MPD Final Project Proposal

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MPD Use of Force Final Project Proposal

Introduction:

Police have existed in America in some form for nearly its entire history. Police forces themselves have their philosophical origin in Patrick Colquhoun's 1797 "Treatise on the Police of the Metropolis." These ideas first took form in London in 1829, but Colquhoun himself spent his early career as a British agent for cotton manufacturers. His conception of policing grew from his time spent enforcing slave codes and working with slave patrols in Virginia. The first hiring of police through legislative means was in Boston in 1838, but before then "police" simply referred to slave patrols. North Carolina's first state police force was formed in order to stamp out the publishing of "The Liberator," William Lloyd Garrison's weekly abolitionist newspaper, soon after he was almost killed in a mob attack in Boston in 1835. The modern American police force began and grew from these dark roots of American history.

The existing literature around racialized policing has established that Black, Hispanic and American Indian/Native Americans are disproportionately likely to be killed by police in America, especially at younger ages. One study using data from between 2013 and 2018 found that Black men are ~2.5 times more and Black women ~1.4 times more likely to be killed by police in their lifetime than white men and white women, respectively. This amounts to some 96 out of 100,000 Black men and boys, between 36 and 81 American Indian/Alaskan Native men and boys, and 53 out of 100,000 Latino men and boys being killed by police over their lifetime, as compared to about 39 out of 100,000 white men and boys being killed. The risk is substantially lower for women across all racial groups. Between 2.4 and 5.4 Black women and girls, 2.4 American Indian/Alaskan Native women and girls, and 2 Latino and white women and girls out of 100,000 are expected to be killed by police throughout their lifetime.

In the past decade, the Black Lives Matter Movement rose up in this context and caused the public to emerge as a strong force to fight for racial justice and equality in the United States. This movement sparked a conversation around the appropriate use of force by the police. The public began pushing for more transparency around the use of force, and policing general (Schwartz, 2020). That demand has been met, to an extent, and today we have detailed data on the use of force by many police departments in the US. In DC, specifically, previous research has used this research to establish that the majority of citizen-police interactions involve Black residents and these individuals were much more likely to be stopped and frisked than white residents (Golash-Boza, T. Et al, 2022).

This study focuses on data tracking the use of force in 2021 by the Metropolitan Police Department (MPD) in Washington, DC. MPD is unique in a number of ways. 51% of its officers were Black and 34% white in 2021 compared to the 46.2% of residents who are white and 45% who are Black. This makes it one of the few police forces in the US where white officers are not over represented as compared to the community. This is commonly thought of as a positive for police forces, and studies have found that when police diversity matches a neighborhood, crime rates tend to be lower.

This data includes incidents that occurred between January 1, 2021 and December 31, 2021. The use of force being defined as any form of physical effort employed to compel, sway, or convince an individual to

adhere to an officer's directive from the MPD. The reportable forces and incidents include "Any use of force resulting in injury or a complaint of injury or pain where the injury or pain is directly associated with a member's use of force" and "The drawing and pointing of a firearm at, or in the direction of, another person when no other force was used" (Metropolitan Department, 2022). The dataset contains 2135 rows and 19 variables, 14 of which are categorical variables and 5 of the others are quantitative. Variables include "IncidentDate", "IncidentTime", "IncidentDistrict", CaseStatus", "DateClose", "uof_type", "disposition", "department_action", "officer_id", "OfficerAssignment" , "OfficerGender", "OfficerRace", "year_force", "subject_age", "subject_race", "subject_gender", "serious", and "CD"(Appendix A). The dataset is largely complete, with only a few cases of missing data. This data, extracted from authoritative sources, is a rich resource for exploring the patterns, implications, and disparities in how force is applied in the nation's capital.

In our case, we will be considering the variables "IncidentDistrict," "uof_type," "IncidentDate," "Disposition," "department_action," "OfficerGender," "OfficerRace," "subject_age," "subject_race," "subject_gender," "serious," and "CD(civil disturbance)." The rest of the variables (case status, when a case closed, the anonymized officer IDs, and officer assignment) are either irrelevant or would taint our data with misleading numbers, such as the anonymized officer IDs.

Hypotheses:

We hypothesize that Black people/African Americans are overrepresented in use of force cases in Washington, DC. They represented 45% of the DC population in 2021, so if $> 45\%$ of the subjects of uses of force in our data are Black/African American, they would be over represented. We also hypothesize that white police officers are over represented in use of force cases in Washington, DC. As of 2021, 34.55% of officers were white. If the % of white officers in use of force cases $> 34.55\%$, this would indicate over-representation. This question could serve as a case study for how accurate representation of a policed community affects the policing itself.

We are particularly interested in predicting the "disposition," or how the department classified a use of force, based on the variables available to us. We hypothesize that uses of force labeled unjustified may be more common in wards like 7 and 8 that are more diverse and poorer. The location variable which is available, "IncidentDistrict," is police district rather than ward, but the police districts are roughly analogous to the wards:

- District 1 = Ward 6
- District 2 = Wards 2 & 3
- District 3 = Ward 1
- District 4 = Ward 4
- District 5 = Ward 5
- District 6 = Ward 7
- District 7 = Ward 8

We could do the same type of prediction but for a binary variable like "serious," which represents the severity of a given use of force.

Methods:

For this study, we will conduct four multiple regressions predicting the use of force in Washington, DC by the Metropolitan Police Department. Our predictors will be the police district in which the use of force took place, the date of the incident, the gender and race of the officer and the age, race, and gender of the subject. The targets will be the type of use of force, the disposition, the department action, and the severity

of the force. We won't include the other potential targets as predictors for one another because severity, for example, will likely be a very high predictor of the type of use of force, muddling our models. We will not include variables such as case status, when a case closed, the anonymized officer IDs, or officer assignments as predictors. We will remove all uses of force against animals, as we are only interested in cases involving humans.

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. We can also see that some wards see more uses of force than others, particularly wards 5, 6, and 7. Our barplot of officer race does seem to indicate that white officers use force at a higher rate than Black/African American officers, but this will require further exploration. Our previous hypotheses remain relevant. We will build multivariate multiple regression models predicting the type of force, disposition, department action, and severity of a use of force with the previously discussed variables as predictors. Given the disproportionate representation of Black/African Americans in cases of use of force, we expect subject race to be highly predictive in the model. We also expect the police district, as a proxy for ward, to be highly predictive, given the disproportionate number of cases in various districts. We also expect officer race to be predictive, but to a lesser extent than subject race. We are especially interested in this variable, given DC's unique positionality as a majority Black police force.

