
London Borough of Croydon

Private Rented Sector: Housing Stock Condition and Stressors Report

September 2019



Executive Summary

Metastreet were commissioned by the London Borough of Croydon 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 Croydon'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 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

- Croydon's private rented sector (PRS) has grown rapidly in recent years, from 16% (2006) to 35.6% (2019)
- Croydon is likely to have one of the largest PRS populations of any housing authority in England
- There are 164,378 residential properties in Croydon, 58,585 (35.6%) of which are PRS properties, 81,300 (49.5%) are owner occupied and 24,493 (14.9%) socially rented
- Poor housing conditions are prevalent in the PRS. 13,896 PRS properties are predicted to have at least 1 serious hazard (Category 1, HHSRS). This represents 23.7% of the PRS stock
- There are significant levels of ASB linked to private rented properties across the borough
- Over the last 4 years, 7,285 PRS properties have been subject to one or more ASB investigations
- Over the same period, a total of 15,746 ASB investigations have been carried out in the PRS market
- Croydon made 12,172 interventions in PRS properties over a 4-year period, this was made up of proactive inspections and inspection after receiving a complaint.
- 1,307 housing and public health statutory notices have been served on noncompliant PRS properties
- 27% of PRS properties in Croydon have an E, F, and G rating. 5.5% of PRS properties have an F and G rating
- Croydon faces challenges relating to IMD Barriers to Housing and Services index. All wards are worse than the national average
- Croydon has some of the highest rates in London for evictions from rented properties (ranked 6) and statutory homelessness (ranked 7)

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Introduction & Project Objectives

Metastreet were commissioned by the London Borough of Croydon to review its housing stock with a focus on the following key areas:

- Residential property tenure changes since 2011
- Housing profile
- Distribution of the PRS
- Condition of housing stock in the PRS
- Housing related stressors, including Anti-Social Behaviour (ASB), service demand, 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 Croydon'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 Croydon, built up from property level data.

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

- Private rented sector (PRS)
- Owner occupiers
- PRS Housing hazards (Category 1)

The second section provides a short private housing policy overview for the region to determine if characteristics exist in the Borough to support any specific action.

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

1 London Borough of Croydon Overview

Croydon is a borough in outer south London. It covers an area of 87 km². It is the southernmost borough of London¹. To the north and east, the borough mainly borders the London Borough of Bromley, and in the north west the boroughs of Lambeth and Southwark. The boroughs of Sutton and Merton are located directly to the west.

1.1 Population

The Office of National Statistics (ONS) population estimate for Croydon as at 2018 was 385,346. This makes Croydon the 2nd most populous London borough (Figure 1)².

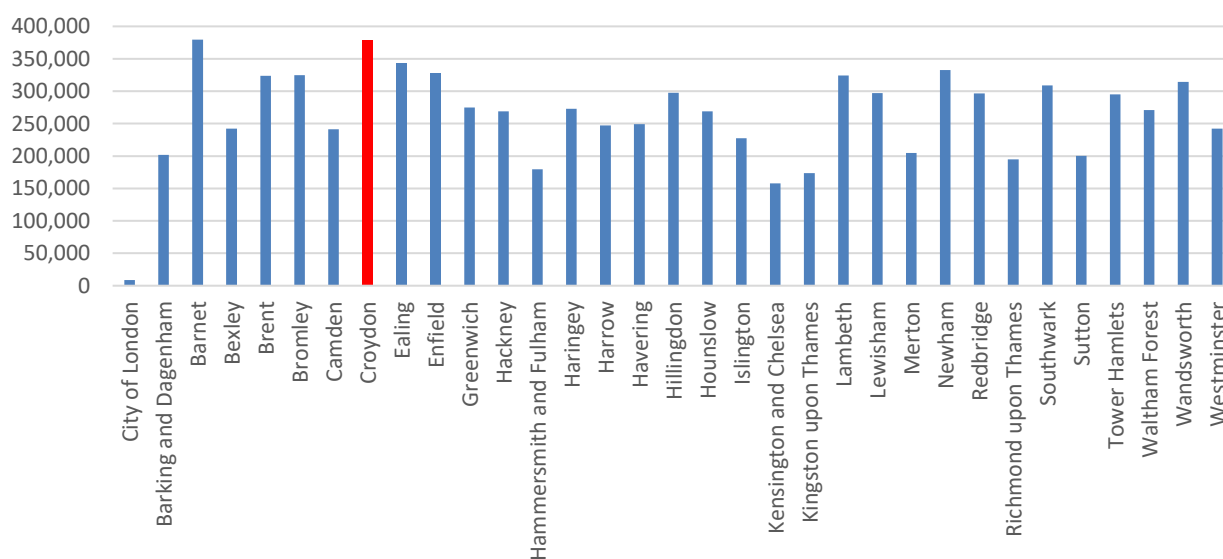


Figure 1. Population estimates by London boroughs (Source: ONS 2017).

Croydon's population has grown considerably since the early 2000's (Figure 2).

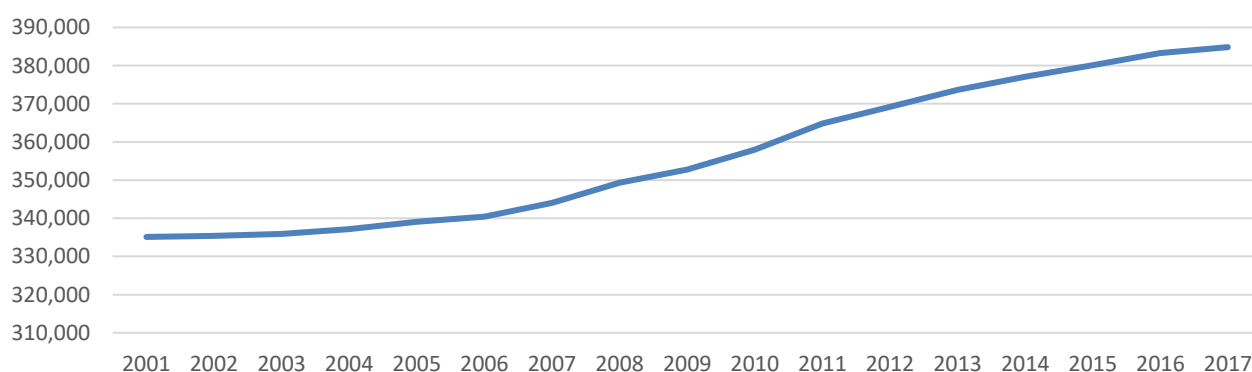


Figure 2. Population growth 2001-2017 (Source: ONS 2017).

¹ Wikipedia, November 2019, https://en.wikipedia.org/wiki/London_Borough_of_Croydon

² Population estimates 2017 ONS

Croydon population is expected to grow significantly over the next two decades (Figure 3)³.

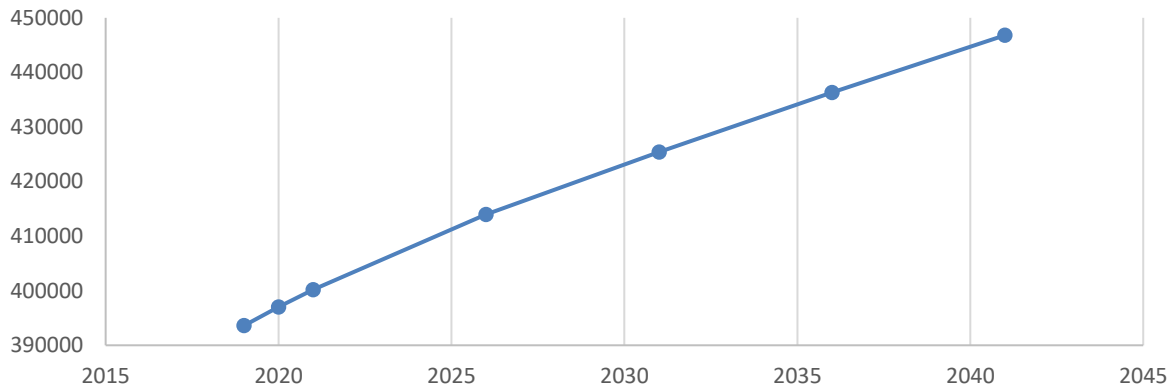


Figure 3. Population projections 2019-2025.

1.2 Migration

Net international migration into Croydon in 2015 was 2,458 (Figure 4)⁴.

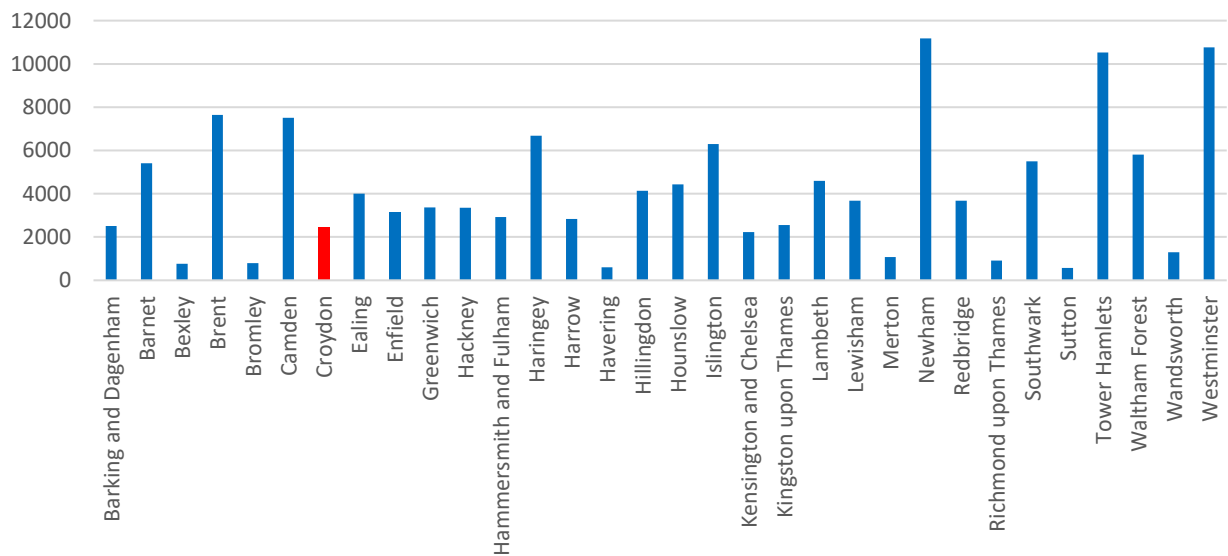


Figure 4. Net international migration by London boroughs (2015).

³ London Datastore 2016, <https://data.london.gov.uk/dataset/london-migration>

⁴ Croydon Observatory 2019, <https://www.croydonobservatory.org/population/>

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.⁵

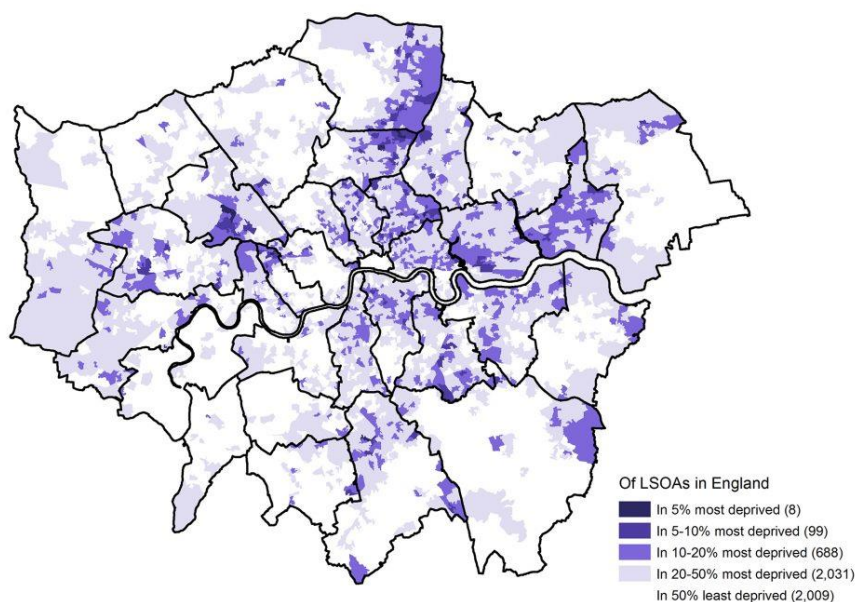


Figure 5. Distribution of deprivation across London (Source: London Datastore 2019, Map by London Datastore).

