

**RESPONSE TO PLAINTIFFS' TENTH REPORT TO COURT AND MONITOR
ON STOP AND FRISK PRACTICES: FOURTEENTH AMENDMENT ISSUES**

Submitted June 17, 2020

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I. Introduction

This document comments on *Plaintiffs' Tenth Report to Court and Monitor on Stop and Frisk Practices: Fourteenth Amendment Issues* (hereafter referred to as *Plaintiffs' Tenth Report*). I note that the Plaintiffs' expert, Professor David Abrams, examined and analyzed Philadelphia Police Department ("PPD") pedestrian stop-and-frisk data for Quarters 3 and 4 of 2019. For the most part, Professor Abrams focused his analysis on a random sample of 3,982 stop-and-frisk encounters (aka, pedestrian stops), drawing from a population of 38,942 pedestrian stop-and-frisk events. Professor Abrams also examined the "full array of stops" at the level of police service areas to present a full summary of the stop rates.

As this report is a review of, and commentary on, *Plaintiffs' Tenth Report*, I organize it in terms of the order in which Professor Abrams presents his data and analyses. Prof. Abrams recently provided the data and syntax he used to run his models, but I have not had the opportunity to replicate and/or conduct my own statistical analyses of the data on which the *Plaintiffs' Tenth Report* are based. I am accepting the findings presented in the *Plaintiffs' Tenth Report* for the purposes of responding to it. Within the next 30 days, I intend to run several multivariate analyses

of my own. To the extent those analyses differ significantly from those of Professor Abrams, I will submit a supplementary report limited in scope to those findings.

II. Summary of my Conclusions

1. *Plaintiff's Tenth Report* shows that the overall number of pedestrian stops decreased by almost 4% during the current reporting period. This decrease, however, was not normally distributed across the city, as the analyses showed great variation in stop figures across police service areas.
2. In general, PSAs with larger African American residential populations experienced increasingly high stop rates per 100 residents. This linear relationship, however, was largely driven by 7 outlier PSAs (out of 65 total PSAs). When those 7 outliers were excluded from my analysis (see Fig. 2), the stop rate trendline became almost flat (with some variability) across PSAs, regardless of the share of Black residents.
3. PPD continues to have a problem with so-called "out of place" stops: PSAs with low African American populations tended to experience high rates of Black pedestrian stops. This pattern, however, was particularly evident in 6 PSAs (see Fig. 3). When excluded from the analysis, the curve flattens, though it is still evident.
4. Dr. Abrams' multiple regression analysis examining stop rates and frisks showed that "Black detainee" was a significant predictor of both outcomes while controlling for other benchmark factors. I question the internal reliability of the models based on the economic indicators used, lack of control for spatial autocorrelation, and the fact there the "frisk" models contained no behavioral controls.
5. Given the reliability issues I have with the regression models, coupled with the identification of several outlier PSAs, I propose conducting a set of additional spatial regression models that can isolate certain regions (specifically, PSAs) of the city that may be driving the overall significant race-based findings. The findings of such an analysis may allow policy-makers to target specific PSAs for intervention.

III. Analysis of Conclusions Drawn from *Plaintiffs' Tenth Report*

1. Responding to Descriptive Analysis

As the *Plaintiffs' Tenth Report* shows, the overall number of pedestrian stops conducted by the Philadelphia Police Department (PPD) during Q3 and Q4 of 2019 declined by 3.9% over the previous reporting period. *Plaintiffs' Tenth Report* notes that this decline is substantially smaller than the 27% decline in pedestrian stops

since the last reporting period. But it is important to keep in mind that, referring back to *Plaintiffs' Ninth Report* (filed 11/27/18), the 27% reduction in pedestrian stops occurred between the “first half of 2017” and Q1 and Q2 of 2018—i.e., almost two years ago. And although the *Plaintiffs' Ninth Report* did not note the original number of stops from the previous reporting period, if the decline in pedestrian stops was 27%, then I can assume the original number in 2017 was roughly 55,500. Thus, in the past two and a half years, the PPD has decreased its overall pedestrian stops from approximately 55,500 to 38,942, which represents an overall 30% reduction in stops.¹

