

TRINITY COLLEGE DUBLIN  
M.SC. APPLIED SOCIAL DATA SCIENCE

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# The Price of Policing: Uncovering Local Economic Divides in Stop and Search

## A Study of London and Merseyside

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## Abstract

This study conducts a comparative analysis of stop and search practices using 2022 policing data from Merseyside and Greater London. Stop and search is a police power allowing officers to stop individuals and search them if they have reasonable grounds to suspect possession of illegal drugs, weapons, stolen property or items that could be used to commit a crime. Without reasonable grounds, searches can only be authorised by a senior officer in specific circumstances, such as suspected serious violence or carrying a weapon [UK Government 2022]. While existing literature predominantly centres on racial disparities in stop and search, this research extends the focus to how regional social compositions shape the economic dynamics of policing. London's diverse and multicultural population contrasting with Merseyside's comparatively homogenous community, offers a unique opportunity to examine localised patterns of economic inequality and the influence on policing outcomes.

To assess these relationships, Negative Binomial Regression models were applied to stop and search counts at the Lower Layer Super Output Area (LSOA) level in each region. The primary independent variable is economic inequality represented by housing price gini coefficient, with dependent variables including crime decile, drug crime count, income domain, house price and ethnic minority proportion. The analysis finds that economic inequality is a consistent predictor of stop and search incidences across both regions. However, Merseyside police demonstrate a pronounced focus on crime, particularly drug related offences, reflecting the area's high volume of such incidents. In contrast, the Metropolitan Police in London exhibit clearer evidence of discrimination against ethnic minorities within their stop and search practices. These findings show the importance of recognising regional variation in policing dynamics and the interplay between ethnic minority population and socioeconomic and factors. The study contributes to a more nuanced understanding of stop and search, emphasising the need for context specific policy responses that address both economic inequality and racial discrimination.

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# 1 Introduction

## 1.1 Background and Context

Stop and search is a widely used policing tactic that allows officers to stop individuals in public spaces and search them for illegal items such as drugs, weapons or stolen property. While intended to enhance public safety and deter crime, the practice has long been controversial in the UK [Marks and Bowling 2024]. Critics such as [Duff and Kemp 2025] argue that it disproportionately targets certain communities, particularly ethnic minorities, raising concerns about racial discrimination and the erosion of the already dwindling public trust in law enforcement. Despite policy reforms aimed at improving transparency and accountability, stop and search remains heavily debated in terms of its effectiveness, fairness and social impact. This study examines the spatial and economic dimensions of stop and search practices, focusing on the relationship between local economic disparities and the geographic distribution of these incidents in two regions: Merseyside and Greater London. By exploring how economic inequality and social composition influence policing strategies, this study contributes to a growing body of work on spatial and structural inequalities in law enforcement.

## 1.2 Research Problem and Motivation

The central issue addressed by this research is how the spatial patterns of stop and search correlate with localised economic inequality. While a significant body of research has explored the ethnic dynamics of stop and search, far less attention has been paid to the role of economic inequality and wider social composition in shaping its implementation. Understanding how policing practices reflect and reinforce socioeconomic divides is essential for developing a more grounded and critical view of their impact in diverse urban environments. By focusing on two contrasting regions, namely Merseyside and Greater London; this study responds to a gap in the literature that tends to overlook the intersection between economic conditions and policing. While existing research often treats ethnicity, geography and class as separate factors, this study aims to explore how these elements combine to produce different policing outcomes across regions.

## 1.3 Research Aim and Objectives

The primary aim of this research is to explore how the spatial distribution of stop and search practices in Merseyside and Greater London correlates with local economic inequality at the Lower Super Output Area (LSOA) level. The specific research objectives are:

- To analyse the spatial distribution of stop and search incidents in Merseyside and Greater London.
- To assess the relationship between economic inequality and the frequency of stop and search incidents.
- To evaluate the impact of social composition on stop and search practices.

## 1.4 Research Questions

The research question guiding this study is:

**How do stop and search patterns in Merseyside and Greater London relate to local economic disparities across LSOAs, given their different social compositions?**

## 1.5 Methodological Approach

This study will employ a quantitative research design, using publicly available data on stop and search incidents from local police authorities in Merseyside and Greater London. Key variables including stop and search rates, socioeconomic indicators and demographic data will be analysed at the LSOA level. Analytical techniques will include spatial mapping to identify policing hotspots, as well as regression modelling to assess the relationship between economic inequality and stop and search frequency. This approach allows for a detailed examination of both geographic and structural dimensions of contemporary policing.

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## 1.6 Hypotheses

This study tests three core hypotheses concerning the relationship between inequality, ethnicity, and the frequency of stop and search activity. These expectations are grounded in both theoretical literature and existing empirical findings.

**Hypothesis 1:** Higher levels of economic inequality within an LSOA are associated with increased rates of stop and search.

**Hypothesis 2:** The relationship between social make-up, inequality and stop and search will differ significantly between Greater London and Merseyside.

**Hypothesis 3:** Areas characterised by both higher economic inequality and greater ethnic diversity will experience disproportionately higher levels of stop and search activity due to the interaction of these factors.

[Hypothesis 1](#) examines the most straightforward hypothesis in this study, namely the well-documented relationship between economic inequality and stop and search. The aim here is not to uncover groundbreaking findings but to ensure that this research is consistent with previous work in the field.

[Hypothesis 2](#) builds on this by focusing on the case study nature of the project, examining how the strength of the relationship between economic inequality and stop and search varies across regions with differing social compositions. In particular, it considers how the contrasting populations of ethnic minority populations in London and Merseyside may shape local policing practices.

Finally, [Hypothesis 3](#) examines the intersection of ethnicity and economic inequality, asking whether areas that are both economically deprived and have higher proportions of ethnic minority residents experience disproportionately high levels of stop and search, beyond what would be expected from either factor independently.

These hypotheses together provide a structured framework through which to investigate not only the consistency of known relationships, but also how the interplay of socioeconomic and demographic factors may produce regionally distinct patterns of policing.

## 1.7 Significance and Contribution

This research is significant for several reasons. Academically, it contributes to the under explored intersection of economic inequality and policing practices in England and Wales, particularly within the context of stop and search. It offers a more integrated understanding of how social and economic factors jointly influence policing in different areas. From a policy perspective, the findings could inform more equitable approaches to policing by highlighting the socioeconomic biases that underpin current practices. Societally, this study aims to improve public awareness of how stop and search disproportionately affects marginalised communities, particularly in areas marked by economic deprivation and racial inequality.

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## 2 Literature Review

In establishing the policy and historical context for this study, the focus is primarily on literature concerning the UK, given the specific legal framework and policing structures under examination [Shiner et al.[2018](#)]. However, when exploring broader conceptual understandings of ethnic and socioeconomic disparities in policing, turning to the extensive body of work from the US provides valuable additional context. The US literature offers both comparative insights and theoretical frameworks that help situate UK patterns within a wider international discourse [Simon[2008, January](#)].

### 2.1 Theoretical Foundations of Stop and Search

A critical dimension in understanding stop and search practices is public trust in the police. [Murray et al.[2021](#)] investigates this through a city based cross-sectional survey of school children across Scotland and England, focusing on their experiences of crime and victimisation . Respondents were asked about their exposure to stop and search, including the frequency and nature of their most recent encounters. This study reveals significant variation in the prevalence of stop and search across cities, with Sheffield showing higher rates among non-white respondents, while Glasgow showed the opposite trend. Interestingly, in cities like Birmingham and Edinburgh, there was no significant ethnic disparity in stop and search prevalence.

These findings show how local social compositions and policing cultures may shape the implementation and perceived fairness of stop and search powers. This serves as a foundation for [Hypothesis 2](#), emphasising the potential for distinct differences in policing prejudice across regions in the UK. However, Murray's study also highlights methodological limitations. Key among them is its reliance on self-reported data, which may introduce recall bias or inaccuracies in reporting sensitive interactions with law enforcement. Although, the use of self reported data may truly be the only way to evaluate UK policing interactions. This is due to the lack of interaction documentation from stop and searches, there is often little to no documented evidence of how the 'suspect' was actually treated or how they perceived their treatment. This has lead to the introduction of Body Worn Cameras (BWC) to document the interactions.

The introduction of this video evidence has lead to studies such as [Henstock and Ariel[2017](#)], which conducted a six month randomised controlled trial to assess the impact of BWCs on police use of force. While the findings indicated a 50% reduction in the odds of force being used when BWCs were present, the study faced significant limitations. Notably, the sample size was relatively small, with only 46 officers participating, in addition, with the officers having to volunteer for the study this introduces potential selection bias.

Or [Owens et al.[2014](#)] who investigated the effect the body worn cameras had on the officers perceptions of themselves. Using surveys they assessed how the officer felt they behaved with or without the BWCs. This style of self reporting perhaps obviously lead to professional "PR" style statements such as "I am just as professional, whether it is switched on or off" [Owens et al.[2014](#)]. Such self-reported statements, however, often lack substantive value for any form of analysis.

These studies often "lack consistency and sample sizes are often small" [Criminal Justice Alliance[2021](#)], limiting their suitability as rigorous empirical evidence within academic research. Given these limitations, the focus of this dissertation will not be on BWCs.

### 2.2 Stop and Search in the UK: Policy and Historical Context

The development of stop and search powers in the UK cannot be separated from their historical application to ethnic minority communities. [Yesufu[2013](#)] traces the origins of this policing tool to the Vagrancy Act 1824, which introduced the so-called 'sus' laws. These gave officers the authority to stop and search individuals based purely on suspicion – a loosely defined term at the time[Roberts[2023](#)]. These powers, widely criticised for their arbitrary use, were disproportionately applied to young black men and played a central role in fuelling distrust between ethnic minority communities and the police [The Police Foundation[2012](#)].

Yesufu's work highlights how early legal frameworks have shaped modern perceptions of policing legitimacy and fairness. This is especially relevant in the context of the ongoing conversation surrounding

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institutional racism. While the most notorious examples are often associated with US police forces, the UK is by no means exempt from such concerns [Delsol2006].

Although the ‘sus’ laws were eventually repealed, their legacy persists in current stop and search practices. Today, black individuals remain significantly more likely to be stopped by police, pointing to a continuity of racialised surveillance under a different legislative guise [Alam et al.2024]. This is particularly evident in the modern use of stop and search powers under Section 60 of the Criminal Justice and Public Order Act 1994, which allows police to stop and search individuals without suspicion in specific areas where there is a perceived threat of violence [UK Government1994].

Critics argue that these powers disproportionately target black communities, reflecting an ongoing pattern of institutionalised racism within policing practices. As highlighted by [Gillborn2008], institutional racism is “not limited to individual acts of discrimination but is embedded in the policies and practices that perpetuate unequal outcomes for ethnic minorities”. This has been echoed in more recent studies, such as by [Shiner et al.2018], who conducted a comprehensive analysis of the [National Stop and Search Data](#) in England and Wales. Their work reveals that black individuals are still significantly more likely to be stopped than their white counterparts, even after controlling for factors like location and crime rates.

The continued use of suspicionless stop and search powers has disproportionately impacted traditionally diverse areas, reinforcing their portrayal as inherently dangerous. This framing not only sustains racialised narratives within policing but also sets the conceptual groundwork for [Hypothesis 3](#).

