

Police fatal shootings and demographics: who is at risk?



Police shootings have been at the forefront of the debates surrounding police reforms and police brutality. While these issues are complex, we wanted to focus our attention on one question: are there specific demographics that get targeted more than any other?

To answer this question, we explored various factors such as: race, age, gender, household median income by city, percentage of residents by city who live below the federal poverty level, education, incidence of mental illness and geographic location. We then set out to see which of these factors play an important role in police fatal shootings, and if these factors combined could give us a “most-at-risk” profile.

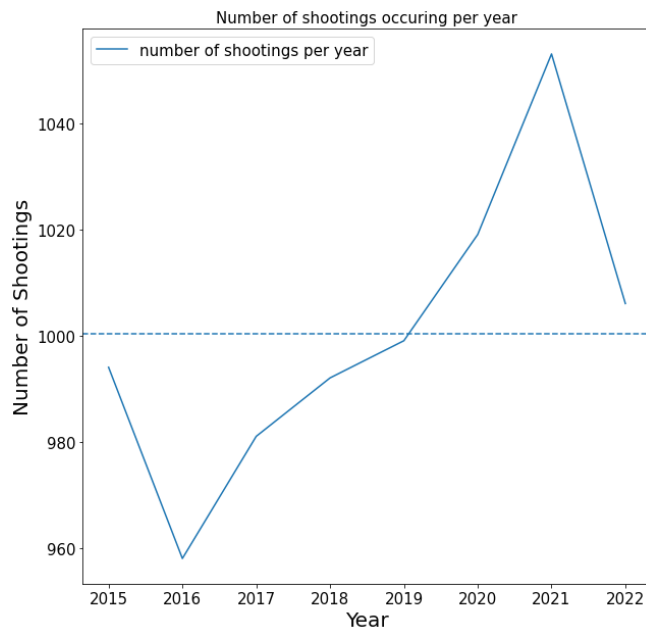
Where is our data from?

The dataset we used was compiled by the Washington Post Fatal Force Dataset. It provides data about each police-involved killing in the United States in 2015 and includes: City and State of the incident, the race, gender, and age of the deceased, and whether they were armed or experiencing a mental-health crisis. We combined this dataset with data on poverty rate,

population, education rate, mental illness rate, and race distribution by cities from the US Census.

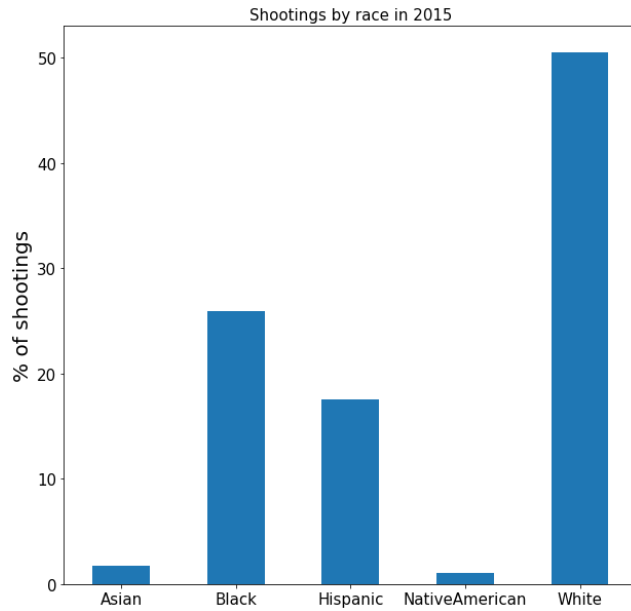
Why 2015?

We focused our attention on 2015 because the data used for income, education and race distribution was for 2015 so focusing on a single year allowed us to merge data frames. When looking at 2015 relative to other years, it had an average number of shootings. Interestingly, 2021 had the highest number of shootings per year, but the largest YoY gap represents fewer than 100 shootings.

