# **I. INTRO:**

#### **Justification of research**

London is globally recognized as a multicultural and diverse city, product of many centuries of national and international migrant flows. This is what makes it a current weaving of ethnicities and nationalities, of diverse religions and economic dynamics. This diversity is what makes it culturally and touristically attractive, but also what makes it a challenging backdrop to tackle socio economic inequities. One of the many challenges this city has faced is urban segregation, a phenomenon involving the physical and socio-economic separation of distinct groups within the urban landscape.

While some migrant communities have been able to successfully integrate into the socio-economic and political dynamics, others have faced larger struggles and systematic barriers limiting their access to housing, employment, education, safety and other social services. These historic disparities often lead to present day segregated clusters, which worsen the cycles of deprivation; low-income communities being forced to live with more low-income communities in impoverished and isolated areas of town with few opportunities for social mobility (Hamnett, 2003; Arbaci, 2019).

This is not to say that urban segregation only happens to impoverished communities who make economic decisions regarding their settlement and employment; migrant communities in large cities segregate based on other diverse characteristics such as ethnicity, religion and cultural background. Some households prioritize proximity to employment hubs, while others seek to reside among culturally similar groups to maintain their traditions and networks (Vertovec, 2006). Although segregation can sometimes have positive aspects, such as strengthening the social weaving and creating vibrant clusters, it can also exacerbate inequalities (Arbaci, 2019).

Under economic segregation, the housing market plays a pivotal role in shaping where people live. Affordability and availability directly influence settlement patterns, with rising house prices, rent levels, and neighbourhood characteristics such as access to public transport and social infrastructure reinforcing socio-economic divides in London. Income disparities further dictate access to housing, often pushing low-income groups into areas of overcrowding or substandard living conditions, while higher-income populations gravitate toward neighbourhoods with better amenities and services (Hamnett, 2003; Arbaci, 2019).

Policy interventions and urban development projects have historically sought to address these divides by improving living conditions in deprived neighbourhoods or redistributing amenities across the city. In London, policies such as the Housing Act, Welfare Reform Act, Right to Buy scheme, Affordable Housing Act, and various regeneration projects aimed to increase housing affordability and accessibility for the most deprived populations. However, while these initiatives intended to enhance housing quality and accessibility, they often yielded mixed or unexpected results.

For instance, the Right to Buy scheme, designed to promote homeownership, disproportionately benefitted higher-income households, reducing the availability of social housing and altering the socio-economic composition of neighbourhoods (Hamnett, 2003). Similarly, large-scale redevelopment projects like those in Elephant and Castle displaced vulnerable groups, reshaping local demographics and creating new patterns of segregation (Watt & Bernstock, 2017). Integration and segregation are not inherently positive or negative, but their occurrence has profound consequences for the lives and opportunities of affected populations.

By examining these dynamics within London, this study investigates how housing market characteristics influence settlement patterns, how these patterns vary across the city, and how migrant communities have been differently impacted. It also evaluates whether the relationship between housing and settlement has improved under the scope of these policies or perpetuated socio-economic divides.

#### **Scope**

This study focuses on six migrant communities (Bangladeshi, Caribbean, South American, Southeast African, Romanian, and Polish), chosen for their significant contributions to London’s multiculturalism and because of their distinct settlement and economic behaviours. These groups reflect a wide spectrum of cultural traditions and socio-economic experiences, providing a comparative lens to analyse segregation patterns.

The geographical scope of this study encompasses the entire city of London, capturing variations in socio-economic infrastructure and housing dynamics. The Middle Layer Super Output Area (from now on referred to as MSOA), a statistical unit comprising groups of populations between 5,000 and 15,000 residents, is used as the primary spatial unit for analysis, enabling a granular examination of neighbourhood-level trends (ONS, 2021). The temporal scope spans three decades, 1991–2021, aligning with census data availability to facilitate a longitudinal analysis of segregation and housing characteristics.

This 30-year period enables comparisons across different policy phases, offering insights into the periods before, during, and after the implementation of key housing policies. The selected policies and projects (Housing Act, Welfare Reform Act, Right to Buy scheme, Affordable Housing Act, and Elephant and Castle Redevelopment) were prioritized for their potential to facilitate spatial and temporal test-control analysis, allowing for robust measurement and comparison.

The study examines key housing characteristics including rent and sale prices, social housing investment, over-occupation rates, and ownership percentage. Neighbourhood characteristics such as crime rates, public transport accessibility, greenery, and past segregation indices complement this analysis. Together, these factors provide a comprehensive framework for exploring the drivers and outcomes of urban segregation.

#### **Research questions and hypotheses**

This study addresses the following main and secondary research questions:

**What is the correlation between segregation and various housing characteristics in London?**

* How does this correlation differ among the six nationalities chosen for this study
* Which housing and neighbourhood characteristics exhibit stronger correlations with segregation patterns?
* For what communities, does historic segregation play a bigger role than housing characteristics?
* How do these correlations vary across different parts of London, highlighting geographical disparities?
* How can these findings be interpreted considering key public policies, aimed at improving housing availability and quality?

This study hypothesizes that housing and neighborhood characteristics correlate differently with segregation and that migrant communities respond uniquely to these factors, shaped by both current housing dynamics and historic settlement patterns. South Asian and African migrants are expected to cluster in specific neighborhoods to maintain cultural and social networks, with limited affordable housing reinforcing historic segregation patterns and increasing overcrowding (Arbaci, 2019; Trust for London, 2023). Eastern European and Latin American migrants, reliant on private rentals, are hypothesized to face increased segregation due to displacement caused by rising rents or stricter regulations, often settling in areas with pre-existing socio-economic divides (Migration Observatory, 2019; IRMO, 2024). Caribbean communities, whose historic settlement patterns are strongly tied to specific neighborhoods, are expected to exhibit enduring segregation influenced by the legacy of historic inequalities, with limited access to affordable housing further constraining mobility (Watt & Minton, 2016; Trust for London, 2023).

Rising house prices, rents, and over-occupation are hypothesized to increase segregation by excluding low-income and migrant populations from central, well-resourced areas while encouraging clustering to reduce household costs. Conversely, access to social housing may mitigate segregation by offering marginalized groups opportunities to settle in more diverse neighbourhoods. Homeownership, associated with greater stability, is expected to reinforce segregation in historically clustered areas, while entrenched historical patterns persist due to structural inequalities and cultural cohesion priorities.

