To what extent does ethnic bias impact the process of stop and searches in contemporary Britain?

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ST344 Individual Project Report

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Contents

Abstract

This report analyses the ethnic bias (which we define as discriminatory behaviour towards people based on their ethnicity [Blum, 2019]) in stop and searches around England. Results show indications of bias and consequential bias from other factors. Refer to ethnic bias as bias for simplicity.

Disclaimer: There's no correct way of measuring bias (subjective). This paper doesn't endorse any specific conclusions regarding policing bias.

1 Introduction

In England and Wales, "Black people are six times more likely to be stopped and searched by the police than a White person and twice as likely if they are Asian" [EHRC, 2010].

In relation to this, this project answers the following questions:

1. What are the correlations between season change and bias, is it affected by the time of day?
2. Are ethnic minorities stopped based on precedential offences?

And measure bias by:

1. Comparing ethnic composition of crime suspects with their locations,
2. Analysing reasons and outcomes of the stop and searches.

We also consider officer ethnic compositions, but conclusions made from this measure can be due to boundless factors.

2 Methods

The first measure is robust, popularly used [Vomfell, 2021], easy to understand and is our primary bias indicator. The second, more unorthodox measure concentrates on underlying patterns that lead to bias.

Our defined ethnic groups are discrete, so we perform Exploratory Data Analysis [Childs, 2019] by analysing the:

- Interval scale: degree of difference in our data set,
- Ratio Scale: effect between populations by scaling the results.

Both measures come with limitations as they assume everyone is equally likely to commit crime, despite ethnicity.

3 Data Used

Table 1: Datasets and variables used.

Stop and search data: This dataset is an open-source dataset, containing individual stop and search records [Data Police UK]. Multiple files are provided by the police data website and are automatically combined in R code. Note: Contains sensitive personal data and thus, results are anonymised before publication. The data is also quality assured and validated.	
Variables	**Description**
Force	County the police force is located in. In this project, we go into more detail with the following three counties: Derbyshire, Surrey, and Sussex.
Date	The date of and time of each individual stop and search. The total time period covered is from 2017.09.30 - 2021.09.30.
Self-defined ethnicity	The ethnicity of the criminal suspect in the stop and search.
Officer-defined ethnicity	The ethnicity of the officer in the stop and search.
Object of search	The suspected crime for the reason of stop and search.
Outcome	The outcome of the stop and search.
Outcome linked to object of search	An indicator, to see if the outcome of the search was linked to the initial object of the search.
Population diversity dataset (population_ethnicity.csv): Dataset with data collated from the Office for National Statistics, including Census 2011. Thus, it contains the ethnic composition in 2011 of England & Wales [GOV UK, 2020], and Surrey [Surrey-i, 2011]. And an estimated ethnic composition of England & Wales in 2019 [ONS, 2021].	
Variables	**Description**
Percentage: 2011 (census)	The ethnic composition of England and Wales in 2011 as percentages.
Percentage: 2019 (ONS estimations)	The estimated ethnic composition of England and Wales in 2019 as percentages.
Percentage: 2011 Surrey (Census)	The ethnic composition of Surrey in 2011 as percentages.

4 Results

We can start by quantifying bias with our first measure.

Table 2: Data normalised to represent how many times more likely an ethnic group would be stopped and searched in comparison to a white person.

