Chicago Police Department Use of Force Data Analysis Project: Executive Summary

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Background

In January 2019, the City of Chicago entered into a policing Consent Decree in *State of Illinois v. City of Chicago*, N.D. Ill. 17-cv-06260. The Consent Decree sets forth numerous requirements for the Chicago Police Department (CPD) to reform training, policies, and practices to ensure constitutional, effective, and transparent policing.

In partial fulfillment of the requirements of the consent decree, researchers from the University of Texas at San Antonio and the University of Pennsylvania (Research Team) was contracted by CPD to develop a best practice methodology for analyzing CPD Tactical Response Report (TRR) and related data for patterns and trends in force used against specific demographic groups in Chicago. The *Proposed Methodology Report* went through several drafts and was accepted by CPD and the Independent Monitoring Team (IMT) in its final form on August 15, 2024.

The current report serves as the main analytic work product outlined in the *Proposed Methodology Report* and details the results from the Research Team's analysis of CPD use of force and related data spanning a four-year period – January 2020 through December 2023. The analyses contained herein are designed to identify potential patterns of disparity in how force was used by CPD against identifiable racial, ethnic, and gender-based subpopulations in Chicago from 2020 – 2023. A separate analysis of female subjects was conducted to determine if their patterns mirrored those of the overall, male-dominated sample. The report uses scientifically appropriate benchmarks and statistical modeling to investigate the nature and extent of those disparities, if any, and to examine relevant subject, officer, situational, and area-level factors that are predictive of observed disparities.

Key Takeaways

1. Disproportionality ratios (DRs) compared the application of force against racial/ethnic groups in Chicago relative to those same groups' representation in arrest or crime suspect descriptions. Results generated using an arrest benchmark indicated that Black individuals experienced a 39% higher relative risk of force compared to White individuals, while Hispanic individuals had a 7% higher risk. When using a crime suspect benchmark, Black individuals had a 52% higher risk and Hispanic individuals had a 33% higher risk compared to White individuals. Two key caveats are relevant to contextualize these results. First, statistical testing demonstrated that some disparities were not statistically significant suggesting they may be due to chance. Second, DRs, by themselves, do not consider other potentially relevant factors related to how these groups experience force differently.

2. More sophisticated modeling revealed that Black and Hispanic individuals were more likely to experience higher maximum and total force levels relative to White individuals, but these disparities largely diminished when considering police beat characteristics and

1

officer-specific factors, suggesting that the location and contextual factors of force incidents significantly contribute to racial disparities in CPD use of force.

3. A beat-level analysis of use of force patterns for Black, Hispanic, and White individuals found that after accounting for demographics, crime rates, and police deployment, disparities in force rates declined significantly. The estimated number of use of force events dropped by 25% for Black individuals, 37% for Hispanic individuals, and 46% for White individuals after accounting for beat-level factors.

4. No single police beat or group of officers disproportionately contributed to any reported disparities, suggesting that systemic factors, rather than individual outliers, are most likely responsible for observed differences.

Data and Measures

The primary use of force data consisted of 16,196 tactical response reports (TRR data) completed by CPD officers between January 1, 2020, and December 31, 2023. These data were supplemented with additional datasets covering the same time period, obtained from both CPD and public sources. These datasets include arrest records, crime reports, crime suspect reports, 911 call log data, police mission deployment records, officer assignments, and census data. Because a single use of force incident can result in multiple TRRs,[1] the TRR data were aggregated to the incident level, which produced 8,595 unique incidents of force represented in the data.

Using the TRR data, a set of measures was constructed for analysis. These variables were grouped as *outcome of force events, incident characteristics, officer characteristics, subject characteristics, subject actions,* and *officer mitigation efforts.* Force outcome events include the *maximum force* used against a subject during a use of force incident, the *total force* used within an incident, and subject injury. Force outcomes were analyzed by subject race, ethnicity, and gender using a variety of statistical techniques, including disproportionality ratios and regression modeling. The spatial distribution of force across police beats and the distribution of force across officers also were analyzed. Force and resistance categories from the TRR were coded to correspond with the CPD Force Options Model that helps provide guidance to officers in aligning force to resistance. Accordingly, officer force and subject resistance levels were coded into corresponding five-item scales, with verbal direction coded as level 1 force and the use of a gun by an officer as a level 5 force. On the subject resistance side, failure to follow verbal directions was coded as a level 1 resistance, while level 5 reflected resistance likely to cause death or serious injury to officers.