Discussion:

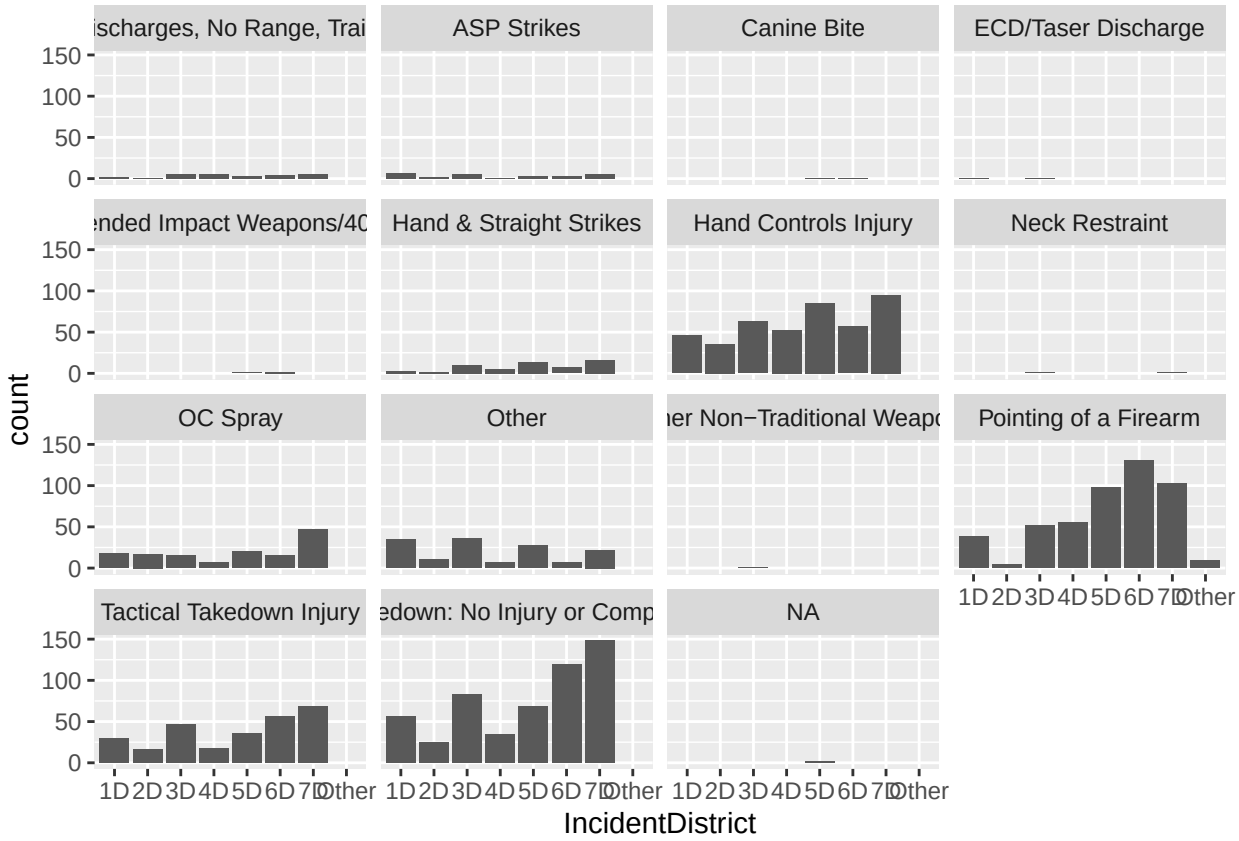
Our research fills a gap in the existing literature by exploring the use of force in DC specifically, rather than in the US as a whole or other metro areas. Other research has explored the implementation of stop and frisk in DC, but not the use of force broadly. The history of racialized policing in America is long, and its roots lay close to Washington, DC. MPD is uniquely positioned as a majority Black police department in a demographically diverse city. By exploring how and which of its officers use force, on whom, and where we may build an understanding of trends in American policing as a whole.

```
library(conflicted)
library(dplyr)
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v forcats   1.0.0     v readr     2.1.4
## v ggplot2   3.4.3     v stringr   1.5.0
## v lubridate 1.9.2     v tibble    3.2.1
## v purrr     1.0.2     v tidyr     1.3.0
```

