

# Google Cloud Hackathon

## Police **Killing** in the US



# Our Team - Super Ace



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**We express our deepest sorrow to people who  
suffered from racial injustice.**

**INJUSTICE MUST BE STOPPED.**

Please also read speaker notes  
**Thanks**

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# Problem Overview



# Problem Overview



*"Genocide, Stereotype, Segregation, Social Exclusion, Slavery, Housing Discrimination, Unequal Wealth Accumulation, Premature Death Due to Pollution"*

**Racial injustice is co-shaped by many aspects of the society**

# Problem Overview

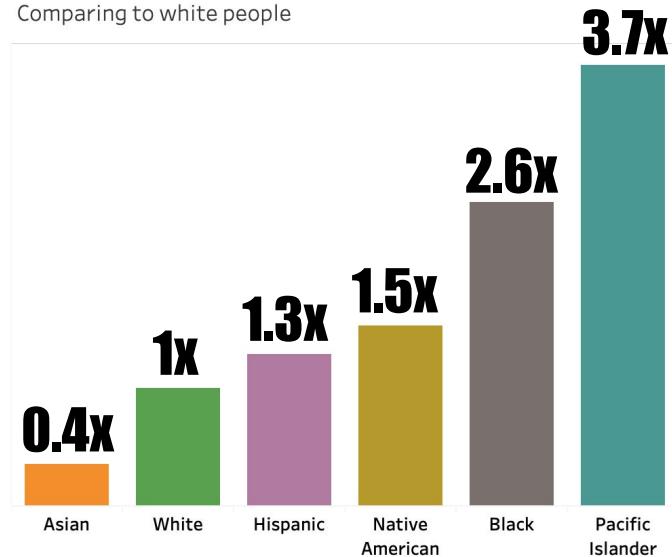


**Police disproportionately kills Hispanic, Native American, Black, Pacific Islanders.**

**THE FACT ITSELF IS THE PROBLEM**

No matter what's the cause.

How many more times likely a race would be killed by police in the US  
Comparing to white people



