

DATA-412/612

COMPARATIVE ANALYSIS OF
POLICE USE OF FORCE DATA IN
AMERICAN CITIES IN 2020

KAYLHAN, PHOEBE,
ADAM

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NATIONAL DATA

Making Sense of Unofficial Deadly Force Data

Justin Nix, PhD, School of Criminology and Criminal Justice, University of Nebraska Omaha

As part of the Violent Crime Control and Law Enforcement Act of 1994, Congress obligated the Attorney General to “acquire data about the use of excessive force by law enforcement officers,” and “publish an annual summary of the data acquired” (see [34 U.S.C. § 12602](#)).

“It’s a huge mess, there’s no question about it,” said Matthew Hickman, a Seattle University professor who worked as a BJS statistician in the early 2000s. “There’s no regulation at the national level. We’ve got 18,000 police departments and they can each do whatever the hell they want.”



The prevalence of fatal police shootings by U.S. police, 2015–2016: Patterns and answers from a new data set

SCATTERED INDIVIDUAL REPORTS

Report: Use of force by Seattle police at all-time low, but racial disparities cloud numbers

April 12, 2022 at 7:18 pm | Updated April 13, 2022 at 3:52 pm



Government of the District of Columbia
Police Complaints Board
Office of Police Complaints



Report on Use of Force by the
Washington, D.C.
Metropolitan Police Department
2020

PPB Force Analysis Summary Report
Q3 2023
July 01 - September 30, 2023



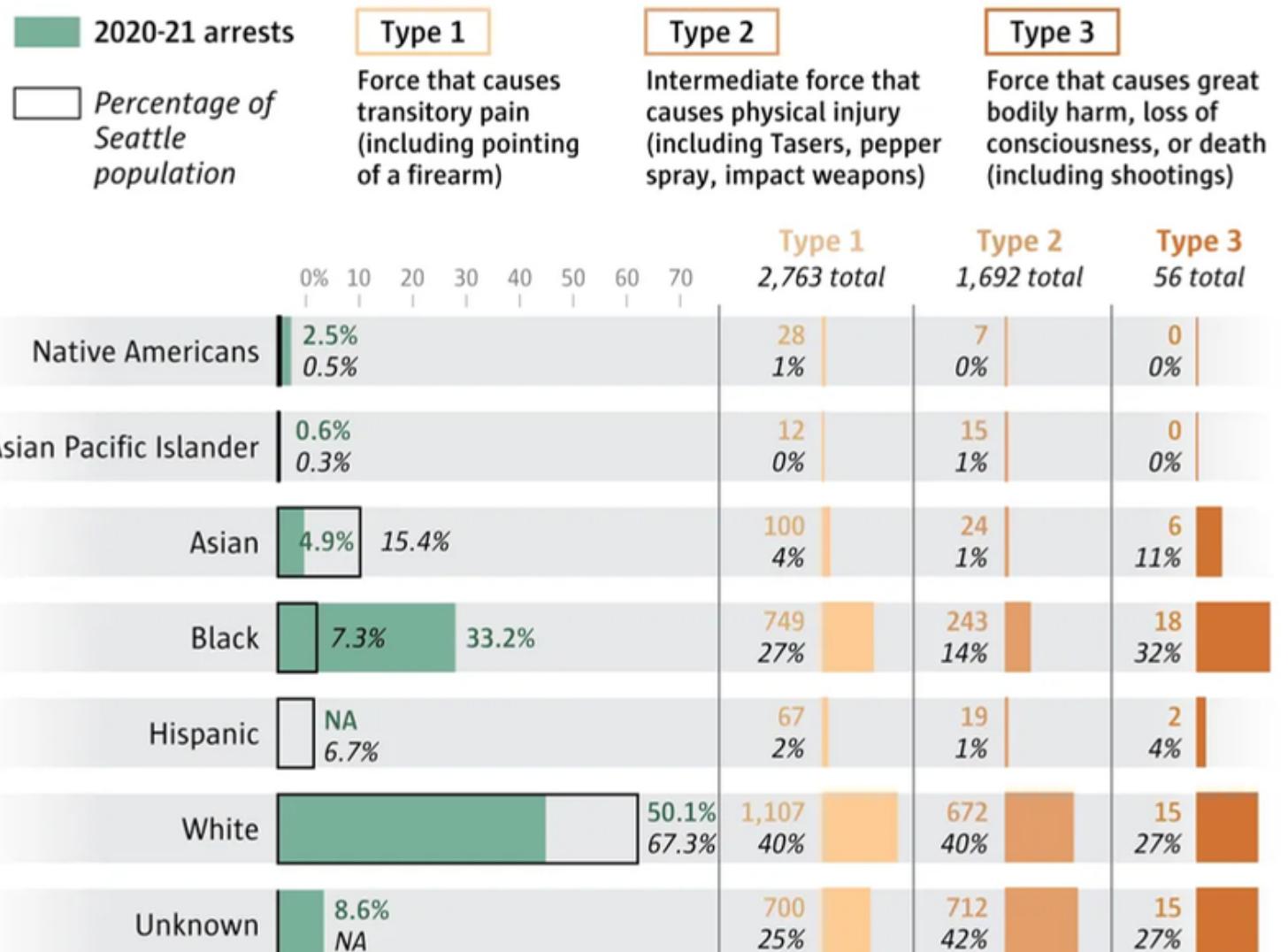
Prepared by
Office of the Inspector General
October 2023



UNIFYING THE DATA

SPD use of force by race

While overall use-of-force incidents involving Seattle police declined in 2021, Black people continue to be disproportionately targeted in all types of force by police.



Note: 2019 arrest data is incomplete.
Source: Seattle Police Monitor

EMILY M. ENG / THE SEATTLE TIMES

serious

An indicator that the incident is a serious use of force- actions by members including:

- All firearm discharges by a member with the exception of range and training incidents, and discharges at animals;
- All uses of force by a member resulting in a serious physical injury;
- All head strikes with an impact weapon;
- All uses of force by a member resulting in a loss of consciousness, or that create a substantial risk of death, serious disfigurement, disability or impairment of the functioning of any body part or organ;
- All incidents where a person receives a bite from an MPD canine;
- All uses of force by an MPD member involving the use of neck restraints or techniques intended to restrict a subject's

1 or 0, indicating whether the incident is a serious use of force or NULL if case is still open

1.5. Category IV:

1.5.1. All member use of force that is intended to establish control of a resistant person, though not reasonably likely to cause persistent pain or physical injury. Category IV force includes, but is not limited to:

1.5.1.1. Takedown performed in a completely controlled manner where there is minimal resistance and no injury;

1.5.1.2. Handcuffing against resistance or control against resistance;

1.5.1.3. Pointing of a firearm;

1.5.1.4. Use of hobble restraint; and

1.5.1.5. Boxing-In maneuver as a vehicle intervention strategy, except static box-ins where there is no injury and no complaint of injury.

1.5.2. Category IV Review.

1.5.2.1. The use of force After Action report shall be reviewed through the chain of command, up to and including the Sergeant's immediate supervisor.

INITIAL HYPOTHESIS

We hypothesize that Black people/African Americans are overrepresented in use of force cases in Washington, DC.

DATA DRIVEN HYPOTHESES:

Our data exploration shows us that Black/African American community members in DC are subject to a disproportionate amount of force, as compared to white community members in DC.

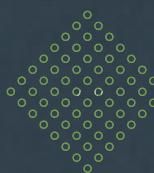
BEFORE PRESENTING THE DATA

- We also collected the use of force data from Seattle, Indianapolis, and Portland to compare and contrast each trends.
- All of the data focused on the incidents occurred in 2020.
- We focused on the seriousness of the incident relation to the subject race.

WASHINGTON, DC FACTS

Something to note before we dive into the EDA...

- the population of Seattle according to the U.S. Census is 712,816 (2020)
- 46.2% are White
- 45% are Black
- 4.7% are Asian
- 11.7% are Hispanic or Latino origin
- 37.5% are White alone, not Hispanic or Latino origin
- Nicknamed “Chocolate City” due to the high counts of Black/African Americans

