UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
GALVESTON DIVISION

TERRY PETTEWAY, et al. Plaintiffs, v. GALVESTON COUNTY, TEXAS, et al. Defendants.	§ § § § § § § §	Civil Action No. 3:22-CV-00057 (consolidated)
UNITED STATES OF AMERICA, Plaintiffs, v. GALVESTON COUNTY, TEXAS, et al. Defendants.	§ § § § § § § §	Civil Action No. 3:22-CV-00093
DICKINSON BAY AREA BRANCH NAACP, et al. Plaintiffs, v. GALVESTON COUNTY, TEXAS, et al. Defendants.	§ § § § § § § §	Civil Action No. 3:22-CV-00117

DEFFENDANTS' MOTION TO EXCLUDE PORTIONS OF DR. MATTHEW BARRETO'S EXPERT AND REBUTTAL REPORTS

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases

Rules and Statutes

DEFFENDANTS' MOTION TO EXCLUDE PORTIONS OF DR. MATTHEW BARRETO'S EXPERT AND REBUTTAL REPORTS

Pursuant to Rule 37(c)(1) and *Daubert v. Merrell Dow Pharms*., Inc., 509 U.S. 579 (1994), and its progeny, Defendants Galveston County, Texas, the Galveston County Commissioners Court, County Judge Mark Henry, and County Clerk Dwight Sullivan (collectively "Defendants") move to exclude: (1) paragraphs 25, 28, and 30–43 of Dr. Matthew Barreto's January 13, 2023 expert report (attached hereto as Exhibit A), and (2) the Bayesian Improved Surname and Geocoding ("BISG") analysis contained in Dr. Barreto's April 14, 2023 rebuttal report (attached hereto as Exhibit B).

INTRODUCTION

The Voting Rights Act requires an intensely local appraisal of voting districts. *Thornburg v. Gingles*, 478 U.S. 30, 79 (1982). However, Dr. Matthew Barreto, the *Gingles* 2 and 3 expert for the Petteway Plaintiffs, ignores this requirement. Arguing that Galveston County's white voters vote Republican for racist reasons as opposed to partisan or other reasons, Dr. Barreto cites political science journals while also admitting that those studies have a national and, in some cases, regional focus (but none of which focus on Galveston County voters). The paragraphs from Dr. Barreto's report identified below are therefore based on generalized assessments that have no relevance to this case and are ultimately unhelpful. This Court should strike those paragraphs and preclude Dr. Barreto from testifying about them.

Next, Dr. Barreto's rebuttal report contains new analysis that, by his own admission, he intended to include in his January 2023 report, but did not. Even after receiving data he

claims he did not have, Dr. Barreto waited three months, until **April 14, 2023,** to submit this new analysis (28 days after Defense expert Dr. John Alford submitted his opposition report, and six days prior to his deposition). This Court should strike Dr. Barreto's new analysis as improper and untimely rebuttal evidence.

Compounding the problem is that, when Dr. Barreto transmitted his rebuttal report on April 14, 2023, he failed to produce an actual usable R script (the underlying data that contained his numerous data inputs and commands), and the probabilities that certain registered voters were white, African American, or Latino. Alternatively, Dr. Barreto chose not to create an R script (a notion that is both unlikely and irresponsible) or to save his R script, and therefore knowingly concealed the backbone of his analysis from Defendants when he produced his rebuttal report three months late. Defendants eventually did get an R script (7 pages of computer code); however, production was hardly voluntarily. It took an order from the Court, and even then all that could be produced was something he recreated at a later date. The Court should therefore strike this new analysis for the additional reason that Dr. Barreto failed to provide underlying data that Rule 26 requires. Fed. R. Civ. P. 26(a)(2)(B)(ii); Fed. R. Civ. P. 37(c)(1).

NATURE OF THE PROCEEDINGS

Discovery closed on April 21, 2023. Trial is scheduled for August 7, 2023, with a pre-trial hearing scheduled for July 25, 2023. *See* Amended Doc. Control Order at 2 (ECF 155, April 28, 2023).

STANDARD OF REVIEW

This Court's ruling on a motion to exclude expert testimony is reviewed for abuse of discretion. *United States v. Valencia*, 600 F.3d 389, 423 (5th Cir. 2010) (citing *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999)). "The admission or exclusion of expert testimony is a matter left to the discretion of the trial court, and that decision will not be disturbed on appeal unless it is manifestly erroneous." *Primrose Operating Co. v. Nat'l Am. Ins. Co*., 382 F.3d 546, 563 (5th Cir. 2004).

Federal Rule of Evidence 702 permits a court to allow a qualified expert to testify so long as the "(1) testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." Fed. R. Evid. 702. Thus, district courts act as gatekeepers in determining the admissibility of expert testimony. *Valencia*, 600 F.3d at 424. As gatekeepers, courts may admit expert testimony only if the proponent of the testimony shows, by preponderance of the evidence, that: "(1) the expert is qualified, (2) the evidence is relevant to the suit, and (3) the evidence is reliable." *Jacked Up, LLC v. Sara Lee Corp*., No. 11-cv-3296 2018 U.S. Dist. LEXIS 29537, *7 (N.D. Tex. Feb. 15, 2018).

For an expert's opinion to be relevant under Fed. R. Evid. 702, the expert's opinion must "assist the trier of fact to understand the evidence or to determine a fact at issue." *Pipitone v. Biomatrix, Inc.*, 288 F.3d 239, 245 (5th Cir. 2002). The relevance of the expert's opinion depends upon whether the expert's "reasoning or methodology properly can be applied to the facts in issue." *Knight v. Kirby Inland Marine Inc.*, 482 F.3d 347, 352 (5th Cir. 2007). Thus, "an expert's opinion should not be admitted if it does not apply to the

specific facts of the case." *Diggs v. Citigroup, Inc*., 551 Fed. Appx. 762, 765 (5th Cir. 2014) (citing *Kumho*, 526 U.S. at 154). Similarly, "expert testimony which does not relate to any issue in the case is not relevant, and ergo, non-helpful." *Roman v. Western Mfg*., 691 F.3d 686, 694 (5th Cir. 2012). "The evidence must possess validity when applied to the pertinent factual inquiry." *United States v. Posado*, 57 F.3d 428, 433 (5th Cir. 1995).

Where the fact-finder is "just as competent as [the expert]" to interpret evidence or identify inconsistencies in the evidence, the expert's testimony is unhelpful and should be excluded. *See Amin-Akbari v. City of Austin, Tex.*, 52 F. Supp. 3d 830, 846 (W.D. Tex. 2014). Additionally, where an expert is making credibility determinations and weighing apparently inconsistent evidence, these subjects are improper for expert testimony and the Court should strike it. *See id*. at 846-47. An expert who merely restates facts "that any layperson would be able to easily comprehend without the assistance of an expert is unhelpful to the fact-finder and should be struck. *See Albert Sidney Johnston Chapter v. Nirenberg*, No. SA-17-CV-1072-DAE, 2018 U.S. Dist. LEXIS 179561 *8 (W.D. Tex. Oct. 18, 2018). Thus, as the Advisory Committee Notes for Rule 702 observe, a test for whether to permit expert testimony is whether "the untrained layman would be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the dispute." *Id*. at *9. Thus, if a party can introduce evidence through a lay witness, an expert is not required to testify in their stead. *Id*; *Musket Corp. v. Suncor Energy (U.S.A.) Mktg,* No. H-15-100, 2016 U.S. Dist. LEXIS 175601 at *23-24 (S.D. Tex. Dec. 20, 2016) (holding that the proposed expert's testimony about communications disclosed in

discovery were unhelpful because the party proffering the expert may introduce those same communications through non-expert witnesses). The proponent of the expert bears the burden to show that by a preponderance of the evidence, the expert's testimony is relevant. *MM Steel, L.P. v. JSW Steel (USA) Inc.*, 806 F.3d 835, 850 (5th Cir. 2015).

ARGUMENT

I. The Court should strike paragraphs 25, 28 and 30–42 of Dr. Barreto's January 13, 2023 Report as unhelpful.

Section 2 of the Voting Rights Act requires an intensely local analysis of the social and political climate in the challenged jurisdiction. *Gingles*, 478 U.S. at 79. In conducting this intensely local analysis, evidence of the political climate nationwide is unhelpful. *Fairley v. Hattiesburg Miss.*, 662 F. App'x 291, 298 (5th Cir. 2016). This is especially true when there is an analytical gap between the nationwide data and the challenged jurisdiction. *See Clark v. Calhoun Cty.*, 88 F.3d 1393, 1399 (5th Cir. 1996). Without bridging the analytical gap between the nationwide data and the challenged jurisdiction, an expert's opinion is merely "generalized armchair speculation." *League of United Latin Am. Citizens, Council No. 4434 v. Clements*, 999 F.2d 831, 867 (5th Cir. 1993) (en banc) ("*Clements*"). Paragraphs 25 and 30-42 of Dr. Barreto's January 13, 2023 expert report are precisely the generalized armchair speculation that this Court should reject and strike in this case.

A. Section 2 of the Voting Rights Act requires an intensely local analysis.

Section 2 of the Voting Rights Act requires courts to conduct "an intensely local appraisal" of the electoral mechanism at issue. *Allen v. Milligan*, No. 21-1086, slip op. at

11 (U.S. June 8, 2023). Whether the majority white population of a challenged district votes as a block to prevent the minority population from electing their candidate of choice "at least plausibly on account of race." *Id.*; *Clements*, 999 F.2d at 867 (rejecting expert opinion that relied on national data because "[a] district court's findings under § 2 must rest on an intensely local appraisal of the social and political climate of the cities and counties in which such suits are brought . . ."") (internal quotation marks omitted); *see also Clark*, 88 F.3d at 1399 (upholding district court's decision to disregard expert opinion based upon political science literature and not "an 'intensely local appraisal' of the social and political climate"). Thus, under the third *Gingles* pre-condition, there must be evidence that white voters *in Galveston County* voted as a bloc to prevent the minority candidate of choice "at least plausibly on account of race." *Allen*, slip op. at 11; *LULAC*, 999 F.2d at 867.

B. Paragraphs 25, 28 and 30-43 fail to provide any local analysis.

Merely showing that white voters prefer different candidates from Latino or African American voters is insufficient to find liability under Section 2 of the Voting Rights Act. *See, e.g., Clements*, 999 F.2d at 878-79; *Lopez v. Abbott*, 339 F. Supp. 3d 589, 604 (S.D. Tex. 2018). Dr. Barreto attempts to fill this evidentiary gap with national studies about voting habits and partisan preferences. He draws from national studies and argues that racist attitudes and positions drive white voters in Galveston County to vote Republican.

This Court should strike Paragraphs 25, 28, and 30-43 from Dr. Barreto's report because these paragraphs contain no analysis of Galveston County voters. In fact, during his deposition, Dr. Barreto admitted that the studies were national in scope or focused on the Southern region of the United States. Barreto Dep. at 109:19-25, 110:1 (attached hereto

as Exhibit C). At best, because these studies are national, their random sampling of the population may include some people in Galveston County. *Id*. 109:13-18. Ultimately, however, these studies are not Texas- or Galveston-specific, and certainly are not specific to Galveston County. These paragraphs should therefore be stricken from the record as unhelpful and not relevant. *See Clark*, 88 F.3d at 1399; *Roman*, 691 F.3d at 694.

Specifically, this Court should strike paragraphs 28 and 43 from Dr. Barreto's report, as both discuss Texas generally and do not discuss Galveston. Nor does Dr. Barreto adduce statistical data from Galveston or Texas to support the assertions made in these paragraphs. The majority of paragraph 28 discusses discrimination against Latinos in Texas broadly and how this discrimination translates into lower rates of voter registration and voter turnout. But there is no citation to statistical information or any other evidence that Latino voters in Galveston register at lower rates than white voters, or vote at lower rates than white voters because of discriminatory institutional policies. In paragraph 43, Dr. Barreto contends that general elections are important to voters in Texas generally but provides no authority for this assertion, and says nothing about Galveston County. Nor does Dr. Barreto provide a citation to support his assertion that some jurisdictions in Texas—he doesn't identify which—"intentionally create districts in which no racial group is a majority, even though creating a majority-minority district is possible. This Court should strike that paragraph. *See Clark*, 88 F.3d at 1399.

This Court should also strike paragraphs 25, 30, 31, 32, 33, 34, and 40 because none of the studies cited by Dr. Barreto are from Galveston County; instead, they have a national or regional focus and do not concern Texas or Galveston County.

Dr. Barreto pieces together several academic studies and concludes without sufficient basis that "partisan general elections" in Galveston County "are often understood by voters through a racial/ethnic lens," and their attitudes about racial public policy issues immigrants and "racial animus" must "influence partisanship among White voters." Exhibit A at ¶ 25. His conclusions about voters' views on race are that "White voters today [are often pushed] into voting for Republican candidates" so that "a clear link to racially polarized voting" exists "even when one considers partisanship." *Id*. His conclusions are unsupported by any local analysis. His theory is one he repeats throughout the County—that racial attitudes drive partisan affiliation and bloc voting. *Id*. ¶ 30. For Dr. Barreto, "racial attitudes, partisanship and voting patterns" all demonstrate that racially polarized voting could not be explained as mere partisanship. *Id*. ¶ 31. This is because, according to Dr. Barreto, negative racial attitudes and attitudes about racial public policy and immigration "are the leading indicators of party affiliation among Whites" and "the underlying mechanism responsible for producing racial bloc voting among Whites." *Id*. ¶ 32-33. Dr. Barreto attempts to move the needle a little closer to home when he asserts that "discriminatory attitudes and racial prejudice play a central role in driving White party identification, and this is especially strong in states such as Texas." *Id*. ¶ 34. He still conducts no localized analysis, and provides no local data to support his beliefs—including his belief that it is not "ideological conservatism" that is driving white voters to the Republican party but "racial attitudes." *Id*. ¶ 40.

Dr. Barreto's sweeping assertions lack the intensely local analysis that *Gingles* requires, and should be stricken. *Allen*, No. 21-1086, slip op. at 11. *See* Exhibit A at ¶ 25

n. 12; ¶ 30 n. 14; ¶ 32-33 n.18; ¶ 34 n.21. Dr. Barreto's analysis of whether Galveston County white voters prevent African American and Latino voters from electing their candidate of choice on account of race is insufficient, and accordingly, should be stricken. *See Allen*, slip op. at 11; *Clements*, 999 F.2d at 867; *Clark*, 88 F.3d at 1399; *Roman*, 691 F.3d at 694.

Additionally, Dr. Barreto's citation of *Busbee v. Smith*, 549 F. Supp. 494 (D.D.C. 1982), demonstrates why this Court should preclude Dr. Barreto from testifying. Exhibit A at ¶ 30. *Busbee* is a 1982 case from Georgia where there was evidence that members of the redistricting committee used profoundly offensive racial slurs. 549 F. Supp. at 500-501 (recounting that the chairman of the redistricting committee frequently used the N-word when describing majority-minority districts). This Court does not need political science journals or a professor from California to help the Court understand that using such a deeply hateful term is racist. *See Albert Sidney Johnston Chapter*, No. SA-17-CV-1072-DAE, 2018 U.S. Dist. LEXIS 179561 *8-9. And in citing *Busbee*, Dr. Barreto again lacks any localized analysis of Texas, Galveston County, or other facts pertinent to this case.

This Court should strike paragraphs 33, 35, 36, 37, 38, 39, 41, and 42 for the same reasons: Dr. Barreto supports his conclusions with studies that are national and regional in focus, and fails yet again to conduct an intensely local appraisal of Galveston County.

For example, Dr. Barreto asserts that President Obama's time in office "reshaped partisan affiliation in contemporary America almost entirely through the lens of racial attitudes." Exhibit A ¶ 33. To prove this point, Dr. Barreto discusses nationwide and southern regional studies demonstrating that President Obama received less support from

white voters in Southern states than did John Kerry and Al Gore. This, Dr. Barreto concludes, is a "direct result of racial prejudice and discriminatory attitudes." *Id.* at ¶ 35. He asserts (without support) that "White voters punished Obama for his race rather than his party affiliation" and, after the election of President Obama, "old fashioned racism" drove partisan preferences. *Id*. at ¶¶ 36-37. Dr. Barreto even states that there is a *causal link* between an individual's racial attitudes and their partisan preferences:

> Importantly, this paper disentangles antipathy toward Black people from other factors that may motivate White Americans to support the Republican party and not be willing to vote for a Black president, such as conservative principles, support for reduced government intervention, and other policy preferences (e.g., foreign policy)….The findings also demonstrate that Democratic commitments to general civil rights in 1963 *do not* produce defection towards the Republican party among Southern whites, if they are unwilling to support a Jewish, Catholic, or Woman president, all other groups that were associated with liberal beliefs at the time. Instead, it is only among those who have negative racial attitudes or who are unwilling to support a Black president who leave the Democratic Party for the Republican Party…[t]he unwillingness to support a Black president is the single most critical factor determining defection from the Democratic party into the Republican party.

Id. at ¶ 39. Despite reference to 'disentangling' other motivating factors, Dr. Barreto provides no such explanations. Rather, he concludes that an inseparable link exists between racial and partisan discrimination. *Id*. at ¶¶ 41-42.

Once again, Dr. Barreto relies upon studies that are national or regional in scope in support. Exhibit B at 109:19-25; Exhibit A at ¶ 25 n.12; ¶ 30 n.14; ¶ 32-33 n.18; ¶ 34 n.21. Dr. Barreto's analysis is insufficient and this Court should strike his opinon that white voters in Galveston County prevent African American and Latino voters from electing their candidate of choice on account of race. *Allen*, slip op. at 11; *Clements*, 999 F.2d at 867;

Clark, 88 F.3d at 1399; *Roman*, 691 F.3d at 694. The Court should strike these paragraphs from his report and preclude Dr. Barreto from testifying as to these topics.

II. This Court should strike from Dr. Barreto's rebuttal report his BISG analysis because it is new analysis, and because he failed to disclose the underlying script.

The Court should strike Dr. Barreto's April 14, 2023 rebuttal report for two reasons. *First*, it is an improper rebuttal report containing additional new analysis that expands the analysis in the original January 13, 2023 report. *Second*, Dr. Barreto never disclosed the underlying data he used to prepare that report, including the script that contained his commands and inputs. In fact, he intentionally refused to create or failed to save that code. To date, Defendants have only received code Dr. Barreto generated after the fact (and did not provide until approximately 5 months after his initial report was due). For these reasons, this Court should strike the April 14, 2023 rebuttal report containing his BISG analysis.

A. Factual Background

After serving their First Requests for Production in August 2022, the Petteway Plaintiffs waited until December 8, 2022 to ask whether Defendants would produce the Galveston County voter file by December 13th. *See* E-Mails Between All Counsel (attached hereto as Exhibit D). As counsel for Defendants noted in email correspondence, the Petteway Plaintiffs had not requested the file in any of their prior written requests. *Id.* Defendants provided the file on or about January 11, 2023 in response to a Second Request for Production of Documents. As per the scheduling order, Plaintiffs submitted their expert reports, including Dr. Barreto's report, on January 13, 2023. ECF 66. Defendants' experts

had two months, until March 17, 2023, to conduct a review of these reports and draft opposition reports. Over this time period, the Petteway Plaintiffs submitted no amendments or corrections to their reports. Approximately 28 days after Defendants' expert, Dr. John Alford, submitted his opposition report, Dr. Barreto submitted a purported rebuttal report containing entirely new analysis known as Bayesian Improved Surname and Geocoding ("BISG").

During his deposition on April 20, 2023, Dr. Barreto testified that to complete his BISG analysis he needed two weeks to one month. Exhibit C at 36:1-8; 40: 9-13. He also testified that he conducted the BISG analysis "earlier this year." *Id*. at 53:19-23. Although Dr. Barreto could have amended his original report and submitted it in February, allowing Dr. Alford the potential to review and respond and Defense counsel time to comprehend the analysis before Dr. Barreto's deposition, Dr. Barreto waited until a week before the close of discovery and six days before his deposition to submit his brand-new BISG analysis. Worse yet, Dr. Barreto consciously refused to create a script that would allow replication, which is highly unlikely, or deleted the corresponding R script (the script that shows every input and command he entered to generate the BISG analysis). Although the Court ordered Dr. Barreto to show Dr. Alford how he conducted the analysis over Zoom, questions still remain. *See* ECF Minute Entries of May 15, 2023 and May 18, 2023.

For example, during Dr. Barreto's deposition, he testified that his BISG analysis of each name on the voter file produced a probability regarding the person's race/ethnicity. Exhibit C at 44:6-17. Dr. Barreto noted that he used this information to arrive at his conclusions. *Id*. at 51:19-24. It is thus uncontroverted that the actual R script that Dr.

Barreto used to run the BISG analysis contains the data he relied on to create the rebuttal report, and that this data was used to study elections not previously considered in his initial expert report. Dr. Barreto has not, and apparently cannot, produce any of the inputs he used for the BISG analysis for Defendants' experts to examine. He only re-created something after the fact, and then only at the Court's order. What's more, the 7-page length and detail of that document suggests that Dr. Barreto's claimed non-use of a script is either irresponsible or incorrect. *See* Exhibit F.

B. This Court should strike Dr. Barreto's BISG analysis because it contains new analysis.

A plaintiff may submit a rebuttal report that is "intended solely to contradict or rebut evidence on the same subject matter identified" by the defendants' expert. Fed. R. Civ. P. 26(a)(2)(D)(ii). Plaintiffs cannot use rebuttal reports to continue advancing their case-in-chief. *See Cates v. Sears, Roebuck & Co*., 928 F.2d 679, 685 (5th Cir. 1991). More "detailed and comprehensive explanation[s] of earlier testimony" are improper rebuttal testimony. *Id*. This is because the term rebuttal "is a term of art denoting evidence introduced by a Plaintiff to meet new facts brought out in his opponent's case in chief." *Morgan v. Commercial Union Assurance Cos*., 606 F.2d 554, 555 (5th Cir. 1979). "An expert report is not proper rebuttal if the report speaks directly to an issue on which [the offering party] bear the burden of proof." *In re Toy Asbestos*, 2021 U.S. Dist. LEXIS 52228, *18 (N.D. Cal. March 19, 2021).

Dr. Barreto's BISG analysis is a continuation of the Petteway Plaintiffs' case-in-chief on an issue which Plaintiffs bear the burden of proof. This conclusion does not require

the Court to analyze or parse the rebuttal report. Dr. Barreto himself testified that he intended to include the BISG analysis in his January 13, 2023 report. Exhibit C at 35:5-8. Indeed, Dr. Barreto states this intention explicitly in writing in his rebuttal report: "We also replicate our original analysis to provide racially polarized voting estimates based on the actual voter file for Galveston, which was not provided to us by Galveston County in time to include in the prior report." Exhibit B at 1, ¶ 5. Even the January 13, 2023 Report hints at this when Dr. Barreto states that he obtained from the Texas Legislative Council "Spanish Surname Registered Voters and Spanish Surname Turnout . . . ." Exhibit A at 2, ¶ 9. Dr. Barreto's BISG analysis is not rebuttal evidence; it is an expansion of his January 13, 2023 report using a new model. And, assuming he was held up by data availability, it is something he could have submitted in February 2023, since he had the voter file starting on January 11, 2023. Had he done so, Dr. Alford—Defendants' expert—would have had one month to review that analysis and include his response in his March 17, 2023 report. Dr. Barreto instead waited until April 14, 2023 to file a "rebuttal report," preventing Dr. Alford from having sufficient time to conduct his own review and analysis to include in his opposition report, and preventing Defendants' counsel from asking Dr. Barreto detailed questions about the analysis at Dr. Barreto's deposition. *In re Toy Asbestos*, 2021 U.S. Dist. LEXIS 52228, *19. The extended time (over two months) between when Dr. Barreto could have provided his BISG analysis and when it was disclosed indicates that the Petteway Plaintiffs were attempting to manufacture a tactical advantage "by waiting to disclose critical information about their case." *Id*. The late analysis should be stricken, as it "play[s] fast-and-loose with Rule 26's requirements." *Id*.; Fed. R. Civ. P. 37(c)(1).

C. The Court should strike Dr. Barreto's BISG analysis because Dr. Barreto failed to disclose his R script detailing his data inputs and commands.

Further compounding this gamesmanship is Dr. Barreto's decision to withhold the R Script he used to conduct his BISG analysis. Rule 26(a)(2)(B)(ii) requires Dr. Barreto to provide all data they considered when forming their opinions and rebuttals. *See Freeny v. Murphy Oil Corp*., No. 2:13CV-791-RSP, 2015 U.S. Dist. LEXIS 118731, at *6 (E.D. Tex. June 3, 2015*); Wesdem, LLC v. Ill. Tool Works, Inc*., No. SA-20-CV-00987-OLG, 2021 U.S. Dist. LEXIS 263726, at *3 (W.D. Tex. Aug. 12, 2021). Should they fail to do so, Plaintiffs cannot use that information or those experts before the Court "unless the failure was substantially justified or is harmless." Fed. R. Civ. P. 37(c)(1). The Fifth Circuit considers four factors in determining substantial justification: (1) the explanation for failing to identify the information; (2) the importance of the information; (3) potential prejudice to the other side; and (4) whether a continuance is available to cure any such prejudice. *Majestic Oil, Inc. v. Certain Underwriters at Lloyd's*, No. 21-20542, 2023 U.S. App. LEXIS 6593, at *3 (5th Cir. Mar. 17, 2023); *see also Primrose Operating Co.*, 382 F.3d at 563-64.

First, there is no explanation for Dr. Barreto's failure to provide his R script. Despite Dr. Barreto's initial deflection for requests for that script by pointing to 'publicly available data,' that data cannot be used to replicate Dr. Barreto's BISG analysis because it does not contain Dr. Barreto's assumptions and variables that he used in conducting the analysis. This analysis contains thousands of key-strokes and without an R script there is simply no way of reviewing each step of the analysis to see if mistakes were made. Dr. Alford cannot

replicate Dr. Barreto's work and test his results without Dr. Barreto having disclosed each step taken, each assumption made, and each variable applied. That information could have been easily saved and produced by saving the R script used. The Federal Rules of Civil Procedure simply do not "impose a duty on an opposing party" to guess how an opposing expert conducted an analysis, what that expert's assumptions were, what inputs were used, and what commands were given. *See Cadena v. El Paso County*, 2017 U.S. Dist. LEXIS 234618, *11 (W.D. Tex. Aug. 11, 2017). And importantly, the fact that Dr. Barreto failed to save his actual R script need not be a willful or malicious act to justify exclusion under Rule 37. *Coane v. Ferrara Pan Candy Co.*, 898 F.2d 1030, 1032 (5th Cir. 1990).

Second, as to the importance of the information, the BISG analysis is simply a different way of demonstrating racially polarized voting. Pages 19-52 of the Dr. Barreto's initial report contain his estimates of how African American, Latino, and White Voters voted in Galveston County across 29 elections. Exhibit A at 19-52. At his deposition, Dr. Barreto testified that he analyzed the same 29 elections using BISG analysis. Exhibit C at 41:4-7. To the extent the Court strikes Dr. Barreto's BISG analysis, the Petteway Plaintiffs still have his January 13, 2023 original analysis to support their claims of racially polarized voting. The BISG analysis was not critical enough for them to do the work for their case. To the extent the Petteway Plaintiffs contend the BISG analysis is of the utmost importance, their decision to stall in its production, and to withhold critical underlying data for that analysis, belies that argument, and is all the more detrimental to Defendants in building their defense. *Cadena*, 2017 U.S. Dist. LEXIS 234618 at *13.

Third, without the actual R script that Dr. Barreto used to run his BISG analysis, Defendants cannot evaluate whether "the reasoning and methodology underlying [Dr. Barreto's] testimony is valid and can be reliably applied to the facts of the case[]" and was indeed reliably applied." *Valencia*, 600 F.3d at 424. It is therefore critically important, and there is no valid reason for it being deleted and not produced with the rebuttal report. Without the actual R script that was used, this Court cannot adequately perform its gatekeeping role prior to Dr. Barreto explaining his inputs and commands for the first time on the witness stand. *Caden*, 2017 U.S. Dist. LEXIS 234618 at *15. Nor could counsel adequately prepare for cross-examination; guessing at what Dr. Barreto's inputs were and commands is not a viable cross-examination strategy. *Id*. at *15. For example, Dr. Barreto testified that his BISG analysis for each name on the voter file assigns each voter a probability that an individual was of either one of the "four main racial groups." Exhibit C at 44:6-17. Those probabilities were created and used by Dr. Barreto to reach the results and conclusions in the rebuttal report. *Id*. at 51:19-24. But these probability scores were not produced with the rebuttal report—not in tables as an appendix to the report, on a thumb drive, or on a webpage accessible by a link provided to opposing counsel.

Dr. Barreto did not provide or offer any of this information with his rebuttal report, and therefore to discover what each individual's probability score for the four main racial groups that Dr. Barreto generated, defense experts would need to replicate Dr. Barreto's analysis using a *generic* or publicly available R script. *Id.* at 71:20-24. In fact, this is exactly what Dr. Barreto contended defense experts in this case should do. But with only public data, the accuracy of Dr. Barreto's BISG analysis cannot be tested because it cannot be

recreated. For example, it is important to be able to test the accuracy of Dr. Barreto's model by checking the probability scores for elections involving Judge Henry, who is white, or Commissioner Holmes and Commissioner Armstrong, who are African American. This is not an idle concern. *See* Imai and Khanna, *Improving Ecological Inference by Predicting Individual Ethnicity from Voter Registration Records*, 24 Political Analysis 263, 268 (Spring 2016) (attached hereto as Exhibit E) (noting that BISG analysis with only name and block data available, the same data Dr. Barreto had, has a false negative rate of 32% for African Americans – i.e. 32% of the time BISG analysis falsely determines that someone who is not Black is Black). Without the actual names and probabilities that Dr. Barreto generated for those names, Defendants cannot adequately prepare to vigorously cross-examine Dr. Barreto at trial.

Fourth, this Court should not afford Dr. Barreto an opportunity to cure the defects in his rebuttal report; instead the appropriate sanction is exclusion of his BISG analysis. The opportunity to cure is only appropriate where it is not dilatory and would not be prejudicial to a party. *See Current v. Atochem N. Am., Inc.*, No. W-00-CA-332, 2001 U.S. Dist. LEXIS 26241, at *16 (W.D. Tex. Sep. 18, 2001) (holding that "permitting [an expert] to continue to refine and refresh his opinion as Plaintiffs discover new data for his review would substantially disrupt the progress of this case"); *Geiserman v. MacDonald*, 893 F.2d 787, 790-93 (5th Cir. 1990).

When Defendants received Dr. Barreto rebuttal report, they met and conferred with Plaintiffs to request the R script and underlying data he used. As explained above, however, this was a fruitless request since Dr. Barreto never actually saved his work. Instead of

explaining this, however, Plaintiffs stonewalled Defendants and forced them to file a Discovery Dispute Letter with the Court. See ECF 170. In the letter, Plaintiffs claimed that the underlying data Defendants sought was not needed while also readily admitting that a temporary file containing the data could be generated. Nevertheless, they claimed that they were not required to re-generate this data because Defendants' experts could re-create the same BISG process Dr. Barreto conducted.

The Court rejected these arguments and ordered Plaintiffs to produce Dr. Barreto's actual R script and underlying data. *See* ECF Minute Entry of May 15, 2023. The Court also required Dr. Barreto to meet with Defendants' expert Dr. Alford so the exchange of data could be facilitated. Regrettably, Plaintiffs again stonewalled Defendants during the experts' meeting: Dr. Barreto continued to insist that he had no obligation to recreate an R script he had not saved to begin with. After a status conference with the Court where the results of the meeting were communicated, the Court ordered Dr. Barreto to meet again with Dr. Alford and show him how to precisely re-create the BISG analysis that appeared in the rebuttal report. ECF No. 180. The meeting then occurred and the dispute over the data was not resolved until May 31, more than a month after the close of discovery and less than a month before exhibit lists for trial are due. It is telling that when the Court required a live demonstration, Barreto used an R-script because it is the most efficient and proper way to conduct this analysis. The fact that his R-script was not saved and disclosed warrants exclusion of the BISG analysis.

Plaintiffs have been given ample opportunity to provide the underlying data for Dr. Barreto's rebuttal report—both by Defendants and by this Court. They have rejected every

opportunity and instead acted in a dilatory and obstructive manner. The inescapable conclusion is that Plaintiffs cannot produce the actual data used in Dr. Barreto's report because Dr. Barreto never saved it or created any record to back up his analysis. All Plaintiffs have been able to do is walk Dr. Alford through how to re-create the data – but that does not give Defendants an opportunity to properly and fully review Dr. Barreto's report.

Because there is no real way to cure the defects in the rebuttal report, and because attempting to do so would create further delay in Defendants' ability to develop their strategy for trial, the only proper remedy is for the rebuttal expert report to be excluded in its entirety.

CONCLUSION

For the foregoing reasons, this Court should grant Defendants' Motion and exclude Dr. Barreto's entire BISG analysis in his rebuttal report, and exclude paragraphs 25, 28, 30-43 from Dr. Barreto's January 13, 2023 report.

Respectfully Submitted,

Date: June 16, 2023

GREER, HERZ & ADAMS, L.L.P.

By: */s/ Joseph Russo*
Joseph Russo (Lead Counsel)
Fed. ID No. 22559
State Bar No. 24002879
jrusso@greerherz.com
Jordan Raschke
Fed. ID No.3712672
State Bar No. 24108764
jraschke@greerherz.com
1 Moody Plaza, 18th Floor
Galveston, TX 77550-7947
(409) 797-3200 (Telephone)
(866) 422-4406 (Facsimile)
Angie Olalde
Fed. ID No. 690133
State Bar No. 24049015
aolalde@greerherz.com
2525 S. Shore Blvd. Ste. 203
League City, Texas 77573
(409) 797-3262 (Telephone)
(866) 422-4406 (Facsimile)
Counsel for Defendants

Counsel for Defendants

HOLTZMAN VOGEL BARAN TORCHINSKY & JOSEFIAK PLLC

Dallin B. Holt
Texas Bar No. 24099466
S.D. of Texas Bar No. 3536519
Jason B. Torchinsky*
Shawn T. Sheehy*
dholt@holtzmanvogel.com
jtorchinsky@holtzmanvogel.com
ssheehy@holtzmanvogel.com
15405 John Marshall Hwy
Haymarket, VA 2019
P: (540) 341-8808
F: (540) 341-8809

**admitted pro hac vice*

PUBLIC INTEREST LEGAL FOUNDATION

Joseph M. Nixon
Federal Bar No. 1319
Tex. Bar No. 15244800
J. Christian Adams*
South Carolina Bar No. 7136
Virginia Bar No. 42543
Maureen Riordan*
New York Bar No. 2058840
107 S. West St., Ste. 700
Alexandria, VA 22314
jnixon@publicinterestlegal.org
jadams@publicinterestlegal.org
mriordan@publicinterestlegal.org
713-550-7535 (phone)
888-815-5641 (facsimile)

**pending pro hac vice application*

CERTIFICATE OF SERVICE

I hereby certify that on June 16, 2023, I served the foregoing via email on all counsel of record in this case.

/s/ Joseph Russo
Joseph Russo

Declaration of Dr. Matt A. Barreto and Michael Rios, MPP

1. Pursuant to 28 U.S.C. section 1746, I, Matt Barreto, and my co-author, Michael Rios, declare as follows:

2. My name is Matt Barreto, and I am currently Professor of Political Science and Chicana/o Studies at the University of California, Los Angeles. I was appointed Full Professor with tenure at UCLA in 2015. Prior to that I was a tenured professor of Political Science at the University of Washington from 2005 to 2014. At UCLA I am the faculty director of the Voting Rights Project in the Luskin School of Public Affairs and I teach a year-long course on the Voting Rights Act (VRA), focusing specifically on social science statistical analysis, demographics and voting patterns, and mapping analysis that are relevant in political science expert reports in VRA cases. I have written expert reports and been qualified as an expert witness more than four dozen times in federal and state voting rights and civil rights cases, including many times in the state of Texas. I have published peer-reviewed social science articles specifically about minority voting patterns, racially polarized voting, and have co-authored a software package (eiCompare) specifically for use in understanding racial voting patterns in VRA cases. I have been retained as an expert consultant by counties across the state of Texas to advise them on racial voting patterns as they relate to VRA compliance during redistricting. As an expert witness in VRA lawsuits, I have testified dozens of times and my testimony has been relied on by courts to find in favor of both plaintiffs and defendants.

3. I have published books and articles specifically about the intersection of partisanship, ideology and racially polarized voting. My 2013 book, *Change They Can't Believe In* was published by Princeton University Press and was about the inherent connectedness between partisanship and racial attitudes in America today, and won the American Political Science Association award for best book on the topic of racial and ethnic politics.

4. I submitted an expert report in Galveston County, Texas in the 2013 lawsuit, *Petteway v. Galveston,* No. 3:11-cv-308. In that report I examined voting and population demographic trends and concluded that Black and Hispanic voters were cohesive and supported like candidates of choice, and that Anglos block-voted against minority candidates of choice. The court accepted that racially polarized voting was prevalent in Galveston County, Texas.

5. I am the primary author of this report and collaborated in its development with my co-author Mr. Michael Rios, MPP, senior data scientist at the UCLA Voting Rights Project. I have worked closely with Mr. Rios for over four years and he has extensive expertise with racially polarized voting analysis in the state of Texas, including authoring a report on racially polarized voting in Galveston County in 2021 and recently performing a racially polarized voting analysis in *Portugal et al. v. Franklin County et al.* (October 2020), a lawsuit involving the Washington Voting Rights Act.

6. My full professional qualifications and activities are set forth in my curriculum vitae. A true and correct copy has been attached hereto as Appendix E1. I, Dr. Barreto, am being compensated by Plaintiffs at a rate of $400 per hour for my report and $500 an hour for any oral testimony in this case. Mr. Rios is being compensated by Plaintiffs at a rate of $275 an

hour for his work on the report and $350 per hour for any oral testimony in this case. A true and correct copy of Mr. Rios' qualifications and activities are set forth in his curriculum vitae, of which a true and correct copy has been attached hereto as Appendix E2.

7. In this portion of my expert analysis, we were asked to assess voting patterns in Galveston County to determine if Black, Hispanic[1] and Anglo voters exhibit racially polarized voting.

8. We also reviewed the existing Galveston County Commission Precinct Plan to determine what impact the 2021 adopted plan had on Black and Hispanic opportunities to elect candidates of choice. As part of this analysis, we reviewed alternative maps submitted by Plaintiffs Terry Petteway, Derreck Rose, Michael Montez, Penny Pope and Sonny James that would allow minority voters to create and/or maintain opportunities to elect candidates of choice.

9. We obtained data from the Texas Legislative Council (TLC) and the Capitol Data Project for statewide election results by county and voter demographics by county. We also obtained data from the Galveston County, Texas recorder-clerk of elections including election results. We obtained district map data by performing a spatial overlay of CVAP data with a map of 2022 VTDs. CVAP estimates are from the U.S. Census ACS disaggregated to census blocks, downloaded from the Redistricting Data Hub.[2] The map of 2022 VTDs was downloaded from the TLC website.[3] All data are available at the voting tabulation district or voting precinct (VTD) level and we have merged together the election returns with voter racial/ethnic demographics to create a standard dataset for analyzing voting patterns. Race and population data were obtained from the U.S. Census 2020 PL-94 Redistricting files, U.S. Census American Community Survey (ACS) datasets, as well as Spanish Surname Registered Voters and Spanish Surname Turnout, which was obtained from TLC repository.

I. Background Conclusions

10. First, more than 25 elections analyzed from 2014 to 2022 reveal a strong and consistent pattern of racially polarized voting in Galveston County. This analysis was conducted across 29 elections for local, state and federal office, using two complimentary court-approved ecological inference techniques, and relying on Census citizen voting age population (CVAP) data, Spanish Surname voter file data, and voter turnout modeled data. The result was more than 350 ecological inference models. In every single instance both Black and Hispanic voters were found to be strongly cohesive in their support for minority preferred candidates. When analyzing Black and Hispanic voters independently or combined, Black voters are strongly cohesive, and vote consistently with Hispanic voters who are likewise cohesive and vote consistently with Black voters. The analysis reports Anglo voters uniformly block vote against Hispanic and Black candidates of choice in Galveston County. There is no question that both

[1] We utilize the terms "Latino" and "Hispanic" interchangeably throughout this report to refer to individuals who self-identify as Latino or Hispanic. Additionally, the terms "Latino" and "Hispanic" mean persons of Hispanic Origin as defined by the United States Census Bureau and U.S. Office of Management and Budget (OMB).

[2] "Texas CVAP Data Disaggregated to the 2020 Block Level (2020)," Redistricting Data Hub, April 21, 2022, https://redistrictingdatahub.org/dataset/texas-cvap-data-disaggregated-to-the-2020-block-level-2020/.

[3] "VTDs," Capitol Data Portal, August 18, 2022, https://data.capitol.texas.gov/dataset/vtds.

Gingles prongs – prong two of minority cohesiveness and prong three related to Anglo bloc voting, are easily met in Galveston County.

11. Second, Galveston County racial and ethnic population demographics changed significantly over the last decade with Anglos declining from 59.3% of the county population in 2010 to 54.6% in 2020. While the Anglo population grew by just 10.8% or 18,706, the non-Anglo (racial minority) population in Galveston grew by 34.3% or 40,667 in just 10 years. The Hispanic population was the fastest growing in the county and increased by 23,366 (35.8%).

12. Third, the map adopted by the Galveston County Commission dilutes the Black and Hispanic vote by eliminating a currently performing district which elects a Hispanic and Black candidate of choice. Given the large increases in the minority populations, and the conclusive finding of racially polarized voting, the adopted map could have easily drawn a performing district for minority voters consistent with the VRA The adopted map failed to reflect growth in both Hispanic and African-American communities and dilutes the ability of both groups to elect candidates of choice.

II. Galveston County Population Growth and Enacted Map Characteristics

13. To situate the discussion over voting patterns and minority representation, we begin with a broader view of Galveston County and how its population has changed and shifted over the past two decades. Overall, Galveston gained over 100,000 in population since 2000 with 59,373 coming in between 2010-2020. However, these gains were uneven by geography and race/ethnicity. Specifically, the Anglo/White population experienced an 8.5-point drop in population share from 2000 to 2020 going from 63.1% of the county population to now just 54.6%. According to the 2021 U.S. Census American Community Survey (ACS) the Anglo population in Galveston has declined by an additional percentage point and is now 53.7% as of 2021. In contrast, the Latino population almost doubled in 20 years, growing from 44,939 to 88,636. In the past 10 years the Latino population was the fastest growing segment of Galveston, adding more than 23,000 in population and now represents 25.3% of the county total. Overall, the non-Anglo racial minority population grew by 72.6% in the past two decades, compared to 21.2% growth among Anglos. There is no question that Galveston County demographics are changing and becoming increasing non-Anglo, racial minority. Today, the county population is close to evenly divided between Anglos and non-Anglo racial minorities and by 2025 Galveston is projected to be a majority-minority population county. A districting scheme must take into account population shifts and draw boundaries around communities of interest, careful not to overly pack or crack minority communities.

14. From a population growth perspective, the 67,017 increase in minority residents should have made the retention of an existing minority-performing district simple. In fact, because the county became *more heavily* minority, a map drawer would have to go out of their way to reduce and dilute the minority vote. A map put forward by Commissioner Holmes in 2021 allowed for a VRA-compliant district to be drawn in Galveston that would allow minorities the opportunity to elect their candidates of choice. Rather than maintaining a minority-performing district, the adopted plan cracks the Black and Hispanic population so that it is narrowly too small to be able to elect a candidate of choice.

15. According to the 2020 Decennial Census, there is no question that the *Gingles One* standard can be met and a performing district can be drawn that is majority Black and Hispanic citizen adult.

Table 1: Galveston County Population Change 2000 to 2020 by race/ethnicity

	2000	2010	2020	00-20 Change	00-20 % chg	10-20 Change	10-20 % chg
Galveston Total	250,158	291,309	350,682	100,524	40.2%	59,373	20.4%
Anglo	157,851 (63.1%)	172,652 (59.3%)	191,358 (54.6%)	33,507	21.2%	18,706	10.8%
Non-Anglo (Racial Minority)	92,307 (36.9%)	118,657 (40.7%)	159,324 (45.4%)	67,017	72.6%	40,667	34.3%
Hispanic	44,939 (17.9%)	65,270 (22.4%)	88,636 (25.3%)	43,697	97.2%	23,366	35.8%
Black	38,179 (15.3%)	39,229 (13.5%)	43,120 (12.3%)	4,941	12.9%	3,891	9.9%
Asian	5,152 (2.1%)	8,515 (2.9%)	12,202 (3.5%)	7,050	136.8%	3,687	43.3%
All other/ multi-racial	4,037 (1.6%)	5,643 (1.9%)	15,366 (4.4%)	11,329	280.6%	9,723	172.3%

III. Racially Polarized Voting Analysis

16. We next examine whether voters of different racial/ethnic backgrounds tend to prefer different or similar candidates in a wide range of electoral settings. The phenomenon called *racially polarized voting* (RPV) is defined as voters of different racial or ethnic groups exhibiting different candidate preferences in an election. It means simply that voters of different groups are voting in polar opposite directions, rather than in a coalition. However, if some groups of voters are voting in coalition, RPV analysis will identify such a trend. Voters may vote for their candidates of choice for a variety of reasons, and RPV analysis is agnostic as to why voters make decisions, instead RPV simply reports *how* voters are voting. It measures the outcomes of voting patterns and determines whether patterns track with the race/ethnicity demographics of neighborhoods, cities, and voting precincts.

17. Issues related to minority vote dilution are especially consequential in the face of racially polarized voting. In 1986 the Supreme Court issued a unanimous ruling (*Thornburg v. Gingles*) that redistricting plans cannot dilute minority voting strength by cracking their population into multiple districts, nor can they pack the population into too few districts. In

this decision, the Court established specific tests to determine if a redistricting plan violated the VRA, in particular calling on a statistical analysis of voting patterns by race and ethnicity. The *Gingles* test concerns how minorities and Anglos vote, and whether they prefer the same, or different candidates. Specifically, the Court asks if minority voters are cohesive (*Gingles Prong Two*); if they generally tend to vote for a "candidate of choice." And next, the Court examines who the larger majority (or Anglo) voters prefer as their candidate and, if that candidate is different than the minority candidate of choice, whether they regularly vote as a bloc to defeat the minority candidate of choice (*Gingles Prong Three*). Evidence of voting patterns differing by the race of voters was called "racially polarized voting" by the courts, to simply describe a finding in which voters of one racial group were voting in one direction, but voters of the other racial group were voting in the opposite direction – their patterns are polarized.

18. Several methods are available to assess the *Gingles* preconditions of minority cohesion and Anglo bloc voting.[4] Ecological Inference (EI) "has been the benchmark in evaluating racial polarization in voting rights lawsuits and has been used widely in comparative politics research on group and ethnic voting patterns."[5] Two variations of EI that have emerged are referred to as King's EI and EI: RxC. The two methods are closely related, and Professor Gary King, the creator of King's EI,[6] was a co-author and collaborator on the RxC method.[7] Generally speaking, both methods take ecological data in the aggregate —such as precinct vote totals and racial demographics—and use Bayesian statistical methods to find voting patterns by regressing candidate choice against racial demographics within the aggregate precinct. Kings EI is sometimes referred to as the iterative approach, in that it runs an analysis of each candidate and each racial group in iterations, whereas the RxC method allows multiple rows (candidates) and multiple columns (racial groups) to be estimated simultaneously in one model. In essence, both versions of EI operate as described above: by compiling data on the percentage of each racial group in a precinct and merging that with precinct-level vote choice from relevant election results.

---

[4] For an approachable overview of this material, see Bruce M. Clarke & Robert Timothy Reagan, Federal Judicial Center, *Redistricting Litigation: An Overview Of Legal, Statistical, and Case-Management Issues* (2002).

[5] Loren Collingwood, Kassra Oskooii, Sergio Garcia Rios, and Matt Barreto, *eiCompare Comparing Ecological Inference Estimates across El and EI:R x C*, 8 R. J., 93 (2016); *see also* Abrajano et al., *Using Experiments to Estimate Racially Polarized Voting*, UC Davis Legal Studies Research Paper No. 419 (2015) ("ecological inference (EI)...[is] the standard statistical tool of vote-dilution litigation). Despite the method's prominence, researchers have identified certain limitations on EI's ability to reveal race-correlated voting patterns in jurisdictions with more than two racial groups and non-trivial residential integration. *See* D. James Greiner, *Re-Solidifying Racial Bloc Voting: Empirics and Legal Doctrine in the Melting Pot*, 86 Indiana L. J. 447–497 (2011); D. James Greiner & Kevin M Quinn, *Exit Polling and Racial Bloc Voting: Combining Individual Level and Ecological Data*, 4 Annals Applied Statistics, 1774–1796 (2010). Strategic calculations by potential candidates as well as interest groups and donors also skew EI data. Abrajano, Marisa A., Christopher S. Elmendorf, and Kevin M. Quinn, *Racially Polarized Voting* (2015); D. James Greiner, *Causal Inference in Civil Rights Litigation*, 122 Harv. L. Rev. 533, 533–598 (2008).

[6] *See* Gary King, A Solution to the Ecological Inference Problem Reconstructing Individual Behavior from Aggregate Data, Princeton University Press (1997).

[7] *See* Ori Rosen, Wenxin Jiang, Gary King, and Martin Tanner, Bayesian and frequentist inference for ecological inference: the R x C case, Statistica Neerlandica, vol. 55 at 134-46 (2001).

19. One popular software program that has been relied on by Federal Courts is *eiCompare*, which imports data and runs both King's EI and RxC models and offers comparison diagnostics.[8] Collingwood, et al. (2016) have concluded that both EI and RxC produce similarly reliable regression estimates of vote choice. The EI models are agnostic on what type of input data political scientists use for racial demographics. It can be Voting Age Population (VAP) data from the U.S. Census, it can be a Spanish surname analysis of registered voters, or it can be a BISG estimate of race of the voter file. If the analyst is well-trained and uses the software properly, the models will perform the same statistical analysis and produce reliable estimates about voter preference by race.

20. To conduct analysis on a county as diverse as Galveston we rely on three different types of racial/ethnic demographic data. First, we used CVAP data from the U.S. Census ACS disaggregated to census blocks, downloaded from the Redistricting Data Hub.[9] Then, we performed a spatial overlay joining the CVAP data with a map of 2022 VTDs, downloaded from the TLC website. CVAP data is particularly useful for Anglo and Black racial estimates which are more difficult to derive from a surname analysis alone. The second data source is Spanish surname turnout, downloaded for each voting precinct/VTD from the TLC website. Spanish surname lists can be used to flag Hispanic voters on the actual voter file, in this case, among those who actually turned out to vote in elections. The third data source is modeled voter turnout by race. Here we use actual votes cast by each VTD over the denominator of total eligible voters (CVAP) to derive the turnout rate, which is then regressed against CVAP by race to arrive at a turnout rate for each racial or ethnic voting population. Using the turnout rate among eligible voters, we can then model what the racial composition of actual voters is by race within each VTD and use this as the input variable. For all models, we relied on CVAP, Spanish surname and modeled voters to produce estimates, and in every instance the Spanish surname estimates closely replicated and matched the Hispanic CVAP or Hispanic voters estimates.

21. Across all elections analyzed there is a clear, consistent, and statistically significant finding of racially polarized voting in Galveston County. Time and again, Black and Hispanic voters in Galveston are cohesive and vote for candidates of choice by roughly a 3-to-1 margin or greater, and always in contrast to Anglo voters who bloc-vote against minority candidates of choice. These voting patterns have been widely reported for at least three decades of voting rights litigation in Texas, including in Galveston area state or federal districts, and Federal courts have routinely concluded that elections in Texas are racially polarized. Galveston County is no different. What's more, this information is well-known to county and state map drawers and demographers and expert consultants in Galveston County. In particular, Galveston County Commissioner Holmes shared a report on racially polarized voting by Mr. Rios at the November 12, 2021, commission meeting, documenting that patterns of racially polarized voting were present in Galveston at the time they were tasked with the 2022 redistricting process.[10]

---

[8] Loren Collingwood, Kassra Oskooii, Sergio Garcia Rios, and Matt Barreto, *eiCompare Comparing Ecological Inference Estimates across El and EI:R x C*, 8 R J., 93 (2016).

[9] "Texas CVAP Data Disaggregated to the 2020 Block Level (2020)," Redistricting Data Hub, April 21, 2022, https://redistrictingdatahub.org/dataset/texas-cvap-data-disaggregated-to-the-2020-block-level-2020/.

[10] Galveston County Commissioner's Court November 12, 2021 Special Hearing Tr. 68: 14-23.

22. Mr. Rios analyzed recent elections in 2018 and 2020 and concluded that Black and Hispanic voters were cohesive and that Anglos block voted against minorities in each election. This report was consistent with the 2013 expert report of Barreto and Pedraza that also found patterns of polarized voting across 24 elections.

23. In the more than 350 ecological inference statistical models performed for this report, based on well-established social science published methodology, we conclude that across the 29 elections and 5 election cycles, elections in Galveston County are defined by racially polarized voting (see Appendix A table of racially polarized voting).

24. In elections across Galveston County ecological inference models point to a clear pattern of racially polarized voting. Hispanic voters and Black voters demonstrate unified and cohesive voting, siding for the same candidates of choice with high support. In contrast, Anglo voters strongly block vote against minority candidates of choice. Anglo block voting appears to be uniform across elections from 2014 to 2022 with rates over 85% opposition to minority-preferred candidates. Anglo voters demonstrate considerable block voting against Hispanic and Black candidates of choice, regularly voting in the exact opposite pattern of Hispanic and Black voters in Galveston. This is consistent with election analysis for Galveston County I presented in an expert report in 2013 that found Black and Hispanic voters to be unified across 24 elections from 2002 to 2012 while Anglos block voted against minority candidates of choice. Thus, this pattern is now consistent across 53 elections over 20 years in Galveston.

25. It is important to acknowledge that not every election contest contains a minority-preferred candidate. In some elections, voters are more or less agnostic about the candidates, while in other elections voters have deep preferences for their candidates of choice. In Galveston County, most elections are partisan and candidates register and run for office most commonly as a Democrat or Republican whether it is for local county office or statewide. In these instances, partisan general elections are often understood by voters through a racial/ethnic lens. Indeed, political science research has proven conclusively that attitudes about racial public policy issues, views on immigrants, and even racial animus influence partisanship among White voters[11]. Thus, it is voters views on matters of race that often push White voters today into voting for Republican candidates in the first place, providing a clear link to racially polarized voting even when one considers partisanship[12]. (For more on partisanship being intertwined with racial attitudes, see Section IV below, page 9)

[11]Marc Hooghe and Ruth Dassonneville. 2018. "Explaining the Trump Vote: The Effect of Racist Resentment and Anti-Immigrant Sentiments" PS: Political Science & Politics , Volume 51 , Issue 3 , July 2018 , pp. 528 – 534; Ashley Jardina. 2021. "In-Group Love and Out-Group Hate: White Racial Attitudes in Contemporary U.S. Elections" Political Behavior volume 43, pages 1535–1559

[12] Michael Tesler and David Sears. 2010. "President Obama and the Growing Polarization of Partisan Attachments by Racial Attitudes and Race." American Political Science Association Annual Conference. August.; Michael Tesler. 2012. "The Spillover of Racialization into Health Care: How President Obama Polarized Public Opinion by Racial Attitudes and Race" American Journal of Political Science. 56(3); Michael Tesler. 2013. "The Return of Old-Fashioned Racism to White Americans' Partisan Preferences in the Early Obama Era" The Journal of Politics. 75(1); Caroline J. Tolbert, David P. Redlawsk and Kellen J. Gracey. 2018. "Racial attitudes and emotional responses to the 2016 Republican candidates." Journal of Elections, Public Opinion and Parties. 28

26. In Galveston County, Blacks and Hispanics vote cohesively, together, for like candidates of choice. In particular, the analysis reveals that Black and Hispanic voters are cohesive in local elections for county offices such as County Judge, County Sherriff, District Court Judge and more, and are also cohesive for statewide elections for Governor, U.S. Senate, and President.

27. Specifically looking at the portion of Galveston County with the largest non-Anglo population Black and Hispanic voters demonstrate overwhelming political cohesion in general elections. Here, primary elections are not as probative a source of information about political cohesion, given that neither group constitutes an outright majority and the relatively low primary voter turnout among minorities.

28. It is also the case that Hispanic communities in Galveston are considerably younger and have lower rates of citizenship, resulting in a smaller pool of eligible voters as compared to Anglos. Due to a long history of discrimination and institutional policies related to voter registration, voter identification laws, access to early voting and absentee-mail voting, Hispanics in Texas have lower rates of voter registration and lower rates of voter turnout.[13] The result is that map drawers throughout Texas, knowledgeable of these trends, dilute the Hispanic vote by creating districts in which Hispanic voters are not large enough in size to overcome the high degree of Anglo bloc-voting against their candidates of choice. For this reason, analysis of actual vote history can be important in understanding Hispanic voting patterns with more precision.

29. While CVAP data from the U.S. Census ACS can provide reliable vote choice estimates by racial group, we can also examine Spanish Surname voters from data compiled by TLC. In particular for groups that have lower rates of citizenship, registration or turnout, such as Hispanics, we can use data from the official voter rolls for actual people who voted to more precisely measure the percentage of Hispanics in a given voting precinct/VTD. We have replicated all ecological inference analyses using Spanish Surname turnout for each respective election year to also provide vote choice estimates for Spanish Surname voters. As the results make clear, Spanish Surname voters in Galveston County vote cohesively for Hispanic candidates of choice, and face bloc-voting against their candidates of choice by Anglo voters. Black voters demonstrate cohesion with Spanish Surname voters in Galveston.

IV. Partisanship, Ideology and Racially Polarized Voting

30. Racially polarized voting is well known and well documented as an indicator of discrimination and has been a hallmark statistical measured relied on by the courts in states and jurisdictions being challenged under the Federal VRA. But racially polarized voting does not occur in a vacuum. Social science research has documented extensively that the underlying catalysts

[13] *Veasey v. Perry,* 71 F. Supp. 3d 627, 697 (S.D. Tex. 2014), aff'd in part, vacated in part, remanded sub nom. *Veasey v. Abbott*, 796 F.3d 487 (5th Cir. 2015), on reh'g en banc, 830 F.3d 216 (5th Cir. 2016), and aff'd in part, vacated in part, rev'd in part sub nom. *Veasey v. Abbott*, 830 F.3d 216 (5th Cir. 2016)

triggering bloc voting are racial attitudes and stereotypes[14] and courts have routinely relied on measures like these as evidence of discrimination in voting lawsuits.[15]

31. In fact, extensive political science research has documented that measures of White racial attitudes have actually become more negative towards Blacks since the 2008, and in turn, have become more intertwined with partisanship. Research by Crayton et al. (2013) reports more than a 10-point increase in the percent of Whites who agreed that "if Blacks would only try harder they could be just as well off as Whites" in 2008 following the election of Barack Obama. At the same time, the American National Election Study (ANES) has shown that in states such as Texas, White voters increasingly believe that Blacks, Hispanics, Asians and Jews have "too much influence in politics" and that Whites have too little influence. Research documents that these beliefs have now been solidified as guiding principles in party affiliation.[16] Specifically, Crayton et al. draw the link between racial attitudes and partisanship noting "One might be inclined to characterize these findings simply as the product of partisanship rather than racial bloc voting, but additional data refute any serious suggestion that ideology accounts for these changes." To further investigate this relationship, Crayton et al. examined racial attitudes, partisanship and voting patterns across all 50 states and dismissed the claim that racially polarized voting was nothing more than partisanship. They conclude "party affiliation alone simply cannot account for this difference in states with roughly similar patterns of allegiance to Republican ideology."

32. Indeed, there is an abundance of published research in leading academic publications which finds that attitudes about racial public policy and views on immigrants are leading indicators of party affiliation among Whites.[17] Scholarly research has produced several significant findings showing that prejudice and discriminatory attitudes towards Blacks and Latinos persists and that it is one of the strongest predictors of party attachment among Whites.[18]

33. Further, a preponderance of the scholarship concludes that harboring negative racial attitudes is the underlying mechanism responsible for producing racial bloc voting among Whites, against minority candidates for elected office. For example, in a large-scale study of racial attitudes and voting, Professor Keith Reeves finds that "a significant number of Whites harbor feelings of

---

[14] Edward G. Carmines & James A. Stimson, ISSUE EVOLUTION: RACE AND THE TRANSFORMATION OF AMERICAN POLITICS (Princeton Univ. Press 1989); Thomas B. Edsall & Mary D. Edsall, CHAIN REACTION: THE IMPACT OF RACE, RIGHTS, AND TAXES ON AMERICAN POLITICS (W.W. Norton 1991); Michael W. Giles & Kaenan Hertz, Racial Threat and Partisan Identifi cation, 88 Am. Pol. Sci. Rev. 317 (1994); Robert Huckfeldt & Carol Weitzel Kohfeld, RACE AND THE DECLINE OF CLASS IN AMERICAN POLITICS (Univ. of Illinois Press 1989); Martin Gilens, Paul M. Sniderman, & James H. Kuklinski, Affi rmative Action and the Politics of Realignment, 28 Brit. J. Pol. Sci. 159 (1998).

[15] See, e.g., Busbee v. Smith, 549 F.Supp. 494, 501 (D. D.C. 1982) (finding state reapportionment committee's use of racially offensive terms to be probative of an intent to discriminate against Black voters).

[16] Christopher Parker and Matt Barreto. 2013. Change They Can't Believe In: The Tea Party and Reactionary Politics in America. Princeton University Press

[17] Dana Ables Morales, Racial Attitudes and Partisan Identification in the United States, 1980-1992, 5 Party Politics 191 (1999); Nicholas A. Valentino & David O. Sears, Old Times There Are not Forgotten: Race and Partisan Realignment in the Contemporary South, 24 Am. J. Pol. Sci. 672 (2005).

[18] M. V. Hood & Seth C. McKee, Gerrymandering on Georgia's Mind: The Effects of Redistricting on Vote Choice in the 2006 Midterm Election, 89 Soc. Sci. Q. 60 (2008); Richard Skinner & Philip Klinkner, Black, White, Brown and Cajun: The Racial Dynamics of the 2003 Louisiana Gubernatorial Election, The Forum 2 (1) (2004).

antipathy toward Black Americans as a categorical group – feelings and sentiments that are openly and routinely expressed…. And where such prejudices are excited…they constitute the critical linchpin in Black office-seekers' success in garnering White votes."[19] Writing more than 10 years later about the 2008 presidential election, Michael Tesler and David Sears[20] find the same pattern. Even after controlling for partisanship and ideology, they find "the most racially resentful were more than 70 percentage points more likely to support McCain in March 2008 than were the least racially resentful." Tesler and Sears conclude that the Obama era unfortunately reshaped partisan affiliation in contemporary America almost entirely through the lens of racial attitudes.

34. In what comes close to a consensus in published, empirical political science studies, scholarly work supports the finding that discriminatory attitudes and racial prejudice play a central role in driving White party identification, and this is especially strong in states such as Texas[21].

35. These findings comport with other existing research that has noted the pattern of polarized voting in national elections. The 2008 election of Barack Obama rekindled decades old research on racial attitudes, partisanship and voting patterns. Newer published research finds clear evidence that in 2012 Barack Obama received less support in his presidential elections among White voters in Southern states than John Kerry did in 2004 or Al Gore in 2000 as a direct result of racial prejudice and discriminatory attitudes.[22]

36. In his analysis of the White vote for Obama in Southern states, Professor Ben Highton notes[23], "at the state level, the influence of prejudice on voting was comparable to the influence of partisanship and ideology. Racial attitudes explain support for Obama and shifts in Democratic voting between 2004 and 2008." This finding is corroborated by Professor Spencer Piston's individual-level analysis of voter attitudes and support for Barack Obama in Southern states, drawing a direct link between racial attitudes and voting, independent of partisanship[24]: "Negative stereotypes about Blacks significantly eroded White support for Barack Obama," concluding that "White voters punished Obama for his race rather than his party affiliation."

37. Other research demonstrates that, recently, particularly after the election of Barack Obama, white American partisan preferences are increasingly the result of "old-fashioned racism." In

[19] Keith Reeves, VOTING HOPES OR FEARS? WHITE VOTERS, BLACK CANDIDATES & RACIAL POLITICS IN AMERICA 74 (Oxford Univ. Press 1997).
[20] Michael Tesler and David Sears, OBAMA'S RACE: THE 2008 ELECTION AND THE DREAM OF A POST-RACIAL AMERICA 61 (Univ. of Chicago Press 2010).
[21] Jonathan Knuckey, Racial Resentment and the Changing Partisanship of Southern Whites, 11 Party Politics 5 (2005); Edward G. Carmines & James A. Stimson, ISSUE EVOLUTION: RACE AND THE TRANSFORMATION OF AMERICAN POLITICS (Princeton Univ Press)
[22] Michael S. Lewis-Beck, Charles Tien, & Richard Nadeau, Obama's Missed Landslide: A Racial Cost?, 43 Pol. Sci. & Politics 69 (2010); Todd Donavan, Obama and the White Vote, 63 Pol. Res. Q. 863 (2010); Anthony G. Greenwald, Colin Tucker Smith, N. Sriram, Yoav Bar-Anon, & Brian A. Nosek, Implicit Race Attitudes Predicted Vote in the 2008 U.S. Presidential Election, 9 Analysis of Soc. Issues & Pub. Pol.'y, 241 (2009); Tom Pyszczynski, Carl Henthorn, Matt Motyl, & Kristel Gerow, Is Obama the AntiChrist? Racial Priming, Extreme Criticisms of Barack Obama, and Attitudes Towards the 2008 U.S. Presidential Candidates, 46 J. of Experimental Soc. Psychol., 863 (2010)
[23] Ben Highton, Prejudice Rivals Partisanship and Ideology When Explaining the 2008 Presidential Vote across the States, 44 PS: Pol. Sci. & Politics 530 (2011).
[24] Spencer Piston, How Explicit Racial Prejudice Hurt Obama in the 2008 Election, 32 Pol. Behavior 431 (2010).

prior social science research, old-fashioned racism is, in part, conceived as a desire to maintain intimate social distance between the races. Published research by Tesler (2013) demonstrates that white Americans who oppose intra-racial dating are more likely to identify with the Republican party[25]. This correlation did not exist during the 1980s-early 2000s. But it manifested after the election of Barack Obama, the first Black president.

38. While the Obama era certainly brought renewed attention to the link between partisanship and racial attitudes, scholars have been studying this phenomenon since the realignment of partisanship across the South. There is a plethora of research demonstrating that partisan sorting on the basis of ethno-racial group identification is a function of racial attitudes, specifically antipathy toward non-white groups among white Americans who have sorted into the Republican Party. A recent study from the *American Economic Review*[26], the premier journal in the field of economics, demonstrates that white Americans, particularly in states such as Texas, began to defect from the Democratic Party after the Democratic party became more strongly committed to Civil Rights (pinpointed as the moment President Kennedy addressed the nation that he was committed to implementing Civil Rights legislation in Spring 1963). Research demonstrates White Americans in the southern states who were predisposed to leave the Democratic party in favor of the Republican party did so for race-based reasons, defined in this particular paper as willingness to vote for a Black president, thus linking racial attitudes, partisanship and voting preference directly together.

39. Perhaps the most conclusive *causal* evidence that racial attitudes are driving partisanship, and not merely conservative ideology, comes from the detailed and comprehensive analysis presented by Kuziemko and Washington (2018). Importantly, this paper disentangles antipathy toward Black people from other factors that may motivate White Americans to support the Republican party and not be willing to vote for a Black president, such as conservative principles, support for reduced government intervention, and other policy preferences (e.g., foreign policy). The overall effect in this paper is driven by White Americans in the southern states including Texas, showing that White Americans in the South relative to White Americans outside the South possess very similar attitudes on conservatism, outside the dimension of racial attitudes, such as economic and foreign policy[27]. The findings also demonstrate that Democratic commitments to general civil rights in 1963 *do not* produce defections towards the Republican party among Southern whites, if they are unwilling to support a Jewish, Catholic, or Woman president, all other groups that were associated with liberal beliefs at the time. Instead, it is *only* among those who have negative racial attitudes or who are unwilling to support a Black president who leave the Democratic Party for the Republican Party. In their regression model, they statistically adjust for views towards Jewish, Catholic, or Female president and find that unwillingness to support a Black president is the

[25] Tesler, Michael. "The return of old-fashioned racism to White Americans' partisan preferences in the early Obama era." The Journal of Politics 75, no. 1 (2013): 110-123.
[26] Kuziemko, Ilyana, and Ebonya Washington. "Why did the Democrats lose the South? Bringing new data to an old debate." American Economic Review 108, no. 10 (2018): 2830-67.