## 2.3 Ethnic and Socioeconomic Disparities in Stop and Search

Dominating much of the discourse on stop and search is the question of ethnic and socioeconomic disparities, with ethnicity, in particular, occupying a central focus. While this is not the primary concern of this research, the topic cannot be ignored. The racialised implementation of stop and search powers has been a longstanding and heavily scrutinised aspect of policing in the UK.

Looking at New York, [Farrell2024] uses NYPD (New York Police Department) Stop, Question and Frisk data to examine how the intersections of gender, race and place simultaneously shape the nature and frequency of stop and frisk encounters. Though based in the US, the study’s insights are instructive, particularly in showing how location and identity are jointly implicated in patterns of policing. In the UK context, similar dynamics are evident, with stop and search powers disproportionately exercised in areas with high ethnic minority populations and elevated socioeconomic deprivation [Buil-Gil et al.2022].

Although gender is not directly addressed in this study, it remains important to acknowledge its interplay with ethnicity. Another US study, [Duff and Kemp2025] highlights how stop and search disproportionately targets “young people and people of colour, especially black young men and boys”. These patterns reflect deeper institutional biases and are symptomatic of broader structural inequalities in British society.

The use of police powers to humiliate, intimidate or exert dominance over individuals, particularly racialised individuals is not new. [Yates Flanagan et al.2022, May] situates such practices within a historical continuation of institutionalised racism, where law enforcement has functioned not just as a tool of public safety but as an instrument of racialised social control across the US. Despite international differences in policing structures and legal frameworks, the underlying dynamics of racialised policing display significant parallels. Studies such as [Bradby2010] highlight the historical and cultural transfer of racialised narratives and practices from the US to the UK, underscoring the value of drawing on US scholarship to contextualise ethnic disparities in British stop and search practices.

Despite these challenges, public resistance has been substantial. Campaigns aimed at legislative reform, increased accountability and, in some cases, the complete de-funding of police institutions have gained significant traction in recent years. The British arm of the black Lives Matter movement, for example, has been vocal in highlighting the racial injustices embedded within stop and search practices and in pushing for fundamental changes to the policing system [Elliott-Cooper2023].

While this research focuses primarily on spatial and socioeconomic dynamics, it is essential to recognise that these are inextricably linked to ethnicity. A complete analysis of stop and search practices must

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account for how these dimensions converge to shape both the implementation and the lived experience of police encounters. Policing is rarely experienced in isolation from identity. As such, ethnicity remains a central axis along which stop and search powers are disproportionately exercised, especially in urban areas with high ethnic diversity.

## 2.4 Legislative Foundations of Stop and Search in the UK

Stop and search powers in the UK have long been justified through the lens of crime prevention, particularly in relation to knife and drug crime. Political rhetoric around these issues has consistently shaped public policy. Successive Prime Ministers, especially during periods of rising youth violence have used stop and search as a visible commitment to public safety. Often invoking it as a deterrent against knife related offences, the strategy gained prominence in the late 2000s and early 2010s, when public concern over knife crime was met with aggressive policing measures rather than social intervention [Squires2009].

### 2.4.1 Knife Crime

The introduction of the *Offensive Weapons Act 2019*, alongside earlier legislation such as the *Criminal Justice and Public Order Act 1994*, granted police broader authority to conduct suspicionless searches in designated areas [UK Parliament1994][UK Parliament2019]. These powers were presented as necessary tools to address a surge in knife-related violence, especially in cities like London. However, evidence from the College of Policing indicates that stop and search has only a limited and inconsistent impact on reducing violent crime [College of Policing2022]. [Shiner et al.2018] displays how these powers are disproportionately applied to black individuals, reinforcing perceptions of bias and contributing to a breakdown in trust between communities and the police. Similarly, the Runnymede Trust has criticised such policies for neglecting the underlying causes of youth violence and has instead called for investment in preventative, community-led approaches [Runnymede Trust2021].

Keeling highlights how stop and search practices shape the lived experiences of young black and minority ethnic men, often fostering feelings of humiliation and exclusion [Keeling2017]. Drawing on government data, Keeling argues that stop and search is less about preventing crime and more about exerting social control. Crucially, the belief that such practices reduce knife crime is increasingly disputed, with even the Metropolitan Police admitting there is “no definitive evidence to prove or disprove the suggested link”.

### 2.4.2 Drug Crime

[Koch et al.2024] outlines how shifting government strategies around drug crime, particularly the ‘county lines’ phenomenon have marked a partial move away from punitive measures. While this shift has been welcomed, the policing of drug-related offences continues to reflect racialised patterns of suspicion and enforcement. In the context of urban hubs, such as London and Merseyside, drug-related stop and search is often justified through vague associations with gang activity or low-level dealing.

A report by the European Harm Reduction Network highlights how drug suspicion is frequently used as a pretext for stop and search, with black individuals disproportionately targeted [Pomfret2024]. Despite the volume of searches conducted, the majority do not result in the discovery of drugs or related paraphernalia. This raises questions about both the efficacy and the true motives behind these practices, particularly when considered alongside the broader social costs of over-policing already marginalised communities.

## 2.5 Gaps in the Literature and Positioning of this Study

A common limitation in existing research on stop and search is the narrow geographical focus of many studies. For instance, [Dippie and Hasan2024] examine stop and search practices within only four London boroughs, restricting the scope of their findings to a highly specific urban context. While their work provides valuable insights into the dynamics of stop and search in these areas, the findings may not be easily generalisable to other regions with different social and ethnic compositions. By examining diverse

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contexts such as Merseyside and the whole of Greater London, this study aims to contribute a more comprehensive understanding of how social and ethnic factors shape stop and search practices at both the local and national levels.

A key source of inspiration for this study is the work of [J. H. Suss and Oliveira<sup>2022</sup>], who introduced an innovative approach to exploring the spatial and economic distribution of stop and search practices. Their study utilised Linear Regressions (OLS) and Spatial Durbin Model (SDM) to assess the distribution of stops and searches in London, aiming to identify potential patterns and underlying factors. Their findings revealed a strong, statistically significant relationship between stop and search frequencies and “highly unequal neighbourhoods where the rich and the poor co-exist” [J. H. Suss and Oliveira<sup>2022</sup>]. This analysis highlighted the role of economic inequality in shaping policing practices, contributing to a relatively under explored area within the literature on economic disparities in law enforcement.

This study shares thematic similarities with [J. H. Suss and Oliveira<sup>2022</sup>]’s research, but aims to broaden the scope by examining differing social make-ups that effect of stop and search patterns. The combination of socio-economic and ethnic factors will allow for a deeper understanding of how these variables interact and influence policing practices across these diverging counties.

## 2.6 Building on the Literature

Building on the insights provided by previous studies, this research expands on the exploration of spatial and socioeconomic factors influencing stop and search practices. As highlighted by [J. H. Suss and Oliveira<sup>2022</sup>], economic inequality plays a significant role in shaping the distribution of policing activities; with their findings demonstrating a strong link between deprivation and stop and search intensity in London. While this prior work offers compelling support for [Hypothesis 1](#), it also highlights the need to test whether these patterns hold in other contexts. This study addresses that by focusing on Greater London and Merseyside, two counties with distinct social compositions and policing cultures, to examine whether similar dynamics are at play.

In contrast to studies that focus on the relationship between stop and search and demographic variables in isolated urban areas such as [Dippie and Hasan<sup>2024</sup>], this research addresses the gap by comparing regions with markedly different social and ethnic compositions, such as Merseyside and Greater London. London the more obvious choice, has been the centre of the majority of the research in this area, specifically in England and Wales. Merseyside by contrast, has featured more frequently in studies concerned with community dynamics and regional identity. From [Kantrowitz<sup>1974</sup>] investigating the Social geography of the county since the 19th centenary to the more recent [Back et al.<sup>1999</sup>] looking at what makes a community. This study explored the “*changing cultures of racism in English football*”, highlighting Merseyside’s markedly different racial composition compared to cities like London and Manchester. It notes how Merseyside fans are often implicitly characterised as white, a framing that becomes particularly relevant in the context of racially charged chants exchanged between supporters [Back et al.<sup>1999</sup>]. These insights stress the importance of regional specificity when examining social dynamics and public perceptions of fairness in policing.

These cities differ not only in size but in their socioeconomic and ethnic make-up, providing a useful basis for comparative analysis. By situating stop and search within these distinct contexts, this research seeks to uncover how structural inequalities play out across counties.

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## 3 Methodology

This study integrates stop and search records from 2022 with demographic and economic data at the LSOA level. By geocoding each stop and linking it to census and deprivation measures, the analysis examines how local area characteristics relate to the frequency of stop and search using regression techniques.

### 3.1 Data Sources and Preparation

#### 3.1.1 UK Police Data

This study draws on CSV files provided by the official [UK Policing website](#). The dataset includes every recorded crime within each policing jurisdiction, all stop and search incidents and the outcomes of criminal cases. While the crime data is already matched with the LSOA where each incident occurred, the stop and search data only includes geographic coordinates (longitude and latitude), making it more difficult to directly associate with specific areas. To combat this boundary shapefiles were used to map the coordinates to the LSOAs. This reflects a broader issue of inconsistency in reporting practices across police forces in the UK.

Importantly, this study focuses only on stop and search data from the Metropolitan Police Service (London) and Merseyside Police. Although other forces such as the City of London Police are available, they were excluded due to limited jurisdiction and a disproportionate number of stop and search incidents. Limiting the scope to these two major forces enables a clearer and more meaningful comparison between two densely populated urban regions with differing social and demographic structures.

#### 3.1.2 Office for National Statistics

The Office for National Statistics (ONS) provided the primary socio-economic data for this study. The ONS offers a comprehensive list of Lower Layer Super Output Areas (LSOAs), which was essential for ensuring that areas with zero stop and search incidents were still represented. Additionally, the ONS provides detailed information on the social composition of each LSOA, accessed through the 2021 Census data. While the Census covers a wide array of variables, from sexual orientation to the number of UK armed forces veterans, only the ethnicity data was utilised for this analysis. Furthermore, the ONS publishes mean house prices by LSOA; and for consistency with the stop and search data, the 2022 edition of this dataset was used.

To overcome the lack of LSOA assignment in the stops and searches, LSOA boundary shapefiles were sourced from the [UK Data Service](#). These shapefiles provide the geographic boundaries of each LSOA in England and Wales for 2021, allowing stop and search records to be accurately assigned to their respective areas.

#### 3.1.3 UK Government's Official Website (GOV.UK)

Data was also sourced from the UK Government's official website (GOV.UK), specifically the Indices of Deprivation 2019 for England and Wales, which were compiled by the [Ministry of Housing, Communities & Local Government \(2018 to 2021\)](#).

This dataset combines income and employment domain scores to evaluate levels of deprivation across LSOAs. For this analysis, the score measure has been used, as it provides a consistent basis for comparison between regions, such as London and Merseyside.

In addition to these core measures, the 2019 Crime Domain Decile was used to capture localised exposure to crime. This domain ranks each LSOA based on police-recorded rates of violence, burglary, theft and criminal damage. LSOAs are assigned a decile from 1 (most deprived) to 10 (least deprived), offering a standardised, nationally comparable measure of relative crime burden. These deciles were essential in assessing whether the intensity of stop and search activity correlated with underlying crime conditions in different neighbourhoods.