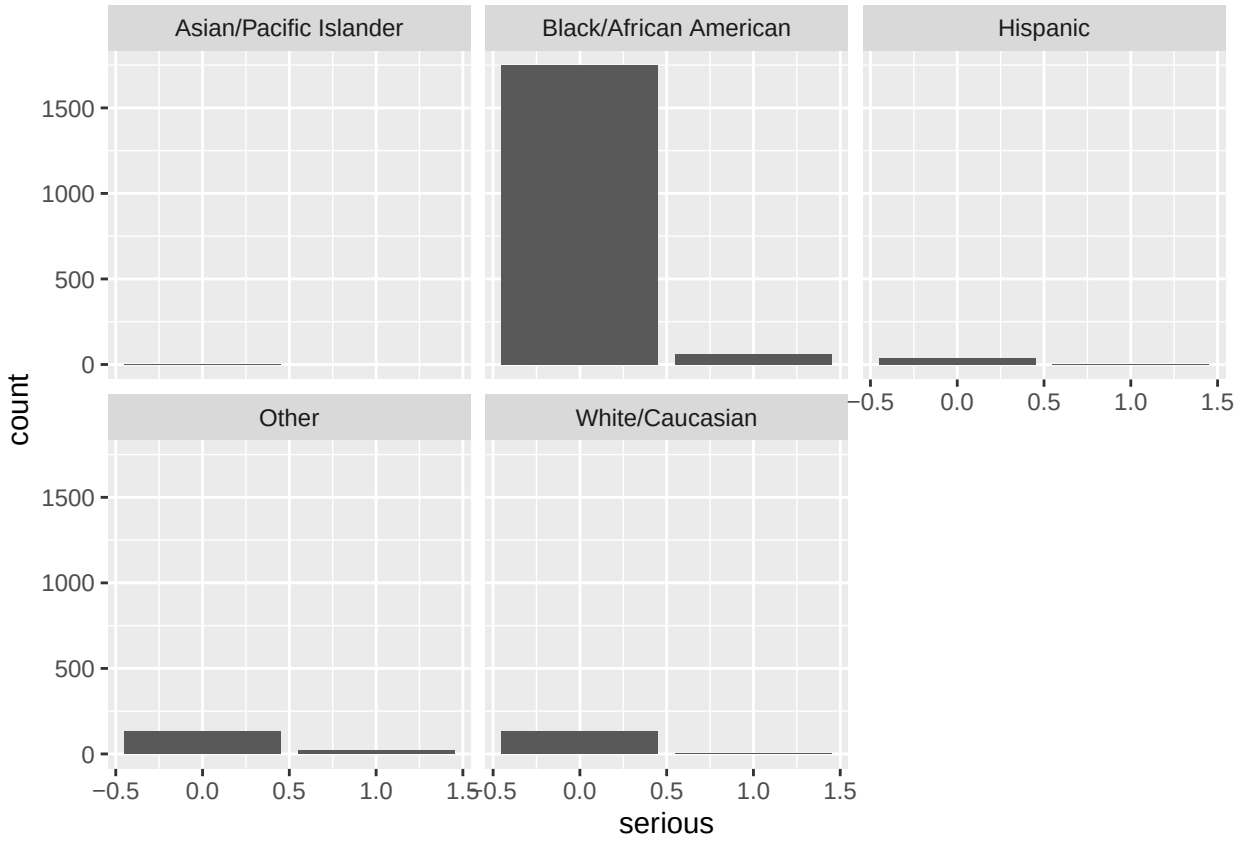
```
library(ggthemes)
library(ggplot2)
library(tibble)
# https://mpdc.dc.gov/node/1635896
df <- read.csv("UoF_mpd_2021_public.csv")
#df
```

```
mpd_dat <- read.csv('UoF_mpd_2021_public.csv')
#head(mpd_dat)
#View(mpd_dat)

ggplot(data = mpd_dat, mapping = aes(x = IncidentDistrict)) +
  geom_bar() +
    facet_wrap(~uof_type)
```



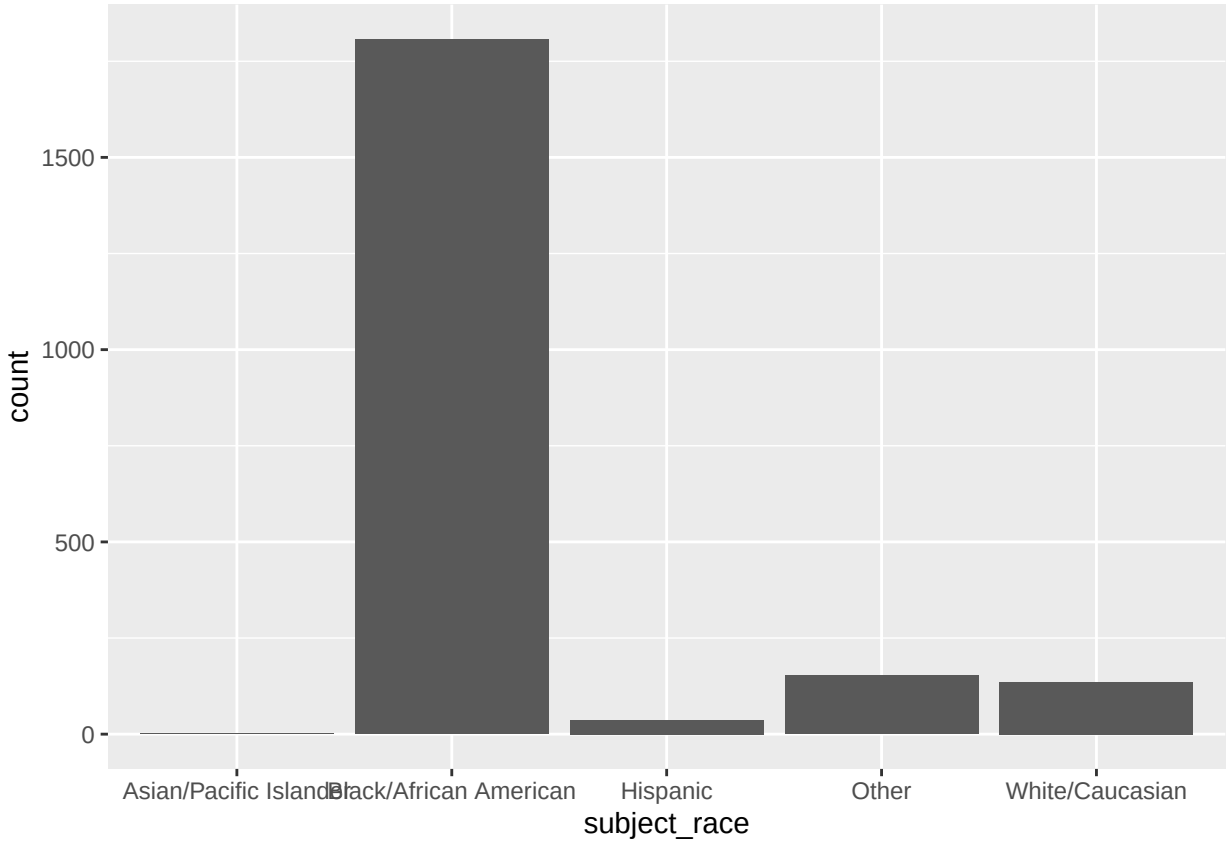
This boxplot provides an overview of use-of-force incidents across different districts, categorizing them by the specific type of force used. From the graph, it is evident that certain categories, namely "hand controls injury," "pointing of a firearm," "tactical takedown injury," and "Tactical Takedown: No Injury or Complaint of Pain," present outstanding counts. Furthermore, districts 6D and 7D stand out as having the highest incidence rates, with "Tactical Takedown: No Injury or Complaint of Pain" almost reaching 150 counts. These findings suggest that these particular districts(6D and 7D) are more prone to experiencing use-of-force incidents.

```
ggplot(data = mpd_dat, mapping = aes(x = serious)) +
  geom_bar() +
    facet_wrap(~subject_race)
```