[27] E.g. agreement that government should not guarantee jobs, agreement that government should help people get medicare care at low cost, agreement the government should not be able to fire suspected communists, keep soldiers abroad to fight communism, etc

single most critical factor determining defection from the Democratic party into the Republican party.

40. More statistical evidence for this finding of the partisan shift in southern states like Texas has been published by Valentino and Sears (2005)[28]. In the years following the Civil Rights Movement, whites in the South became increasingly Republican over time. Valentino and Sears also prove that white Southerners who hold "symbolically racist" beliefs are more likely to identify with the Republican party over time. That is, it was not just in the 1960s and 1970s that things changed, but these attitudes stayed with people and continued to inform their partisan affiliation. In their detailed statistical analysis, the scholars rule out secular conservative principles outside of providing support for Black people by demonstrating that ideologically conservativism is not causing whites to become more Republican over time. Instead, conservative racial attitudes are directly linked to Republican affiliation. Therefore, although many Southern whites hold conservative principles, this is *not* their motivation for partisan switching, rather, the key motivation is their racial attitudes.

41. The findings in political science are not limited to racial views towards Blacks, but increasingly today White partisanship is influenced by views towards Latinos and immigrants. Hajnal and Rivera (2014)[29] conclude that negative views towards immigrants motivates defection from Democrats and toward the Republican party. Likewise, more recent research published by Ostfeld (2019)[30] demonstrates that when Democratic political elites make campaign appeals to Latinos, it results in partisan defections by white Americans from the Democratic party toward the Republican party.

42. Perhaps most directly taking on the question of race and party are political scientists Sean Westwood and Erik Peterson in their 2020 published paper[31], "The inseparability of race and partisanship in the United States." The authors demonstrate that although partisanship and race are highly correlated with one another, white Americans viewpoints toward racial minority groups directly effects their attachment to either the Democratic or Republican Party, and vice versa. In other words, a negative evaluation of a Blacks or Hispanics translates into a negative evaluation of Democrats in general, and positive evaluation of Whites translates into positive evaluations of Republicans in general, and vice versa. They conclude that racial discrimination is intimately linked to partisan discrimination, and their research finds these two concepts to be "inseparable." Indeed, how White Americans view or interact with Blacks and Latinos directly influences their views of political parties, as they write "out-race interactions rapidly spill into assessments of the other political party."

43. In Texas, the most critical elections to voters of color are often the general election when Black and Hispanic voters regularly vote together for similar candidates of choice. These elections

[28] Valentino, Nicholas A., and David O. Sears. "Old times there are not forgotten: Race and partisan realignment in the contemporary South." American Journal of Political Science 49, no. 3 (2005): 672-688.
[29] Hajnal, Zoltan, and Michael U. Rivera. "Immigration, Latinos, and white partisan politics: The new democratic defection." American Journal of Political Science 58, no. 4 (2014): 773-789.
[30] Ostfeld, Mara Cecilia. "The new white flight?: The effects of political appeals to Latinos on white democrats." Political Behavior 41, no. 3 (2019): 561-582.
[31] Westwood, Sean J., and Erik Peterson. "The inseparability of race and partisanship in the United States." Political Behavior (2020): 1-23.

are critical because voters are deciding who to send to the State Capital or our Nation's Capital to represent them in public policy debates. While candidates also face off in primary debates, in most instances minority voters can regularly elect their candidate of choice in a primary, given their electoral influence in a district. However, in some instances, jurisdictions intentionally create districts in which no racial group is a majority, even though creating a majority-minority is possible. In these instances of diverse and mixed districts coalitions can and do emerge. In districts where no single racial group is large enough by themselves to determine who wins, there can be different candidates who emerge from different communities. However, it is usually the case that even after a contested primary, minority voters form a very strong coalition in the November general election when voter turnout is much higher, and the stakes are much higher to select their ultimate representative for the State or Federal legislature. Primary elections are also not as probative a source of information about political cohesion, given the relatively low voter turnout and the skewed nature of the electorate.

V. Performance Analysis of Different Districts

44. As a result of the increase of over 40,000 non-Anglo racial minorities in Galveston County in the last ten years, Black and Hispanic voters are easily large and geographically compact enough to form a majority-minority performing political district for the County Commission. However, even before this large growth in the minority population between 2010 – 2020, the Black and Hispanic community was already large in size and geographically compact enough to allow minority voters to elect a candidate of their choice.

45. Looking closely at the adopted map as compared to demonstration maps submitted by plaintiffs, it is clear that the map adopted by Galveston County dilutes the Hispanic and Black vote by creating numerous districts which do not perform for minority candidates of choice, cracking their population. Given the large growth in the minority population and the *decline* in the Anglo *share* of the county population, plaintiffs' demonstration maps can remedy the dilution in the adopted map and put back together a district which performs for Hispanic and Black candidates of choice which the adopted map eliminated.

46. To assess district performance, I compiled election results constrained to the political boundaries of the Galveston County Commission districts. Data were obtained from the State of Texas, TLC and Galveston County. In looking at the election results below in table 2, it is clear that none of the four districts perform for Black and Hispanic candidates of choice, and instead all four districts elect Anglo-preferred candidates. Reviewing demonstration plans submitted by plaintiffs, I conclude that a district which performs for Black and Hispanic candidates of choice can be drawn. Examining prior election results, sorted just for the precincts/VTDs within a given district, I conclude that Galveston County has failed to create a performing Black + Hispanic district.

Table 2: Performance Analysis of Recent Elections

			Adopted			
			1	2	3	4
	Anglo CVAP		64.9%	62.4%	64.0%	61.6%
	Black CVAP		10.7%	14.4%	9.5%	18.2%
	Hispanic CVAP		21.5%	20.6%	19.0%	15.3%
	Other CVAP		2.9%	2.6%	7.6%	4.9%
2022	Governor	Abbott	65.2%	59.2%	65.8%	62.3%
		O'Rourke	34.8%	40.8%	34.2%	37.7%
	Attorney General	Paxton	64.8%	58.9%	65.7%	62.2%
		Garza	35.2%	41.1%	34.3%	37.8%
	Lt. Governor	Patrick	64.9%	58.7%	65.4%	61.9%
		Collier	35.1%	41.3%	34.6%	38.1%
	County Judge	Henry	66.6%	60.2%	67.8%	63.7%
		King	33.4%	39.8%	32.2%	36.3%
	U.S. House of Representatives, District #14	Weber	66.7%	60.7%	67.4%	63.7%
		Williams	33.3%	39.3%	32.6%	36.3%
	District Judge #122	Jones	66.4%	60.4%	67.4%	63.6%
		Walsdorf	33.6%	39.6%	32.6%	36.4%
	District Attorney	Roady	67.5%	61.8%	68.7%	64.5%
		Dragony	32.5%	38.2%	31.3%	35.5%
2020	President	Trump	63.8%	56.8%	64.6%	60.6%
		Biden	36.2%	43.2%	35.4%	39.4%
	Senate	Cornyn	65.4%	58.1%	66.8%	62.1%
		Hegar	34.6%	41.9%	33.2%	37.9%
	Sheriff	Trochesset	65.1%	59.6%	66.8%	62.2%
		Salinas	34.9%	40.4%	33.2%	37.8%
		Weber	65.8%	58.4%	67.6%	62.4%

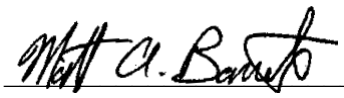
	U.S. House of Representatives, District #14	Bell	34.2%	41.6%	32.4%	37.6%
2018	Senate	Cruz	62.3%	53.7%	64.6%	59.6%
		O'Rourke	37.7%	46.3%	35.4%	40.4%
	Governor	Abbott	66.9%	58.4%	69.9%	63.8%
		Valdez	33.1%	41.6%	30.1%	36.2%
	Lt. Governor	Patrick	63.3%	55.2%	65.9%	60.0%
		Collier	36.7%	44.8%	34.1%	40.0%
	Attorney General	Paxton	62.3%	53.7%	65.1%	59.1%
		Nelson	37.7%	46.3%	34.9%	40.9%
	U.S. House of Representatives, District #14	Weber	64.0%	55.6%	67.2%	61.2%
		Bell	36.0%	44.4%	32.8%	38.8%
2016	President	Clinton	34.5%	44.2%	31.7%	38.3%
		Trump	65.5%	55.8%	68.3%	61.7%
	Supreme Court, Position #5	Green	66.9%	56.6%	71.4%	63.4%
		Garza	33.1%	43.4%	28.6%	36.6%
	U.S. House of Representatives, District #14	Weber	67.4%	56.9%	71.8%	63.8%
		Cole	32.6%	43.1%	28.2%	36.2%
2014	Senate	Cornyn	70.3%	59.2%	76.2%	64.8%
		Alameel	29.7%	40.8%	23.8%	35.2%
	U.S. House of Representatives, District #14	Weber	69.2%	57.7%	75.3%	64.0%
		Brown	30.8%	42.3%	24.7%	36.0%
	Governor	Abbott	66.3%	54.0%	72.4%	61.7%
		Davis	33.7%	46.0%	27.6%	38.3%
	Lt. Governor	Patrick	66.5%	54.7%	72.5%	61.9%
		Van De Putte	33.5%	45.3%	27.5%	38.1%

	Attorney General	Paxton	67.4%	55.1%	73.8%	62.7%
		Houston	32.6%	44.9%	26.2%	37.3%
	Supreme Court, Position #7	Boyd	67.5%	55.1%	73.9%	62.7%
		Benavides	32.5%	44.9%	26.1%	37.3%

47. In preparing this report there were some data that was not yet produced, or made readily available by Defendants, and as more data does become available, or new elections results are posted, we will provide additional data and analysis of population statistics and election results to supplement this report.

48. I declare under penalty of perjury that the foregoing is true to the best of my personal knowledge.

January 13, 2023



Dr. Matt A. Barreto

Agoura Hills, California

January 13, 2023

Michael Rios

Rancho Cucamonga, California

Appendix A: Racially Polarized Voting Tables

Table 1: Galveston County Ecological Inference (EI) Candidate Choice Estimates

Year	Office	Candidate	Ecological Inference (EI) Iterative							
			CVAP as race input				SSTO	Estimated actual vote		
			Anglo	Non-Anglo	Hispanic	Black	Spanish Surname	Anglo	Hispanic	Black
2022	Attorney General	Paxton	85.8	16.9	33.3	0.7	22.4	80.5	25.5	0.8
		Garza	14.2	83.1	66.7	99.3	77.6	19.5	74.5	99.2
	County Judge	Henry	87.6	18.3	30.2	0.9	32.0	82.5	24.3	0.8
		King	12.4	81.7	69.8	99.1	68.0	17.5	75.7	99.2
	Governor	Abbott	86.0	16.8	32.8	0.5	38.2	80.8	29.7	0.5
		O'Rourke	14.0	83.2	67.2	99.5	61.8	19.2	70.3	99.5
	Lt. Governor	Patrick	85.5	16.5	33.7	0.9	23.6	80.3	26.8	0.1
		Collier	14.5	83.5	66.3	99.1	76.4	19.7	73.2	99.9
	U.S. House of Reps, District #14	Weber	87.3	18.7	31.2	0.5	31.3	82.7	24.9	0.4
		Williams	12.7	81.3	68.8	99.5	68.7	17.3	75.1	99.6
	District 122 Judge	Jones	87.2	18.1	29.0	0.6	30.6	82.4	25.1	0.8
		Walsdorf	12.8	81.9	71.0	99.4	69.4	17.6	74.9	99.2
	District Attorney	Roady	88.3	19.8	29.4	1.1	30.8	83.7	24.8	0.8
		Dragony	11.7	80.2	70.6	98.9	69.2	16.3	75.2	99.2

2020	County Sheriff	Trochesset	88.2	15.8	27.1	0.5	41.5	82.8	22.8	0.5
		Salinas	11.8	84.2	72.9	99.5	58.5	17.2	77.2	99.5
	President	Trump	85.6	14.9	33.4	0.6	21.8	80.4	24.6	1.0
		Biden	14.4	85.1	66.6	99.4	78.2	19.6	75.4	99.0
	U.S. Senate	Cornyn	87.2	16.5	29.2	0.6	34.3	82.5	24.1	0.5
		Hegar	12.8	83.5	70.8	99.4	65.7	17.5	75.9	99.5
	U.S. House of Reps, District #14	Weber	87.6	17.4	27.6	0.8	40.9	83.0	23.8	1.3
		Bell	12.4	82.6	72.4	99.2	59.1	17.0	76.2	98.7
	District 405 Judge	Robinson	87.4	16.7	27.8	1.2	34.8	82.7	24.4	0.4
		Hudson	12.6	83.3	72.2	98.8	65.2	17.3	75.6	99.6
	District 56 Judge	Cox	88.4	18.4	30.5	0.7	34.9	83.9	25.7	1.1
		Lindsey	11.6	81.6	69.5	99.3	65.1	16.1	74.3	98.9
2018	Attorney General	Paxton	84.5	11.0	14.5	0.8	10.8	79.5	14.1	1.4
		Nelson	15.5	89.0	85.5	99.2	89.2	20.5	85.9	98.6
	Governor	Abbott	89.1	15.9	15.7	0.5	29.1	84.9	15.7	0.7
		Valdez	10.9	84.1	84.3	99.5	70.9	15.1	84.3	99.3
	Lt. Governor	Patrick	85.5	11.9	15.8	1.0	14.8	80.6	14.4	0.7
		Collier	14.5	88.1	84.2	99.0	85.2	19.4	85.6	99.3
	U.S. Senate	Cruz	84.3	11.5	15.2	1.1	16.6	79.5	13.9	0.8
		O'Rourke	15.7	88.5	84.8	98.9	83.4	20.5	86.1	99.2
	U.S. House of Reps, District #14	Weber	86.6	12.9	15.2	0.8	9.7	81.8	16.0	0.6
		Bell	13.4	87.1	84.8	99.2	90.3	18.2	84.0	99.4
2016	President	Trump	86.8	13.1	16.8	0.7	0.3	80.7	16.1	0.7

		Clinton	13.2	86.9	83.2	99.3	99.7	19.3	83.9	99.3
	Supreme Court Justice, Position #5	Green	88.2	15.6	15.9	0.5	22.8	82.8	16.0	0.4
		Garza	11.8	84.4	84.1	99.5	77.2	17.2	84.0	99.6
	U.S. House of Reps, District #14	Weber	88.6	15.8	17.4	0.4	31.8	83.2	15.5	0.1
		Cole	11.4	84.2	82.6	99.6	68.2	16.8	84.5	99.9
	District 10 Judge	Neves	88.9	15.8	17.6	0.4	32.0	83.3	17.3	0.1
		Walker	11.1	84.2	82.4	99.6	68.0	16.7	82.7	99.9
2014	Attorney General	Paxton	86.4	18.8	16.9	0.6	16.5	82.3	14.9	0.2
		Houston	13.6	81.2	83.1	99.4	83.5	17.7	85.1	99.8
	County Commissioner, Precinct #4	Clark	86.7	45.2	37.3	10.7	0.0	87.1	37.1	0.1
		Hutchins	13.3	54.8	62.7	89.3	100.0	12.9	62.9	99.9
	Governor	Abbott	85.8	16.9	15.9	0.2	15.4	81.5	13.0	0.0
		Davis	14.2	83.1	84.1	99.8	84.6	18.5	87.0	100.0
	Lt. Governor	Patrick	86.3	16.6	15.1	0.3	14.4	82.0	12.0	0.4
		Van De Putte	13.7	83.4	84.9	99.7	85.6	18.0	88.0	99.6
	U.S. Senate	Cornyn	89.0	22.2	16.2	2.0	13.5	85.2	11.2	0.3
		Alameel	11.0	77.8	83.8	98.0	86.5	14.8	88.8	99.7
	Supreme Court Justice, Position #7	Boyd	86.9	18.3	15.4	0.3	13.8	82.7	13.7	0.5
		Benavides	13.1	81.7	84.6	99.7	86.2	17.3	86.3	99.5
	U.S. House of Reps, District #14	Weber	88.3	20.5	15.6	1.5	14.0	84.3	12.4	0.2
		Brown	11.7	79.5	84.4	98.5	86.0	15.7	87.6	99.8

Table 2: Galveston County EI Rows by Columns (RxC) Candidate Choice Estimates

Year	Office	Candidate	Ecological Inference Rows by Columns (RxC)								
			CVAP as race input					SSTO	Estimated actual vote		
			Anglo	Non-Anglo	Anglo	Hispanic	Black	Spanish Surname	Anglo	Hispanic	Black
2022	Attorney General	Paxton	86.4	15.2	82.4	32.3	7.2	32.5	77.4	27.6	6.5
		Garza	13.6	84.8	17.6	67.7	92.8	67.5	22.6	72.4	93.5
	County Judge	Henry	87.6	17.9	84.4	33.9	7.2	32.5	79.6	27.5	7.3
		King	12.4	82.1	15.6	66.1	92.8	67.5	20.4	72.5	92.7
	Governor	Abbott	86.2	16.3	82.6	33.3	6.8	31.1	78.0	27.1	5.7
		O'Rourke	13.8	83.7	17.4	66.7	93.2	68.9	22.0	72.9	94.3
	Lt. Governor	Patrick	86.0	15.6	82.0	32.3	7.6	29.9	77.3	28.4	5.6
		Collier	14.0	84.4	18.0	67.7	92.4	70.1	22.7	71.6	94.4
	U.S. House of Reps, District #14	Weber	87.4	18.4	84.1	36.2	6.5	31.5	79.7	29.5	6.5
		Williams	12.6	81.6	15.9	63.8	93.5	68.5	20.3	70.5	93.5
	District 122 Judge	Jones	87.4	18.0	84.5	33.5	6.5	32.2	79.7	27.2	6.1
		Walsdorf	12.6	82.0	15.5	66.6	93.5	67.8	20.3	72.8	93.9
	District Attorney	Roady	88.1	20.0	85.2	36.1	7.8	30.6	80.8	28.8	6.9
		Dragony	11.9	80.0	14.8	63.9	92.2	69.4	19.2	71.2	93.1

2020	County Sheriff	Trochesset	88.3	15.4	85.4	28.4	7.1	30.8	80.0	25.9	6.8
		Salinas	11.7	84.6	14.6	71.6	92.9	69.2	20.0	74.1	93.2
	President	Trump	86.1	14.2	82.2	29.5	6.9	31.4	77.3	26.8	6.0
		Biden	13.9	85.8	17.8	70.5	93.1	68.6	22.7	73.2	94.0
	U.S. Senate	Cornyn	87.4	16.2	84.3	30.7	6.6	31.8	79.6	25.7	6.4
		Hegar	12.6	83.8	15.7	69.3	93.4	68.2	20.4	74.4	93.6
	U.S. House of Reps, District #14	Weber	87.9	16.6	85.4	29.6	7.2	32.3	80.5	25.2	6.4
		Bell	12.1	83.4	14.6	70.4	92.8	67.7	19.5	74.8	93.6
	District 405 Judge	Robinson	87.8	16.0	85.2	29.0	6.8	30.1	80.6	20.6	6.6
		Hudson	12.2	84.0	14.8	71.0	93.2	69.9	19.4	79.4	93.4
	District 56 Judge	Cox	88.4	18.2	85.4	33.8	6.9	32.1	81.0	29.1	6.7
		Lindsey	11.6	81.8	14.6	66.2	93.1	67.9	19.0	70.9	93.3
2018	Attorney General	Paxton	85.0	10.0	82.0	16.7	7.0	25.8	76.2	18.1	6.1
		Nelson	15.0	90.0	18.0	83.3	93.0	74.2	23.8	81.9	93.9
	Governor	Abbott	89.6	14.9	87.0	23.2	7.3	27.3	82.2	18.8	7.2
		Valdez	10.4	85.1	13.0	76.8	92.7	72.7	17.8	81.2	92.8
	Lt. Governor	Patrick	85.8	11.5	83.0	18.0	7.6	24.0	77.8	17.9	6.9
		Collier	14.2	88.5	17.0	82.0	92.4	76.0	22.2	82.1	93.1
	U.S. Senate	Cruz	85.2	9.6	81.8	17.8	6.8	25.1	76.7	17.4	5.7
		O'Rourke	14.8	90.4	18.2	82.2	93.2	74.9	23.3	82.6	94.3
	U.S. House of Reps, District #14	Weber	87.2	11.4	84.2	18.9	7.1	26.4	79.2	17.0	5.3
		Bell	12.8	88.6	15.8	81.1	92.9	73.6	20.8	83.0	94.7
2016	President	Trump	87.6	11.4	84.9	19.8	7.0	24.8	78.7	16.1	5.7

		Clinton	12.3	88.6	15.1	80.2	93.0	75.2	21.3	83.9	94.3
	Supreme Court Justice, Position #5	Green	89.5	13.2	87.4	17.9	8.4	25.0	81.0	15.2	6.1
		Garza	10.5	86.8	12.6	82.1	91.6	75.0	19.0	84.8	93.9
	U.S. House of Reps, District #14	Weber	89.4	14.4	87.0	21.3	8.2	27.1	81.3	16.5	4.8
		Cole	10.6	85.6	13.0	78.7	91.8	72.9	18.7	83.5	95.2
	District 10 Judge	Neves	89.8	14.2	87.5	20.5	8.1	28.3	81.3	16.4	6.2
		Walker	10.2	85.8	12.5	79.5	91.9	71.7	18.7	83.6	93.8
2014	Attorney General	Paxton	87.9	15.8	86.1	24.7	9.0	22.1	80.4	17.2	6.6
		Houston	12.1	84.2	13.9	75.3	91.0	77.9	19.6	82.8	93.4
	County Commissioner, Precinct #4	Clark	90.2	35.7	88.5	41.2	39.9	46.1	85.4	40.4	40.2
		Hutchins	9.8	64.3	11.5	58.8	60.1	53.9	14.6	59.6	59.8
	Governor	Abbott	86.8	14.5	84.1	21.3	8.0	24.7	79.0	16.6	5.8
		Davis	13.2	85.4	15.9	78.7	92.0	75.3	21.0	83.4	94.2
	Lt. Governor	Patrick	87.8	13.6	84.9	21.0	7.9	23.4	79.7	16.5	5.9
		Van De Putte	12.2	86.4	15.1	79.0	92.1	76.6	20.3	83.5	94.1
	U.S. Senate	Cornyn	91.1	17.9	89.6	22.0	9.4	23.2	83.9	17.5	6.8
		Alameel	8.8	82.1	10.4	78.0	90.6	76.8	16.1	82.5	93.2
	Supreme Court Justice, Position #7	Boyd	88.5	15.0	86.3	19.6	8.3	22.5	80.9	15.2	6.4
		Benavides	11.5	85.0	13.7	80.4	91.7	77.5	19.1	84.8	93.6
	U.S. House of Reps, District #14	Weber	90.3	16.4	88.6	20.8	9.1	24.2	82.8	16.8	7.2
		Brown	9.7	83.6	11.4	79.2	90.9	75.8	17.2	83.2	92.8

Table 3: Galveston County Ecological Inference (EI) Candidate Choice Confidence Intervals (CVAP)

Year	Office	Candidate	[LOWER] EI - Anglo (CVAP)	[UPPER] EI - Anglo (CVAP)	[LOWER] EI - Non-Anglo (CVAP)	[UPPER] EI - Non-Anglo (CVAP)	[LOWER] EI - Anglo (CVAP)	[UPPER] EI - Anglo (CVAP)	[LOWER] EI - Hispanic (CVAP)	[UPPER] EI - Hispanic (CVAP)	[LOWER] EI - Black (CVAP)	[UPPER] EI - Black (CVAP)
2022	Attorney General	Paxton	84.1	87.4	13.1	20.1	84.4	87.1	22.0	46.2	0.4	1.7
		Garza	12.8	16.2	79.2	86.2	12.8	15.7	49.1	79.2	98.0	99.7
	County Judge	Henry	86.1	89.2	15.1	21.1	85.6	88.8	16.8	42.1	0.3	2.3
		King	10.8	13.8	78.7	84.8	11.2	14.2	58.6	79.9	99.5	99.7
	Governor	Abbott	84.6	87.2	14.2	20.6	84.8	87.9	21.2	48.4	0.3	0.6
		O'Rourke	12.2	15.5	79.7	85.9	12.5	15.5	53.0	78.6	98.8	99.7
	Lt. Governor	Patrick	83.8	87.1	13.8	19.7	83.9	87.0	17.8	45.8	0.4	2.3
		Collier	13.1	16.3	79.8	86.2	13.2	16.1	48.9	78.6	99.3	99.6
	U.S. House of Reps, District #14	Weber	85.9	89.1	16.1	22.4	86.0	88.9	20.7	43.6	0.3	0.8
		Williams	11.4	14.6	77.5	84.3	11.1	14.0	58.0	78.8	99.4	99.8
	District 122 Judge	Jones	86.1	88.6	15.4	21.1	86.1	89.2	19.3	39.2	0.3	1.0
		Walsdorf	11.5	14.3	79.3	84.6	10.7	13.9	61.9	80.6	99.4	99.8
	District Attorney	Roady	86.2	89.7	17.4	23.3	86.7	89.5	17.4	39.5	0.6	2.2
		Dragony	9.8	13.6	77.2	83.2	10.0	13.3	58.3	81.2	98.7	99.6
2020	County Sheriff	Trochesset	86.7	89.3	13.4	18.7	87.0	89.5	16.8	35.4	0.3	0.7
		Salinas	10.7	13.5	82.0	86.2	10.7	13.9	64.1	83.0	99.2	99.7
	President	Trump	84.0	87.5	11.5	18.4	83.4	87.0	20.4	48.1	0.3	1.0
		Biden	12.9	16.4	81.0	87.6	12.7	16.0	51.6	78.7	99.4	99.7
	U.S. Senate	Cornyn	85.6	88.4	13.5	19.8	85.5	88.8	16.8	38.7	0.3	1.2
		Hegar	11.3	14.5	80.6	86.9	11.5	14.4	57.9	80.5	98.0	99.7

	U.S. House of Reps, District #14	Weber	86.1	88.8	14.1	20.3	86.3	89.3	18.4	39.7	0.5	1.2
		Bell	10.6	14.2	79.6	85.3	10.9	14.1	60.1	81.0	96.7	99.5
	District 405 Judge	Robinson	86.2	89.0	14.1	20.0	86.0	89.1	19.4	38.4	0.5	3.0
		Hudson	10.9	14.4	80.4	85.9	11.4	14.3	64.9	80.6	98.3	99.6
	District 56 Judge	Cox	86.8	89.8	14.8	21.7	86.4	90.1	17.6	38.3	0.4	1.4
		Lindsey	10.1	12.9	78.8	84.4	10.2	13.9	57.8	80.6	98.1	99.7
2018	Attorney General	Paxton	83.4	85.7	8.0	14.0	83.2	85.6	9.0	22.1	0.5	1.0
		Nelson	14.1	16.8	86.0	91.5	14.3	16.4	77.2	90.8	97.8	99.4
	Governor	Abbott	87.7	90.6	13.7	19.4	87.8	90.3	9.6	23.9	0.2	1.6
		Valdez	9.7	12.4	81.7	86.7	9.8	12.5	78.9	90.1	99.0	99.9
	Lt. Governor	Patrick	84.4	86.7	9.9	14.2	84.0	86.6	9.0	24.2	0.4	2.1
		Collier	13.2	16.0	85.4	90.3	13.4	16.0	75.1	91.3	99.0	99.6
	U.S. Senate	Cruz	82.8	85.3	9.0	13.6	82.7	85.5	9.1	24.3	0.5	2.1
		O'Rourke	14.4	17.2	86.6	90.6	14.2	16.7	77.3	92.1	99.2	99.6
	U.S. House of Reps, District #14	Weber	85.0	87.7	9.9	15.6	85.3	87.8	9.1	20.7	0.3	2.2
		Bell	12.2	14.8	84.3	89.8	12.1	14.8	77.9	89.9	97.7	99.7
2016	President	Trump	85.8	88.1	11.0	16.0	85.0	88.2	10.5	24.7	0.2	2.5
		Clinton	12.1	14.7	84.2	89.7	11.9	14.9	73.6	90.1	99.3	99.7
	Supreme Court Justice, Position #5	Green	86.7	89.4	12.6	18.0	87.0	89.4	9.9	22.3	0.3	0.8
		Garza	10.2	13.3	81.5	86.5	10.7	12.9	77.8	90.5	98.9	99.6
	U.S. House of Reps, District #14	Weber	87.1	89.7	13.4	19.1	87.5	90.0	11.9	22.8	0.1	0.7
		Cole	10.2	13.0	80.1	86.7	10.3	13.1	76.5	87.9	99.6	99.8

	District 10 Judge	Neves	87.5	89.8	13.5	18.7	87.6	90.3	11.5	25.7	0.2	0.7
		Walker	9.8	12.2	81.4	86.9	9.8	12.3	74.5	90.6	99.6	99.8
2014	Attorney General	Paxton	84.8	87.8	16.2	22.0	84.9	87.9	10.9	26.2	0.1	1.6
		Houston	11.8	15.2	77.9	83.7	11.9	15.1	76.0	89.2	99.0	99.8
	County Commissioner, Precinct #4	Clark	82.0	92.1	30.5	62.4	81.3	91.1	33.3	40.5	0.0	26.2
		Hutchins	8.1	20.6	39.3	69.8	6.7	18.2	59.6	67.0	77.3	99.8
	Governor	Abbott	84.0	87.3	14.2	20.0	84.5	87.2	8.9	23.5	0.1	0.4
		Davis	13.2	15.4	79.2	85.8	12.9	15.9	77.3	90.1	98.5	99.9
	Lt. Governor	Patrick	84.7	87.4	13.0	19.1	84.6	87.6	8.5	22.1	0.1	0.5
		Van De Putte	12.1	15.3	80.9	85.6	12.4	15.4	76.9	90.2	99.1	99.9
	U.S. Senate	Cornyn	87.7	90.4	18.6	26.2	87.7	90.2	10.1	23.3	0.9	3.3
		Alameel	9.2	12.4	74.6	81.1	9.5	12.5	79.0	88.9	96.7	99.0
	Supreme Court Justice, Position #7	Boyd	85.4	88.4	15.2	22.1	85.5	88.4	9.9	20.5	0.1	0.4
		Benavides	11.2	14.6	78.8	84.7	11.8	15.0	79.2	89.4	99.4	99.9
	U.S. House of Reps, District #14	Weber	86.6	89.3	17.2	23.4	86.8	89.7	10.7	23.3	0.4	2.6
		Brown	10.5	13.4	77.0	83.2	10.6	13.5	77.2	90.2	96.9	99.3

Table 4: Galveston County Ecological Inference (EI) Candidate Choice Confidence Intervals (SSTO)

Year	Office	Candidate	[LOWER] EI - Spanish Surname (SSTO)	[UPPER] EI - Spanish Surname (SSTO)
2022	Attorney General	Paxton	10.0	40.4
		Garza	59.5	90.6
	County Judge	Henry	27.1	37.7
		King	63.8	73.0
	Governor	Abbott	34.3	41.0
		O'Rourke	58.0	64.8
	Lt. Governor	Patrick	8.9	44.8
		Collier	56.0	91.4
	U.S. House of Reps, District #14	Weber	25.1	38.5
		Williams	61.9	76.2
	District 122 Judge	Jones	24.7	37.6
		Walsdorf	63.5	75.8
	District Attorney	Roady	24.3	36.4
		Dragony	63.2	75.9
2020	County Sheriff	Trochesset	37.1	46.2
		Salinas	54.4	62.8
	President	Trump	5.3	45.3
		Biden	57.6	94.7
	U.S. Senate	Cornyn	30.2	41.4
		Hegar	60.9	70.6

	U.S. House of Reps, District #14	Weber	37.0	43.7
		Bell	55.7	61.6
	District 405 Judge	Robinson	27.6	40.8
		Hudson	59.1	74.6
	District 56 Judge	Cox	27.5	41.2
		Lindsey	58.4	72.3
2018	Attorney General	Paxton	7.5	17.7
		Nelson	82.1	93.3
	Governor	Abbott	22.9	34.5
		Valdez	65.4	78.2
	Lt. Governor	Patrick	7.1	29.8
		Collier	72.4	93.4
	U.S. Senate	Cruz	5.6	30.5
		O'Rourke	75.8	92.5
	U.S. House of Reps, District #14	Weber	7.6	15.0
		Bell	84.8	92.3
2016	President	Trump	0.0	1.1
		Clinton	86.6	99.9
	Supreme Court Justice, Position #5	Green	27.0	31.6
		Garza	91.2	99.8
	U.S. House of Reps, District #14	Weber	28.5	34.5
		Cole	65.0	72.4

	District 10 Judge	Neves	29.0	34.2
		Walker	65.4	70.7
2014	Attorney General	Paxton	15.3	17.3
		Houston	82.7	84.5
	County Commissioner, Precinct #4	Clark	0.0	0.2
		Hutchins	70.2	99.8
	Governor	Abbott	13.7	18.4
		Davis	81.9	87.0
	Lt. Governor	Patrick	12.6	16.5
		Van De Putte	83.6	87.6
	U.S. Senate	Cornyn	11.0	17.5
		Alameel	83.2	89.0
	Supreme Court Justice, Position #7	Boyd	13.3	14.1
		Benavides	84.0	86.6
	U.S. House of Reps, District #14	Weber	11.2	16.7
		Brown	83.6	88.4

Table 5: Galveston County Ecological Inference (EI) Candidate Choice Confidence Intervals (Estimated Actual Vote)

Year	Office	Candidate	[LOWER] EI - Anglo Voters	[UPPER] EI - Anglo Voters	[LOWER] EI - Hispanic Voters	[UPPER] EI - Hispanic Voters	[LOWER] EI - Black Voters	[UPPER] EI - Black Voters
2022	Attorney General	Paxton	79.4	81.4	12.0	39.2	0.3	1.7
		Garza	18.5	20.4	56.6	86.8	97.9	99.7
	County Judge	Henry	81.6	83.6	12.3	42.3	0.3	2.1
		King	16.5	18.6	61.4	86.3	99.4	99.7
	Governor	Abbott	79.9	81.7	20.0	41.5	0.3	0.7
		O'Rourke	18.2	20.2	52.8	86.0	99.1	99.6
	Lt. Governor	Patrick	79.3	81.3	12.7	41.5	0.0	0.7
		Collier	18.7	20.7	56.5	85.9	97.5	99.5
	U.S. House of Reps, District #14	Weber	81.4	83.4	12.9	44.8	0.3	0.6
		Williams	16.2	18.3	59.1	87.9	98.3	99.7
	District 122 Judge	Jones	81.2	83.4	13.9	39.8	0.3	2.3
		Walsdorf	16.6	19.0	64.0	86.3	97.8	99.6
	District Attorney	Roady	82.4	84.8	15.2	34.5	0.5	1.1
		Dragony	15.2	17.6	63.4	85.4	97.5	99.4
2020	County Sheriff	Trochesset	81.7	84.1	10.9	34.3	0.1	0.9
		Salinas	16.0	18.3	64.1	87.3	98.0	99.7
	President	Trump	79.1	81.4	23.7	25.8	0.4	1.6
		Biden	18.6	20.5	74.4	76.3	98.9	99.5
	U.S. Senate	Cornyn	81.1	83.4	14.1	34.9	0.3	0.7
		Hegar	16.4	18.6	69.2	86.4	99.4	99.7

	U.S. House of Reps, District #14	Weber	81.8	84.0	10.6	35.2	0.4	2.8
		Bell	15.8	18.2	59.7	88.1	98.8	99.5
	District 405 Judge	Robinson	81.7	83.5	13.3	37.6	0.3	0.6
		Hudson	16.5	18.5	64.6	88.8	98.9	99.6
	District 56 Judge	Cox	82.9	84.9	16.0	37.7	0.6	1.7
		Lindsey	15.0	17.3	59.8	84.1	98.8	99.4
2018	Attorney General	Paxton	78.4	80.3	13.7	14.4	0.7	2.7
		Nelson	19.6	21.7	85.6	86.0	99.0	99.4
	Governor	Abbott	83.7	85.8	9.2	24.0	0.3	1.4
		Valdez	14.0	16.0	74.7	92.9	97.5	99.9
	Lt. Governor	Patrick	79.5	81.9	7.0	25.2	0.3	1.4
		Collier	18.5	20.4	76.8	93.0	98.3	99.7
	U.S. Senate	Cruz	78.5	80.3	5.9	27.7	0.5	1.4
		O'Rourke	19.3	21.3	75.8	92.5	97.7	99.6
	U.S. House of Reps, District #14	Weber	81.2	82.7	8.5	24.0	0.2	1.4
		Bell	17.1	19.3	76.7	93.2	99.3	99.8
2016	President	Trump	79.9	81.3	8.1	26.6	0.4	1.0
		Clinton	18.7	20.1	71.4	92.3	99.6	99.8
	Supreme Court Justice, Position #5	Green	82.1	83.6	8.3	25.1	0.1	1.0
		Garza	16.4	17.9	75.3	92.0	99.4	99.9
	U.S. House of Reps, District #14	Weber	82.1	83.8	8.9	25.5	0.0	0.2
		Cole	16.4	17.3	77.3	91.2	99.7	99.8
	District 10 Judge	Neves	82.7	84.0	8.1	30.3	0.0	0.1

		Walker	16.1	17.8	71.5	92.0	99.7	99.8
2014	Attorney General	Paxton	81.6	83.3	7.6	22.3	0.1	0.5
		Houston	16.7	18.9	75.6	93.3	99.5	99.9
	County Commissioner, Precinct #4	Clark	86.5	87.4	33.6	41.5	0.0	0.2
		Hutchins	12.2	13.4	57.3	67.2	98.2	99.9
	Governor	Abbott	80.5	82.4	5.0	22.7	0.0	0.0
		Davis	17.7	19.5	79.8	93.5	99.8	100.0
	Lt. Governor	Patrick	80.9	83.0	6.0	21.1	0.1	1.6
		Van De Putte	17.2	18.9	76.5	96.4	99.9	99.9
	U.S. Senate	Cornyn	83.9	86.3	5.9	17.0	0.1	0.5
		Alameel	13.8	16.0	80.6	93.5	99.6	99.9
	Supreme Court Justice, Position #7	Boyd	81.3	83.6	7.0	23.3	0.1	1.5
		Benavides	16.5	18.4	77.2	93.1	98.9	99.9
	U.S. House of Reps, District #14	Weber	83.0	85.5	5.6	23.4	0.1	0.5
		Brown	14.8	16.6	80.1	94.5	99.1	99.9

Table 6: Galveston County EI Rows by Columns (RxC) Candidate Choice Confidence Intervals (CVAP)

Year	Office	Candidate	[LOWER] RxC - Anglo (CVAP)	[UPPER] RxC - Anglo (CVAP)	[LOWER] RxC - Non-Anglo (CVAP)	[UPPER] RxC - Non-Anglo (CVAP)	[LOWER] RxC - Anglo (CVAP)	[UPPER] RxC - Anglo (CVAP)	[LOWER] RxC - Hispanic (CVAP)	[UPPER] RxC - Hispanic (CVAP)	[LOWER] RxC - Black (CVAP)	[UPPER] RxC - Black (CVAP)
2022	Attorney General	Paxton	82.7	88.7	10.7	22.7	78.1	86.1	19.3	47.1	3.1	13.7
		Garza	11.3	17.3	77.3	89.3	13.9	21.9	52.9	80.7	86.3	96.9
	County Judge	Henry	84.4	89.8	13.4	24.4	80.5	87.4	22.4	46.4	3.1	12.8
		King	10.2	15.6	75.6	86.6	12.6	19.5	53.6	77.6	87.2	96.9
	Governor	Abbott	83.0	88.7	11.3	22.9	78.7	86.1	21.3	47.9	2.7	12.7
		O'Rourke	11.3	17.0	77.1	88.6	13.9	21.3	52.1	78.6	87.4	97.3
	Lt. Governor	Patrick	82.9	88.4	10.7	21.9	78.1	85.1	20.5	44.9	3.4	14.1
		Collier	11.6	17.1	78.1	89.3	14.9	21.9	55.1	79.5	85.9	96.6
	U.S. House of Reps, District #14	Weber	83.7	89.9	13.4	26.0	79.6	87.6	24.4	50.4	3.0	11.9
		Williams	10.1	16.3	74.0	86.6	12.3	20.4	49.6	75.6	88.0	97.0
	District 122 Judge	Jones	84.5	89.8	13.0	24.0	80.9	87.6	21.4	46.2	2.9	12.8
		Walsdorf	10.2	15.5	76.0	87.0	12.4	19.1	53.8	78.6	87.2	97.1
	District Attorney	Roady	84.8	90.6	15.0	26.7	81.4	88.3	25.2	51.0	3.4	13.9
		Dragony	9.4	15.2	73.3	85.0	11.7	18.6	49.0	74.8	86.1	96.6
2020	County Sheriff	Trochesset	85.1	90.6	11.0	21.6	81.5	88.9	17.8	42.0	3.3	13.4
		Salinas	9.4	14.9	78.3	89.0	11.1	18.5	58.0	82.2	86.6	96.7
	President	Trump	83.2	88.4	9.7	19.5	77.4	85.9	17.9	45.1	3.1	13.3
		Biden	11.6	16.8	80.5	90.3	14.1	22.6	54.9	82.1	86.7	96.9
	U.S. Senate	Cornyn	84.3	89.7	11.8	22.2	79.4	87.7	18.7	46.8	3.0	13.0
		Hegar	10.3	15.7	77.8	88.2	12.3	20.6	53.2	81.3	87.0	97.0

	U.S. House of Reps, District #14	Weber	84.9	90.0	12.6	22.4	82.0	88.1	18.8	41.3	3.2	13.1
		Bell	10.0	15.1	77.6	87.4	11.9	18.0	58.7	81.2	86.9	96.8
	District 405 Judge	Robinson	84.6	90.0	11.8	22.1	81.6	88.1	19.3	41.2	3.0	12.2
		Hudson	10.0	15.4	77.8	88.2	11.9	18.4	58.8	80.7	87.8	97.0
	District 56 Judge	Cox	85.4	90.8	13.6	24.0	80.8	88.8	22.6	47.2	3.0	13.2
		Lindsey	9.2	14.6	76.0	86.4	11.2	19.2	52.8	77.4	86.8	97.0
2018	Attorney General	Paxton	82.6	86.9	6.2	14.6	78.8	84.6	9.0	28.6	3.1	12.9
		Nelson	13.2	17.4	85.4	93.8	15.4	21.2	71.4	91.0	87.1	96.9
	Governor	Abbott	87.0	91.4	11.3	20.2	84.0	89.6	13.2	34.3	3.0	14.0
		Valdez	8.6	13.1	79.8	88.7	10.4	16.0	65.7	86.8	86.0	97.0
	Lt. Governor	Patrick	83.5	87.7	7.6	16.1	79.3	85.6	9.5	30.7	3.5	13.7
		Collier	12.3	16.5	83.9	92.3	14.4	20.7	69.3	90.5	86.3	96.5
	U.S. Senate	Cruz	82.5	86.8	6.2	15.0	79.0	84.4	9.5	29.0	2.8	12.3
		O'Rourke	13.2	17.5	85.0	93.8	15.6	21.0	71.0	90.5	87.7	97.2
	U.S. House of Reps, District #14	Weber	84.6	89.0	7.9	16.7	80.8	86.7	10.2	30.5	3.3	13.1
		Bell	11.0	15.4	83.3	92.1	13.3	19.2	69.5	89.8	86.9	96.7
2016	President	Trump	85.3	89.5	7.6	16.2	82.3	87.2	11.2	30.9	3.0	14.4
		Clinton	10.5	14.7	83.8	92.4	12.8	17.7	69.1	88.8	85.6	97.0
	Supreme Court Justice, Position #5	Green	86.7	91.4	9.5	19.2	84.6	89.9	9.8	29.9	4.0	14.8
		Garza	8.6	13.3	80.8	90.5	10.1	15.4	70.1	90.2	85.2	96.0
	U.S. House of Reps, District #14	Weber	87.0	91.2	10.7	19.6	83.8	89.5	12.2	33.8	3.9	14.8
		Cole	8.8	13.1	80.4	89.3	10.5	16.2	66.2	87.8	85.2	96.2

	District 10 Judge	Neves	87.4	91.6	10.4	19.2	84.8	90.0	11.1	31.7	3.6	14.1
		Walker	8.4	12.6	80.8	89.6	10.0	15.2	68.3	88.9	85.9	96.4
2014	Attorney General	Paxton	85.4	90.0	11.6	21.0	82.9	88.5	14.3	37.8	4.3	15.2
		Houston	10.0	14.5	79.0	88.4	11.5	17.1	62.2	85.7	84.8	95.7
	County Commissioner, Precinct #4	Clark	77.6	95.8	19.5	71.8	80.3	94.2	15.3	75.8	12.0	77.7
		Hutchins	4.2	22.4	28.2	80.5	5.8	19.7	24.2	84.7	22.3	88.0
	Governor	Abbott	84.0	88.9	10.2	20.4	81.1	86.5	10.7	34.4	3.5	14.9
		Davis	11.1	16.0	79.6	89.8	13.5	18.9	65.6	89.3	85.1	96.5
	Lt. Governor	Patrick	85.3	89.8	9.3	18.8	82.0	87.3	11.1	34.3	3.7	13.8
		Van De Putte	10.2	14.7	81.2	90.7	12.7	18.0	65.7	88.9	86.2	96.3
	U.S. Senate	Cornyn	88.8	92.9	14.3	22.9	87.2	91.5	13.2	33.1	4.7	17.1
		Alameel	7.1	11.2	77.1	85.7	8.5	12.8	66.9	86.8	82.9	95.3
	Supreme Court Justice, Position #7	Boyd	86.2	90.3	11.2	19.8	83.2	88.4	10.4	33.5	4.0	14.7
		Benavides	9.7	13.8	80.2	88.8	11.6	16.8	66.4	89.6	85.3	96.0
	U.S. House of Reps, District #14	Weber	87.9	92.2	12.4	21.3	86.2	90.8	11.9	32.0	4.7	15.7
		Brown	7.8	12.1	78.7	87.6	9.2	13.8	68.0	88.1	84.3	95.3

Table 7: Galveston County EI Rows by Columns (RxC) Candidate Choice Confidence Intervals (SSTO)

Year	Office	Candidate	[LOWER] RxC - Spanish Surname (SSTO)	[UPPER] RxC - Spanish Surname (SSTO)
2022	Attorney General	Paxton	14.1	58.3
		Garza	41.7	85.9
	County Judge	Henry	13.6	59.6
		King	40.4	86.4
	Governor	Abbott	10.3	56.8
		O'Rourke	43.2	89.7
	Lt. Governor	Patrick	10.2	55.2
		Collier	44.8	89.8
	U.S. House of Reps, District #14	Weber	13.3	58.9
		Williams	41.1	86.7
	District 122 Judge	Jones	11.1	61.9
		Walsdorf	38.1	88.9
	District Attorney	Roady	12.2	56.0
		Dragony	44.0	87.8
2020	County Sheriff	Trochesset	10.9	57.5
		Salinas	42.5	89.1
	President	Trump	12.4	59.5
		Biden	40.5	87.6
	U.S. Senate	Cornyn	13.1	57.3

		Hegar	42.7	86.9
	U.S. House of Reps, District #14	Weber	10.8	57.8
		Bell	42.2	89.2
	District 405 Judge	Robinson	11.4	55.8
		Hudson	44.2	88.6
	District 56 Judge	Cox	13.3	59.1
		Lindsey	40.9	86.7
2018	Attorney General	Paxton	9.9	50.9
		Nelson	49.1	90.1
	Governor	Abbott	9.7	52.9
		Valdez	47.1	90.3
	Lt. Governor	Patrick	9.6	44.5
		Collier	55.5	90.4
	U.S. Senate	Cruz	10.1	45.9
		O'Rourke	54.1	89.9
	U.S. House of Reps, District #14	Weber	9.4	50.8
		Bell	49.2	90.6
2016	President	Trump	7.7	49.9
		Clinton	50.1	92.3
	Supreme Court Justice, Position #5	Green	9.0	48.1
		Garza	51.9	91.0
	U.S. House of Reps, District #14	Weber	10.1	51.1
		Cole	48.9	89.9

	District 10 Judge	Neves	10.0	51.3
		Walker	48.7	90.0
2014	Attorney General	Paxton	6.8	42.2
		Houston	57.8	93.2
	County Commissioner, Precinct #4	Clark	14.2	81.5
		Hutchins	18.5	85.8
	Governor	Abbott	9.1	45.8
		Davis	54.2	90.9
	Lt. Governor	Patrick	8.3	43.9
		Van De Putte	56.1	91.7
	U.S. Senate	Cornyn	8.3	41.4
		Alameel	58.6	91.7
	Supreme Court Justice, Position #7	Boyd	9.3	40.4
		Benavides	59.6	90.7
	U.S. House of Reps, District #14	Weber	10.0	44.0
		Brown	56.0	90.0

Table 8: Galveston County EI Rows by Columns (RxC) Candidate Choice Confidence Intervals (Estimated Actual Vote)

Year	Office	Candidate	[LOWER] RxC - Anglo Voters	[UPPER] RxC - Anglo Voters	[LOWER] RxC - Hispanic Voters	[UPPER] RxC - Hispanic Voters	[LOWER] RxC - Black Voters	[UPPER] RxC - Black Voters
2022	Attorney General	Paxton	74.7	80.0	12.9	44.1	2.7	11.9
		Garza	20.0	25.4	55.9	87.1	88.1	97.3
	County Judge	Henry	76.3	82.0	12.7	46.2	3.3	13.2
		King	18.0	23.7	53.8	87.3	86.8	96.7
	Governor	Abbott	74.4	80.5	13.2	44.4	2.4	10.7
		O'Rourke	19.5	25.6	55.6	86.9	89.3	97.7
	Lt. Governor	Patrick	74.0	79.8	14.8	46.9	2.4	10.8
		Collier	20.2	26.0	53.1	85.2	89.2	97.7
	U.S. House of Reps, District #14	Weber	76.7	82.3	14.7	49.1	2.9	12.3
		Williams	17.7	23.3	50.9	85.3	87.7	97.1
	District 122 Judge	Jones	76.8	81.9	13.7	43.4	2.8	11.2
		Walsdorf	18.1	23.2	56.6	86.3	88.8	97.2
	District Attorney	Roady	77.7	83.2	14.5	47.0	3.2	12.9
		Dragony	16.8	22.3	53.0	85.5	87.1	96.8
2020	County Sheriff	Trochesset	76.9	82.5	12.9	43.2	2.9	13.0
		Salinas	17.5	23.1	56.8	87.1	87.0	97.1
	President	Trump	73.7	80.3	12.4	45.5	2.8	11.0
		Biden	19.7	26.3	54.5	87.6	89.0	97.2
	U.S. Senate	Cornyn	76.7	82.2	12.8	45.0	2.8	11.7
		Hegar	17.8	23.3	55.0	87.2	88.3	97.2

	U.S. House of Reps, District #14	Weber	77.5	82.7	13.9	41.6	2.7	12.5
		Bell	17.3	22.5	58.4	86.1	87.5	97.3
	District 405 Judge	Robinson	77.6	83.1	8.7	38.0	2.9	12.5
		Hudson	16.9	22.4	62.1	91.3	87.5	97.1
	District 56 Judge	Cox	77.8	83.6	15.6	45.9	3.0	12.7
		Lindsey	16.4	22.2	54.1	84.4	87.4	97.0
2018	Attorney General	Paxton	73.5	78.7	7.8	33.5	2.5	11.2
		Nelson	21.3	26.5	66.5	92.2	88.8	97.5
	Governor	Abbott	79.4	84.5	8.3	34.9	3.4	13.4
		Valdez	15.5	20.6	65.1	91.7	86.6	96.6
	Lt. Governor	Patrick	74.7	80.1	7.9	32.2	3.2	12.8
		Collier	19.9	25.3	67.8	92.1	87.2	96.8
	U.S. Senate	Cruz	73.7	79.0	6.9	33.8	2.3	11.5
		O'Rourke	21.0	26.3	66.2	93.1	88.5	97.7
	U.S. House of Reps, District #14	Weber	76.5	81.6	7.6	31.3	2.3	10.0
		Bell	18.4	23.5	68.7	92.4	90.0	97.7
2016	President	Trump	76.8	80.2	6.8	28.6	2.4	10.8
		Clinton	19.8	23.2	71.4	93.2	89.2	97.6
	Supreme Court Justice, Position #5	Green	79.2	82.6	6.9	27.2	2.7	11.9
		Garza	17.4	20.8	72.8	93.1	88.0	97.3
	U.S. House of Reps, District #14	Weber	79.3	82.9	7.4	30.4	2.0	9.3
		Cole	17.1	20.7	69.6	92.6	90.7	98.0

	District 10 Judge	Neves	79.3	83.1	7.4	29.5	2.6	11.3
		Walker	16.9	20.7	70.5	92.6	88.7	97.4
2014	Attorney General	Paxton	78.3	82.3	7.8	30.5	2.9	12.5
		Houston	17.7	21.7	69.5	92.2	87.5	97.1
	County Commissioner, Precinct #4	Clark	80.0	90.1	12.6	76.2	10.9	76.9
		Hutchins	9.9	20.0	23.8	87.4	23.1	89.1
	Governor	Abbott	76.7	80.9	6.8	31.3	2.5	10.5
		Davis	19.1	23.3	68.7	93.2	89.5	97.5
	Lt. Governor	Patrick	77.3	81.9	5.4	32.6	2.4	11.5
		Van De Putte	18.1	22.7	67.4	94.6	88.5	97.6
	U.S. Senate	Cornyn	81.7	85.7	6.9	35.3	3.0	12.9
		Alameel	14.3	18.3	64.7	93.1	87.1	97.0
	Supreme Court Justice, Position #7	Boyd	78.4	82.9	5.9	30.1	2.7	12.6
		Benavides	17.1	21.6	69.9	94.1	87.4	97.3
	U.S. House of Reps, District #14	Weber	80.6	84.7	6.3	32.0	3.3	13.4
		Brown	15.3	19.4	68.0	93.7	86.6	96.7

Appendix B: Performance Analysis of Additional Maps

Table 1: Performance Analysis of Plaintiff Proposed Map A

			Plaintiff (Rush) Proposed Map A			
			1	2	3	4
	Anglo CVAP		68.8%	73.6%	40.4%	69.6%
	Black CVAP		9.4%	6.0%	30.5%	7.2%
	Hispanic CVAP		18.5%	15.5%	26.1%	16.7%
	Other CVAP		3.3%	4.9%	3.0%	6.5%
2022	Governor	Abbott	63.6%	70.5%	39.9%	68.8%
		O'Rourke	36.4%	29.5%	60.1%	31.2%
	Attorney General	Paxton	63.4%	70.4%	39.5%	68.5%
		Garza	36.6%	29.6%	60.5%	31.5%
	Lt. Governor	Patrick	63.3%	70.1%	39.5%	68.2%
		Collier	36.7%	29.9%	60.5%	31.8%
	County Judge	Henry	65.3%	71.4%	40.7%	70.9%
		King	34.7%	28.6%	59.3%	29.1%
	U.S. House of Reps, District #14	Weber	65.3%	71.8%	41.1%	70.5%
		Williams	34.7%	28.2%	58.9%	29.5%
	District Judge #122	Jones	65.1%	71.7%	40.6%	70.5%
		Walsdorf	34.9%	28.3%	59.4%	29.5%
	District Attorney	Roady	66.1%	72.8%	41.9%	71.6%
		Dragony	33.9%	27.2%	58.1%	28.4%
2020	President	Trump	62.9%	69.5%	38.4%	67.7%
		Biden	37.1%	30.5%	61.6%	32.3%

	Senate	Cornyn	64.8%	70.9%	38.8%	70.1%
		Hegar	35.2%	29.1%	61.2%	29.9%
	Sheriff	Trochesset	64.7%	71.7%	39.3%	70.2%
		Salinas	35.3%	28.3%	60.7%	29.8%
	U.S. House of Reps, District #14	Weber	65.1%	71.4%	39.0%	70.9%
		Bell	34.9%	28.6%	61.0%	29.1%
2018	Senate	Cruz	60.6%	68.5%	35.1%	68.1%
		O'Rourke	39.4%	31.5%	64.9%	31.9%
	Governor	Abbott	65.4%	73.1%	39.0%	73.5%
		Valdez	34.6%	26.9%	61.0%	26.5%
	Lt. Governor	Patrick	61.8%	69.4%	36.1%	69.1%
		Collier	38.2%	30.6%	63.9%	30.9%
	Attorney General	Paxton	60.8%	68.1%	34.7%	68.5%
		Nelson	39.2%	31.9%	65.3%	31.5%
	U.S. House of Reps, District #14	Weber	62.6%	70.4%	35.9%	70.9%
		Bell	37.4%	29.6%	64.1%	29.1%
2016	President	Clinton	35.8%	28.7%	63.5%	28.3%
		Trump	64.2%	71.3%	36.5%	71.7%
	Supreme Court, Position #5	Green	66.3%	72.8%	36.1%	75.1%
		Garza	33.7%	27.2%	63.9%	24.9%
	U.S. House of Reps, District #14	Weber	66.7%	72.3%	37.5%	75.3%
		Cole	33.3%	27.7%	62.5%	24.7%
2014	Senate	Cornyn	69.0%	75.2%	37.5%	79.5%

		Alameel	31.0%	24.8%	62.5%	20.5%
	U.S. House of Reps, District #14	Weber	67.9%	74.0%	36.5%	78.5%
		Brown	32.1%	26.0%	63.5%	21.5%
	Governor	Abbott	64.6%	70.7%	34.3%	75.6%
		Davis	35.4%	29.3%	65.7%	24.4%
	Lt. Governor	Patrick	64.9%	71.4%	35.0%	75.4%
		Van De Putte	35.1%	28.6%	65.0%	24.6%
	Attorney General	Paxton	65.9%	72.1%	34.7%	77.0%
		Houston	34.1%	27.9%	65.3%	23.0%
	Supreme Court, Position #7	Boyd	66.1%	72.2%	34.3%	77.3%
		Benavides	33.9%	27.8%	65.7%	22.7%

Table 2: Performance Analysis of Plaintiff Proposed Map B

			Plaintiff (Rush) Proposed Map B			
			1	2	3	4
	Anglo CVAP		68.9%	73.6%	40.0%	70.3%
	Black CVAP		9.2%	6.0%	30.7%	6.9%
	Hispanic CVAP		18.6%	15.5%	26.3%	16.1%
	Other CVAP		3.3%	4.9%	2.9%	6.7%
2022	Governor	Abbott	64.9%	70.5%	39.4%	68.9%
		O'Rourke	35.1%	29.5%	60.6%	31.1%
	Attorney General	Paxton	64.8%	70.4%	38.9%	68.7%
		Garza	35.2%	29.6%	61.1%	31.3%
	Lt. Governor	Patrick	64.7%	70.1%	39.0%	68.3%
		Collier	35.3%	29.9%	61.0%	31.7%
	County Judge	Henry	66.7%	71.4%	40.2%	71.1%
		King	33.3%	28.6%	59.8%	28.9%
	U.S. House of Reps, District #14	Weber	66.6%	71.8%	40.6%	70.6%
		Williams	33.4%	28.2%	59.4%	29.4%
	District Judge #122	Jones	66.5%	71.7%	40.1%	70.6%
		Walsdorf	33.5%	28.3%	59.9%	29.4%
	District Attorney	Roady	67.5%	72.8%	41.4%	71.8%
		Dragony	32.5%	27.2%	58.6%	28.2%
2020	President	Trump	64.5%	69.5%	37.7%	67.9%
		Biden	35.5%	30.5%	62.3%	32.1%

	Senate	Cornyn	66.3%	70.9%	38.2%	70.3%
		Hegar	33.7%	29.1%	61.8%	29.7%
	Sheriff	Trochesset	66.2%	71.7%	38.8%	70.4%
		Salinas	33.8%	28.3%	61.2%	29.6%
	U.S. House of Reps, District #14	Weber	66.6%	71.4%	38.4%	71.1%
		Bell	33.4%	28.6%	61.6%	28.9%
2018	Senate	Cruz	62.4%	68.5%	34.3%	68.3%
		O'Rourke	37.6%	31.5%	65.7%	31.7%
	Governor	Abbott	67.2%	73.1%	38.2%	73.7%
		Valdez	32.8%	26.9%	61.8%	26.3%
	Lt. Governor	Patrick	63.6%	69.4%	35.3%	69.3%
		Collier	36.4%	30.6%	64.7%	30.7%
	Attorney General	Paxton	62.7%	68.1%	33.9%	68.7%
		Nelson	37.3%	31.9%	66.1%	31.3%
	U.S. House of Reps, District #14	Weber	64.5%	70.4%	35.1%	71.1%
		Bell	35.5%	29.6%	64.9%	28.9%
2016	President	Clinton	33.7%	28.7%	64.4%	28.0%
		Trump	66.3%	71.3%	35.6%	72.0%
	Supreme Court, Position #5	Green	68.4%	72.8%	35.3%	75.3%
		Garza	31.6%	27.2%	64.7%	24.7%
	U.S. House of Reps, District #14	Weber	68.7%	72.3%	36.7%	75.6%
		Cole	31.3%	27.7%	63.3%	24.4%

2014	Senate	Cornyn	71.8%	75.2%	36.3%	79.7%
		Alameel	28.2%	24.8%	63.7%	20.3%
	U.S. House of Reps, District #14	Weber	70.7%	74.0%	35.3%	78.8%
		Brown	29.3%	26.0%	64.7%	21.2%
	Governor	Abbott	67.4%	70.7%	33.2%	75.8%
		Davis	32.6%	29.3%	66.8%	24.2%
	Lt. Governor	Patrick	67.6%	71.4%	33.9%	75.7%
		Van De Putte	32.4%	28.6%	66.1%	24.3%
	Attorney General	Paxton	68.7%	72.1%	33.6%	77.2%
		Houston	31.3%	27.9%	66.4%	22.8%
	Supreme Court, Position #7	Boyd	68.9%	72.2%	33.1%	77.6%
		Benavides	31.1%	27.8%	66.9%	22.4%

Table 3: Performance Analysis of Plaintiff Proposed Map C

			Plaintiff (Rush) Proposed Map C			
			1	2	3	4
	Anglo CVAP		69.0%	72.6%	38.1%	69.4%
	Black CVAP		9.1%	6.4%	32.8%	7.4%
	Hispanic CVAP		18.5%	16.1%	26.3%	16.8%
	Other CVAP		3.3%	4.9%	2.8%	6.4%
2022	Governor	Abbott	65.0%	68.6%	37.3%	68.7%
		O'Rourke	35.0%	31.4%	62.7%	31.3%
	Attorney General	Paxton	64.8%	68.4%	36.9%	68.5%
		Garza	35.2%	31.6%	63.1%	31.5%
	Lt. Governor	Patrick	64.8%	68.2%	37.0%	68.1%
		Collier	35.2%	31.8%	63.0%	31.9%
	County Judge	Henry	66.7%	69.5%	38.1%	70.9%
		King	33.3%	30.5%	61.9%	29.1%
	U.S. House of Reps, District #14	Weber	66.7%	70.0%	38.4%	70.4%
		Williams	33.3%	30.0%	61.6%	29.6%
	District Judge #122	Jones	66.5%	69.8%	37.9%	70.4%
		Walsdorf	33.5%	30.2%	62.1%	29.6%
	District Attorney	Roady	67.5%	71.1%	39.0%	71.6%
		Dragony	32.5%	28.9%	61.0%	28.4%
2020	President	Trump	64.6%	67.6%	35.7%	67.7%
		Biden	35.4%	32.4%	64.3%	32.3%

	Senate	Cornyn	66.4%	69.0%	36.0%	70.0%
		Hegar	33.6%	31.0%	64.0%	30.0%
	Sheriff	Trochesset	66.3%	69.9%	36.5%	70.2%
		Salinas	33.7%	30.1%	63.5%	29.8%
	U.S. House of Reps, District #14	Weber	66.7%	69.5%	36.1%	70.8%
		Bell	33.3%	30.5%	63.9%	29.2%
2018	Senate	Cruz	62.4%	66.5%	32.3%	68.1%
		O'Rourke	37.6%	33.5%	67.7%	31.9%
	Governor	Abbott	67.2%	71.0%	36.0%	73.4%
		Valdez	32.8%	29.0%	64.0%	26.6%
	Lt. Governor	Patrick	63.7%	67.5%	33.2%	69.1%
		Collier	36.3%	32.5%	66.8%	30.9%
	Attorney General	Paxton	62.7%	66.1%	31.8%	68.5%
		Nelson	37.3%	33.9%	68.2%	31.5%
	U.S. House of Reps, District #14	Weber	64.5%	68.4%	32.9%	70.9%
		Bell	35.5%	31.6%	67.1%	29.1%
2016	President	Clinton	33.7%	30.6%	66.5%	28.3%
		Trump	66.3%	69.4%	33.5%	71.7%
	Supreme Court, Position #5	Green	68.5%	70.9%	33.1%	75.1%
		Garza	31.5%	29.1%	66.9%	24.9%
	U.S. House of Reps, District #14	Weber	68.8%	70.5%	34.3%	75.3%
		Cole	31.2%	29.5%	65.7%	24.7%

2014	Senate	Cornyn	71.9%	73.5%	33.4%	79.5%
		Alameel	28.1%	26.5%	66.6%	20.5%
	U.S. House of Reps, District #14	Weber	70.7%	72.2%	32.6%	78.5%
		Brown	29.3%	27.8%	67.4%	21.5%
	Governor	Abbott	67.4%	68.7%	30.8%	75.6%
		Davis	32.6%	31.3%	69.2%	24.4%
	Lt. Governor	Patrick	67.6%	69.4%	31.5%	75.5%
		Van De Putte	32.4%	30.6%	68.5%	24.5%
	Attorney General	Paxton	68.7%	70.2%	31.1%	77.0%
		Houston	31.3%	29.8%	68.9%	23.0%
	Supreme Court, Position #7	Boyd	69.0%	70.3%	30.7%	77.3%
		Benavides	31.0%	29.7%	69.3%	22.7%

Table 4: Performance Analysis of Maps Proposed by Commissioner Holmes (2021)

			Commissioner Holmes Proposed Map A (Rejected)				Commissioner Holmes Proposed Map B (Rejected)			
			1	2	3	4	1	2	3	4
	Anglo CVAP		68.7%	72.7%	40.4%	70.7%	68.5%	74.0%	40.0%	69.7%
	Black CVAP		9.3%	6.8%	31.3%	5.8%	9.2%	6.3%	31.5%	6.3%
	Hispanic CVAP		19.4%	16.2%	25.0%	16.3%	19.0%	15.3%	25.7%	16.8%
	Other CVAP		2.6%	4.3%	3.4%	7.2%	3.3%	4.4%	2.7%	7.2%
2022	Governor	Abbott	67.4%	68.6%	36.6%	69.2%	64.9%	70.9%	37.5%	68.5%
		O'Rourke	32.6%	31.4%	63.4%	30.8%	35.1%	29.1%	62.5%	31.5%
	Attorney General	Paxton	67.3%	68.4%	36.2%	69.0%	64.7%	70.8%	37.0%	68.4%
		Garza	32.7%	31.6%	63.8%	31.0%	35.3%	29.2%	63.0%	31.6%
	Lt. Governor	Patrick	67.2%	68.2%	36.2%	68.7%	64.7%	70.5%	37.0%	68.0%
		Collier	32.8%	31.8%	63.8%	31.3%	35.3%	29.5%	63.0%	32.0%
	County Judge	Henry	69.0%	69.6%	37.6%	71.2%	66.5%	71.9%	38.3%	70.6%
		King	31.0%	30.4%	62.4%	28.8%	33.5%	28.1%	61.7%	29.4%
	U.S. House of Reps, District #14	Weber	69.0%	69.9%	37.9%	71.0%	66.5%	72.2%	38.7%	70.3%
		Williams	31.0%	30.1%	62.1%	29.0%	33.5%	27.8%	61.3%	29.7%
	District Judge #122	Jones	68.8%	69.7%	37.5%	70.9%	66.3%	72.1%	38.3%	70.3%
		Walsdorf	31.2%	30.3%	62.5%	29.1%	33.7%	27.9%	61.7%	29.7%
	District Attorney	Roady	69.8%	71.0%	38.6%	72.1%	67.4%	73.2%	39.6%	71.5%
		Dragony	30.2%	29.0%	61.4%	27.9%	32.6%	26.8%	60.4%	28.5%
2020	President	Trump	67.0%	68.0%	35.0%	68.1%	64.2%	70.2%	36.0%	67.5%

