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Medway Council

Private Rented Sector: Housing Stock Condition and Stressors Report

May 2024

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### Executive Summary

Metastreet were commissioned by Medway Council to review the housing stock in the district and assess housing stressors related to key tenures, particularly the private rented sector (PRS).

The detailed housing stock information provided in this report will facilitate the development and delivery of Medway'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 rented sector (PRS) properties and tenure change over time.
- Levels of serious hazards that might amount to a Category 1 hazard (Housing Health & Safety Rating System (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 2 & 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 a wide range of housing authorities to understand their housing stock and relationships with key social, environmental and economic stressors.

The models are developed using unique property reference numbers (UPRN) and a large range of council held and open-source data, which when combined, provide detailed analysis at the property level.

Data records used to form the foundation of this report includes but are not limited to:

- 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

- Medway 's PRS is now calculated to be 23.2% of all housing stock.
- The PRS in Medway is distributed across all 24 wards.
- 13 out of 24 Medway wards have an equal or higher percentage PRS than the national average in 2024 (19%) .
- 12 of 24 wards have aggregated IMD rankings below decile 5 (national average)
- Medway has a higher proportion of households in fuel poverty (9.5%) when compared to southeast England (8.4%) but has a lower proportion when compared to the national average (13.1%).
- Medway has an above average rented property possession rate, with 14 claims per 10,000 households in 2023 (national average is 8.1 per 10,000).
- Medway has above average rents (all categories) for England (£895) (national average is £825).
- 3,619 private rented properties in Medway that are likely to have at least one serious housing hazard (Category 1 and high scoring Category 2, HHSRS).
- PRS properties with serious hazards are distributed across all wards.
- Medway recorded 3,045 complaints and service requests from private tenants and others linked to 2,071 PRS properties over a 5-year period.
- It has been calculated that 19.5% (4,611) PRS properties in Medway have an E, F, and G rating.
- 1,605 anti-social behaviour (ASB) incidents have been linked to PRS properties over the past five years.
- The known and predicted HMO population in Medway is calculated to be 1,018.
- The HMO population is distributed across all wards.
- Analysis shows that 232 of 1,018 shared amenities HMOs in Medway are predicted to have at least one serious hazard.
- Most wards have HMOs with predicted hazards.
- Medway recorded 198 complaints from tenants and others linked to HMOs over a 5-year period.
- 101 ASB incidents have been matched with individual HMO properties.

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### Introduction & Project Objectives

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

- Residential property tenure changes
- Distribution of the PRS
- Condition of housing stock in the PRS
- Housing related stressors, including Anti-Social Behaviour (ASB), regulatory interventions and deprivation.

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

The report details the findings of the stock and tenure modelling, including an introduction to the methodology. A combination of Medway'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 developed to underpin the process.

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

A number of bespoke predictive tenure models (Ti) have been developed as part of this project which are unique to Medway, they include:

- Private rented sector (PRS)
- Owner occupiers
- Serious PRS housing hazards (Category 1 and high scoring Category 2, HHSRS A-D)
- Houses in Multiple Occupation (shared amenities)

The appendices to the report contain a summary of the data and a more detailed report methodology.

## 1. Medway overview

Medway is a unitary authority district in Kent, Southeast England. The main towns in the conurbation are (from west to east): Strood, Rochester, Chatham, Gillingham, and Rainham. These are traditionally known as the Medway Towns. Many other towns and villages such as Frindsbury and Brompton lie within the conurbation. Medway covers an area of 192km<sup>2</sup>.<sup>1</sup>

### 1.1. Population

The Office of National Statistics (ONS) Census 2021 population estimates for Medway was 279,800 (Figure 1)<sup>2</sup>. This represents a 6% increase over the last decade.

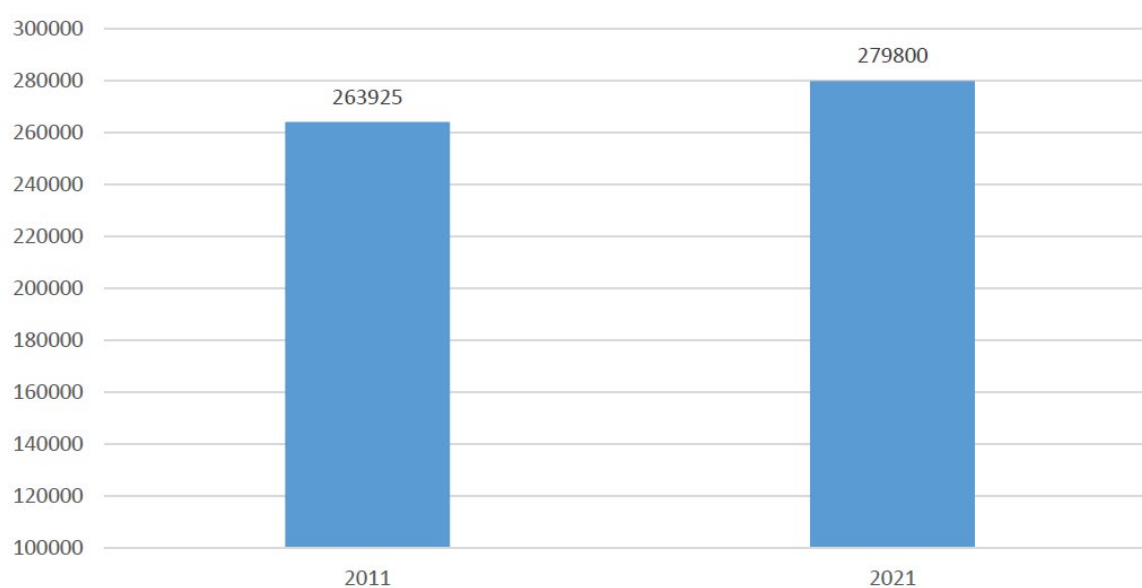


Figure 1. Population estimates, Census 2011 & 2021 (Source: Census ONS).

### 1.2. Household size

Household size (all tenures) provides an insight into how dwellings are occupied across the housing authority. One and two person households are most common in Medway . (Figure 2).<sup>3</sup>

<sup>1</sup> [Medway, Wikipedia](https://en.wikipedia.org/wiki/Medway) (https://en.wikipedia.org/wiki/Medway)

<sup>2</sup> [Office for National Statistics – Census 2021](https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021)

(https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021)

<sup>3</sup> [Office for National Statistics – Census 2021, Household size](https://www.ons.gov.uk/datasets/TS017/editions/2021/versions/3)

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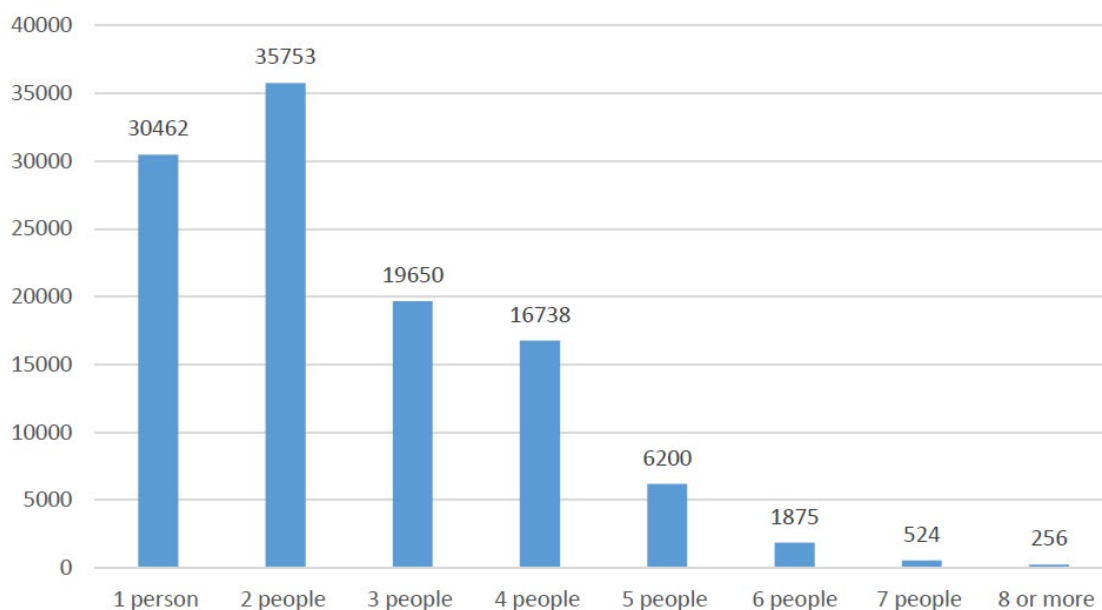


Figure 2. Medway household size (all tenures) (Source: Census 2021).

### 1.3. Deprivation

The Indices of Multiple Deprivation 2019 (IMD 2019) provide a set of relative measures of deprivation for LSOAs (Lower-layer super output areas) across England, based on seven domains of deprivation<sup>4</sup>.

To produce the ward level IMD 2019 data, government guidance and methodology to convert the data has been used<sup>5</sup>. LSOAs have been matched to wards using an Open Geoportal lookup tables. IMD 2019 scores have been ranked (deciles) and weighted for population.

Average IMD 2019 decile aggregated at ward level reveals a clear picture of ward level deprivation (Figure 3 & Map 1). 1.0 on the graph represents the most deprived 10% areas and 5.0 represents 50% most deprived (national average).

Medway has a mixture of high and low deprivation wards. 12 of 24 wards have aggregated IMD rankings below decile 5 (national average) (Figure 4).

<sup>4</sup> [Accredited official statistics English indices of deprivation 2019](https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019)  
(<https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>)

<sup>5</sup> [Ministry of Housing, Communities & Local Government; The English Indices of Deprivation 2019 Research report](https://assets.publishing.service.gov.uk/media/5d8b364ced915d03709e3cf2/loD2019_Research_Report.pdf)  
([https://assets.publishing.service.gov.uk/media/5d8b364ced915d03709e3cf2/loD2019\\_Research\\_Report.pdf](https://assets.publishing.service.gov.uk/media/5d8b364ced915d03709e3cf2/loD2019_Research_Report.pdf))

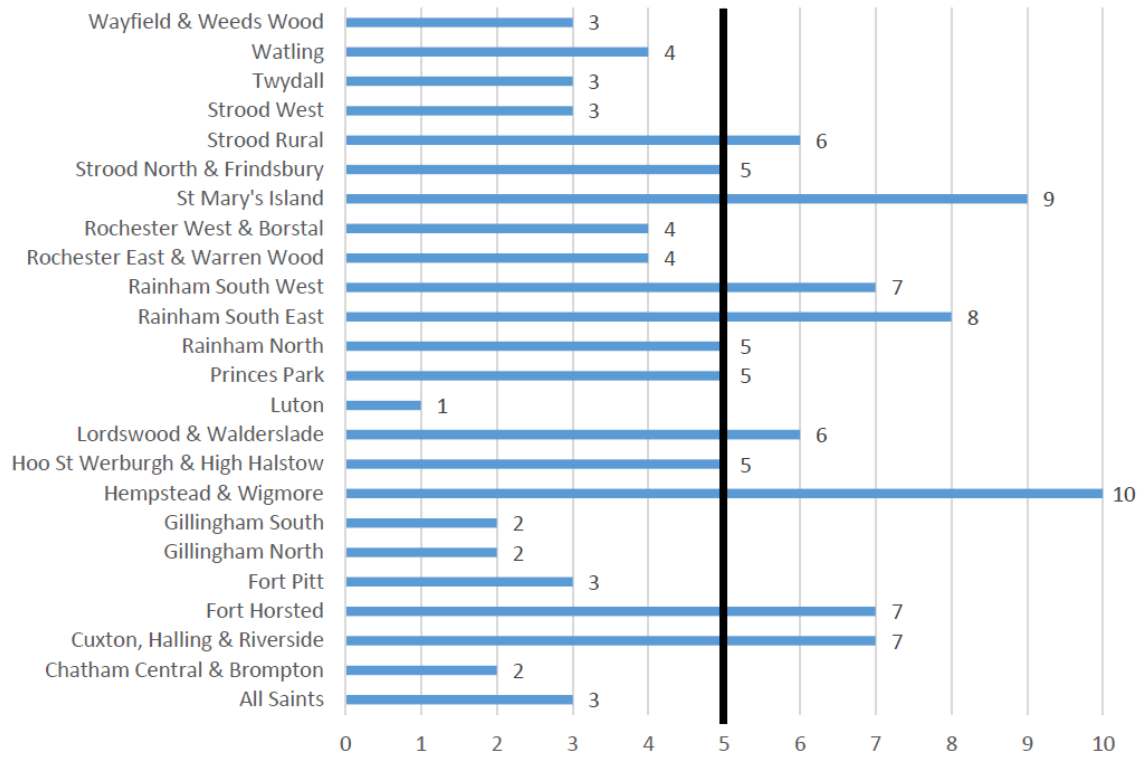
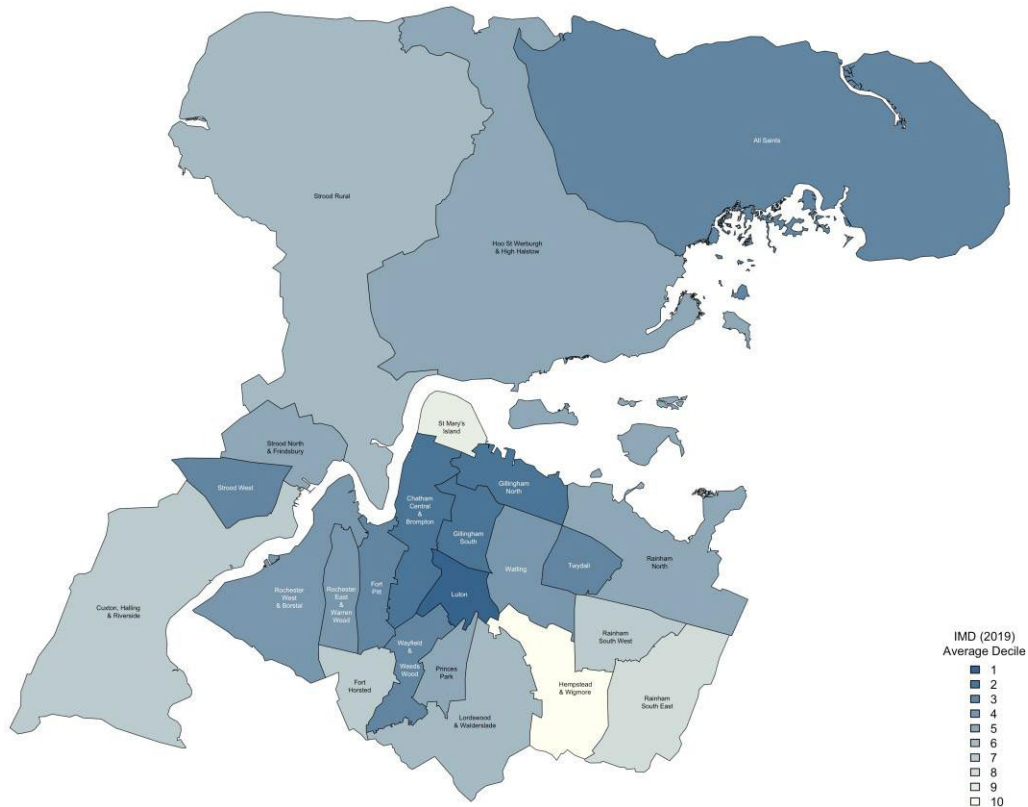


Figure 3. Average IMD (2019) decile by ward (Source: IMD 2019).

Horizontal line shows the national average (decile 5).



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

### 1.3.1. Fuel Poverty

Fuel poverty is defined by the Warm Homes and Energy Conservation Act. A household is 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.

The fuel poverty score was produced by the Department for Energy Security & Net Zero using 2021 data and published in 2023. Over the coming years these figures are likely to change significantly because of acute fuel price increases during much of 2023/24. Medway has a higher proportion of households in fuel poverty (9.5%) when compared to southeast England (8.4%) but has a lower proportion when compared to the national average (13.1%). (Figure 4)<sup>6</sup>.