Housing policies are hypothesized to shape these dynamics by influencing affordability, social housing availability, and displacement. The Right to Buy scheme, introduced under the Housing Act 1980, likely increased segregation by reducing council housing stock and displacing low-income populations to outer boroughs (Housing Act 1980, legislation.gov.uk). Similarly, the Welfare Reform Act 2012, which capped housing benefits, likely reinforced segregation by displacing low-income renters to under-resourced areas and increasing overcrowding (Welfare Reform Act 2012, legislation.gov.uk). Redevelopment projects like Elephant and Castle regeneration are expected to have contributed to gentrification and displacement of marginalized groups, deepening socio-economic divides (Southwark Council, 2004). Policies such as the Affordable Housing Program may have reduced segregation in some areas but failed to fully address systemic barriers (Greater London Authority, 2021).

#### **Methodology**

By combining quantitative analyses with qualitative insights, the study ensures a multi-dimensional understanding of the research questions.

#### Quantitative Analysis

The analysis begins by measuring segregation using well-established indices such as Dissimilarity, Theil’s H, and Isolation Indexes, which quantify spatial settlement patterns across neighbourhoods. These indices enable temporal and city-wide comparisons, capturing segregation dynamics for each nationality. Statistical tools, including correlation analyses, examine the relationships between segregation indices and housing characteristics such as rent levels, house prices, over-occupation, ownership, and social housing investment. Scatterplots and linear regression highlight key drivers of segregation, while geographically weighted regression (GWR) assesses spatial heterogeneity, providing localized insights into segregation dynamics across London.

#### Qualitative Contextualization

This study uses spatial and temporal comparisons to analyse how five key housing policies influenced housing characteristics and, in turn, segregation patterns. By focusing on the specific time periods and MSOAs affected by the prioritised policies, the analysis examines how these interventions shaped affordability, ownership, and social housing availability. The results reveal how changes in housing characteristics impacted segregation across London over time.

1. *Innovation and Contribution*

This study introduces several innovative contributions to the field of urban studies by addressing critical gaps in the analysis of segregation and its relationship with housing and neighbourhood dynamics. By focusing on specific housing characteristics, rather than composite indices, the study provides detailed insights into housing market dynamics and their direct influence on segregation. The integration of longitudinal (2001–2021) and spatial (MSOA-level) analyses offers a unique temporal-spatial synergy, capturing both the persistence and variability of segregation patterns across London.

The use of MSOAs as the primary spatial unit enables a granular examination of neighbourhood-level trends, offering a more precise understanding of segregation dynamics than broader borough-wide analyses. Furthermore, the study examines the experiences of six specific nationalities, highlighting group-specific segregation patterns and the diverse impacts of housing policies. This comparative focus emphasizes the differential effects of housing market dynamics and neighbourhood characteristics on distinct migrant communities, adding depth to the analysis.

The study’s qualitative approach to housing policy also contributes to its innovative framework. This allows for a richer understanding of how policies have shaped settlement patterns and segregation dynamics over time. By combining housing variables with neighbourhood factors like crime rates and public transport accessibility, the research offers a holistic perspective on segregation, addressing both structural and socio-cultural dimensions.

An innovative aspect of this study is the incorporation of lagged segregation into its analysis. By considering the delayed effects of prior segregation patterns on current settlement trends, the study captures the persistent impact of historic inequalities on housing dynamics. This approach provides deeper insights into how past segregation interacts with contemporary housing and neighborhood characteristics to influence the spatial integration of diverse communities over time.

Overall, this study bridges significant gaps in the urban studies literature by integrating detailed housing variables, temporal-spatial analyses, and qualitative policy framing.

# **II. LITERATURE REVIEW**

The dynamics of segregation in London provide a lens through which to examine the interplay between settlement, housing policies, and urban inequalities. London’s housing market, shaped by historical and contemporary policies, reflects and reinforces patterns of socio-economic and ethnic segregation. This literature review integrates theoretical frameworks, empirical studies, and methodological advancements to explore the relationship between housing and segregation, with a specific focus on the settlement patterns of six key nationalities.

### **1. Theoretical frameworks to understand Segregation in London**

The study of segregation in London needs a robust theoretical foundation to unpack the complexities of housing, migration, and settlement patterns. By critically engaging with these frameworks, this section establishes the rationale for applying them to London’s socio-spatial dynamics while also identifying gaps that this research aims to address.

#### **1.1 Spatial Assimilation Theory**

Spatial Assimilation Theory, rooted in classical migration studies, says that as migrants achieve upward social and economic mobility, they tend to move out of dense ethnic enclaves into more diverse or affluent neighbourhoods. This theory has often been used to explain settlement patterns in cities like London, where migrant groups initially cluster in areas of affordability and cultural familiarity before dispersing as they gain socioeconomic capital (Pais et al., 2012).

While this theory has value in relating mobility and integration, its real-life application in large cities like London has been criticised. Vertovec (2006) highlighted that this framework oversimplifies the motivations behind clustering, failing to account for structural barriers such as housing affordability and systemic discrimination. Wessendorf (2016) argued that the theory assumes equal access to housing and ignores the constraints faced by low-income migrants in high-demand urban markets. In London, where affordability crises persist, many migrants remain trapped in enclaves not by choice but by necessity.

#### **1.2 Place Stratification Theory**

Place Stratification Theory complements Spatial Assimilation by focusing on the structural barriers that restrict certain groups’ access to housing and upward mobility. It emphasizes how factors such as discrimination, historical inequalities, and restrictive housing policies reinforce segregation. Hamnett (2003) argued that the privatization of council housing under certain policies disproportionately excluded low-income and minority groups, reducing the availability of affordable housing and exacerbating socio-economic divides.

This theory provides a valuable mention to how inequalities are spatially reproduced. However, its primary focus on structural constraints can sometimes overshadow the agency of migrants and their ability to adapt or resist these barriers. Krysan and Crowder (2017) noted that Place Stratification Theory assumes homogeneity within ethnic groups, ignoring the diversity of experiences and strategies employed by migrants to navigate housing markets. First of all, do to racial and religious similarities, not all ethnic and migrant groups are discriminated against, and they don’t all react the same way to it.