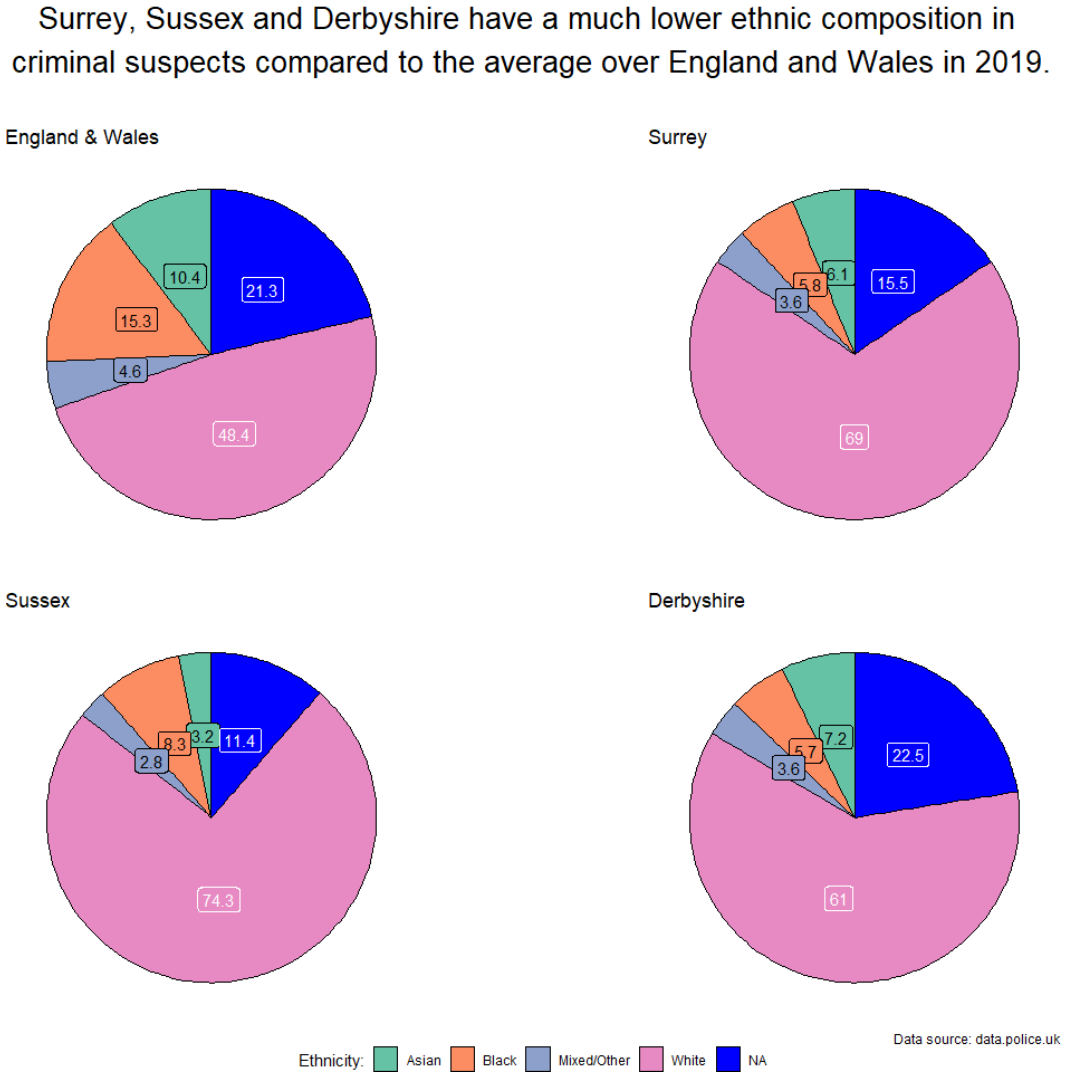
Comparing the disproportionality ratio between bias against ethnic minority groups show bias in ethnic minority groups.

Crime Suspect ethnicity	Against the population diversity in	
	2011 (census data)	2019 (ONS estimated)
Asian	2.5	2.3
Black	8.2	7.7
Mixed/Other	2.6	2.2
White	1	1
NA	5	4.7

In England & Wales: a black person is 7.7x, and an Asian is 2.3x more likely to be stopped than a white person. Compared to the introductory statement, these figures suggest its higher. Population diversity in 2011 indicates a decrease in bias (given crime ethnic composition remains constant). Now, does location impact bias?

