

EXHIBIT 4

DECLARATION OF MARISA OMORI

I, MARISA OMORI, declare as follows:

1. I am an Assistant Professor in the department of Criminology and Criminal Justice at the University of Missouri-St. Louis. I will be an Associate Professor starting September 1, 2022. Before this appointment, I was an Assistant Professor in the department of Sociology at the University of Miami.
2. I completed a PhD in Criminology, Law & Society from the University of California, Irvine, in 2014.
3. I completed a Master of Arts in Social Ecology from the University of California, Irvine in 2010, and a Master of Arts in Criminal Justice from John Jay College of Criminal Justice, the City University of New York, in 2007.
4. I completed a Bachelor of Arts degree in Economics from Occidental College in 2003, where I passed my comprehensive exam with distinction.
5. I have published over 25 peer-reviewed journal articles and book chapters, including statistical analyses of criminal justice systems in leading academic journals, such as *Criminology*, *Journal of Quantitative Criminology*, *Social Problems*, *Justice Quarterly*, and *Law & Society Review*.
6. I have conducted evaluations and analyses for several agencies and nonprofit organizations, including the St. Louis County Prosecutor's Office, the Southern District of Florida, the American Civil Liberties Union of Florida, and the California Department of Corrections and Rehabilitation. I have also served as an Co-Investigator on several external grants.

7. I have taught introductory undergraduate, as well as introductory and advanced graduate-level statistics courses for the past seven years, including Multivariate Statistics, Advanced Sociological Statistics (Econometrics), and Statistical Analysis in Criminology and Criminal Justice. I have also previously served as a teaching assistant for several introductory and advanced statistics courses. These courses cover the statistical analyses used in my work on this case.
8. My curriculum vitae is attached.
9. I was asked by counsel Brian Cosgrove and David Macher of the Law Offices of The Public Defender, County of Riverside to analyze charging information for PC 187 murder cases in Riverside County, California, to assess whether there were racial and ethnic disparities between the years 2016-2021.
10. Counsel provided me with spreadsheet data from Riverside County including all PC 187 murder cases filed by the Riverside County District Attorney's Office (DA) from January 1, 2016 to January 1, 2022, including a total of 696 cases. Of the 696 cases where the DA charged PC 187, there were 253 cases where there was at least one special circumstance under PC 190.2, and of those cases, there were 22 cases in which the DA sought the death penalty. The spreadsheet contained some additional information, including the defendant name, case number, the penal code for the special allegation, and race/ethnicity of defendant.

Racial/ethnic disproportionality in cases with PC 187 murder charges

11. To examine whether defendants of a particular race/ethnicity were disproportionately charged with PC 187 murder charges, I obtained adult¹ population statistics by race/ethnicity in the American Community Survey (ACS) from the Census between 2016-2020 for Riverside County.² These ACS numbers represent the most recently-released estimates available to date. Of the adult population in Riverside County between 2016-2020, the estimated population of White non-Hispanic people in Riverside County is 700,651 (38.4%), Black non-Hispanic people is 115,632 (6.3%), Hispanic people is 825,328 (45.2%), and people of other race and ethnicities is 182,854 (10.0%).
12. I first compared the percentages of race/ethnicity of those represented in murder cases with the adult population of Riverside County. Of the 696 defendants who had PC 187 murder cases filed, 143 (20.5%) were White non-Hispanic, 139 (20.0%) were Black non-Hispanic, 395 (56.8%) were Hispanic, and 19 (2.7%) were of other race or ethnicity.³
13. I then calculated the rate of PC 187 murder cases filed per 100,000 population in Riverside County by race/ethnicity. White non-Hispanic people have PC 187 murder charges filed against them at a rate of $((143/700,651) \times 100,000 = 20.41)$ 20.41 per 100,000 population, Black non-Hispanic people have murder charges filed against them at a rate of $((139/115,632) = 120.21)$ 120.21 per 100,000 population, and Hispanic people

¹ I obtained the adult population (18 years or older) because juveniles are not eligible for the death penalty in California. I did replicate all population analyses with the full population, but the general findings and statistical tests did not change.

² American Community Survey Census data were obtained from the Integrated Public Use Microdata Series through their online data analysis system. See Ruggles, Flood, Goeken, Schouweiler and Sobek. "IPUMS USA: Version 12.0 [dataset]." Minneapolis, MN: IPUMS, 2022. <https://doi.org/10.18128/D010.V12.0>. <https://sda.usa.ipums.org/>. The ACS calculates estimates over a 5-year period of time, and so allow for increased statistical reliability.