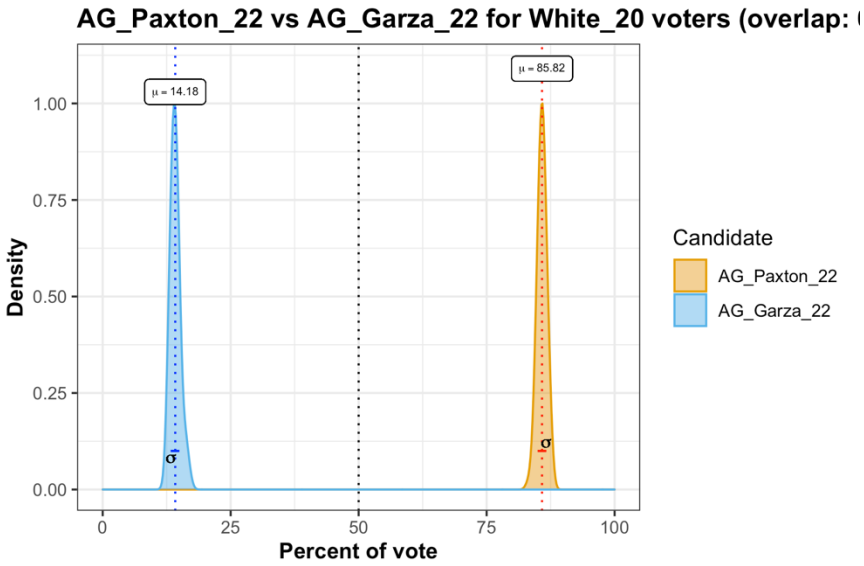
		Biden	33.0%	32.0%	65.0%	31.9%	35.8%	29.8%	64.0%	32.5%
	Senate	Cornyn	68.6%	69.3%	35.7%	70.3%	65.9%	71.7%	36.5%	69.9%
		Hegar	31.4%	30.7%	64.3%	29.7%	34.1%	28.3%	63.5%	30.1%
	Sheriff	Trochesset	68.3%	70.1%	36.5%	70.6%	65.8%	72.2%	37.5%	70.1%
		Salinas	31.7%	29.9%	63.5%	29.4%	34.2%	27.8%	62.5%	29.9%
	U.S. House of Reps, District #14	Weber	69.1%	69.8%	35.8%	71.1%	66.3%	72.1%	36.7%	70.6%
		Bell	30.9%	30.2%	64.2%	28.9%	33.7%	27.9%	63.3%	29.4%
2018	Senate	Cruz	65.3%	66.7%	31.5%	68.4%	62.0%	69.4%	32.7%	67.9%
		O'Rourke	34.7%	33.3%	68.5%	31.6%	38.0%	30.6%	67.3%	32.1%
	Governor	Abbott	69.9%	71.2%	35.5%	73.7%	66.8%	74.0%	36.7%	73.2%
		Valdez	30.1%	28.8%	64.5%	26.3%	33.2%	26.0%	63.3%	26.8%
	Lt. Governor	Patrick	66.3%	67.7%	32.6%	69.4%	63.2%	70.4%	33.8%	68.9%
		Collier	33.7%	32.3%	67.4%	30.6%	36.8%	29.6%	66.2%	31.1%
	Attorney General	Paxton	65.4%	66.3%	31.3%	68.7%	62.3%	69.1%	32.4%	68.2%
		Nelson	34.6%	33.7%	68.7%	31.3%	37.7%	30.9%	67.6%	31.8%
	U.S. House of Reps, District #14	Weber	67.1%	68.5%	32.5%	71.2%	64.0%	71.3%	33.7%	70.7%
		Bell	32.9%	31.5%	67.5%	28.8%	36.0%	28.7%	66.3%	29.3%
2016	President	Clinton	31.3%	30.5%	66.8%	28.0%	34.2%	27.4%	66.0%	28.6%
		Trump	68.7%	69.5%	33.2%	72.0%	65.8%	72.6%	34.0%	71.4%
	Supreme Court, Position #5	Green	70.5%	70.8%	33.2%	75.3%	67.7%	74.0%	33.8%	74.8%
		Garza	29.5%	29.2%	66.8%	24.7%	32.3%	26.0%	66.2%	25.2%

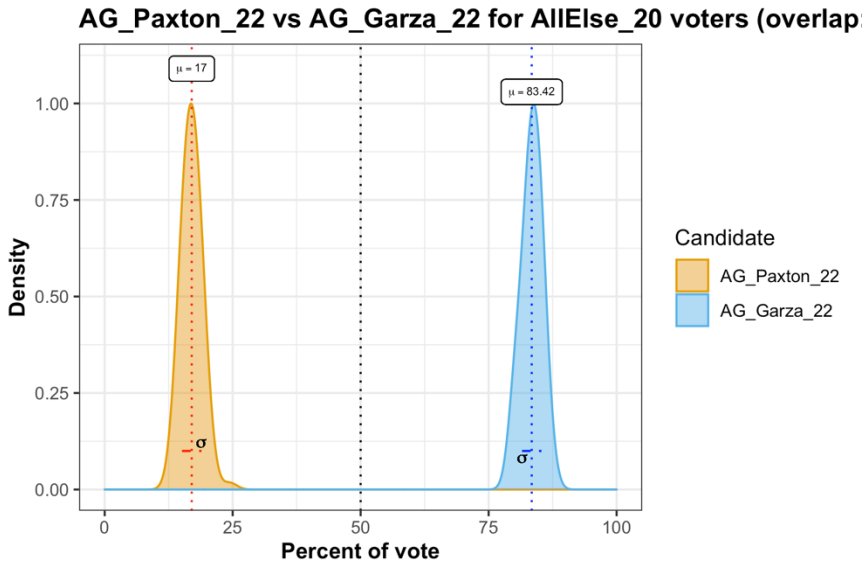
	U.S. House of Reps, District #14	Weber	70.8%	70.4%	34.8%	75.4%	68.0%	73.5%	35.4%	75.0%
		Cole	29.2%	29.6%	65.2%	24.6%	32.0%	26.5%	64.6%	25.0%
2014	Senate	Cornyn	73.9%	72.6%	34.5%	79.6%	70.9%	75.7%	35.9%	79.2%
		Alameel	26.1%	27.4%	65.5%	20.4%	29.1%	24.3%	64.1%	20.8%
	U.S. House of Reps, District #14	Weber	72.9%	71.4%	33.4%	78.5%	69.8%	74.6%	34.8%	78.2%
		Brown	27.1%	28.6%	66.6%	21.5%	30.2%	25.4%	65.2%	21.8%
	Governor	Abbott	69.7%	68.1%	31.3%	75.5%	66.4%	71.6%	32.6%	75.1%
		Davis	30.3%	31.9%	68.7%	24.5%	33.6%	28.4%	67.4%	24.9%
	Lt. Governor	Patrick	70.0%	68.9%	31.7%	75.4%	66.7%	72.3%	33.2%	75.1%
		Van De Putte	30.0%	31.1%	68.3%	24.6%	33.3%	27.7%	66.8%	24.9%
	Attorney General	Paxton	71.0%	69.4%	31.6%	77.0%	67.8%	72.9%	32.9%	76.6%
		Houston	29.0%	30.6%	68.4%	23.0%	32.2%	27.1%	67.1%	23.4%
	Supreme Court, Position #7	Boyd	71.2%	69.4%	31.2%	77.4%	68.0%	72.9%	32.5%	77.0%
		Benavides	28.8%	30.6%	68.8%	22.6%	32.0%	27.1%	67.5%	23.0%

Appendix C: Density Plots of Ecological Inference (EI) Iterative Candidate Choice Estimates

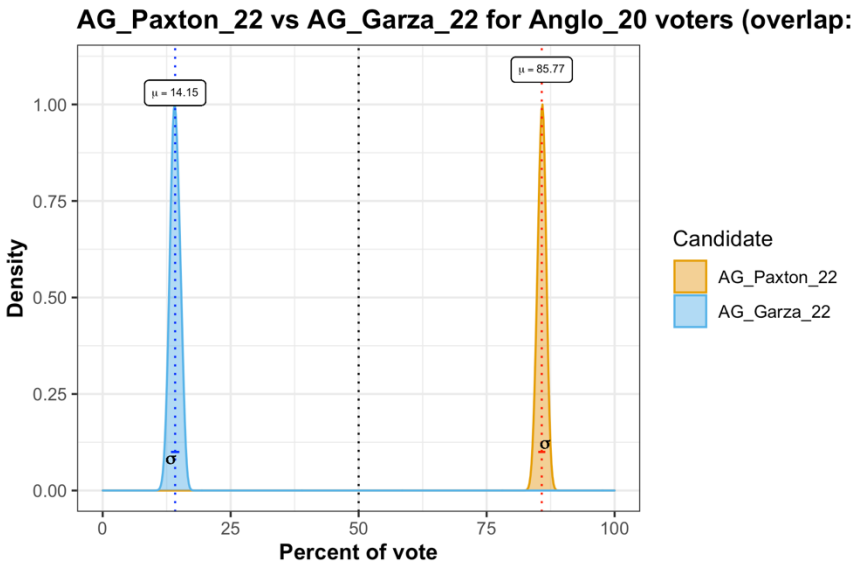
I. 2022 Attorney General

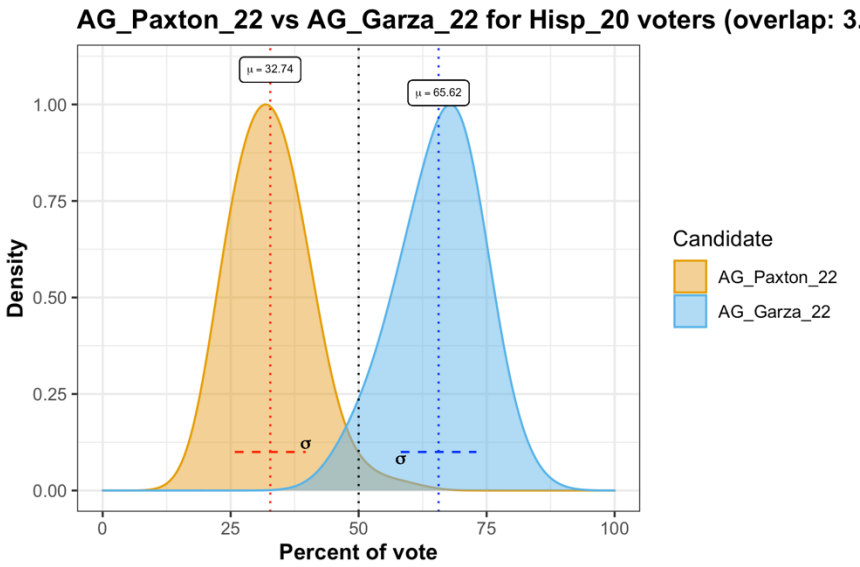
Anglo and Non-Anglo (CVAP)

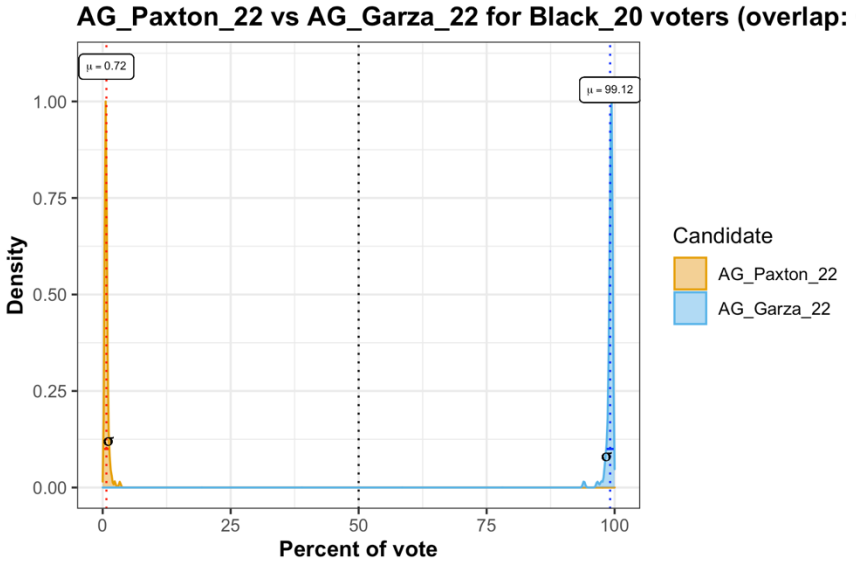




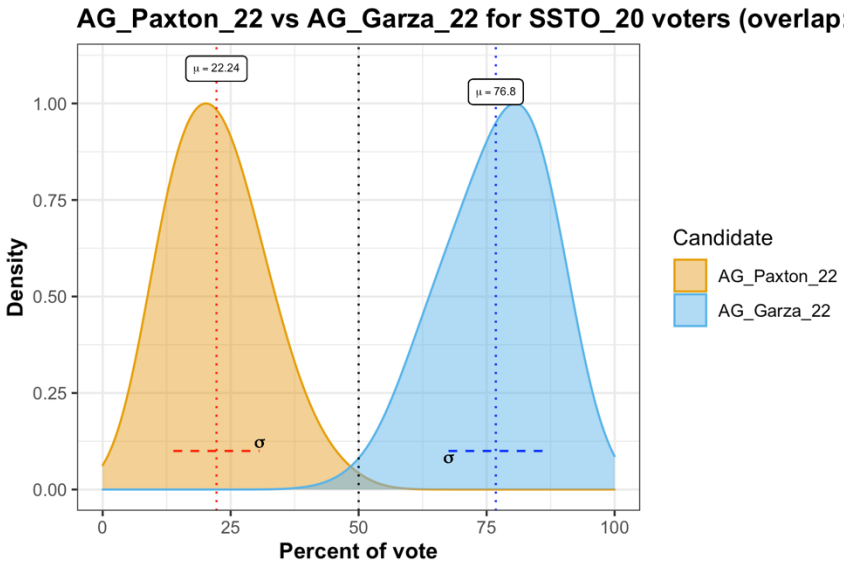
Anglo, Hispanic, and Black (CVAP)



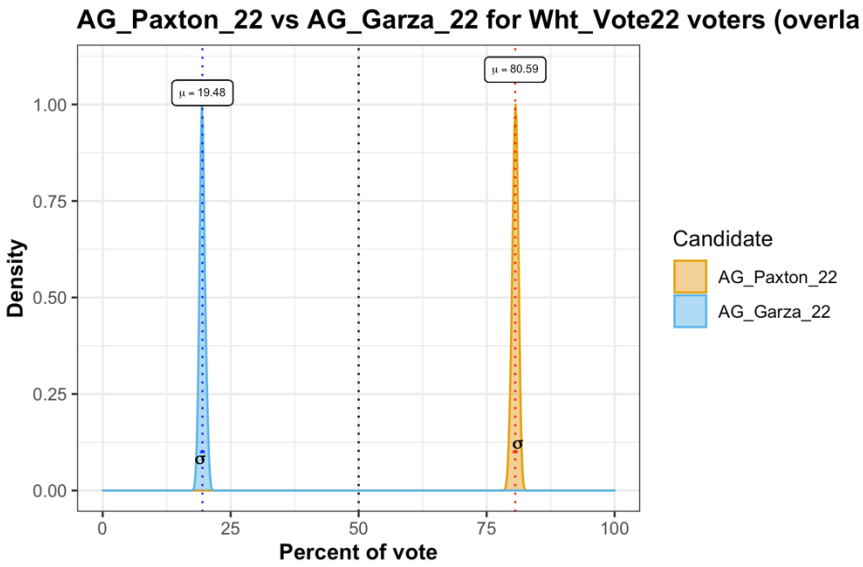


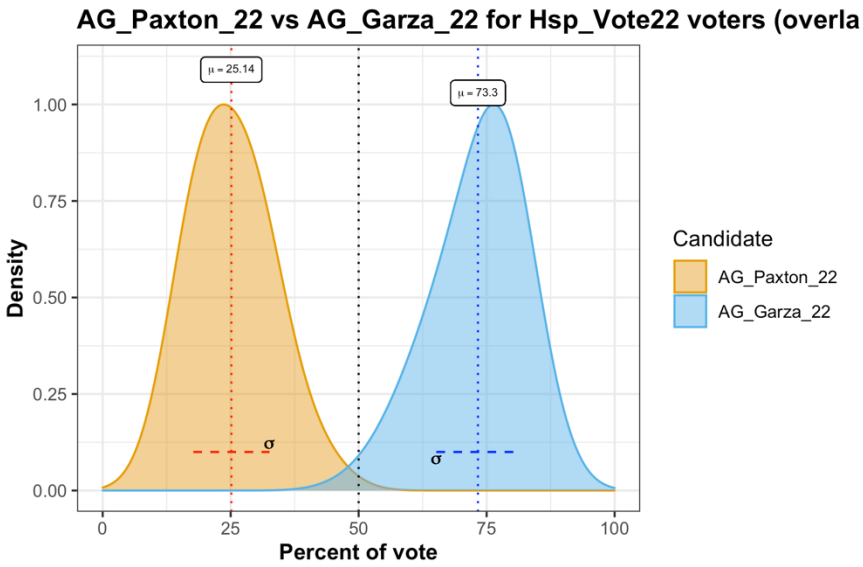


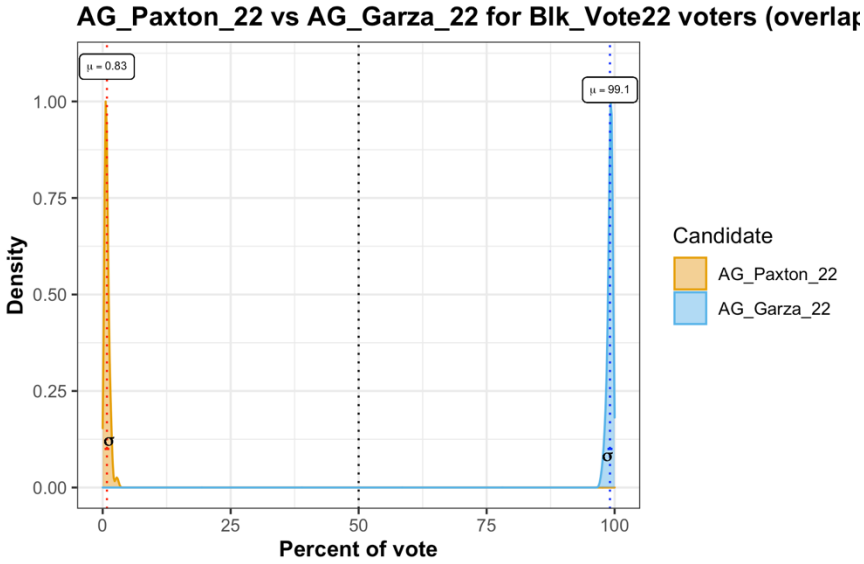
SSTO


AG_Paxton_22 vs AG_Garza_22 for SSTO_20 voters (overlap:
μ = 22.24
μ = 76.8
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
AG_Paxton_22
AG_Garza_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

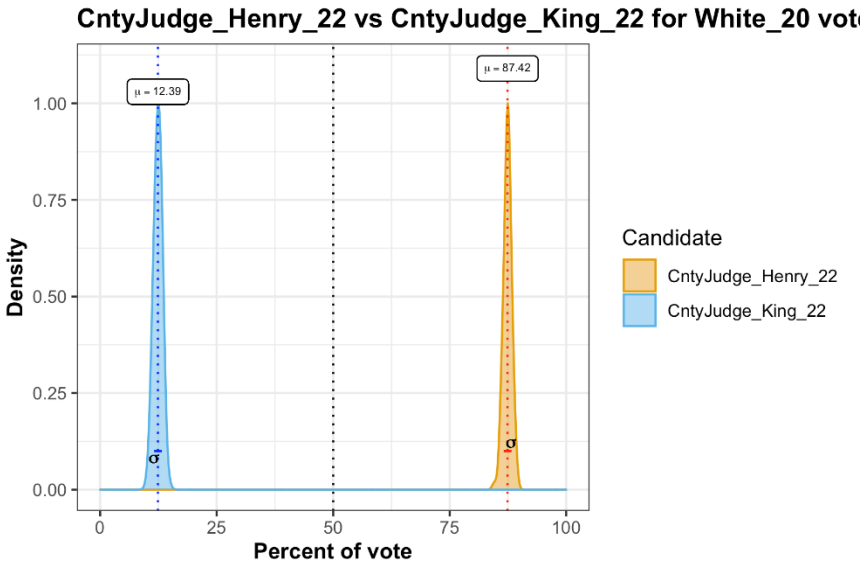


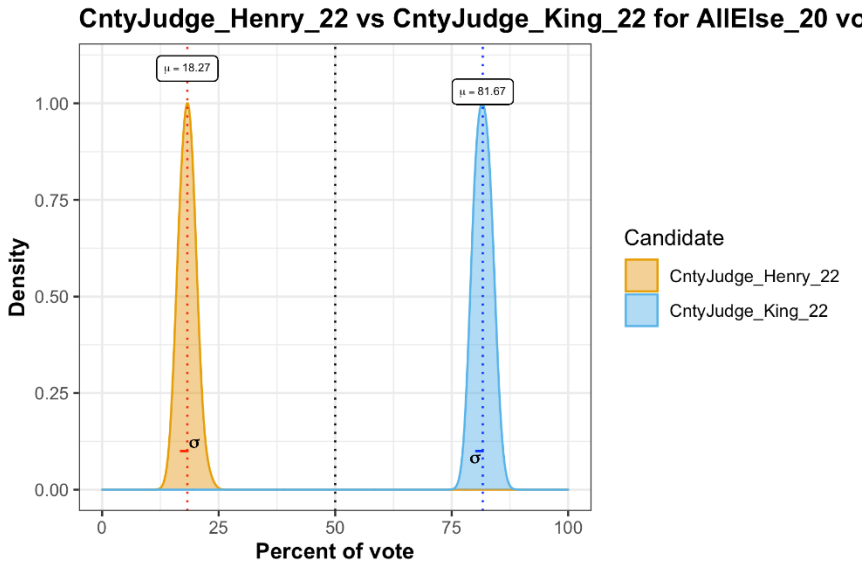




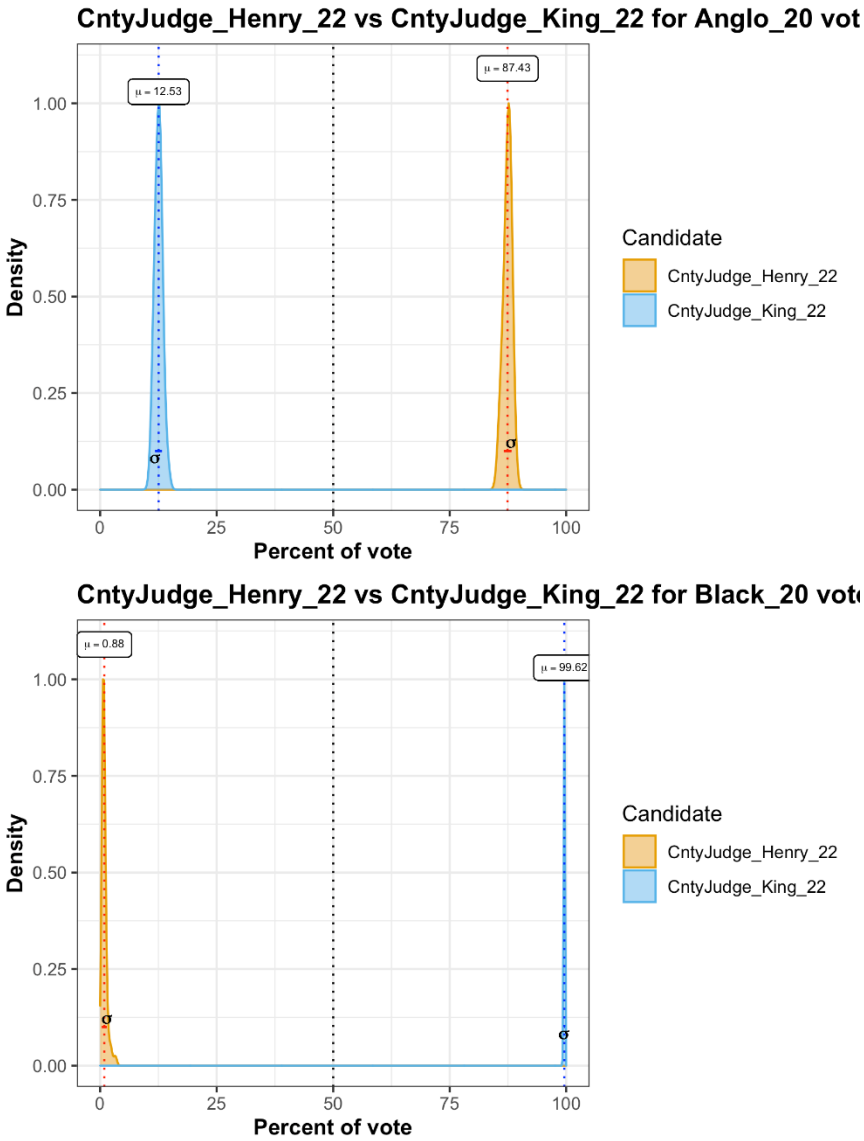
II. 2022 County Judge

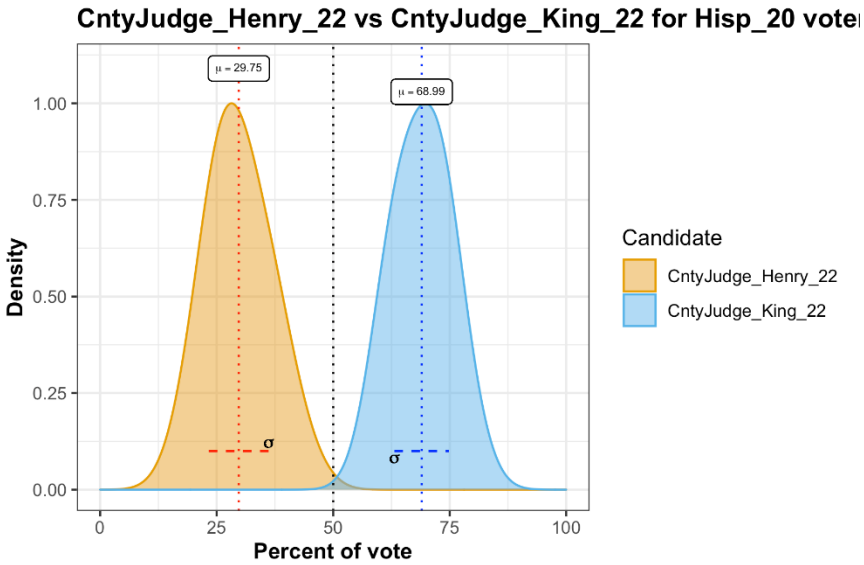
Anglo and Non-Anglo (CVAP)



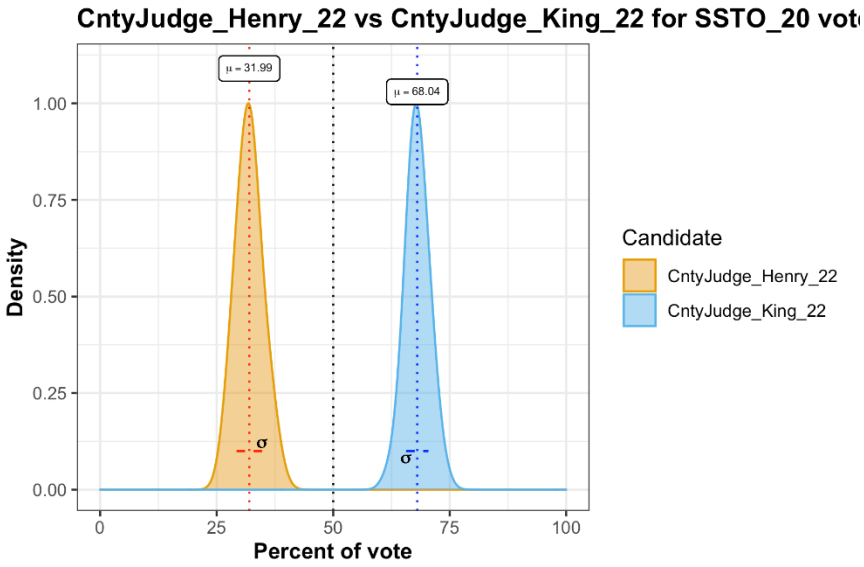


Anglo, Hispanic, and Black (CVAP)

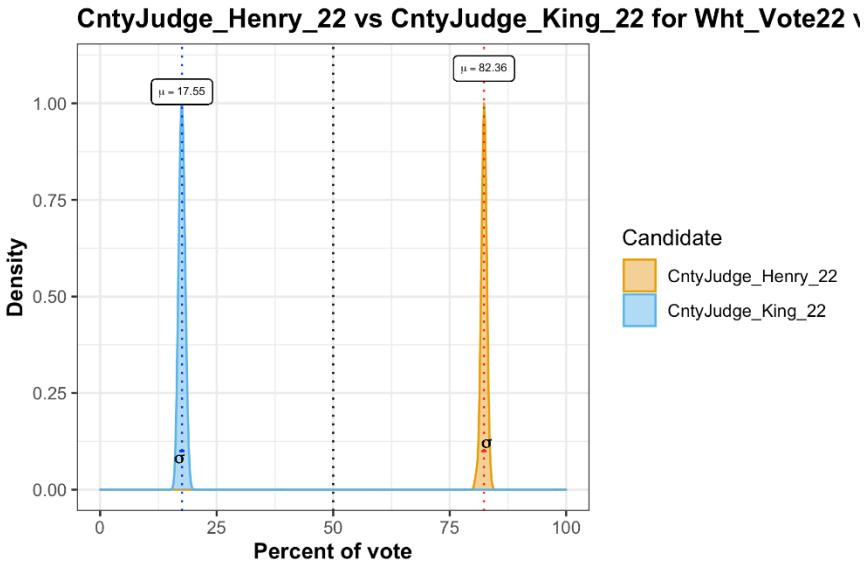


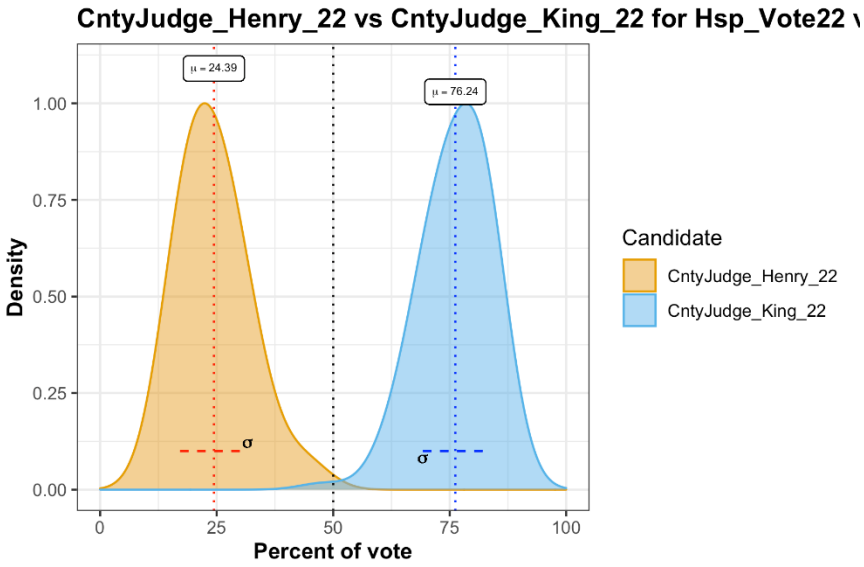


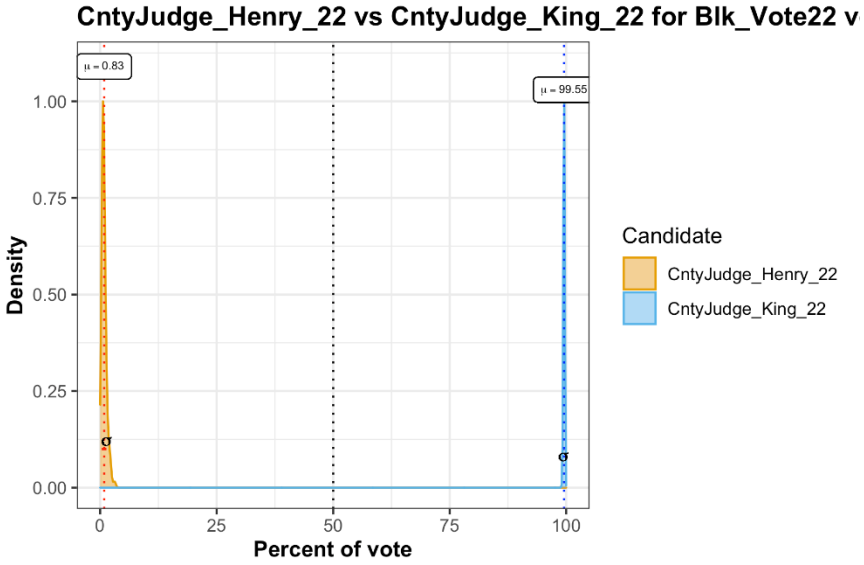
SSTO


CntyJudge_Henry_22 vs CntyJudge_King_22 for SSTO_20 vot
μ = 31.99
μ = 68.04
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
CntyJudge_Henry_22
CntyJudge_King_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

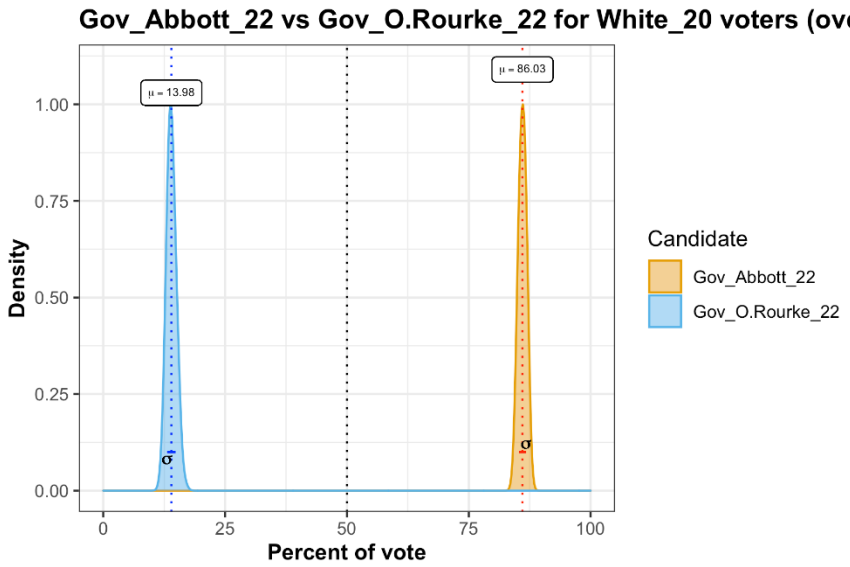


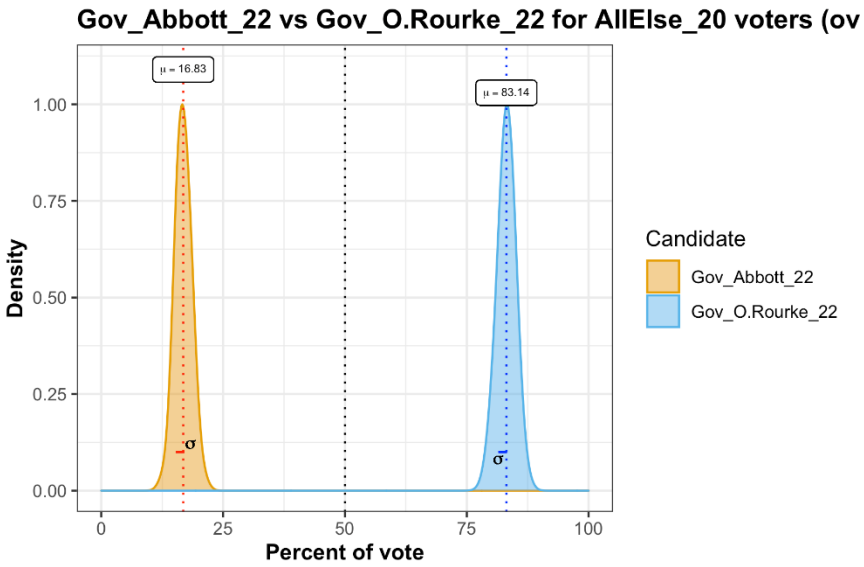




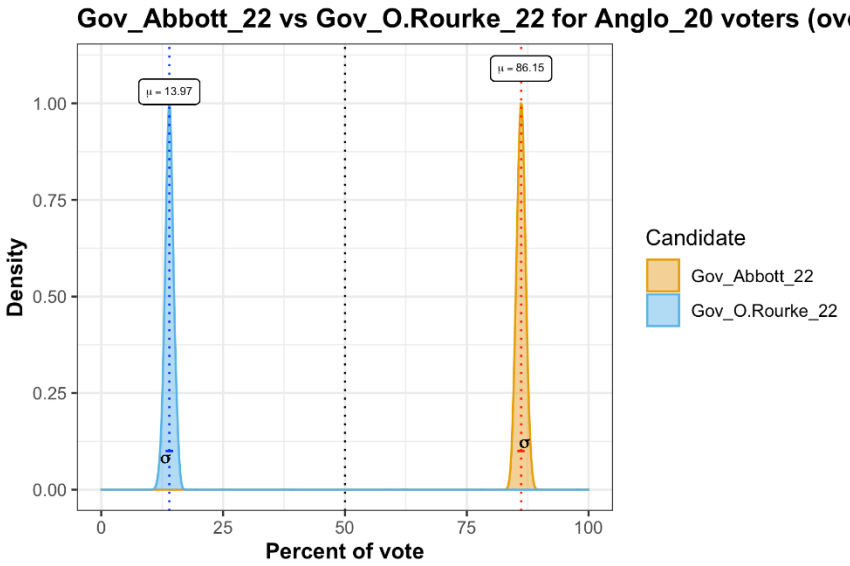
III. 2022 Governor

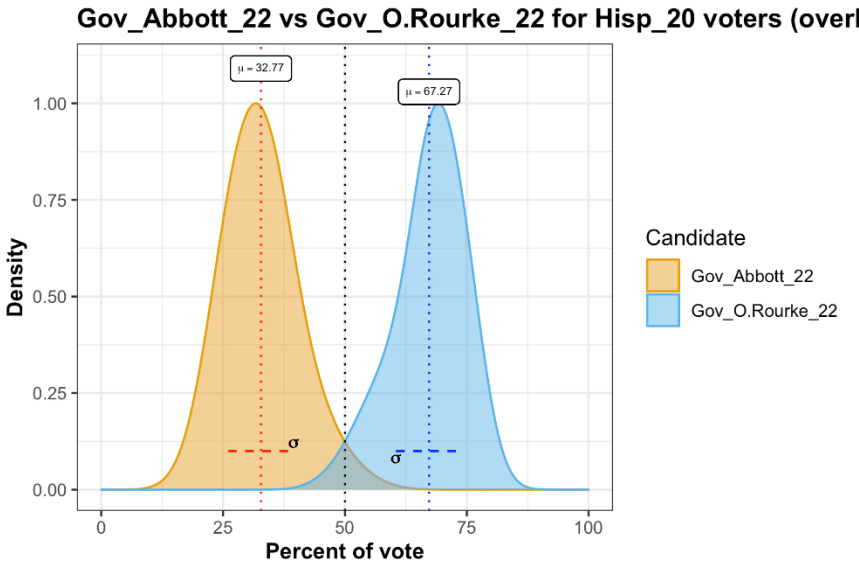
Anglo and Non-Anglo (CVAP)

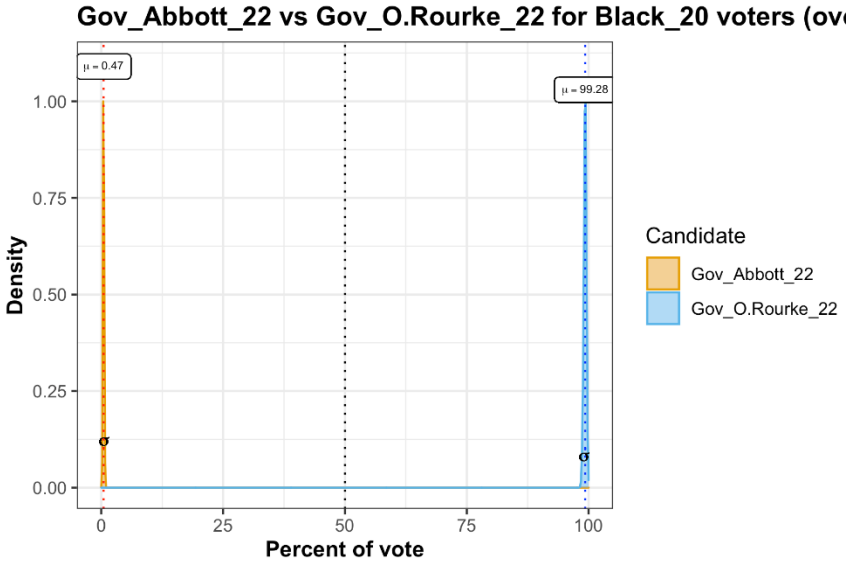




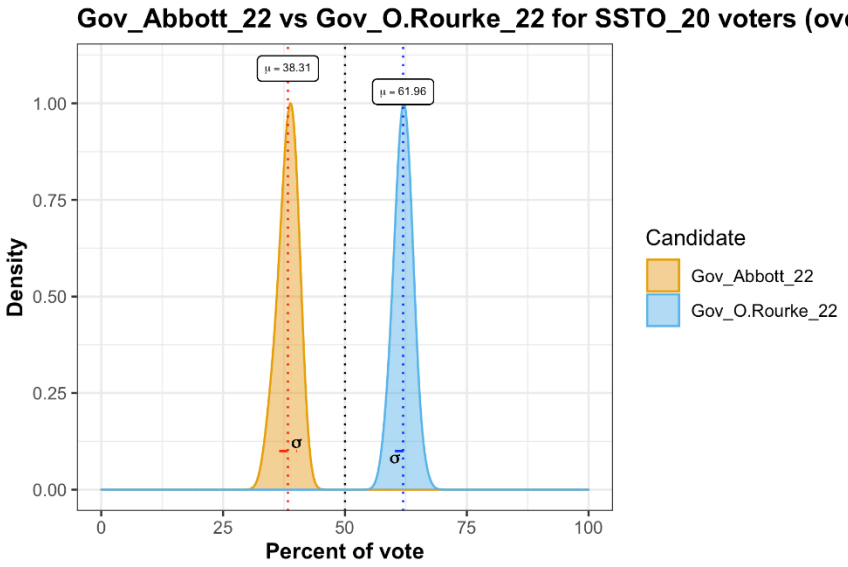
Anglo, Hispanic, and Black (CVAP)



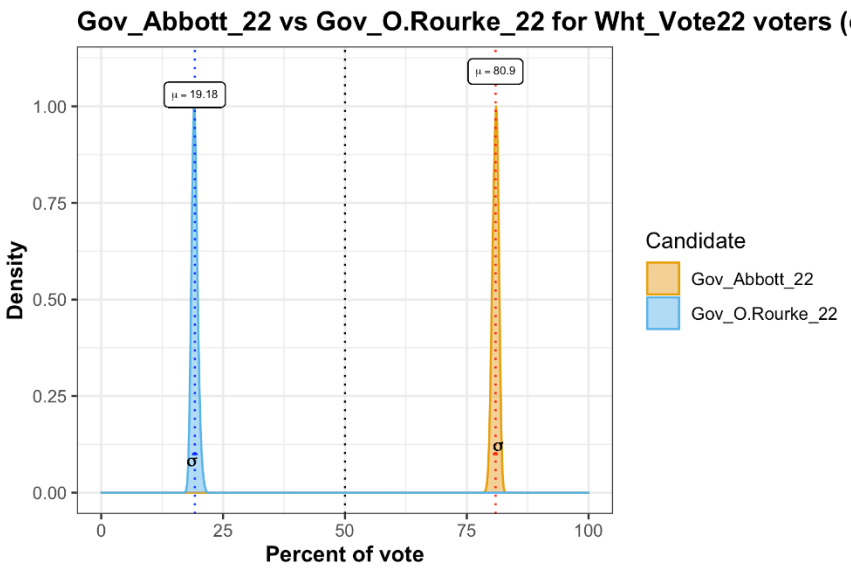


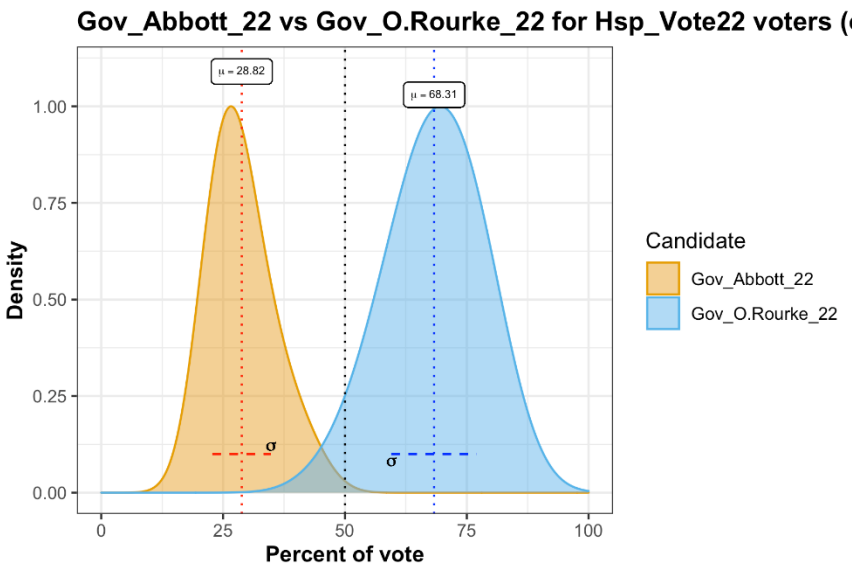


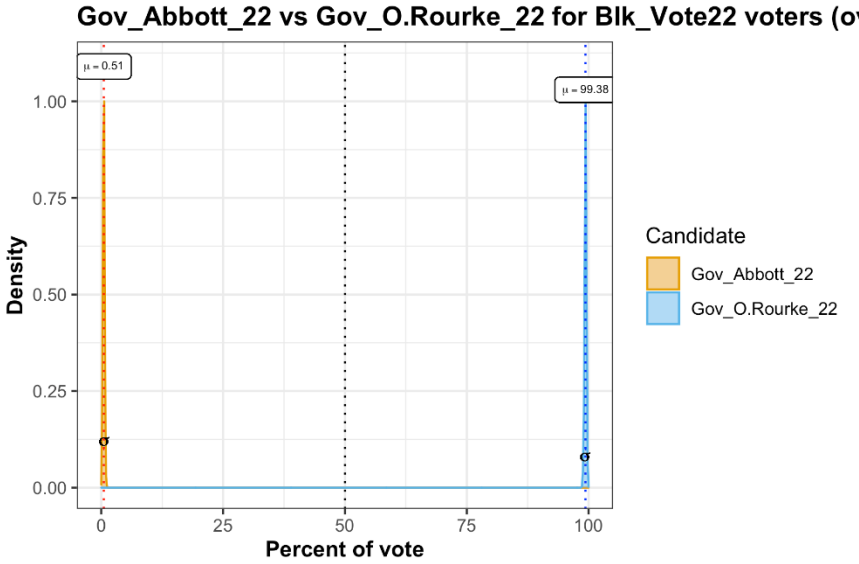
SSTO


Gov_Abbott_22 vs Gov_O.Rourke_22 for SSTO_20 voters (ove
μ = 38.31
μ = 61.96
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Gov_Abbott_22
Gov_O.Rourke_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

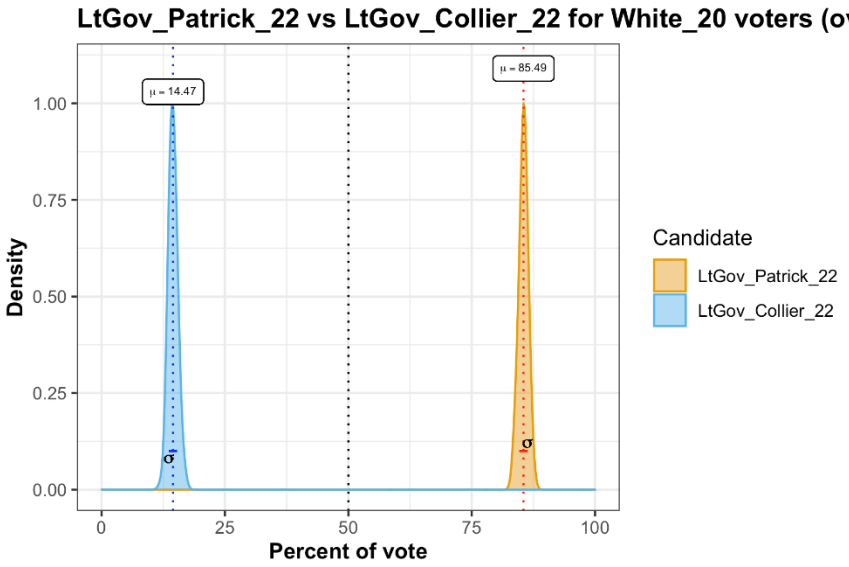


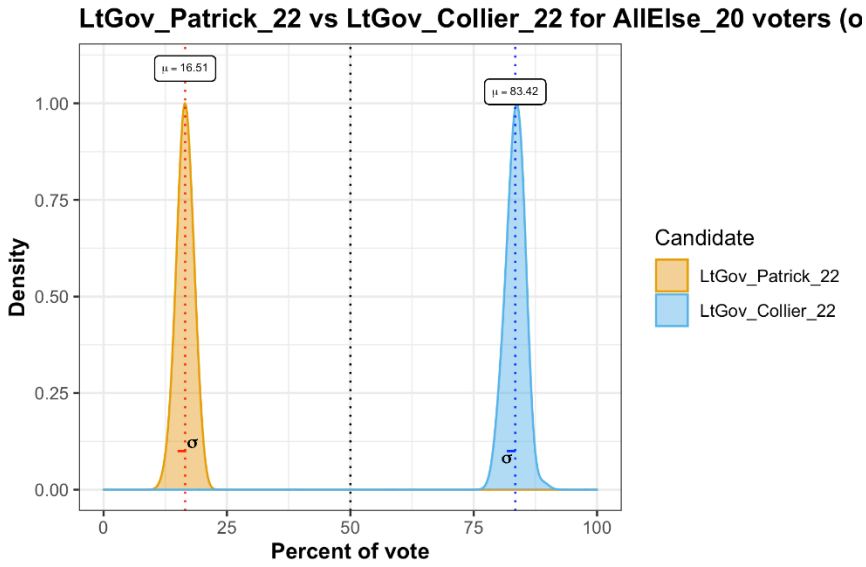




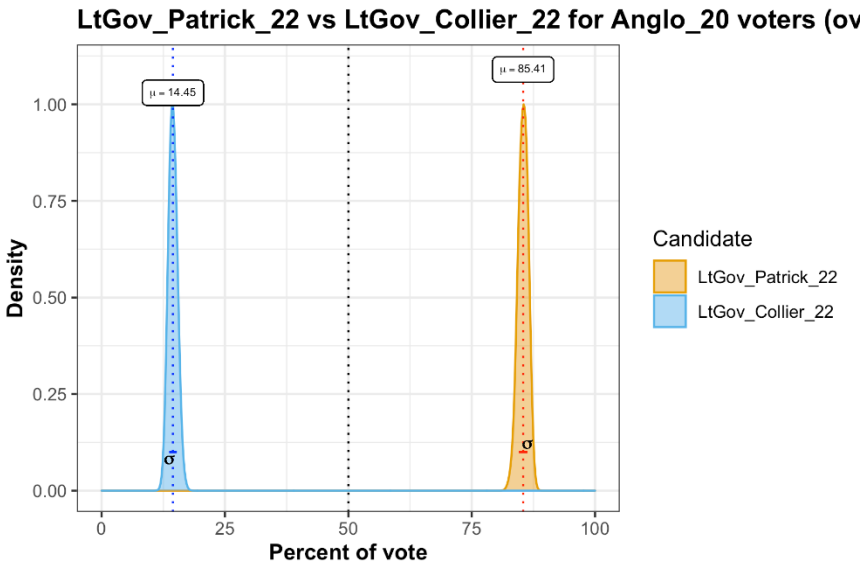
IV. 2022 Lt. Governor

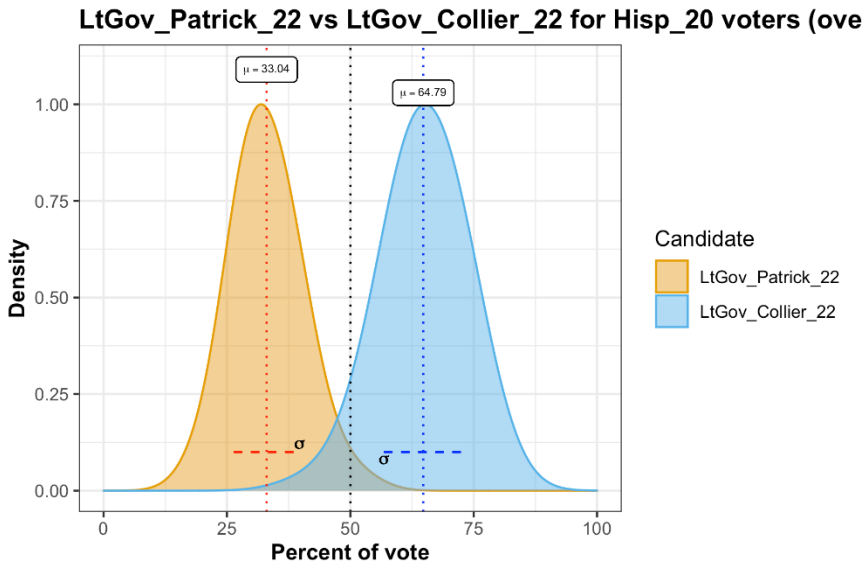
Anglo and Non-Anglo (CVAP)

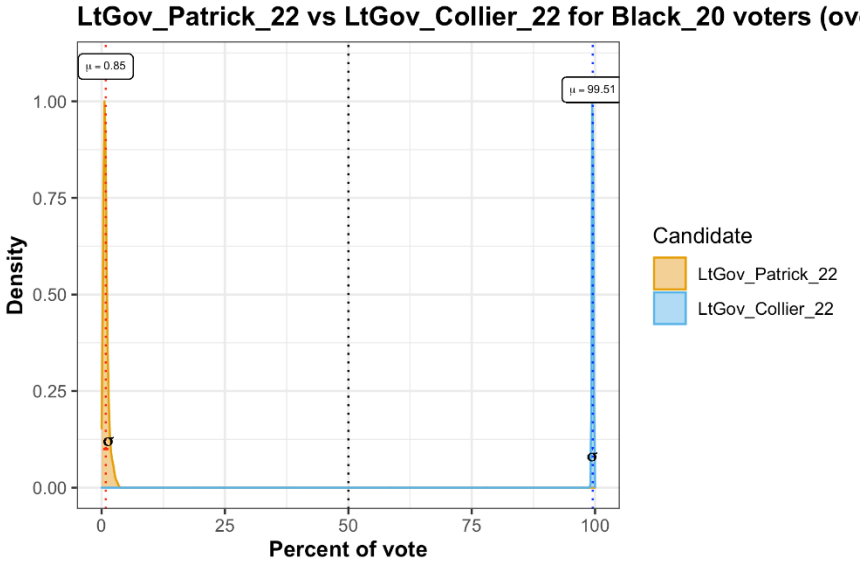




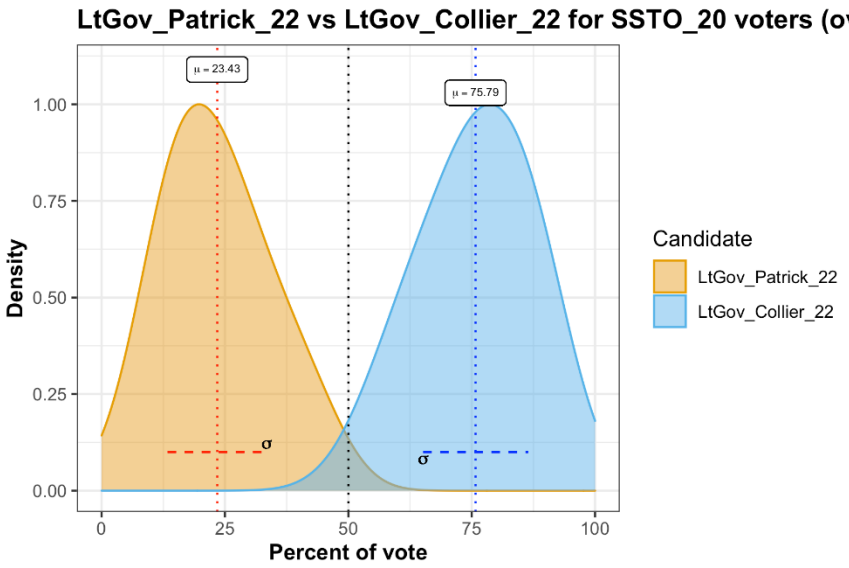
Anglo, Hispanic, and Black (CVAP)



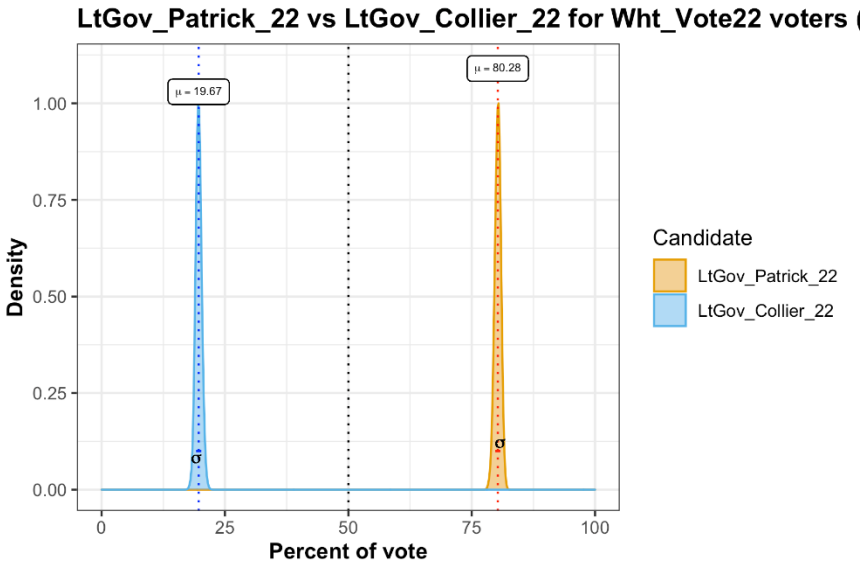


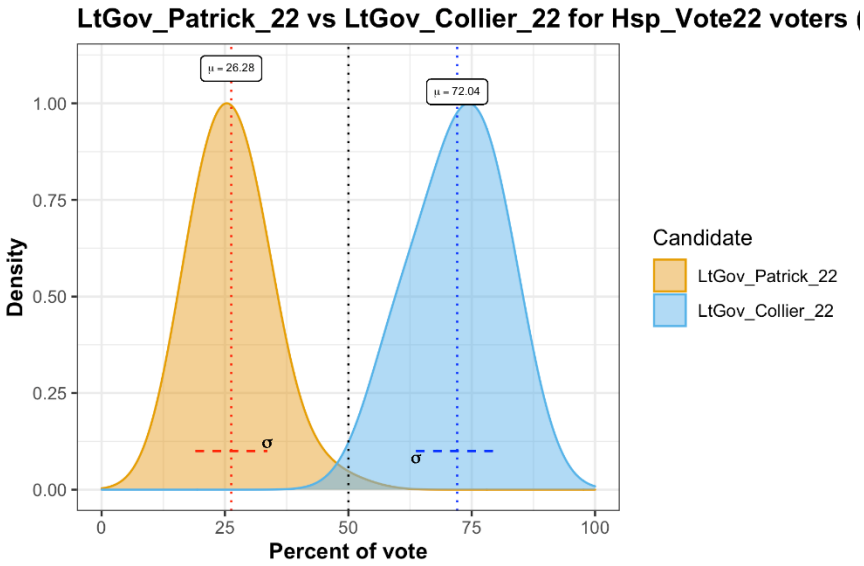


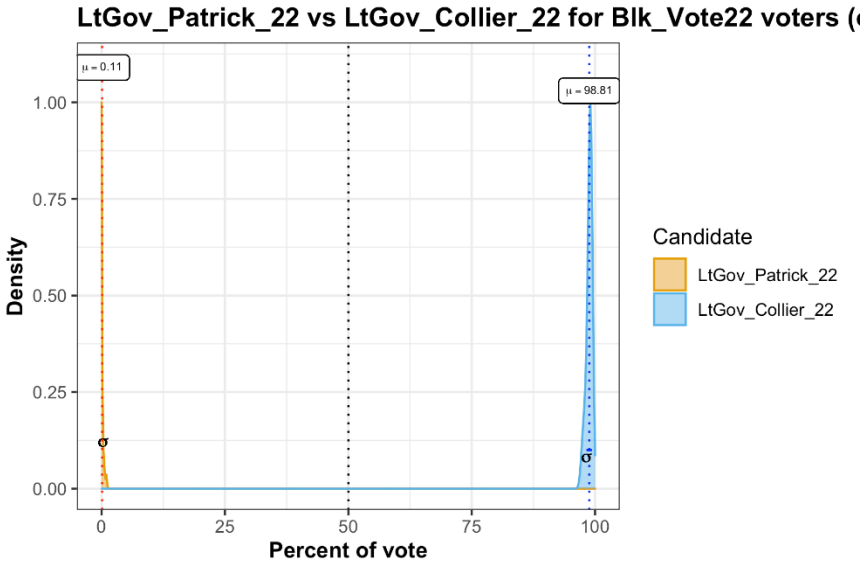
SSTO


LtGov_Patrick_22 vs LtGov_Collier_22 for SSTO_20 voters (ov
μ = 23.43
μ = 75.79
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
LtGov_Patrick_22
LtGov_Collier_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

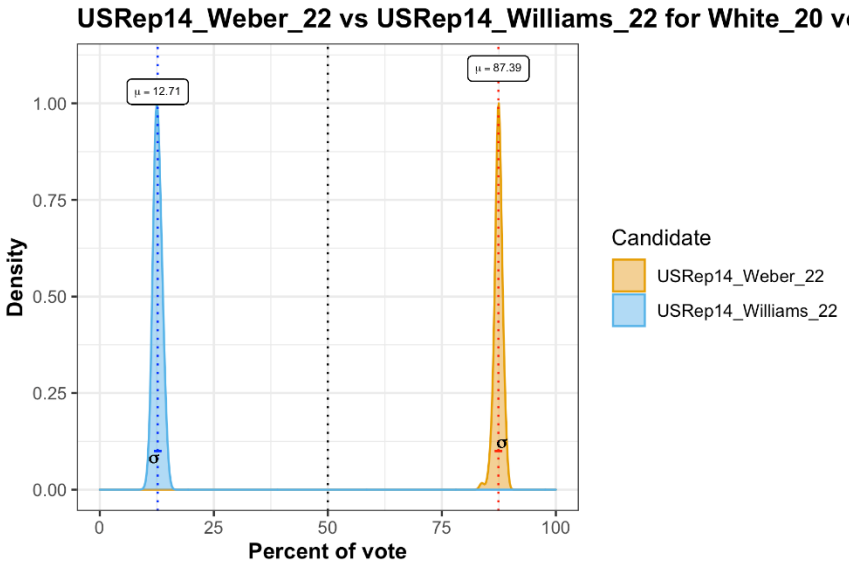


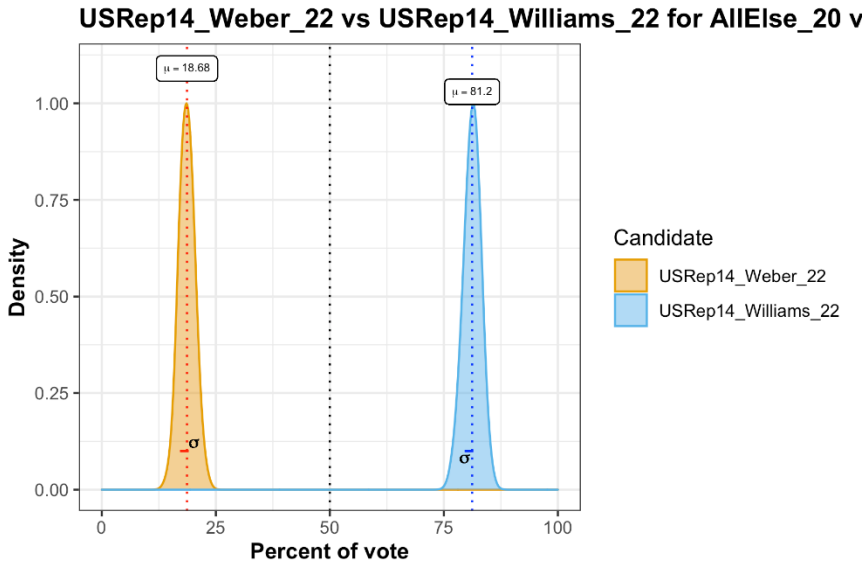




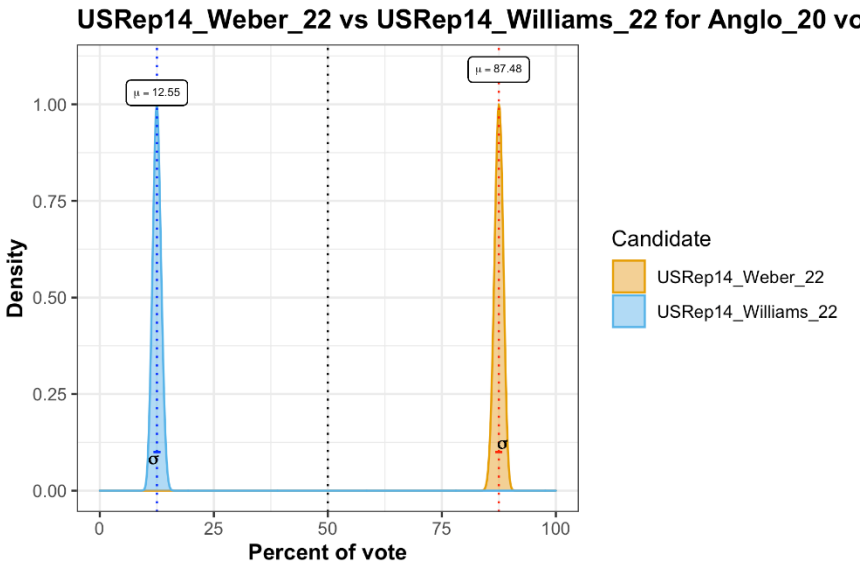
V. 2022 U.S. House of Reps, District #14