#### **1.3 Labor Market Segmentation Theory**

Labor Market Segmentation Theory links segregation to labour markets, where the primary sector offers stable, well-paid jobs, while the secondary sector is characterized by precarious, low-wage employment. Migrants, particularly those in low-skilled jobs, are often confined to the secondary labour market, limiting their housing options and increasing their reliance on shared or overcrowded accommodations. Grimshaw et al. (2017) found that in London, migrants working in sectors such as hospitality and construction are disproportionately concentrated in areas like Newham, where affordable housing is scarce.

While Labor Market Segmentation Theory highlights the link between precarious employment and restricted housing options, it has been critiqued for assuming a rigid and relationship between low-wage employment and poor housing outcomes. This perspective risks overlooking other socio-political factors such as discriminatory housing practices, migration policies, and urban planning. Bauder (2001) argues that integrating housing policies into labour market analyses is essential for capturing the complex interplay between employment conditions and segregation dynamics.

### 1.4 Historical Institutionalism

Historical Institutionalism examines how past policies and institutional practices shape current social structures, including patterns of segregation. This theory posits that decisions made at critical junctures create enduring legacies, influencing present-day socio-spatial dynamics. For instance, Massey and Denton (1993) demonstrated how historical practices like redlining and discriminatory housing policies in the United States established residential segregation patterns that persist over time. Similarly, in the UK, historical housing allocations and urban planning decisions have contributed to the current distribution of ethnic communities across cities (Phillips, 2006).

### 1.5 Ethnic Preference and Constraint Theory

Ethnic Preference and Constraint Theory explores the interplay between voluntary and involuntary factors in shaping residential segregation. The theory posits that while some individuals actively choose to live within ethnically similar communities for cultural cohesion, support networks, or shared values, others are constrained by systemic barriers such as housing affordability, discrimination, or employment dynamics. Peach (1996) highlights how ethnic clustering can be both a choice—driven by cultural preservation—and a necessity, shaped by external socio-economic pressures.

Each of these theories offers a partial but valuable perspective on segregation in London. However, the complexities of London’s housing market, compounded by super-diversity, require an integrative approach that considers both structural constraints and migrant agency. This study builds on these frameworks by examining how housing policies, affordability, and neighbourhood characteristics interact with the settlement patterns of six nationalities, offering a nuanced understanding of segregation dynamics in one of the world’s most diverse cities.

### **2. Housing and Segregation in London**

The relationship between housing and segregation is mediated by a range of factors, including affordability, accessibility, and other neighbourhood socio economic and cultural characteristics. In London, these factors intersect in complex ways, reflecting the city’s unique socio-economic stratification.

Research has consistently demonstrated that housing affordability is one of the strongest determinants of segregation. Hamnett (2003) linked the rising house prices in central boroughs like Islington to gentrification and displacement, forcing low-income groups to relocate to outer boroughs. Similarly, Arbaci (2019) observed that rent increases exacerbate spatial inequalities, limiting access to quality housing for migrant communities. Over-occupation is another critical factor, with Vertovec (2006) noting that overcrowding in boroughs such as Tower Hamlets reflects affordability constraints, reinforcing clustering in deprived areas.

Public transport accessibility also plays a significant role in moderating segregation. Arbaci (2019) highlighted that high-PTAL boroughs such as Camden attract more diverse populations due to their connectivity to employment and public services, reducing segregation. Conversely, neighbourhoods with low transport accessibility, often concentrated in outer boroughs, experience greater spatial isolation.

Crime rates further compound these dynamics. Cheshire and Kerswill (2011) found that high crime levels deter middle-income families, concentrating low-income households in less desirable areas. This phenomenon reinforces socio-economic divides, as safe neighbourhoods attract wealthier residents, while deprived areas become further entrenched in cycles of poverty and exclusion.

### **3. Settlement Patterns of Six Nationalities**

The settlement patterns of London’s diverse migrant communities provide a unique perspective on the interaction between housing, labour markets, and systemic barriers. This section explores the historical arrival, settlement locations, integration challenges, and experiences of exclusion that each of the selected nationalities have faced.

#### **3.1 Bangladeshi Community**

The Bangladeshi community in London emerged prominently during the post-war era. Migration was initially driven by labour shortages in the UK, with a significant influx during the 1970s and 1980s. Tower Hamlets became a hub for Bangladeshi migrants due to its affordability and access to social housing. Vertovec (2006) noted that cultural and linguistic networks provided social support, facilitating early settlement. Despite forming a cohesive community, the Bangladeshi population faced systemic challenges, including high poverty rates and overcrowding in inner-city areas. Spencer (2002) documented the reliance of this group on public housing, which shaped their settlement in areas with concentrated deprivation. However, the gentrification of Tower Hamlets, particularly in areas like Spitalfields, has displaced many families to suburban boroughs such as Redbridge, reflecting both upward mobility and involuntary exclusion.

#### **3.2 Caribbean Community**

The Caribbean community’s migration to London is deeply tied to the post-war Windrush era, beginning in 1948. Recruited to address labour shortages, many Caribbean migrants settled in boroughs like Hackney, Lambeth, and in some neighbourhoods in the West, where affordable housing and employment opportunities were available. However, gentrification and housing policy shifts disrupted these settlement patterns. Hamnett (2003) argued that the privatization of social housing disproportionately affected Caribbean families, reducing their access to affordable housing and driving displacement. Today, many Caribbean families reside in outer boroughs like Croydon and Barking, often as a result of exclusionary economic forces rather than voluntary mobility. Despite these challenges, the Caribbean community has maintained cultural resilience through activism and social institutions, highlighting their contributions to London’s diversity, having also maintained certain clusters in inner-London neighbourhoods such as Brixton and Peckham.

#### **3.3 South American Community**

The migration of South Americans to London, particularly from countries like Ecuador, Colombia, and Brazil, increased significantly in the 1990s and 2000s. Southwark became a focal point for this community, drawn by its relative affordability and established informal networks. Wessendorf (2016) observed that South Americans often relied on shared housing and informal employment, which limited their access to secure housing and exacerbated clustering in specific neighbourhoods. While cultural networks have supported settlement, economic constraints have made integration challenging. Rising rents in Southwark have displaced many South American families to outer boroughs. Nevertheless, the community has enriched London’s urban culture, particularly in areas like Elephant and Castle, where South American businesses and festivals have revitalized public spaces.