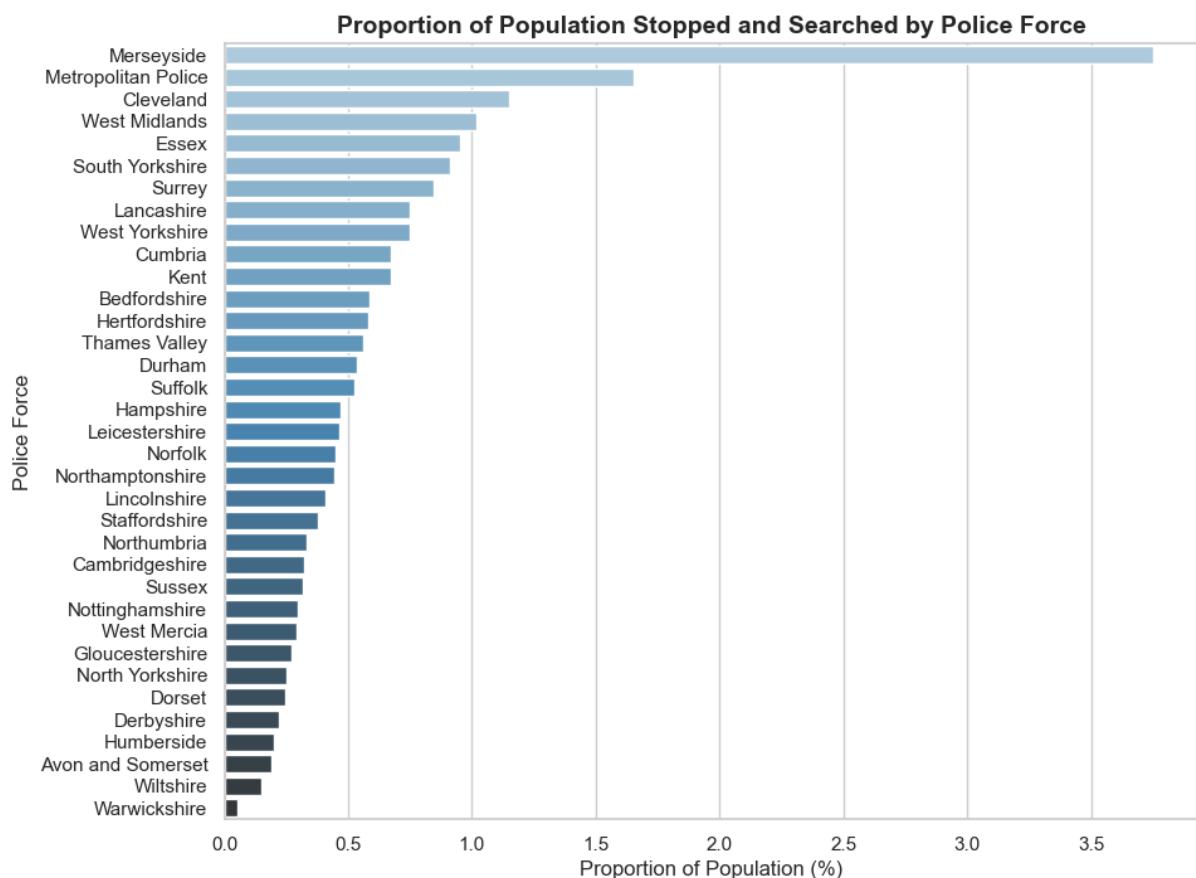
Finally, and perhaps most significant, the price paid per house data – also obtained from GOV.UK was used. This dataset contains information on the sale price of individual properties across England and Wales. This data is crucial in assessing spatial disparities in housing markets and understanding how

these disparities relate to patterns of policing, including the calculation of housing inequality using the Gini coefficient.

### 3.2 Justification for Case Selection

As previously stated this study focuses on London and Merseyside as case study areas. Originally, Greater Manchester was considered, but data availability issues prevented its inclusion. Specifically, as noted on the [official police data changelog](#), Greater Manchester Police stopped releasing crime, outcome, and stop and search data from July 2019 onwards due to a change in IT systems, making it unsuitable for this analysis.

As illustrated in [Figure 1](#), Merseyside has the highest rate of stop and search incidents relative to its population, with the Metropolitan Police Service ranking second. Merseyside is therefore selected as the second focus area to provide a meaningful contrast with London. This approach allows for an exploration of how policing patterns differ across two distinct urban contexts, using a rate-based comparison that accounts for population size rather than absolute counts which was crucial for the pre-regression analysis and helped set the stage for modelling the count data in the regression.



*NB:* The British Transport Police and City of London were excluded due to disproportionately low or undefined population counts.

Figure 1: Stop and Search Distribution  
(Data source: [Data.Police.UK](#))

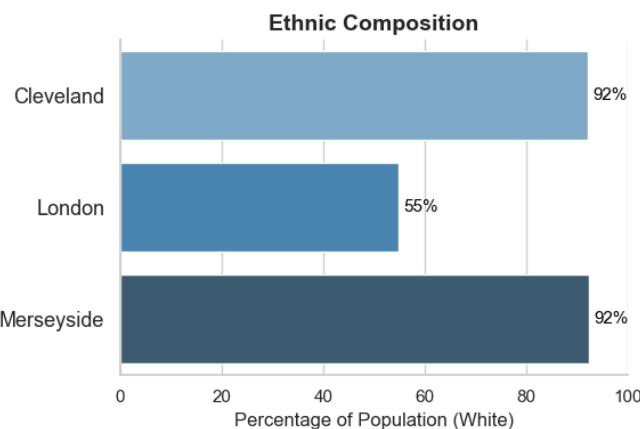


Figure 2: Ethnic Distribution  
(Data source: [2021 Census](#))

populations. Since Cleveland's ethnic minority composition does not differ meaningfully from Merseyside, its inclusion would add little analytical value.

Table 1: Proportion of Stop and Search records missing location data

Police Force	Total Records	Missing Location Data	% Missing
London (Met)	145,097	15,041	10.37%
Merseyside	53,347	2,079	3.90%
Cleveland	6,558	2,170	33.09%

Finally, there is the issue of data quality. Each stop and search record contains longitude and latitude fields, which were used to assign LSOAs. As shown in [Table 1](#), Cleveland had over 30% missing location data, making it unsuitable for spatial analysis. It's unclear whether this is due to systemic issues, local reporting practices or internal policy, but it is something that should be investigated by the relevant police authorities.

### 3.3 Variable Selection

The selection of variables for this analysis was guided by the data sources available and the specific objectives of the study. These variables were operationalised to ensure a comprehensive understanding of the relationships between socio-economic factors and stop and search practices across different regions.

#### 3.3.1 Dependant Variable

The primary dependent variable in this analysis is the count of stop and search incidents per LSOA. As previously mentioned, this data was spatially aggregated using the geographic coordinates provided in the raw dataset. Any entries where the LSOA was missing or could not be assigned were reclassified as zero counts, under the assumption that these represent areas with no recorded stops.

The maps below illustrate the geographical distribution of stop and search events recorded in each region. To allow a fair visual comparison between the two counties, the stop and search counts have been normalised using z-scores, with high z-scores representing concentrations more than  $2\sigma$  above the mean, and the other extreme representing values more than  $1\sigma$  below the mean.

Cleveland Constabulary (North East England) was also a potential candidate for this analysis, as the county experiences significant levels of stop and search relative to its population. However, there were several factors that led to its omission. Firstly, for this case study, it is easier to make a direct comparison between Merseyside and London due to their size and urban context.

A large part of this analysis involves understanding differing patterns in stop and search in relation to the social makeup of an area. As illustrated in [Figure 2](#), both Merseyside and Cleveland exhibit nearly identical proportions of ethnically white

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Figure 3: Stop and Search locations in London

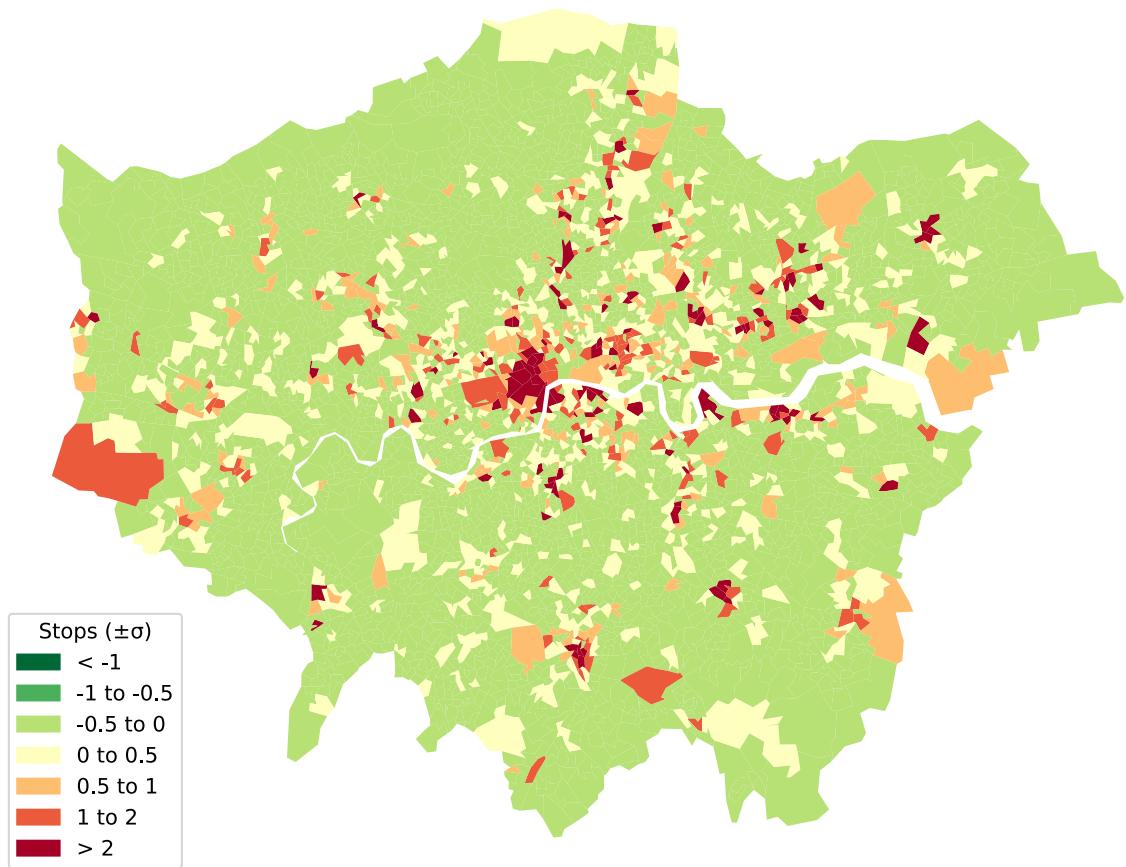
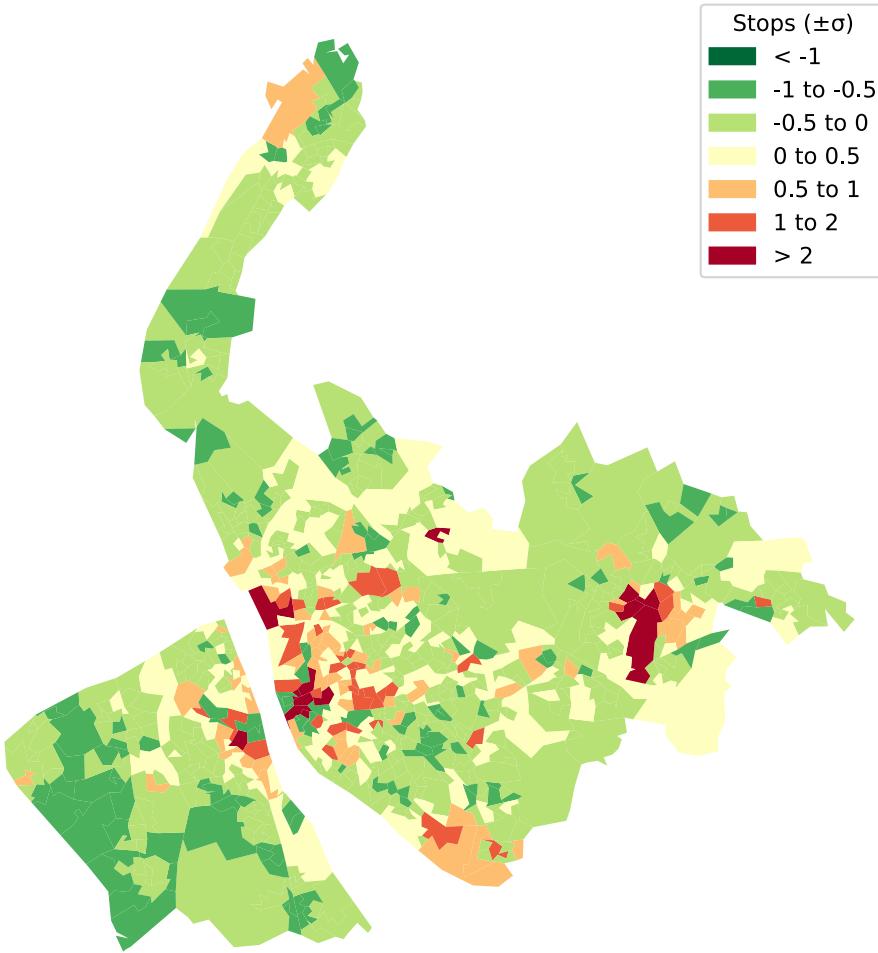