# Problem Overview



**EDUCATION**

**POVERTY**

**EMPLOYMENT**

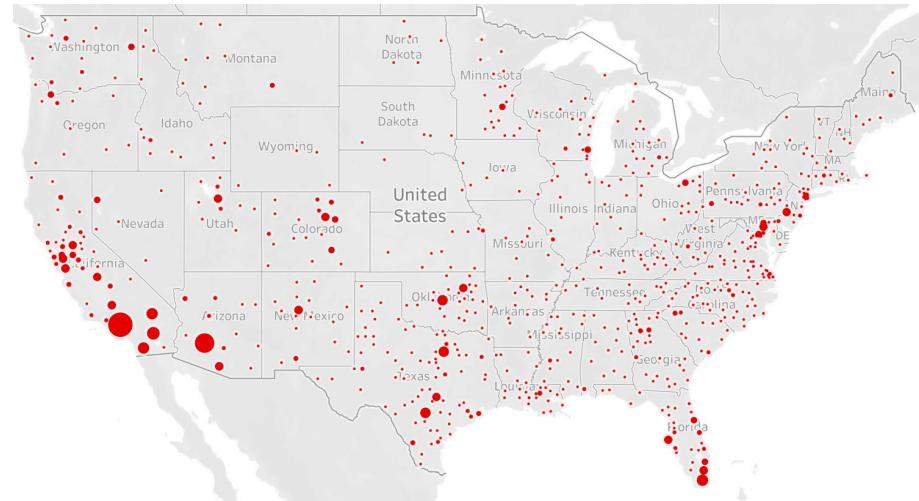


**Police  
Killing**

# Methodology



# Methodology



**Granularity:** On a county year level,

**Variables:** Examine how racial composition education employment poverty  
Affect police killing by race

**Data Source:** Census Bureau, mappingpoliceviolence

**Tool:** GCP AutoML, Double-Lasso Regression

# Exploratory Analysis

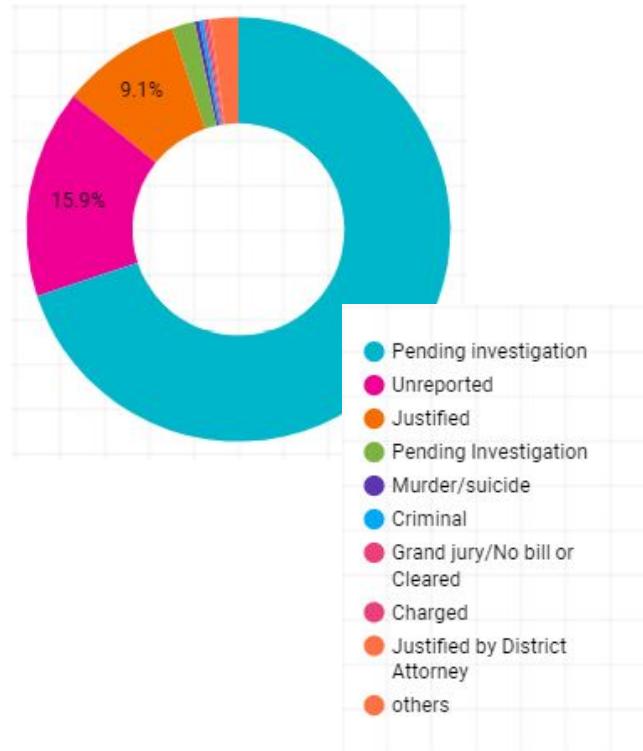


# Exploratory Analysis - Police Killing Cases

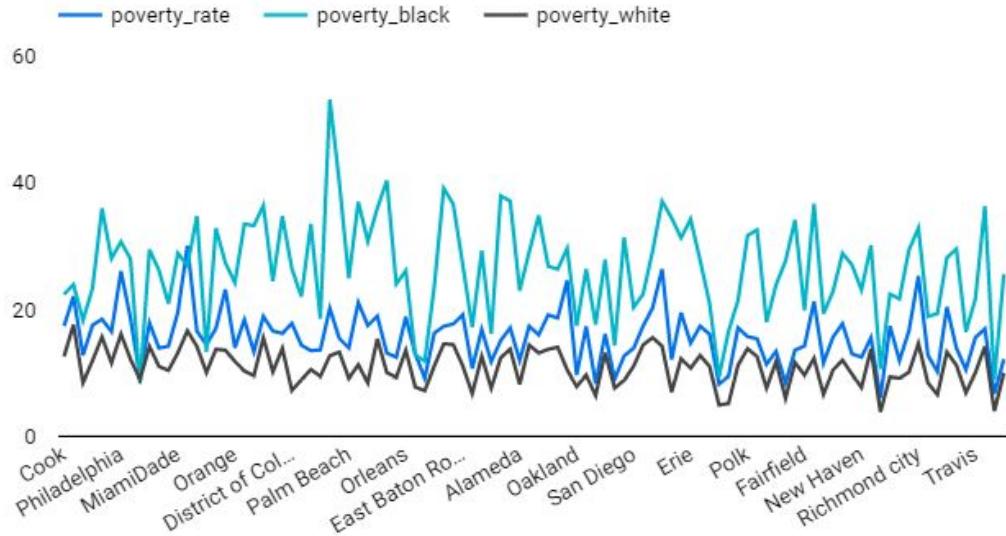
More than **84%**

of police killing is either  
unreported or pending investigation

Police officers face minimum pressure in reducing  
killing