This plot shows the proportion of serious (1) to non serious (0) uses of force for each subject race. Serious uses of force include firearm discharges, uses of force resulting in a serious injury, all head strikes with an impact weapon, uses of force resulting in unconsciousness or that create a substantial risk of death or disfigurement, canine bites, neck restraints, or uses of force which resulted in death.

```
ggplot(data = mpd_dat, mapping = aes(x = subject_race)) +
  geom_bar()
```

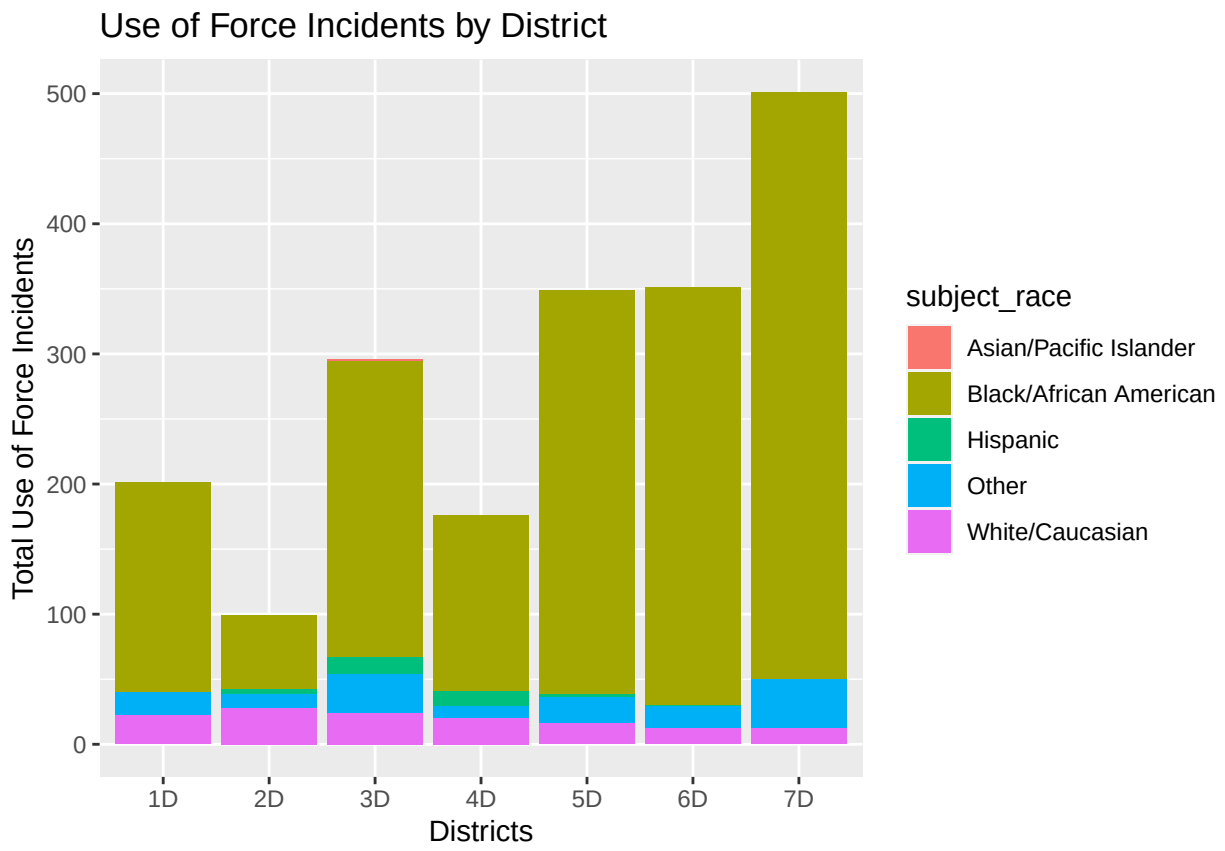


This boxplot takes subject_race as the x-axis and calculates its count as the y-axis. The data presented in the plot clearly indicates that Black/African American individuals have experienced a significantly higher number of use-of-force incidents compared to the other four racial categories. Conversely, Asian/Pacific Islander individuals appear to experience the least instances of use of force. This significant difference between each race can lead to the assumptions that Black/African American are mostly being targeted by the police.

```
force_by_district_race <- mpd_dat %>%
group_by(OfficerAssignment, subject_race) %>% summarize(Total_Use_of_Force = n()) #total num of cases o
```