General Portrait of Force

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[1] For example, a single incident may involve multiple officers and/or multiple subjects. By policy, any CPD officer who uses physical force during an encounter is required to complete a TRR.

The maximum level of force used within a case was most frequently Level 3, followed by Level 2 and Level 4 force. The use of Level 1 and Level 5 force was the most infrequent. The distribution of maximum force across racial/ethnic groups was similar with White subjects most often receiving Level 2 force and Black and Hispanic subjects most often receiving Levels 3 and 4 force. Level 5 (deadly) force was rare. *Despite some variation, the overall pattern of maximum force used across racial/ethnic groups was similar.*

Figure 1: Percentage of Maximum Force Levels by Subject Race/Ethnicity
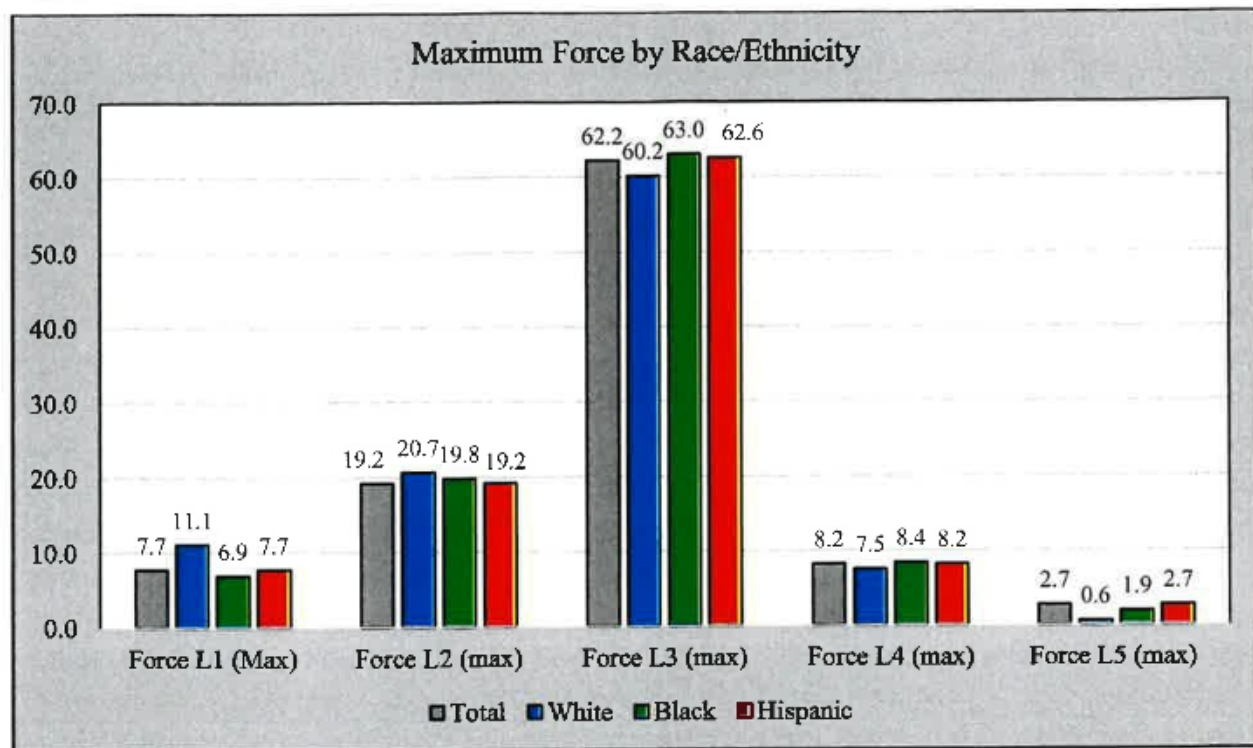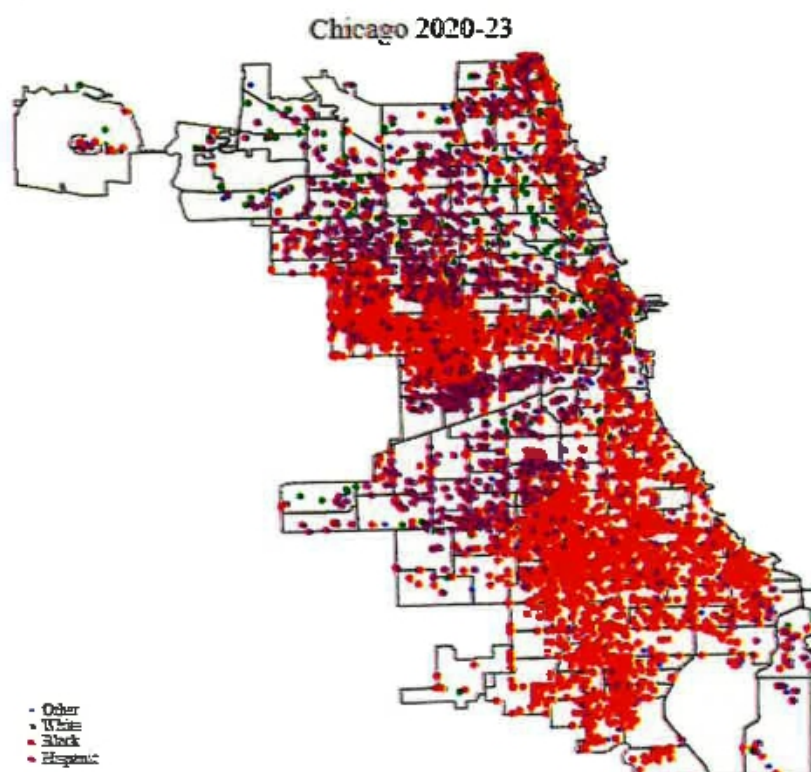