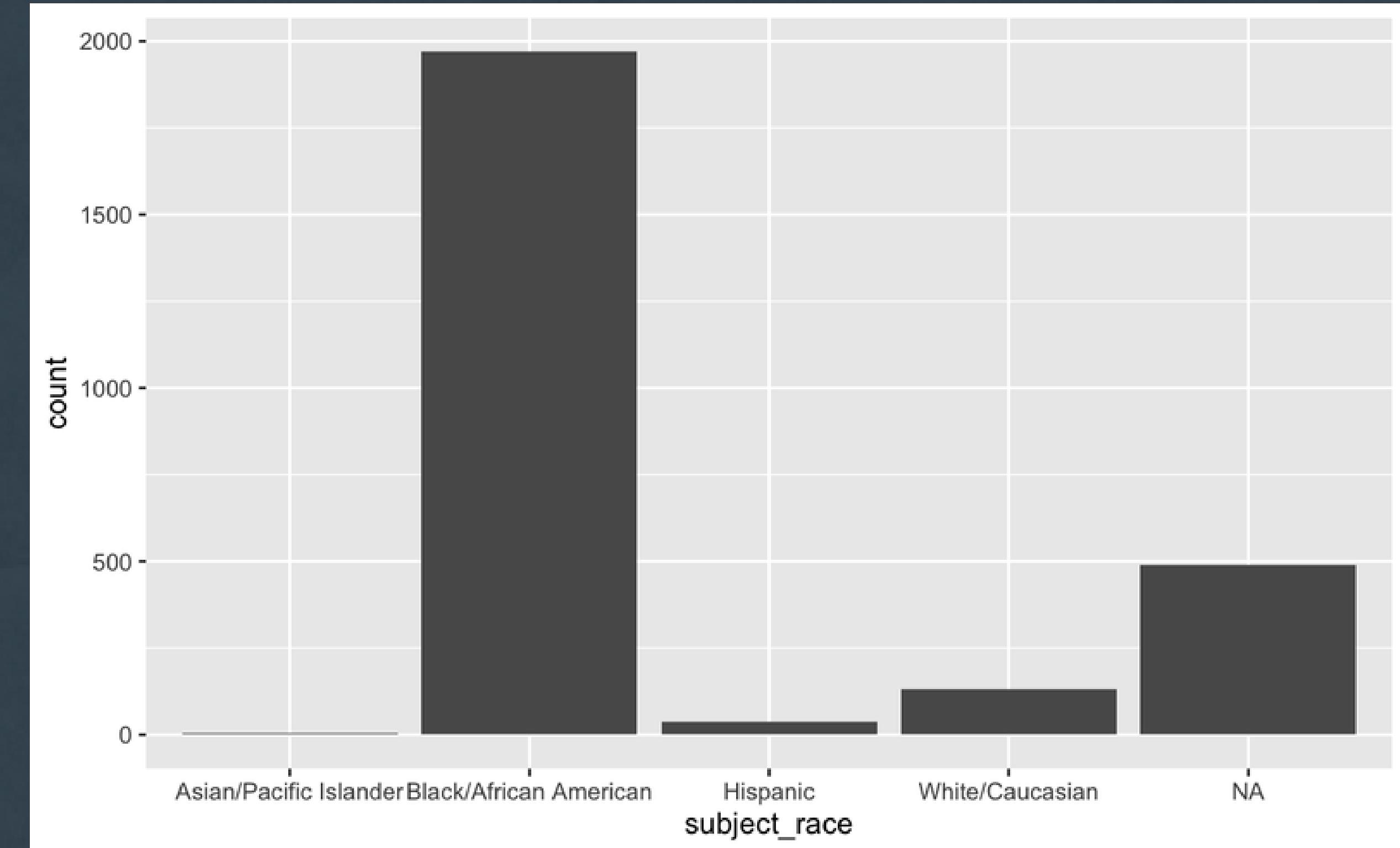


WASHINGTON, DC EDA

Distribution of Incident Counts by Subject Race

Black/ African American have a significantly higher amount of incident counts in 2020.

Conversely, Asian/Pacific Islander individuals appear to experience the least instances of use of force.

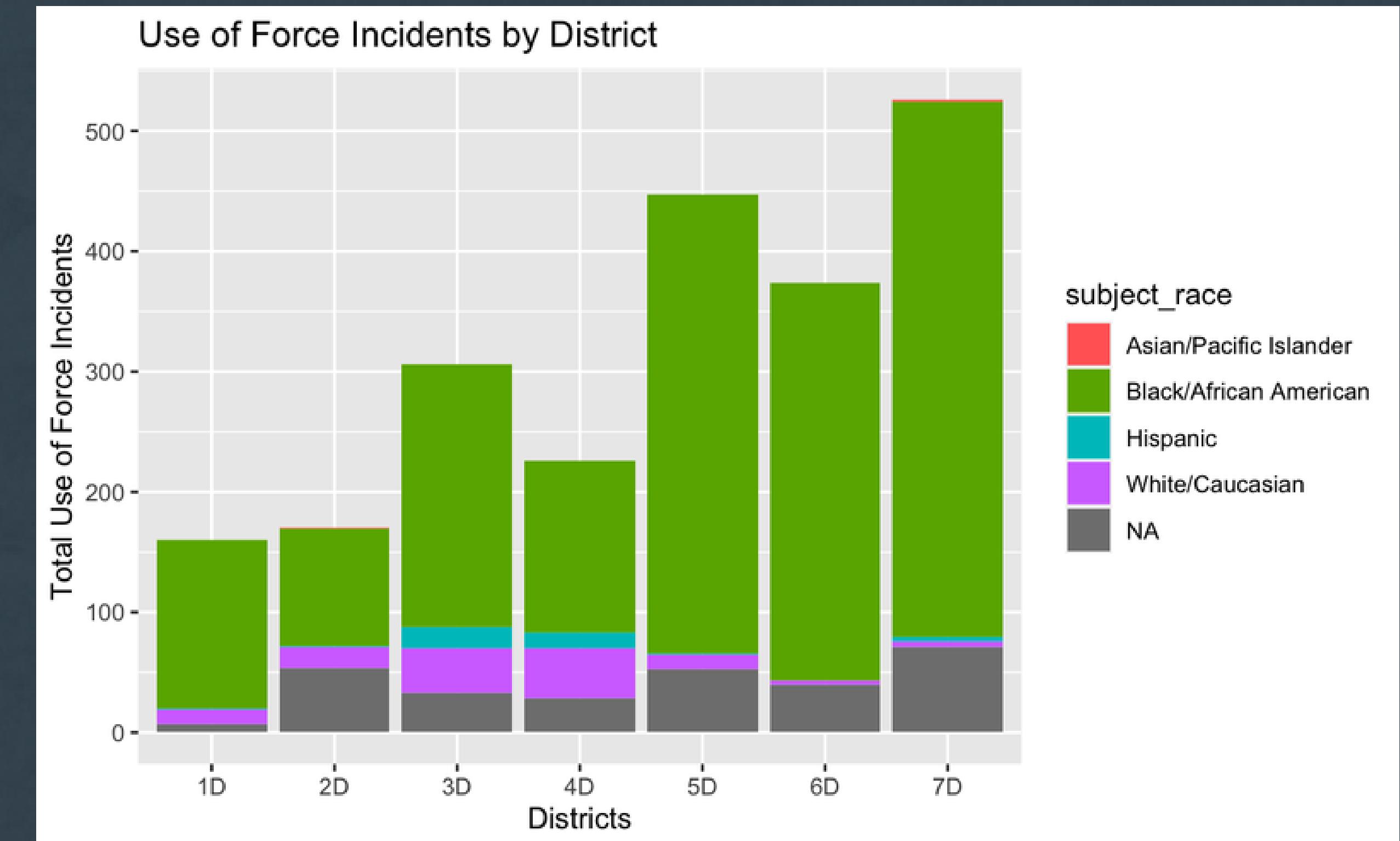


WASHINGTON, DC EDA

UOF Incident Counts by District and Subject Race

Across all districts in DC, it is prevalent that Black/African Americans experience UOF at a higher rate than their counterparts.

7th District has the highest total UOF incidents out of all the DC districts.

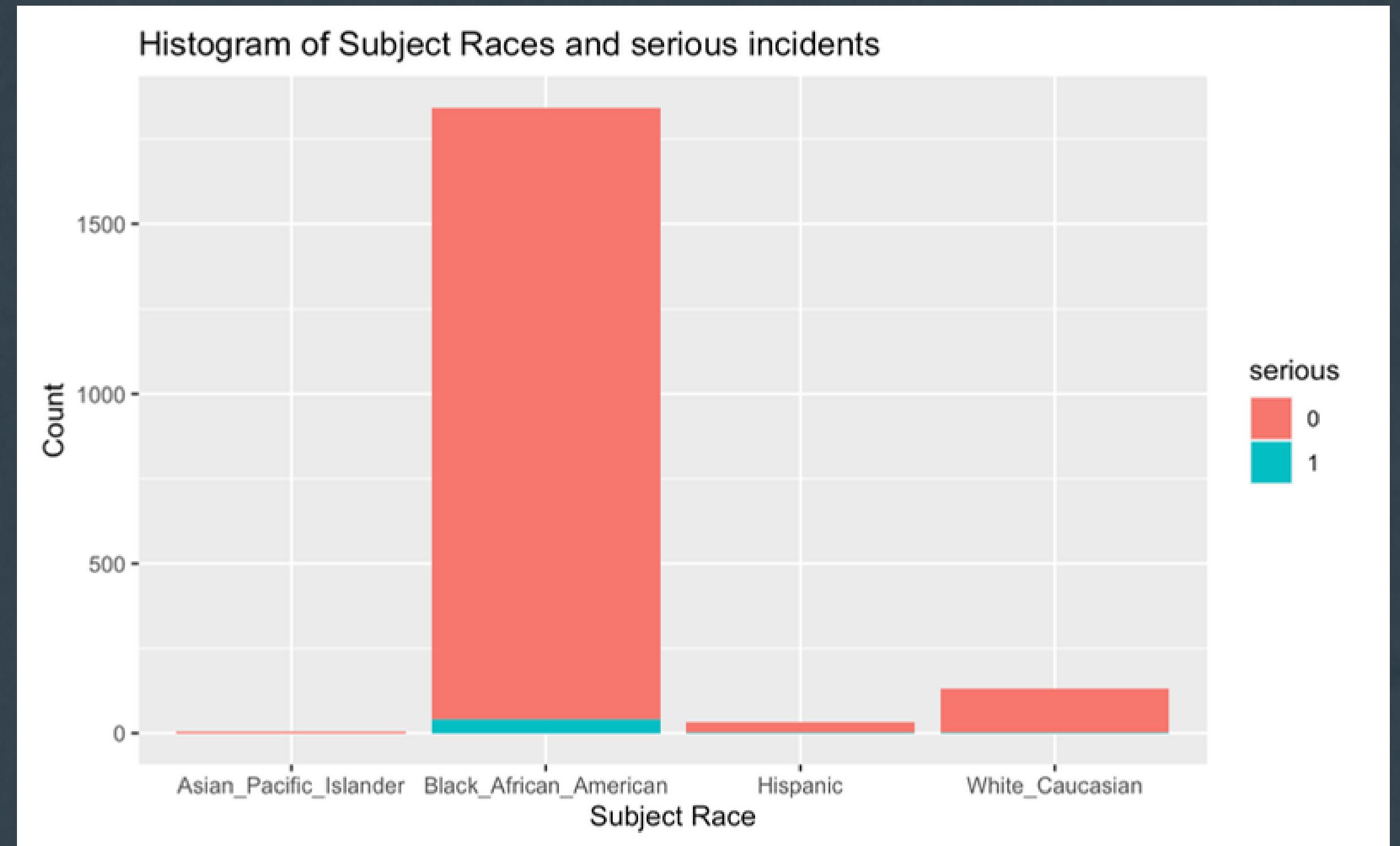


WASHINGTON, DC EDA

Distribution of Incident Types by Subject Race

The counts of the “Black African American” stands out the most compared to other three categories.