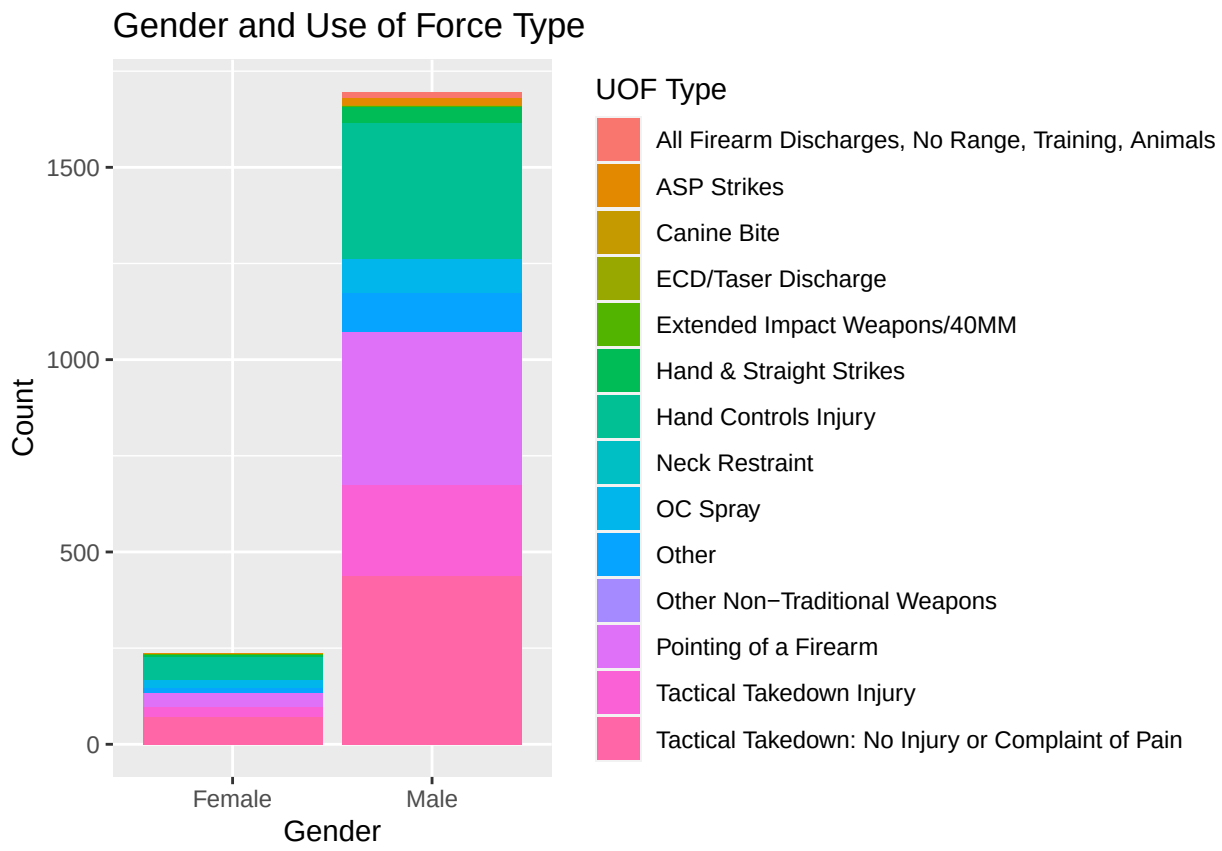
```
## `summarise()` has grouped output by 'OfficerAssignment'. You can override using
## the `.groups` argument.
```

```
ggplot(subset(force_by_district_race, OfficerAssignment %in% c("1D", "2D", "3D", "4D", "5D", "6D", "7D"
       aes(x = OfficerAssignment, y = Total_Use_of_Force, fill = subject_race)) +
  geom_bar(stat = "identity") +
  labs(title = "Use of Force Incidents by District") +
  xlab("Districts") +
  ylab("Total Use of Force Incidents")
```




```
#what dispositions are we most interested in knowing more about?
```

```
#graph for gender and uof type
mpd_dat <- mpd_dat[complete.cases(mpd_dat), ] #removed nulls

ggplot(mpd_dat, aes(x = subject_gender, fill = uof_type)) +
  geom_bar() +
  labs(title = "Gender and Use of Force Type",
       x = "Gender",
       y = "Count") +
  scale_fill_discrete(name = "UOF Type")
```



This plot shows the number of uses of force and the subject race of those uses for each police district. Based on the graph, the district of 7D occurs the most incidents of the use of force. For the overall trend, Black/African American still occurs as the significance in this case.

```
unique(mpd_dat$disposition)
```

```
## [1] "Justified - Tactical Improvement Opportunity"
## [2] "Tracking Only"
## [3] "Justified - Within Department Policy"
## [4] "Not Justified - Not Within Departmental Policy"
```

```
#rename
#Justified - tactical improvement opp -> jtip
#Justified - within department policy -> jwdp
#not justified - not within departmental policy -> njnwdp

mpd_dat$disposition <- recode(mpd_dat$disposition,
  "Justified - Tactical Improvement Opportunity" = "JTIP",
  "Tracking Only" = "Tracking",
  "Justified - Within Department Policy" = "JWDP",
  "Not Justified - Not Within Departmental Policy" = "NJNWDP",
  "NA" = "Unknown"
)
```

```r
unique(mpd_dat$disposition)
```

```
## [1] "JTIP"     "Tracking" "JWDP"     "NJNWDP"
```

This plot shows the count for each gender and uses color to indicate the different use of force type. The count of male was significant, which likely suggests that men experience the use of force more than females. At the same time, the type of "Hand & Straight Strikes", "Other non-traditional weapons", and "Tactical Takedown: No Injury or Complaint of Pain" happened the most in the incidents of the use of force.