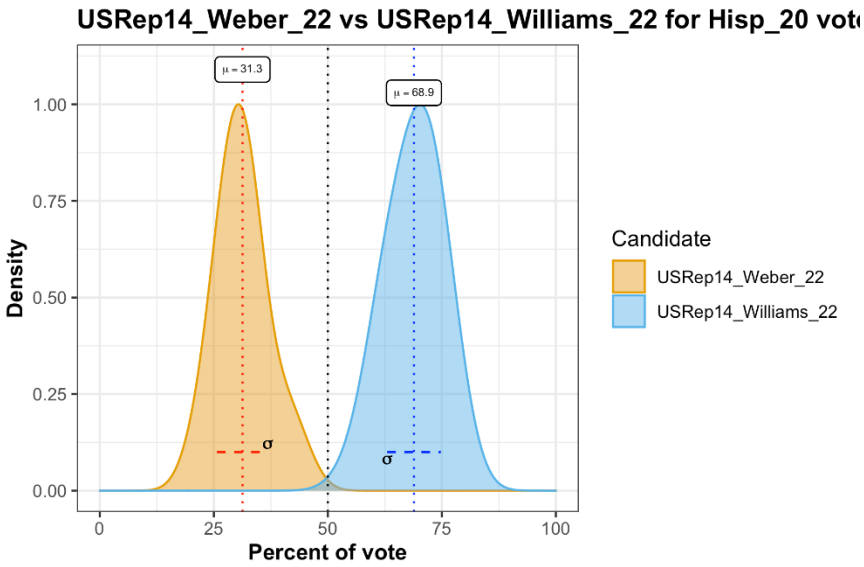
Anglo and Non-Anglo (CVAP)

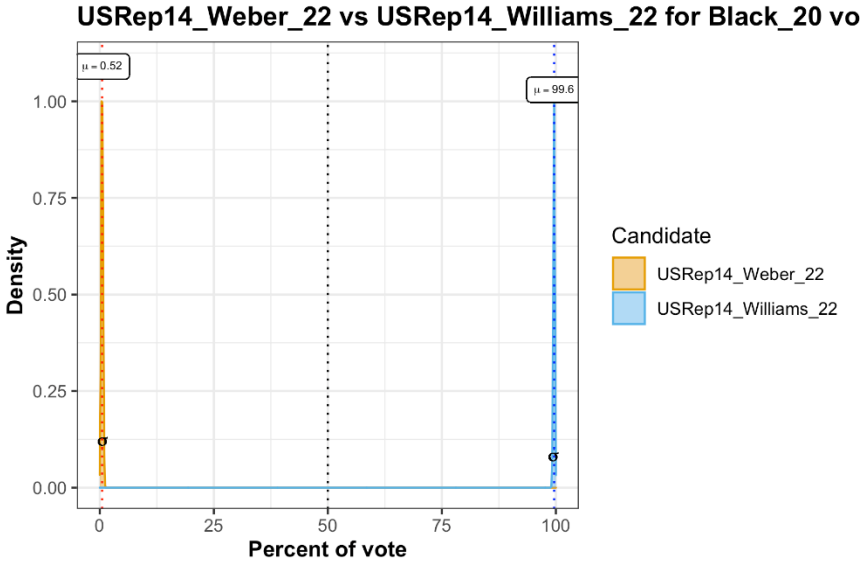




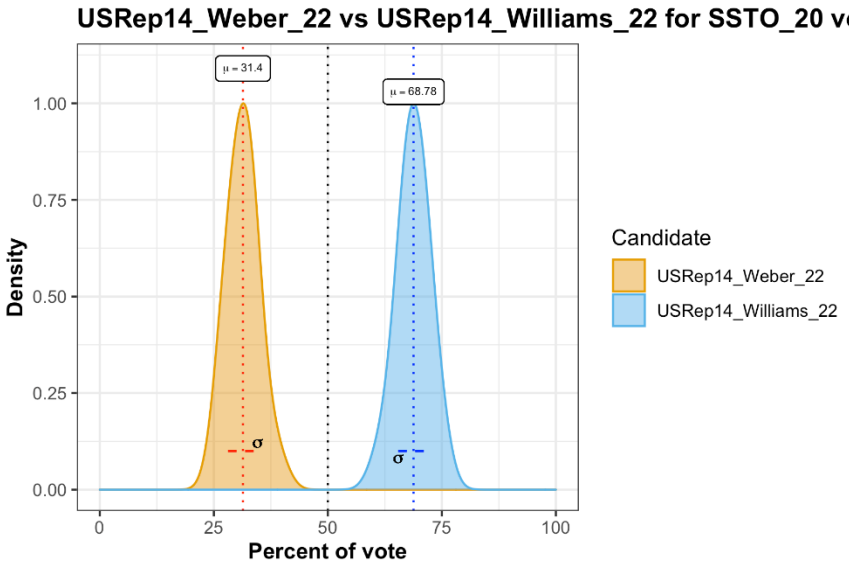
Anglo, Hispanic, and Black (CVAP)



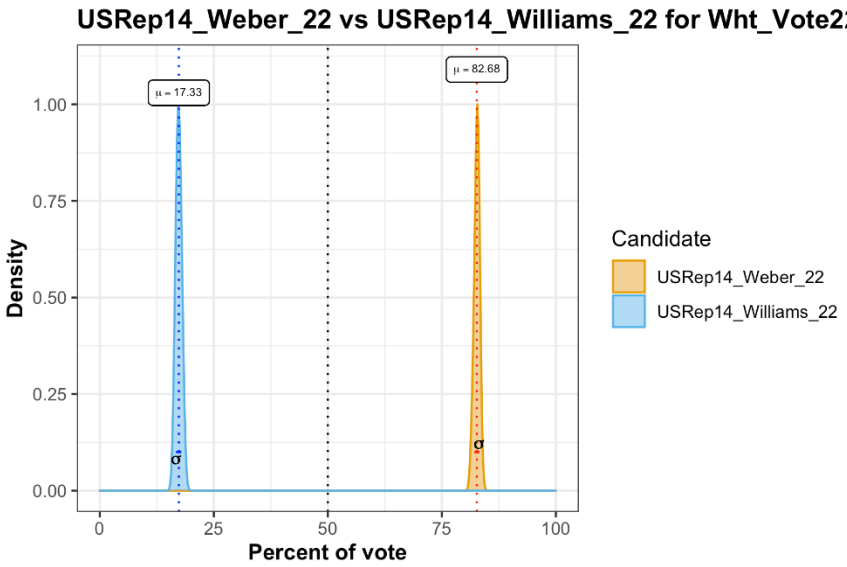


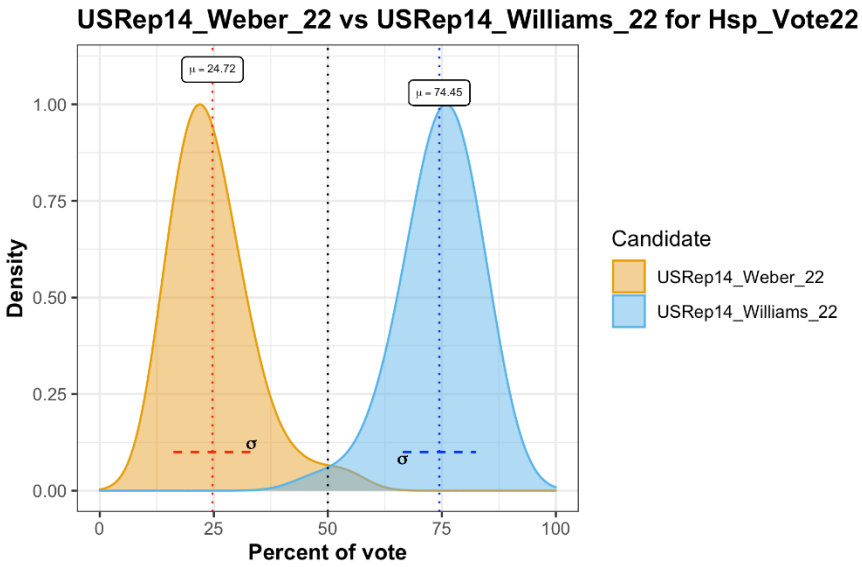


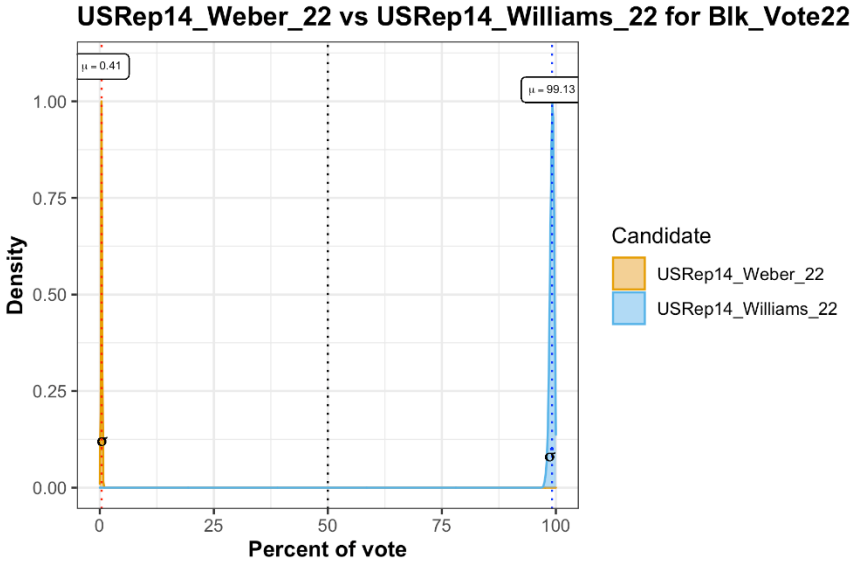
SSTO


USRep14_Weber_22 vs USRep14_Williams_22 for SSTO_20 vo
μ = 31.4
μ = 68.78
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
USRep14_Weber_22
USRep14_Williams_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

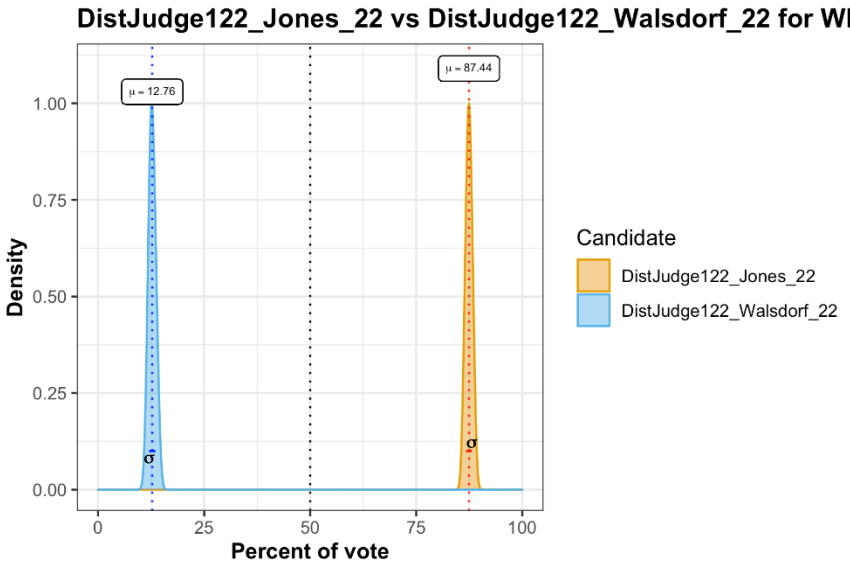


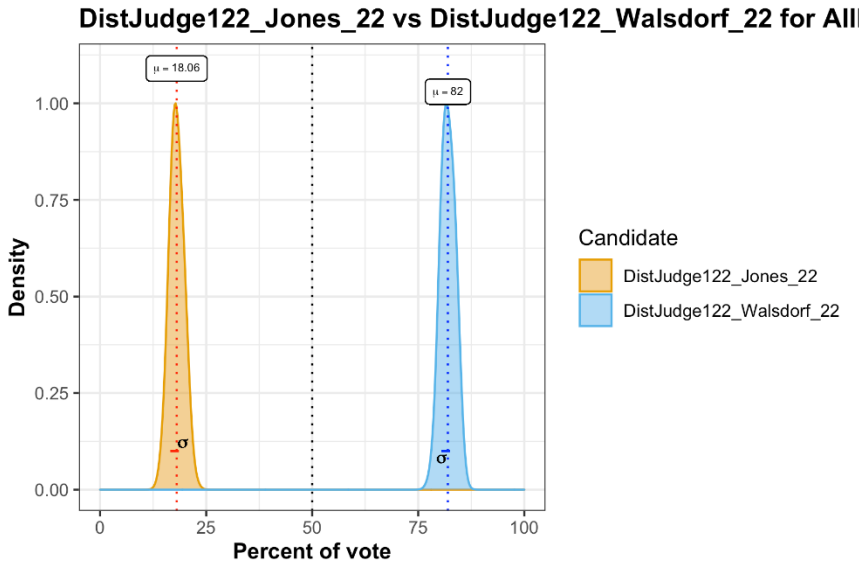




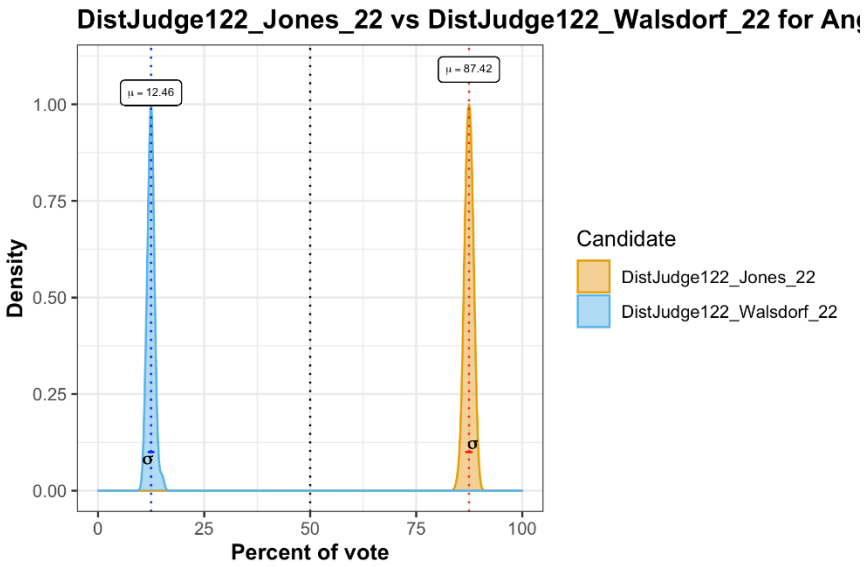
VI. 2022 District 122 Judge

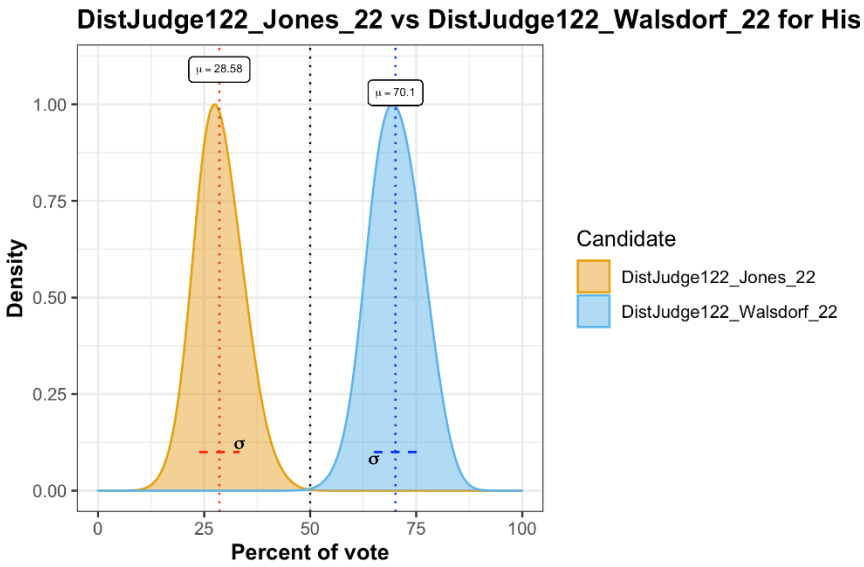
Anglo and Non-Anglo (CVAP)

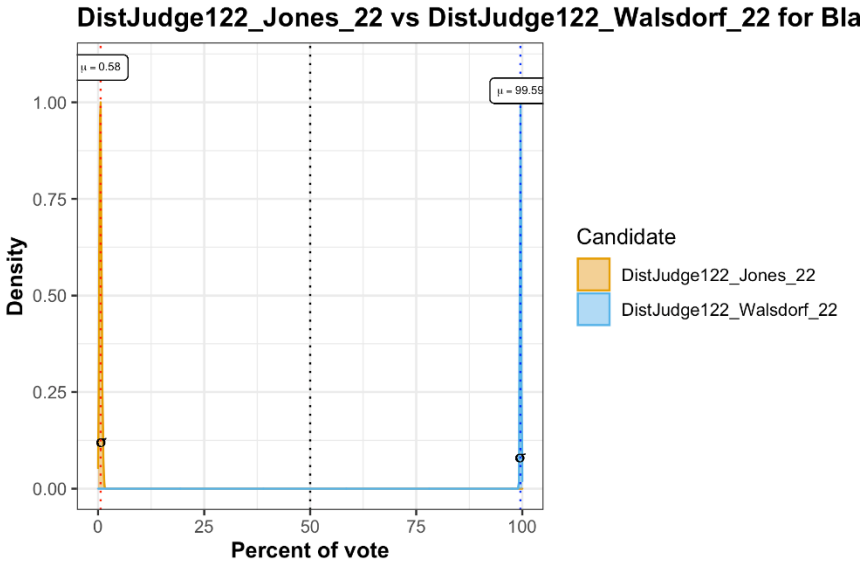




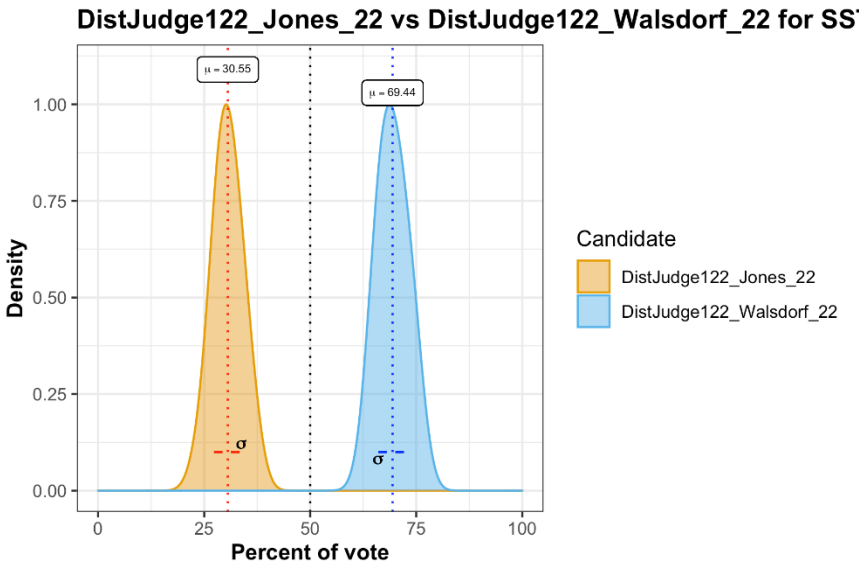
Anglo, Hispanic, and Black (CVAP)



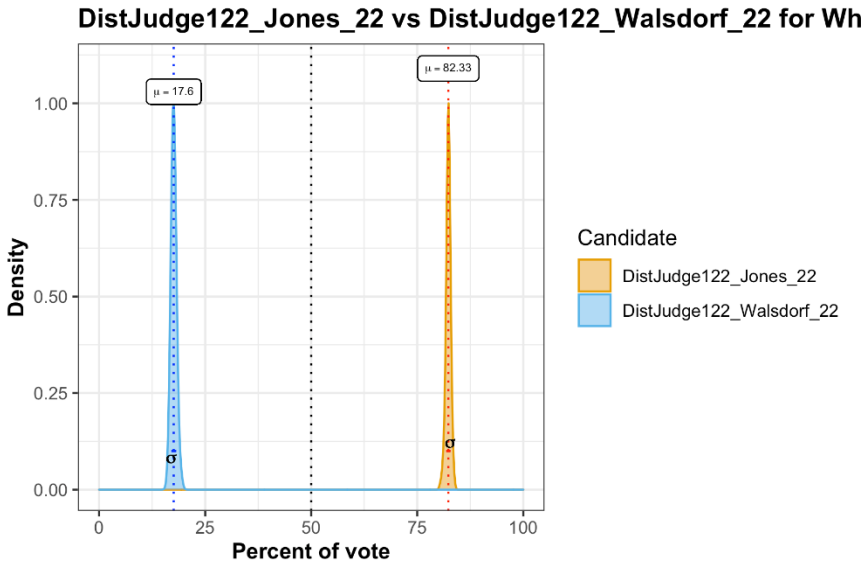


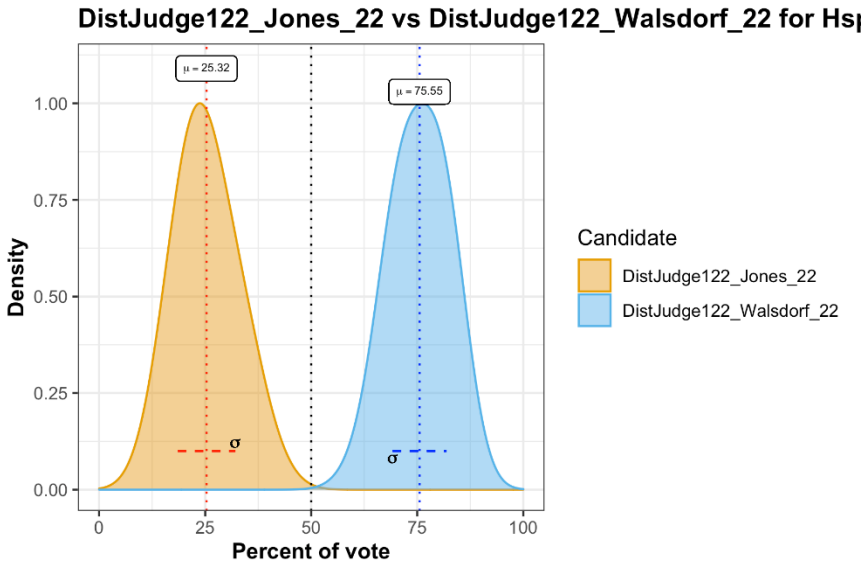


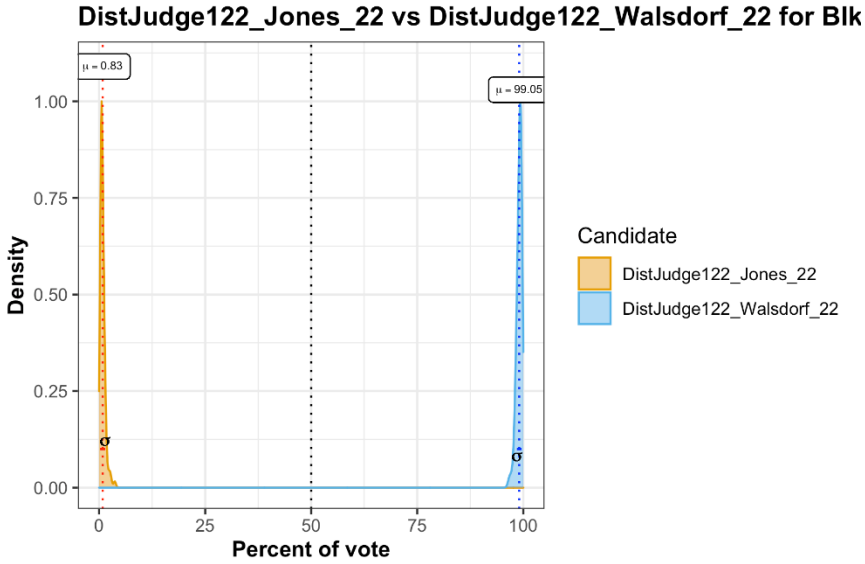
SSTO


DistJudge122_Jones_22 vs DistJudge122_Walsdorf_22 for SS
μ = 30.55
μ = 69.44
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
DistJudge122_Jones_22
DistJudge122_Walsdorf_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

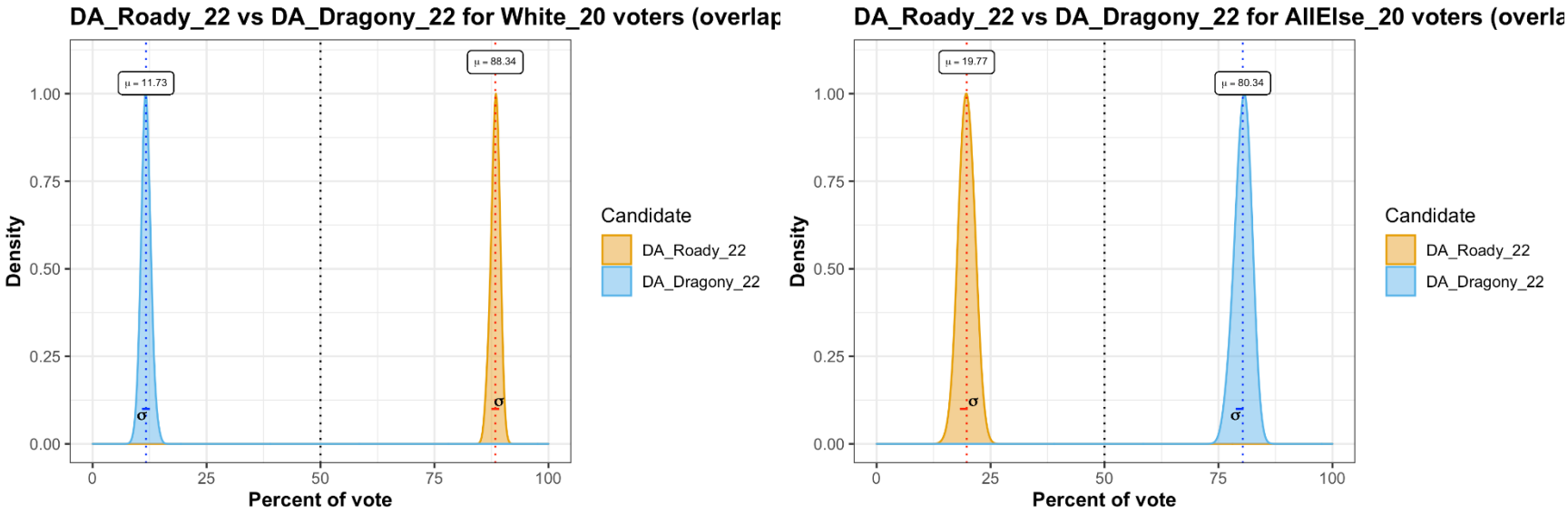




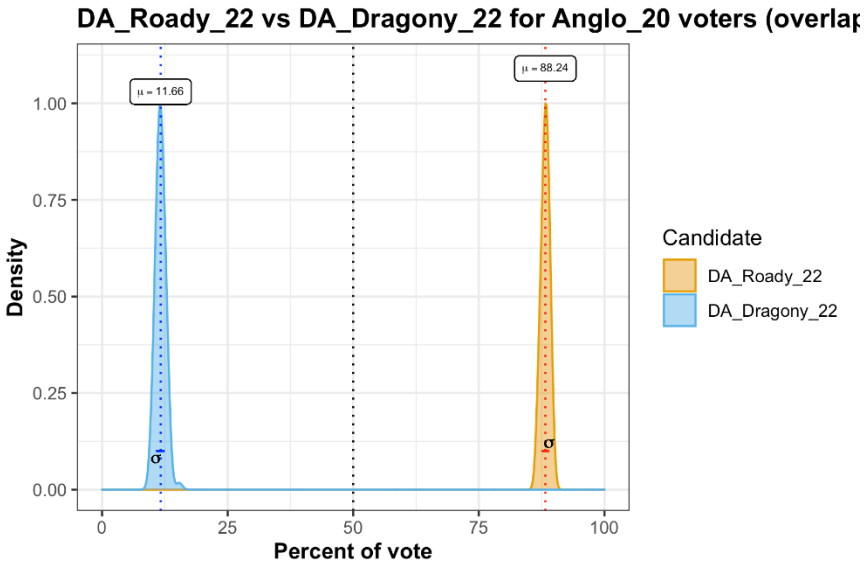


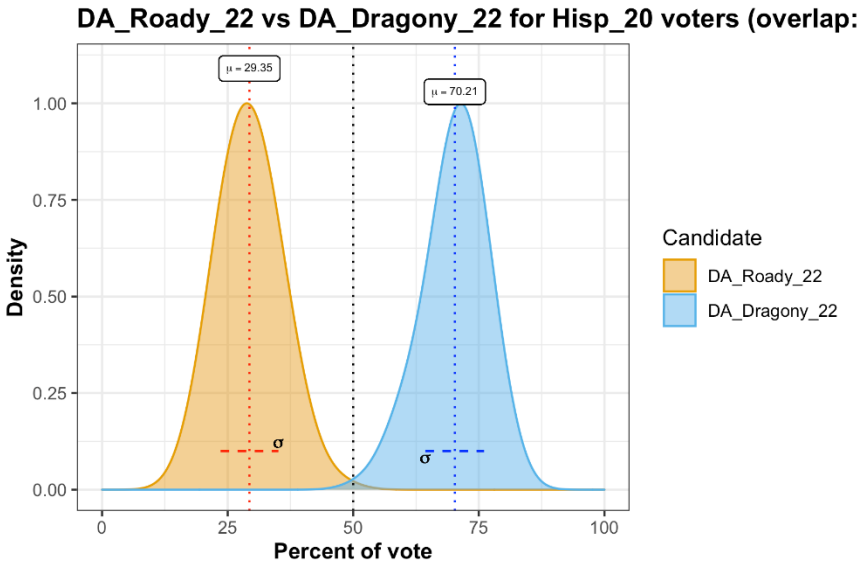
VII. 2022 District Attorney

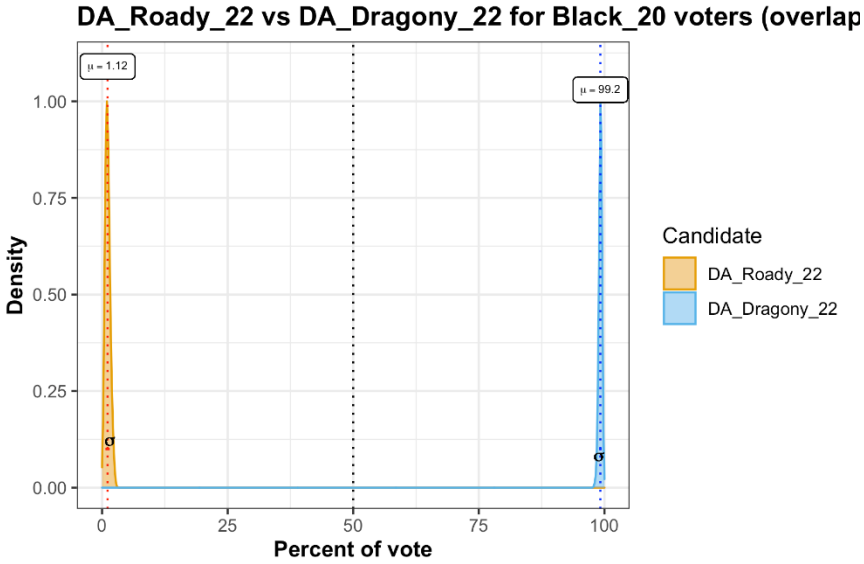
Anglo and Non-Anglo (CVAP)



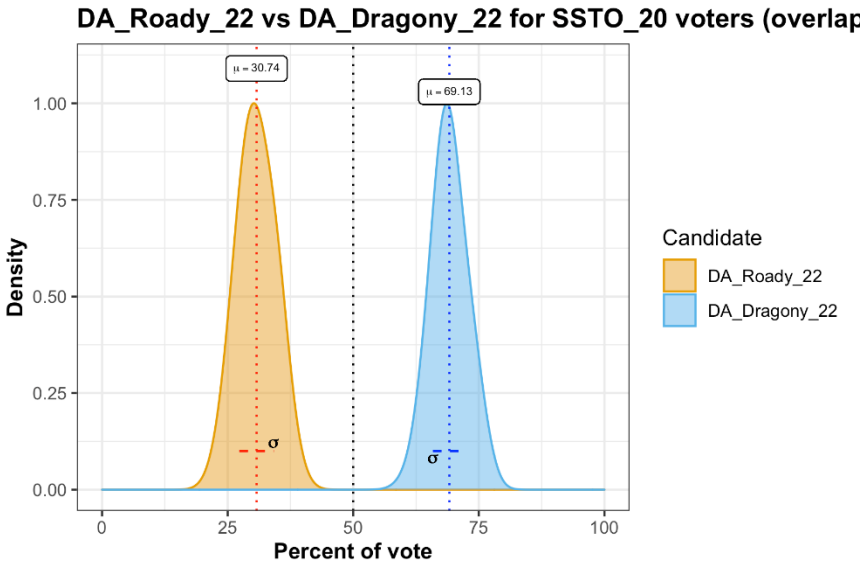
Anglo, Hispanic, and Black (CVAP)



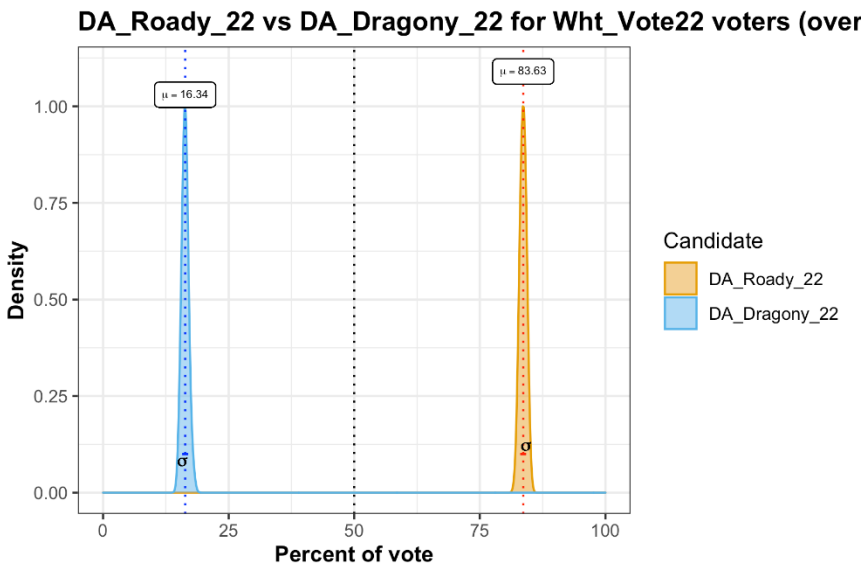


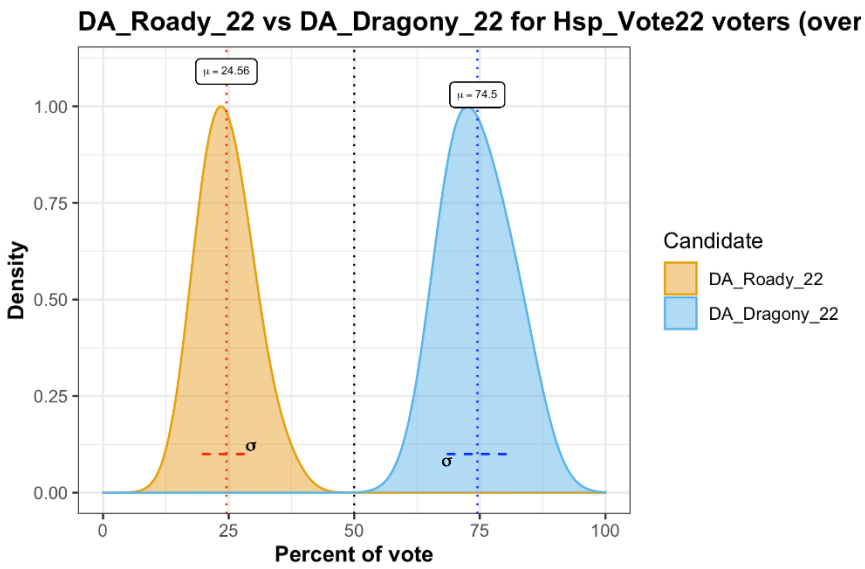


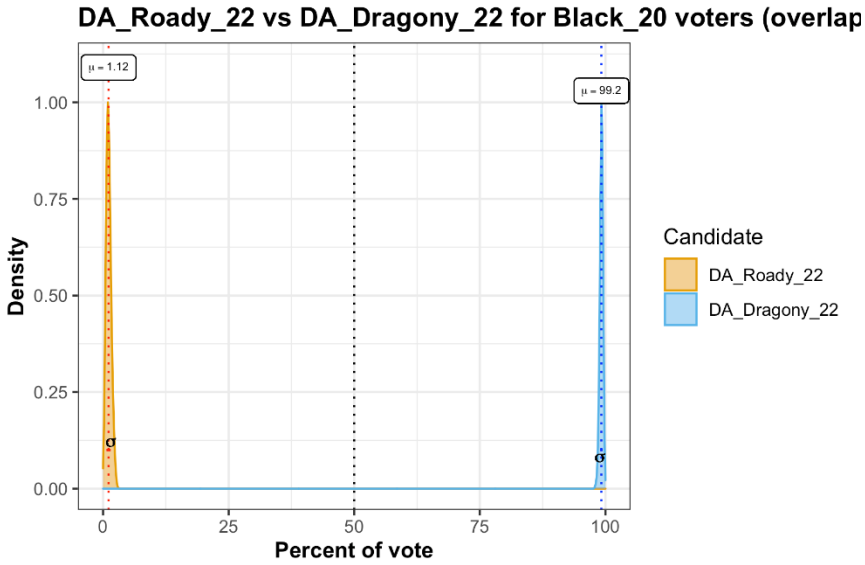
SSTO


DA_Roady_22 vs DA_Dragony_22 for SSTO_20 voters (overlap
μ = 30.74
μ = 69.13
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
DA_Roady_22
DA_Dragony_22

Anglo, Hispanic, and Black (Estimated Actual Vote)

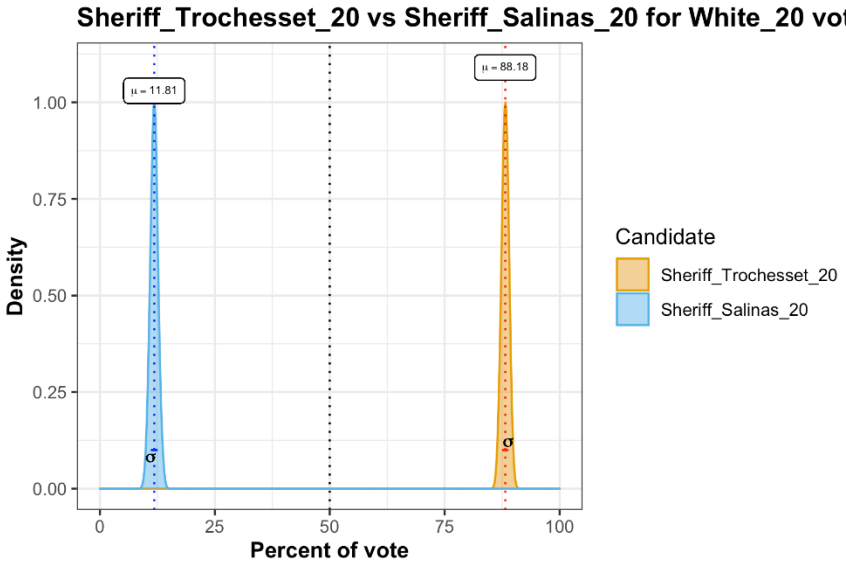


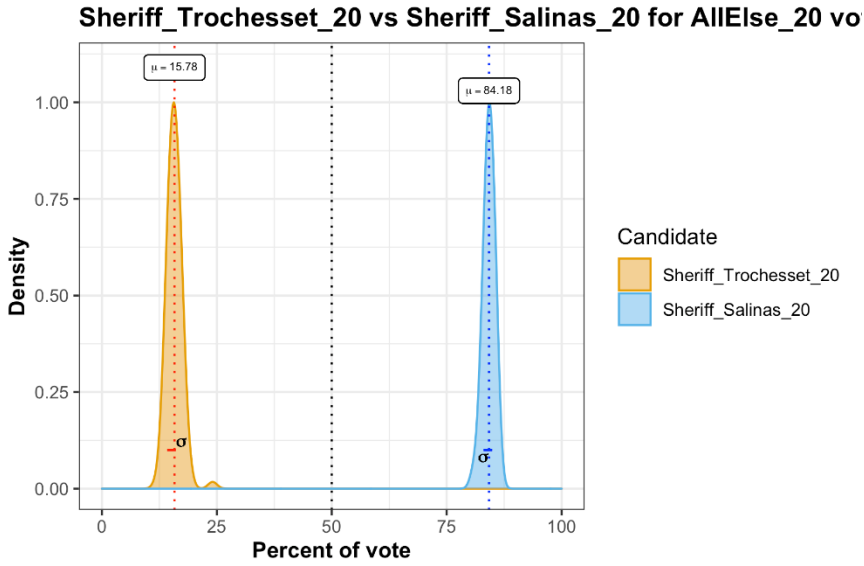




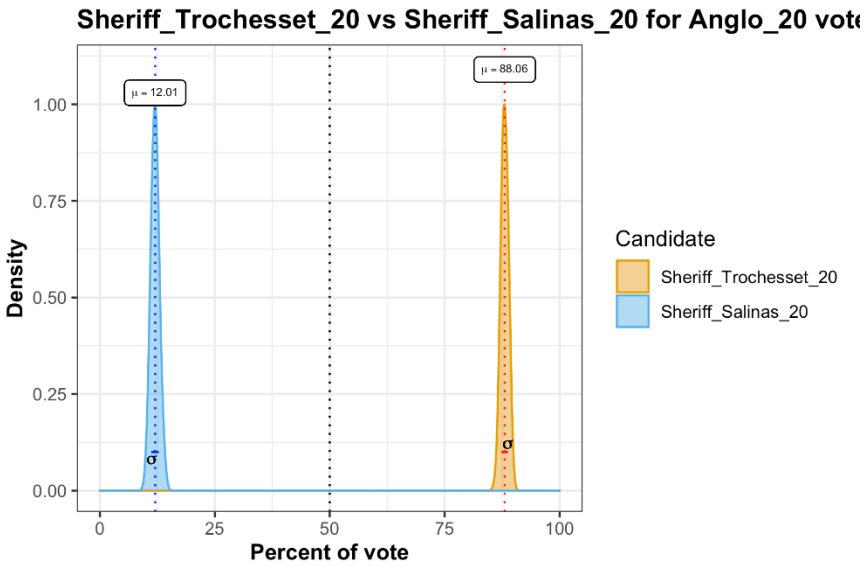
VIII. 2020 County Sheriff

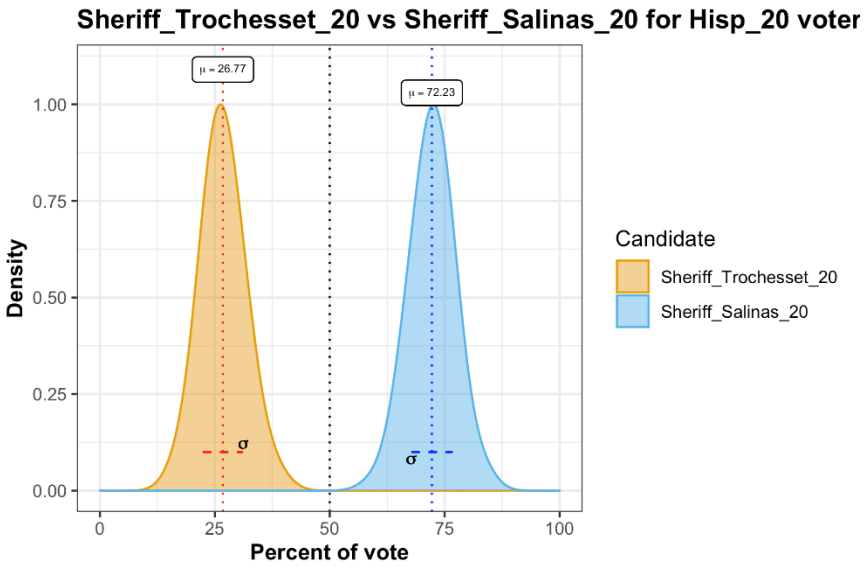
Anglo and Non-Anglo (CVAP)

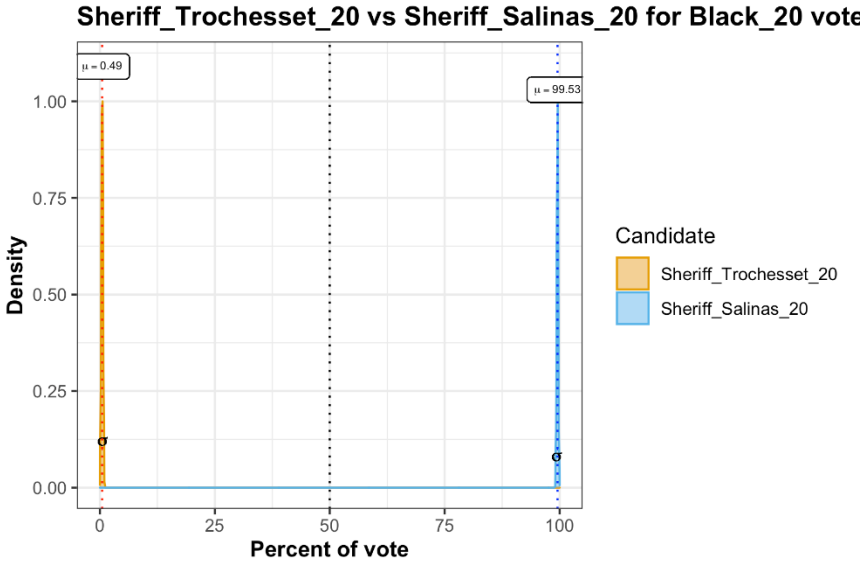




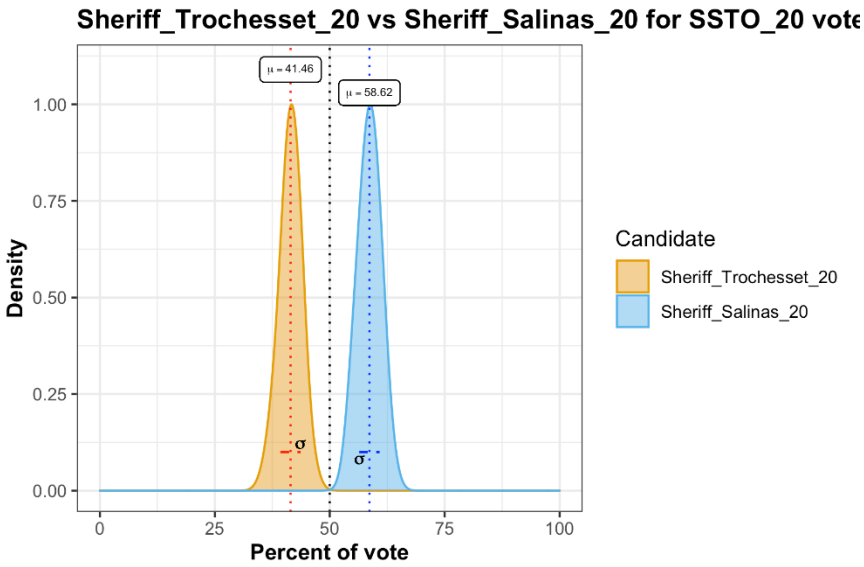
Anglo, Hispanic, and Black (CVAP)



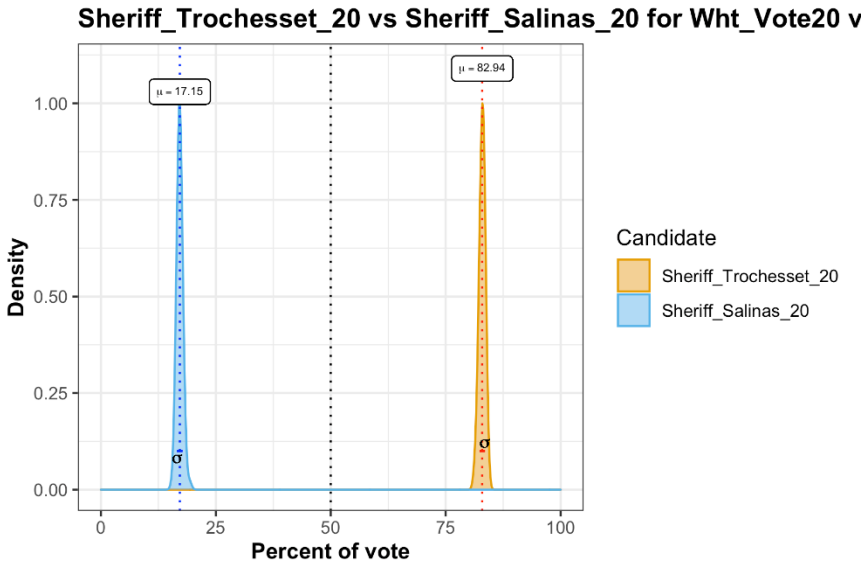


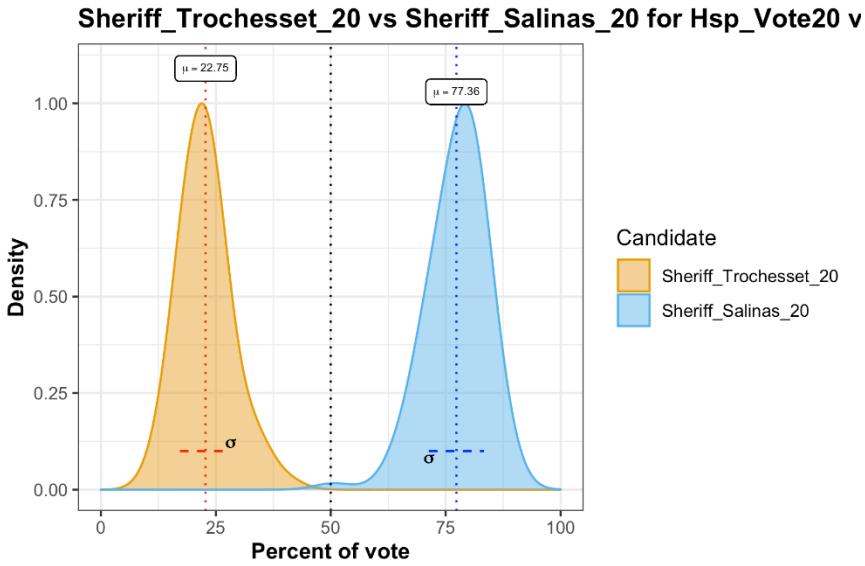


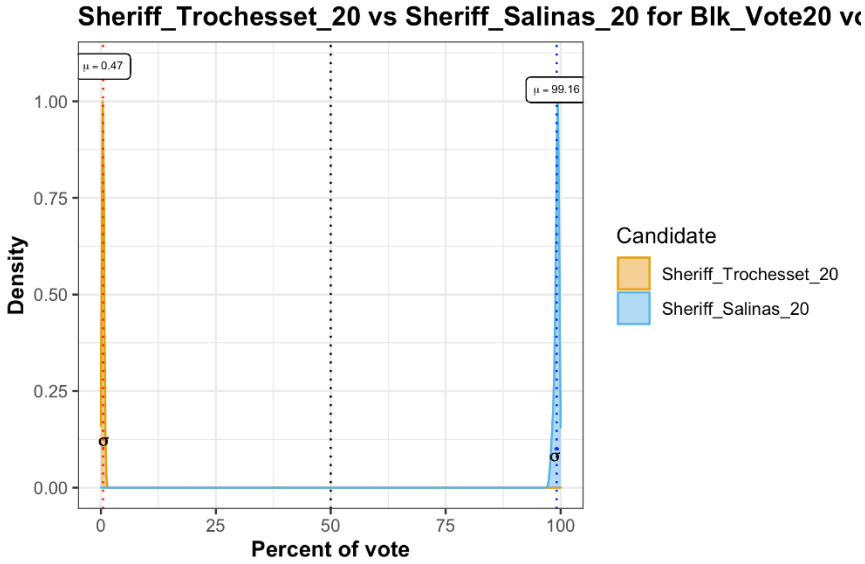
SSTO


Sheriff_Trochesset_20 vs Sheriff_Salinas_20 for SSTO_20 vote
μ = 41.46
μ = 58.62
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Sheriff_Trochesset_20
Sheriff_Salinas_20

Anglo, Hispanic, and Black (Estimated Actual Vote)

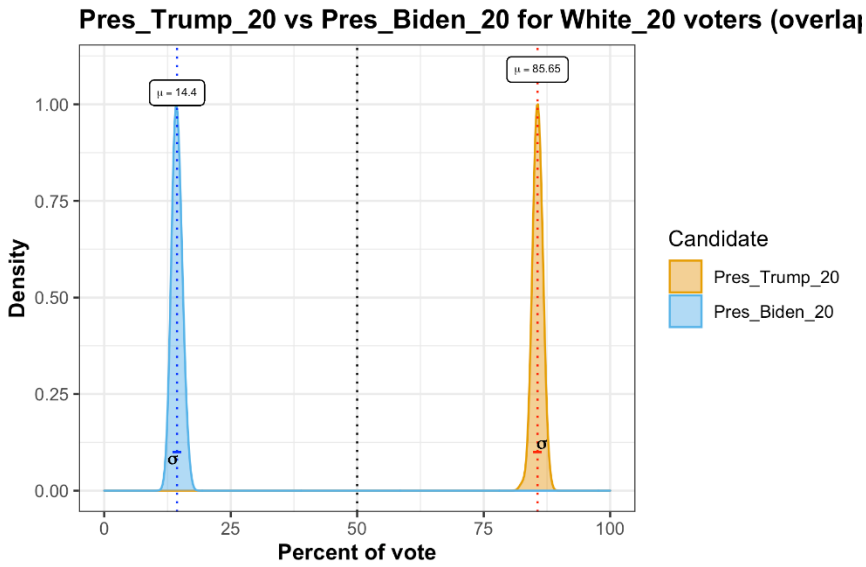


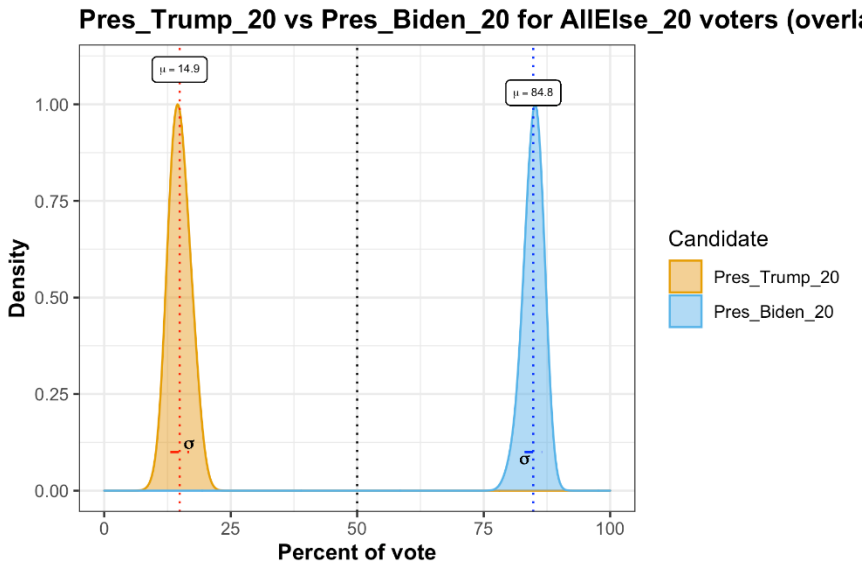




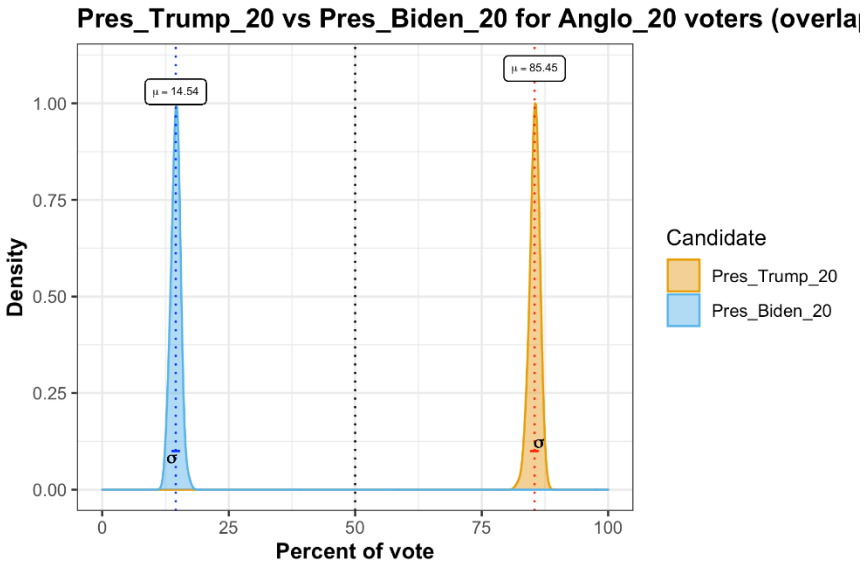
IX. 2020 President

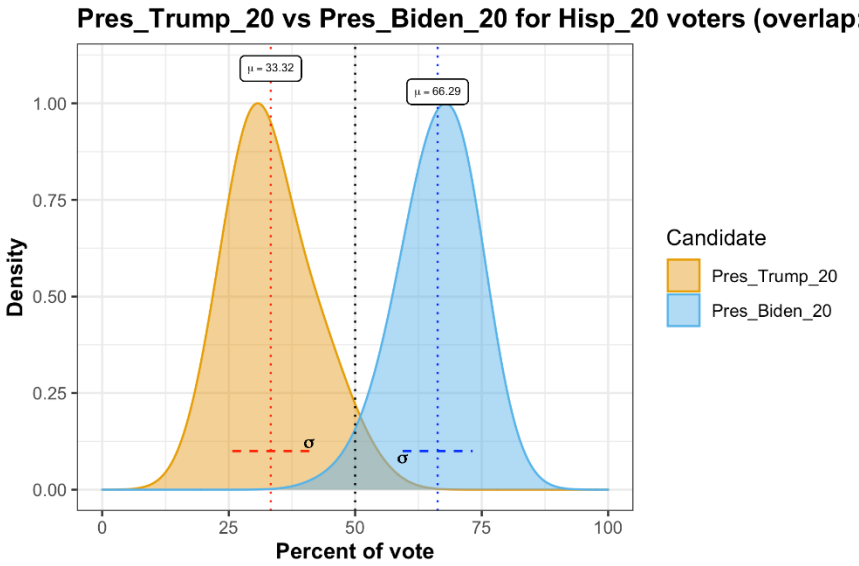
Anglo and Non-Anglo (CVAP)

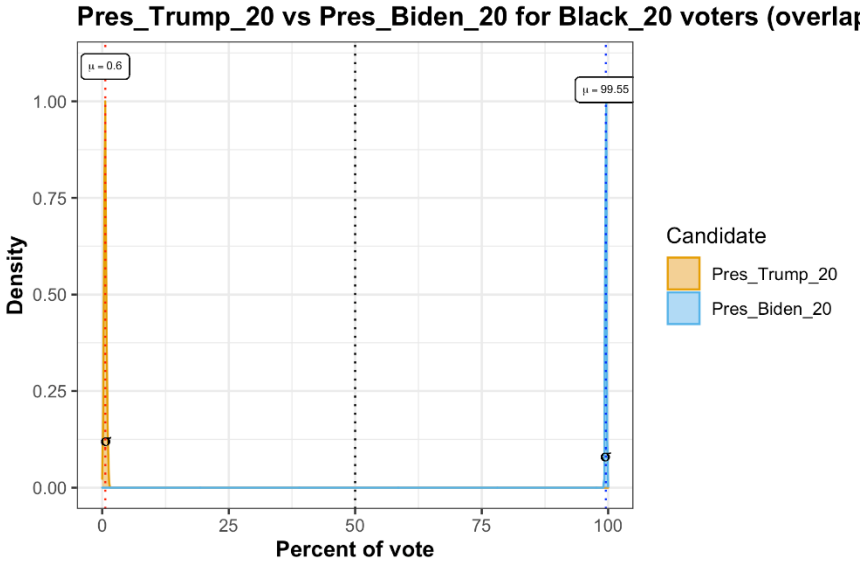




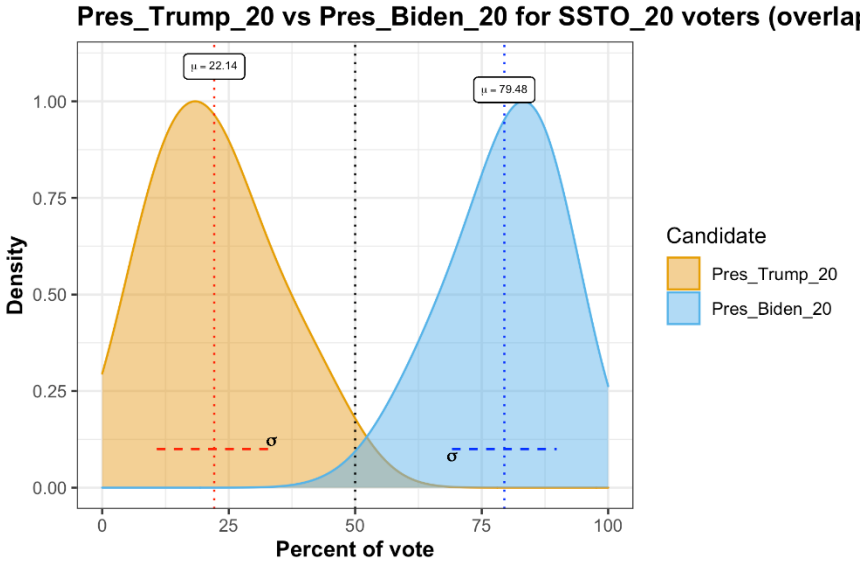
Anglo, Hispanic, and Black (CVAP)



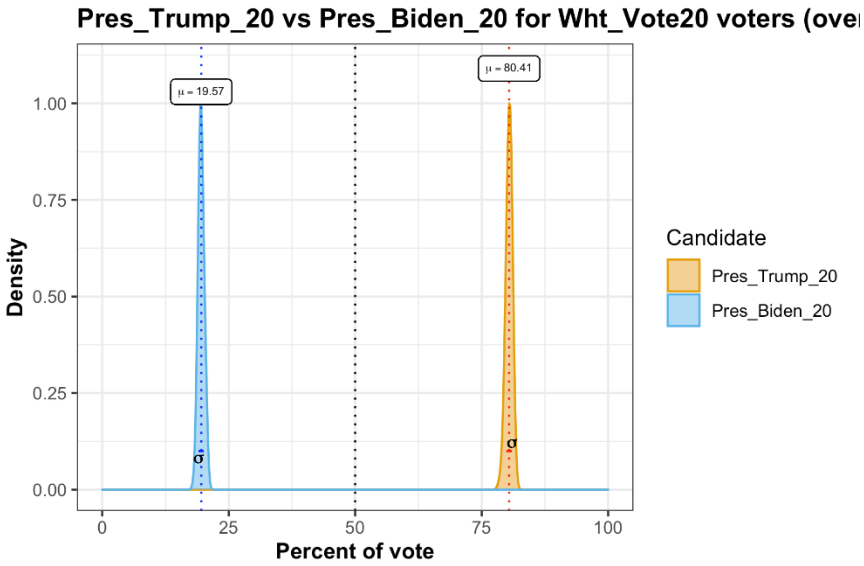


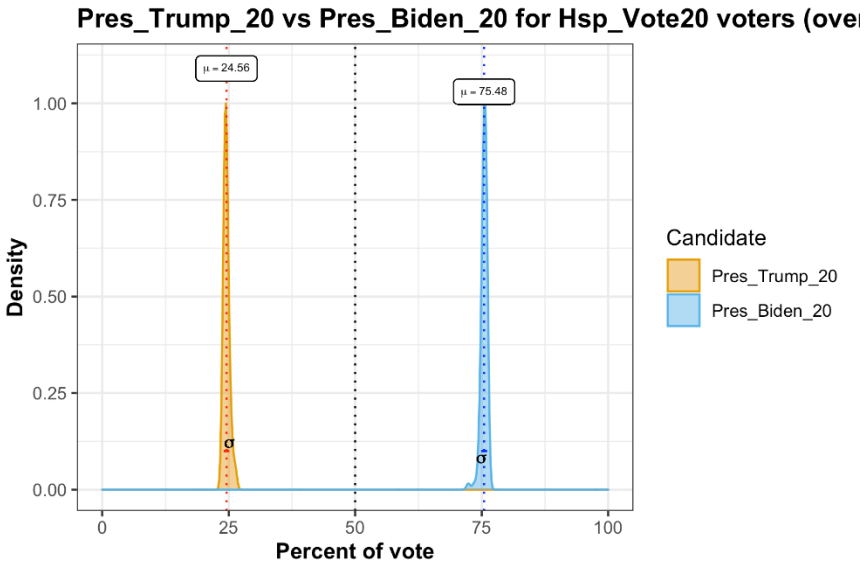


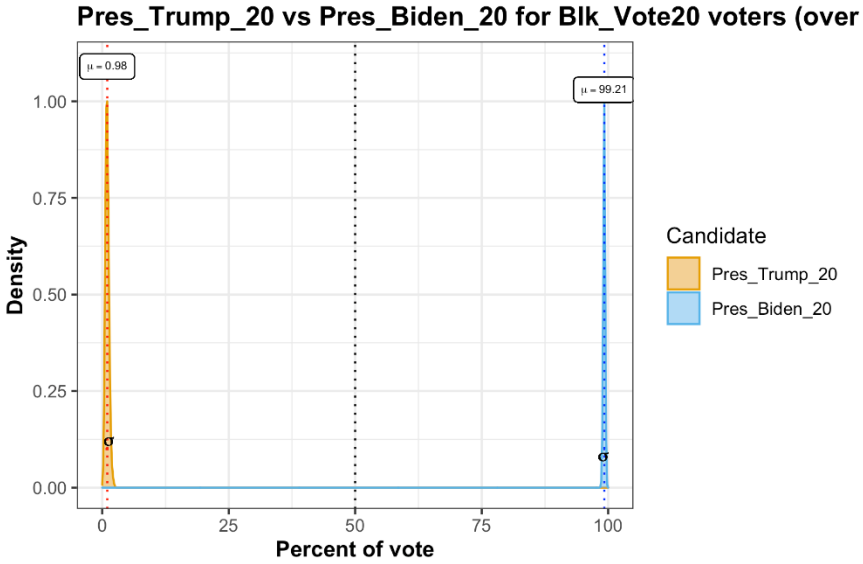
SSTO


Pres_Trump_20 vs Pres_Biden_20 for SSTO_20 voters (overla
μ = 22.14
μ = 79.48
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Pres_Trump_20
Pres_Biden_20

Anglo, Hispanic, and Black (Estimated Actual Vote)