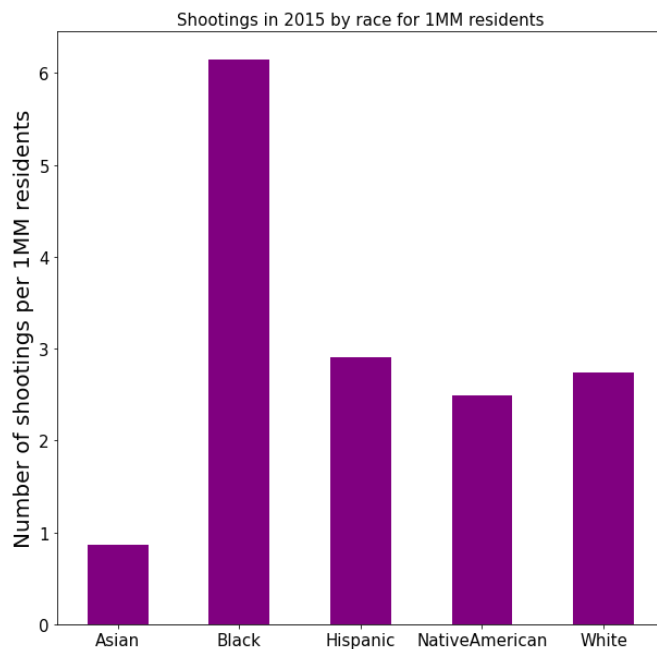


Let's start with the obvious: Race

If we simply look at who got shot in 2015, then White people make up the largest group (they were involved in 50% of incidents).



Does this mean that white people got shot by the police more than any other race? Not really, as white people were the most populous racial group in the US in 2015. So when we adjusted these shootings by the US population, we found out that Black people were actually more likely to be shot than white people. As we can see in the graph below, in 2015, there were 6.1 incidents per 1 million involving Black people, and only 2.7 per 1 million incidents involving white people.

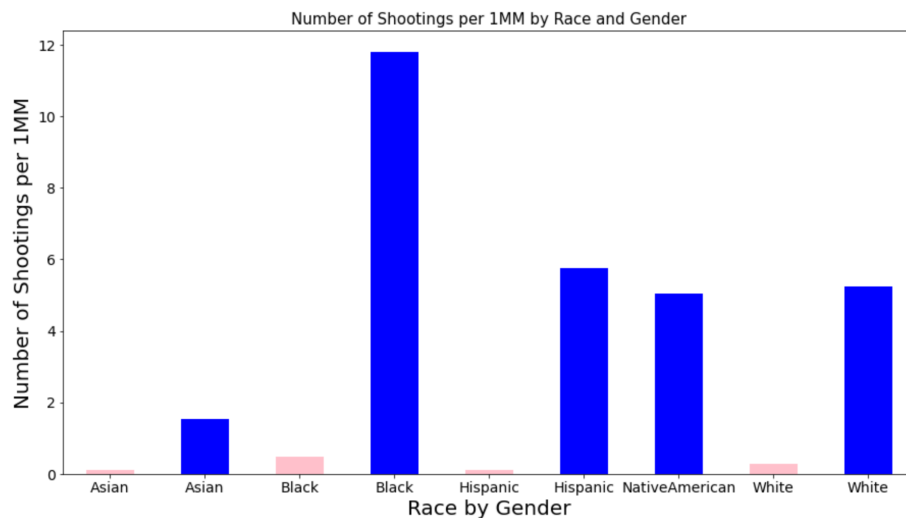


Gender

Although gender is almost evenly split in the broader US population (50.8% of women, 49.2% of men), men were overrepresented among shooting victims in 2015: they accounted for 96% of the killings. In other words, in the US, 0.3 in 1 million women were killed by the police whereas 6 in 1 million men were. Hence, gender is an important factor in fatal police shootings.