#### **3.4 Southeast African Community**

Southeast African migration, particularly from Somalia and Eritrea, reflects the unique challenges faced by refugees. Many arrived in London fleeing conflict and political instability, with Newham becoming a primary settlement area. The concentration of Southeast African families in this borough reflects both affordability constraints and the availability of cultural and religious networks. Horn (2005) linked high rates of overcrowding and low housing quality in Newham to systemic barriers that limit mobility for refugee populations. Language barriers and high unemployment rates further complicate integration efforts. While some families have achieved upward mobility and moved to more diverse neighbourhoods like Waltham Forest, many remain trapped in cycles of poverty, illustrating the enduring impact of structural inequalities. However, the community’s resilience is evident in their ability to form strong social ties and navigate systemic challenges.

#### **3.5 Polish Community**

Polish migration to London has occurred in waves, beginning with post-war arrivals and intensifying after Poland’s accession to the European Union in 2004. Initially clustering in East London boroughs such as Ealing and Hammersmith, Polish migrants were drawn to London by employment opportunities in construction, hospitality, and other sectors. Ryan (2010) documented how shared housing arrangements provided a temporary solution for new arrivals, though they often reinforced clustering. Over time, economic mobility allowed many Polish families to move to suburban boroughs with better housing quality and educational opportunities.

#### **3.6 Romanian Community**

Romanian migration to London grew significantly after Romania’s accession to the European Union in 2007. Many Romanian migrants settled in boroughs like Brent and Redbridge, drawn by established Eastern European networks and labour market opportunities. Unlike earlier waves of migration, Romanian migrants have faced significant stigmatization due to negative media portrayals and political discourse framing them as burdens on public resources (Dustmann & Preston, 2001). This stigmatization has exacerbated their economic vulnerability, confining many Romanians to low-wage jobs and overcrowded housing. Arbaci (2019) observed that affordability constraints, coupled with limited access to social housing, have reinforced clustering in high-density, low-quality accommodations.

The settlement patterns of these six nationalities reflect the intricate interplay of cultural networks, economic constraints, and housing policies. While some groups have achieved varying degrees of integration, systemic barriers continue to reinforce segregation and spatial inequality for others.

### **4. Key Housing Policies**

Housing policies in London have profoundly shaped the city’s socio-spatial dynamics, influencing affordability, accessibility, and the settlement patterns of diverse populations. While many aimed to promote integration and affordability, their implementation often produced unintended consequences, either reinforcing or mitigating segregation. This section examines five key housing policies and other relevant initiatives that have impacted housing and segregation in London.

The **Right to Buy** policy, introduced under the Housing Act 1980, aimed to promote homeownership by enabling council tenants to purchase their homes at discounted rates. While it increased homeownership, the policy drastically reduced London’s social housing stock, with some boroughs losing up to 50% (Hamnett, 2003). Many Right to Buy properties transitioned into the private rental market, inflating rents and displacing low-income families to outer boroughs with more affordable housing (Arbaci, 2019). This privatization entrenched spatial inequalities, clustering wealthier homeowners in central neighbourhoods and lower-income renters in suburban areas.

The **Welfare Reform Act** (2012–2016) introduced measures like the “bedroom tax” and benefit caps to reduce housing benefit costs. These changes disproportionately affected low-income renters in boroughs like Newham and Tower Hamlets, displacing families to more affordable outer boroughs, which often had poorer infrastructure and fewer job opportunities (Hamnett, 2014; Grimshaw et al., 2017). The policy reinforced economic segregation, clustering low-income families in areas like Enfield while wealthier populations remained concentrated elsewhere.

The **Elephant and Castle Redevelopment**(2004–2021) transformed the Heygate Estate into a mixed-tenure development as part of Southwark’s urban regeneration strategy. While the project aimed to revitalize the area, it displaced over 1,200 low-income households, offering only 82 affordable units in the new development (Watt & Bernstock, 2017). Rising property values in the surrounding area further excluded low-income residents, reinforcing socio-economic segregation (Burgess, 2023).

The **Housing Act 2004** sought to improve safety and quality in the private rental sector, particularly in Houses in Multiple Occupation (HMOs). While it raised housing standards in boroughs like Tower Hamlets and Hackney, increased compliance costs for landlords were often passed on to tenants, leading to higher rents and the displacement of low-income migrants to less regulated areas (Arbaci, 2019). This highlighted the trade-offs between housing quality and affordability.

The **Affordable Housing Program** (2016–2022), part of the Mayor of London’s Housing Strategy, aimed to deliver 116,000 affordable homes, focusing on low-income families and key workers. By 2021, over 72,000 homes were completed or under construction, promoting some socio-economic integration in boroughs like Barking and Croydon (Whitehead & Travers, 2018). However, many units remained unaffordable for the lowest-income families, limiting the program’s impact on reducing segregation.

Other relevant policies also shaped housing and segregation dynamics. The **London Affordable Housing Program**, launched in 2016, sought to address housing shortages across Greater London. While it delivered significant numbers of affordable homes, its impact was constrained by affordability barriers and the uneven distribution of housing across boroughs (Greater London Authority, 2021). The **Immigration and Asylum Act 1999**introduced dispersal schemes for asylum seekers, concentrating marginalized groups in deprived boroughs like Tower Hamlets and Croydon, reinforcing spatial inequalities (Sales, 2002). The **London Crime Prevention Strategy** aimed to improve safety in areas like Newham and Croydon, making them more attractive to low-income families seeking affordable housing. However, its effects on segregation remain underexplored in the literature (Mayor of London).

In conclusion, these housing policies and related initiatives sought to address affordability, homeownership, safety, and quality but often exacerbated spatial inequalities and segregation. The persistence of affordability barriers, displacement, and uneven housing distribution underscores the need for more equitable and comprehensive housing strategies in London.

5. Methodological approaches

The study of segregation and housing dynamics in London requires a multi-dimensional methodological framework, building on both quantitative and qualitative approaches. Previous studies have provided valuable insights into segregation patterns, but critical gaps remain, particularly in connecting housing policies with socio-spatial dynamics. This section reviews existing methodologies and highlights how this study builds upon and advances prior research.

#### 5.1 Existing Methodologies in Segregation Research

Quantitative approaches have been central to segregation research, providing precise measurements of patterns and trends. Indices such as the Dissimilarity Index (DI) are foundational, offering metrics to assess the evenness of population distributions across geographic areas. Horn (2005) emphasized the DI’s utility in studying urban diversity and housing inequalities. In the London context, Johnston et al. (2015) applied the DI to borough-level data, revealing persistent clustering of ethnic minorities in areas like Tower Hamlets and Newham due to systemic exclusion.