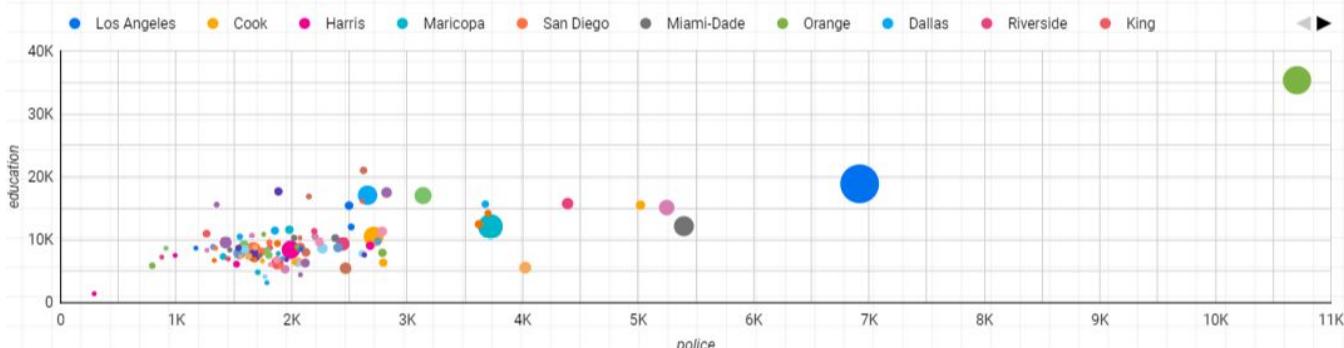
# Exploratory Analysis - Poverty Rate



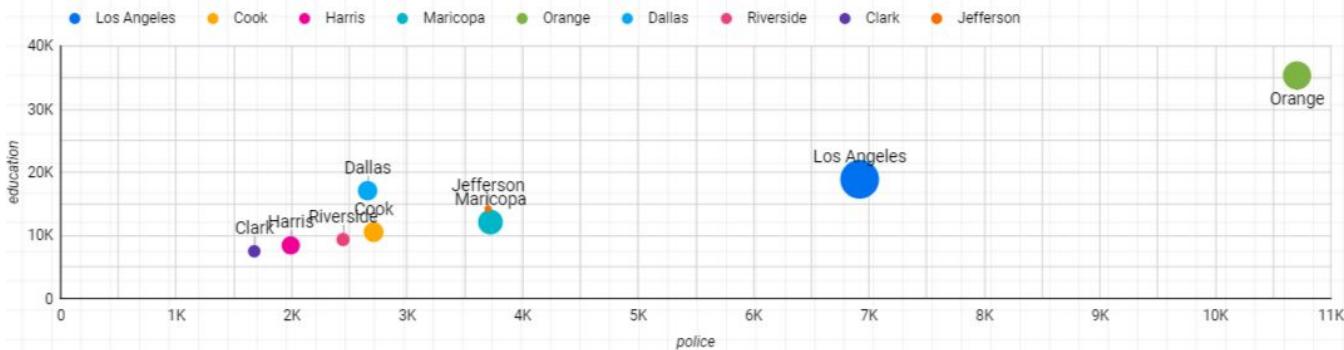
**Poverty rates in Counties**  
Black poverty is pervasive

# County budget education vs. police

All Counties  
nationwide



Top 9 Counties with  
most police killing



# Model Results



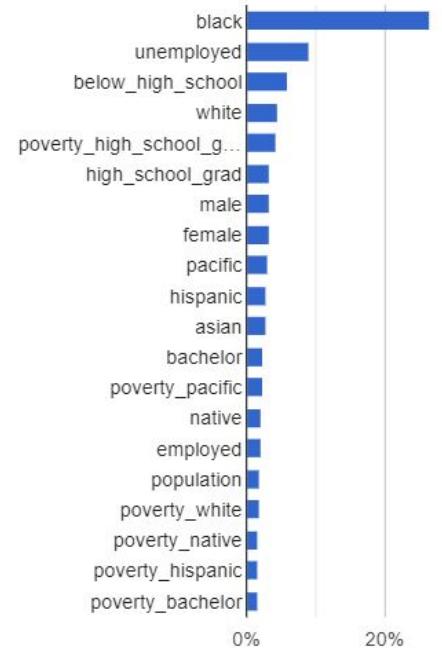
# Result - AutoML

**R<sup>2</sup>** 0.9

## Top 3 Features

- Black population in the county
- Unemployment
- Population not graduated from high school

## What contributes to police killing black



# Result - Double-LASSO for poverty rate, education and employment

## Police killings on black people

Treatment Variables	Beta
Poverty Rate	-0.00039 **
Education	-0.0074 **
Unemployment	0.0012