Most cases are non-serious incidents. There’s less than 200 counts of serious incidents under “Black African American”

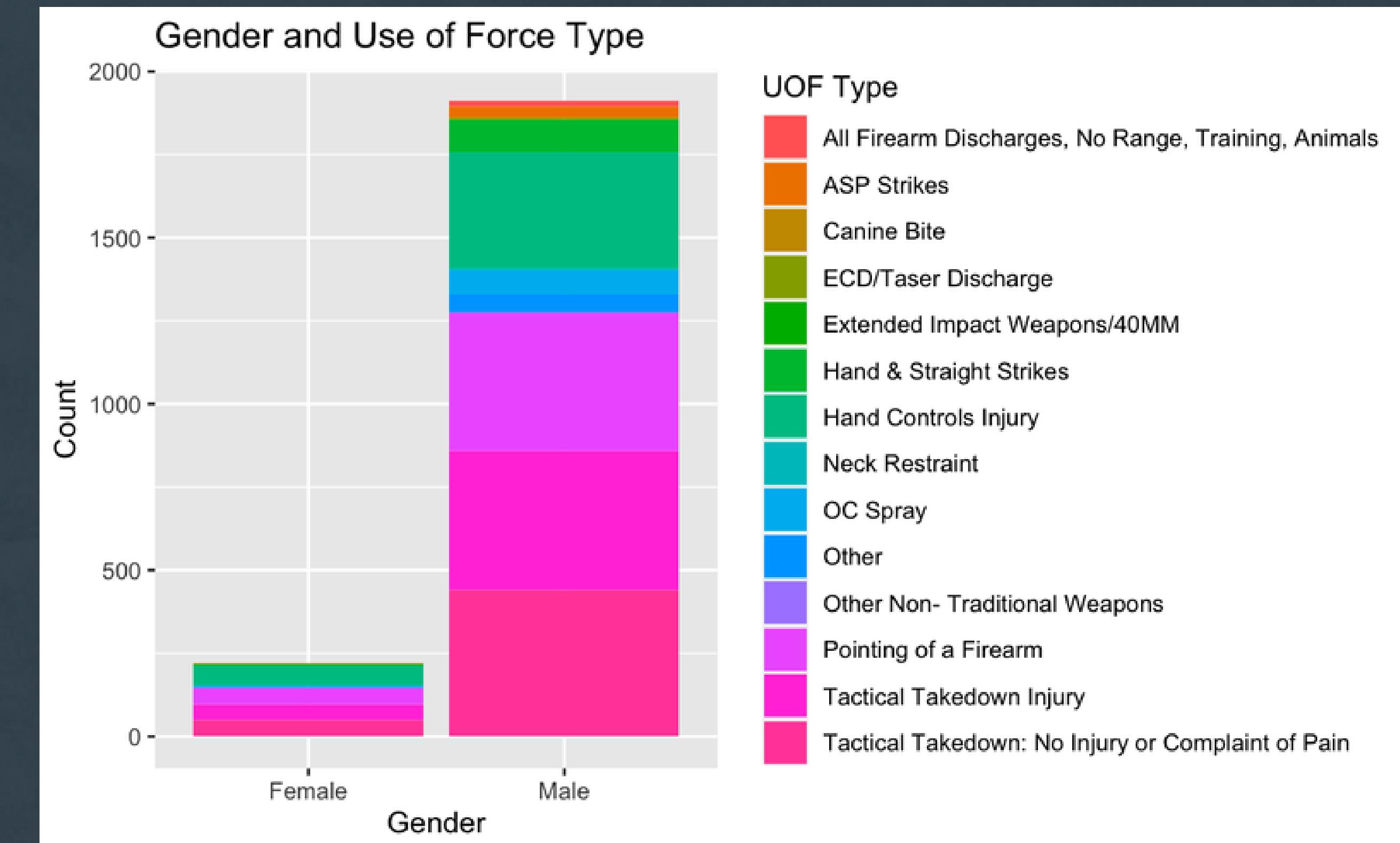


WASHINGTON, DC EDA

Gender and Use of Force Type

Females experience less or have little-to-know contact with law enforcement compared to their male counterparts.

Females do not experience a range of different UOF tactics, unlike male persons who may go through a diverse range of UOF tactics.



WASHINGTON, DC EDA

Key findings from our EDA



Although there were not many serious cases of UOF, there is an overwhelming amount of ‘not-so-serious’ UOF across all races. Though Black/African Americans experience a great amount of use of force.

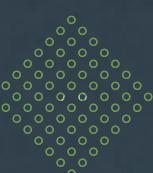
The 7th district is known to have a large population of Black/African Americans. The 7th is the leading statistic of high counts of UOF incidents by district.

Across all districts in DC, Black/African Americans are the most prevalent group in the MPD UOF data in 2020. One may say that this could be not unusual due to this population being one of the leading races statistically in DC. However, whites make up 1.6% more than the Black population, yet experience far less UOF conducted by MPD.

SEATTLE, WASHINGTON FACTS

Something to note before we dive into the EDA...

- the population of Seattle according to the U.S. Census is 749,256 (2022)
- 64.9% are White
- 6.8% are Black
- 16.3% are Asian
- 7.2% are Hispanic or Latino origin
- 62.2% are White alone, not Hispanic or Latino origin
- Underlying factors of the shift of Use of Force for 2020: Black Lives Matter Movement, Asian Hate Crime, and the rise of right extremism
- Many officers were abandoning the East precinct as the BLM escalated



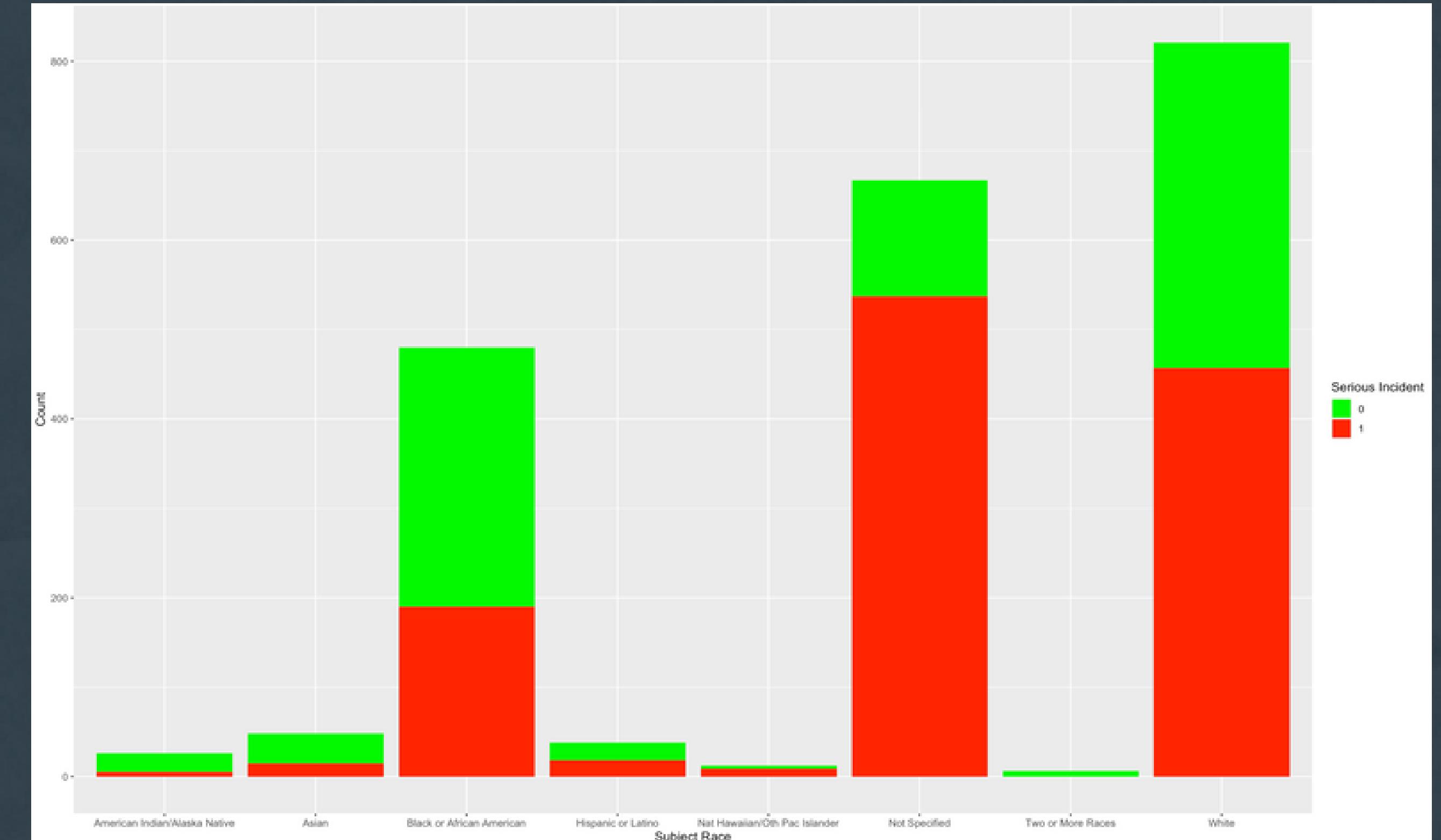
SEATTLE, WASHINGTON EDA

Distribution of Incident Types by Subject Race

There is a huge amount of ‘Not Specified’ values for this data visualization during the year 2020.

White people have a shared count amount of serious incidents regarding use of force my the police department.

The next following group that stands out is ‘Black or African American,’ with level 1 - Use of Force being greater than the other levels.

