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Oxford City Council

Private Rented Sector: Housing Stock Condition and Stressors Report

July 2020

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## Executive Summary

Metastreet were commissioned by the Oxford City Council to review housing stock in the borough and assess housing stressors related to key tenures, particularly the private rented sector.

The detailed housing stock information provided in this report will facilitate the development and delivery of Oxford City Council's housing strategy and enable a targeted approach to tackling poor housing.

The main aim of this review was to investigate and provide accurate estimates of:

- Current levels of private rental sector (PRS) properties and tenure change over time.
- Levels of serious hazards that might amount to a Category 1 hazard (HHSRS).
- Other housing related stressors, including antisocial behaviour (ASB), service demand, population and deprivation linked to the PRS.
- Assist the council to make policy decisions, including the possible introduction of property licensing schemes under Part 3 of the Housing Act 2004.

Metastreet has developed a stock-modelling approach based on metadata and machine learning to provide insights about the prevalence and distribution of a range of housing factors. This approach has been used by several councils to understand their housing stock and relationships with key social, environmental and economic stressors.

The housing models are developed using unique property reference numbers (UPRN), which provide detailed analysis at the property level.

Data records used to form the foundation of this report include:

Council tax	Electoral register	Other council interventions records	Tenancy deposit data
Housing benefit	Private housing complaints and interventions records	ASB complaints and interventions records	Energy Performance data

## **Key Findings**

- Oxford's private rented sector (PRS) has grown rapidly over the last two decades, from 20.8% (2001) to 49.3% (2020)
- Oxford is likely to have one of the largest PRS populations, measured by the proportion of housing stock, of any housing authority in England
- Affordability is one of the key challenges for private renters in Oxford. Median rents in Oxford range between 51.5% and 82.7% higher than the English average depending on bedroom categories
- Oxford's median house price in 2019 was £ 501,284, this is 78.4% higher than the national average
- 6,242 private rented properties in Oxford are likely to have a serious home hazard (Category 1, HHSRS)
- 2.5% of PRS properties have an F and G rating. Extrapolated to the entire PRS, 763 properties are likely to fail the MEES statutory requirement.
- Oxford also has a higher proportion of households in fuel poverty (11.8%) than the national average (10.4%)
- Oxford City Council received 3,360 complaints from private renters related to 2,990 rented properties over a 5-year period
- Oxford City Council has recorded 2,723 serious housing hazards (Category 1 and 2, HHSRS) during property inspections
- Oxford City Council has served 2,451 housing and public health notices over a 5-year period
- 7 out of 24 wards have aggregated IMD rankings below the national average and 2 wards (Blackbird Leys & Carfax) are in the bottom quartile nationally
- Between 2015-2019 a total of 4,058 ASB investigations were carried out by Oxford Council linked to PRS properties
- St. Clement's (445) and St. Mary's (425) has by the far the highest number of ASB investigations

## **Table of Contents**

Table of figures .....	6
Table of tables.....	8
Table of maps.....	9
Introduction & Project Objectives .....	10
1 Oxford City Council Overview .....	11
1.1 Population.....	11
1.2 Migration.....	13
1.3 Deprivation .....	14
1.4 Fuel Poverty .....	16
1.5 Child Poverty.....	18
1.6 Homelessness.....	18
1.7 Housing affordability.....	19
2 Results of housing stock and stressor modelling.....	22
2.1 Methodology.....	22
2.2 Results - Private Rented Sector.....	23
2.2.1 Population and distribution .....	23
2.2.2 Housing conditions.....	29
2.2.3 PRS enforcement interventions .....	36
2.2.4 Anti-social behaviour (ASB).....	39
2.2.5 PRS and financial vulnerability.....	42
3 Conclusions .....	44
Appendix 1 – Ward summaries.....	46

Appendix 2 - Tenure Intelligence (Ti) – stock modelling methodology .....49

## Table of figures

Figure 1. Population by age and sex (Source: ONS 2018).	11
Figure 2. Estimated population growth 2001-2020 (Source: ONS 2013).	12
Figure 3. Population projections 2020-2043 (Source: ONS 2018).	12
Figure 4. Oxford internal net migration by age group (Source: ONS 2019).	13
Figure 5. Percentage of live births born to non-UK-born mothers (Source: ONS 2017).	14
Figure 6. Average IMD (2019) decile by ward (Source: IMD 2019).	15
Figure 7. Proportion of households in fuel poverty (%) by core city (BEIS 2017).	17
Figure 8. Fuel poverty (%) by comparable towns and cities (BEIS 2017).	17
Figure 9. Proportion of children in poverty by ward (Source: End Child Poverty 2017)	18
Figure 10. Homelessness acceptances per 1,000 households (Source: MHCLG 2019)	19
Figure 11. Median monthly private rents (Source: VOA 2019).	20
Figure 12. Mean price paid (2019) for a residential property (Source: Land Registry 2019).	20
Figure 13. Housing Affordability Ratio 2016 (Source: ONS 2016).	21
Figure 14. Tenure profile 2001 & 2020 (Source: ONS & Ti 2020).	23
Figure 15. PRS as a percentage of total housing stock (Source: ONS & Ti 2020).	24
Figure 16. Number of PRS dwellings by ward (Source: Ti 2020).	25
Figure 17. Percentage of PRS dwellings by each ward (Source Ti 2020).	27
Figure 18. Housing Stock Age Profile and Council Tax band (Source: VOA 2019).	29
Figure 19. Property type as a percent of total (Source: EPC data 2020).	30
Figure 20. Predicted number of Category 1 hazards by ward (Source: Ti 2020).	31
Figure 21. Percentage of PRS properties predicted to have at least one Category 1 hazards by ward (Source: Ti 2020)	33
Figure 22. PRS complaints made by private tenants to the Council (Source Ti 2020).	34

Figure 23. Distribution of Energy Performance Certificate ratings in PRS (Source: Ti 2020). ..... 35

Figure 24. Housing and public health notices served on PRS properties by ward (Source: Ti 2020). .. 36

Figure 25. Housing hazards (Category 1 & 2) identified by Oxford CC (Source: Ti 2020). ..... 38

Figure 26. Total ASB investigations linked to PRS properties by ward (Source Ti 2020). ..... 39

Figure 27. ASB investigations linked to PRS per 1000 properties by ward (Source: Ti 2020). ..... 40

Figure 28. Types of ASB linked to PRS properties (Source: Ti 2020). ..... 42

Figure 29. PRS housing benefit payments (households) by ward (Source: Ti 2020). ..... 43

Figure 30. Summary of Metastreet Tenure Intelligence methodology. .... 49

**Table of tables**

Table 1. Percentage and number of PRS properties by ward (Source Ti 2020)..... 28

Table 2. Ward summary overview (Source Ti 2020)..... 46

Table 3. Owner occupier predictive factors..... 51

Table 4. PRS predictive factors..... 52

Table 5. Category 1 (HHSRS) hazard predictive factors. .... 52



## Table of maps

Map 1. Distribution of Average IMD (2019) decile by ward (Source: IMD 2019, map by MS).....	16
Map 2. Number of PRS properties (Source: Ti 2020, map by MS).....	26
Map 3. PRS properties as percentage of housing stock (Source: Ti 2020, map by MS). ....	28
Map 4. Distribution of PRS properties with category 1 hazards (Source: Ti 2020, map by MS). ....	32
Map 5 PRS complaints made by private tenants to the Council (Source: Ti 2020, map by MS). ....	34
Map 6 Housing and public health notices served on PRS properties by ward (Source: Ti 2020, map by MS).....	37
Map 7. ASB investigations linked to PRS properties by ward (Source: Ti 2020, map by MS).....	41

## Introduction & Project Objectives

Metastreet were commissioned by the Oxford City Council to review its housing stock with a focus on the following key areas:

- Residential property tenure changes since 2001
- Housing profile
- Distribution of the PRS
- Condition of housing stock in the PRS
- Housing related stressors, including Anti-Social Behaviour (ASB), service demand and interventions, population change and deprivation

The report provides the council with the evidence base for developing housing policy and service interventions. The report also satisfies the council's responsibility to review its housing stock as set out under Part 1, Section 3 of the Housing Act 2004.

The first section of the report details the findings of the stock and tenure modelling, including an introduction to the methodology. A combination of Oxford City Council's data warehouse, machine learning and modelling techniques have been used to pinpoint tenure and predict property conditions within its PRS housing stock. An advanced property level data warehouse has been used to facilitate the analysis.

For the purposes of this review, it was decided that a ward-level summary is the most appropriate basis to assess housing conditions across Oxford, derived from property level data.

Three separate predictive tenure models (Ti) have been developed as part of this project which are unique to Oxford, they include:

- Private rented sector (PRS)
- Owner occupiers
- Serious PRS housing hazards (Category 1, HHSRS)

The appendices to the report contain a summary of the data and a more detailed report methodology. This report version excludes HMO analysis.

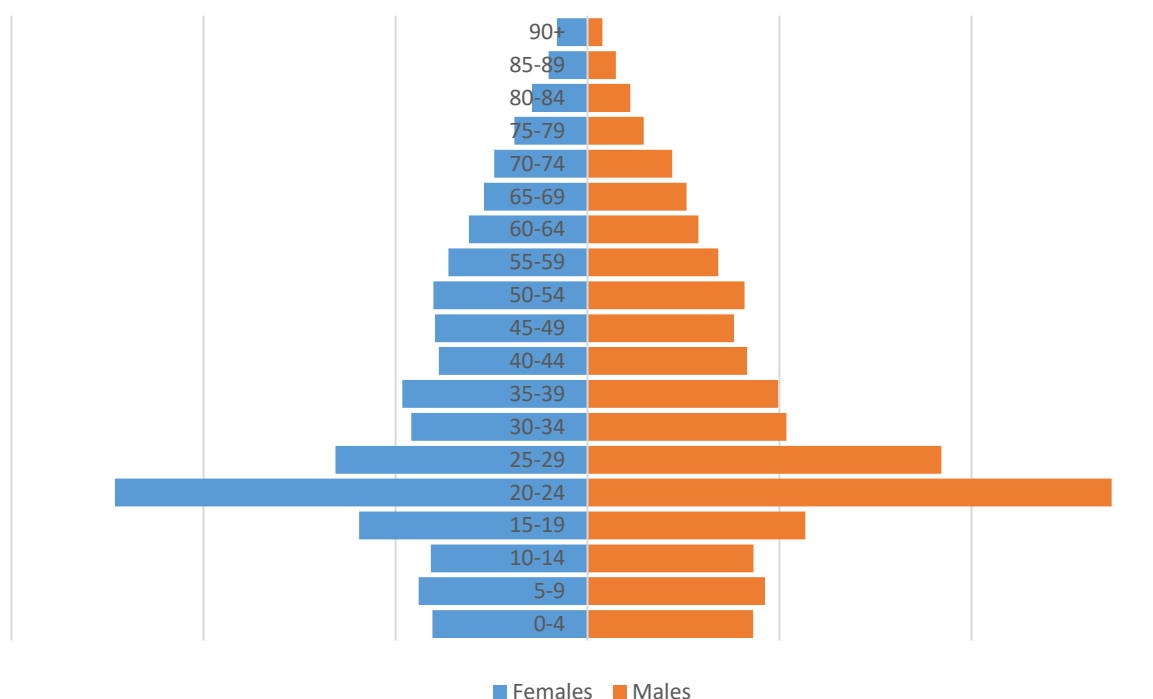
## 1 Oxford City Council Overview

Oxford is a city in Oxfordshire, England. The city is home to the University of Oxford, the oldest university in the English-speaking world, and has buildings in every style of English architecture from late Anglo-Saxon. Oxford is 24 miles north-west of Reading, 26 miles north-east of Swindon, 36 miles east of Cheltenham and 43 miles east of Gloucester and 51 miles west-north-west of London. The rivers Cherwell and Thames run through Oxford and meet south of the city centre. The city covers an area of 17.60 square miles.<sup>1</sup>

### 1.1 Population

The Office of National Statistics (ONS) population estimate for Oxford as at 2018 was 154,600<sup>2</sup>.

Oxford has a significant population peak in the 20-24 year group, driven in part by student populations. Oxford had 33,640 students enrol for full-time studies across two universities in 2018, this represents the largest proportion of adults in full-time studies of any city in England and Wales<sup>3</sup>. This group is apparent in the city's population pyramid (Figure 1)



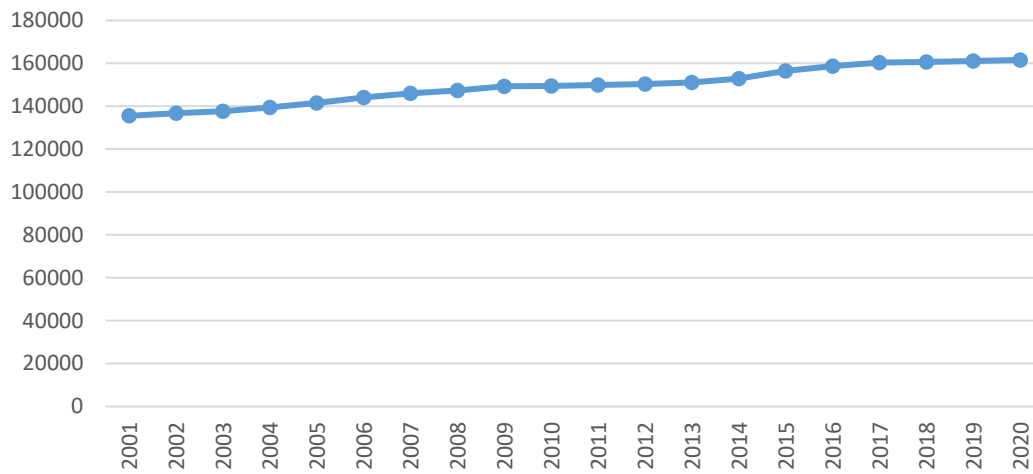
**Figure 1. Population by age and sex (Source: ONS 2018).**

<sup>1</sup> Oxford Wikipedia <https://en.wikipedia.org/wiki/Oxford>

<sup>2</sup> Population estimates 2018 ONS [https://www.oxford.gov.uk/downloads/file/1086/oxford\\_population\\_estimate\\_2001-2006](https://www.oxford.gov.uk/downloads/file/1086/oxford_population_estimate_2001-2006)

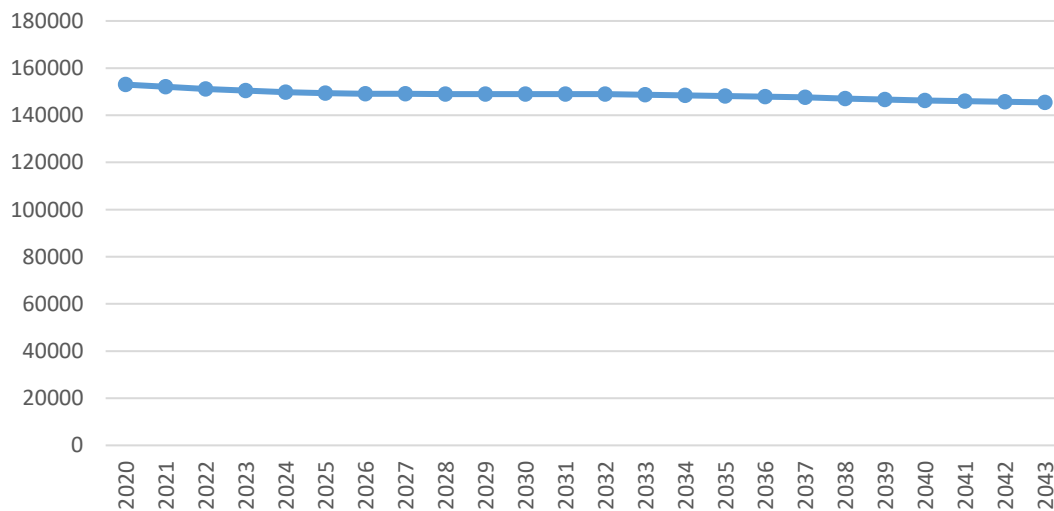
<sup>3</sup> Oxford facts [https://www.oxford.gov.uk/info/20131/population/459/oxfords\\_population](https://www.oxford.gov.uk/info/20131/population/459/oxfords_population)

Oxford's population has grown steadily since the 2001 (Figure 2) <sup>4</sup>.



