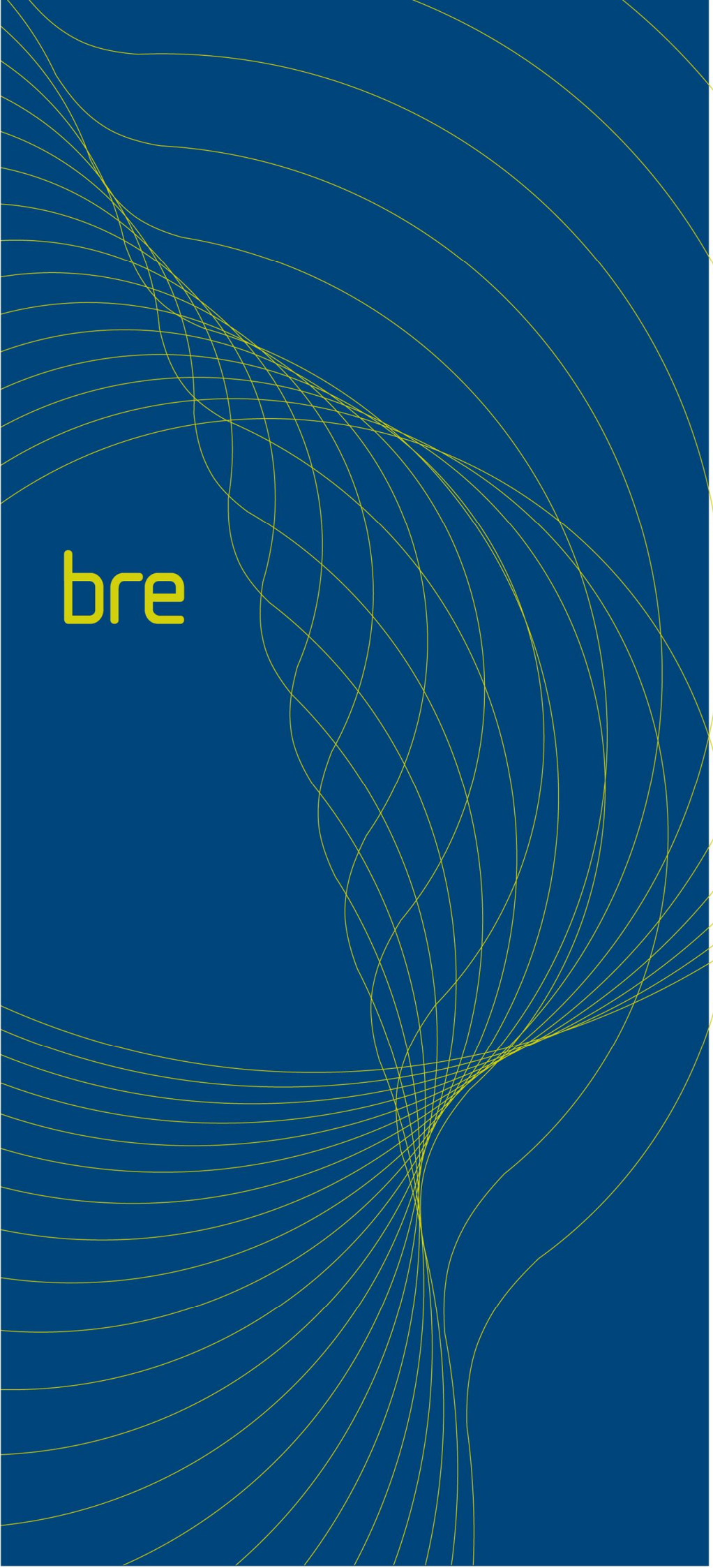

Dwelling level housing stock modelling and database for Camden Council

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September 2013

Client report number 286-999
Version 3

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Executive Summary

BRE were commissioned to provide information on key housing and domestic energy variables, with a focus on private sector housing, to Camden Council. Principal among these indicators is the rate of Category 1 Housing Health and Safety Rating Hazards found in the stock as this is now the minimum standard for housing which every housing authority is obliged to keep under review. The information provided on Category 1 Hazards will also provide the principal inputs for a Health Impact Assessment of private sector housing should the authority wish to undertake such a study in future.

The estimates for Category 1 Hazards and the other indicators have been provided using a stock modelling methodology. Such approaches have been used for many years by BRE but this particular set of models is one of the first of its kind to make significant use of the Experian UK Consumer Dynamics Database of dwelling and household indicators as inputs to the models. This and data from the Department for Communities and Local Government's English Housing Survey (EHS) have been the main input data to the models.

The methodology is explained in some detail in the report and appendices but begins with dwelling level inputs provided by Experian and expands on these using inference techniques to provide sufficient information to calculate the likely energy efficiency of each dwelling in the stock. Some of the housing standards can be directly inferred from this data while others use regression techniques to predict whether a dwelling is likely to meet the standard.

Table E1 summarises the modelled estimates for Camden's private sector housing and includes national results from the 2009 EHS for comparison.

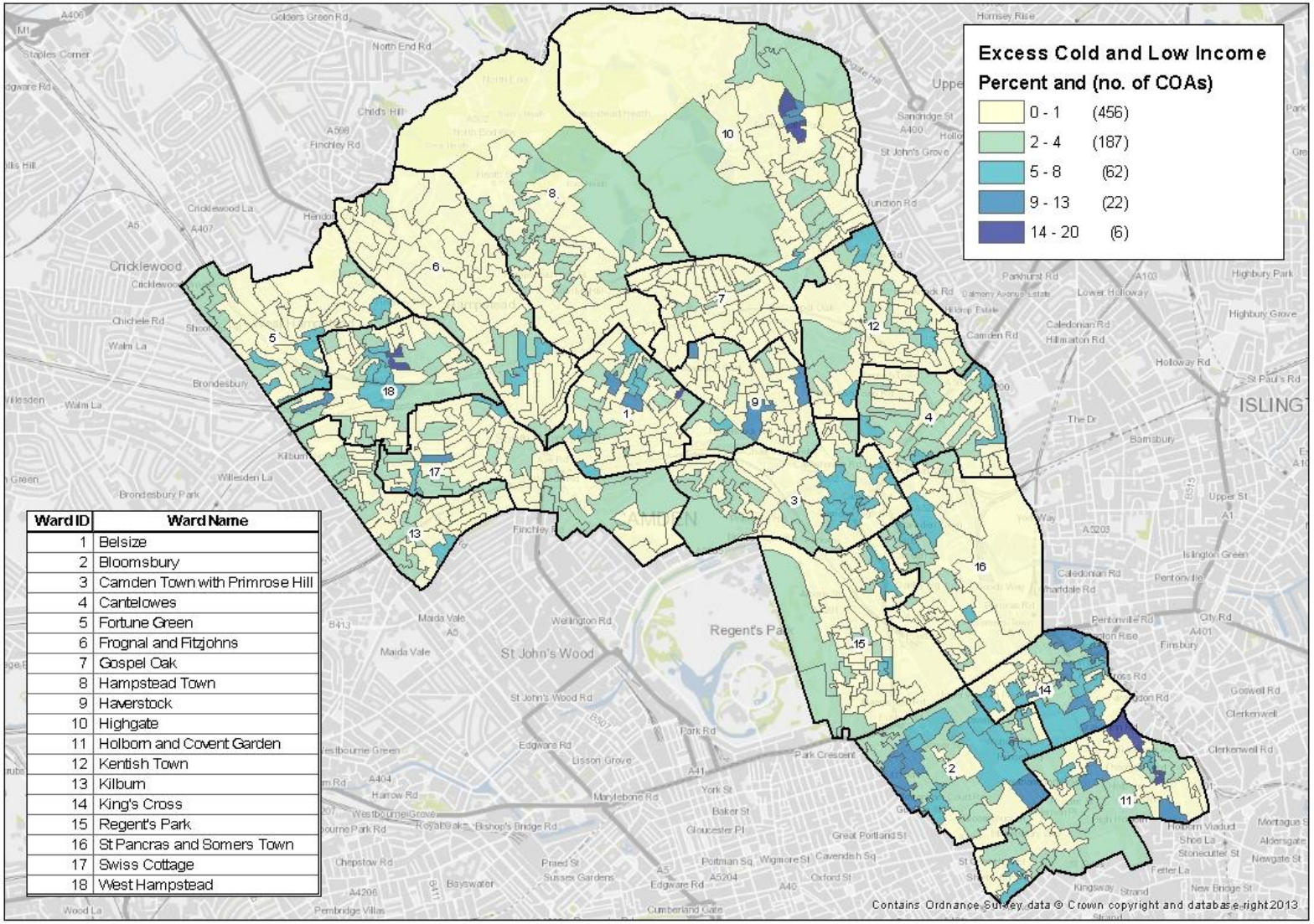
Table E1: Modelled data, private sector stock: authority level summary

	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Camden Council	65,444	11,560 (18%)	5,022 (8%)	5,423 (8%)	5,753 (9%)	7,821 (12%)	10,975 (17%)	53
2009 EHS (private stock)		(22%)	(9%)	(13%)	(6%)	(18%)	(22%)	51

The results in table E1 demonstrate that the private housing stock in Camden is better than the 2009 national average in most respects, however; 18% of the housing stock, which equates to an estimated 11,650 dwellings, is still expected to pose a Category 1 Hazard. This is lower than the corresponding proportion of properties observed at the national level (22%). Most of these hazards are due to Fall Hazards (5,423, 8% of Camden's housing stock compared with a 2009 EHS figure of 13%) with the next highest incidence being from Excess Cold (5,022, 8% of Camden's housing stock compared with 9% in the 2009 EHS). An average SimpleSAP score of 53 exceeds the national average by 2 points, which is not surprising given the slightly lower than national average level of Category 1 Excess Cold hazards. The one item where the stock performance is notable worse than the national average is the level of Disrepair which affects 9% of the housing stock within Camden compared with 6% nationally.

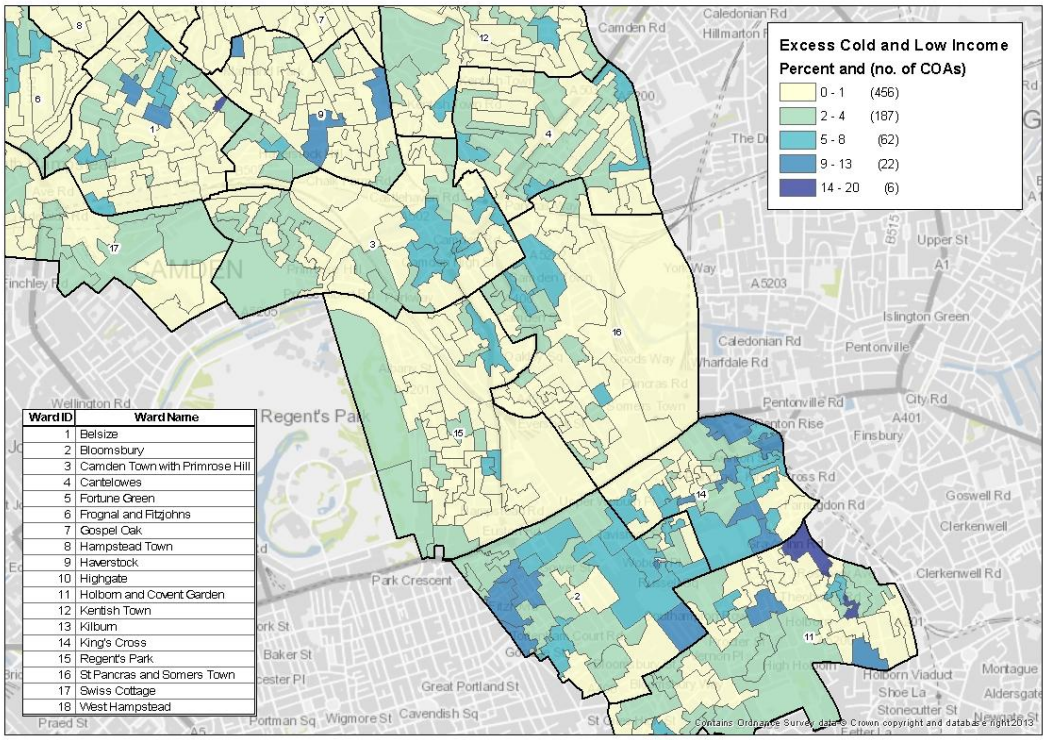
The authority level data is valuable as it allows the results to be placed in a national context and can be used to predict the likely demand for private sector housing services. The dwelling level database however, holds the most useful information as it allows cross tabulations to be made with different variables, the results of which can be mapped to highlight small areas which are likely to be of most interest to Council Officers. The Maps E1(i) to E1(iii) below illustrates how cross tabulating Category 1 Hazard for Excess Cold with Low Income Households can indicate where concentrations of households living on the lowest incomes and in the hardest dwellings to heat are likely to be found.

Map E1(i): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households



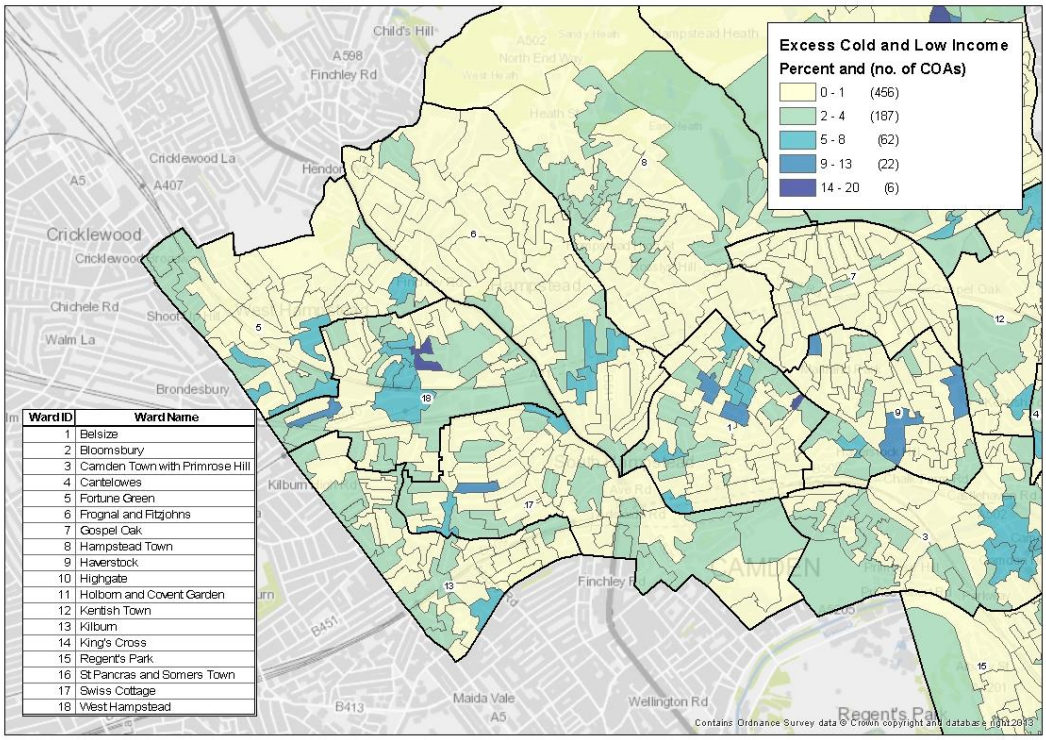
Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
8	Hampstead Town
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map E1(ii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households, Camden Town



Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
8	Hampstead Town
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map E1(iii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households, Hampstead



Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
8	Hampstead Town
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Such maps, and the dwelling lists that underlie them, are useful when considering how best to target the Council's efforts to improve private sector housing whether these are focused on publicity, joint working or use of enforcement powers.

The database also contains Basic Green Deal and HMO data. The Basic Green Deal variables, which include solid walls, uninsulated cavity walls and presence of loft insulation, identify areas where energy improvements can be made. This information will be useful for targeting areas which may benefit from Green Deal and ECO funding. The HMO data seeks to identify HMOs and mandatorily licensable HMOs. The HMO models estimate that there are 2,539 HMOs in Camden, of which 415 are potentially mandatorily licensable.

While the summary results and maps provided are a valuable output of the project, its main strength is the dwelling level database which underlies it. This can be used by Council officers to manipulate, amalgamate and extract information to aid Camden Council's Housing Services' projects and reporting. All of the housing stock model outputs (tables and maps) in this report have been calculated by using the dwelling level information from the database.

The report concludes with a brief description of how the database could be improved by matching the addresses provided to the local authority's own list and allowing the authority's own data to be brought in and where appropriate take place of the modelled data.

Contents

Introduction

BRE were commissioned to provide information on key housing indicators to Camden Council. These include the Housing Health and Safety Rating System (HHSRS) and Fuel Poverty. The information has been derived from a series of models which make use of the Experian UK Consumer Dynamics Database using a range of statistical methods. This data provides officers at Camden Council with detailed information on the likely condition of the stock and the geographical distribution of properties of interest, such as those that might benefit from energy efficiency improvements, or other forms of intervention.

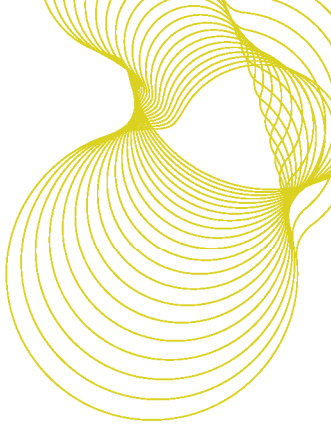
Before considering the stock models themselves we first of all set out the basic legislative, government and local reporting requirements on private sector housing information. We then proceed to the results themselves.

Background

Local housing authorities are required to review housing conditions in their districts in accordance with the Housing Act 2004 s3. This is a wide ranging requirement as it refers to other parts of the Act as well as other legislation, which between them cover:

- dwellings that fail to meet the minimum standard for housing i.e. dwellings with Category 1 Hazards under the HHSRS
- HMOs
- selective licensing of other houses
- demolition and slum clearance
- the need for provision of assistance with housing renewal
- the need for assistance with adaptation of dwellings for disabled persons.

While these are the areas covered by the legislation, the latter does not proscribe precisely what information should be collected when an authority reviews its housing.



Regional and local information requirements

The information to be collected is therefore largely for the authority to decide, although it needs to take account of Government policy. The previous Government (through the CLG) took the view that 'primary responsibility for repairing and improving homes in the private sector lies with the owner'. They recognized, however, that some - particularly the elderly and other vulnerable groups - would not have the resources necessary for this. Authorities were expected, through the powers they have under the Regulatory Reform Order 2002, to have developed policies on providing such assistance. Government funding for such assistance was channelled via the Regional Assemblies, who were expected to prioritise those most in need.

Audit Commission guidance[1] further advised on the need and methodology for collecting information and how it should be used.

The Coalition Government, however, has abolished Regional Assemblies, the Regional Development Agencies, the Government Offices for the regions and the Audit Commission.

In their place the DCLG in their Draft Structural Reform Plan has announced among other measures that it will 'Move from local authorities primarily reporting to central government to local authorities that report to local people'. This has included the abolition of Comprehensive Area Assessment and it is pledged to cut local government inspection. It has also announced its intention to 'design and implement a new approach with less reporting burdens on local government and greater transparency for local people'. This has been followed up by a letter from the Minister to all local authorities, revoking all Local Area Agreements, and effectively handing over control of Local Agreements to local authorities. The letter specifically states that authorities wishing to drop any targets may do so, and where authorities choose to retain targets DCLG will not monitor them. It is therefore very much for Camden Council to decide on its housing priorities.

Before turning to the modelled results we briefly consider how the most recent government policy is shaping local authority housing information requirements.

[1] Updated strategic approach to housing KLOE for use from 12 April 2010 Audit Commission January 2010

Coalition Government Policy: Laying the foundations: A Housing Strategy for England

The Coalition Government has recently published a strategy document 'Laying the Foundations: A Housing Strategy for England'[2]. The main focus of this document is on areas other than private sector housing; notably on increasing housing supply and reforming social and affordable housing. However, two chapters of the report do focus on traditional areas of private sector housing policy interest; the private rented sector and empty homes.

The growth of the private rented sector in recent years is acknowledged, and they state that they are 'looking at measures to deal with rogue landlords and encouraging local authorities to make full use of the robust powers they already have to tackle dangerous and poorly maintained homes'. They commend the approach adopted by Liverpool City Council, which works closely with landlords through a Landlord Forum and Panel operating a Landlord Accreditation Scheme, but still operates a robust enforcement regime. They also commend the partnership with Liverpool Primary Care Trust. The 'Healthy Home Programme' has identified over 2000 hazards and led to an estimated £3 million investment by landlords into the housing stock, delivering sustainable health improvements and enhancing community wellbeing. The Health Impact Assessment which will be informed by the Category 1 Hazard models is a first stage in the development of such a program.

The document also draws attention to the Green Deal (discussed in more detail below), which will enable all consumers to install energy efficiency measures at no upfront cost. Householders will repay the cost of the measures through their energy bill savings.

From 2016 reasonable requests by tenants for such energy efficiency improvements will not be able to be refused and from 2018 it will be unlawful for landlords to rent out properties that do not reach a minimum standard of energy efficiency. DECC have indicated the minimum standard is likely to be set at Energy Performance band 'E'[3]. While there will be various caveats to these powers, they will provide a new minimum standard for rented accommodation. Part of this project includes provision of a private rented sector variable that should assist in identifying such dwellings.

The document does, however, also point out that the Housing Health and Safety Rating can be used effectively to improve rented property and quotes Hull City Council's PEAL scheme (Proactive housing and Environmental Action Locally) as an example of how training for landlords in the Rating System can result in effective self-regulation.

So, while new powers will become available in 2016, there are existing powers that can be used effectively to deal with the hazards identified by the BRE models.

Empty homes brought back into use will qualify for the New Homes Bonus where, for the following six years, the Government is to match funding the Council Tax on long term empty properties brought back into use. The document also draws attention to the Empty Homes Toolkit provided by the Homes and Communities Agency. From 2012-15, £100million capital funding from within the Affordable Homes Programme will be available to tackle long-term empty homes. While the data provided by this project cannot necessarily assist with identification of empty homes, the database provided would be the logical place for such information to be stored could it be gathered from other sources.

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

[3] https://www.gov.uk/getting-a-green-deal-information-for-householders-and-landlords

New Government Policy: The Green Deal and the Energy Company Obligation

Background

The Green Deal is a finance framework which provides the upfront capital to make energy efficiency improvements to dwellings from autumn 2012. The framework is designed so that householders make the repayments through their energy bill by attaching a Green Deal charge to the electricity meter. The "Golden Rule" of the Green Deal is that the expected savings from the energy efficiency measures must be greater than the charge attached to the meter.

The role of a Green Deal provider is to provide the finance and to organise the improvement works – either themselves or through sub-contractors. The provider can be a commercial company, social enterprise or a local authority and they may act alone or in partnership.

In cases where additional financial support is required for householders, the Energy Company Obligation (ECO)[4] has been designed to sit alongside the Green Deal. The 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[5] properties. Under ECO, energy companies are obliged to meet targets expressed as carbon or costs saved (from 1 January 2013 - 31 March 2015[6]). The 3 different ECO obligations and their associated overall savings targets are as follows:

- Carbon Emissions Reduction Obligation (CERO) – covering measures which can't be financed solely through the Green Deal, e.g. solid wall insulation (20.9 $MtCO_2$ savings)
- Carbon Saving Community Obligation (CSCO) – insulation measures to low income households and ensures 15% of the obligation is used in rural areas (6.8 $MtCO_2$ savings)
- Home Heating Cost Reduction Obligation (HHCRO) or Affordable Warmth – insulation and heating measures to vulnerable low-income groups living in private tenure dwellings (£4.2 billion savings)

The estimated annual spend on the measures required to achieve these targets is £1.3 billion. Since the Green Deal and the ECO commenced the more pro-active authorities have mainly been focussing on how to attract ECO funding into their areas.

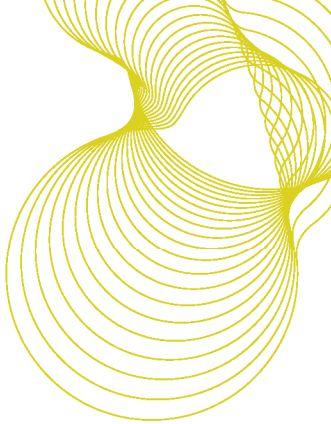
The latest statistical data[7] gives provisional estimates that there have been 81,798 measures installed under ECO up to the end of April 2013. The majority of measures were loft insulation, cavity wall insulation and boiler upgrades.

[4] The Electricity and Gas (Energy Companies Obligation) Order 2012, Statutory Instrument No. 3018, 4 December 2012 (http://www.legislation.gov.uk/uksi/2012/3018/part/4/made)

[5] Where standard cost effective energy efficient fabric measures are not possible (e.g. dwellings with solid walls)

[6] Although energy companies have been able to count measures delivered since October 2012 against their targets.

[7] Domestic Green Deal and Energy Company Obligation in Great Britain, Monthly report, Statistical Release: Experimental Statistics, DECC, 27 June 2013 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/209097/Statistical_Release-_Green_Deal_and_Energy_Company_Obligation_in_Great_Britain_-_Mid-June_2013.pdf)



The ECO and Local Authorities

The Green Deal and Energy Company Obligation Consultation Document and government response[8] and the associated local authority information note[9] outline the various roles an authority can adopt within the Green Deal framework - provide, partner or promote. Depending on the extent of engagement the authority decides on, all three roles are likely to require them to provide information on the local housing stock, as well as assisting with marketing campaigns to increase uptake in their local area.

An understanding of the condition of the local housing stock is pivotal for identifying which households require energy efficiency improvements. The availability of small-area housing stock data, particularly focussed on energy efficiency, will be of value to authorities as they rise to the challenge of attracting ECO funding. Such data will enable the identification on a street-by-street basis of opportunities for ECO roll out; for example areas where cavity wall insulation is not yet installed and properties are considered hard-to-treat.

In turn, local authorities are likely to see benefits in their area; for example, reducing residents' fuel bills, improving the condition of the local housing stock, economic growth through the generation of local jobs.

Furthermore, this type of information could be used to demonstrate how local authorities plan to engage with the Green Deal and ECO as part of their reports on how they propose to significantly improve the energy efficiency of dwellings in their areas. These further reports and progress reports are required by new guidance under the Home Energy Conservation Act (HECA) 1995[10].

[8] The Green Deal and Energy Company Obligation Consultation Document, DECC, 2011and Government response, DECC, June 2012 (https://www.gov.uk/government/consultations/the-green-deal-and-energy-company-obligation)

[9] Local Authorities and the Green Deal, DECC, 2011 (https://www.gov.uk/local-authorities-and-the-green-deal))

[10] Guidance to English Energy Conservation Authorities issued Pursuant to the Home Energy Conservation Act 1995, DECC, July 2012 (revised March 2013) (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/180786/Updated_version_of_HECA_guidance-_March_2013.pdf)

BRE Dwelling Level Housing Stock Models

The original BRE Housing Stock Models, developed in 2003, were the result of an 18-month development program supported by the BRE Trust. These models, until recently, were based on a combination of data from the English Housing Survey (EHS) and nationally available small area datasets such as the census. These models proved to be useful and very popular with authorities, with over 230 Local Authorities in England purchasing the models.

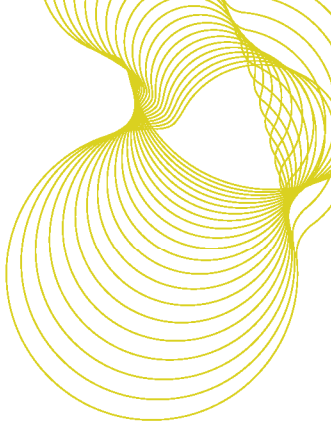
Over the last few years BRE have been looking to further improve the quality of this service. The models provided to Camden Council are BRE's new approach which improves upon the previous methodology and is dwelling rather than area based.