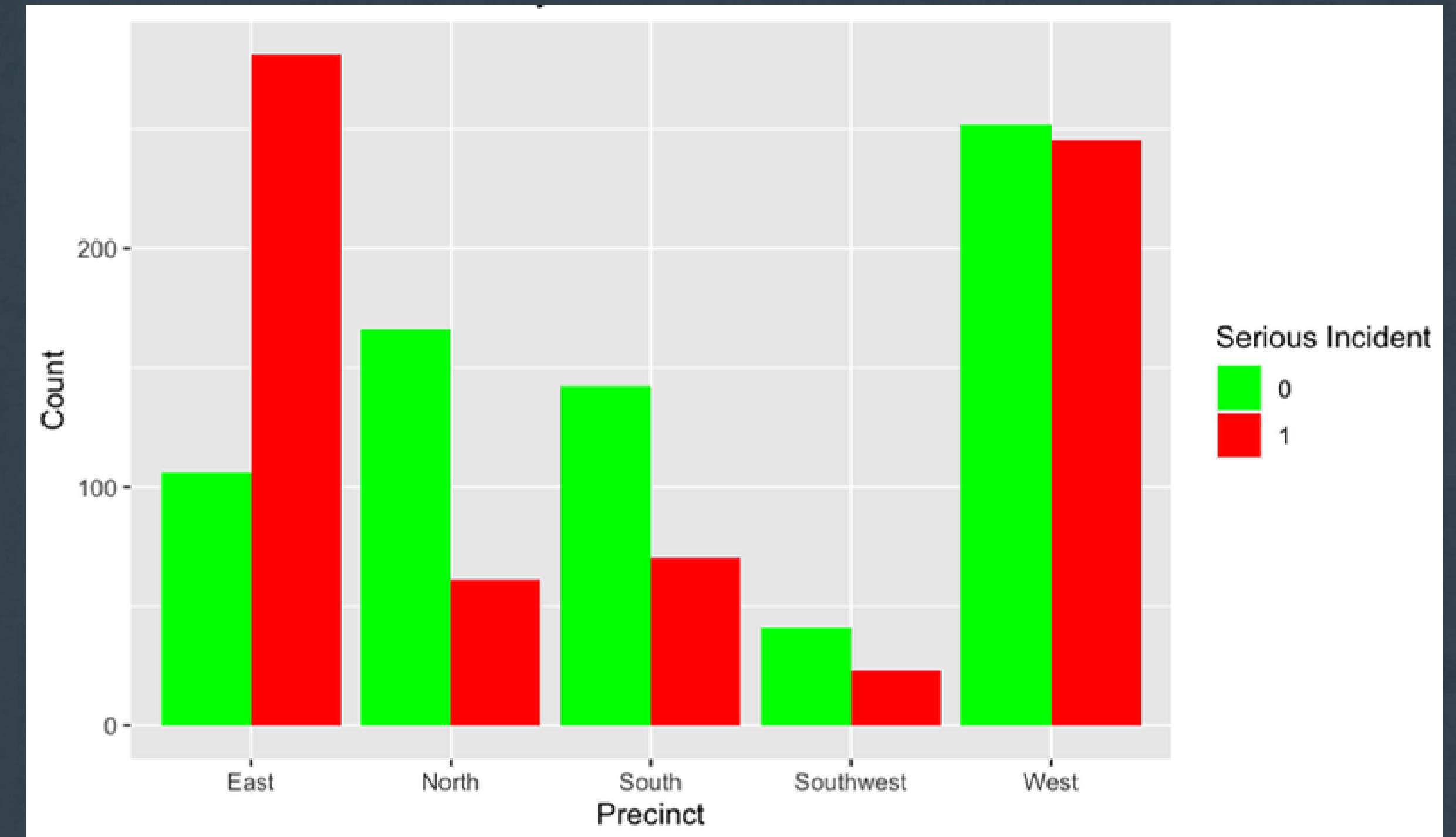


SEATTLE, WASHINGTON EDA

Comparitive Analysis: Distribution of Incidents by Precinct

The East precinct has the highest count of Level 2 and 3 (with OIS) incidents. The West has an equally shared count amount of serious incidents (all levels of UOF).

Comparatively, Southwest Seattle has the lowest counts of serious incidents.

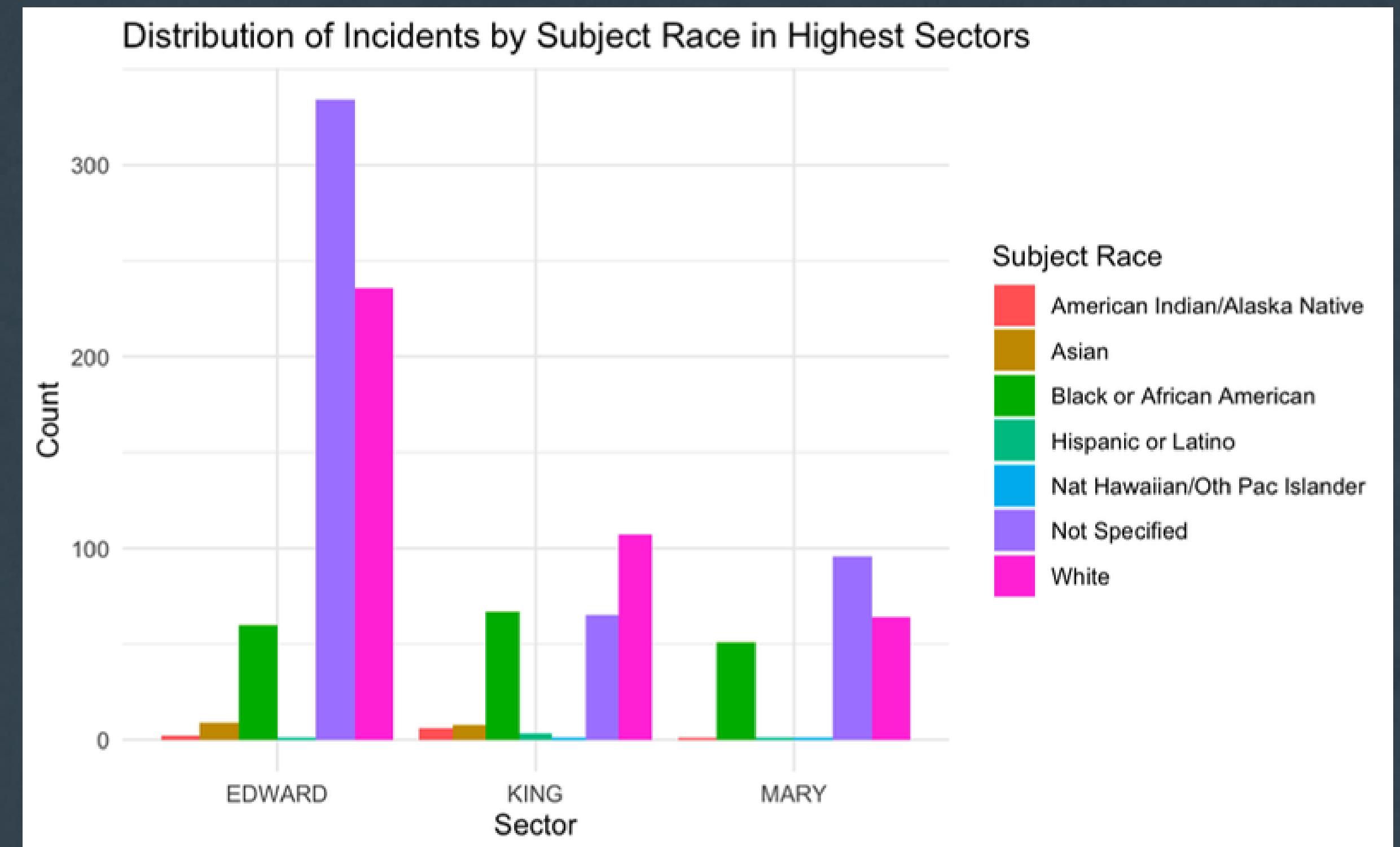


SEATTLE, WASHINGTON EDA

Comparative Analysis: Incidents by Subject Race in Highest Sectors

Edward, King, and Mary are the top three sectors in Seattle, WA that has the highest count of incidents out of the 17 recorded sectors.

There is a high amount of unreported ‘Subject Race’ across the sectors in the graph.