The darker shades are the most deprived areas. Croydon ranks as the 102th most deprived borough in England out of 317.

To produce the ward level data, LSOA have been matched to new wards using an Open Geoportal Portal lookup table⁶. 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.

Croydon has a mixture of high and low deprivation wards. 14 wards have aggregated IMD rankings below the national average.

⁵ ONS2019 <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>.

⁶ ONS2019 http://geoportal.statistics.gov.uk/datasets/8c05b84af48f4d25a2be35f1d984b883_0/data

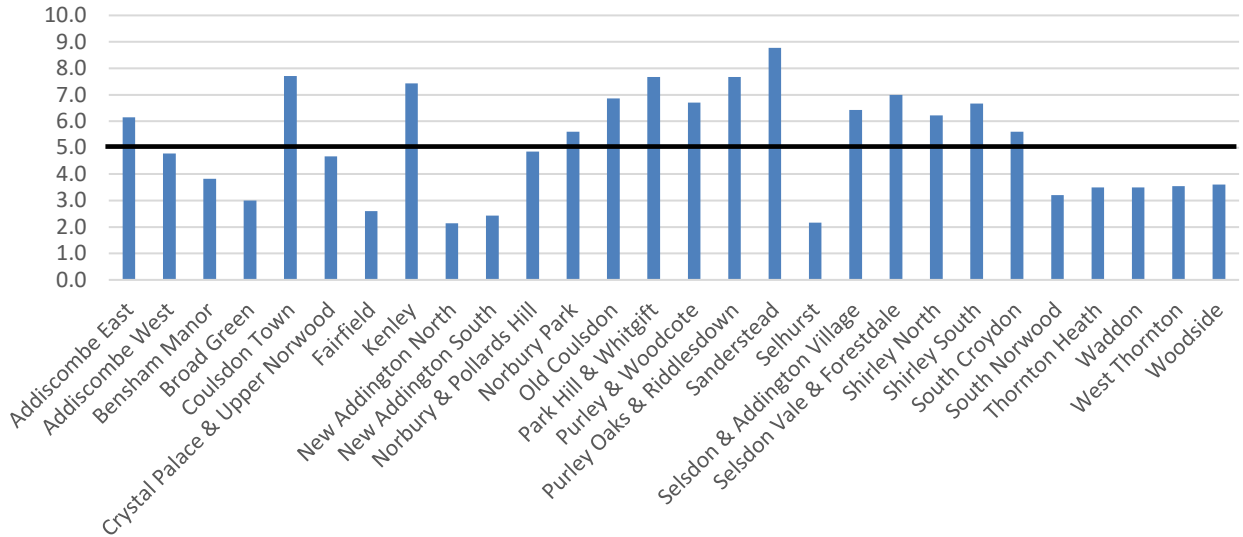
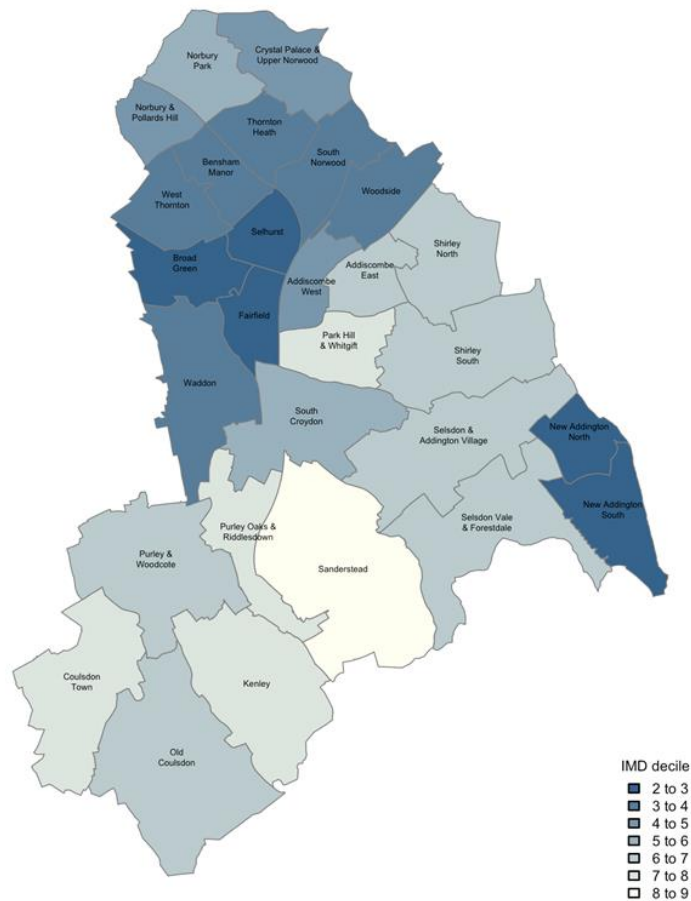


Figure 6. Average IMD (2019) decile by ward (Source: IMD 2019). Horizontal line shows the national median (5)



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

Croydon faces significant challenges relating to barriers to housing. All wards are worse than the National average (21.6) for Barriers to Housing and Services measure (Figure 7). The barriers to housing domain include indicators such as; overcrowding, homelessness and housing affordability.

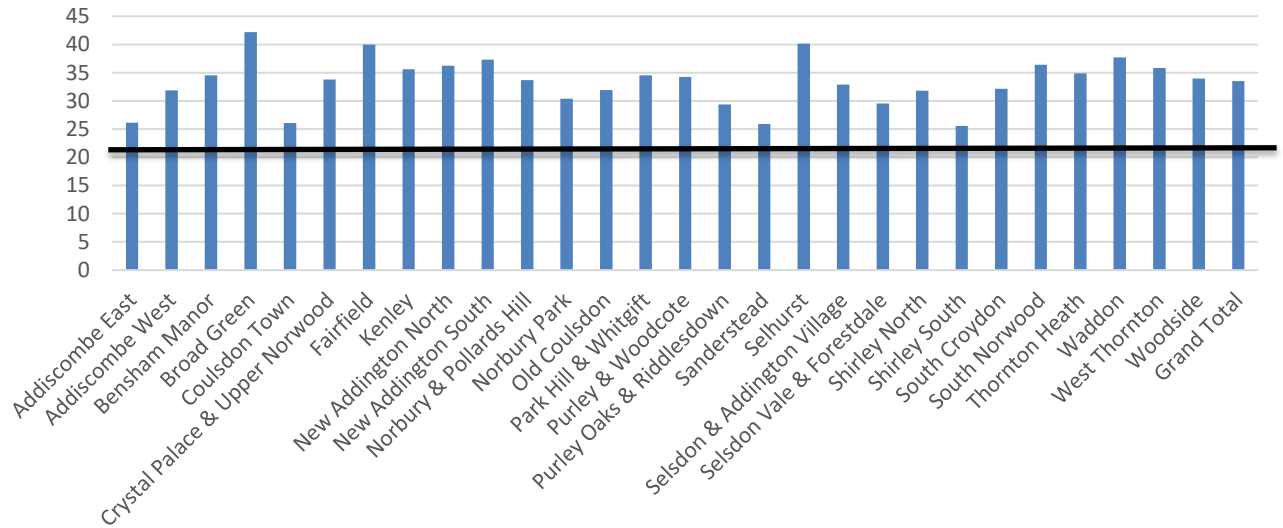


Figure 7. Average barriers to housing and services decile by ward (IMD 2019). Horizontal line shows the London mean average (21.6).

1.4 Fuel Poverty

Fuel poverty is defined by the Warm Homes and Energy Conservation Act as if he/she is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost. The fuel poverty score produced by Department for Business, Innovation & Skills (BEIS) in 2016 measure risk of fuel poverty based on 12 indicators.

The score represents a percentage of households that are of risk from fuel poverty. Croydon has a marginally higher proportion in fuel poverty than the London average (Figure 8).

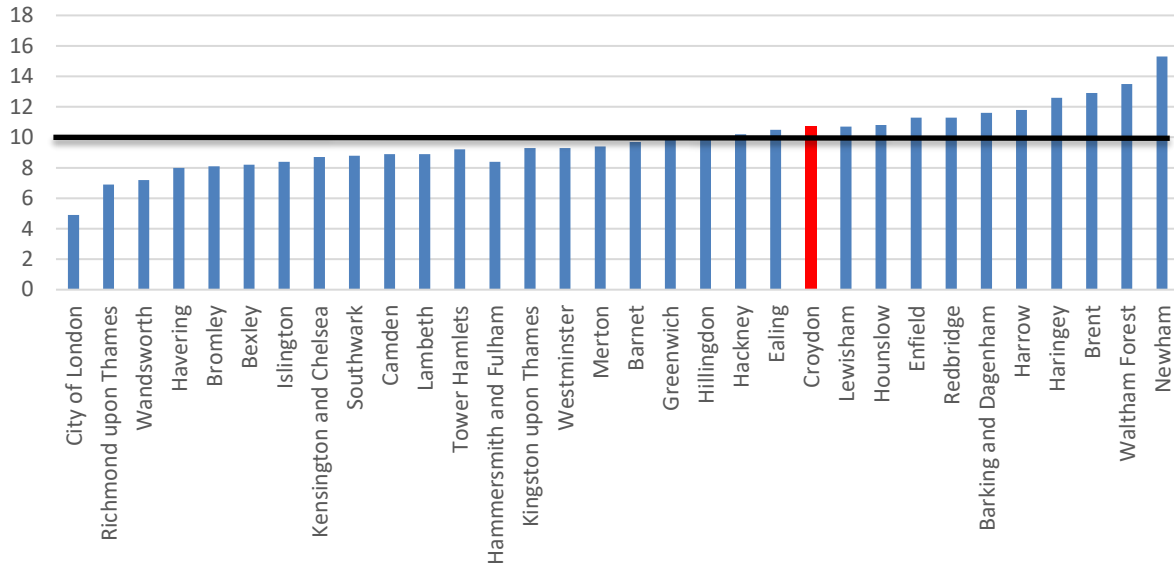


Figure 8. Proportion of households in fuel poverty (%) by borough (BEIS 2016). Horizontal line shows London average (10%).

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 PRS⁷.

The graph (Figure 9) gives estimates of the percentage of children living under the poverty line in each London borough between October and December 2015⁸. Croydon has a score considerably above the national average (31.7%).