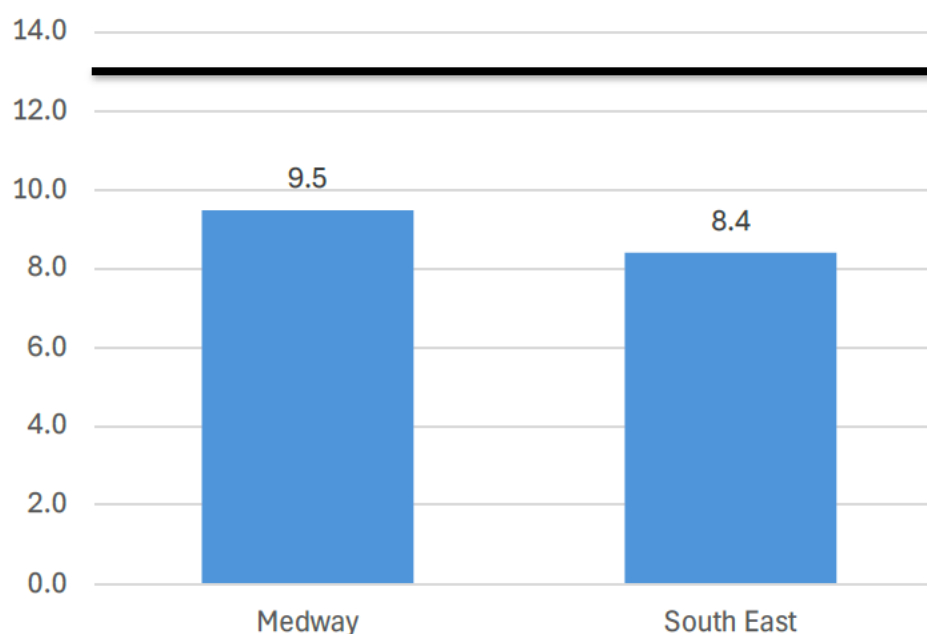


Figure 4. Proportion of households in fuel poverty (%) by selected comparable areas (Source: Dept. for Energy Security & Net Zero 2023).

Horizontal black line shows England average (13.1%).

### 1.4. Rented property possession claim rates

Medway has an above average (mean) rented property possession rate, with 14 claims per 10,000 households in 2023<sup>7</sup> (Figure 7). The average (mean) number of claims for authorities in England was 8.1 per 10,000.

<sup>6</sup> [Department for Energy Security & Net Zero Official Statistics; Sub-regional fuel poverty in England, 2023 \(2021 data\)](https://www.gov.uk/government/statistics/sub-regional-fuel-poverty-2023-2021-data/sub-regional-fuel-poverty-in-england-2023-2021-data) (https://www.gov.uk/government/statistics/sub-regional-fuel-poverty-2023-2021-data/sub-regional-fuel-poverty-in-england-2023-2021-data)

<sup>7</sup> [Number of landlord possession claims per 10,000 households \(Source: Ministry of Justice\)](https://lginform.local.gov.uk/reports/lgastandard?mod-metric=3498&modarea=E06000031&mod-group=AllSingleTierAndCountyLInCountry_England&mod-type=namedComparisonGroup) (https://lginform.local.gov.uk/reports/lgastandard?mod-metric=3498&modarea=E06000031&mod-group=AllSingleTierAndCountyLInCountry\_England&mod-type=namedComparisonGroup)

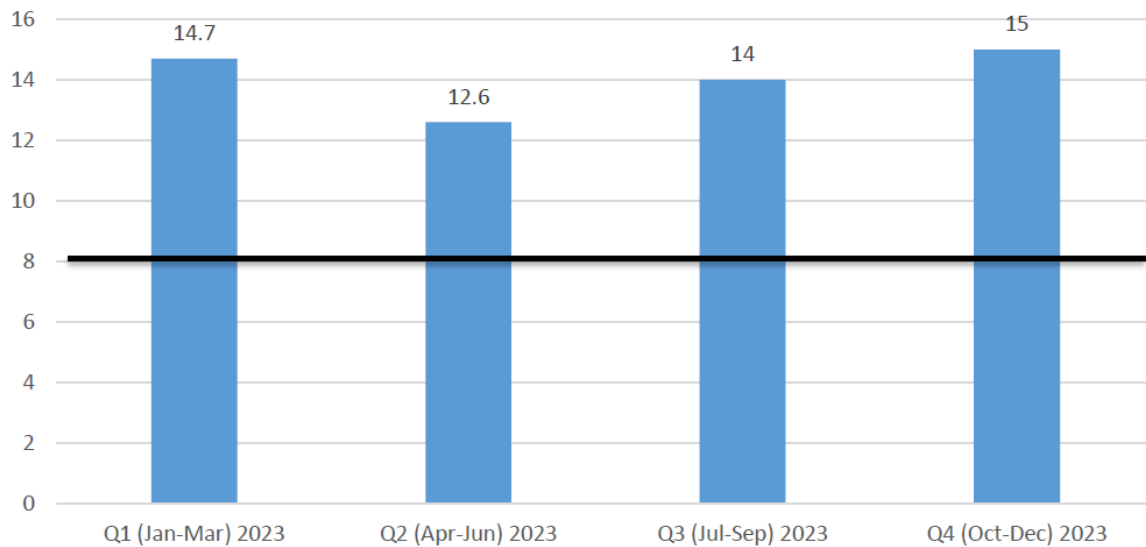


Figure 5. Number of possession claims issued by landlords per 10,000 households 2023 (MOJ 2024)

Black line equals English authorities mean average 8.1 per 10,000 households (last 4 quarters).

### 1.5. Rents and affordability

Private rents vary by area. As this report is concerned with housing conditions and other housing stressors, we have looked at the average (median) rents for all dwelling types (all categories). Overall Medway has above average rents (all categories) for England (£895) (Figure 6). The national average is £825.<sup>8</sup>

<sup>8</sup> [Private rental market summary statistics in England: April 2022 to March 2023](https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/privaterentalmarketsummarystatisticsinengland/april2022tomarch2023) (Source: Office for National Statistics) (<https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/privaterentalmarketsummarystatisticsinengland/april2022tomarch2023>)

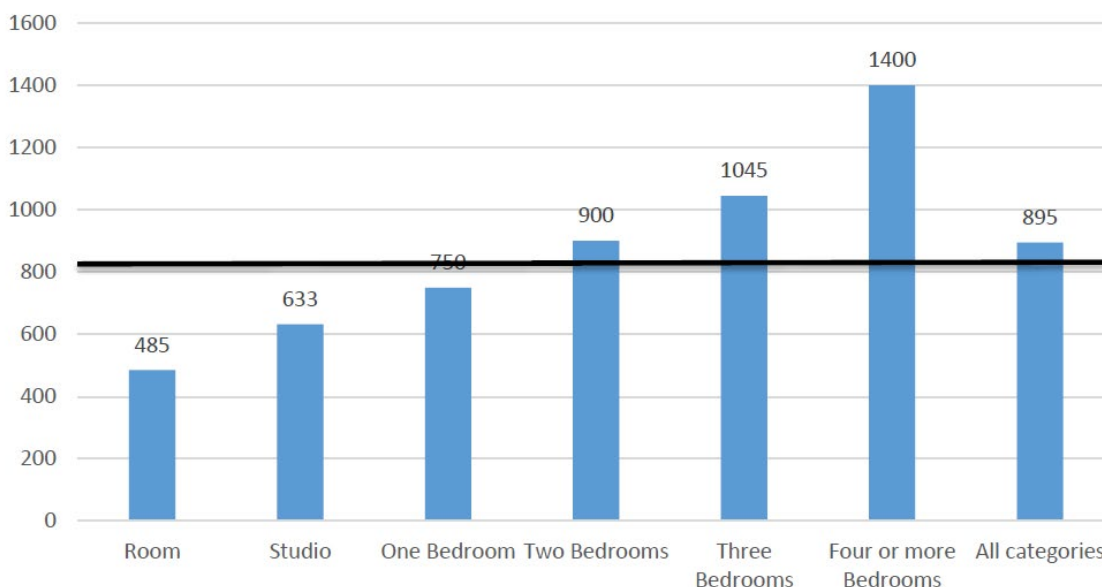


Figure 6. Median monthly rents (£) (1 April 2022 to 31 March 2023) (all categories) (Source: VOA 2024).

Horizontal black line shows national average (£825)

## 2. Results of housing stock and stressor modelling

### 2.1. Methodology

Tenure Intelligence (Ti) uses council held 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 machine learning to help predict the tenure of individual properties where they are not already known. Metastreet has 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 126,091 unique property references (UPRN), excluding parent (shell properties) and non-dwellings. Therefore, only properties that are dwellings have been included in this study, common parts and ancillary properties have been excluded.

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 serious hazards (HHSRS) and other stressors. To achieve the maximum accuracy, unique models are built for each council and tenure, incorporating individual authority data and using local known outcomes to train predictive models. Where a tenure or outcome is already known by the authority, this will be added to the final model.

Once the data warehouse was created, statistical modelling was used to determine tenure using the methodology outlined below. All specified and requested council held longitudinal data is five consecutive years, from April 2018 – March 2023.

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 decision tree model is then used to allocate properties to predefined outcomes.

A number of predictive models have been developed as part of this project which are unique to Medway . 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 large datasets and statistical models include some level of error. A more detailed description of the methodology and the specific factors selected to build predictive models for this project can be found in Appendix 2.

Metastreet was asked to exclude HMOs (known and predicted) from the PRS stressors results, including housing conditions, ASB, service requests and council interventions. This resulted in the removal of 1,018 known HMO properties from the master PRS dataset. However, all PRS dwellings have been accounted for in the population and distribution section to enable the council to compare other authorities and government statistics.

## 2.2. Results - Private rented sector

### 2.2.1. Population and distribution

The private rented sector (PRS) in Medway has grown steadily since 2011<sup>9</sup>.

Based on tenure modelling (2024), Medway 's PRS is now calculated to be 23.2% of all housing stock (Figure 7). The 2021 Census reports the PRS in Medway to be 20.2%. The difference is likely to be a result of lower response rates in the PRS from the Census data, in part as a result of the March 2021 government-imposed coronavirus lockdown measures<sup>10 11</sup>. Further details of the differences between the Census 2021 and Ti 2024 results can be found in Appendix 2. It's important to note that Census tenure data is based on reported households, while Ti data is based on known dwellings within a local authority area. Some dwellings have multiple

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<sup>9</sup> [Population estimates, Census 2021 \(Source: Office for National Statistics\)](https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates) (<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>)

<sup>10</sup> [Timeline of UK government coronavirus lockdowns and restrictions \(Source: Institute for Government\)](https://www.instituteforgovernment.org.uk/data-visualisation/timeline-coronavirus-lockdowns) (<https://www.instituteforgovernment.org.uk/data-visualisation/timeline-coronavirus-lockdowns>)

<sup>11</sup> [London Councils briefing warns that Census may have 'significantly undercounted' capital's population \(Source: On London, Article from July 2022\)](https://www.onlondon.co.uk/london-councils-briefing-warns-that-census-may-have-significantly-undercounted-capitals-population/) (<https://www.onlondon.co.uk/london-councils-briefing-warns-that-census-may-have-significantly-undercounted-capitals-population/>)

households (Table 7). Therefore, the number of households should normally exceed the number of known dwellings.

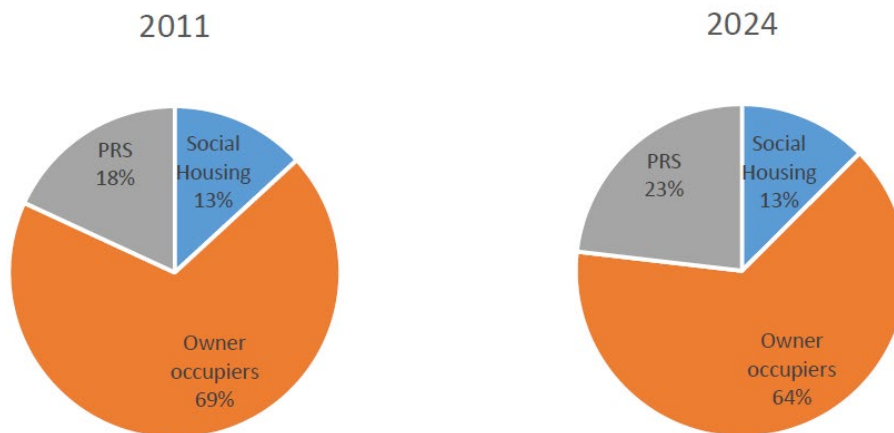


Figure 7. Tenure profile 2011 & 2024 (Source: ONS & Metastreet Ti model).

Tenure percentage change over the last two decades in Medway has been consistent with the national trend (Figure 8), the PRS increase is part of a long term nationwide and regional trend.

The PRS in the UK has grown from 9.4% of housing stock in 2000<sup>12</sup> to 19% of households 2023<sup>13</sup>. The PRS remains the second largest housing tenure in England.<sup>14</sup>

<sup>12</sup> [The profile of UK private landlords; Kath Scanlon and Christine Whitehead; LSE London; December 2016; CML RESEARCH](https://www.lse.ac.uk/business/consulting/assets/documents/The-Profile-of-UK-Private-Landlords.pdf) (https://www.lse.ac.uk/business/consulting/assets/documents/The-Profile-of-UK-Private-Landlords.pdf)

<sup>13</sup> [Accredited official statistics, Chapters for English Housing Survey 2022 to 2023 Headline Report](https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report) (https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report)

<sup>14</sup> [Accredited official statistics, Chapters for English Housing Survey 2022 to 2023 Headline Report](https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report) (https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report)

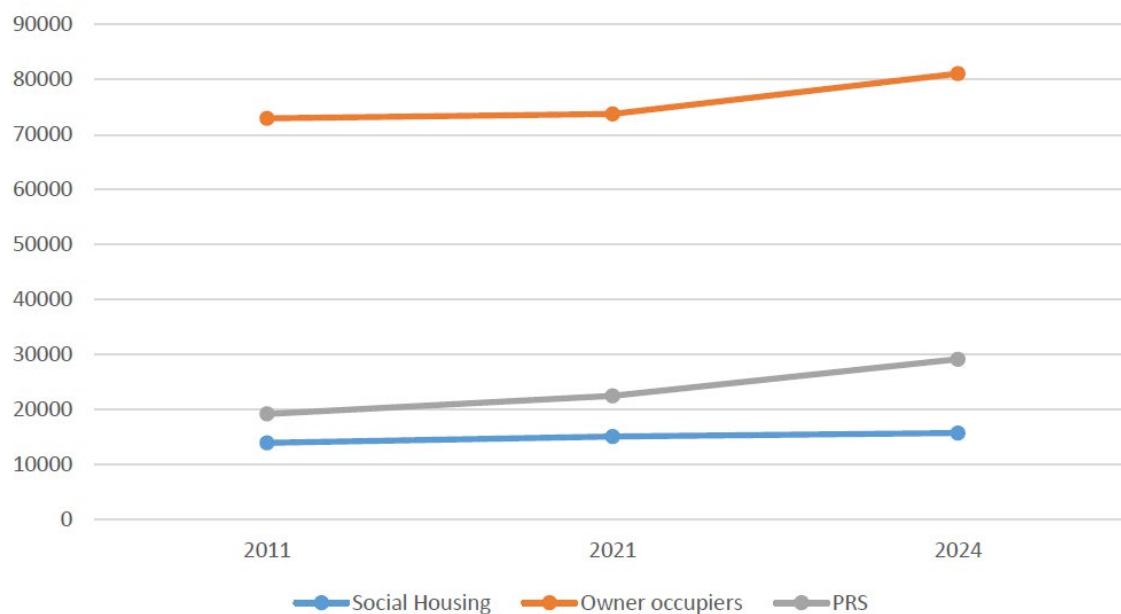


Figure 8. Medway tenure change and total housing stock, 2011, 2021 & 2024 (Source: ONS & 2024 Ti).

In line with the UK average, Medway's PRS stock has continued to grow steadily since 2011. Social

rented housing stock has been stable over the last decade (Figure 8 and table 1).

Table 1. Number of households & dwellings by tenure 2011, 2021 & 2024 (Source: ONS & Ti 2024).

Tenure	2011 (Census)	2021 (Census)	2024 (Ti)
Social Housing	13,996	15,130	15,791
Owner occupiers	72,967	73,768	81,096
PRS	19,246	22,559	29,204
Totals	106,209	111,457	126,091

The data in Table 1 shows a clear discrepancy between Census recorded households (2021) and the number of known dwellings (Ti 2024), with at least 14,634 households missing from the 2021 Census data when compared to known dwellings.

The PRS in Medway is distributed across all 24 wards (Figure 9). The number of PRS dwellings per ward ranges from 3,693 (Gillingham South) to 362 (Fort Horsted).