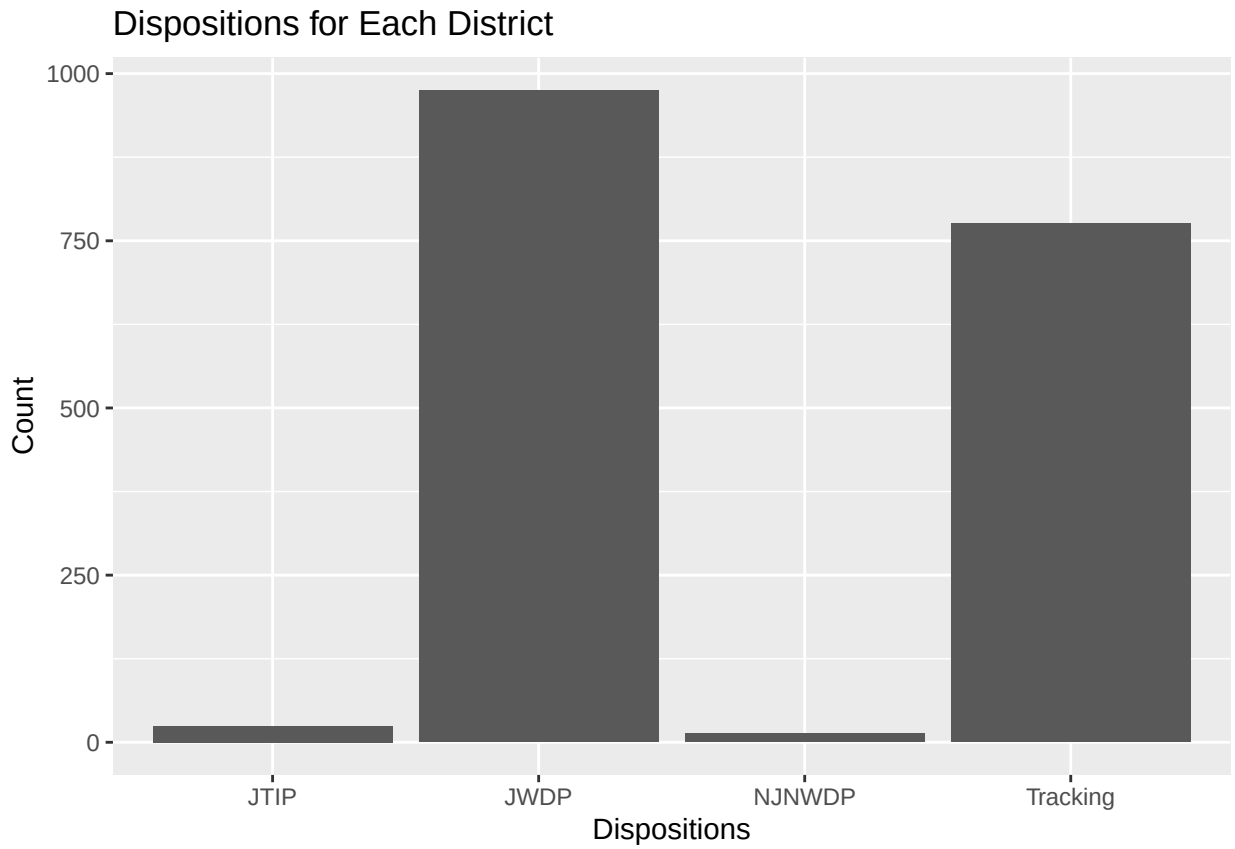
```r
unique(mpd_dat$uof_type)
```

```
##  [1] "Hand Controls Injury"
##  [2] "Hand & Straight Strikes"
##  [3] "Tactical Takedown: No Injury or Complaint of Pain"
##  [4] "Tactical Takedown Injury"
##  [5] "All Firearm Discharges, No Range, Training, Animals"
##  [6] "Pointing of a Firearm"
##  [7] "OC Spray"
##  [8] "ASP Strikes"
##  [9] "Other"
## [10] "Extended Impact Weapons/40MM"
## [11] "Canine Bite"
## [12] "ECD/Taser Discharge"
## [13] "Other Non-Traditional Weapons"
## [14] "Neck Restraint"
```

```r
unique(mpd_dat$OfficerAssignment)
```

```
##  [1] "5D"
##  [2] "6D"
##  [3] "4D"
##  [4] "1D"
##  [5] "3D"
##  [6] "7D"
##  [7] "2D"
##  [8] "School Safety Division"
##  [9] "Narcotics and Special Investigations Division/Violent Crime Suppression Division"
## [10] "Special Operations Division"
## [11] "Metropolitan Police Academy Division"
## [12] "Criminal Investigations Division"
## [13] "Strategic Change Division"
## [14] "Youth and Family Services Division"
## [15] "Administration"
```

```r
districts <- c("1D", "2D", "3D", "4D", "5D", "6D", "7D")
mpd_dat_filtered <- mpd_dat[mpd_dat$OfficerAssignment %in% districts, ]


ggplot(mpd_dat_filtered, aes(x = disposition)) +
  geom_bar() +
  labs(title = "Dispositions for Each District",
       x = "Dispositions",
       y = "Count")
```

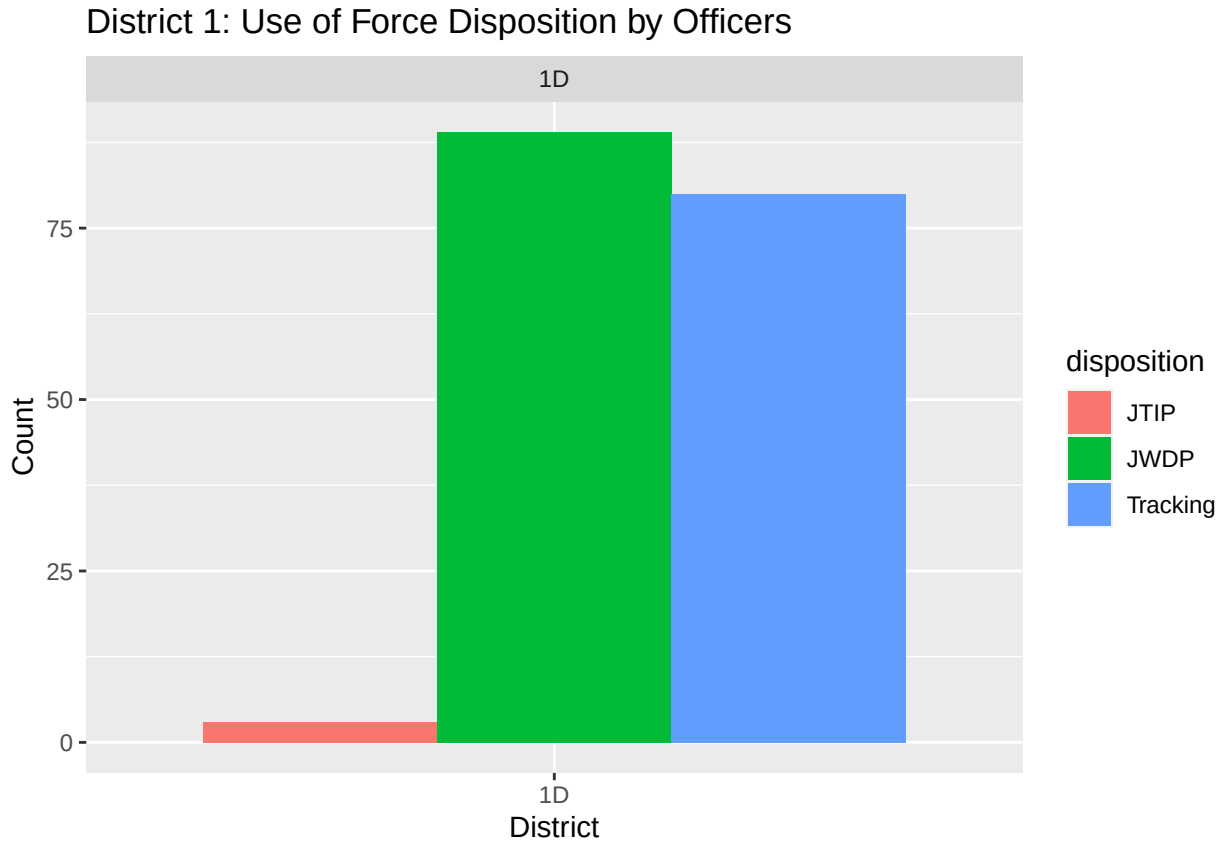



```
#df with officer assignment, disposition, officer race
officer_by_district <- mpd_dat %>%
  group_by(OfficerAssignment, disposition, OfficerRace)
```

```
summary_data <- officer_by_district %>%
  filter(OfficerAssignment %in% c("1D")) %>%
  group_by(OfficerAssignment, disposition) %>%
  summarise(count = n())
```

```
## `summarise()` has grouped output by 'OfficerAssignment'. You can override using
## the `.groups` argument.
```