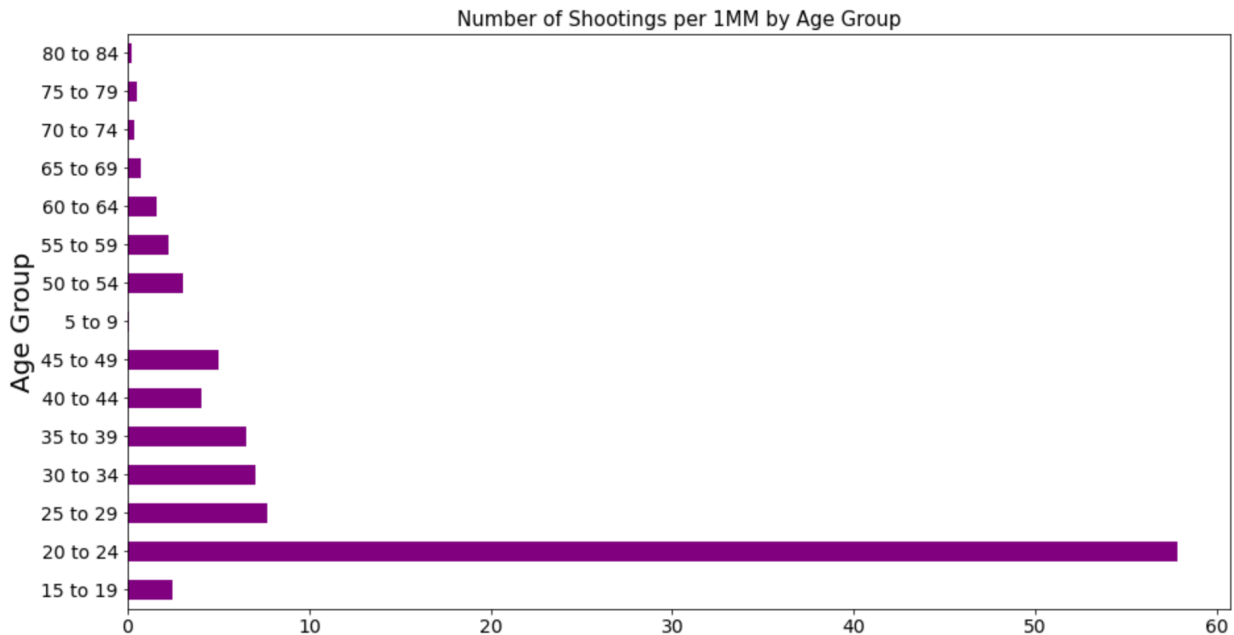


And if we look at the breakdown by racial group, we can see women were far less likely to be shot and killed by the police, regardless of their race.



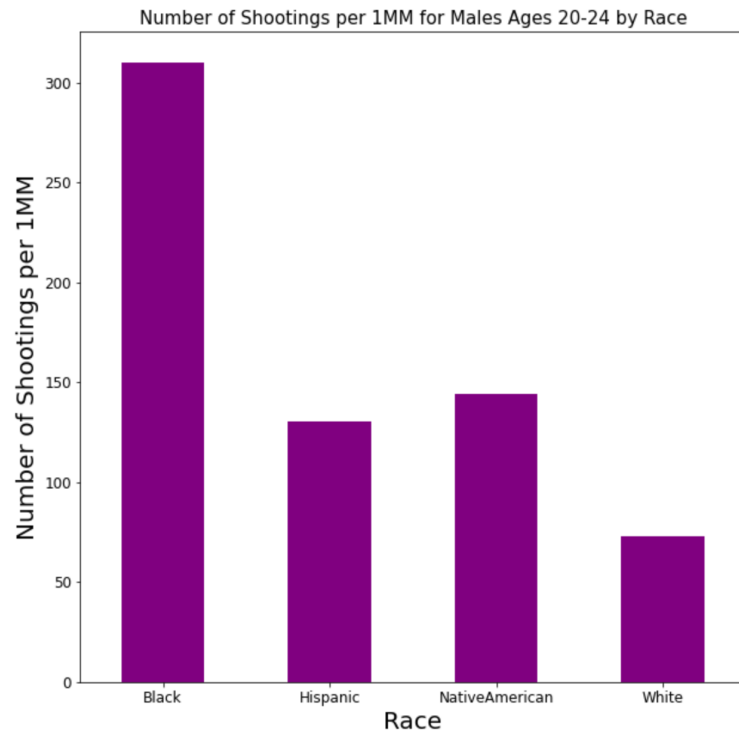
What about age?

In addition to race and gender, we looked at the breakdown of shootings per age. Although, sadly, victims ranged in age from 2 to 92 years old, the majority of victims fell in the 20-to-24 age range. As we can see in the graph below, there were almost 60 shootings per 1 million people in the 20-24 age range, which is significantly higher than any other age group.



Assembling a Demographic Profile

To assemble a demographic profile, we first wanted to verify that these factors combined (male, Black, 20–24 years old) made up the highest number of shooting victims, so we combined all factors. As we can see in the figure below, black men between the ages of 20 to 24 were indeed the most likely to be killed by the police, with incidents per 1 million more than triple the number of incidents involving white people.