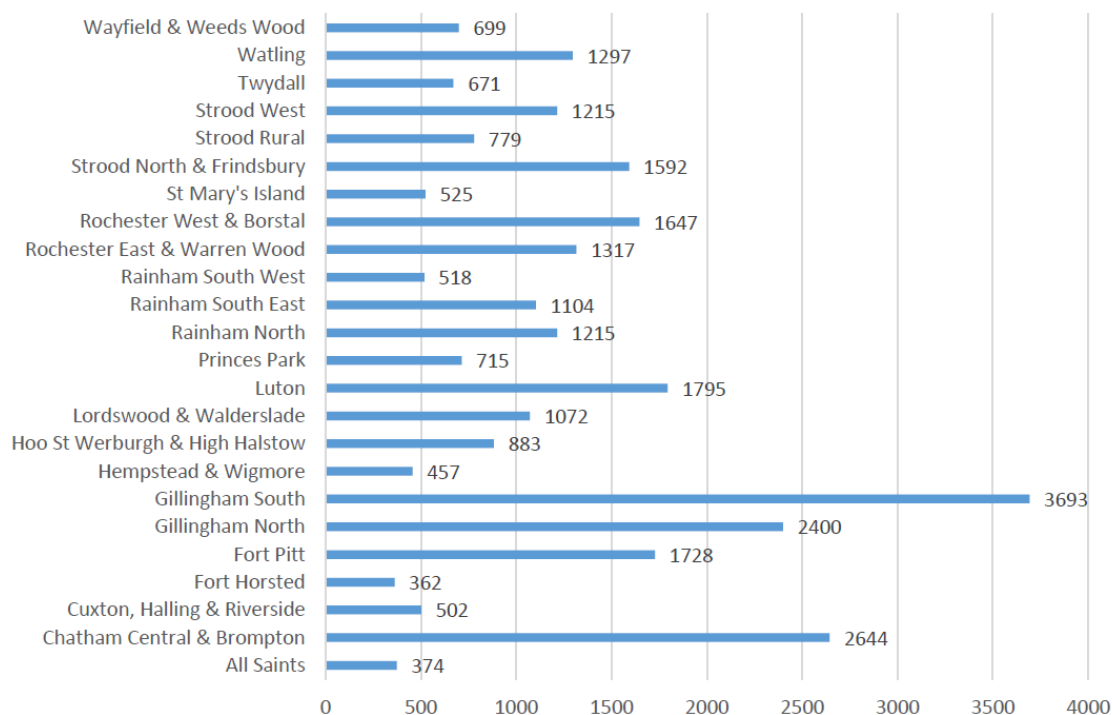


Figure 9. Number of PRS dwellings by ward (Source: Ti 2024).

The percentage of PRS properties in each ward ranges between 45.1% (Gillingham South) and 11.9% (Hempstead & Wigmore) (Figure 10 & Table 2). Therefore, 13 out of 24 Medway wards have an equal or higher percentage PRS than the national average in 2024 (19%)<sup>15</sup>.

<sup>15</sup> Accredited official statistics, Chapters for English Housing Survey 2022 to 2023 Headline Report (<https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report>)

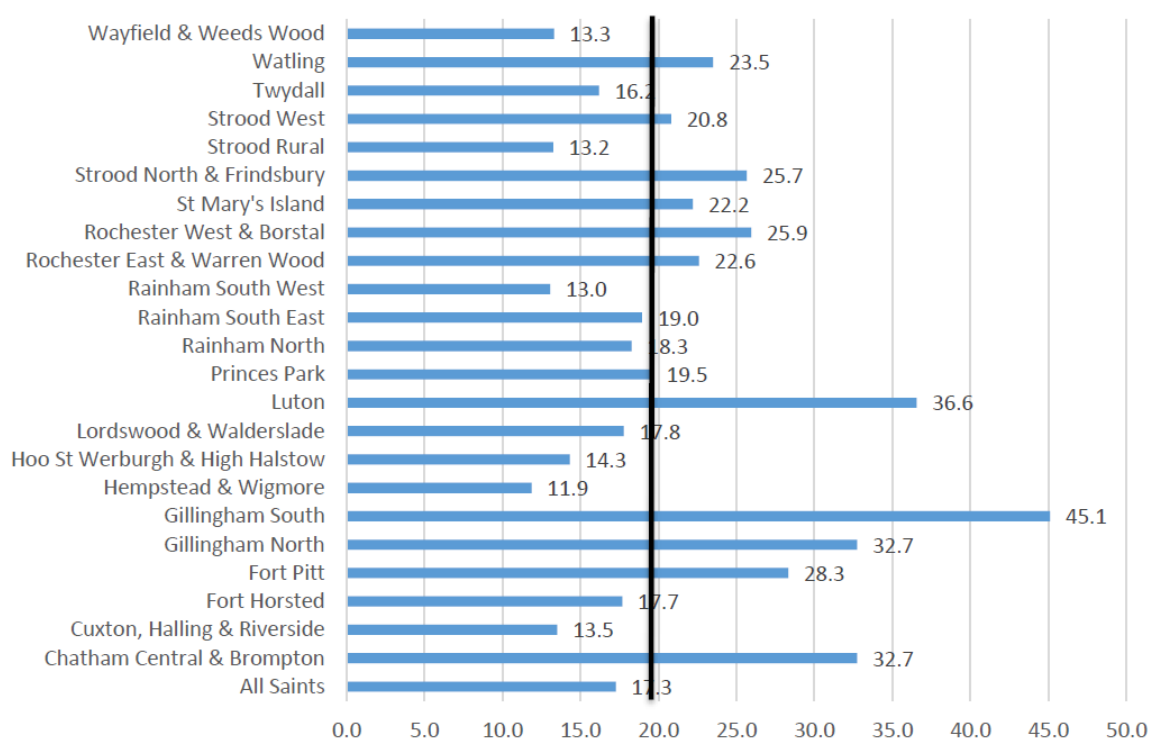


Figure 10. Percentage of PRS dwellings by each ward (Source Ti 2024).

Horizontal black line shows national average 2024 (19%)

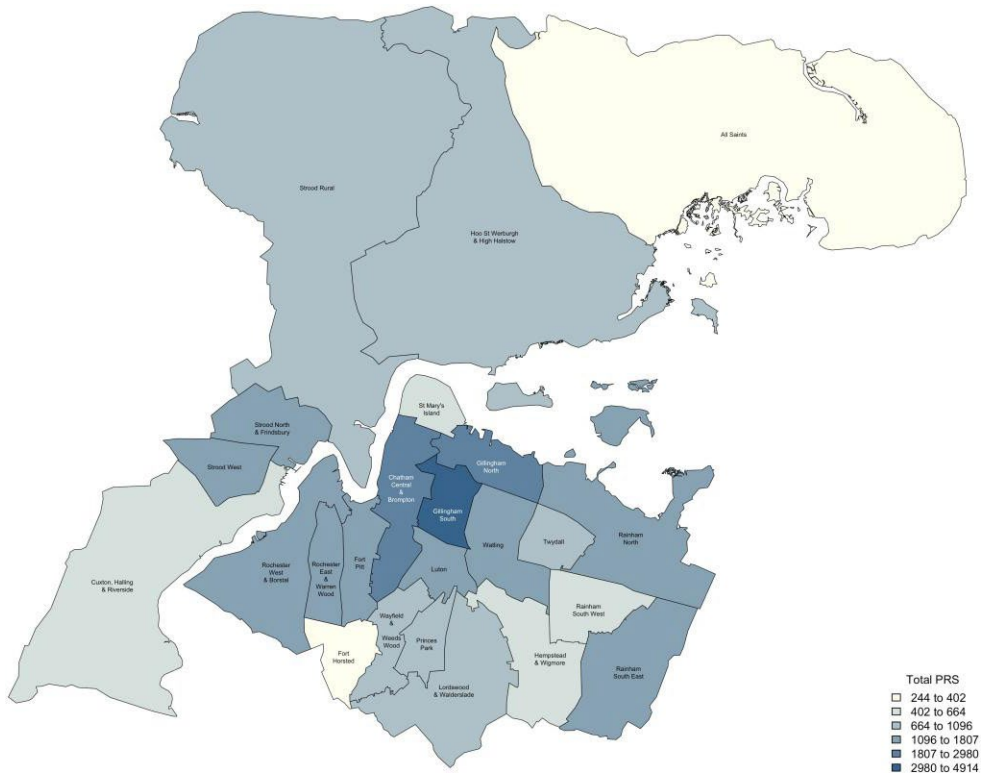
The table below shows the total PRS dwellings in each ward and the percentage PRS compared to the total housing stock.

Table 2. Number and percentage of PRS properties by ward (Source Ti 2024).

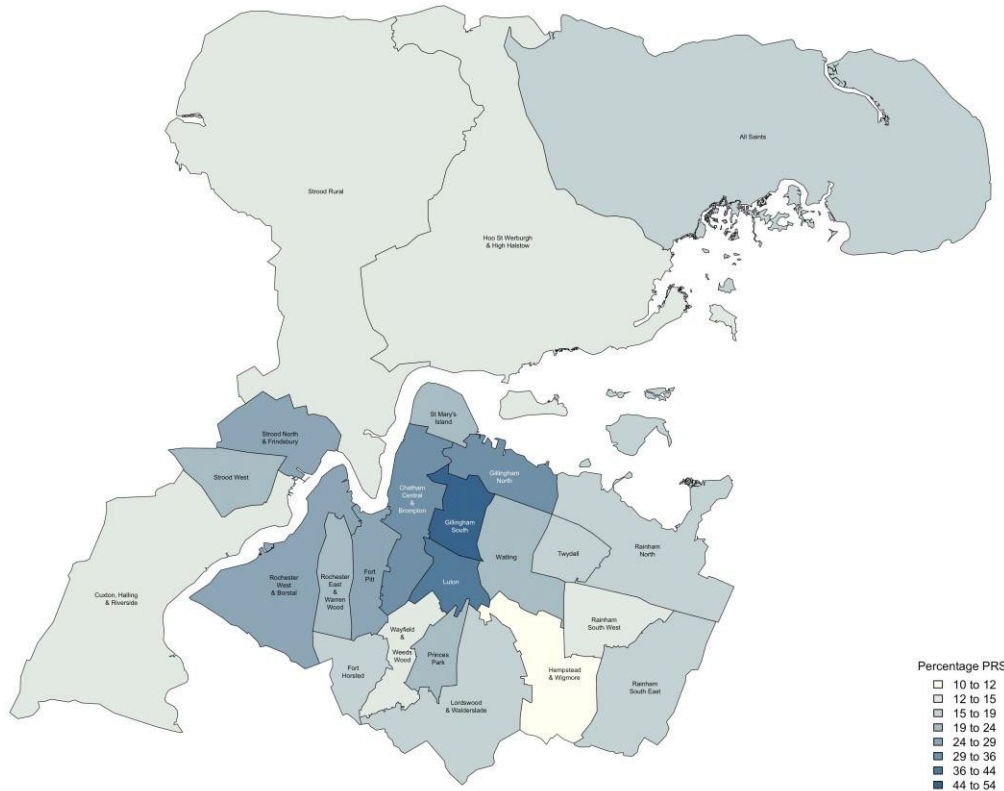
Wards	No. PRS	% PRS
Appleton	1028	30.3%
Bankfield	517	17.2%
Beechwood & Heath	245	7.4%
Birchfield	418	13.1%
Bridgewater	977	23.8%
Central & West Bank	819	22.8%
Daresbury, Moore & Sandymoor	279	10.2%
Ditton, Hale Village & Halebank	685	21.4%
Farnworth	425	12.7%
Grange	789	21.7%
Halton Castle	666	20.3%
Halton Lea	581	16.7%
Halton View	700	20.2%
Highfield	456	15.3%
Hough Green	683	20.3%
Mersey & Weston	1247	29.2%
Norton North	476	14.8%
Norton South & Preston Brook	495	16.0%
All Saints	374	17.3

<b>Wards</b>	<b>No. PRS</b>	<b>% PRS</b>
Chatham Central & Brompton	2,644	32.7
Cuxton, Halling & Riverside	502	13.5
Fort Horsted	362	17.7
Fort Pitt	1,728	28.3
Gillingham North	2,400	32.7
Gillingham South	3,693	45.1
Hempstead & Wigmore	457	11.9
Hoo St Werburgh & High Halstow	883	14.3
Lordswood & Walderslade	1,072	17.8
Luton	1,795	36.6
Princes Park	715	19.5
Rainham North	1,215	18.3
Rainham South East	1,104	19.0
Rainham South West	518	13.0
Rochester East & Warren Wood	1,317	22.6
Rochester West & Borstal	1,647	25.9
St Mary's Island	525	22.2
Strood North & Frindsbury	1,592	25.7
Strood Rural	779	13.2
Strood West	1,215	20.8
Twydall	671	16.2
Watling	1,297	23.5
Wayfield & Weeds Wood	699	13.3
<b>Grand Total</b>	<b>11486</b>	<b>0.189319</b>

PRS properties are distributed across Medway (Maps 2 & 3).



Map 2. Number of PRS properties in Medway (Source: Ti 2024, Map by Metastreet).



Map 3. PRS properties as percentage of dwellings in Medway (Source: Ti 2024, 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 (HHSRS) hazards have a physiological or psychological impact on the occupant and may result in medical treatment.<sup>16</sup> There is also a serious impact on public services: hazardous conditions in the PRS are estimated to cost the NHS £340 million a year.<sup>17</sup>

In 2024, 12% 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 (8%), and significantly higher than owner occupied dwellings (9%) or social rented dwellings (4%). Furthermore, the private rented sector had the highest proportion of non-decent homes (21%)<sup>18</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>19</sup>.

A local authority's property age profile can have an impact on housing conditions. Medway has a significant number of residential properties (34.5%) built pre-Second World War<sup>20</sup>. The council tax band provides an indication of relative distribution of property value in each ward. (Figure 11).

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<sup>16</sup> [Office of the Deputy Prime Minister, Housing Health and Safety Rating System Operating Guidance](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>17</sup> [UK Parliament, Committee on Private rented housing](https://committees.parliament.uk/committee/127/public-accounts-committee/news/165326/private-rented-housing-failing-far-too-often-to-provide-safe-and-secure-homes/) (https://committees.parliament.uk/committee/127/public-accounts-committee/news/165326/private-rented-housing-failing-far-too-often-to-provide-safe-and-secure-homes/)

<sup>18</sup> [Accredited official statistics, Chapters for English Housing Survey 2022 to 2023 Headline Report](https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report) (https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report)

<sup>19</sup> [Office of the Deputy Prime Minister, Housing Health and Safety Rating System Operating Guidance](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>20</sup> [Official Statistics, Council Tax: stock of properties, 2019](https://www.gov.uk/government/statistics/council-tax-stock-of-properties-2019) (https://www.gov.uk/government/statistics/council-tax-stock-of-properties-2019)

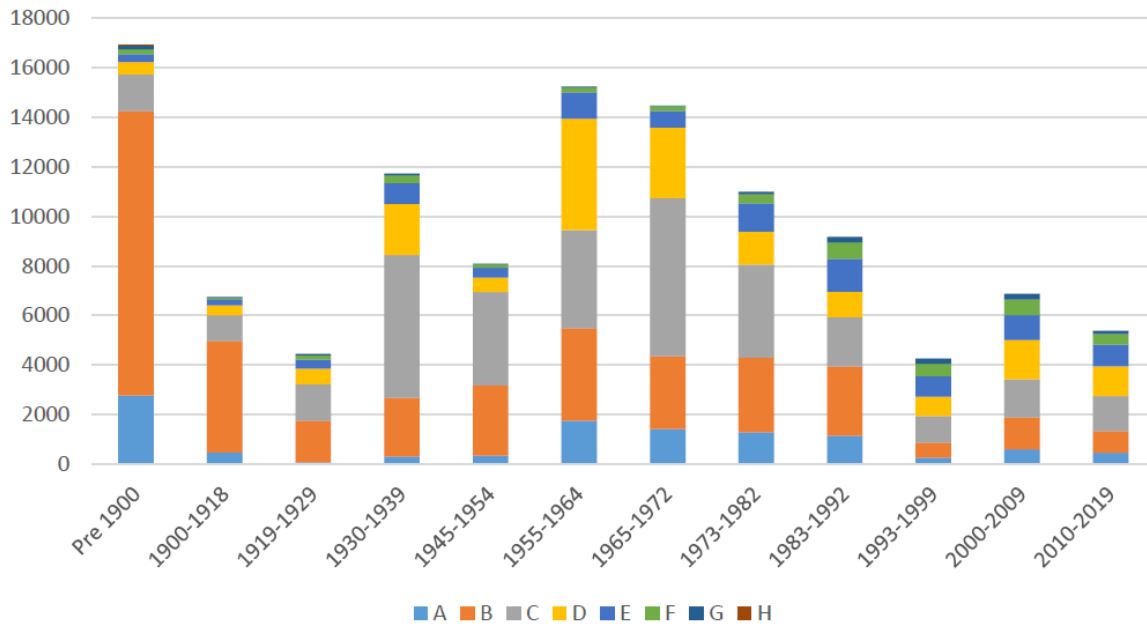


Figure 11. All housing stock age profile and council tax band (Source: VOA 2019).

A local authority’s property type profile offers an indication of housing density, construction type and other population factors. The most common private rented property type in Medway are houses (67%), while maisonette are the least common property types (3%) (Figure 12).

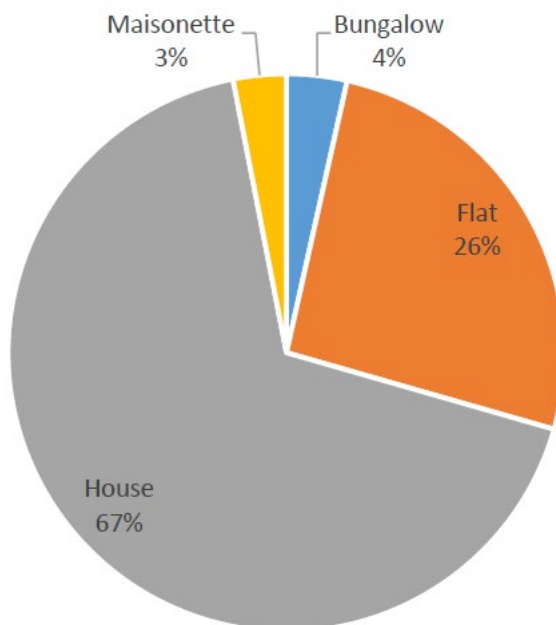


Figure 12. Private rented property type as a percent of total (Source: Medway matched EPC records 2024).