Figure 2 below shows use of force locations within police beats in Chicago for White, Black, Hispanic, and Other groups between 2020 and 2023. The map shows that there was some spatial concentration in use of force events in the West, South, and Northshore sections of Chicago. There were few instances of force with White subjects in the South or West side of Chicago. This pattern suggests that the locational *contexts* where force was used may be salient for explaining racial and ethnic disparities in use of force patterns. These factors include crime rates, arrest rates, police deployment on crime suppression missions, volume of 911 calls requiring officer responses, crime suspect descriptions, and socioeconomic factors linked to poverty. These possibilities are explored in the multivariate models discussed below.

Figure 2: Force Locations

Chicago 2020-23

Legend:
- Other
- White
- Black
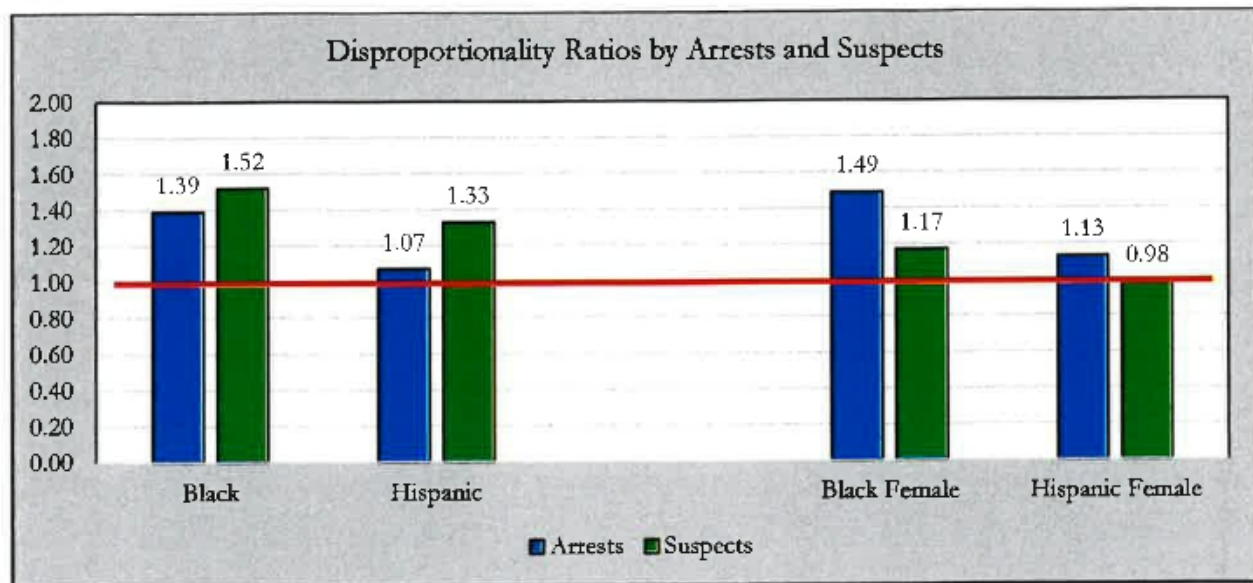- Hispanic

Benchmarking

A series of statistical benchmarks were estimated to assess city-wide patterns in use of force and how racial/ethnic disparities in force can be accounted for by location and context in which the events occur. A valid benchmark is a comparison group of similarly-situated people *at risk* for experiencing the use of force assuming no officer bias exists. For benchmarking purposes, CPD data on reported crime suspects and arrestees were used to develop race, ethnicity, and gender-based benchmarks to compare against the TRR data.

