

# Police Violence towards African Americans in America

By Medha Gupta

## 1 An Overview

Police brutality towards African Americans has been an issue in America since the 19th century. In the late 1800s, Black Codes acted as a type of enforcement to control African Americans even after they were emancipated from slavery. In the 1960s, there was a rise of militarized police forces, such as SWAT, which targeted the Black Panther Party. In fact, police brutality of African Americans became such an issue that in 1963, Martin Luther King Jr. led the March on Washington to protest against racial discrimination and police violence. The issue of racism and police violence has been consistently increasing to the present, as the Black Lives Matter movement has brought the deaths of Breonna Taylor and George Floyd, just two of the hundreds of African Americans wrongfully killed by police, to attention.

We have heard of many cases of black people killed by police, but what does it mean for the African American population in America overall? To understand the significance of the police brutality in America, this paper will answer the question,

What is the probability that an African American person in America will be killed by police brutality in their lifetime?

## 2 Data Collection

The question is essentially trying to predict the probability of an event occurring *in the future*. To make a prediction about the future, we can use statistical tools to analyze data from the past. We can first gather data about the number of African Americans killed by police violence in America. The source containing this data is Mapping Police Violence,<sup>1</sup> which tracked the number of people overall killed by the police in America since 2013. It provides a sheet containing raw data<sup>2</sup> that we will use. We can filter this data by race to only look at African Americans who were killed.

## 3 The Approach

We can first outline the general approach to answer this question. To begin, we can use our raw data to create a data set of the number of black people killed by police every year.

An issue does appear in that our research question asked about a person's lifespan. Sources<sup>3</sup> describe that an average African American's lifespan in America is 74.9 years. However, our data provides information from 2013 to March 2022, which is only about 10 years. This means that if our data set is based on the number of African American people killed by police in a specific year, then we will only have 10 data points.

---

<sup>1</sup>[mappingpoliceviolence.org](https://mappingpoliceviolence.org)

<sup>2</sup>[airtable.com](https://airtable.com)

<sup>3</sup>[healio.com](https://healio.com)

This is a very small sample size and is not enough to be able to accurately make a prediction. To solve this issue, we can note that the data we have is actually given for every *day* from 2013 to March 2022. This means that we can instead separate our data into months instead of years. This will provide us with  $12 \times 9 + 3 = 111$  data points (there are 12 months in the 9 years from 2013 – 2021, and then data till only March 2022, which is three months). While 111 data points is not as great as if we found data from the entire history of police violence in the United States, it is larger than 10 data points and sufficient to answer the question of this paper.

Linked is a document<sup>4</sup> containing the data set we created from our raw data. It is in a sheet in the document called “Data Set by Month.” We have to remember, though, that our ultimate goal is to find a probability. For the first step of this, we can determine the probability that an African American person was going to be killed by police violence in each month from 2013 – 2022. To calculate this, we can divide each value in our data set by the total African American population in America in that year<sup>5</sup> (no source could be found that provided population in a specific month). The total population data is written in the sheet called “Black Pop.” The probabilities for each month are in the sheet called “Probability” in the table called “Probability of Being Killed.”

Now that we have the probabilities that an African American person was killed by police in a specific month, we need to subtract each probability from 1. The reasoning for this is that if we don’t subtract each probability from 1, then ultimately we will be determining the probability that a person will be killed by police *every* month in their lifetime, not just anytime. So, by subtracting each probability from 1, we would first find the probability that they are not going to be killed by police every month.

The new values are found in the same sheet, in the table called “Probability of Not Being Killed.”

Now that we have our final data, we can construct a confidence interval which shows where the mean of the entire population would reside at 99% confidence. The ‘mean of the entire population’ is the average probability that an African American person in America will not be killed by police in a month. The equation for the confidence interval is

$$\left[ \mu - T \times \frac{s}{\sqrt{N}}, \mu + T \times \frac{s}{\sqrt{N}} \right]$$

where  $\mu$  is the mean of the sample,  $s$  is the sample standard deviation,  $N$  is the sample size, and  $T$  is the  $T$ -score given the degree of confidence and sample size. Below is a table providing the possible  $T$ -scores.