Multi-group indices have been developed to overcome the limitations of binary comparisons in super-diverse cities. Johnston et al. (2015) highlighted how these indices capture interactions between multiple ethnic and socio-economic groups, offering a nuanced understanding of segregation. However, the application of multi-group indices often requires highly granular data, which remains a limitation in many urban studies, including this one.

Temporal analysis has also advanced the study of segregation. Van Ham and Manley (2014) demonstrated the utility of lagged regression models and Cross-Correlation Functions (CCF) in revealing how historical settlement patterns shape present-day segregation. These methods are particularly relevant for understanding the long-term impacts of housing policies, such as Right to Buy and Welfare Reform, which may have delayed but significant effects on socio-spatial dynamics.

Spatial methodologies further enhance segregation research. Geographically Weighted Regression (GWR) accounts for spatial heterogeneity, revealing local variations in segregation dynamics. Van Ham and Manley (2014) applied GWR to London, uncovering how housing affordability and transport accessibility influence segregation differently across boroughs. This localized focus is critical in a city as geographically diverse as London, where policy impacts and economic conditions vary significantly between neighbourhoods.

Neighbourhood-level variables, such as house prices, rent levels, over-occupation rates, and social housing availability, have been central to segregation research. Hamnett (2003) linked rising house prices in central boroughs like Islington to displacement and socio-economic clustering. Arbaci (2019) argued that affordability crises limit access to quality housing for low-income and migrant groups, exacerbating segregation. Over-occupation among new migrants, as noted by Vertovec (2006), reflects affordability constraints and reinforces spatial clustering in boroughs like Tower Hamlets.

In addition, qualitative methods provide critical insights into the human dimensions of segregation. Ryan (2010) examined the role of cultural networks in shaping the settlement patterns of Polish migrants in London, while Wessendorf (2016) explored the normalization of diversity in urban neighbourhoods. These studies highlight how lived experiences shape and reflect broader segregation dynamics. However, qualitative approaches alone lack the generalizability required for informing policy, underscoring the need for integration with quantitative methods.

#### 5.2 Gaps in Existing Methodologies

Despite significant advancements, existing studies often fall short in addressing the interplay between housing policies and segregation. Many focus on either temporal or spatial dimensions, leaving gaps in understanding their combined effects. Traditional segregation indices, while valuable, often fail to capture the complexities of multi-group interactions in super-diverse contexts like London. Similarly, while qualitative methods offer depth, they lack the scalability needed for city-wide analyses.

Comparative studies in other cities have addressed related challenges. For example, Logan and Zhang (2010) examined the spatial assimilation of migrants in New York, highlighting how economic conditions and urban policies interact to shape segregation. In Amsterdam, Musterd and van Kempen (2009) studied housing allocation policies and their impact on ethnic clustering, providing a framework for understanding policy-driven segregation dynamics. However, in the London context, few studies have explicitly linked housing policies to quantitative and qualitative analyses of segregation.

While much of the existing literature on segregation focuses on ethnicity, comparisons by nationality remain less explored. Studies like Housing and Race Equality in London (Greater London Authority, 2024) emphasize disparities faced by broad racial or ethnic groups (e.g., Black, Asian, and minority ethnic groups), often aggregating diverse nationalities into singular categories. This aggregation can mask nuanced experiences within ethnic groups, such as the differing housing needs of Polish and Romanian immigrants compared to Bangladeshi or Caribbean populations. Research by Musterd and Ostendorf (2023) calls for more granular analyses to address these complexities, advocating for the inclusion of nationality-specific data in segregation studies.

Most segregation studies in London are conducted at the borough or city level, which, while insightful, may overlook localized patterns of segregation within smaller geographic units. The Housing Benefit Reform and Spatial Segregation of Low-Income Households in London (Cambridge Centre for Housing and Planning Research, 2024) highlights the importance of examining smaller spatial scales, such as Middle Super Output Areas (MSOAs), to capture micro-level disparities in housing and neighbourhood characteristics. Similarly, Lloyd et al. (2023) underscores the need for fine-grained spatial data in understanding social-spatial segregation. This MSOA-level approach provides a more detailed perspective on how segregation manifests across neighbourhoods, offering a valuable complement to broader borough-level analyses.

**6. Conclusion**

This study contributes to the understanding of segregation and housing dynamics in London by integrating robust theoretical frameworks, a comprehensive review of existing literature, and innovative methodologies. By examining the interplay between housing policies, neighbourhood characteristics, and the settlement patterns of diverse migrant groups, it highlights the multifaceted nature of segregation in a super-diverse city. The findings underscore the persistent influence of structural barriers, the complexity of migrant agency, and the critical role of housing reforms in shaping socio-spatial inequalities. This work not only fills gaps in existing research but also provides actionable insights for policymakers seeking to promote urban equity and inclusion.

# **III. Methodology**

The methodology of this study is designed to comprehensively analyse the relationship between housing characteristics and segregation patterns in London, with a focus on six nationalities and comparison between MSOAs. This chapter outlines the data sources, preparation methods, analytical techniques, and statistical approaches used to address the research questions and hypotheses.

#### **1. Data Preparation**

The quantitative process started with data cleaning and preparation. The three census demographic datasets were cleaned, joined, the count data was converted to proportions, the segregation indexes were calculated, the data was joined to spatial geometries for each MSOA. The housing and neighbourhood characteristics followed a similar process of cleaning and joining each dataset, conciliating and calculating all data to a census-year level and MSOA level, as well as joining to MSOA geometries. This process required standardizing column names, geometries, making sure all values were complete and legitimate, making sure as well that the data was standardized for a better statistical analysis.

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### **2. Measures of Segregation**

This study measured three complementary segregation metrics: the **Dissimilarity Index**, the **Isolation Index**, and **Theil’s H**. These measures collectively provided a robust framework for analysing spatial and demographic patterns of segregation in London, focusing on both evenness and exposure dimensions.

#### **2.1 Dissimilarity Index**

The **Dissimilarity Index (DI)** quantifies how evenly two population groups are distributed across geographic units, making it one of the most widely used measures of segregation.

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**Interpretation**: A DD-value of 0 indicates perfect integration, while 1 represents complete segregation. For instance, a DD-value of 0.40 implies that 40% of one group would need to relocate to achieve evenness across the area.

#### **3.2 Isolation Index**

The **Isolation Index (II)** measures the likelihood that a member of a group is exposed only to members of the same group in their residential area.