³ "Other" race and ethnicity includes all people who are not identified as White non-Hispanic, Black non-Hispanic, or Hispanic or Latino. Because this group is not a meaningful race/ethnicity, it is not included in much of the subsequent analyses.

have murder charges filed against them at a rate of $((395/825,328) \times 100,000=47.86)$ 47.86 per 100,000 population.

14. To compare these rates directly, I calculated the incident rate ratios, which captures the ratio of the rate between White non-Hispanic defendants and the rates for each of the other racial and ethnic groups.⁴ Based on the adult population for Riverside County, Black non-Hispanic defendants have murder cases filed against them at a rate that is $(120.21/20.41=5.89)$ 5.89 times higher than White non-Hispanic defendants, and Hispanic defendants have murder cases filed against them at a rate that is $(47.86/20.41=2.34)$ 2.34 times higher than White non-Hispanic defendants.
15. Finally, to test whether the rates were statistically significantly different from each other, I conducted a differences of proportions z-score test⁵. The rate of Black non-Hispanic murder cases filed is statistically significantly⁶ higher than the rate of White non-Hispanic murder cases filed in the adult population. The test comparing the rate of Black non-Hispanic murder cases filed relative to the rate of White non-Hispanic murder cases

⁴ Incident rate ratios are calculated by dividing the rate for one group by the rate for another group. For example, the incident rate ratio for Black non-Hispanic defendants relative to White non-Hispanic defendants with murder charges filed against them is $IRR = [((143/837,555) \times 100,000)] / [((139/149,107) \times 100,000)] = 5.46$. An incident rate ratio of 1 means that the rates for the two groups are the same.

⁵The difference of proportions test determines whether two proportions are statistically significantly different from each other in the population. See Agresti, A. & Finlay, B. (2009). *Statistical methods for the social sciences*. Pearson. The difference of proportions z-score test assumes that (1) we are working with independent random samples; (2) we are testing nominal-level variables, and (3) the sampling distribution will approximate a normal distribution. To test whether two proportions are statistically significantly different from each other, we calculate the difference in a z-score, which captures the number of standard deviations the difference in the two proportions is from the null hypothesis (where the null hypothesis is 0, or no difference between the two groups' proportions). The z-score formula for proportions is calculated as: $z = \frac{\hat{\pi}_1 - \hat{\pi}_2}{\sqrt{\hat{\pi}(1-\hat{\pi}) \times [\frac{1}{n_1} + \frac{1}{n_2}]}}$, where $\hat{\pi}_1$ and $\hat{\pi}_2$ represent group 1 and group

2's proportions, respectively, $\hat{\pi}$ represents the pooled (overall) proportion for both groups, and n_1 and n_2 represent the sample sizes for groups 1 and 2. z-scores are associated with a probability value, which is then used to determine statistical significance.

⁶ In the social sciences, a probability value (p-value) of 0.05 (5%) is a common threshold for statistical significance. Because the American Statistical Association discourages strict thresholds for statistical significance, I report both whether the statistical test meets the 0.05 threshold and is statistically significant or not, and the actual probability value along with an interpretation. See Wasserstein, R & Lazar, N. (2016). The ASA Statement on p-values: Context, process, and purpose. *The American Statistician*, 70:2, 129-133.

filed in the adult population is statistically significant, suggesting that the chance of observing the difference in rates for Black non-Hispanic and White non-Hispanic people due to random chance is less than 0.01%.⁷

16. The rate of Hispanic murder cases filed is significantly higher than the rate of White non-Hispanic murder cases filed in the adult population. The test comparing the rate of Hispanic murder cases filed relative to the rate of White non-Hispanic cases filed is statistically significant, suggesting that the chance of observing the difference in rates due to random chance is less than 0.01%.
17. These results provide evidence that (1) Black non-Hispanic defendants have murder cases filed against them at a rate disproportionately higher than their adult population in Riverside County; (2) In contrast, White non-Hispanic defendants are underrepresented in murder charges relative to their the adult population. (3) Black non-Hispanic defendants have murder cases filed against them over five times as high relative to White non-Hispanic defendants based on their respective populations; and (4) Black non-Hispanic defendants have murder cases filed against them at a rate per population that is statistically significantly greater than the rate for White non-Hispanic defendants.
18. The results also provide evidence that (1) Hispanic defendants have murder cases filed against them at a rate disproportionately higher than their adult population; (2) Hispanic defendants have murder cases filed against them that is over two times higher relative to White non-Hispanic defendants; and (3) Hispanic defendants have murder cases filed

⁷ The probability value (p-value) is the probability of observing results as extreme as or more extreme than the one obtained if the null hypothesis were true. The null hypothesis in this case is that there is no difference in rate of murder cases filed between Black non-Hispanic and White non-Hispanic groups. Since the probability of observing this difference in the rates between Black non-Hispanic and White non-Hispanic groups if there actually was no difference is so low (in this case, less than 0.1%), we reject the null hypothesis and conclude that there is a statistically significant difference between Black non-Hispanic and White non-Hispanic rates.

against them at a rate per population that is statistically significantly greater than White non-Hispanic defendants.