This new methodology makes use of a model originally devised for modelling carbon emissions which we call 'SimpleCO_2'. The model uses basic dwelling descriptions from the Experian UK Consumer Dynamics Database e.g. dwelling type and age to define broad dwelling archetypes. It then uses knowledge of distributions from the English Housing Survey (EHS) to predict the likely fuel type, boiler type, insulation levels and other key variables which are required to calculate levels of energy efficiency.

Variables such as 'SimpleSAP' (an estimate of the Government's energy efficiency rating known as SAP) and Excess Cold are direct outputs of the calculations performed by the model. For the other indicators we have adopted a top down methodology similar in many respects to the approach used by our previous set of models (the full list indicators is provided later in this section). This method uses data from the EHS and Experian to establish relationships between the housing standards and various dwelling and social characteristics using logistic forms of regression analysis. Once these relationships are established, they are used to create a regression model which calculates the likelihood of a dwelling failing a given standard.

There are therefore, in effect, two methodologies being used. The first deals with the lack of information required to undertake an energy efficiency calculation by modelling missing input data such as insulation levels. The second models the probability of a dwelling failing a standard by using formulae derived from the EHS which are then applied to the national Experian dataset. The probabilities are then converted into pass or fail values based on the expected pass/fail level in the census output area (COA) in which the dwelling is found. These approaches ensure indicative values are provided for each variable and each dwelling i.e. pass/fail for a standard or an actual value e.g. for 'SimpleSAP'. The probabilistic models used to reach these values mean that the individual dwelling data can only be indicative but in our view this makes as full a use as is possible of the dwelling level input data.

Additional information on our methodology is included in Appendix A.



Results from the BRE Housing Stock Models

Table 1 and 2 provide estimated percentage and stock totals, from the BRE Housing Stock Model, at ward and authority level for the following indicators:

- The presence of a Category 1 Rating System Hazard
- 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)
- The presence of a Category 1 Hazard for Falls (including falls associated with baths, falling on the level, falling on stairs and falling between levels)
- Dwellings in Disrepair (based on the former Decent Homes Standard criterion for disrepair)
- Fuel Poverty (this is based on the full fuel poverty measure based on 10% of earnings being spent on heating costs)
- Dwellings occupied by a Low Income Household
- An estimate of the SAP rating which, to emphasise its origin from a reduced set of variables, we refer to as 'SimpleSAP'[11].

Definitions for all of the modelled indicators are provided in Appendix B.

[11] **Important note: while we can provide 'SimpleSAP' ratings from the 'SimpleCQ' 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.**

Table 1: Modelled data, all stock

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Belsize	6,441	1,052 (16%)	461 (7%)	481 (7%)	563 (9%)	778 (12%)	1,549 (24%)	54
Bloomsbury	5,567	1,361 (24%)	915 (16%)	342 (6%)	643 (12%)	918 (16%)	1,709 (31%)	49
Camden Town with Primrose Hill	5,886	781 (13%)	286 (5%)	387 (7%)	418 (7%)	625 (11%)	1,828 (31%)	57
Cantelowes	4,785	802 (17%)	335 (7%)	354 (7%)	492 (10%)	591 (12%)	1,627 (34%)	54
Fortune Green	4,836	776 (16%)	268 (6%)	405 (8%)	467 (10%)	594 (12%)	1,234 (26%)	52
Frognal and Fitzjohns	5,566	955 (17%)	403 (7%)	467 (8%)	487 (9%)	703 (13%)	939 (17%)	52
Gospel Oak	4,505	497 (11%)	99 (2%)	276 (6%)	383 (9%)	459 (10%)	1,791 (40%)	59
Hampstead Town	4,949	799 (16%)	318 (6%)	412 (8%)	351 (7%)	582 (12%)	933 (19%)	53
Haverstock	5,366	793 (15%)	294 (5%)	319 (6%)	542 (10%)	668 (12%)	2,209 (41%)	57
Highgate	4,687	849 (18%)	358 (8%)	356 (8%)	481 (10%)	677 (14%)	1,466 (31%)	52
Holborn and Covent Garden	6,548	1,183 (18%)	750 (11%)	284 (4%)	676 (10%)	868 (13%)	2,380 (36%)	55
Kentish Town	5,243	894 (17%)	331 (6%)	427 (8%)	534 (10%)	670 (13%)	1,682 (32%)	53
Kilburn	5,739	791 (14%)	315 (5%)	308 (5%)	488 (9%)	729 (13%)	2,276 (40%)	57
King's Cross	4,835	1,112 (23%)	698 (14%)	271 (6%)	616 (13%)	792 (16%)	1,891 (39%)	51
Regent's Park	5,482	711 (13%)	297 (5%)	285 (5%)	501 (9%)	614 (11%)	2,162 (39%)	58
St Pancras and Somers Town	5,683	671 (12%)	287 (5%)	226 (4%)	544 (10%)	630 (11%)	2,695 (47%)	60
Swiss Cottage	7,196	1,163 (16%)	462 (6%)	562 (8%)	644 (9%)	848 (12%)	1,711 (24%)	54
West Hampstead	5,556	918 (17%)	320 (6%)	477 (9%)	570 (10%)	715 (13%)	1,571 (28%)	53

Summary of results: all stock
Table summarises the key statistics at the authority level for all stock.

Table 2: Modelled data, all stock: authority level summary

	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Camden Council	98,870	16,108 (16%)	7,197 (7%)	6,639 (7%)	9,400 (10%)	12,461 (13%)	31,653 (32%)	54
2009 EHS (all stock)		(21%)	(8%)	(12%)	(6%)	(18%)	(30%)	53

The house condition indicators suggest the housing stock in Camden Council to be better than the 2009 national average in most respects:

- For HHSRS Category 1 Hazards; the model estimate of 16% is lower than the 2009 national average, 21%.
- Fall Hazards, which contribute a significant proportion of Category 1 Hazards, are similarly less frequent (7% compared with 12% nationally).
- Disrepair, is the one condition indicator where a greater proportion of Camden Council's housing stock are affected than the national average reported in the 2009 EHS (10% compared with 6%).

The energy efficiency indicators suggest the housing stock in Camden Council to be better than the 2009 national average:

- Excess Cold, which is the most common Category 1 Hazard, is less prevalent in Camden Council's housing stock (7% compared with 8%).
- The average 'SimpleSAP' rating for Camden Council of 54 is better than the national average SAP rating for 2009, 53.
- Fuel Poverty was estimated to occur in only 13% of households which is below the 2009 national average, 18%.

The sole indicator of purely socio-economic conditions, Low Income Households (32%), suggests that Camden Council is in a slightly worse position than the national average (30%)

The stock totals used in the model come directly from the Experian tenure data. By purchasing the tenure variable from Experian it is possible to break the housing stock model information down by tenure. Before we show the housing stock models results the stock totals are provided by tenure in Table 3 below.

Table 3: Experian stock totals by tenure

Tenure	Number of dwellings	% of all stock
Owner Occupied	23,974	24%
Private Rented	49,225	50%
Social	25,671	26%
Total	98,870	-

The stock totals were compared to the reported 2011 Census figures[12] shown in Table as a way of validating the Experian information.

Table 4: 2011 Census stock totals by tenure

Tenure	Number of dwellings	% of all stock
Owner Occupied	32,042	33%
Private Rented	33,197	34%
Social	32,295	33%
Total	97,534	-

The Experian stock totals report 1,336 more dwellings than the Census; however the proportions of properties in each tenure differ considerably. The largest difference between the Census and the Experian stock totals is for privately rented households which the Census reported at 34% and the models at 50% of the total number of dwellings. This represents a discrepancy of 16,028 households for the privately rented stock. As the Experian tenure indicated a larger proportion of private rented then social dwelling, whereas the Census suggests otherwise, it was decided to modify the tenure variable using information from the Census.

The Census information is published down to census output areas (COAs) through the Office for National Statistics Neighbourhood Statistics tables. By using this in data it was possible to compare the tenure proportions in each COA to the corresponding Experian proportions. Differences in these proportions were identified and re-balanced accordingly. The resulting stock totals used for the BRE Dwelling Level Stock Model, shown in Table , are now comparable in proportions to the 2011 Census.

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

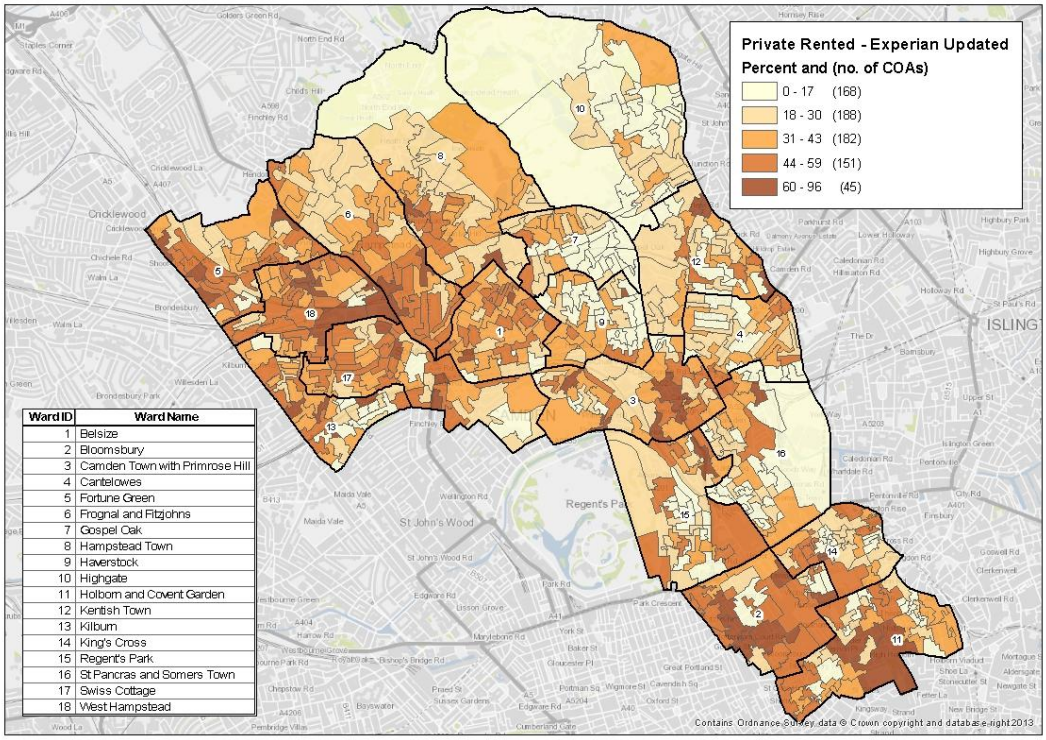
Table 5: Updated Model stock totals by tenure

Tenure	Number of dwellings	% of all stock
Owner Occupied	32,522	33%
Private Rented	32,922	33%
Social	33,426	34%
Total	98,870	-

By mapping the proportions of private rented dwellings at this level it is possible to further validate if the distribution of private rented dwellings is similar for the tenure data used in the Stock Models and Census data (Maps 1, 2 and 3). As the tenure adjustments have been made using the 2011 Census it is expected that the two distributions will agree, however, given the difference in the overall numbers it is still a worthwhile validation tool.

The distribution of privately rented dwellings for the Stock Model and 2011 Census datasets do correlate well, with the greatest concentrations being found in Bloomsbury, Fortune Green and West Hampstead. There are however, some very minor variations but overall the distributions of privately rented dwellings are positive suggesting that the BRE Housing Stock Models should provide a good overview of the stock in Camden.

Map 1(i): Percentage of privately rented dwellings (Experian - Updated)



Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
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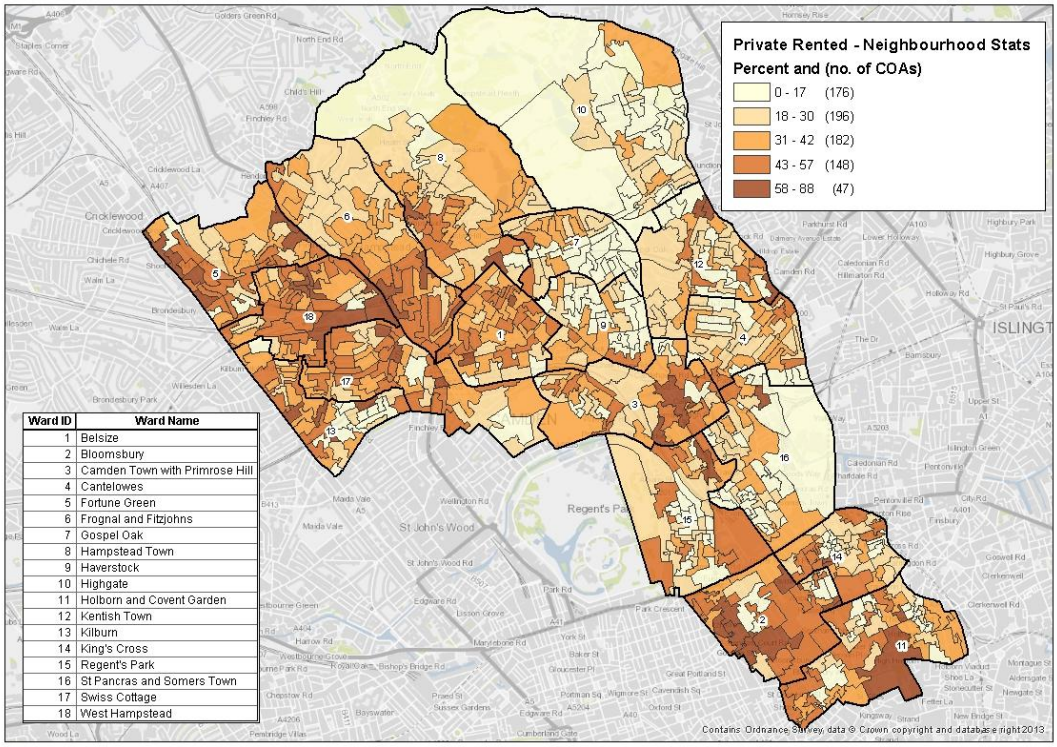
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map 1(ii): Percentage of privately rented dwellings (2011 Neighbourhood Statistics)



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11	Holborn and Covent Garden
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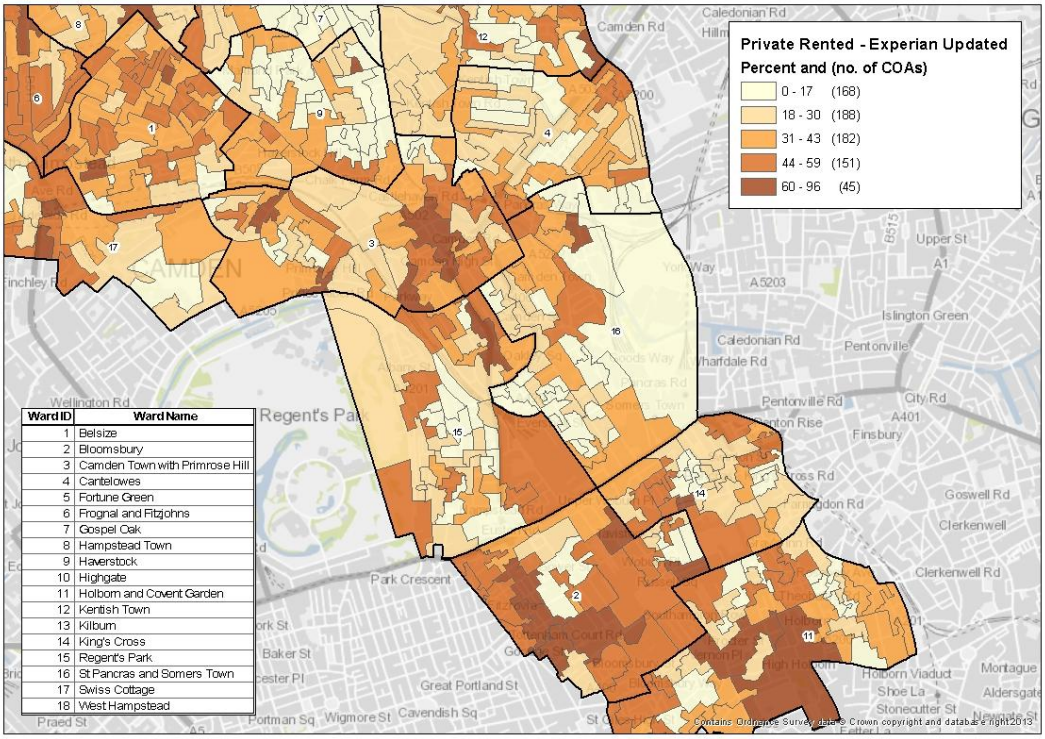
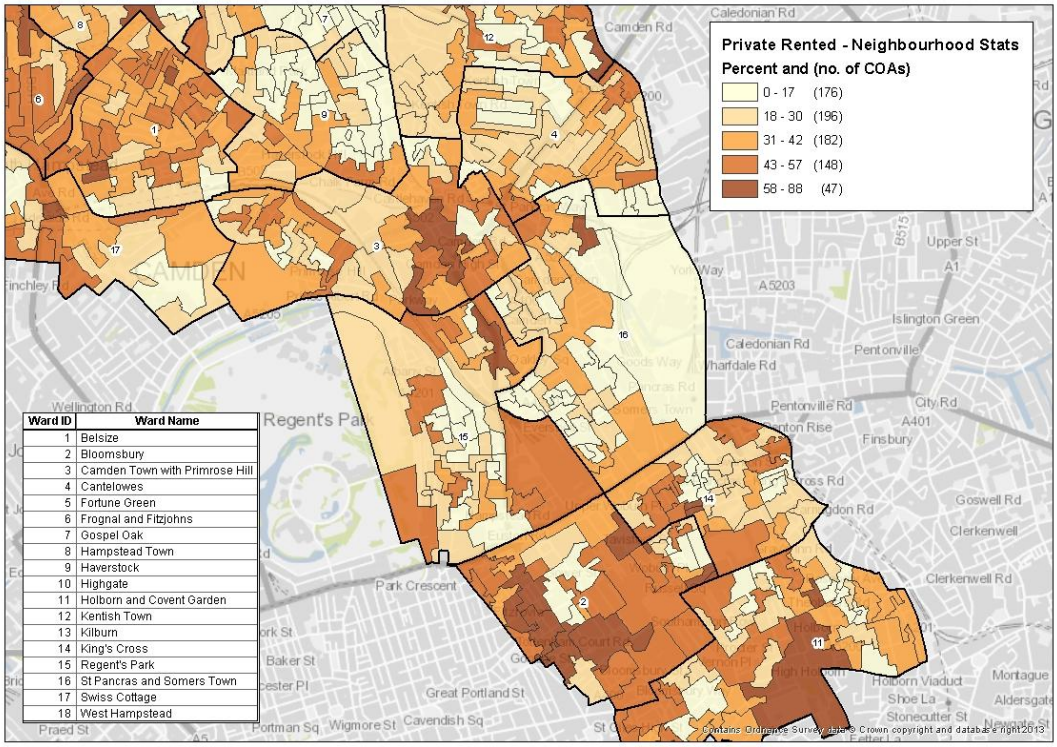
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

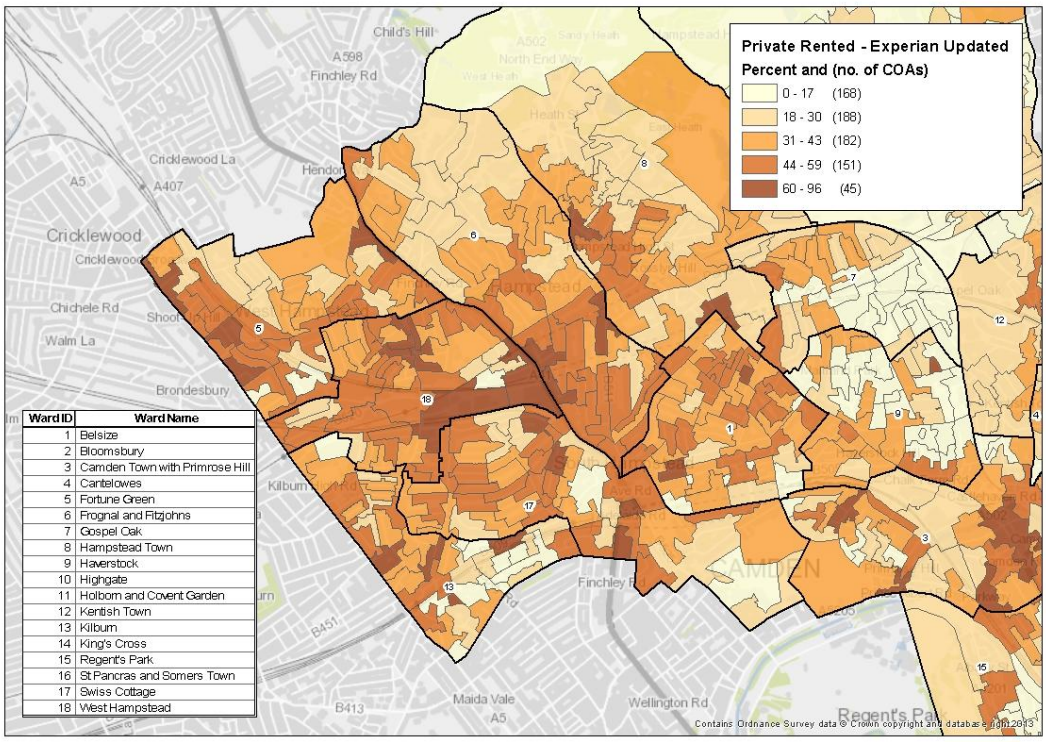
Map 2(i): Percentage of privately rented dwellings, Camden Town (Experian)



Map 2(ii): Percentage of privately rented dwellings, Camden Town (2011 Neighbourhood Statistics)



Map 3(i): Percentage of privately rented dwellings, Hampstead (Experian)



Ward ID	Ward Name
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13	Kilburn
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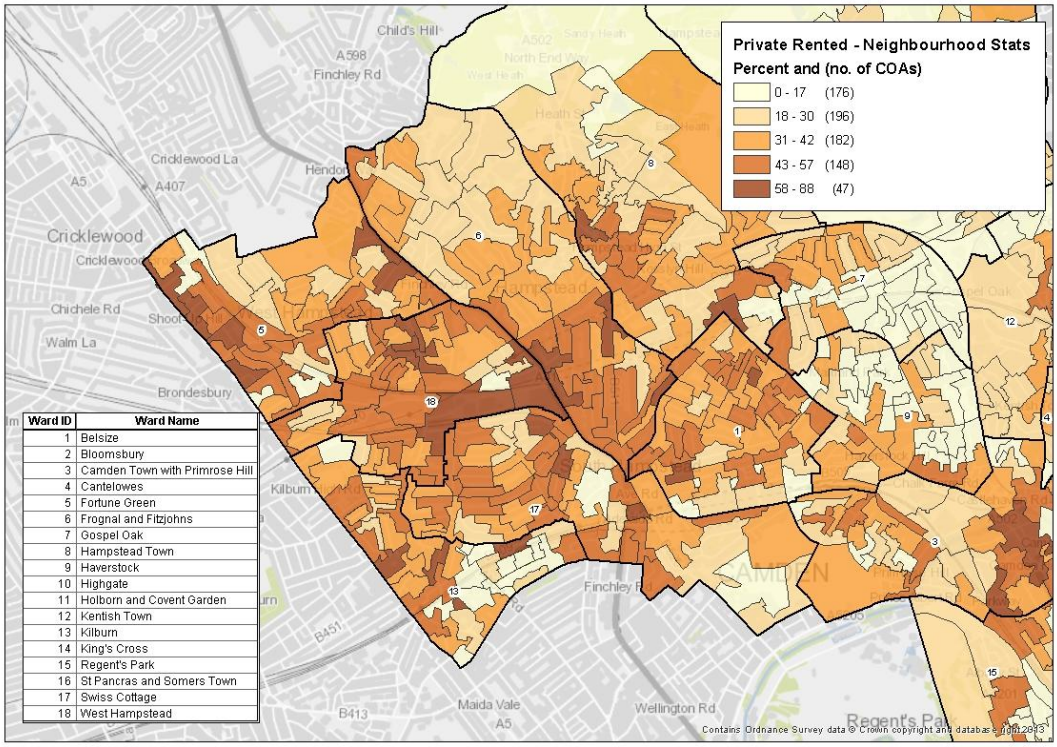
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map 3(ii): Percentage of privately rented dwellings, Hampstead (2011 Neighbourhood Statistics)



Ward ID	Ward Name
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16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Summary of results: by tenure

Table 6 summarises the key statistics at the authority level by tenure.

Table 6: Modelled data by tenure: authority level summary

	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Owner Occupied	32,522	5,760 (18%)	2,220 (7%)	2,895 (9%)	2,363 (7%)	3,615 (11%)	3,437 (11%)	52
Private Rented	32,922	5,800 (18%)	2,802 (9%)	2,528 (8%)	3,390 (10%)	4,206 (13%)	7,538 (23%)	54
Social	33,426	4,548 (14%)	2,175 (7%)	1,216 (4%)	3,647 (11%)	4,640 (14%)	20,678 (62%)	58

The differences between the tenures generally reflect the position at the national level with the private rented stock being in poorest condition; with the owner occupied stock slightly better and the social rented stock in the best condition.

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

As the focus of this report is the private sector stock the next set of results provided are the housing stock information at ward and local authority level data for the private sector stock (Table7 and 8), followed by census output area (COA) level information presented in map format.

Table 7: Modelled data, private sector stock

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Belsize	5,153	844 (16%)	333 (6%)	440 (9%)	428 (8%)	578 (11%)	754 (15%)	54
Bloomsbury	3,973	1,061 (27%)	715 (18%)	282 (7%)	444 (11%)	655 (16%)	749 (19%)	48
Camden Town with Primrose Hill	3,997	596 (15%)	217 (5%)	323 (8%)	270 (7%)	405 (10%)	671 (17%)	55
Cantelowes	2,819	518 (18%)	205 (7%)	265 (9%)	265 (9%)	329 (12%)	452 (16%)	52
Fortune Green	4,022	675 (17%)	226 (6%)	372 (9%)	385 (10%)	483 (12%)	724 (18%)	52
Frognal and Fitzjohns	5,137	877 (17%)	351 (7%)	448 (9%)	443 (9%)	631 (12%)	716 (14%)	52
Gospel Oak	2,251	292 (13%)	49 (2%)	207 (9%)	172 (8%)	200 (9%)	354 (16%)	56
Hampstead Town	4,264	744 (17%)	287 (7%)	396 (9%)	319 (7%)	514 (12%)	522 (12%)	51
Haverstock	2,661	470 (18%)	196 (7%)	220 (8%)	232 (9%)	306 (11%)	480 (18%)	54
Highgate	3,017	577 (19%)	225 (7%)	289 (10%)	271 (9%)	401 (13%)	404 (13%)	50
Holborn and Covent Garden	3,814	686 (18%)	431 (11%)	196 (5%)	312 (8%)	432 (11%)	706 (19%)	55
Kentish Town	3,406	622 (18%)	215 (6%)	340 (10%)	316 (9%)	394 (12%)	572 (17%)	52
Kilburn	3,204	500 (16%)	206 (6%)	226 (7%)	260 (8%)	386 (12%)	649 (20%)	55
King's Cross	2,641	643 (24%)	415 (16%)	177 (7%)	288 (11%)	402 (15%)	532 (20%)	50
Regent's Park	2,809	432 (15%)	182 (6%)	201 (7%)	237 (8%)	303 (11%)	532 (19%)	55
St Pancras and Somers Town	2,094	264 (13%)	122 (6%)	110 (5%)	152 (7%)	188 (9%)	435 (21%)	59
Swiss Cottage	5,934	1,000 (17%)	391 (7%)	510 (9%)	514 (9%)	671 (11%)	951 (16%)	53
West Hampstead	4,248	759 (18%)	256 (6%)	421 (10%)	445 (10%)	543 (13%)	772 (18%)	52

Summary of results: private sector stock

Table8 summarises the key statistics at the authority level by tenure.