⁷ JRT, Housing costs and poverty: private rents compared to local earnings 2018

⁸ Trust for London 2017, <https://www.trustforlondon.org.uk/data/child-poverty-and-housing-tenure/>

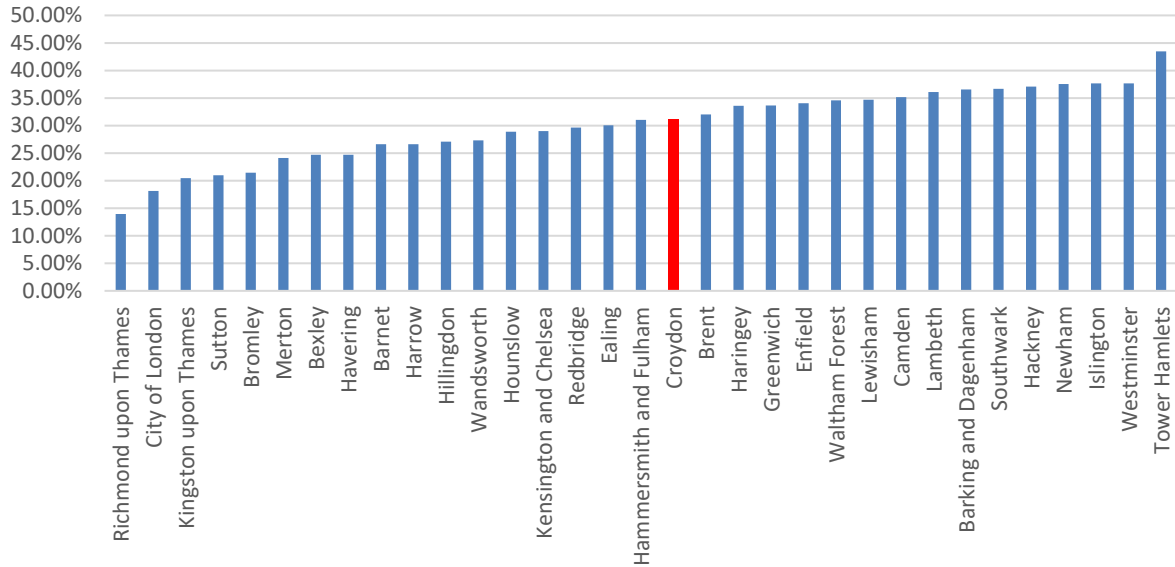


Figure 9. Child poverty score by borough (Source: Trust for London 2016). Horizontal line shows England average (17%)

1.6 Possession order rates

Croydon has the 6th highest possession order rate in London, with 18.4 orders per every 1,000 renting households⁹ (Figure 10). The average possession order rate for London is 11.5 per every 1,000 households (2017/18).

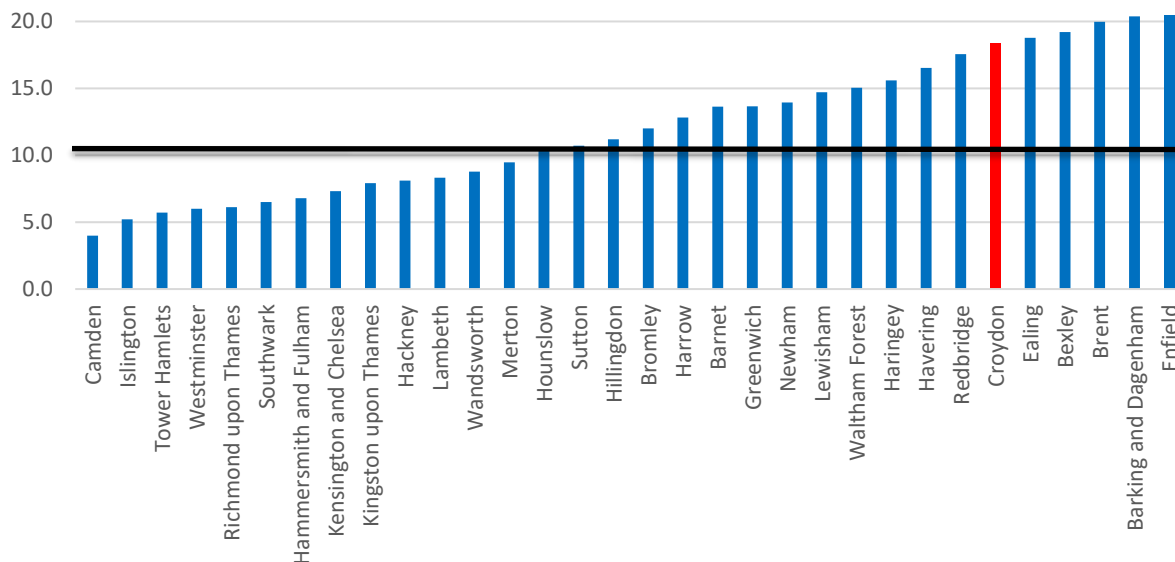


Figure 10. Possession order rates for renters by London boroughs (MoJ 2017/18). Horizontal line shows London average (11.5%)

⁹ MoJ Possession order rates across London (2017/18)

Eviction rates are higher in boroughs with high numbers of families with children living in the private rental sector receiving housing benefit¹⁰. Between 2015-2019 Croydon received 56,160 housing benefit applications (Ti 2019).

1.7 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 2016/17 financial year show Croydon has the 7th highest homelessness acceptance rates in London (Figure 11)¹¹.

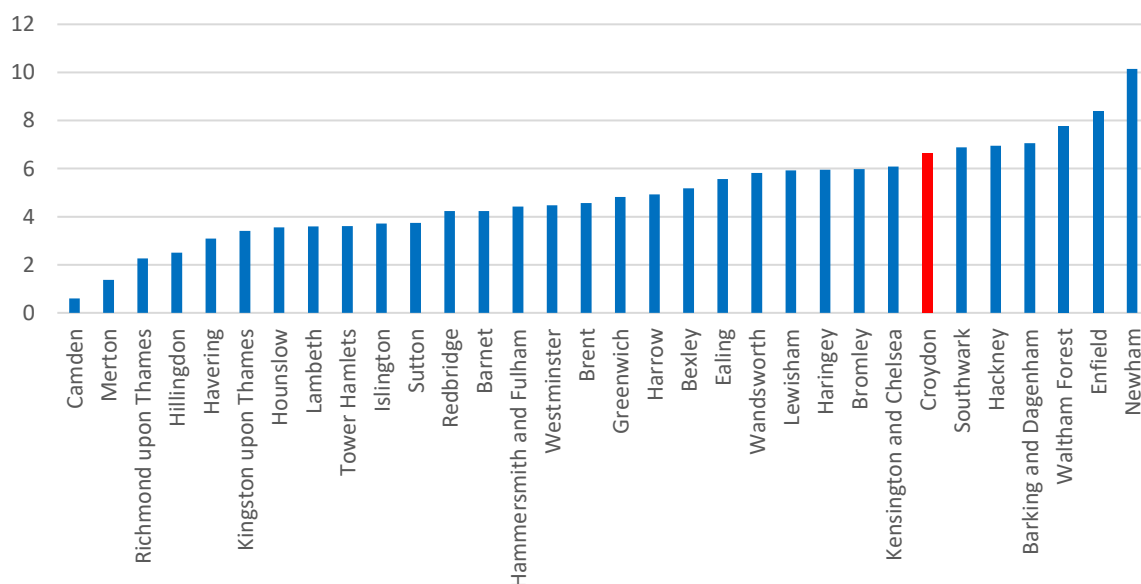


Figure 11. Homelessness acceptances per 1,000 households by London borough (Source: MHCLG 2016/17)

1.8 Rents and Affordability

Private rents vary by borough. As this report is concerned with housing conditions and other housing stressors, we have looked at the lower quartile (bottom 25%) of earnings as a percentage of rents. 55% of earnings for the lowest quartile of workers is used to pay rent (Figure 12)¹².

¹⁰ Trust for London Borough Profile,

¹¹ London data store, original source MHCLG 2016/17

¹² Valuation Office Agency (VOA), Private rental market summary statistics: 2018

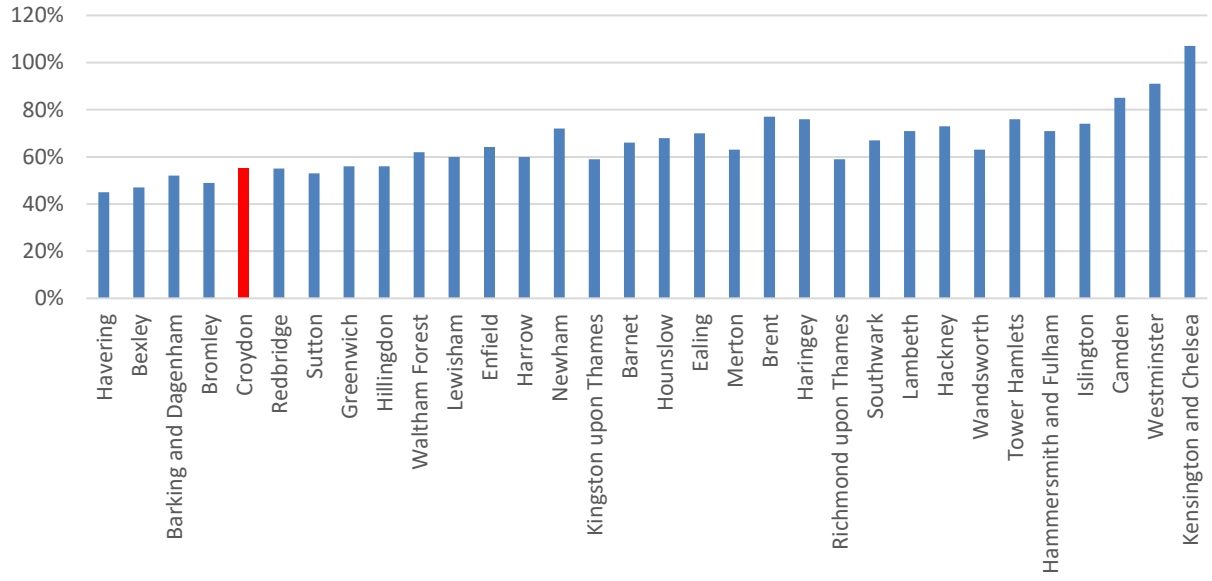


Figure 12. Rent as a proportion of lower quartile monthly gross earnings (Source: VOA 2018).

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 164,378 unique property references (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, 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 four consecutive years, from April 2015 – March 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 Croydon 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 Croydon 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 Croydon has grown significantly since 2006.

Based on tenure modelling, Croydon's PRS is now calculated to be 35.6% of housing stock (Figure 13). This compares to 16.1% of households in 2006 and 17.1% in 2011 (ONS). This represents a 121% increase over the last 13 years. The growth of the PRS has come mostly from a reduction in owner occupation, from 67% (2006) to 49% (2019) (Figure 14).

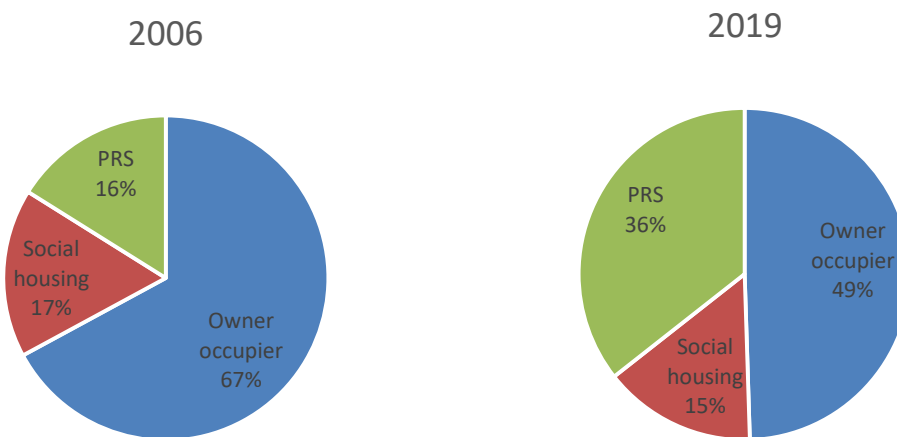


Figure 13. Tenure profile 2006 & 2019 (Source: ONS & Metastreet Ti model).