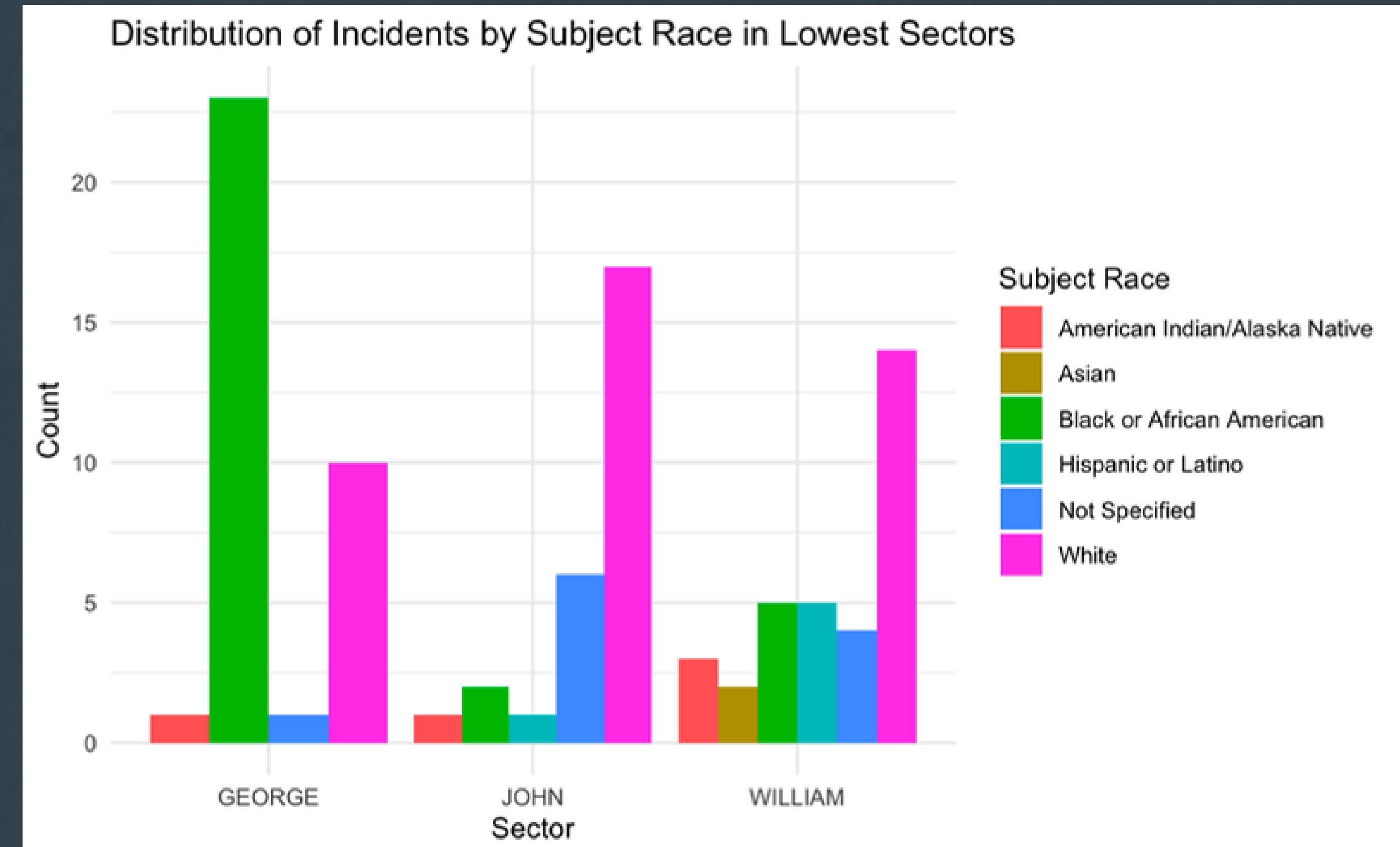


SEATTLE, WASHINGTON EDA

Comparative Analysis: Incidents by Subject Race in Lowest Sectors

George, John, and William are the bottom three sectors in Seattle, WA that has the lowest count of incidents out of the 17 recorded sectors. There is a high amount of unreported ‘Subject Race’ across the sectors in the graph.

However, something notable to mention is that the George sector has a significantly high amount of Black or African American counts of use of force against them. George is in the East precinct and is close to E2 beat.



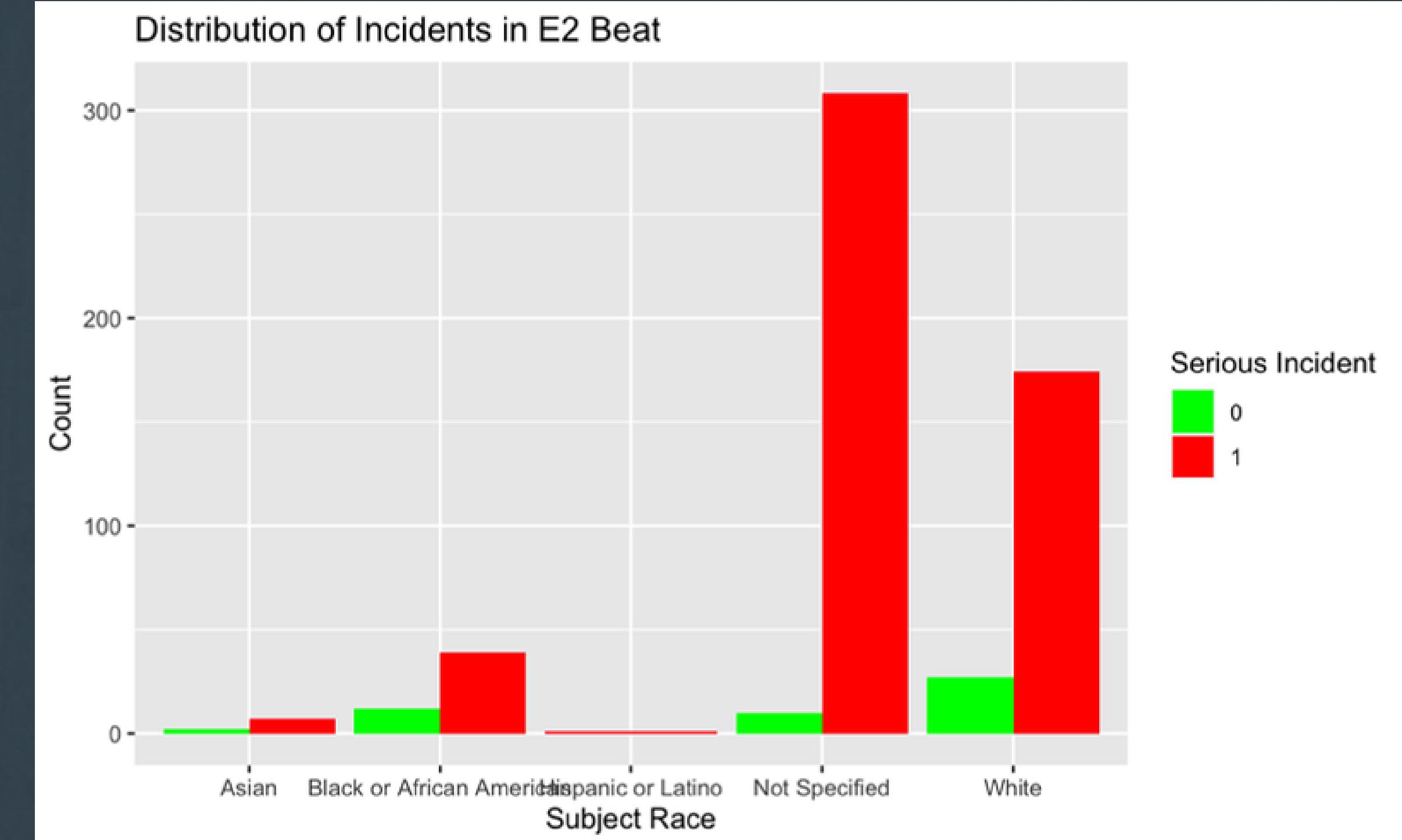
SEATTLE, WASHINGTON EDA

Comparative Analysis: Incidents in E2 by Subject Race

E2 has the highest amount of incidents across all the other beats in Seattle. There are a total of 52 beats reported in the dataset.

Many of the ‘Subject Race’ is left unreported or ‘Not Specified’ in the year 2020. The next leading race that are subjected to incidents in the E2 beat are White, then it is Black or African American.

It is notable to mention that many of the serious incidents are reported as ‘Not Specified’ in the E2 beat.



SEATTLE, WASHINGTON EDA

Key findings from our EDA



E2 has the highest amount of incidents across all the other beats in Seattle. There are a total of 52 beats reported in the dataset.

Many of the ‘Subject Race’ is left unreported or ‘Not Specified’ in the year 2020. The next leading race that are subjected to incidents in the E2 beat are White, then it is Black or African American.

It is notable to mention that many of the serious incidents are reported as ‘Not Specified’ in the E2 beat.

 E2 beat is in the East Precinct where Capitol Hill is geographically located. This is where people would go to protest, resulting in *unreported* and a high surge arrests.

INDIANAPOLIS FACTS

Something to note before we dive into the EDA...

- the population of Indianapolis according to the DATA U.S.A is 880,104 (2021)
- 52.7% are White (Non-Hispanic)
- 28.5% are Black or African American (Non-Hispanic)
- 3.82% are Asian
- 3.7% are multiracial (Non-Hispanic)

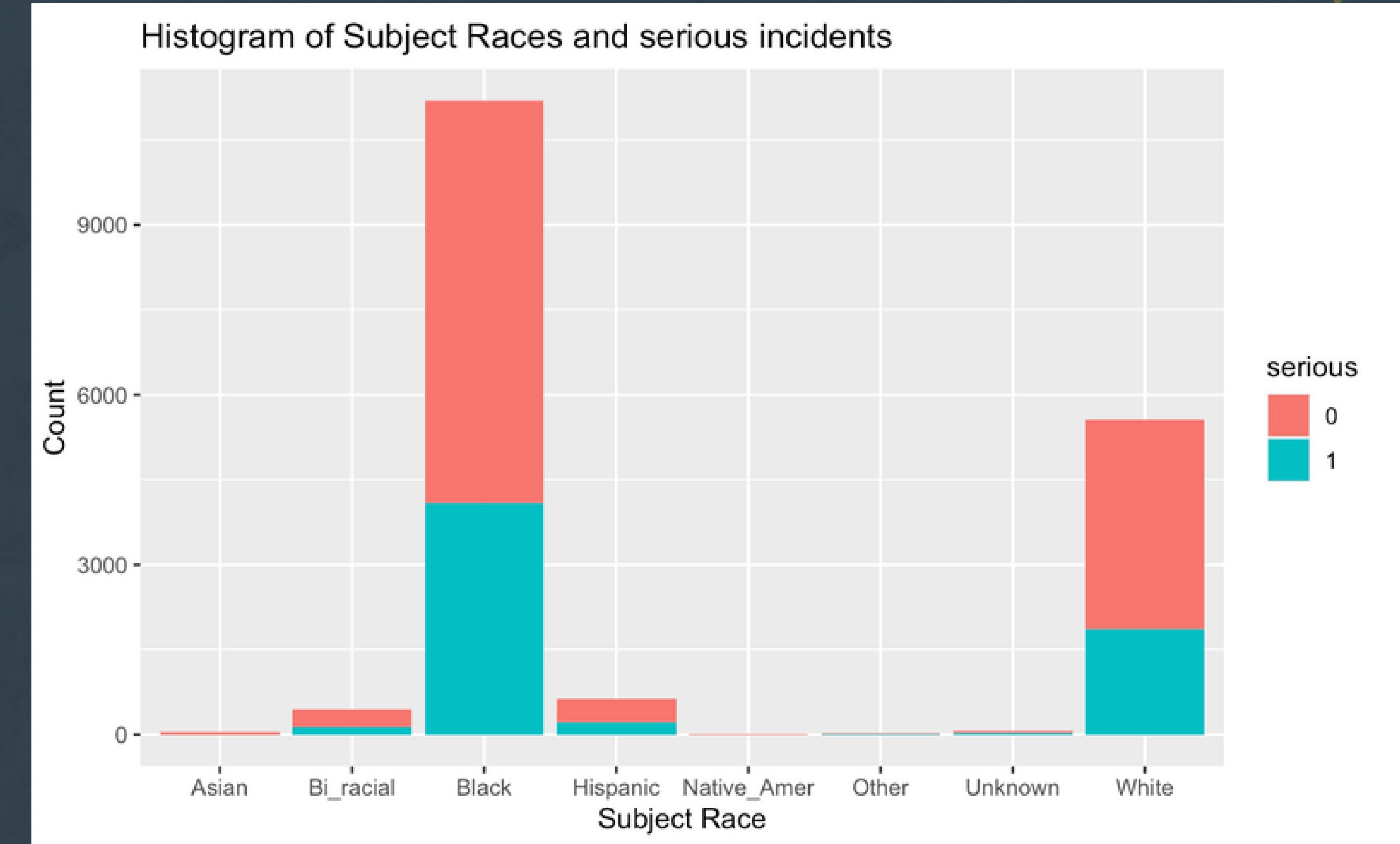


INDIANAPOLIS, INDIANA

Distribution of Incident Types by Subject Race

The 'Black' category has the highest count of both serious and non-serious incidents combined, followed by the 'White' category.