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**Interpretation**: An II-value of 0.60 indicates that, on average, 60% of a group’s neighbours belong to the same group. Unlike the DI, the II is sensitive to group size, which can highlight patterns of isolation in smaller groups.

#### **3.3 Theil’s H**

The **Theil’s H** index measures segregation by quantifying entropy, to evaluate diversity and evenness within geographic units. It is particularly useful for analysing multigroup segregation.

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**Interpretation**: H=0: Complete integration, meaning all geographic units have the same diversity as the entire region. H=1: Complete segregation, indicating that each geographic unit contains only one group. For example, an HH-value of 0.30 suggests that 30% of diversity is not captured at the local level. It provides insights into how much local diversity differs from the overall diversity of the region.

### ***3.4 Selection of the Dissimilarity Index***

Among the three metrics employed, the **Dissimilarity Index** was selected as the primary measure of segregation for several reasons. First, its straightforward interpretability allows policymakers and urban planners to easily understand the extent of segregation and its implications. Second, the DI is well-suited for examining binary group comparisons, which aligns with the study’s objective to analyse the dynamics of specific migrant communities. While London is a super-diverse city, disaggregating the analysis to binary comparisons provides granular insights into the segregation patterns of individual nationalities. Third, the DI has been extensively used in urban studies, offering a benchmark for comparison with prior research. This ensures methodological consistency and facilitates comparative analysis across time periods and regions.

### **4. Exploratory Data Analysis**

The exploratory data analysis phase served as a foundational step for understanding the temporal and spatial dynamics of segregation in London. This process involved examining temporal trends, visualizing spatial distributions, and calculating statistical measures to identify patterns in the data. This initial analytical helped prove right the chosen temporal and spatial methodologies as both variations were conclusive. Additionally, during this phase the final definition of the nationalities was defined, to be used in all further statistical measurements.

#### **4.1 Temporal Measurements**

Temporal analysis aimed to capture changes in segregation patterns across the three census years (2001, 2011, and 2021). The Dissimilarity Index, Isolation Index, and Theil’s H were calculated for each year to track trends over time. Line charts and bar graphs were employed to depict changes in segregation indices for each of the nationalities.

#### **Spatial Measurements**

The spatial analysis examined segregation across London’s Middle Layer Super Output Areas (MSOAs), using the Dissimilarity Index (DI) and clustering metrics to explore geographic disparities. Choropleth maps visualized the spatial distribution of segregation, highlighting areas with high DI values as zones of pronounced segregation and low DI values as indicators of greater integration.

Local Indicators of Spatial Association (Anselin, 1995), alongside global measures like Moran’s I, were employed to detect spatial patterns, with results visualized to pinpoint hotspots and cold spots of segregation (Moran, 1950).

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Clustering analysis complemented the DI by focusing on the spatial proximity of groups within neighbourhoods, offering insights into geographic concentrations. While the DI assesses proportional distributions across geographic units, clustering analysis evaluates the extent to which members of a group are located near one another. This dual approach provides a nuanced understanding of segregation in a city as diverse and spatially complex as London.

Clustering analysis provides critical insights into the spatial relationships between groups that the Dissimilarity Index cannot capture. While the DI assesses proportional distribution across geographic units, clustering identifies localized concentrations, revealing hidden segregation patterns or areas of community cohesion. It also highlights potential challenges in highly clustered neighbourhoods, such as limited access to resources and reduced mobility, while accounting for dynamic urban processes like gentrification or redevelopment. By complementing the DI, clustering analysis offers a more nuanced understanding of segregation’s spatial and social dimensions.

#### **4.3 Key Insights from EDA**

By combining temporal and spatial analyses with robust statistical measures, the EDA provided a nuanced understanding of segregation dynamics in London, laying the groundwork for the study’s quantitative modeling and qualitative framing.

### **5. Correlation Analysis**

Before conducting linear regression, a comprehensive correlation analysis was performed to assess the individual relationships between the dependent variable (yy) and each independent variable (xx). This preliminary step provided valuable insights into the strength and direction of these relationships and helped identify significant variables for further analysis.

*5.1 CFF:*

To explore temporal relationships, Cross-Correlation Functions (CCF) were employed. This method allowed for the identification of potential lead-lag relationships between housing characteristics (e.g., house prices, rents, over-occupation rates) and segregation patterns. The analysis revealed that certain variables, such as rent levels, exhibited delayed effects on segregation, emphasizing the importance of incorporating temporal dynamics into the study.

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*5.2 Correlation Matrix:*

A correlation matrix was constructed to evaluate pairwise relationships among all variables. This matrix revealed the degree of linear association between each independent variable (xx) and the dependent variable (yy). Variables with high positive or negative correlation coefficients (rr) were identified as potential drivers of segregation. For instance, variables like housing affordability and public transport accessibility showed strong correlations with segregation indices, while other variables displayed weaker or insignificant relationships.

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*5.3 Individual correlation scatterplots:*

Individual correlation scatterplots were generated to visualize the relationships between yy and each xx variable. These scatterplots provided a clear depiction of linear trends and potential outliers. Variables with significant correlations displayed strong linear patterns, confirming their relevance to segregation dynamics. Conversely, weaker correlations were identified through scattered or non-linear plots, which informed decisions on their inclusion in subsequent regression models.

### The correlation analysis not only quantified the strength and significance of relationships but also served as a screening tool for variable selection in linear regression. with insignificant correlations were excluded from the regression to maintain model parsimony and relevance.

### **6. Linear Regression Analysis**

For this analysis, a personalized scaling approach was applied to the independent variables to align their magnitudes with the dependent variable, the Dissimilarity Index (Diss\_Index), which ranges between 0 and 1. Scaling is a standard practice in regression analysis to improve the interpretability and numerical stability of models. Each variable was scaled based on its original range and context: variables already normalized between 0 and 1 (e.g., Greenery, Owned, Rented, Social) were left unchanged, while those with larger magnitudes were scaled down proportionally. For example, Rent was divided by 1,000 to represent it in thousands, Budget (in billions) was divided by 100, Houseprice (in hundreds of thousands) was divided by 100,000, and Crime was divided by 10 to reduce its magnitude. This approach ensures comparability across variables, avoids numerical instability, and retains the relationships between the independent and dependent variables. By scaling variables appropriately, the resulting coefficients represent interpretable relationships while maintaining their statistical and mathematical validity.