Racial/ethnic disproportionality in murder cases with PC 190.2 special circumstances

19. To examine whether defendants of a particular race/ethnicity were disproportionately charged with special circumstances under PC 190.2, I compared the race/ethnicity in these cases to population statistics in the American Community Survey (ACS) from the Census between 2016-2020 for Riverside County.
20. Of 253 defendants who had special circumstances, 35 (13.8%) were White non-Hispanic, 75 (29.6%) were Black non-Hispanic, 139 (54.9%) were Hispanic, and 4 (1.6%) were of other race or ethnicity.
21. I calculated the rates of murder cases charged with special circumstances by race/ethnicity per 100,000 of their respective adult populations. The rate for White non-Hispanic murder cases with special circumstances filed is $((35/700,651) \times 100,000=5.00)$ 5.00 per 100,000 adult population, the rate for Black non-Hispanic people is $((75/115,632) \times 100,000=64.86)$ 64.86 per 100,000 adult population, and the rate for Hispanic people is $((139/825,328) \times 100,000=16.84)$ 16.84 per 100,000 adult population.
22. To compare the rates to each other, I calculated the incident rate ratios for Black non-Hispanic relative to White non-Hispanic, as well as the rate for Hispanic relative to White non-Hispanic. Based on the adult population, Black non-Hispanic people have an incident rate ratio of $(64.86/5.00=12.98)$ 12.98 relative to White non-Hispanic people, and Hispanic people have an incident rate ratio of $(16.84/5.00=3.37)$ 3.37.

23. I conducted a differences of proportions z-score test comparing the rate of Black non-Hispanic special circumstances cases to White non-Hispanic special circumstances cases per population. The rate of Black non-Hispanic special circumstances cases is statistically significantly higher than the rate of White non-Hispanic special circumstances cases in the adult population. The test comparing the rate of Black non-Hispanic relative to the rate of White non-Hispanic special circumstances cases is statistically significant, suggesting that the chance of observing the difference in rates for Black non-Hispanic and White non-Hispanic people due to random chance is less than 0.01%.
24. I also conducted a differences of proportions z-score test comparing the rate of Hispanic special circumstances cases to White non-Hispanic special circumstances cases per population. The rate of Hispanic special circumstances cases is statistically significantly higher than the rate of White non-Hispanic special circumstances cases. The z-score test suggests that the chance of observing the difference in rates for Hispanic and White non-Hispanic people due to random chance is less than 0.1%.
25. As a more stringent test, I conducted a differences of proportions z-score test comparing the proportion of special circumstances cases out of murder cases for Black non-Hispanics ($75/139=0.540$) and White non-Hispanics ($35/143=0.245$). Out of murder cases, the proportion of special circumstances cases for Black non-Hispanics is statistically significantly greater than the proportion of special circumstances cases for White non-Hispanics. The test results indicate that the chance of observing the difference in proportions of special circumstances cases out of murder cases for Black non-Hispanic people and White non-Hispanic people due to random chance is less than 0.01%.

26. I also conducted a differences of proportions z-score test comparing the proportion of special circumstances cases out of murder cases for Hispanics ($139/395=0.352$) and White non-Hispanics ($35/143=0.245$). Out of murder cases, the proportion of special circumstances cases for Hispanics is statistically significantly greater than the proportion of special circumstances cases for White non-Hispanics. The test results indicate that the chance of observing the difference in proportions for Black non-Hispanic people and White non-Hispanic people due to random chance is 1.9%.
27. These results provide evidence that (1) compared to the adult population in Riverside County, Black non-Hispanic defendants are overrepresented in those charged with special circumstances under PC 190.2; (2) White non-Hispanic defendants are underrepresented in those charged with special circumstances relative to their population; (3) Black non-Hispanic defendants are charged with special circumstances at a rate that is over 12 times higher than White non-Hispanic defendants; (4) Black non-Hispanic defendants are charged with special circumstances at a rate per population that is statistically significantly higher than White non-Hispanic defendants; and (5) Even out of murder cases, Black non-Hispanic defendants have a significantly higher proportion of special circumstances cases relative to White non-Hispanic defendants.
28. These results also provide evidence that (1) compared to the adult population in Riverside County, Hispanic defendants are overrepresented in those charged with special circumstances under PC 190.2; (2) Hispanic defendants are charged with special circumstances at a rate that is over 3 times higher than White non-Hispanic defendants; (4) Hispanic defendants are charged with special circumstances at a rate per population that is statistically significantly higher than White non-Hispanic defendants; and (5) Even

out of murder cases, Hispanic defendants have a significantly higher proportion of special circumstances cases relative to White non-Hispanic defendants.