\*\* means that the variable is significant under 95% significance level

# Result - Double-LASSO for poverty rate

## 1st Stage

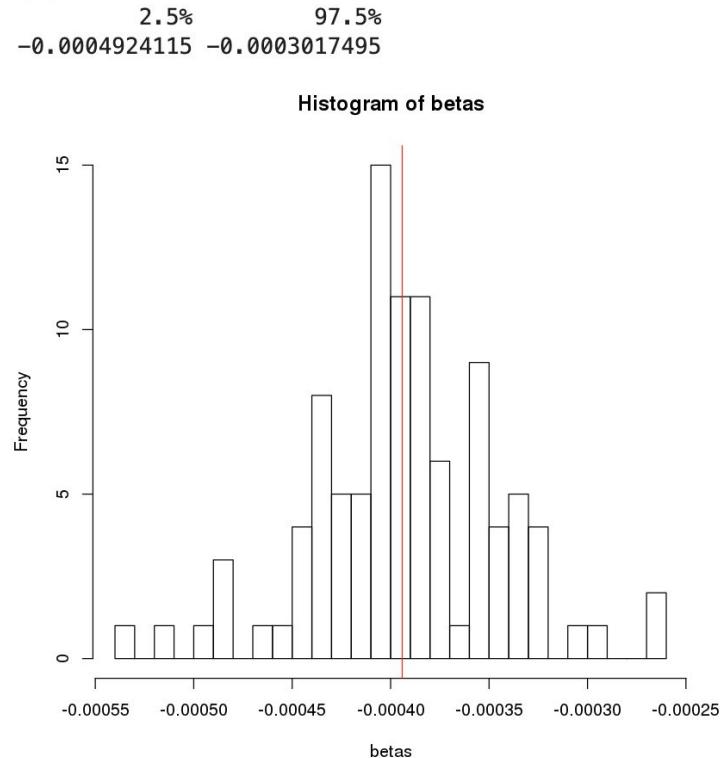
poverty of each race, such as black and hispanic, can be **effectively explained** by variables like education, gender ratio, and employment rate

## 2nd Stage

we keep 2 variables and have a **strong R-square value** of 0.018

## Bootstrap

The bootstrap methods shows there is significant effect from the poverty rate on number of killings for each race, but the effect is very close to **zero**



**Black:**  
**Killings percent by population and poverty rate**

# Recommendations



# Recommendation

1. Invest more on improving black communities, especially those who are less educated and suffer from high unemployment rate.
2. Improve the percentage of black people finishing at least high school education.
3. Metrics in social justice (education, poverty, unemployment) should guide how the federal government and regional governors allocate budgets.



# Works in Future

We've shown that by using Double-Stage Lasso, after controlling for confounding effects, high school education has significant effect in bringing down police killings towards black people.

Given more time and data, we can study how alternative social justice factors affect police killings. For example, poverty, municipal policies, transportation, medicare, and more.

Such research can also be extended to other races than black people. Our preliminary result showed educational level doesn't equally affect all races, and other factors might driving police killings for, let's say, Hispanics.