**Figure 2. Estimated population growth 2001-2020 (Source: ONS 2013).**

Oxford population is predicted to decrease slightly over the next two decades (Figure 3)<sup>5</sup>.



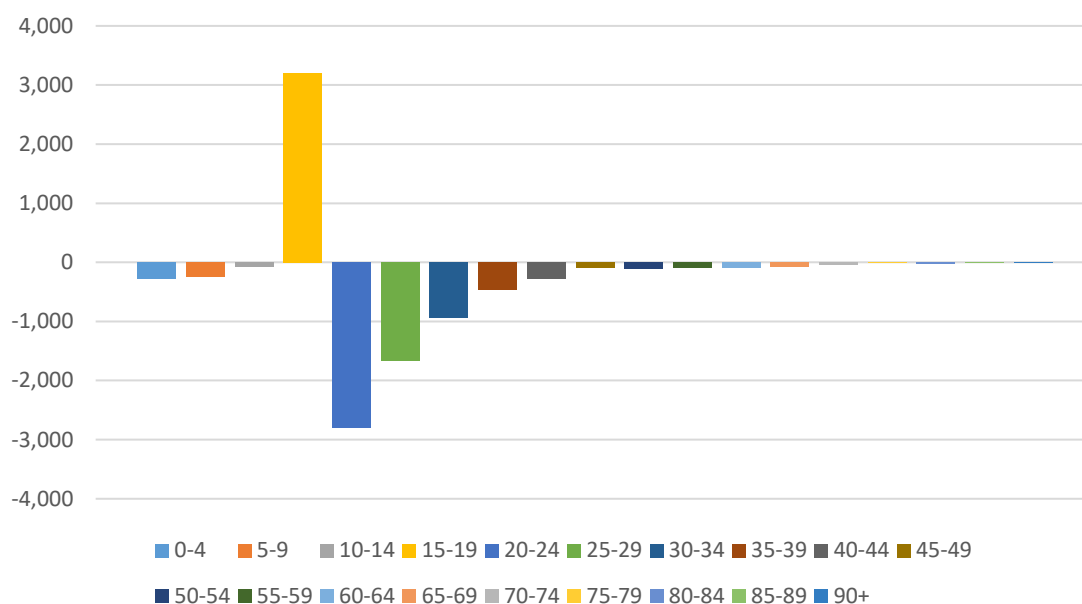
**Figure 3. Population projections 2020-2043 (Source: ONS 2018).**

<sup>4</sup> Population estimates 2018 ONS [https://www.oxford.gov.uk/info/20131/population/459/oxfords\\_population](https://www.oxford.gov.uk/info/20131/population/459/oxfords_population)

<sup>5</sup> Population estimates 2018 ONS [https://www.oxford.gov.uk/downloads/file/1086/oxford\\_population\\_estimate\\_2001-2006](https://www.oxford.gov.uk/downloads/file/1086/oxford_population_estimate_2001-2006)

## 1.2 Migration

Oxford has a significant internal net migration from other local authorities in England and Wales in the 15-19 age group. Oxford's population is therefore younger than that of England and Wales as a whole, with 51.3% of its population under the age of 30.<sup>6</sup>



**Figure 4. Oxford internal net migration by age group (Source: ONS 2019).**

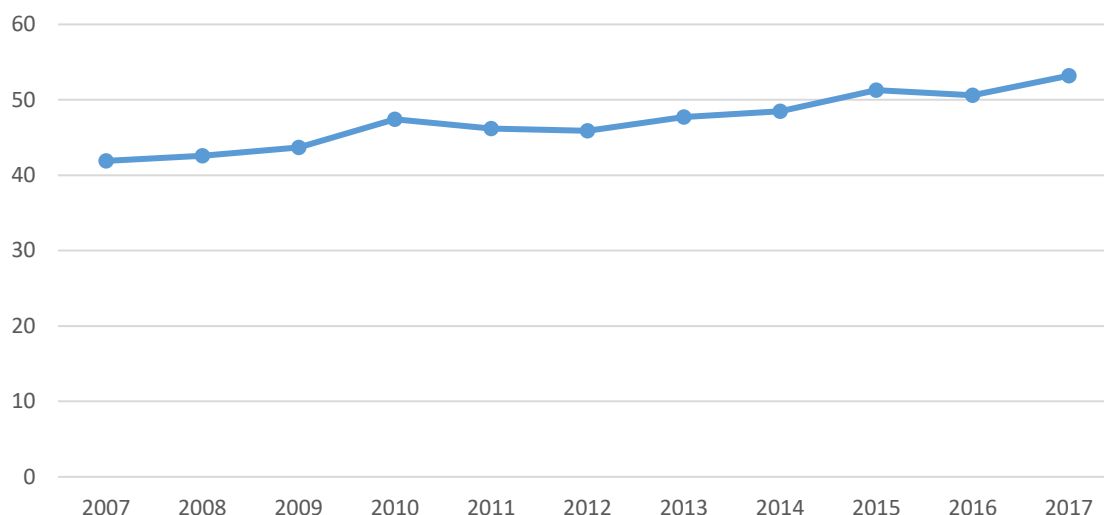
Oxford is also a destination for international migrants. The 2011 Census showed that 28% of Oxford's population was born outside the UK, compared to 19% in the 2001 Census. The most common countries of birth were Poland, the USA, China (including Hong Kong), Germany, India and Pakistan.<sup>7</sup>

In 2017, the English region with the highest percentage of live births to women born outside the UK was London (57.9%). In Oxford, 53.2% of women with live births were born outside the UK, this has increased from 41.9% in 2007.<sup>8</sup>

<sup>6</sup> ONS Internal Migration (2018)  
<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/migrationwiththeuk/datasets/internalmigrationmoversbylocalauthoritiesandregionsinenglandandwalesby5yearagegroupandsex>

<sup>7</sup> Internal migration  
[https://www.oxford.gov.uk/info/20131/population/464/international\\_migration#:~:text=Oxford%20has%20long%20been%20a,it%20for%20work%20or%20study.&text=Most%20people%20come%20to%20Oxford,the%20age%20of%2016%20years.](https://www.oxford.gov.uk/info/20131/population/464/international_migration#:~:text=Oxford%20has%20long%20been%20a,it%20for%20work%20or%20study.&text=Most%20people%20come%20to%20Oxford,the%20age%20of%2016%20years.)

<sup>8</sup> ONS Births by parent birth (2017)  
<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/parentscountryofbirthenglandandwales/2017>



**Figure 5. Percentage of live births born to non-UK-born mothers - 2007 to 2017 (Source: ONS 2017).**

### 1.3 Deprivation

The Indices of Multiple Deprivation 2019 (IMD2019) provide a set of relative measures of deprivation for LSOAs (Lower-layer Super Output Areas) across England, based on seven domains of deprivation.<sup>9</sup>

Oxford has an average score ranking of 182 making it the 136th least deprived of the 317 local authorities in England. This compares to an average score ranking of 166 in 2015 when it was the 161st least deprived of the 326 local authorities included. Oxford has therefore become relatively less deprived. Oxford remains the most deprived of the five Oxfordshire districts.<sup>10</sup>

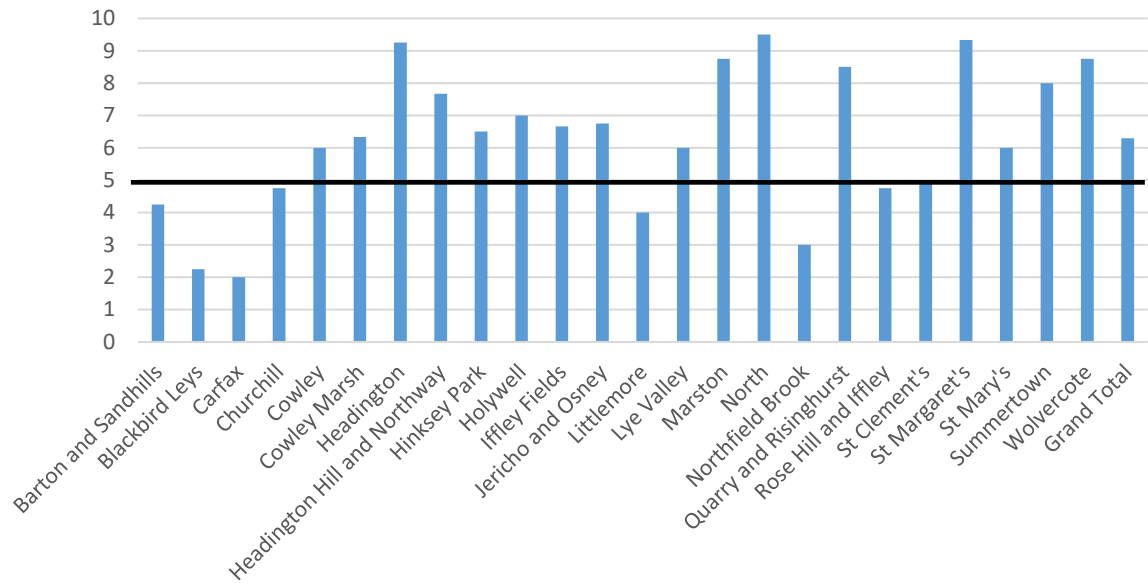
To analyse data at the ward level, LSOA have been matched to new wards using an Open Geoportal Portal lookup table<sup>11</sup>. Average IMD2019 decile aggregated reveals a ward level deprivation picture (Figure 6). 1.0 on the graph represents the most deprived 10% areas and 5.0 represents 50% most deprived.

Oxford has a minority of high deprivation wards. 7 out of 24 wards have aggregated IMD rankings below the national average. 2 wards (Blackbird Leys & Carfax) are in the bottom quartile nationally.

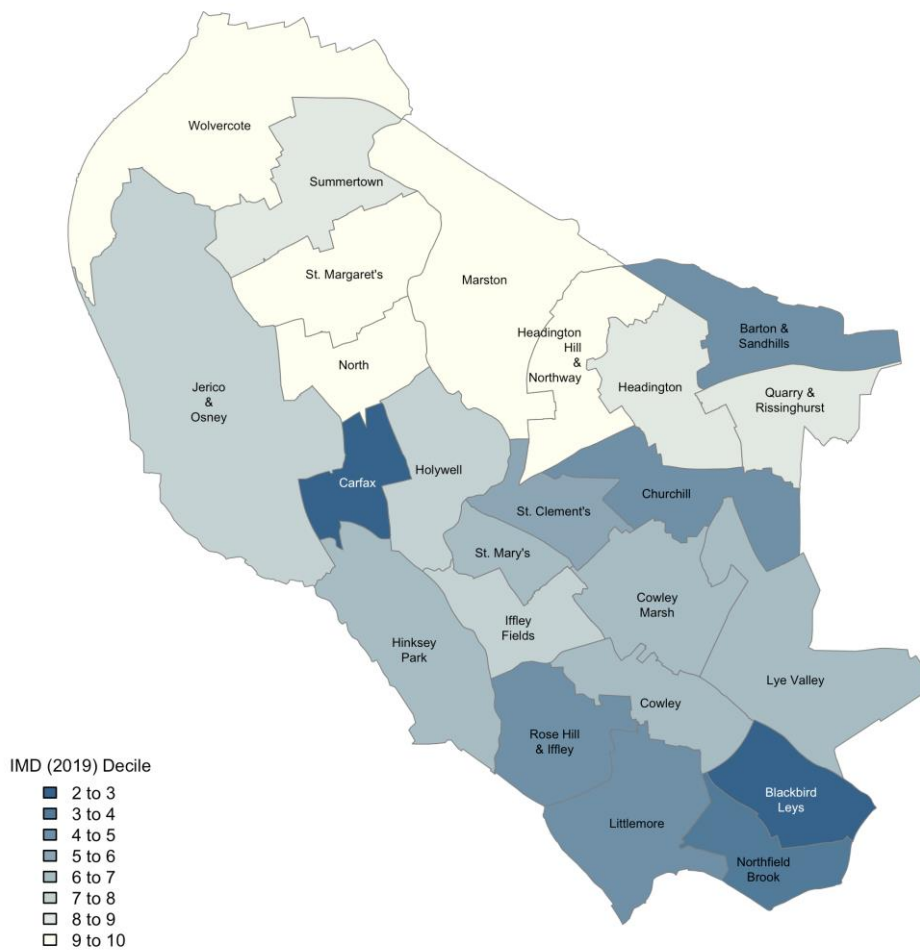
<sup>9</sup> ONS2019 <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>,

<sup>10</sup> IMD 2019 Oxford City results [https://www.oxford.gov.uk/downloads/file/6758/indices\\_of\\_deprivation\\_2019\\_oxford\\_report](https://www.oxford.gov.uk/downloads/file/6758/indices_of_deprivation_2019_oxford_report)

<sup>11</sup> ONS2019 [http://geoportal.statistics.gov.uk/datasets/8c05b84af48f4d25a2be35f1d984b883\\_0/data](http://geoportal.statistics.gov.uk/datasets/8c05b84af48f4d25a2be35f1d984b883_0/data)



**Figure 6. Average IMD (2019) decile by ward (Source: IMD 2019).** Horizontal line shows the national median average (5.0)



**Map 1. Distribution of Average IMD (2019) decile by ward (Source: IMD 2019, map by MS).**

#### 1.4 Fuel Poverty

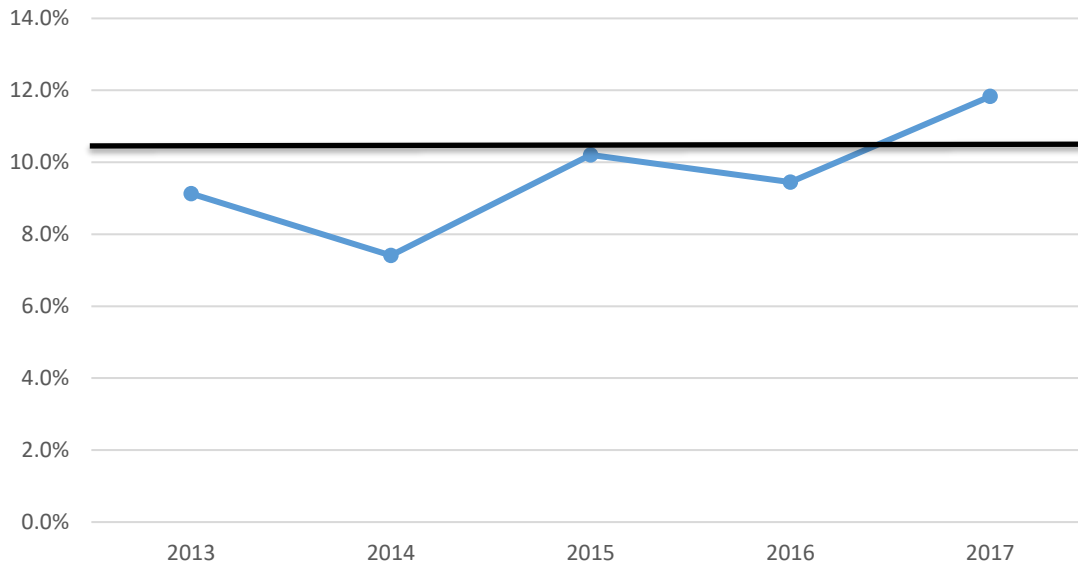
Fuel poverty is defined by the Warm Homes and Energy Conservation Act. A household is considered to be fuel poor if they have required fuel costs that are above average (the national median level); and, were they to spend that amount, they would be left with a residual income below the official poverty line.<sup>12</sup>