Figure 3 and Figure 4 illustrate the distribution of stop and search incidents in both London and Merseyside. In both regions, there is a noticeable concentration of stops around the city centres, which may be indicative of higher population density and greater policing activity in these areas. Additionally, pockets of increased stop and search activity appear on the outskirts of both regions, suggesting that areas with varying demographic and socioeconomic characteristics may experience different policing priorities. These patterns could reflect a combination of factors, including targeted policing strategies, areas with known crime hotspots, or the availability of resources in more densely populated urban areas. Further analysis will hopefully reveal the underlying drivers of these clustering patterns and help assess whether they align with broader trends in crime and policing practices.

Figure 4: Stop and Search Locations in Merseyside



### 3.3.2 Independent Variables

The primary independent variable of interest is economic inequality, operationalised here as housing inequality, which is conceptually distinct from absolute house prices. This measure follows the approach developed by [J. Suss2023], who introduced the use of a Gini coefficient at the MSOA level as a means of capturing inequality in the housing market. While the present study draws on a slightly different data source, the same methodological framework is applied.

Specifically, housing inequality is calculated using the Gini coefficient derived from house prices within each LSOA. The formula used is:

$$G = \frac{\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|}{2\bar{y}}$$

where:

- $n$  is the total number of house sales in that LSOA
- $\bar{y}$  is the average house price in that LSOA
- $y_i$  is the price of the  $i^{\text{th}}$  house sale
- $y_j$  is the price of the  $j^{\text{th}}$  house sale

as outlined by [J. Suss2023]. This metric captures the degree of variation in house prices within an area; lower Gini values reflect more uniform house prices, indicating lower levels of inequality. Conversely, higher values signal greater disparity in property values.

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[Figure 5](#) and [Figure 6](#) display the spatial distribution of housing inequality in London and Merseyside, respectively. In London, higher Gini coefficients, indicating greater housing inequality, appear concentrated in certain inner and western areas, while lower inequality is more prevalent in the outer boroughs. Similarly, Merseyside exhibits a varied distribution of housing inequality, with pockets of both high and low Gini coefficients scattered across the region, including notable hotspots of inequality on the outskirts of the county.

Figure 5: Inequality Gini map of London

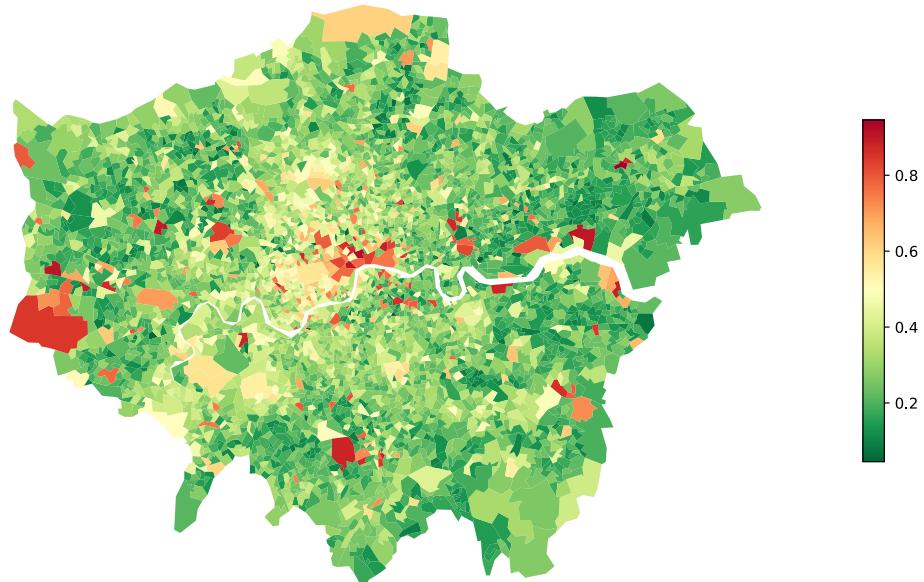
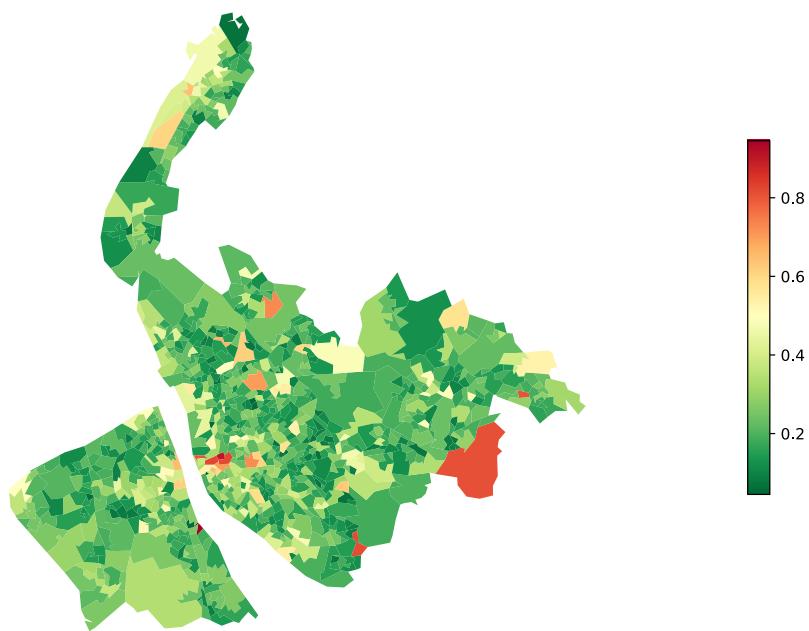


Figure 6: Inequality Gini map of Merseyside



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In addition to housing inequality, several other independent variables are included in the model to control for key socioeconomic and demographic factors:

- **Income Domain Score**

This variable is derived from the Index of Multiple Deprivation (IMD) 2019 and reflects the proportion of the population in an area experiencing income deprivation. It is based on data from means-tested benefits, including Income Support, income-based Jobseeker's Allowance, Pension Credit and Universal Credit. A higher score indicates a greater prevalence of income deprivation in the LSOA.

- **Mean House Price**

The average house price in each LSOA, based on sales data, serves as a proxy for the overall affluence and market value of properties in the area. Unlike the Gini coefficient, which captures inequality, this variable provides a sense of absolute economic value in the housing market.

- **Drug Crime Sum**

This variable captures the total number of police recorded drug-related offences within each LSOA during 2022, sourced from the UK Police API. It reflects both the prevalence of drug-related activity and local enforcement priorities. Including this variable enables the analysis to account for the spatial concentration of drug enforcement and its potential relationship with stop and search practices. It also provides insight into whether certain areas are subject to intensified policing strategies that may disproportionately target specific communities.

- **Crime Domain Decile**

The Crime Domain Decile represents the level of crime-related deprivation in an LSOA, based on its rank within national distributions. It is derived from the Indices of Deprivation 2019, produced by the Ministry of Housing, Communities & Local Government. Each LSOA is assigned a decile from 1 to 10, where 1 indicates the highest levels of crime-related deprivation and 10 the lowest. It is the only categorical variable in the dataset and is included to account for broader structural and environmental conditions influencing both crime prevalence and policing patterns. While not a direct measure of recorded offences, it captures long-term trends in crime and public safety that may shape operational policing decisions.

- **Percentage of Ethnic Minorities**

This variable denotes the percentage of the LSOA population identifying as an ethnic minority (ethnic groups except the White British group, [Cabinet Office2021]), based on the most recent census estimates. It acts as a key demographic indicator and is used to investigate potential disparities in policing outcomes across ethnically diverse areas. Including this variable helps to control for racial composition, enabling a more robust assessment of whether stop and search activity is disproportionately concentrated in areas with higher minority populations.

### **3.3.3 Descriptive Statistics**

**Table 2** and **Table 3** provide an overview of the social and spatial landscape across which stop and search practices occur in London and Merseyside. The summary statistics highlight several important contrasts between the two regions.

Stop and search activity in London exhibits considerably less variability across LSOAs compared to Merseyside, as evidenced by the substantially lower standard deviation. This suggests a more uniform distribution of stops within the capital. Additionally, the average LSOA in London contains a marginally larger population than those in Merseyside, reflecting subtle spatial differences in the underlying administrative geography.

Ethnic composition presents a marked contrast. London demonstrates significantly greater diversity, with the mean percentage of ethnic minority residents per LSOA at approximately 45%, in contrast to just 7% in Merseyside. Despite this demographic disparity, both regions display similar average values across the Crime Domain Decile, indicating comparable overall levels of crime intensity.

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With regard to drug-related offences, the average number of incidents is notably higher in Merseyside, where the mean is 12.3 per LSOA, compared to 7.1 in London. This aligns with previous studies identifying a stronger association between stop and search activity and drug-related crime outside of the capital.