# Limitations

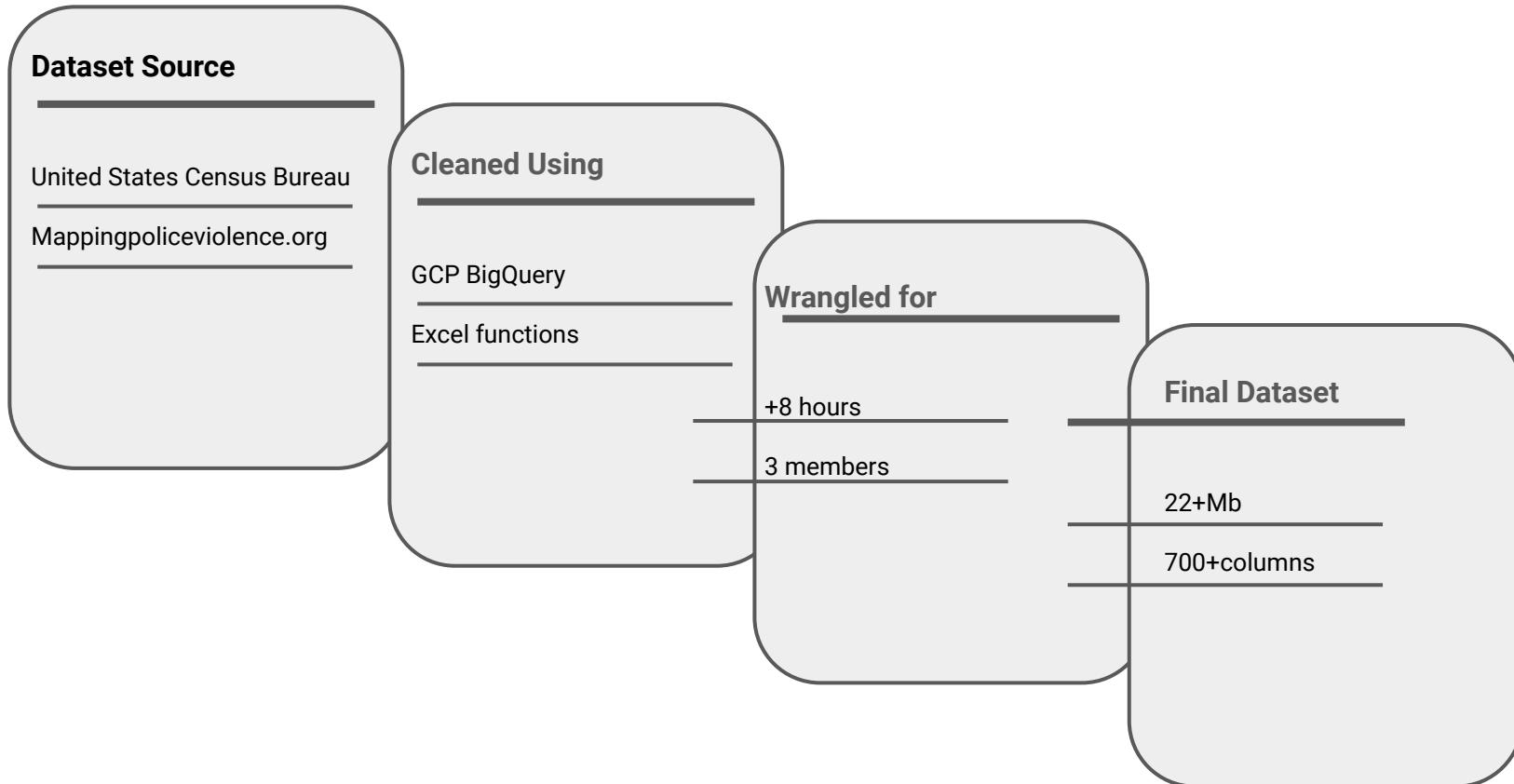
For racial injustice, it's very hard, if not impossible, to produce a flawless analysis. We are highly aware of the limitations in our analysis.

Reducing police killing doesn't necessarily equal to reducing racial injustice. The police killing data doesn't distinguish innocent victims, and it's possible that innocent people would still likely be killed as before.

Furthermore, black victims of crime are much less likely to receive help from police than white victims. It means that police selectively dealt fewer black cases as they should have and thus, deflated the number of black people killed by police.

Or maybe one more question we need to ask for ourselves. Can we afford waiting for a conclusive study to take on actions to stop racial injustice? If not, act on based on your good will first.

# Data Integrity



# Reference

1. **United Census Bureau, 2013 - 2018** <https://data.census.gov/cedsci>
2. **Mapping Police Violence** <https://mappingpoliceviolence.org/>
3. **Criminal Victimization, 2018 – Supplemental Tables**  
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<https://replicationindex.com/2019/09/27/poverty-explain-racial-biases-in-police-shootings/>
8. **Police, Race, and the Production of Capital Homicides**  
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**Thank You**