Using a training sample of properties that are known to have at least one serious housing hazard (Category 1 and high scoring Category 2, HHSRS), it is possible to

predict the number of PRS properties with at least one serious hazard across the area (Figure 13). Further details of the method can be found in Appendix 2.

There are 3,619 private rented properties in Medway that are likely to have at least one serious housing hazard (Category 1 and high scoring Category 2, HHSRS). PRS properties with serious hazards are distributed across all wards. Gillingham South (706) and Chatham Central & Brompton

(468) have the highest number of properties with at least one Category 1 and/or high scoring Category 2 hazard (Figure 13 & Map 4).

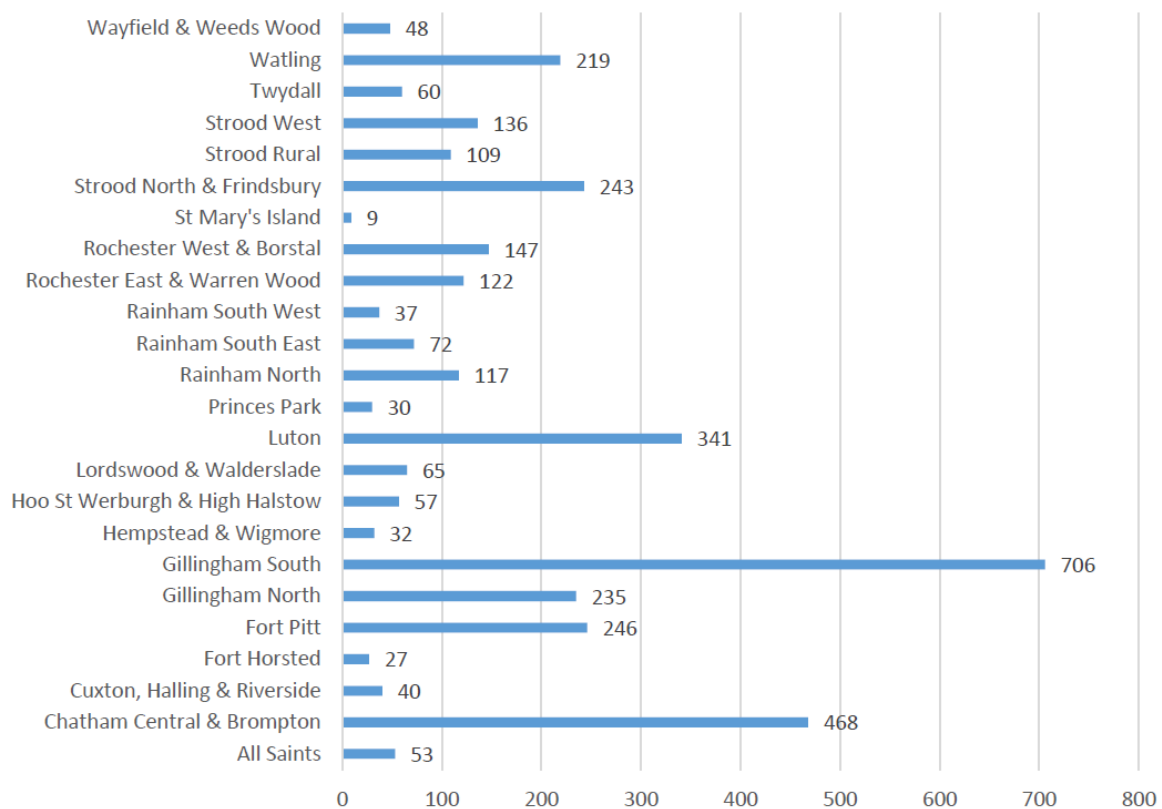
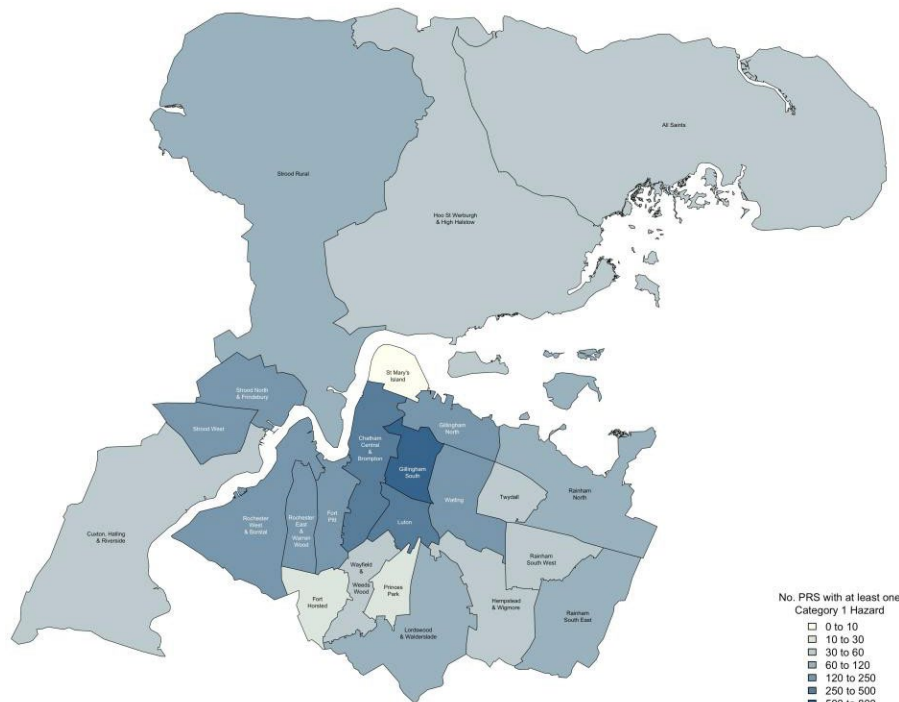


Figure 13. Predicted number of dwellings with serious hazards by ward (Source: Ti 2024).

Category 1 and/or high scoring Category 2 hazards in the PRS are distributed across Medway with concentrations of hazards in some central and southern wards (Map 4).



Map 4. Distribution of PRS dwellings with predicted Category 1 and/or high scoring Category 2 hazards (HHSRS) (Source: Ti 2024, map by Metastreet).

The rates of Category 1 and/or high scoring Category 2 HHSRS hazards per 100 PRS properties reveals a wide distribution across Medway (Figure 14 & Map 5). Gillingham South (19.6 per 100) has the highest rates of predicted PRS properties with serious hazards. The national average for category 1 hazards in the PRS is 12%<sup>21</sup>.

<sup>21</sup> [Department for Levelling Up, Housing & Communities, Accredited official statistics, Introduction and key findings 2022-2023](https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report/introduction-and-key-findings) (https://www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report/introduction-and-key-findings)

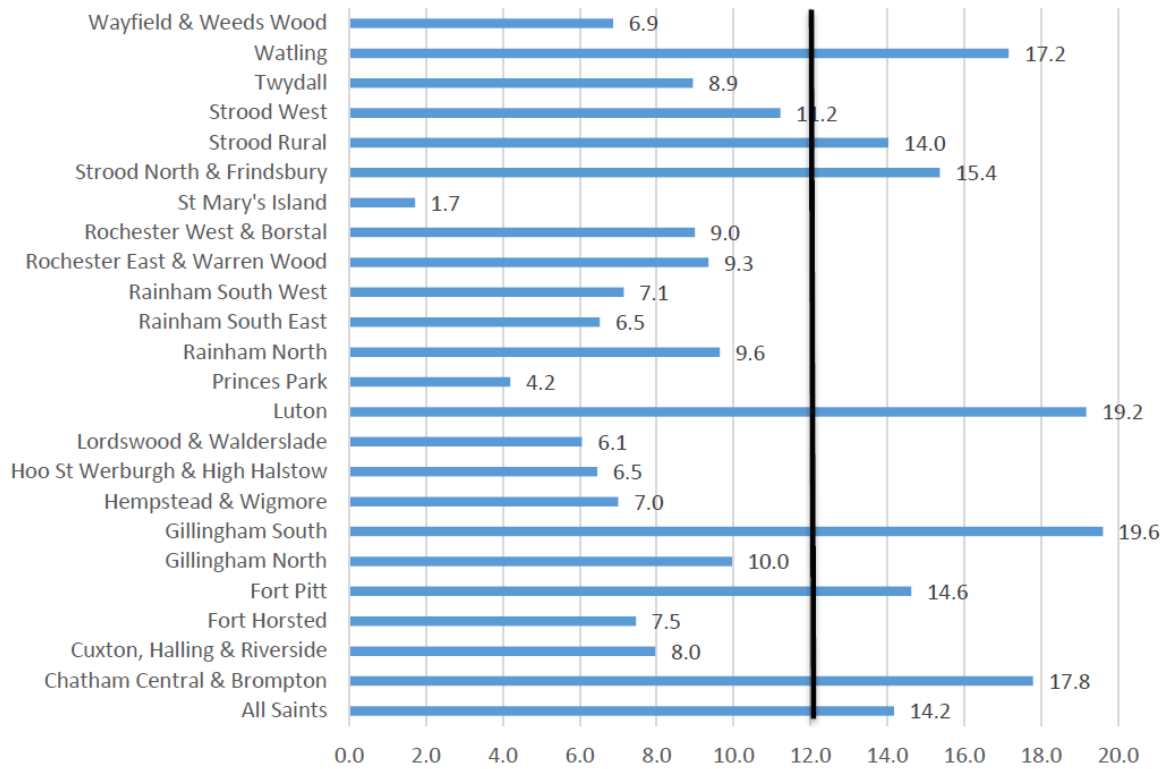
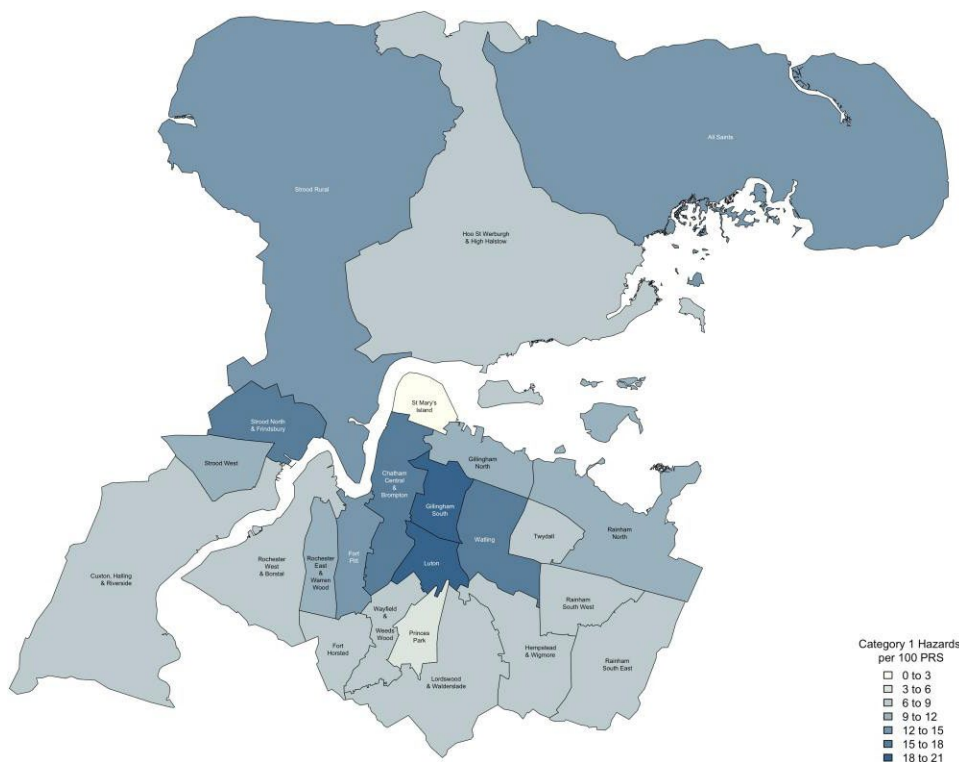


Figure 14. Rates per 100 PRS properties of predicted Category 1 and/or high scoring Category 2 HHSRS hazards by ward (Source: Ti 2024).

Horizontal black line shows national average for Category 1, 2022 (12 per 100)



Map 5. Distribution of PRS dwellings with predicted Category 1 and/or high scoring Category 2 hazards (HHSRS) per 100 properties (Source: Ti 2024, map by Metastreet).

Complaints and service requests made by PRS tenants to the council about poor property conditions and inadequate property management are a direct indicator of low quality PRS. Medway recorded 3,045 complaints and service requests from private tenants and others linked to 2,071 PRS properties over a 5-year period. Gillingham South (675) and Chatham Central & Brompton (429) had the highest number of complaints and service requests (Figure 15 & Map 6).

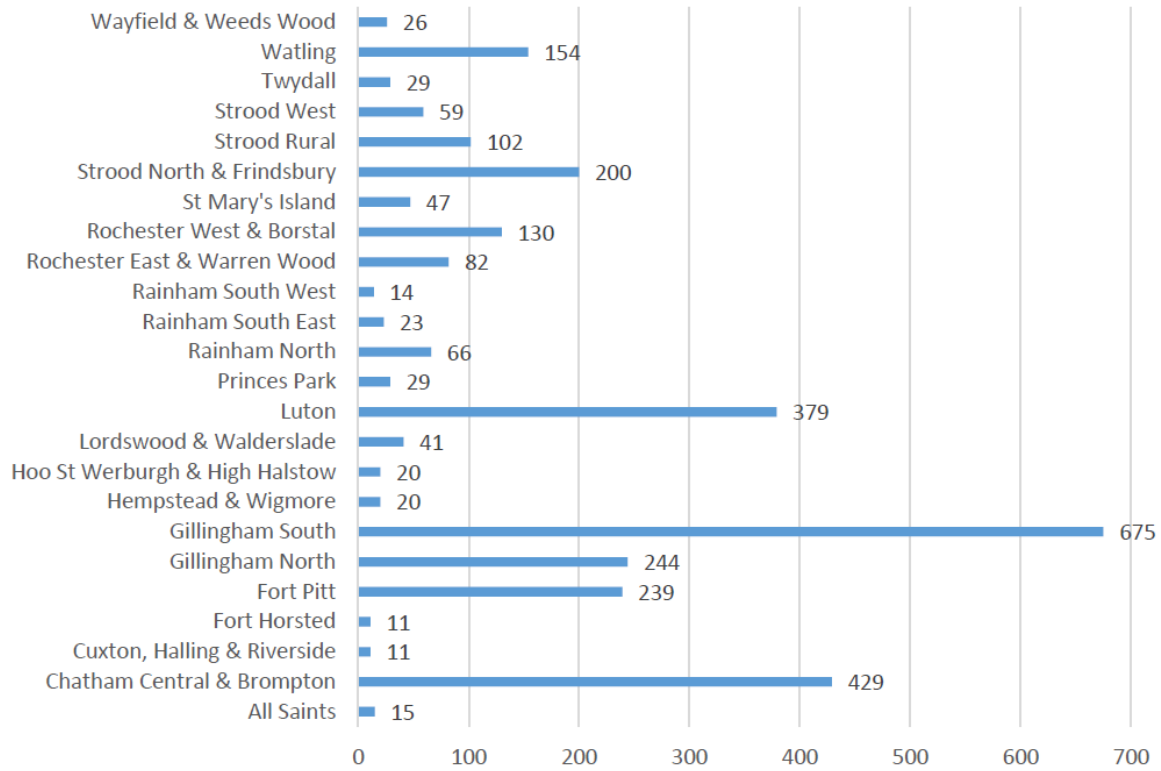
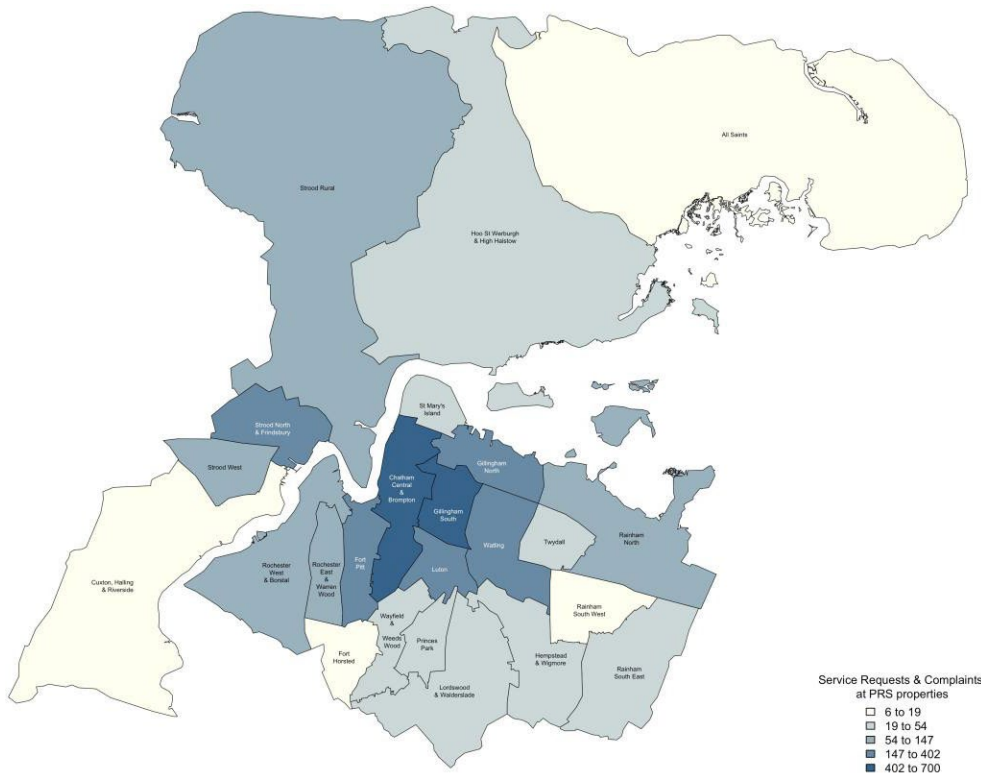


Figure 15. PRS complaints and service requests made by private tenants and others to the Council (Source Ti 2024)



Map 6. Distribution of PRS service requests and tenant complaints (Source: Ti 2024, Map by Metastreet).