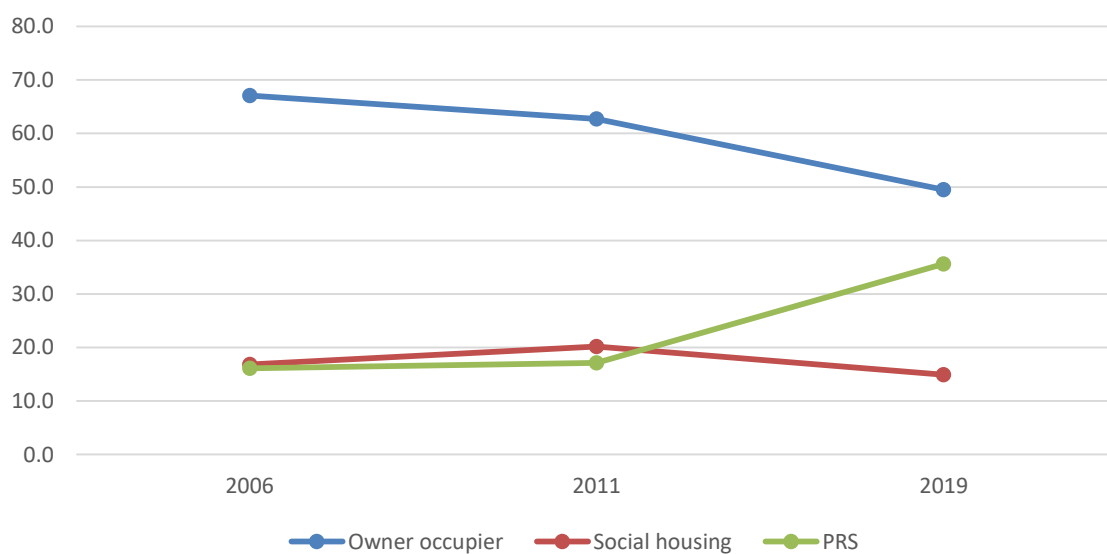


Figure 14. PRS as a percentage of total housing stock, 2006, 2011 & 2019 (Source: ONS & Ti 2019).

This increase is part of a nationwide and regional trend. The PRS in the UK has grown from 9.4% of housing stock in 2000¹³. 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 landlords¹⁴.

The PRS in Croydon is distributed across all 28 wards (Figure 15). The number of PRS per ward ranges from 4,792(Fairfield) to 570 (Old Coulsdon).

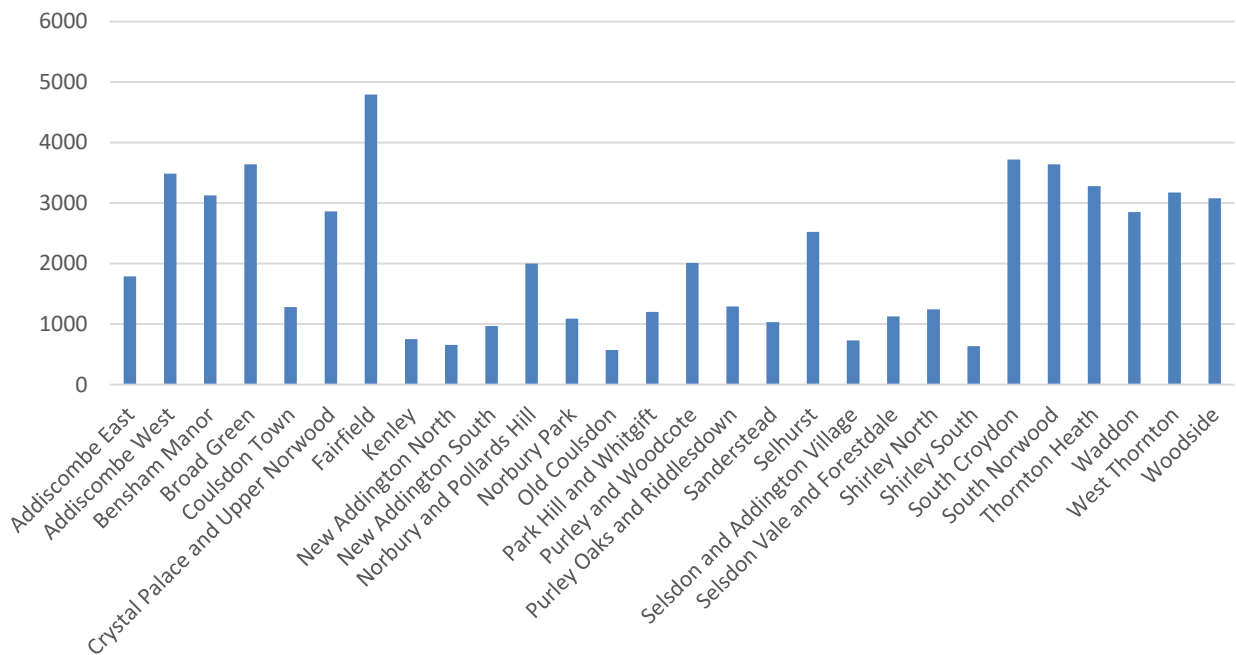


Figure 15. Number of PRS dwellings by ward (Source: Ti 2019).

The percentage of PRS properties in each ward ranges between 56.8% (Fairfield) and 14.2% (Old Coulsdon) (Figure 16). Therefore, 22 out of 28 Croydon wards have a higher percentage PRS than the national average (19% 2019).

¹³ The profile of UK private landlords Scanlon K & Woodhead C CML research. LSE London. December 2017 www.cml.org.uk

¹⁴ Landlord Licensing. Interim report-overview of the incidence and cost of HMO & discretionary schemes in England. February 2015. www.landlords.org.uk

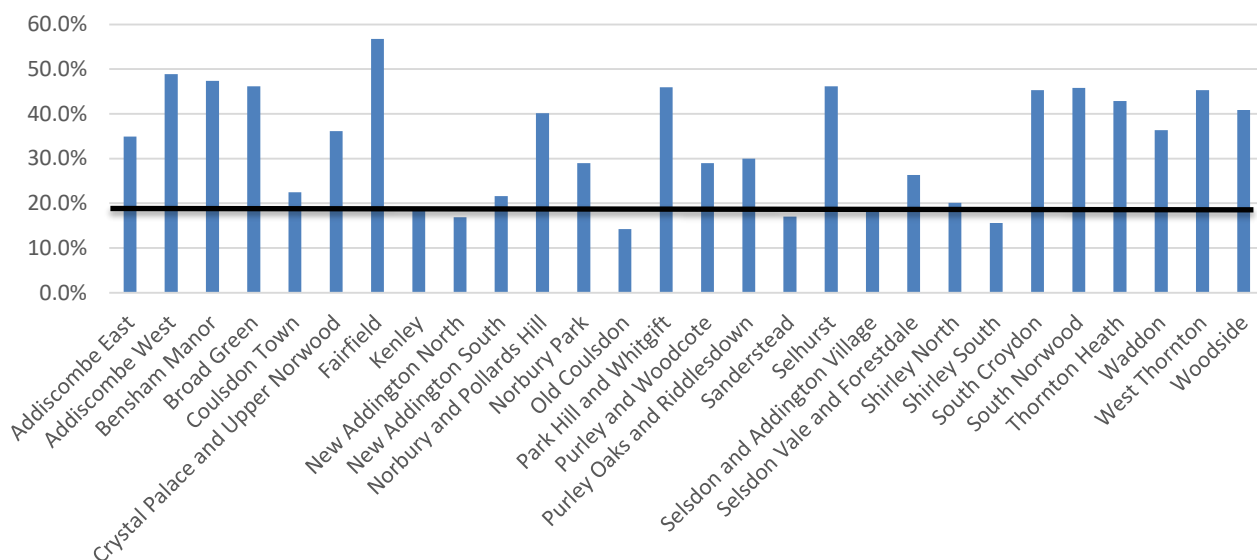


Figure 16. Percentage of PRS dwellings by each ward (Source Ti 2019). Black line represents national average in 2019 (19%).

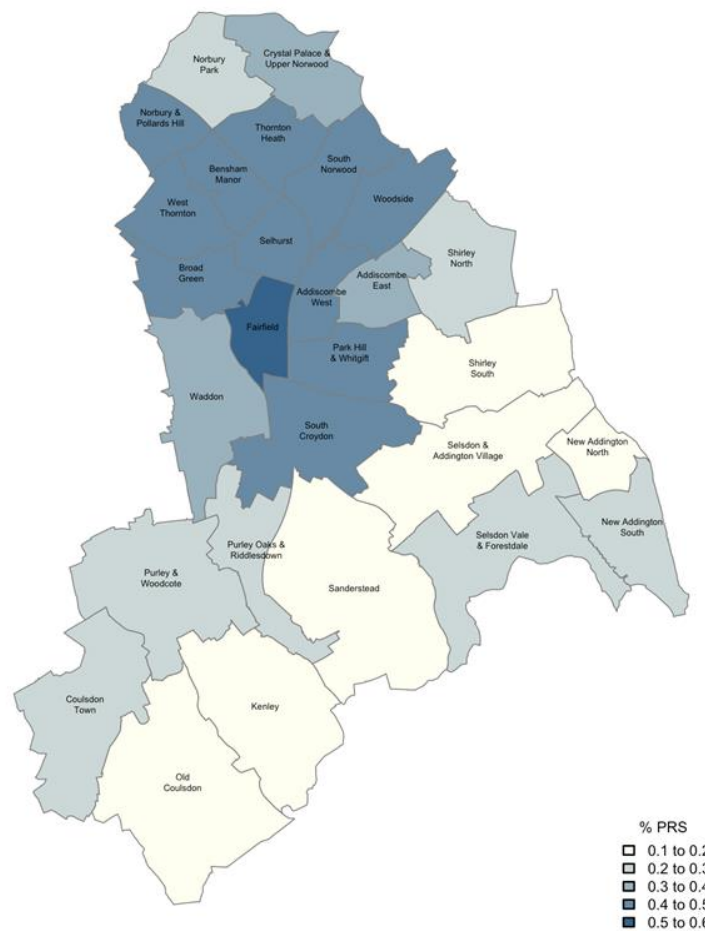
Table 1 shows the total PRS in each ward and the percentage PRS compared to the total housing stock.

Table 1. Percentage and number of PRS properties by ward (Source Ti 2019).

Ward	% PRS	No. PRS
Addiscombe East	34.9%	1,790
Addiscombe West	48.9%	3,488
Bensham Manor	47.4%	3,125
Broad Green	46.2%	3,638
Coulsdon Town	22.4%	1,281
Crystal Palace and Upper Norwood	36.1%	2,860
Fairfield	56.8%	4,792
Kenley	18.3%	754
New Addington North	16.9%	656
New Addington South	21.6%	969
Norbury and Pollards Hill	40.1%	2,002
Norbury Park	28.9%	1,092
Old Coulsdon	14.2%	570
Park Hill and Whitgift	45.9%	1,202
Purley and Woodcote	29.0%	2,011
Purley Oaks and Riddlesdown	30.0%	1,291
Sanderstead	17.0%	1,032
Selhurst	46.2%	2,525
Selsdon and Addington Village	18.2%	731

Selsdon Vale and Forestdale	26.4%	1,126
Shirley North	20.1%	1,242
Shirley South	15.6%	638
South Croydon	45.3%	3,718
South Norwood	45.8%	3,640
Thornton Heath	42.9%	3,278
Waddon	36.4%	2,850
West Thornton	45.3%	3,175
Woodside	40.9%	3,077

PRS properties are widely distributed across the borough, with higher concentrations in the northern wards (Map 2Error! Reference source not found.).



Map 2. PRS properties as percentage of dwellings in Croydon (Source: TI 2019, map by Metastreet).

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 and may result in medical treatment.¹⁵

In 2017, 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%)¹⁶. 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 1980¹⁷.

A council's property age profile can have an impact on housing conditions. Croydon has a high number of residential properties built pre 1900 and between the world wars (Figure 17).

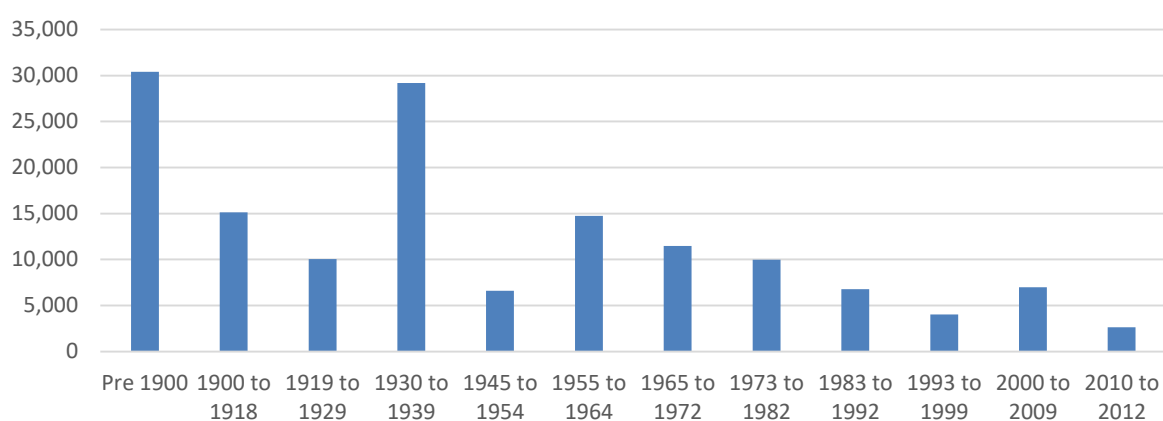


Figure 17. Age profile of Housing stock for all tenures (Source: VOA 2018).