Table 8: Modelled data, private sector stock: authority level summary

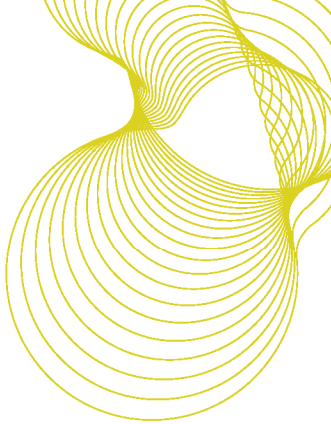
	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Camden Council	65,444	11,560 (18%)	5,022 (8%)	5,423 (8%)	5,753 (9%)	7,821 (12%)	10,975 (17%)	53
2009 EHS (private stock)		(22%)	(9%)	(13%)	(6%)	(18%)	(22%)	51

The house condition indicators give a mixed impression of the private sector housing stock in Camden Council relative to the 2009 national average:

- For HHSRS Category 1 Hazards; the model estimate of 18% is lower than the 2009 national average, 22%.
- Fall Hazards, the most significant contributor to the overall number of Category 1 Hazards, are similarly less frequent (8% compared with 13%).
- Disrepair is the one condition indicator where within Camden Council's housing stock where conditions are worse witht a higher level than the 2009 national average (9% compared with 6%).

The energy efficiency indicators suggest the private sector housing stock in Camden Council to be better than the 2009 national average:

- Excess Cold is less prevalent in Camden Council's housing stock (8% compared with 9%).
- The average 'SimpleSAP' rating for Camden Council of 53 is better than the national average SAP rating for 2009, 51.
- Fuel Poverty was estimated to occur in only 12% of private sector households which is below the 2009 national average, 18%.
- At 17%, the proportion of Low Income Households within Camden Council is lower than the 2009 national average of 22%.



Housing Stock Model outputs by census output areas

Outputs from the models for the private sector stock are also produced in map form at the level of the COA[13]. These typically comprise around 125 households and usually include whole postcodes, which have populations that are largely similar.

The maps show the percentages of private sector homes in each output area that are, for example, estimated to have a HHSRS Category 1 Hazard. The ranges are defined based on the Jenks' Natural Breaks algorithm of the COA statistics (natural breaks classes are based on natural groupings inherent in the data). The outputs in the lightest and darkest colours on the maps are the extreme ends of the range, which therefore highlight the best and worst areas.

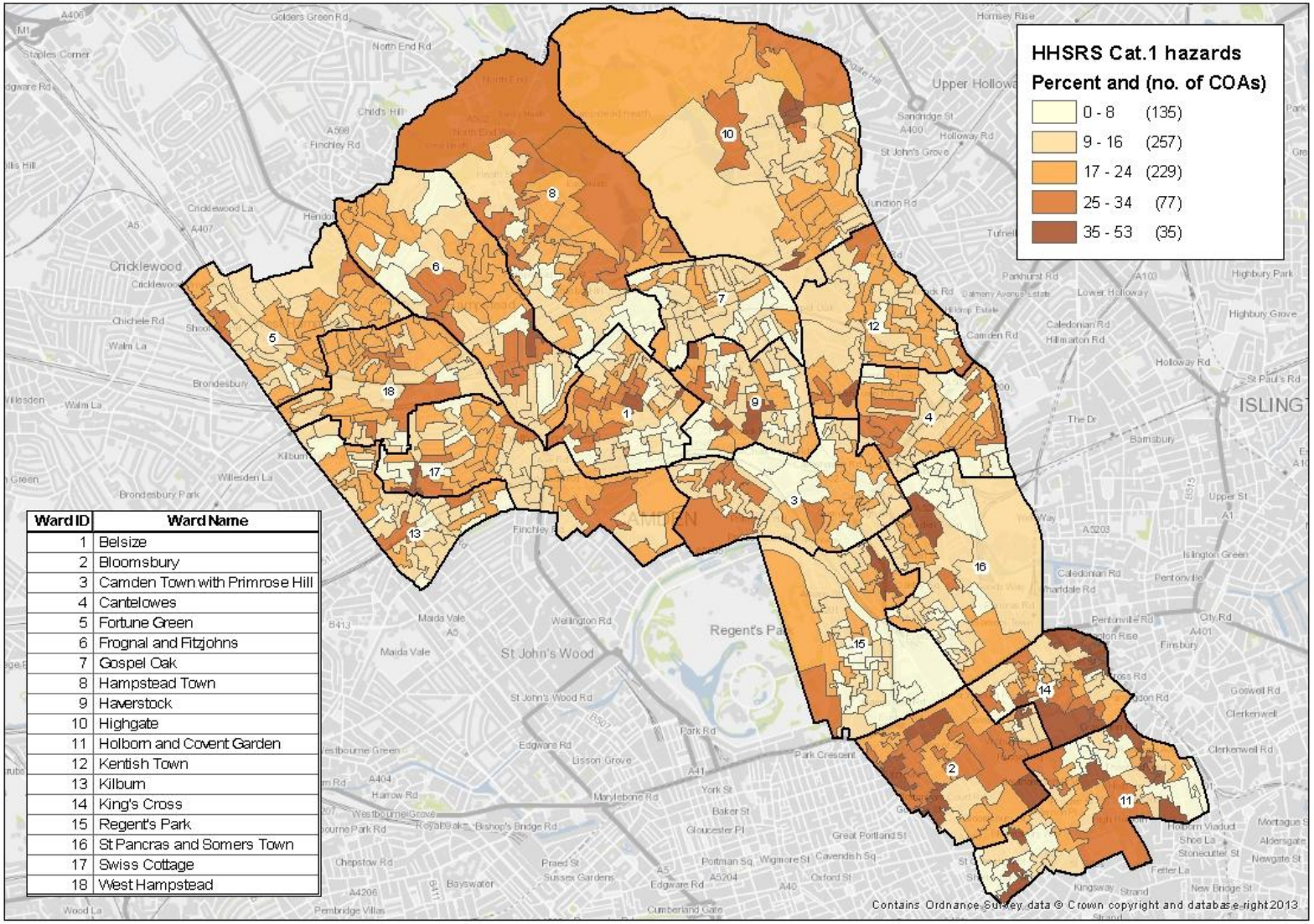
The COA data in map format is provided in this report for the following indicators:

- The presence of a Category 1 Rating System Hazard
- The presence of a Category 1 Hazard for Excess Cold
- The average 'SimpleSAP'[14] rating
- Levels of Fuel Poverty
- Dwellings occupied by Low Income Households

[13] The COA level maps have been produced using Esri ArcGIS for Desktop and the colour symbols used are from ColorBrewer.org

[14] **Important note: while we can provide 'SimpleSAP' ratings from the 'SimpleCQ' 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.**

Map 4(i): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard



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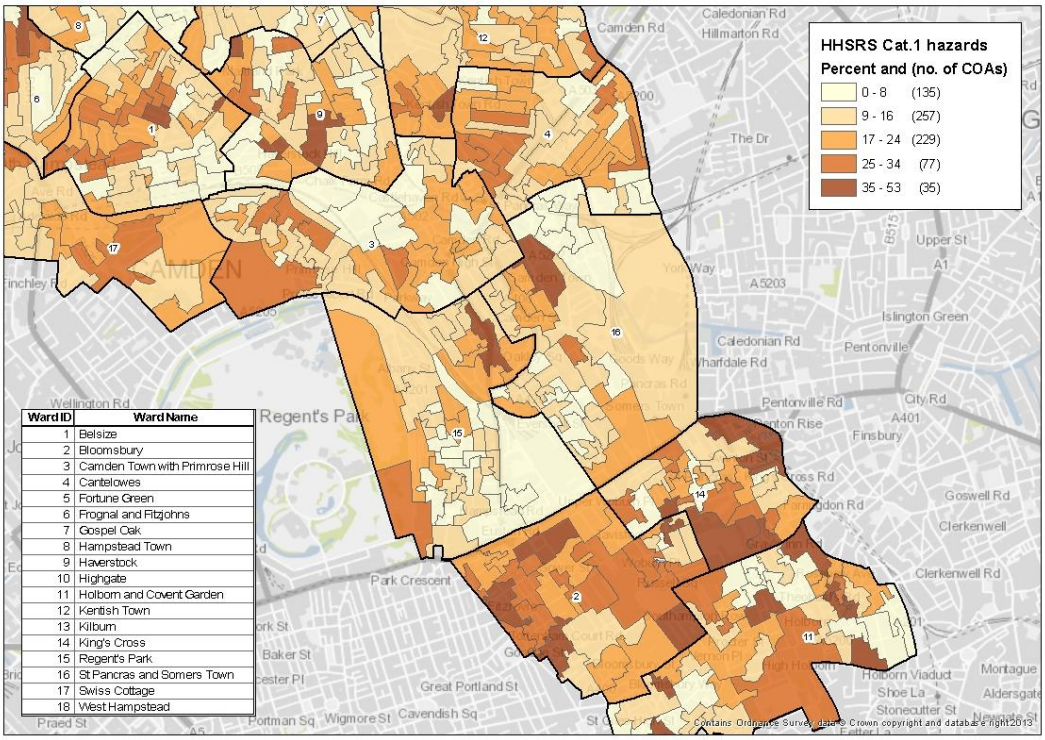
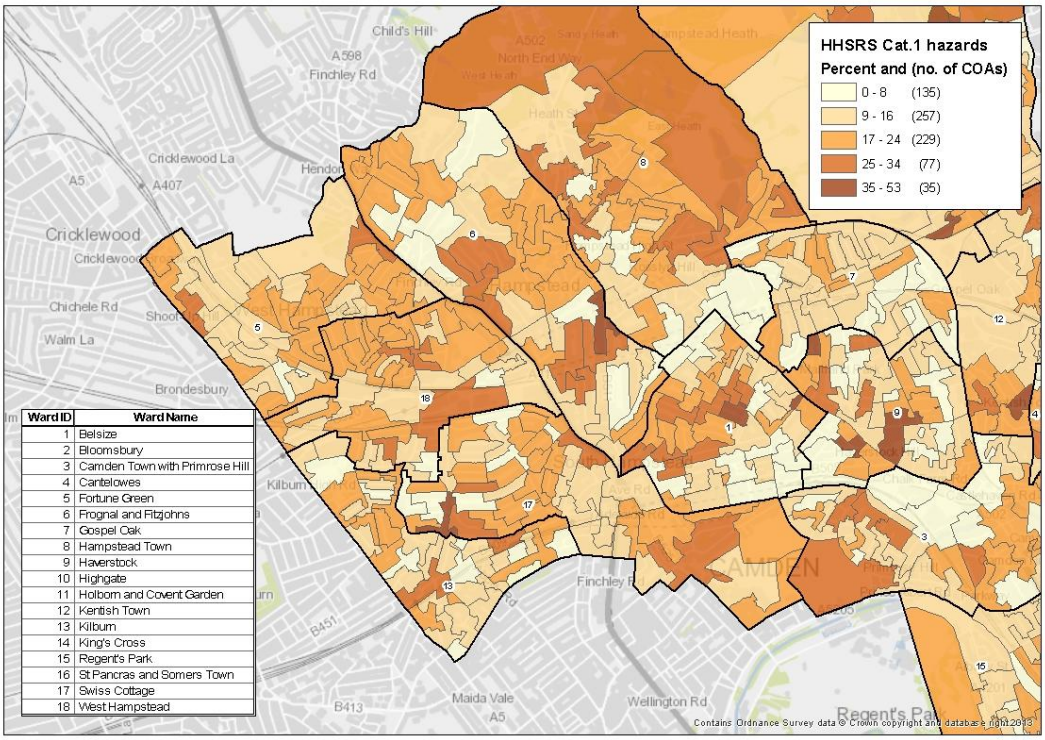
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

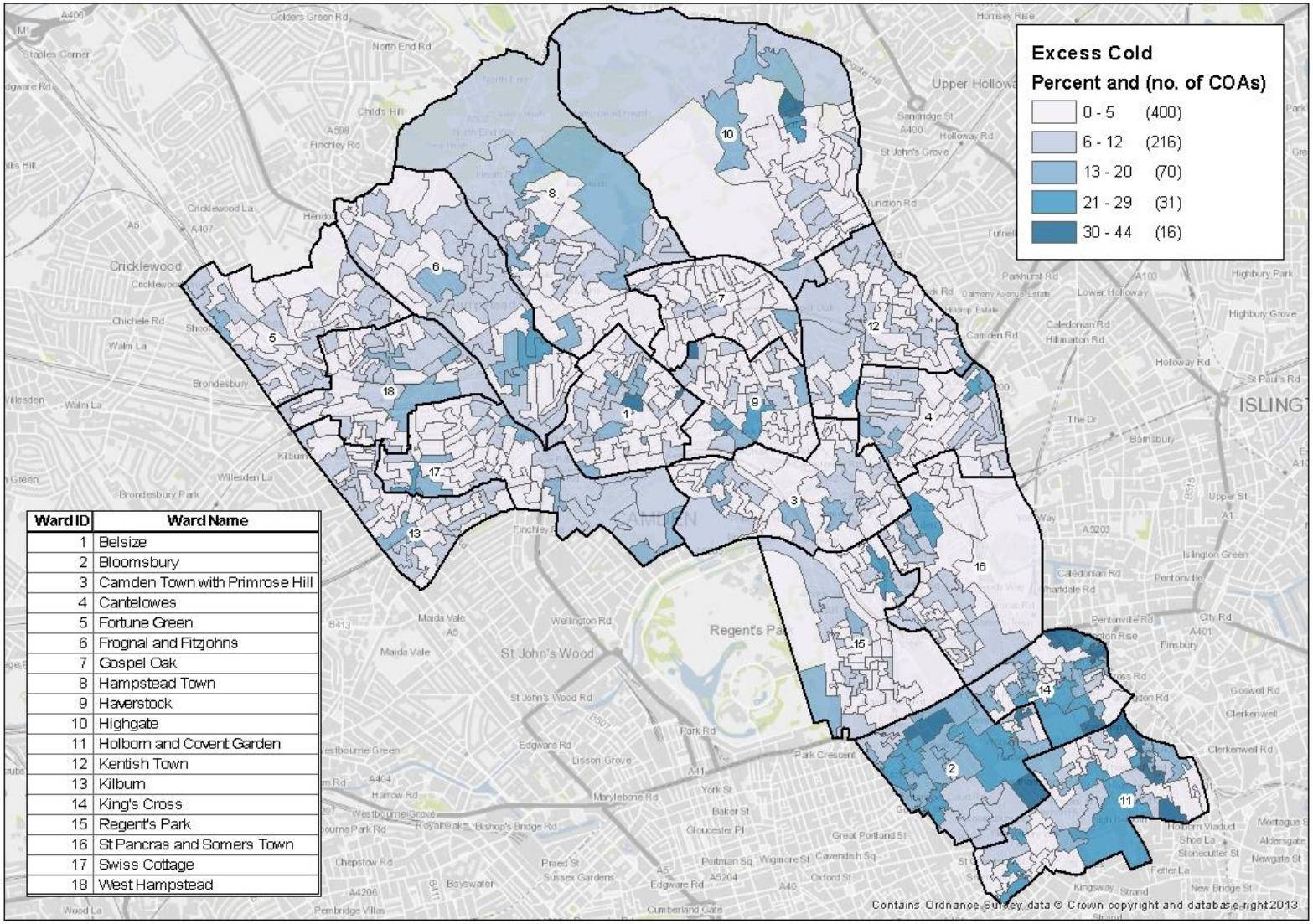
Map 4(ii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard, Camden Town



Map 4(iii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard, Hampstead



Map 5(i): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold



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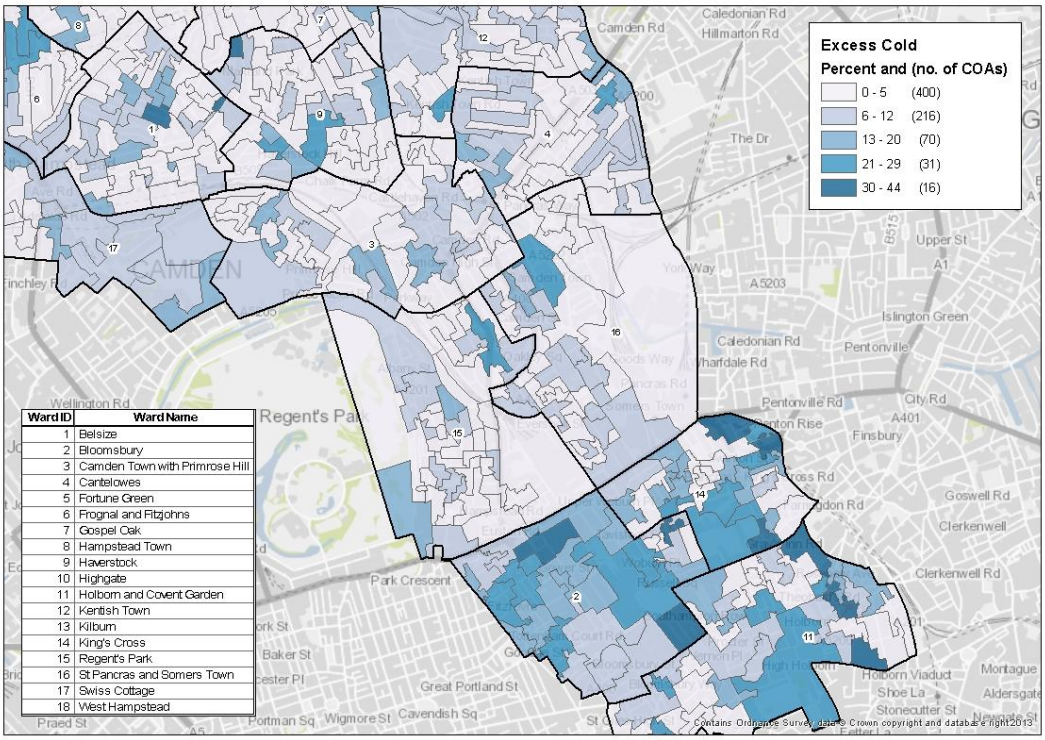
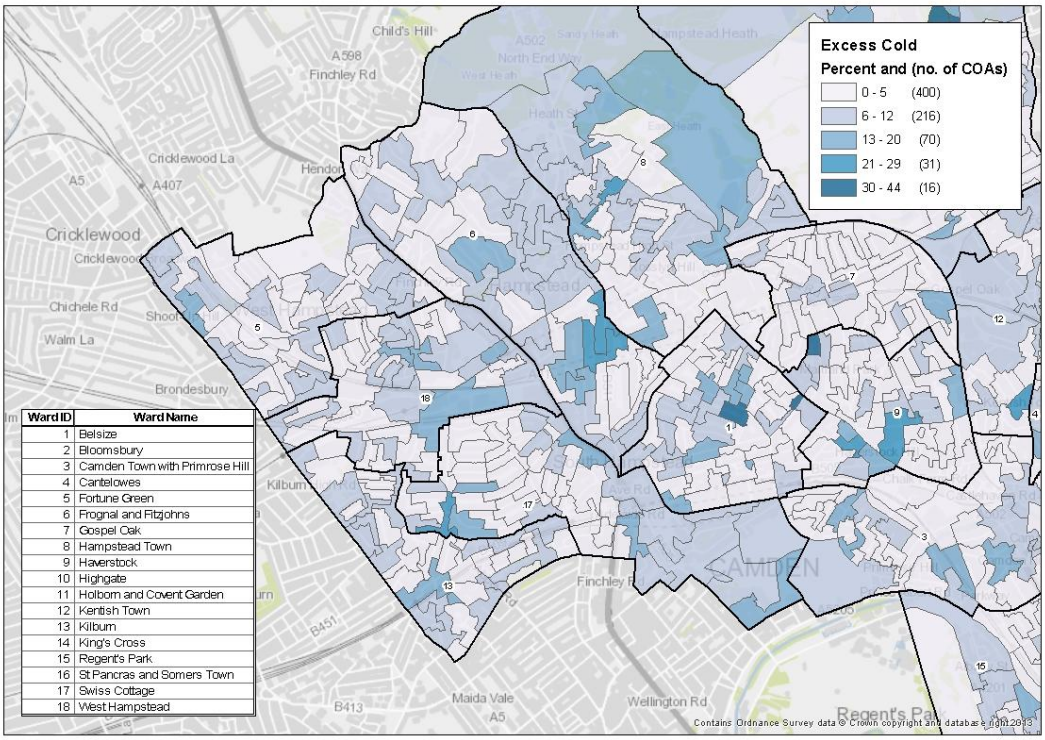
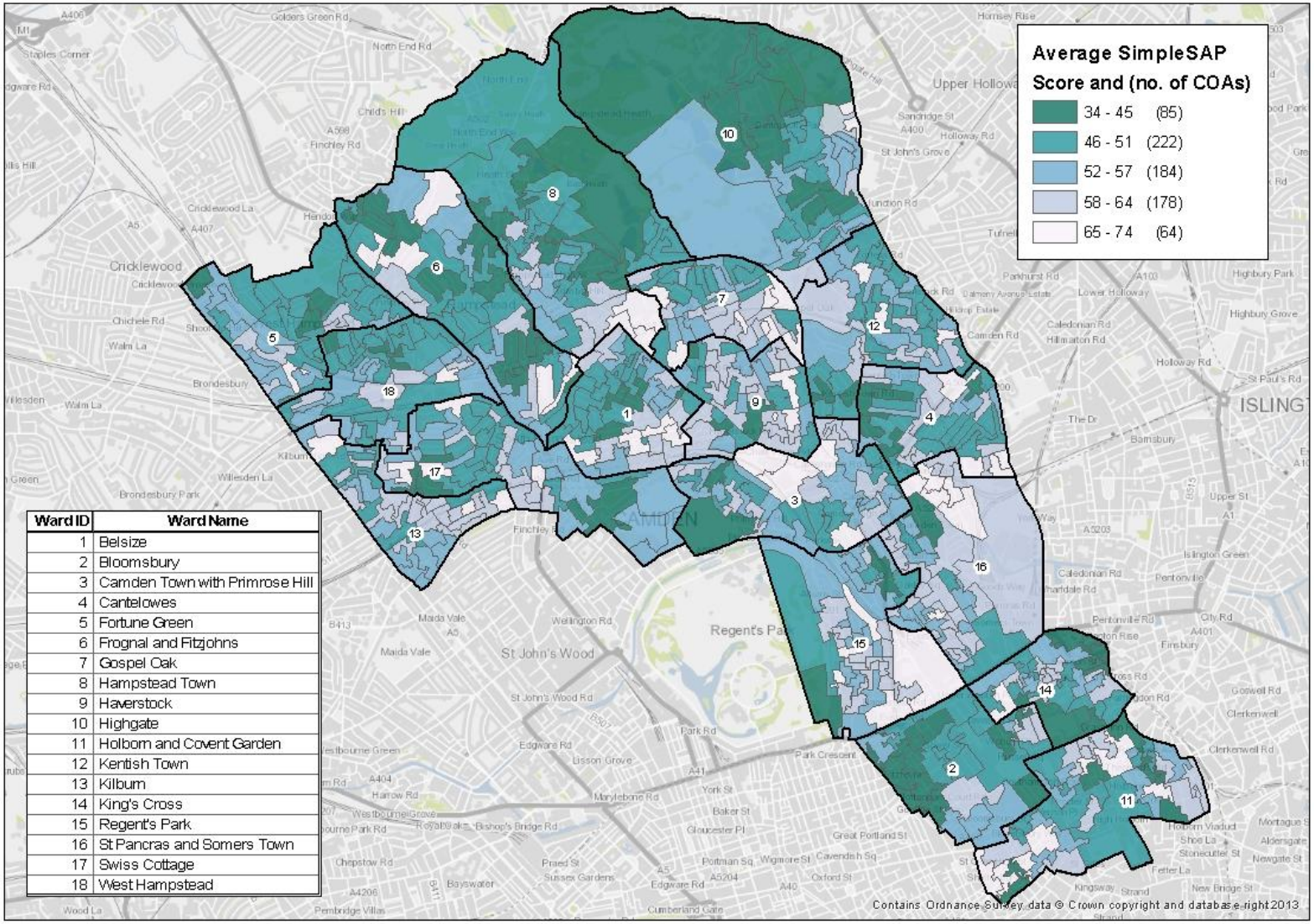
Map 5(ii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold, Camden Town