Moreover, if those estimated 55,500 pedestrian stops represented an unfettered number – i.e., one largely unconstrained by a major policy initiative – then it stands to reason that a major policy change would result in a swift and substantial decline². Moreover, we would expect the reduction to resemble a “step” function, rather than a linear downward trend. That is, at the initial measurement period after the policy “redoubling” effort, we would expect a large decrease in pedestrian stops (step 1), and then smaller reductions at subsequent measurement periods. The distribution would look like a staircase rather than a linear trend line.

¹ For the avoidance of doubt, these figures reflect the specific figures in Plaintiffs' Tenth Report on Fourteenth Amendment issues, which Plaintiffs themselves note differ somewhat from the numbers in both parties' Fourth Amendment reports. See Plaintiffs' Tenth Report on Fourteenth Amendment Issues, at 3 (Doc. No. 106).

² The language in the opening pages of *Plaintiffs' Ninth Report* suggests that efforts to reduce and examine pedestrian stops were redoubled in 2016 with the creation of the 2016 “benchmarks.” Such efforts likely created a kind of “reset” in the PPD to increase the vigor with which the department attempted to reduce the number of pedestrian investigations. Thus, for this report, 2016 represents a baseline year for monitoring purposes.

This is all by way of arguing that a 27% initial reduction, coupled with another 3.9% reduction in pedestrian stops during the current reporting period is exactly what organizational theory would predict; and it demonstrates that during Q3 and Q4 of 2019, the PPD was still working to reduce the number of pedestrian stops agency-wide.

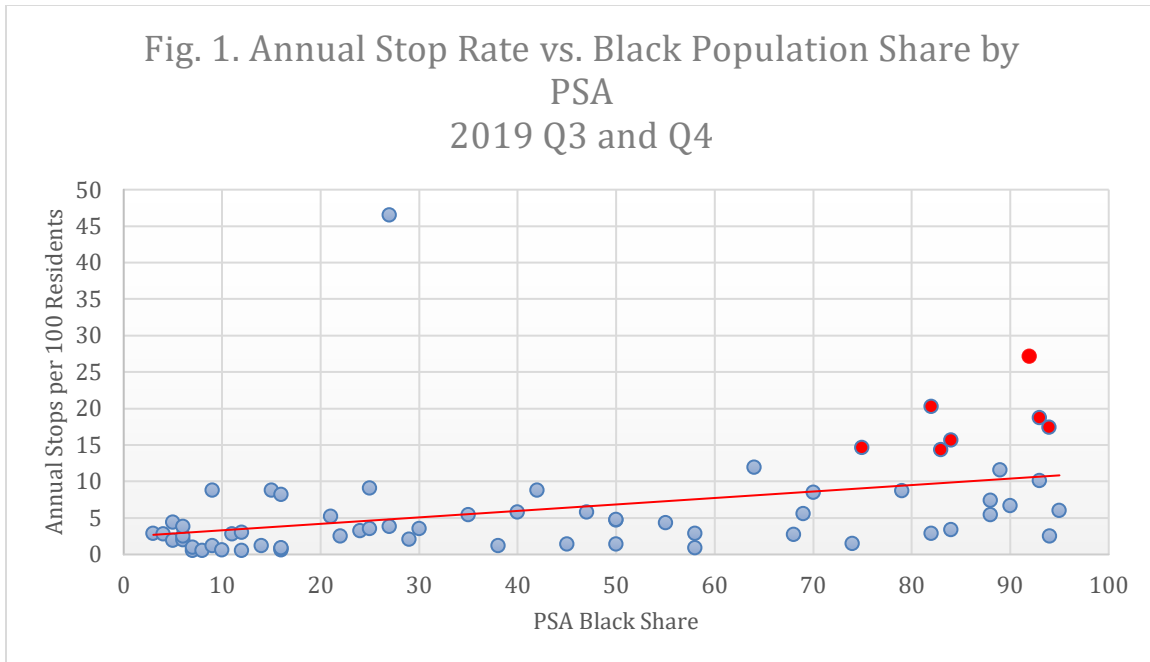
Next, *Plaintiffs' Tenth Report* examines pedestrian stop rates based on Black, White, and Latino "shares" of group populations based on U.S. Census measures to identify potential racial biases in stop patterns. They first focus on the city as a whole, showing that, overall, Black pedestrians make up 71% of all stops, despite that they represent just 44% of the population. White and Latino pedestrians were stopped at rates lower than their overall representation. The problem with this analysis, of course, is that findings from a city-level examination of stop rates by race/ethnicity will be obscured to the point of being rendered useless by the enormous within-city variations in stop rates and racial/ethnic shares. And while *Plaintiffs' Tenth Report* acknowledges this bias, it still attempts to make it the city-level results a serious finding.

