A Multi-Level Bayesian Analysis of Racial Bias in Police Shootings at the County-Level in the United States, 2011-2014

Memo 1: Correction of 7 Duplicated Data Points and a Robustness Check

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July 12, 2016

Abstract

The original publication included analysis of a data set which contained 7 cases of duplicated data points which were not caught by my screening procedure. These errors were brought to my attention by Richard J. Smith (School of Social Work, Wayne State University). I have revised the data set used in my analysis omitting the duplicated versions of these data. I check the sensitivity of the original findings to exclusion of these errors. I find no qualitative changes in inference.

I. Introduction

The original publication included analysis of a data set which contained 7 cases of duplicated data points which were not caught by my screening procedure. For detals, see the file DuplicatedCases.csv in the MaintainedImprovedData folder in this GitHub repository.

These 7 cases have been removed from all relevant files. In 5 cases, the main data (race and armed-status) was consistent in both copies of the data. There were two cases with conflicting armed status: 1) J. Ferrell, who was considered unarmed in one case and armed with only hands and feet in the second case. In the revised data, he is considered unarmed. 2) W. Jackson who was shot while reaching for a cellphone in his car. In one case, he was considered armed since a knife was found in his car, but review of the new reports indicate that he was not in possession of the knife when shot. He is now coded as unarmed.

II. Methods

I have re-run the estimation of rates of racial bias in police shootings, following the original model.

III. Results

I find very little difference in the national-level posterior median estimates of racial bias (between a 0% and a 3% change relative to the original posterior median parameter estimates, see Table 1).

Likewise, when comparing the county-level estimates, I find strong correlations in the posterior median estimates of racial bias (Table 2). See Fig. 1 for an example scatterplot.

Table 1: *National-level percent differences in posterior median estimates*

Relative Risk	Old Post. Median	Revised Post Median	|Pct. Diff. |
RR_Black_Armed_Versus_Unarmed	2.7943	2.7508	0.02
RR_White_Armed_Versus_Unarmed	3.3135	3.294	0.01
RR_Hispanic_Armed_Versus_Unarmed	3.083	3.0375	0.01
RR_Black_Armed_Versus_White_Armed	2.9439	2.9492	0
RR_Hispanic_Armed_Versus_White_Armed	1.568	1.5553	0.01
RR_Hispanic_Armed_Versus_Black_Armed	0.5274	0.5233	0.01
RR_Black_Unarmed_Versus_White_Unarmed	3.4918	3.4567	0.01
RR_Hispanic_Unarmed_Versus_White_Unarmed	1.6787	1.7235	0.03
RR_Hispanic_Unarmed_Versus_Black_Unarmed	0.4636	0.4722	0.02
RR_Black_Unarmed_Versus_White_Armed	1.0408	1.0642	0.02
RR_Hispanic_Unarmed_Versus_White_Armed	0.5151	0.5236	0.02

Table 2: *County-level associations*

Correlation of Original and Revised Posterior Median Estimates at County-Level	
RR_Black_Armed_Versus_Unarmed	0.93
RR_White_Armed_Versus_Unarmed	0.94
RR_Hispanic_Armed_Versus_Unarmed	0.91
RR_Black_Armed_Versus_White_Armed	0.97
RR_Hispanic_Armed_Versus_White_Armed	0.96
RR_Black_Unarmed_Versus_White_Unarmed	0.94
RR_Hispanic_Unarmed_Versus_White_Unarmed	0.92
RR_Black_Unarmed_Versus_White_Armed	0.98
RR_Hispanic_Unarmed_Versus_White_Armed	0.97

IV. Discussion

Given that neither the national nor the county-level estimates have changed that much due to removal of the 7 duplicated cases, I see no need to re-estimate the models which estimate county-level outcomes as a function of covariates as the current time.

Figure 1: *A comparison of the county-level posterior median estimates for the black to white unarmed relative risk estimates.*