Disproportionality ratios (DRs) examine the rates of force experienced by minority group subjects relative to Whites and are intuitive and easily interpretable in relation to 1.0. DRs less than 1.0 indicate *less risk* of force compared to Whites while DRs greater than 1.0 indicate the minority group was at *higher risk* for force relative to Whites.

As shown in Figure 3 below, the DRs for Black and Hispanic subjects relative to White subjects across all years are 1.39 and 1.07, respectively, suggesting that Black, and to a lesser extent Hispanic, individuals have a higher relative risk of force to *arrest* than White individuals. Likewise, the DRs for Black and Hispanic subjects relative to White subjects using a *crime suspect* benchmark are 1.52 and 1.33, respectively, suggesting that Black and Hispanic individuals have a higher force risk compared to crime suspects relative to White individuals. *However, tests of statistical significance showed that the disparities in force experienced by Black and Hispanic*

4

individuals relative to Whites could have been the result of chance. Therefore, further statistical modeling examined if the *amount* or *severity* of force used by the CPD against individuals in Chicago differed by the race and/or ethnicity of the subjects against whom force was used. Additional analyses examined *rates of injury* resulting from the use of force by CPD officers and whether injury rates varied by the race/ethnicity of subjects.

Figure 3: Disparity Ratio of Race, Ethnicity and Gender

Statistical Modeling

Tables 1 and 2 below show the results from five regression models that control for important variables related to the subject (e.g. race/ethnicity, gender, disability status, use of alcohol or drugs), the officer (rank, assignment, race/ethnicity, gender), the incident itself, (e.g. subject resistance, type of crime, reason for the event), and the police beat where the incident occurred (e.g. crime rate, arrests, racial composition of the area). The models are iterative and add variables sequentially. Model 3 is the most complete model and includes all relevant individual, incident, and beat-level characteristics outlined above. Models 4 and 5 help gauge how much of the differences across racial/ethnic groups are attributable to the actual police beat location (model 4) where the incident took place or the individual officers (model 5) involved in the event.

Table 1 highlights the average *maximum level* of force (while considering other relevant variables), the 95% confidence interval for each of these estimates (used to determine statistical significance[2]), and the percent difference between the Black, Hispanic, or Other subjects relative to White subjects. Table 2 shows the results from these same models but examines the *total force*

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[2] Statistically significant results reflect differences between groups that are unlikely due to chance.

applied as the outcome variable of interest.[3] The three statistics in each model provide an overall average *maximum or total* force level for each group, if any difference is statistically meaningful, and the substantive interpretation of the difference. The discussion below will focus primarily on models 3-5.

Table 1: Maximum Force Models 1 to 5

	Model 1	Model 2	Model 3	Model 4	Model 5
White Subjects	2.69	2.70	**2.71**	2.72	2.69
95% CI	2.63-2.75	2.64-2.76	2.64-2.77	2.66-2.79	2.07-3.31
Black Subjects	2.79	2.79	**2.79**	2.79	2.85
95% CI	2.77-2.80	2.78-2.81	2.77-2.80	2.77-2.80	2.34-3.35
% Difference from Whites	*3.6%**	*3.2%**	*2.9%**	*2.5%*	*5.6%*
Hispanic Subjects	2.80	2.81	**2.83**	2.84	2.86
95% CI	2.77-2.84	2.78-2.85	2.78-2.87	2.80-2.88	2.32-3.40
% Difference from Whites	*3.9%**	*3.9%**	*4.2%**	*4.2%**	*5.9%*
Other Subjects	2.75	2.79	**2.80**	2.81	2.75
95% CI	2.58-2.93	2.62-2.96	2.62-2.97	2.63-2.98	2.19-3.31
% Difference from Whites	*2.2%*	*3.2%*	*3.2%*	*3.2%*	*2.2%*

Note: 95% CI=confidence interval; ***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$.