In both “White” and “Black” categories, the non-serious incidents play more significant.



INDIANAPOLIS EDA



Key findings from our EDA

The presence of an 'Unknown' category for subject race suggests that data collection may not be complete or consistently conducted across all incidents. But overall, the "Black" category shows significantly higher number of incidents compared to other races.

The seriousness of the cases seems to vary across races, but for those races with a significant number of incidents (Black and White categories), non-serious incidents outnumber serious incidents. This could indicate that while the use of force is more commonly reported as non-serious, serious use of force incidents still occur with notable frequency in these populations.

PORLAND FACTS

Something to note before we dive into the EDA...

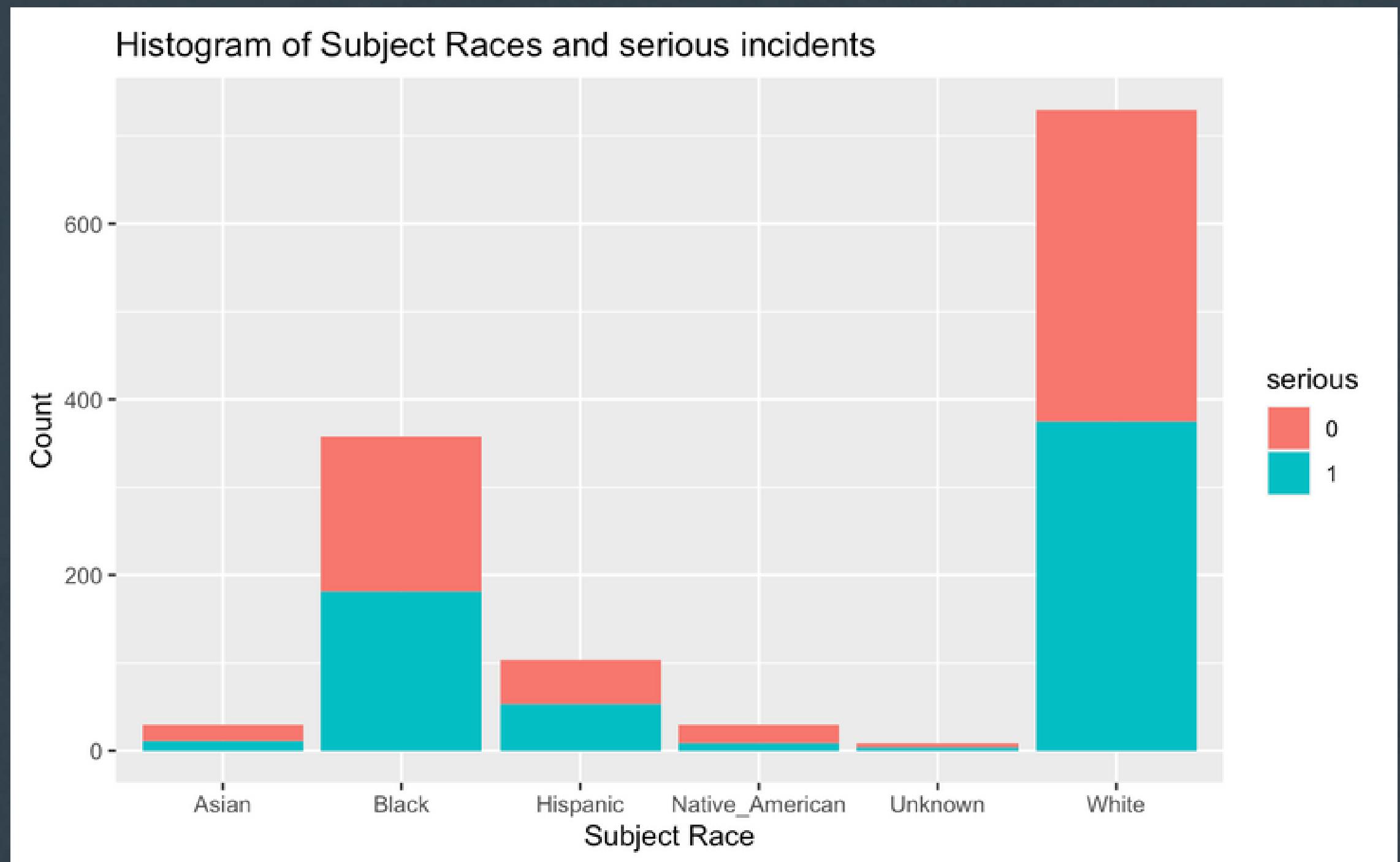
- the population of Portland according to the U.S. Census is 635,067
- 73.8% are White (Non-Hispanic)
- 5.6% are Black or African American (Non-Hispanic)
- 8.5% are Asian
- 3.7% are multiracial (Non-Hispanic)



PORLAND

Distribution of Incident Types by Subject Race

Portland proposed a more interesting outcome where the “White” category stands out with a evenly distributed counts of serious incidents.



PORTLAND EDA

Key findings from our EDA



The distribution of the plot from Portland is comparatively different from rest of the cities. This may due to the reason that the White population make up a larger proportion of the total population. (73.8%)

In the dataset, there's still data under the subject race written as “unknown”

FORMULAE

W

Seattle Police Use of Force Severity = $\alpha + \beta_1 \text{Subject Race}_1 + \beta_2 \text{Subject Gender}_2 + \beta_3 \text{Precinct}_3 + \varepsilon$

DC Police Use of Force = $\alpha + \beta_1 \text{Police District}_1 + \beta_2 \text{Officer Race}_2 + \beta_3 \text{Subject Race}_3 + \beta_4 \text{Subject Age}_4 + \beta_5 \text{Subject Gender}_5 + \varepsilon$

Portland Police Use of Force Severity = $\alpha + \beta_1 \text{Precinct}_1 + \beta_2 \text{Subject Race}_2 + \beta_3 \text{Subject Sex}_3 + \beta_4 \text{Age}_4 + \varepsilon$

Indianapolis Police Use of Force = $\alpha + \beta_1 \text{Subject Race}_1 + \beta_2 \text{Subject Sex}_2 + \beta_3 \text{Officer Race}_3 + \beta_4 \text{Officer Sex}_4 + \beta_5 \text{Subject Age}_5 + \beta_6 \text{Officer Age}_6 + \varepsilon$