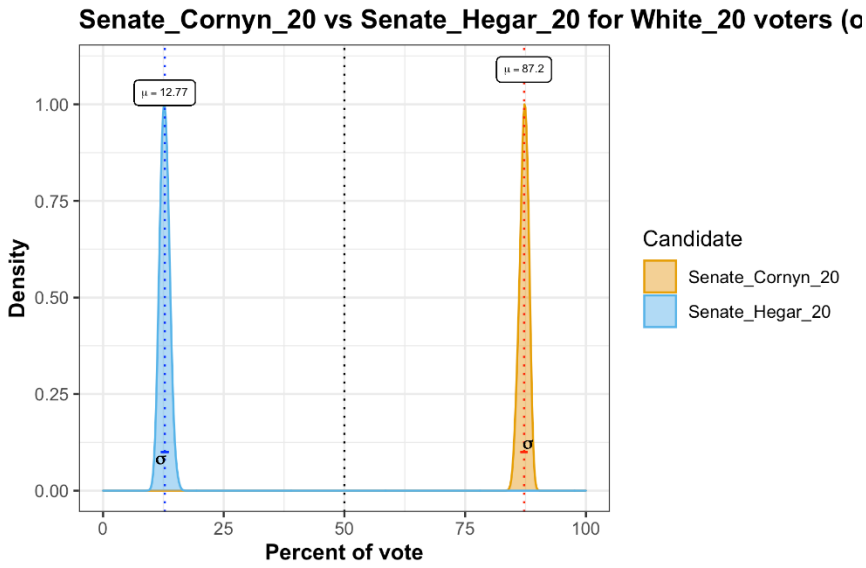


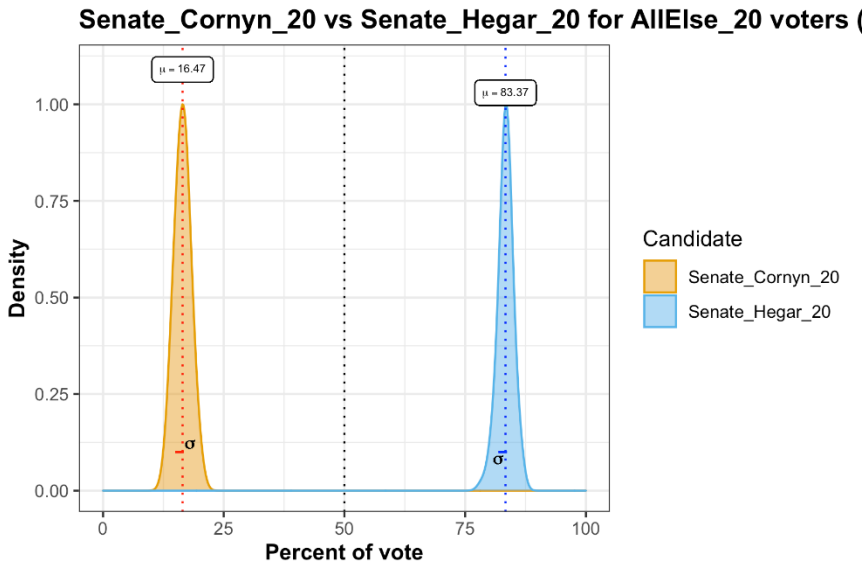




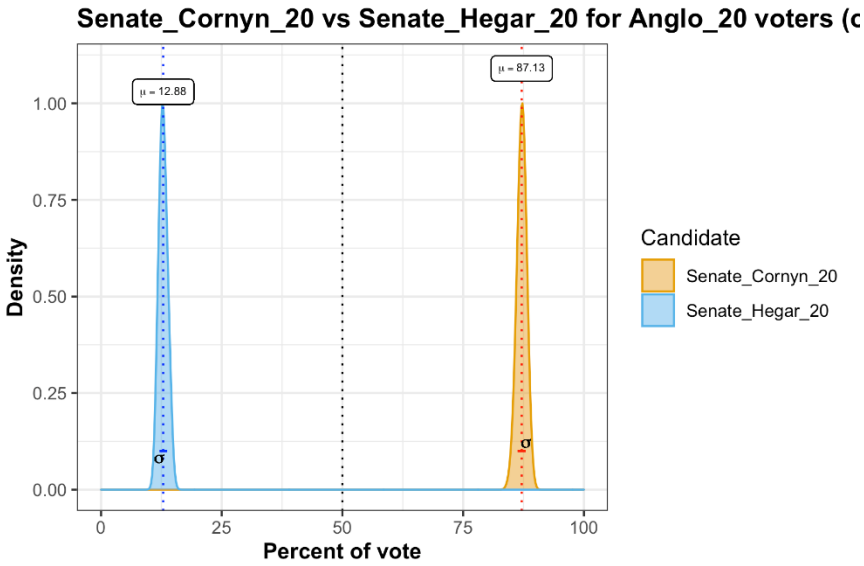
X. 2020 U.S. Senate

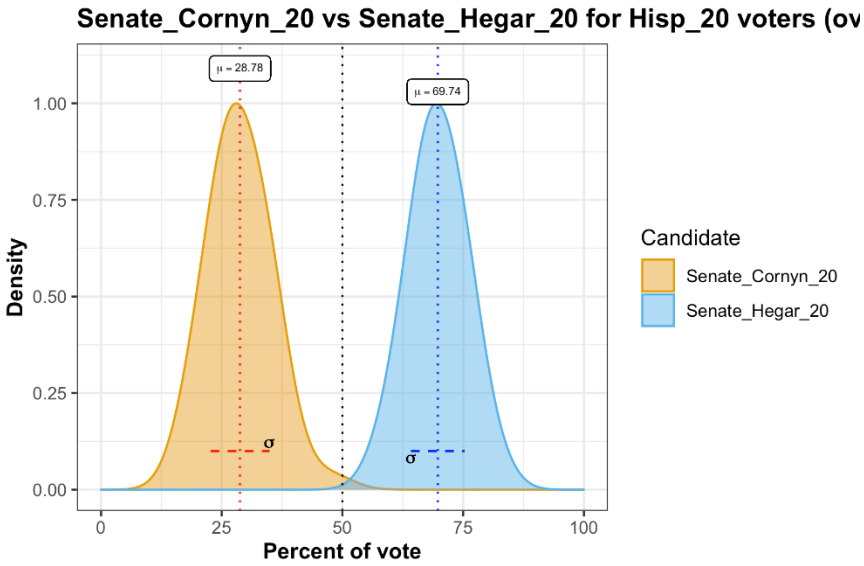
Anglo and Non-Anglo (CVAP)

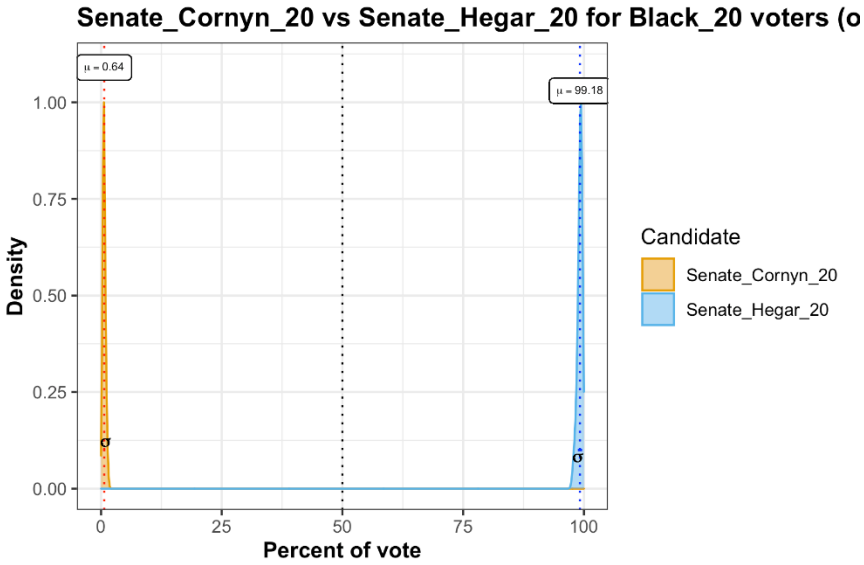




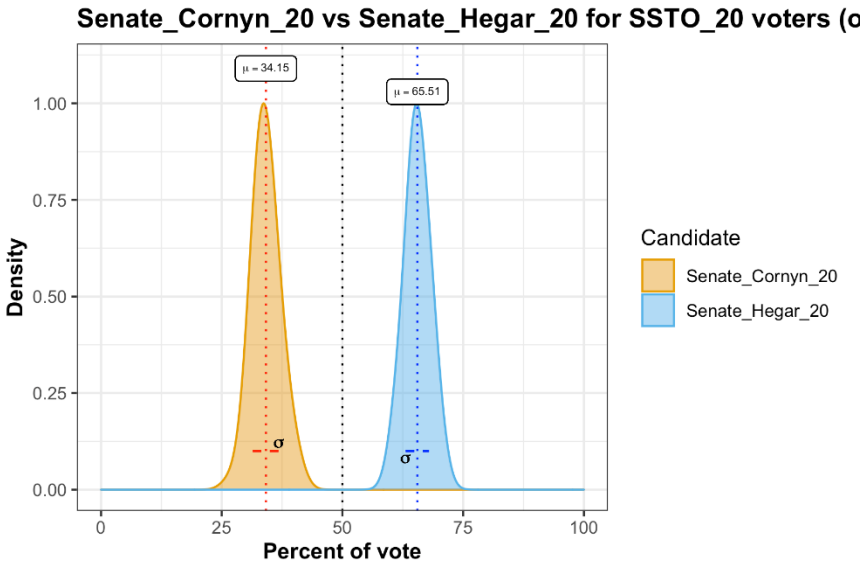
Anglo, Hispanic, and Black (CVAP)



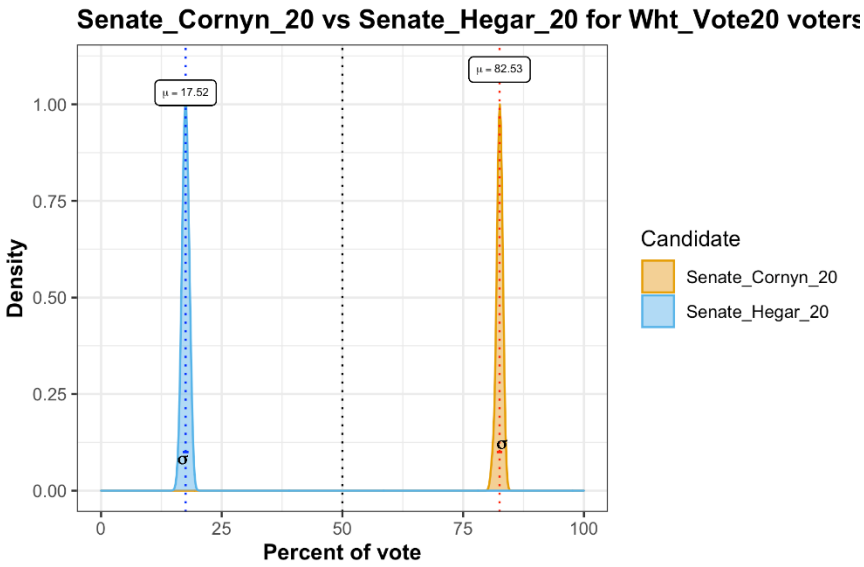


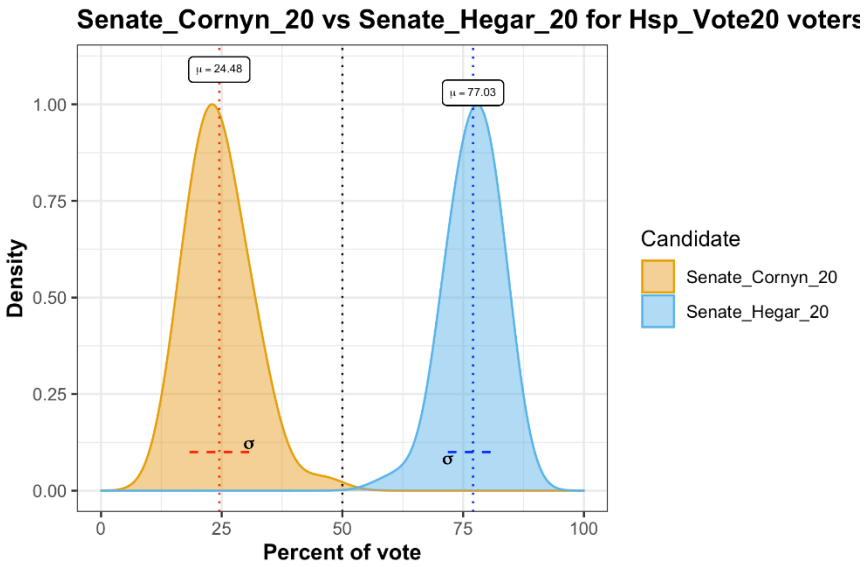


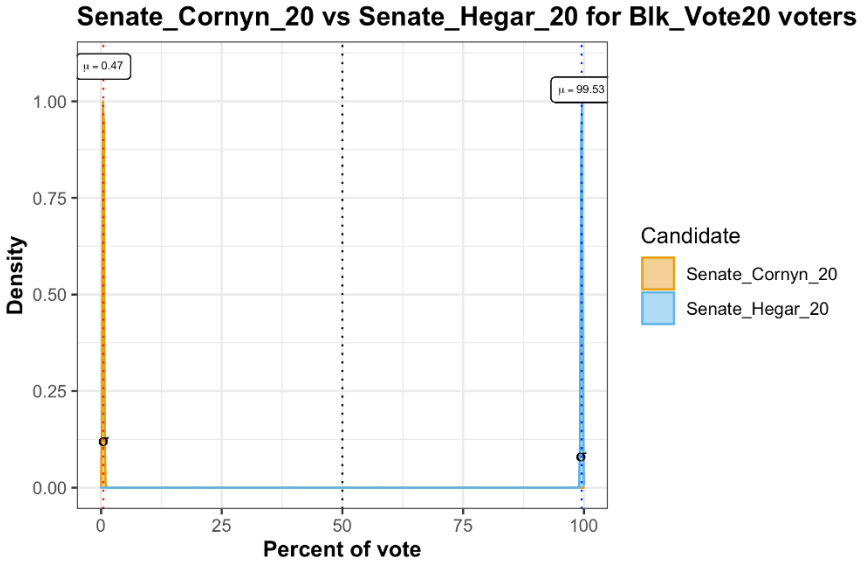
SSTO


Senate_Cornyn_20 vs Senate_Hegar_20 for SSTO_20 voters (o
μ = 34.15
μ = 65.51
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
Senate_Cornyn_20
Senate_Hegar_20

Anglo, Hispanic, and Black (Estimated Actual Vote)

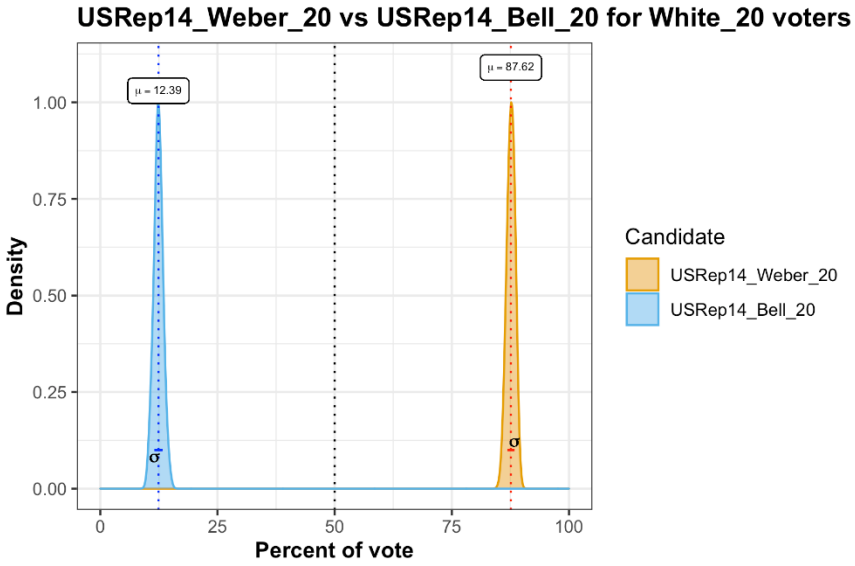


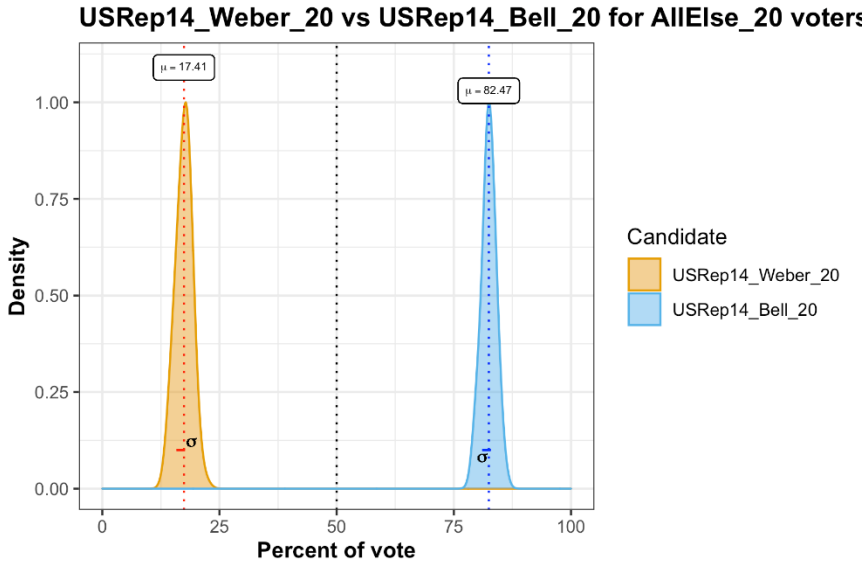




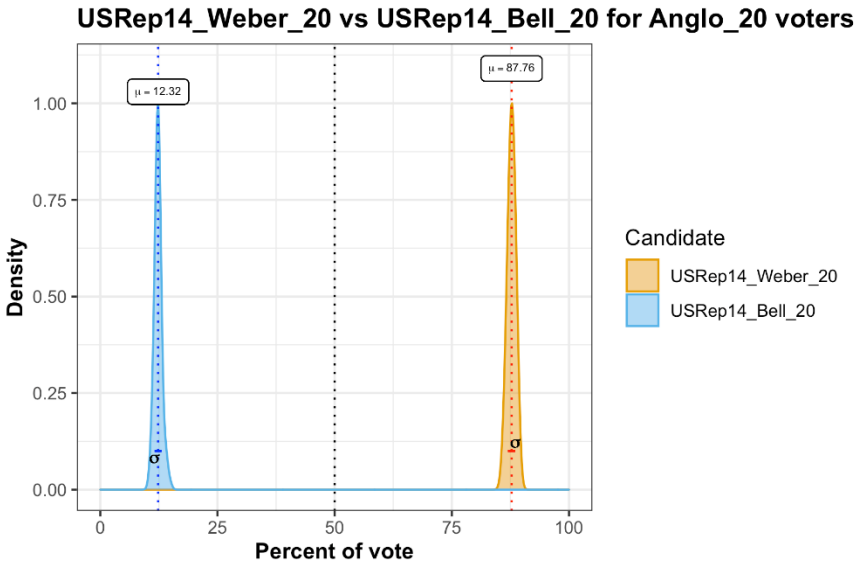
XI. 2020 U.S. House of Reps, District #14

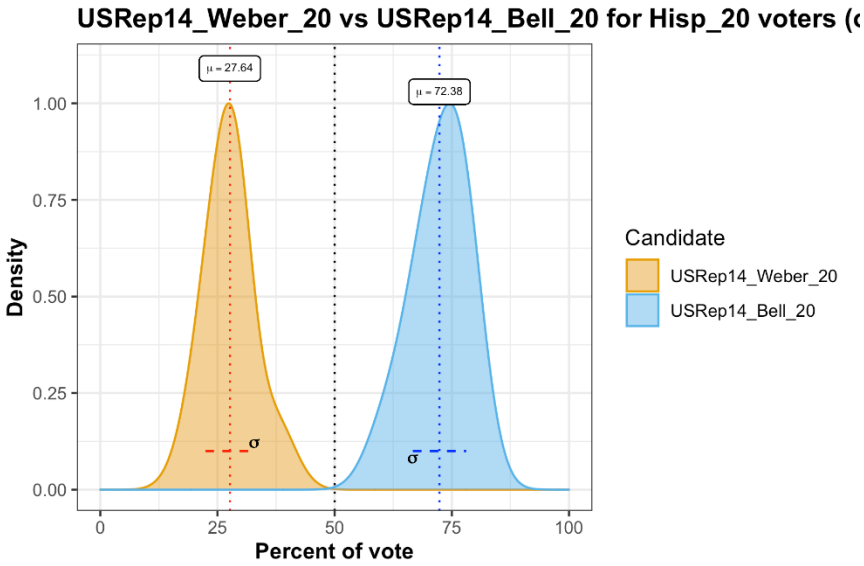
Anglo and Non-Anglo (CVAP)

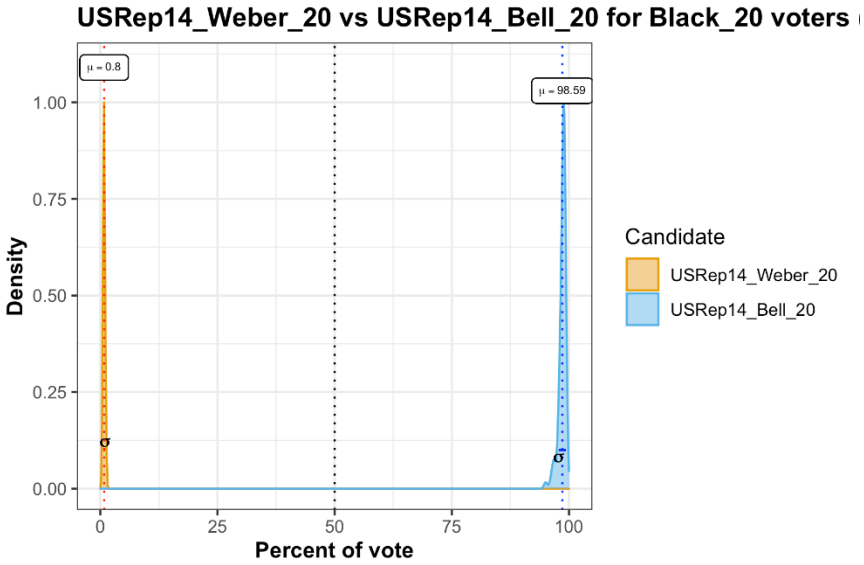




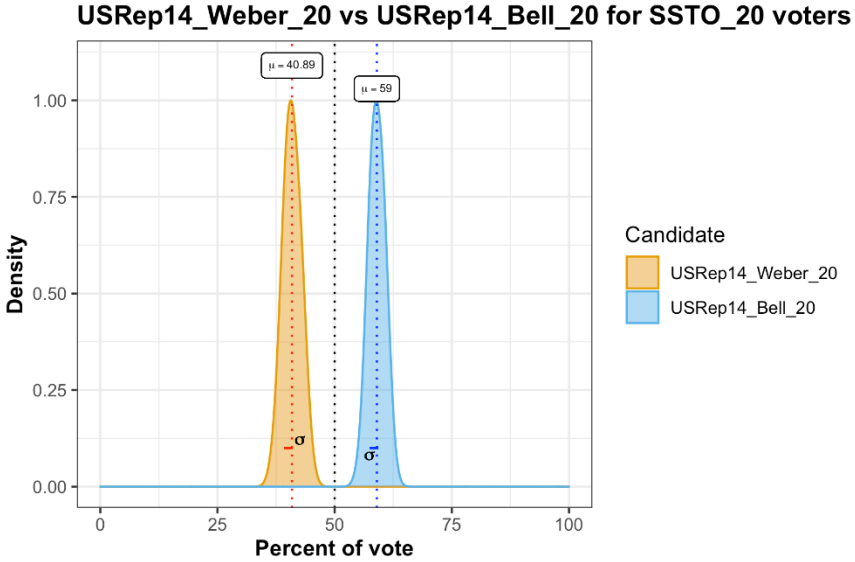
Anglo, Hispanic, and Black (CVAP)



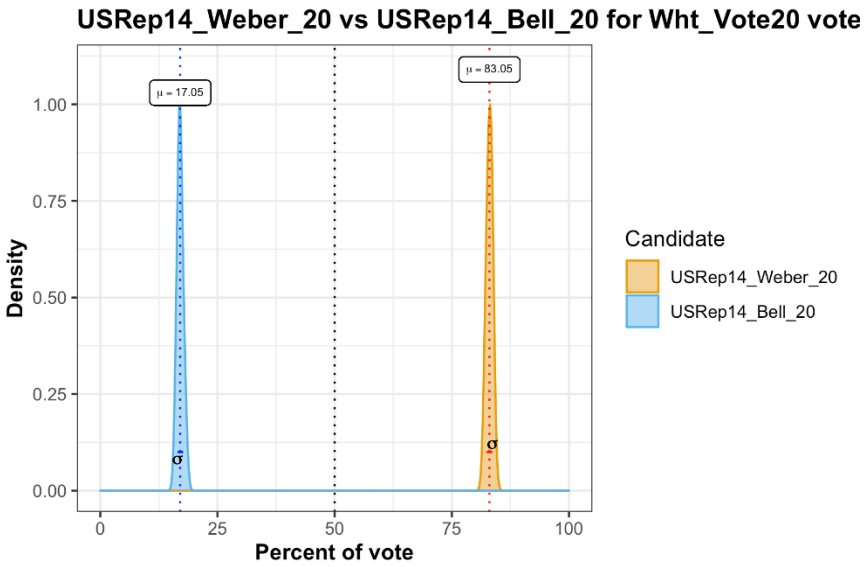


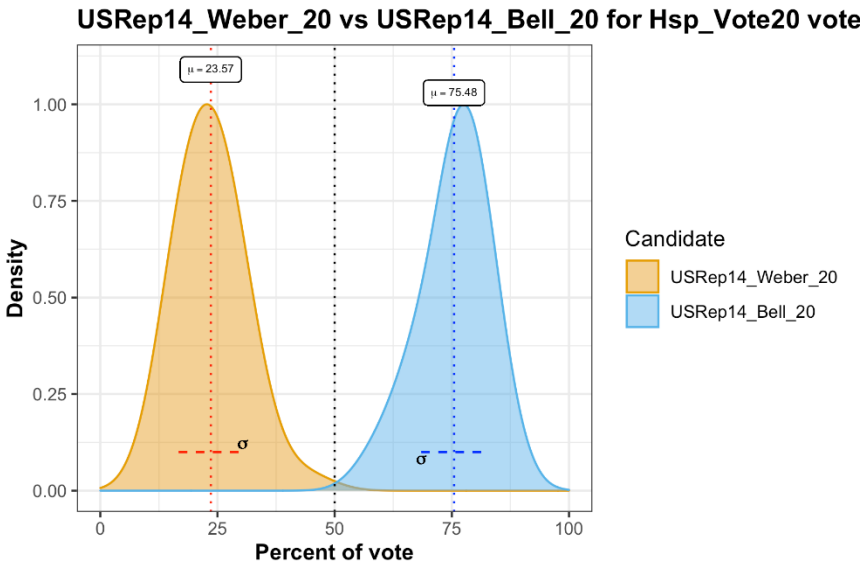


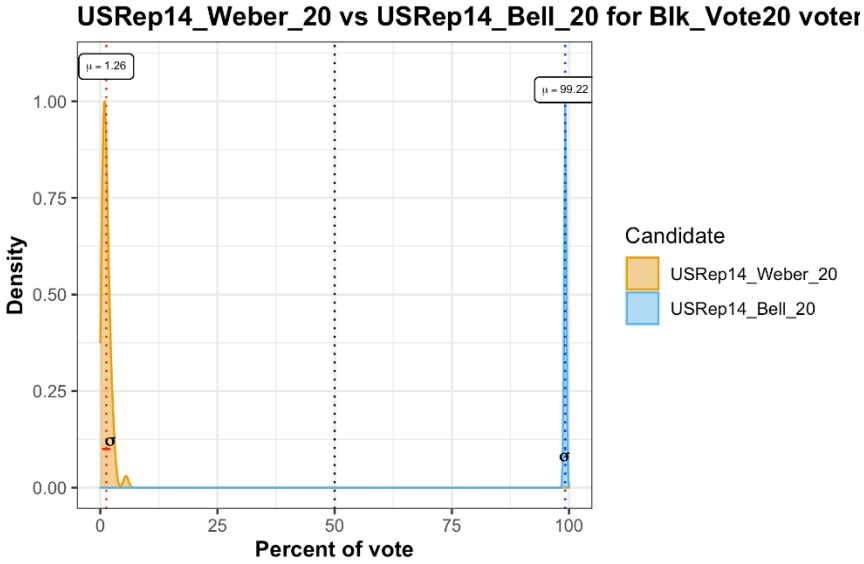
SSTO


USRep14_Weber_20 vs USRep14_Bell_20 for SSTO_20 voters
μ = 40.89
μ = 59
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
USRep14_Weber_20
USRep14_Bell_20

Anglo, Hispanic, and Black (Estimated Actual Vote)

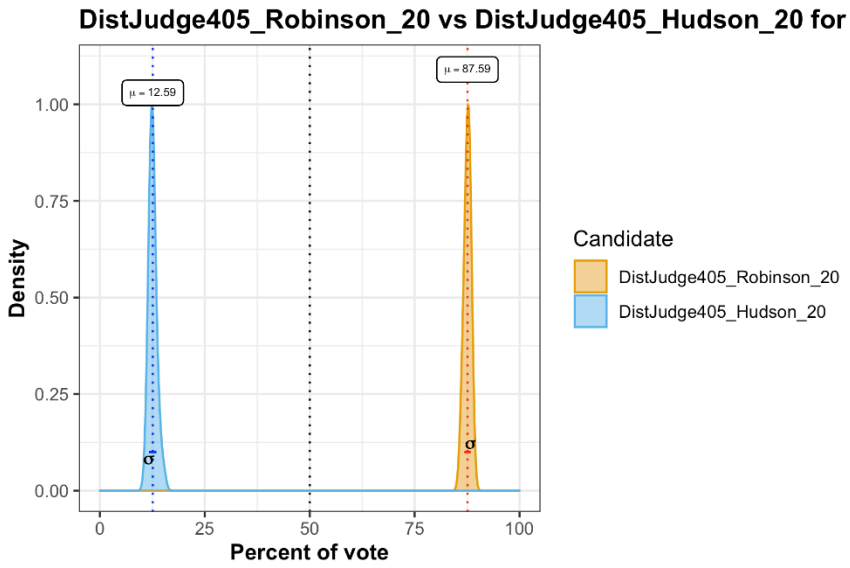


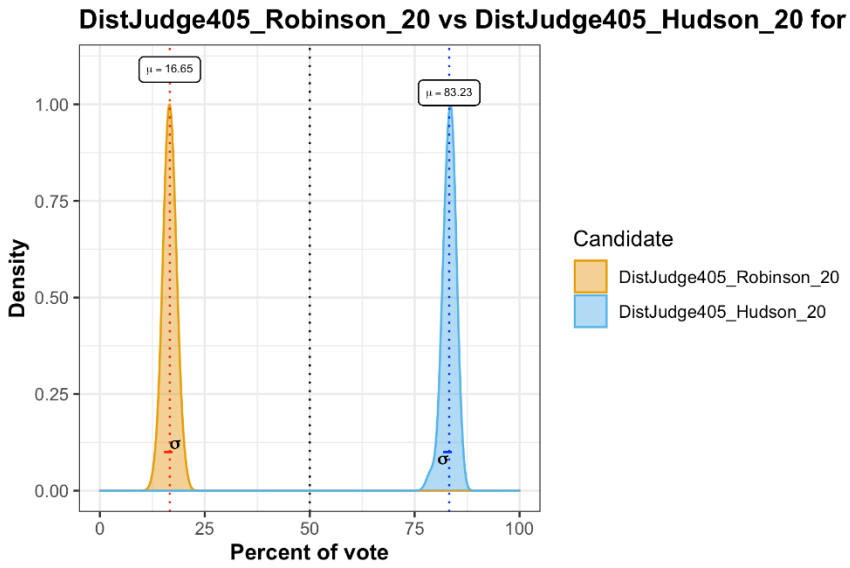




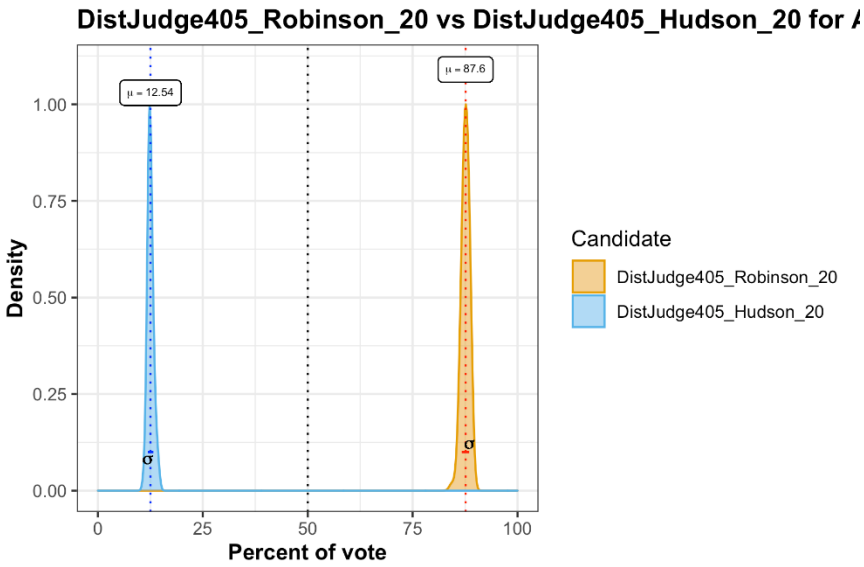
XII. 2020 District 405 Judge

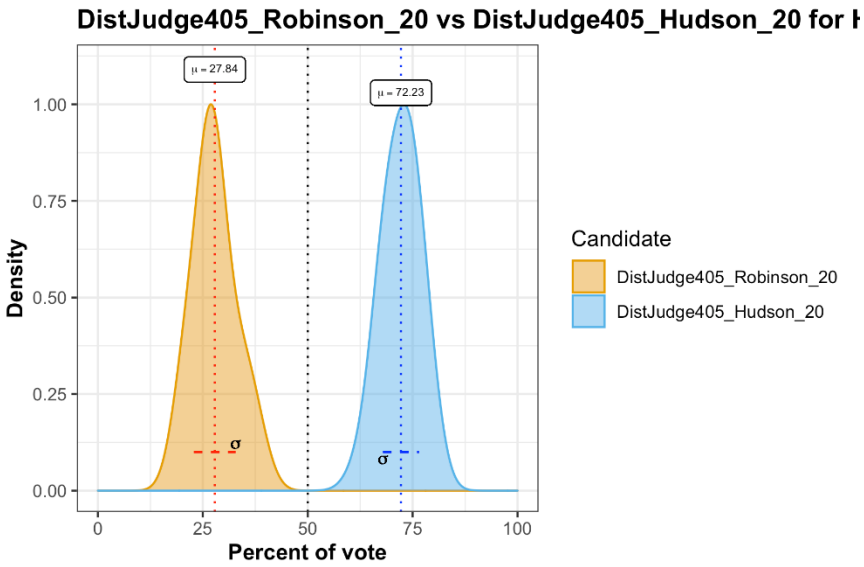
Anglo and Non-Anglo (CVAP)

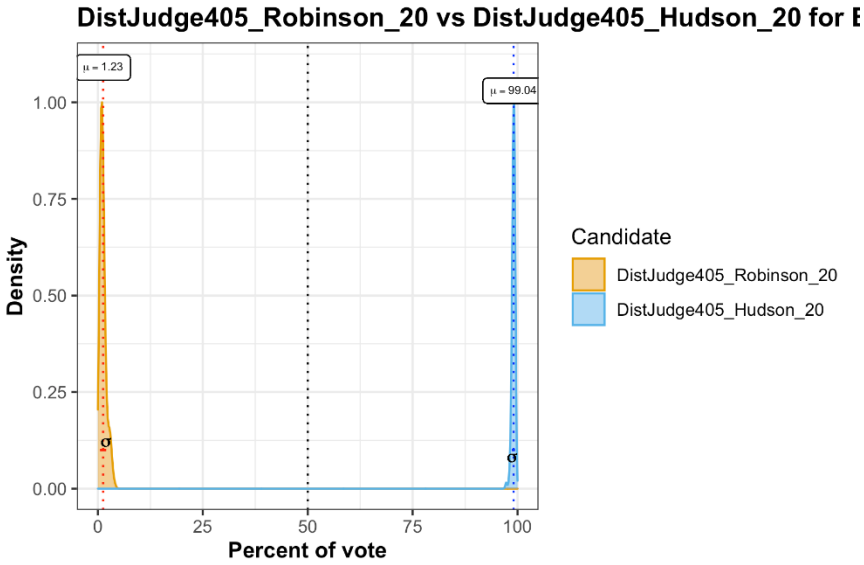




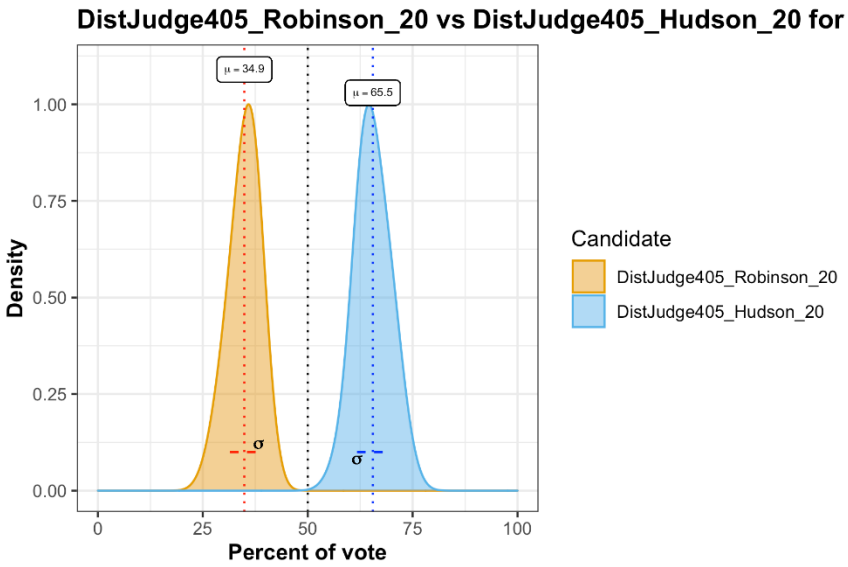
Anglo, Hispanic, and Black (CVAP)



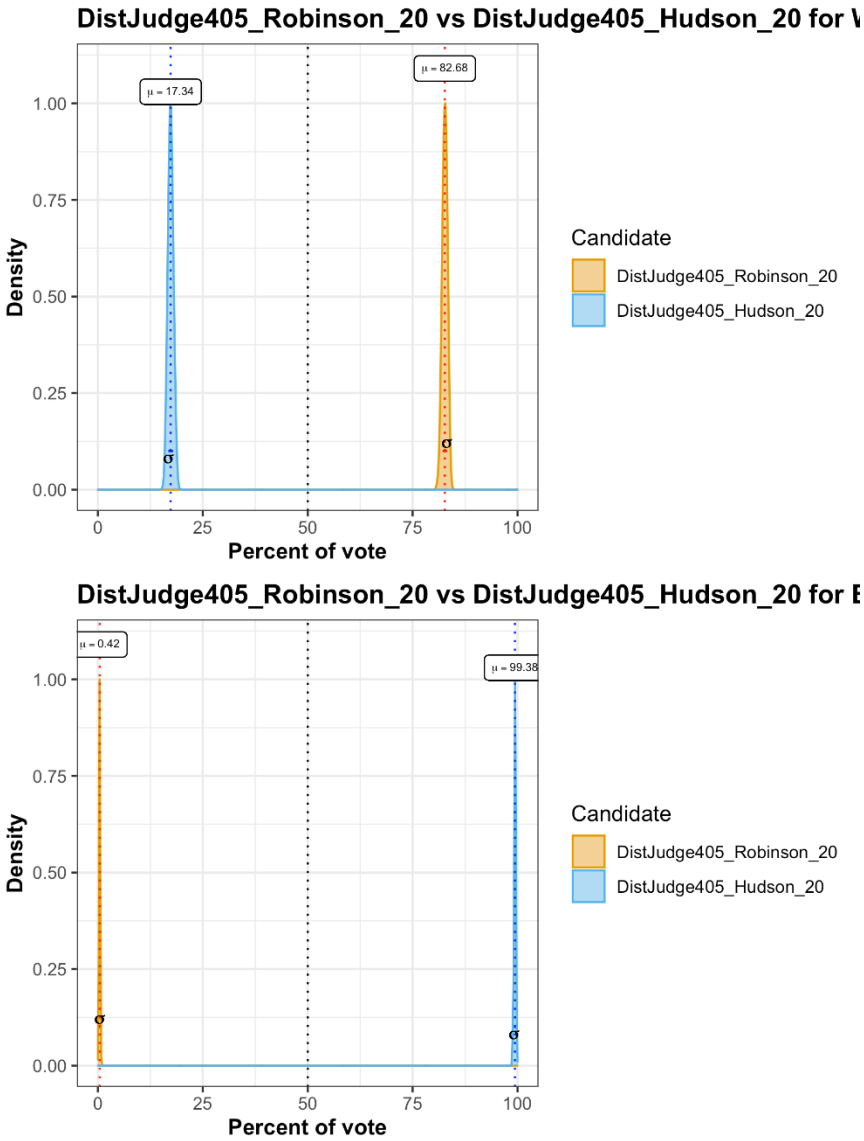


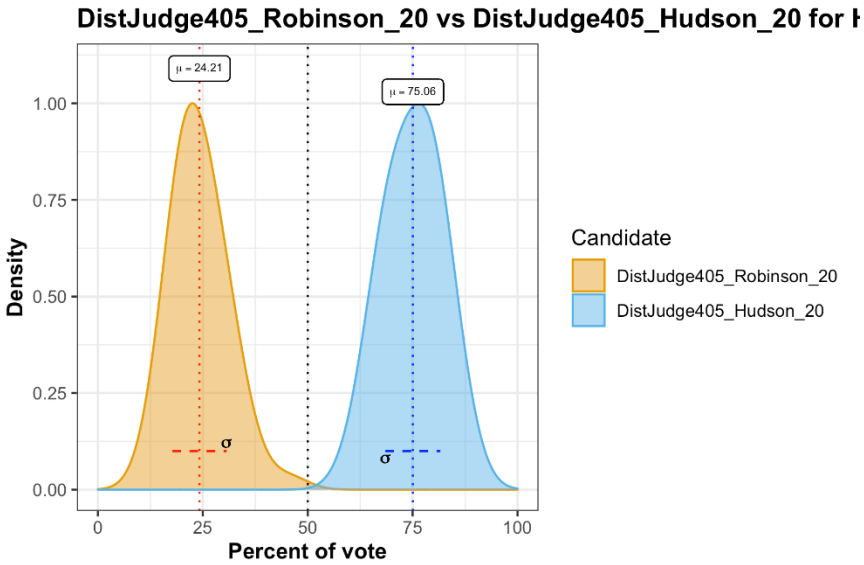


SSTO


DistJudge405_Robinson_20 vs DistJudge405_Hudson_20 for S
μ = 34.9
μ = 65.5
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
DistJudge405_Robinson_20
DistJudge405_Hudson_20

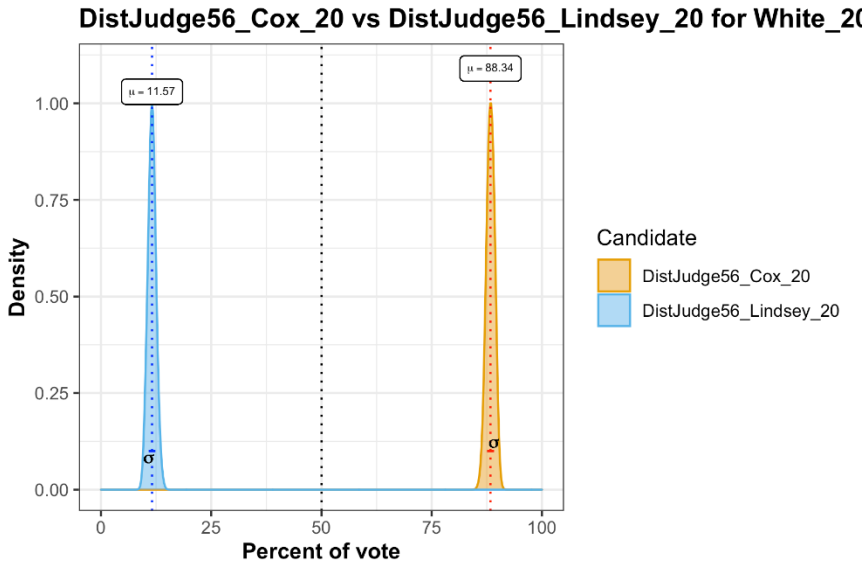
Anglo, Hispanic, and Black (Estimated Actual Vote)

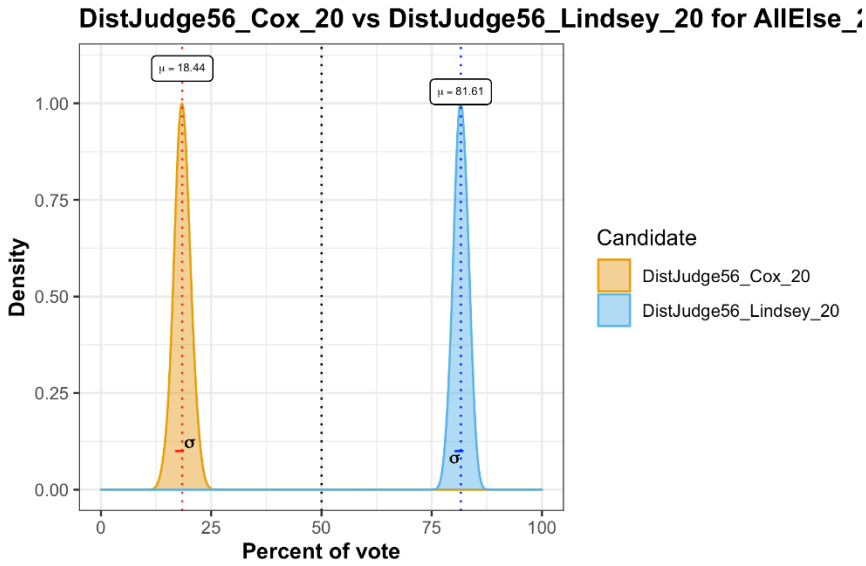




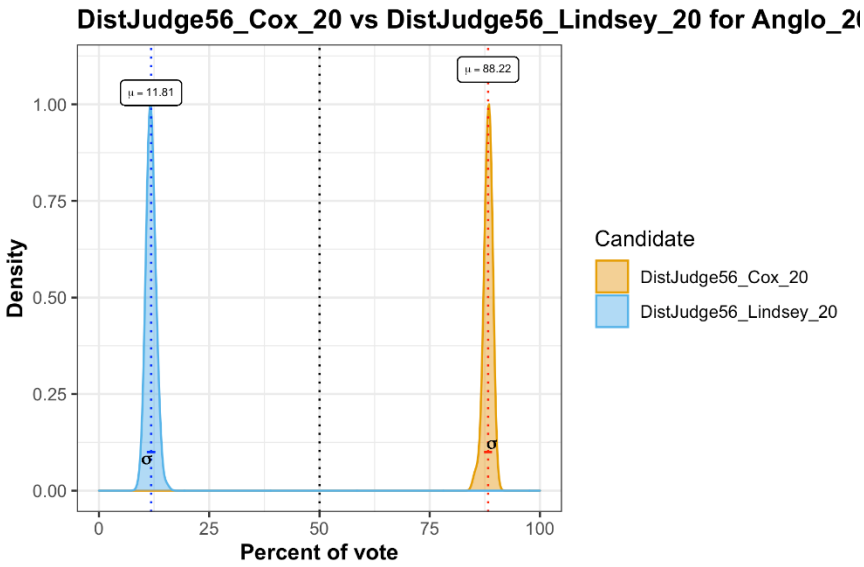
XIII. 2020 District 56 Judge

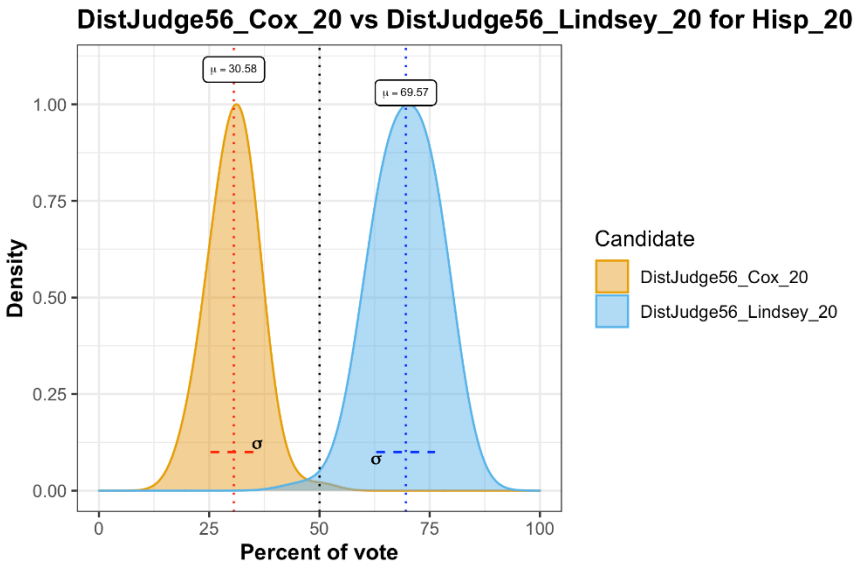
Anglo and Non-Anglo (CVAP)

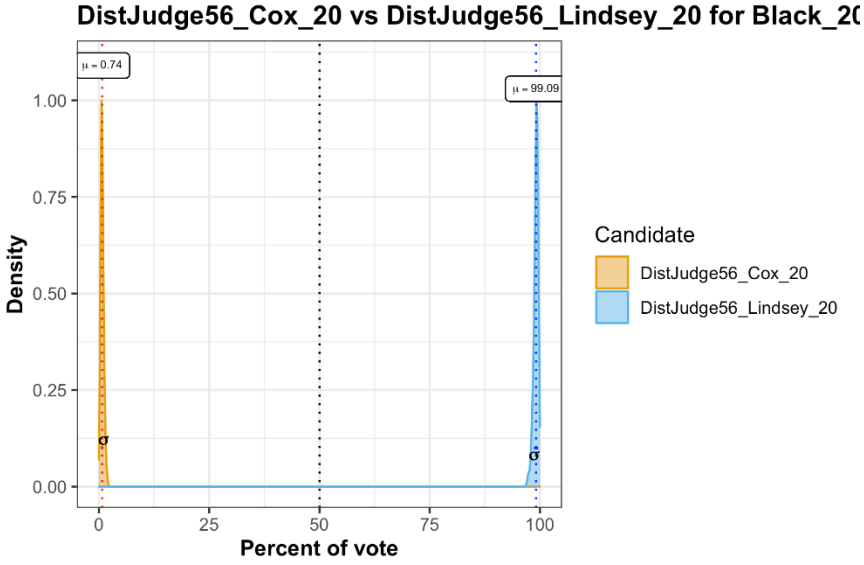




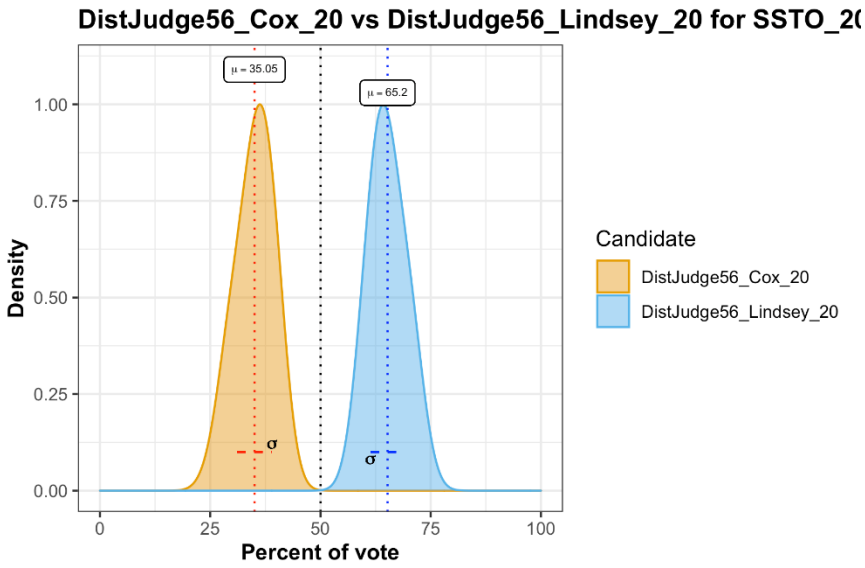
Anglo, Hispanic, and Black (CVAP)



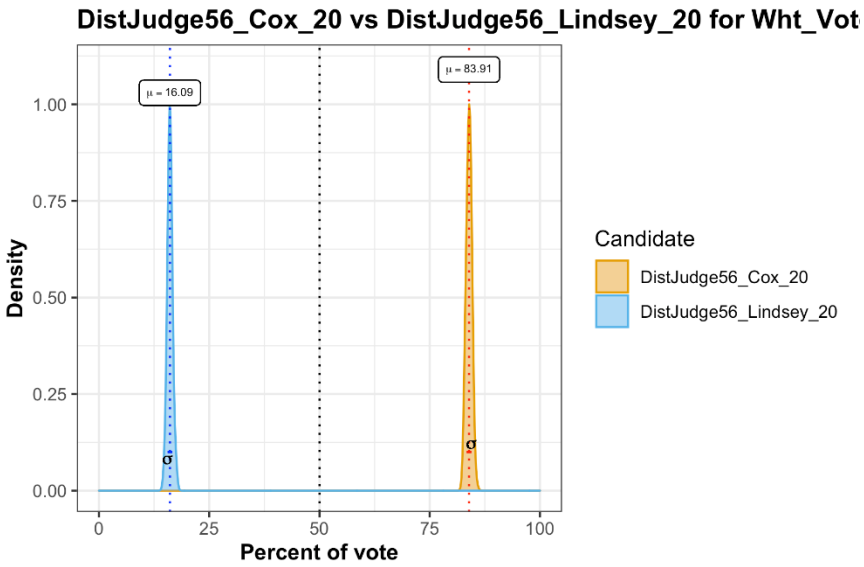


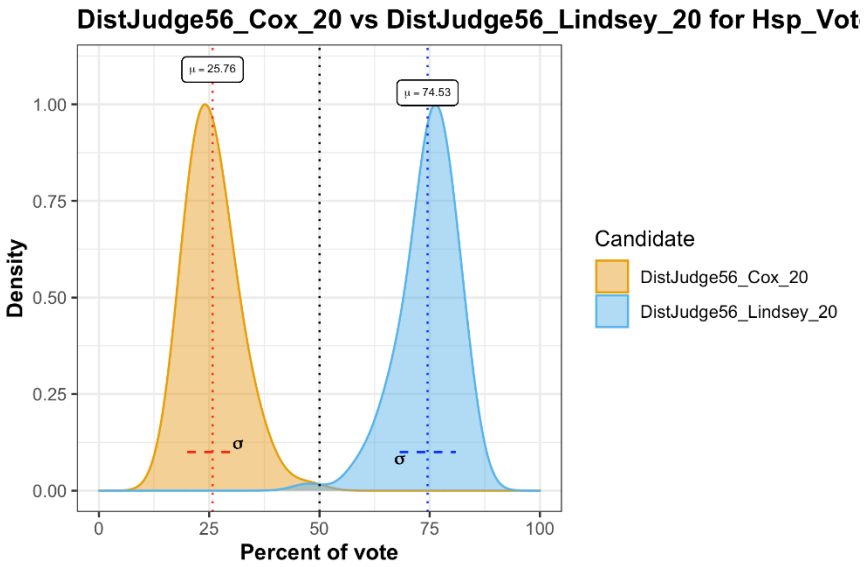


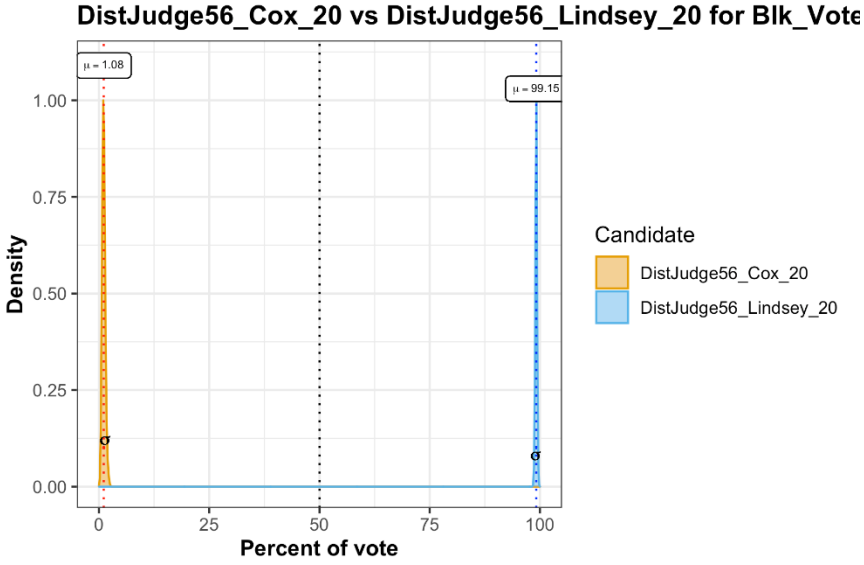
SSTO


DistJudge56_Cox_20 vs DistJudge56_Lindsey_20 for SSTO_20
μ = 35.05
μ = 65.2
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
DistJudge56_Cox_20
DistJudge56_Lindsey_20

Anglo, Hispanic, and Black (Estimated Actual Vote)

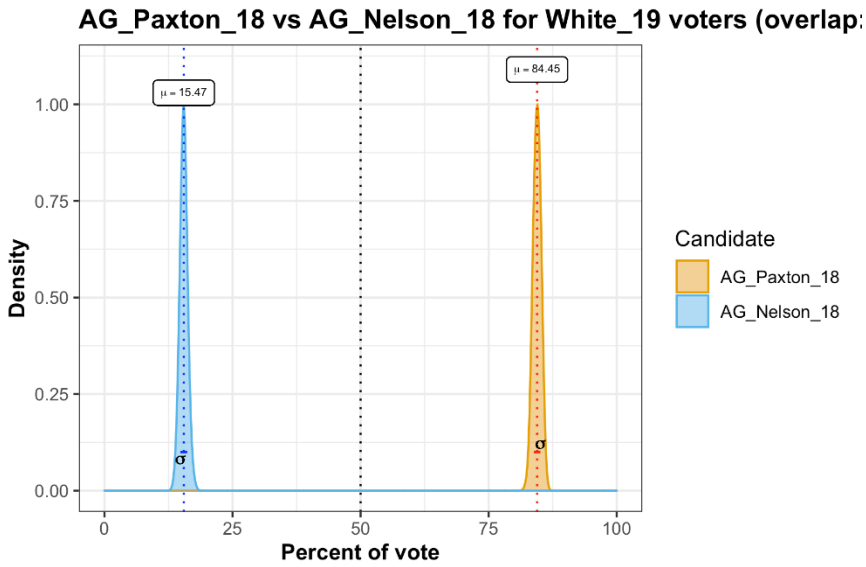


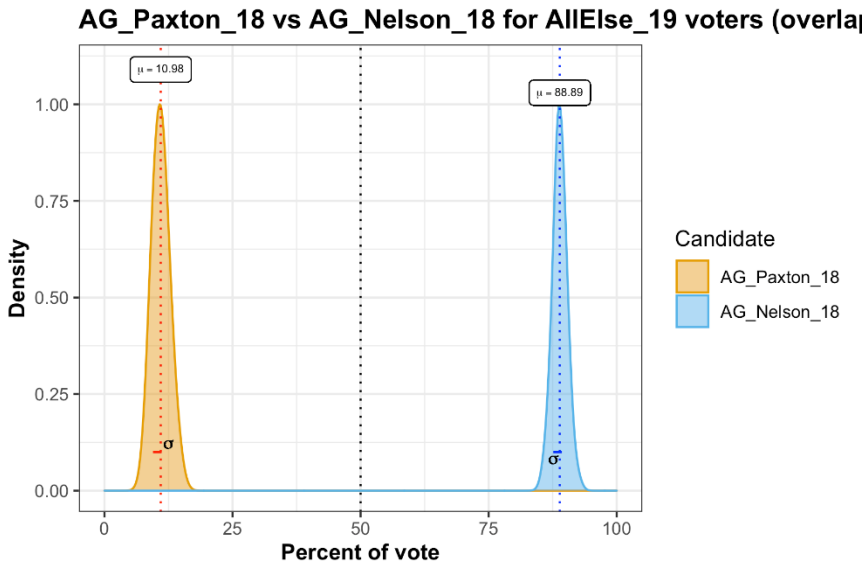




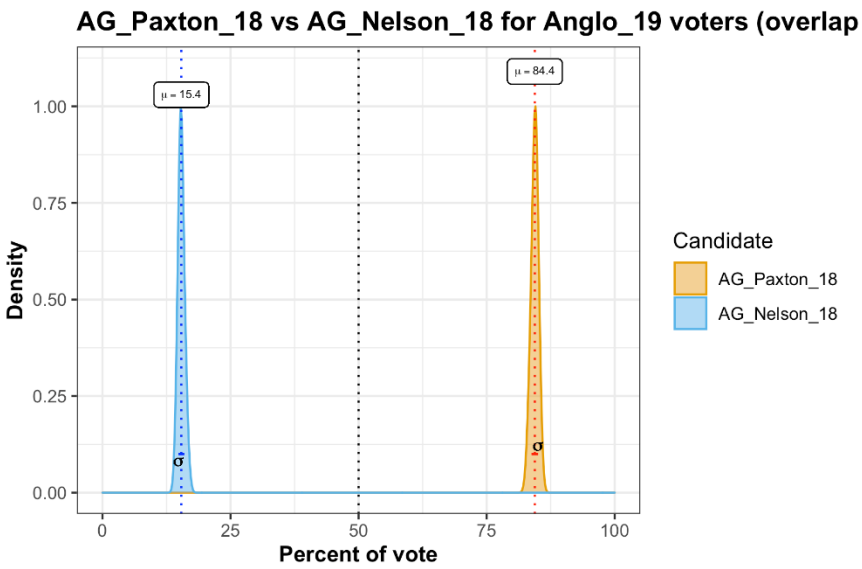
XIV. 2018 Attorney General

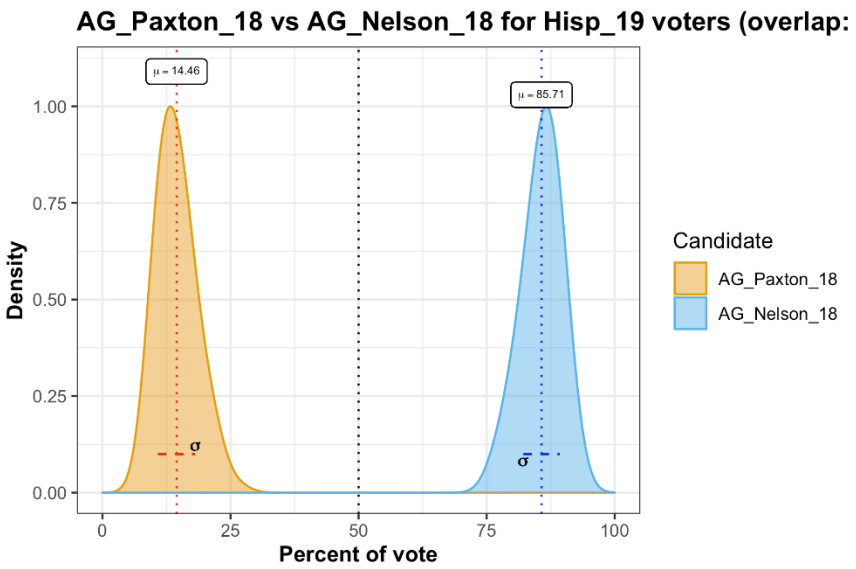
Anglo and Non-Anglo (CVAP)

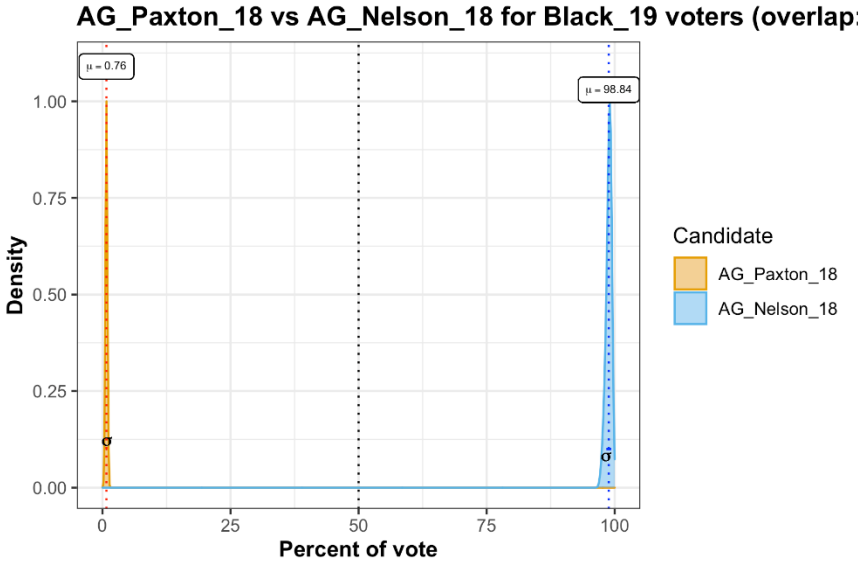




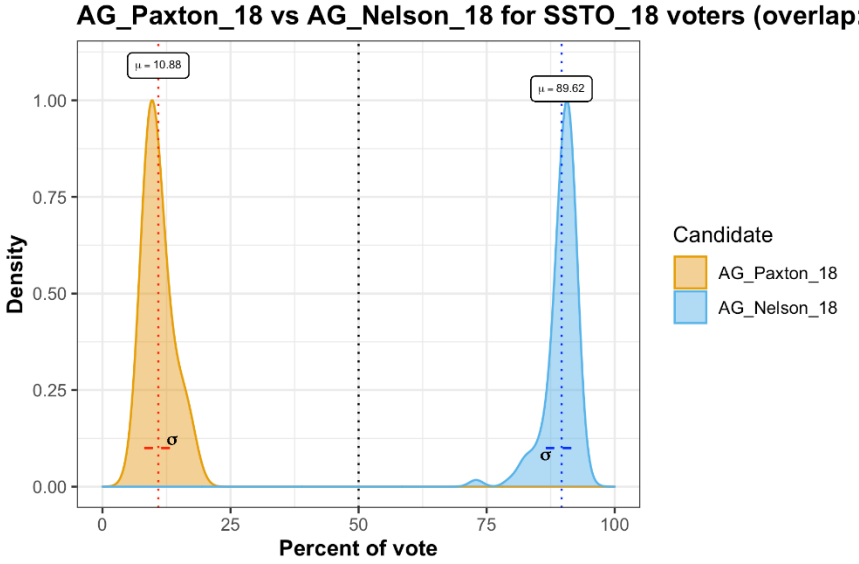
Anglo, Hispanic, and Black (CVAP)