Oxford has a higher proportion of households in fuel poverty (11.8%) than the national average (10.4%).<sup>13</sup>

<sup>12</sup> Department for Business, Energy & Industrial Strategy 2016 <https://Oxford.gov.uk/council/key-statistics-and-data/data/deprivation/>

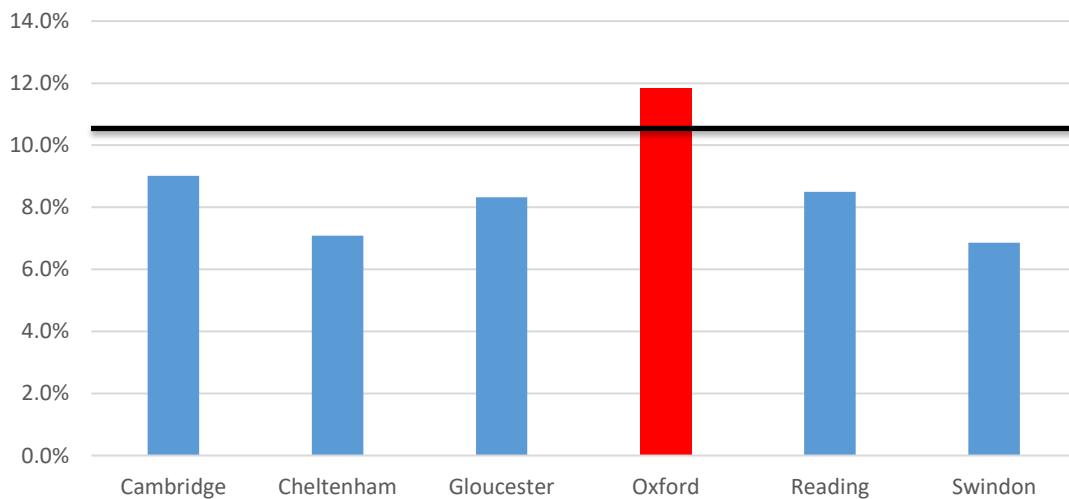
<sup>13</sup> ONS fuel poverty estimates <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/researchoutputsmallareastimationoffuelpovertyinengland2013to2017/2019-07-08>





**Figure 7. Proportion of households in fuel poverty (%) by core city (BEIS 2017). Horizontal line shows England average (10.4% 2017).**

Oxford has a higher proportion of households in fuel poverty (11.8%) compared to comparable towns and cities and the national average (10.4%)<sup>14</sup>.



**Figure 8. Fuel poverty (%) by comparable towns and cities (BEIS 2017). Horizontal line shows England average (10.4% 2017).**

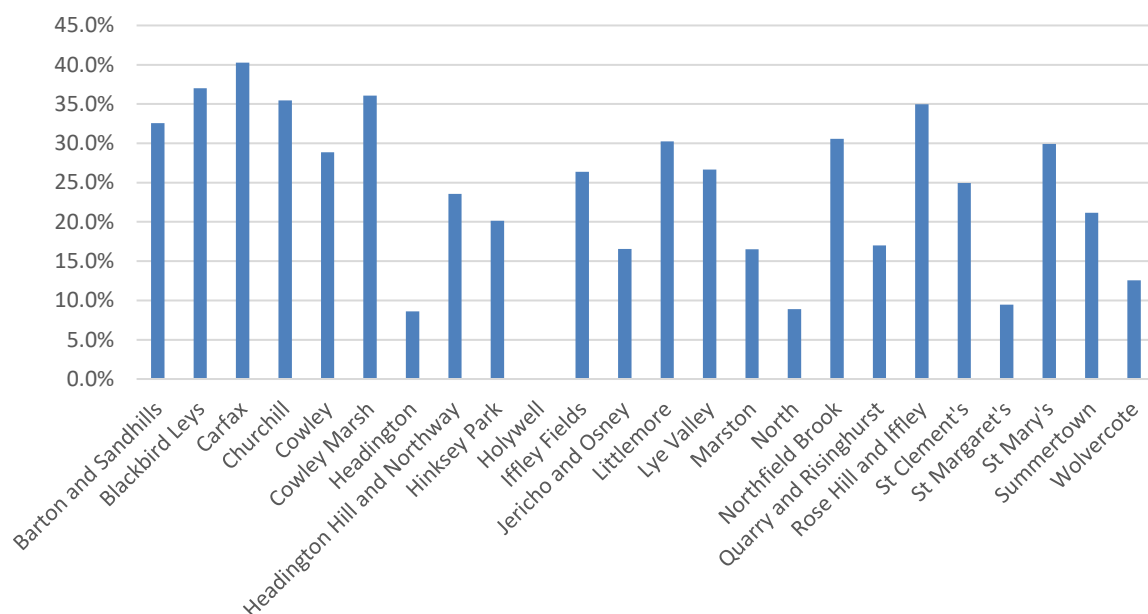
<sup>14</sup> ONS fuel poverty estimates

<https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/researchoutputsmallareaestimationoffuelpovertyinengland2013to2017/2019-07-08>

## 1.5 Child Poverty

PRS rents have been identified as a key driver of poverty. With greater numbers of children living in the PRS, understanding child poverty levels help us to understand the wider impacts of the PRS<sup>15</sup>.

The graph (Figure 9) gives estimates of children in low-income families. It shows the proportion of children living in families in receipt of out-of-work (means-tested) benefits or in receipt of tax credits after housing costs have been accounted for. Oxford has an estimated child poverty rate of 23.7%.<sup>16</sup>



**Figure 9. Proportion of children in poverty by ward (Source: End Child Poverty 2017)**

## 1.6 Homelessness

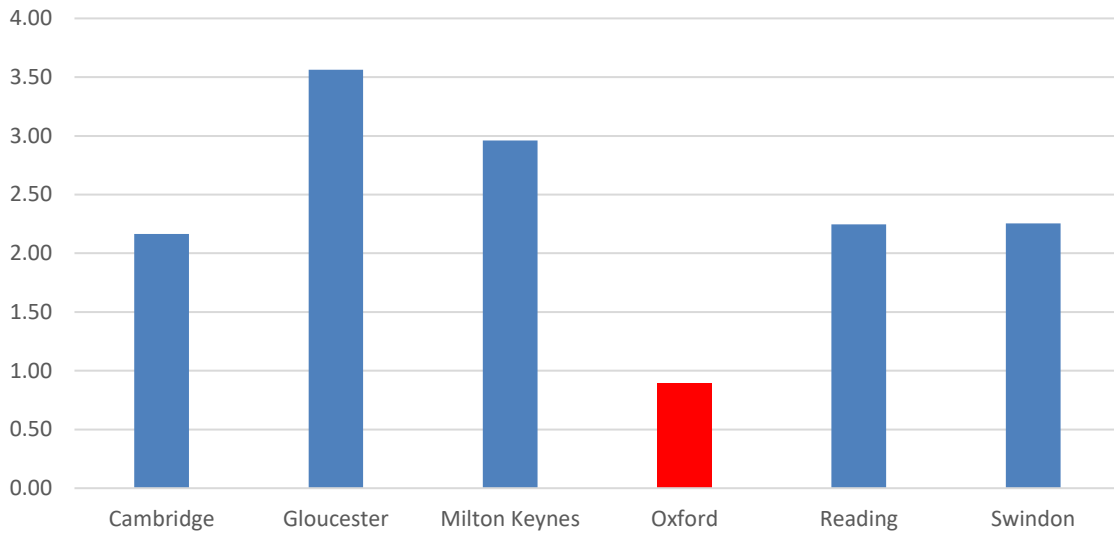
Statutory homelessness acceptance includes those who the local authority has determined are legally entitled to assistance. To be accepted as statutorily homeless by the local authority you must be found legally and unintentionally homeless, be eligible for assistance and in priority need.

Homelessness returns to government in the 2019 (October to December) year shows Oxford has relatively low homelessness acceptance rates over the period when compared to comparable towns and cities (Figure 10)<sup>17</sup>.

<sup>15</sup> JRT, Housing costs and poverty: private rents compared to local earnings 2018

<sup>16</sup> Children in poverty <https://Oxford.gov.uk/council/key-statistics-and-data/data/deprivation/>

<sup>17</sup> MHCLG 2019 <https://www.gov.uk/government/statistical-data-sets/live-tables-on-homelessness>



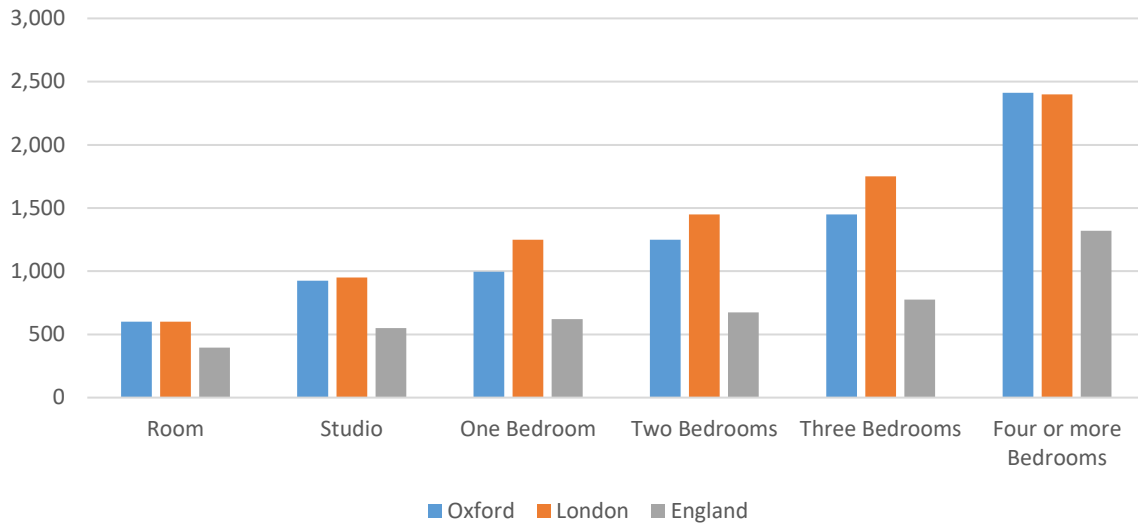
**Figure 10. Homelessness acceptances per 1,000 households by comparable towns and cities (Source: MHCLG 2019)**

### 1.7 Housing affordability

Median monthly private rents recorded between 1 October 2018 to 30 September 2019 for all bedroom categories are significantly above the England average (Figure 11). Median rents in Oxford range between 51.5% and 82.7% higher than the English average depending on bedroom categories. The median monthly rents for rooms and studio flats are equal to the London average. Rents for four or more bedroom are higher than the London average.<sup>18</sup>

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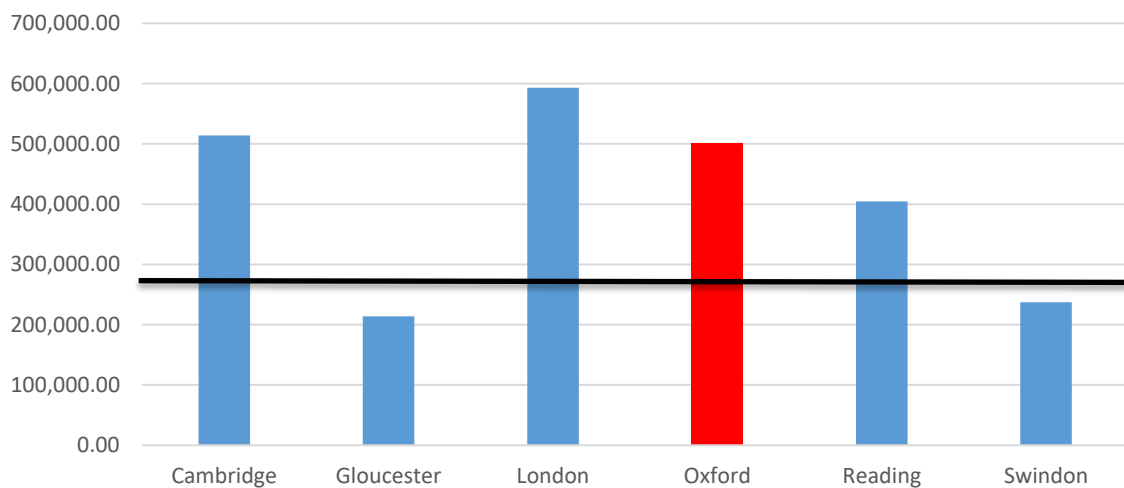
<sup>18</sup> Median monthly private rents  
<https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/privaterentalmarketsummarystatisticsinengland/october2018toseptember2019>



**Figure 11. Median monthly private rents recorded between October 2018 to September 2019 for all bedroom categories (Source: VOA 2019).**

Oxford’s median house price in 2019 was £ 501,284. The English average house price for the same period was £ 281,012. Therefore, house prices in Oxford are 78.4% higher than the national average.

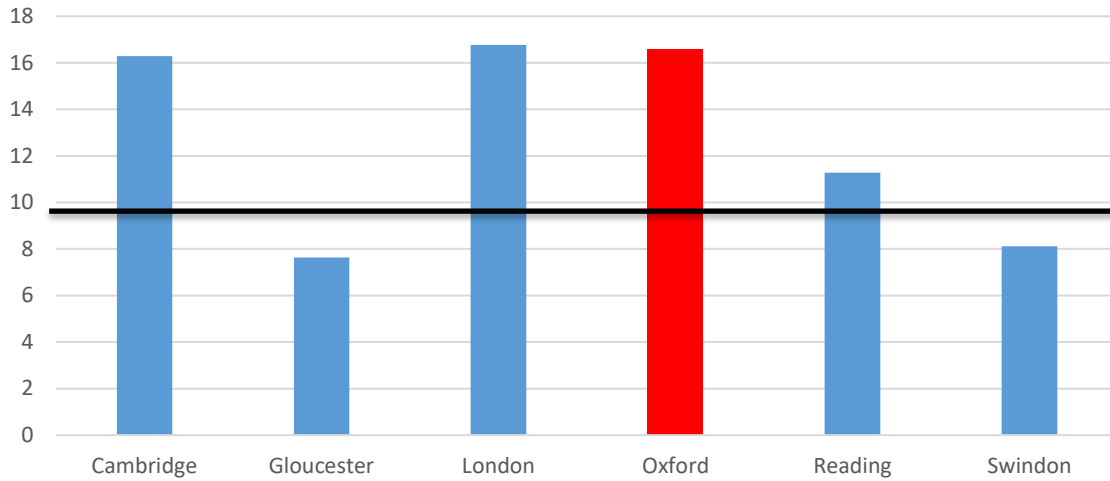
<sup>19</sup>



**Figure 12. Mean price paid (2019) for a residential property (Source: Land Registry 2019). Horizontal line shows English average (£281,000)**

<sup>19</sup> Mean house prices 2019 <https://www.centreforcities.org/data-tool/#graph=table&city=show-all&indicator=housing-affordability-ratio\single\2016&tableOrder=tableOrder\1,1>

Housing affordability estimates are calculated by dividing house prices by annual earnings to create a ratio<sup>20</sup>. Oxford's Housing Affordability ratio (16.57%) is significantly above the national average (9.82%) (Figure 13).