Linear regression was employed to examine the relationship between housing and neighbourhood variables and the Dissimilarity Index (DI), the primary measure of segregation (Montgomery et al. 2021). A stepwise modelling approach progressively included variables, isolating their contributions to segregation.

#### Progressive Modelling Steps

1. **Baseline Model:** Initial models included housing variables such as rent levels, house prices, social housing stocks, over-occupation rates, and tenancy patterns. Each predictor was added iteratively.
2. **Adding Lagged Dissimilarity:** A lagged DI (-1) was introduced to account for temporal persistence in segregation. This tested whether historical segregation patterns influenced current levels, highlighting the role of long-term dynamics.
3. **Incorporating Neighbourhood Variables:** Additional neighbourhood factors, including crime rates, Public Transport Accessibility Levels (PTAL), and green space availability, were added to the comprehensive model.

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Model diagnostics included calculating Variance Inflation Factors (VIF) to check for multicollinearity and analysing residuals for normality, homoscedasticity, and independence. Statistical outputs such as Adjusted R2R2 quantified the model’s explanatory power, while pp-values identified the strongest predictors of segregation.

### **7. Geographically Weighted Regression (GWR)**

The Geographically Weighted Regression (GWR) model was employed to account for spatial variations in the relationships between segregation and its predictors. The model extends traditional linear regression by allowing coefficients to vary by location, enabling the analysis of localized dynamics (Fotheringham et al, 2002).

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Key predictors such as rent levels, house prices, and social housing stocks were selected based on their significance in prior linear regression models. Lagged segregation indices (DIt−1DIt−1​) and neighbourhood characteristics, including Public Transport Accessibility Levels (PTAL) and crime rates, were incorporated to explore their spatially variable impacts on segregation.

GWR coefficients were estimated for each predictor at each spatial unit, allowing for a granular understanding of how relationships differ geographically. Local R2 values were calculated to evaluate model fit across different areas, providing insights into the spatial variation in explanatory power. The GWR approach enabled the analysis of localized patterns that are often missed by global regression models, supporting a detailed investigation into the drivers of segregation across London’s neighbourhoods.

Model performance was assessed using metrics like the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to balance explanatory power and complexity. Variance Inflation Factors (VIF) were calculated to address multicollinearity among predictors, while cross-validation tested the generalizability of the models. These steps ensured the robustness and reliability of the analytical framework.

By integrating GWR with linear regression, this study offered a comprehensive understanding of segregation’s drivers, addressing both global and local dynamics. Together, these methods provided robust insights into how housing and neighbourhood factors shape segregation patterns in London.

8. Policy Framing

The qualitative analysis of housing policies leverages the temporal and spatial variations introduced by their implementation to contextualize the quantitative findings. While the study does not measure the direct impact of policies on segregation, it explores their potential indirect effects by examining how these policies shaped housing characteristics, which in turn correlate with segregation patterns. Information about the years and MSOAs affected by key policies allows for comparisons between areas and periods influenced by the interventions and those that were not.

This approach incorporates temporal blocks in the regression analysis, comparing periods before and after the implementation of policies (e.g., pre-2004 vs. post-2004). Similarly, in the GWR analysis, MSOAs with and without policy exposure are compared to identify spatial variations in housing characteristics and their correlation with segregation. By interpreting these temporal and spatial comparisons alongside quantitative results, the analysis infers the potential implications of housing policies on segregation dynamics.

While this methodology does not establish a direct causal link between policies and segregation, it offers a robust framework for exploring how policies indirectly influenced settlement patterns through their impact on housing affordability, accessibility, and related characteristics. This provides a nuanced understanding of the interplay between policy interventions, housing markets, and socio-spatial inequalities, enriching the interpretation of the study’s findings.

9. Innovation and Limitations

*9.1 Innovation*

This study brings several innovative elements to the field of urban segregation research. By integrating temporal and spatial analyses, it captures how segregation patterns evolve over time and vary across geographic locations, providing a nuanced understanding of housing and neighbourhood dynamics. The use of Geographically Weighted Regression (GWR) to complement traditional regression models highlights spatial heterogeneity, revealing localized relationships between housing characteristics and segregation indices that are often obscured in global models. Furthermore, the inclusion of detailed housing variables alongside neighbourhood factors adds granularity to the analysis, enabling a deeper exploration of the mechanisms driving segregation. Additionally, the qualitative framing of key housing policies adds a contextual layer to the findings, linking policy interventions to spatial and temporal changes in segregation.

*9.2 Limitations*

While the methodology offers significant strengths, it is not without limitations. The reliance on MSOAs introduces potential boundary effects, known as the Modifiable Areal Unit Problem (MAUP), and although efforts were made to harmonize boundaries across census periods, changes in administrative geography may have introduced inconsistencies. Furthermore, while the Dissimilarity Index provides valuable measures of segregation, tits two-group focus may oversimplify the complex realities of multi-group diversity in London.

Another constraint lies in the interpretive limitations of Geographically Weighted Regression. While GWR identifies spatially varying relationships, it does not establish causality, making it challenging to determine whether housing characteristics drive segregation or vice versa. Additionally, the study relies on secondary data sources, which may contain biases or inaccuracies, particularly regarding informal housing markets and undocumented migration patterns. Finally, the qualitative framing, while providing valuable context, lacks primary qualitative data, such as interviews or focus groups, which could offer deeper insights into the lived experiences of affected populations. Addressing these limitations in future research could enhance the robustness and applicability of the findings.

It is also very important to mention that this study only accounts for relationships and correlations, it does not account for impact and causality.

## **IV. Results**

The objective of this chapter is to address the main research question:  
**“What is the correlation between segregation and various housing characteristics in London?”** and the subsequent sub-questions:

* How does this correlation differ among the six nationalities chosen for this study
* Which housing and neighbourhood characteristics exhibit stronger correlations with segregation patterns?
* For what communities, does historic segregation play a bigger role than housing characteristics?
* How do these correlations vary across different parts of London, highlighting geographical disparities?
* How can these findings be interpreted considering key public policies, aimed at improving housing availability and quality?

This chapter explores spatial and temporal trends in segregation indices and their relationship with housing characteristics. The findings provide insights into how these relationships differ among six nationalities and across London’s MSOAs, while also contextualizing the results within key housing policies.