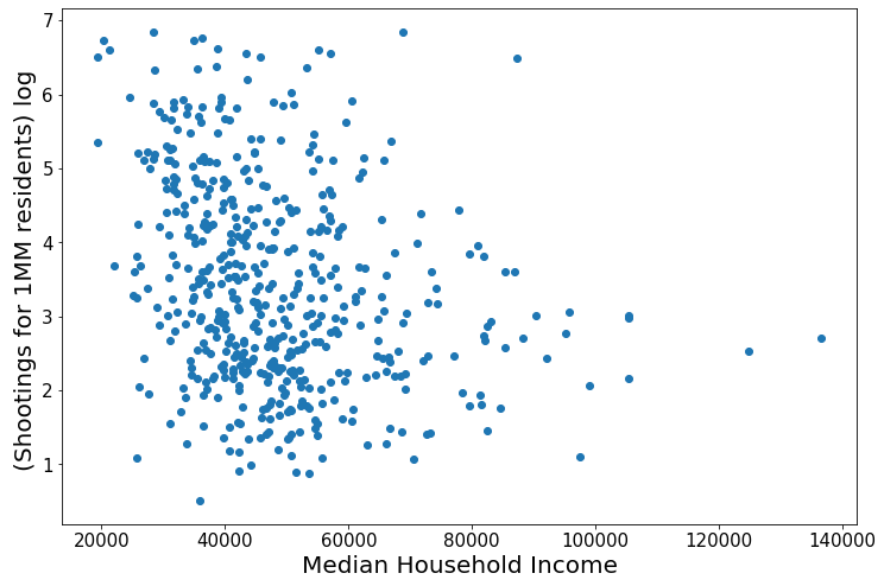


Other factors at play: Income & Poverty, Education, Location, and Mental Illness

The demographics of police shooting victims only tell part of the story. To get a better picture of the factors involved in police killings, we looked at the number of shootings per 1 million people compared to median income, poverty rate, percent of high school graduates.

Median Household Income was inconclusive

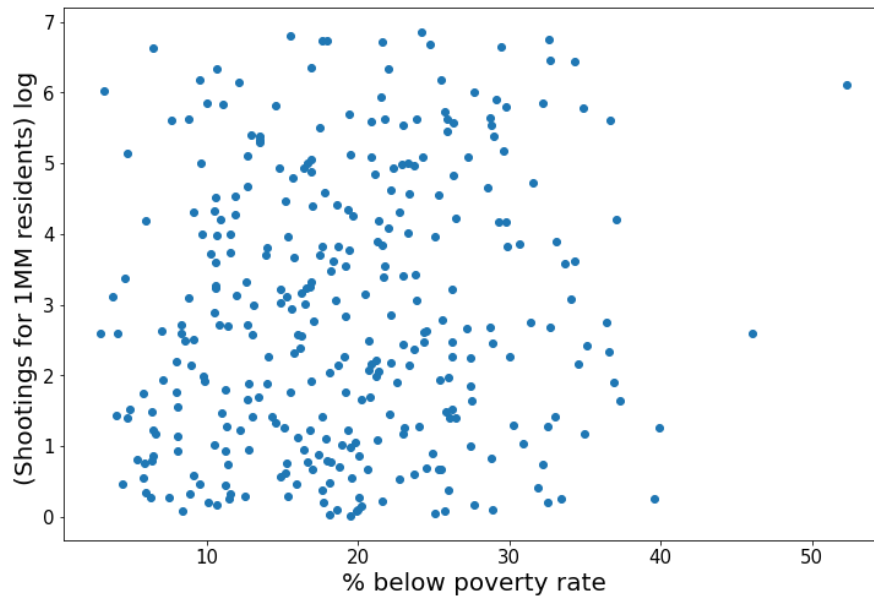
As mentioned above, we compiled the number of shootings per 1 million residents for each city with more than one shooting, and then plotted it against the median household income for each city.



While the correlation between a city's median household income and the number of shootings seems weak (-0.2), we can clearly see that there is a “cluster” of shootings toward the lower end of the median household income range. Hence, while we can safely say that the cities with the most shootings had a lower median household income, we cannot say that the median household income of a city is a factor in police fatal shootings.

