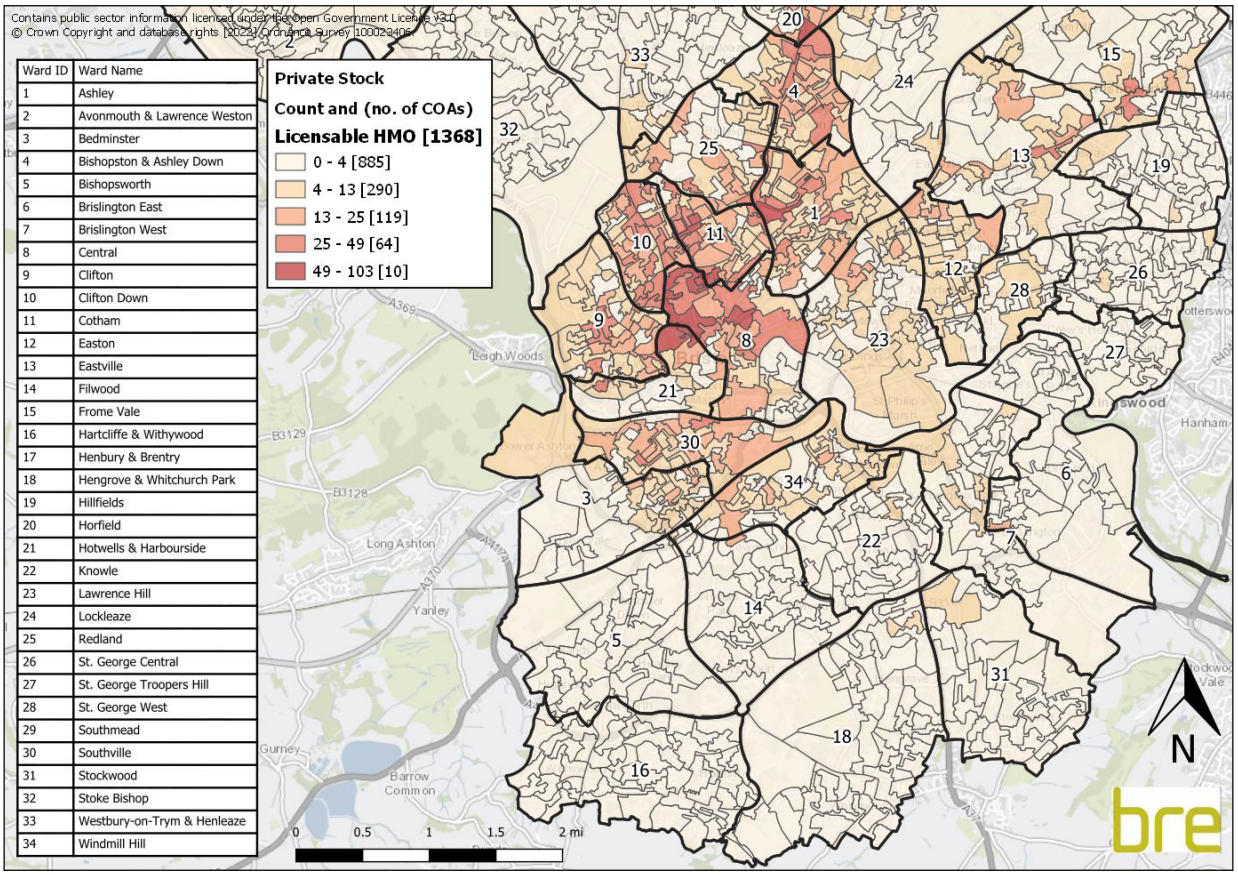
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

Map D. 26: Bristol mandatory licensable HMOs in the south. *N.B. in the legend, values are greater than the lower bound and less than or equal to the upper bound.* *Return to main report*



Ward ID	Ward Name
1	Ashley
2	Avonmouth & Lawrence Weston
3	Bedminster
4	Bishopston & Ashley Down
5	Bishopsworth
6	Brislington East
7	Brislington West
8	Central
9	Clifton
10	Clifton Down
11	Cotham
12	Easton
13	Eastville
14	Filwood
15	Frome Vale
16	Hartcliffe & Withywood
17	Henbury & Brentry
18	Hengrove & Whitchurch Park
19	Hillfields
20	Horfield
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22	Knowle
23	Lawrence Hill
24	Lockleaze
25	Redland
26	St. George Central
27	St. George Troopers Hill
28	St. George West
29	Southmead
30	Southville
31	Stockwood
32	Stoke Bishop
33	Westbury-on-Trym & Henleaze
34	Windmill Hill

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
DLUHC	Department for Levelling Up, Housing and Communities (previously MHCLG)
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 Department for Levelling Up, Housing and Communities (DLUHC). It collects information about people's housing circumstances and the condition and energy efficiency of housing in England
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
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 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 falls 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