Map 5(iii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold, Hampstead



Map 6(i): Average 'SimpleSAP' Ratings per dwelling, private sector



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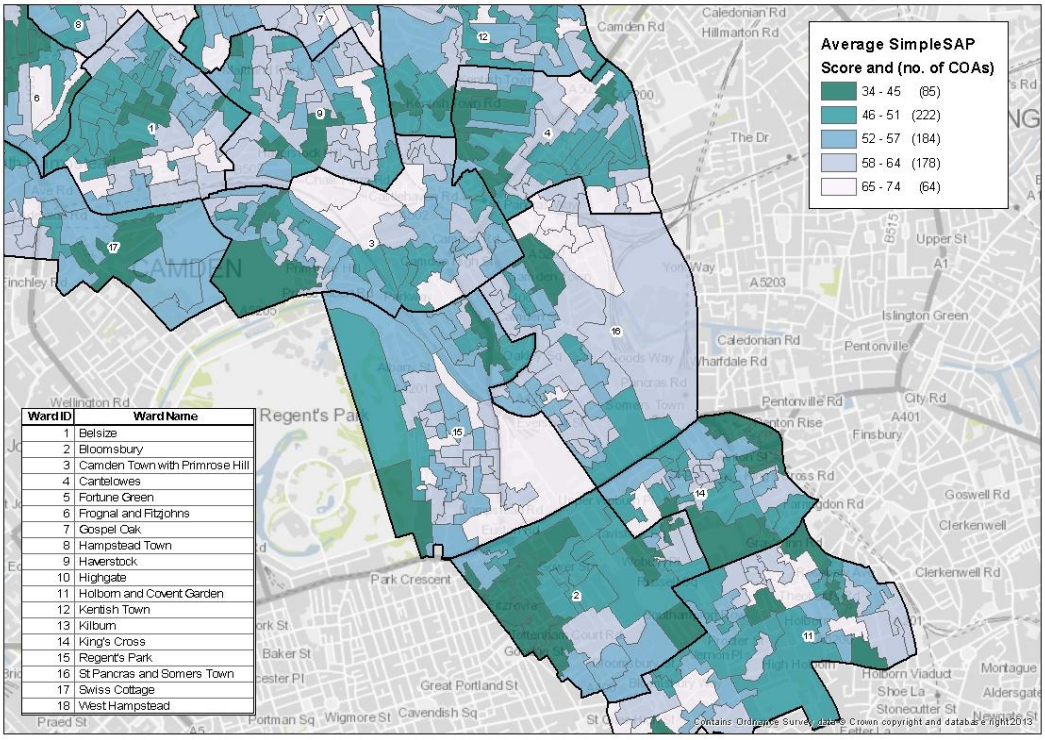
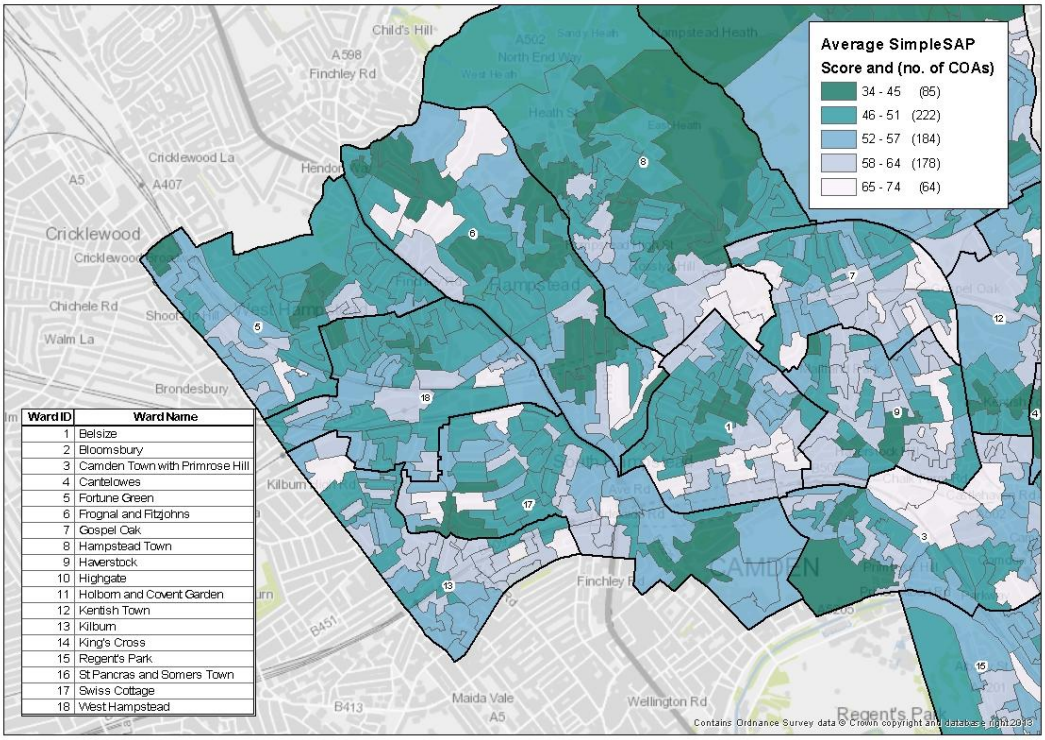
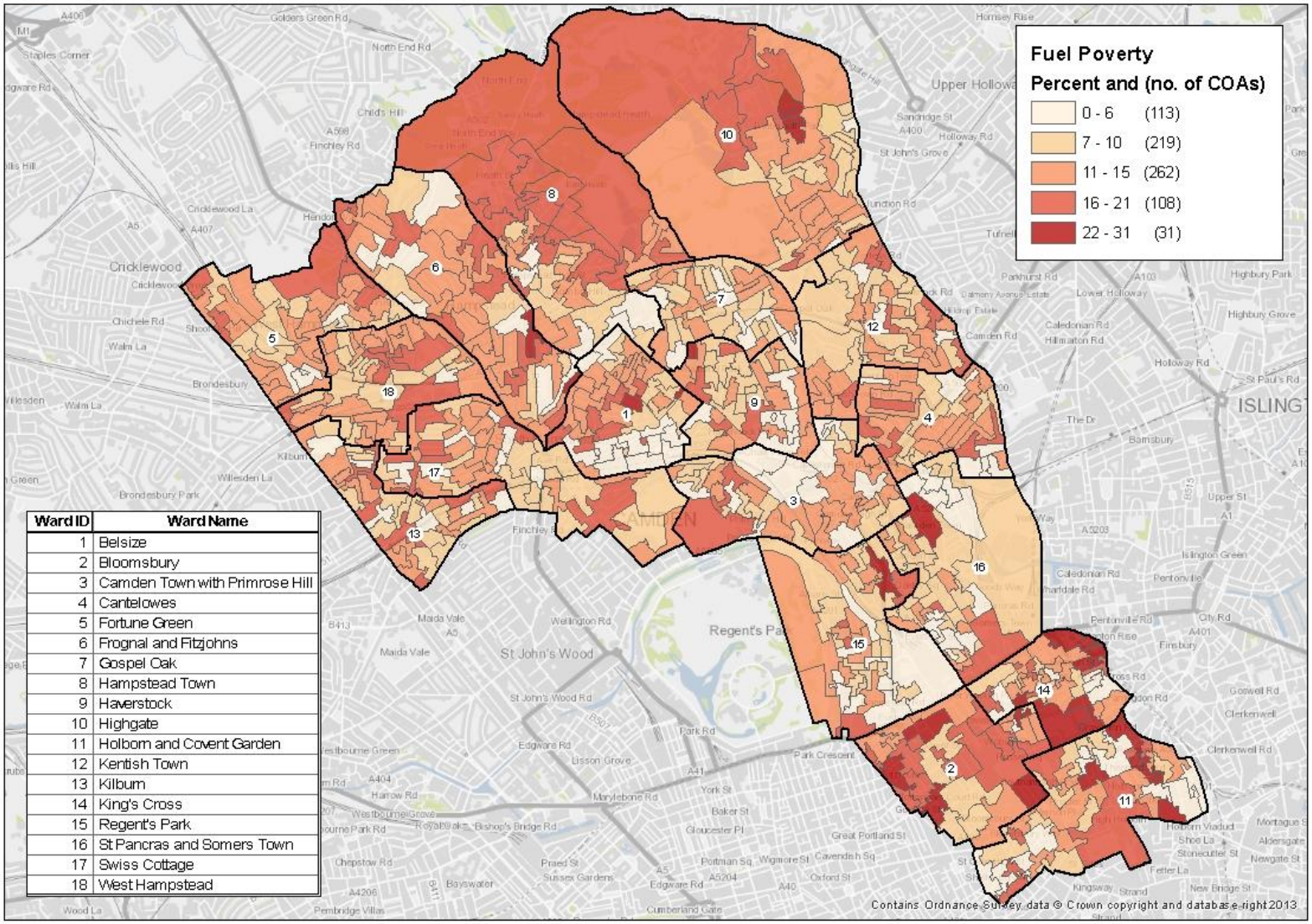
Map 6(ii): Average 'SimpleSAP' Ratings per dwelling, private sector, Camden Town



Map 6(iii): Average 'SimpleSAP' Ratings per dwelling, private sector, Hampstead



Map 7(i): Percentage of private sector dwellings occupied by households in Fuel Poverty



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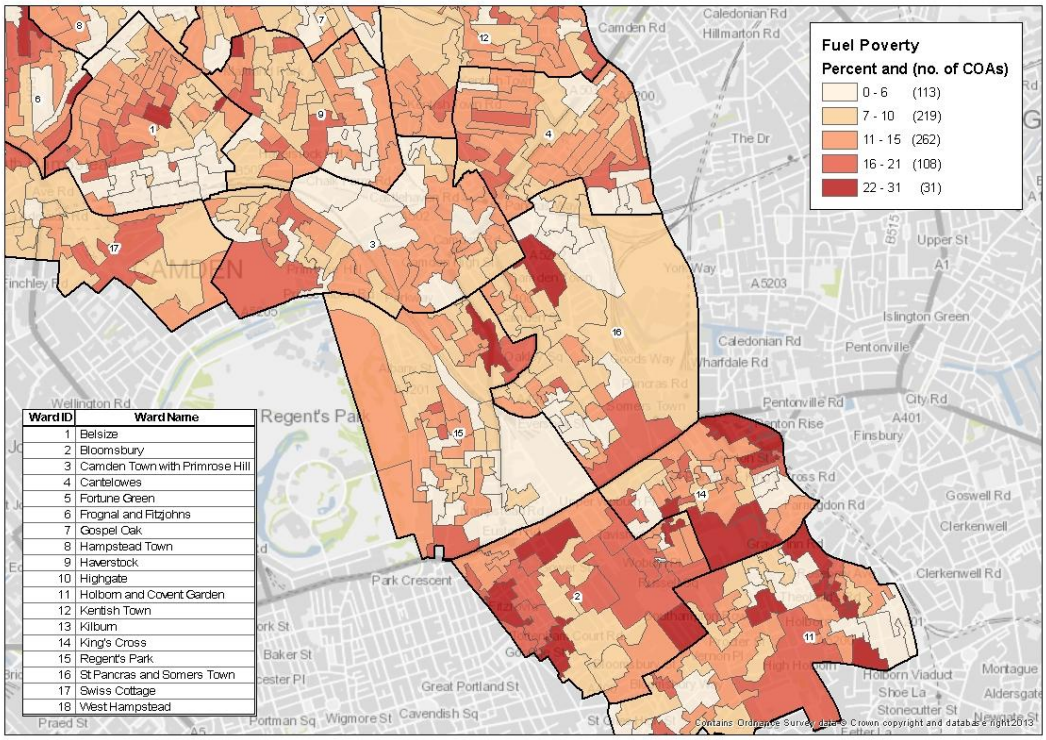
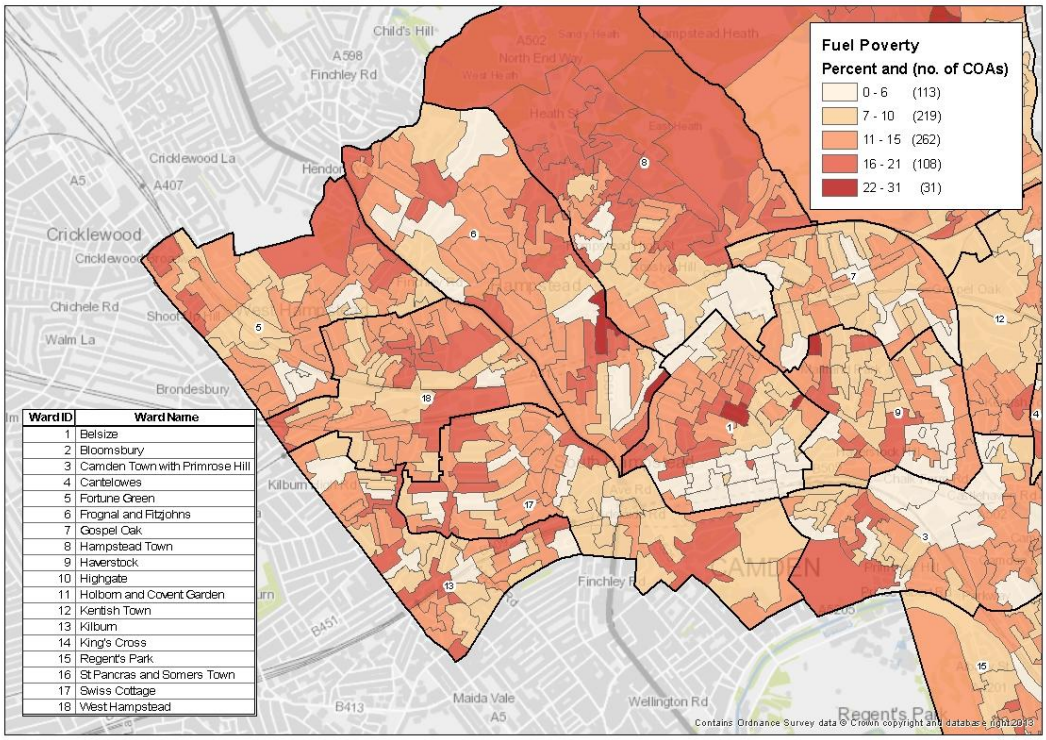
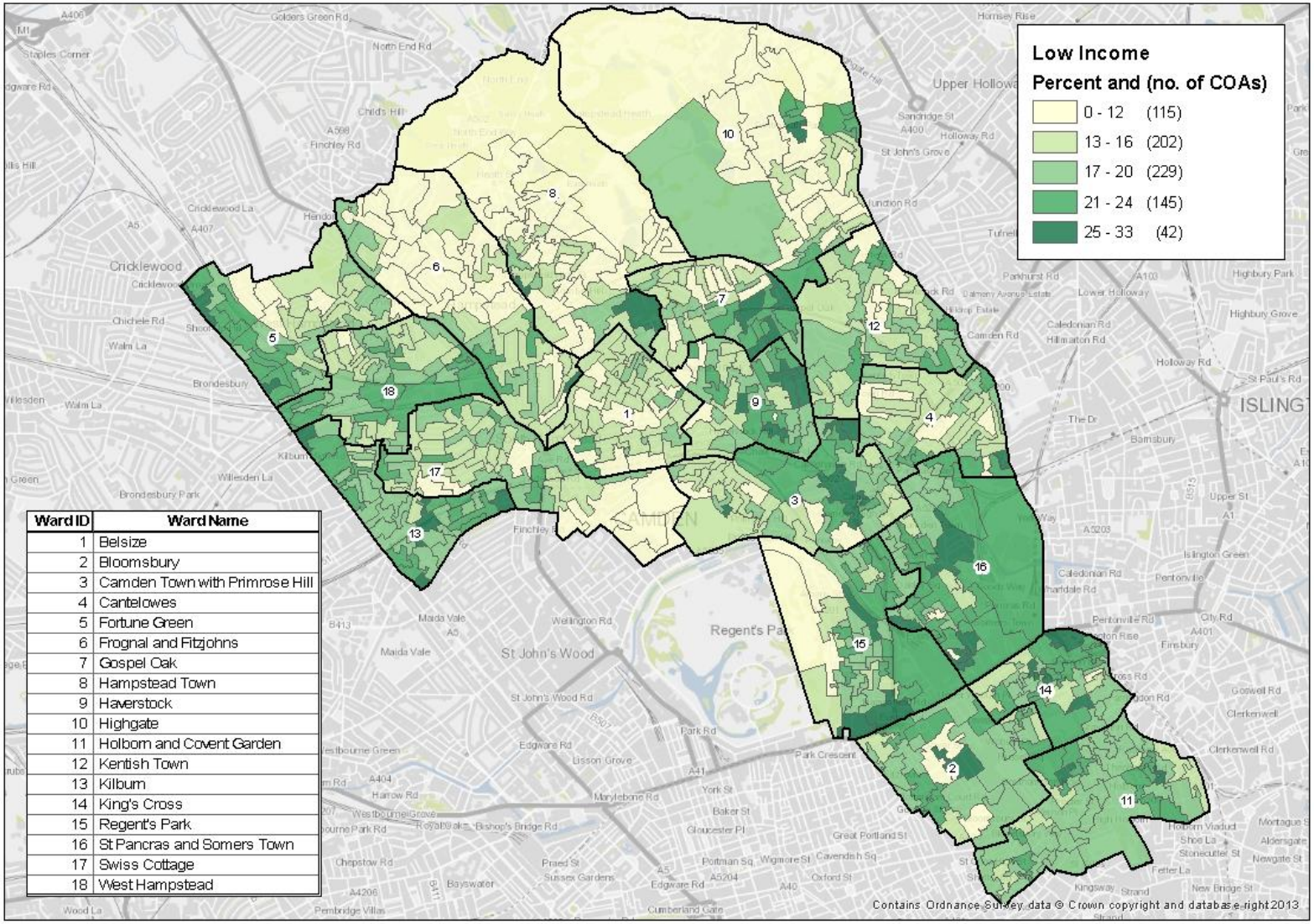
Map 7(ii): Percentage of private sector dwellings occupied by households in Fuel Poverty, Camden Town



Map 7(iii): Percentage of private sector dwellings occupied by households in Fuel Poverty, Hampstead



Map 8(i): Percentage of private sector dwellings occupied by Low Income Households



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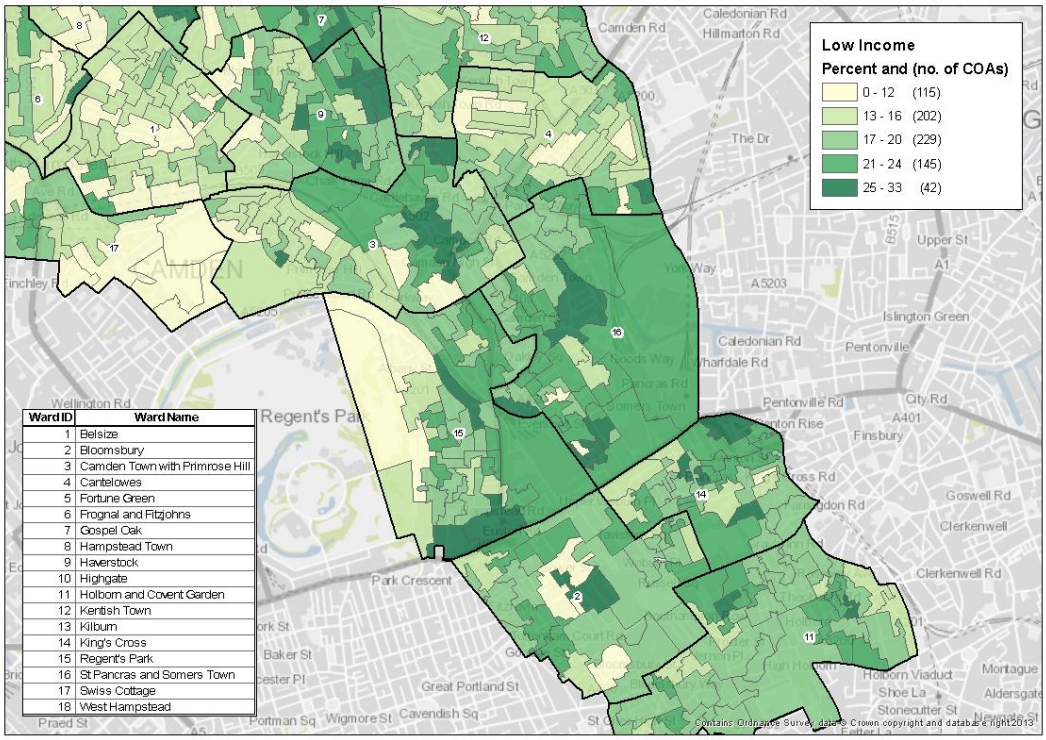
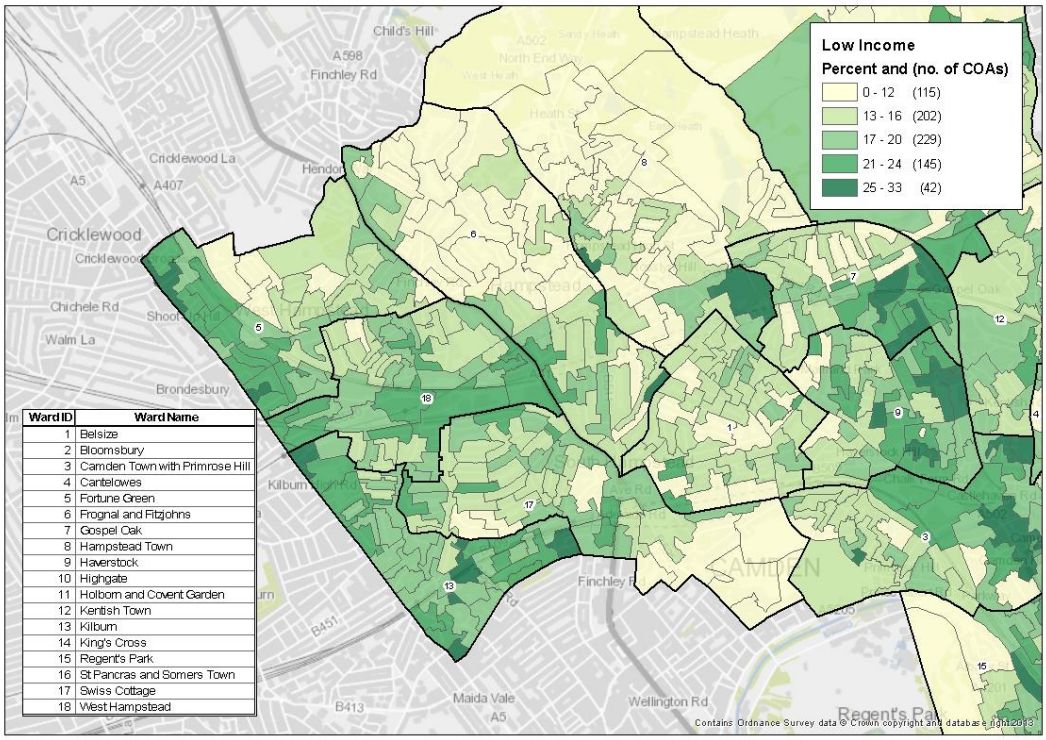
Map 8(ii): Percentage of private sector dwellings occupied by Low Income Households, Camden Town



Map 8(iii): Percentage of private sector dwellings occupied by Low Income Households, Hampstead



Additional requirements

The current English Local Authority Statistics on Housing (ELASH) report required by CLG includes information regarding the private sector stock. A number of these outputs are already provided in earlier summary tables. Additional information required includes EPC ratings and cost of mitigating Category 1 hazards.

The average SimpleSAP rating for the private sector stock in Camden Council is 53 which corresponds with an estimated EPC rating of E. The number of private sector dwellings with an EPC rating below E is estimated to be 8,777 (13%). The breakdown of SimpleSAP into the 7 EPC bandings is provided in Table 9.

Table 9: Energy Efficiency Rating (based on SimpleSAP), private sector stock

	Count	Percent
(92-100) A	0	0%
(81-91) B	140	<1%
(69-80) C	7,656	12%
(55-68) D	25,228	39%
(39-54) E	23,643	36%
(21-38) F	5,872	9%
(1-20) G	2,905	4%

The estimated cost of mitigating Category 1 hazards in Camden Council is provided in Table 10. These costs are based on the average cost of mitigating Category 1 hazards for London using 2009 EHS data.

Table 10: Cost of mitigating Category 1 Hazards, private sector stock

	Average Cost	Total Number in the Authority	Total Cost (£000)
HHSRS Category 1 Hazards	£3,381	11,560	£39,084

There are several caveats about the use of these costs since the method used is based on standardised cost assumptions intended for comparison purposes. It might be preferable to use local data on costs, such as information on grant or loan aided works, however these are not without their own issues (as they are rarely an unbiased sample of the affected stock). In the absence of these, however, the above sums provide useful starting points.

The Energy Act 2011

Under the Energy Act 2011 new rules will be brought into force so that from 2016 onwards landlords will not be able to refuse a tenants reasonable request for consent to install Green Deal measures. Furthermore, from 2018 Landlords must ensure that their properties meet a minimum energy efficiency standard, likely to be set at EPC rating Band E (unless they have already installed the full range of measures possible under the Green Deal).

The number of private rented dwellings in Camden Council with a rating below E is estimated to be 4,349 (13%) using SimpleSAP as a means of estimating EPC bands.

Table 11 below shows the breakdown of SimpleSAP into the 7 EPC ratings bands for private rented stock only.

Table 11: Energy Efficiency Rating (based on SimpleSAP), private rented stock

	Count	Percent
(92-100) A	0	0%
(81-91) B	94	<1%
(69-80) C	4,274	12%
(55-68) D	13,698	42%
(39-54) E	10,507	32%
(21-38) F	2,778	8%
(1-20) G	1,571	5%

Basic Green Deal Variables

The Green Deal and ECO both focus on improving SAP scores and reducing carbon emissions of the stock. Being able to identify areas where energy improvements can be made will be useful for targeting areas which may benefit from Green Deal and ECO funding. The availability of small area datasets for targeting can reduce time and resources used for authority wide surveys or marketing which may otherwise be required to identify such areas.

The SimpleCO2 model, as described earlier in the report, was originally devised for modelling carbon emissions. The model inputs include dwelling type, age and tenure as well as a number of energy efficiency variables including fuel type, boiler type, cavity wall insulation and levels of loft insulation. Two relatively simple improvements which can be made to a dwelling to improve the energy performance are cavity wall insulation and installing or increasing the level of loft insulation.

