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BODY CAMERAS AND POLICE DISCRIMINATION: EVIDENCE FROM LONDON

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Body Cameras and Police Discrimination: Evidence from London

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Abstract

This paper uses administrative data from the London Metropolitan Police Service to investigate discrimination in police searches and to estimate the effects of body cameras on discrimination. It finds that, prior to a body camera trial, black individuals were 2.5 times more likely to be searched than white or South Asian (Indian or Pakistani) individuals. Ethnic disparities were greater for drug searches, for which black individuals were 2.9 times and South Asians 1.4 times more likely to be searched than whites. Men were 15.8 times more likely to be searched than women. These disparities cannot be completely explained by accurate statistical discrimination, as there were significant differences in search success rates between ethnic, gender, and age groups. Ethnic and age differences were driven by drug searches. Overall, the differences were consistent with preference-based or inaccurate statistical discrimination against young minority-ethnic men. Using variation in the timing and location of body camera use resulting from a one-year camera trial, I find suggestive but not conclusive evidence that cameras reduced these disparities, particularly the gender disparity in search success rates.

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1 Introduction

There is growing concern over police discrimination. In the United States, for example, police misconduct targeting African Americans has been on national display, from high-profile police killings of Michael Brown and Eric Gardner to documented racial bias in New York's "Stop-and-Frisk" policy (Gelman, Fagan & Kiss 2007). In response, the Black Lives Matter movement has started a national conversation about racial profiling and police brutality. However, activists and policymakers are still searching for solutions. Body-worn video cameras have been proposed as a means to reduce bias in policing, but the effects of the cameras are not well-understood. Existing research on body cameras has focused on general patterns of police use of force and citizen complaints (Ariel, Farrar & Sutherland 2015; Ariel et al. 2016; Jennings, Lynch & Fridell 2015; Ready & Young 2015; Yokum, Ravishankar & Coppock 2019), not discrimination.

This paper investigates discrimination in police searches and evaluates the effects of body cameras, using data from the London Metropolitan Police. In London, police officers have the power to stop and search individuals for weapons, drugs, and items to be used in crimes, among other reasons. However, officers must have "reasonable grounds for suspicion," which include an objective basis for suspicion that would lead a reasonable person to reach the same conclusion. Physical appearance, such as ethnic appearance, gender, or age, can never support reasonable grounds, meaning an officer may not rely on "[g]eneralisations or stereotypical images that certain groups or categories of people are more likely to be involved in criminal activity" (UK Home Office 2014a).

Using administrative data on over 400,000 searches between April 2013 and April 2015, I find that, in the year prior to a body camera trial, the London police disproportionately stopped ethnic minorities and men. Black individuals made up approximately 16% of the London population but 33% of searched persons, making them 2.5 times more likely to be searched than whites. This disparity was greater for drug searches, for which black Londoners were 2.9 times more likely to be searched than whites. South Asian (predominantly Indian and Pakistani) individuals were 1.4 times more likely to be searched for drugs than whites, but approximately equally as likely to be searched overall. Men made up 94% of searched persons but only half of the overall population,

making them 15.8 times more likely to be searched.

A simple comparison of search rates does not take into account the possibility that the distribution of characteristics that give rise to reasonable suspicion might vary by group. For example, if men are more likely to carry illegal weapons, the "facts, information and/or intelligence which are relevant to the likelihood that the object in question will be found" — that is, the objective basis needed for reasonable grounds for suspicion (UK Home Office 2014a) — will lead to gender disproportionality. (This is similar to, but distinct from, a claim of statistical discrimination *based on* gender.) To distinguish the possibility that police officers engaged in (unlawful) preference-based discrimination, rather than (unlawful) statistical discrimination based on ethnic appearance, gender, or age, or (lawful) statistical discrimination based on observable characteristics that correlate with ethnic appearance, gender, or age, this paper examines search success, or "hit," rates across different groups. A further possibility is that police officers engage in inaccurate statistical discrimination, that is, statistical discrimination based on incorrect beliefs (Bohren et al. 2019). If police officers aim to maximize the rate at which they discover illegal behavior, and if they do not engage in preference-based or inaccurate statistical discrimination, search success rates should be equal across groups (under certain assumptions described in Section 3).

Considering all searches in the year prior to a body camera trial, search success rates were on average 0.7 percentage points (p.p.) lower for black persons and 2.0 p.p. lower for South Asians than for whites, consistent with preference-based or inaccurate statistical discrimination against these ethnic minorities. However, after including a full set of control variables, the black-white difference falls to zero. That said, conditional on further action by the police, searches of black persons were 2.5 p.p. more likely to result in arrest and 2.7 p.p. less likely to result in a warning. The overall disparities between ethnic groups appear to be driven by drug searches (the most frequent kind), for which search success rates were 2.4 p.p. and 4.6 p.p. lower for black and South Asian persons, respectively, as well as searches of young persons. In general, young persons (particularly those under 20 years old) experienced lower search success rates, and the age differences were most striking for South Asians and for drug searches. With respect to gender, the

search success rate was on average 6–7 p.p. lower for men than for women, and this pattern was fairly stable across different search grounds and age groups.

Using variation in the timing and location of body camera use resulting from a one-year camera trial by the London police, this paper estimates the effect of body cameras on differences in search rates and search success rates between ethnic and gender groups. The cameras slightly increased the relative frequency of searches of black persons, slightly decreased the relative frequency of searches of South Asians, and had no effect on the relative frequency of searches of men. However, controlling for borough-specific time trends eliminates these ethnicity effects, calling into question the validity of the empirical design. A triple difference-in-differences approach suggests that, consistent with the changes in search frequency, the cameras slightly decreased the relative search success rate for black persons and slightly increased the relative success rate for South Asian persons. (And these findings are made stronger by the inclusion of borough- and group-specific time trends.) That said, the estimated effects on search success rates are somewhat small. Finally, there was an economically large and statistically significant (positive) effect on the search success rate for men relative to women, suggesting the cameras may have reduced gender discrimination. Therefore, when it comes to reducing discrimination, the usefulness of body cameras is mixed. If the primary goal is to reduce ethnic disparities, body cameras are not a cure-all.

The rest of this paper proceeds as follows. Section 2 provides background information about stop and search practices in London, including the legal grounds necessary for search, protections against discrimination, and reporting requirements. Section 3 describes the conceptual framework that guides the analysis, and Section 4 describes the data used throughout. Section 5 analyzes searches and search outcomes, with an eye toward distinguishing different types of discrimination. Section 6 evaluates the effects of body cameras, using variation in camera use due to a one-year trial. Section 7 concludes.

2 Background

The London Metropolitan Police Service (MPS or "Met") has the power to stop and search individuals. The Police and Criminal Evidence Act (PACE) of 1984, which governs this practice, provides that police officers may conduct searches to enforce section 1 of PACE (stolen goods and offensive weapons), section 23 of the Misuse of Drugs Act of 1971 (drugs), section 47 of the Firearms Act of 1968 (firearms), section 60 of the Criminal Justice and Public Order Act of 1994 (anticipated violence), and, in rare circumstances, the Terrorism Act of 2000. Almost all searches require "reasonable grounds for suspicion"[1] (UK Home Office 2014a). Physical appearance, such as ethnic appearance, gender, or age, can never support reasonable grounds. In particular, police officers may not rely on "[g]eneralisations or stereotypical images that certain groups or categories of people are more likely to be involved in criminal activity." In addition, the Equality Act of 2010 stipulates that officers "have a duty to have due regard to the need to eliminate unlawful discrimination, harassment and victimisation."[2]

Despite legal protections against discrimination in its application, "stop and search" is the subject of ongoing criticism of police across the United Kingdom — and the London police, in particular (London Assembly 2014; Oyeniran 2017). In 2010, the UK Equality and Human Rights Commission (EHRC) concluded that "the evidence indicates that [stop and search] may be being used in a discriminatory and unlawful manner" (EHRC 2010). The primary criticism of the practice is that it disproportionately affects ethnic minorities (Oyeniran 2017). In 2014, then–Home Secretary Theresa May remarked: "Nobody wins when stop and search is misapplied. It is a waste of police time. It is unfair, especially to young black men. It is bad for public confidence in the

[1] "Reasonable grounds for suspicion" is a two-part test. First, a police officer must form "a genuine suspicion in their own mind that they will find the object for which the search power being exercised allows them to search." Second, the officer must have "an objective basis for that suspicion based on facts, information and/or intelligence which are relevant to the likelihood that the object in question will be found, so that a reasonable person would be entitled to reach the same conclusion" (UK Home Office 2014a). Section 60 searches do not require reasonable grounds, but these searches are relatively rare. (They constituted less than 1 percent of all searches between 2013 and 2015.)

[2] The Equality Act also requires police officers to have due regard for the need "to advance equality of opportunity between people who share a 'relevant protected characteristic' and people who do not share it, and to take steps to foster good relations between those persons," where "relevant protected characteristic" includes age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation (UK Home Office 2014a).

police" (UK Home Office 2014b). In many ways, the criticisms of stop and search in London echo those of New York City's controversial "stop-and-frisk" program, namely, that the practice entails racial profiling (Gelman, Fagan & Kiss 2007) and does not reduce crime (Rosenfeld & Fornango 2014).

By law, all stops and searches in London must be documented, electronically or on paper, on the spot. If doing so is impracticable, the officer must make a record as soon as possible after the search. In addition, the officer must offer the searched person a copy of the search record, furnishing it immediately if they accept. Appendix Figure A1 displays the search record (Form 5090) used by the London police for this purpose. The record must always include the date, time, and place of the person or vehicle search; the legal grounds for search; the self-defined ethnicity of the person searched ("SDE code"); and, if different, their ethnic appearance ("EA code"). These records are held by the London police as electronic data. Searched persons receive a white copy of the form in Figure A1 that includes information about their rights and responsibilities, as well as instructions for filing a complaint.

Although the police are legally required to document searches, some have expressed concerns about under-reporting (London Assembly 2014). According to the MPS, about 5 percent of searches go unrecorded (*Id.*) If true, this relatively low rate is probably a result of the widely known requirement to provide a copy of the search record, which police accountability groups highlight in their educational materials (Odogwu 2012). Nonetheless, under-reporting is an important issue, one that this paper returns to in Section 5.