**Figure 13. Housing Affordability Ratio 2016 (Source: ONS 2016). Horizontal line shows national average - 9.82)**

<sup>20</sup>ONS 2016  
<https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/housingaffordabilityinenglandandwales/1997to2016>

## **2 Results of housing stock and stressor modelling**

### **2.1 Methodology**

Tenure Intelligence (Ti) uses council held data and publicly available data to identify tenure and analyse property stressors, including property conditions and ASB.

Data trends at the property level are analysed using mathematical algorithms to help predict the tenure of individual properties using factors such as occupant transience and housing benefit data. Metastreet have worked with the council to create a residential property data warehouse. This has included linking millions of cells of council and externally held data to 61,896 unique property reference numbers (UPRN).

Machine learning is used to make predictions for each tenure and property condition based on a sample of known tenures and outcomes. Results are analysed to produce a summary of housing stock makeup, predictions of Category 1 hazards (HHSRS) and other stressors. To achieve the maximum accuracy, unique models are built for each council, incorporating individual borough data and using known outcomes to train predictive models.

Once the data warehouse was created, statistical modelling was used to determine tenure using the methodology outlined below. All council held longitudinal data is for five consecutive years, from 2015 –2019.

Different combinations of risk factors were systematically analysed for their predictive power in terms of key outcomes. Risk factors that duplicated other risk factors but were weaker in their predictive effect were systematically eliminated. Risk factors that were not statistically significant were also excluded through the same processes of elimination.

For each UPRN a risk score was calculated using logistic regression. The selected risk factors have a better or worse than evens chance of being predictive.

A number of predictive models have been developed as part of this project which are unique to Oxford Council. Known stressors linked to individual properties have been modelled to calculate population level incidences and rates.

It is important to note that this approach can never be 100% accurate as all statistical models include some level of error. A more detailed description of the methodology and the specific factors selected to build bespoke predictive models for this Oxford project can be found in Appendix 2.

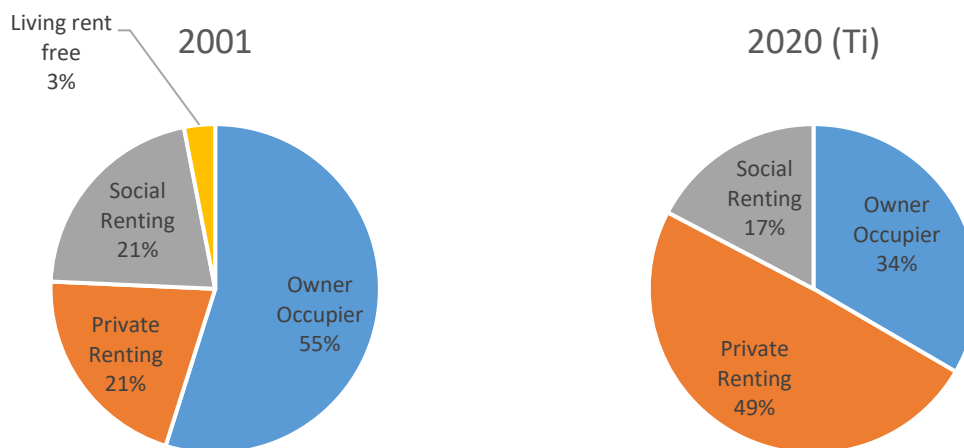
## 2.2 Results - Private Rented Sector

### 2.2.1 Population and distribution

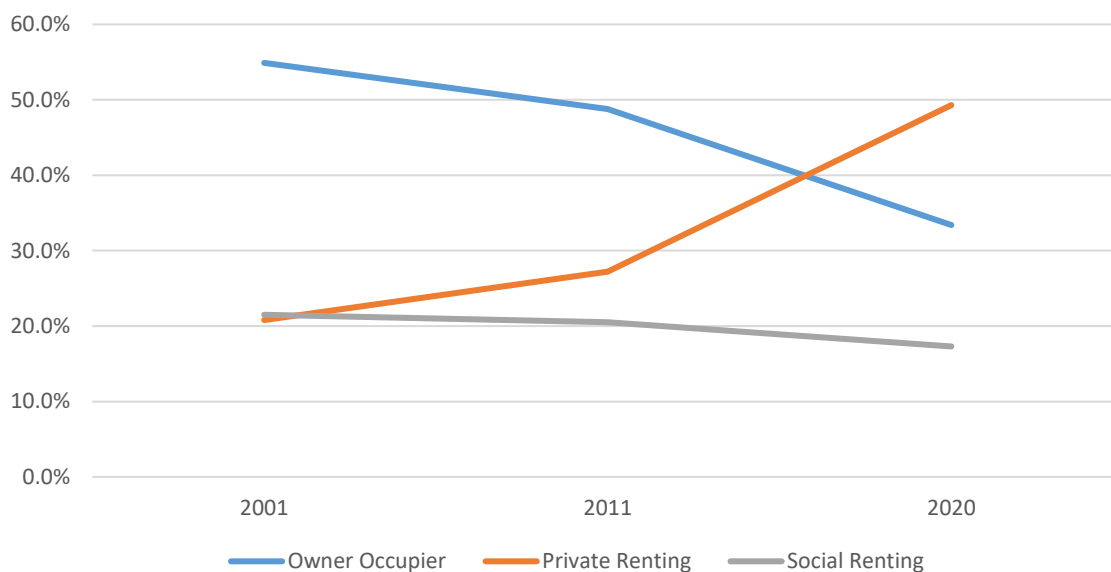
The private rented sector (PRS) in Oxford has grown significantly since 2001.

The study identified a total of 61,896 residential properties in Oxford (excluding rooms and shell properties). 49.3% (30,508) of which are PRS, 33.4% (20,672) are owner occupied and 17.3% (10,716) socially rented (Figure 13). The PRS in Oxford is distributed across all 24 wards (Figure 17 & Map 4). Oxford has one of the largest PRS populations, measured by proportion of total housing stock, of any housing authority in England.

Based on tenure modelling, Oxford City Council's PRS is now calculated to be 49.3% (30,508) of housing stock (Figure 14). This compares to 20.8% of households in 2001 and 27.2% in 2011 (ONS). This represents a 137% increase over the last 19 years. The growth of the PRS has come mostly from a reduction in owner occupation, from 54.9% (2001) to 33.4% (2020) (Figure 15).



**Figure 14. Tenure profile 2001 & 2020 (Source: ONS & Ti 2020).**



**Figure 15. PRS as a percentage of total housing stock, 2001, 2011 & 2020 (Source: ONS & Ti 2020).**

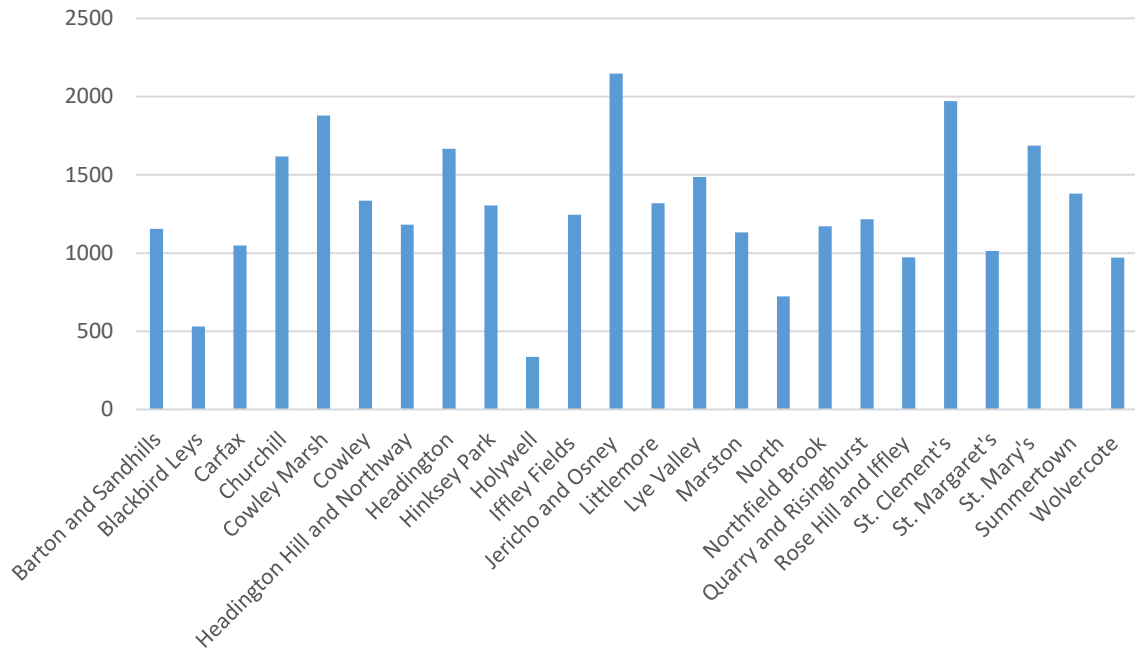
This increase is part of a nationwide and regional trend. The PRS in the UK has grown from 9.4% of housing stock in 2000<sup>21</sup>. It is now the second largest housing tenure in England, with a growing number of households renting from a population of around 1.5 million private landlords<sup>22</sup>.

The PRS in Oxford is distributed across all 24 wards (Figure 16). The number of PRS per ward ranges from 2,147 (Jericho and Osney Ward) to 336 (Holywell Ward).

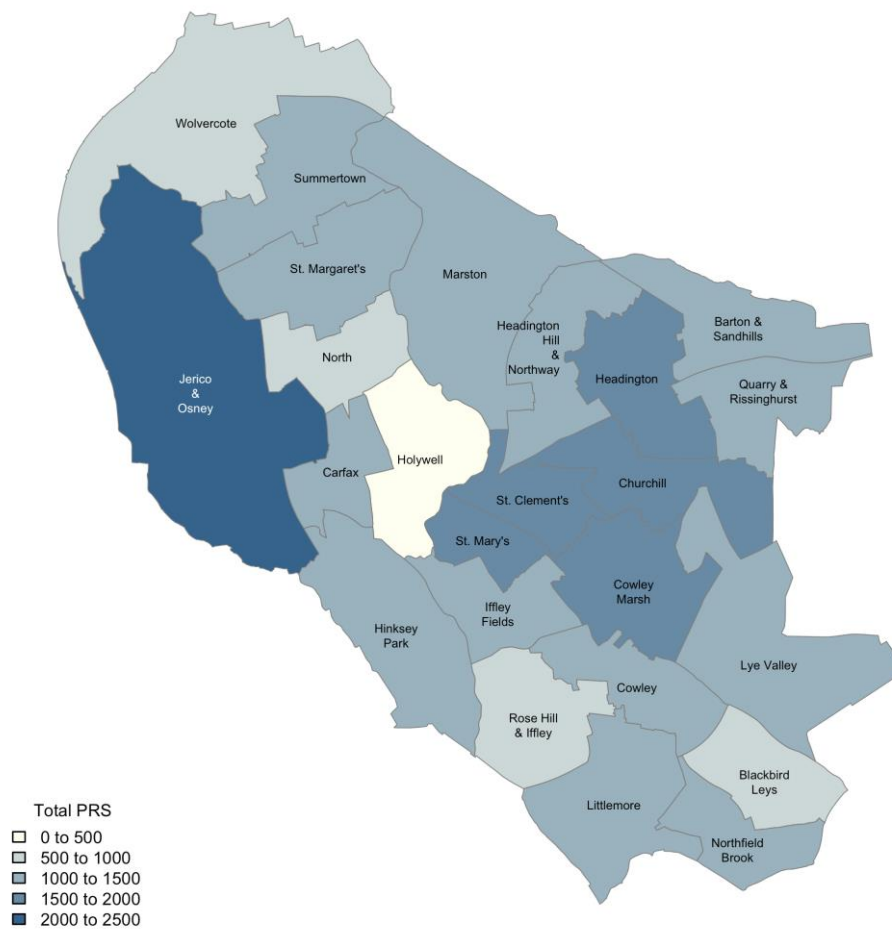
<sup>21</sup> The profile of UK private landlords Scanlon K & Woodhead C CML research. LSE London. December 2017 [www.cml.org.uk](http://www.cml.org.uk)

<sup>22</sup> Landlord Licensing. Interim report-overview of the incidence and cost of HMO & discretionary schemes in England. February 2015. [www.landlords.org.uk](http://www.landlords.org.uk)



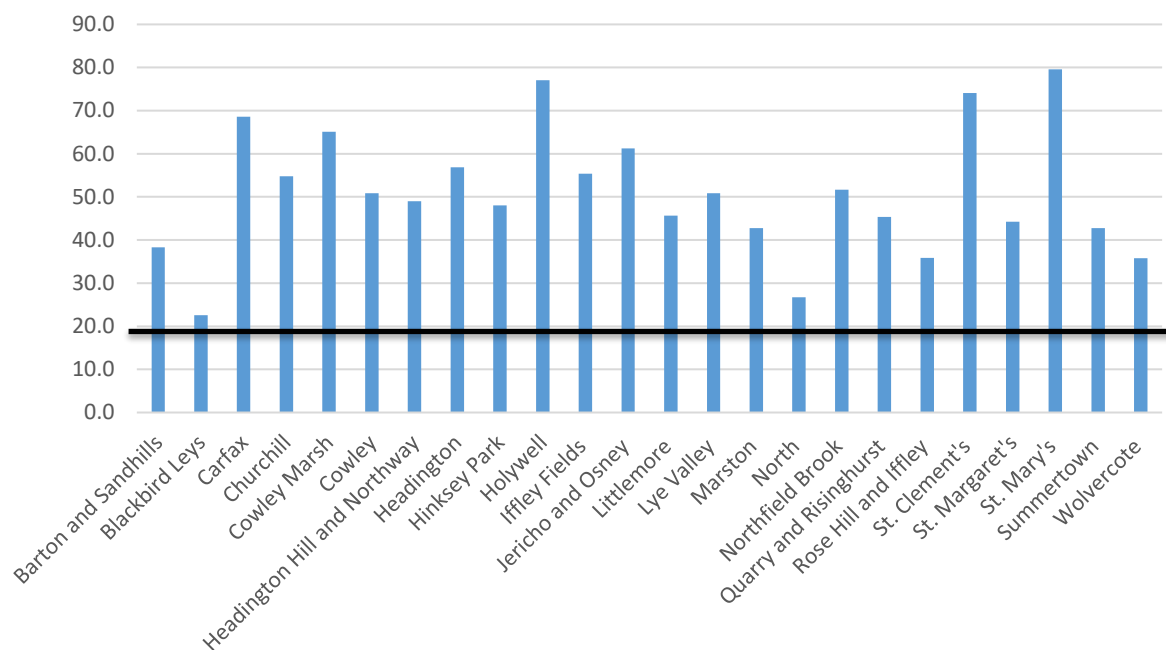


**Figure 16. Number of PRS dwellings by ward (Source: Ti 2020).**



**Map 2. Number of PRS properties (Source: Ti 2020, map by MS).**

The percentage of PRS properties in each ward ranges between 79.6% (St. Mary's) and 22.6% (Blackbird Leys) (Figure 16). Therefore, 24 out of 24 Oxford City Council wards have a higher percentage of PRS than the national average (19% 2019).