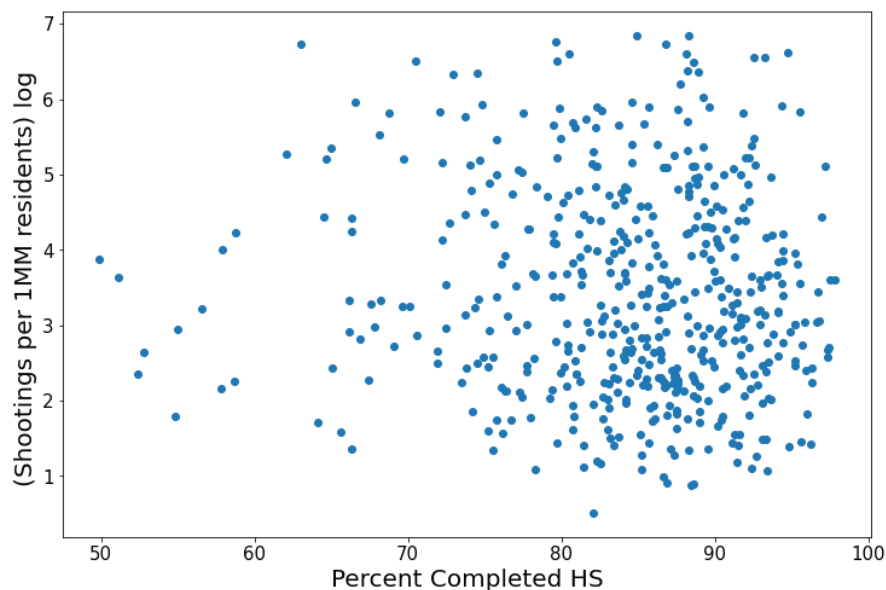
...and so was the Poverty Rate...

Similarly, when we looked at the poverty rate (determined by the percentage of the population for every city living under the federal poverty line), we could not determine if this was a factor: the correlation between the number of shootings within a city and this city' poverty rate was almost nonexistent (0.12). Unlike median household income (which was slightly skewed toward the lower end of the income range), the poverty rate did not show any “cluster” as most shootings happened in cities with a poverty rate between 10 and 40%, which is where most cities in the US fall in. Therefore, we could not conclude that there is a relationship between a city's poverty rate and the number of fatal police shootings this city experiences.



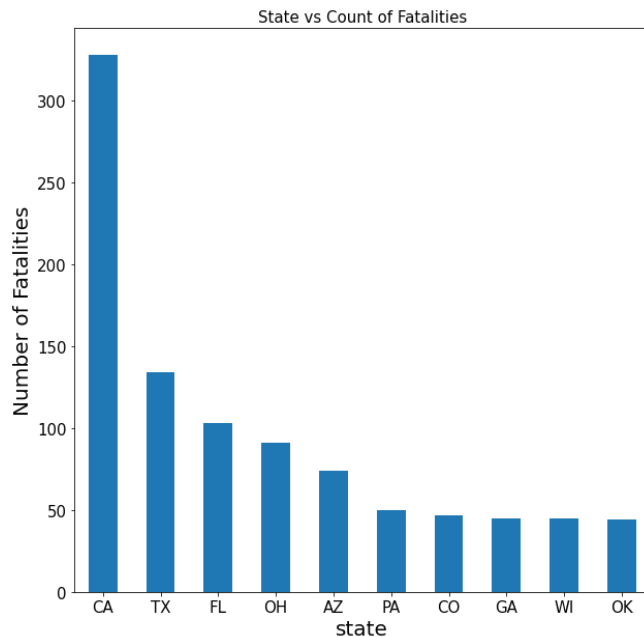
...and Education

To see if education had an impact on police shootings, we set out to look at the percentage of people over 25 who graduated high school for each city. We were hoping to see if cities with a lower rate of graduation had a higher rate of fatal police shootings. Unfortunately, not only was the correlation between those two variables almost zero (-0.05), but most shootings were happening in cities with a graduation rate between 80 and 90%. Does this mean that shootings happen in cities with a higher graduation rate? No, because most cities in the US have a graduation rate that falls within this range (87.6% of the US population 25 or older in the 2011 Census reported to hold a high school diploma). So the data on police shootings simply follows the nationwide trend. Not much to see here!