Examining the maximum force levels (bolded in the table above) for each racial/ethnic group reveals that Black and Hispanic subjects experienced slightly higher levels of force than White subjects across all models. **In model 3, which includes all available individual, situational, and beat-level characteristics, those differences are statistically significant and show that the average maximum force level for Black subjects was 2.9% higher than for Whites; for Hispanic subjects, the maximum force level was 4.2% higher than for Whites.** In models 4 and 5, the differences from Whites largely become non-significant (as indicated by the overlapping confidence intervals), except for Hispanic subjects in model 4 whose average maximum force level continues to exceed that of Whites by 4.2%. Thus, even when controlling for the police beat location (model 4), Hispanics experienced slightly higher maximum levels of force than Whites. When we consider the individual officers involved in use of force incidents (model 5), the differences in force experienced by Hispanic and White individuals are no longer statistically significant, suggesting that the use of force by some officers contributes disproportionately to the disparities evident in model 3.

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[3] For example, if a CPD officers gave verbal direction (CPD level 2), used an armbar control technique (CPD level 3), and deployed a Taser (CPD level 4) the total force level during the event would equal 9.

Table 2: Total Force Models 1 to 5

	Model 1	Model 2	**Model 3**	Model 4	Model 5
White Subjects	4.44	4.41	**4.47**	4.49	4.94
95% CI	4.25-4.62	4.22-4.60	4.27-4.67	4.29-4.69	2.48-7.41
Black Subjects	4.76	4.83	**4.80**	4.80	5.49
95% CI	4.70-4.82	4.77-4.89	4.73-4.86	4.74-4.86	3.49-7.50
% Difference from Whites	*6.7%**	*8.7%**	*6.9%**	*6.5%**	*10.0%*
Hispanic Subjects	4.71	4.69	**4.79**	4.79	4.79
95% CI	4.58-4.84	4.60-4.82	4.64-4.93	4.63-4.94	3.27-7.55
% Difference from Whites	*5.7%*	*6.0%**	*6.7%*	*6.3%*	*-3.1%*
Other Subjects	4.85	4.77	**4.87**	4.84	5.47
95% CI	4.33-5.49	4.22-5.43	4.20-5.54	4.13-5.54	3.25-7.69
% Difference from Whites	*8.5%*	*7.5%*	*8.2%*	*7.2%*	*9.7%*

Note: 95% CI=confidence interval; ***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$.

The results from the total force models (Table 2 above) are consistent with the maximum force models. Black and Hispanic subjects experienced slightly higher total levels of force than White subjects, although by model 3 (including all available variables) the difference between Hispanics and Whites was no longer statistically different. **The average total force level experienced by Black subjects after considering all variables in model 3 remained 6.9% higher than for Whites, and it remained higher in model 4 after controlling for the specific police beats where force occurred.**

Looking at injuries resulting from use of force (see Table 26 from main report), **Black subjects were about 50%** *less likely* **to experience a major injury than White subjects** following a use of force encounter with CPD. Hispanic subjects also were less likely than Whites to be injured, but those results were not statistically significant, meaning they could be the result of chance.

Officer-specific use of force estimates (see Figure 13 from main report) show that while maximum force levels followed a typical distribution, a small number of incidents exhibited unusually high *total* force scores. These high-scoring incidents, primarily related to domestic disturbances involving mental health issues, involved only four officers. *However, after accounting for situational factors, there were no distinct group of officers identified as consistently using excessive force and unusual outliers.* The analysis also found that the prevalence of injuries by race and ethnic groups was not driven by specific outlier officers (see Table 26 from main report).

Beat-Level Results
This report includes a set of analyses that examines how much the characteristics of specific police beats account for racial and ethnic disparities in the reported use of force, and they assess the contribution of outlier beats to overall rates of force in Chicago and by race/ethnic group.

A comparison across models reveals that the rate of force decreases across all racial groups (Black, Hispanic, and White) as more beat-level factors are considered in the models. The estimated number of use of force events dropped by 25% for Black individuals, 37% for Hispanic individuals, and 46% for White individuals after accounting for beat-level factors. **Higher arrest volume consistently emerges as the most significant predictor of force rates across all groups but especially for Black subjects.** This highlights the critical role of arrest rates in influencing the likelihood of police use of force in high crime neighborhoods that experience high rates of arrest. One reason for this vast inequality in crime and arrest rates in general by location in Chicago is that there are simply no areas where White subjects have comparable levels of arrest, suspect descriptions, and reported crime to Black subjects.