3 Conceptual Framework

Economic models of discrimination began with the seminal work of Becker (1957), who proposed a model of labor market discrimination based on discriminatory preferences. Phelps (1972) and Arrow (1973) later developed a theory of statistical discrimination involving inferences based on group averages. To distinguish the possibility that police officers engage in (unlawful) preference-

based discrimination, rather than (unlawful) statistical discrimination based on ethnic appearance, gender, or age, or (lawful) statistical discrimination based on observable characteristics that correlate with ethnic appearance, gender, or age, this paper uses a Becker-type outcome test that examines search success, or "hit," rates across different groups.[3] A search is defined to be successful if it results in an arrest, warning, or other action (a "hit"). The intuition behind this approach is that, if the search success rate is higher for group A than for group B, that is evidence that the threshold for suspicion is lower for group B. That is, the police have searched too many members of group B, and they could improve the rate at which they discover illegal behavior by searching more members of group A. Note that this could be true whether group B members make up 5% or 95% of all searches.

A complication, which much of the literature ignores, is that the equality of average search success rates does not imply, and is not implied by, the equality of marginal search success rates (Anwar and Fang 2006). This is known as the "infra-marginality problem." A comparison of marginal search success rates is better because it more directly addresses the question of whether officers use a different threshold of suspicion for different groups. One way to justify using average, rather than marginal, search success rates is to assume that individual decisions to carry illegal objects are endogenously determined by group-specific search rates, such that average and marginal search success rates are equal (Knowles, Persico & Todd 2001). However, this theoretical result requires fairly restrictive assumptions. Researchers have developed tests to overcome the so-called inframarginality problem (e.g., Anwar & Fang 2006; Antonovics & Knight 2009; Arnold, Dobbie & Yang 2018), but these tend to require demographic information about searching officers or quasi-random assignment of decisionmakers. The London police have not been able to provide officer demographics at the search level, although they may provide demographic information about officers at the borough-month level. The following theoretical model suggests a method to overcome the inframarginality problem using aggregated officer demographic information, should

[3] A further possibility is that police officers engage in inaccurate statistical discrimination, that is, statistical discrimination based on incorrect beliefs (Bohren et al. 2019). Distinguishing this possibility would require eliciting officers' preferences or observing them over time (Bohren, Imas & Rosenberg, forthcoming).

it become available.

To begin, consider the model proposed by Antonovics and Knight (2009). Suppose, for simplicity, that potential search subjects fall into one of two groups, denoted $g \in \{M, W\}$. For example, M could be "men" and W "women," M "minority" and W "white," and so on. Each subject has characteristic c, which could be informative to the police. The subject receives a payoff of zero (or normalized to zero) if he does not carry an illegal object. If he carries an illegal object, he receives a benefit $v(c,g)$ if he is not searched, but he incurs a cost Z, distributed according to $F(z)$, no matter what, plus a cost $j(c,g)$ if he is searched. Let $\gamma^j(c,g)$ be the probability that officers from group j search subjects from group g, and let ρ be the proportion of officers with $j = M$. Then the subject has the following expected payoff from carrying an illegal object:

$$-\gamma(c,g)\,j(c,g) + [1-\gamma(c,g)]v(c,g) - Z,$$

where $\gamma(c,g) = \rho\,\gamma^M(c,g) + (1-\rho)\gamma^W(c,g)$.

Suppose the police receive a payoff of one (or normalized to one) if a search is successful. Police officers incur a group-specific cost, $t_g^j \in (0,1)$, where j is the group of the officer and g is the group of the subject, as well as an idiosyncratic cost U, distributed according to $H(u)$. Let $\pi(c,g)$ be the probability that a subject carries an illegal object. Then the expected payoff to an officer from a search is:

$$\pi(c,g) - t_g^j - U.$$

If officers maximize the expected payoff of search, and subjects maximize the expected payoff from carrying an illegal object, the following conditions must hold in equilibrium:

$$\gamma^{M*}(c,g) = H(\pi^*(c,g) - t_g^M),$$

$$\gamma^{W*}(c,g) = H(\pi^*(c,g) - t_g^W), \text{ and}$$

$$\pi^*(c,g) = F(-\gamma^*(c,g)\,j(c,g) + [1-\gamma^*(c,g)]v(c,g)),$$

where $\gamma^*(c,g) = \rho\gamma^{M*}(c,g) + (1-\rho)\gamma^{W*}(c,g)$.

Antonovics and Knight demonstrate that if average search costs are equal across officer groups, i.e., $t_W^W + t_M^W = t_M^M + t_W^M$, and at least one group prefers to search subjects of the other group, then search rates will differ across officer groups in equilibrium, i.e., $\gamma^{W*}(c,g) \neq \gamma^{M*}(c,g)$ for a given g. In contrast, without a discriminatory preference, search rates may differ across subject groups, i.e., $\gamma^*(c,W) \neq \gamma^*(c,M)$ (indicating statistical discrimination based on c or g or both), but not officer groups, i.e., $\gamma^{W*}(c,g) = \gamma^{M*}(c,g) = \gamma^*(c,g)$. This forms the basis for their empirical test using officer-subject mismatch.

Antonovics and Knight focus on differential search rates. Consider the following extension. First, observe that the equilibrium search success rate, $S^*(c,g)$, is decreasing in the equilibrium search rate, $\gamma^*(c,g)$. (Antonovics and Knight focus their empirical analysis on search rates, but the data set used in this paper (described in Section 4) contains only searches, not stops that never resulted in a search.) Second, note that if there is no preference-based discrimination, such that search rates do not differ across officer groups, then the subject group–specific search rate, $\gamma^*(c,g)$, and the subject group–specific search success rate, $S^*(c,g)$, do not depend on the fraction of M officers, ρ, even if there is statistical discrimination. On the other hand, in the presence of preference-based discrimination, for example, if $\gamma^{W*}(c,g) > \gamma^{M*}(c,g)$ for fixed g, an increase in ρ would correspond with a decrease in the average search rate, $\gamma^*(c,g) = \rho\gamma^{M*} + (1-\rho)\gamma^{W*}$, and therefore an increase in the average search success rate. This forms the basis for an empirical test using average search success rates and *aggregated* officer demographic information, should this information become available. In the absence of preference-based discrimination, the coefficient on the interaction between a group g indicator and the fraction of M officers (ρ) in a regression on search success rates should equal zero. A nonzero coefficient, then, would be indicative of preference-based discrimination.

4 Data

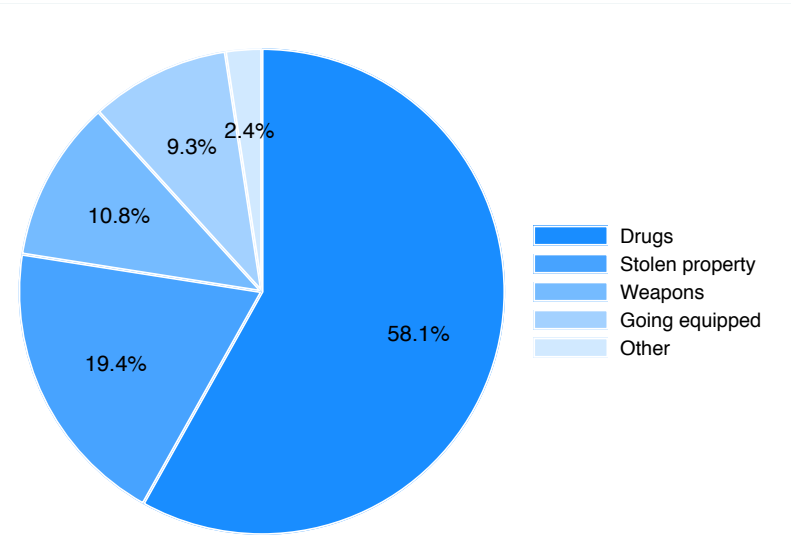
This paper uses administrative data provided by the London Metropolitan Police. The data set includes all searches recorded between April 2013 and April 2015, amounting to 472,533 observations. Each observation is an individual search. This data set is the product of the reporting requirements described in Section 2. Therefore, each search record contains the exact date and time of the search; search type (person, vehicle, or person and vehicle); borough location; gender, age, self-defined ethnicity, and ethnic appearance of the searched person; search grounds; and search outcome.

As Appendix Table A1 shows, 79% of searches are of persons only, while 21% are of persons and vehicles, and less than 1% are of vehicles only. That is, most searches are of pedestrians, and a vehicle rarely gets searched without a person getting searched, too. Table A2 displays the distribution of searches across London's thirty-two boroughs. The table shows that searches vary significantly by location. Compare, for example, Westminster, which is the home of Parliament (8.0% of all searches), and Southwark, which has one of the highest crime rates (7.1% of all searches), with Merton, the home of Wimbledon (1.3% of all searches).

Figure 1 displays the distribution of legal grounds for search. The largest category by far is drugs, which makes up more than half of all searches (58%), followed by stolen property (19%), weapons including firearms (11%), and "going equipped" (9%). "Going equipped" means possession of an article for use in connection with a burglary or theft. All other search grounds, including anticipated violence and terrorism, make up less than 3% of searches. Appendix Table A3 lists search grounds and their frequency in more detail. The most striking feature of these data is the prevalence of drug searches, of which there were about 265,000 over the two-year period between April 2013 and April 2015.

Appendix Tables A4 and A5 list the categories for ethnic appearance and self-defined ethnicity, respectively. A couple of things are worth noting. First, ethnic appearance — that is, the ethnicity of the searched person as perceived by the police officer — will be the primary variable used in this analysis. The reason is that discrimination will be defined in terms of decisions made by police

Figure 1: Search Grounds



Source: London Metropolitan Police Service; author calculations.
Note: "Going equipped" means possession of an article for use in connection with any burglary or theft. "Other" includes the other search grounds listed in Table A3.

officers, based in part on their subjective beliefs. Second, as Tables A4 and A5 show, "Asian" in the United Kingdom means Indian, Pakistani, or Bangladeshi, while East Asian (for example, Chinese or Japanese) individuals form a much smaller group, frequently categorized together with all other ethnicities. For simplicity, and to reflect the major ethnic groups in London, the primary groups of analysis in what follows will be termed white, black, South Asian, and other. In the latest census, these groups constituted 60%, 16%, 18%, and 6% of the London population, respectively (UK Office for National Statistics 2011).

Finally, Table 1 displays the frequency of search outcomes. A search can result in: no action; an arrest; a warning, such as a cannabis warning or a verbal warning; or (less frequently) some other action, such as an alcohol confiscation or dispersing of groups. Most searches result in no action (70%). Fewer result in an arrest (17%), warning (10%), or other action (3%). Appendix Table A6 displays the different search outcomes in more detail. Prior to 2015, "advised" was a nuance for "no further action." However, in 2014, the MPS removed "advised" to simplify recording, leaving "no further action" for everything except formal criminal justice outcomes. The data show that,

around the time of this change, "advised" disappeared and "no further action" increased by the same amount. Therefore, this paper combines the two categories into "no action," meaning no formal criminal justice outcome, such as an arrest or warning.