Finally, property values reveal one of the most pronounced differences between the two regions. As expected, house prices in London are considerably higher, with the maximum value exceeding that of Merseyside by as much as £7 million. This extreme range contributes to a much greater standard deviation in house prices, approximately £500,000 in London compared to £100,000 in Merseyside.

Table 2: Descriptive Statistics for Stop and Search Data in London

Statistic	N	Mean	St. Dev.	Min	Max
Total Stop Count	4,994	32.2	77.6	0	2,393
LSOA Population	4,994	1,762.1	319.9	1,002	4,282
Gini	4,994	0.3	0.1	0.0	0.9
Ethnic Minority Percentage	4,994	45.2	18.7	3.3	98.0
Income Domain Score	4,994	0.1	0.1	0.01	0.4
Crime Domain Decile	4,659	4.5	2.2	1	10
Drug-Related Crime Count	4,994	7.1	16.3	0	731
Mean House Price	4,994	680,011	494,341	156,810	8,325,277

Finally, it is important to acknowledge the missing data associated with the Crime Domain Decile variable. As shown in [Table 2](#) and [Table 3](#), the number of observations for this variable is slightly lower than for others due to a small number of unresolvable `NA` values. Since Crime Decile is a categorical measure, conventional methods such as mean filling were not appropriate. As a result, regression models that include this variable are estimated on a marginally reduced sample. Given the small proportion of missing data, this has a negligible impact on the overall analysis.

Table 3: Descriptive Statistics for Stop and Search Data in Merseyside

Statistic	N	Mean	St. Dev.	Min	Max
Total Stop Count	923	54.2	127.0	0	2,198
LSOA Population	923	1,542.0	294.3	1,009	3,789
Gini	923	0.2	0.1	0.05	0.9
Ethnic Minority Percentage	923	7.7	8.6	0.6	78.4
Income Domain Score	923	0.2	0.1	0.01	0.6
Crime Domain Decile	889	4.8	2.8	1	10
Drug-Related Crime Count	923	12.3	28.1	0	565
Mean House Price	923	199,442	98,193	67,866	1,020,604

Together, these descriptive statistics offer context for the analysis that follows, signalling that both regions feature substantial variation, yet differ meaningfully in their social composition and spatial dynamics. Although the raw variables will not be used directly in the analysis, they provide useful insight into the overall structure of the data. To facilitate a consistent comparison between London and Merseyside, all independent variables were standardised using z-score normalisation, with the exception of the Gini coefficient and Crime Domain Decile. This process transforms each variable to indicate how many standard deviations it is from the mean, putting all variables on the same scale. This standardisation makes it easier to compare data across regions and improves the robustness of the analysis.

### 3.4 Modelling Approach and Rationale

Given that the outcome variable is count data, specifically the number of stop and search incidents recorded per LSOA, two appropriate modelling frameworks are considered: Poisson regression and Negative Binomial regression. Although Ordinary Least Squares (OLS) regression was run, it was

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ultimately disregarded as neither accurate nor appropriate for this type of data. While [J. H. Suss and Oliveira2022] opted for a Spatial Durbin Model (SDM), this study instead focuses on comparing count-based models.

To evaluate model performance and address potential overdispersion, both Poisson and Negative Binomial (NB) regressions were estimated for the London and Merseyside datasets. Model comparison statistics, namely the Akaike Information Criterion (AIC) and log likelihood values overwhelmingly favoured the Negative Binomial specification.

Table 4: Model Fit Comparison: London

Metric	Poisson.Model	Negative.Binomial.Model
AIC	171,487	37,793
Log Likelihood	-85,736	-18,888

Table 5: Model Fit Comparison: Merseyside

Metric	Poisson.Model	Negative.Binomial.Model
AIC	31,980.880	7,597.680
Log Likelihood	-15,983.440	-3,790.840

As shown in [Table 4](#) and [Table 5](#), the Negative Binomial model yields a significantly lower AIC for both regions: a reduction of approximately 130,000 for London and over 20,000 for Merseyside. Similarly, log-likelihood values improved substantially, moving closer to zero by almost 70,000 and over 12,000 for London and Merseyside respectively.

These diagnostics clearly indicate the presence of overdispersion in the count data, making the Poisson model unsuitable. Consequently, the Negative Binomial model is selected as the more robust and appropriate framework for modelling variation in stop and search activity across LSOAs.

### 3.5 Fixed Effects

Fixed effects were incorporated to control for unobserved heterogeneity across the boroughs. This approach has been applied in similar spatial regression contexts, such as in [Hilber et al.2011] and [J. H. Suss and Oliveira2022], particularly in studies focused on London.

Theoretically, fixed effects help mitigate multicollinearity and account for geographical biases. For example, boroughs that carry reputations for being ‘rough’ may experience disproportionate levels of policing that are not directly explained by observable variables. Including fixed effects captures these latent, borough specific factors, improving model accuracy.

As shown in [Table 6](#) and [Table 7](#), the inclusion of fixed effects improves model fit for both regions. AIC values decrease and log-likelihoods become less negative, both indicators of stronger model performance. Additionally, the pseudo  $R^2$  increases, suggesting a greater proportion of variance in stop and search counts is explained. Regarding the dispersion parameter (theta), there is only a negligible increase for London (less than 0.04), indicating a very marginal rise in overdispersion. For Merseyside, theta increases slightly more (by 0.08), which may suggest a minor trade-off in model accuracy. Nonetheless, these changes are minimal, and the consistent improvements across AIC, log-likelihood and pseudo  $R^2$  support the inclusion of fixed effects.

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Table 6: Fixed Effects Model Fit Statistics: London

	No Fixed Effects	With Fixed Effects
AIC	37,790.540	37,668.200
Log Likelihood	-18,888.270	-18,795.100
Pseudo R-squared	0.068	0.071
Dispersion (Theta)	1.060	1.100

Furthermore, Merseyside follows a similar, though less pronounced, trend, with improvements in AIC and log-likelihood when fixed effects are included, as well as a minor increase in pseudo  $R^2$ . While the modest increase in overdispersion warrants mention, the overall evidence justifies the use of fixed effects for both regions. For transparency and robustness, both the fixed and non-fixed effects models are presented in the final analysis.

Table 7: Fixed Effects Model Fit Statistics: Merseyside

	No Fixed Effects	With Fixed Effects
AIC	7,595.680	7,505.050
Log Likelihood	-3,790.840	-3,741.530
Pseudo R-squared	0.117	0.128
Dispersion (Theta)	1.690	1.900

### 3.5.1 Interaction Terms

To conceptualise [Hypothesis 3](#), which investigates the complex interplay between structural inequalities and ethnicity in shaping stop and search practices, the model incorporates two interaction terms. These terms allow for a nuanced analysis of how socioeconomic factors and ethnic composition jointly influence policing patterns, capturing potential variations in stop and search rates that arise from their intersection.

**Ethnic Minority  $\times$  Income Deprivation**

**Ethnic Minority  $\times$  Housing Gini.**

Both terms are constructed using z-score standardised variables. The percentage of ethnic minority residents in each LSOA is interacted with measures of local inequality, capturing whether deprivation or income disparity affects stop and search activity differently in racially diverse areas.

The decision to include these interaction terms is informed by prior research emphasising how race and economic marginalisation intersect to shape criminal justice outcomes. For example, [\[Bright2016\]](#) demonstrated that racial disparities in the US criminal justice system are compounded by poverty, significantly increasing the likelihood of receiving a death sentence. This evidence supports modelling the combined effect of ethnicity and structural disadvantage through interaction terms, allowing for a more nuanced understanding of how these factors jointly influence stop and search practices.

Similarly, the background paper by [\[Perera2019\]](#) explores how low-income housing and race intersect in London, particularly in the context of police interactions. They argue that state narratives such as when former Prime Minister David Cameron introduced terms like “gangs” and “ghettos” into policy; have long-lasting effects, shaping both public discourse and enforcement patterns. These examples illustrate how institutional racism is embedded in both government and policing structures.

This rationale directly informs the inclusion of interaction terms focusing on ethnicity and inequality. These variables capture two distinct forms of socioeconomic disadvantage: one through income, the other through housing inequality. Mean house price is excluded from the interaction analysis, as it did not yield significant results in similar studies, such as [\[J. H. Suss and Oliveira2022\]](#).

## 4 Results

### 4.1 London

The following analysis focuses on regression models estimated for the Metropolitan Police Service, examining how borough-level socioeconomic and demographic characteristics are associated with stop and search activity. Table 8 presents five model specifications. Model (1) includes all predictors, serving as the full model. Models (2) and (3) extend the analysis by testing for interactions between key socioeconomic indicators; specifically income deprivation and income inequality, and the ethnic composition of boroughs, in order to explore whether these associations differ in more ethnically diverse areas.

Table 8: London Stop and Search Regression Table

Dependent Variable: Model:	Stop and search Count		
	(1)	(2)	(3)
<i>Variables</i>			
Gini Coefficient	1.21*** (0.174)	1.23*** (0.170)	1.20*** (0.175)
Income Deprivation (z)	0.075* (0.030)	0.077** (0.029)	0.082** (0.031)
Mean House Price (z)	-0.035 (0.025)	-0.040 (0.025)	-0.031 (0.024)
Drug Crime Rate (z)	0.833*** (0.113)	0.833*** (0.113)	0.834*** (0.114)
Ethnic Minority (z)	0.156*** (0.033)	0.192*** (0.040)	0.155*** (0.033)
Crime Domain Decile = 1	0.509*** (0.091)	0.512*** (0.090)	0.507*** (0.091)
Crime Domain Decile = 2	0.424*** (0.062)	0.428*** (0.062)	0.421*** (0.062)
Crime Domain Decile = 3	0.258*** (0.064)	0.259*** (0.063)	0.258*** (0.064)
Crime Domain Decile = 4	0.139* (0.061)	0.140* (0.060)	0.138* (0.061)
Crime Domain Decile = 6	0.037 (0.072)	0.040 (0.072)	0.039 (0.072)
Crime Domain Decile = 7	-0.285*** (0.064)	-0.282*** (0.064)	-0.278*** (0.065)
Crime Domain Decile = 8	-0.278*** (0.083)	-0.272** (0.084)	-0.268** (0.085)
Crime Domain Decile = 9	-0.365*** (0.101)	-0.357*** (0.103)	-0.354*** (0.104)
Crime Domain Decile = 10	-0.184 (0.200)	-0.174 (0.198)	-0.162 (0.198)
Gini Coefficient × Ethnic Minority (z)		-0.158 (0.111)	
Income Deprivation (z) × Ethnic Minority (z)			-0.025 (0.020)
Borough <i>Fixed-effects</i>	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	4,659	4,659	4,659
Squared Correlation	0.24903	0.24903	0.24903
Pseudo R <sup>2</sup>	0.07310	0.07314	0.07315
BIC	37,968.1	37,974.8	37,974.4
Over-dispersion	1.1067	1.1071	1.1072

*Clustered (Borough) standard-errors in parentheses*

Signif. Codes: \*\*\*: 0.001, \*\*: 0.01, \*: 0.05, .: 0.1, : 1

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The results presented in [Table 8](#) reveal consistent and significant associations between key structural characteristics and stop and search activity across Greater London Boroughs.

Across all model specifications, income inequality – measured by the Gini coefficient shows a strong and positive relationship with stop and search rates. This suggests that LSOAs with greater internal economic disparity are more likely to be subjected to heightened levels of police intervention.