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 efficiency. The exposure and orientation of the dwelling are also relevant.

As part of this project 23,593 EPC ratings were matched to PRS properties (Figure 16). All figures have been modelled from this group.

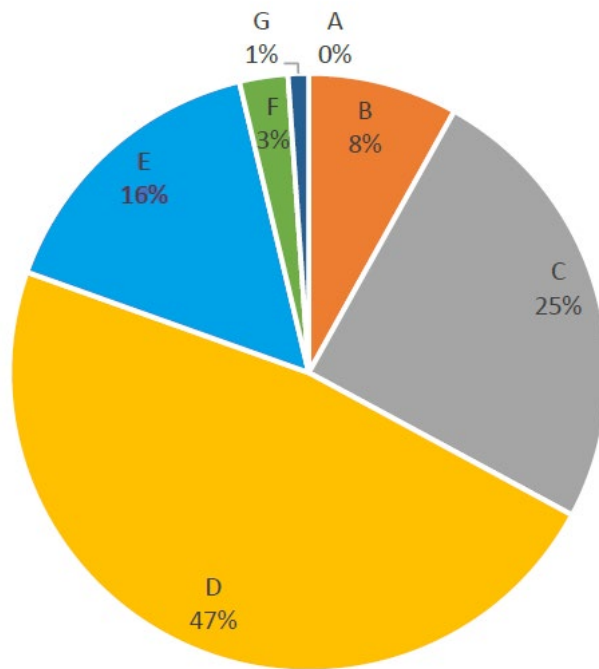


Figure 16. Distribution of Energy Performance Certificate ratings in PRS (Rating A-G) (Source: TI 2024).

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 A-E to be compliant. It has been calculated using the matched addresses that 19.5% of PRS properties in Medway have an E, F, and G rating. 3.7% of PRS properties have an F and G rating (Figure 16).

Extrapolated to the entire PRS, 1,080 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 death<sup>22</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. Children in cold homes are twice as likely to suffer from a variety of respiratory problems<sup>23</sup>. 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>24</sup>. Therefore, the F and G properties

<sup>22</sup> [Office of the Deputy Prime Minister, Housing Health and Safety Rating System Operating Guidance](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>23</sup> [Health Equity in England: The Marmot Review 10 Years On, Report, 2020](https://www.health.org.uk/reports-and-analysis/reports/health-equity-in-england-the-marmot-review-10-years-on-0) (https://www.health.org.uk/reports-and-analysis/reports/health-equity-in-england-the-marmot-review-10-years-on-0)

<sup>24</sup> [Office of the Deputy Prime Minister, Housing Health and Safety Rating System Operating Guidance](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)

present a serious risk to the occupants' health, particularly if over the age of 65 (Figure 16, 17 & 18).

Medway has 4,611 PRS EPC ratings that are E, F, & G. EPC ratings E, F, & G represent properties with the least energy efficiency. Gillingham South (884) and Chatham Central & Brompton (452) have the highest number of EPC rating E-G (Figure 17).

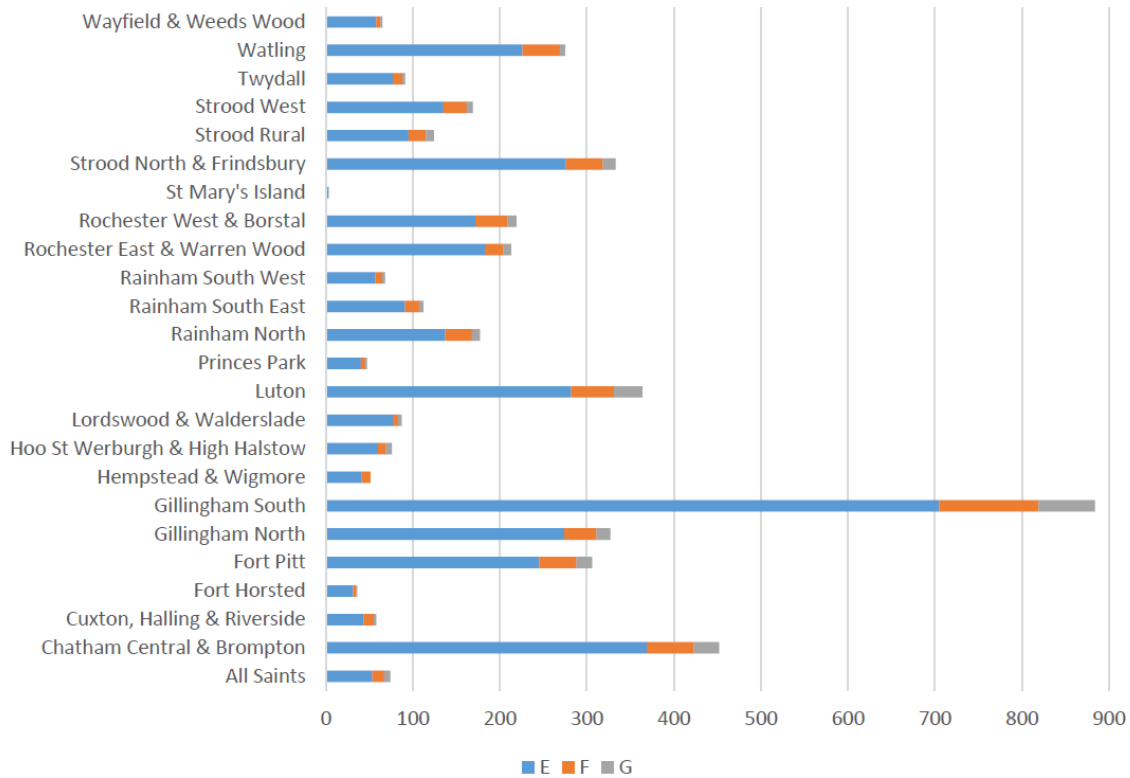


Figure 17. Energy Performance Certificate ratings in PRS by ward (Rating E, F & G) (Source: TI 2024).

The difference between the current and potential energy performance score (EPC) helps owners of residential property understand what practical improvements can be made to improve a properties energy performance. The gap between current and potential EPC scores represents the opportunity to improve energy performance within a reasonable economic envelope (Figure 18).

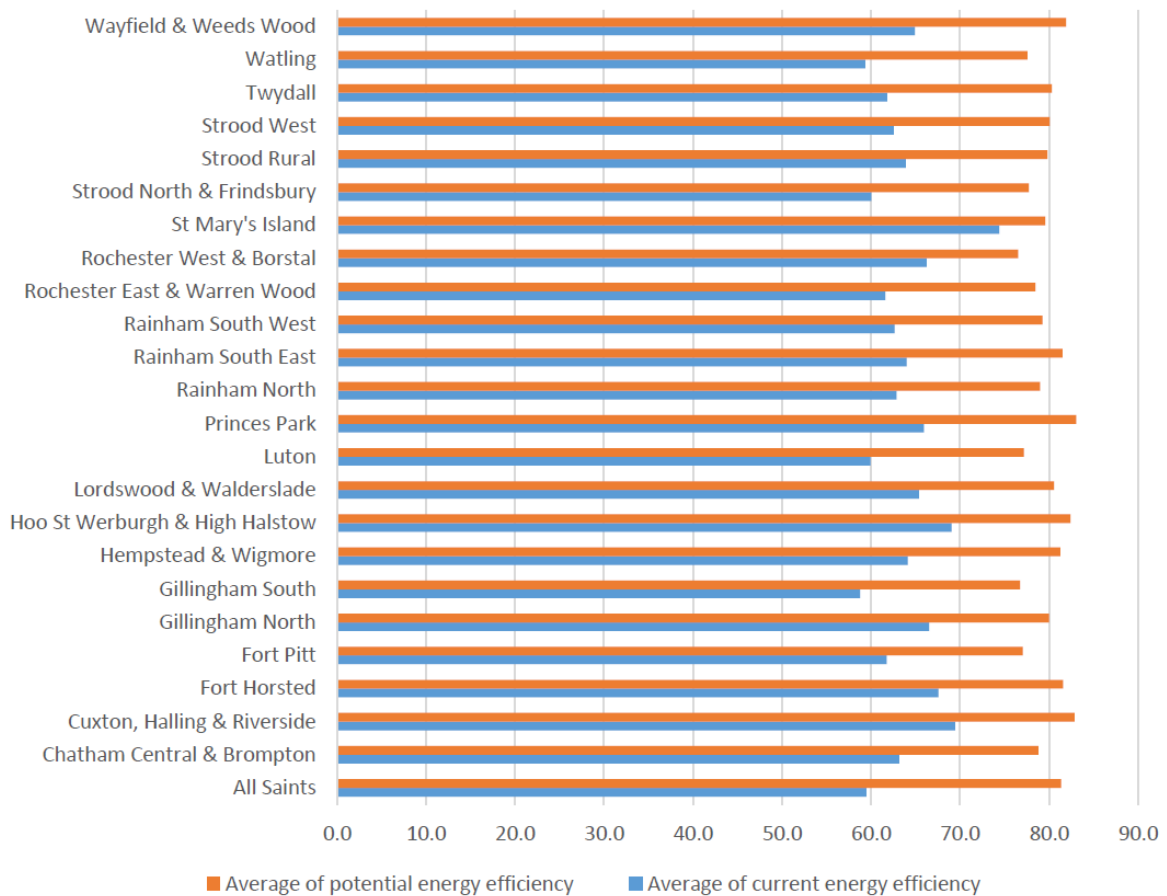


Figure 18. Current and Potential Energy Performance Certificate score (mean average) in PRS by ward (Source: Ti 2024).

### 2.2.3. PRS & anti-social behaviour (ASB)

It's important to note that the study focuses exclusively on ASB associated with residential premises. Incidents, such as those investigated on a street corner, which cannot be linked to a residential property, are excluded from the study.

The council has recorded a total of 1,605 incidents related to anti-social behaviour (ASB) and nuisance linked to PRS properties over the past five years. Gillingham South (289) has the highest levels of PRS ASB incidents (Figure 19 & Map 7).

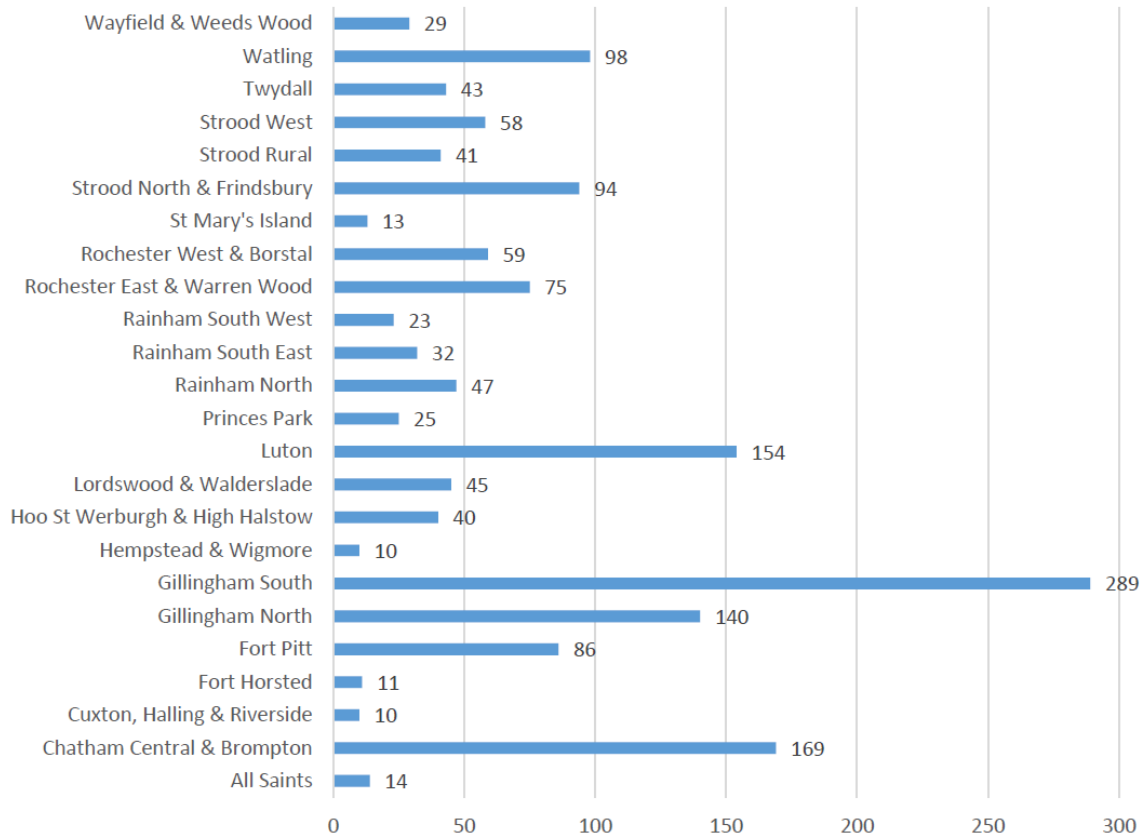
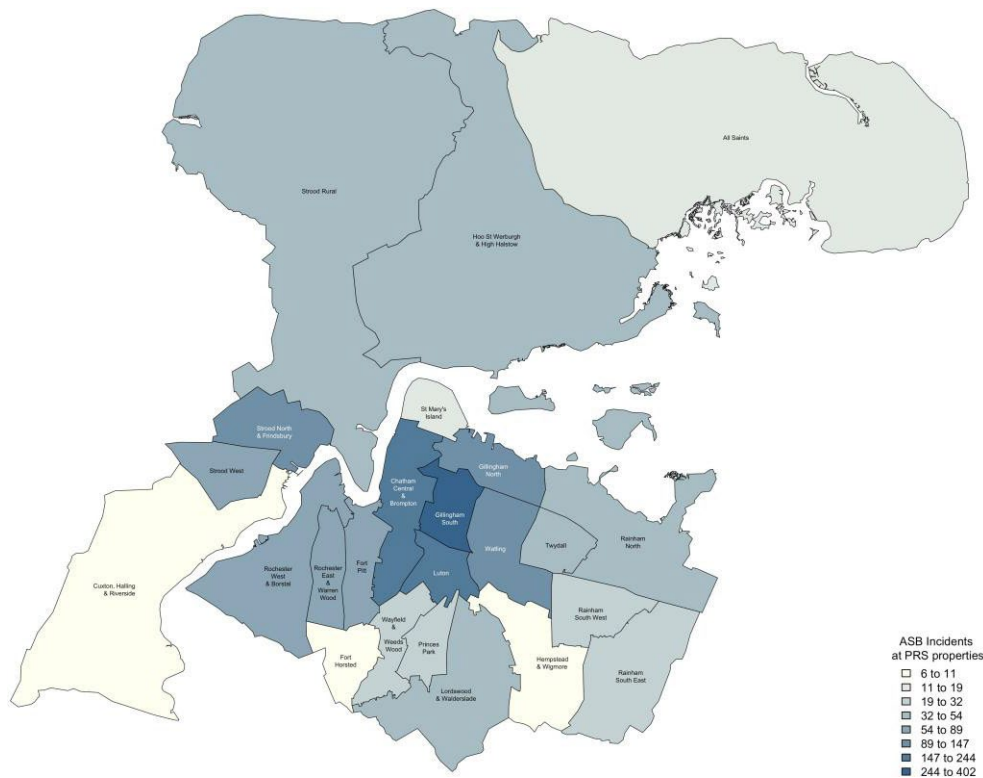


Figure 19. Number of ASB incidents linked to PRS by ward (Source Ti 2024).