Fifty years of urban policing research demonstrates that police behaviors are best understood at the workgroup level³, which in Philadelphia means examining

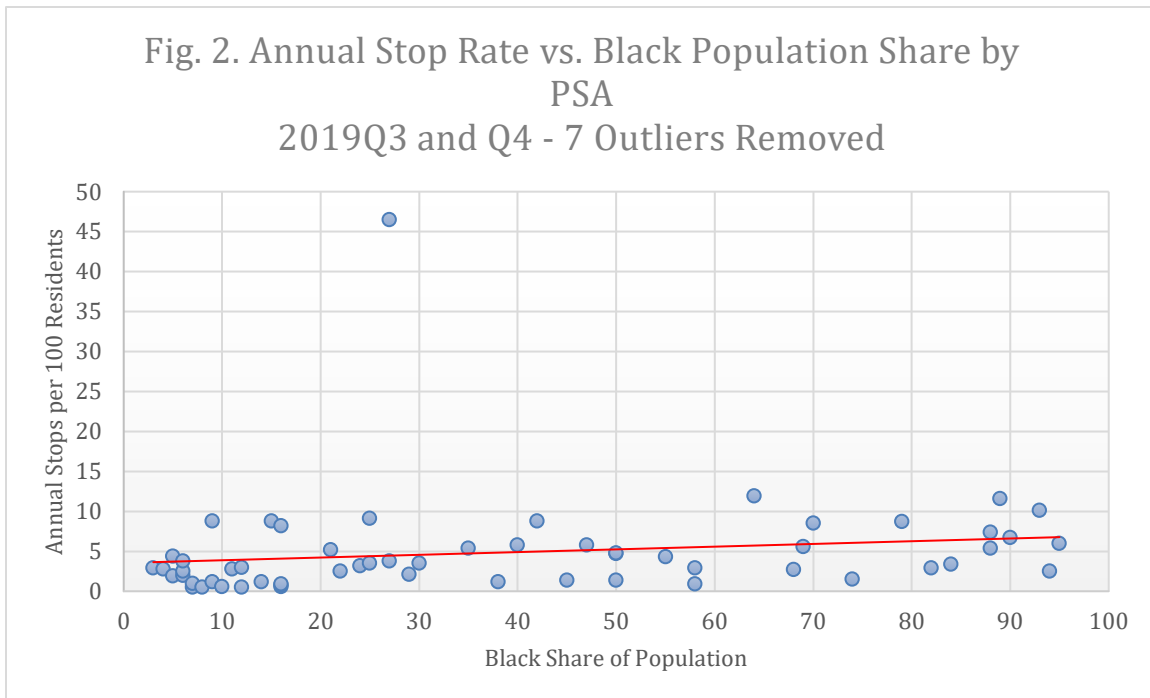
³ Rubinstein J, *City Police* (Farrar, Straus and Giroux, New York, 1973); Wilson JQ, *Varieties of Police Behavior: The Management of Law and Order in Eight Communities* (Harvard University Press, Cambridge, MA, 1968), <http://www.hup.harvard.edu/catalog.php?isbn=9780674932111> viewed 10 January 2019; Herbert S, "The Normative Ordering of Police Territoriality: Making and Marking Space with the Los Angeles Police Department" (1996) *Ann. Assoc. Am. Geogr.*; Klinger D, "Negotiating Order in Patrol Work: An Ecological Theory of Police Response To Deviance*" (1997) 35 *Criminology* 277, <http://doi.wiley.com/10.1111/j.1745-9125.1997.tb00877.x>; Kane RJ and Cronin