4.1 Location: Derbyshire, Surrey and Sussex

Graph 1: Comparing the ethnic composition of criminal suspects in 2019, as this is the most recent data with a comparable population data (ONS estimates) to give inference on how to interpret following analysis.



Surrey is adjacent and north of Sussex, both located in South-East England. Assuming bias is geographically influenced, we expect similar figures for both above, differing to Derbyshire (East Midlands).

For Derbyshire, Sussex and Surrey, the percentage of ethnically minority crime suspects are 16.5%, 14.3% and 15.5% (roughly half the average of England Wales), with crime rates of 70.1, 55.6 and 63.6 per 1,000 population respectively [Clark, 2022]. Solely on this data, we cannot infer bias.

From above, one may speculate; higher composition of ethnic minority crime suspects results in higher crime rates, or more north counties have higher crime rates. These are not backed up. We will concentrate on Surrey to represent the median of our three counties stated previously.

Table 3: Analysing how the ethnic bias in Surrey could have changed between 2017 and 2019.

Comparing the disproportionality ratio between bias against ethnic minority groups in Surrey, relative to population diversity in 2011.

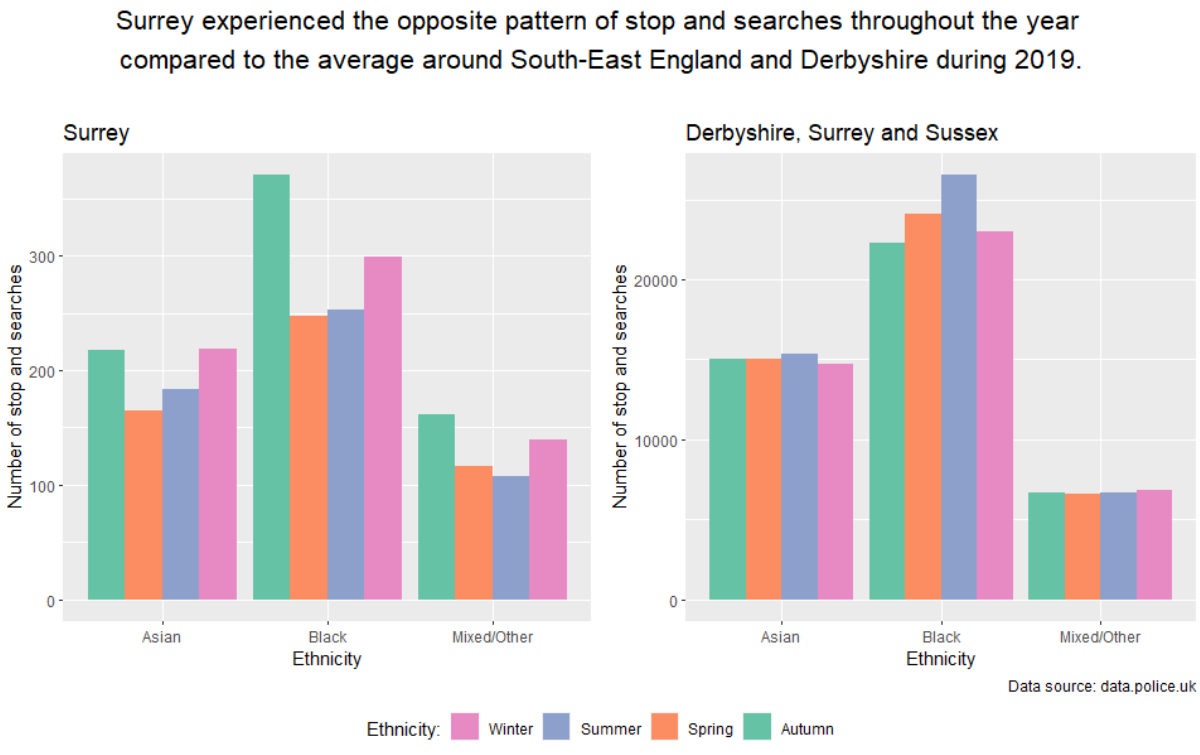
Crime Suspect ethnicity	Crime Suspect Ethnic Composition in	
	2017	2020
Asian	1.1	1.4
Black	8.1	6.9
Mixed/Other	1.4	1.6
White	1	1
NA	3.3	3.6

Between 2017 and 2020, the chance of a black, compared to white person being stopped decreased from 8.1x to 6.8x. Whereas an Asian person had similar chances, slightly increasing in 2020.