**Figure 17. Percentage of PRS dwellings by each ward (Source Ti 2020). Black line represents national average in 2019 (19%).**

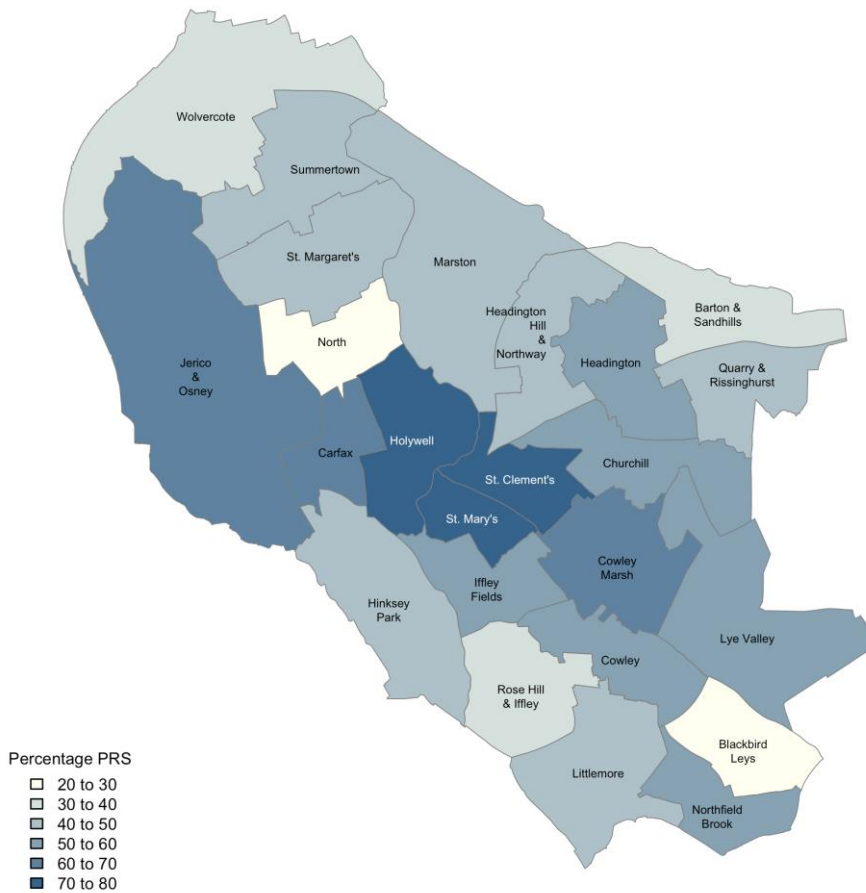
Table 1 shows the total PRS in each ward and the percentage PRS compared to the total housing stock.

Wards	Number PRS properties	% PRS (%)
Barton and Sandhills	1,155	38.3
Blackbird Leys	530	22.6
Carfax	1,049	68.6
Churchill	1,617	54.8
Cowley Marsh	1,880	65.1
Cowley	1,335	50.9
Headington Hill and Northway	1,181	49.0
Headington	1,667	56.9
Hinksey Park	1,305	48.0
Holywell	336	77.1
Iffley Fields	1,245	55.4
Jericho and Osney	2,147	61.2
Littlemore	1,319	45.7
Lye Valley	1,487	50.8
Marston	1,132	42.7
North	723	26.7
Northfield Brook	1,171	51.6
Quarry and Risinghurst	1,216	45.4

Rose Hill and Iffley	972	35.9
St. Clement's	1,972	74.1
St. Margaret's	1,014	44.2
St. Mary's	1,687	79.6
Summertown	1,380	42.7
Wolvercote	971	35.8

**Table 1. Percentage and number of PRS properties by ward (Source Ti 2020).**

PRS properties are widely distributed across the borough, with higher proportions of housing stock in the central wards (Map 3Error! Reference source not found.).



**Map 3. PRS properties as percentage of housing stock (Source: Ti 2020, map by MS).**

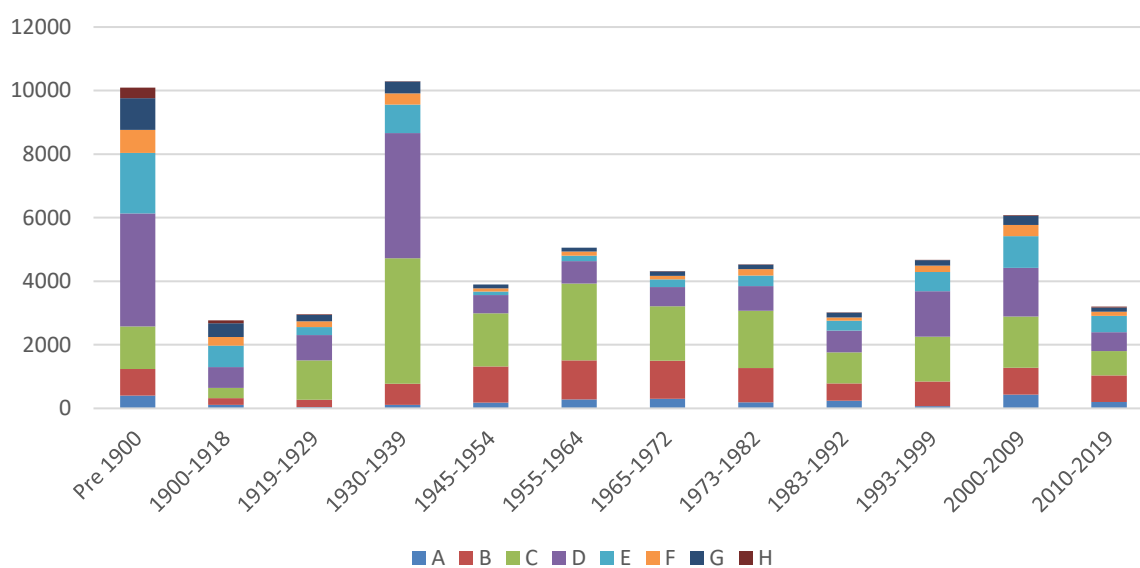
## 2.2.2 Housing conditions

Housing conditions are affected by the level of maintenance and quality of repair, the age of the property, thermal efficiency and type of construction. Category 1 hazards have a physiological or psychological impact on the occupant which may result in medical treatment.<sup>23</sup>

In 2019, 14% of private rented dwellings in England had at least one Category 1 hazard; this was a higher proportion than the average for the total housing stock (11%)<sup>24</sup>.

It is notable that there is a gradient of risk with age of the property, the risk being greatest in dwellings built before 1900, and lowest in the more energy efficient dwellings built after 1980<sup>25</sup>.

A council's property age profile can have an impact on housing conditions. Oxford has a significant proportion of its residential housing stock built pre 1900 (16.5%). In fact, a significant proportion of Oxford's housing stock was built before the Second World War (42.3%) (Figure 18).<sup>26</sup>



**Figure 18. Housing Stock Age Profile and Council Tax band (Source: VOA 2019).**

<sup>23</sup> Housing Health and Rating System, Operation Guidance, 2006,

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/15810/142631.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf)

<sup>24</sup> MHCLG Private rented sector 2018-19 English Housing survey Headline Report,

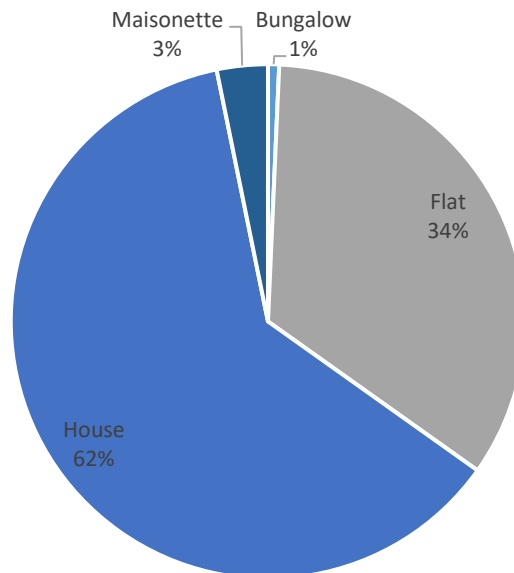
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/860076/2018-19\\_EHS\\_Headline\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860076/2018-19_EHS_Headline_Report.pdf)

<sup>25</sup> Housing Health and Rating System, Operation Guidance, 2006,

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/15810/142631.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf)

<sup>26</sup> Council tax band and property age profile <https://www.gov.uk/government/statistics/council-tax-stock-of-properties-2019>

A borough's property type profile offers an indication of housing density, construction type and other social economic indicators. Property types in Oxford are shown in Figure 19. The most common property type are Houses (62%), while bungalows are the least common property type (1%)



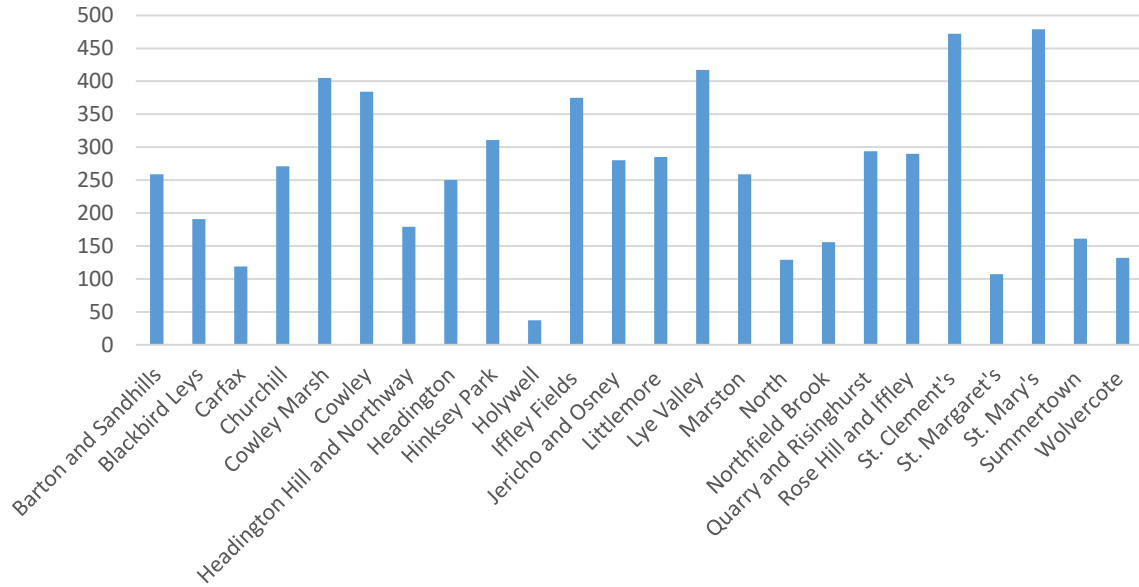
**Figure 19. Property type as a percent of total (Source: EPC data 2020).**

Using a sample of properties that are known to have at least 1 serious housing hazard (Category 1, HHSRS), it is possible to predict the number of PRS properties with at least 1 serious hazard across the borough (Figure 20).

There are **6,242** private rental properties in Oxford that are likely to have a serious home hazard (Category 1, HHSRS). This represents **20.4%** of the PRS stock, significantly higher than the national average (14%, 2019) <sup>27</sup>. PRS properties with serious hazards are distributed across the city.

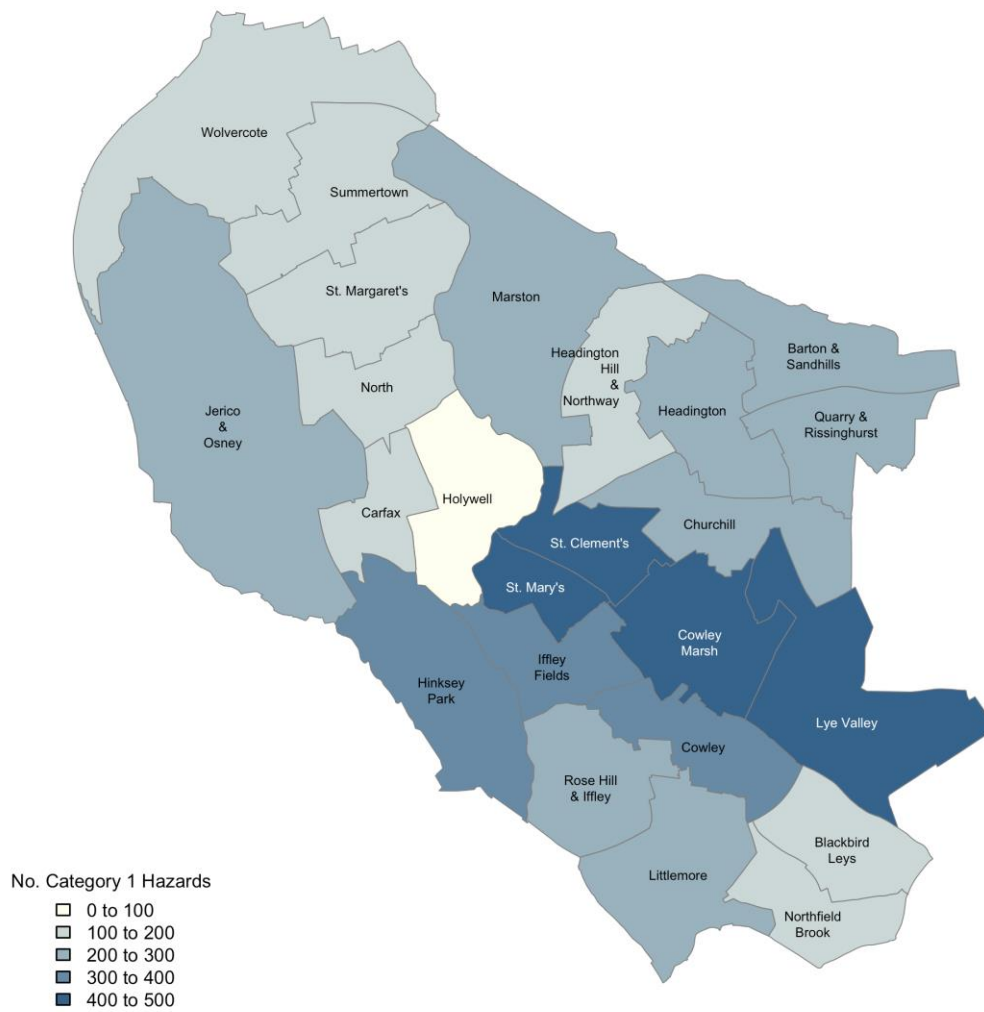
St. Mary's (479) and St. Clement's (472) wards have the highest number of properties with at least one Category 1 hazard (HHSRS).