policing processes and outcomes in police service areas (PSAs). *Plaintiffs' Tenth Report* presents PSA-level findings next; and yet – just like at the city-level, it reports the “average” number of Black stops by black share across PSA, noting that, “There were an average of 439 stops of Black pedestrians per PSA...compared with 118 White stops, and 42 of Latinos.” Again, as with the city-level examination, this reporting of PSA-level averages obscures cross-PSA differences that may be driving these findings.

Plaintiffs' Tenth Report, however, does move to the PSA-level, reporting that PSAs with increasing Black shares of the population experience higher annual stop rates per 100 residents than PSAs with lower Black shares. This relationship is shown in Figure 4 of *Plaintiffs' Tenth Report*. Fig. 1 of the present report replicates Figure 4 of *Plaintiffs' Tenth Report*:



As the data in Fig. 1 show (and consistent with Figure 4 in *Plaintiff's Tenth Report*), the annual number of pedestrian stops per PSA gradually increased (indicated by the fitted linear trendline) as PSA Black share increased. If there were no differences in overall PSA stop rates relative to PSA Black Share, the trend line would be horizontal. But as Fig. 1 also shows using red markers, 7 PSAs at the high end of Black Share exist as obvious outliers, dragging the trend line upward as Black share increases. That is, in 7 PSAs (i.e., PSAs 122, 123, 172, 181, 182, 392, and 393) that contain at least 75% Black residential population, annual numbers of stops per 100 residents are unusually high. Fig. 2 below represents the same relationship as Fig. 1 but with those 7 outlier PSAs removed from the analysis.