---

<sup>4</sup>My Google Sheet

<sup>5</sup>This source shows the population till 2020: [statista.com](https://www.statista.com). To determine the African American population in 2021 and 2022, we can take the total US population, as in this source, [worldpopulationreview.com](https://worldpopulationreview.com), and multiply it by the average percent of the population that were African Americans (13.4%, as per this source: [census.gov](https://www.census.gov)) in 2020. This is not completely accurate but it is the only data found.

## T-SCORES (TWO-TAILED)

| Sample Size | 80%   | 90%   | 95%    | 99%   |
|-------------|-------|-------|--------|-------|
| $\infty$    | 1.282 | 1.645 | 1.960  | 2.576 |
| 1           | 3.078 | 6.314 | 12.706 | 3.656 |
| 2           | 1.886 | 2.920 | 4.303  | 9.925 |
| 3           | 1.638 | 2.353 | 3.182  | 5.841 |
| 4           | 1.533 | 2.132 | 2.776  | 4.604 |
| 5           | 1.476 | 2.015 | 2.571  | 4.032 |
| 6           | 1.440 | 1.943 | 2.447  | 3.707 |
| 7           | 1.415 | 1.895 | 2.365  | 3.499 |
| 8           | 1.397 | 1.860 | 2.306  | 2.896 |
| 9           | 1.383 | 1.833 | 2.262  | 3.250 |
| 10          | 1.372 | 1.812 | 2.228  | 3.169 |
| 20          | 1.325 | 1.725 | 2.086  | 2.845 |
| 30          | 1.310 | 1.697 | 2.042  | 2.750 |
| 60          | 1.296 | 1.671 | 2.000  | 2.660 |

Below are also the formulas for  $\mu$  and  $s$ . Note that  $x_i$  represents our data set.

$$\mu = \frac{\sum(x_i)}{N}$$

$$s = \sqrt{\frac{\sum(x_i - \mu)^2}{N - 1}}$$

Because we want to look at 99% confidence and we previously determined that our sample size was 111, the  $T$ -score is 2.576 (we have a large sample size so we can look at the  $\infty$  row in the  $T$ -score table). In the “Probability” Google Sheet, underneath the “Probability of Not Being Killed” table, there are calculations for each variable as well as the confidence interval. The confidence interval is written as two parts: the lower end as well as the upper end of the interval. It can be found under the label “99% Confidence Interval of the Probability that a Black Person Will NOT be Killed by Police in a Month.”

We now have the confidence interval for the probability that an African American person will not be killed by police in a month. The probability that a person will not be killed by police in their *lifetime* can be calculated if we raise the interval to an exponent, where the exponent is the number of months in an average African American’s lifespan. We previously found that an average African American’s lifespan is 74.9 years. This is 898.8 months. Thus, we will raise our confidence interval to the power of 898.8. This is shown in the same Google Sheet under the label “99% Confidence Interval of the Probability that a Black Person Will NOT be Killed by Police in their Lifetime (898.8 months).”

We finally have the confidence interval which contains the average probability that an African American person in America will not be killed by police in their lifetime. Our last step is to subtract this from 1 again to find the probability that a person *will* be killed by police in their lifetime. This calculation is under the label “99% Confidence Interval of the Probability that a Black Person WILL be Killed by Police in their Lifetime.” We can also convert this probability to a percentage, as shown in the columns to the right. We find that our confidence interval is now [0.04%, 0.05%].

## 4 Answer and Analysis

Our final confidence interval is [0.04%, 0.05%]. This can be interpreted as,

We can say with 99% confidence that there is 0.04% – 0.05% chance that an African American person in America will be killed by police in their lifetime.

Initially, 0.04% and 0.05% can seem like very small percentages. 0.04% – 0.05% means that for every 10,000 African Americans in America, we can say with 99% confidence that 4 or 5 people will be killed by police. While this seems like a small amount, we are thinking in terms of millions of people. For example, we can use our confidence interval to determine the total number of black people who died from police violence in 2021. From the “Black Pop.” page in the Google Sheet, we can see that the total black population in 2021 was 45040000. 0.04% of this is 18016, and 0.05% is 22520. This means that we can be 99% confident that in 2021, between 18016 and 22520 black people died from police violence in America. Now, these are very large numbers, which shows how significant our results are. It illustrates how great of an issue police brutality is and how many lives it impacts.