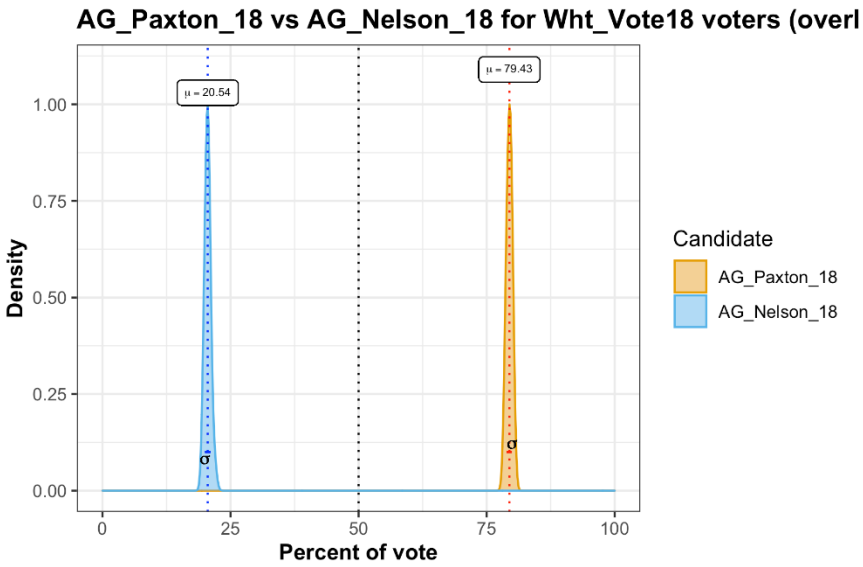


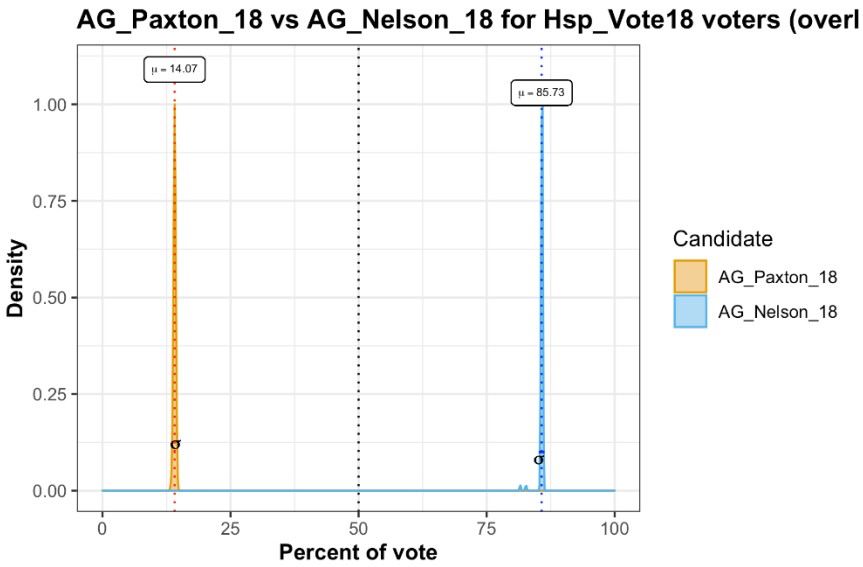


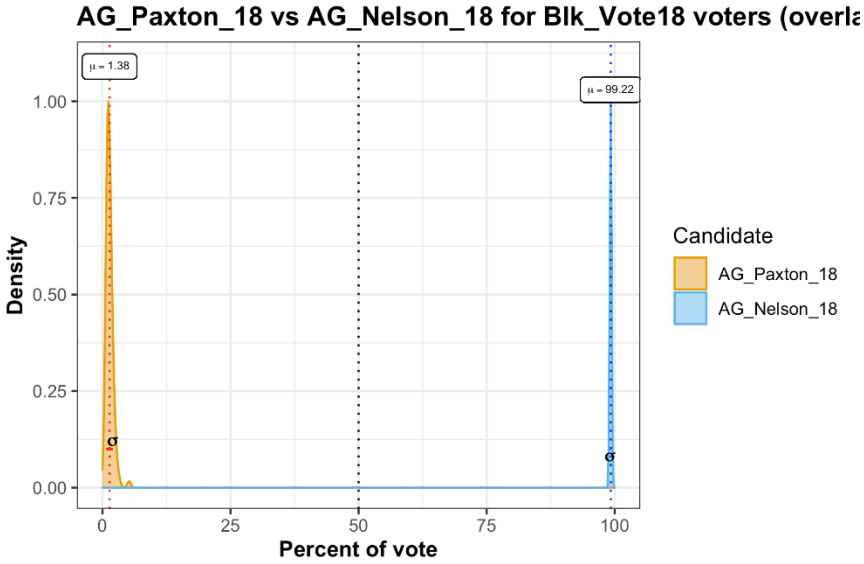
SSTO


AG_Paxton_18 vs AG_Nelson_18 for SSTO_18 voters (overlap
μ = 10.88
μ = 89.62
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
AG_Paxton_18
AG_Nelson_18

Anglo, Hispanic, and Black (Estimated Actual Vote)

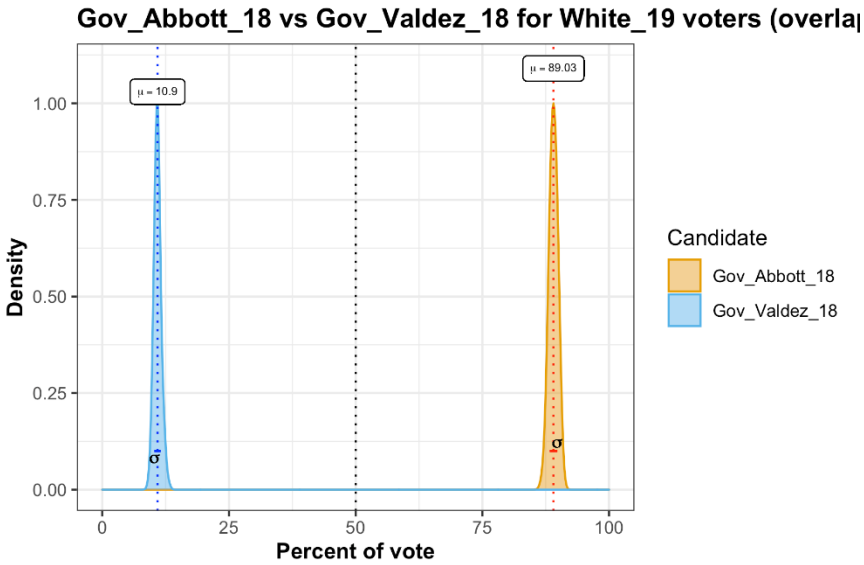


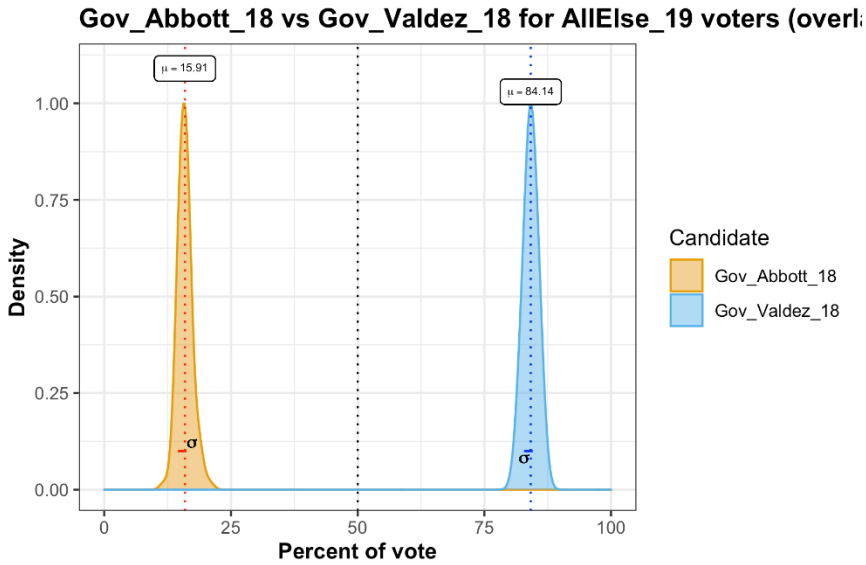




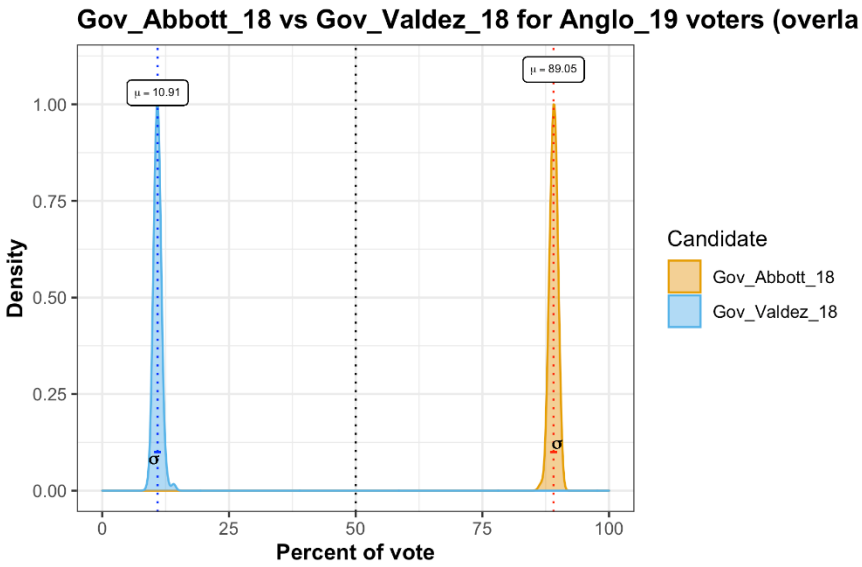
XV. 2018 Governor

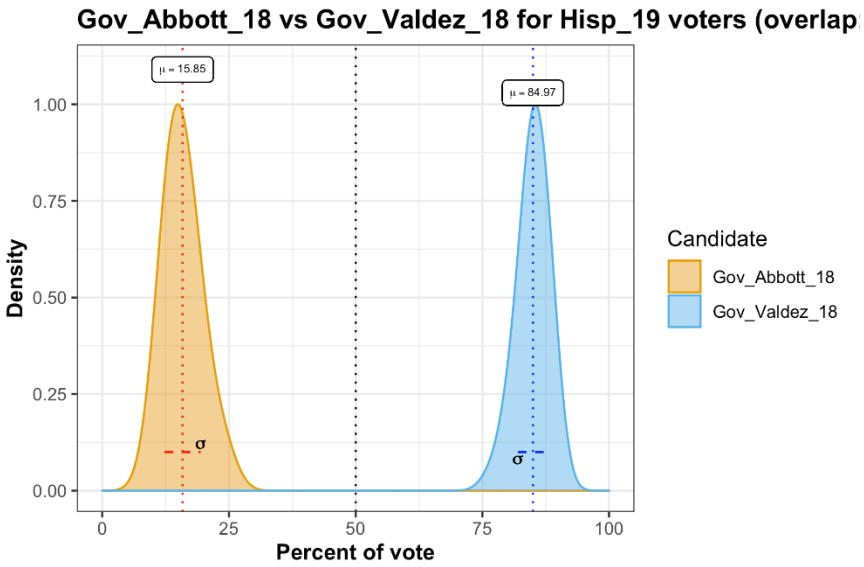
Anglo and Non-Anglo (CVAP)

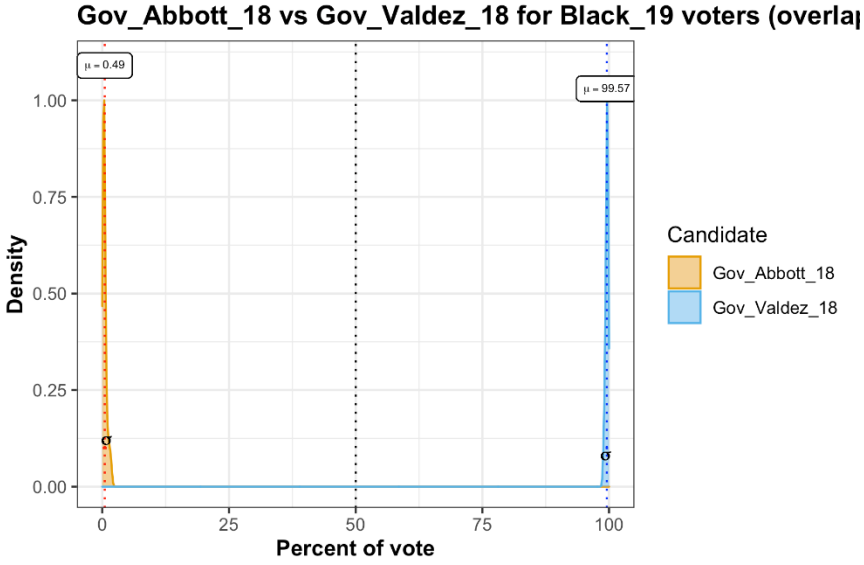




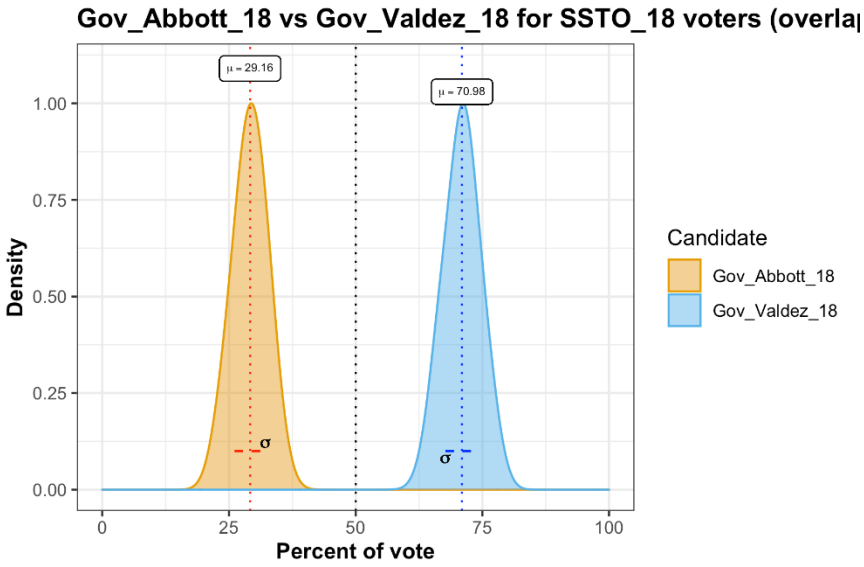
Anglo, Hispanic, and Black (CVAP)



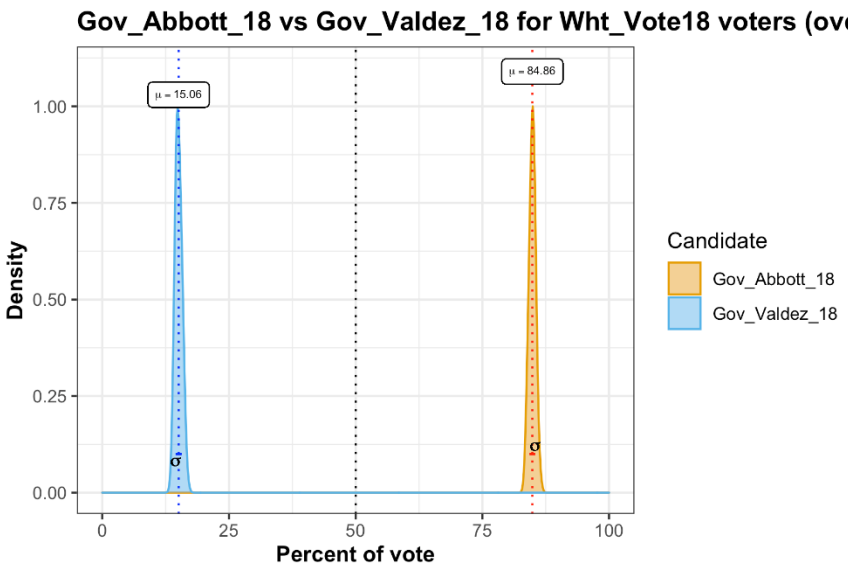


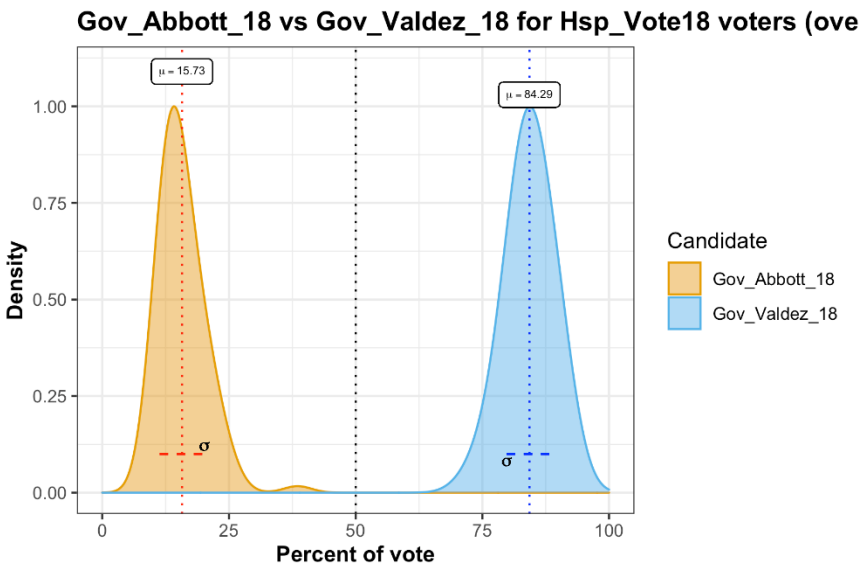


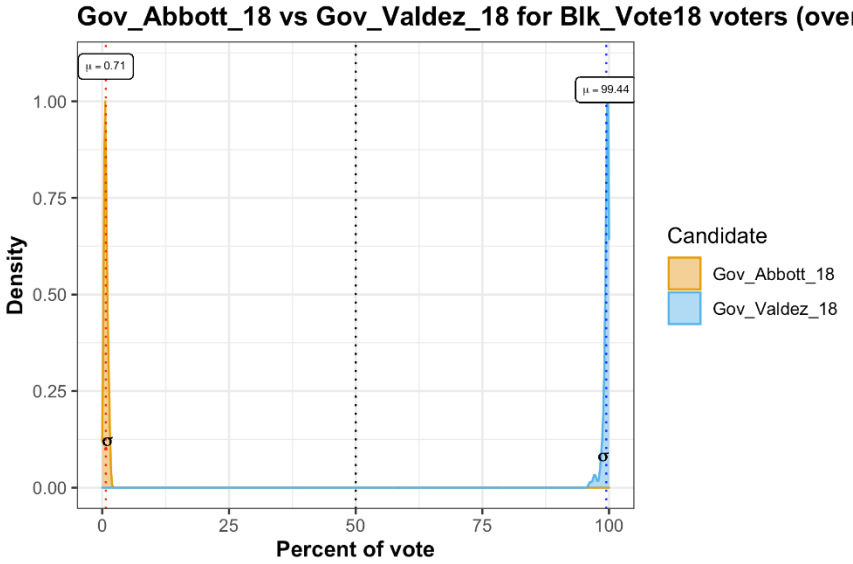
SSTO


Gov_Abbott_18 vs Gov_Valdez_18 for SSTO_18 voters (overla
μ = 29.16
μ = 70.98
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
Gov_Abbott_18
Gov_Valdez_18

Anglo, Hispanic, and Black (Estimated Actual Vote)

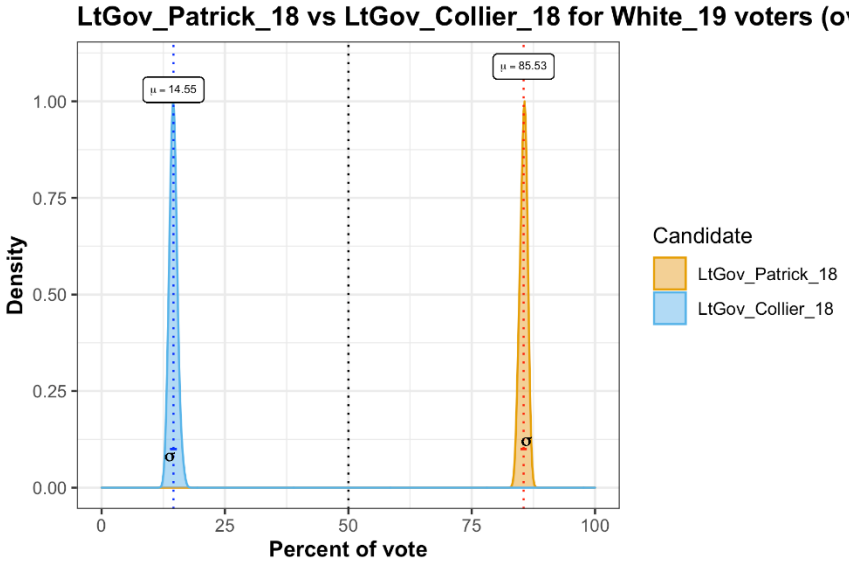


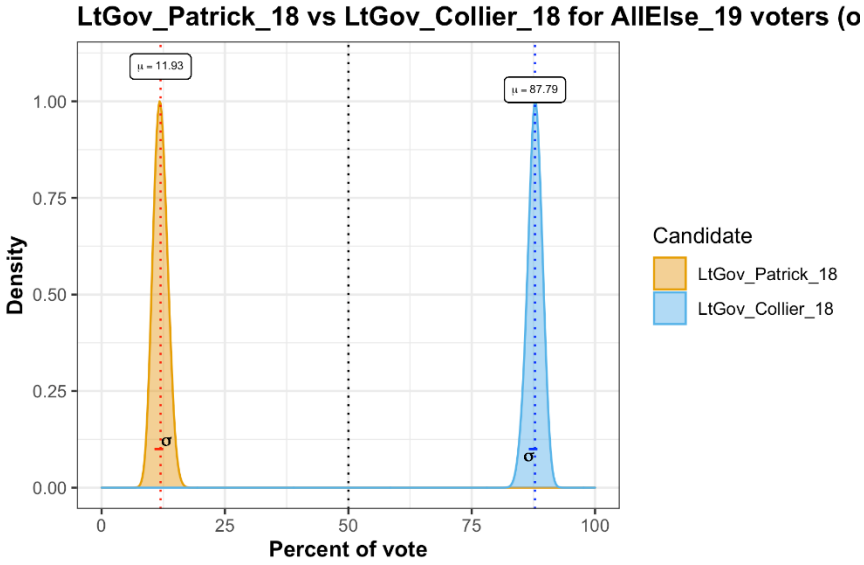




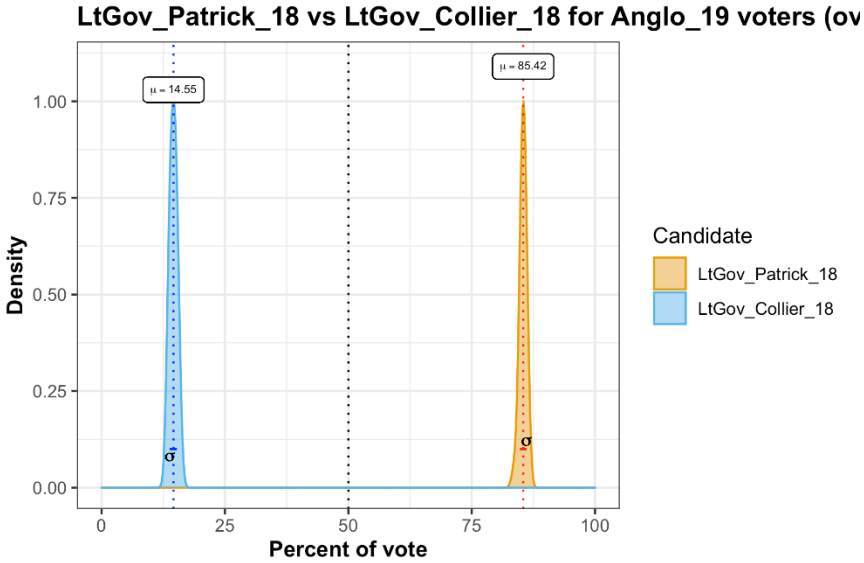
XVI. 2018 Lt. Governor

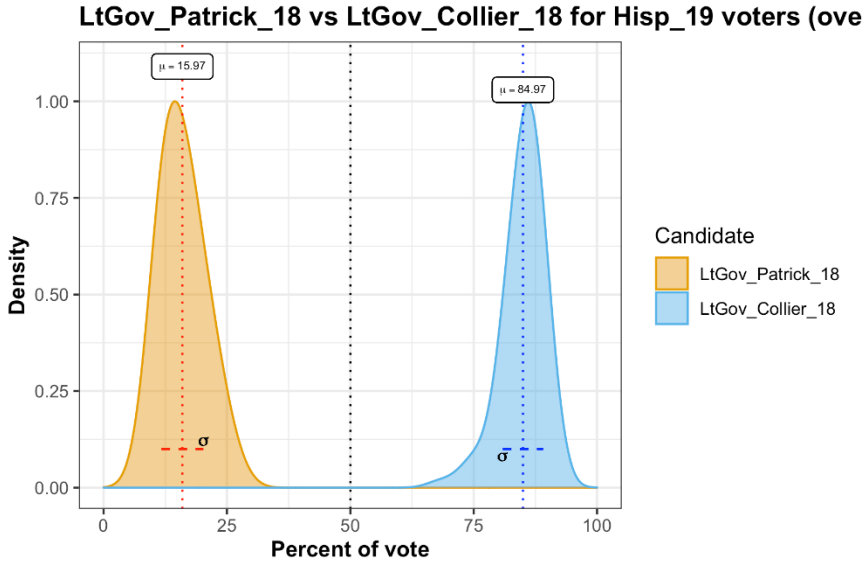
Anglo and Non-Anglo (CVAP)

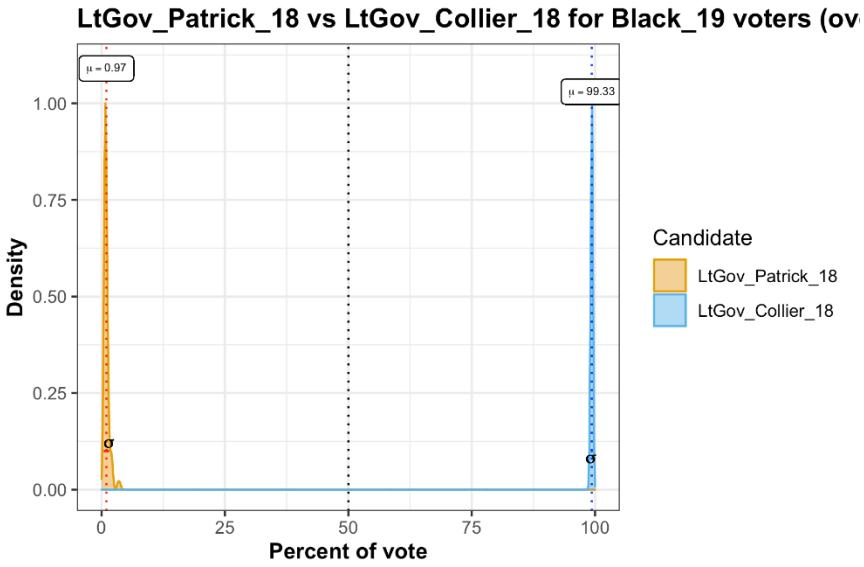




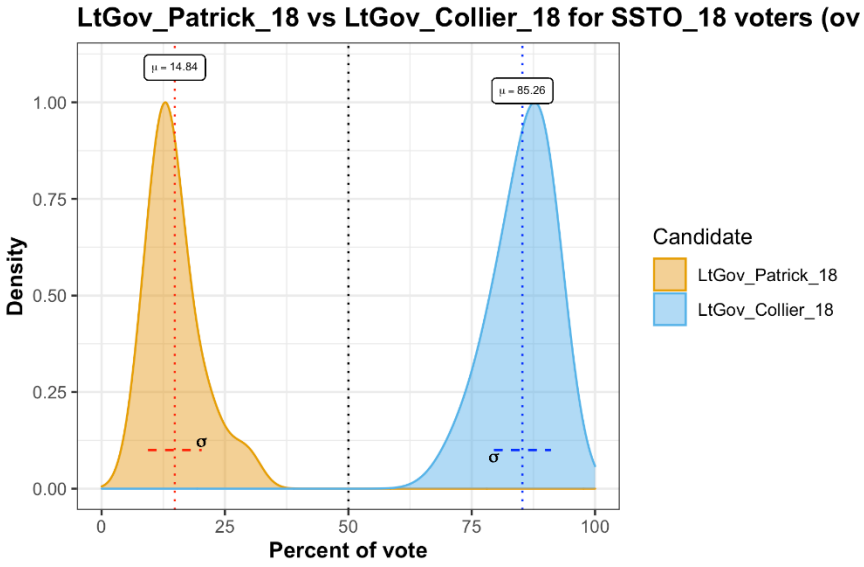
Anglo, Hispanic, and Black (CVAP)



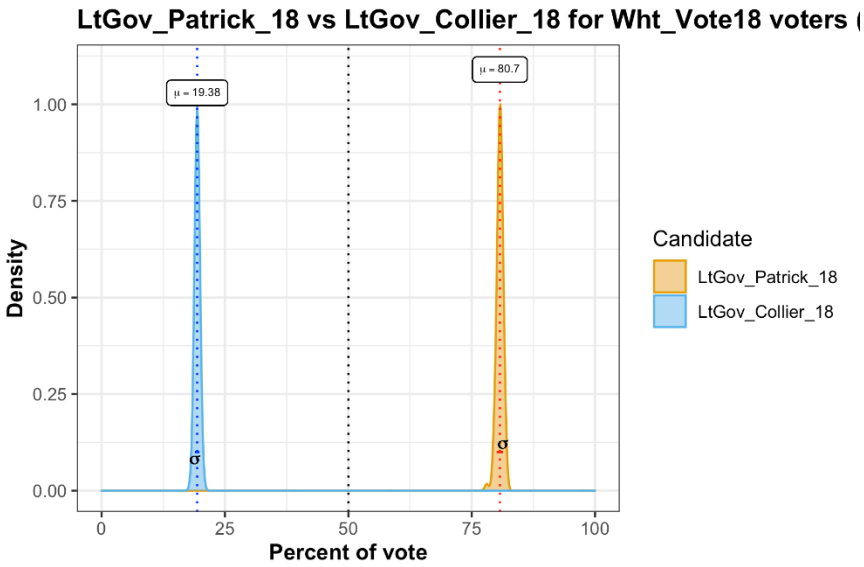


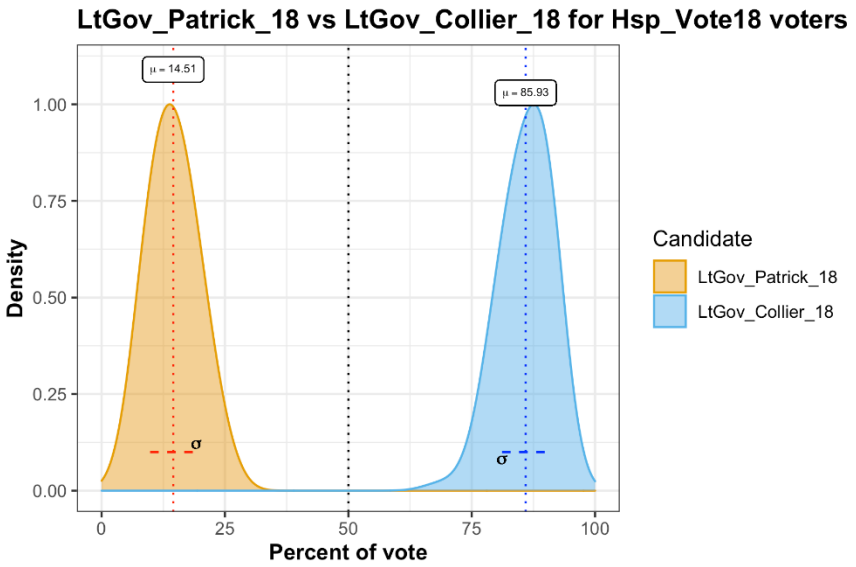


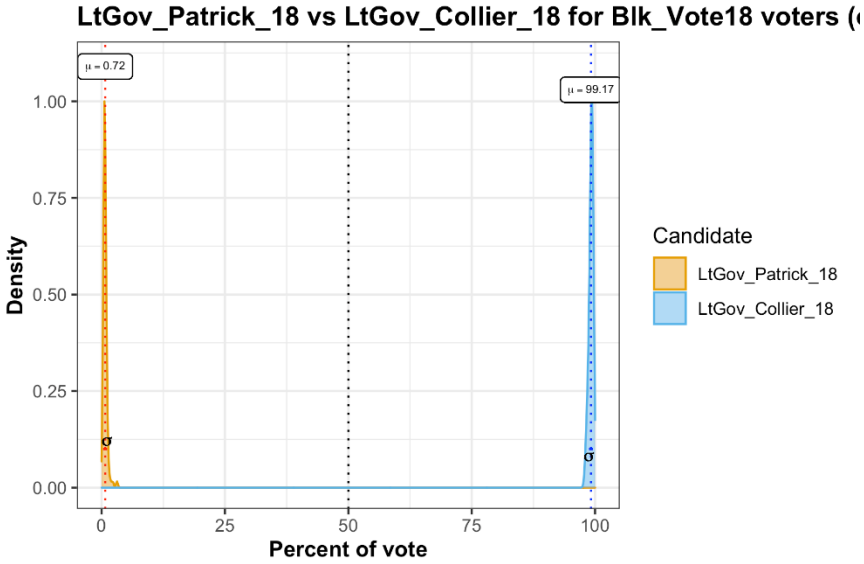
SSTO


LtGov_Patrick_18 vs LtGov_Collier_18 for SSTO_18 voters (ov
μ = 14.84
μ = 85.26
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
LtGov_Patrick_18
LtGov_Collier_18

Anglo, Hispanic, and Black (Estimated Actual Vote)

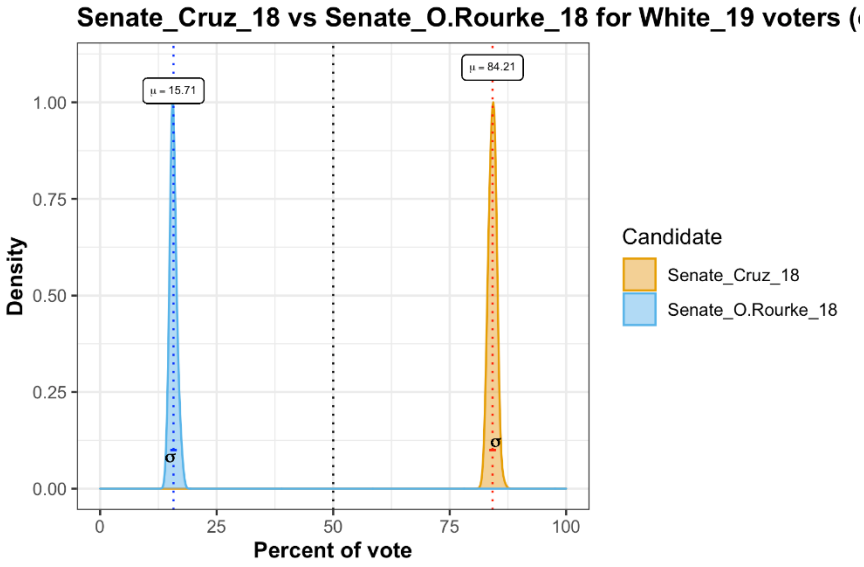


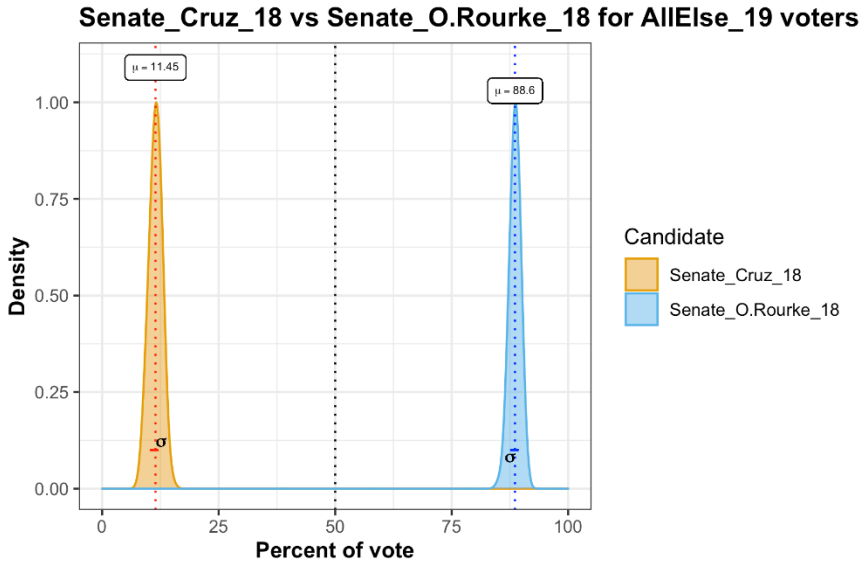




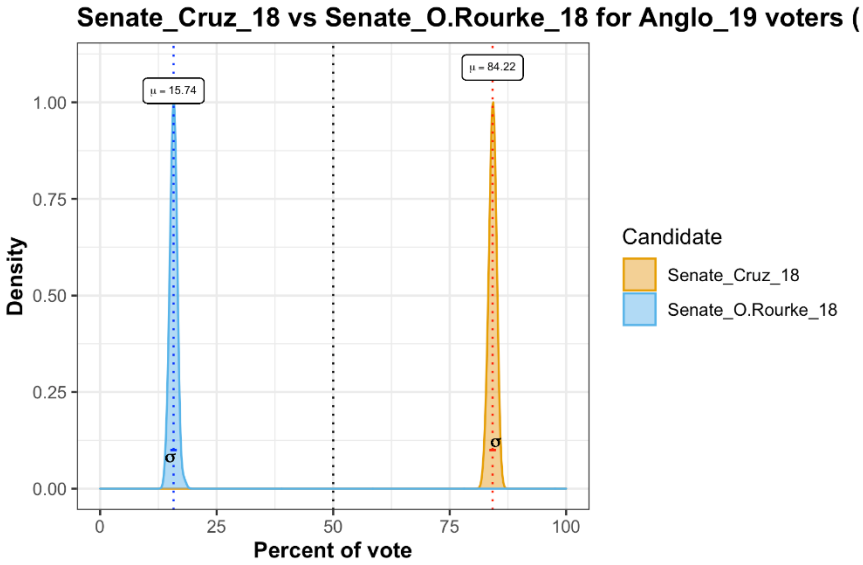
XVII. 2018 U.S. Senate

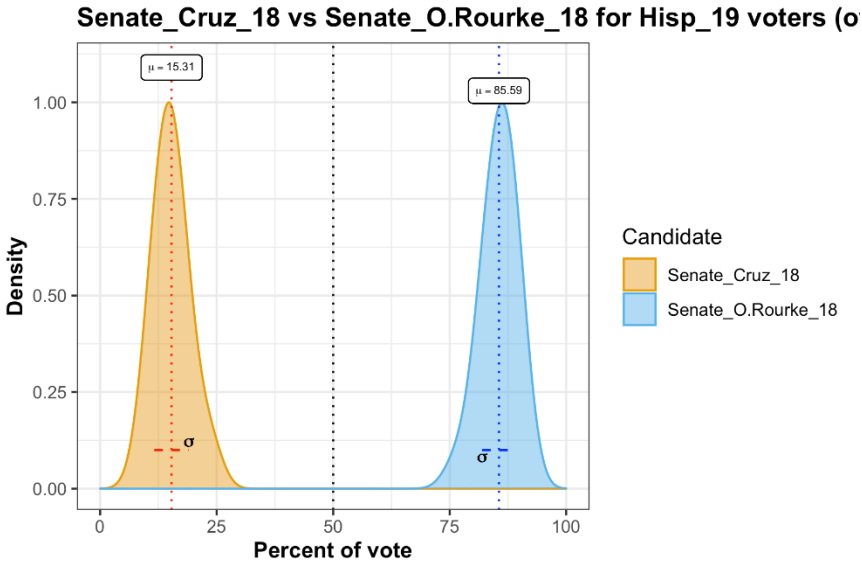
Anglo and Non-Anglo (CVAP)

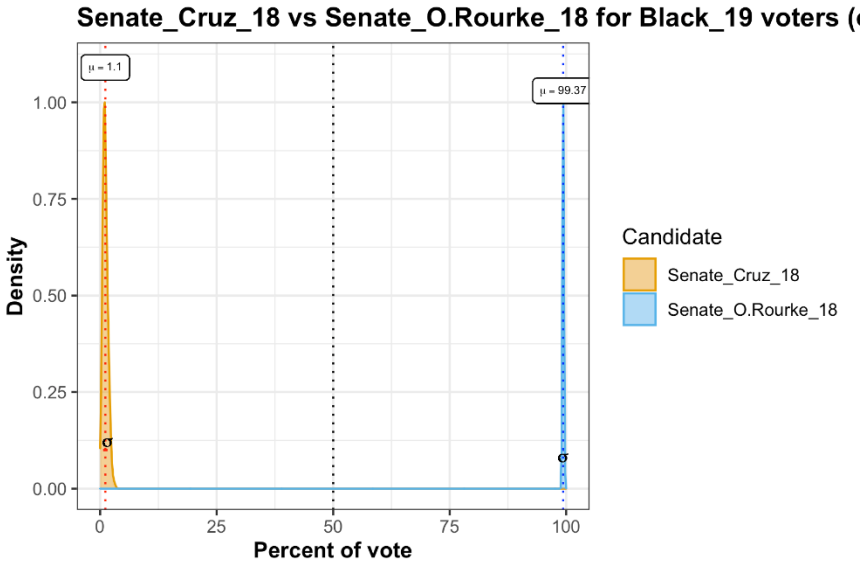




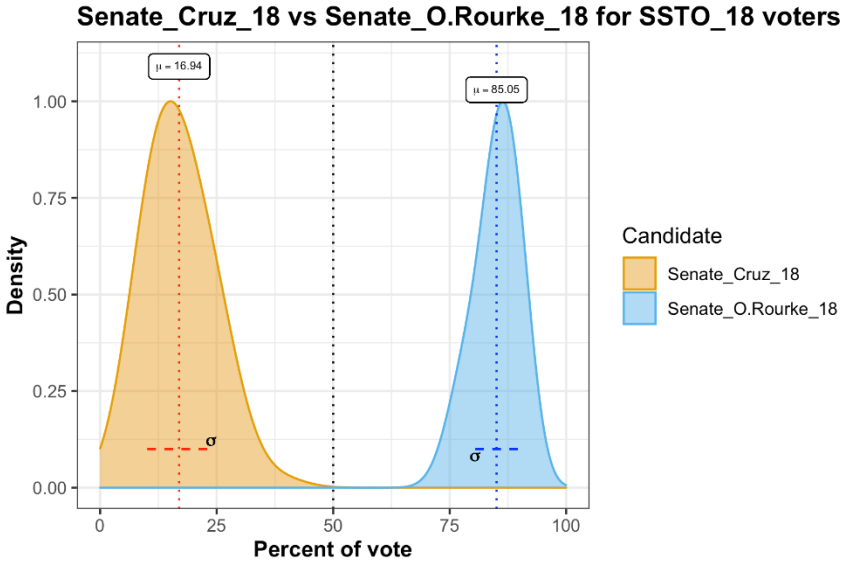
Anglo, Hispanic, and Black (CVAP)



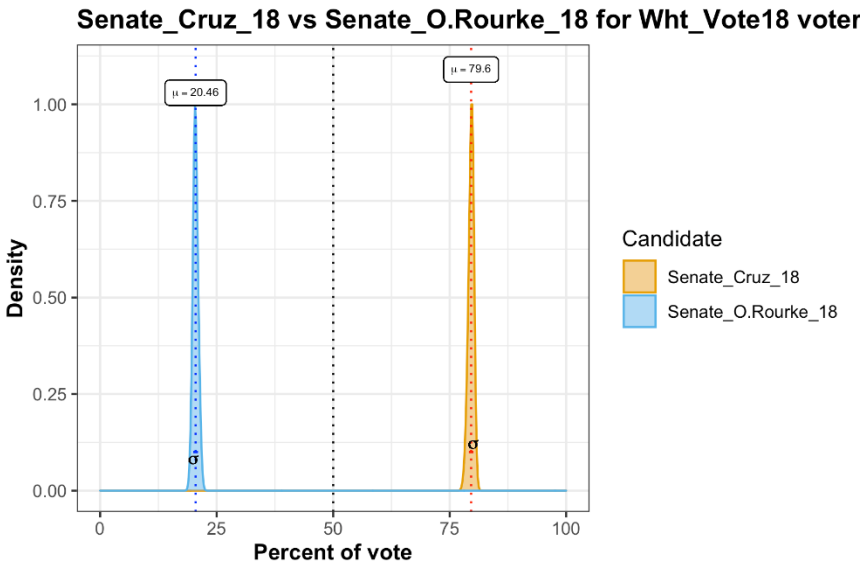


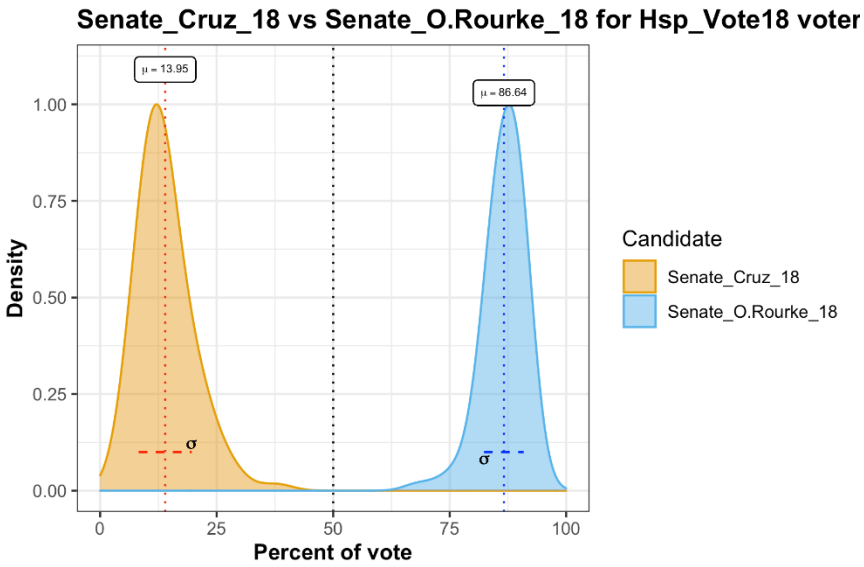


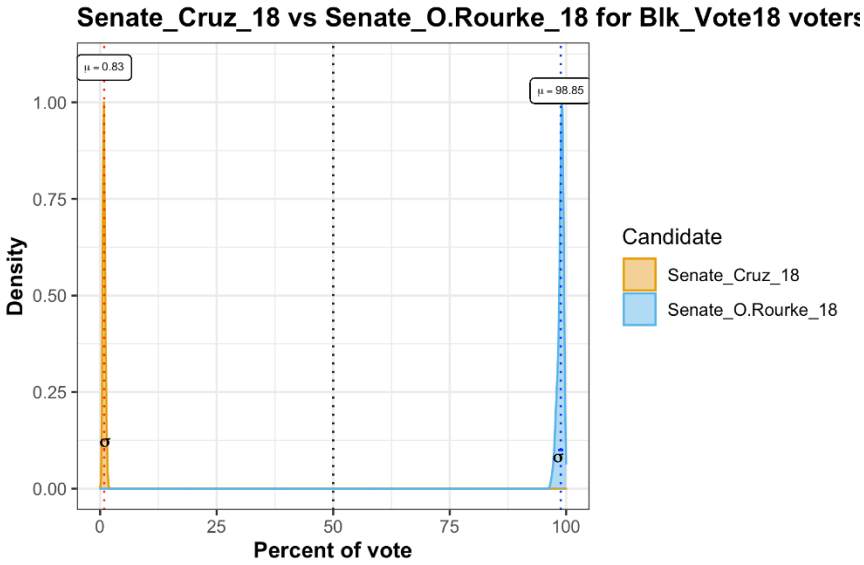
SSTO


Senate_Cruz_18 vs Senate_O.Rourke_18 for SSTO_18 voters (
μ = 16.94
μ = 85.05
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Senate_Cruz_18
Senate_O.Rourke_18

Anglo, Hispanic, and Black (Estimated Actual Vote)

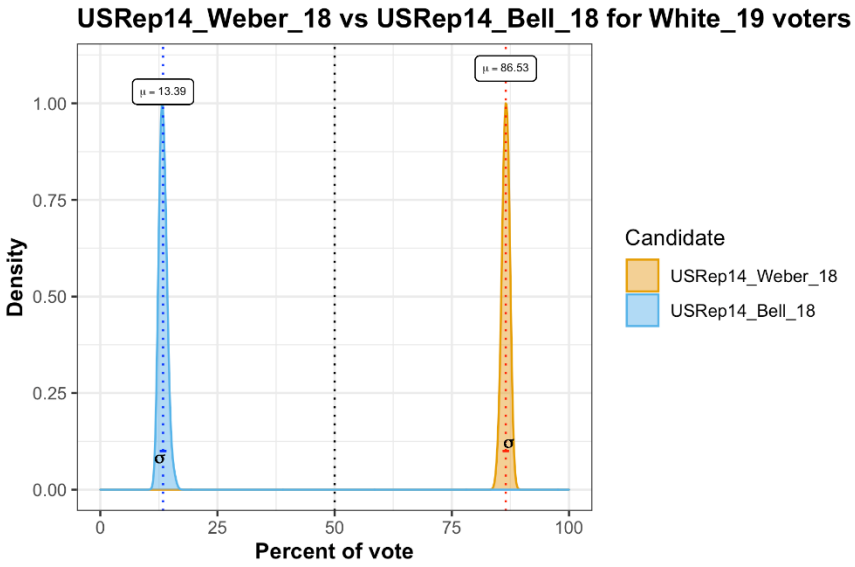


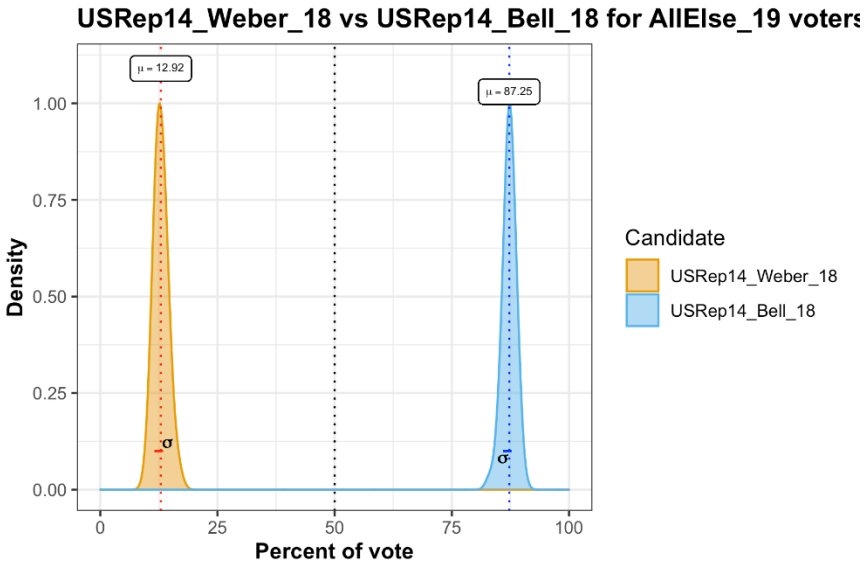




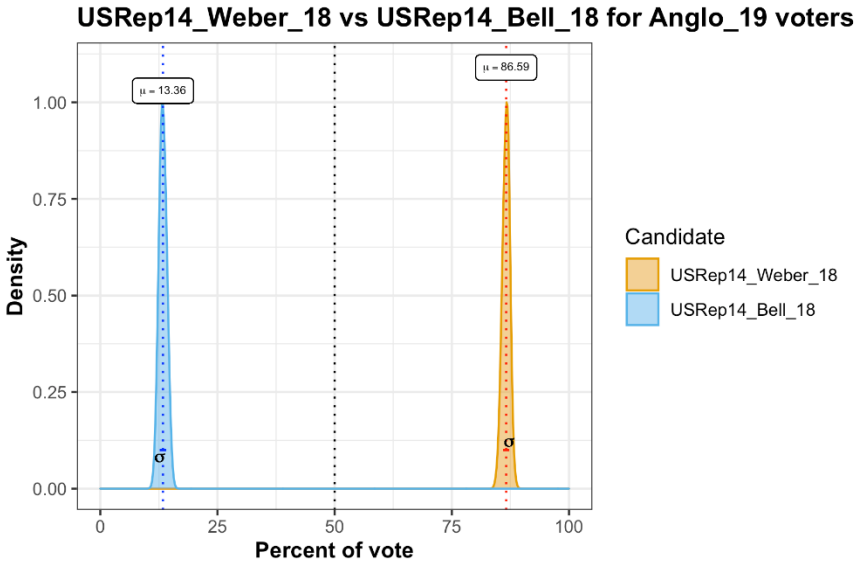
XVIII. 2018 U.S. House of Reps, District #14

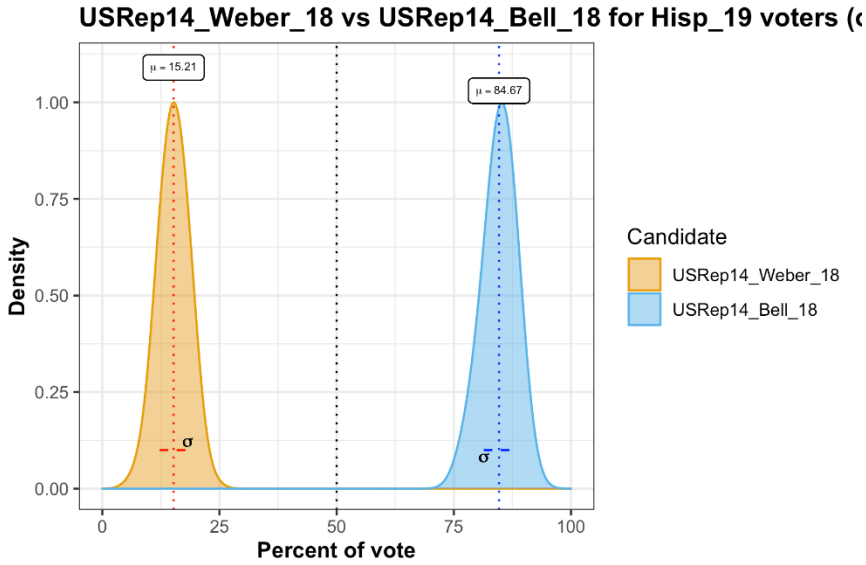
Anglo and Non-Anglo (CVAP)

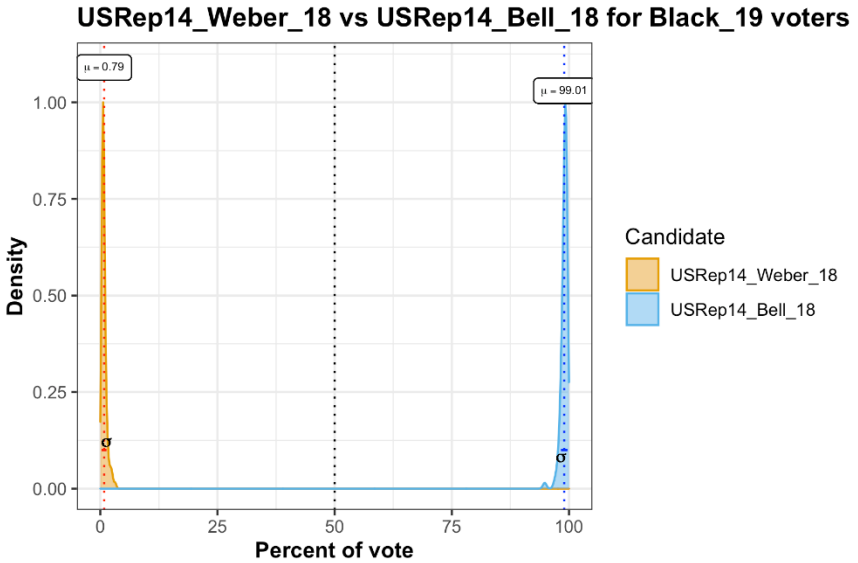




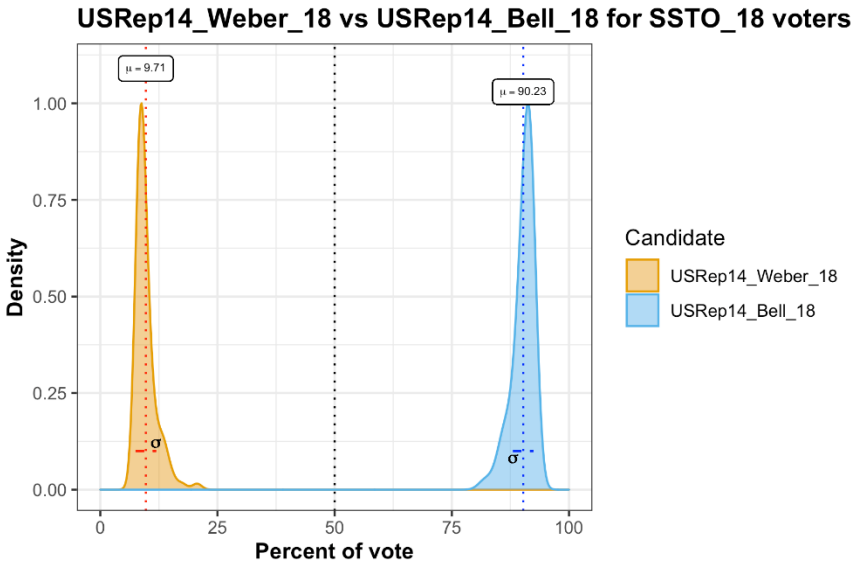
Anglo, Hispanic, and Black (CVAP)



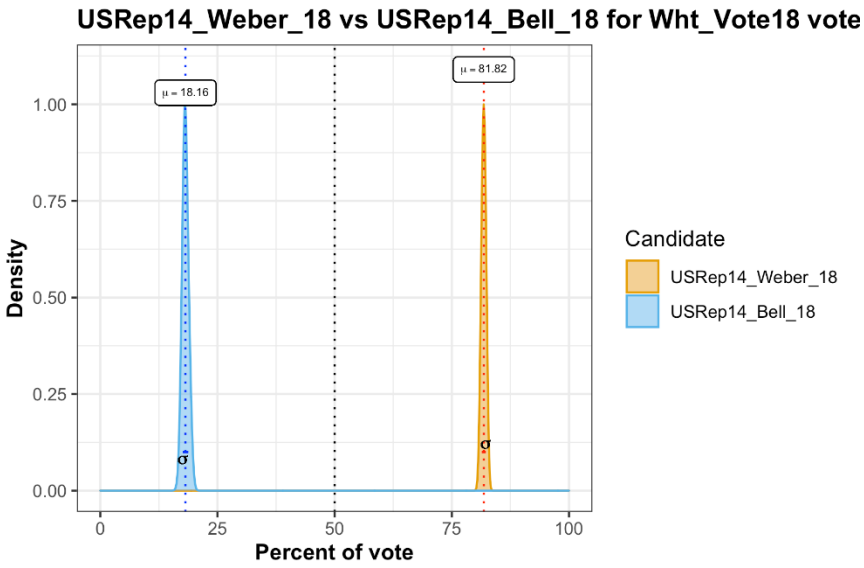


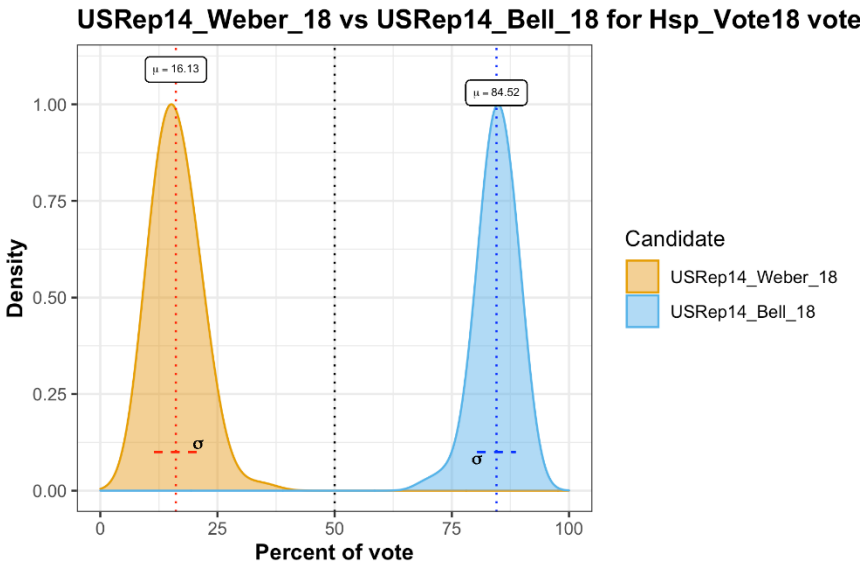


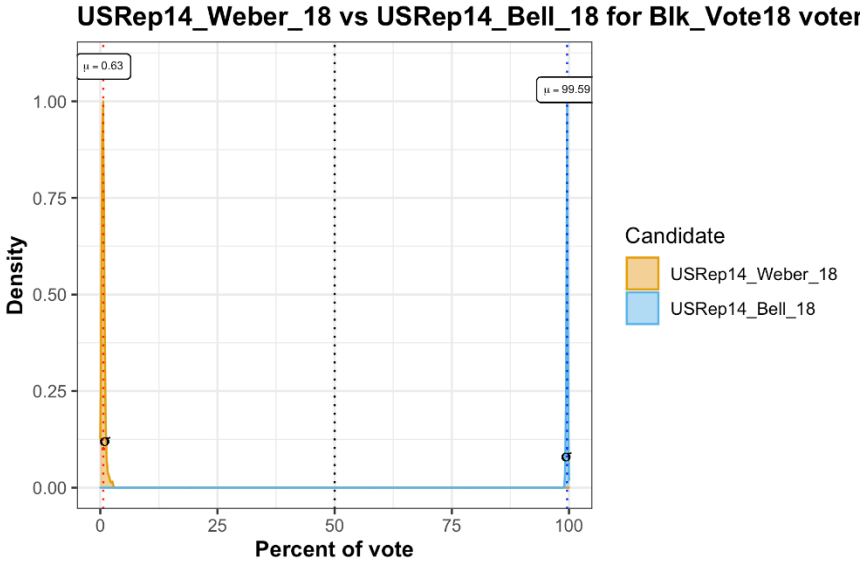
SSTO


USRep14_Weber_18 vs USRep14_Bell_18 for SSTO_18 voters
μ = 9.71
μ = 90.23
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
σ
σ
Candidate
USRep14_Weber_18
USRep14_Bell_18

Anglo, Hispanic, and Black (Estimated Actual Vote)

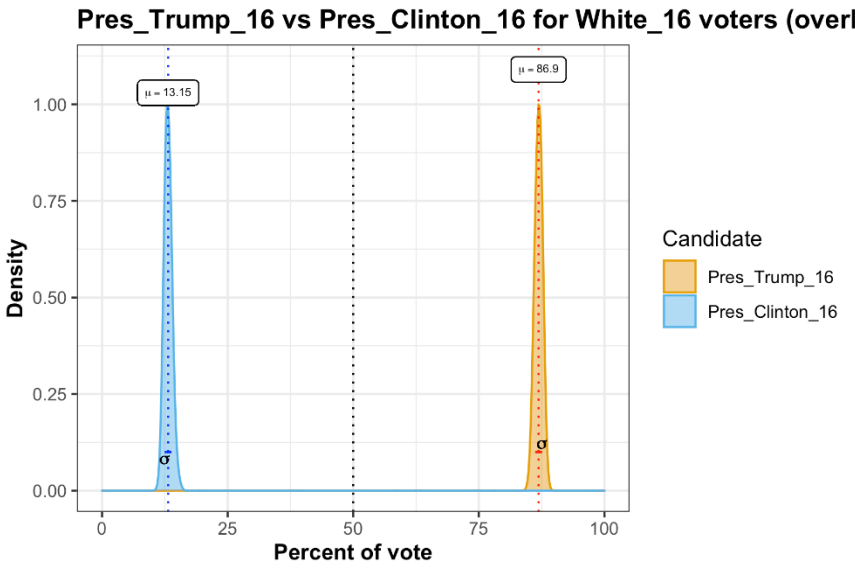


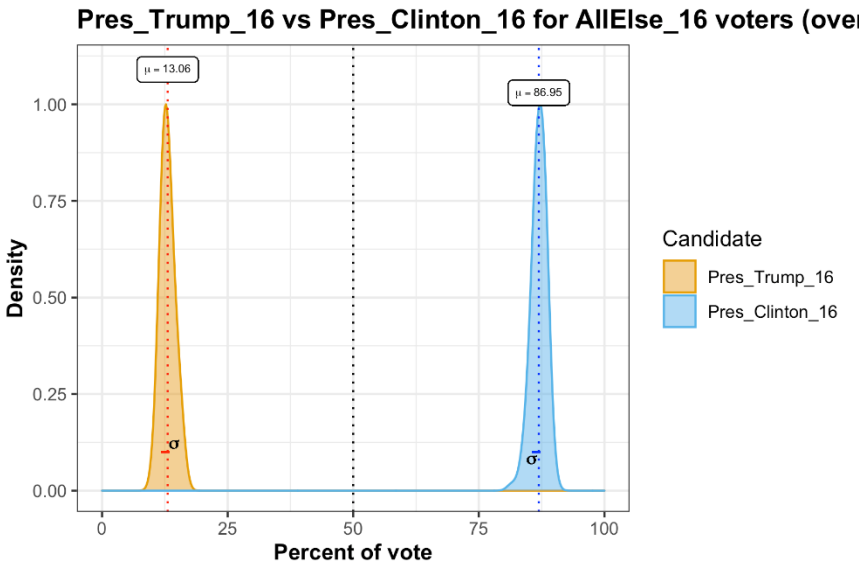




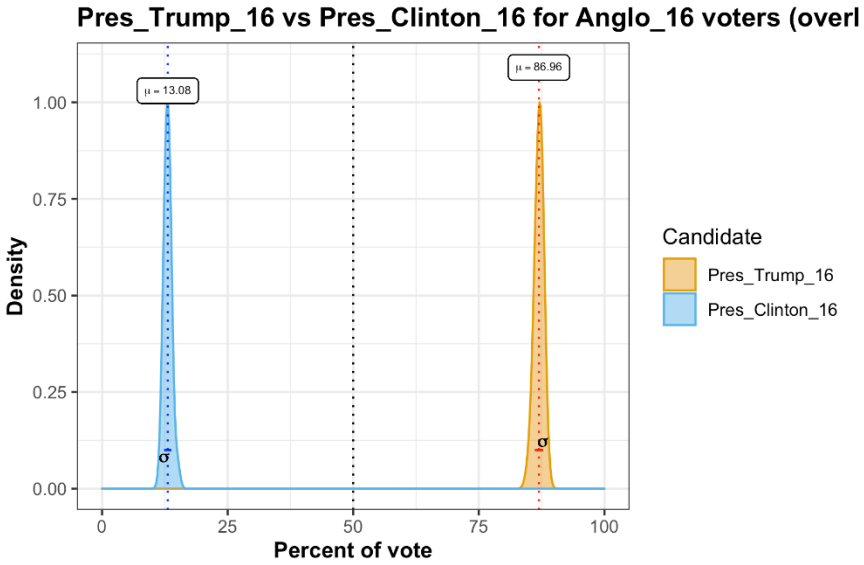
XIX. 2016 President

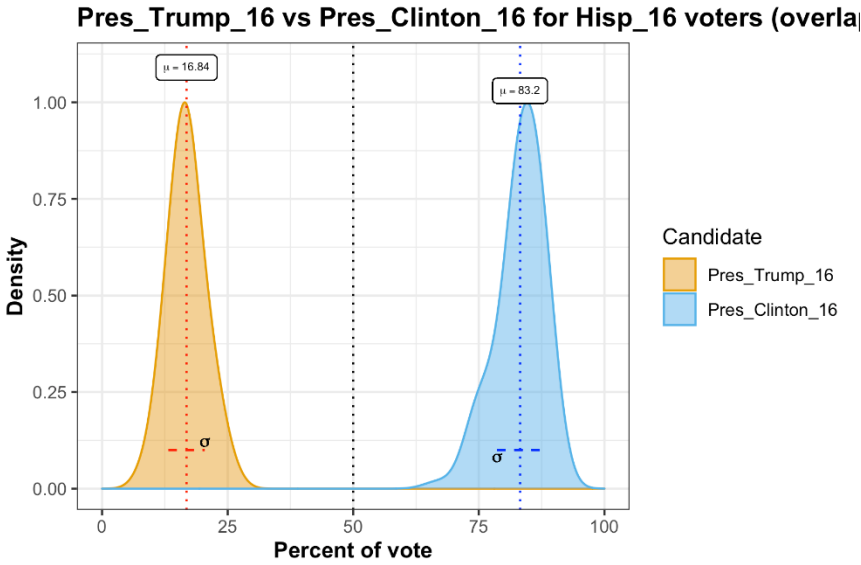
Anglo and Non-Anglo (CVAP)