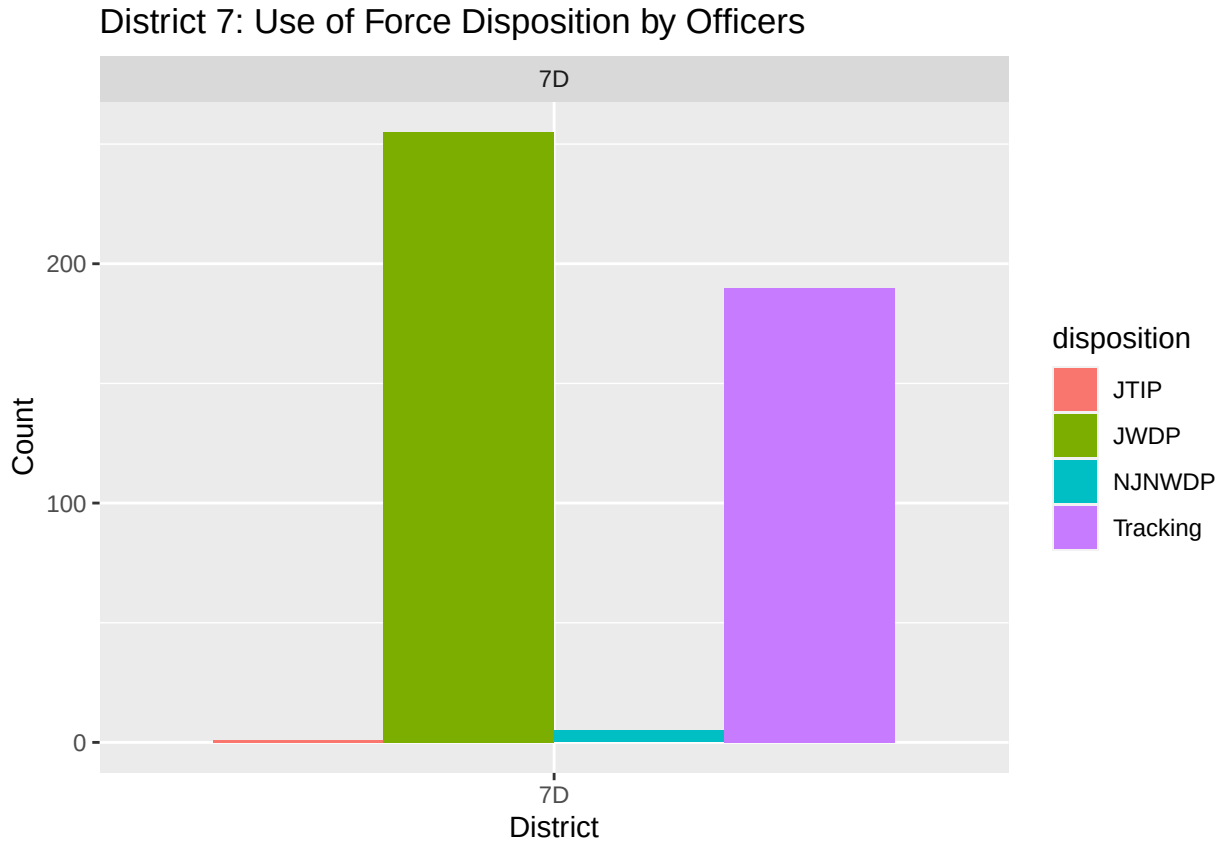
```
ggplot(summary_data, aes(x = OfficerAssignment, fill = disposition, y = count)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "District 1: Use of Force Disposition by Officers",
       x = "District",
       y = "Count") +
  facet_wrap(~OfficerAssignment, ncol = 2)
```



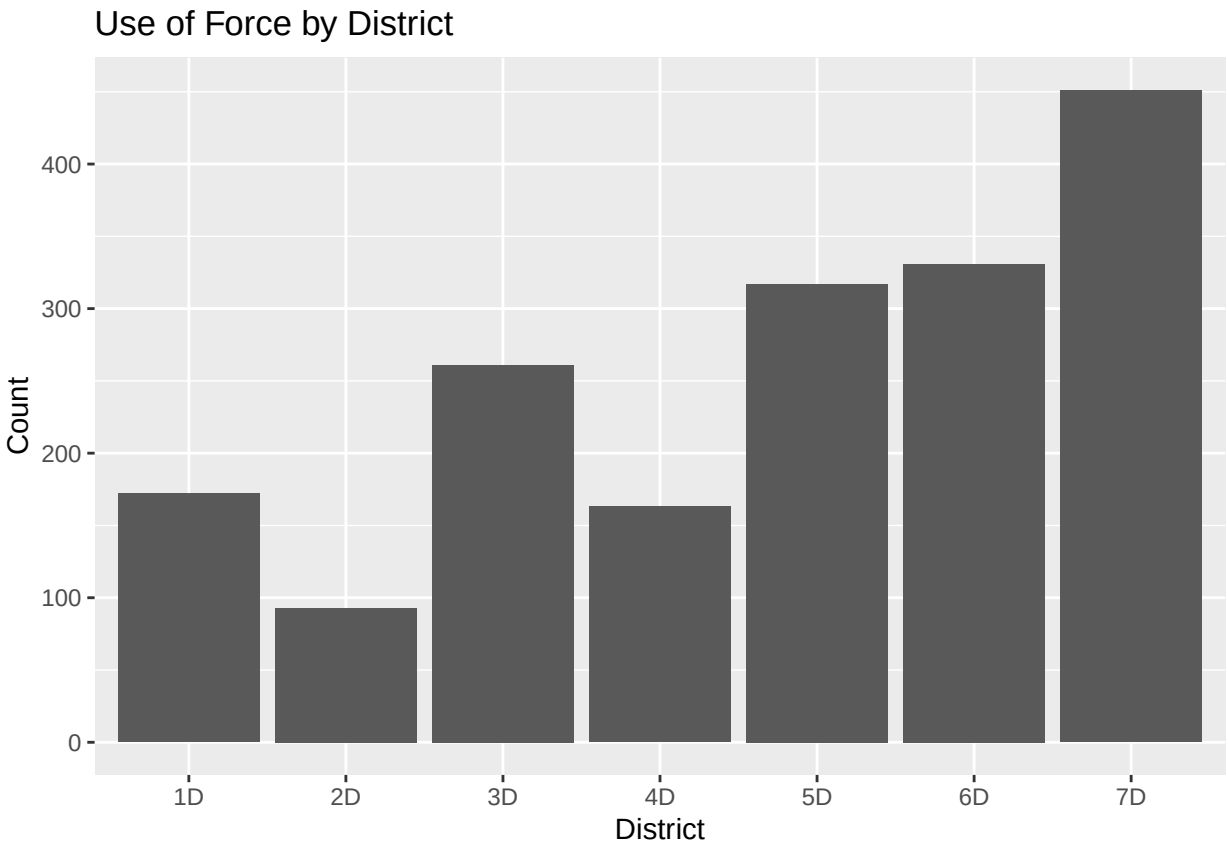

```
summary_data <- officer_by_district %>%
  filter(OfficerAssignment %in% c("7D")) %>%
  group_by(OfficerAssignment, disposition) %>%
  summarise(count = n())
```

```
## `summarise()` has grouped output by 'OfficerAssignment'. You can override using
## the `.groups` argument.
```

```
ggplot(summary_data, aes(x = OfficerAssignment, fill = disposition, y = count)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "District 7: Use of Force Disposition by Officers",
       x = "District",
       y = "Count") +
  facet_wrap(~OfficerAssignment, ncol = 2)
```