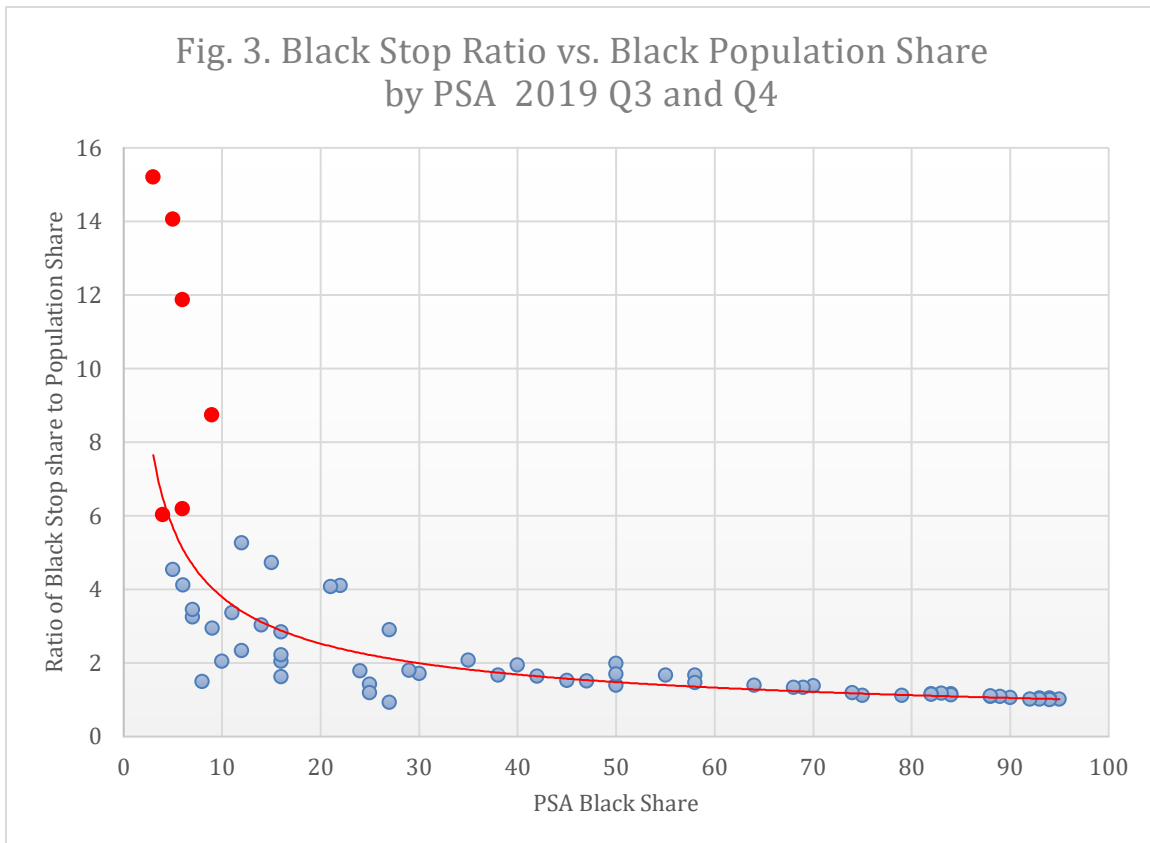
As the trend line in Fig. 2 shows, the relationship between the number of annual stops per 100 residents and PSA Black share becomes less elevated, indicating that when the six outlier PSAs are removed, the annual number of stops per 100 residents across PSAs comes closer to constant, regardless of PSA Black share. There is, of course, at least one PSA (242) that remains a very high outlier in terms of stop rate, and it resides at the lower end of the PSA Black Share distribution. The conclusion to be drawn with this analysis is that, when examining the annual rates of pedestrian stops within PSAs in relation to Black population, 7 PSAs (i.e., 10.8%) accounted for the vast majority of the upward linear trend.

Plaintiff's Tenth Report also notes that Black pedestrians were stopped more than White and Latino pedestrians relative to their share of their PSA populations,

and that these disparities were particularly evident in PSAs where the Black residential population is quite low—i.e., identifying so-called “out of place” pedestrian stops. While this report does not dispute the findings showing PSA-level racial disparities for Black pedestrians, it does offer some context.

First, from the “Ratio of Black Stop Share to Population Share” column in Table 4a, I note that the mean Black stop to Black share ratio = 2.52, meaning that on average across the PSAs, Black pedestrians were stopped at a rate that was 2.52 times higher than their representation in the PSA populations. During the last reporting period, *Plaintiff’s Ninth Report* showed Black stop to Black share ratio of 2.75, indicating that across PSAs, the average Black to Black share disparity has slightly decreased for this reporting period.

Plaintiff’s Tenth Report examines the ratio of Black stop share to population share by PSA Black share, summarizing this relationship in Figure 3 of the report. *Plaintiff’s Tenth Report* notes that, “If the ratio of...(Black) stops were independent of PSA...(Black) share, the points should form a horizontal line.” But it does not form a horizontal line. At least at the low end of Black share distribution, the ratio of Black stop share to population share is quite high, indicating a disproportionately high rate of Black stops in PSAs that contain low Black residential populations. This report replicates the analysis that produced Figure 3 in Plaintiff’s Tenth Report, displaying the results in Fig. 3 below.