Table 1: Search Outcomes

	Freq.	Percent	Cum.
No action	317,252	69.61	69.61
Arrest	78,572	17.24	86.85
Warning	45,247	9.93	96.78
Other action	14,684	3.22	100.00
Total	455,755	100.00	

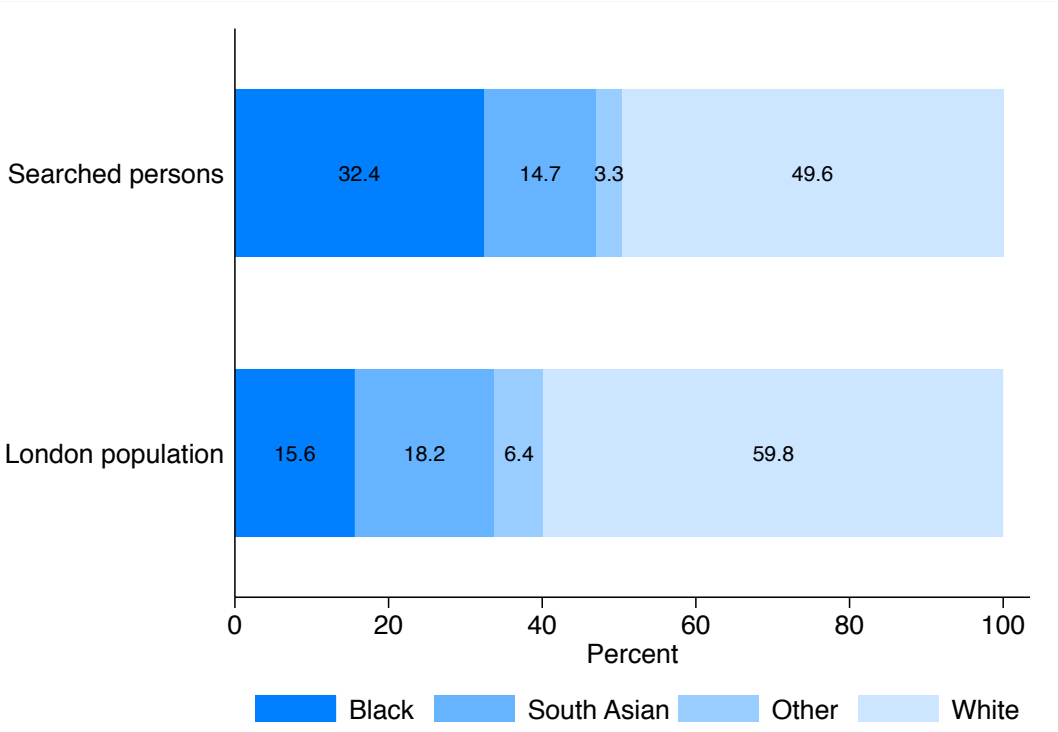
Source: London Metropolitan Police Service; author calculations.
Note: "Other action" includes the other search outcomes listed in Table A6, besides "advised," which the MPS combined with "no further action" in 2014.

After removing observations with missing values or uncoded fields, the resulting data set comprises 455,755 searches between April 2013 and April 2015, 298,782 of which were completed before the body camera trial (discussed in Section 6), which began in May 2014. Appendix Table A7 displays summary statistics for the main variables used in the following analysis.

5 Results: Searches and Search Outcomes

To investigate discrimination in police searches, this paper begins by examining disproportionality in search rates — that is, the extent to which police officers search members of certain groups relative to the groups' fraction of the population. The following analysis considers only searches completed before the start of the London body camera trial. Figure 2 displays the ethnic makeup of searched persons versus the overall London population. As the figure shows, black individuals make up only 16% of the London population but 32% of searched persons over this time period. In other words, searches disproportionately affected black Londoners. In contrast, the South Asian and white shares of searched persons (15% and 50%, respectively) were lower than the corresponding population shares (18% and 60%). These percentages can be translated into a likelihood

Figure 2: Ethnic Makeup of Searched Persons Versus London Population

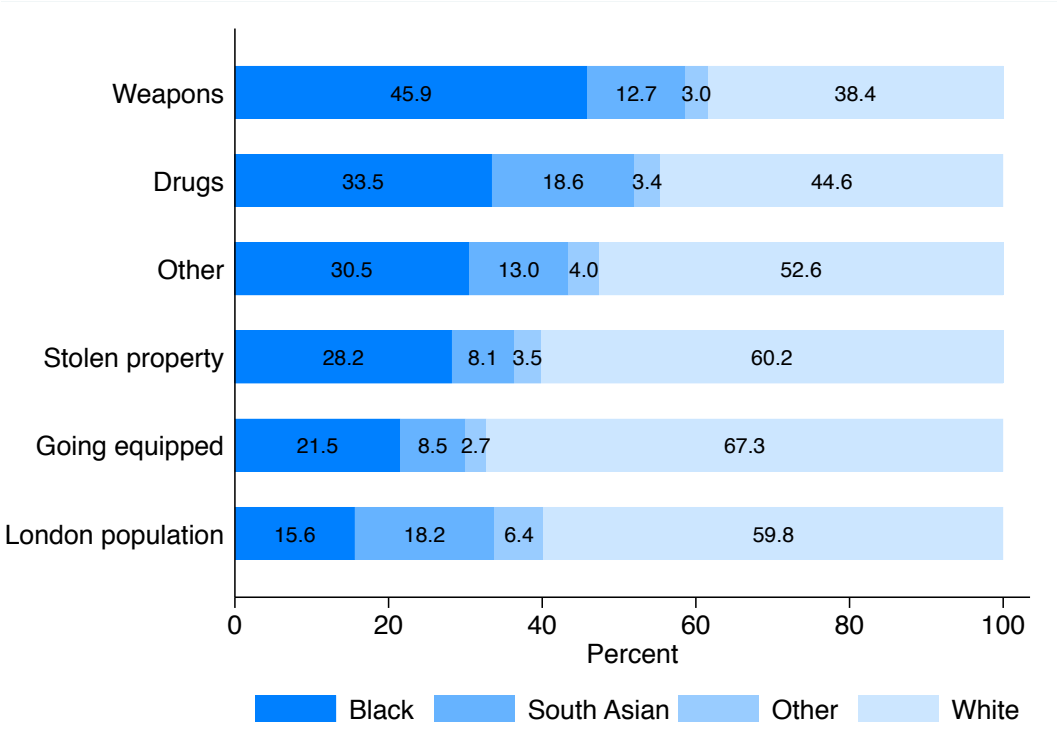


Source: London Metropolitan Police Service; London 2011 census; author calculations.
Note: All searches completed prior to the body camera trial, which began in May 2014. "Other" includes East Asian and Middle Eastern individuals.

ratio using Bayes's formula. Using this formula, we see that black Londoners were 2.5 times more likely to be searched than whites. South Asians were about equally likely to be searched as whites. Figure 3 displays the ethnic makeup of searched persons by search grounds, with the overall London population for comparison. Here, we can see that, for all search grounds, black Londoners were stopped at rates that exceeded their population share. This disparity was greatest for weapon and drug searches. Drug searches, which were by far the most common type of search (see Figure 1), is also the search category for which South Asians represented their largest share (and the only category exceeding their population share). Again using Bayes's formula, black Londoners were 2.9 times and South Asians 1.4 times more likely to be searched for drugs than whites.

Search disparities in terms of gender were even greater. Figure 4 displays the gender makeup of searched persons versus the London population. Approximately 94% of searched persons were

Figure 3: Ethnic Makeup of Searched Persons by Search Grounds

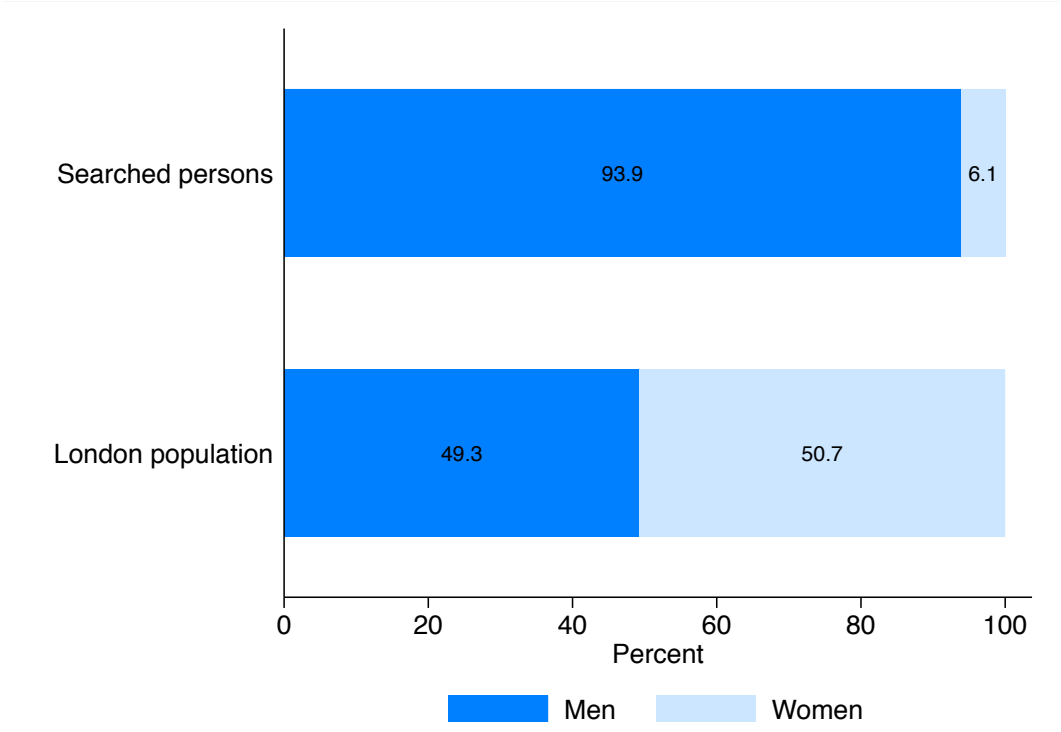


Source: London Metropolitan Police Service; London 2011 census; author calculations.
Note: All searches completed prior to the body camera trial, which began in May 2014. London population shown for comparison. "Other" search grounds include the grounds listed in Table A3. "Other" includes East Asian and Middle Eastern individuals.

men, despite men making up only half of the population. This means that men were 15.8 times more likely than women to be searched. As Appendix Figure A2 shows, this disparity was relatively constant across search grounds, although it was greatest for weapons and "going equipped" (i.e., possession of an article for use in a burglary) searches. It was smallest for stolen property searches, but, even for those, men exceeded 90% of searches.