Tables 12 and 13 provide the BRE Basic Green Deal Variables estimated percentage and stock totals at ward and authority level for the following indicators:

- Wall Type and presence of cavity wall insulation
    - Solid Wall
    - Insulated Cavity Wall
    - Uninsulated Cavity Wall

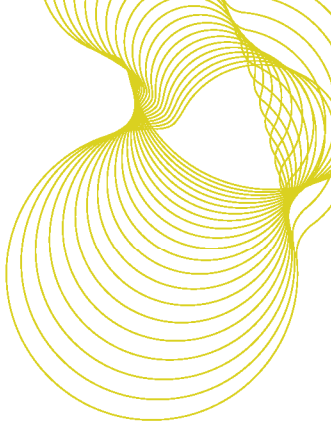
- Presence and level of loft insulation
    - No Loft
    - Loft with no insulation
    - 50mm loft insulation
    - 100mm loft insulation
    - 150mm loft insulation
    - 200mm loft insulation
    - 250mm + loft insulation

Table 12: Basic Green Deal Modelled data, private sector stock

Ward	Dwellings	Wall Type			Levels of Loft Insulation						
		Solid Wall	Insulated Cavity Wall	Uninsulated Cavity Wall	No Loft	Loft but no Insulation	50mm	100mm	150mm	200mm	250mm plus
Belsize	5,153	3,477 (67%)	436 (8%)	1,240 (24%)	2,249 (44%)	399 (8%)	444 (9%)	1,403 (27%)	223 (4%)	137 (3%)	298 (6%)
Bloomsbury	3,973	3,202 (81%)	163 (4%)	608 (15%)	2,287 (58%)	275 (7%)	233 (6%)	814 (20%)	114 (3%)	73 (2%)	177 (4%)
Camden Town with Primrose Hill	3,997	2,167 (54%)	527 (13%)	1,303 (33%)	1,521 (38%)	259 (6%)	396 (10%)	1,323 (33%)	211 (5%)	118 (3%)	169 (4%)
Cantelowes	2,819	1,862 (66%)	248 (9%)	709 (25%)	1,129 (40%)	181 (6%)	271 (10%)	835 (30%)	138 (5%)	94 (3%)	171 (6%)
Fortune Green	4,022	3,049 (76%)	229 (6%)	744 (18%)	1,499 (37%)	334 (8%)	466 (12%)	1,164 (29%)	227 (6%)	117 (3%)	215 (5%)
Frognal and Fitzjohns	5,137	3,591 (70%)	435 (8%)	1,111 (22%)	2,276 (44%)	396 (8%)	410 (8%)	1,392 (27%)	232 (5%)	143 (3%)	288 (6%)
Gospel Oak	2,251	1,440 (64%)	237 (11%)	574 (25%)	917 (41%)	154 (7%)	213 (9%)	652 (29%)	119 (5%)	77 (3%)	119 (5%)
Hampstead Town	4,264	2,783 (65%)	416 (10%)	1,065 (25%)	1,447 (34%)	344 (8%)	503 (12%)	1,361 (32%)	227 (5%)	163 (4%)	219 (5%)
Haverstock	2,661	1,625 (61%)	236 (9%)	800 (30%)	1,247 (47%)	159 (6%)	191 (7%)	767 (29%)	121 (5%)	67 (3%)	109 (4%)
Highgate	3,017	2,263 (75%)	180 (6%)	574 (19%)	961 (32%)	228 (8%)	410 (14%)	993 (33%)	185 (6%)	150 (5%)	90 (3%)
Holborn and Covent Garden	3,814	1,896 (50%)	668 (18%)	1,250 (33%)	2,341 (61%)	147 (4%)	171 (4%)	828 (22%)	132 (3%)	76 (2%)	119 (3%)
Kentish Town	3,406	2,389 (70%)	271 (8%)	746 (22%)	1,164 (34%)	258 (8%)	351 (10%)	1,147 (34%)	198 (6%)	119 (3%)	169 (5%)
Kilburn	3,204	1,727 (54%)	343 (11%)	1,134 (35%)	1,624 (51%)	166 (5%)	205 (6%)	914 (29%)	96 (3%)	51 (2%)	148 (5%)

Table 13: Basic Green Deal Modelled data, private sector stock (continued)

Ward	Dwellings	Wall Type			Levels of Loft Insulation						
		Solid Wall	Insulated Cavity Wall	Uninsulated Cavity Wall	No Loft	Loft but no Insulation	50mm	100mm	150mm	200mm	250mm plus
King's Cross	2,641	1,823 (69%)	209 (8%)	609 (23%)	1,522 (58%)	138 (5%)	158 (6%)	606 (23%)	78 (3%)	42 (2%)	97 (4%)
Regent's Park	2,809	1,572 (56%)	293 (10%)	944 (34%)	1,460 (52%)	144 (5%)	182 (6%)	744 (26%)	118 (4%)	54 (2%)	107 (4%)
St Pancras and Somers Town	2,094	911 (44%)	387 (18%)	796 (38%)	1,180 (56%)	73 (3%)	98 (5%)	527 (25%)	104 (5%)	54 (3%)	58 (3%)
Swiss Cottage	5,934	4,085 (69%)	445 (7%)	1,404 (24%)	3,004 (51%)	391 (7%)	452 (8%)	1,458 (25%)	181 (3%)	115 (2%)	333 (6%)
West Hampstead	4,248	3,302 (78%)	210 (5%)	736 (17%)	1,799 (42%)	324 (8%)	402 (9%)	1,171 (28%)	181 (4%)	121 (3%)	250 (6%)



Summary of results: private sector stock

Table14 summarises the Basic Green Deal variables at the authority level

Table 14: Modelled data, private sector stock: authority level summary

	Dwellings	Wall Type			Levels of Loft Insulation						
		Solid Wall	Insulated Cavity Wall	Uninsulated Cavity Wall	No Loft	Loft but no Insulation	50mm	100mm	150mm	200mm	250mm plus
Camden Council	65,444	43,164	5,933	16,347	29,627	4,370	5,556	18,099	2,885	1,771	3,136
		(66%)	(9%)	(25%)	(45%)	(7%)	(8%)	(28%)	(4%)	(3%)	(5%)
2009 EHS (private stock)		(33%)	(32%)	(35%)	(8%)	(3%)	(11%)	(37%)	(17%)	(13%)	(11%)

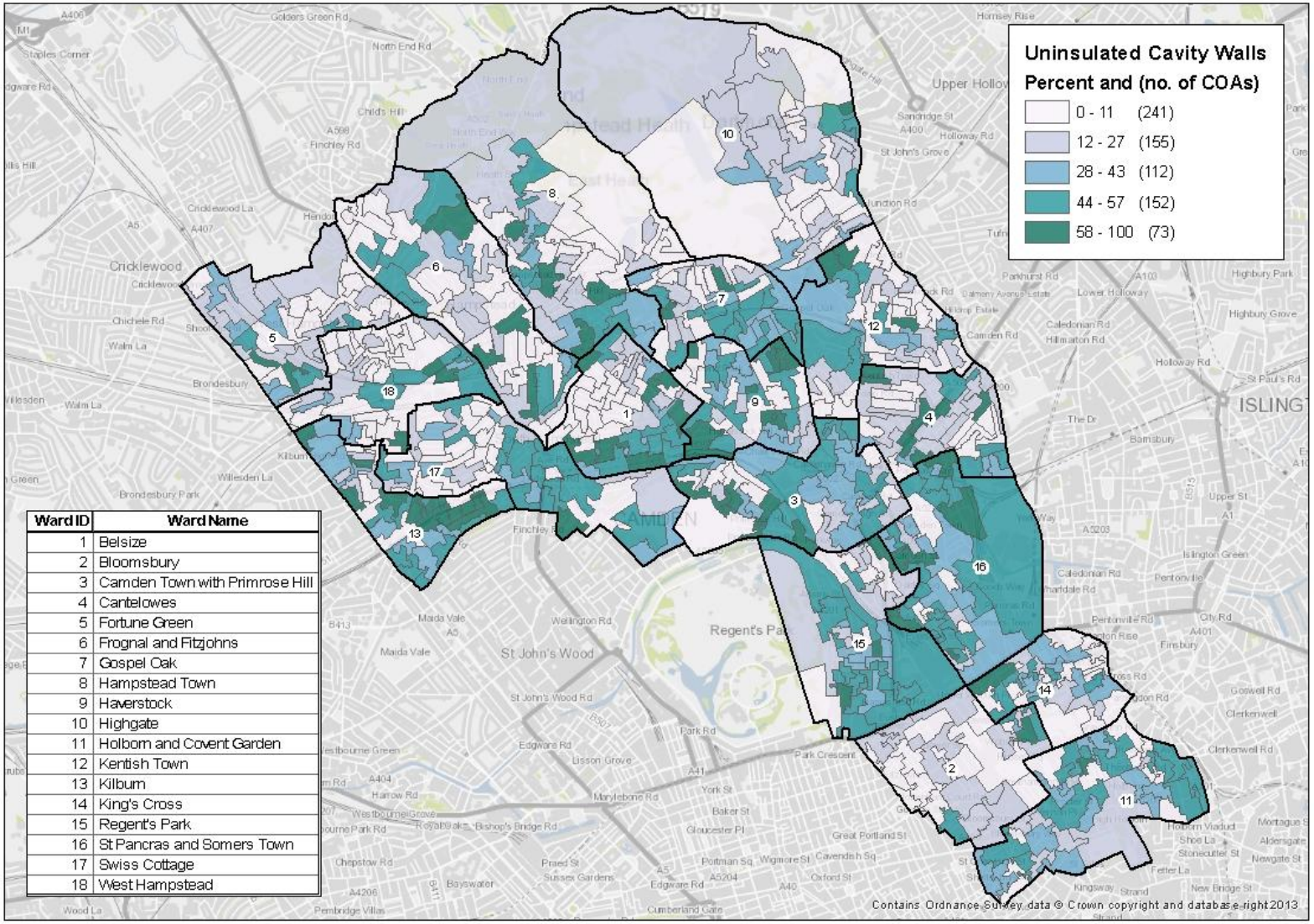
The modelled results for Camden Council suggest that a sizeable proportion of the private sector stock could benefit from energy efficiency improvements with an estimated 16,347 dwellings having un-insulated cavity walls. The model also estimates that 9,926 dwellings (15% of Camden Council's private housing stock) have less than 100mm of loft insulation out of which 4,370 dwellings (7% of Camden Council's housing stock) have no loft insulation at all. These types of dwellings are likely to be of particular interest to Green Deal providers. Camden Council's private housing stock also provides an opportunity major challenge for ECO investment with 43,164 dwellings possessing solid walls. This equates to 66% of the private housing stock – almost double the proportion observed nationally (33%). The distribution of dwellings with un-insulated cavity walls, solid walls and dwellings with loft insulation less than 100mm is demonstrated graphically, at a local level, in the maps 9, 10 and 11.

In 2011 data was published on the number of dwellings which benefited from having cavity wall insulation and/or loft insulation installed under the Carbon Emissions ReductionTarget (CERT) scheme15. Over the four years of the CERT scheme over 1.6 million dwellings had cavity wall insulation installed while over 2.2 million had loft insulation installed. This equates to 7% and 10% respectively, of all dwellings nationally. The CERT data, at a local level, reports that 4% of dwellings in Camden Council had cavity wall insulation installed and 2% had loft insulation installed under the four year scheme.

In Camden Council, it is estimated that 34% of the housing stock have cavity walls (compared to 67% nationally) and that over half of these cavities have not been insulated. This is indicative that the former CERT scheme may not have been as successful as it could have been in targeting un-insulated cavity walls in Camden and leaves an opportunity for implementation of ECO and the Green Deal.

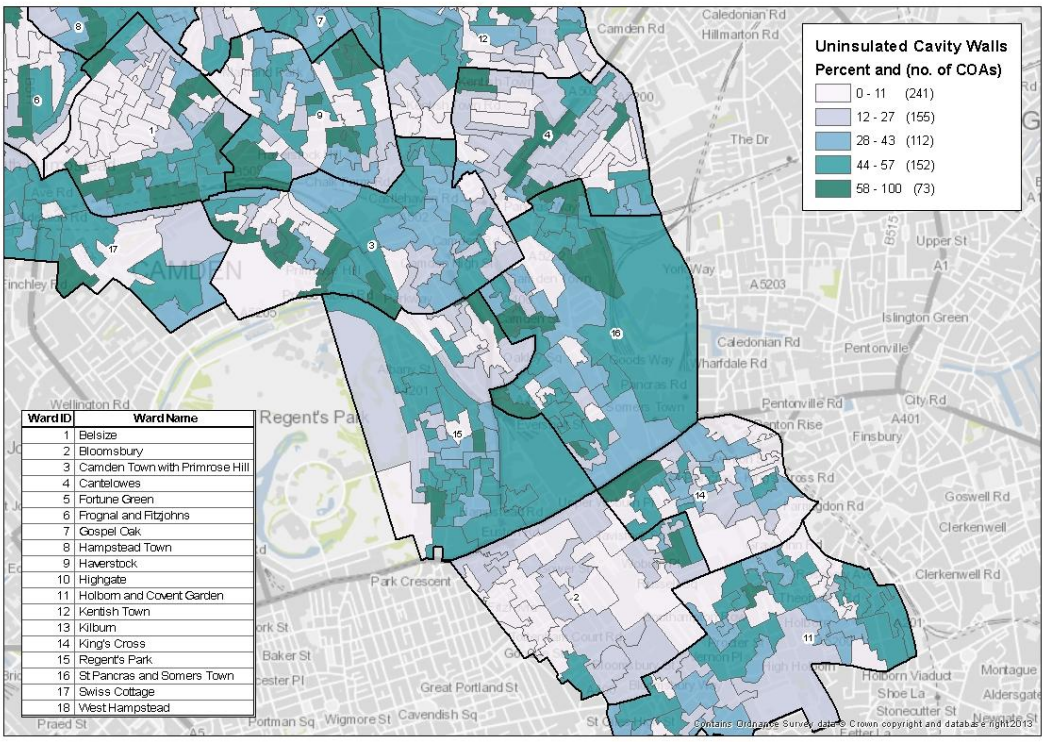
[15] http://www.energysavingtrust.org.uk/scotland/Publications2/Housing-professionals/HEED-PDFs/HEED-publications-for-UK/CERT-summary-report-Q12-by-Local-Authority

Map 9(i): Percentage of private sector dwellings with uninsulated cavity walls

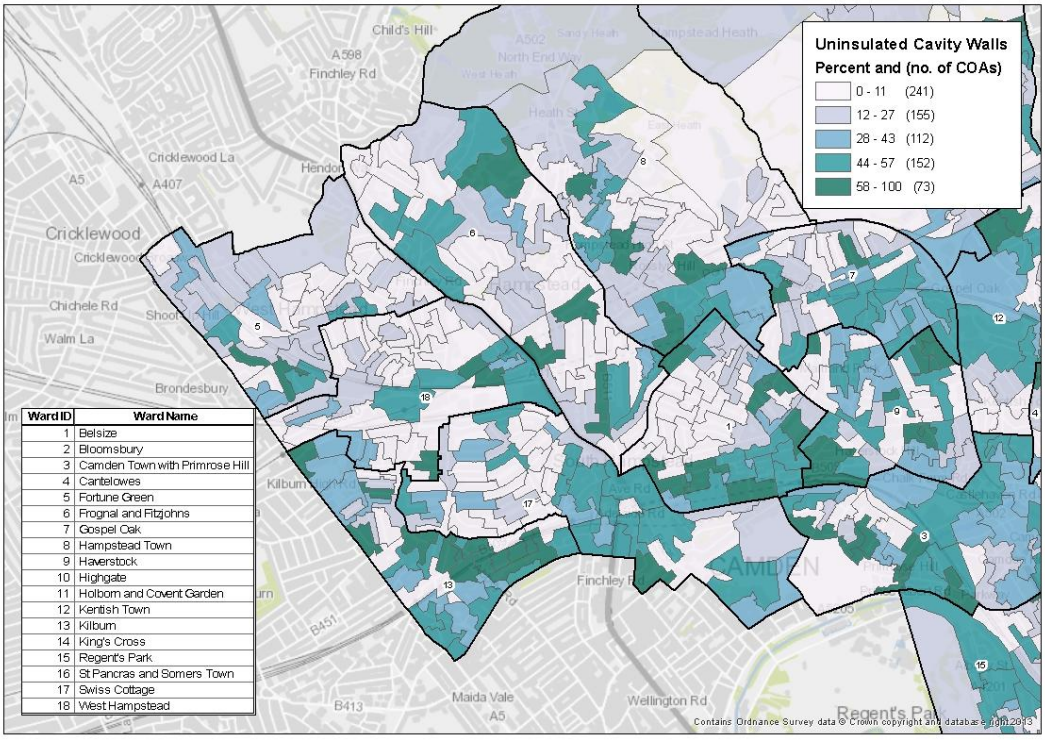


Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
8	Hampstead Town
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

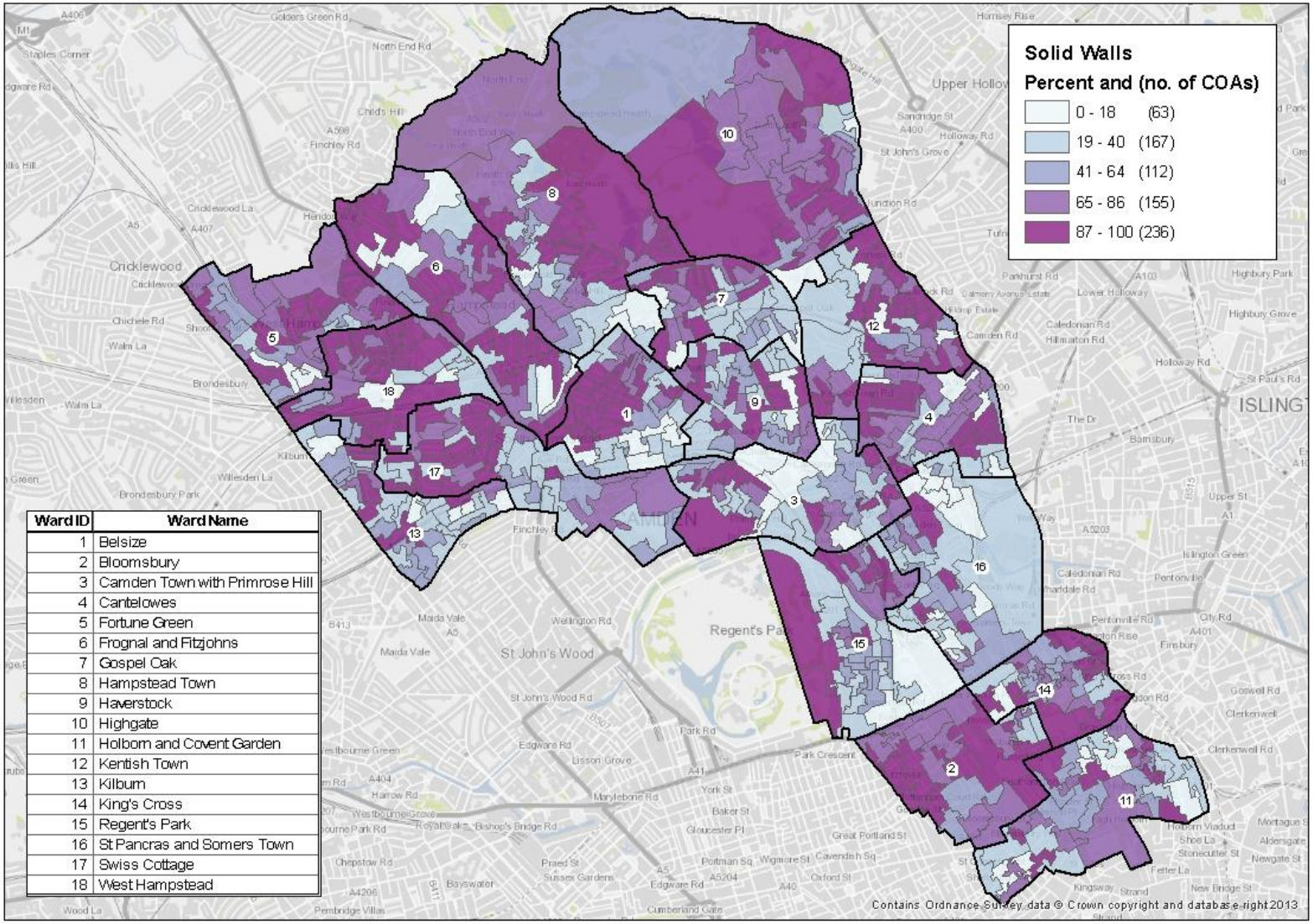
Map 9(ii): Percentage of private sector dwellings with uninsulated cavity walls, Camden Town



Map 9(iii): Percentage of private sector dwellings with uninsulated cavity walls, Hampstead



Map 10(i): Percentage of private sector dwellings with solid walls



Ward ID	Ward Name
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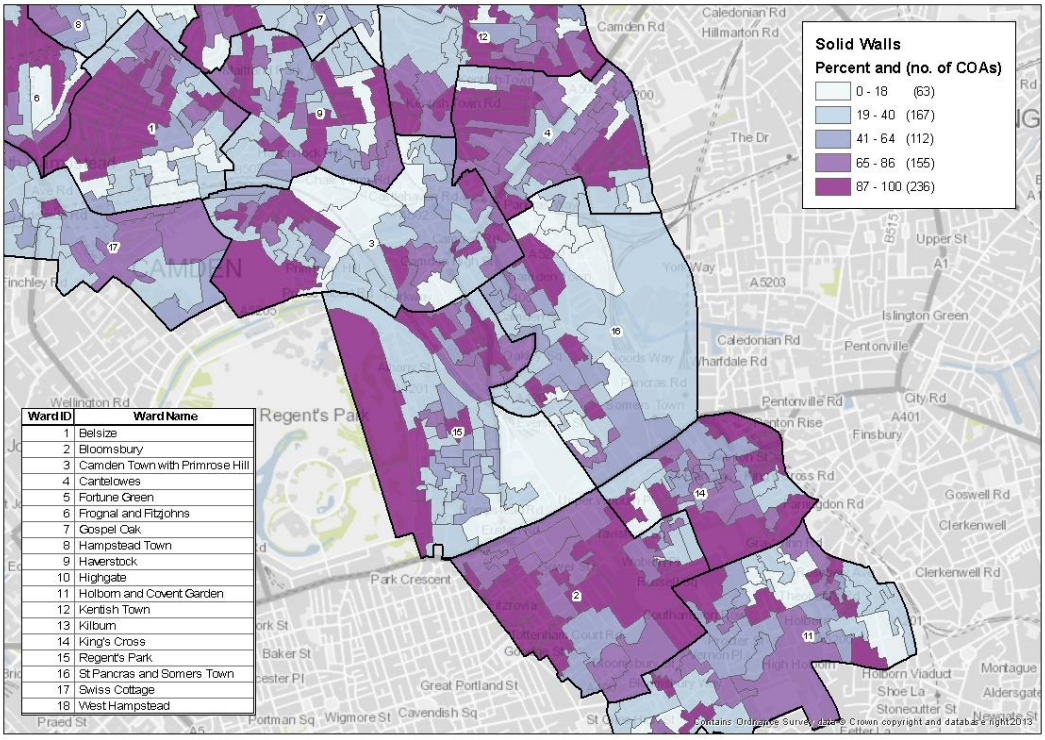
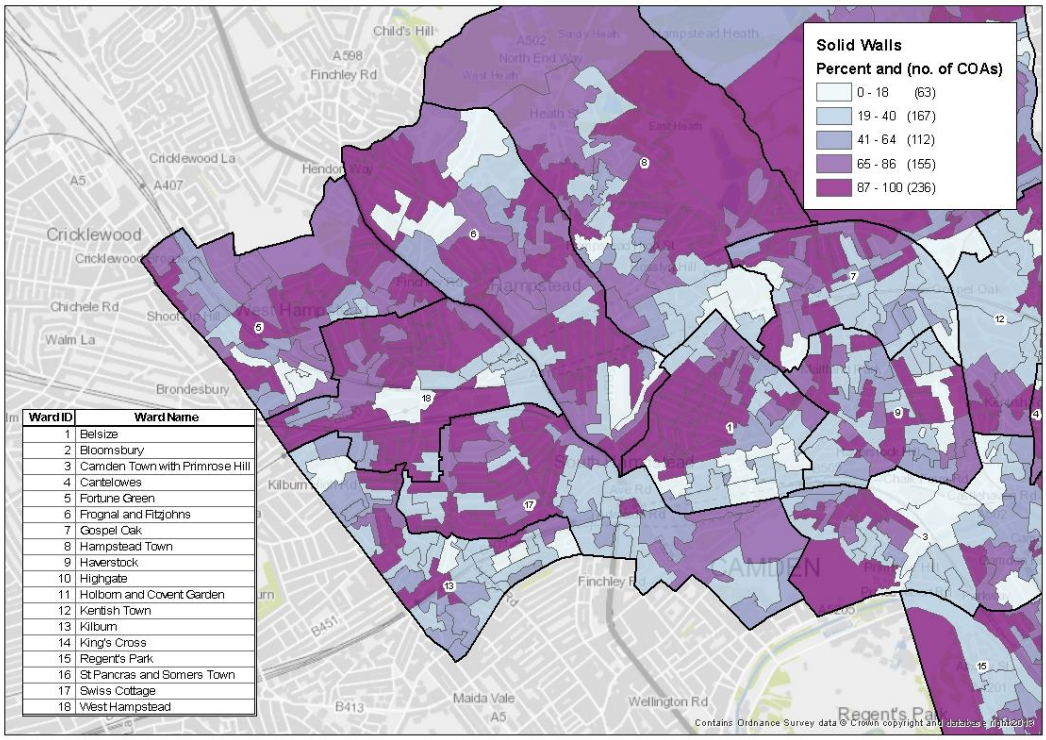
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

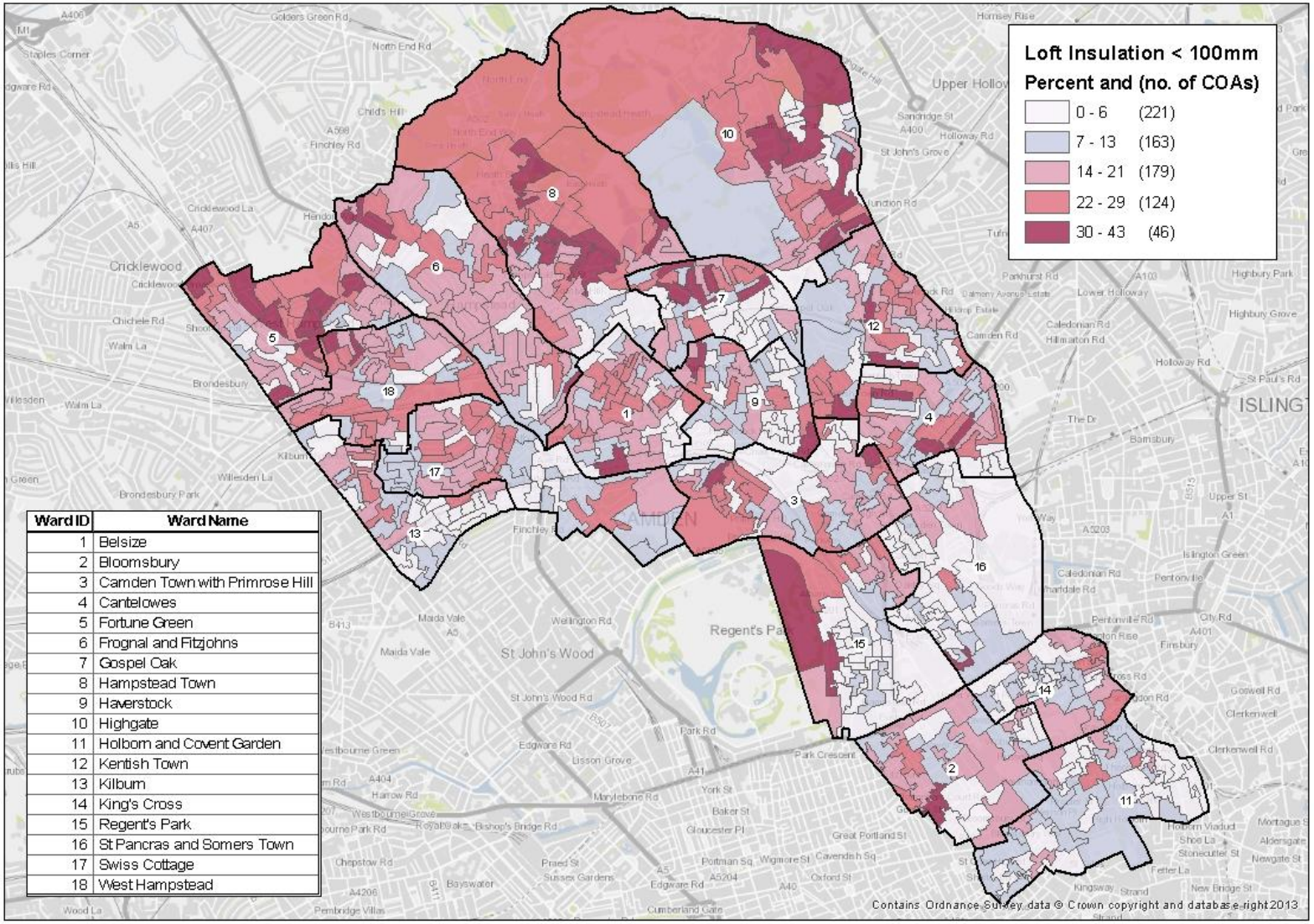
Map 10(ii): Percentage of private sector dwellings with solid walls, Camden Town



Map 10(iii): Percentage of private sector dwellings with solid walls, Hampstead



Map 11(i): Percentage of private sector dwellings with no or less than 100mm of loft insulation



Ward ID	Ward Name
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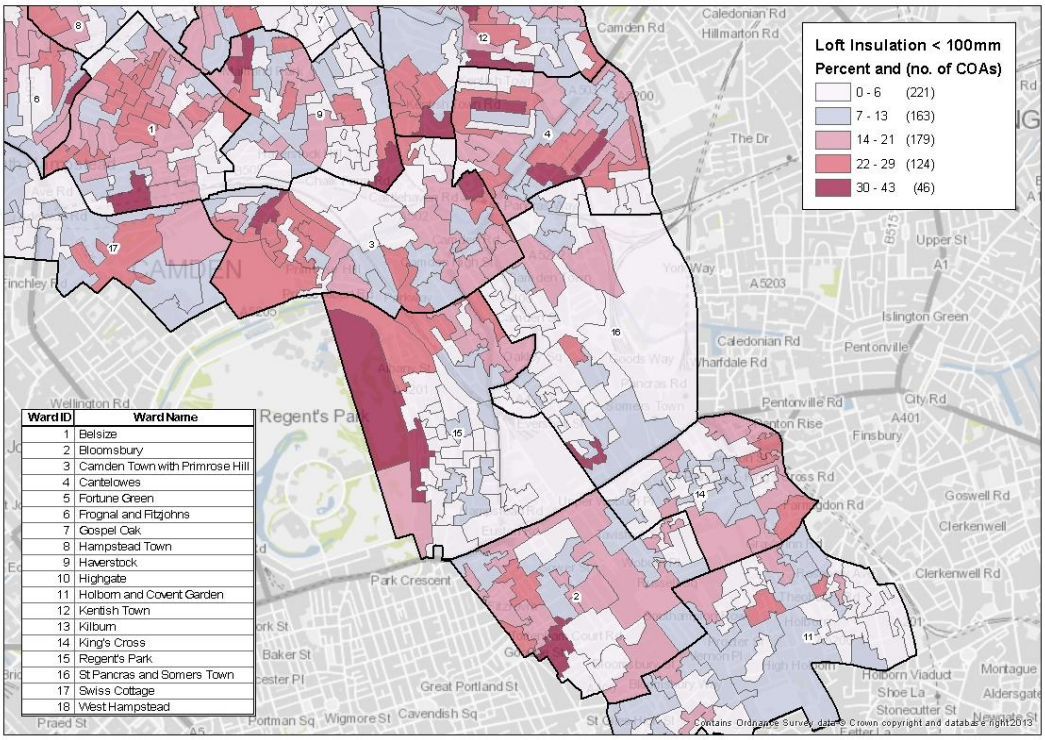
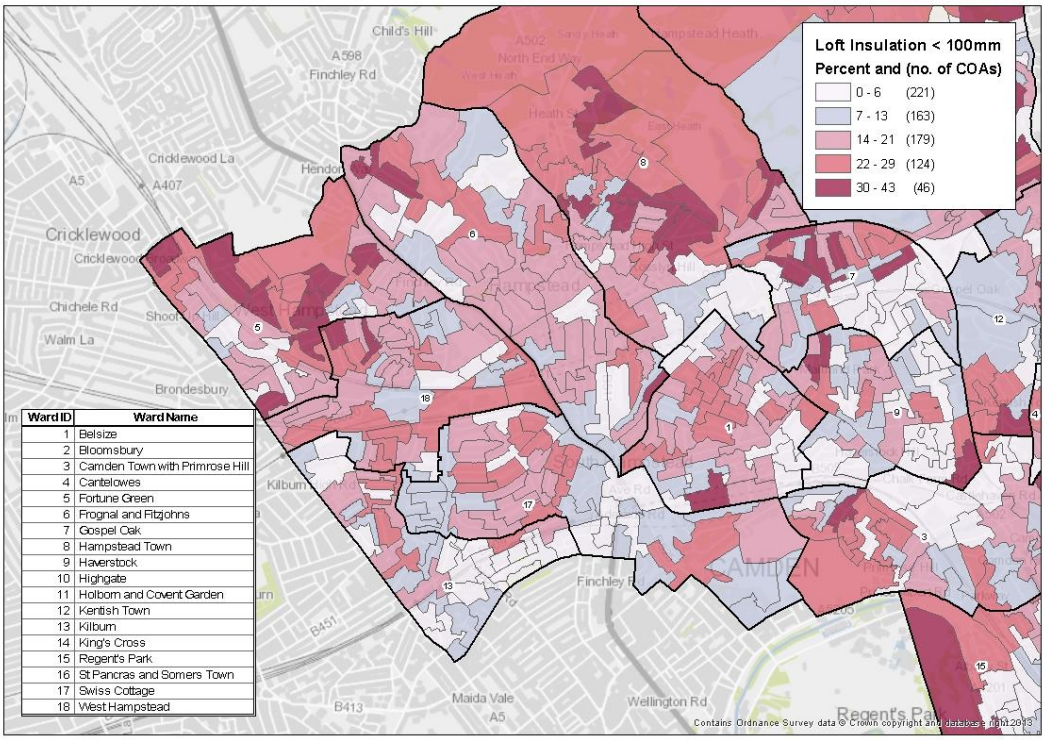
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map 11(ii): Percentage of private sector dwellings with no or less than 100mm of loft insulation, Camden Town



Map 11(iii): Percentage of private sector dwellings with no or less than 100mm of loft insulation, Hampstead



Housing in Multiple Occupation

The Housing Act 2004 introduced a new definition of a House in Multiple Occupation (HMO) from 6th April 2006 in England.