<sup>27</sup> MHCLG Private rented sector 2018-19 English Housing survey Headline Report, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/860076/2018-19\\_EHS\\_Headline\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860076/2018-19_EHS_Headline_Report.pdf)



**Figure 20. Predicted number of Category 1 hazards by ward (Source: Ti 2020).**

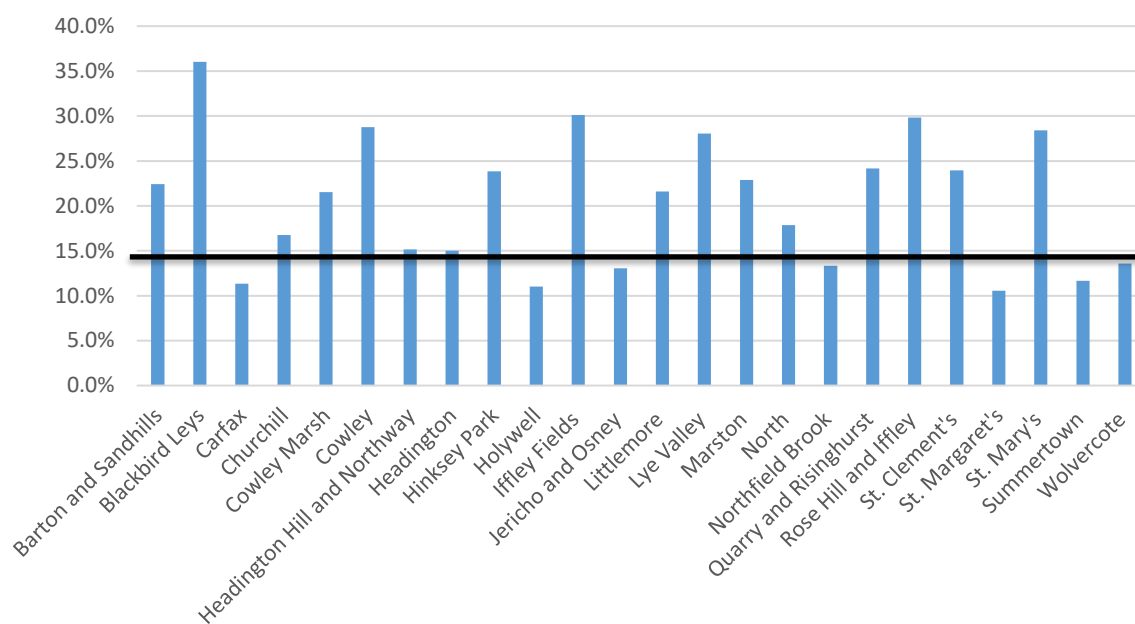
Category 1 hazards in the PRS are distributed across the whole borough (Map 4). Concentrations of properties with serious hazards can be found in the central and southeast wards.



**Map 4. Distribution of PRS properties with category 1 hazards (Source: Ti 2020, map by MS).**

The rates of Category 1 hazards per 1,000 PRS properties reveals a wider distribution across Oxford (Figure 21).

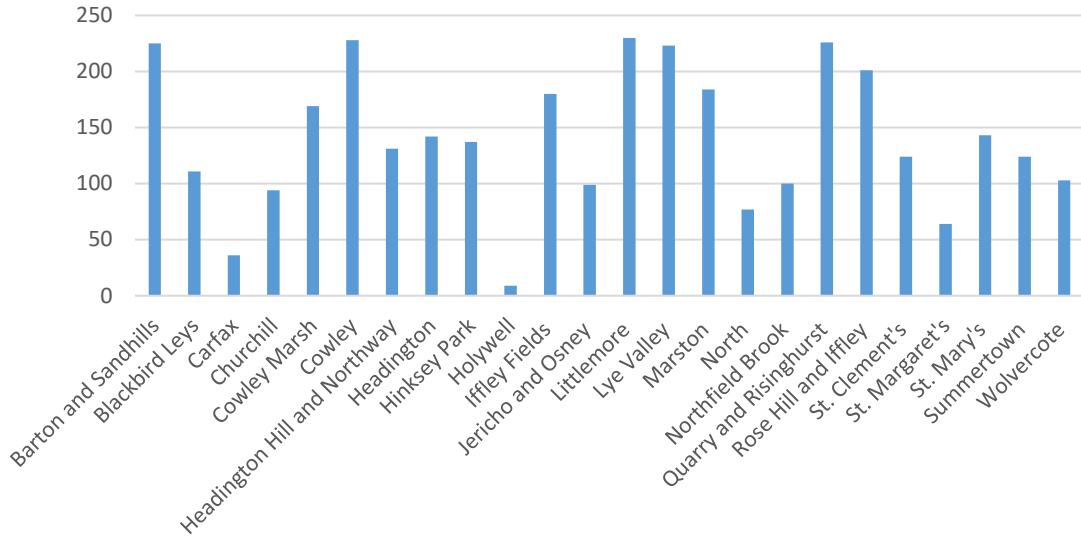




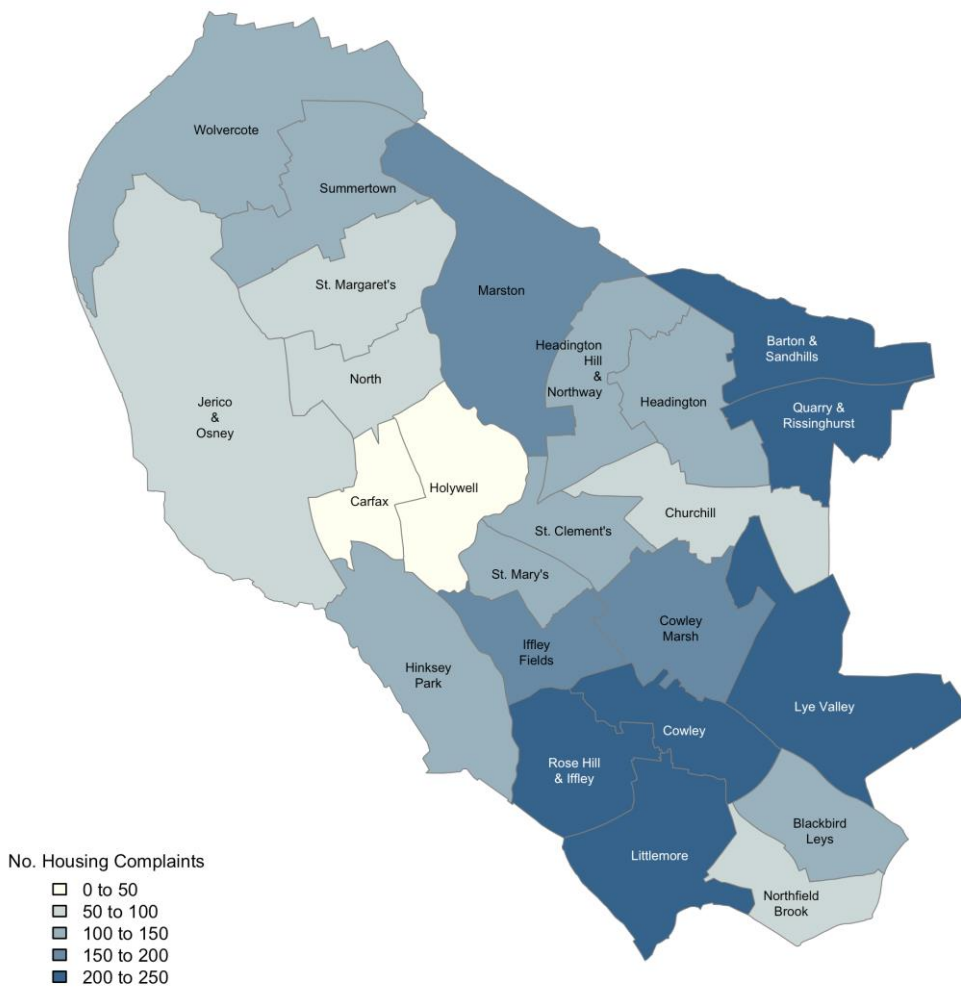
**Figure 21. Percentage of PRS properties predicted to have at least one Category 1 hazards by ward (Source: Ti 2020) Horizontal line shows UK average (14%)**

Complaints made by PRS tenants to the council about poor property conditions and inadequate property management are a direct indicator of lower quality and poorly managed PRS. Oxford received **3,360** complaints related to 2,990 unique private rented properties over a 5-year period (2015-2019) (Figure 21). This equates to approximately 1 in 10 of all rented properties in Oxford.

Littlemore (230), Cowley (228) and Quarry and Risinghurst (226) wards have the highest number of complaints. PRS housing complaints are distributed across all 24 wards



**Figure 22. PRS complaints made by private tenants to the Council (Source Ti 2020).**

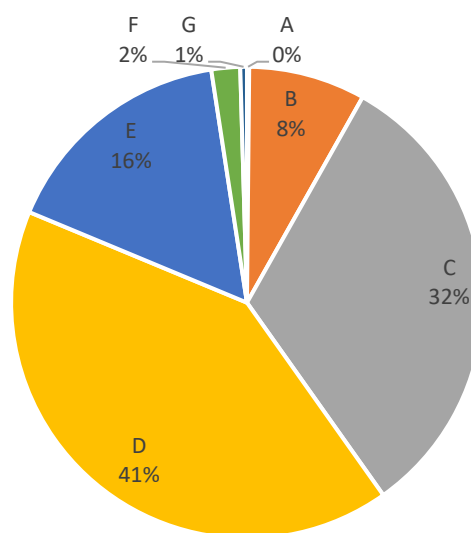


**Map 5 PRS complaints made by private tenants to the Council (Source: Ti 2020, map by MS).**

An EPC rating is an assessment of a property's energy efficiency. It is primarily used by buyers or renters of residential properties to assess the energy costs associated with heating a house or flat. The rating is from A to G. A indicates a highly efficient property, G indicates low efficiency.

The energy efficiency of a dwelling depends on the thermal insulation of the structure, on the fuel type, and the size and design of the means of heating and ventilation. Any disrepair or dampness to the dwelling and any disrepair to the heating system may affect their efficiency. The exposure and orientation of the dwelling are also relevant.

As part of this project 21,282 ratings were matched to PRS properties (Figure 23). All results have been modelled from this group.



**Figure 23. Distribution of Energy Performance Certificate ratings in PRS (Rating A-G) (Source: Ti 2020).**

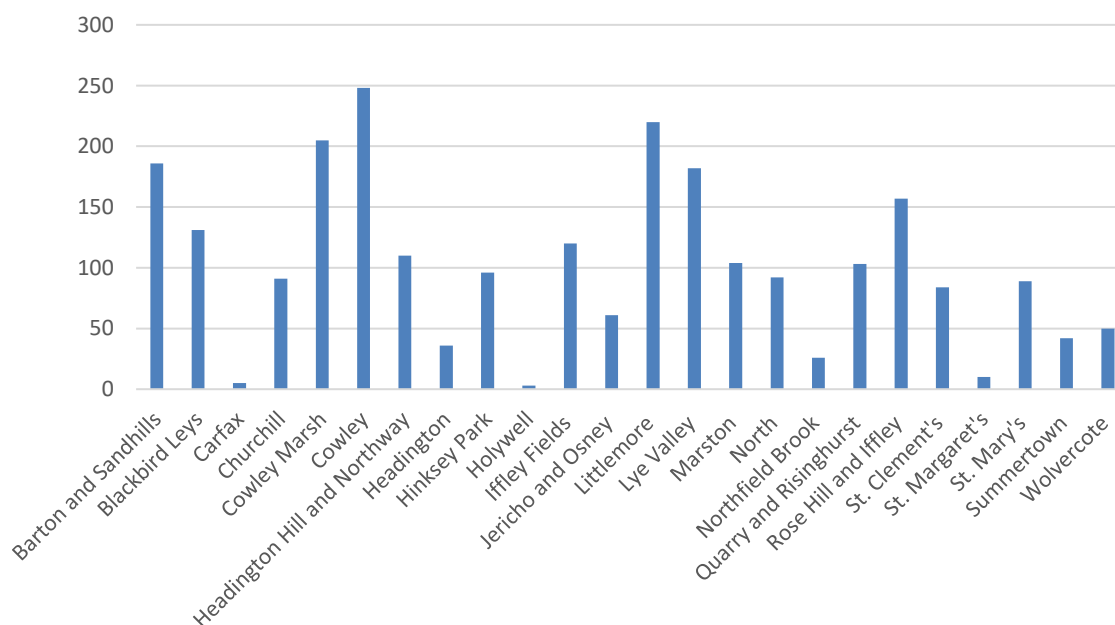
The Minimum Energy Efficiency Standard (MEES) came into force in England and Wales on 1 April 2018. The regulation applies to PRS properties and mandates that all dwellings must have an EPC rating of E and above to be compliant.

Using the EPC records it has been possible to calculate that 18.7% of PRS properties in Oxford have an E, F, and G rating. 2.5% of PRS properties have an F and G rating (Figure 23). Extrapolated to the entire PRS, 763 properties are likely to fail the MEES statutory requirement.

The statistical evidence shows that there is a continuous relationship between indoor temperature and vulnerability to cold-related death<sup>28</sup>. The colder the dwelling, the greater the risk. The percentage rise in deaths in winter is greater in dwellings with low energy efficiency ratings. There is a gradient of risk with age of the property, the risk being greatest in dwellings built before 1850, and lowest in the more energy efficient dwellings built after 1980<sup>29</sup>. Therefore, the sizeable number of F and G properties present a serious risk to the occupants' health, particularly if over the age of 65.

### 2.2.3 PRS enforcement interventions

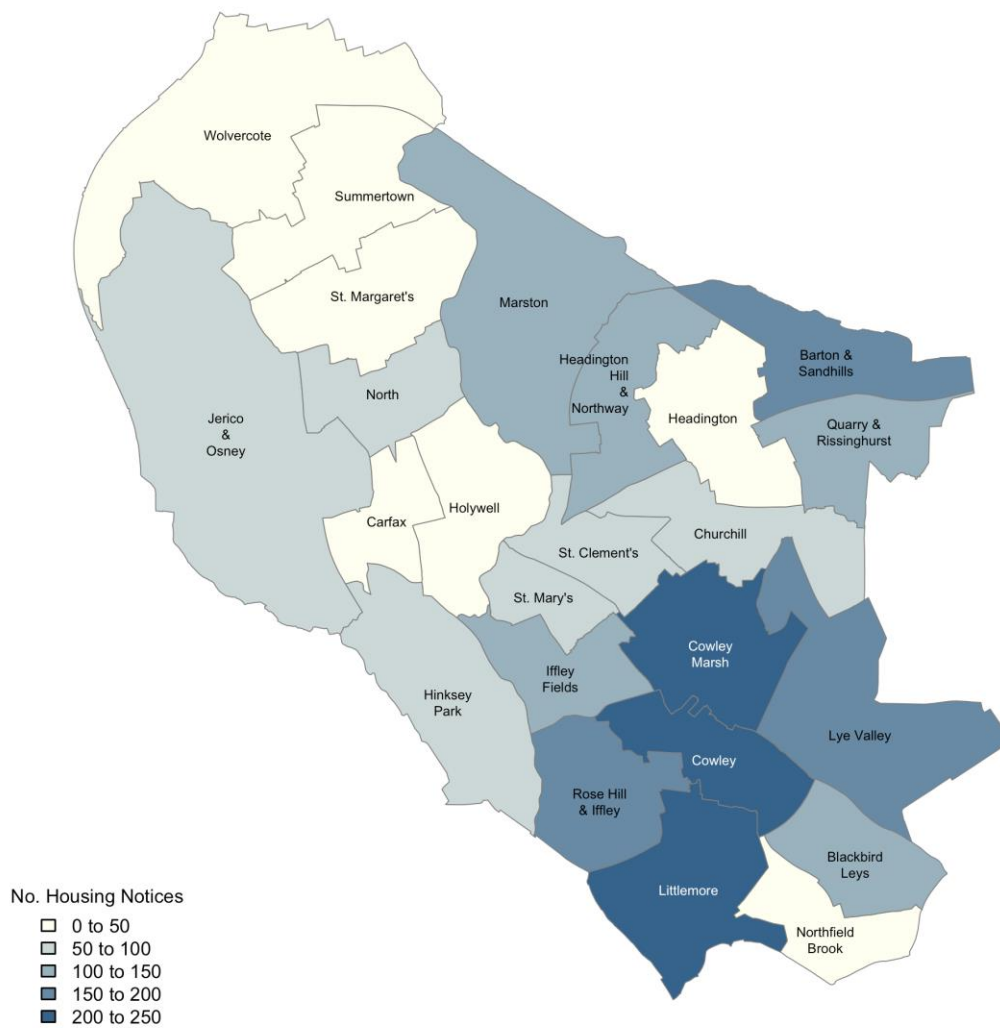
Oxford uses a wide range of statutory housing and public health notices to address poor housing standards in the PRS. These are often because of a complaint being made by a tenant about their accommodation or as a result of a proactive inspection. Over a 5-year period (2015-19) Oxford served 2,451 housing and public health notices (Figure 24).