A borough's property type profile offers an indication of housing density, construction type and other social economic indicators. Property types in Croydon are shown in Figure 18. The most common property type flats (36.7%), while bungalows are the least common property type (2.5%)

¹⁵ Housing Health and Rating System, Operation Guidance, 2006, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

¹⁶ MHCLG Private rented sector 2017-18 English Housing survey Headline Report, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/834603/2017-18_EHS_Headline_Report.pdf

¹⁷ Housing Health and Rating System, Operation Guidance, 2006, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

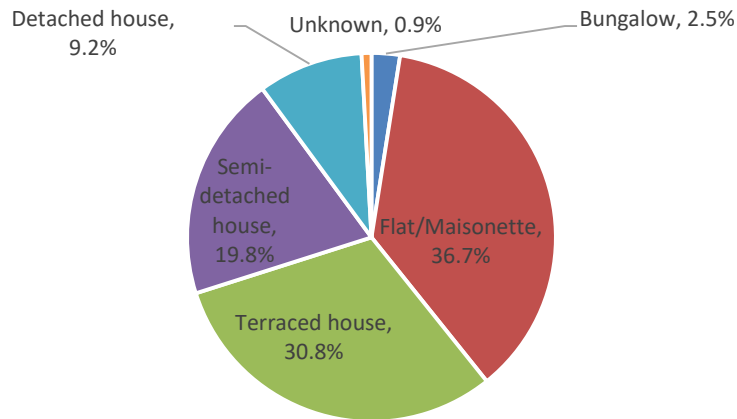


Figure 18. Property type as a percent of total (Source: VOA 2018).

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 19).

There are 12,596 private rental properties in Croydon that are likely to have a serious home hazard (Category 1, HHSRS). PRS properties with serious hazards are distributed across the borough. Thornton Heath (1,012) and South Norwood have the highest number of properties with at least 1 Category 1 hazard.

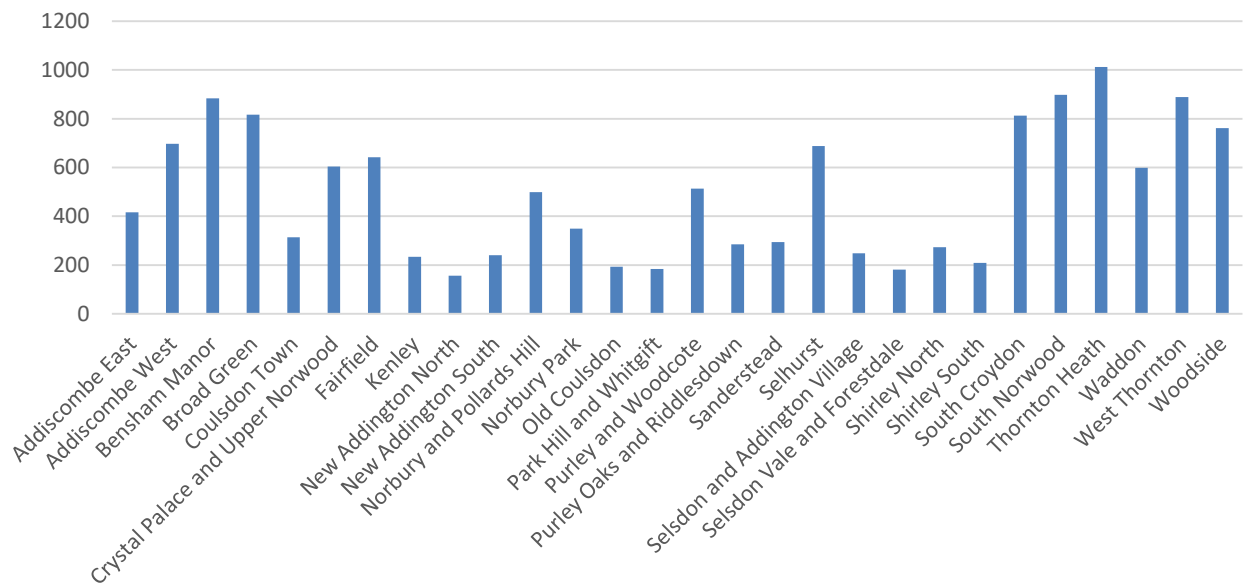
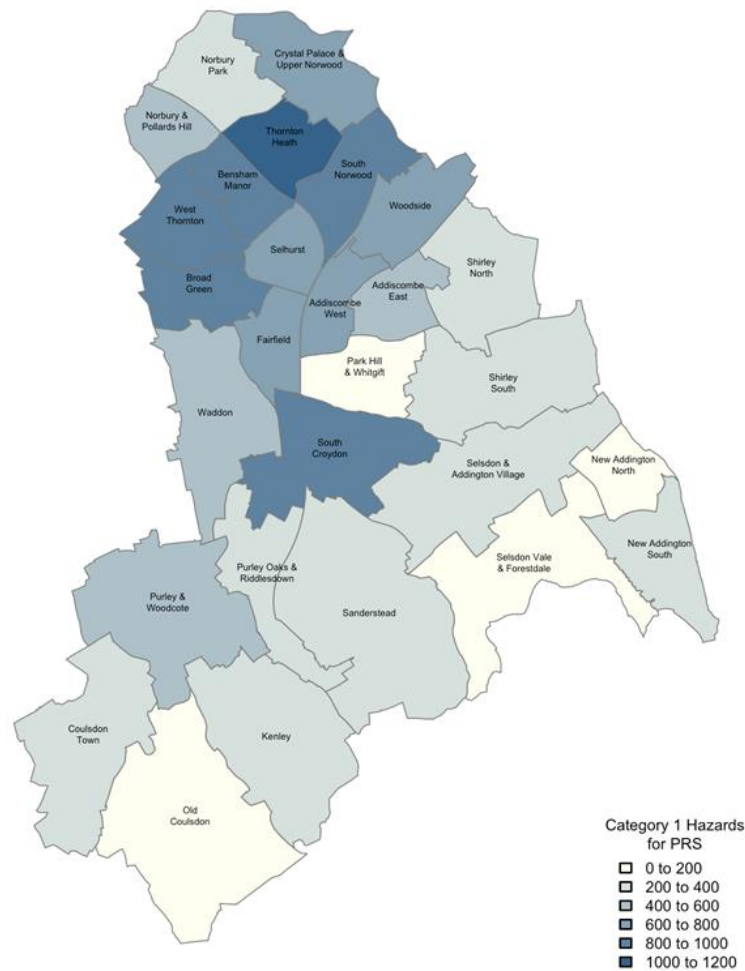


Figure 19. Predicted number of Category 1 hazards by ward (Source: Ti 2019).

Category 1 hazards in the PRS are distributed across the whole borough (Map 3). Concentrations of properties with serious hazards can be found in the central and northern wards.



Map 3. Distribution of PRS properties with category 1 hazards (Source: Ti 2019, map by Metastreet).

The rates of Category 1 hazards per 1,000 PRS properties reveals a wide distribution across Croydon (Figure 20). Although Old Coulsdon and Selsdon and Addington Village wards have the smallest PRS populations, they have the highest rate of properties with Category 1 hazards.

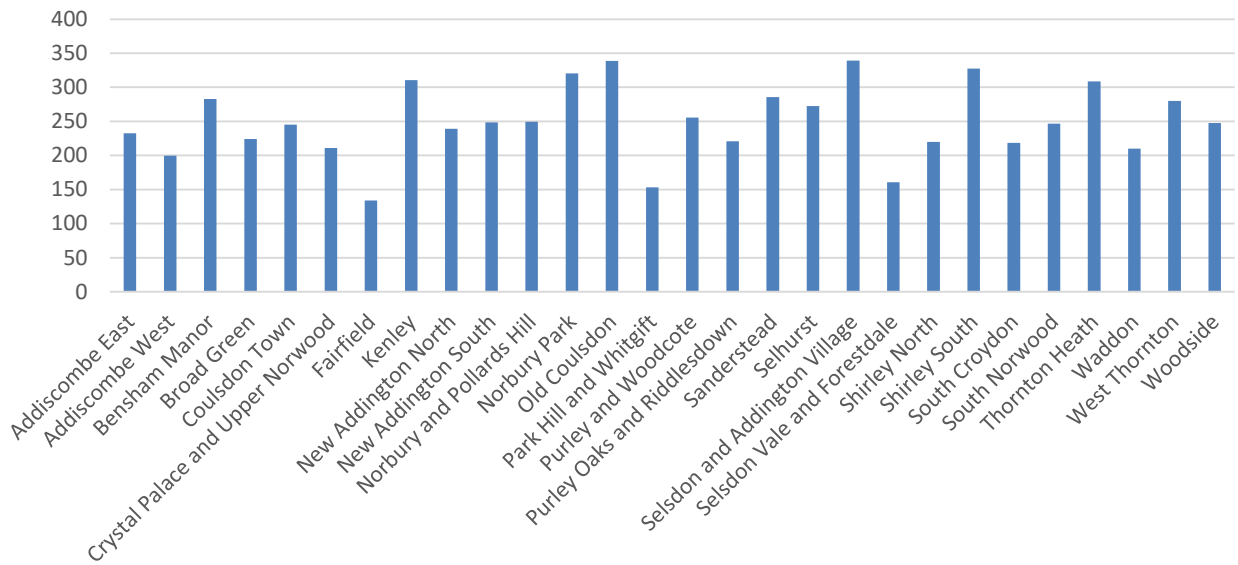


Figure 20. Rates per 1,000 PRS properties of predicted Category 1 hazards by ward (Source: Ti 2019).

Complaints made by PRS tenants to the council about poor property conditions and inadequate are a direct indicator of low quality PRS. Croydon received 4,646 complaints from tenants over a 4-year period (Figure 21).

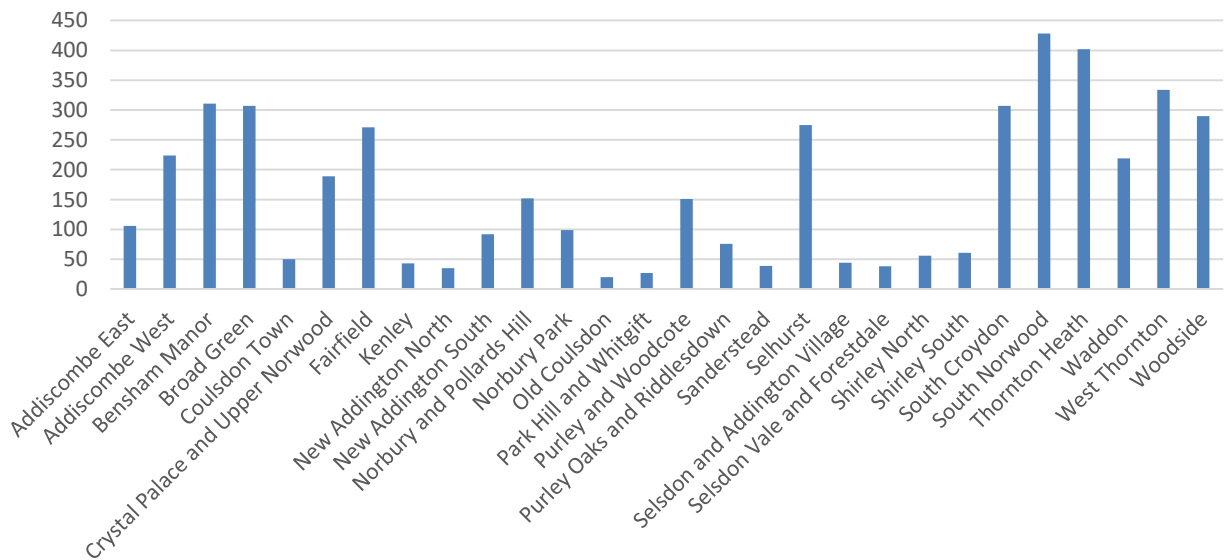


Figure 21. PRS disrepair complaints made by private tenants to the Council (2015-19) (Source Ti 2019).