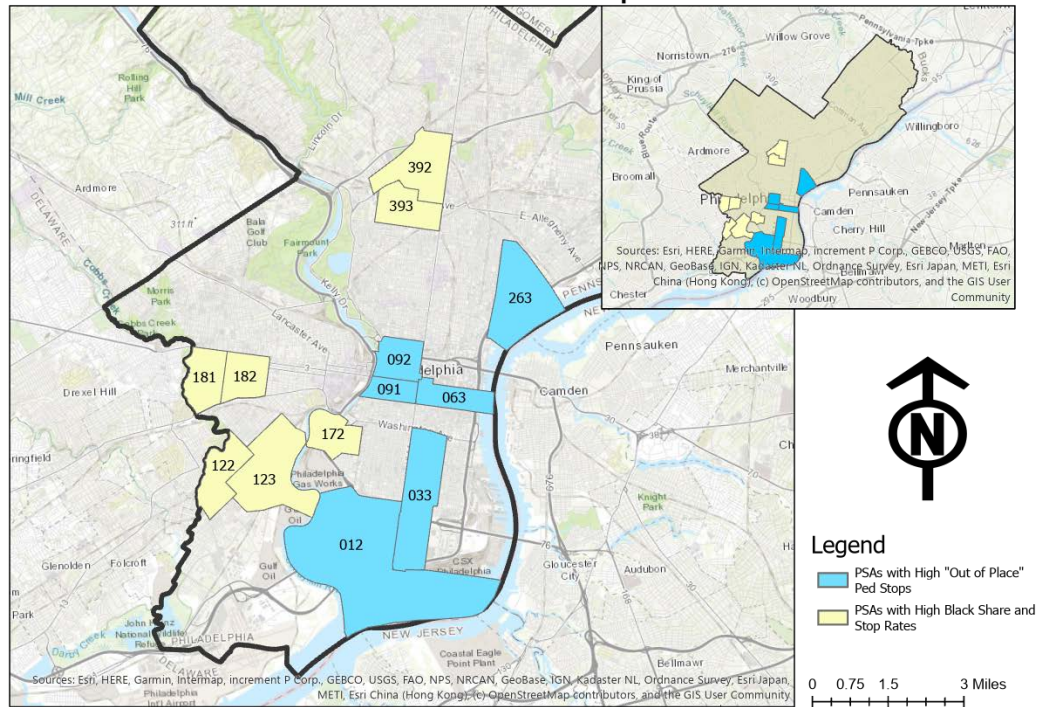


As the data in Fig. 3 show, a strong “power” trendline ($R^2=.93$) dominates the Black share distribution, indicating that at least 6 obvious outlier PSAs (marked in red on Fig. 3) are driving the much of the relationship between ratio of Black stop share to population share and PSA Black share. These outliers show that the rates of “out of place” stops in 6 PSAs (12, 33, 63, 91, 92, and 263) account for much of the curvature in the trend line. Were those seven PSAs removed from the analysis, the trend would become much less accelerated; though, admittedly, the trend line remain “accelerated” as opposed to linear (let alone, horizontal).

The descriptive analyses summarized above, and in the *Plaintiff's Tenth Report*, show that while the PPD has continued to decrease its numbers of pedestrian stops at the agency level, there remain at least two obvious sources of

racial disparities. First, in general, the ratio of Black stops per population share tends to increase in increasingly Black PSA's; and second, the so-called "out of place" pedestrian stops seem to drive the disparities in the PSA's with lower Black residential populations. Identifying the outlier PSA's at both ends of the "Black share" continuum allows the PPD to focus its corrective efforts in specific locations. In an effort to demonstrate the concentrated geographic distribution of these relationships, Fig. 4 shows a map of Philadelphia with both the "out of place" and the high black share-high stop rate PSAs visualized.

Fig. 4. Police Service Areas in Philadelphia showing Different Patterns of Pedestrian Stops



The descriptive findings also suggest the importance of estimating regression models that do not assume linear relationships between racial shares and the stop outcomes, such as geographically weighted regression. Such an analysis would demonstrate, spatially, “where” (i.e., in which PSAs) race may (or may not) remain a significant predictor of stop rates while controlling for the other benchmark factors.