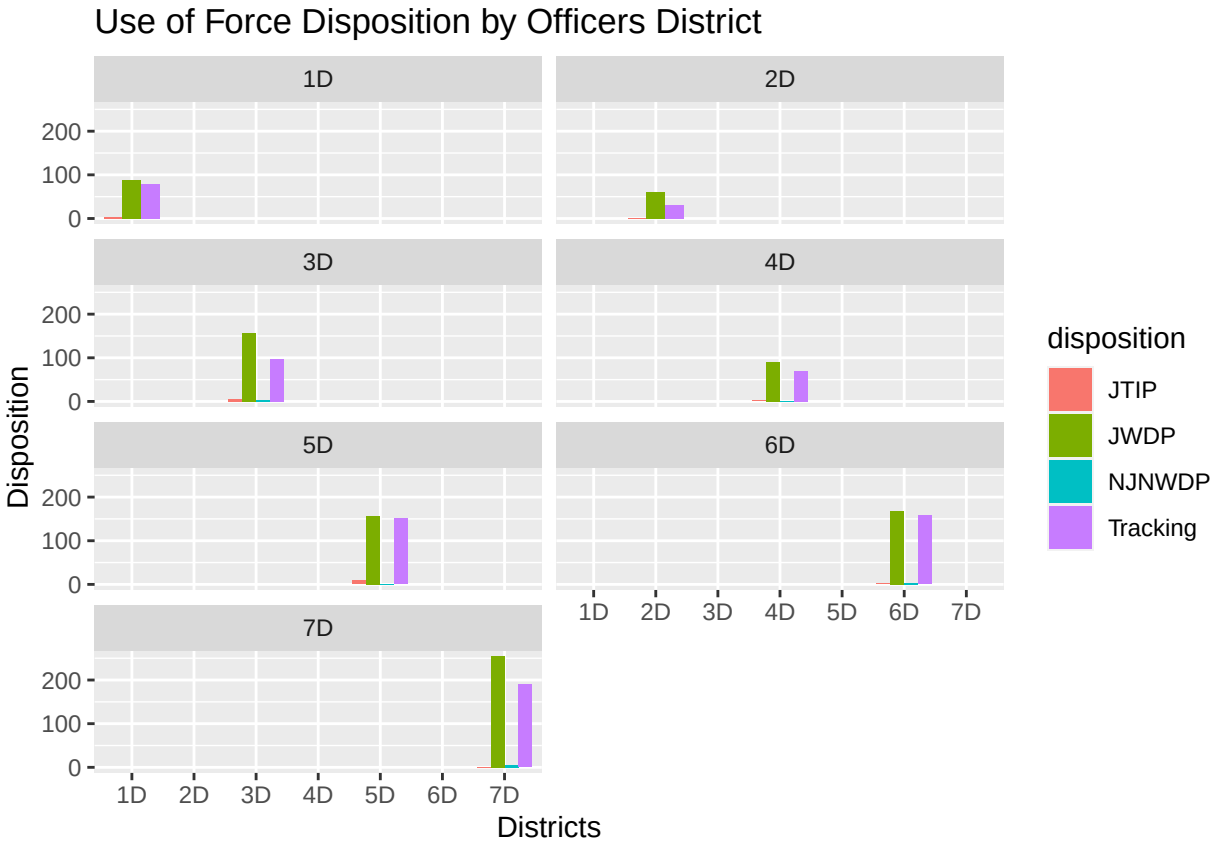

```
districts <- c("1D", "2D", "3D", "4D", "5D", "6D", "7D")
mpd_dat_filtered <- mpd_dat[mpd_dat$OfficerAssignment %in% districts, ]

uof_counts <- mpd_dat_filtered %>%
  group_by(OfficerAssignment) %>%
  summarise(Count = n())

ggplot(uof_counts, aes(x = OfficerAssignment, y = Count)) +
  geom_bar(stat = "identity") +
  labs(title = "Use of Force by District",
       x = "District",
       y = "Count")
```




```
summary_data <- officer_by_district %>%
  filter(OfficerAssignment %in% c("1D", "2D", "3D", "4D", "5D", "6D", "7D")) %>%
  group_by(OfficerAssignment, disposition) %>%
  summarise(count = n())
```

```
## `summarise()` has grouped output by 'OfficerAssignment'. You can override using
## the `.groups` argument.
```

```
ggplot(summary_data, aes(x = OfficerAssignment, fill = disposition, y = count)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "Use of Force Disposition by Officers District",
       x = "Districts",
       y = "Disposition") +
  facet_wrap(~OfficerAssignment, ncol = 2)
```



Citation:

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