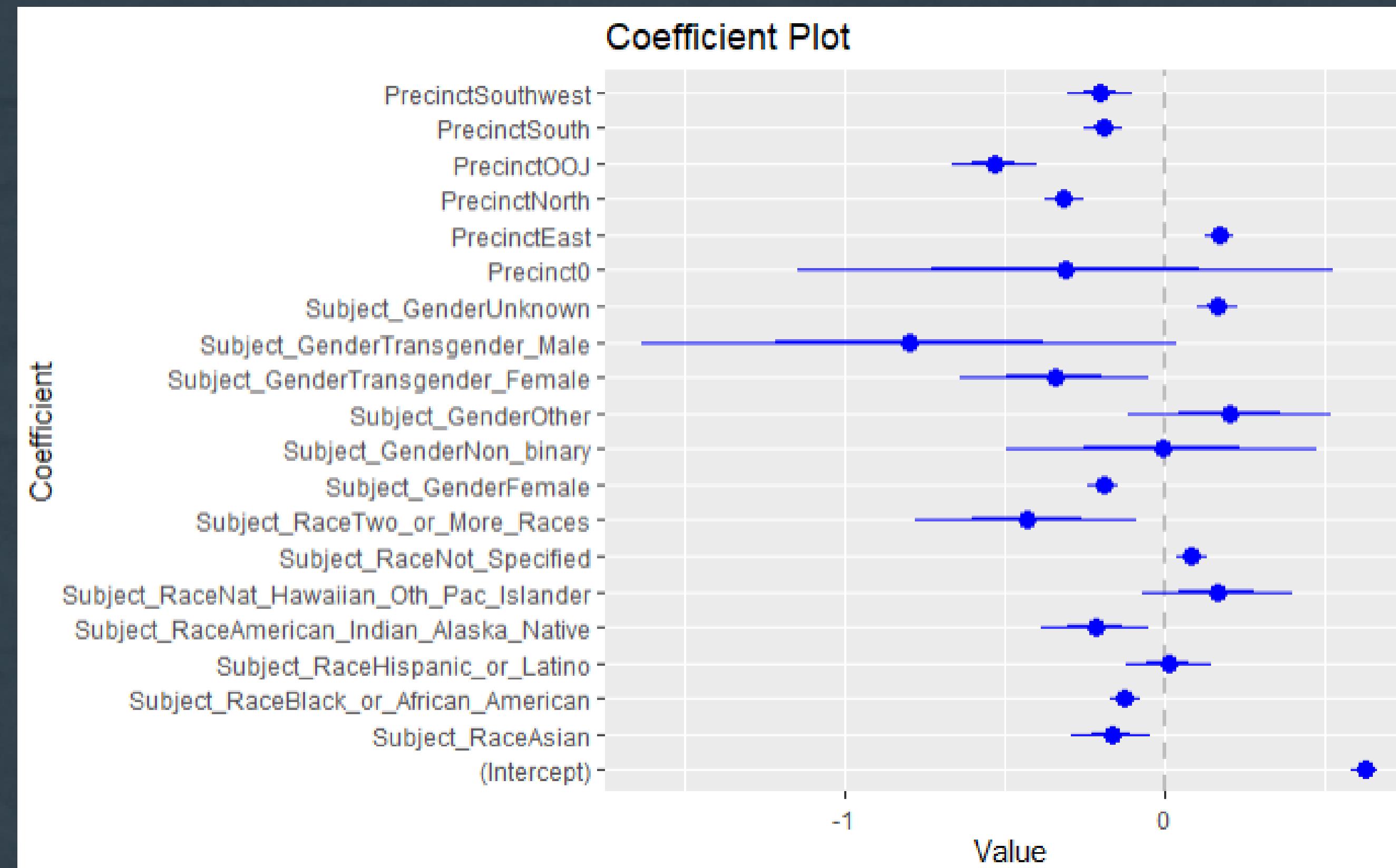
SEATTLE RESULTS

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.625230	0.020224	30.915	< 2e-16 ***
Subject_RaceAsian	-0.166947	0.062229	-2.683	0.007358 **
Subject_RaceBlack_or_African_American	-0.123328	0.023826	-5.176	2.48e-07 ***
Subject_RaceHispanic_or_Latino	0.012506	0.066177	0.189	0.850127
Subject_RaceAmerican_Indian_Alaska_Native	-0.216579	0.083953	-2.580	0.009953 **
Subject_RaceNat_Hawaiian_oth_Pac_Islander	0.164827	0.116898	1.410	0.158684
Subject_RaceNot_Specified	0.085625	0.024136	3.548	0.000397 ***
Subject_RaceTwo_or_More_Races	-0.431160	0.171830	-2.509	0.012173 *
Subject_GenderFemale	-0.190272	0.023635	-8.050	1.35e-15 ***
Subject_GenderNon_binary	-0.008613	0.241461	-0.036	0.971548
Subject_GenderOther	0.203586	0.158326	1.286	0.198629
Subject_GenderTransgender_Female	-0.343263	0.148017	-2.319	0.020485 *
Subject_GenderTransgender_Male	-0.796388	0.417466	-1.908	0.056567 .
Subject_GenderUnknown	0.166532	0.031909	5.219	1.97e-07 ***
Precinct0	-0.311631	0.417933	-0.746	0.455962
PrecinctEast	0.171159	0.022341	7.661	2.77e-14 ***
PrecinctNorth	-0.313694	0.029514	-10.629	< 2e-16 ***
Precinct00J	-0.531919	0.066854	-7.956	2.84e-15 ***
PrecinctSouth	-0.192167	0.029932	-6.420	1.67e-10 ***
PrecinctSouthwest	-0.201666	0.049937	-4.038	5.57e-05 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

SEATTLE RESULTS



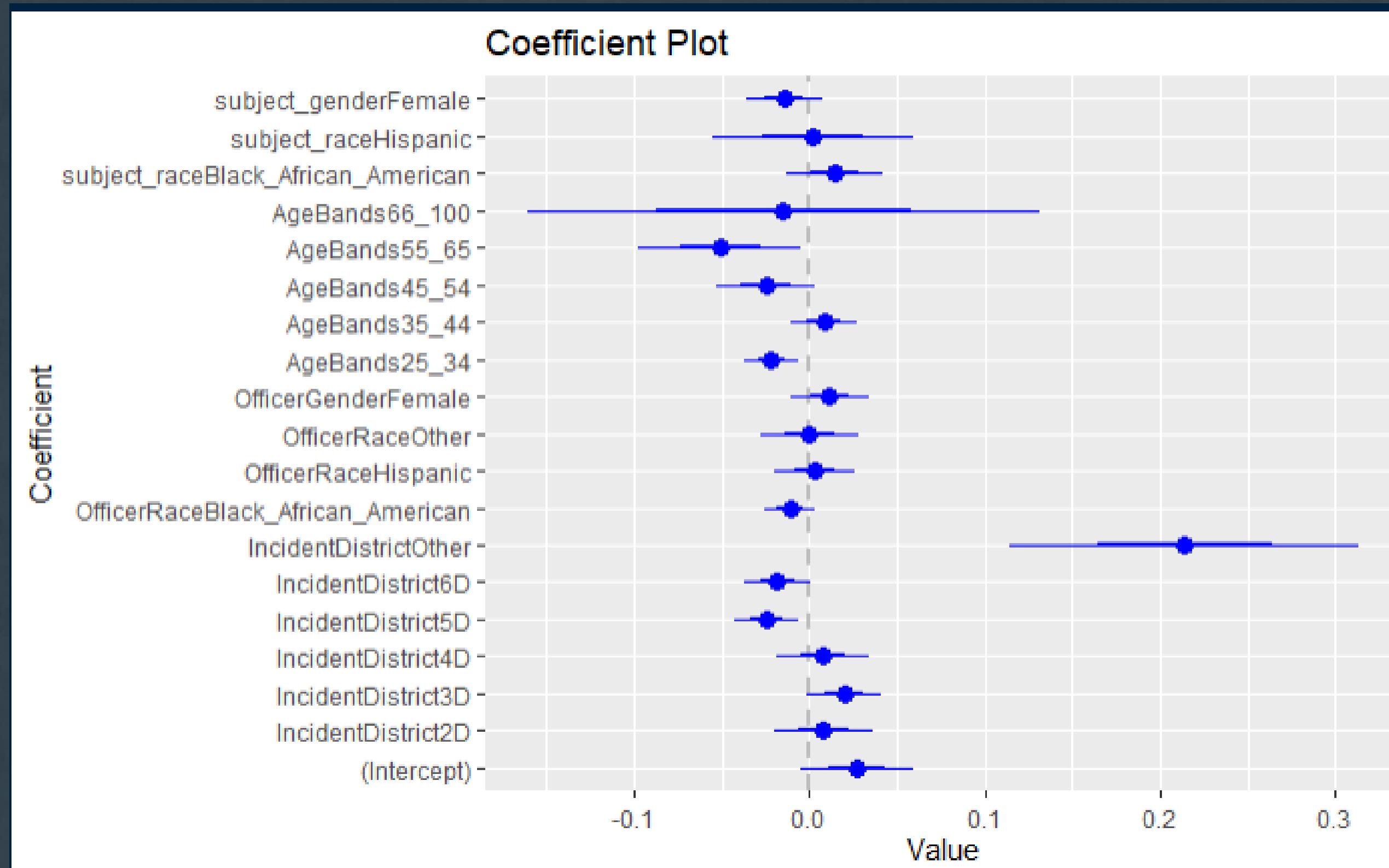
DC RESULTS

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.0268214	0.0160077	1.676	0.09399 .
IncidentDistrict2D	0.0081125	0.0140112	0.579	0.56265
IncidentDistrict3D	0.0197266	0.0104725	1.884	0.05976 .
IncidentDistrict4D	0.0076422	0.0130105	0.587	0.55701
IncidentDistrict5D	-0.0242273	0.0092516	-2.619	0.00889 **
IncidentDistrict6D	-0.0183856	0.0095872	-1.918	0.05529 .
IncidentDistrictother	0.2143488	0.0498187	4.303	1.77e-05 ***
officerRaceBlack_African_American	-0.0112253	0.0072042	-1.558	0.11935
officerRaceHispanic	0.0030355	0.0113752	0.267	0.78961
officerRaceother	0.0001299	0.0142572	0.009	0.99273
officerGenderFemale	0.0115627	0.0110954	1.042	0.29748
AgeBands25_34	-0.0215921	0.0078973	-2.734	0.00631 **
AgeBands35_44	0.0082553	0.0094316	0.875	0.38153
AgeBands45_54	-0.0250014	0.0140251	-1.783	0.07480 .
AgeBands55_65	-0.0509218	0.0232159	-2.193	0.02839 *
AgeBands66_100	-0.0149708	0.0730176	-0.205	0.83757
subject_raceBlack_African_American	0.0141636	0.0136904	1.035	0.30100
subject_raceHispanic	0.0023417	0.0286974	0.082	0.93497
subject_genderFemale	-0.0144387	0.0109316	-1.321	0.18671