2. Responding to the Regression Analyses

As *Plaintiffs’ Tenth Report* suggests, employing a series of properly specified regression models can help us understand the extent to which any identified disparities may amount to bias. To that end, *Plaintiffs’ Tenth Report* employed a series of multi-regression models to examine potential race effects on stop rates

(Table 5), frisks (Table 6), reasonable suspicion for stop (Table 8), reasonable suspicion for frisk (Table 9), firearm recovered (Table 11), and contraband recovered (Table 12). The models included a series of PSA-level variables (e.g., demographic and crime), as well as what appeared to be individual-level variables: Detainee Black, Detainee Latino, Detainee Male, and Detainee Age.

With respect to the analysis presented in Table 5, the analyst created three PSA data sets (one each for white, Latino, and African American detainees), “stacked” them into a single data file so that each PSA appears three times (65 PSAs x 3), and then included district-level fixed effects to presumably estimate any potential spatial dependence processes (i.e., in Model 8 of Table 5). The dependent variable then becomes the Stop Rate, which represents “the number of stops in the sample examined per 10,000 residents of the same race in the district...”; and the total number of observations = 195 (again, 65x3 PSAs).

When considering the regression analyses presented in Table 5, the most important place to begin is with Models 7 and 8: the “full” models (with and without the district-level fixed effect) that examined the multivariate effects of race/ethnicity of detainee on the stop rates. In both models the only two significant predictors were the violent crime rates and “detainee black,” suggesting at first glance that when controlling for the benchmark factors, Black pedestrians were significantly more likely to be detained than others.

Three issues, however, stand out as potential threats to the internal reliability of these models: First, I realize that “employment rate” is the benchmark economic indicator to be used in these regression analyses; but this is not state of

the science when examining ecological processes. The standard economic indicator in such analyses is an index that would include percent poverty, percent households receiving public assistance, percent of the population that is unemployed, percent female-headed households with children, and percent low educational attainment⁴. The unemployment rate by itself does not reliably estimate the degree of structural disadvantage in communities – or in this case, PSA’s. Given how racially segregated Philadelphia remains, the “detainee black” variable may well represent a proximate indicator for structural disadvantage. In other words, these models may be suffering from unobserved heterogeneity, which occurs when the models fail to include important controls that might independently affect the outcome, and which may be represented by other variables in the model. In this case, “detainee black” may actually represent a proxy for structural disadvantage, explaining why it is a significant predictor of the stop rate. A more reliable analysis would include an index of structural disadvantage while controlling for black detainee.

Next, the models also exclude controls for spatial autocorrelation, which normally represent important estimates of spatial processes. I made this observation in my previous report, and when I re-estimated the regression models then, I found that spatial autocorrelation did not have a significant impact on the stop rates. Still, the fact that the spatial lag variable is not significant during the

⁴ Sampson RJ, Raudenbush SW and Earls F, “Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy” (1997) 277 *Science* (80-.). 918, <http://www-personal.umich.edu/~rauden/Science.pdf%5Cnhttp://www.sciencemag.org/cgi/content/abstract/sci;277/5328/918>; Vélez MB, “The Role of Public Social Control in Urban Neighborhoods: A Multilevel Analysis of Victimization Risk” (2001) 39 *Criminology* 837.

previous observation period does not diminish its theoretical utility: it is well-known in policing research⁵ that spatial processes tend to correlate across administrative areas, such as PSA's. Failing to control for them produces results that may be unreliable.

While I am not disputing the findings presented in Table 5, I cannot be convinced of their reliability because of the unaccounted for threats to internal reliability inherent to the regression models. Additional analyses that address these reliability issues should be conducted before any firm conclusions are drawn about the effect of "black detainee" on the stop rates.