The foregoing analysis has several limitations. First, as mentioned in Section 2, the police may under-report searches. According to the London MPS, about 5% of searches go unrecorded (London Assembly 2014), which should serve as a lower bound. Whether this means searches were more or less disproportionate is difficult to know. On the one hand, if a police officer searches a minority-ethnic person and nothing turns up, the officer might not want to document the encounter out of fear of being accused of ethnic profiling. On the other hand, knowing that ethnic profiling is

Figure 4: Gender Makeup of Searched Persons Versus London Population



Source: London Metropolitan Police Service; London 2011 census; author calculations.
Note: All searches completed prior to the body camera trial, which began in May 2014.

a source of concern among the public, the officer might be keen to document the encounter out of fear that failure to do so will be noticed by the searched individual and become part of a complaint against the police. In addition, the knowledge or willingness to ask for a copy of the search record might vary by group. Unfortunately, it is impossible to tell with the data on hand. A second limitation is that there may be meaningful differences in the resident population, as measured by the census, and the "street" or "available" population that is subject to search (Waddington et al. 2004).

But, more importantly (and as described in Section 3), the distribution of characteristics that give rise to reasonable suspicion might vary by group. For example, if men are more likely to carry illegal weapons, the "facts, information and/or intelligence which are relevant to the likelihood that the object in question will be found" — that is, the objective basis needed for reasonable grounds for suspicion — likely leads to more searches of men. Note that this claim is distinct from, but

related to, a claim of statistical discrimination *based on* gender. If men are more likely to carry illegal weapons and a police officer uses this information to search more men, this would constitute statistical discrimination based on gender. However, doing so would be illegal under UK law, which specifies that physical appearance, such as ethnic appearance, gender, or age, can never support reasonable grounds for suspicion, and that police officers may not rely on "[g]eneralisations or stereotypical images that certain groups or categories of people are more likely to be involved in criminal activity" (UK Home Office 2014a). Still, the distribution of *other* characteristics giving rise to suspicion might vary by group. For example, if men carry illegal weapons at higher rates than women, then whatever observable characteristics (besides gender) that correlate with weapon possession also correlate with gender. In that case, police officers would end up searching more men than women, even if they did not discriminate against men based on gender stereotypes (statistical discrimination) or animus (preference-based discrimination).

To distinguish (unlawful) preference-based discrimination from (unlawful) statistical discrimination based on race or gender or (lawful) statistical discrimination based on observable characteristics that correlate with race or gender,[4] I estimate the following linear probability model using ordinary least squares (OLS) regression:

$$Hit_{ibt} = \alpha + \beta_1 Ethnicity_{ibt} + \beta_2 Gender_{ibt} + \beta_3 Age_{ibt} + \gamma X_{ibt} + \delta_b + \eta_t + \varepsilon_{ibt}, \tag{1}$$

where Hit_{ibt} is a binary variable for search success[5]; $Ethnicity_{ibt}$ and $Gender_{ibt}$ are factor variables for ethnic appearance and gender; Age_{ibt} is age in years, X_{ibt} is a vector of search-level covariates, including age squared, search type (person, vehicle, or person and vehicle), and search grounds[6];

[4]Statistical discrimination may be further subdivided into accurate statistical discrimination (based on correct beliefs) and inaccurate statistical discrimination (based on incorrect beliefs) (Bohren et al. 2019). Differences in search success rates may be due to preference-based or inaccurate statistical discrimination (or both). In the present context, the two possibilities cannot be distinguished. However, the absence of a difference in search success rates is evidence against both possibilities, unless the two forms of discrimination exactly offset one another. That is, equal search success rates, when coupled with disproportionality, are evidence of accurate statistical discrimination.

[5]A search is defined to be successful if it results in an arrest, warning, or other action. A search is unsuccessful if it results in no action.

[6]It should be noted that search type and search grounds may be endogenous. For example, if an officer searches a person suspected of carrying illegal drugs and finds a weapon, he might record the search as a weapons search. Put differently, we might think of search grounds as a possible outcome variable or proxy control affected by the variable

δ_b is a borough fixed effect for borough b; η_t is a month-by-year fixed effect; and ε_{ibt} is an error term. The results of this regression are shown in Table 2. Columns (1) and (2) display the results excluding search-level controls and fixed effects. That is, these columns show nonparametric estimates of average search success rates for different ethnic and gender groups. Column (3) adds search-level controls, including age, and column (4) adds borough and month-by-year fixed effects. Heteroskedasticity-robust standard errors are reported in parentheses.

Table 2: Search Success Rates

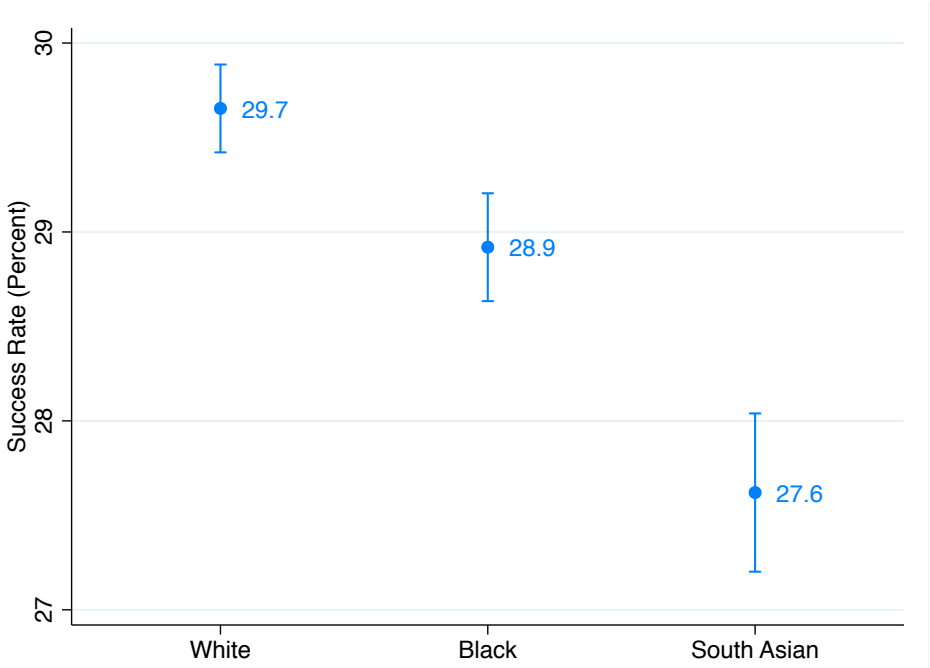
	(1)	(2)	(3)	(4)
Black	-0.007		0.001	-0.000
	(0.002)		(0.002)	(0.002)
South Asian	-0.020		-0.014	-0.019
	(0.002)		(0.002)	(0.003)
Male		-0.073	-0.060	-0.060
		(0.004)	(0.004)	(0.004)
Age			0.015	0.015
			(0.000)	(0.000)
Search-level controls	No	No	Yes	Yes
Borough fixed effects	No	No	No	Yes
Month-by-year fixed effects	No	No	No	Yes
Observations	298,782	298,782	298,782	298,782

Note: This table displays results from ordinary least squares regressions with a binary search success (or "hit") variable as their estimand. White women are the base category. A search is defined to be successful if it results in an arrest, warning, or other action. A search is unsuccessful if it results in no action. "Search-level controls" include age, age squared, search type (person, vehicle, or person and vehicle), and search grounds. Heteroskedasticity-robust standard errors are in parentheses. All searches completed prior to the body camera trial, which began in May 2014.

As columns (1) and (2) of Table 2 show, prior to the camera trial, the search success rates for black and South Asian persons were 0.7 p.p. and 2.0 p.p. lower than for white persons, and the search success rate for men was 7.3 p.p. lower than for women. These results are displayed graphically in Figures 5 and 6. Figure 5 shows that search success rates were 29.7%, 28.9%,

of interest. Fortunately, the results that follow are robust to including only search-level covariates that can be thought of as "fixed" at the time of search, such as age, age squared, borough, and month.

Figure 5: Search Success Rates by Ethnic Appearance

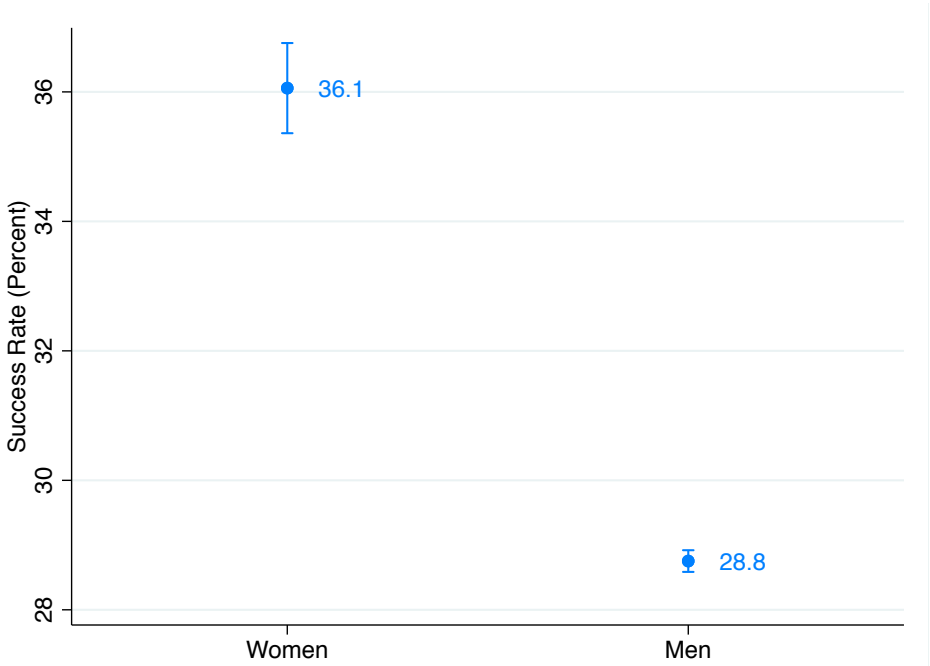


Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

and 27.6% for white, black, and South Asian persons, respectively. Figure 6 displays the average search success rates for women (36.1%) and men (28.8%). Columns (3) and (4) of table 2 show that the results for South Asians and men persist when using search-level controls and borough and month-by-year fixed effects, although the differences narrow somewhat — to 1.9 p.p. for South Asians and 6.0 p.p. for men. However, the black-white difference disappears after including these controls. The results are robust to alternative specifications, such as probit and logit.