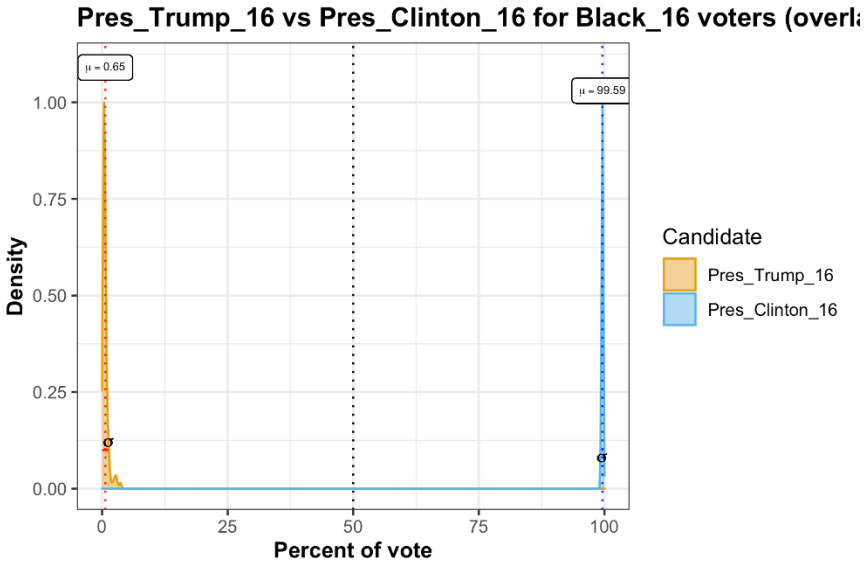




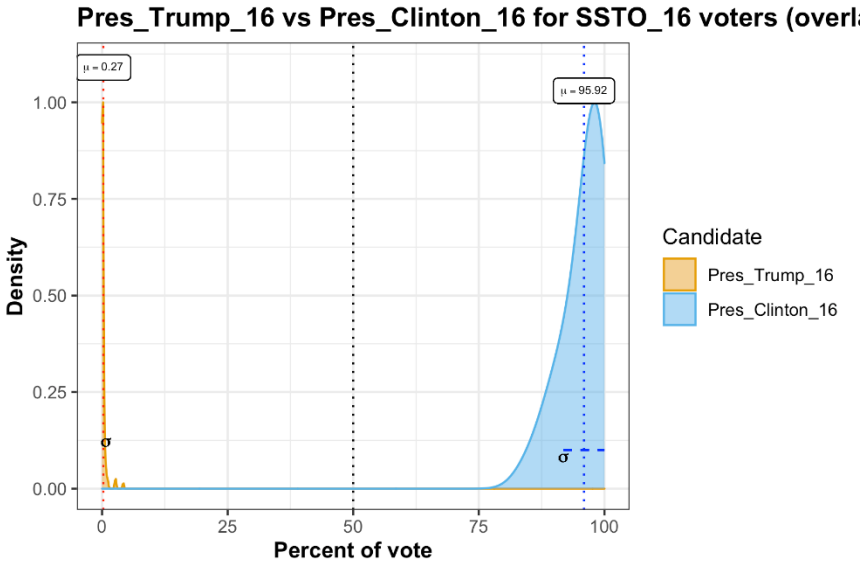
Anglo, Hispanic, and Black (CVAP)



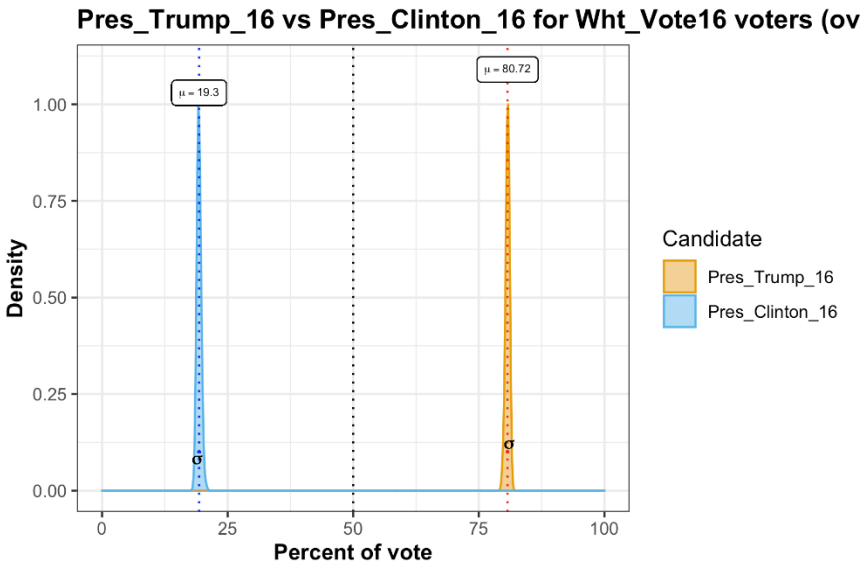


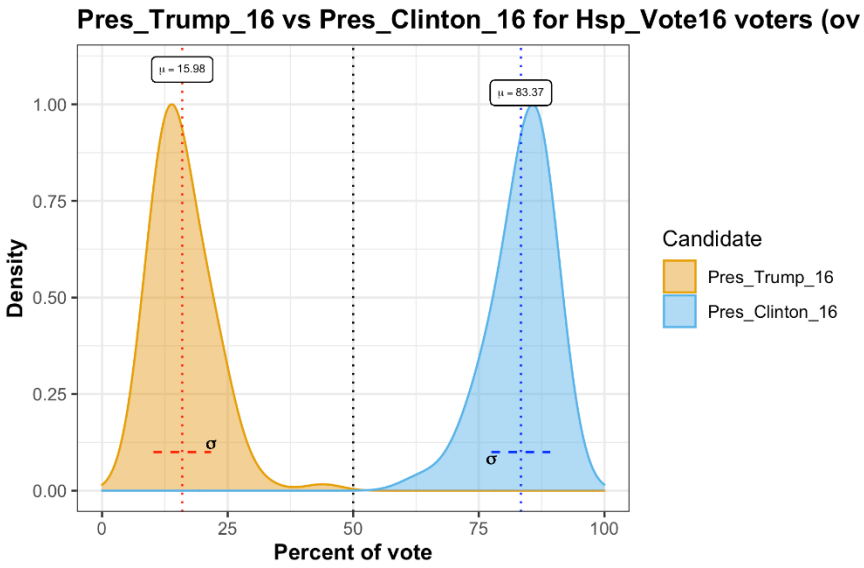


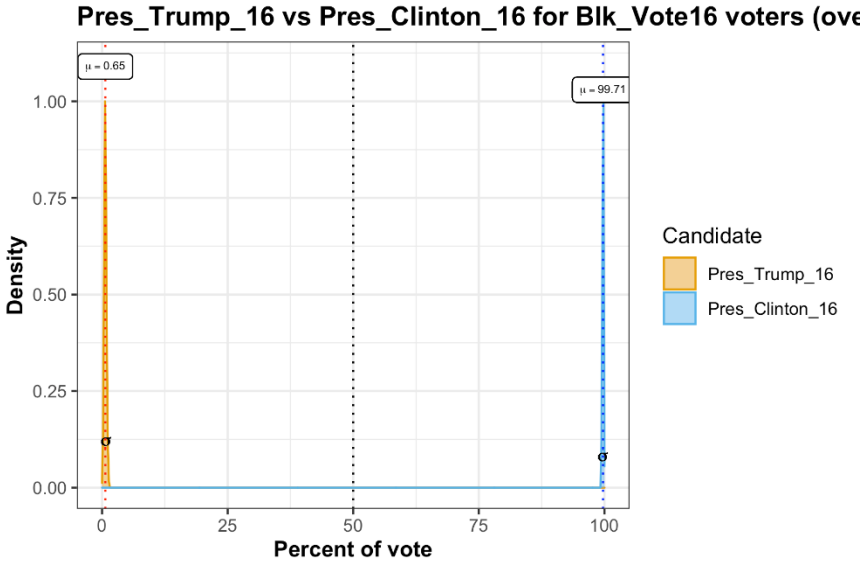
SSTO


Pres_Trump_16 vs Pres_Clinton_16 for SSTO_16 voters (overl
μ = 0.27
μ = 95.92
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Pres_Trump_16
Pres_Clinton_16

Anglo, Hispanic, and Black (Estimated Actual Vote)

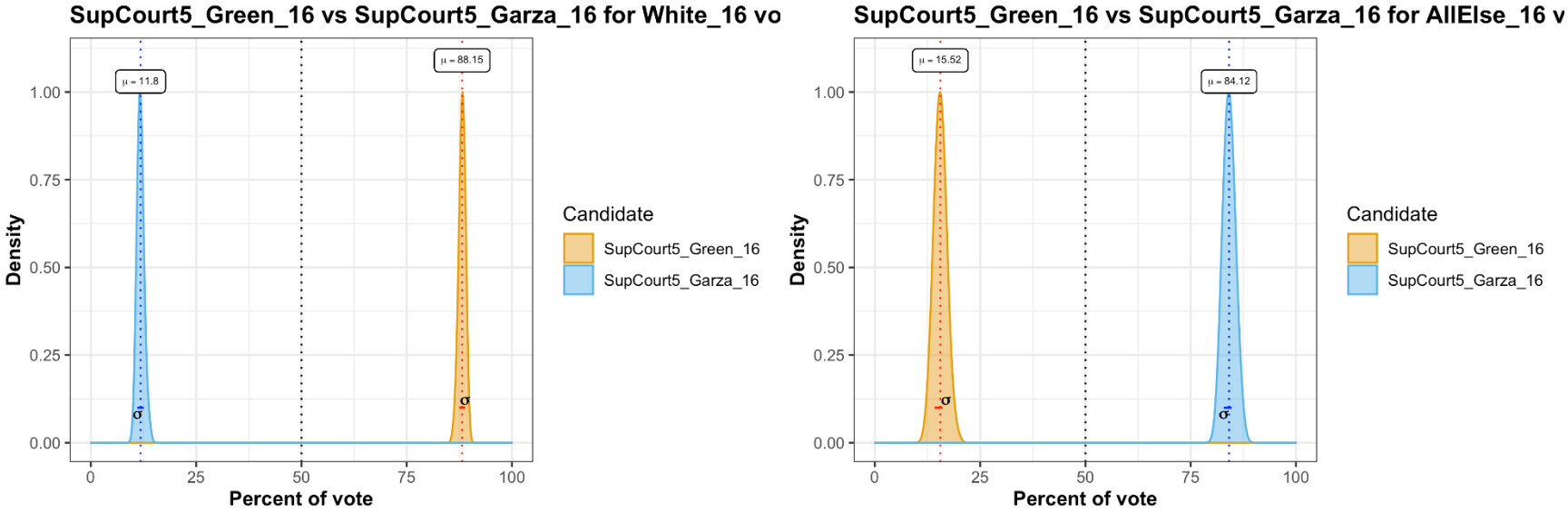




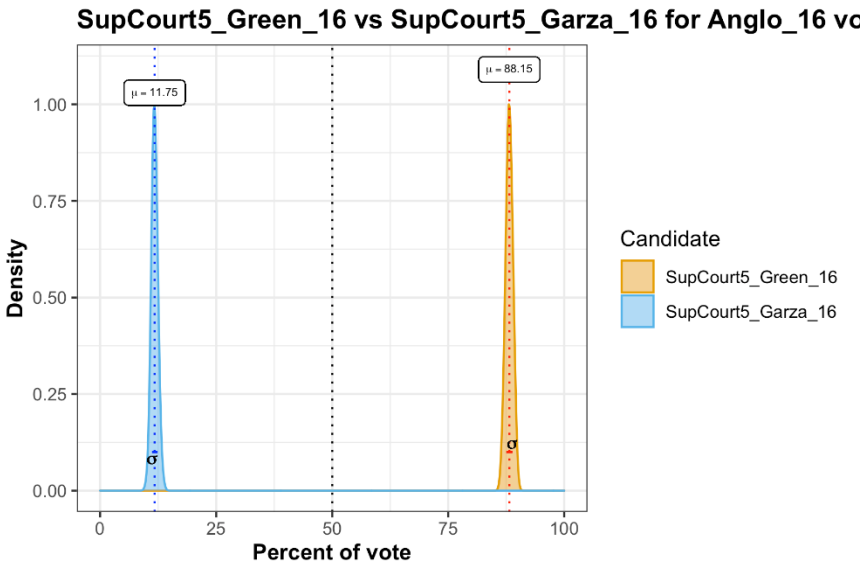


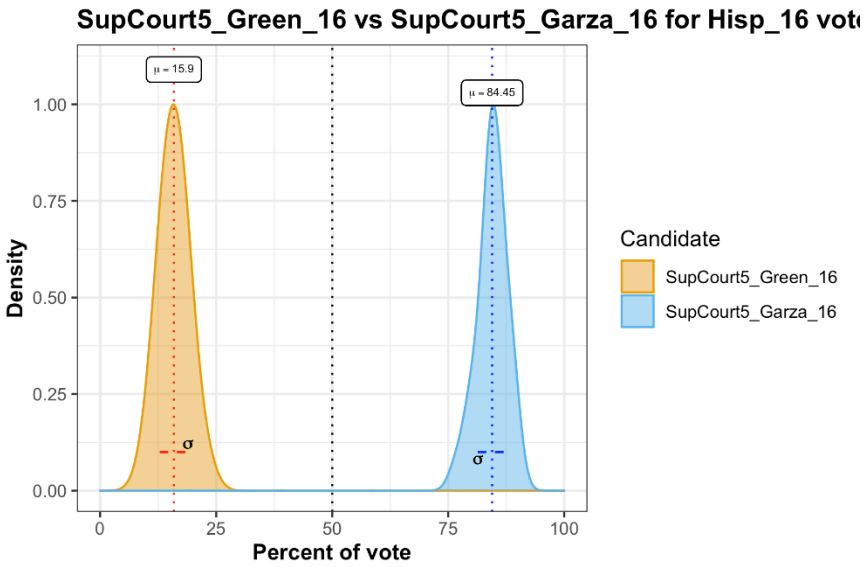
XX. 2016 Supreme Court Justice, Position #5

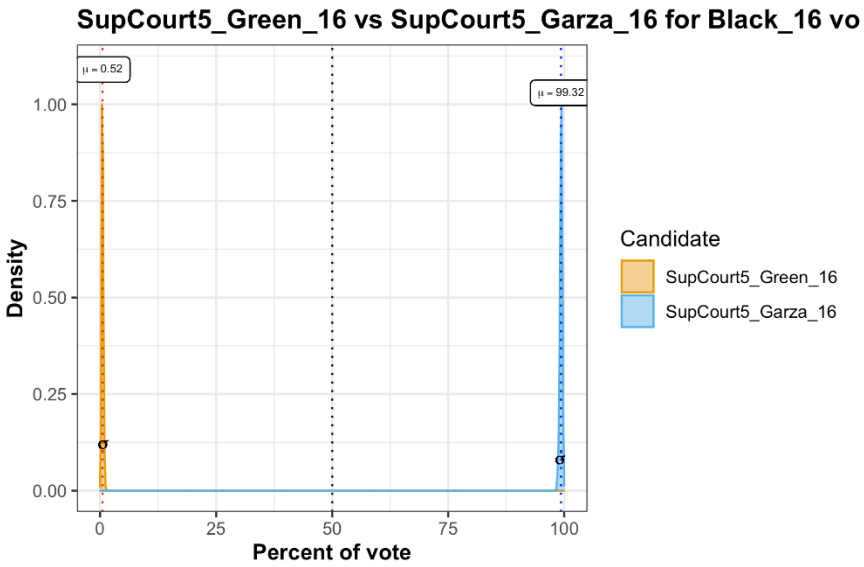
Anglo and Non-Anglo (CVAP)



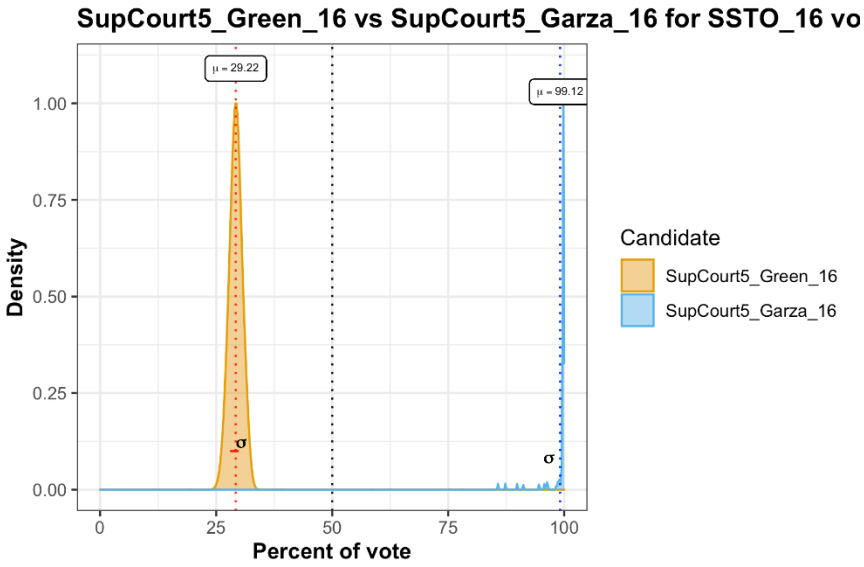
Anglo, Hispanic, and Black (CVAP)



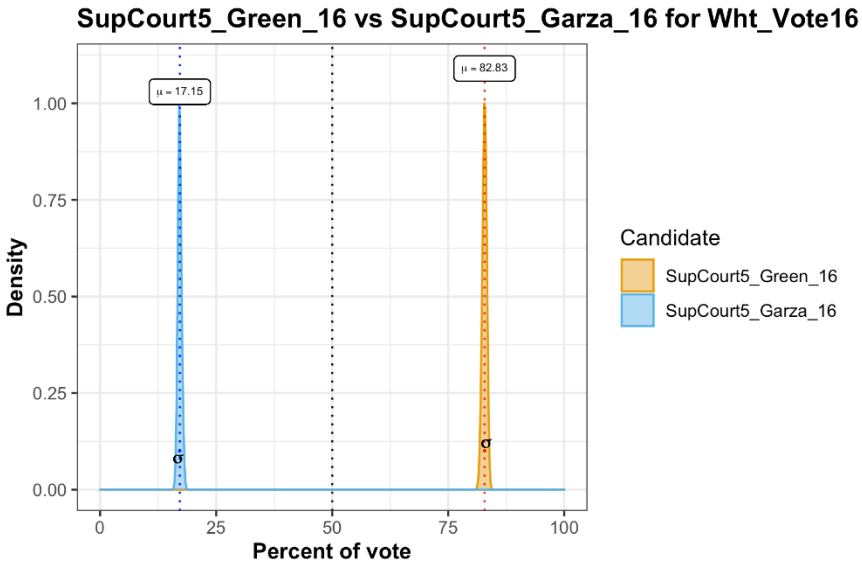


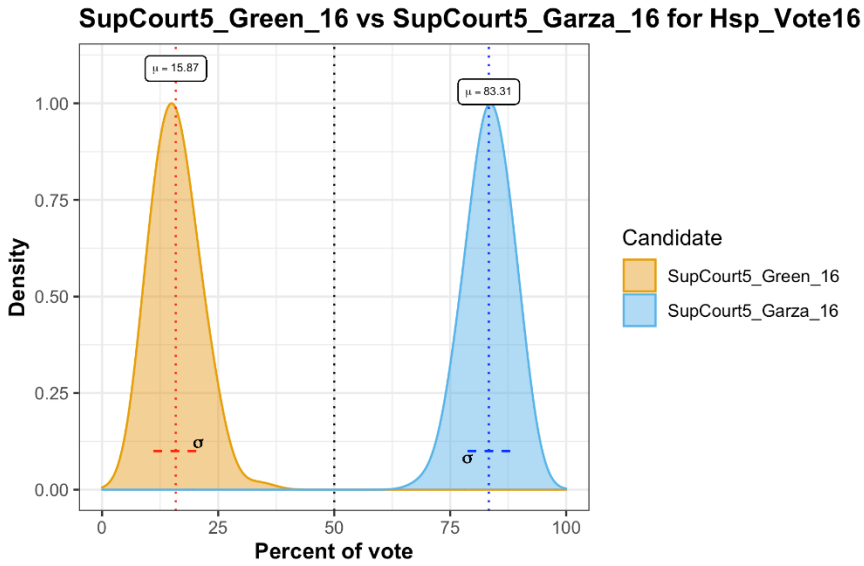


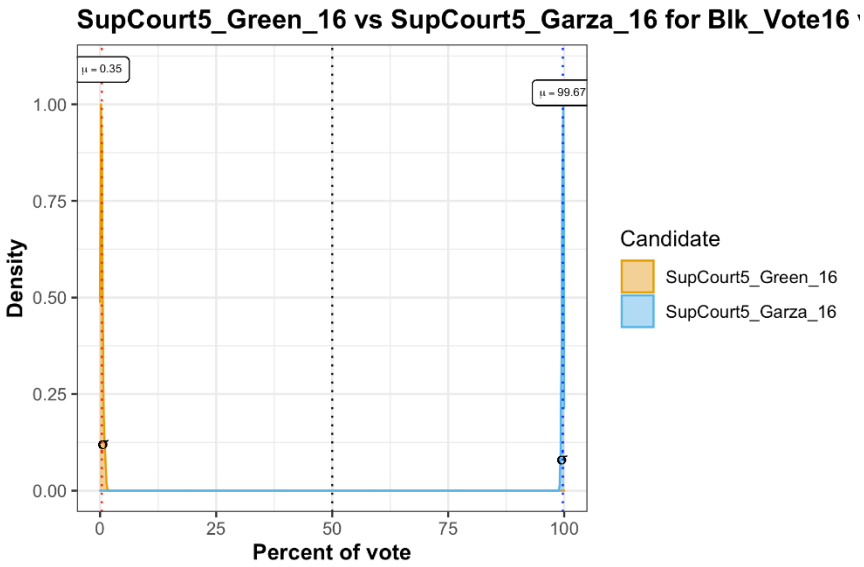
SSTO


SupCourt5_Green_16 vs SupCourt5_Garza_16 for SSTO_16 vo
μ = 29.22
μ = 99.12
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
SupCourt5_Green_16
SupCourt5_Garza_16

Anglo, Hispanic, and Black (Estimated Actual Vote)

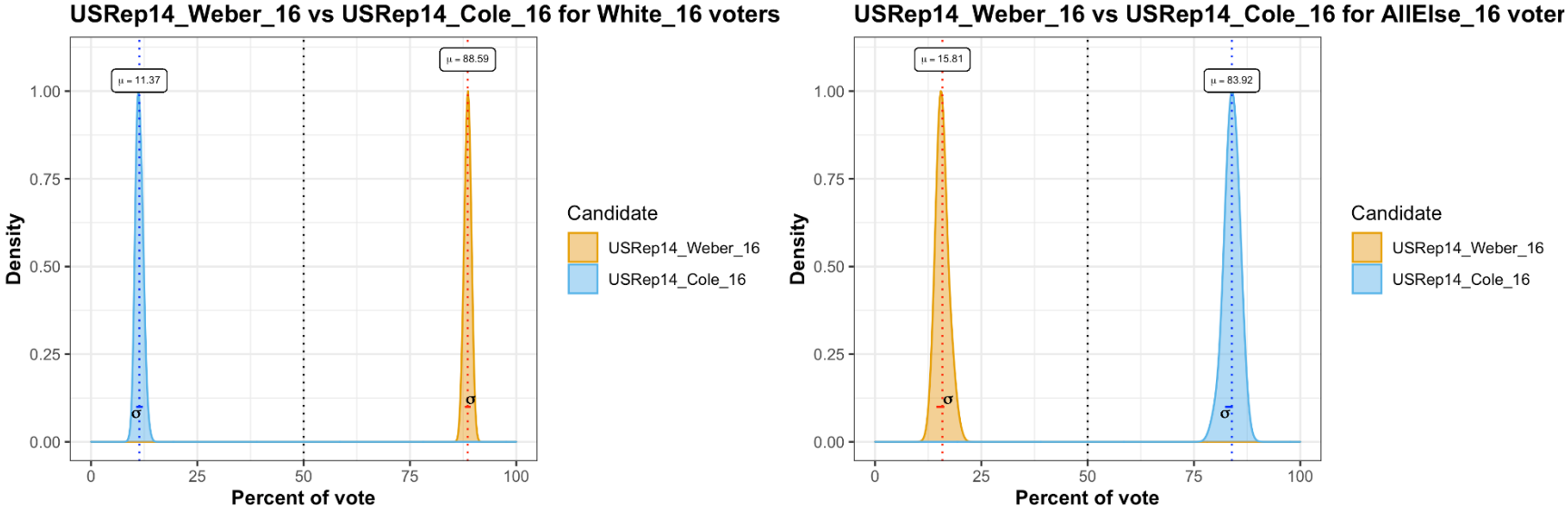




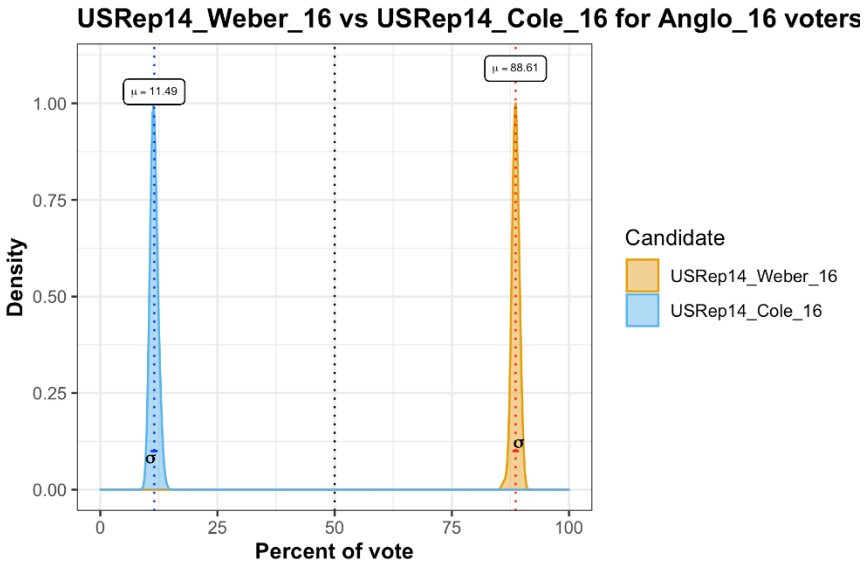


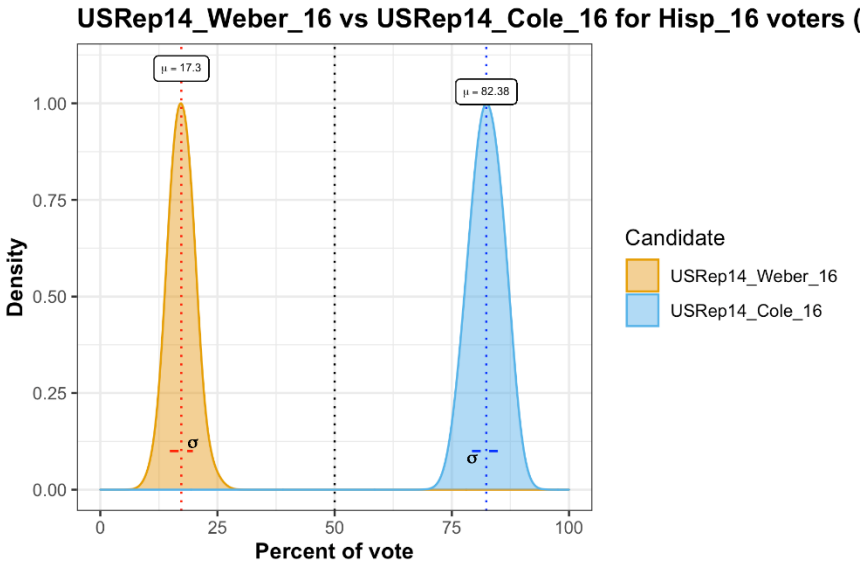
XXI. 2016 U.S. House of Reps, District #14

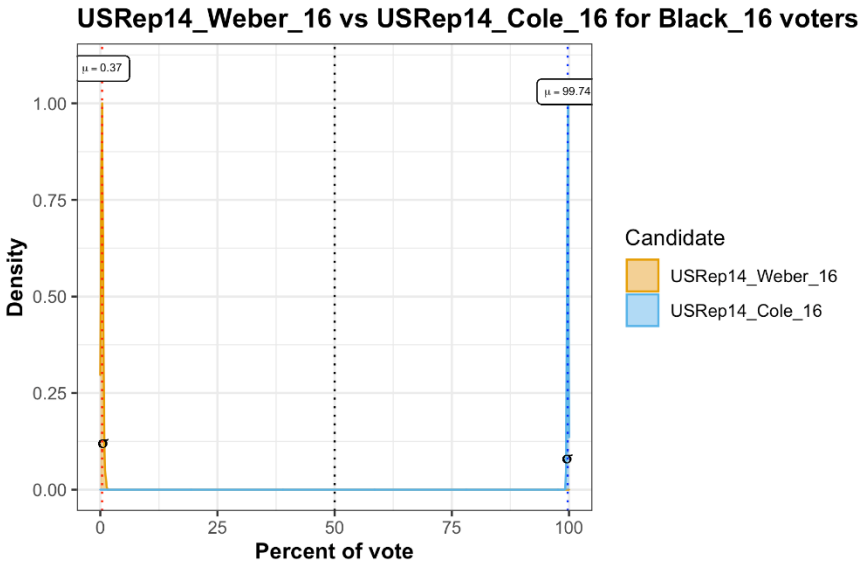
Anglo and Non-Anglo (CVAP)



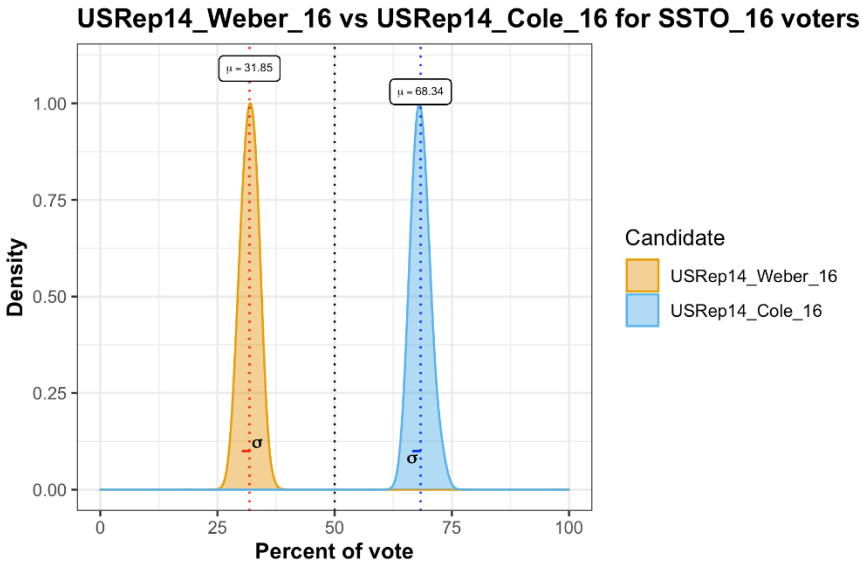
Anglo, Hispanic, and Black (CVAP)



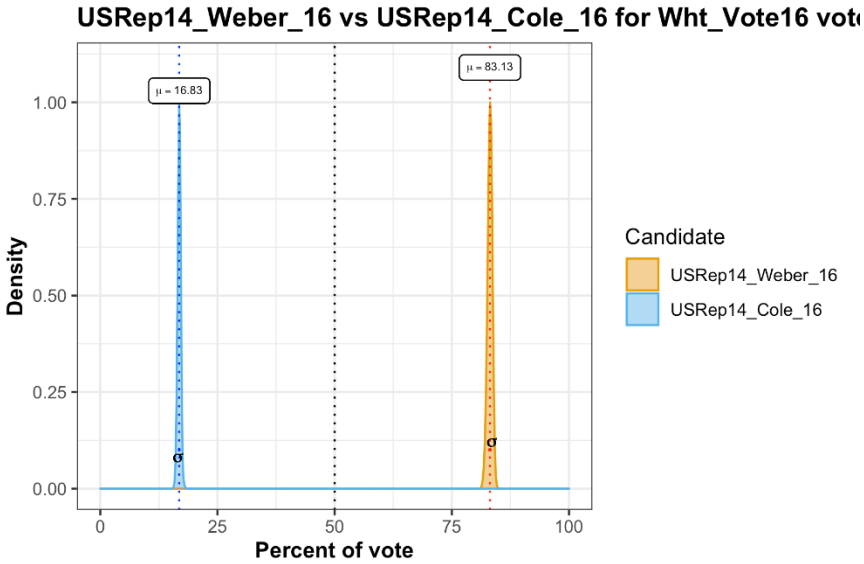


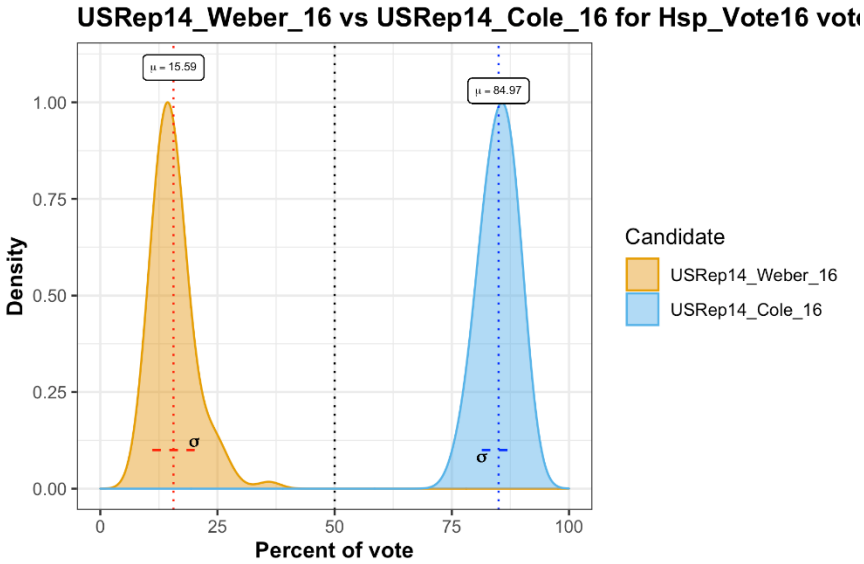


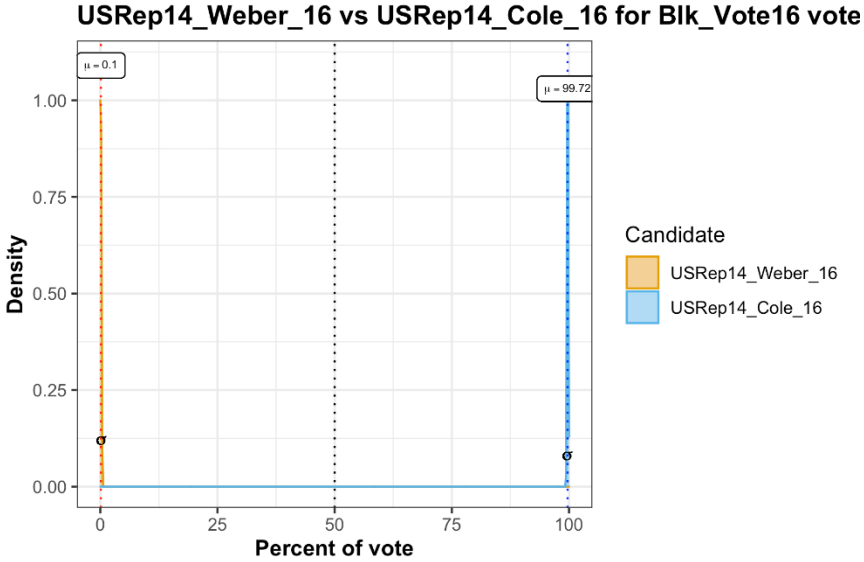
SSTO


USRep14_Weber_16 vs USRep14_Cole_16 for SSTO_16 voters
μ = 31.85
μ = 68.34
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
USRep14_Weber_16
USRep14_Cole_16

Anglo, Hispanic, and Black (Estimated Actual Vote)

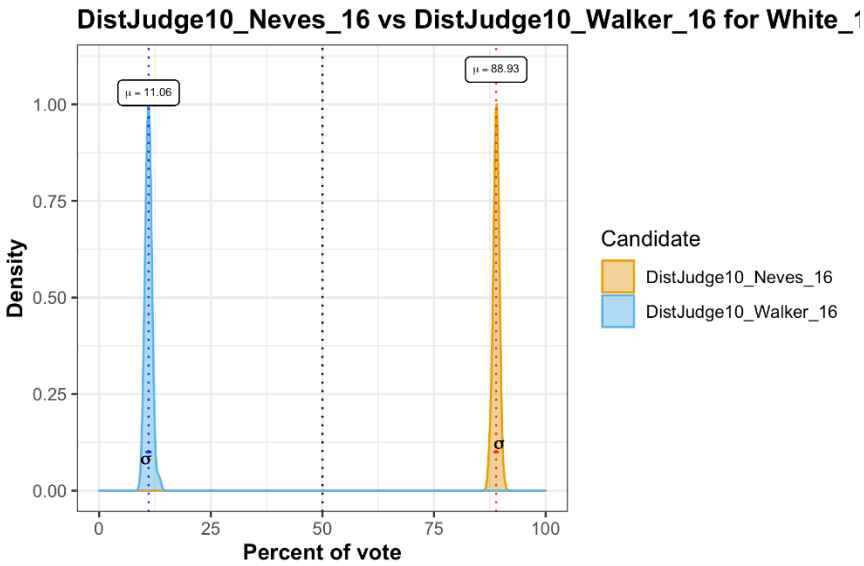


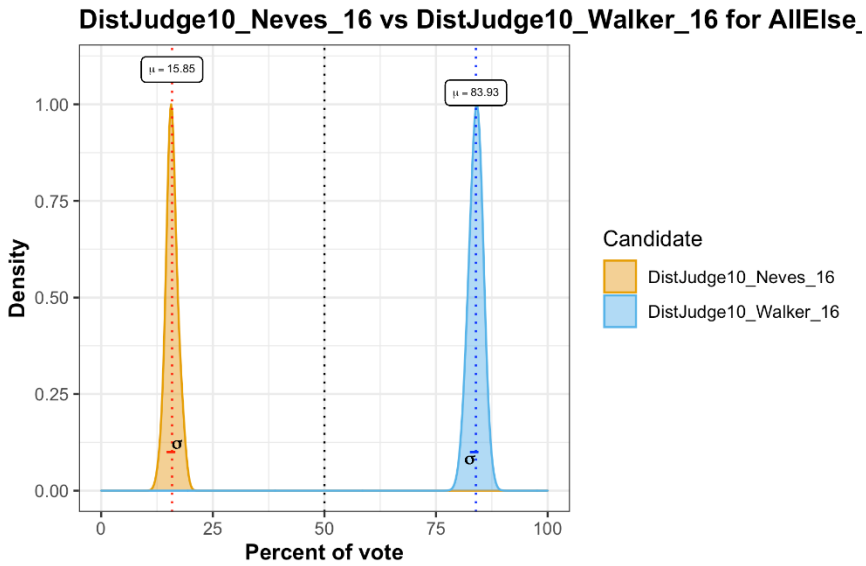




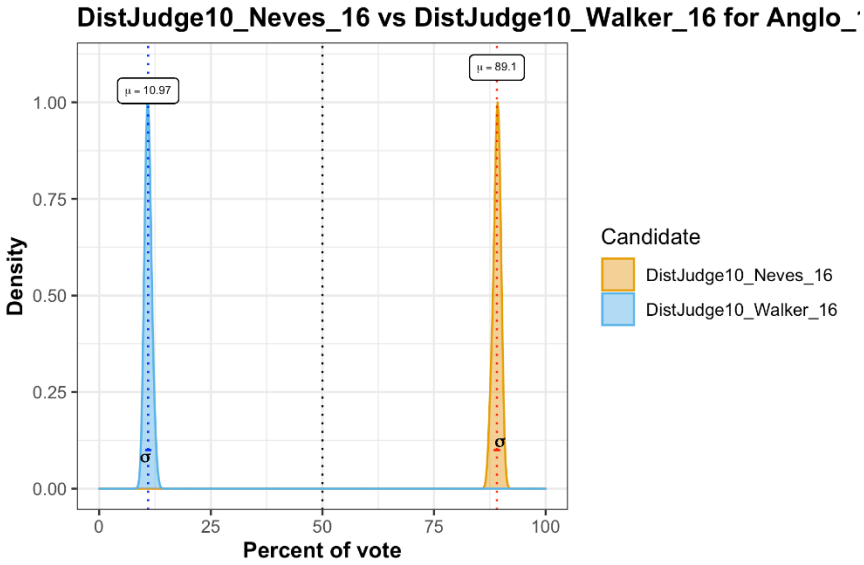
XXII. 2016 District 10 Judge

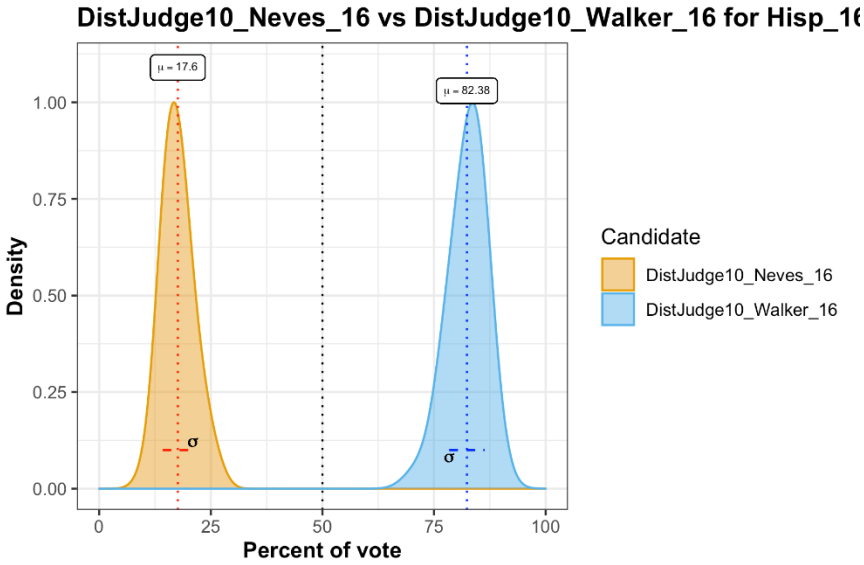
Anglo and Non-Anglo (CVAP)

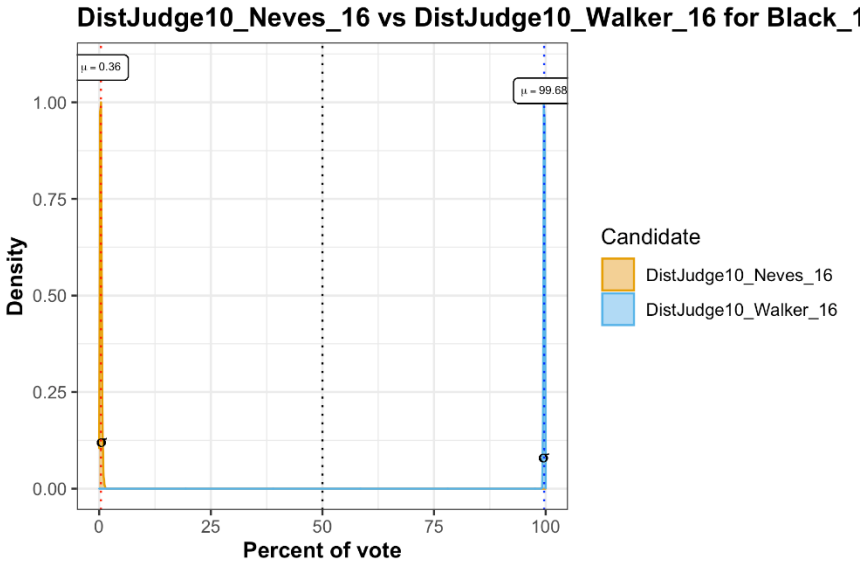




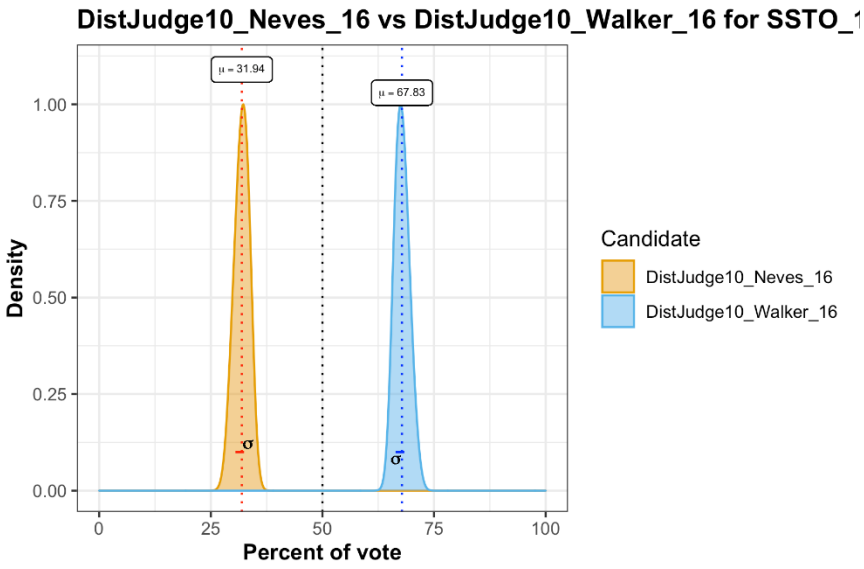
Anglo, Hispanic, and Black (CVAP)



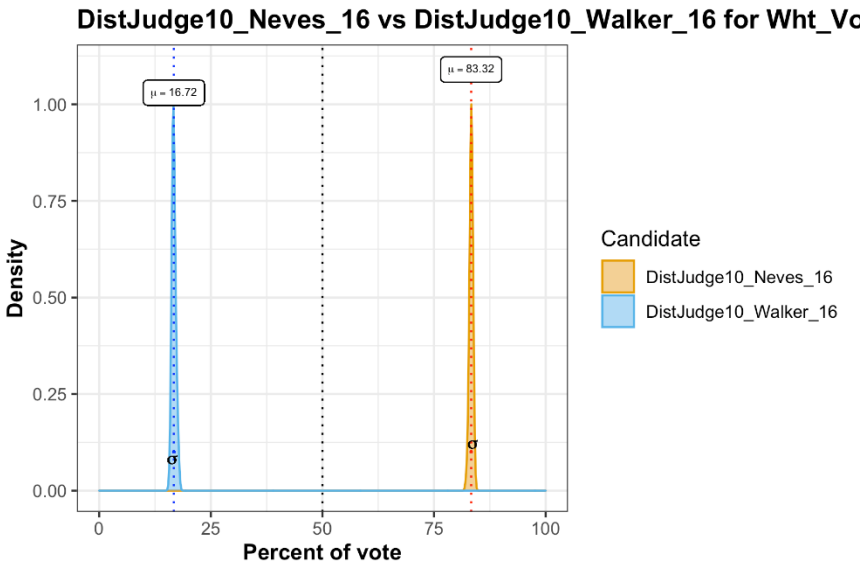


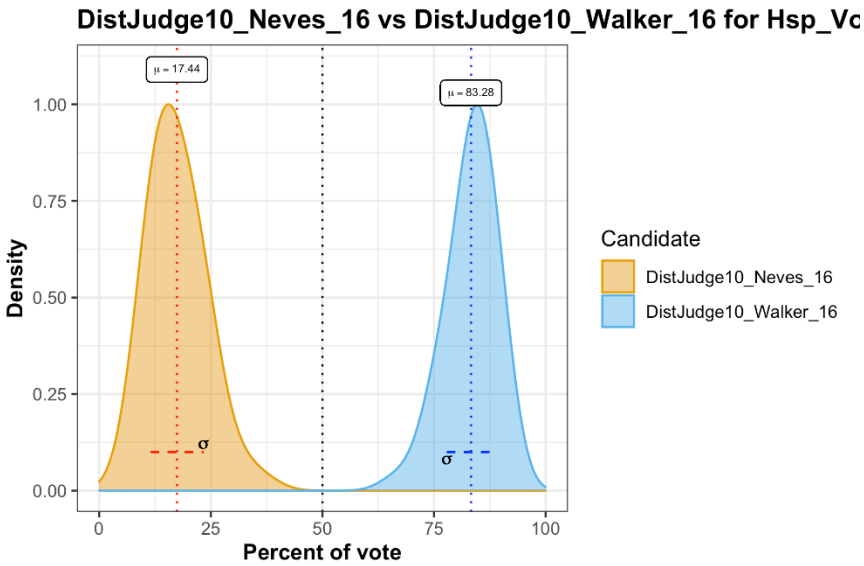


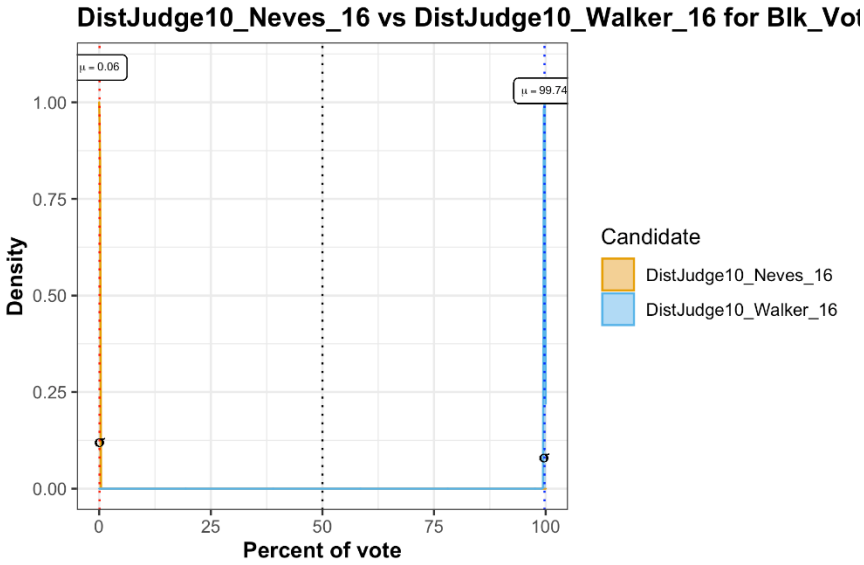
SSTO


DistJudge10_Neves_16 vs DistJudge10_Walker_16 for SSTO_1
μ = 31.94
μ = 67.83
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
DistJudge10_Neves_16
DistJudge10_Walker_16

Anglo, Hispanic, and Black (Estimated Actual Vote)

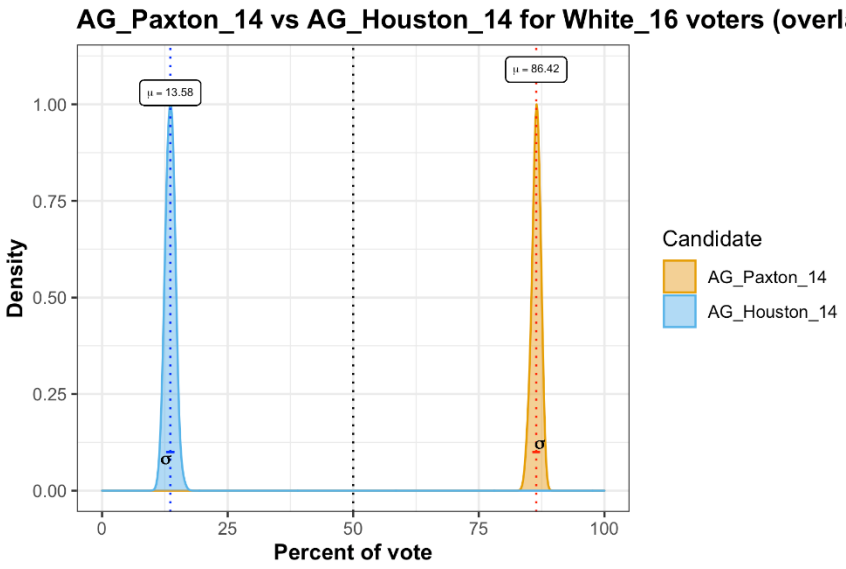


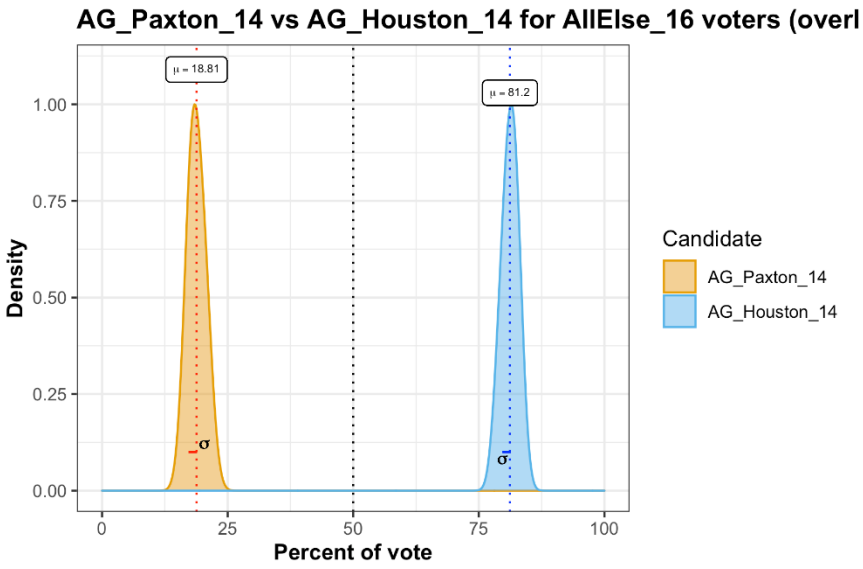




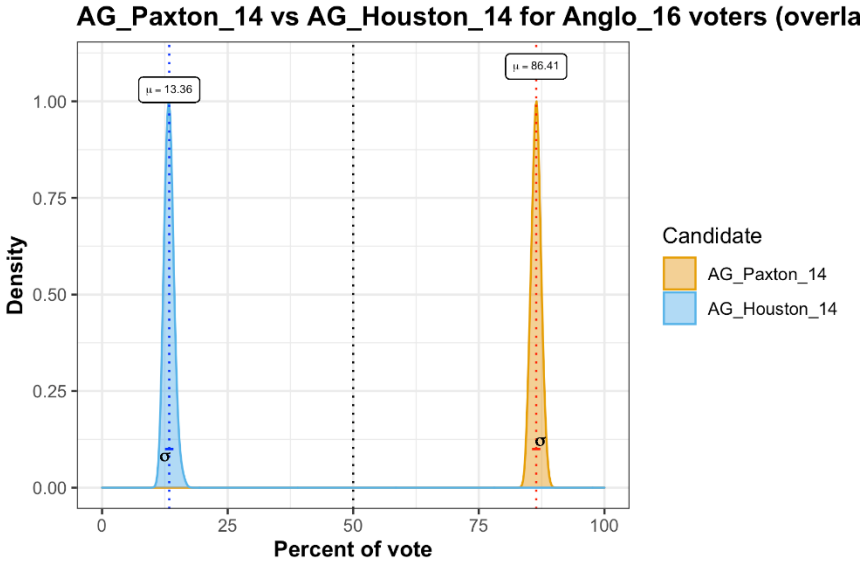
XXIII. 2014 Attorney General

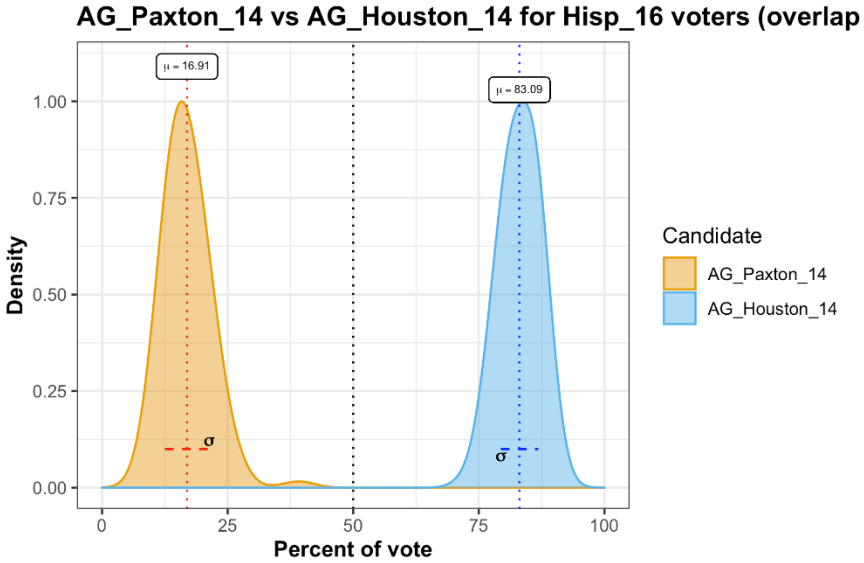
Anglo and Non-Anglo (CVAP)

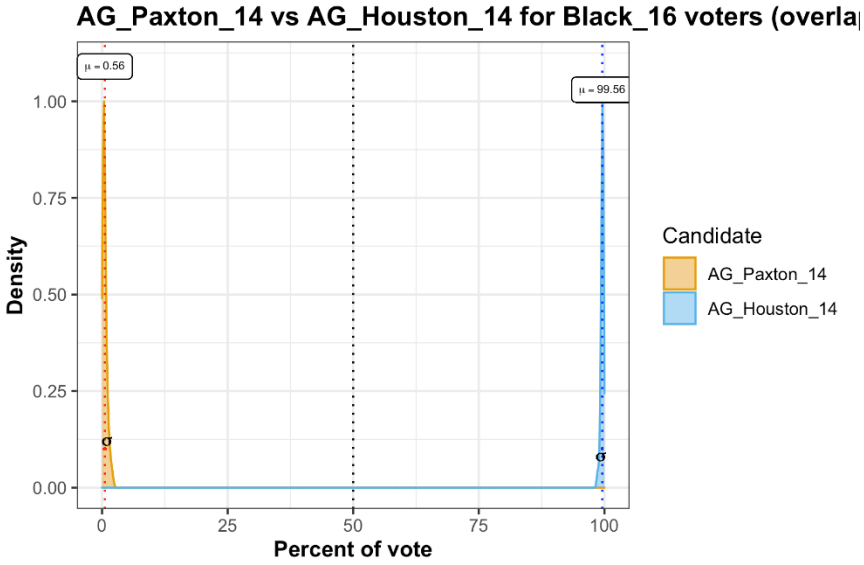




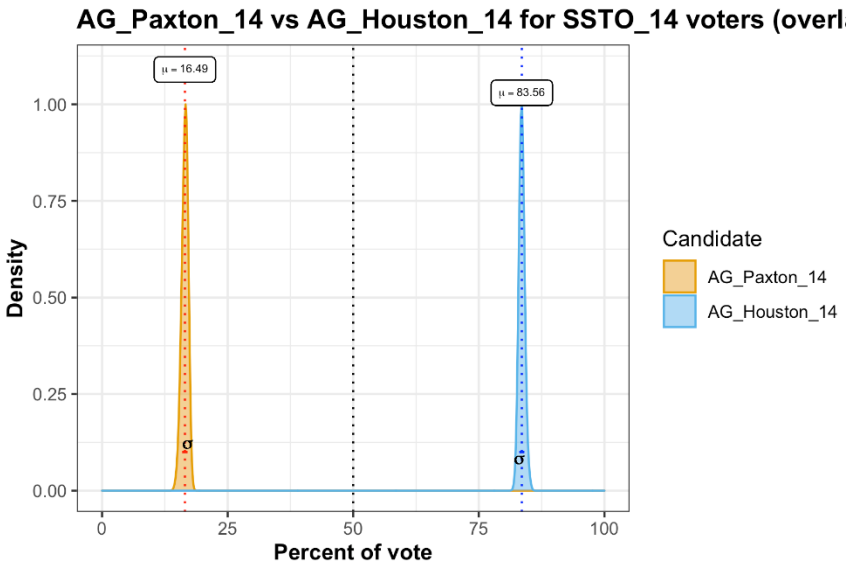
Anglo, Hispanic, and Black (CVAP)



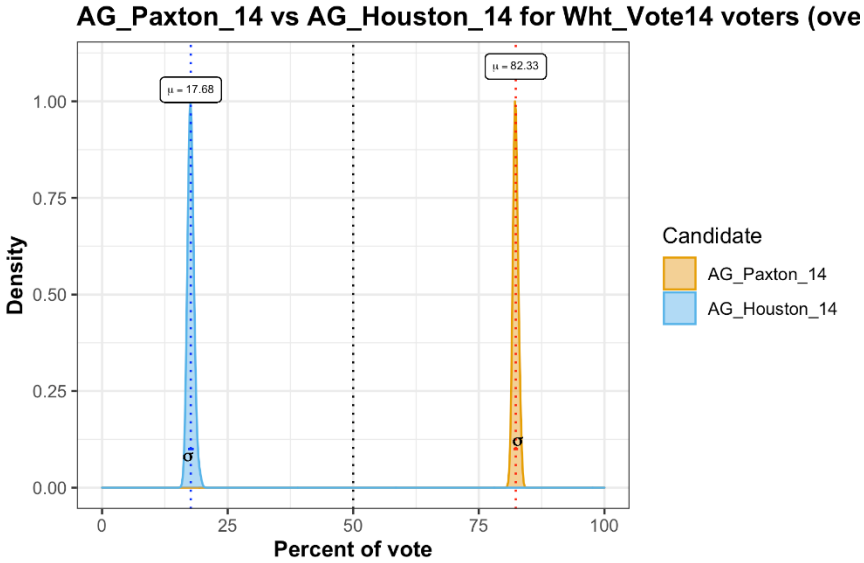


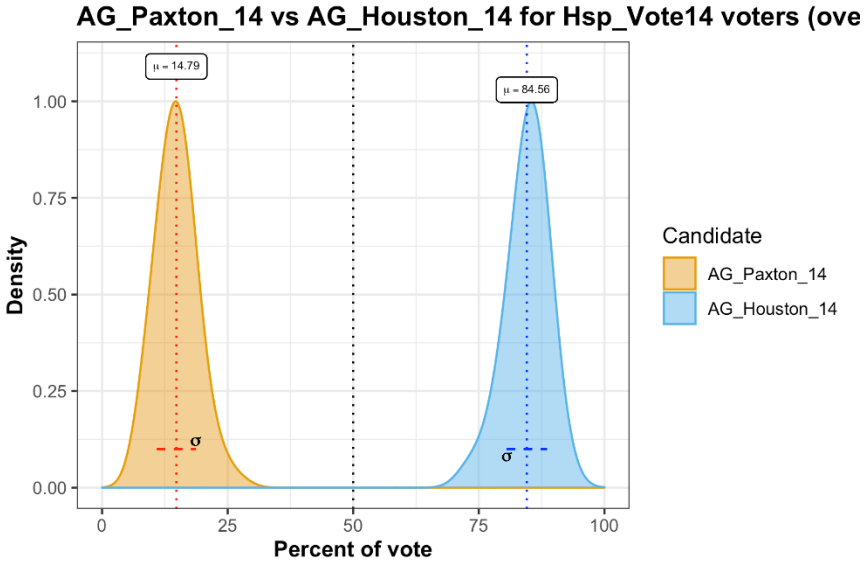


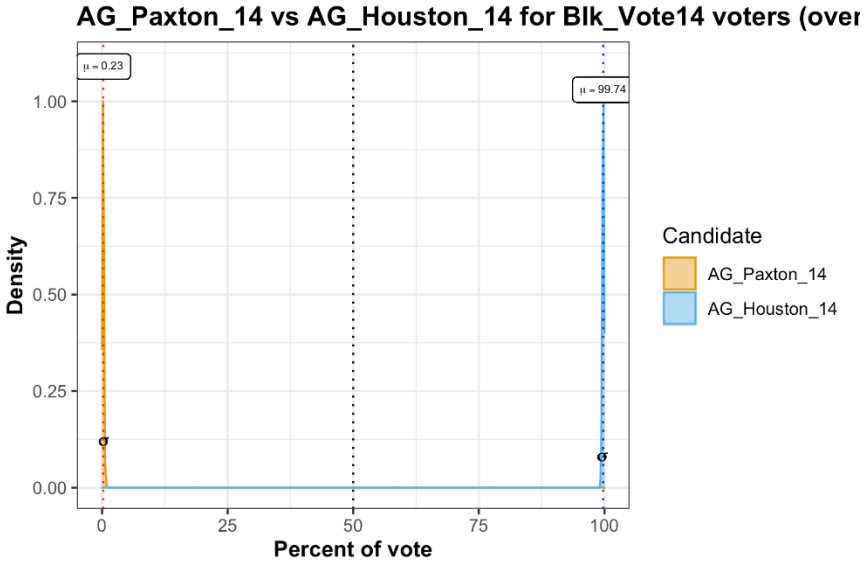
SSTO


AG_Paxton_14 vs AG_Houston_14 for SSTO_14 voters (overla
μ = 16.49
μ = 83.56
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
AG_Paxton_14
AG_Houston_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