Map 7. Distribution of ASB linked to PRS properties (Source: Ti 2024, Map by Metastreet).

ASB incidents rates provides a relative measure of ASB linked to PRS properties. (Figure 20 & Map 8). It's important to note that ASB can be affected by recording bias, such as targeted action by groups or the authorities in particular areas or tenures.

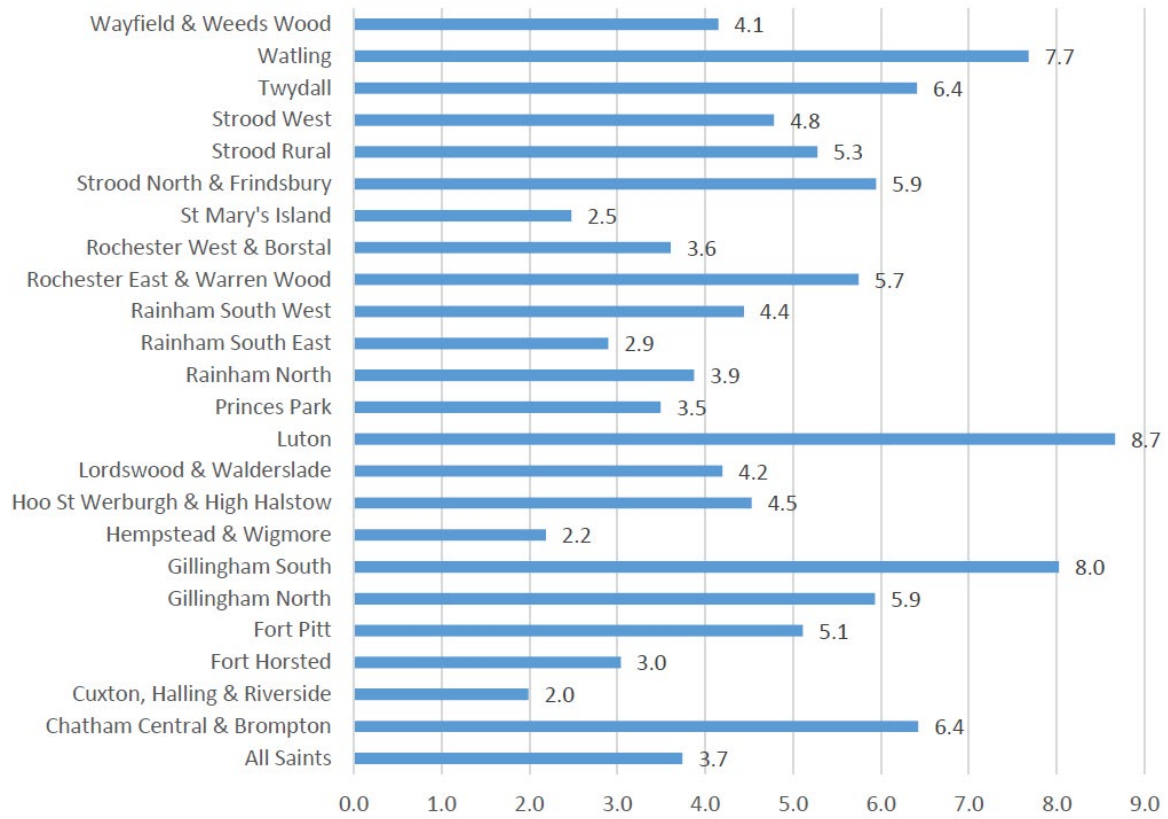
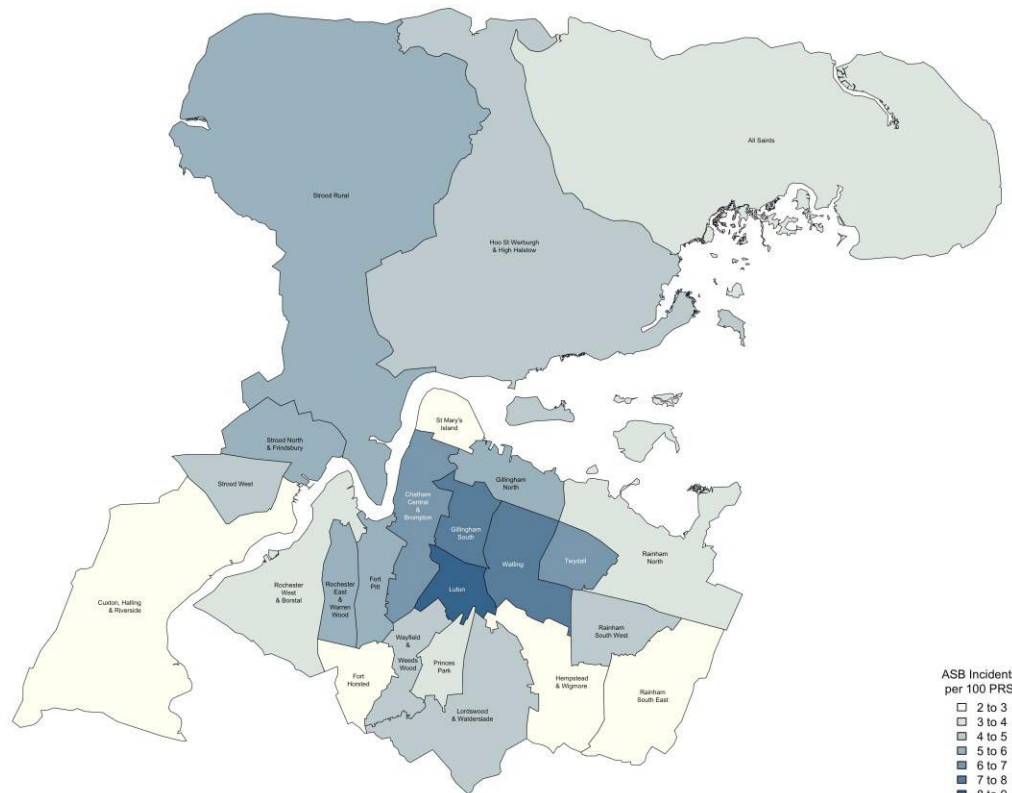


Figure 20. ASB incidents (rates per 100 properties) linked to key tenures across Medway (Source Ti 2024).



Map 8. Distribution of ASB (rates per 100 properties) linked to PRS properties (Source: Ti 2024, Map by Metastreet)

## 2.3. Results - Houses in Multiple Occupation (HMO)

For the purposes of this report, HMOs in Medway have been divided into two main groups, known HMOs (licensed by the authority under Part 2, Housing Act 2004,) and predicted HMOs (shared amenity HMOs with 3 or more occupants).

The known HMO group meet the following standards:

- Dwellings inhabited by five or more occupiers, residing in two or more distinct households, and sharing common amenities like a kitchen or bathroom. This regulation applies irrespective of the number of floors.

The predicted HMO group are based on the following standard:

- Dwellings inhabited by three or more occupiers, residing in two or more distinct households, and sharing common amenities like a kitchen or bathroom. The property type is not considered.

### 2.3.1. Population and distribution

Medway's HMO population is made up of known HMOs that share basic amenities (264) and predicted HMOs (754). The total HMO population in Medway is therefore calculated to be 1,018.

The HMO population is distributed across all wards. Gillingham South (205) has the most HMOs, (Figure 21 and Map 9).

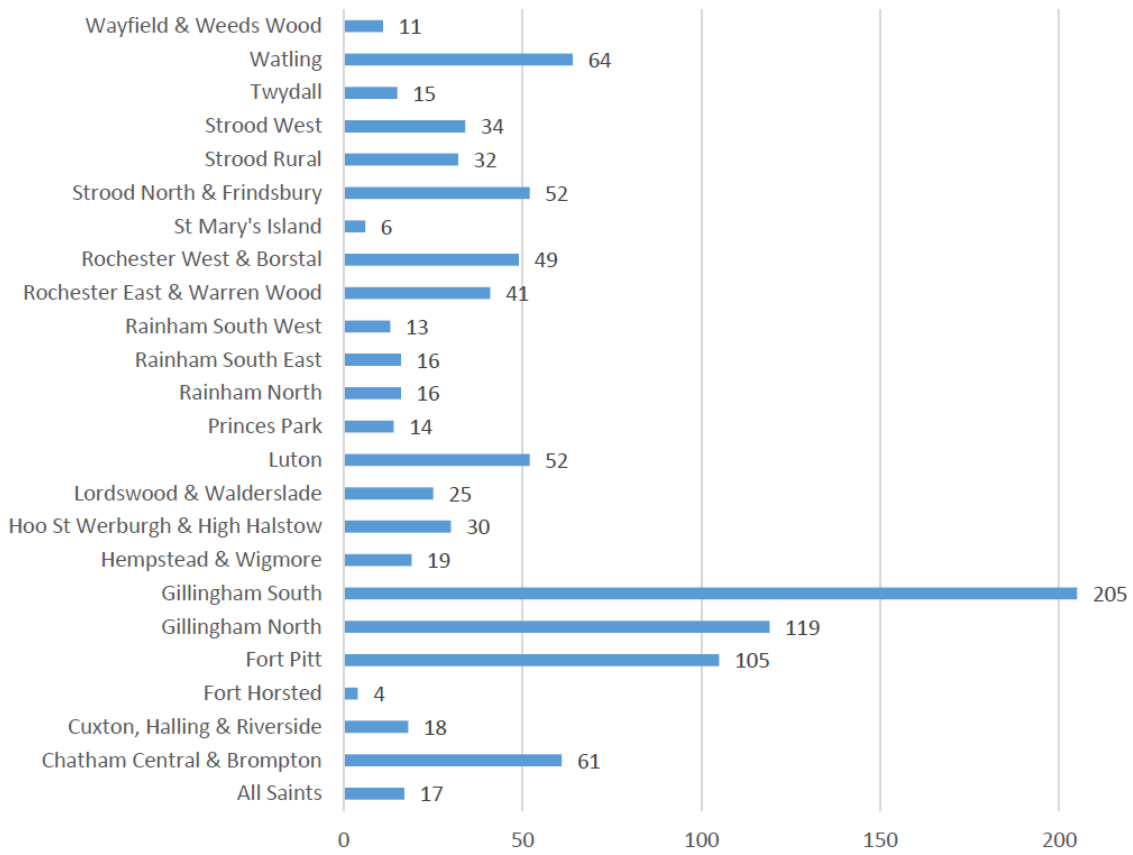
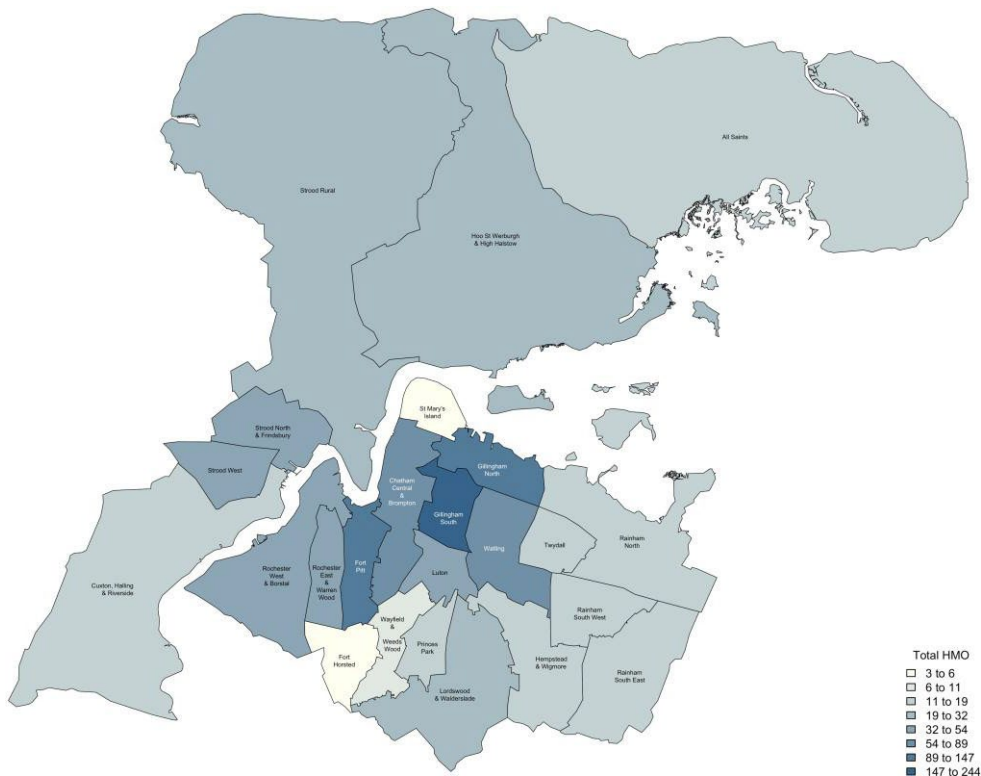


Figure 21. Number of HMOs by ward (known and predicted) (Source Ti 2024)



Map 9. Distribution of shared HMOs (known and predicted) (Source Ti 2024, map by Metastreet)

Shared HMOs tend to be the cheapest form of private housing available and have traditionally been occupied by single adults, however in recent years many more couples and children reside in HMOs. Pressure on affordable housing and higher rates of homelessness has driven demand for this type of dwelling.<sup>25</sup>

Known HMOs are distributed across nearly all wards; Gillingham South (88) has the most known HMOs (Figure 22).

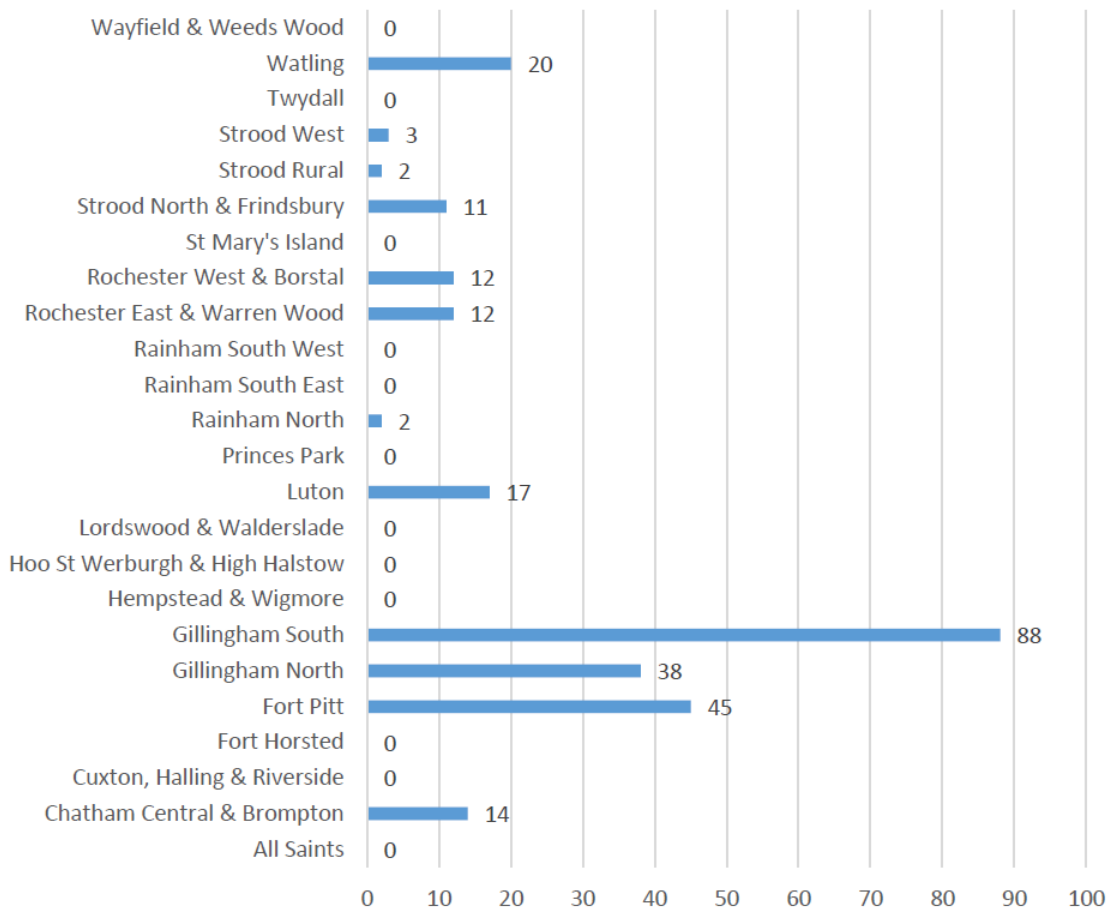


Figure 22. Number of known HMOs (Mandatory) by ward (Source Ti 2024).

Predicted HMOs are distributed across all wards; Gillingham South (117) and Gillingham North (81) have most predicted HMOs (Figure 23).