Racial/ethnic disproportionality in cases with notice of intent to seek the death penalty

29. To examine whether defendants of a particular race/ethnicity were disproportionately represented in cases where the DA sought the death penalty, I compared the race/ethnicity in these cases to population statistics in the American Community Survey (ACS) from the Census between 2016-2020 for Riverside County.
30. Of 22 defendants where the DA sought the death penalty, 2 (9.1%) were White non-Hispanic, 7 (31.8%) were Black non-Hispanic, 12 (54.5%) were Hispanic, and 1 (4.5%) was of other race or ethnicity.
31. I then calculated the rates of murder cases where the DA sought the death penalty by race/ethnicity per 100,000 of their respective adult populations. The rate for White non-Hispanic murder cases where the DA sought the death penalty is $((2/700,651) \times 100,000=0.29)$ 0.29 per 100,000 adult population, the rate for Black non-Hispanic people is $((7/115,632) \times 100,000=6.05)$ 6.05 per 100,000 adult population, and the rate for Hispanic people is $((12/825,328) \times 100,000=1.45)$ 1.45 per 100,000 adult population.
32. I calculated the incident rate ratios for Black non-Hispanic relative to White non-Hispanic rates per population in Riverside County, as well as for Hispanic relative to White non-Hispanic rates. Black non-Hispanic people have murder cases where the DA sought the death penalty at a rate that is $(6.05/0.29=21.21)$ 21.21 times higher than White non-Hispanic people. Hispanic people have murder cases where the DA sought the death

penalty at a rate that is $(1.45/0.29=5.09)$ 5.09 times higher than White non-Hispanic people.

33. I conducted a differences of proportions z-score test comparing the rate of Black non-Hispanic murder cases where the DA sought the death penalty to the rate for White non-Hispanic. The rate of Black non-Hispanic murder cases where the DA sought the death penalty is statistically significantly higher than the rate of White non-Hispanics. The test comparing the rate of Black non-Hispanic relative to the rate of White non-Hispanic murder cases where the DA sought the death penalty is statistically significant, suggesting that the chance of observing the difference in rates between Black non-Hispanic and White non-Hispanic cases due to random chance is less than 0.01%.
34. I also conducted a differences of proportions z-score test comparing the rate of Hispanic murder cases where the DA sought the death penalty to White non-Hispanic murder cases where the DA sought the death penalty cases per population. The rate of Hispanic murder cases where the DA sought the death penalty is statistically significantly higher than the rates for White non-Hispanics. The test comparing the rate of Hispanics relative to the rate of White non-Hispanics is statistically significant, where the chance of observing the difference in rates between Hispanic and White non-Hispanic cases due to random chance is 0.89%.
35. I conducted a differences of proportions z-score test comparing the proportion of murder cases where the DA sought the death penalty out of special circumstances cases for Black non-Hispanics $(7/75=0.093)$ 0.093 to White non-Hispanics $(2/35=0.057)$ 0.057.⁸ Out of

⁸ This is a conservative analysis because it includes all special circumstances cases, including "pending" and other kinds of cases in the denominator, and so pending and other kinds of cases are assumed to be the same as not seeking the death penalty. Out of 35 cases with special circumstances for White non-Hispanics, 11 are pending or other. Out of 75 special circumstances cases for Black non-Hispanics, 40 are pending or other. Out of 139 special

special circumstances cases, the proportion of cases where the DA sought the death penalty for Black on-Hispanics is not statistically significantly greater than the proportion of special circumstances cases for White non-Hispanics. The test results indicate that the chance of observing the difference in proportions for Black non-Hispanic people and White non-Hispanic people due to random chance is more than 5%. This is due to the small number of cases in which the DA has sought the death penalty. Power analyses⁹ indicate that a sample size of over 2500 cases would be needed to detect statistically significant differences in proportions.

36. I also conducted a differences of proportions z-score test comparing the proportion of murder cases where the DA sought the death penalty out of special circumstances cases for Hispanics ($12/139=0.086$) 0.086 to White non-Hispanics ($2/35=0.057$) 0.057. Out of special circumstances cases, the proportion of cases where the DA sought the death penalty for Hispanics is not statistically significantly greater than the proportion of proportion of cases where the DA sought the death penalty for White non-Hispanics. The test results indicate that the chance of observing the difference in proportions for

circumstances cases for Hispanics, 72 are pending or other. Excluding pending and other cases, the proportion of Black non-Hispanics where the DA sought the death penalty out of special circumstances cases is ($7/35=0.250$), for White non-Hispanics is ($2/24=0.083$), and for Hispanics is ($12/55=0.218$). When using these proportions to conduct a z-score test for the difference between Black non-Hispanics and White non-Hispanics, the test is closer, but still not over the 0.05 (5%) threshold to achieve statistical significance. Using these proportions to test the difference between Hispanics and White non-Hispanics also does not result in a statistically significant z-score test.