Income Deprivation also remains a positive predictor of stop and search across all models, although the strength of this effect declines slightly as further controls and interaction terms are introduced. This aligns with the wider understanding that economically disadvantaged areas, particularly those with greater reliance on state support, are disproportionately policed.

Mean house prices, by contrast, are only significant in the latter models (Model (2) and (3)), where the interaction terms are included. This suggests that housing wealth, when considered in isolation, may appear irrelevant but gains explanatory power once the intersection of race and inequality is accounted for. In short, mean house prices may not directly predict stop and search rates, but their effect becomes apparent when viewed through the lens of broader structural inequalities.

The proportion of ethnic minority residents and local rates of drug-related crime both display strong positive associations with stop and search counts. These findings reflect broader patterns of racialised and offence-targeted policing observed in previous research. Notably, the drug-related crime variable remains both large and statistically significant across all model specifications, highlighting its consistent role regardless of variation in crime deprivation levels.

Finally, while the full model shows no significant association for the 6th and 10th Crime Domain Deciles, there is still evidence that policing intensity is structured by localised crime rankings. In the reduced model, a clear trend emerges: as the Crime Domain Decile increases (indicating lower levels of recorded crime), the frequency of stop and search decreases. This suggests that more ‘crime-heavy’ areas continue to face intensified policing.

#### 4.1.1 Model Fit

While all models perform reasonably well, Model (1) shows the best overall fit, as indicated by the lowest BIC score. A lower BIC suggests a better balance between model complexity and explanatory power, making Model (1) the strongest of the set.

Additionally, it has one of the highest Pseudo R<sup>2</sup> values, suggesting comparatively stronger explanatory power. Although the inclusion of interaction terms marginally reduces this value (by -0.00005), the model still performs well. This is notable given the reduced number of observations caused by including the Crime Domain Decile variable, which may limit model precision.

It is important to note that Pseudo R<sup>2</sup> values tend to be low in count models dealing with complex social phenomena. However, the consistent direction of effects, statistical significance of key predictors and the improved BIC across specifications indicate that the selected variables contribute meaningfully to explaining variation in stop and search activity.

## 4.2 Merseyside

Table 9: Merseyside Stop and Search Regression Table

Dependent Variable:	Stop and search Count		
Model:	(1)	(2)	(3)
<i>Variables</i>			
Gini Coefficient	0.708*	0.740*	0.649*
	(0.305)	(0.348)	(0.293)
Income Deprivation (z)	0.130*	0.126*	0.139
	(0.056)	(0.056)	(0.082)
Mean House Price (z)	-0.074**	-0.077**	-0.068***
	(0.026)	(0.025)	(0.018)
Drug Crime Rate (z)	0.996***	1.00***	0.974**
	(0.297)	(0.298)	(0.312)
Ethnic Minority (z)	0.024	0.059	0.085*
	(0.032)	(0.032)	(0.041)
Crime Domain Decile = 1	0.471*	0.466*	0.477*
	(0.209)	(0.207)	(0.208)
Crime Domain Decile = 2	0.401***	0.400***	0.395***
	(0.106)	(0.106)	(0.108)
Crime Domain Decile = 3	0.235**	0.234**	0.234**
	(0.073)	(0.072)	(0.072)
Crime Domain Decile = 4	0.127	0.124	0.110
	(0.101)	(0.102)	(0.112)
Crime Domain Decile = 6	-0.121	-0.116	-0.130
	(0.189)	(0.188)	(0.184)
Crime Domain Decile = 7	-0.205*	-0.205*	-0.204*
	(0.102)	(0.102)	(0.100)
Crime Domain Decile = 8	-0.472**	-0.471**	-0.458**
	(0.180)	(0.180)	(0.174)
Crime Domain Decile = 9	-0.581***	-0.579***	-0.558***
	(0.098)	(0.097)	(0.096)
Crime Domain Decile = 10	-1.02***	-1.02***	-1.00***
	(0.144)	(0.144)	(0.141)
Gini Coefficient × Ethnic Minority (z)		-0.108	
		(0.104)	
Income Deprivation (z) × Ethnic Minority (z)			-0.054***
			(0.016)
<i>Borough Fixed-effects</i>			
Observations	Yes	Yes	Yes
Squared Correlation	889	889	889
Pseudo R <sup>2</sup>	0.35125	0.35102	0.35063
BIC	0.13077	0.13083	0.13124
Over-dispersion	7,604.1	7,610.4	7,606.9
	1.9108	1.9117	1.9208

*Clustered (Borough) standard-errors in parentheses*

Signif. Codes: \*\*\*: 0.001, \*\*: 0.01, \*: 0.05, .: 0.1, : 1

The regression results for Merseyside, shown in [Table 9](#), reveal a pattern that is both similar to and yet distinct from that observed in Greater London. As in London, housing inequality, measured by the Gini coefficient, shows a consistent and significant positive association with stop and search counts across all model specifications.

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Income Deprivation also remains statistically significant across all models, reinforcing the relationship between economic disadvantage and increased police intervention. However, several key differences emerge. Mean house price is both negative and significant across models, indicating that LSOAs with higher property values tend to experience fewer stop and search incidents. This contrasts sharply with the London results, where house prices only briefly appeared significant and in the opposite direction.

As with London, drug-related crime continues to dominate the models, with a strong and significant positive association across all specifications. This effect persists regardless of whether the Crime Domain Decile is included, highlighting the consistent link between drug offence rates and stop and search activity.

In contrast, the proportion of ethnic minority residents is only significant in Model (2), and even more so in Model (3), where the Income and Ethnic Population interaction term is included. Its lack of significance in the full model suggests that, within Merseyside, ethnic composition may not contribute independently to explaining stop and search counts once other structural factors are taken into account.

Finally, the results for the Crime Domain Decile follow a broadly similar trend to that found in London. Higher-crime areas are associated with more stop and search activity, while lower-crime decile areas experience statistically significantly fewer stops. This supports the broader interpretation that stop and search practices are shaped in part by localised crime rankings.

#### 4.2.1 Model Fit

All models perform reasonably well, but again Model (1) shows the strongest overall fit. It has the lowest BIC score, indicating a better trade-off between model complexity and explanatory value. A lower BIC suggests the model explains the data effectively without overfitting.

Additionally, Model (1) has one of the highest Pseudo R<sup>2</sup> values, and the inclusion of interaction terms leads to a small improvement of 0.00047. This indicates that the interaction terms add marginal explanatory value. The relatively high Pseudo R<sup>2</sup> of approximately 0.13 is notable for a count model in this social context, suggesting that the model captures a meaningful portion of the variation in stop and search activity across Merseyside LSOAs. Despite the inherent limitations of Pseudo R<sup>2</sup> in models dealing with complex social behaviours, the combination of statistical significance, consistent directional effects and improved model selection criteria points to a well-specified and informative model.

### 4.3 Coefficient Estimates

For clarity and consistency, this section focuses on the full models in both [Table 8](#) and [Table 9](#) (Models (1)), as they include the all the key variables of interest and provide the most comprehensive basis for interpretation. With the exception of the Gini Housing Inequality and Crime Domain Decile, the other independent variables have been standardised using z-scores to enable meaningful comparison across counties. That is, a one-unit change in these variables corresponds to a one standard deviation ( $1\sigma$ ) shift from the mean.

#### 4.3.1 Housing Inequality (Gini)

Both London and Merseyside show strong positive coefficients with respect to the Gini coefficient. These coefficients correspond to a 1 unit increase. In the case of Gini, this represents an end-to-end change across the entire spectrum (i.e., from least to most unequal) as the gini is measured from 0 to 1. A more interpretable measure is a 0.1 unit increase rather than a full unit:

To interpret a 0.1 unit increase:

$$\text{Merseyside: } \exp(0.708 \times 0.1) = \exp(0.0708) \approx 1.073 \rightarrow 7.3\% \text{ increase}$$

$$\text{London: } \exp(1.21 \times 0.1) = \exp(0.121) \approx 1.129 \rightarrow 12.9\% \text{ increase}$$

The results show that housing inequality has a substantially stronger effect in London than in Merseyside, with the coefficient in London nearly double that of Merseyside. This supports [Hypothesis 1](#), offering clear evidence that higher levels of LSOA-level inequality are associated with increased instances of

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stop and search. Several factors may account for this. Notably, as shown in [Table 2](#) and [Table 3](#), house prices in London display far greater variation, partly due to the presence of some of the most expensive properties in the country [HM Land Registry [2025, June](#)], with this economic disparity is not as pronounced in Merseyside. Crucially, these results also support [Hypothesis 2](#), suggesting that the distinct social compositions of London and Merseyside contribute to differing rates of stop and search. While it must be acknowledged that correlation does not imply causation, the association identified remains both statistically and substantively significant.

#### 4.3.2 Income Deprivation

A one-unit ( $\sigma$ ) increase in the Income Domain Score, equivalent to a one standard deviation rise in income deprivation, is associated with a significant increase in stop and search rates in both Merseyside and London. The Income Domain Score reflects the proportion of the population experiencing low income and receiving benefits.

$$\text{Merseyside: } \exp(0.130) \approx 1.14 \rightarrow 14\% \text{ increase}$$

$$\text{London: } \exp(0.075) \approx 1.078 \rightarrow 7.8\% \text{ increase}$$

These results suggest that increases in income deprivation are associated with higher levels of stop and search activity, particularly in Merseyside, where the effect size is notably larger. This may reflect more spatially concentrated poverty or more targeted enforcement strategies in deprived areas. In contrast, London's slightly weaker association could reflect a more complex socioeconomic geography or a broader mix of policing priorities. Overall, these findings point to the role of economic marginalisation in shaping local policing patterns.

#### 4.3.3 House Price

Examining the effect of house prices reveals the first major contrasting pattern between Merseyside and London. For Merseyside, the coefficient is 0.074 ( $p < 0.01$ ), indicating a significant negative association with stop and search occurrences. This suggests that areas with higher house prices tend to experience substantially fewer stop and search incidents. Translating the coefficient to an incidence rate ratio (IRR):

$$\text{Merseyside: } \exp(-0.074) \approx 0.928 \rightarrow 7.7\% \text{ Decrease}$$

A one-unit increase ( $\sigma$ ) in the standardised house price score corresponds to approximately a 7.7% decrease in stop and search rates.

In contrast, the London coefficient is -0.035 and not statistically significant, indicating little to no measurable relationship between house prices and stop and search activity in that region. This difference may reflect London's broader housing market diversity, greater variation in price and more complex socioeconomic landscape, where high house prices alone do not strongly predict stop and search intensity. The stark contrast between the two regions further emphasises the role of local context in shaping stop and search dynamics. In Merseyside, house price appears to act as a clear protective factor against such interventions, while in London, other factors may dominate or obscure this relationship. This supports the idea that regional social and economic structures differentially influence policing patterns, aligning with [Hypothesis 2](#) regarding varied social compositions and their effects.