<sup>25</sup> [Regulating the Privately Rented Housing Sector, Evidence into Practice, By Jill Stewart, Russell Moffatt \(2022\)](https://www.taylorfrancis.com/books/edit/10.1201/9781003246534/regulating-privately-rented-housing-sector-jill-stewart-russell-moffatt) (https://www.taylorfrancis.com/books/edit/10.1201/9781003246534/regulating-privately-rented-housing-sector-jill-stewart-russell-moffatt)

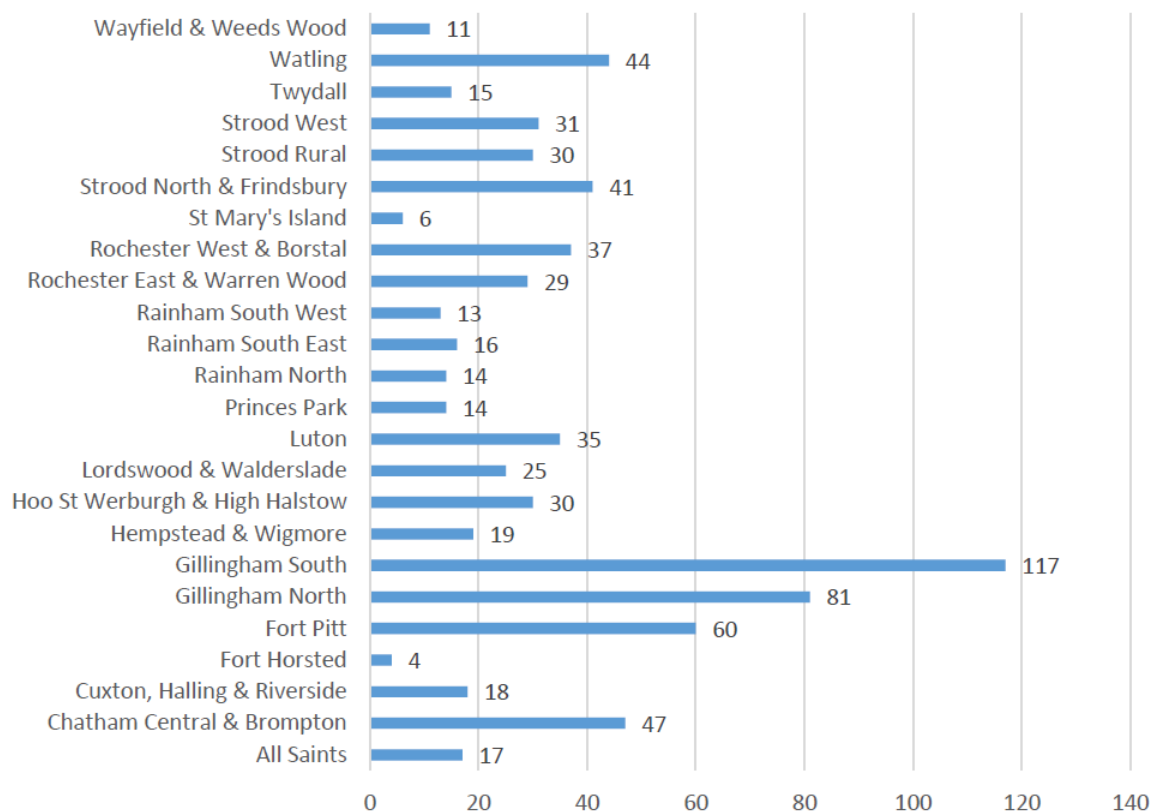


Figure 23. Number of predicted HMOs (shared amenities) by ward (Source Ti 2024).

### 2.3.2. HMO & housing conditions

Housing conditions are affected by the level of maintenance, quality of repair & management, the age of the property, thermal efficiency, and type of construction.

Proper management of HMOs is necessary to safeguard the tenants and the wider community. The HMO Management Regulations require the manager to keep all parts of the HMO safe, clean and well maintained. They also place a duty on tenants of HMOs to cooperate with the manager and not damage any fire safety equipment.<sup>26</sup>

Using a sample of properties that are known to have at least one serious housing hazard, it is possible to predict the number of HMOs (licensed & predicted) with at least one serious hazard (Category 1 and high scoring Category 2, HHSRS A-D) across the borough (Figure 24). Further details of the methodology can be found in Appendix 2.

Analysis shows that 232 of 1,018 shared amenities HMOs (known and predicted) in Medway are predicted to have at least one serious hazard. The number of Category 1 and high scoring Category 2, (HHSRS A-D) hazards is highest in Gillingham South (55) (Figure 24 & Map 10). Most wards have HMOs with predicted hazards.

<sup>26</sup> [The Management of Houses in Multiple Occupation \(England\) Regulations 2006](https://www.legislation.gov.uk/uksi/2006/372/contents/made) (<https://www.legislation.gov.uk/uksi/2006/372/contents/made>)

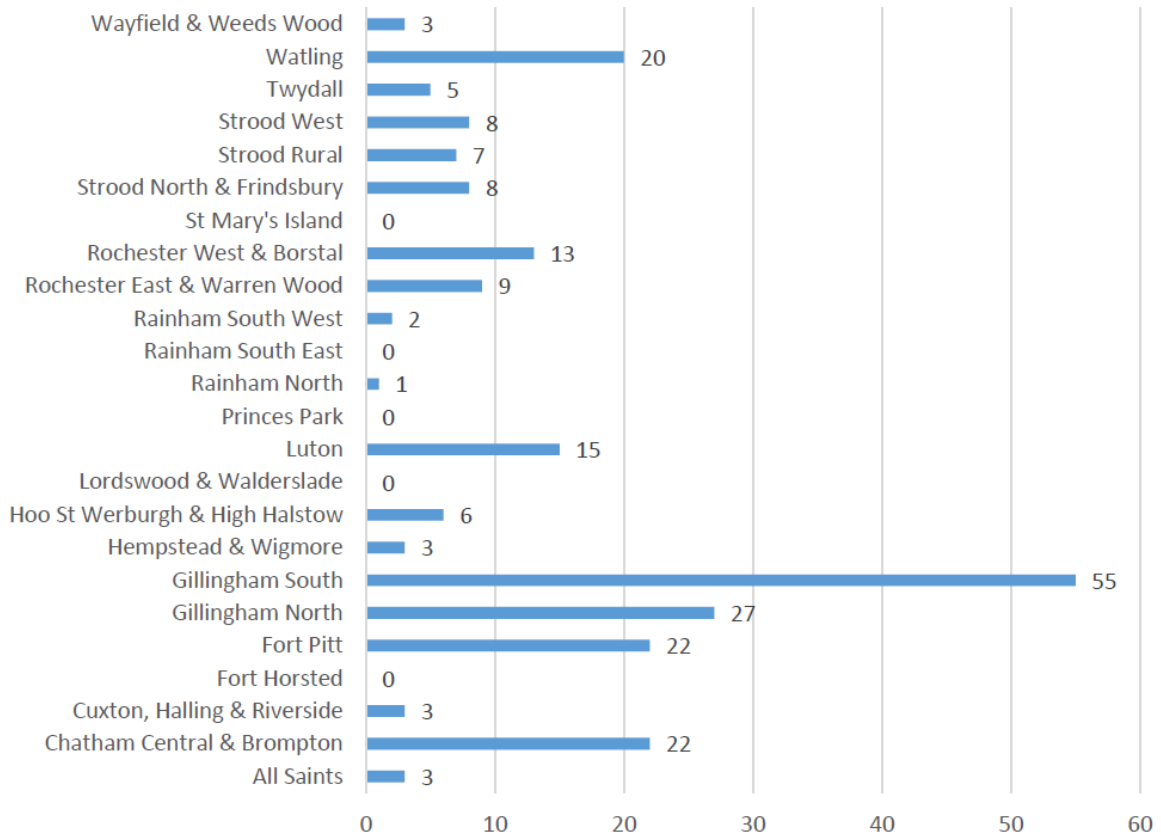
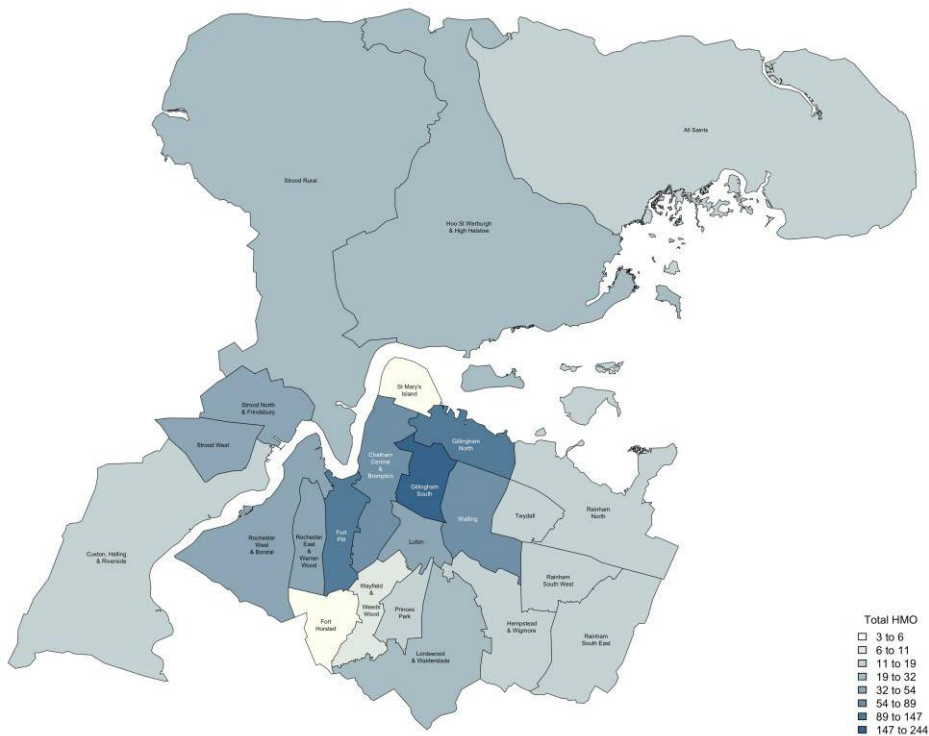


Figure 24. Number of HMO (known and predicted) with Category 1 and high scoring Category 2, (HHSRS A-D) by ward (Source Ti 2024).



Map 10. Distribution of HMO (known and predicted) with Category 1 and high scoring Category 2, (HHSRS A-D) by ward (Source Ti 2024, map by Metastreet).

Complaints made by tenants and others to Medway Council regarding poor property conditions, inadequate property management and anti-social behaviour are a direct indicator of low quality and poorly managed HMOs. Medway recorded 198 complaints from tenants and others linked to HMOs over a 5-year period (April 2018 – March 2023) Gillingham South (44) have highest number of tenant and other complaints linked to HMO (Figure 25 and Map 11).

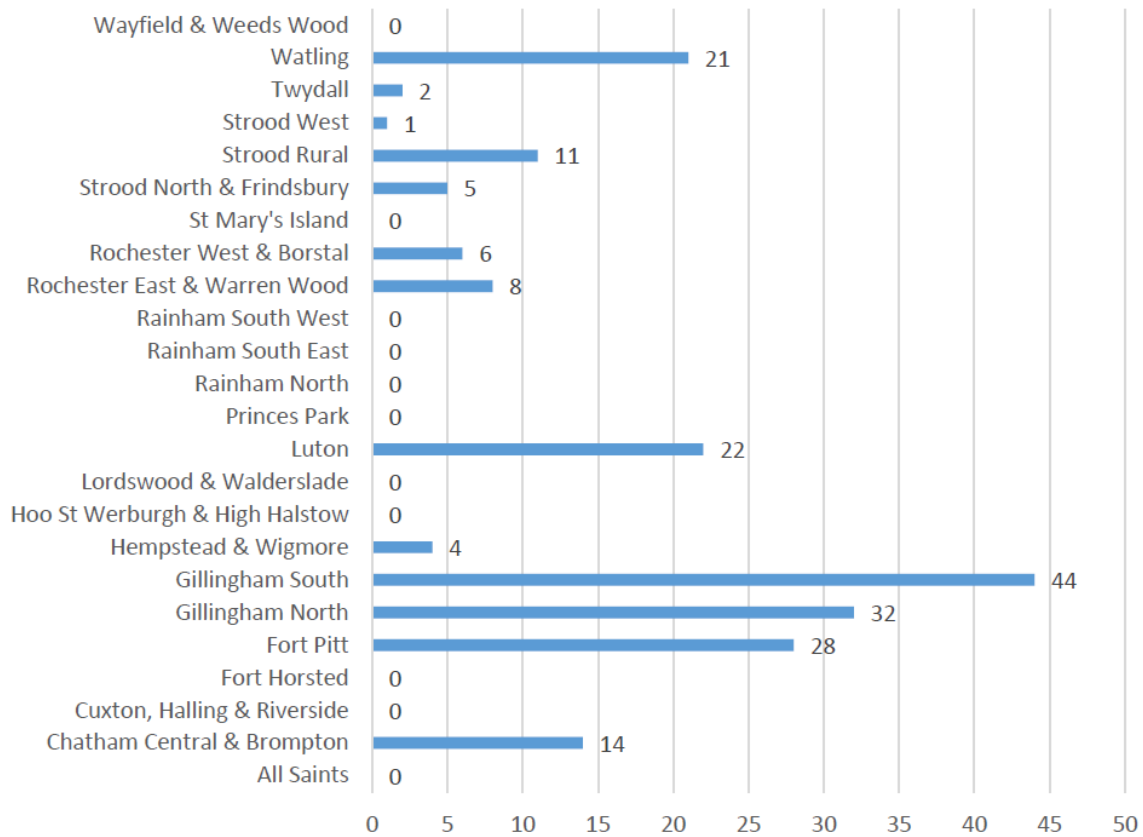
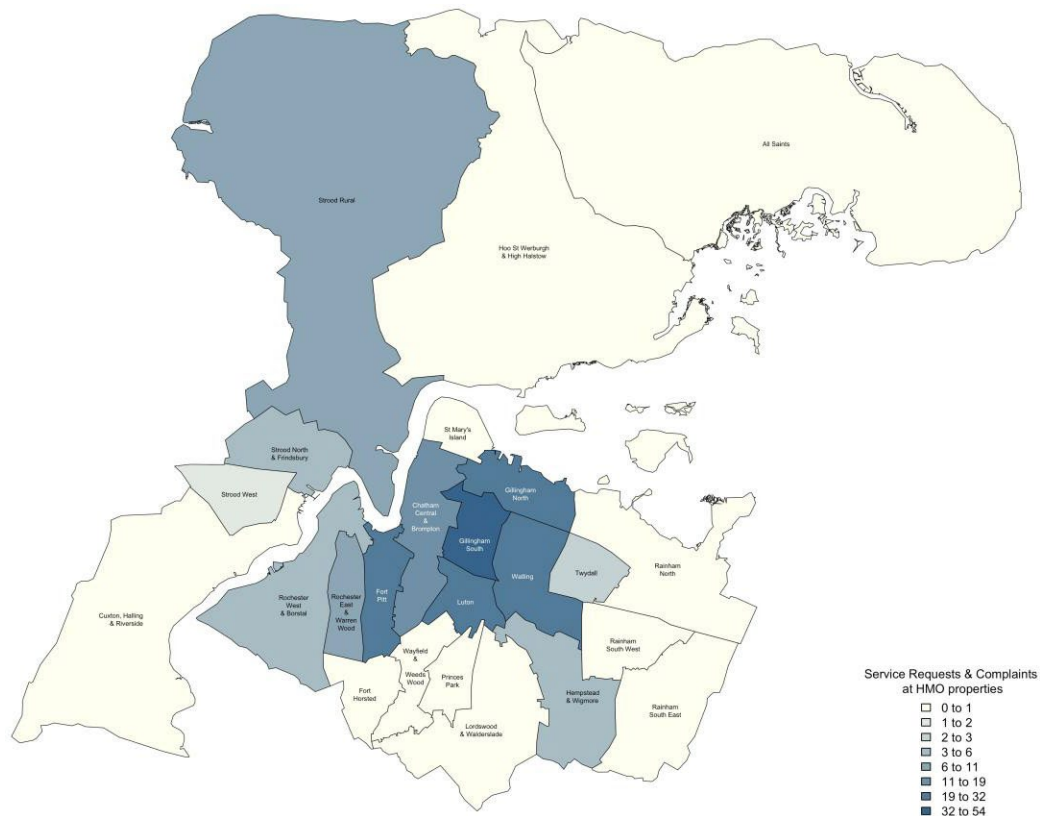


Figure 25. Number of tenant and other complaints linked to HMO by ward (Source Ti 2024)



Map 11. Distribution of tenant and other complaints linked to HMO by ward (Source Ti 2024, map by Metastreet).

### 2.3.3. HMO & anti-social behaviour (ASB)

Different types of ASB incidents recorded by the council over a 5-year period (April 2018 – March 2023) have been linked to HMO properties (known & predicted) and analysed. 101 incidents have been matched with individual HMO properties (Figure 26). It is important to note, where incidents could not be matched directly at the property level with an HMO, ASB incidents have been discarded from this study. For example, ASB incidents investigated on a street corner that cannot be directly linked to an HMO property have been excluded.