The results are presented in the following sections:

* **Exploratory Data Analysis:** Temporal and spatial trends in segregation and clustering, including analysis of six nationalities and housing characteristics.
* **Linear Regression Analysis:** Quantitative relationships between segregation indices and housing variables, through correlation and CFF measurements before diving in to the progressive linear regressions.
* **Geographically Weighted Regression:** Spatial variations in these relationships.
* **Synthesis of Policy Context:** How findings relate to the aims and outcomes of housing policies.

4.1 Exploratory Analysis

This section examines the temporal and spatial trends of segregation indices across London’s MSOAs, including proportions, dissimilarity indices, and Theil’s H, through various temporal and spatial measurements and visualizations.

#### **Visualizations and analysis**

1. **Temporal line graphs of all indexes.**
2. **Heatmaps of spatial distributions for all indexes.**
   * Comparison maps for each index (side-by-side) for the same year.
   * Temporal changes in spatial distributions (2001, 2011, 2021).
3. **LISA Maps for study of clustering and spatial correlation:**
   * Local Moran’s I map showing clusters of high-high and low-low segregation indices for each nationality.
   * Comparative maps showing the relationship between spatial clustering (Moran’s I) and segregation indices.

The observed spatial variations in segregation indices, combined with clustering patterns, justify the inclusion of the six nationalities. These differences emphasize the need to study how housing characteristics shape these distinct trajectories, aligning with the research aims.

#### **4.2 Linear Regression Analysis**

This section quantifies the relationships between segregation indices and housing and neighbourhood characteristics. It statistically evaluates which housing variables are most strongly correlated with segregation indices, identifying variations by nationality, and examining changes over time. The **CCF, correlation matrix, and scatterplots** are incorporated to explore relationships before delving into regression modelling.

#### **Visualizations and analysis**

1. **Correlation Matrix**:
   * Heatmap of correlations between segregation indices and housing variables.
2. **Scatterplots**:
   * Visualize significant correlations (e.g., rent vs. segregation indices), stratified by nationality or time periods.
3. **CCF Plots**:
   * Show temporal lag relationships (e.g., whether increases in rent correlate with later increases in segregation indices).

The coefficients presented in this regression analysis may appear small, with many values around 0.02. This reflects the scale of the dependent variable, the Dissimilarity Index, which measures segregation and ranges between 0 and 1. A coefficient of 0.02, for example, indicates that a 1-unit increase in the scaled independent variable is associated with a 2% increase in the segregation index. This is because regression coefficients are influenced by the scale of both the dependent and independent variables: when the dependent variable has a larger scale, the corresponding coefficients reflect larger numerical changes to align with that scale. In this case, the Dissimilarity Index’s small range ensures that the coefficients accurately reflect meaningful, proportional changes.

1. **Regression Tables**:
   * Display coefficients and p-values for each housing variable.
2. **Temporal analysis**:
   * Compare regression coefficients across pre-, during-, and post-policy periods.

#### **4.3 Geographically Weighted Regression (GWR)**

This section explores spatial variation in the relationships between segregation indices and housing variables, identifying areas where these relationships are stronger or weaker. The main x variables will showcase a map with their respective coefficients.

***Visualizations and analysis***

1. **Coefficient Maps**:
   * Display spatial variation in the effects of rent, overcrowding, and social housing availability.
2. **Cluster Maps**:
   * Highlight MSOAs where significant relationships exist for specific housing variables.

#### **Synthesis of Policy Context**

To contextualize findings within major housing policies and explore how these policies correlate with observed trends and relationships in segregation and housing characteristics.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Policy | Time Scope | Geographical Scope | Aim | Actions | Impacts | Sources |
| Right to Buy (1980–2010) | 1980–2010 | Barking, Havering, Redbridge, Newham, Haringey | Increase homeownership by allowing council tenants to purchase their homes. | Reduced council housing stock, transitioned homes to private rentals. | Loss of affordable housing, increased segregation, displacement to outer boroughs. | Housing Act 1980, Hamnett (2003), Jones & Murie (2008), Arbaci (2019) |
| Welfare Reform Act (2012–2016) | 2012–2016 | Newham, Tower Hamlets, Barking, Hackney, Enfield | Reduce government spending on housing benefits by capping rents and implementing the bedroom tax. | Reduced rent affordability, increased overcrowding, displaced low-income renters to suburban areas. | Reinforced socio-economic segregation, clustered low-income groups in outer boroughs. | UK Welfare Reform Act 2012, Hamnett (2014), Watt & Minton (2016) |
| Elephant and Castle Redevelopment (2004–2021) | 2004–2021 | Southwark (Elephant and Castle, Walworth Road) | Redevelop Heygate Estate into a mixed-use area to attract higher-income residents. | Demolished 1,200 council homes, replaced with mixed-income developments. | Displacement of low-income households, gentrification, rising property values. | Southwark Regeneration Plan (2004), Watt & Bernstock (2017), Hamnett (2016), Burgess (2023) |
| Housing Act 2004 (2004–2011) | 2004–2011 | Tower Hamlets, Hackney, Newham, Brent, Ealing | Improve safety and quality of private rental housing through stricter HMO regulations. | Enforced landlord licensing, increased rental standards. | Reduced affordable housing availability in regulated boroughs, increased overcrowding in less regulated areas. | Housing Act 2004, Arbaci (2019), Hamnett (2014) |
| Affordable Housing Program (2016–2022) | 2016–2022 | Newham, Tower Hamlets, Croydon, Barking | Deliver 116,000 affordable homes for low-income households and key workers. | Built affordable homes, integrated affordable units into mixed-income developments. | Delivered 72,000 affordable homes by 2021, reduced segregation, supported low-income households. | Mayor of London’s Housing Strategy 2016, Whitehead & Travers (2018), Mayor of London (2021) |

***Visualizations and analysis***

1. **Policy Trend Lines**:
   * Show changes in housing variables and segregation indices across policy periods.
2. **Maps**:
   * Highlight MSOAs where policies correlated strongly with changes in segregation indices.
3. **Policy Effects on Housing and Segregation**:
   * Example: "The Right to Buy policy reduced social housing availability in boroughs like Barking, correlating with increased segregation for South American households."
4. **Unintended Outcomes**:
   * Example: "Rent caps post-Welfare Reform were associated with increased clustering of Bangladeshi households in overcrowded housing."
5. **Synthesis**:
   * Example: "The observed relationships emphasize the importance of designing housing policies that consider both affordability and spatial equity."

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