An EPC rating is an assessment of a property's energy efficiency. It's 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 29,659 ratings were matched to PRS properties (Figure 22). All figures have been modelled from this this group.

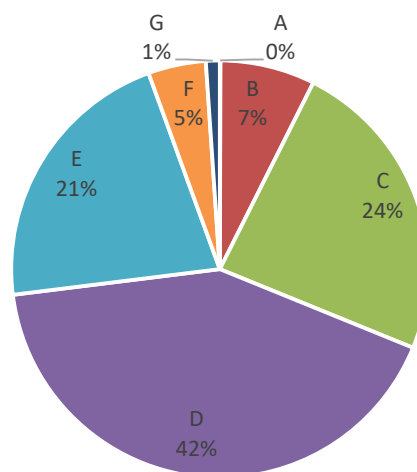


Figure 22. Distribution of Energy Performance Certificate ratings in PRS (Rating A-G) (Source: Ti 2019).

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. It has been calculated that 27% of PRS properties in Croydon have an E, F, and G rating. 5.5% of PRS properties have an F and G rating (Figure 22). Extrapolated to the entire PRS, 3,222 PRS 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 death¹⁸. The colder the dwelling, the greater the risk. The

¹⁸ Housing Health and Rating System, Operation Guidance, 2006
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

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 1980¹⁹. 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 by council

Croydon uses a range of statutory housing and public health notices to address poor housing standards in the PRS. These are often as a result of a complaint being made by a tenant about their accommodation. Over a 4-year period (2015-19) this resulted in 1,307 housing and public health notices (Figure 23).

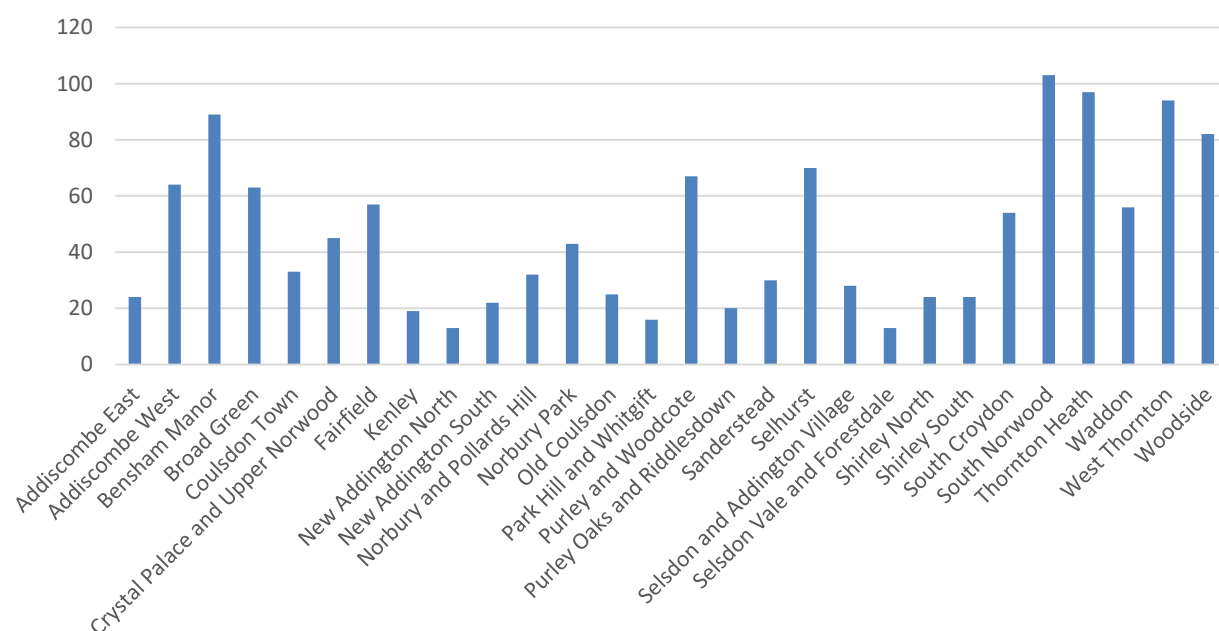


Figure 23. Housing and public health notices served on PRS properties by ward (Source: Ti 2019).

Part of the housing conditions review is to report on council intervention and service requests in the private rented sector. These include proactive and reactive inspections of residential properties by council officers to identify poor housing standards. Property licensing has been used in Croydon to maximise the effectiveness of interventions made.

Croydon made 12,172 interventions in PRS properties over a 4-year period, this was made up of proactive inspections and inspection after receiving a complaint. Thornton Heath (914) and West

¹⁹ Housing Health and Rating System, Operation Guidance, 2006
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15810/142631.pdf

Thornton (804) received the greatest number of council service requests relating to PRS housing standards (Figure 24 & Map 4).

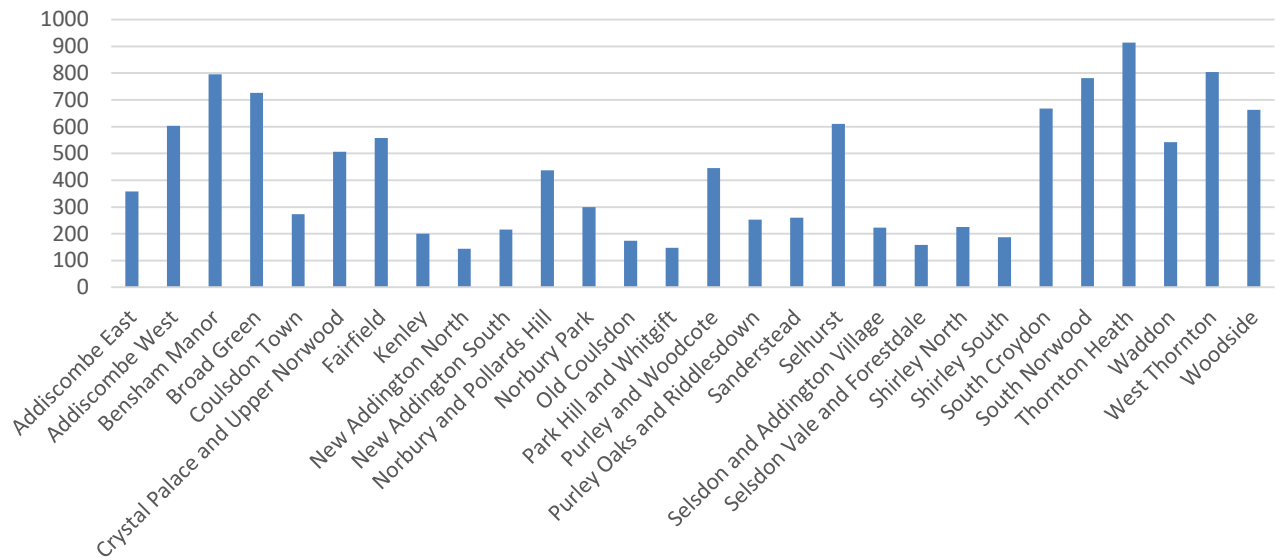
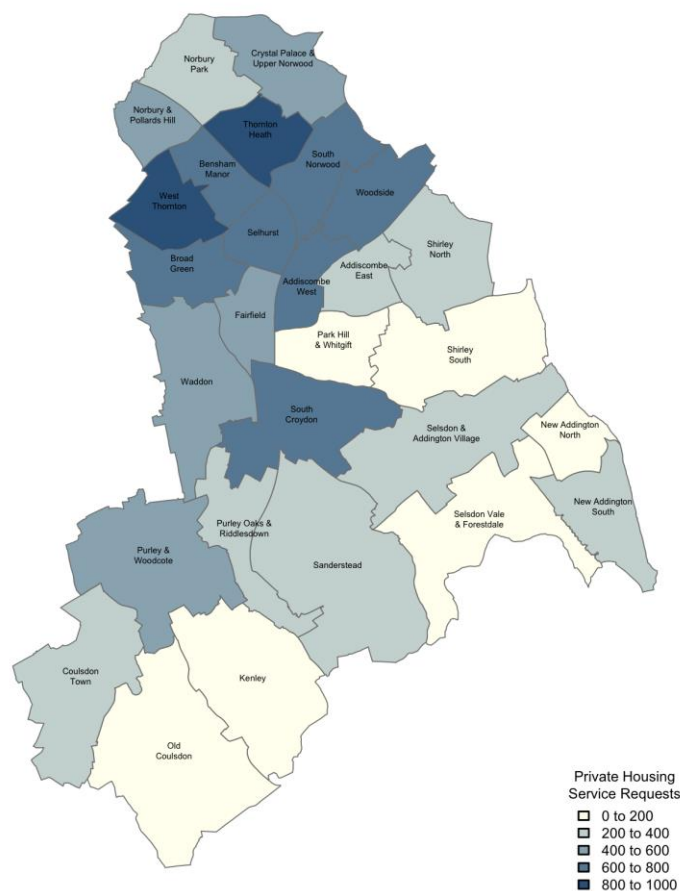


Figure 24. PRS visits and interventions by ward (Source: Ti 2019).



Map 4. Distribution of PRS interventions in Croydon (Source: Ti 2019, Map by Metastreet).

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's 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 investigated by a council officer have been included.

Private rented properties have high levels of ASB investigations (Figure 25). Over a 4-year period (2015-19), 7,285 PRS properties have been subject to one or more ASB investigations. ASB investigation represent a fraction of the total ASB incidents, as not all incident result in an investigation. Thornton Heath (503), has the highest levels and Park Hill and Whitgift (92) has the lowest level of PRS ASB investigations.

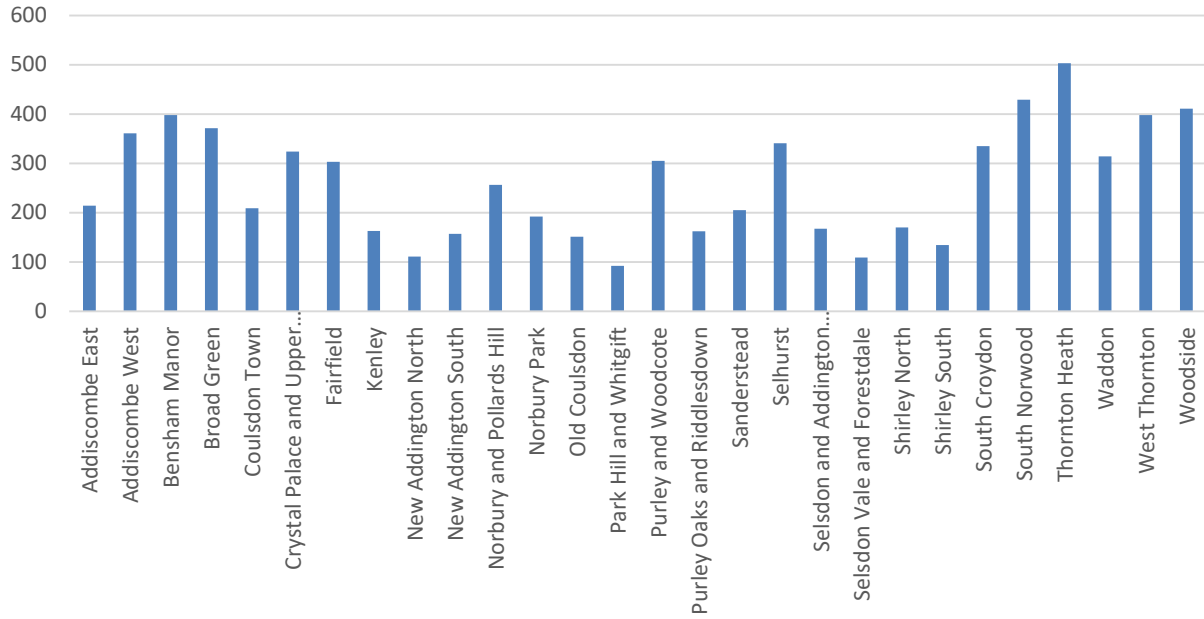


Figure 25. PRS properties subject to one or more ASB investigations (Source Ti 2019).