#### 4.3.4 Ethnic Minority

Unlike house value, the percentage of ethnic minority residents in Merseyside was only statistically significant when interaction terms were included (Model 2 and 3), suggesting its effect depends on the socioeconomic context. In comparison, London exhibited a clear positive effect from the full model (Model 1):

$$\text{London: } \exp(1.56) \approx 1.17 \rightarrow 17\% \text{ Increase}$$

This indicates a 17% increase in stop and search counts for every standard deviation increase in the proportion of the population from an ethnic minority background, accounting for the interaction between ethnicity and inequality. This suggests that ethnicity plays a significant role in explaining variation in stop and search rates across London boroughs.

This sets the stage for the interaction terms. Across both regressions, only one interaction is statistically significant:

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Merseyside: Income Deprivation (z)  $\times$  Ethnic Minority (z) = -0.054\*\*\*

$$\exp(-0.054) \approx 0.947 \rightarrow 5.5\% \text{ Decrease}$$

At first glance, this negative interaction may seem counter-intuitive but it becomes clearer when unpacked carefully. In Merseyside, the usual positive effect of ethnicity on stop and search frequency weakens in areas with higher income deprivation. Put simply, being from an ethnic minority group is less strongly linked to increased stop and search rates in poorer neighbourhoods.

This could reflect that in areas of greater economic disadvantage, stop and search practices are driven more by poverty-related issues affecting the entire community rather than ethnicity alone. As a result, the relative influence of ethnicity on stop and search rates diminishes in these contexts. Alternatively, the lack of significance in Merseyside may be due to the relatively small ethnic minority population in the sample, which limits the statistical power to detect meaningful effects.

#### 4.3.5 Crime

Crime variables, particularly drug-related offences, are central to this analysis, consistently emerging as the strongest predictors of stop and search activity. Their influence underscores the targeting of specific offence types within police practices and highlights the importance of accounting for local crime patterns when interpreting stop and search distributions.

##### Drug Related Crime

Drug-related crime rates show strong and consistent positive associations with stop and search counts across all models and areas analysed. This reinforces the idea that police activity is closely linked to drug offence prevalence, reflecting an offence-specific focus in stop and search decisions

As shown below, the magnitude of this effect is substantial in both Merseyside and London:

Merseyside:  $\exp(0.996) \approx 2.63 \rightarrow 163\% \text{ Increase}$

London:  $\exp(0.833) \approx 2.30 \rightarrow 130\% \text{ Increase}$

These findings suggest two possible conclusions. First, police activity in Merseyside appears to be more narrowly focused on drug offences. Second, in London, higher stop and search rates are linked to a broader range of crimes, which may reflect the city's larger size and more complex urban environment.

Overall, this indicates that stop and search powers are applied primarily in response to specific crime concerns, particularly drug-related offences, rather than simply targeting areas with high overall crime rates.

### Crime Domain Decile

As shown in [Figure 7](#), there is a clear trend in how stop and search counts vary by Crime Domain Decile. Compared to the baseline category (Decile 5), lower-crime areas consistently experience fewer stops, while higher-crime areas tend to experience more.

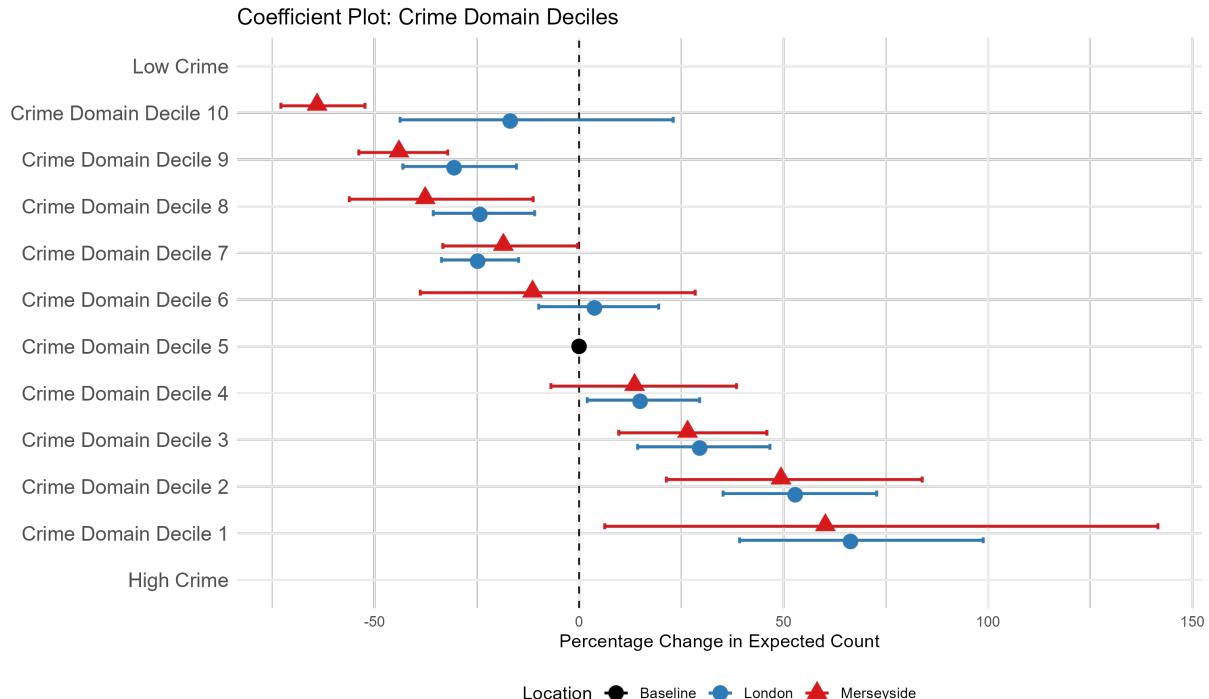


Figure 7: Regression Table Outputs

However, a notable difference emerges between London and Merseyside. For the highest crime deciles (Deciles 4 to 1), the pattern is broadly similar across both regions, with elevated stop and search rates relative to the baseline. The distinction appears in the lower-crime deciles, for example in Merseyside, there is a more linear gradient, with each decrease in crime decile corresponding to a further drop in stop and search counts. This indicates a clearer hierarchy in policing intensity based on crime levels. In contrast, London's lower-crime deciles (7 to 10) cluster more tightly around the baseline, suggesting less variation and a weaker differentiation between low-crime areas.

This may imply that, in Merseyside, stop and search practices are more closely tied to the local crime ranking, whereas in London the distinction between low-crime areas is less pronounced in how policing is applied.

$$\text{Merseyside (most crime): } \exp(0.471) \approx 1.60 \rightarrow 60\% \text{ Increase}$$

$$\text{London (most crime): } \exp(0.509) \approx 1.66 \rightarrow 66\% \text{ Increase}$$

$$\text{Merseyside (least crime): } \exp(-1.02) \approx 0.36 \rightarrow 64\% \text{ Decrease}$$

$$\text{London (least crime): } \exp(-0.184) \approx 0.832 \rightarrow 17\% \text{ Decrease}$$

Looking at the extreme ends of the Crime Domain spectrum, we see that in both regions the most deprived areas (Decile 1) are associated with roughly similar increases in stop and search activity: 60% in Merseyside and 66% in London.

However, the difference is more striking at the other end of the scale. In Merseyside's least deprived areas (Decile 10), stop and search rates fall by 64%, compared to only a 17% decrease in London. This

indicates a much sharper policing gradient in Merseyside, where the gap in stop and search use between high and low crime areas is more extreme. In contrast, London's approach appears flatter, with the least deprived areas still facing relatively high levels of police activity compared to the middle baseline.

This may reflect differing strategies or resource allocation, where Merseyside policing is more tightly concentrated in the most deprived areas, while London's policing is more evenly distributed.

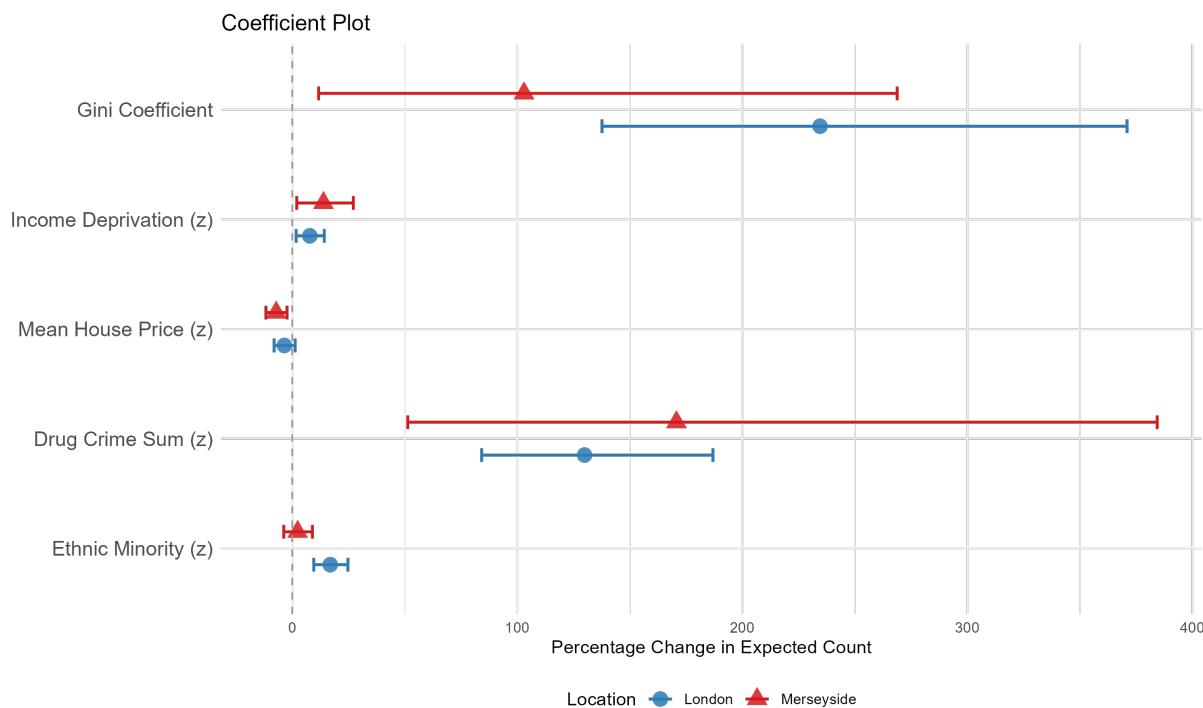


Figure 8: Regression Table Outputs

[Figure 8](#) presents the percentage changes associated with each covariate. Housing inequality (Gini) has a much stronger association in London than in Merseyside. The ethnic minority variable in Merseyside is the only one to cross the zero boundary, making it the clearest point of divergence between the two regions.

For covariates that are significant in both contexts, the confidence intervals mostly overlap. This suggests that while regional differences in significance exist, the size of the effects may not differ in a meaningful way. Even so, the consistent direction and strength of key associations across both locations support the wider point that structural conditions, whether economic or racialised, shape the use of stop and search.

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## 5 Discussion

### 5.1 Overview

The results reveal several principal findings that highlight clear patterns across both London and Merseyside. Economic inequality influences stop and search in both areas, with a stronger effect in London. Drug-related crime is a more significant factor driving stop and search in Merseyside. Meanwhile, ethnicity plays a lesser role in economically deprived areas of Merseyside, pointing to a distinct regional approach to policing ethnic minorities. These findings set the stage for deeper exploration of how socioeconomic disparities and policing priorities differ between the two regions.