The definition of an HMO is set out in sections 254-258 of the Act. The definition is a complex one but the bullet points below, which are adapted from web pages provided by the National HMO Network[16], provide a useful summary definition of an HMO:

- 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 (commonly referred to as s:257 HMOs).

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.

HMOs have been modelled using the following criteria from a number of Experian data sources and information derived for the SimpleCO_2 model. The criteria includes:

- privately rented dwellings with three or more bedrooms occupied by
    - male home sharers,
    - female home sharers
    - mixed home sharers
    - multi-occupancy dwelling

    or classified as
    - students and other transients singles in multi-let houses

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

Mandatory HMO licensing applies across England to all HMOs of three or more storeys and occupied by five or more persons forming more than one household.

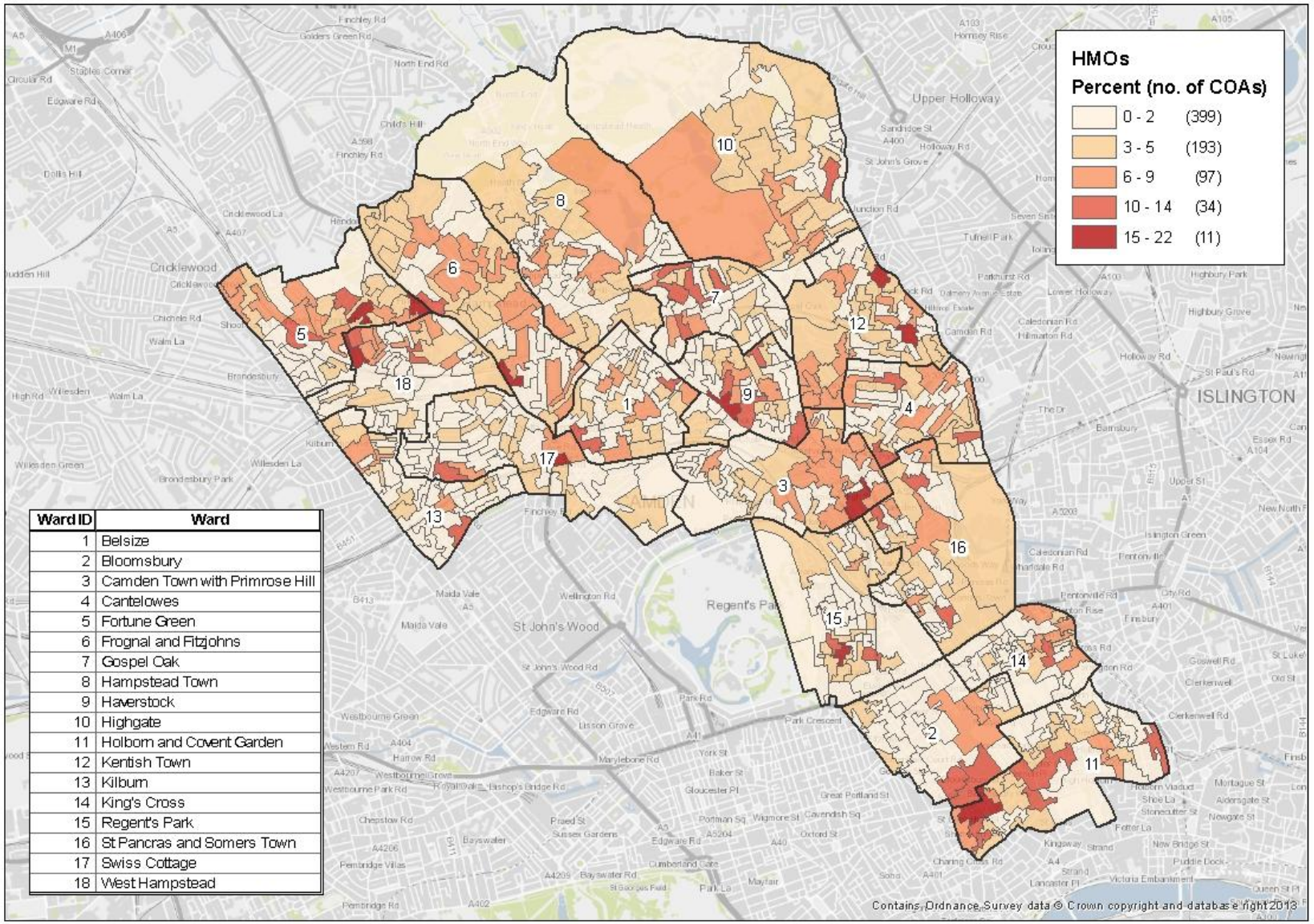
Mandatory licensable HMOs have been estimated following the same criteria as above but include only dwellings estimated to have 3 or more storeys.

The HMO models estimate that there are 3,074 HMOs in Camden, of which 505 could be subject to mandatory licensing. The spread of HMO's is fairly even throughout the local authority although the higher numbers of HMOs are found in Kentish Town, Holborn and Covent Garden, Fortune Green and Frognal and Fitzjohns. The results for HMOs and Mandatory Licensable HMOs at ward level are provided in Table 15. The results are also displayed graphically at COA level in maps 12(i)-(iii) and 13(i)-(iii).

Table 15: Modelled HMOs data

Ward	Dwellings	HMOs	Licensable HMOS
Belsize	6,441	152 (2%)	32 (0%)
Bloomsbury	5,567	106 (2%)	12 (0%)
Camden Town with Primrose Hill	5,886	205 (3%)	43 (1%)
Cantelowes	4,785	173 (4%)	47 (1%)
Fortune Green	4,836	225 (5%)	51 (1%)
Frognal and Fitzjohns	5,566	224 (4%)	31 (1%)
Gospel Oak	4,505	131 (3%)	25 (1%)
Hampstead Town	4,949	142 (3%)	33 (1%)
Haverstock	5,366	169 (3%)	18 (0%)
Highgate	4,687	138 (3%)	33 (1%)
Holborn and Covent Garden	6,548	263 (4%)	30 (0%)
Kentish Town	5,243	252 (5%)	43 (1%)
Kilburn	5,739	121 (2%)	15 (0%)
King's Cross	4,835	109 (2%)	9 (0%)
Regent's Park	5,482	163 (3%)	19 (0%)
St Pancras and Somers Town	5,683	176 (3%)	15 (0%)
Swiss Cottage	7,196	169 (2%)	21 (0%)
West Hampstead	5,556	156 (3%)	28 (1%)
Camden Council	98,870	3,074 (3%)	505 (1%)

Map 12(i): Percentage of HMOs based on all dwellings



Ward ID	Ward
1	Belsize
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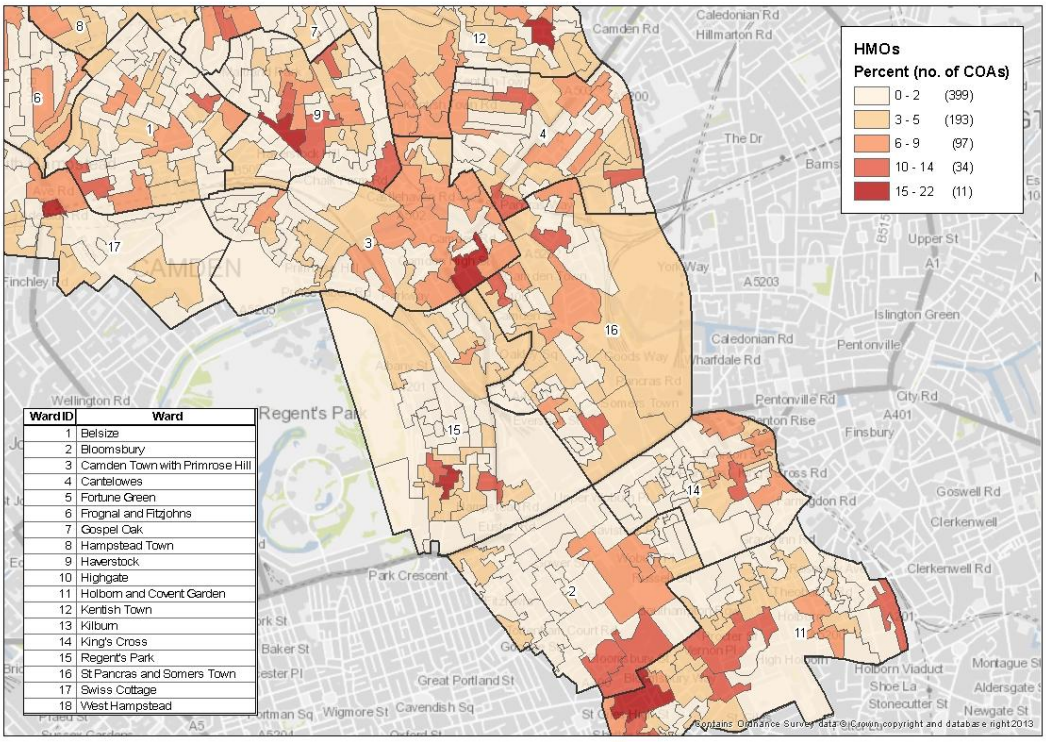
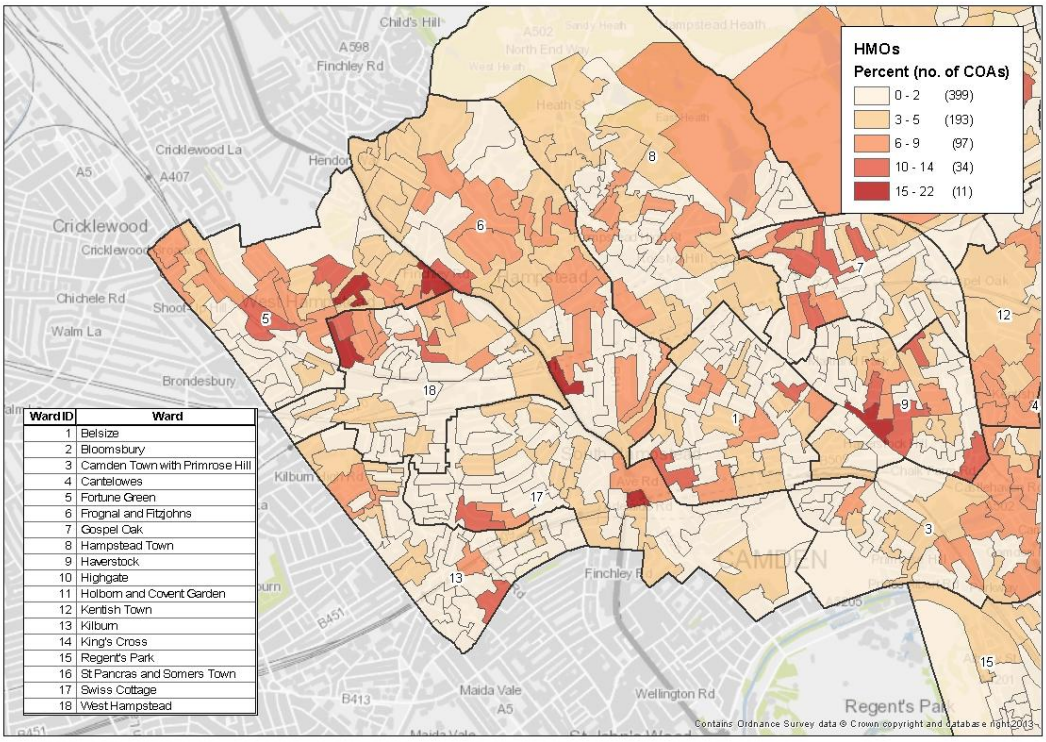
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

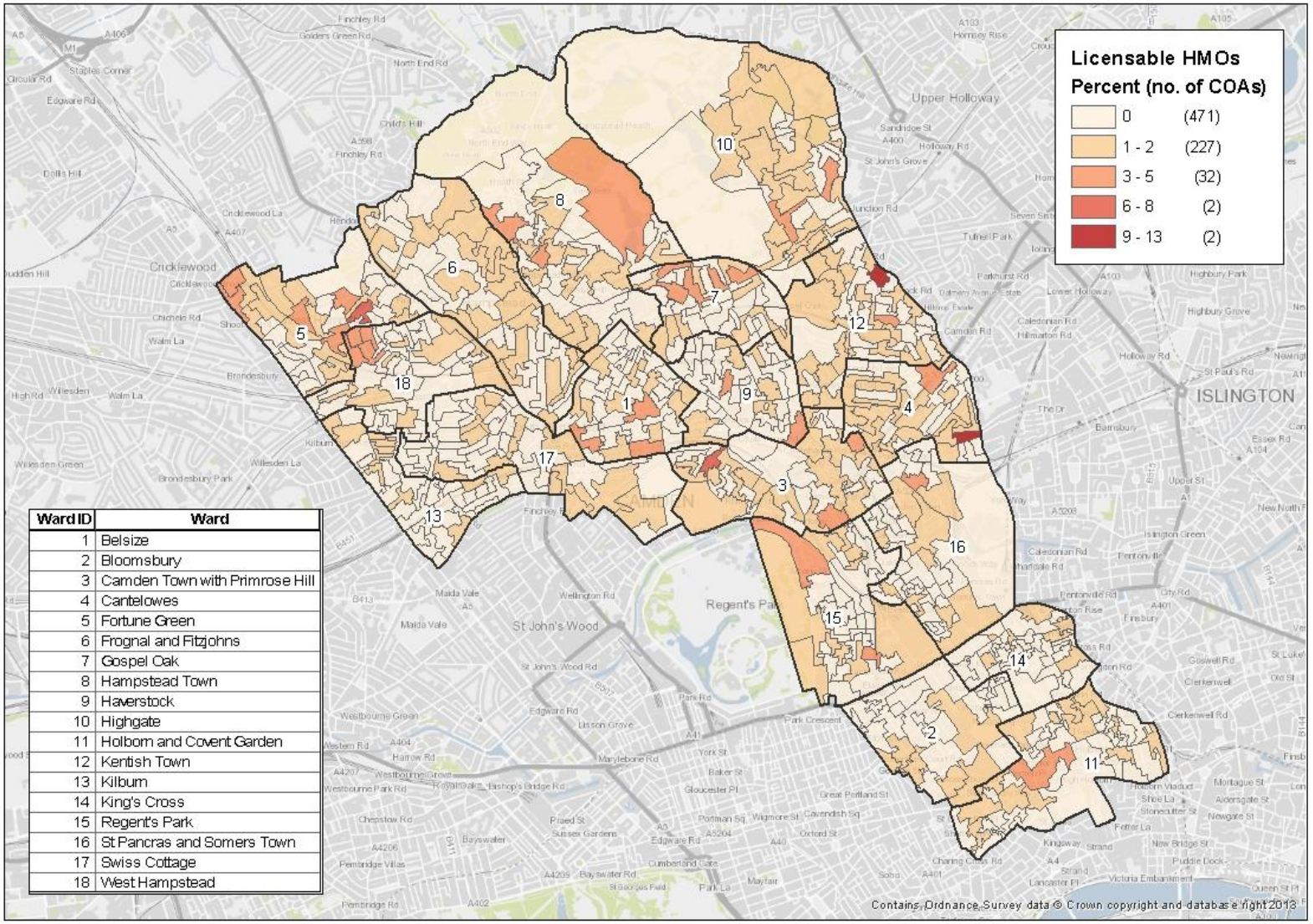
Map 12(ii): Percentage of HMOs based on all dwellings, Camden Town



Map 12(iii): Percentage of HMOs based on all dwellings, Hampstead



Map 13(i): Percentage of Licensable HMOs based on all dwellings



Ward ID	Ward
1	Belsize
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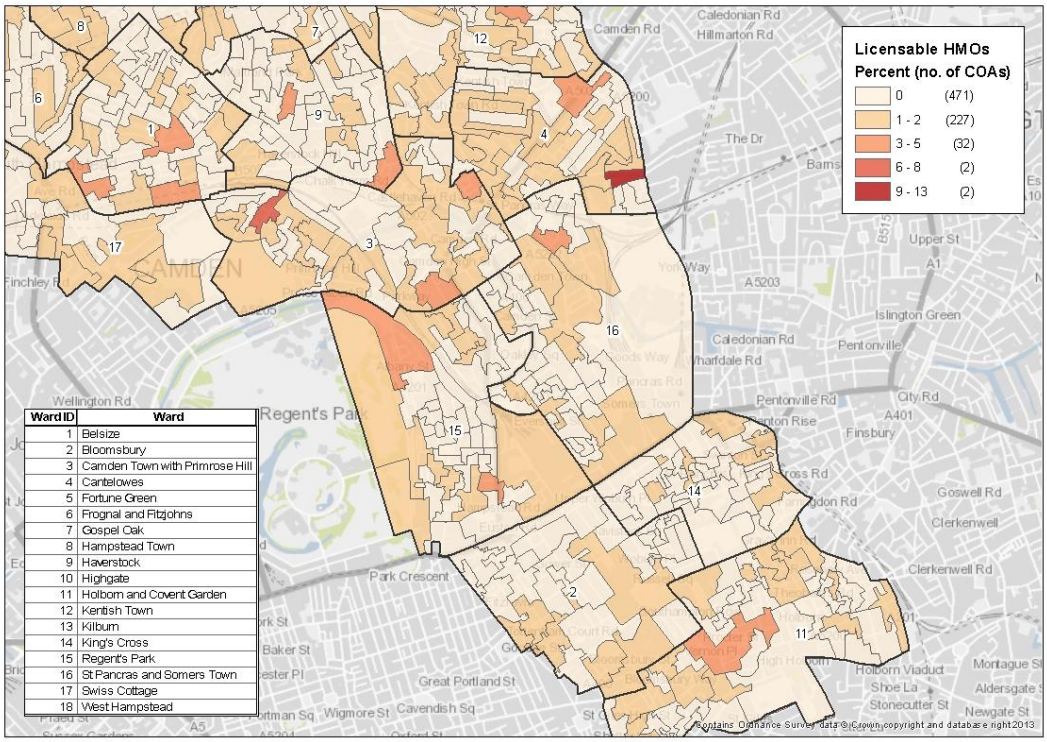
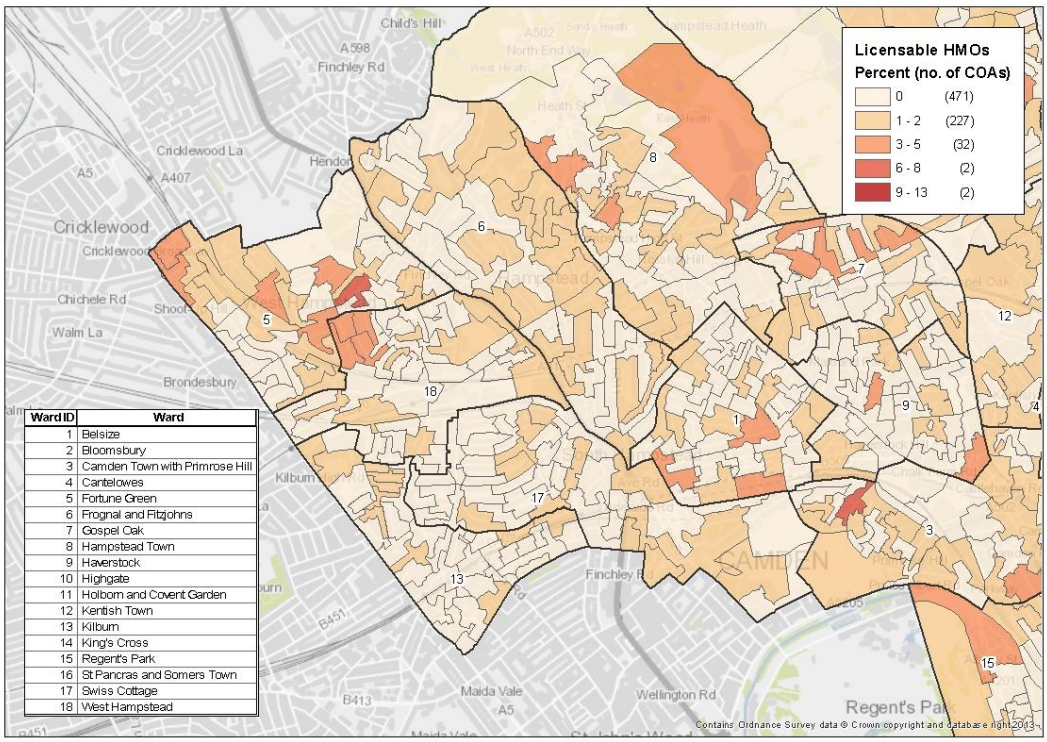
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map 13(ii): Percentage of Licensable HMOs based on all dwellings, Camden Town



Map 13(iii): Percentage of Licensable HMOs based on all dwellings, Hampstead



Section 56 of the Housing Act 2004 gives powers to LHAs to designate areas, or the whole of the area, within their district as subject to additional licensing in respect of some or all of the HMOs in its area that are not already subject to mandatory licensing.

As Camden are currently considering additional licensing, data has been modelled to include all HMOs in the area as defined at the beginning of this section. This includes s:257 HMOs. The HMOs have therefore been split into the following groupings; shared/bedsit HMOs, s:257 HMOs and Mandatory Licensable HMOs.

To identify s:257 HMOs and we have used privately rented flats in converted buildings. The authority wishes to know the number of buildings, as opposed to the number of dwellings. To do this an assumption has been made using data from the 2004 Private Sector House Condition Survey17 which estimated that the average number of flats in a converted building was three. Although this is unlikely to be true for all conversions, it is the best estimate available. The BRE modelled data does not identify the buildings which failed the standards of the 1991 Building Regulations, hence the resulting numbers are likely to be inflated compared to the actual numbers. The number of privately rented converted flats in Camden is 13,737. Using the assumption that on average there are three dwellings per converted building, this equates to 4,579 buildings.

Table 16 shows the stock profile of all HMOs and the three different HMO groups plus a comparison with the rented private sector.

Table 16: Modelled HMOs data, private sector: authority level summary

	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Private Rented Sector	32,922	5,800 (18%)	2,802 (9%)	2,528 (8%)	3,390 (10%)	4,206 (13%)	7,538 (23%)	54
All HMOs	7,652	1,219 (16%)	461 (6%)	665 (9%)	499 (7%)	587 (8%)	1,067 (14%)	54
Shared/bedsit HMOs	2,569	460 (18%)	179 (7%)	251 (10%)	269 (10%)	125 (5%)	154 (6%)	53
s:257 HMOs	4,578	620 (14%)	254 (6%)	308 (7%)	181 (4%)	429 (9%)	867 (19%)	55
Mandatory Licensable HMOs	505	139 (28%)	28 (6%)	106 (21%)	49 (10%)	33 (7%)	46 (9%)	51

The ward level results for all HMOs have been provided in Tables 17 and 18. A detailed ward level table of the separate HMO groups is provided in Appendix D.