Between 2015-2019 a total of **15,746** ASB investigation were carried out by Croydon Council linked to PRS properties. Thornton Heath (1,176) has the highest number of ASB investigations.

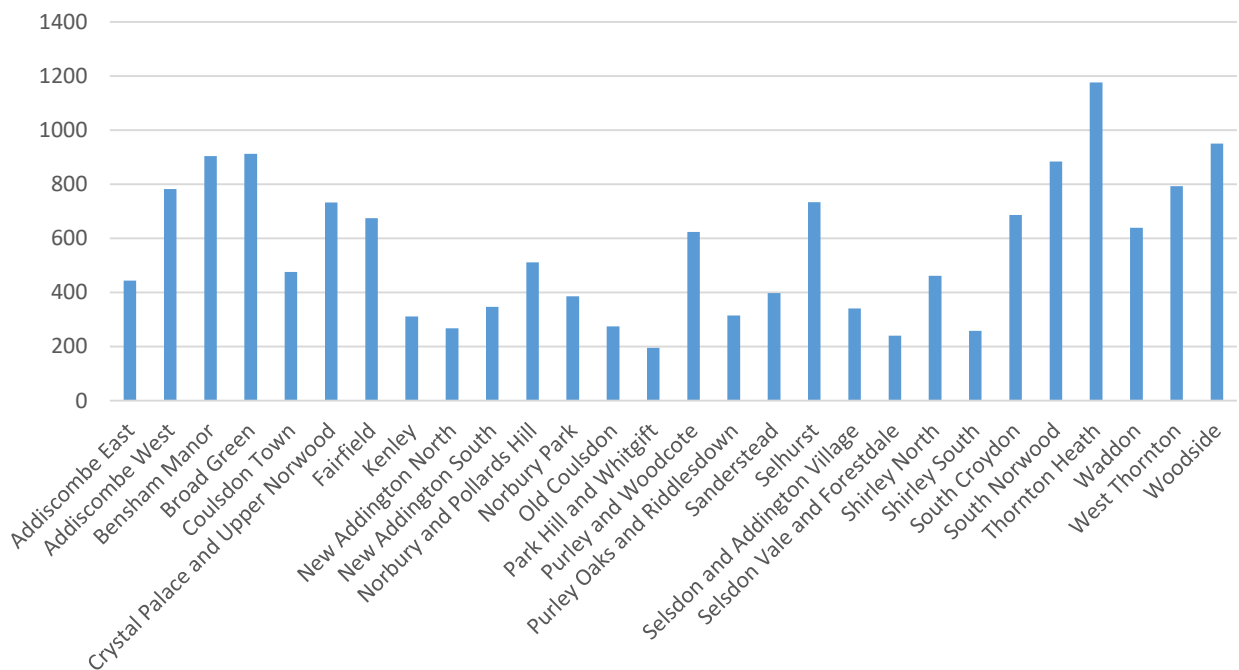


Figure 26. Total ASB investigations linked to PRS properties by ward (Source Ti 2019).

ASB in the PRS expressed as investigations per 1000 dwellings, shows a similar distribution across all wards (Figure 27). Using this measure, Old Coulsdon (265 per 1000) and Selsdon and Addington Village (288 per 1000) wards have the greatest number of ASB investigations proportional to the size of the PRS.

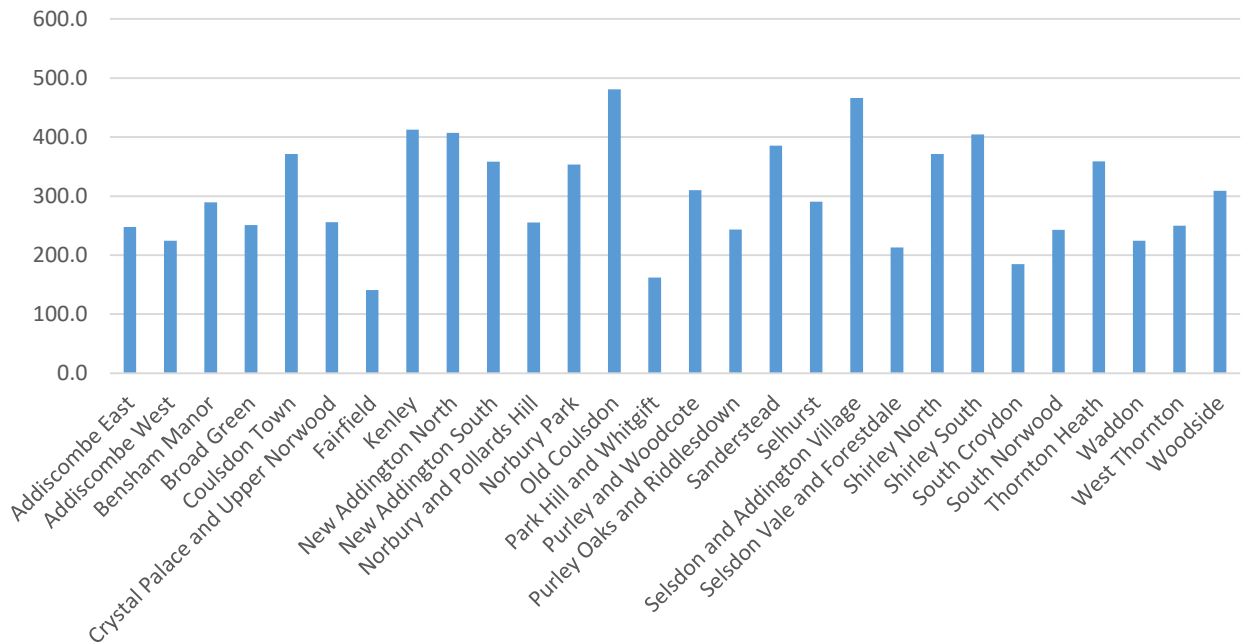
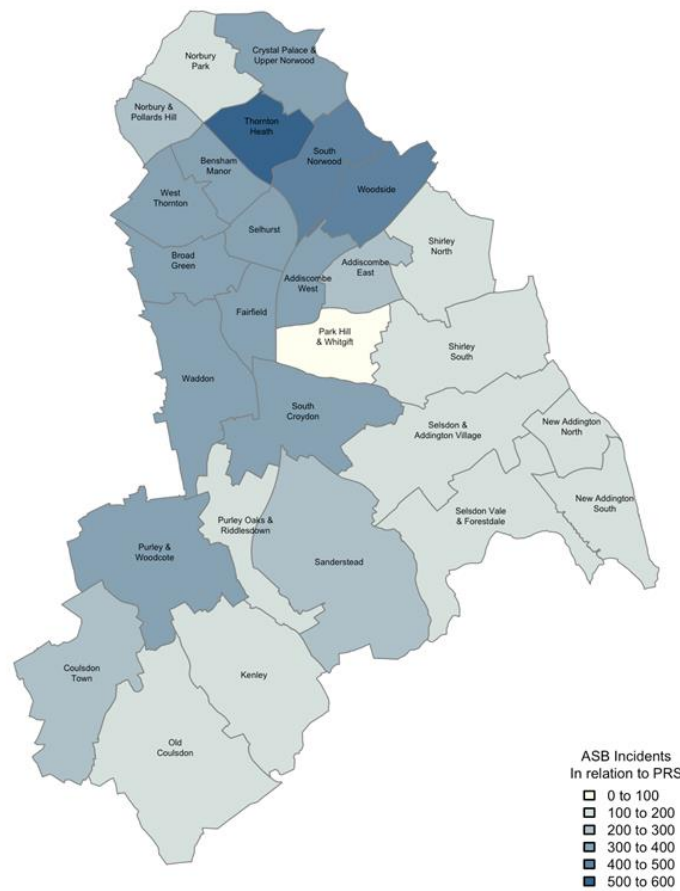


Figure 27. ASB investigations linked to PRS per 1000 properties by ward (Source: Ti 2019).

PRS properties subject to one or more ASB investigations across Croydon are shown in Map 5.



Map 5. PRS properties subject to one or more ASB investigations (Source: Ti 2019, Map by Metastreet).

Recorded ASB investigations in the PRS have been split into two types. Noise (95%) and other ASB (5%) (Figure 28). Other ASB category includes, verbal abuse, harassment, intimidation, nuisance animals, nuisance vehicles, drugs and substance misuse, domestic violence, rubbish and fly tipping. All incidents are directly linked to PRS properties.

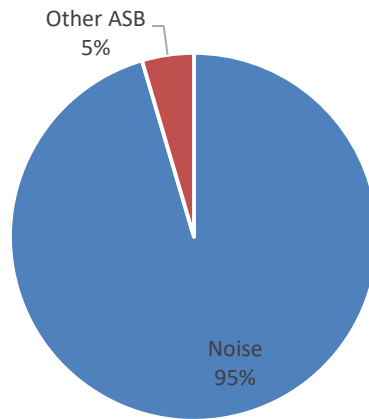


Figure 28. Types of ASB linked to PRS properties (Source: Ti 2019).

2.2.5 PRS and financial vulnerability

Housing benefit payments related to the PRS can be an indicator of financially vulnerable households and deprivation. Croydon administered 56,160 housing benefit claims relating to PRS households between 2015-2019 (Figure 29). Housing benefit payments are distributed across all wards.

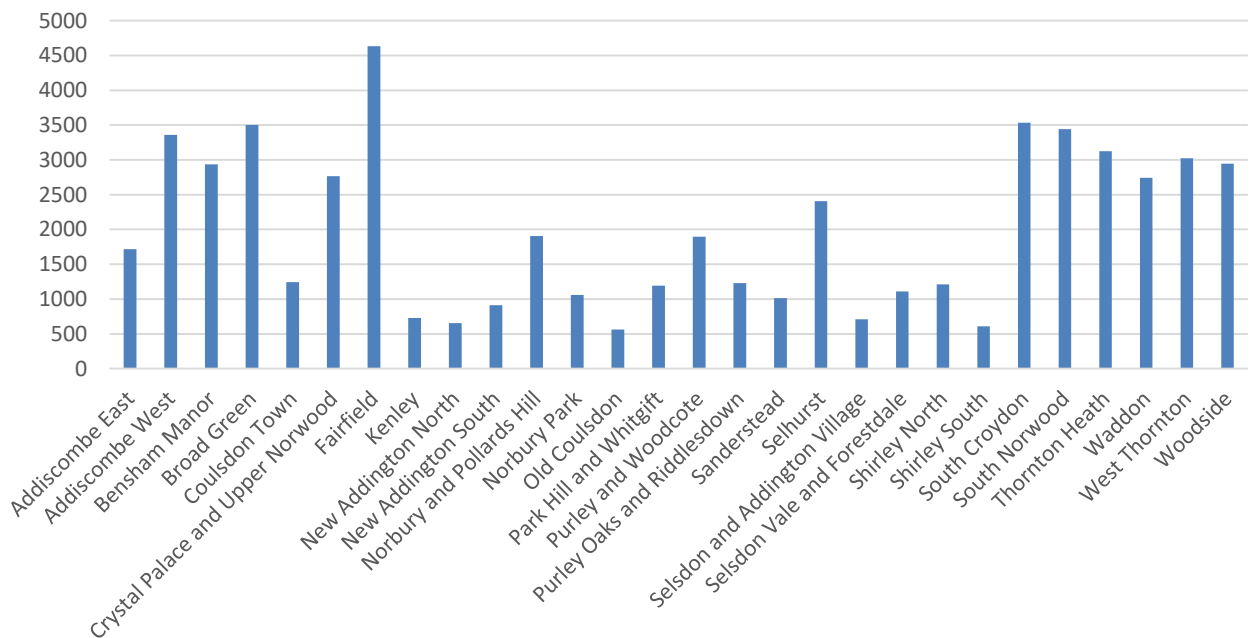


Figure 29. PRS housing benefit payments by ward (Source: Ti 2019).