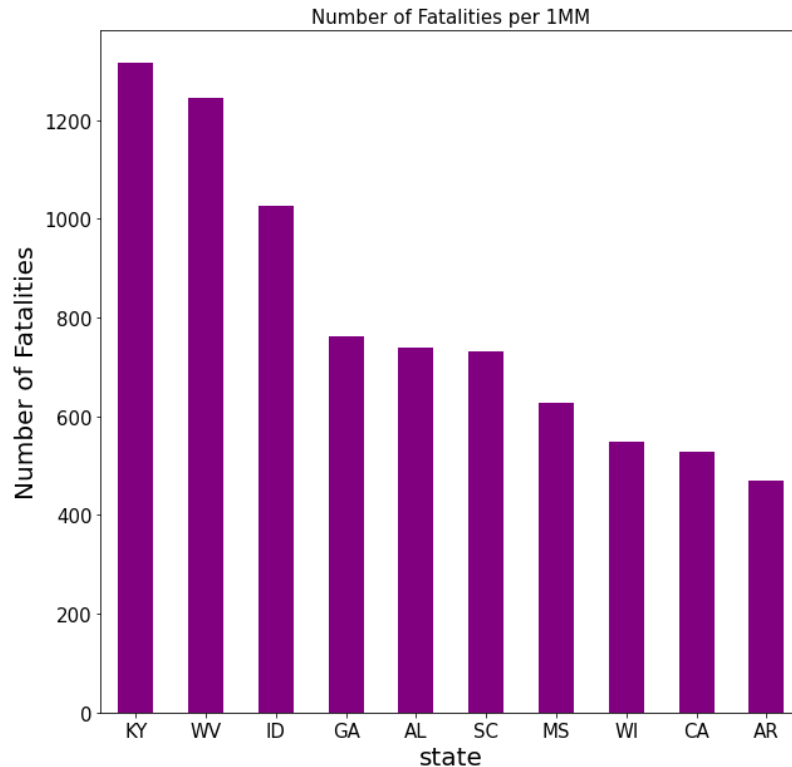


Does location matter?

We additionally looked at how the frequency of fatal police shootings varied per state. When looking at raw counts, California, Texas, and Florida had the highest number of people killed by the police in 2015.



However, when normalized for 1 million people, Kentucky, West Virginia, and Idaho had the highest rates of police killings. One surprising finding was that California, even after adjusting for population, was one of the deadliest states (with the number of fatalities averaging at 527 per 1 million).

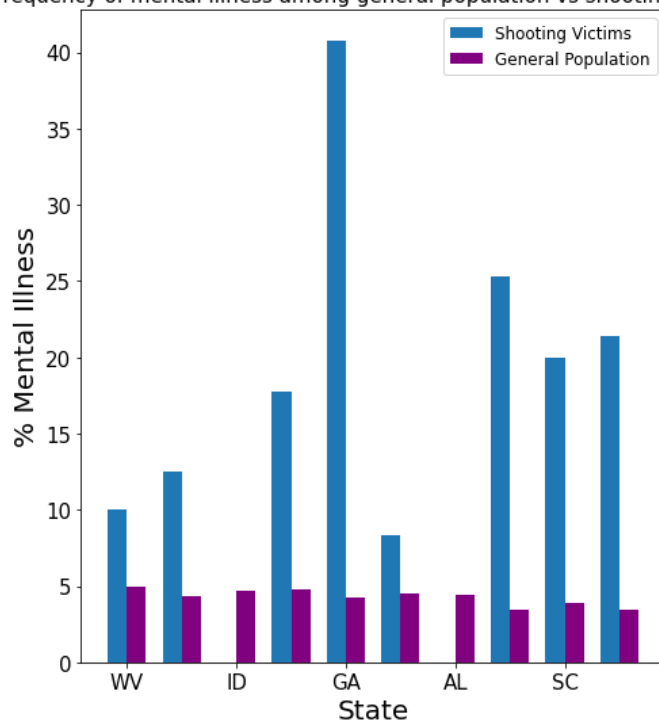


Is mental illness a factor too?

Unfortunately, those with severe mental illness are often victims of police shootings. Within the dataset, displaying signs of mental illness was listed only as true or false so we could not assess the effect of specific mental illnesses on police killings. We wanted to see if mental illness increased the likelihood of being killed by the police. To explore this, we looked at the instance of mental illness in the general population and compared it to the frequency of mental illness among shooting victims. In the general population, mental illness per state falls between 3% and 5%, whereas the occurrence of mental illness among shooting victims is as high as 40% which indicates that those who display signs of mental illness are far more likely to be killed by the police than those without.

*The x axis of this graph should read KY, WV, ID, GA, AL, SC, MS, CA, AR, FL.

Frequency of mental illness among general population vs shooting victims



To wrap up: who is at risk? What factors do matter?

As we demonstrated, the demographic the most likely to be fatally shot by the police is a black male between the ages of 20 - 24, with approximately 304 incidents per 1 million. This demographic demonstrates that race, gender, and age play a major role in whether someone is fatally shot by the police or not. Mental illness was also determined to be another factor that impacts whether someone is fatally shot by the police, with the occurrence of mental illness among shooting victims as high as 40% in some states. When looking into median income, education, and poverty rate, the results were inconclusive. Overall the factors race, gender, age, and mental illness have a significant impact, while we could not determine a correlation with median income, education, and poverty rate.