Table 2 shows that there was a significant (positive) relationship between age and search success. That is, the search success rate was increasing in age. This finding is explored nonparametrically in Figure 7. The figure displays search success rates for different age groups with roughly equal observations. Young persons, particularly teenagers, had the lowest search success rates — less than 25 percent. The search success rate increases linearly with age until about age 30 years old, when it levels off around 35 percent. This is evidence of preference-based or inaccurate statistical discrimination against younger individuals.

Figure 6: Search Success Rates by Gender

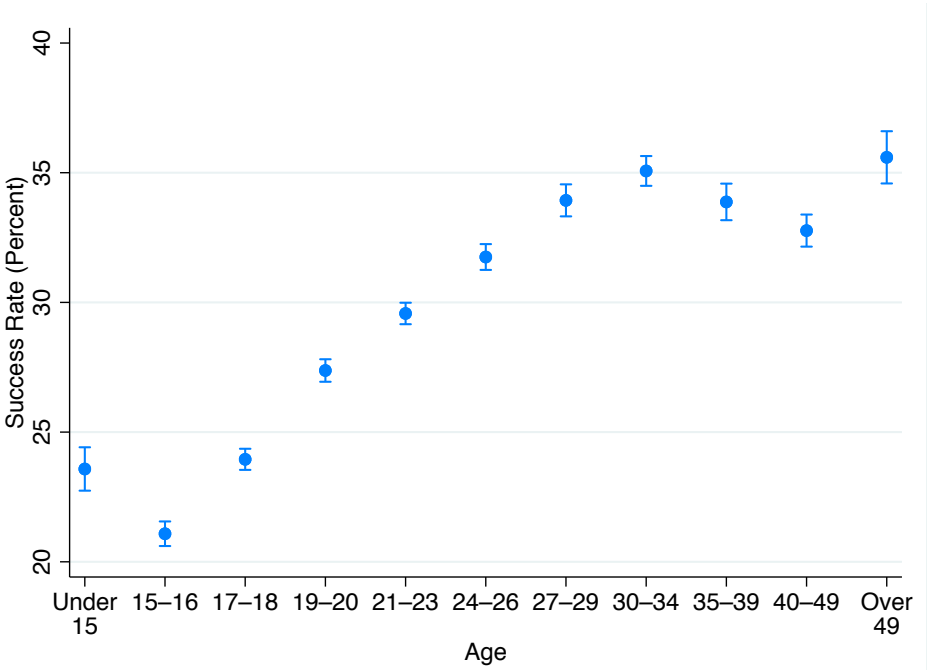


Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

Appendix Figures A3–A5 explore heterogeneity in these results. For example, Figure A3 displays search success rates by ethnic appearance and age. The figure can be interpreted in a couple of ways. First, every ethnic group exhibited upward-sloping search success rates with respect to age, but the slope was steepest for South Asians. Second, the lower average search success rates for black and South Asian persons appear to be driven by searches of young persons, particularly those between ages 19 and 29 years old. Figure A4 shows that search success rates were consistently lower for men than for women, regardless of age. (And search success rates increased with age for both genders.) Finally, Figure A5 shows that search success rates were lower for men than for women, regardless of ethnic appearance, but that ethnic differences in search success rates were driven by men.

So far, this analysis has considered overall search success rates — that is, the rates at which searches result in criminal justice outcomes, rather than no action by police. However, we can further investigate specific outcomes. Appendix Table A8 shows search success (or "hit") rates

Figure 7: Search Success Rates by Age



Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

overall and by specific outcome.[7] Men were consistently less likely to experience a criminal justice outcome, whether an arrest, warning, or some other action. South Asian persons were also less likely to be arrested or receive a warning, conditional on search. However, whereas search success rates were equal for black and white persons (after conditioning on covariates), black persons were 2.5 p.p. more likely to be arrested and 2.7 p.p. less likely to receive a warning, conditional on search (and conditional on further action by the police). This finding is striking. Of course, if the characteristics of the offense differed systematically by ethnic group, the differences in outcomes may not be due to different treatment. However, in that case, it may be odd that the overall search success rates were equal.

Finally, we can examine search success rates separately by search grounds. Appendix Table

[7] Whether a specific outcome, such as arrest, should be the primary outcome of analysis is a good question. Because there is not detailed information about what the search found (e.g., a quantity of drugs), this paper takes the approach that is least likely to be confounded by differential arrest rates conditional on search findings. The main outcome of interest could be rephrased in terms of its converse: what is the rate at which a search results in no further action?

A9 displays these results, using a full set of controls. As the table shows, for the largest category of search — drug searches — search success rates were 2.4 p.p. and 4.6 p.p. lower for black and South Asian Londoners, respectively. These magnitudes and the relative frequency of drug searches appear to drive the overall disparity in search success rates for black and South Asian persons. The success rates for these groups were also lower for weapons searches, but they were higher for stolen property searches (and going equipped searches, for black persons), moderating the overall disparity. Search success rates were consistently and significantly (between 6 and 16.7 p.p.) lower for men than for women, with the exception of drug searches, for which they were 0.8 p.p. higher. The coefficient on age is twice as high or more for drugs and weapons searches (0.02) than for searches for stolen property (0.01) or going equipped (0.003).

Overall, these results are consistent with statistical discrimination against black Londoners (and South Asians for drug searches) and men, as these groups were searched more frequently than their population share. Furthermore, there is evidence of preference-based or inaccurate statistical discrimination against black and South Asian persons, as they had lower search success rates, on average, than whites. The black-white difference disappears once we account for a full set of control variables, but conditional on search and on further action by the police, black persons were significantly more likely than whites to be arrested, and they were less likely to receive a warning. Overall differences in search success rates by ethnic group appear to be driven by drug searches (the most frequent kind), for which black and South Asian persons had significantly lower search success rates, and by searches of young persons. In general, young persons (particularly those under 20 years old) had significantly lower search success rates, regardless of ethnic appearance. Age disparities also appear to be driven by drug searches. Finally, there is considerable evidence of preference-based or inaccurate statistical discrimination against men, as their average search success rate was 6–7 p.p. lower than women, and the direction of this difference was fairly stable across different search grounds.

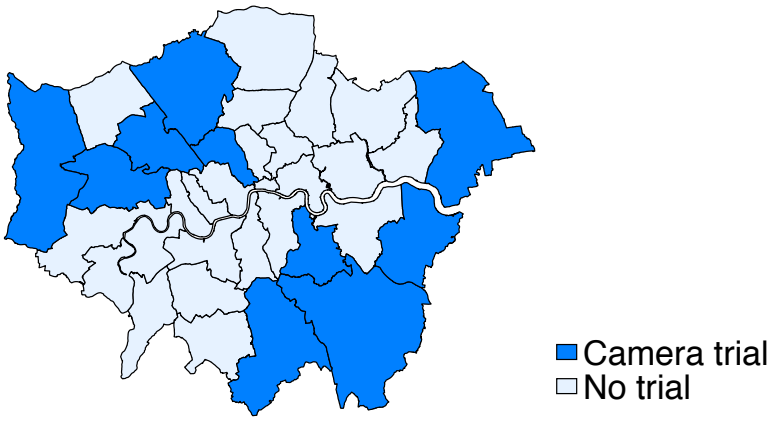
6 Results: Body Cameras

If police discriminate against, for example, young minority-ethnic men, what can be done to stop it? This section evaluates the potential of body-worn video cameras. Body cameras are frequently invoked as a way to reduce police bias (e.g., Oyeniran 2017), but the effect of the cameras on discrimination are not well-understood. Between May 2014 and April 2015, the London police conducted a randomized trial of body cameras in ten boroughs. Using variation in the timing and location of camera use, this paper estimates the effect of cameras on differences in search rates and search success rates between ethnic and gender groups. It finds that the cameras slightly increased the relatively frequency of searches of black persons and decreased the relative frequency of searches of South Asians, although this finding may reflect pre-existing borough-level trends. Consistent with relatively more searches of black persons and relatively fewer searches of South Asians, the black search success rate decreased and the South Asian success rate increased. Although there was not a detectable effect of camera use on gender differences in terms of search frequency, there was an economically large and statistically significant (positive) effect on the search success rate for men relative to women. Overall, these findings suggest that body cameras may have lessened, to some degree, the disparities described in the previous section.

Between May 2014 and April 2015, the London police conducted a randomized trial of body-worn video cameras. This trial took place in ten London boroughs: Barnet, Brent, Bexley, Bromley, Camden, Croydon, Ealing, Havering, Hillingdon, and Lewisham. These boroughs are displayed in Figure 8. In each borough, five Emergency Response Teams (ERTs) were assigned to either treatment or control conditions. Treated ERTs were required to wear body cameras, while control teams were not. The London MPS collected information from both sets of teams to evaluate whether the cameras affected complaints against police; the frequency of stops and searches; or arrests (Grossmith et al. 2015).

As a result of the body camera trial, the London MPS made several findings. First, the cameras reduced the frequency of complaints against the police (Grossmith et al. 2015). Whether this was due to changed officer behavior or changed citizen behavior (or both) is not certain, but when

Figure 8: Body Camera Trial Boroughs



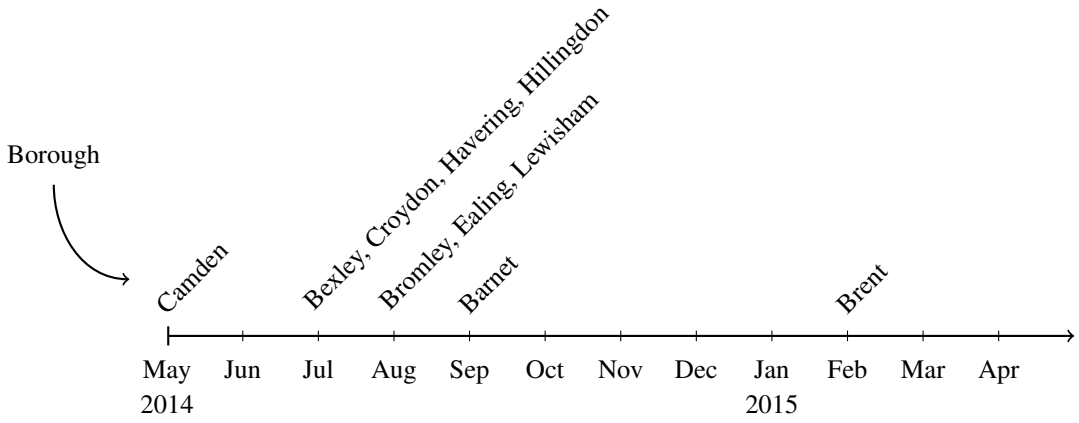
Source: London Metropolitan Police Service.
Note: The 10 trial boroughs are: Barnet, Brent, Bexley, Bromley, Camden, Croydon, Ealing, Havering, Hillingdon, and Lewisham.

surveyed, officers reported that the cameras made them feel protected against complaints. Some officers told anecdotes of camera use as a way to preempt potential complaints. Second, the cameras did not affect the overall frequency of stops and searches (Grossmith et al. 2015). However, arrests following searches were less likely among officers with cameras.