[17] http://camden.gov.uk/ccm/content/housing/information-on-private-sector-housing/shared-pages/private-sector-house-condition survey-2004

Table 17: Modelled HMOs data, private rented sector

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Belsize - Private Rented Sector	2,449	405 (17%)	166 (7%)	210 (9%)	249 (10%)	299 (12%)	507 (21%)	54
Belsize - All HMOs	580	81 (14%)	26 (4%)	49 (8%)	33 (6%)	45 (8%)	75 (13%)	56
Bloomsbury - Private Rented Sector	2,395	678 (28%)	466 (19%)	173 (7%)	308 (13%)	425 (18%)	557 (23%)	47
Bloomsbury - All HMOs	362	103 (28%)	59 (16%)	42 (12%)	16 (4%)	43 (12%)	55 (15%)	49
Camden Town with Primrose Hill - Private Rented Sector	1,959	280 (14%)	114 (6%)	145 (7%)	155 (8%)	209 (11%)	461 (24%)	56
Camden Town with Primrose Hill - All HMOs	487	47 (10%)	16 (3%)	27 (6%)	18 (4%)	23 (5%)	63 (13%)	57
Cantelowes - Private Rented Sector	1,351	248 (18%)	115 (9%)	116 (9%)	149 (11%)	168 (12%)	294 (22%)	53
Cantelowes - All HMOs	382	57 (15%)	19 (5%)	34 (9%)	31 (8%)	24 (6%)	47 (12%)	54
Fortune Green - Private Rented Sector	2,052	355 (17%)	146 (7%)	173 (8%)	228 (11%)	283 (14%)	508 (25%)	52
Fortune Green - All HMOs	548	90 (16%)	26 (5%)	55 (10%)	41 (7%)	41 (7%)	94 (17%)	53
Frognal and Fitzjohns - Private Rented Sector	2,370	409 (17%)	179 (8%)	197 (8%)	250 (11%)	319 (13%)	482 (20%)	53
Frognal and Fitzjohns - All HMOs	628	93 (15%)	30 (5%)	50 (8%)	52 (8%)	47 (7%)	94 (15%)	55
Gospel Oak - Private Rented Sector	934	110 (12%)	22 (2%)	78 (8%)	83 (9%)	89 (10%)	211 (23%)	56
Gospel Oak - All HMOs	272	34 (13%)	6 (2%)	26 (10%)	19 (7%)	16 (6%)	40 (15%)	55
Hampstead Town - Private Rented Sector	1,679	253 (15%)	94 (6%)	140 (8%)	145 (9%)	186 (11%)	310 (18%)	55
Hampstead Town - All HMOs	386	47 (12%)	14 (4%)	29 (8%)	27 (7%)	25 (6%)	43 (11%)	56
Haverstock - Private Rented Sector	1,231	200 (16%)	88 (7%)	93 (8%)	125 (10%)	143 (12%)	302 (25%)	55
Haverstock - All HMOs	312	47 (15%)	15 (5%)	27 (9%)	30 (10%)	18 (6%)	42 (13%)	56

Table 18: Modelled HMOs data, private rented sector (continued)

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Highgate - Private Rented Sector	799	151 (19%)	71 (9%)	67 (8%)	93 (12%)	115 (14%)	182 (23%)	52
Highgate - All HMOs	202	32 (16%)	9 (4%)	20 (10%)	15 (7%)	11 (5%)	19 (9%)	52
Holborn and Covent Garden - Private Rented Sector	2,249	400 (18%)	258 (11%)	112 (5%)	205 (9%)	257 (11%)	520 (23%)	55
Holborn and Covent Garden - All HMOs	373	86 (23%)	42 (11%)	40 (11%)	9 (2%)	28 (8%)	35 (9%)	54
Kentish Town - Private Rented Sector	1,541	268 (17%)	103 (7%)	139 (9%)	172 (11%)	192 (12%)	362 (23%)	53
Kentish Town - All HMOs	469	83 (18%)	25 (5%)	53 (11%)	32 (7%)	31 (7%)	62 (13%)	53
Kilburn - Private Rented Sector	1,896	300 (16%)	139 (7%)	131 (7%)	173 (9%)	250 (13%)	480 (25%)	55
Kilburn - All HMOs	457	69 (15%)	31 (7%)	32 (7%)	27 (6%)	38 (8%)	77 (17%)	55
King's Cross - Private Rented Sector	1,711	416 (24%)	274 (16%)	112 (7%)	205 (12%)	271 (16%)	420 (25%)	50
King's Cross - All HMOs	296	83 (28%)	48 (16%)	32 (11%)	20 (7%)	44 (15%)	50 (17%)	50
Regent's Park - Private Rented Sector	1,628	250 (15%)	117 (7%)	109 (7%)	158 (10%)	186 (11%)	399 (25%)	56
Regent's Park - All HMOs	314	49 (16%)	24 (8%)	21 (7%)	16 (5%)	25 (8%)	40 (13%)	55
St Pancras and Somers Town - Private Rented Sector	1,236	153 (12%)	81 (7%)	61 (5%)	100 (8%)	117 (9%)	321 (26%)	59
St Pancras and Somers Town - All HMOs	228	30 (13%)	15 (7%)	14 (6%)	16 (7%)	9 (4%)	19 (8%)	57
Swiss Cottage - Private Rented Sector	2,991	482 (16%)	191 (6%)	247 (8%)	304 (10%)	356 (12%)	654 (22%)	54
Swiss Cottage - All HMOs	721	100 (14%)	28 (4%)	61 (8%)	47 (7%)	64 (9%)	115 (16%)	55
West Hampstead - Private Rented Sector	2,451	442 (18%)	178 (7%)	225 (9%)	288 (12%)	341 (14%)	568 (23%)	52
West Hampstead - All HMOs	635	88 (14%)	28 (4%)	53 (8%)	50 (8%)	55 (9%)	97 (15%)	53

Applying the dwelling level housing stock model information

The analysis provided on the dwelling level housing stock models in this report is displayed as local authority and ward level tables or COA level maps. All of these figures have been calculated by aggregating dwelling level information from the database which has been provided. While these results are valuable outputs, the main strength of this project is the dwelling level database which can be used by Council officers to manipulate, amalgamate and extract information from the database to aid Camden Council's Housing Services projects and reporting.

To give one example, if looking to target energy improvement measures; one of the indicators which may be useful is the presence of Excess Cold Category 1 Hazards. Map 14 below is a copy of a COA map provided earlier in the report on the presence of Excess Cold Category 1 Hazards at COA level. This map very clearly shows that the main concentration of Excess Cold Category 1 Hazards occurs to the South of Camden Council (Kings Cross, Holborn and Covent Garden, and Bloomsbury). Throughout the rest of the local authority, the presence of Excess Cold appears to be much more evenly distributed. For targeting purposes the local authority may want to focus on dwellings occupied by Low Income Households as these households are more likely to be eligible for assistance to improve their homes (Map 15).

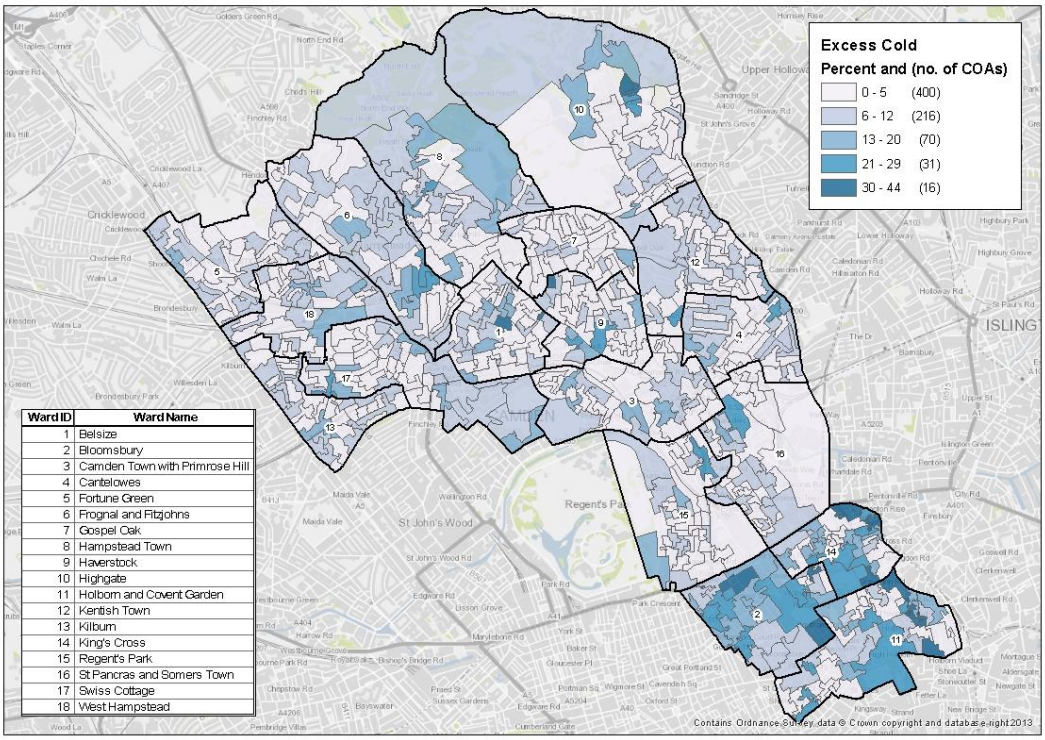
Within the database it is possible to create a variable which combines Excess Cold Category 1 Hazards and dwellings occupied by Low Income Households which can then be mapped in the same way at COA (Maps 16). This map provides a potentially more useful representation of areas within the local authority on which officers may wish to target energy saving measures. While Kings Cross, Holborn and Covent Garden, and Bloomsbury show up very clearly as areas where assistance may be required, parts of Highgate, Haverstock and Belsize also come to the fore when these indicators are combined whereas these did not particularly stand out for either indicator standing alone. Other wards may stand out less in this map but there are individual COAs that still stand out and would be worth further investigation.

This is an example of where the data within the database can be manipulated to provide a useful variable which can be used by the authority, by combining two variables to target resources. We have shown that, by displaying the aggregated information at COA level, maps can quickly and effectively give an idea of where higher levels of the targeted demographic can be found.

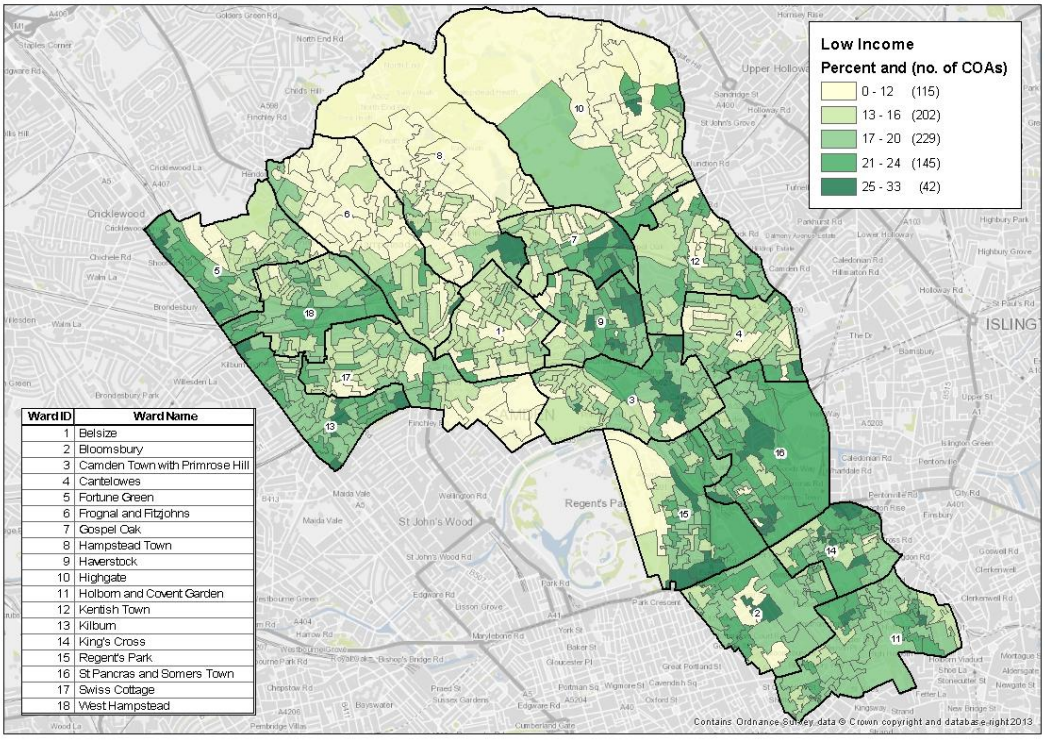
The dwelling level information can then be used to extract a list of addresses which the models have estimated as being in that targeted demographic, for example, dwellings most likely to have Excess Cold Category 1 Hazards and be occupied by Low Income Households. Figure 1 is a screenshot of the database providing this information for the first seven addresses (with building names and street numbers obscured).

A user guide for the database, including this example, is provided in Appendix C.

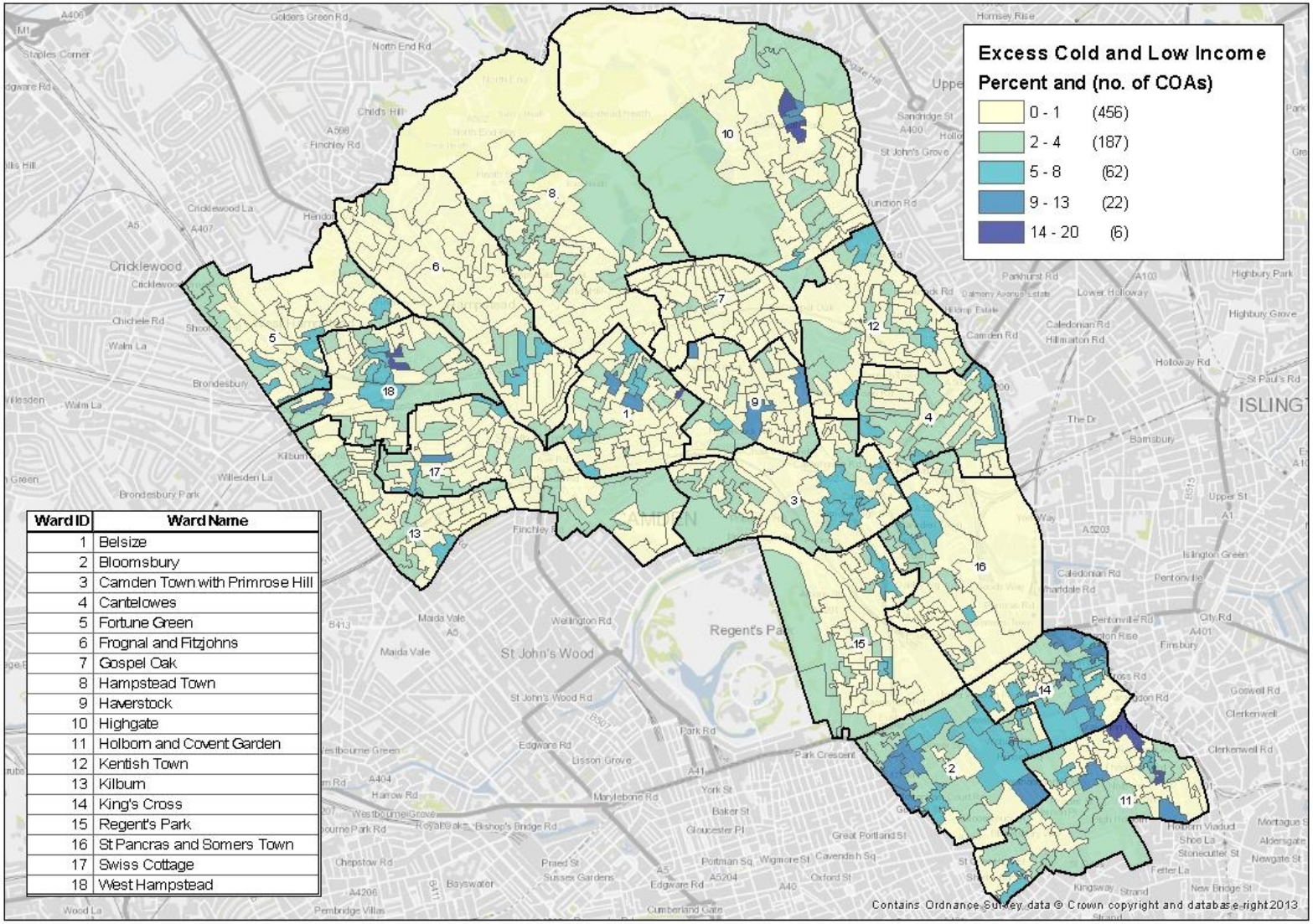
Map 14: Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold



Map 15: Percentage of private sector dwellings occupied by Low Income Households

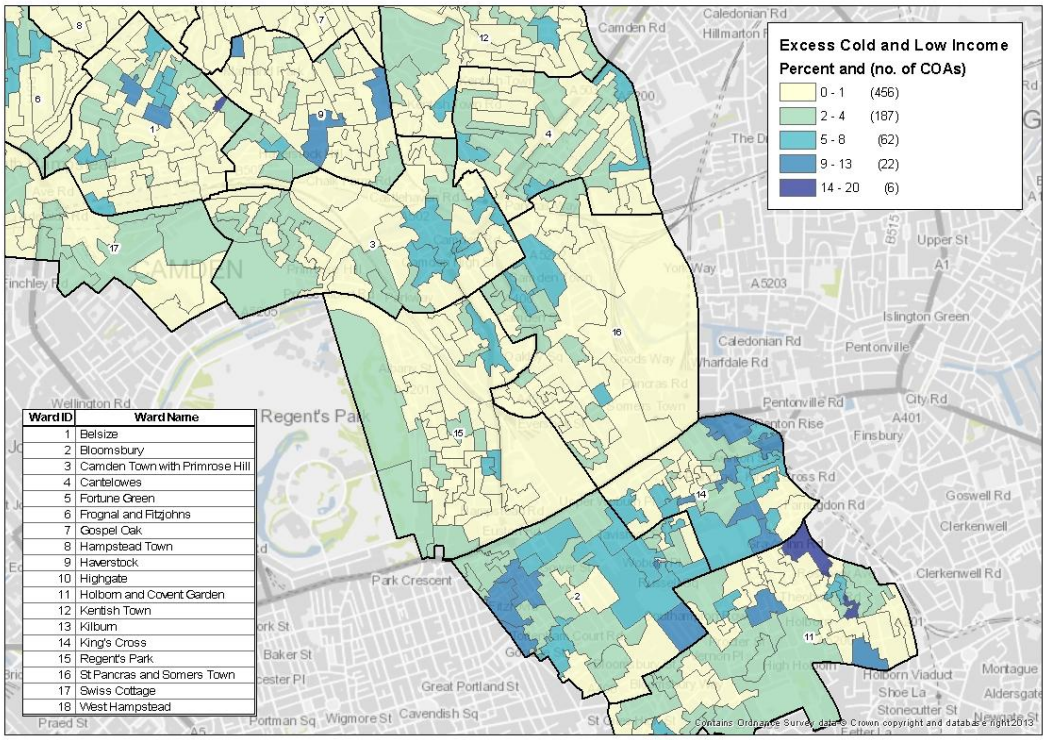


Map 16(i): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households



Ward ID	Ward Name
1	Belsize
2	Bloomsbury
3	Camden Town with Primrose Hill
4	Cantelowes
5	Fortune Green
6	Frognal and Fitzjohns
7	Gospel Oak
8	Hampstead Town
9	Haverstock
10	Highgate
11	Holborn and Covent Garden
12	Kentish Town
13	Kilburn
14	King's Cross
15	Regent's Park
16	St Pancras and Somers Town
17	Swiss Cottage
18	West Hampstead

Map 16(ii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households, Camden Town



Map 16(iii): Percentage of private sector dwellings with the presence of a HHSRS Category 1 Hazard for Excess Cold and occupied by Low Income Households, Hampstead

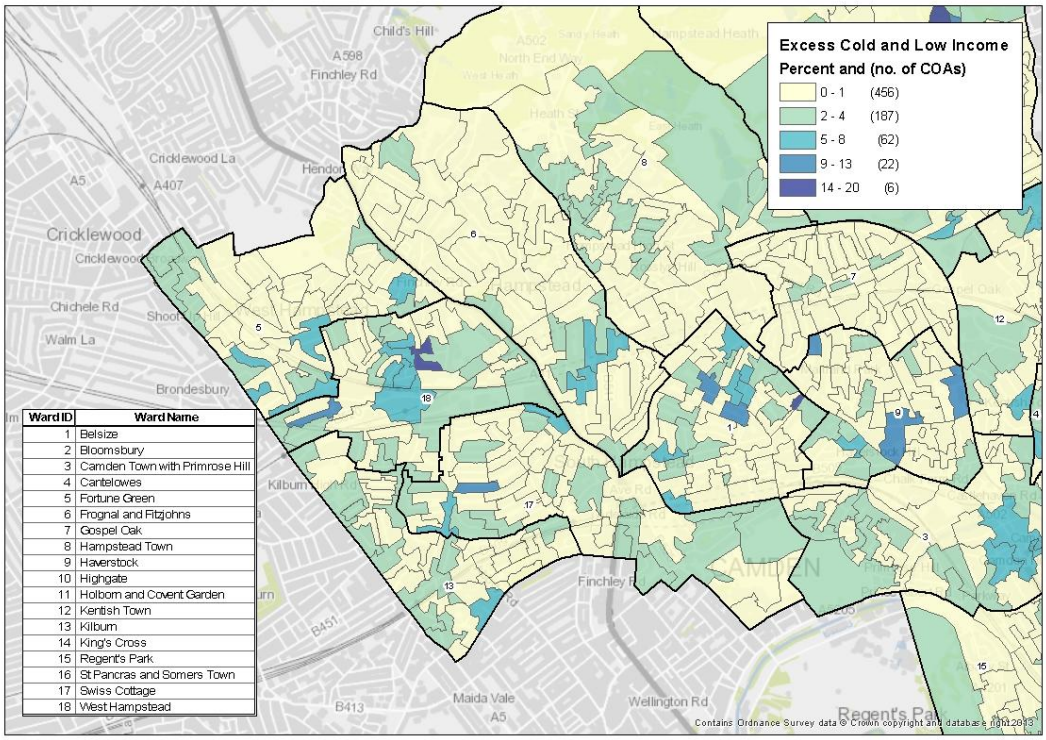
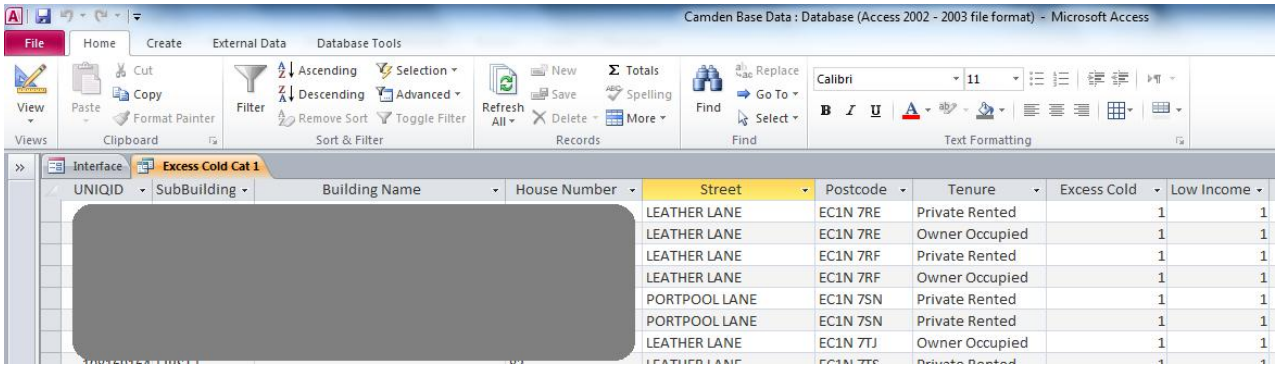


Figure 1: Extract from database of addresses estimated to be most likely to have Excess Cold Category 1 Hazards and be occupied by Low Income Households



UNIQID	SubBuilding	Building Name	House Number	Street	Postcode	Tenure	Excess Cold	Low Income
[redacted]				LEATHER LANE	EC1N 7RE	Private Rented	1	1
				LEATHER LANE	EC1N 7RE	Owner Occupied	1	1
				LEATHER LANE	EC1N 7RF	Private Rented	1	1
				LEATHER LANE	EC1N 7RF	Owner Occupied	1	1
				PORTPOOL LANE	EC1N 7SN	Private Rented	1	1
				PORTPOOL LANE	EC1N 7SN	Private Rented	1	1
				LEATHER LANE	EC1N 7TJ	Owner Occupied	1	1

Developing a private sector house condition and energy database

The title of this section is to some extent a misnomer as such a database has effectively already been supplied. It stands alone as a useful source of estimates of energy and condition characteristics of the whole stock including the private sector stock. There are, however, a range of improvements that could be made to this data and we list these below:

1 Match local authority UPRN(s) and addresses to each record provided. This is an essential prerequisite to cross referencing any data held by the local authority with data provided by the models.

2 Obtain an extract from the Council Tax address list including any information on households receiving means tested benefits such as Council Tax Benefit. This will provide more precise information on 'low income households' and can be used to both check the quality of the BRE low income household indicator and replace it where appropriate.

3 Obtain an extract from any information held on the energy efficiency of dwellings. Such information may be held by the local authority or available from a third party organisation such as Warm Front. Where supplied by Warm Front a further address matching exercise may be necessary but hundreds or maybe thousands of accurate records of energy efficiency improvement may be available which can be used to update the database and replace modelled data. Energy Performance Certificate covering around one third of the stock is also now available at a cost of 10p per record although there are limitations on how this data can be used.

4 Obtain an extract from departmental records on the status of other variables such as HHSRS or disrepair which can also be used to update the database and replace modelled data.

5 Obtain any data that can be used as inputs to the models for any future updating of the models themselves. Such variables include the age, type, size, main fuel source and tenure of the dwelling but where more detail is available this may also be worth storing in this database.

6 Consider arranging for other useful housing information such as HMO status, empty property status, overcrowding status also to be stored on this database. By setting up periodic imports of other useful strategic information all the data would be in one location for access by those charged with strategic reporting or development tasks.

7 Link the data to the authority's GIS system to allow the data to be interrogated geographically and linked to geographic data sources.

We have recently completed the first such database for a local authority and can provide a quotation for a similar service if required.

Appendix A – Dwelling level housing stock modelling methodology

The 'SimpleCO_2' Model

BRE are the original developers of the Building Research Establishment Domestic Energy Model. The model calculates from measures of building characteristics the energy costs of a dwelling assuming a standard heating and living regime. The model has a number of outputs including an estimate of the SAP rating and carbon emissions.

BRE have developed a variant of the BREDEM software ('SimpleCO_2') that can calculate outputs that are indicative of the full BREDEM outputs described above from a reduced set of input variables. The minimum set of variables the software can accept is information on:

- Dwelling type
- Dwelling age
- Number of bedrooms
- Heating fuel
- Heating system
- Tenure

BRE are using the Experian UK Consumer Dynamics Database as a source of these variables. BRE take the above variables from this database and convert them into a suitable format for the 'SimpleCO_2' software.

The above variables are insufficient on their own for the software to calculate a 'SimpleSAP' rating or carbon emissions estimate. Additional variables are required and as these values cannot be precisely inferred then a technique known as hot deck imputation is undertaken. This is a process of assigning values in accordance with their known proportions in the stock. One area where this technique is used is for predicting heating fuels as the Experian data can only tell us whether a dwelling is on the gas network or not. We do not know what fuel might be used by dwellings not on the gas network, so in most cases this information will be assigned using probabilistic methods to dwellings known to be off the gas grid. The process is actually far more complex e.g. dwellings with particular characteristics such as larger dwellings are more likely to be assigned with oil as a fuel than smaller dwellings.

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). While there is the possibility that some values assigned will be incorrect for a particular dwelling (as part of the assignment process has to be random) they ensure that examples of some of the more unusual types of dwelling that will be present in the stock are included.

While this approach is an entirely sensible and commonly adopted approach to dealing with missing data in databases intended for strategic use, it raises issues where one of the intended uses is planning implementation measures. Mindful of this all variables where hot deck imputation has been applied by BRE are identified.

It is important to note that some variables have been entirely assigned using hot 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 our estimates of SAP and Excess Cold. We discuss in a later section how we derive the other key variables.

The estimates of 'SimpleSAP' etc. cannot be guaranteed due to their being calculated from modelled data which may itself be inaccurate. 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
- in its depth of coverage for example by providing more detailed information on age of dwellings or
- in its breadth by providing additional input variables such as insulation.