**Figure 24. Housing and public health notices served on PRS properties by ward (Source: Ti 2020).**

<sup>28</sup> Housing Health and Rating System, Operation Guidance, 2006  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/15810/142631.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf)

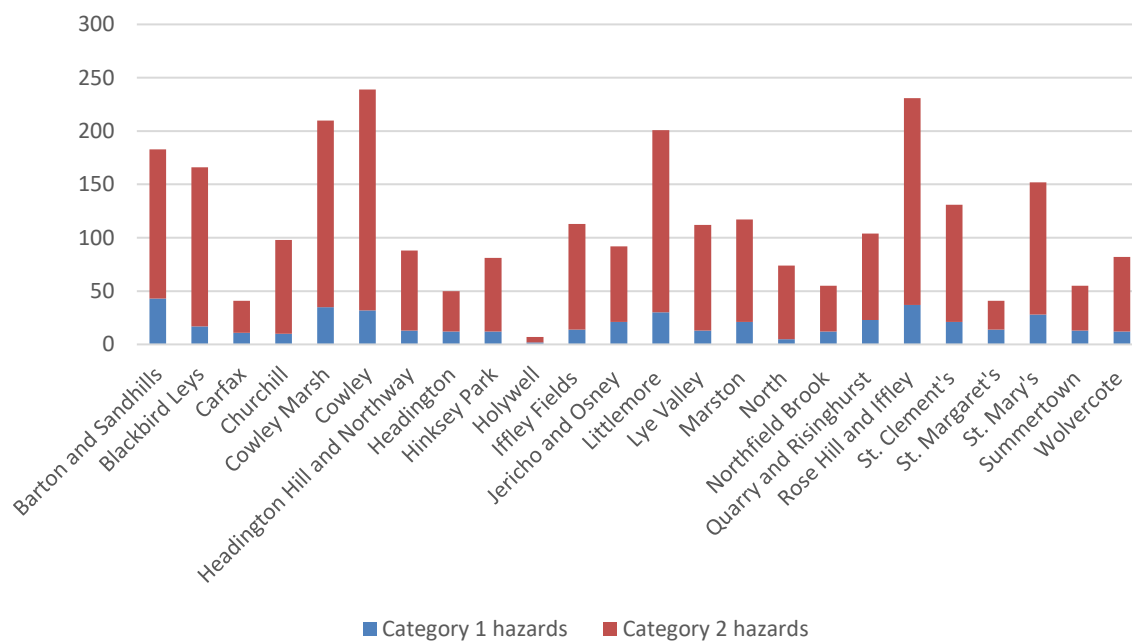
<sup>29</sup> Housing Health and Rating System, Operation Guidance, 2006  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/15810/142631.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf)



**Map 6 Housing and public health notices served on PRS properties by ward (Source: Ti 2020, map by MS).**

Part of the housing conditions review is to report on council intervention and findings during property inspections. Oxford City Council recorded the number of housing hazards, (Category 1 and 2, HHSRS) identified by competent officers during property inspections over a 5-year period (2015-2019).

Officers identified 2,723 housing hazards; 451 Category 1 hazards and 2,272 Category 2 hazards. Housing hazards were identified across all 24 wards. Cowley (207) and Rose Hill and Iffley (194) have the highest number of recorded home hazards (Figure 25).



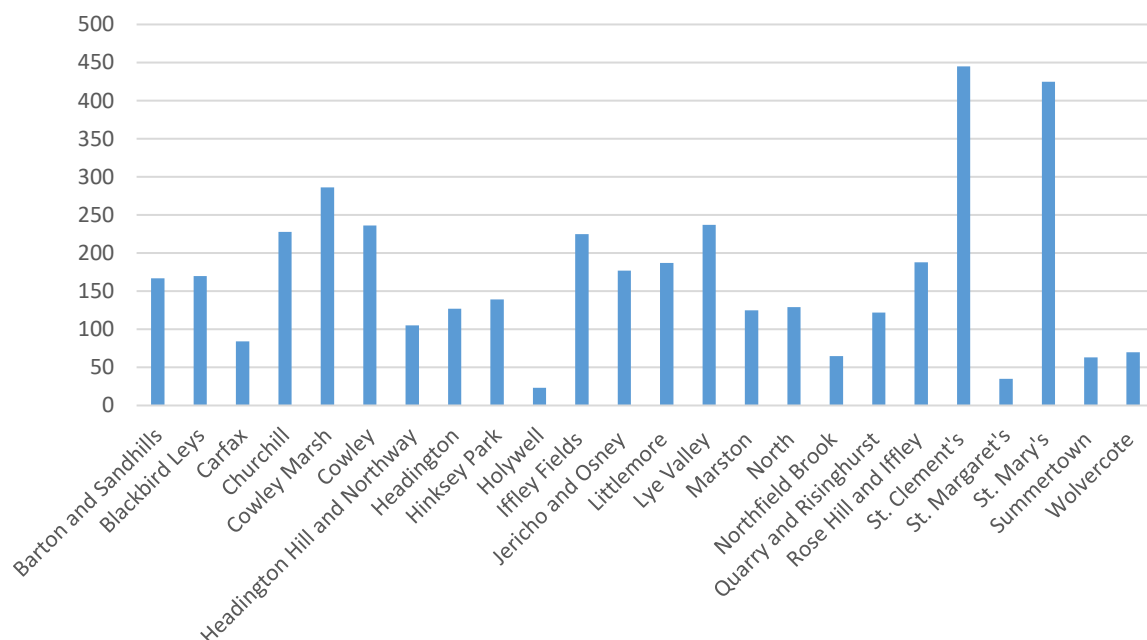
**Figure 25. Housing hazards (Category 1 & 2) identified by Oxford CC Officers during inspections (Source: Ti 2020).**

## 2.2.4 Anti-social behaviour (ASB)

The number of ASB incidents that resulted in an intervention by the council are shown below. They relate to ASB associated with residential premises only. For example, ASB incidents investigated on a street corner that cannot be linked to a residential property are excluded.

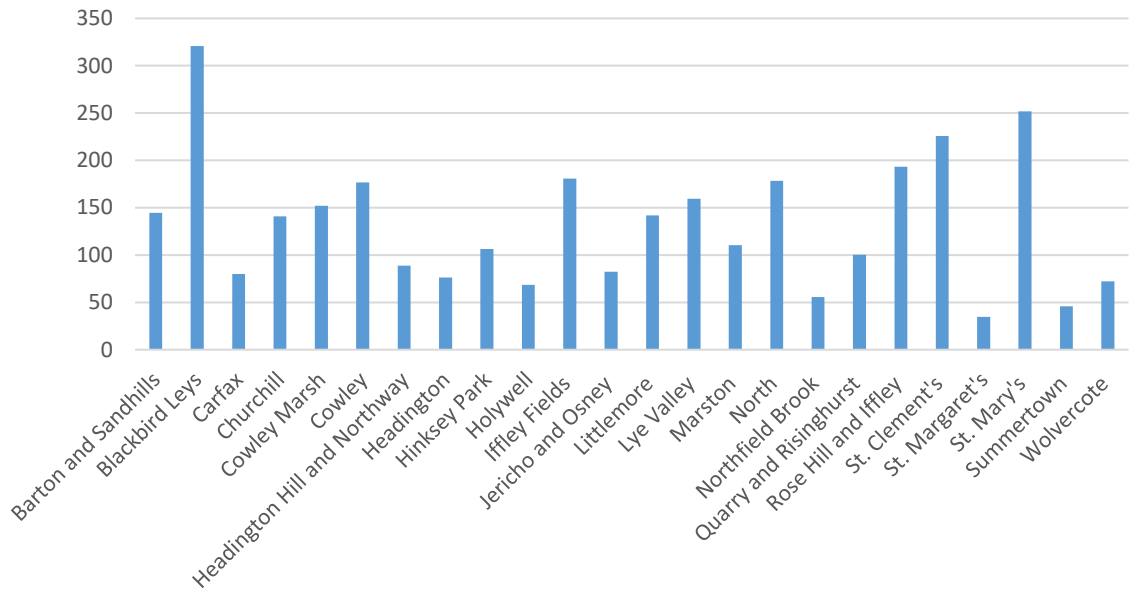
It is important to note that ASB can be subject to recording issues and therefore results do not include all reported ASB incidents, for the purpose of this report only ASB incidents recorded by a council officer have been included.

Between 2015-2019 a total of **4,058** ASB investigations were carried out by Oxford Council linked to PRS properties. St. Clement's (445) and St. Mary's (425) has by the far the highest number of ASB investigations (Figure 26).



**Figure 26. Total ASB investigations linked to PRS properties by ward (Source Ti 2020).**

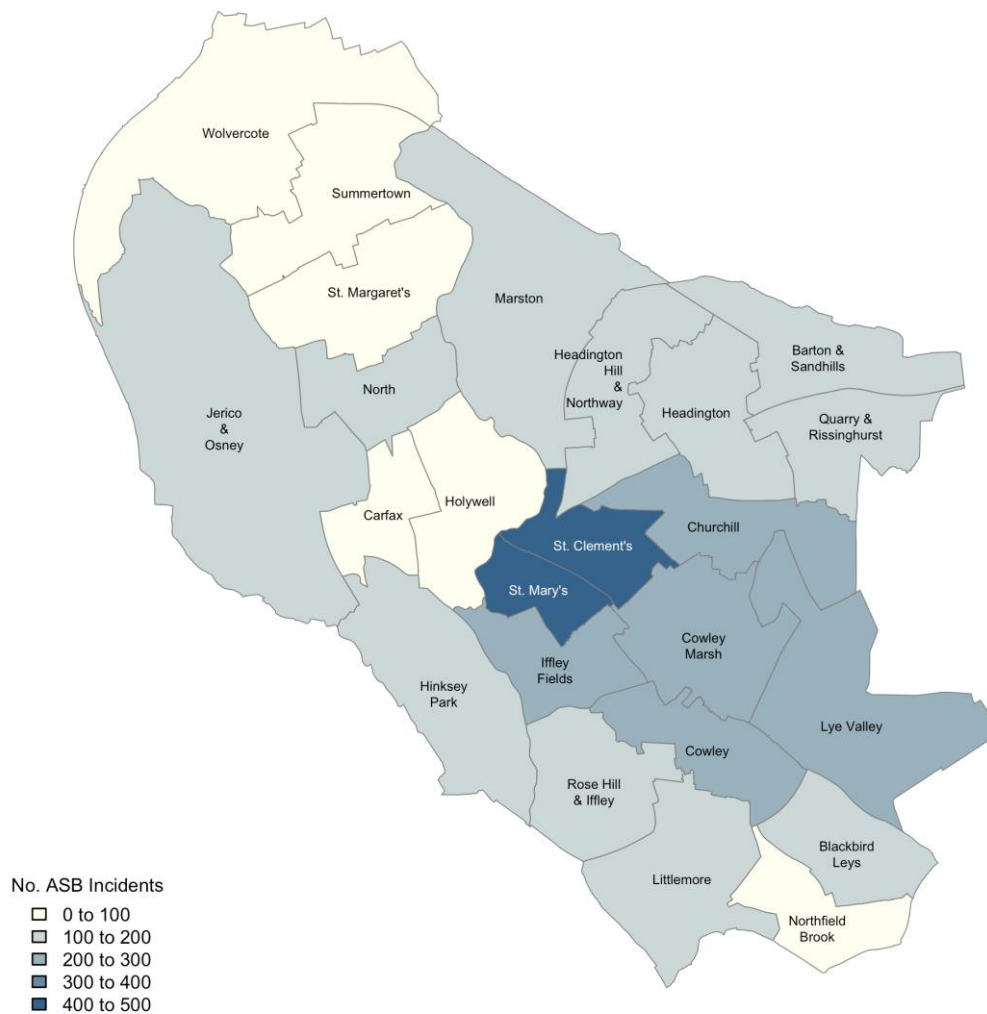
ASB in the PRS expressed as investigations per 1,000 dwellings, shows a more even distribution across all wards (Figure 27). Using this measure, Blackbird Leys (321 per 1,000) and St. Mary's (252 per 1000) wards have the greatest number of ASB investigations proportional to the size of the PRS.



**Figure 27. ASB investigations linked to PRS per 1000 properties by ward (Source: Ti 2020).**

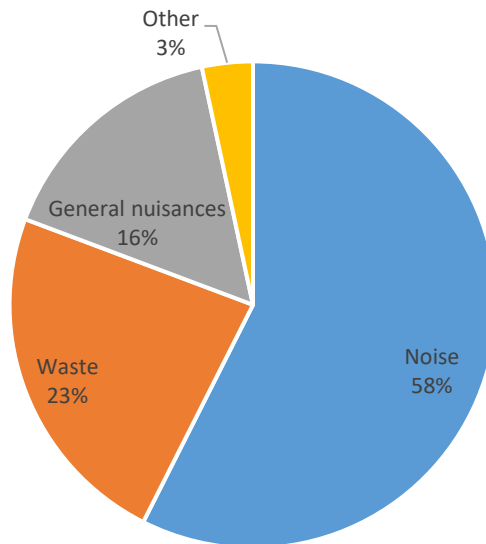
ASB investigations linked to PRS across Oxford wards are shown in Map 7.