⁹ Power analyses estimate the sample size needed to detect any statistically significant difference in a statistical test. In other words it is the "probability of detecting an effect when it exists" (UCLA Statistical Methods and Data Analysis (2021). *Two Independent Proportions Power Analysis*. <https://stats.oarc.ucla.edu/other/gpower/two-independent-proportions-power-analysis/>). Based on a threshold of 5% and the proportions of 0.093 for Black non-Hispanics and 0.057 for White non-Hispanics, the sample size needed to detect a statistically significant difference is 1389 for each group (or 2778 overall). Calculations for the test were drawn from Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. Even excluding pending and other cases, the estimated sample size would need to be 127 for each group (or 254 overall). Therefore, regardless of whether pending and other kinds of cases are included, the samples lack the sufficient size to detect statistically significant differences between Black non-Hispanic and White non-Hispanic groups.

Hispanic people and White non-Hispanic people due to random chance is more than 5%. This is also due to the small number of cases in which the DA has sought the death penalty. Power analyses indicate that a sample size of nearly 4100 cases would be needed to detect statistically significant differences in proportions.¹⁰

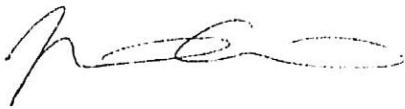
37. These results provide evidence that (1) Black non-Hispanic defendants are overrepresented in cases where the DA sought the death penalty relative to their adult population in Riverside County; and (2) White non-Hispanic defendants are underrepresented in cases where the DA sought the death penalty relative to their adult population in Riverside County. (3) Black non-Hispanic defendants have a rate of cases per population where the DA sought the death penalty that is over 20 times higher than the rate for White non-Hispanic defendants; (4) Black non-Hispanic defendants have murder cases where the DA sought the death penalty at a rate per population that is statistically significantly greater than for White non-Hispanic defendants, although (5) based on the proportion of cases in which the DA sought the death penalty relative to special circumstances cases, this difference is not statistically significant due to small sample size.

38. These results also provide evidence that (1) Hispanic defendants are overrepresented in cases where the DA sought the death penalty relative to their population in Riverside County; (2) Hispanic defendants have a rate of cases per population where the DA sought

¹⁰ Based on a threshold of 5% and the proportions of 0.086 for Hispanics and 0.057 for White non-Hispanics, the sample size needed to detect a statistically significant difference is 2049 for each group (or 4098 overall). Calculations for the test were drawn from Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. Even excluding pending and other cases, the estimated sample size would need to be 180 for each group (or 360 overall). Therefore, the samples lack the sufficient size to detect statistically significant differences between Hispanic and White non-Hispanic groups.

the death penalty that is over 5 times higher than the rate for White non-Hispanic defendants; (3) Hispanic defendants have murder cases where the DA sought the death penalty at a rate per population that is statistically significantly greater than for White non-Hispanic defendants, although (4) based on the proportion of cases in which the DA sought the death penalty relative to special circumstances cases, this difference is not statistically significant due to small sample size.

I declare under penalty of perjury that the foregoing is true and correct.

A handwritten signature in black ink, appearing to be a stylized name with a long horizontal stroke extending to the right.

Executed on this 17th day of June 2022, in St. Louis, Missouri

EXHIBIT 5

DECLARATION OF MARISA OMORI

I, MARISA OMORI, declare as follows:

1. I am an Associate Professor in the department of Criminology and Criminal Justice at the University of Missouri-St. Louis. Before this appointment, I was an Assistant Professor in the department of Sociology at the University of Miami.
2. I completed a PhD in Criminology, Law & Society from the University of California, Irvine, in 2014.
3. I completed a Master of Arts in Social Ecology from the University of California, Irvine in 2010, and a Master of Arts in Criminal Justice from John Jay College of Criminal Justice, the City University of New York, in 2007.
4. I completed a Bachelor of Arts degree in Economics from Occidental College in 2003, where I passed my comprehensive exam with distinction.
5. I have published over 25 peer-reviewed journal articles and book chapters, including statistical analyses of criminal justice systems in leading academic journals, such as *Criminology*, *Journal of Quantitative Criminology*, *Social Problems*, *Justice Quarterly*, and *Law & Society Review*.
6. I have conducted evaluations and analyses for several agencies and nonprofit organizations, including the St. Louis County Prosecutor's Office, the Southern District of Florida, the American Civil Liberties Union of Florida, and the California Department of Corrections and Rehabilitation. I have also served as a Co-Investigator on several external grants.
7. I have taught introductory undergraduate, as well as introductory and advanced graduate-level statistics courses for the past seven years, including Multivariate Statistics,

Advanced Sociological Statistics (Econometrics), and Statistical Analysis in Criminology and Criminal Justice. I have also previously served as a teaching assistant for several introductory and advanced statistics courses. These courses cover the statistical analyses used in my work on this case.