4.2 Time of day and Seasonal Impacts

Studies suggest stops are less biased during the night [Bonner, 2020] due to difficulty in identifying race, another stating black people were less likely to be stopped after sunset [Abate, 2020]. This being so, how would seasons affect bias? We hypothesise that a black person is less likely to be stopped during the winter, as winter has fewer hours of sunlight.

Graph 2: Comparing the number of stop and searches on ethnic minority group for each season.



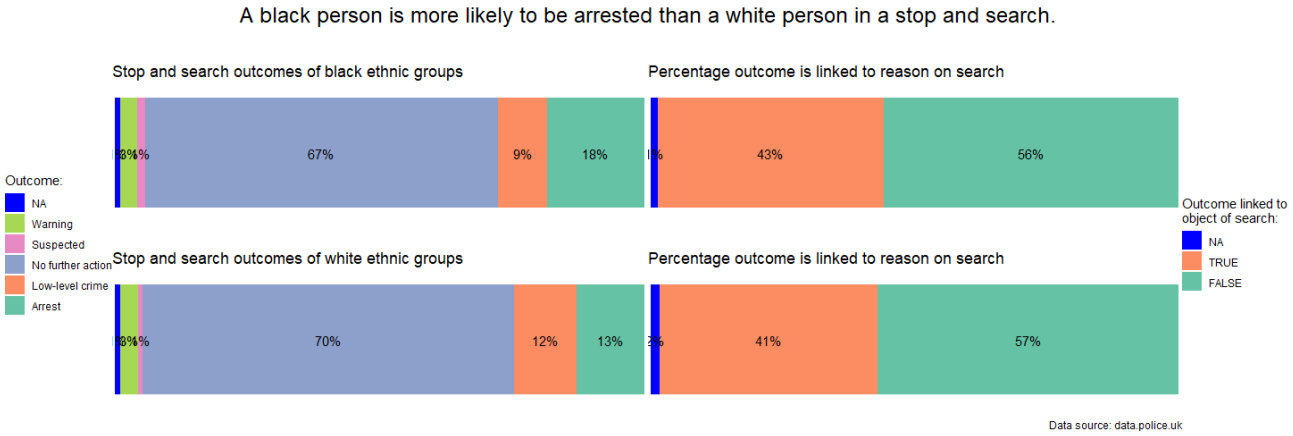
Data over our three counties show fewer black people being stopped in winter and autumn, backing up our hypothesis. But there is not much difference between the other ethnic groups.

Surrey exhibits the opposite, the number of stops decreases during Spring and Summer, indicating less bias. This, however, may be influenced by other factors, like fewer drivers in these seasons. It also suggests our hypothesis is more prevalent in Derbyshire or Sussex.

4.3 Injustice Of The Criminal System

With our second bias measure, consider "Two-thirds of minority ethnic Britons believe the police and criminal justice system are biased against them" [Dodd, 2020].

Graph 3: Comparing the outcome of stop and searches between White and Black ethnic groups.



A black, compared to a white person is 5% more likely to be arrested, and 2% more likely to be linked to the object of search during a stop and search, but these numbers only differ marginally.