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DC RESULTS



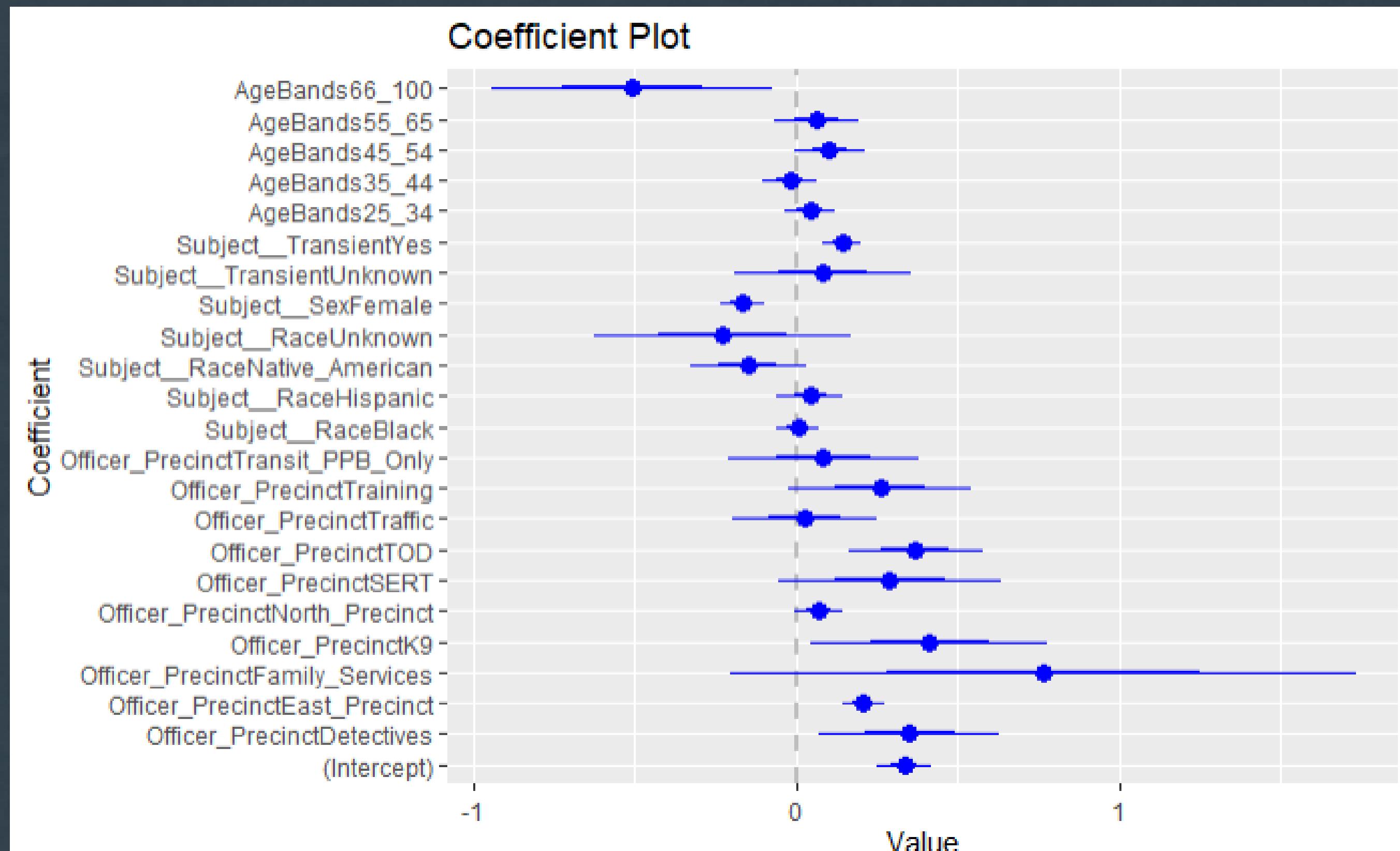
PORTLAND RESULTS

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.335347	0.042389	7.911	5.62e-15 ***
officer_PrecinctDetectives	0.352590	0.139463	2.528	0.011588 *
officer_PrecinctEast_Precinct	0.208699	0.032361	6.449	1.61e-10 ***
officer_PrecinctFamily_Services	0.766666	0.483352	1.586	0.112962
officer_PrecinctK9	0.414573	0.182990	2.266	0.023651 *
officer_PrecinctNorth_Precinct	0.071772	0.038102	1.884	0.059843 .
officer_PrecinctSERT	0.291294	0.171438	1.699	0.089548 .
officer_PrecinctTOD	0.369611	0.103819	3.560	0.000385 ***
officer_PrecinctTraffic	0.026949	0.113118	0.238	0.811738
officer_PrecinctTraining	0.260655	0.141169	1.846	0.065072 .
officer_PrecinctTransit_PPB_Only	0.086352	0.146828	0.588	0.556562
Subject_RaceBlack	0.005783	0.031373	0.184	0.853786
Subject_RaceHispanic	0.045301	0.051158	0.886	0.376049
Subject_RaceNative_American	-0.147907	0.090108	-1.641	0.100962
Subject_RaceUnknown	-0.227911	0.199360	-1.143	0.253172
Subject_SexFemale	-0.167067	0.033736	-4.952	8.36e-07 ***
Subject_TransientUnknown	0.084212	0.137525	0.612	0.540428
Subject_TransientYes	0.142413	0.028070	5.073	4.50e-07 ***
AgeBands25_34	0.043266	0.039677	1.090	0.275727
AgeBands35_44	-0.018903	0.041728	-0.453	0.650631
AgeBands45_54	0.104659	0.053594	1.953	0.051066 .
AgeBands55_65	0.065054	0.066456	0.979	0.327826
AgeBands66_100	-0.508783	0.217695	-2.337	0.019591 *

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

PORTLAND RESULTS



INDIANAPOLIS RESULTS

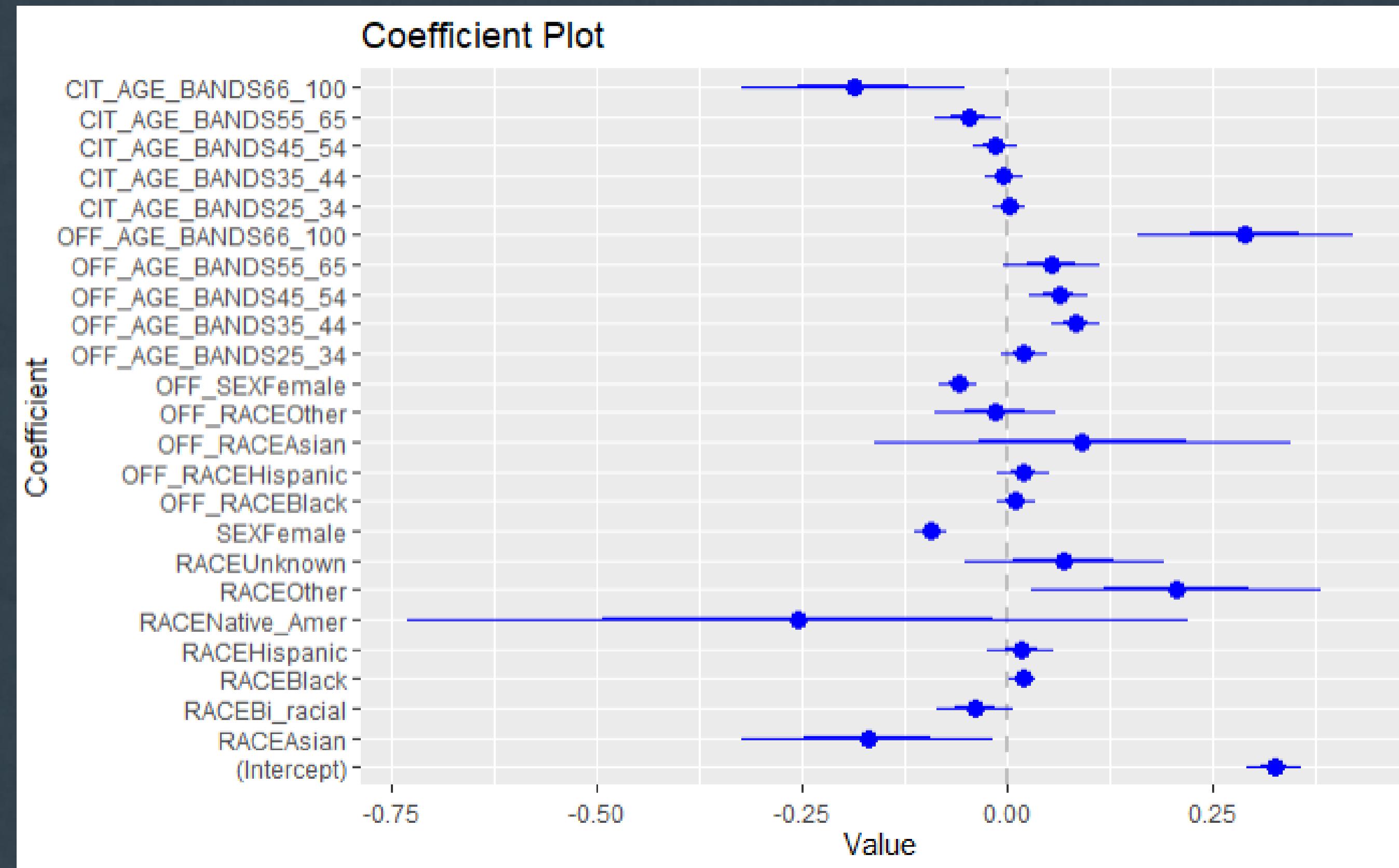
Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	0.325008	0.016310	19.927	< 2e-16	***
RACEAsian	-0.170006	0.076891	-2.211	0.027048	*
RACEBi_racial	-0.039397	0.023697	-1.662	0.096431	.
RACEBlack	0.018460	0.007953	2.321	0.020297	*
RACEHispanic	0.017079	0.020243	0.844	0.398848	
RACENative_Amer	-0.254777	0.237340	-1.073	0.283075	
RACEOther	0.205467	0.087972	2.336	0.019524	*
RACEUnknown	0.068844	0.060739	1.133	0.257045	
SEXFemale	-0.092887	0.009377	-9.905	< 2e-16	***
OFF_RACEBlack	0.010232	0.011565	0.885	0.376317	
OFF_RACEHispanic	0.019432	0.015705	1.237	0.216000	
OFF_RACEAsian	0.091843	0.127390	0.721	0.470942	
OFF_RACEOther	-0.015158	0.036509	-0.415	0.678010	
OFF_SEXFemale	-0.060023	0.011955	-5.021	5.20e-07	***
OFF AGE_BANDS25_34	0.020470	0.013896	1.473	0.140755	
OFF AGE_BANDS35_44	0.082784	0.014769	5.605	2.11e-08	***
OFF AGE_BANDS45_54	0.062503	0.017581	3.555	0.000379	***
OFF AGE_BANDS55_65	0.053472	0.029621	1.805	0.071054	.
OFF AGE_BANDS66_100	0.289811	0.065595	4.418	1.00e-05	***
CIT AGE_BANDS25_34	0.002185	0.009581	0.228	0.819571	
CIT AGE_BANDS35_44	-0.003829	0.011187	-0.342	0.732178	
CIT AGE_BANDS45_54	-0.015707	0.013607	-1.154	0.248405	
CIT AGE_BANDS55_65	-0.047737	0.020481	-2.331	0.019777	*
CIT AGE_BANDS66_100	-0.187517	0.068376	-2.742	0.006105	**

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					



INDIANAPOLIS RESULTS



DISCUSSION



What we could do to improve....

For Seattle, WA EDA, conducting a time-series analysis would be interesting to dive into the critical time periods of the demonstrations occurring during BLM. This way, we could visualize more closely if the peak months of the protests have a direct impact on the rise of 'not specified' Subject Race data.

What we could do to improve....

Making the models more comparable by reducing the number of independent variables and making the variable names consistent.