8. I was asked by counsel Brian Cosgrove and David Macher of the Law Offices of the Public Defender, County of Riverside, and co-counsel from the ACLU Capital Punishment Project and the ACLU of Southern California to respond to the Riverside County District Attorney's opposition to motion for a hearing and relief pursuant to the Racial Justice Act, Penal Code 745(C).
9. I initially conducted analyses of charging information for PC 187 murder cases in Riverside County, California, to assess whether there were racial and ethnic disparities from January 1, 2016 to January 1, 2022 including a total of 696 cases. In the Riverside County District Attorney's opposition to motion, it was noted that 7 cases included juveniles. I therefore re-ran the analyses excluding these 7 cases, for a total of 689 cases.
10. Of the 689 cases where the DA charged PC 187, there were 246 cases where there was at least one special circumstance under PC 190.2, and of those cases, there were 22 cases in which the DA sought the death penalty.
11. In the re-estimated statistics excluding the 7 juvenile cases, all of the previous conclusions in the prior declaration dated June 17, 2022 remain the same. For PC 187 murder charges, I find that (1) Black non-Hispanic defendants are overrepresented in murder charges ($((139/689) \times 100=20.2\%)$ relative to their adult population¹ in Riverside

¹ Population data were drawn from the American Community Survey (ACS) 2016-2020 estimates. American Community Survey Census data were obtained from the Integrated Public Use Microdata Series through their online data analysis system. See Ruggles, Flood, Goeken, Schouweiler and Sobek. "IPUMS USA: Version 12.0 [dataset]."

County (6.3%); (2) White non-Hispanic defendants are underrepresented in murder charges ((142/689) x 100=20.6%) relative to their adult population in Riverside County (38.4%). (3) Black non-Hispanic defendants have murder charges filed against them at a rate ((139/115,632)=120.21) over five times as high relative to White non-Hispanic defendants ((142/700,651) x 100,000=20.27) based on their respective populations; and (4) Conducting a differences of proportions z-score test², Black non-Hispanic defendants have murder cases filed against them at a rate per population that is statistically significantly greater³ than the rate for White non-Hispanic defendants.

12. In examining cases charged with special circumstances under PC 190.2, I still find that (1) compared to their adult population in Riverside County, Black non-Hispanic defendants are overrepresented in those charged with special circumstances ((75/246) x 100=30.5%); (2) White non-Hispanic defendants are underrepresented in those charged with special circumstances ((34/246) x 100=13.8%) relative to their population; (3) Black non-Hispanic defendants are charged with special circumstances at a rate ((75/115,632) x

Minneapolis, MN: IPUMS, 2022. <https://doi.org/10.18128/D010.V12.0>. <https://sda.usa.ipums.org/>. The ACS calculates estimates over a 5-year period of time, and so allow for increased statistical reliability.

²The difference of proportions test determines whether two proportions are statistically significantly different from each other in the population. See Agresti, A. & Finlay, B. (2009). *Statistical methods for the social sciences*. Pearson. The difference of proportions z-score test assumes that (1) we are working with independent random samples; (2) we are testing nominal-level variables, and (3) the sampling distribution will approximate a normal distribution. To test whether two proportions are statistically significantly different from each other, we calculate the difference in a z-score, which captures the number of standard deviations the difference in the two proportions is from the null hypothesis (where the null hypothesis is 0, or no difference between the two groups' proportions). The z-score formula for proportions is calculated as: $z = \frac{\hat{\pi}_1 - \hat{\pi}_2}{\sqrt{\hat{\pi}(1-\hat{\pi}) \times \left[\frac{1}{n_1} + \frac{1}{n_2} \right]}}$, where $\hat{\pi}_1$ and $\hat{\pi}_2$ represent group 1 and group

2's proportions, respectively, $\hat{\pi}$ represents the pooled (overall) proportion for both groups, and n_1 and n_2 represent the sample sizes for groups 1 and 2. z-scores are associated with a probability value, which is then used to determine statistical significance.