3 Policy Context

3.1 PRS Strategy across London

Rapid PRS growth has been seen across London over the last 15 years. The policy response has generally been for greater regulation of the market through property licensing to mitigate some of the concerns that accompany large and growing PRS populations (Table 2).

Table 2. Overview of the PRS and property licensing across London.

Borough	No. PRS	% PRS	Selective Licensing (Y/N)	Additional Licensing (Y/N)	Notes
L.B. Haringey	36,000	34%	No	Yes	Additional licensing introduced in 2019 borough wide
L.B Newham	52,000	47%	Yes	Yes	Borough wide additional and selective licensing introduced in 2013, renewed in 2017 excluding Olympic Park area.
L.B. Havering	30,215	29%	No	Yes	Additional licensing introduced in 2018 in 12 of 18 wards
L.B. Croydon	58,585	35.6%	Yes	No	Borough wide selective licensing, due for renewal in 2020.
L.B. Enfield	43,500	34%	No	No	Currently proposing a borough wide additional licensing and large selective scheme
L.B Barking and Dagenham	21,000	28%	Yes	Yes	Borough wide selective licensing introduced in 2014, Renewed in 2019.
L.B. Waltham Forest	38,000	39%	Yes	No	Borough wide licensing introduced in 2015, currently under renewal process
Westminster C.C.	55,784	44%	No	No	Currently no discretionary property licensing
L.B. Redbridge	30,000	30%	Yes	Yes	Borough wide additional and 78% Selective introduced in 2016

L.B. Islington	25,217	27%	No	No	Proposed borough wide additional and ward based selective.
L.B. Brent	35,000	32%	Yes	Yes	Borough wide additional, ward based selective.
L.B Camden	NA	32.2%	No	Yes	Borough-wide additional licensing.
L.B Southwark	42,000	29.3%	Yes	Yes	Borough wide additional, area based selective.
L.B. Hammersmith & Fulham	NA	33%	Yes	Yes	Borough wide additional, area based selective.

*Additional licensing - relates to small HMOs only (3&4 person) **Selective licensing - related to all private single-family dwellings

4 Conclusions

Croydon's PRS has grown rapidly in recent years, from 16% (2006) to 35.6% (2019).

There are a total of 164,378 residential properties in Croydon, 35.6% (58,585) of which are PRS, 49.5% (81,300) are owner occupied and 14.9% (24,493) socially rented (Figure 13). The PRS in Croydon is distributed across all 28 wards (Figure 15 & Map 4). Croydon is likely to have one of the largest PRS populations of any housing authority in England.

Poor housing conditions are prevalent in the PRS. **13,896** PRS properties are predicted to have at least 1 serious hazard (Category 1, HHSRS). This represents 23.7% of the PRS stock, double the national average (14%). (Figure 19 & Map 3).

There are significant levels of ASB linked to private rented properties across the borough (Figure 25). Over the last 4 financial years, **7,285** PRS properties have been subject to one or more ASB investigations. A total of **15,746** ASB investigations were carried out by Croydon Council linked to PRS properties. PRS properties are significantly more likely have an ASB incident compared to owner occupied properties. Most ASB incidents are domestic noise.

Croydon makes large numbers of PRS interventions. (Figure 24 & Map 4). Council officers carried out 12,172 interventions in PRS properties over a 4-year period, this was made up of proactive inspections and inspection after receiving a complaint. This resulted in 1,307 housing and public health notices. (Figure 23).

27% of PRS properties in Croydon have an E, F, and G rating. 5.5% of PRS properties have an F and G rating (Figure 22). Extrapolated to the entire PRS, 3,222 PRS properties are likely to fail the MEES statutory minimum requirement.

Possession orders, homelessness, deprivation and child poverty are linked with the growth of the PRS. Croydon has some of the highest rates in London for evictions from rented properties as a result of a possession order (ranked 6, Figure 10) and statutory homelessness (ranked 7, Figure 11). Croydon faces challenges relating to IMD Barriers to Housing and Services index. All wards are worse than the national average

Appendix 1 – Ward summaries

Table 3. Ward summary overview (Source Tf 2019).

Ward	Summary (All council data is 4 consecutive years, April 2015 - March 2019)	
Addiscombe East	Total residential stock	5,126
	% PRS	34.9%
	No. PRS	1,790
	No. ASB incidents	214
	No. Category 1 hazards	416
Addiscombe West	Total residential stock	7,138
	% PRS	48.9%
	No. PRS	3,488
	No. ASB incidents	361
	No. Category 1 hazards	697
Bensham Manor	Total residential stock	6,595
	% PRS	47.4%
	No. PRS	3,125
	No. ASB incidents	398
	No. Category 1 hazards	884
Broad Green	Total residential stock	7,879
	% PRS	46.2%
	No. PRS	3,638
	No. ASB incidents	371
	No. Category 1 hazards	816
Coulsdon Town	Total residential stock	5712
	% PRS	22.4%
	No. PRS	1,281
	No. ASB incidents	209
	No. Category 1 hazards	314
Crystal Palace and Upper Norwood	Total residential stock	7,921
	% PRS	36.1%
	No. PRS	2,860
	No. ASB incidents	324
	No. Category 1 hazards	604
Fairfield	Total residential stock	8,613
	% PRS	56.8%
	No. PRS	4,792
	No. ASB incidents	303
	No. Category 1 hazards	642
Kenley	Total residential stock	4,128

	% PRS	18.3%
	No. PRS	754
	No. ASB incidents	163
	No. Category 1 hazards	234
New Addington North	Total residential stock	3,882
	% PRS	16.9%
	No. PRS	656
	No. ASB incidents	111
	No. Category 1 hazards	157
New Addington South	Total residential stock	4,481
	% PRS	21.6%
	No. PRS	969
	No. ASB incidents	157
	No. Category 1 hazards	241
Norbury and Pollards Hill	Total residential stock	4,988
	% PRS	40.1%
	No. PRS	2,002
	No. ASB incidents	256
	No. Category 1 hazards	499
Norbury Park	Total residential stock	3,774
	% PRS	28.9%
	No. PRS	1,092
	No. ASB incidents	192
	No. Category 1 hazards	350
Old Coulsdon	Total residential stock	4,001
	% PRS	14.2%
	No. PRS	570
	No. ASB incidents	151
	No. Category 1 hazards	193
Park Hill and Whitgift	Total residential stock	2,616
	% PRS	45.9%
	No. PRS	1,202
	No. ASB incidents	92
	No. Category 1 hazards	184
Purley and Woodcote	Total residential stock	6,934
	% PRS	29.0%
	No. PRS	2,011
	No. ASB incidents	305
	No. Category 1 hazards	514
Purley Oaks and Riddlesdown	Total residential stock	4,305
	% PRS	30.0%
	No. PRS	1,291

	No. ASB incidents	162
	No. Category 1 hazards	285
Sanderstead	Total residential stock	6,078
	% PRS	17.0%
	No. PRS	1,032
	No. ASB incidents	205
	No. Category 1 hazards	295
Selhurst	Total residential stock	5,468
	% PRS	46.2%
	No. PRS	2,525
	No. ASB incidents	341
	No. Category 1 hazards	688
Selsdon and Addington Village	Total residential stock	4,011
	% PRS	18.2%
	No. PRS	731
	No. ASB incidents	167
	No. Category 1 hazards	248
Selsdon Vale and Forestdale	Total residential stock	4,273
	% PRS	26.4%
	No. PRS	1,126
	No. ASB incidents	109
	No. Category 1 hazards	181
Shirley North	Total residential stock	6,186
	% PRS	20.1%
	No. PRS	1,242
	No. ASB incidents	170
	No. Category 1 hazards	273
Shirley South	Total residential stock	4,098
	% PRS	15.6%
	No. PRS	638
	No. ASB incidents	134
	No. Category 1 hazards	209
South Croydon	Total residential stock	8,209
	% PRS	45.3%
	No. PRS	3,718
	No. ASB incidents	335
	No. Category 1 hazards	812
South Norwood	Total residential stock	7,942
	% PRS	45.8%
	No. PRS	3,640
	No. ASB incidents	429
	No. Category 1 hazards	898

Thornton Heath	Total residential stock	7,643
	% PRS	42.9%
	No. PRS	3,278
	No. ASB incidents	503
	No. Category 1 hazards	1,012
Waddon	Total residential stock	7,840
	% PRS	36.4%
	No. PRS	2,850
	No. ASB incidents	314
	No. Category 1 hazards	599
West Thornton	Total residential stock	7,010
	% PRS	45.3%
	No. PRS	3,175
	No. ASB incidents	398
	No. Category 1 hazards	889
Woodside	Total residential stock	7,527
	% PRS	40.9%
	No. PRS	3,077
	No. ASB incidents	411
	No. Category 1 hazards	762

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 Croydon.

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.

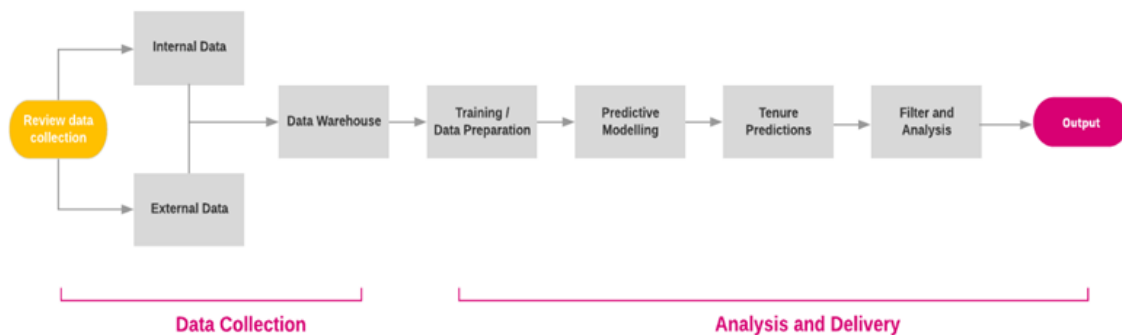


Figure 30. Summary of Metastreet Tenure Intelligence methodology.

Methodology

Metastreet has worked with Croydon to create a residential property data warehouse based on a detailed specification. This has included linking approximately 8 million cells of data to 164,378 unique property references, including council and externally sourced data. All longitudinal council held data is 4 consecutive years, from April 2015 – March 2019

Once the property data warehouse was created, 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 Croydon; 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 75% (Table 4).

Table 4. Owner occupier predictive factors.

Risk factors selected	Pr(>Chi)*
Accounts over 3 years	3.938e-05
Housing benefit type	6.902e-10
Account balances for all liabilities	0.0194118
Total service requests	8.920e-10
ASB count	0.0025987
Training data, n= 682	
D ² test = 0.75 **	

* Pr(>Chi) = Probability value/null hypothesis test, ** D² 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 79% (Table 5).

Table 5. PRS predictive factors.

Risk factors selected	Pr(>Chi)
Housing benefit type	6.902e-10

Tenancy deposit	7.630e-08
Total service requests	8.920e-10
EP current names registered	0.02138
Account balances for all liabilities	0.0009684
Training data, n= 682	
D ² test = 0.79	

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 96% (Table 6).

Table 6. Category 1 (HHSRS) hazard predictive factors.

Risk factors selected	Pr (>Chi)
Account balances for all liabilities	1.697e-07
Current energy efficiency	0.0022059
Private housing complaint made	2.2e-16
ASB count	2.2e-16
Total service requests	2.2e-16
Training data, n= 403	
D ² test = 0.96	

Version, Final

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