The London MPS's internal trial was consistent with other studies of body cameras, which tend to focus on general patterns of police behavior and citizen complaints (Ariel, Farrar & Sutherland 2015; Jennings, Lynch & Fridell 2015; Ready & Young 2015; Yokum, Ravishankar & Coppock 2019). In what follows, this paper uses variation in the timing and location of camera use to investigate the effects of the cameras on demographic patterns of stop and search.

At this time, the London police are unable to provide officer-level data on the body-worn camera trial. Therefore, this paper is not able to directly compare treatment and control groups. However, because camera use varied across London boroughs and across time, I propose a difference-in-differences approach to overcome this limitation (Card & Krueger 1994). The ten trial boroughs were selected for the camera trial in part based on their characteristics, including their crime rate,

Figure 9: Timing of Introduction of Body Cameras



Source: London Metropolitan Police Service.

stop and search rate, and prior experience with cameras (Grossmith et al. 2015). Thus, a simple comparison between trial boroughs and non-trial boroughs would suffer from selection bias. However, a peculiar feature of the London body camera trial is that the cameras were not introduced simultaneously. Because of limited resources for training and technical support, the cameras were introduced in a staggered fashion over the course of a year. Figure 9 displays a timeline of the camera roll-out.[8] We can use variation in the timing and location of camera use to estimate its effect on race and gender differences in search rates and search success rates. To begin, I estimate the following linear equation using OLS regression:

$$y_{ibt} = \delta_b + \eta_t + \beta Treat_{ibt} + \gamma X_{ibt} + \varepsilon_{ibt}, \tag{2}$$

where y_{ibt} is the fraction of searches devoted to a particular group, such as men, black persons, or South Asian persons; $Treat_{ibt}$ is an indicator for whether a particular search was conducted in a trial borough *after* the introduction of cameras in that borough; and the other variables are defined

[8]Boroughs are listed according to when 50 percent or more officers in a treatment team uploaded an operational video clip. To avoid the possibility that treatment is mismeasured due to camera use prior to the date listed in Figure 9, the analysis that follows drops months after May 2014 but prior to 50 percent operation. The results are robust to including these months (which, in some cases, makes the results even stronger).

as before (see Section 5). The coefficient of interest is β. Because of the inclusion of borough and month-by-year fixed effects (δ_b and η_t) and the definition of $Treat_{ibt}$, this is a difference-in-differences estimate. Table 3 shows the results, with standard errors robust to intra-borough correlation in parentheses. As the table indicates, the fraction of search subjects that were black

Table 3: Effect of Body Cameras on Demographic Share of Searched Persons

	Black		South Asian		Men	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat	0.008	-0.006	-0.010	0.006	0.002	0.001
	(0.009)	(0.014)	(0.004)	(0.011)	(0.004)	(0.006)
Borough-specific time trends	No	Yes	No	Yes	No	Yes
Observations	441,598	441,598	441,598	441,598	441,598	441,598

Note: This table displays results from difference-in-differences (DD) regressions with demographic indicator variables listed in the column headings as estimands. All regressions use search-level controls, including age, age squared, search type (person, vehicle, or person and vehicle), and search grounds, as well as borough and month-by-year fixed effects. Standard errors robust to intra-borough correlation are in parentheses. A positive coefficient indicates that body cameras increased the relative frequency of search for that group.

increased by 0.8 p.p. (column 1), and the fraction that were South Asian decreased by 1 p.p. (column 3). However, only the second difference is statistically significant when using clustered standard errors. There does not appear to be an effect on the fraction of search subjects that were men (columns 5–6). Furthermore, the purported effects on searches by ethnic group disappear with the inclusion of borough-specific time trends (columns 2 and 4), a robustness check suggested by Besley and Burgess (2004) and Wolfers (2006). This suggests that the parallel trends assumption necessary for a valid difference-in-differences design may not hold.

To further investigate the effects of the cameras on differences in search success rates, I estimate the following linear probability model using OLS:

$$Hit_{ibt} = \delta_{bg} + \eta_{tg} + \beta_1 Treat_{ibt} + \beta_2 Group_{ibt} + \beta_3 Treat \times Group_{ibt} + \gamma X_{ibt} + \varepsilon_{ibt}, \qquad (3)$$

where $Group_{ibt}$ is either a factor variable for ethnicity or an indicator variable for gender, and the other variables are defined as before, except that the borough and month-by-year fixed effects

are estimated separately by group g, that is, by ethnic or gender group. This results in a triple difference-in-differences (DDD) estimate of the effect of the body cameras. That is, the comparison is between, for example, searches of black and white persons, before and after camera use, relative to the same double difference in boroughs that did not take part in the camera trial.

Table 4 shows the triple difference-in-differences results. Columns (1) and (2) indicate that the cameras did not have statistically significant effects on the search success rates for black or South Asian persons relative to whites, although the direction of the estimates is consistent with columns (1) and (3) of Table 3. However, in this case, the inclusion of borough- and group-specific time trends magnifies the estimated effects. As for gender, columns (3) and (4) suggest that the cameras had a significant effect on the gender difference in search success rates. This effect ranged from 3.9 p.p. to 8.3 p.p. (when including borough- and group-specific time trends), eliminating as much as half or all of the pre-trial difference (see Table 2 and Figure 6).

Table 4: Effect of Body Cameras on Search Success Rates

	(1)	(2)	(3)	(4)
Treat	-0.008	-0.002	-0.044	-0.084
	(0.012)	(0.019)	(0.023)	(0.032)
Treat × Black	-0.001	-0.019		
	(0.014)	(0.025)		
Treat × South Asian	0.008	0.022		
	(0.016)	(0.023)		
Treat × Male			0.039	0.083
			(0.022)	(0.029)
Borough- and group-specific time trends	No	Yes	No	Yes
Observations	441,598	441,598	441,598	441,598

Note: This table displays results from difference-in-difference-in-differences (DDD) regressions with a binary search success (or "hit") variable as their estimand. A search is defined to be successful if it results in an arrest, warning, or other action. All regressions use search-level controls, including age, age squared, search type (person, vehicle, or person and vehicle), and search grounds, as well as borough and month-by-year fixed effects, estimated separately by comparison group, i.e., by ethnic group for columns (1) and (2) and by gender for columns (3) and (4). Standard errors robust to intra-borough correlation are in parentheses. A positive interaction coefficient indicates that body cameras increased the relative search success rate for that group.

7 Conclusion

Using data on over 400,000 stops and searches by the London Metropolitan Police Service, this paper shows that, prior to the introduction of body cameras, black Londoners were 2.5 times more likely to be searched than whites. This disparity was even greater for drug searches, which constituted approximately half of all searches, for which black Londoners were 2.9 times more likely to be search than whites. South Asians were 1.4 times more likely to be searched for drugs than whites, but approximately equally as likely to be searched overall. The overall search success, or "hit," rates were 0.7 p.p. lower for black persons and 2.0 p.p. lower for South Asians, consistent with preference-based or inaccurate statistical discrimination against them. However, after including a full set of control variables, the black-white difference reduces to zero. Conditional on the search resulting in further action, black persons were 2.5 p.p. more likely than whites to be arrested and 2.7 p.p. less likely to receive a warning. Differences between ethnic groups appear to be driven by drug searches (the most frequent kind) and searches of young persons, particularly those between 19–29 years old. In general, young persons had significantly lower search success rates, and this was true regardless of ethnicity or gender. Men were 15.8 times more likely to be searched, and their average search success rate was 7.3 p.p. lower than women, which is evidence of gender-based discrimination in searches. Body cameras may have reduced these disparities, particularly the gender disparity, but this finding is complicated by pre-existing trends in boroughs that participated in a camera trial. In any event, the estimated effect of the cameras on ethnic differences is small. For activists and policymakers looking to address ethnic disparities in police searches, body cameras should not be viewed as a panacea.

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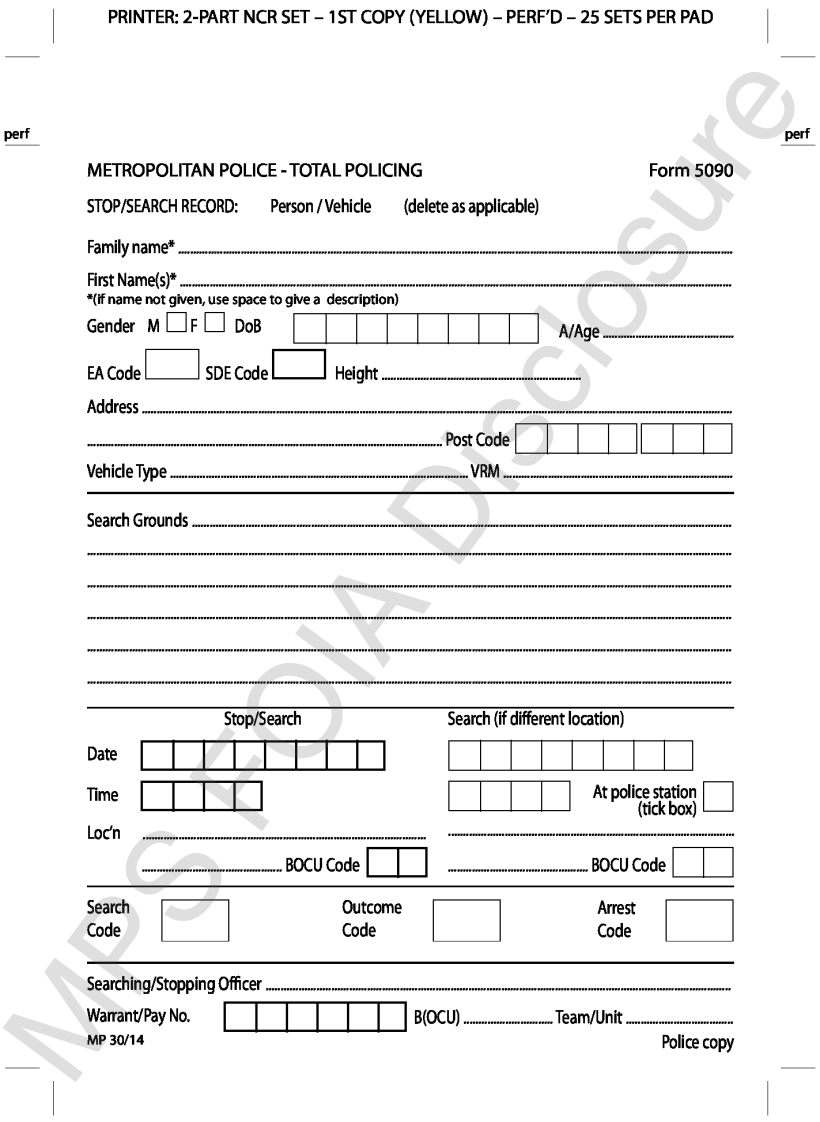
9 Appendix