#### 5.1.1 Economic Disparities

Economic disparities between London and Merseyside manifest in distinct ways. Housing inequality is considerably greater in London, whereas income deprivation is more pronounced in Merseyside. This discrepancy may be due in part to the wider variation in house prices across London, as illustrated in [Table 2](#). The broader spread of property values in the capital creates more polarised neighbourhoods, with affluent and deprived areas existing in close proximity. In contrast, Merseyside's housing market is more compressed, with property prices showing less variation overall.

This difference may help explain why average house price plays a more influential role in Merseyside's stop and search outcomes. In a region where house prices are more tightly clustered, deviations from the norm might act as a stronger signal of socioeconomic status, making this variable more prominent for interpreting patterns in policing. In London, the heterogeneity of housing values may dilute its explanatory power.

Interestingly, and contrary to the expectations outlined in [Hypothesis 3](#), areas characterised by lower income but high social diversity tend to experience reduced rates of stop and search. This suggests that ethnicity becomes a comparatively small determinant in less affluent contexts. Understanding this requires closer attention to the social structure within deprived areas. One interpretation is that in communities experiencing significant economic hardship, ethnic differences become less operationally relevant. The shared experience of poverty may obscure ethnic distinctions, leading police to rely less on racial profiling and more on broader markers of deprivation.

This dynamic is especially apparent in London, where high levels of ethnic diversity intersect with areas of socioeconomic struggle. In Merseyside, which is less ethnically diverse, police appear to concentrate their efforts more directly on economically disadvantaged areas, rather than targeting specific ethnic groups.

The divergence between these two regions supports the argument that ethnic dynamics in policing become more pronounced ethnically diverse settings. In Merseyside, class appears to be the dominant axis of profiling. In London, however, the intersection of class and race produces a more complex landscape of surveillance, where both factors inform police decision-making.

#### 5.1.2 Policing Biases

London police appear more responsive to some economic inequality, particularly in areas where wealth and deprivation border each other. This may not solely reflect institutional bias but could be attributed to the understanding that such socioeconomic disparities are more prominent in London than in Merseyside. Nevertheless, the data also suggest that London police are more discriminatory towards ethnic minorities compared to their counterparts in Merseyside.

As discussed in [Hypothesis 2](#), a divergence in stop and search patterns was anticipated due to differences in social composition. However, it was expected that the less diverse area, namely Merseyside would exhibit more discriminatory practices. Contrary to this, [Figure 8](#) shows that the ethnic minority variable has minimal influence on stop and search outcomes in Merseyside, especially when compared to the significant effect observed in London.

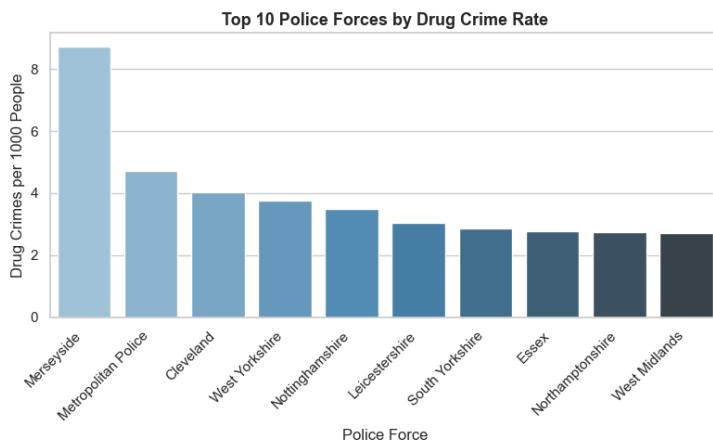


Figure 9: Top 10 Police Forces by Drug Crime (2022)  
(Data source: [Data.Police.UK](#))

drug crime remains statistically significant, it has a lower share of drug related crime per capita. This suggests that policing priorities in London are more diverse, responding to a wider range of criminal activity. The city's urban complexity introduces additional challenges such as knife crime and other serious offences, which require simultaneous attention alongside drug-related issues.

## 5.2 Implications for Policy

The findings suggest that stop and search practices are shaped by both socioeconomic context and ethnic minority demographics, with significant variation between regions. This highlights the importance of developing policing policies that are sensitive to local conditions.

In areas such as Merseyside, where drug related crime dominates stop and search priorities, interventions may benefit from targeted drug reform policy and enhanced community engagement strategies. Rather than relying heavily on stop and search as a tool to combat drug crime, which evidence suggests is not highly effective. Local authorities should adopt a preventative approach aligned with national drug strategy recommendations from [UK Government 2021]. Key components of this approach include:

- **Breaking drug supply chains:** Disrupting the full supply chain from trafficking to local street dealing, making it increasingly difficult for organised crime groups to operate.
- **Delivering a world class treatment and recovery system:** Investing in accessible, high quality treatment and recovery services to support individuals affected by drug use.
- **Achieving a generational shift in demand for drugs:** Implementing evidence based deterrence and prevention programmes aimed at reducing recreational drug use and preventing initiation, especially among young people.

In contrast, London's broader crime profile and greater ethnic diversity require a different policy focus, centred on oversight mechanisms to prevent disproportionate targeting of ethnic minority communities. This calls for dynamic workplace accountability and institutional reforms, as advocated by the Police Race Action Plan [National Police Chiefs' Council (NPCC) 2023]. Key areas include:

- **Culture and workforce:** Building a police service that is representative of Ethnic Minority communities and actively supports Ethnic Minority officers, staff and volunteers.
- **Powers and procedures:** Ensuring policing actions are equitable, fair and respectful towards Ethnic Minority individuals.
- **Trust and reconciliation:** Promoting consistent involvement of Ethnic Minority communities in police governance and decision-making.
- **Safety and victimisation:** Protecting Ethnic Minority individuals from crime and ensuring justice for victims within these communities.

One possible explanation for this contrast lies in the role of drug-related crime. It appears that Merseyside police concentrate their stop and search efforts more directly on preventing drug offences than addressing a broader range of crimes. This focused approach is supported by the data shown in Figure 9, where Merseyside leads the country in drug crime per capita by nearly double.

This focus on drug crime likely shapes officer behaviour and informs the deployment of stop and search as a policing tool. In contrast, London presents a more complex pattern. While

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More broadly, these results emphasise the need for policy frameworks that promote transparency and accountability, with region specific strategies tailored to local social dynamics. The evidence strongly suggests that one-size-fits-all approaches are insufficient to address the complex structural inequalities embedded in current stop and search practices across England and Wales.

### 5.3 Limitations

This study is subject to several limitations, both methodological and contextual, which should be considered when interpreting the findings.

Firstly, aggregating data to the LSOA level introduces the Modifiable Areal Unit Problem (MAUP). This refers to the fact that statistical patterns can vary depending on the spatial scale or zoning system used. Patterns observed at the LSOA level may look different if data were grouped by MSOAs, wards or region. For example, an apparent hotspot may disappear or shift if boundaries are redrawn or data are aggregated differently. This limitation is structural and inherent in spatial analysis but it remains important to acknowledge as it may obscure within-area variation or exaggerate between-area differences.

The use of aggregate-level data also introduces the risk of ecological fallacy. While structural-level analysis is appropriate for studying policing patterns, the absence of micro-level data means the findings should not be interpreted as definitive evidence of individual-level discrimination or intent.

Not all stop and search records included usable geographic coordinates. In particular, 10.37% of London incidents and 3.90% of those in Merseyside lacked location data and could not be reliably mapped to an LSOA. These incidents were effectively treated as missing or zero-counts. If the missing data are randomly distributed, the effect may be minimal. However, if certain types of stops (e.g. vehicle searches) or certain locations (e.g. boundary areas or town centres) are more prone to data loss, the result may be biased spatial representations of stop and search intensity.

There are also measurement constraints concerning the accuracy and consistency of stop and search records, as well as how variables were normalised and harmonised across datasets. For example, data from Greater Manchester were missing for the relevant time period. This absence may have introduced bias in regional comparisons and arguably limits the representativeness of the chosen case studies. In retrospect, Greater Manchester might have served as a more appropriate comparator to London given its scale and demographic composition.

The LSOA boundaries used in this study are based on the 2021 census geography. However, urban areas are not static. Gentrification, regeneration, population churn and new housing developments can alter the character and population structure of a neighbourhood within a short period. Using fixed 2021 boundaries to analyse data from earlier years may lead to mismatches between the actual social geography at the time of the searches and the boundaries used in the analysis. This is particularly relevant in areas experiencing rapid demographic or infrastructural change.

The case study design limits the scope of generalisation. By focusing only on Merseyside and Greater London, this research captures the dynamics of stop and search within two very specific urban contexts. Both cities have unique demographic profiles, policing histories and political environments. As such, the findings may not be representative of patterns in rural areas, smaller towns or other regions of England and Wales. That said, the aim here is depth over breadth to understand how social composition shapes spatial policing in particular contexts.

Finally, several important factors lie beyond the reach of this analysis. While the study incorporates demographic and deprivation indicators, it does not account for organisational culture within police forces, differences in leadership, local crime reporting practices or political pressures. These unmeasured variables may significantly influence where and how stops occur, meaning that the observed spatial patterns should not be interpreted as purely or even primarily determined by demographic variables.

Despite these limitations, the study provides valuable insights into how structural, economic and demographic contexts shape policing outcomes. It offers a methodological framework that can be applied to other regional contexts and raises important questions for future research and policy development.

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## **5.4 Directions for Future Research**

Future research should aim to extend this analysis to additional policing constabularies across England and Wales, to assess whether the patterns identified here are unique to London and Merseyside or part of a wider trend. Expanding the geographical scope would help to generalise the findings, distinguishing between systemic biases inherent to national policing policies and localised practices.

Moreover, further study is needed to explore whether a traceable relationship exists between social composition and stop and search practices over time, incorporating longitudinal data to assess changes in policing behaviour in response to shifting neighbourhood demographics and policy reforms. Investigating causal mechanisms would be particularly valuable to understand not only correlations but the drivers of disproportionate policing, including the influence of external factors such as political pressures, crime rates and police training.

Finally, qualitative research focusing on policing cultures, officer decision-making processes and community experiences would also provide vital complementary perspectives. Such work could uncover how structural factors identified quantitatively are operationalised in day to day policing, including how officers interpret and apply stop and search powers within complex social environments. Additionally, engaging with communities subject to stop and search would shed light on the lived realities and social consequences of policing practices.

## **5.5 Concluding Remarks**

This study offers a focused examination of how socioeconomic status, ethnic minority demographics and policing practices interact in Merseyside and Greater London. But it also raises broader questions about the national landscape of stop and search. Within the scope of this research, both Merseyside and London exhibit disproportionate targeting of economically deprived communities, yet the mechanisms and emphasis diverge. In Merseyside, regional and economic biases are more pronounced, with a marked focus on drug related offences, suggesting a issue specific policing agenda. In contrast, London's greater social and ethnic diversity corresponds with a broader policing strategy that shows signs of racial profiling. These findings challenge the idea of a uniform national approach to stop and search, instead highlighting regionally contingent policing biases. They call for context specific policy responses that reflect the distinct social fabrics of each area. Ultimately, the analysis demonstrates how structural inequalities shape the application of police powers, reinforcing the need for transparency, accountability and equity in law enforcement practices.

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