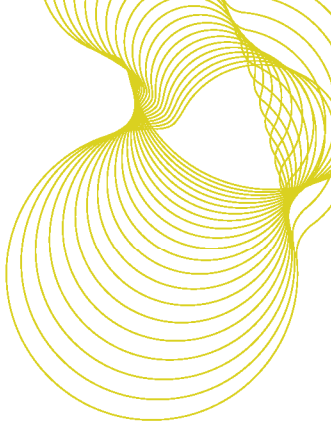
Improving any of these would enhance the accuracy of the output variables. For this reason it is always worth considering utilising additional information sources where they are available.

The approach described above can provide estimates for the variables we are offering to supply where they:

1. are produced by the 'SimpleCO$_2$' software i.e. 'SimpleSAP'
2. can be derived from the outputs i.e. Excess Cold (using the SAP <31.5 surrogate) or
3. can be derived from the imputed input variables e.g. HHSRS Category 1 Hazard from Excess Cold.

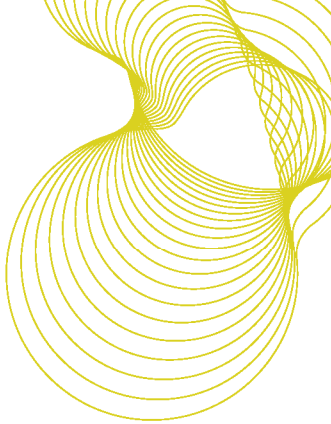
The other variables we are offering to supply estimates of, however, are not based solely (or in most cases not at all) on the thermal characteristics of the dwelling and these include:

- The presence of a Category 1 Rating System Hazard
- The presence of a Category 1 Fall Hazard
- The presence of a household in Fuel Poverty (this is the full fuel poverty measure based on 10% of earnings being spent on heating costs)
- Disrepair (using the Decent Homes standard definition of disrepair)
- The presence of a low income households (defined as a dwelling likely to be in receipt of a means tested benefit)



These present a different challenge and we have adopted a top down methodology similar in many respects to the approach used by our previous set of models. We use data from the English Housing Survey and statistical techniques such as logistic regression to determine the combination of variables that are most strongly associated with failure of a particular standard. We develop a formula to predict likelihood of failure and then apply that to the variables in the national Experian dataset to provide a likelihood of failure for each dwelling. This is then assigned a failure/compliance to standard value on an area basis. 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, Fall Hazards and Other Hazards such that failure of any one of these hazards leads to failure of the standard.



Appendix B – Definitions of the modelled indicators

HHSRS Category 1 Hazards

Homes posing a Category 1 Hazard under the Housing Health and Safety Rating System (HHSRS). HHSRS includes 29 hazards in the home categorised into Category 1 (serious) or Category 2 (other) based on a weighted evaluation tool.

Excess Cold (HHSRS Category 1 Hazard)

Households living in homes with a threat to health arising from sub-optimal indoor temperatures. The assessment is based on the most vulnerable group, who for this hazard are those aged 65 years or more (the assessment does not require a person of this age to be an occupant). The EHS does not measure the achieved temperatures in the home and therefore this hazard is based on homes with an energy rating of less than 35 based on the SAP 2001 methodology. Under the SAP 2005 methodology, the comparable threshold was recalculated to be 31.5 and the latter is used when providing statistics for the HHSRS Category 1 Hazard.

Fall Hazards (HHSRS Category 1 Hazard)

The HHSRS Falls model includes the following hazards:

- 19. Falls associated with Baths etc
- 20. Falling on the level etc
- 21. Falling on stairs etc
- 22. Falling between levels etc

Disrepair

Included in the previous Decent Homes standard a home is said fail this criteria if it is not found to be in a reasonable state of repair (assessed from the age and condition of a range of building components including walls, roofs, windows, doors, electrics and heating systems).

Households in Fuel Poverty

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 degrees for the main living area, and 18 degrees 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 counted as being in Fuel Poverty.

Full Income definition is the official headline figure. 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 Benefit (CTB).

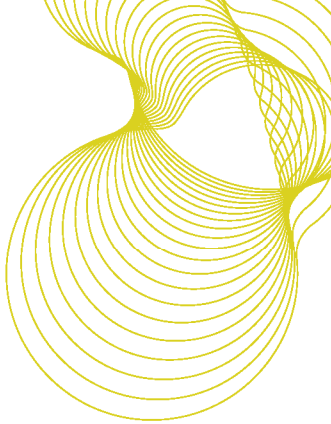
Fuel costs are modelled, rather than based on actual spending. They are calculated by combining the fuel requirements of the household with the corresponding fuel prices. The key goal in the modelling is to make sure that the household achieves the adequate level of warmth set out in the definition of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

Low Income Households

A household in receipt of at least one of the principle means-tested or disability related benefits.

The definition of a low income household is 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 or working credit. For child tax credit and working tax credit, the household is only considered a low income household if it has a relevant income of less than £15,050.

The definition also includes households in receipt of council tax benefit and income based job seekers allowance.



'SimpleSAP' Rating, an estimate of SAP[18]

SAP (Standard Assessment Procedure) 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 2005.

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 averaged over the previous three years across all regions in the UK. 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.

SAP is not affected by the individual characteristics of the household occupying the dwelling or by the geographical location.

[18] **Important note: while we can provide 'SimpleSAP' ratings from the 'SimpleCQ' 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.**

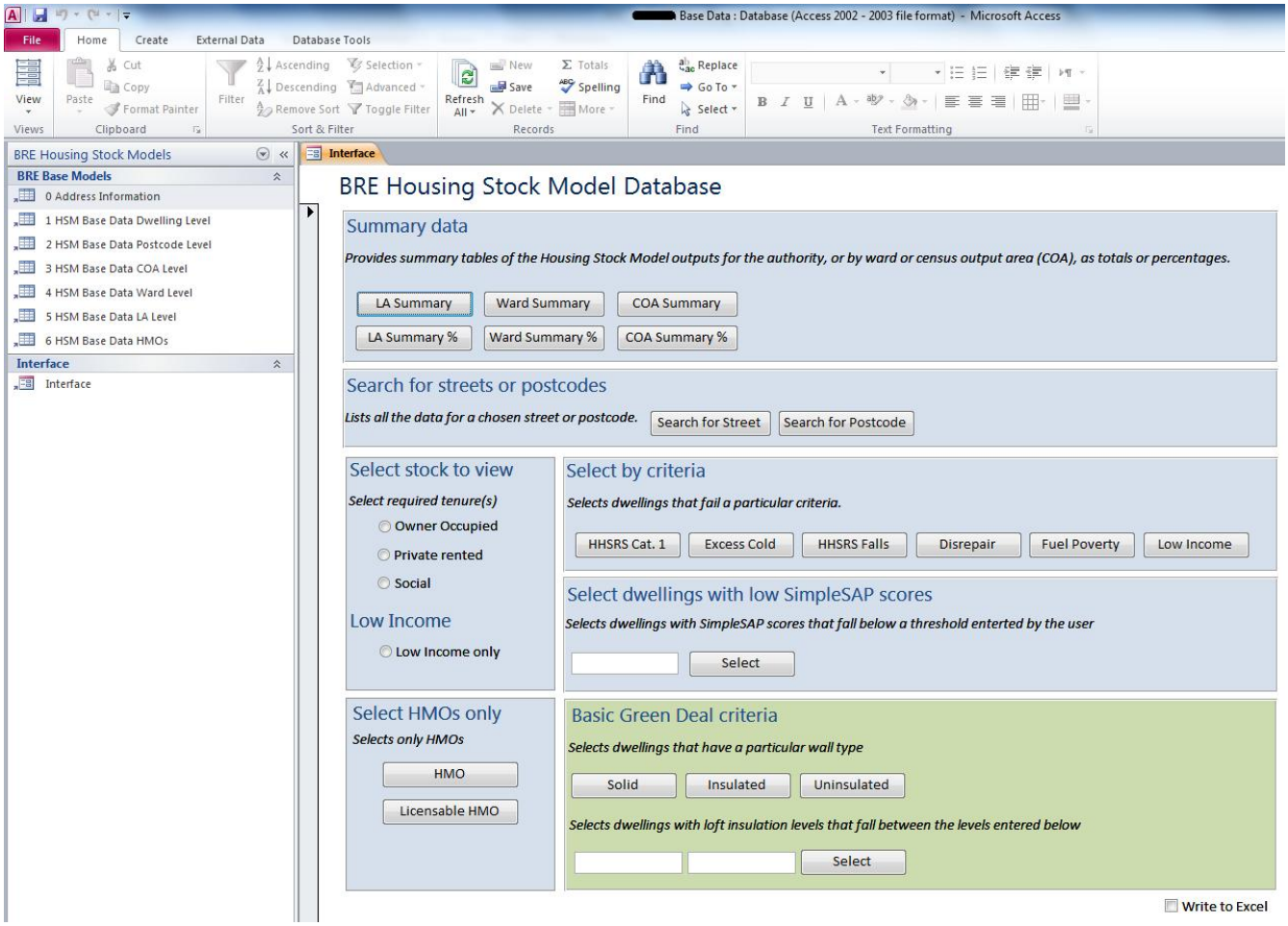
Appendix C – BRE Dwelling Level Database

The BRE Dwelling Level Database has been designed to provide the BRE Housing Stock Models in a useable format to local authority officers. The database offers the officers a number of different options for summarising or investigating their data, and generating lists of properties of interest.

Interface

The database will open on the interface screen as shown in Figure A1.

Figure A1: BRE Dwelling Level Database, Interface



On the left hand side of the database is a vertical column known as the 'navigational pane'. Under the heading 'BRE Base Models' there are six tables which hold the BRE Housing Stock Model data. These are as follows:

- 0 Address Information

  This table holds address details including building names, house numbers and postcode as provided by the Experian Consumer Dynamics database. It also indicates which census output area (COA), lower super output area (LSOA) and ward which the address is in.

- 1 HSM Base Data Dwelling Level

  This table holds the dwelling level housing stock model data and the Experian tenure variable (if purchased). SimpleSAP is provided as a score out of 100. The rest of the indicators are either 0 or 1. 0 indicates that a dwelling is predicted as passing the standard and 1 indicates that the dwelling is predicted to fail the standard.

The two tables above have a unique ID 'UNIQID' in the first column which can be used to match the address details to the Housing Stock Model data if required. The following four tables:

- 2 HSM Base Data Postcode Level
- 3 HSM Base Data COA level
- 4 HSM Base Data Ward level
- 5 HSMS Base Data LA level

All of the tables above provide summary information and statistics at the aggregated level specified. If the Experian tenure variable has been purchased there are five 'stock levels' which are provided; all stock, private stock, owner occupied, private rented and social. There are, therefore potentially five records for each COA/ward.

The final table:

- 6 HSM Base Data HMOs

As with the other address level tables this table contains the unique ID 'UNIQID' in the first column which can be used to match in the address details.

The rest of the screen is the main interface which has been equipped with a number of standard queries that will present the user with information likely to be of use when reviewing data in order to design a housing stock strategy. There are four sections to the interface: Summary data, Search for street or postcode, Select by criteria and Select dwellings with a low SimpleSAP scores.

Summary data

These options allow the user to generate summaries of their data at different levels of aggregation. The three different levels of aggregation are;

- Local Authority
- Ward
- COA

There are two types of summaries available at each level, totals and percentages.

- Totals give the user the total number of dwellings that fail a particular standard, for example, the total number of dwellings that have a HHSRS Category 1 Hazard in the authority.
- Percentages tell the user the percentage of dwellings that fail a criterion, for example, the percentage of dwellings suffering from HHSRS Category 1 Excess Cold hazards.

Search for street or postcode

These options allow the user to search for particular areas, either by street name or postcode. By clicking on a search button the user will be asked to type in either a street or postcode required. A table which then been shown provided a list all dwellings in the street or postcode given.

If the full name of the street is not known, wildcard characters can be used to search for close matches. A wildcard character is one that can stand in for any other letter or group of letters. Access uses an asterisk (*) as the wildcard character. For example entering “Abbey*” will return any street name starting with “Abbey”, for example, “Abbey Road”, “Abbey Close”, “Abbeyfield” etc. Wildcard characters can be used at both the beginning and the end of the search text. For example, by entering “*Abbey*” would find “Abbey Road”, “Old Abbey Road” etc.

The street names used are those provided in the Experian Consumer Dynamics database. It can sometimes be the case that a street name can be written differently across databases (e.g. “Rose Wood Close” or “Rosewood Close”). If a road name does not appear to be present, try using wildcard characters to check for alternatives.

The postcode search facility works in a similar manner. Entering “BN15 0AD” will find all dwellings in that exact post code, but entering “BN15*” will find all dwellings whose postcode begins with BN15.

Note: you will need to close the results of an existing search before starting a new one. Clicking the button when the results of an existing search are still open will simply take you back to the results of that search. A search, or any other table, can be closed by clicking the “x” in the top right corner of the table window.

Selecting by criteria

It is also possible to select dwellings based on their criteria.

First, the user needs to select which tenure(s) they are interested in by using the 'Select by tenure' box on the left of the 'Select by criteria' title. This contains three radio buttons used to select which tenures are active.

The default setting is that no tenures are active, so the user will need to select at least one in order to get any results. Multiple tenures can be selected, so if you are interested in all the private stock you can select both owner occupied and private rented.

Note: If the authority has not brought the tenure variable from Experian the 'Select stock to view' section will be locked to provide details of the private sector stock only.

Once one or more of the tenures has been selected you may then choose which housing standard you are interested in. Clicking any of the buttons will bring up a list of all dwellings that fail that standard, and are of the pre-selected tenure. For example, if private rented has been chosen as the tenure, and you click the "HHSRS Cat.1" button then the database will show all dwellings that are private rented and fail HHSRS (e.g. have a Category 1 Hazard). The Basic Green Deal criteria for solid, insulated or uninsulated cavity walls also work in this way.

As will the searches, you will need to close the results of an existing selection before starting a new one.

Selecting by criteria – low income only

Below the 'Select stock to view' section there is a 'Low Income' option. By selecting this radio button for low income only and then one of the housing standards will return dwellings which fail the given standard and are occupied by a low income households. For example, setting the tenure to owner occupied and clicking the 'Excess Cold' button in this section will bring up a list of all low income owner occupiers who are at risk from Excess Cold.

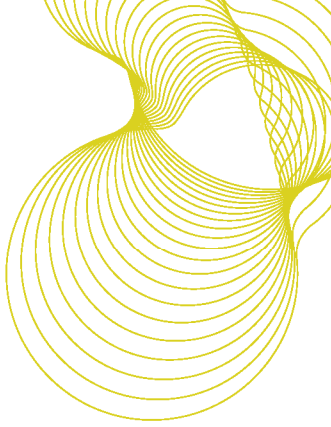
HMOs

These options allow the user to look at either all HMOs or Licensable HMOs. A full list of HMOs will be provided along with the Housing Stock Model results for these addresses.

Creating Excel Files

While it is possible to copy the data from any of the queries accessed from the interface screen, an option has been added to make this process easier. If you wish to output results to Excel simply click the 'Write to Excel' check box at the bottom of the screen. As long as this box is checked, clicking any of the summary data, search or criteria selection buttons will cause the resulting data to be written to Excel instead of being displayed.

If this option is selected; on clicking any button you will be prompted to choose a format for your output data. Once you have selected the appropriate file format, click "OK". You will then be prompted for a file name and location. Choose the directory where you want to save the file and the name you want to call it, and click "OK" to save the file.



In this manner it is possible to rapidly export summary tables for inclusion in reports or lists of dwellings which can be used to target improvement programmes.

Appendix D – HMO tables

The ward level results for HMOs with a comparison to the private sector stock have been provided in Tables D1-D5, however, when reviewing these tables it is important to be aware of the total number of properties included and whether therefore the results are meaningful.

Table D1: Modelled HMOs data, private sector

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Belsize - Private Rented Sector	2,449	405 (17%)	166 (7%)	210 (9%)	249 (10%)	299 (12%)	507 (21%)	54
Belsize - Shared/bedsit HMOs	120	19 (16%)	9 (8%)	10 (8%)	11 (9%)	5 (4%)	2 (2%)	54
Belsize - s:257 HMOs	428	55 (13%)	17 (4%)	32 (7%)	20 (5%)	38 (9%)	72 (17%)	56
Belsize - Mandatory Licensable HMOs	32	7 (22%)	0 (0%)	7 (22%)	2 (6%)	2 (6%)	1 (3%)	59
Bloomsbury - Private Rented Sector	2,395	678 (28%)	466 (19%)	173 (7%)	308 (13%)	425 (18%)	557 (23%)	47
Bloomsbury - Shared/bedsit HMOs	94	25 (27%)	17 (18%)	8 (9%)	11 (12%)	6 (6%)	3 (3%)	51
Bloomsbury - s:257 HMOs	256	72 (28%)	41 (16%)	29 (11%)	5 (2%)	36 (14%)	51 (20%)	48
Bloomsbury - Mandatory Licensable HMOs	12	6 (50%)	1 (8%)	5 (42%)	0 (0%)	1 (8%)	1 (8%)	48
Camden Town with Primrose Hill - Private Rented Sector	1,959	280 (14%)	114 (6%)	145 (7%)	155 (8%)	209 (11%)	461 (24%)	56
Camden Town with Primrose Hill - Shared/bedsit HMOs	162	19 (12%)	2 (1%)	15 (9%)	7 (4%)	3 (2%)	9 (6%)	57
Camden Town with Primrose Hill - s:257 HMOs	282	18 (6%)	10 (4%)	6 (2%)	7 (2%)	17 (6%)	50 (18%)	58
Camden Town with Primrose Hill - Mandatory Licensable HMOs	43	10 (23%)	4 (9%)	6 (14%)	4 (9%)	3 (7%)	4 (9%)	50

Table D2: Modelled HMOs data, private sector (continued)

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Cantelowes - Private Rented Sector	1,351	248 (18%)	115 (9%)	116 (9%)	149 (11%)	168 (12%)	294 (22%)	53
Cantelowes - Shared/bedsit HMOs	126	23 (18%)	8 (6%)	13 (10%)	16 (13%)	6 (5%)	11 (9%)	51
Cantelowes - s:257 HMOs	209	23 (11%)	10 (5%)	11 (5%)	12 (6%)	15 (7%)	31 (15%)	55
Cantelowes - Mandatory Licensable HMOs	47	11 (23%)	1 (2%)	10 (21%)	3 (6%)	3 (6%)	5 (11%)	55
Fortune Green - Private Rented Sector	2,052	355 (17%)	146 (7%)	173 (8%)	228 (11%)	283 (14%)	508 (25%)	52
Fortune Green - Shared/bedsit HMOs	174	42 (24%)	11 (6%)	30 (17%)	29 (17%)	9 (5%)	19 (11%)	49
Fortune Green - s:257 HMOs	323	31 (10%)	13 (4%)	12 (4%)	7 (2%)	30 (9%)	69 (21%)	55
Fortune Green - Mandatory Licensable HMOs	51	17 (33%)	2 (4%)	13 (25%)	5 (10%)	2 (4%)	6 (12%)	50
Frognal and Fitzjohns - Private Rented Sector	2,370	409 (17%)	179 (8%)	197 (8%)	250 (11%)	319 (13%)	482 (20%)	53
Frognal and Fitzjohns - Shared/bedsit HMOs	193	31 (16%)	12 (6%)	12 (6%)	35 (18%)	7 (4%)	10 (5%)	55
Frognal and Fitzjohns - s:257 HMOs	404	53 (13%)	15 (4%)	34 (8%)	10 (2%)	36 (9%)	83 (21%)	55
Frognal and Fitzjohns - Mandatory Licensable HMOs	31	9 (29%)	3 (10%)	4 (13%)	7 (23%)	4 (13%)	1 (3%)	47
Gospel Oak - Private Rented Sector	934	110 (12%)	22 (2%)	78 (8%)	83 (9%)	89 (10%)	211 (23%)	56
Gospel Oak - Shared/bedsit HMOs	106	12 (11%)	2 (2%)	9 (8%)	7 (7%)	4 (4%)	10 (9%)	54
Gospel Oak - s:257 HMOs	141	13 (9%)	4 (3%)	8 (6%)	8 (6%)	10 (7%)	26 (18%)	56
Gospel Oak - Mandatory Licensable HMOs	25	9 (36%)	0 (0%)	9 (36%)	4 (16%)	2 (8%)	4 (16%)	51

Table D3: Modelled HMOs data, private sector (continued)

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Hampstead Town - Private Rented Sector	1,679	253 (15%)	94 (6%)	140 (8%)	145 (9%)	186 (11%)	310 (18%)	55
Hampstead Town - Shared/bedsit HMOs	109	22 (20%)	5 (5%)	16 (15%)	16 (15%)	7 (6%)	9 (8%)	55
Hampstead Town - s:257 HMOs	244	18 (7%)	9 (4%)	7 (3%)	7 (3%)	14 (6%)	32 (13%)	57
Hampstead Town - Mandatory Licensable HMOs	33	7 (21%)	0 (0%)	6 (18%)	4 (12%)	4 (12%)	2 (6%)	51
Haverstock - Private Rented Sector	1,231	200 (16%)	88 (7%)	93 (8%)	125 (10%)	143 (12%)	302 (25%)	55
Haverstock - Shared/bedsit HMOs	151	26 (17%)	10 (7%)	13 (9%)	20 (13%)	8 (5%)	14 (9%)	55
Haverstock - s:257 HMOs	143	16 (11%)	3 (2%)	11 (8%)	7 (5%)	9 (6%)	25 (17%)	58
Haverstock - Mandatory Licensable HMOs	18	5 (28%)	2 (11%)	3 (17%)	3 (17%)	1 (6%)	3 (17%)	48
Highgate - Private Rented Sector	799	151 (19%)	71 (9%)	67 (8%)	93 (12%)	115 (14%)	182 (23%)	52
Highgate - Shared/bedsit HMOs	105	19 (18%)	5 (5%)	12 (11%)	11 (10%)	3 (3%)	8 (8%)	52
Highgate - s:257 HMOs	64	7 (11%)	2 (3%)	4 (6%)	1 (2%)	5 (8%)	8 (13%)	54
Highgate - Mandatory Licensable HMOs	33	6 (18%)	2 (6%)	4 (12%)	3 (9%)	3 (9%)	3 (9%)	48
Holborn and Covent Garden - Private Rented Sector	2,249	400 (18%)	258 (11%)	112 (5%)	205 (9%)	257 (11%)	520 (23%)	55
Holborn and Covent Garden - Shared/bedsit HMOs	233	46 (20%)	25 (11%)	18 (8%)	7 (3%)	17 (7%)	3 (1%)	54
Holborn and Covent Garden - s:257 HMOs	110	27 (25%)	10 (9%)	16 (15%)	1 (1%)	9 (8%)	26 (24%)	56
Holborn and Covent Garden - Mandatory Licensable HMOs	30	13 (43%)	7 (23%)	6 (20%)	1 (3%)	2 (7%)	6 (20%)	47

Table D4: Modelled HMOs data, private sector (continued)

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
Kentish Town - Private Rented Sector	1,541	268 (17%)	103 (7%)	139 (9%)	172 (11%)	192 (12%)	362 (23%)	53
Kentish Town - Shared/bedsit HMOs	209	36 (17%)	12 (6%)	24 (11%)	16 (8%)	12 (6%)	20 (10%)	51
Kentish Town - s:257 HMOs	217	31 (14%)	10 (5%)	16 (7%)	13 (6%)	17 (8%)	39 (18%)	55
Kentish Town - Mandatory Licensable HMOs	43	16 (37%)	3 (7%)	13 (30%)	3 (7%)	2 (5%)	3 (7%)	49
Kilburn - Private Rented Sector	1,896	300 (16%)	139 (7%)	131 (7%)	173 (9%)	250 (13%)	480 (25%)	55
Kilburn - Shared/bedsit HMOs	106	23 (22%)	8 (8%)	14 (13%)	9 (8%)	4 (4%)	6 (6%)	52
Kilburn - s:257 HMOs	336	44 (13%)	23 (7%)	16 (5%)	17 (5%)	34 (10%)	69 (21%)	56
Kilburn - Mandatory Licensable HMOs	15	2 (13%)	0 (0%)	2 (13%)	1 (7%)	0 (0%)	2 (13%)	56
King's Cross - Private Rented Sector	1,711	416 (24%)	274 (16%)	112 (7%)	205 (12%)	271 (16%)	420 (25%)	50
King's Cross - Shared/bedsit HMOs	100	32 (32%)	15 (15%)	16 (16%)	16 (16%)	10 (10%)	6 (6%)	50
King's Cross - s:257 HMOs	187	46 (25%)	32 (17%)	12 (6%)	3 (2%)	33 (18%)	43 (23%)	50
King's Cross - Mandatory Licensable HMOs	9	5 (56%)	1 (11%)	4 (44%)	1 (11%)	1 (11%)	1 (11%)	49
Regent's Park - Private Rented Sector	1,628	250 (15%)	117 (7%)	109 (7%)	158 (10%)	186 (11%)	399 (25%)	56
Regent's Park - Shared/bedsit HMOs	144	23 (16%)	9 (6%)	13 (9%)	7 (5%)	7 (5%)	2 (1%)	56
Regent's Park - s:257 HMOs	151	24 (16%)	15 (10%)	6 (4%)	7 (5%)	18 (12%)	37 (25%)	53
Regent's Park - Mandatory Licensable HMOs	19	2 (11%)	0 (0%)	2 (11%)	2 (11%)	0 (0%)	1 (5%)	57

Table D5: Modelled HMOs data, private sector (continued)

Ward	Dwellings	HHSRS Category 1 Hazards			Disrepair	Fuel Poverty	Low Income Households	SimpleSAP Score
		All Hazards	Excess Cold	Fall Hazards				
St Pancras and Somers Town - Private Rented Sector	1,236	153 (12%)	81 (7%)	61 (5%)	100 (8%)	117 (9%)	321 (26%)	59
St Pancras and Somers Town - Shared/bedsit HMOs	161	23 (14%)	13 (8%)	10 (6%)	12 (7%)	7 (4%)	10 (6%)	56
St Pancras and Somers Town - s:257 HMOs	52	6 (12%)	2 (4%)	3 (6%)	2 (4%)	2 (4%)	8 (15%)	56
St Pancras and Somers Town - Mandatory Licensable HMOs	15	1 (7%)	0 (0%)	1 (7%)	2 (13%)	0 (0%)	1 (7%)	65
Swiss Cottage - Private Rented Sector	2,991	482 (16%)	191 (6%)	247 (8%)	304 (10%)	356 (12%)	654 (22%)	54
Swiss Cottage - Shared/bedsit HMOs	148	27 (18%)	12 (8%)	11 (7%)	12 (8%)	7 (5%)	6 (4%)	53
Swiss Cottage - s:257 HMOs	552	69 (13%)	16 (3%)	46 (8%)	34 (6%)	56 (10%)	109 (20%)	55
Swiss Cottage - Mandatory Licensable HMOs	21	4 (19%)	0 (0%)	4 (19%)	1 (5%)	1 (5%)	0 (0%)	52
West Hampstead - Private Rented Sector	2,451	442 (18%)	178 (7%)	225 (9%)	288 (12%)	341 (14%)	568 (23%)	52
West Hampstead - Shared/bedsit HMOs	128	12 (9%)	4 (3%)	7 (5%)	27 (21%)	3 (2%)	6 (5%)	52
West Hampstead - s:257 HMOs	479	67 (14%)	22 (5%)	39 (8%)	20 (4%)	50 (10%)	89 (19%)	54
West Hampstead - Mandatory Licensable HMOs	28	9 (32%)	2 (7%)	7 (25%)	3 (11%)	2 (7%)	2 (7%)	49