Figure A1: Police Stop & Search Form



PRINTER: 2-PART NCR SET – 1ST COPY (YELLOW) – PERF'D – 25 SETS PER PAD

perf perf

METROPOLITAN POLICE - TOTAL POLICING Form 5090

STOP/SEARCH RECORD: Person / Vehicle (delete as applicable)

Family name* .....

First Name(s)* .....

*(if name not given, use space to give a description)

Gender M ☐ F ☐ DoB ☐☐☐☐☐☐☐☐ A/Age .....

EA Code ☐☐ SDE Code ☐ Height .....

Address .....

..... Post Code ☐☐☐☐ ☐☐☐

Vehicle Type ..... VRM .....

Search Grounds .....

.....

.....

.....

.....

.....

	Stop/Search	Search (if different location)
Date	☐☐☐☐☐☐☐☐	☐☐☐☐☐☐☐☐
Time	☐☐☐☐	☐☐☐☐ At police station (tick box) ☐
Loc'n	.....	.....
	..... BOCU Code ☐☐	..... BOCU Code ☐☐

Search Code ☐ Outcome Code ☐ Arrest Code ☐

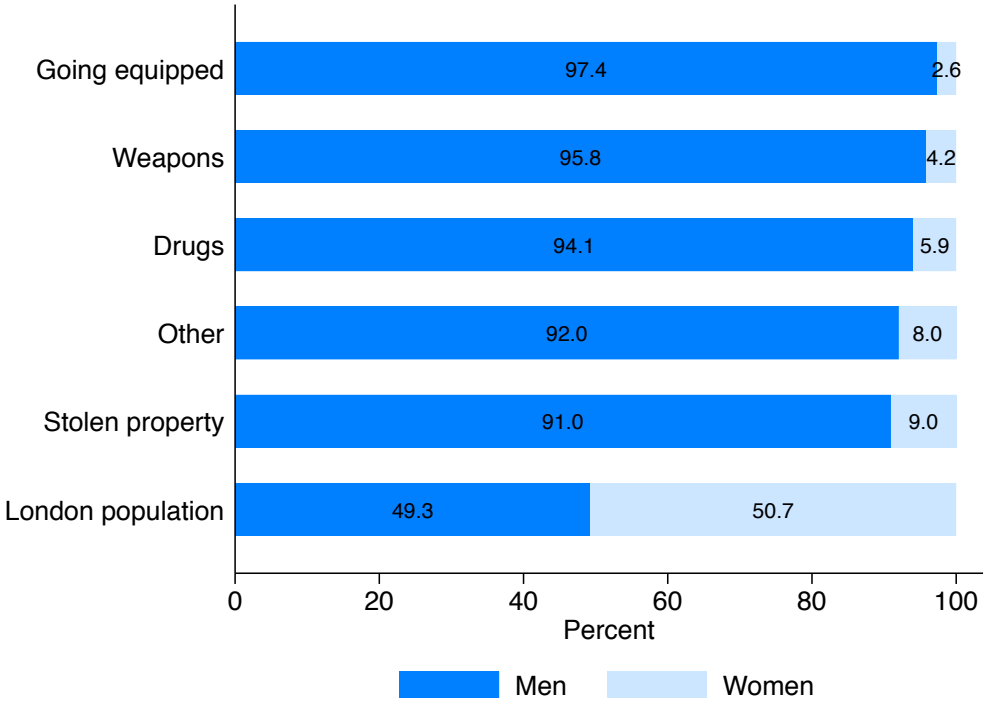
Searching/Stopping Officer .....

Warrant/Pay No. ☐☐☐☐☐☐ B(OCU) ..... Team/Unit .....

MP 30/14 Police copy

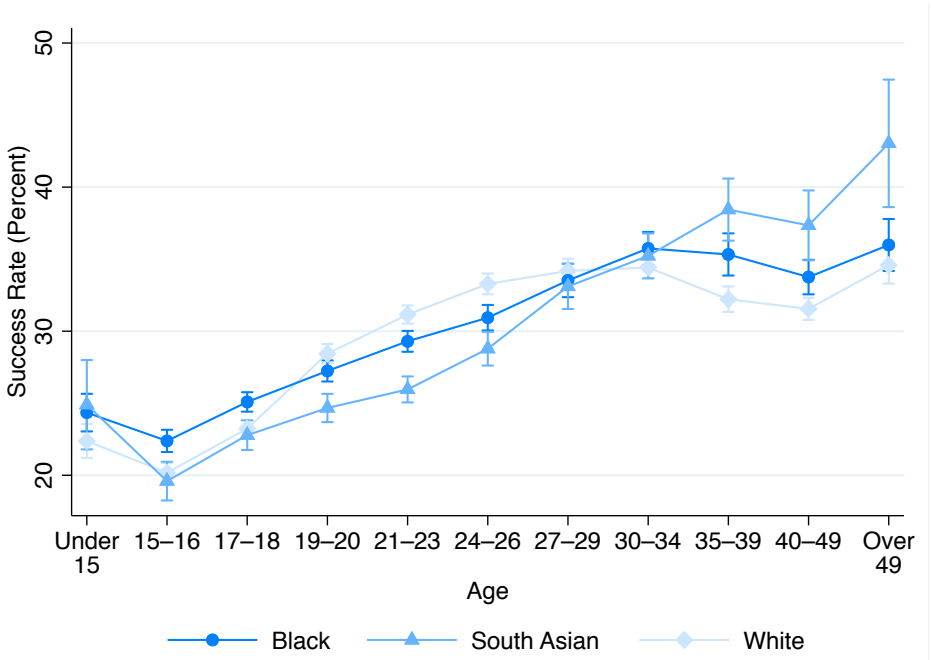
Source: London Metropolitan Police Service.

Figure A2: Gender Makeup of Searches by Search Grounds



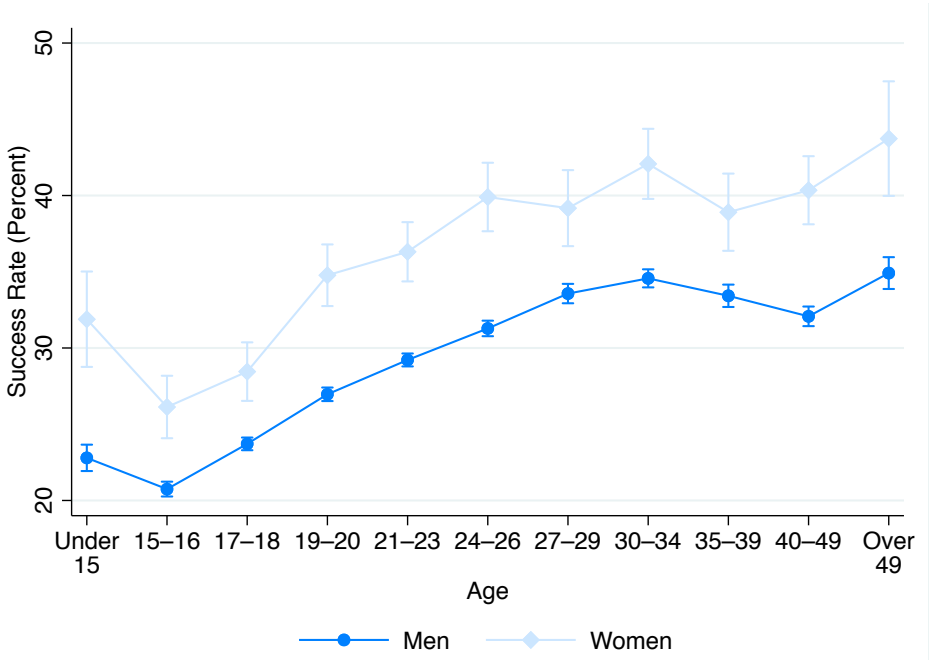
Source: London Metropolitan Police Service; London 2011 census; author calculations.
Note: All searches completed prior to the body camera trial, which began in May 2014. London population shown for comparison. "Other" search grounds include the grounds listed in Table A3.

Figure A3: Search Success Rates by Ethnic Appearance and Age



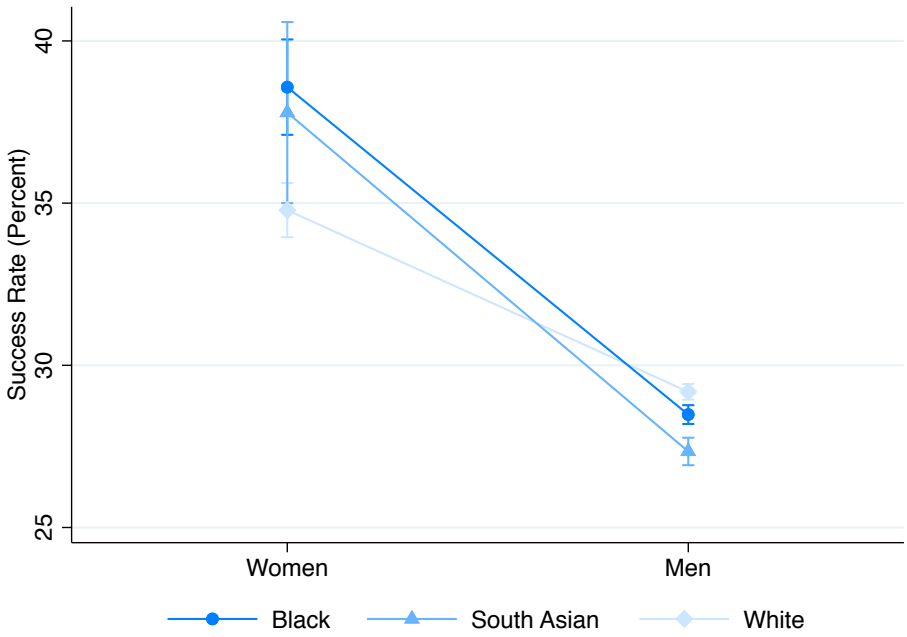
Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

Figure A4: Search Success Rates by Gender and Age



Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

Figure A5: Search Success Rates by Ethnic Appearance and Gender



Source: London Metropolitan Police Service; author calculations.
Note: Error bars represent 95% confidence intervals. All searches completed prior to the body camera trial, which began in May 2014.