Figure 26 shows the number of ASB incidents associated with all HMO premises (commercial and ASB incidents not linked to residential premises are excluded from these figures). Gillingham North

(23) and Gillingham South (21) have the highest recorded ASB incidents linked to HMOs (Figure 26 & Map 12).

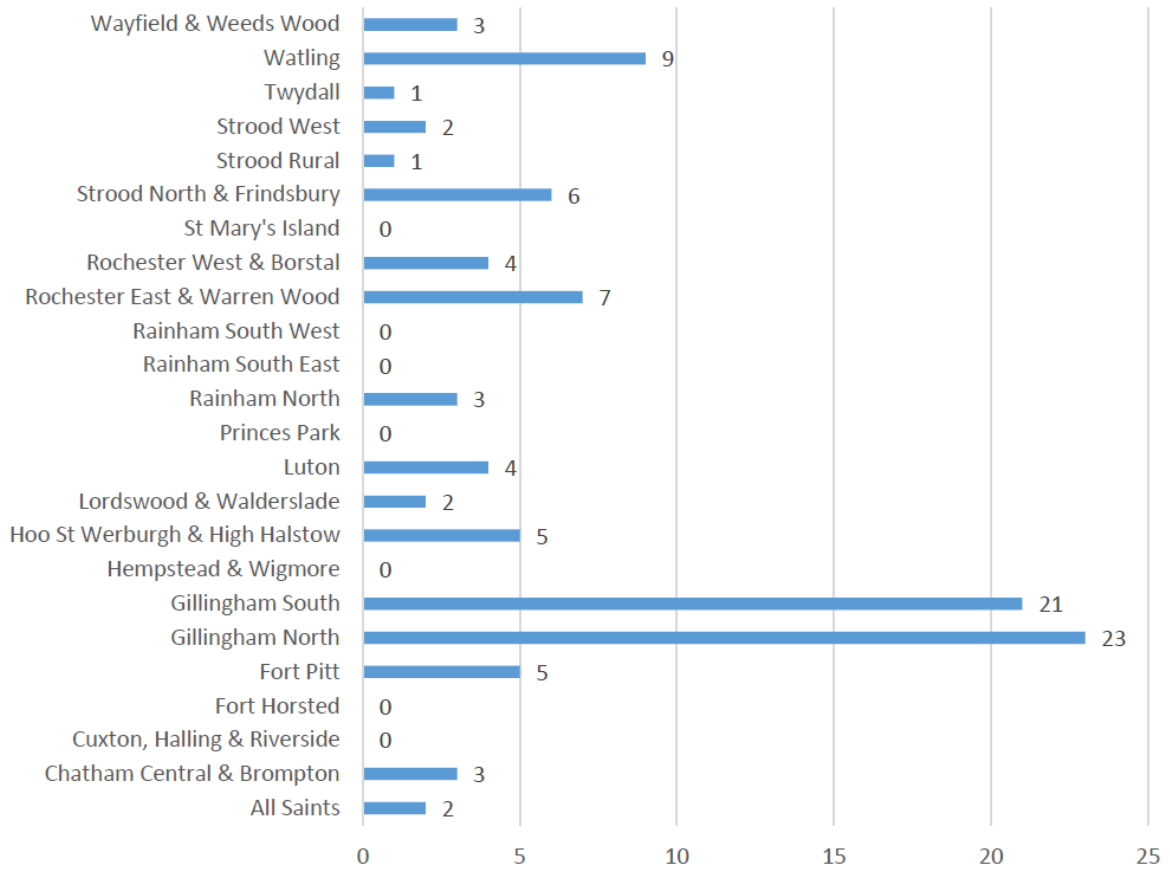
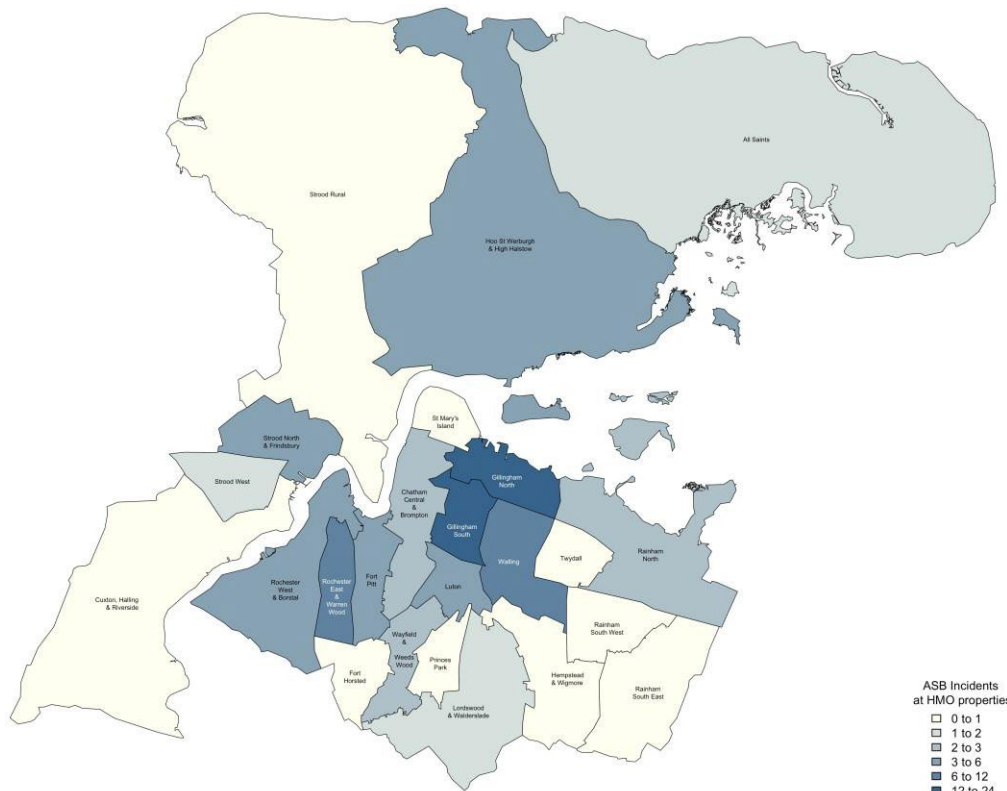


Figure 26. Number of ASB incidents linked to all HMOs (known and predicted) by ward (Source Ti 2024).



Map 12. Distribution of HMOs (known and predicted) with linked ASB incidents (Source Ti 2024, map by Metastreet)

### 3. Conclusions

The private rented sector (PRS) in Medway has grown steadily since 2011. Based on tenure

modelling (2024), Medway's PRS is now calculated to be 23.2% of all housing stock (Figure 7). The PRS in Medway is distributed across all 24 wards (Figure 9). The number of PRS dwellings per ward ranges from 3,693 (Gillingham South) to 362 (Fort Horsted).

The percentage of PRS properties in each ward ranges between 45.1% (Gillingham South) and 11.9% (Hempstead & Wigmore) (Figure 10 & Table 2). Therefore, 13 out of 24 Medway wards have an equal or higher percentage PRS than the national average in 2024 (19%).

Medway has a mixture of high and low deprivation wards. 12 of 24 wards have aggregated IMD rankings below decile 5 (national average) (Figure 4). Medway has a higher proportion of households in fuel poverty (9.5%) when compared to southeast England (8.4%) but has a lower proportion when compared to the national average (13.1%) (Figure 4).

Medway has an above average (mean) rented property possession rate, with 14 claims per 10,000 households in 2023 (Figure 7). The average (mean) number of claims for authorities in England was

8.1 per 10,000. Overall Medway has above average rents (all categories) for England (£895) (Figure 6). The national average is £825.

There are 3,619 private rented properties in Medway that are likely to have at least one serious housing hazard (Category 1 and high scoring Category 2, HHSRS). PRS properties with serious hazards are distributed across all wards. Gillingham South (706) and Chatham Central & Brompton (468) have the highest number of properties with at least one Category 1 and/or high scoring Category 2 hazard (Figure 13 & Map 4). Category 1 and/or high scoring Category 2 hazards in the PRS are distributed across Medway with concentrations of hazards in some central and southern wards (Map 4). The rates of Category 1 and/or high scoring Category 2 HHSRS hazards per 100 PRS properties reveals a wide distribution across Medway (Figure 14 & Map 5). Gillingham South (19.6 per 100) has the highest rates of predicted PRS properties with serious hazards. The national average for category 1 hazards in the PRS is 12%.

Medway recorded 3,045 complaints and service requests from private tenants and others linked to 2,071 PRS properties over a 5-year period. Gillingham South (675) and Chatham Central & Brompton (429) had the highest number of complaints and service requests (Figure 15 & Map 6).

As part of this project 23,593 EPC ratings were matched to PRS properties (Figure 16). All figures have been modelled from this group. It has been calculated using the matched addresses that 19.5% (4,611) PRS properties in Medway have an E, F, and G rating. 3.7% of PRS properties have an F and G rating (Figure 16). Extrapolated to the entire PRS, 1,080 PRS properties are likely to fail the MEES statutory requirement.

The council has recorded a total of 1,605 incidents related to anti-social behaviour (ASB) and nuisance linked to PRS properties over the past five years. Gillingham South (289) has the highest levels of PRS ASB incidents (Figure 19 & Map 7).

Medway's HMO population is made up of known HMOs that share basic amenities (264) and predicted HMOs (754). The total HMO population in Medway is therefore calculated to be 1,018. The HMO population is distributed across all wards. Gillingham South (205) has the most HMOs, (Figure 21 and Map 9). Known HMOs are distributed across nearly all wards; Gillingham South (88) has the most known HMOs (Figure 22). Predicted HMOs are distributed across all wards; Gillingham South (117) and Gillingham North (81) have most predicted HMOs (Figure 23).

Analysis shows that 232 of 1,018 shared amenities HMOs (known and predicted) in Medway are predicted to have at least one serious hazard. The number of Category 1 and high scoring Category 2, (HHSRS A-D) hazards is highest in Gillingham South (55) (Figure 24 & Map 10). Most wards have HMOs with predicted hazards.

Medway recorded 198 complaints from tenants and others linked to HMOs over a 5-year period (April 2018 – March 2023) Gillingham South (44) have highest number of tenant and other complaints linked to HMO (Figure 25 and Map 11).

Different types of ASB incidents recorded by the council over a 5-year period (April 2018 – March 2023) have been linked to HMO properties (known & predicted) and analysed. 101 incidents have been matched with individual HMO properties. Gillingham North (23) and Gillingham South (21) have the highest recorded ASB incidents linked to HMOs (Figure 26 & Map 12).

### Appendix 1 – Ward summaries

Table 3. Ward PRS summary (Source Ti 2024)

Wards	No. PRS	% PRS	Hazards (properties with one or more)
All Saints	374	17.3	53
Chatham Central & Brompton	2,644	32.7	468
Cuxton, Halling & Riverside	502	13.5	40
Fort Horsted	362	17.7	27
Fort Pitt	1,728	28.3	246
Gillingham North	2,400	32.7	235
Gillingham South	3,693	45.1	706
Hempstead & Wigmore	457	11.9	32
Hoo St Werburgh & High Halstow	883	14.3	57
Lordswood & Walderslade	1,072	17.8	65
Luton	1,795	36.6	341
Princes Park	715	19.5	30
Rainham North	1,215	18.3	117
Rainham South East	1,104	19.0	72
Rainham South West	518	13.0	37
Rochester East & Warren Wood	1,317	22.6	122
Rochester West & Borstal	1,647	25.9	147
St Mary's Island	525	22.2	9
Strood North & Frindsbury	1,592	25.7	243
Strood Rural	779	13.2	109
Strood West	1,215	20.8	136
Twydall	671	16.2	60
Watling	1,297	23.5	219
Wayfield & Weeds Wood	699	13.3	48
Grand Total	2,9204	23.2	3,619

Table 4. Ward HMO (known and predicted) summary (Source Ti 2024)

Wards	No. HMO	Hazards (properties with one or more)	Service Requests & complaints
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All Saints	17	3	0
Chatham Central & Brompton	61	22	14
Cuxton, Halling & Riverside	18	3	0
Fort Horsted	4	0	0
Fort Pitt	105	22	28
Gillingham North	119	27	32
Gillingham South	205	55	44
Hempstead & Wigmore	19	3	4
Hoo St Werburgh & High			
Halstow	30	6	0
Lordswood & Walderslade	25	0	0
Luton	52	15	22
Princes Park	14	0	0
Rainham North	16	1	0
Rainham South East	16	0	0
Rainham South West	13	2	0
Rochester East & Warren Wood	41	9	8
Rochester West & Borstal	49	13	6
St Mary's Island	6	0	0
Strood North & Frindsbury	52	8	5
Strood Rural	32	7	11
Strood West	34	8	1
Twydall	15	5	2
Watling	64	20	21
Wayfield & Weeds Wood	11	3	0
Grand Total	1,018	232	198

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

This Appendix explains at a summary level Metastreet's Tenure Intelligence (Ti) method (Figure 27).

Ti uses big data and machine learning 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 comprising millions of cells of data.

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

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 27. Summary of Metastreet Tenure Intelligence method.

## Methodology

Metastreet has worked with Medway Council to create a residential property data warehouse based on a detailed specification. This has included linking millions of cells of data to 72,064 unique property references, including council and externally sourced data. All longitudinal data requested from council departments is 5 consecutive years, from April 2018 – March 2023

Once the property data warehouse was created, the Ti model was used to predict tenure and stock condition using the method 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.

Four predictive models have been developed as part of this project. Each model is unique to Medway , they include:

- Owner occupiers
- Private rented sector (PRS)
- Houses in Multiple Occupation (HMO)
- PRS housing hazards (HHSRS, Category 1 and high scoring Category 2 A-D).

Using a D2 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 D2 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 3 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 large data models include error for a range of reasons. The D2 value is one measure of model “effectiveness”. The true test of predictions is field trials by the private housing service. However, error is kept a low as is possible through detailed post analysis filtering and validation.

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 94% (Table 5).

Table 5. Owner occupier predictive factors.

Risk factors selected	Pr (>Chi)*
Accounts.over.5.years	2.2e-16
Benefit_claims_last_5_years	2.2e-16
Correspondence.address.not.same.as.subject.address	2.2e-16
no_PRS_SRs	2.2e-16
EPC.TENURE	2.2e-16
Training data, n= 1265	
D <sup>2</sup> test = 0.94**	

\* 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 67% (Table 6).

Table 6. PRS predictive factors.

Risk factors selected	Pr(>Chi)
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Accounts.over.5.years.	2.2e-16
EPC.TENURE	1.267e-15
Length.of.current.account	1.122e-09
no PRS SRs	2.2e-16
Benefit claims last 5 years	2.2e-16
Training data, n= 1629	
D <sup>2</sup> test = 0.67	

### Category 1 (HHSRS) hazards model

Numerous properties where the local housing authority has recently taken action to address serious hazards were sampled for training data. Specifically, this included Housing Act 2004 Notices served on properties to address Category 1 hazards. It's important to note that due to the complex risk-based approach to HHSRS scoring model and assessment, predictions are likely to include both properties with Category 1 hazards and properties with high scoring Category 2 hazards. It is reasonable to conclude that properties identified are likely to include hazards that would be scored A-D, using HHSRS scoring matrix and therefore be considered serious. The model results show that each of the model terms is statistically significant, with the overall model having a “predictive capacity” of around 71% (Table 7).

Table 7. Category 1 (HHSRS) hazard predictive factors.

<b>Risk factors selected</b>	<b>Pr (&gt;Chi)</b>
CURRENT ENERGY EFFICIENCY	2.2e-16
no PRS SRs	2.2e-16
Length.of.current.account	3.151e-12
TDS	2.2e-16
Benefit.claims.over.last.5.years	7.842e-08
Training data, n= 1070	
D2 test = 0.71	
Risk factors selected	

### HMO (House in Multiple Occupation) model

This model predicts the likelihood that a UPRN will be an HMO (Table 8). Each of the 5 model terms is statistically significant and the overall model has a “predictive capacity” of around 59%.

Table 8. HMO predictive factors.

<b>Risk factors selected</b>	<b>Pr (&gt;Chi)</b>
ASB	1.228e-07
NUMBER_HABITABLE_ROOMS	2.2e-16
Benefit.claims.over.last.5.years	7.367e-05
Ctax.liability.order	0.0232081
Accounts.over.5.years	5.752e-08
Training data, n= 1070	
D2 test = 0.59	

## Ti 2024 – Census 2021 data comparison

Table 9. Ti dwelling data compared to Census household data.

<b>Medway 2024</b>	<b>April 2018 – March 2023</b>		<b>Census 2021</b>	
<b>Tenure</b>	<b>No. dwellings</b>	<b>%</b>	<b>No. households</b>	<b>%</b>
Social Housing	15,791	12.5%	15,130	13.6%
Owner occupiers	81,096	64.3%	73,768	66.2%
PRS	29,204	23.2%	22,559	20.2%
ToT	126,091		111,457	

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