³ The probability value (p-value) is the probability of observing results as extreme as or more extreme than the one obtained if the null hypothesis were true. The null hypothesis in this case is that there is no difference in rate of murder cases filed between Black non-Hispanic and White non-Hispanic groups. Since the probability of observing this difference in the rates between Black non-Hispanic and White non-Hispanic groups if there actually was no difference is so low, we reject the null hypothesis and conclude that there is a statistically significant difference between Black non-Hispanic and White non-Hispanic rates. In all of these statistical analyses, I use a threshold of less than 0.01 (or 1%) to reject the null hypothesis.

100,000=64.86) that is over 13 times higher than White non-Hispanic defendants ((34/700,651) x 100,000=4.85); (4) Black non-Hispanic defendants are charged with special circumstances at a rate per population that is statistically significantly higher than White non-Hispanic defendants; and (5) Even out of murder cases, Black non-Hispanic defendants have a statistically significantly higher proportion of special circumstances cases (75/139=0.540) relative to White non-Hispanic defendants (34/142=0.239).

13. Finally, in examining cases in which the DA sought the death penalty, I still find that (1) Black non-Hispanic defendants are overrepresented in cases where the DA sought the death penalty ((7/22) x 100=31.8%) relative to their adult population in Riverside County; and (2) White non-Hispanic defendants are underrepresented in cases where the DA sought the death penalty ((2/22) x 100=9.1%) relative to their adult population in Riverside County. (3) Black non-Hispanic defendants have a rate of cases per population where the DA sought the death penalty ((7/115,632) x 100,000=6.05) that is over 20 times higher than the rate for White non-Hispanic defendants ((2/700,651) x 100,000=0.29); (4) Black non-Hispanic defendants have murder cases where the DA sought the death penalty at a rate per population that is statistically significantly greater than for White non-Hispanic defendants.

14. As the Riverside County District Attorney's opposition to motion notes, I found that in comparing the proportion of cases in which the DA sought the death penalty out of special circumstances cases between Black non-Hispanic defendants (7/75=0.093) and White non-Hispanics defendants (2/34=0.059), this difference is not statistically significant. I note that this finding is due to small sample size, however, and estimate that

a sample size of over 2500 cases⁴ would be needed to detect statistically significant differences in proportions. In other words, we do not have a large enough sample size in this case to draw a conclusion as to whether there is a difference. Concluding that there is not statistical significance between two groups is not evidence of finding no difference, but rather that we do not have enough evidence to say that there is a difference between two groups.

15. Additionally, this was the only statistical test performed where there was not a statistically significant difference between Black non-Hispanic to White non-Hispanic defendants. All of the other six statistical tests performed comparing Black non-Hispanic to White non-Hispanic defendants concluded with statistically significant differences, where Black non-Hispanic defendants were significantly overrepresented relative to White non-Hispanic defendants. The one statistical test performed that found no statistically significant results still points in the same direction as the other tests, where the Black non-Hispanic rate is higher than White non-Hispanic rate.

16. Notably, racial inequalities in the rates between Black non-Hispanic defendants and White non-Hispanic defendants actually increase as cases progress murder cases filed to special circumstances filed to death notices filed. Specifically, Black non-Hispanic defendants have a rate of murder cases filed per population that is 5.93 times higher than

⁴ Power analyses estimate the sample size needed to detect any statistically significant difference in a statistical test. In other words it is the “probability of detecting an effect when it exists” (UCLA Statistical Methods and Data Analysis (2021). *Two Independent Proportions Power Analysis*. <https://stats.oarc.ucla.edu/other/gpower/two-independent-proportions-power-analysis/>). Based on a threshold of 5% and the proportions of 0.093 for Black non-Hispanics and 0.059 for White non-Hispanics, the sample size needed to detect a statistically significant difference is 1576 for each group (or 3152 overall). Calculations for the test were drawn from Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. Therefore, the samples lack the sufficient size to detect statistically significant differences between Black non-Hispanic and White non-Hispanic groups.

White non-Hispanic defendants, but a rate of special circumstances filed is 13.37 times higher, and a rate where the DA intends to seek the death penalty that is 21.21 times higher.

17. I am attaching Exhibit A, which contains tables 1 through 4 and figure 1 reflecting these results.

I declare under penalty of perjury that the foregoing is true and correct.

A handwritten signature in black ink, consisting of a stylized first letter followed by a series of loops and a long horizontal stroke.