Referring to Table 6, which summarizes the results of the Frisk outcomes, I have the same issues as with the results presented in Table 5. I note that in Table 6, detainee Black, Detainee age, detainee male, violent crime rate, and male population under 24 were all significant predictors of frisk. But these models also include the employment rate as the sole indicator of structural disadvantage, and they do not include an estimate of spatial autocorrelation – both of which may be reducing the reliability of the models. In addition, and perhaps more importantly, is the fact that the models summarized in Table 6 do not include any behavioral factors that may have led the officers to move from a pedestrian stop to a frisk. This is not a criticism of the analysis itself, because I know that the analyst used the agreed-upon benchmark indicators to build the models. It is, however, a comment on the

⁵ O'Brien A-M and Kane RJ, "Policing as a Social Determinant of Health: The Impact of Drug Enforcement on Prenatal Care Utilization in Urban Communities" (2018) 6 Med. Res. Arch. 1; Kane and Cronin, "Associations Between Order Maintenance Policing and Violent Crime", n 2.

methodology used to test the question of whether frisks were the product of racial bias.

It is no secret that relations between police officers and some predominantly Black communities in Philadelphia have become increasingly strained in recent years. In light of this fact, it is quite possible, for example, that Black detainees viewed the police with more wariness and/or skepticism than white and Latino detainees⁶. The officers may have viewed this wariness as suspicion that the detainees were possession of weapons. I realize that the issue of police legitimacy is well beyond the scope of this report; but nevertheless, as a policing scholar who conducts research on police legitimacy⁷, I am compelled to point out the methodological flaws that raise serious questions about the reliability of the findings summarized in Table 6 – – regardless of the previously agreed upon benchmarks.

Turing to the regression analyses summarized in Tables 8 and 9, which examined patterns of reasonable suspicion for stops and frisks, respectively, Plaintiff's Tenth Report shows significant race effects for both these outcomes. The findings that Black detainees are significantly more likely to be subjected to

⁶ BRUNSON RK, "POLICE DON'T LIKE BLACK PEOPLE': AFRICAN-AMERICAN YOUNG MEN'S ACCUMULATED POLICE EXPERIENCES*" (2007) *Criminol. Public Policy*.

⁷ O'Brien and Kane, n 4; Kane RJ, "Compromised Police Legitimacy as a Predictor of Violent Crime in Structurally Disadvantaged Communities" (2005) 43 *Criminology* 469; Kane and Cronin, "Associations Between Order Maintenance Policing and Violent Crime", n 2; Kane RJ, "The Social Ecology of Police Misconduct" (2002) 40 *Criminology* 867, <http://onlinelibrary.wiley.com/doi/10.1111/j.1745-9125.2002.tb00976.x/full%5Cnhttp://doi.wiley.com/10.1111/j.1745-9125.2002.tb00976.x>.

“unreasonable” stops and frisks is difficult to dispute; and as the analyst concludes, it does appear that the PPD has experienced some backsliding in this area as compared to prior reporting periods. It is, however, worth noting that – as the descriptive analyses highlighted – the relationship between race and reasonable suspicion is likely confined to concentrated areas of the city and may not reflect citywide patterns. This is why subsequent regression analyses will be important to conduct.

IV. Conclusions

Overall, the *Plaintiffs’ Tenth Report* presents evidence of a continued overall decline in the number of total pedestrian stops conducted by the PPD. Indeed, these downward trends were also apparent in both the Plaintiff’s Eight and Ninth reports, which accounts for approximately two and a half year’s worth of data. Given the difficulty policy-makers often encounter with attempting to change police behaviors, the reduction in pedestrian stops over the previous reporting period is a positive sign.

That said, the descriptive data also show considerable racial disparities in stop-and-frisk activities, both in terms of minority detainees being overly represented in PSAs based on racial composition, as well as the “out of place” stops. I nevertheless remain skeptical of the internal reliability of the regression models summarized in Tables 5 and 6 of *Plaintiffs’ Tenth Report*. Again, it is not so much that I dispute the findings presented in the *Plaintiffs’ Tenth Report* as it is I question the reliability of the findings. As I noted at the top of this document, I hope to complete my own spatial regression analyses over the next thirty days that will, among other

things, examine the spatial stability of relationships between race and pedestrian stops at the PSA level. Comparing the results of those models to those produced by Professor Abrams in the *Plaintiffs' Tenth Report* should help clarify the role of race in pedestrian stop production in Philadelphia.