To further analyze the significance of 0.04% – 0.05%, we can calculate what the risk is for a *white* person in America to be killed by police in their lifetime. We will use the same process as when getting our previous results. In the same Google Sheet, there are three pages called “White Data Set by Month,” “White Pop,” and “White Probability.” These do the same math as when answering our previous research question, except they use data about white people. The results show that:

We can say with 99% confidence that there is 0.01% – 0.02% chance that a white person in America will be killed by police in their lifetime.

This interval is less than half compared to the percentages for black people, which means that a black person has more than double the risk of being killed by police in their lifetime than a white person does. This illustrates the racial discrimination by police in America.

## 5 Interdisciplinary Connection

It is important to not only establish that police violence towards black people is an issue, as shown in this paper, but also to understand the causes behind it. Firstly, studies show that a lack of proper training can be the cause of overall police brutality. In “Police Education is Broken. Can it be fixed?” Caroline Preston states that “police academies, the shorter-term, skills-based programs for officers, skew toward a military-style training model.”<sup>6</sup> The academies focus more on self-defense and officers’ physical abilities than on conflict resolution or non-violent approaches to situations. Preston adds that the academies established this militarized training in the 1960s during the “war on drugs,” and increased it after the 9/11 attacks. The militarized training leads to police brutality because many police officers are taught to immediately react to a situation with a weapon instead of first trying to figure out a non-violent strategy.

One reason for police brutality towards specifically black people is the white supremacist views in law enforcement. In fact, 67%, of law enforcement officers in America are white.<sup>7</sup> White supremacy in law enforcement is also not a new issue: a 2006 FBI assessment warned FBI agents that the police force was infiltrated by people sympathetic to the white supremacist cause; more recently, in 2015, a leaked counterterrorism guide warned that many militia and white supremacist extremists had active ties to law enforcement.<sup>8</sup> White supremacy is the belief that white people are the dominant race and should exclude

---

<sup>6</sup>[hechingerreport.org](https://hechingerreport.org)

<sup>7</sup>[datausa.io](https://datausa.io)

<sup>8</sup>[brennancenter.org](https://brennancenter.org)

people of color from society. This is very dangerous because it can lead to violence towards people of color. Additionally, because police officers have a greater ability to commit violence and have greater access to weapons, having white supremacist views in law enforcement can be much more dangerous and harmful.

This tie to white supremacy is emphasized by law enforcement's varying responses to protests by different groups in 2021. On January 6, 2021, pro-Trump white supremacist rioters stormed the US Capitol Building. Even though it was a violent protest, Isabella Leyva, the coauthor of "In the Fight Between White Supremacy and Racial Justice, Police Play Favorites," wrote, "there was a conspicuous absence of the heavy-handed police response consistently used to suppress racial justice movements."<sup>9</sup> While police did not take much action at this riot, they acted very differently at peaceful Black Lives Matter protests. In a protest in Denver on May 29, police shot rubber bullets and bean-bag rounds at protesters.<sup>10</sup> Although these are considered less lethal than actual bullets, they still caused severe injuries. This significant contradiction between the police's response to the Capitol riot and a BLM protest shows the racial discrimination in law enforcement and the higher police violence towards black people.

## 6 Further Inquiry

The topic of this paper quantified a major issue in America: police violence towards black people. A common justification for police violence towards black people is that black people just commit more crime than white people, so they will have more violent encounters with police. This provokes inquiry about whether this claim is actually true. So, a follow-up question is,

What is the correlation between the number of crimes committed by black people in America and the number of black people killed by police?

An initial approach to answering this question is to create a data set for the number of crimes committed by African Americans in America every month. Another data set would be the number of African Americans killed by police every month. Note that we are using months because previously we could not find enough data for a large sample size involving years. With our two data sets, we can calculate a correlation coefficient ( $\rho$ ). If  $\rho$  is close to 1, this can suggest that police are justified in killing black people because an increase in police violence is related to an increase in crime. If  $\rho$  is close to 0, this means that there is no correlation, suggesting that the police violence towards black people is unjustified. If the correlation is close to  $-1$ , this would mean that as crime by black people increases, the police violence towards them decreases, or vice versa. This result would require further research to understand because it seems counterintuitive that an increase in crime would be related to a decrease in police violence.

Overall, these results would just be correlations and would not explain causation, but they would provide a good first step to understanding whether police violence towards black people is justified or not.

---

<sup>9</sup>[nyclu.org](https://www.nyclu.org)

<sup>10</sup>[usatoday.com](https://www.usatoday.com)