Table A1: Search Types

	Freq.	Percent	Cum.
PERSON AND VEHICLE	95,655	20.99	20.99
PERSON ONLY	359,715	78.93	99.92
VEHICLE ONLY	385	0.08	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A2: Searches by London Borough

	Freq.	Percent	Cum.
BARKING AND DAGENHAM	9,083	1.99	1.99
BARNET	11,777	2.58	4.58
BEXLEY	7,802	1.71	6.29
BRENT	22,483	4.93	11.22
BROMLEY	19,255	4.22	15.45
CAMDEN	19,065	4.18	19.63
CROYDON	14,881	3.27	22.90
EALING	12,888	2.83	25.72
ENFIELD	14,119	3.10	28.82
GREENWICH	15,748	3.46	32.28
HACKNEY	11,834	2.60	34.87
HAMMERSMITH & FULHAM	20,607	4.52	39.39
HARINGEY	11,041	2.42	41.82
HARROW	9,962	2.19	44.00
HAVERING	7,336	1.61	45.61
HILLINGDON	8,173	1.79	47.41
HOUNSLOW	14,402	3.16	50.57
ISLINGTON	9,723	2.13	52.70
KENSINGTON AND CHELSEA	7,909	1.74	54.43
KINGSTON-UPON-THAMES	9,076	1.99	56.43
LAMBETH	24,592	5.40	61.82
LEWISHAM	12,279	2.69	64.52
MERTON	5,826	1.28	65.79
NEWHAM	18,261	4.01	69.80
REDBRIDGE	16,539	3.63	73.43
RICHMOND-UPON-THAMES	7,314	1.60	75.03
SOUTHWARK	32,114	7.05	82.08
SUTTON	5,042	1.11	83.19
TOWER HAMLETS	18,498	4.06	87.25
WALTHAM FOREST	12,374	2.72	89.96
WANDSWORTH	9,089	1.99	91.96
WESTMINSTER	36,663	8.04	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A3: Search Grounds: Detail

	Freq.	Percent	Cum.
A - STOP & SEARCH FOR STOLEN PROPERTY (S1 PACE)	87,701	19.24	19.24
B - DRUGS (S23 MISUSE OF DRUGS ACT)	265,234	58.20	77.44
C - FIREARMS (S47 FIREARMS ACT)	4,574	1.00	78.44
D - OFFENSIVE WEAPONS (S1 PACE)	38,214	8.38	86.83
E - OFFENSIVE WEAPONS (S139 - CJA, SCHOOLS)	6,462	1.42	88.25
F - GOING EQUIPPED (S1 PACE)	42,713	9.37	97.62
G - OTHER POWER	5,443	1.19	98.81
H - TERRORISM 44(1)	1	0.00	98.81
J - TERRORISM 44(2)	2	0.00	98.81
K - ANTICIPATED VIOLENCE (S60 CJPO)	1,983	0.44	99.25
L- ARTICLES TO CAUSE CRIMINAL DAMAGE	2,635	0.58	99.83
N - S.43 TERORISM ACT 2000	785	0.17	100.00
Q - S.47A TERRORISM	3	0.00	100.00
R - TERRORISM 47A(3)	5	0.00	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A4: Ethnic Appearance of Searched Persons

	Freq.	Percent	Cum.
WHITE - NORTH EUROPEAN	185,984	40.81	40.81
WHITE - SOUTH EUROPEAN	38,044	8.35	49.16
BLACK	151,043	33.14	82.30
ASIAN	65,798	14.44	96.73
CHINESE, JAPANESE, AND OTHER	3,073	0.67	97.41
MIDDLE EASTERN	11,813	2.59	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A5: Self-Defined Ethnicity of Searched Persons

	Freq.	Percent	Cum.
A1 - INDIAN	10,637	2.33	2.33
A2 - PAKISTANI	10,191	2.24	4.57
A3 - BANGLADESHI	15,960	3.50	8.07
A9 - ANY OTHER ASIAN BACKGROUND	25,869	5.68	13.75
B1 - CARIBBEAN	39,217	8.60	22.35
B2 - AFRICAN	42,696	9.37	31.72
B9 - ANY OTHER BLACK BACKGROUND	43,527	9.55	41.27
M1 - WHITE AND BLACK CARIBBEAN	7,696	1.69	42.96
M2 - WHITE AND BLACK AFRICAN	1,861	0.41	43.37
M3 - WHITE AND ASIAN	1,203	0.26	43.63
M9 - ANY OTHER MIXED BACKGROUND	7,746	1.70	45.33
N1 - OFFICER REQUIRED ELSEWHERE	708	0.16	45.49
N2 - PUBLIC DISORDER	634	0.14	45.63
N3 - SUBJECT DOES NOT UNDERSTAND	5,042	1.11	46.73
N4 - SUBJECT DECLINES TO DEFINE	23,539	5.16	51.90
O1 - CHINESE	1,219	0.27	52.17
O9 - ANY OTHER ETHNIC GROUP	9,651	2.12	54.28
UNCODED	32	0.01	54.29
W1 - BRITISH	134,511	29.51	83.80
W2 - IRISH	6,610	1.45	85.25
W9 - ANY OTHER WHITE BACKGROUND	67,206	14.75	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A6: Search Outcomes: Detail

	Freq.	Percent	Cum.
01 - NO FURTHER ACTION	229,151	50.28	50.28
02 - ADVISED	88,101	19.33	69.61
03 - VERBALLY WARNED	13,001	2.85	72.46
04 - ARRESTED	78,572	17.24	89.70
05 - OTHER	8,978	1.97	91.67
06 - DISPERSE GROUPS PART 4 ASB ACT	1,273	0.28	91.95
07 - DIRECTED TO LEAVE ALCOHOL LOCN.	790	0.17	92.13
08 - ALCOHOL CONFISCATION	788	0.17	92.30
09 - CANNABIS WARNING	32,246	7.08	99.37
11 - PENALTY NOTICE (PND/FPN)	1,722	0.38	99.75
12 - POSTAL CHARGE REQUISITION / SUMMONS	392	0.09	99.84
13 - COMMUNITY RESOLUTION	649	0.14	99.98
14 - CAUTION (SIMPLE OR CONDITIONAL)	92	0.02	100.00
Total	455,755	100.00	

Source: London Metropolitan Police Service; author calculations.

Table A7: Summary Statistics

	Min.	Max.	Mean	Std. Dev.
Black	0	1	0.331	0.471
South Asian	0	1	0.144	0.351
Other race	0	1	0.0327	0.178
Male	0	1	0.938	0.241
Age	5	92	25.23	9.663
Stolen property	0	1	0.192	0.394
Drugs	0	1	0.582	0.493
Weapons	0	1	0.108	0.310
Going equipped	0	1	0.0937	0.291
Other search grounds	0	1	0.0238	0.152
Arrested	0	1	0.172	0.378
Warning	0	1	0.0993	0.299
Other action	0	1	0.0322	0.177
Hit	0	1	0.304	0.460
No action	0	1	0.696	0.460
Treat	0	1	0.0720	0.259
Observations	455,755			

Source: London Metropolitan Police Service; author calculations.

Table A8: Search Success Rates: Detail

	Overall	Specific Outcome		
	(1)	(2) Arrest	(3) Warning	(4) Other action
Black	-0.000	0.025	-0.027	0.002
	(0.002)	(0.002)	(0.001)	(0.001)
South Asian	-0.019	-0.008	-0.013	0.002
	(0.003)	(0.002)	(0.002)	(0.001)
Male	-0.060	-0.021	-0.019	-0.019
	(0.004)	(0.003)	(0.002)	(0.002)
Age	0.015	0.010	0.005	0.001
	(0.000)	(0.000)	(0.000)	(0.000)
Search-level controls	Yes	Yes	Yes	Yes
Borough fixed effects	Yes	Yes	Yes	Yes
Month-by-year fixed effects	Yes	Yes	Yes	Yes
Observations	298,782	298,782	298,782	298,782

Note: This table displays results from ordinary least squares regressions with binary search outcome variables listed in the column headings as estimands. White women are the base category. A search is defined to be successful (a "hit") if it results in an arrest, warning, or other action. A search is unsuccessful if it results in no action. "Search-level controls" include age, age squared, search type (person, vehicle, or person and vehicle), and search grounds. All searches completed prior to the body camera trial, which began in May 2014.

Table A9: Search Success Rates by Search Grounds

	All Searches	By Search Grounds				
	(1)	(2) Stolen property	(3) Drugs	(4) Weapons	(5) Going equipped	(6) Other
Black	-0.000	0.060	-0.024	-0.024	0.028	-0.040
	(0.002)	(0.004)	(0.003)	(0.006)	(0.006)	(0.013)
South Asian	-0.019	0.051	-0.046	-0.025	0.000	-0.047
	(0.003)	(0.007)	(0.003)	(0.009)	(0.009)	(0.017)
Male	-0.060	-0.167	0.008	-0.074	-0.070	-0.060
	(0.004)	(0.007)	(0.005)	(0.014)	(0.016)	(0.019)
Age	0.015	0.010	0.020	0.020	0.003	0.029
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Search-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Borough fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Month-by-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	298,782	62,282	168,670	31,117	28,861	7,852

Note: This table displays results from ordinary least squares regressions with a binary search success (or "hit") variable as their estimand, estimated separately by search grounds. White women are the base category. A search is defined to be successful if it results in an arrest, warning, or other action. A search is unsuccessful if it results in no action. "Search-level controls" include search type (person, vehicle, or person and vehicle), age, and age squared. Heteroskedasticity-robust standard errors are in parentheses. All searches completed prior to the body camera trial, which began in May 2014.