4.4 Type of crime

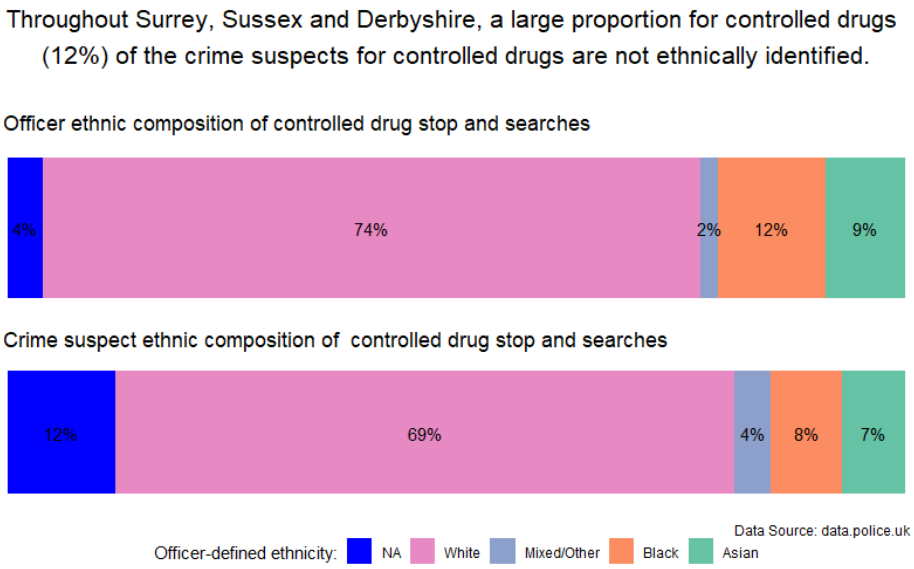
Table 4: Analysing the average ethnic composition of suspected criminals for the top three, and bottom three offences.

The ethnic minority are searched more for the same offenses on average over Surrey, Sussex and Derbyshire.

Ethnicity	Surrey: Ethnicity percentage		All counties: Ethnicity percentage	
	Top three offenses	Bottom three offenses	Top three offenses	Bottom three offenses
NA	14.4	10	18.2	25.4
Asian	7.6	20	11.7	0
Black	7.3	7	18.6	7.7
Mixed/Other	3.7	3	5	0
White	67.1	60	46.6	66.9

The ethnic minority makes up more of the top than bottom offences, suggesting they are more likely to be stopped for the same offences, stereotyping to certain crimes. E.g. "black people are nine times more likely to be stopped and searched for drugs than white people" [LSE, 2018].

Graph 4: Analysing the difference in officer and crime suspect ethnic composition for the top offense - controlled drugs, found from previous results.



Here we cannot compare the ethnic makeup of the officers to crime suspects due to large proportions of missing crime suspect ethnicities. One attempt would be scaling figures, but a good proportion of the missing data are likely ethnic minority groups, as they can be harder to classify.

5 Conclusion

In England & Wales, our results suggested that a black person, compared to white, was eight times more likely to be stopped. In this event, they were also more likely to be arrested, displaying bias in the justice system itself. We also noticed ethnic minority groups were more likely to be searched for the same offense.

Compared to Derbyshire, Surrey and Sussex, whose population diversity is lower than average, we saw similar but less intense patterns in bias. As suggested, a black person was less likely to be stopped during seasons with less daylight. This was not the same for the other ethnic minority groups, however, other factors such as lifestyle and culture may have impacted this.

Interestingly, Surrey alone followed opposite trends. Generally, there were significantly more stops during brighter seasons. With more time, measures that are harder to quantify could be analysed, such as social standards. Tables 1 and 3 suggested Surrey exhibits fewer signs of bias compared to the average, with less bias against Asians.

5.1 Limitations

1. Graphs/tables use ratio scaling for easy understanding and comparability - quantitative value of results differ.
2. Table data normalised against white populations - assumes no bias against a white person.
3. Stop and search data contains missing data - analysis may not be representative.
4. Census 2011 is the most reliable dataset representing ethnic population breakdown in England - assume population diversity hasn't changed or use 2019 estimates.

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