**Map 7. ASB investigations linked to PRS properties by ward (Source: Ti 2020, map by MS).**

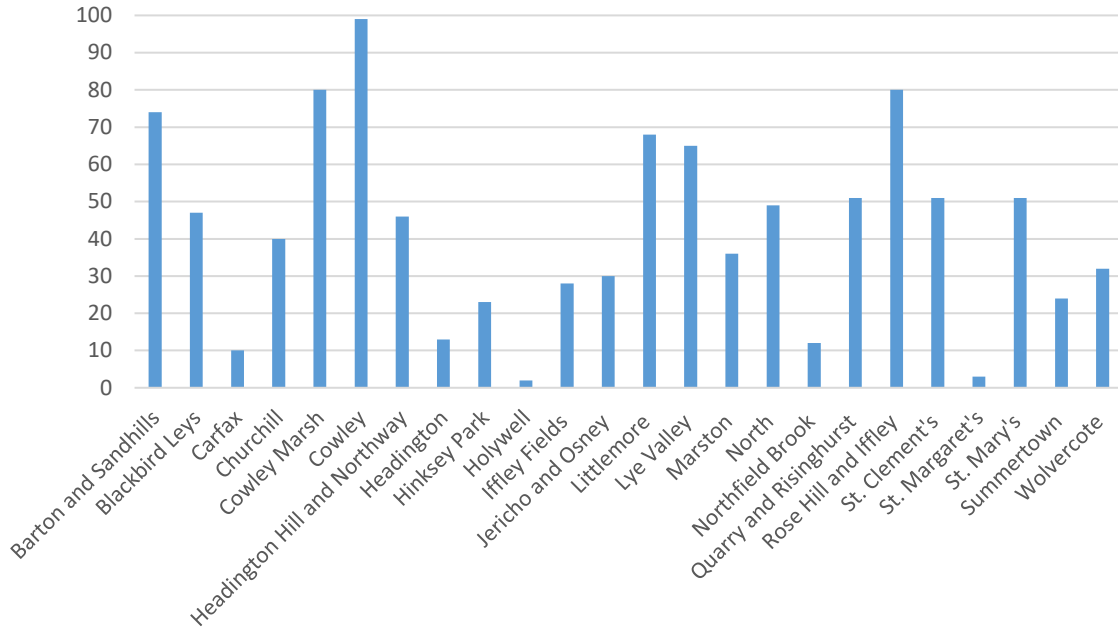
Recorded ASB investigations in the PRS have been split into four types. Noise (58%), Waste (23%), general nuisances (16%) and other ASB (3%) (Figure 28). Other ASB category includes, verbal abuse, graffiti, harassment, drugs and substance misuse and domestic violence. All incidents are directly linked to PRS properties.



**Figure 28. Types of ASB linked to PRS properties (Source: Ti 2020).**

### **2.2.5 PRS and financial vulnerability**

Housing benefit payments related to the PRS can be an indicator of financially vulnerable households and deprivation. At the time of this study Oxford administered 1,014 housing benefit payments to PRS households (Figure 29). Cowley (99) and Rose Hill and Iffley (80) wards received the most payments.



**Figure 29. PRS housing benefit payments (households) by ward (Source: Ti 2020).**

### **3 Conclusions**

Oxford City Council's PRS has grown rapidly over the last two decades, from 20.8% (2001) to 49.3% (2020).

There are a total of 61,896 residential properties in Oxford (excluding shell properties), **49.3%** (30,508) of which are PRS, 33.4% (20,672) are owner occupied and 17.3% (10,716) socially rented. The PRS in Oxford is distributed across all 24 wards. Oxford is likely to have one of the largest PRS populations, measured by proportion of housing stock, of any housing authority in England.

Affordability is one of the key challenges for private renters. Median rents in Oxford range between 51.5% and 82.7% higher than the English average depending on bedroom categories. Room and studio flats median monthly rents are equal to the London average. Four or more bedroom rents are higher than the London average. Oxford's median house price in 2019 was £ 501,284. The English average house price for the same period was £ 281,012. Therefore, house prices in Oxford are 78.4% higher in than the national average.

Poor housing conditions are prevalent in the PRS. There are **6,242** private rental properties in Oxford that are likely to have a serious home hazard (Category 1, HHSRS). PRS properties with serious hazards are distributed across the city.

18.7% of PRS properties in Oxford have an E, F, and G rating. **2.5%** of PRS properties have an F and G rating. Extrapolated to the entire PRS, 763 properties are likely to fail the MEES statutory requirement. Oxford also has a higher proportion of households in fuel poverty (11.8%) than the national average (10.4%).

Oxford City Council received 3,360 complaints from private renters related to 2,990 rented properties over a 5-year period. This equates to approximately 1 in 10 of all rented properties in Oxford.

Oxford City Council's recorded a number of serious housing hazards (Category 1 and 2, HHSRS) during the course of property inspections. Officers identified **2,723** housing hazards: 451 Category 1 hazards and 2,272 Category 2 hazards. Housing hazards were identified across all 24 wards.

In response, Oxford City Council has made significant numbers of regulatory interventions. Over a 5-year period (2015-19) the Council served **2,451** housing and public health notices.

Oxford has a minority of high deprivation wards. 7 out of 24 wards have aggregated IMD rankings below the national average. Two wards (Blackbird Leys & Carfax) are in the bottom quartile nationally.

Between 2015-2019 a total of **4,058** ASB investigations were carried out by Oxford Council linked to PRS properties. St. Clement's (445) and St. Mary's (425) has by the far the highest number of ASB investigations.

## Appendix 1 – Ward summaries

**Table 2. Ward summary overview (Source Ti 2020).**

Ward	Summary (All council data is 5 consecutive years, 2015 - 2019)	
Barton and Sandhills	Total residential stock	3016
	% PRS (%)	38.3
	No. PRS	38.3
	No. ASB incidents	167.0
	No. Category 1 hazards	259.0
Blackbird Leys	Total residential stock	2,348
	% PRS (%)	22.6
	No. PRS	530
	No. ASB incidents	170
	No. Category 1 hazards	191
Carfax	Total residential stock	1,530
	% PRS (%)	68.6
	No. PRS	1,049
	No. ASB incidents	84
	No. Category 1 hazards	119
Churchill	Total residential stock	2,951
	% PRS (%)	54.8
	No. PRS	1,617
	No. ASB incidents	228
	No. Category 1 hazards	271
Cowley Marsh	Total residential stock	2,887
	% PRS	65.1
	No. PRS	1,880
	No. ASB incidents	286
	No. Category 1 hazards	405
Cowley	Total residential stock	2,624
	% PRS (%)	50.9
	No. PRS	1,335
	No. ASB incidents	236
	No. Category 1 hazards	384
Headington Hill and Northway	Total residential stock	2,409
	% PRS (%)	49.0
	No. PRS	1,181
	No. ASB incidents	105
	No. Category 1 hazards	179
Headington	Total residential stock	2,932
	% PRS (%)	56.9
	No. PRS	1,667
	No. ASB incidents	127

	No. Category 1 hazards	250
Hinksey Park	Total residential stock	2,719
	% PRS (%)	48.0
	No. PRS	1,305
	No. ASB incidents	139
	No. Category 1 hazards	311
Holywell	Total residential stock	436
	% PRS (%)	77.1
	No. PRS	336
	No. ASB incidents	23
	No. Category 1 hazards	37
Iffley Fields	Total residential stock	2,248
	% PRS (%)	55.4
	No. PRS	1,245
	No. ASB incidents	225
	No. Category 1 hazards	375
Jericho and Osney	Total residential stock	3,506
	% PRS (%)	61.2
	No. PRS	2,147
	No. ASB incidents	177
	No. Category 1 hazards	280
Littlemore	Total residential stock	2,889
	% PRS (%)	45.7
	No. PRS	1,319
	No. ASB incidents	187
	No. Category 1 hazards	285
Lye Valley	Total residential stock	2,925
	% PRS (%)	50.8
	No. PRS	1,487
	No. ASB incidents	237
	No. Category 1 hazards	417
Marston	Total residential stock	2,648
	% PRS (%)	42.7
	No. PRS	1,132
	No. ASB incidents	125
	No. Category 1 hazards	259
North	Total residential stock	2,706
	% PRS (%)	26.7
	No. PRS	723
	No. ASB incidents	129
	No. Category 1 hazards	129
Northfield Brook	Total residential stock	2,268
	% PRS (%)	51.6
	No. PRS	1,171
	No. ASB incidents	65

	No. Category 1 hazards	156
Quarry and Risinghurst	Total residential stock	2,680
	% PRS (%)	45.4
	No. PRS	1,216
	No. ASB incidents	122
	No. Category 1 hazards	294
Rose Hill and Iffley	Total residential stock	2,710
	% PRS (%)	35.9
	No. PRS	972
	No. ASB incidents	188
	No. Category 1 hazards	290
St. Clement's	Total residential stock	2,661
	% PRS (%)	74.1
	No. PRS	1,972
	No. ASB incidents	445
	No. Category 1 hazards	472
St. Margaret's	Total residential stock	2,292
	% PRS (%)	44.2
	No. PRS	1,014
	No. ASB incidents	35
	No. Category 1 hazards	107
St. Mary's	Total residential stock	2,120
	% PRS (%)	79.6
	No. PRS	1,687
	No. ASB incidents	425
	No. Category 1 hazards	479
Summertown	Total residential stock	3,230
	% PRS (%)	42.7
	No. PRS	1,380
	No. ASB incidents	63
	No. Category 1 hazards	161
Wolvercote	Total residential stock	2,711
	% PRS (%)	35.8
	No. PRS	971
	No. ASB incidents	70
	No. Category 1 hazards	132



## **Appendix 2 - Tenure Intelligence (Ti) – stock modelling methodology**

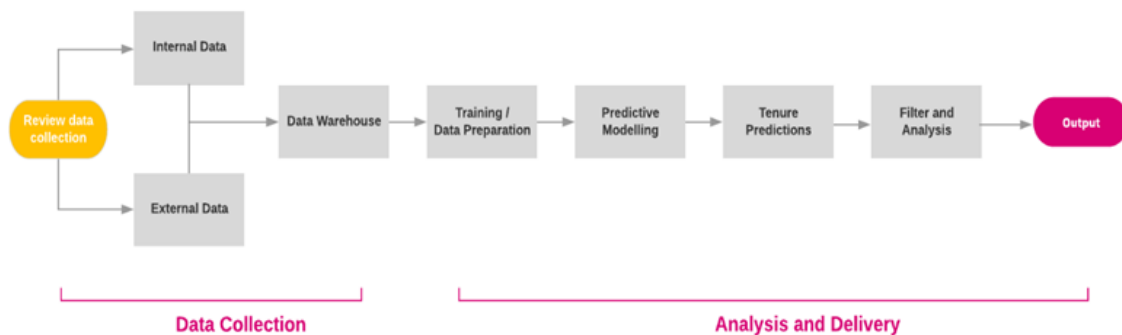
This Appendix explains at a summary level Metastreet’s Tenure Intelligence (Ti) methodology (Figure 30).

Ti uses a wide range of data to spot trends at the property level. Machine learning is used in combination with expert housing knowledge to accurately predict a defined outcome at the property level.

Council and external data have been assembled as set out in Metastreet’s data specification to create a property data warehouse.

Machine learning is used to make predictions of defined outcomes for each residential property, using known data provided by Oxford.

Results are analysed by skilled practitioners to produce a summary of housing stock, predictions of levels of property hazards and other property stressors. The results of the analysis can be found in the report findings chapter.



**Figure 30. Summary of Metastreet Tenure Intelligence methodology.**

### **Methodology**

Metastreet has worked with Oxford to create a residential property data warehouse based on a detailed specification. This has included linking 3.6 million cells of data to 61,896 unique property

references, including council and externally sourced data. Properties identified as shell addresses or rooms were excluded. All longitudinal data is 5 consecutive years, from 2015 –2019.

Once the property data warehouse was developed, the Ti model was used to predict tenure and stock condition using the methodology outlined below.

Machine learning was utilised to develop predictive models using training data provided by the council. Predictive models were tested against all residential properties to calculate risk scores for each outcome. Scores were integrated back into the property data warehouse for analysis.

Many combinations of risk factors were systematically analysed for their predictive power using logistic regression. Risk factors that duplicated other risk factors but were weaker in their predictive effect were eliminated. Risk factors with low data volume or higher error are also eliminated. Risk factors that were not statistically significant are excluded through the same processes of elimination. The top 5 risk factors for each model have the strongest predictive combination.

Three predictive models have been developed as part of this project. Each model is unique to Oxford; they include:

- Owner occupiers
- Private rented sector (PRS)
- PRS housing hazards

Using a  $D^2$  constant calculation it is possible to measure the theoretical quality of the model fit to the training data sample. This calculation has been completed for each model. The  $D^2$  is a measure of “predictive capacity”, with higher values indicating a better model.

Based on the modelling each residential property is allocated a probability score between 0-1. A probability score of 0 indicates a strong likelihood that the property tenure type is *not* present, whilst a score of 1 indicates a strong likelihood the tenure type *is* present.

Predictive scores are used in combination to sort, organise and allocate each property to one of 4 categories described above. Practitioner skill and experience with the data and subject matter is used to achieve the most accurate tenure split.

It is important to note that this approach cannot be 100% accurate as all mathematical models include error for a range of reasons. The  $D^2$  value is one measure of model “effectiveness”. The true

test of predictions is field trials by the private housing service. However, error is kept to a minimum through detailed post analysis filtering and checking to keep errors to a minimum.

A continuous process of field testing and model development is the most effective way to develop accurate tenure predictions.

The following tables include detail of each selected risk factors for each model. Results of the null hypothesis test are also presented as shown by the Pr(>Chi) results. Values of <0.05 are generally considered to be statistically significant. All the models show values much smaller, indicating much stronger significance.

**Owner occupier model**

The owner occupier model shows each of the 5 model terms to be statistically significant, with the overall model showing a “predictive capacity” of around 95% (Table 3).

**Table 3. Owner occupier predictive factors.**

<b>Risk factors selected</b>	<b>Pr(&gt;Chi)*</b>
Number of days liable (Ctax)	1.638e-15
Transaction type (EPC)	2.2e-16
Accounts over four years (Ctax)	2.2e-16
Total service requests (SR)	2.2e-16
Experian Mosaic Group	2.517e-16
Training data, n= 456	
D <sup>2</sup> test = 0.95**	

\* Pr(>Chi) = Probability value/null hypothesis test, \*\* D<sup>2</sup> test = Measure of model fit

**PRS predictive model**

The PRS model shows that each of the 5 model terms is statistically significant, with the overall model having a “predictive capacity” of around 97% (Table 4).

**Table 4. PRS predictive factors.**

<b>Risk factors selected</b>	<b>Pr(&gt;Chi)</b>
Transaction type (EPC)	2.2e-16
Experian Mosaic Group	2.2e-16
Registered deposits (TDS scheme)	2.2e-16
Housing benefit	2.149e-06
Total service requests	2.2e-16
Training data, n= 1461	
D <sup>2</sup> test = 0.97	

**Category 1 (HHSRS) hazards model**

Numerous properties where the local housing authority has taken action to address serious hazards were sampled for training data, including poor housing conditions. Specifically, this included Housing Act 2004 Notices served on properties to address Category 1 hazards. The model results show that each of the model terms is statistically significant, with the overall model having a “predictive capacity” of around 92% (Table 5).

**Table 5. Category 1 (HHSRS) hazard predictive factors.**

<b>Risk factors selected</b>	<b>Pr (&gt;Chi)</b>
Energy performance score (EPC)	2.2e-16
ASB count	3.331e-10
Total service requests	2.2e-16
Accounts over four years (Ctax)	1.176e-06
Environmental impact (EPC)	2.2e-16
Training data, n= 471	

D<sup>2</sup> test = 0.92

Version, Final

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