Executed on this 10th day of October 2022, in St. Louis, Missouri

Exhibit A: Tables and figures examining death penalty statistics

Table 1: Percent of Adult population, murder cases filed, death penalty eligible, and death notices filed in Riverside County

	Adult population		Murder cases filed		Death penalty eligible		Intent to seek death penalty	
	N	%	N	%	N	%	N	%
White non-Hispanic	700651	38.4%	142	20.6%	34	13.8%	2	9.1%
Black non-Hispanic	115632	6.3%	139	20.2%	75	30.5%	7	31.8%
Hispanic or Latino	825328	45.2%	389	56.5%	133	54.1%	12	54.5%
Other	182854	10.0%	19	2.8%	4	1.6%	1	4.5%
Total	1824465	100.0%	689	100.0%	246	100.0%	22	100.0%

Note: Population estimates from ACS Census from 2016-2020 for Riverside County

Figure 1: Percent of Adult population, murder cases filed, death penalty eligible, and death notices filed in Riverside County

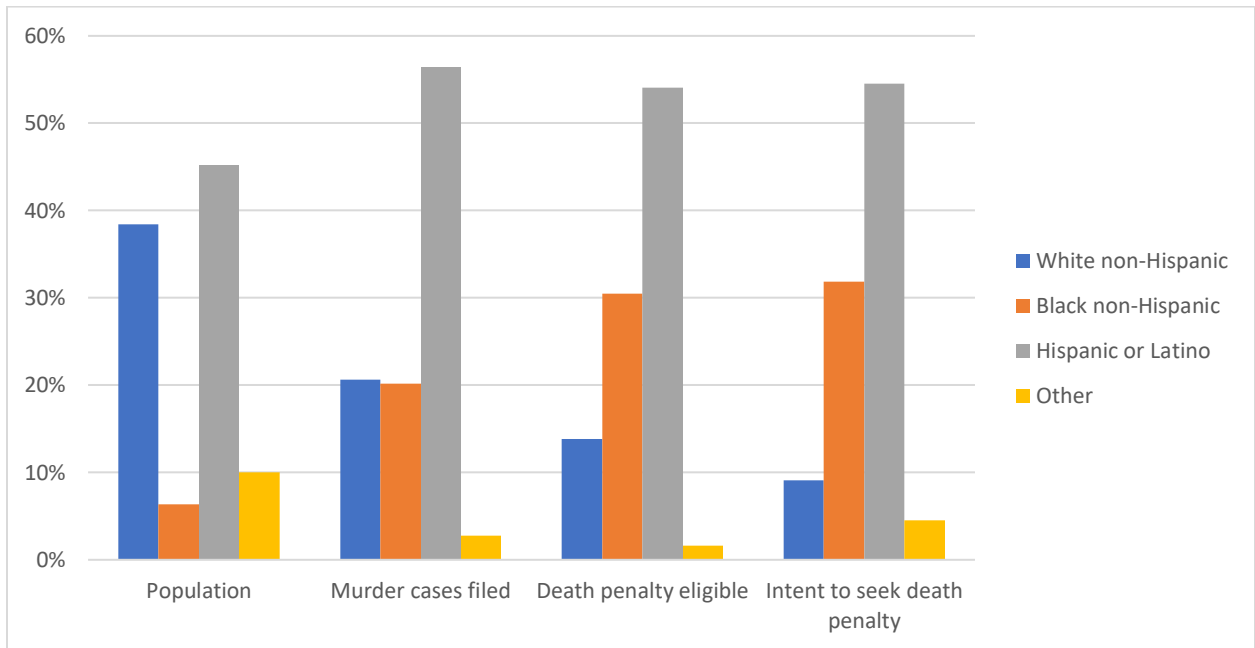


Table 2: Rates of cases filed, death penalty eligible, and death notices filed in Riverside County

	Adult population	Murder cases filed		Death penalty eligible		Intent to seek death penalty	
	N	N	Rate	N	Rate	N	Rate
White non-Hispanic	700651	142	20.27	34	4.85	2	0.29
Black non-Hispanic	115632	139	120.21	75	64.86	7	6.05
Hispanic or Latino	825328	389	47.13	133	16.11	12	1.45
Other	182854	19	10.39	4	2.19	1	0.55
Total	1824465	689	37.76	246	13.48	22	1.21

Note: All rates out of 100,000 population by respective racial/ethnic group

Table 3: Incident rate ratios (IRR) comparing White non-Hispanic rates to all other groups in Riverside County

	Murder cases filed IRR	Death penalty eligible IRR	Intent to seek death penalty IRR
Black non-Hispanic	5.931	13.366	21.208
Hispanic or Latino	2.326	3.321	5.094
Other	0.513	0.451	1.916

Table 4: Proportion of death penalty eligible and intent to file death penalty by race/ethnicity in Riverside County

	Murder cases filed	Death penalty eligible		Intent to seek death penalty	
	N	N	Proportion of murder cases	N	Proportion of death penalty eligible cases
White non-Hispanic	142	34	0.239	2	0.059
Black non-Hispanic	139	75	0.540	7	0.093
Hispanic or Latino	389	133	0.342	12	0.090
Other	19	4	0.211	1	0.250
Total	689	246	0.357	22	0.089