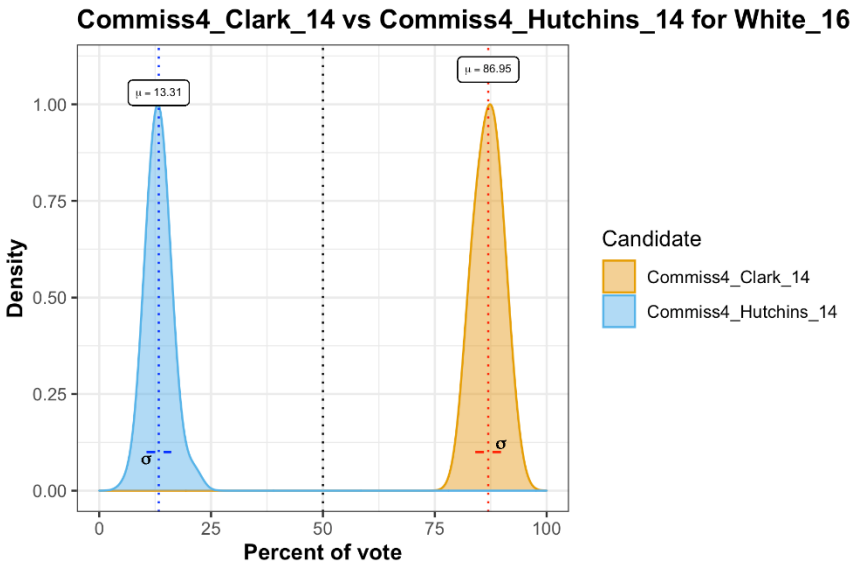


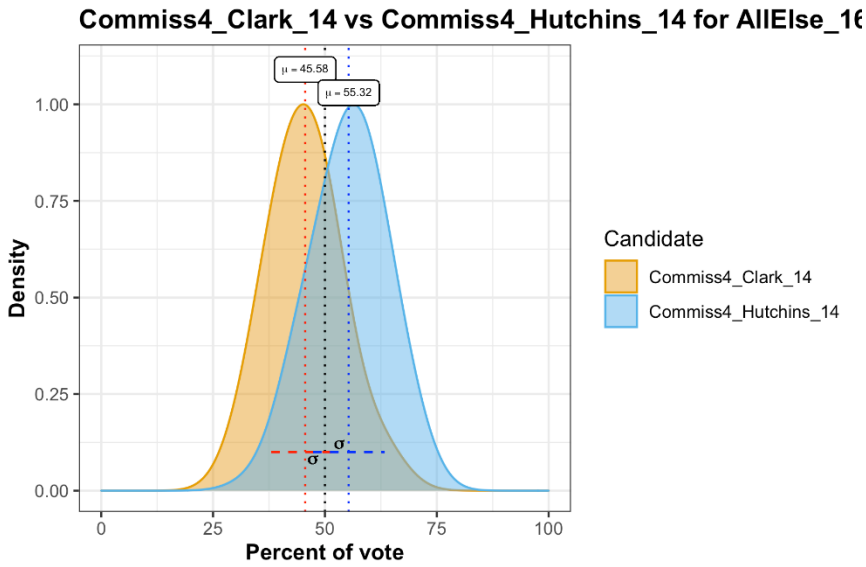




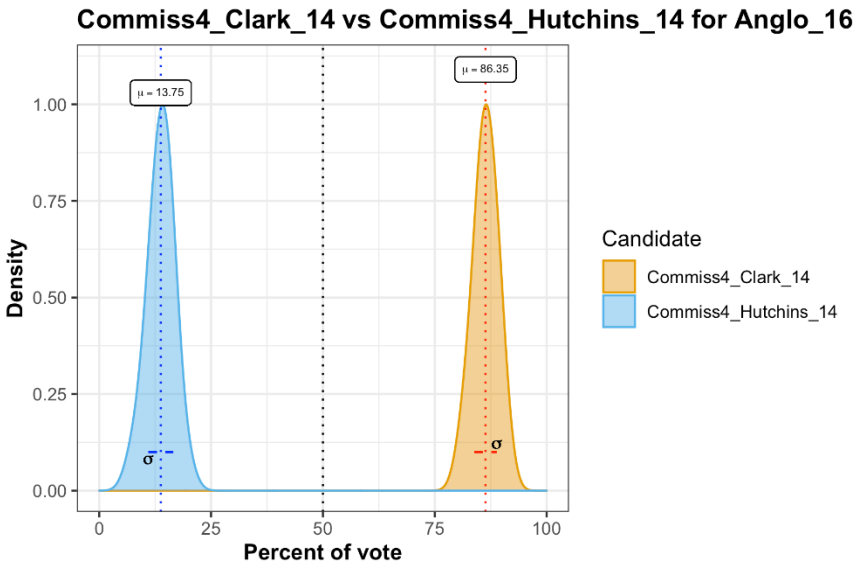
XXIV. 2014 County Commissioner, Precinct #4

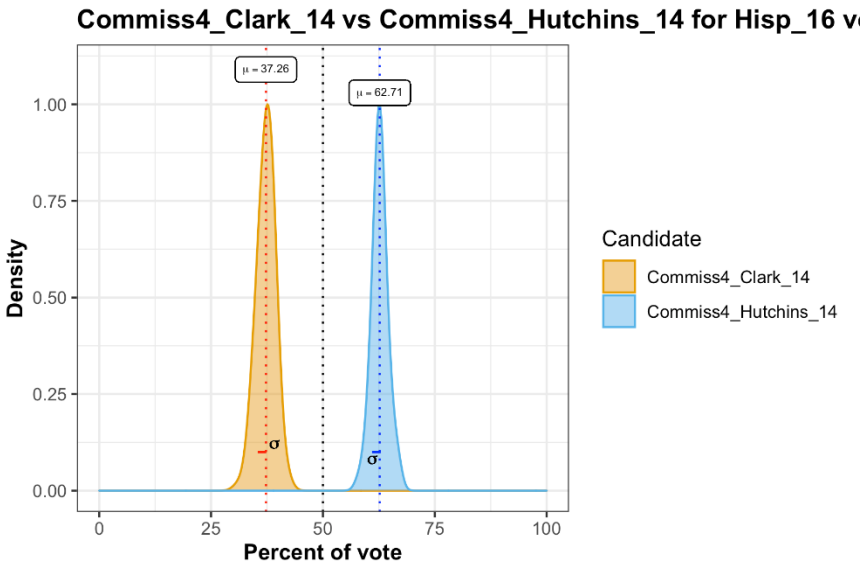
Anglo and Non-Anglo (CVAP)

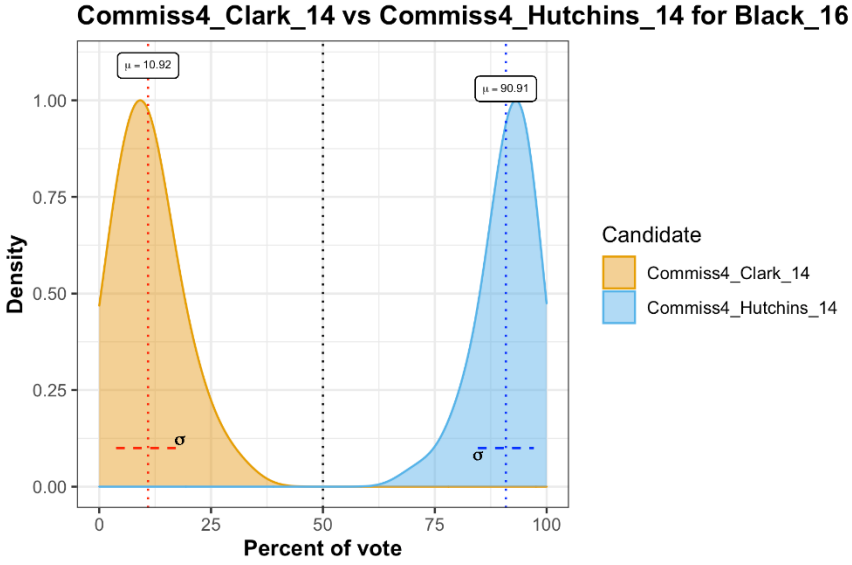




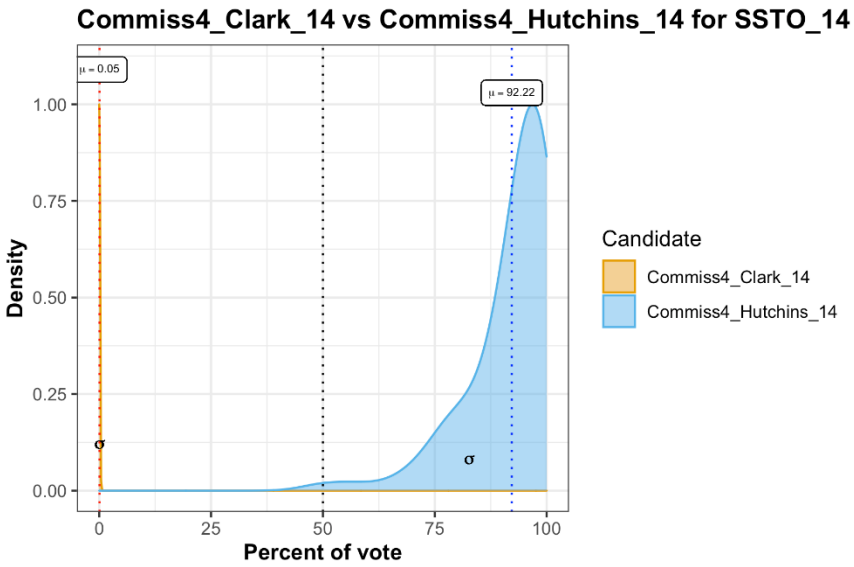
Anglo, Hispanic, and Black (CVAP)



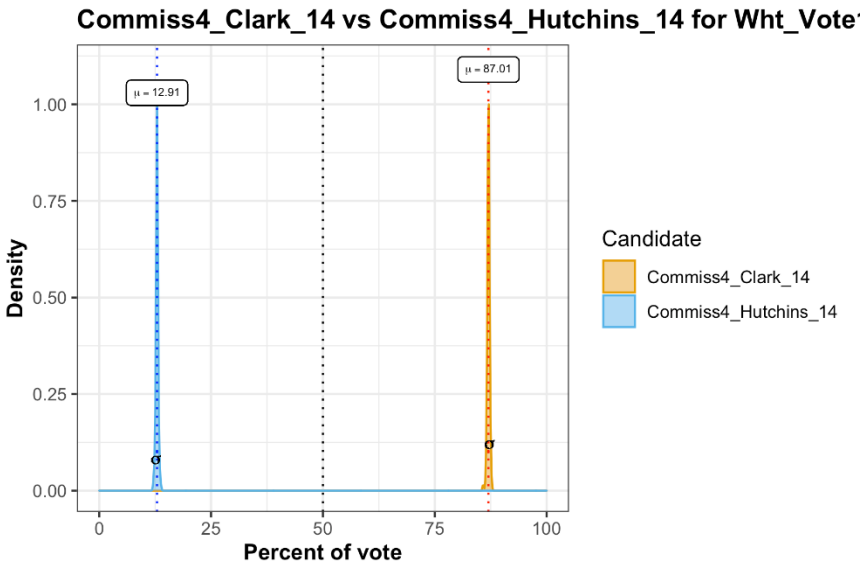


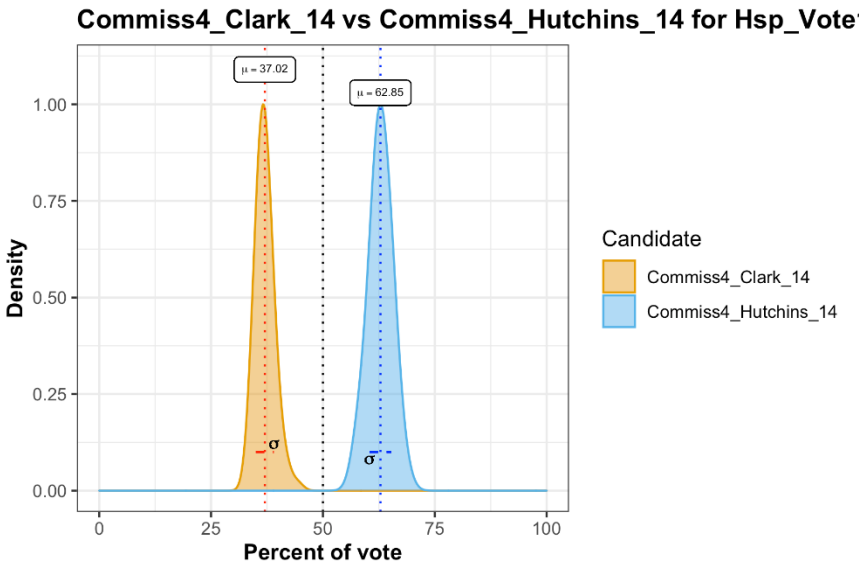


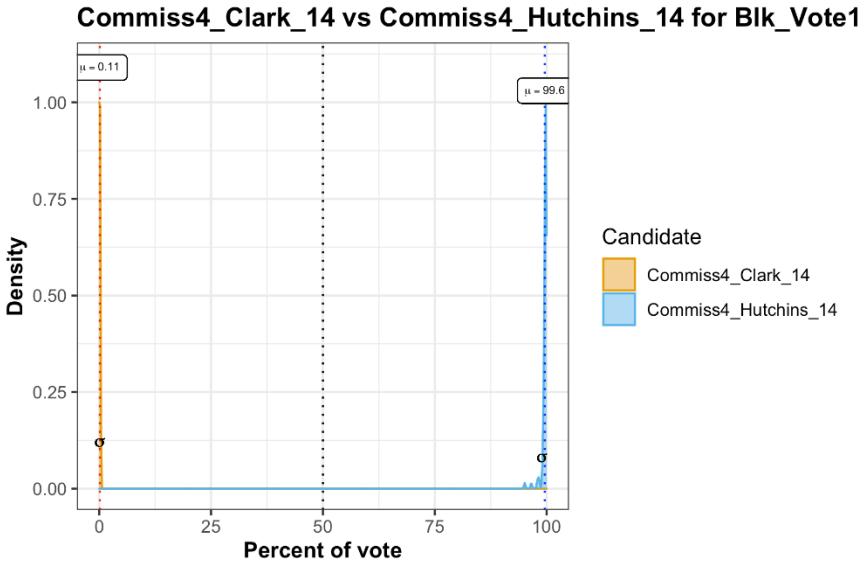
SSTO


Commiss4_Clark_14 vs Commiss4_Hutchins_14 for SSTO_14
μ = 0.05
μ = 92.22
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
Commiss4_Clark_14
Commiss4_Hutchins_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

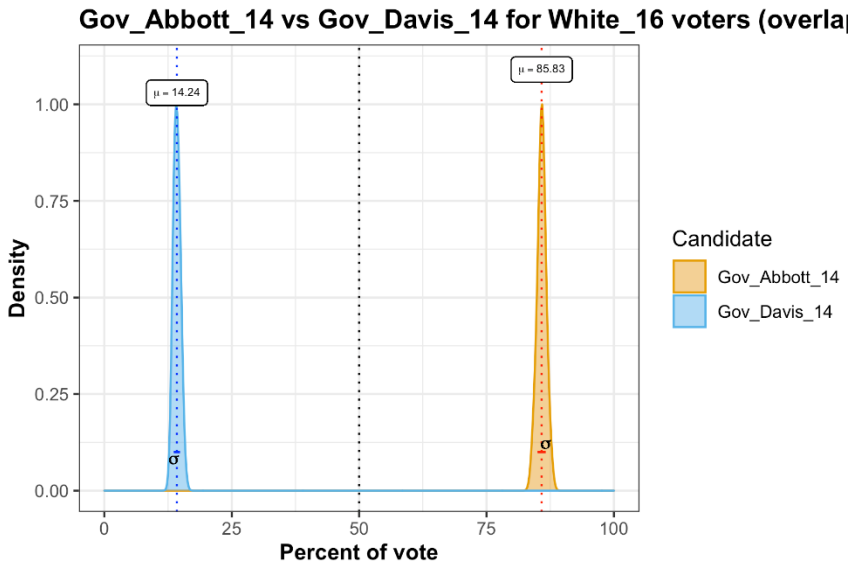


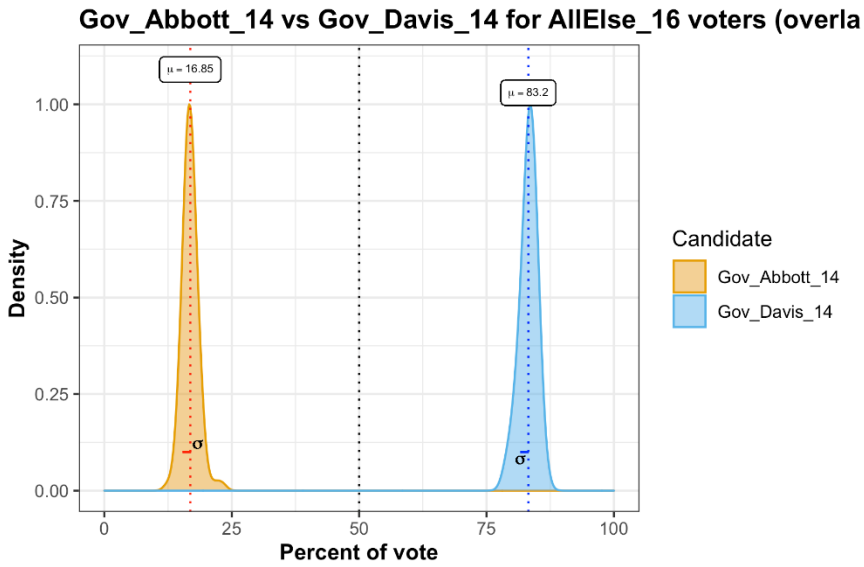




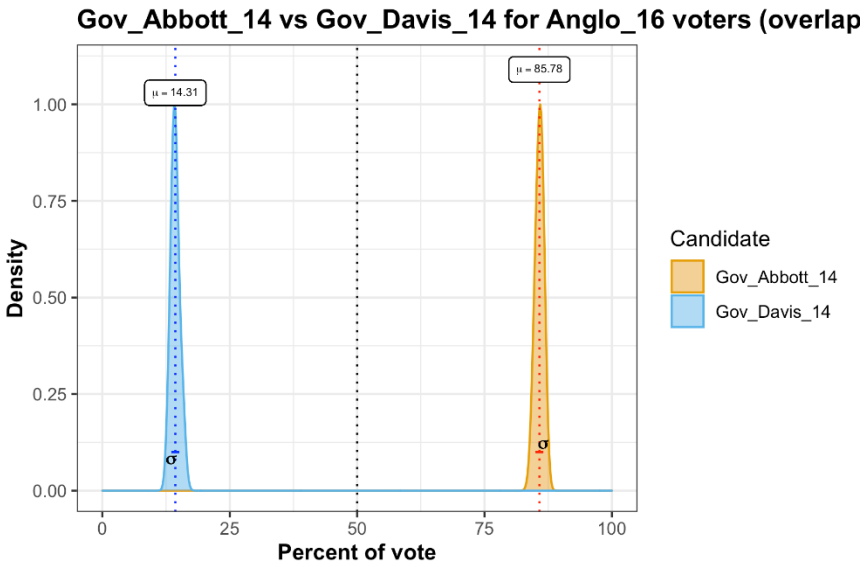
XXV. 2014 Governor

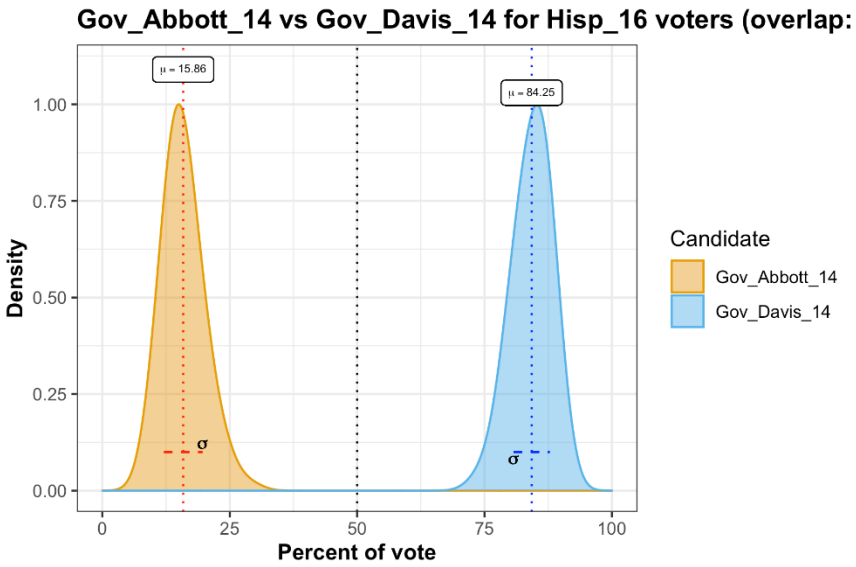
Anglo and Non-Anglo (CVAP)

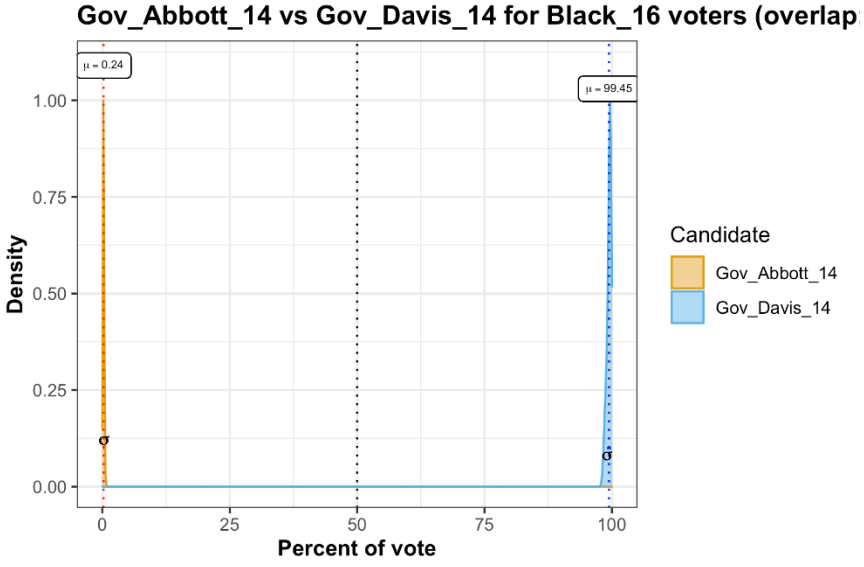




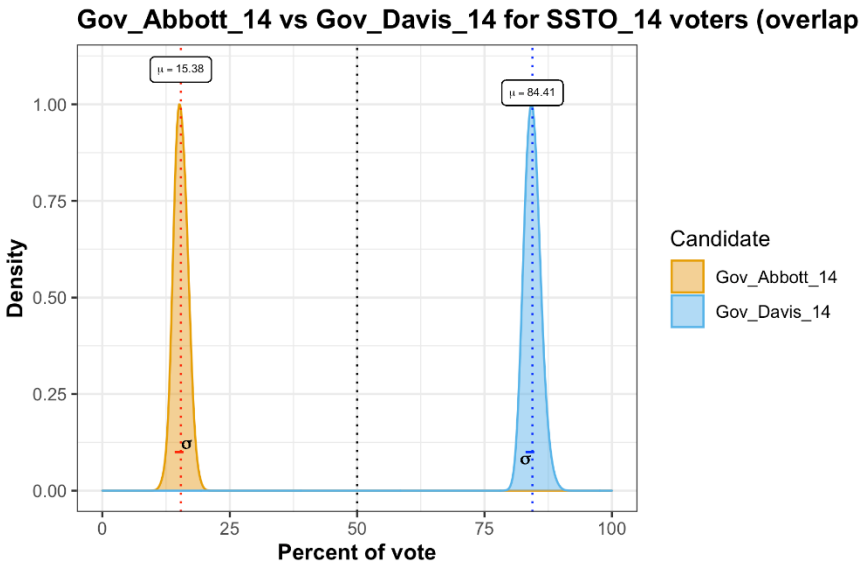
Anglo, Hispanic, and Black (CVAP)



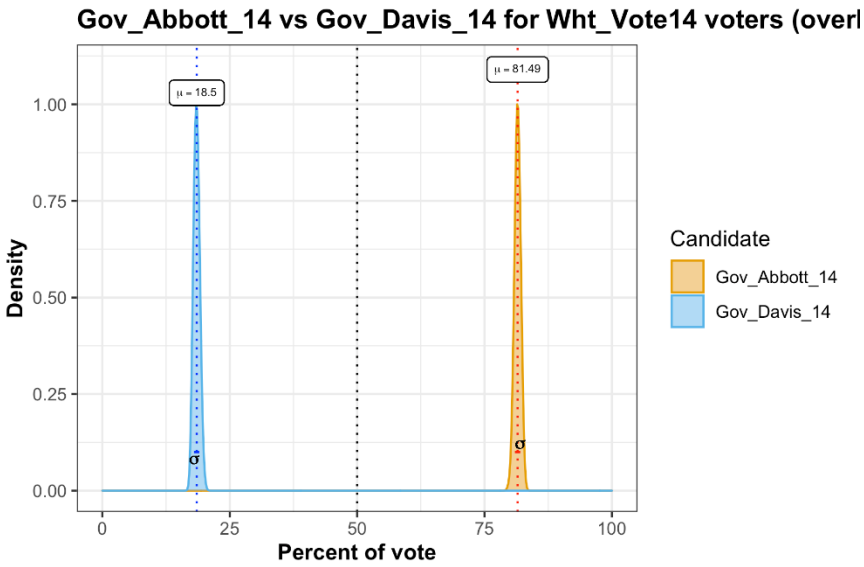


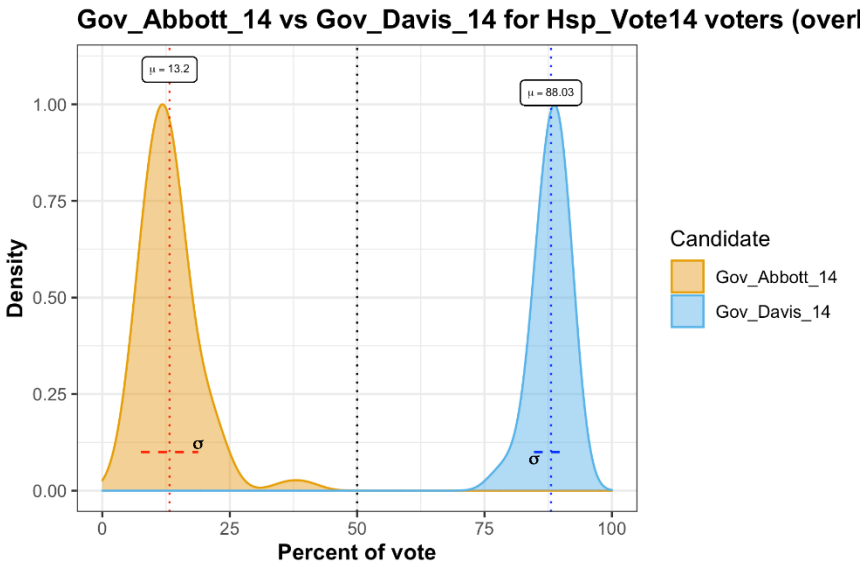


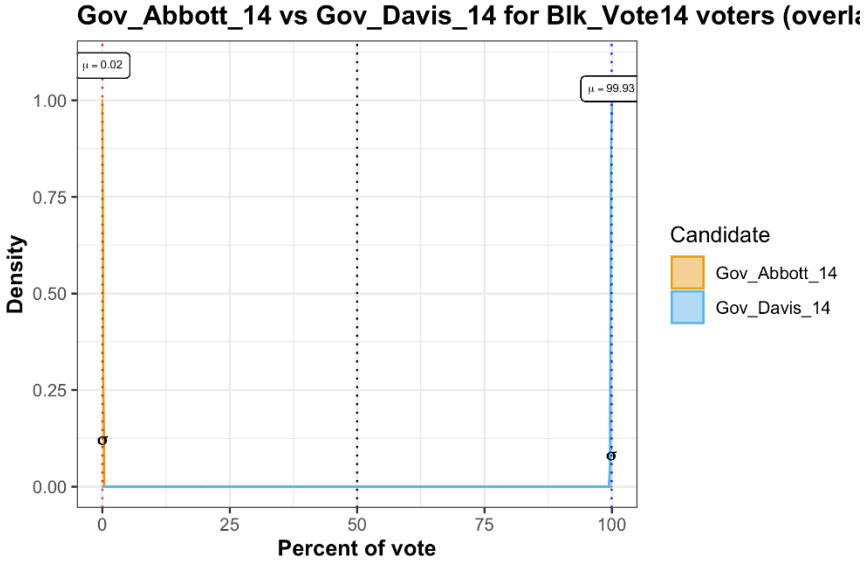
SSTO


Gov_Abbott_14 vs Gov_Davis_14 for SSTO_14 voters (overlap
μ = 15.38
μ = 84.41
1.00
0.75
0.50
0.25
0.00
Density
σ
σ
0
25
50
75
100
Percent of vote
Candidate
Gov_Abbott_14
Gov_Davis_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

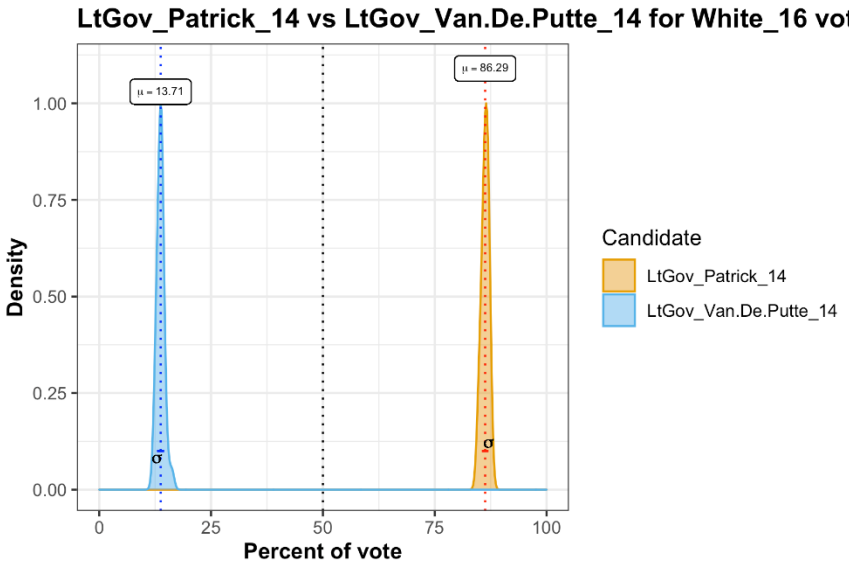


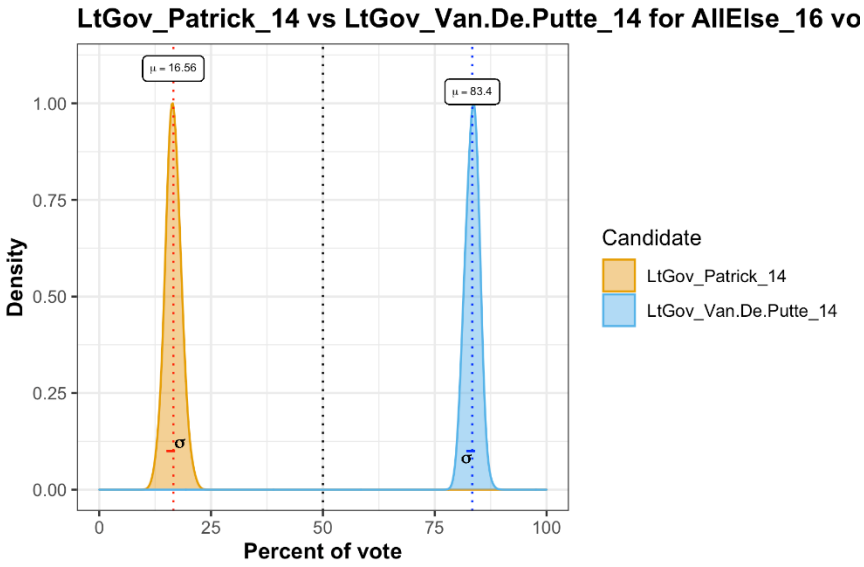




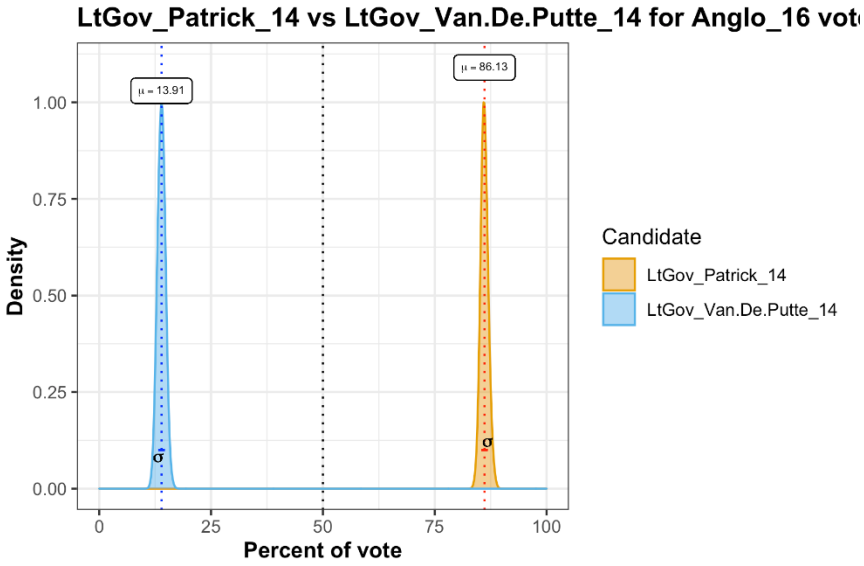
XXVI. 2014 Lt. Governor

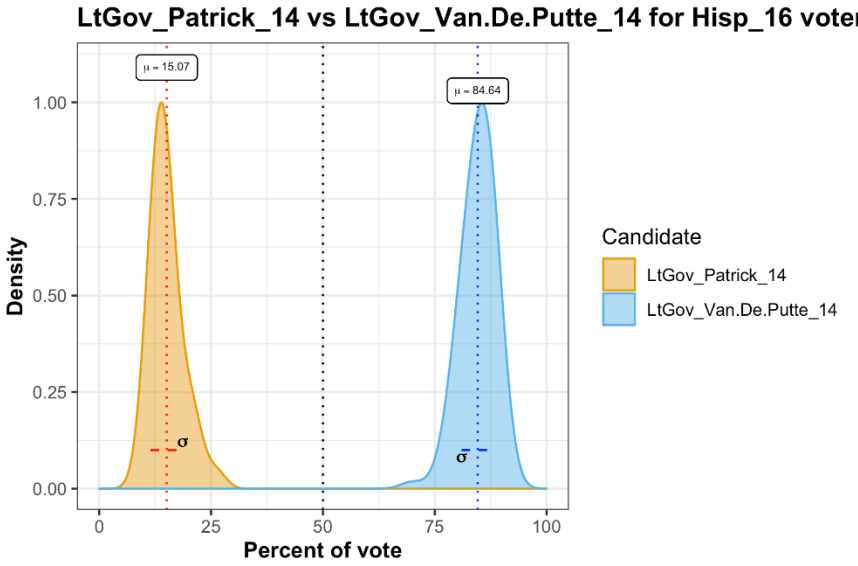
Anglo and Non-Anglo (CVAP)

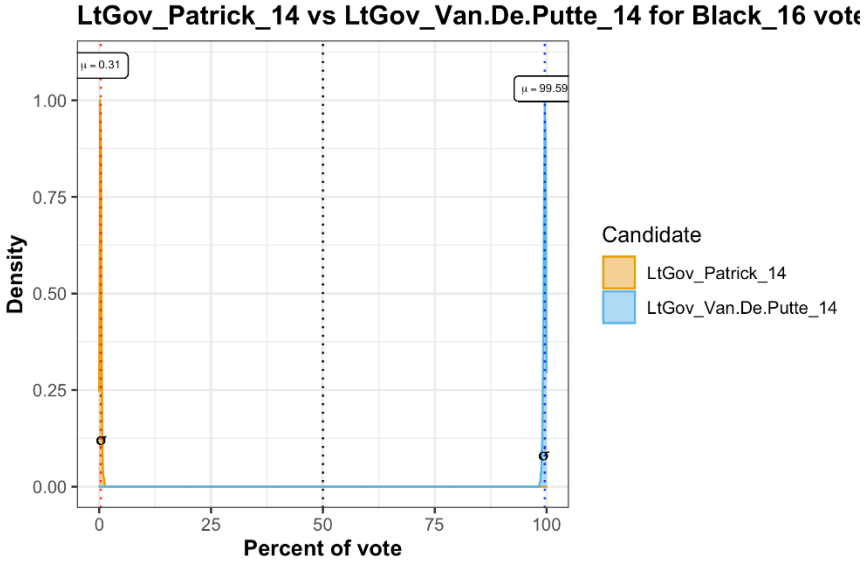




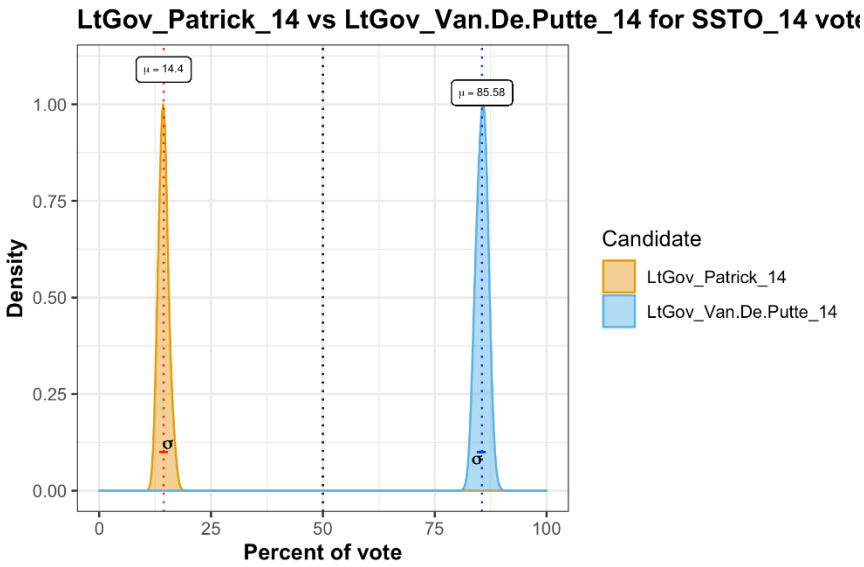
Anglo, Hispanic, and Black (CVAP)



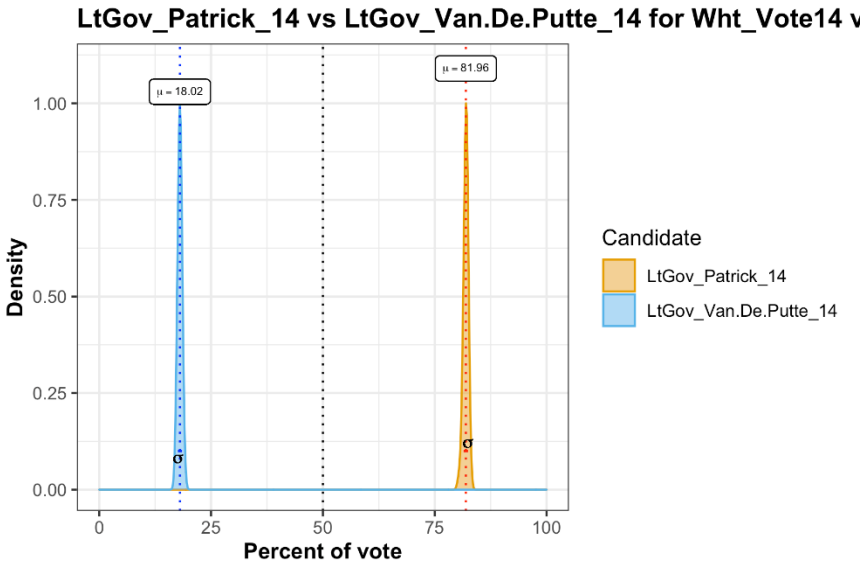


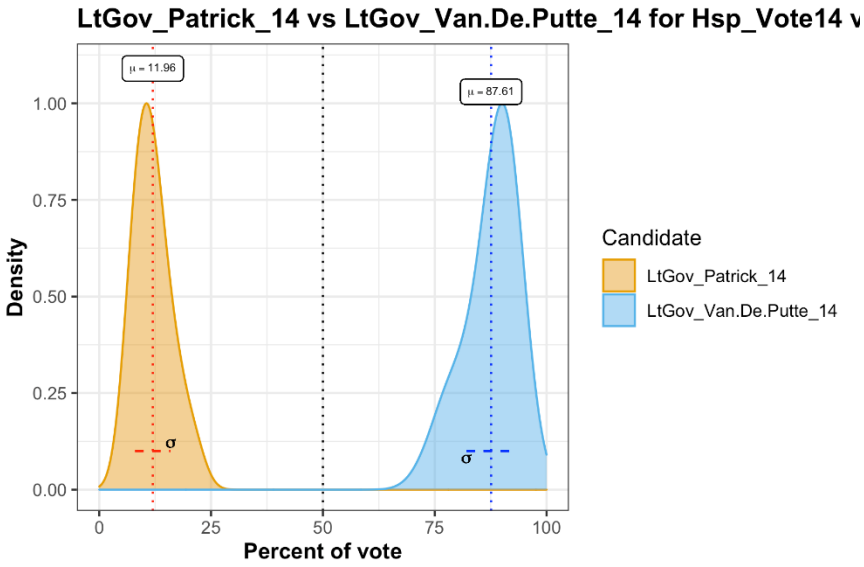


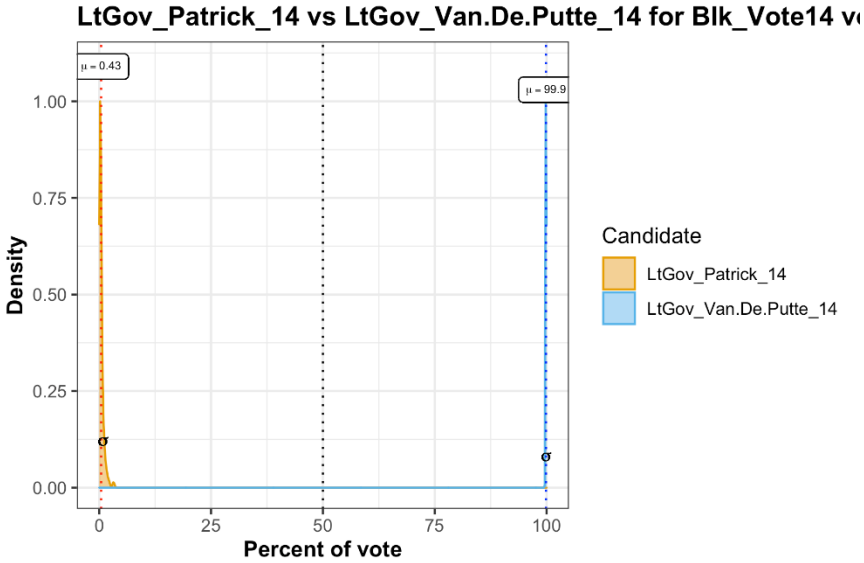
SSTO


LtGov_Patrick_14 vs LtGov_Van.De.Putte_14 for SSTO_14 vote
μ = 14.4
μ = 85.58
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
LtGov_Patrick_14
LtGov_Van.De.Putte_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

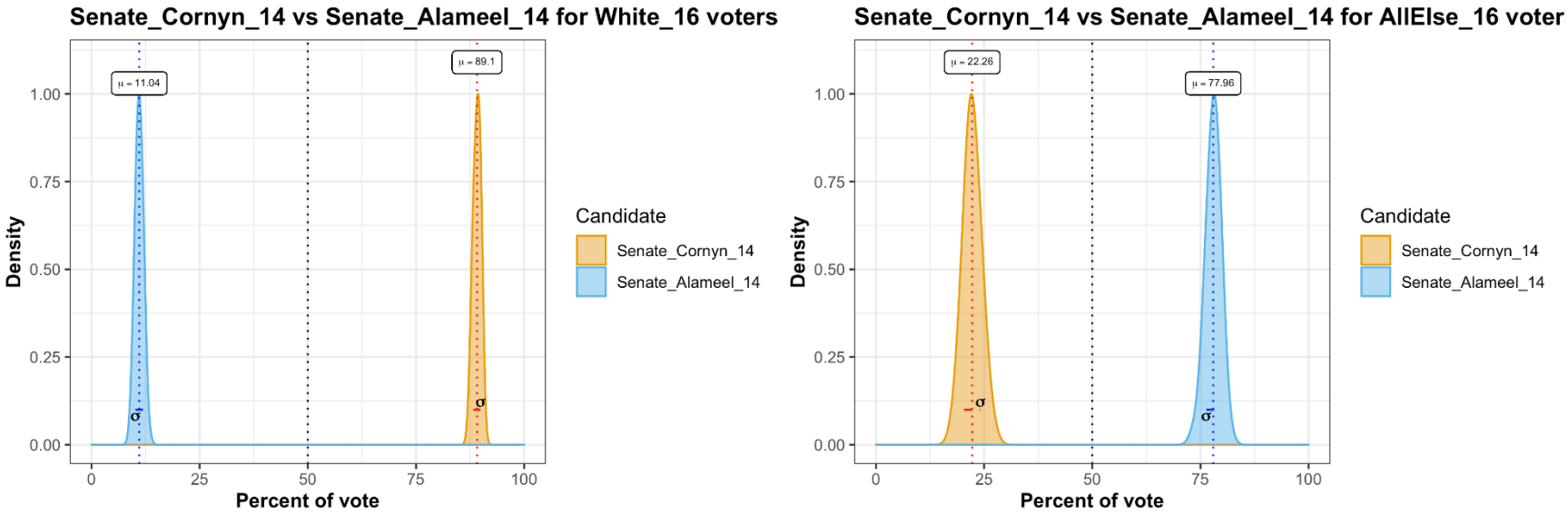




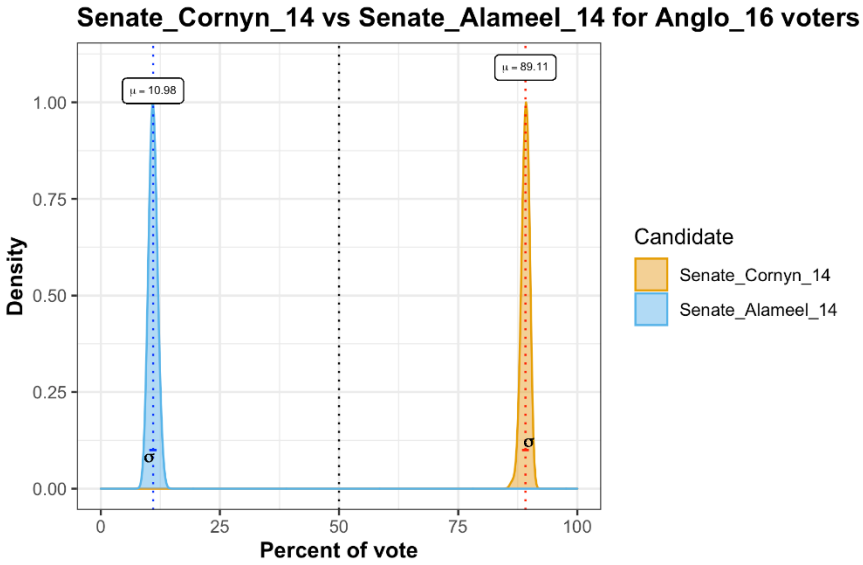


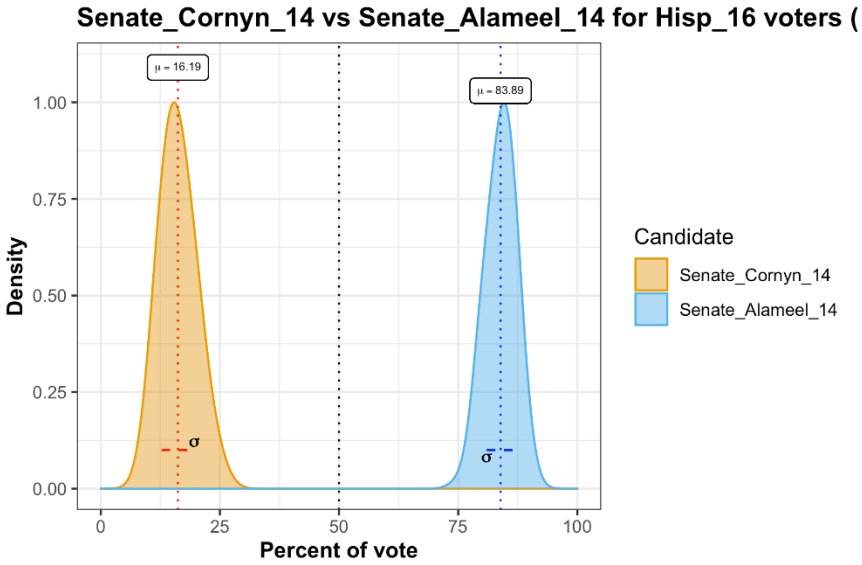
XXVII. 2014 U.S. Senate

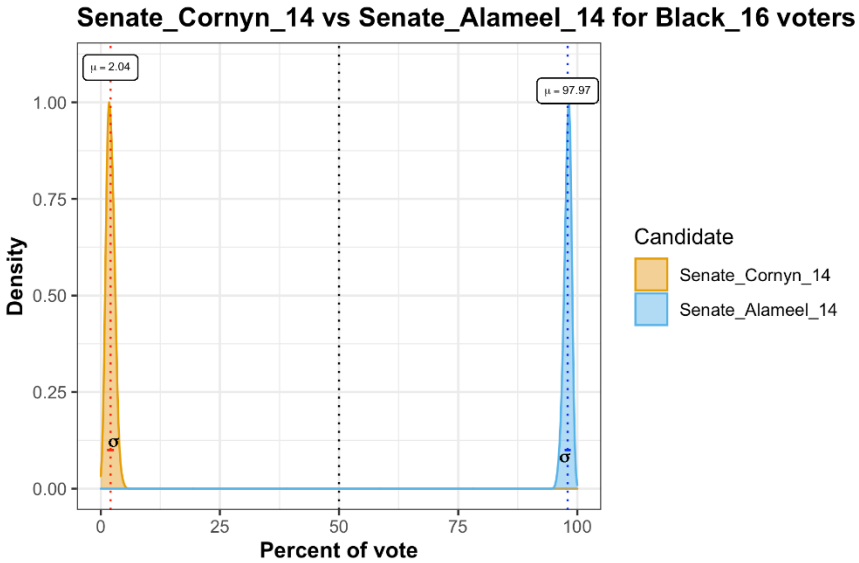
Anglo and Non-Anglo (CVAP)



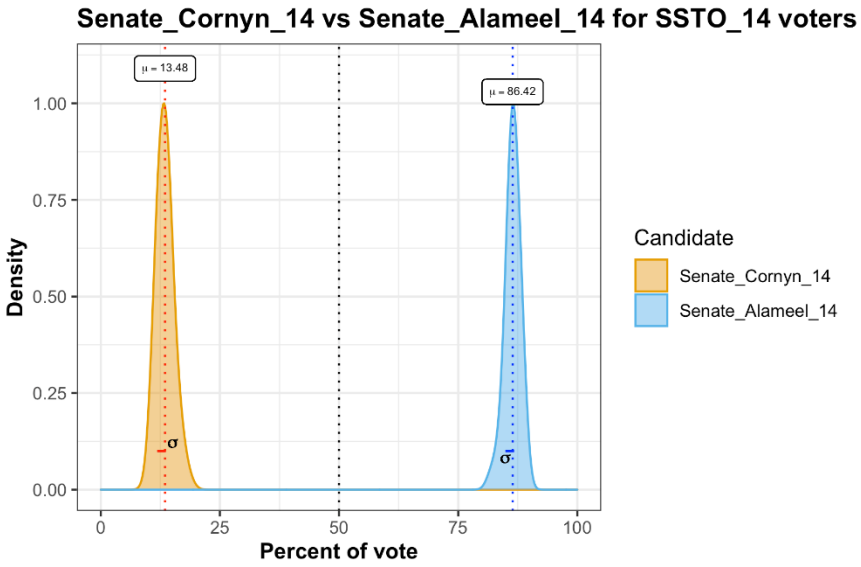
Anglo, Hispanic, and Black (CVAP)



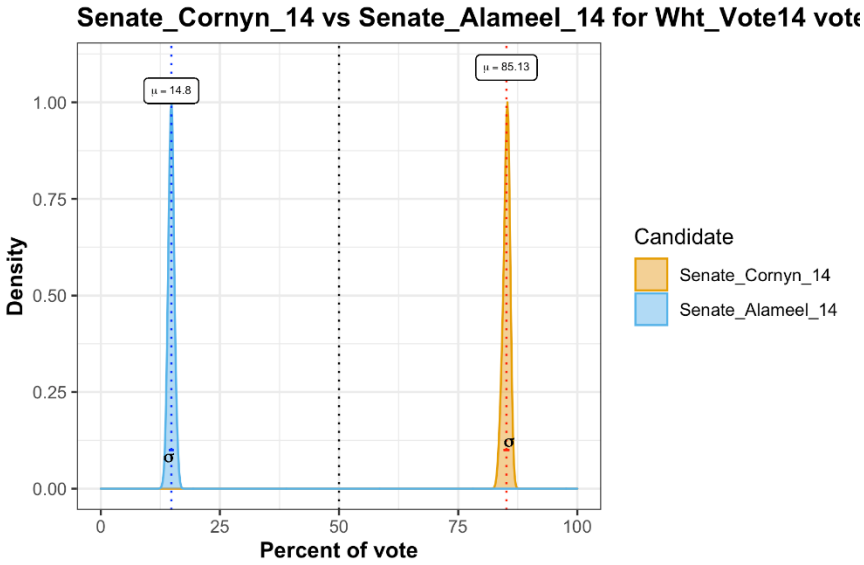


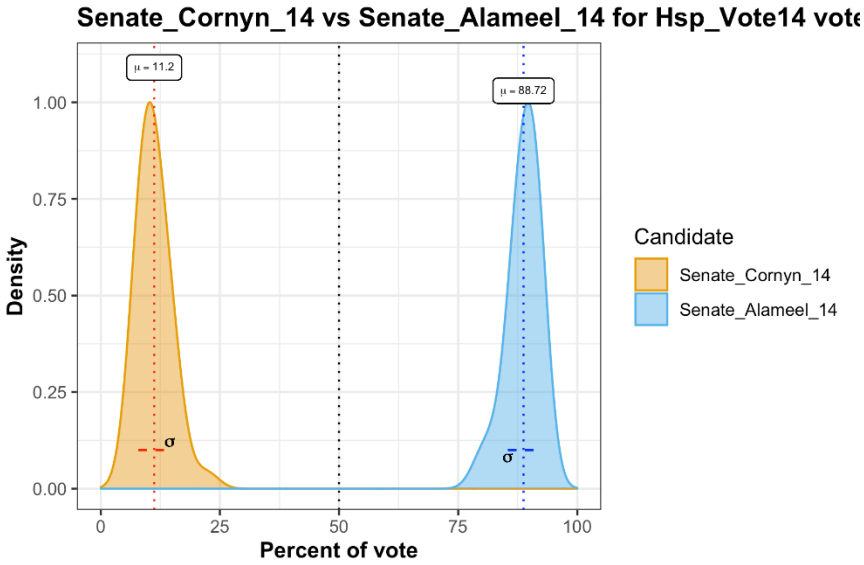


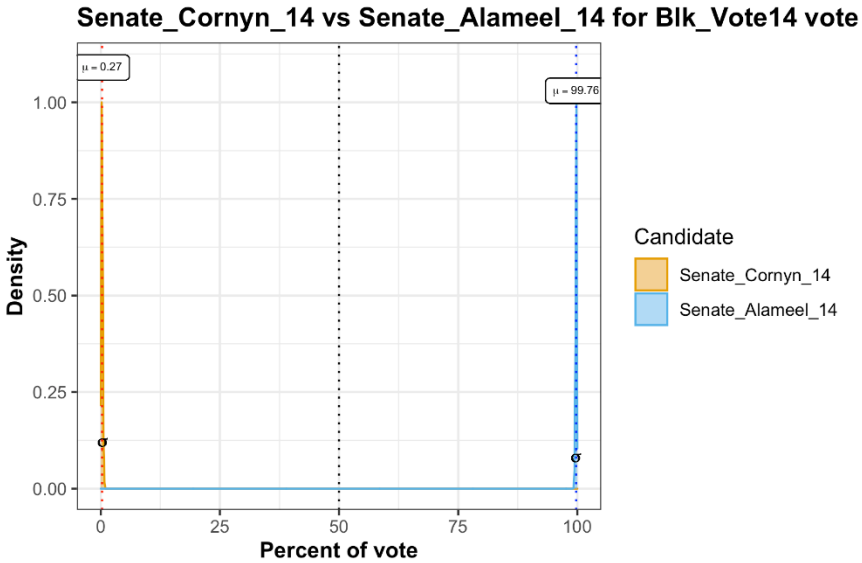
SSTO


Senate_Cornyn_14 vs Senate_Alameel_14 for SSTO_14 voters
μ = 13.48
μ = 86.42
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
Senate_Cornyn_14
Senate_Alameel_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

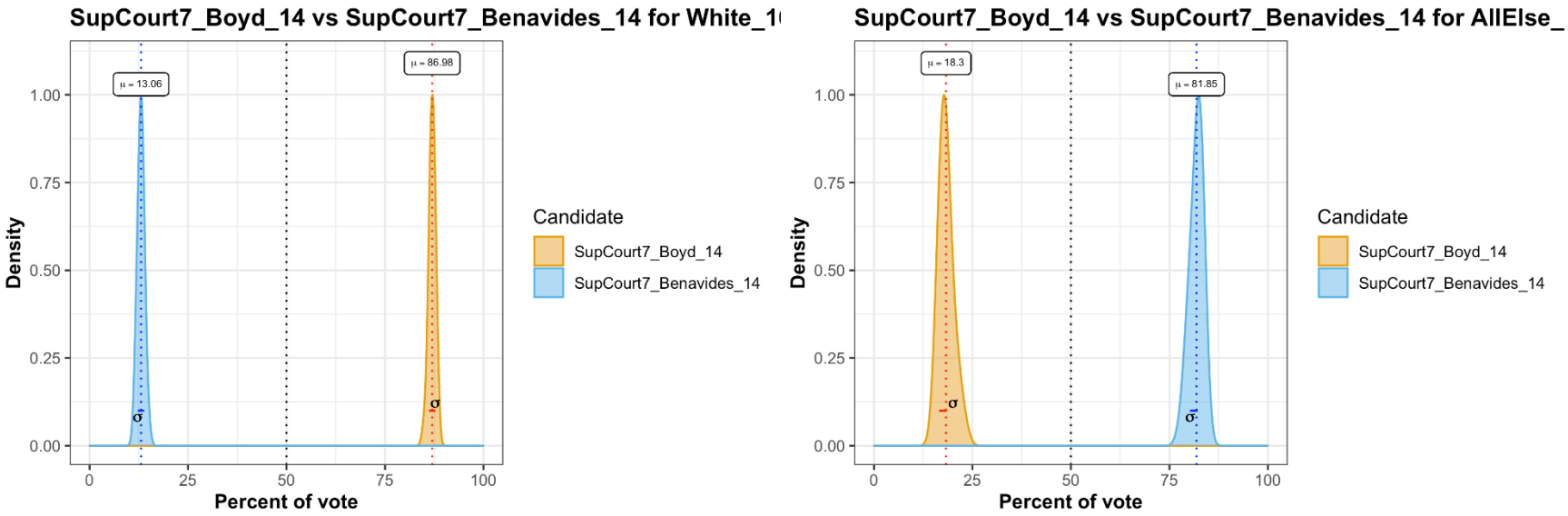




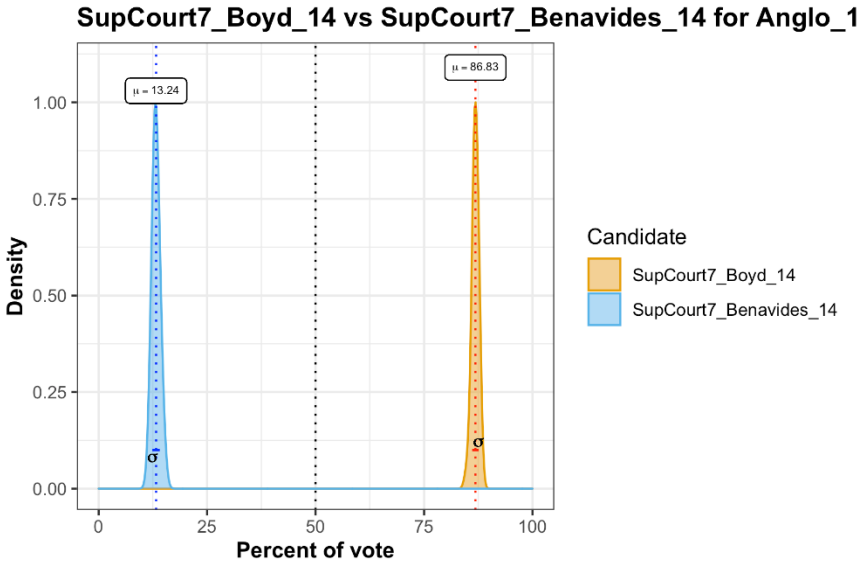


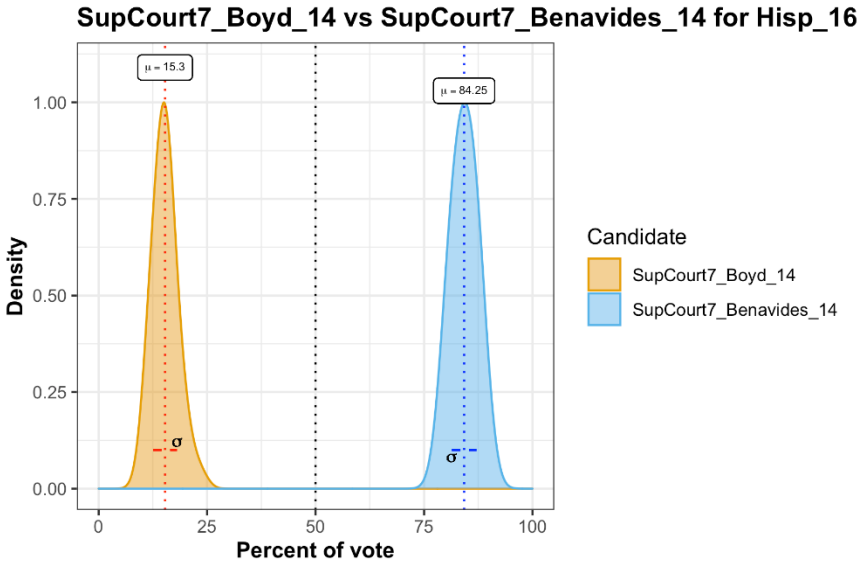
XXVIII. 2014 Supreme Court Justice, Position #7

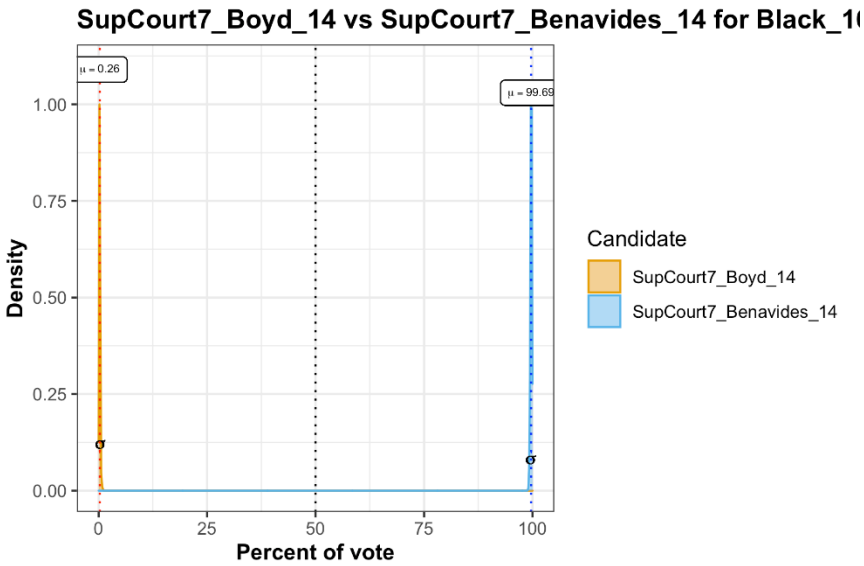
Anglo and Non-Anglo (CVAP)



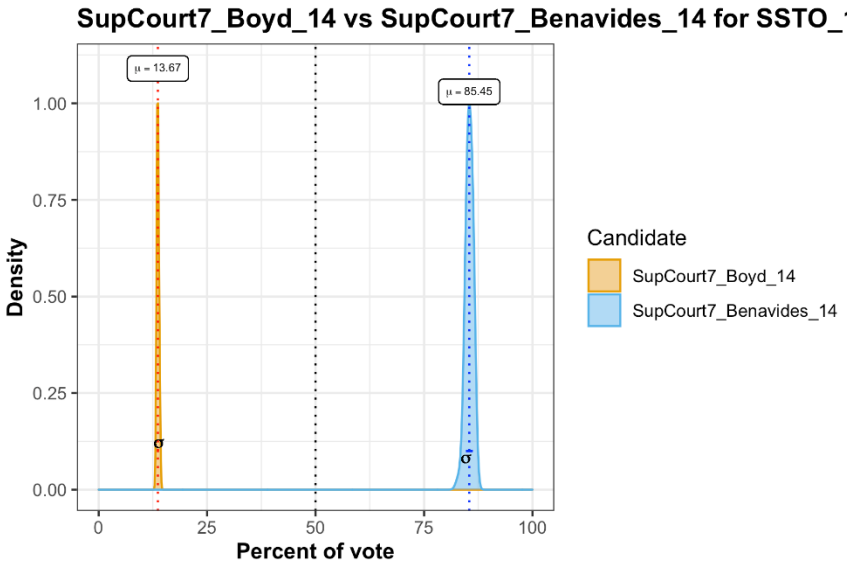
Anglo, Hispanic, and Black (CVAP)



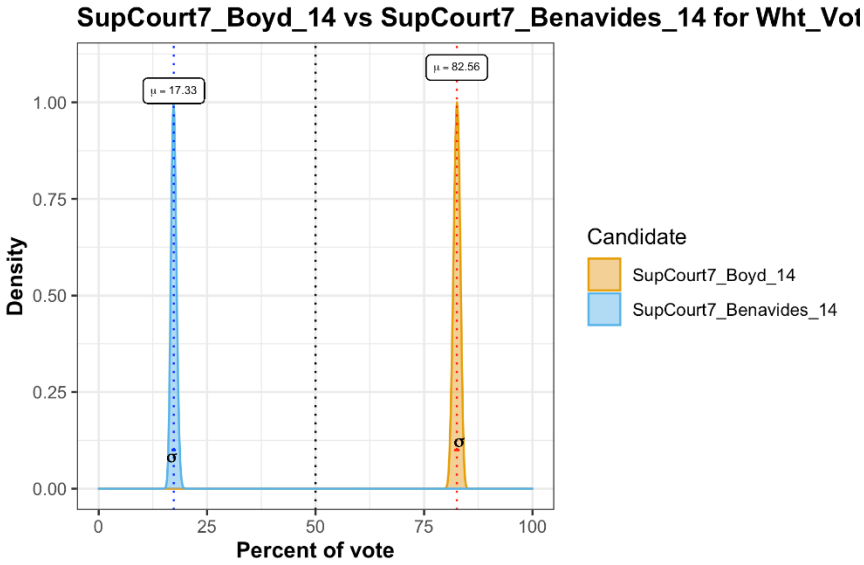


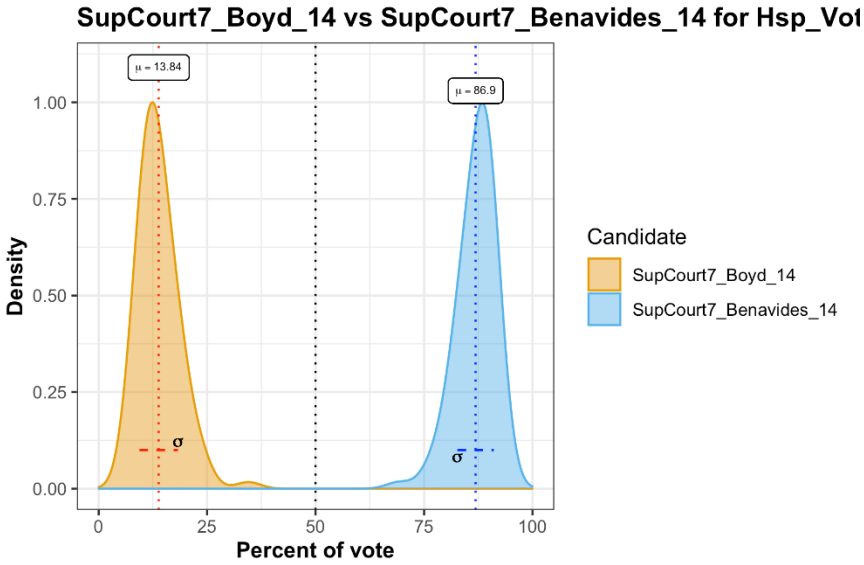


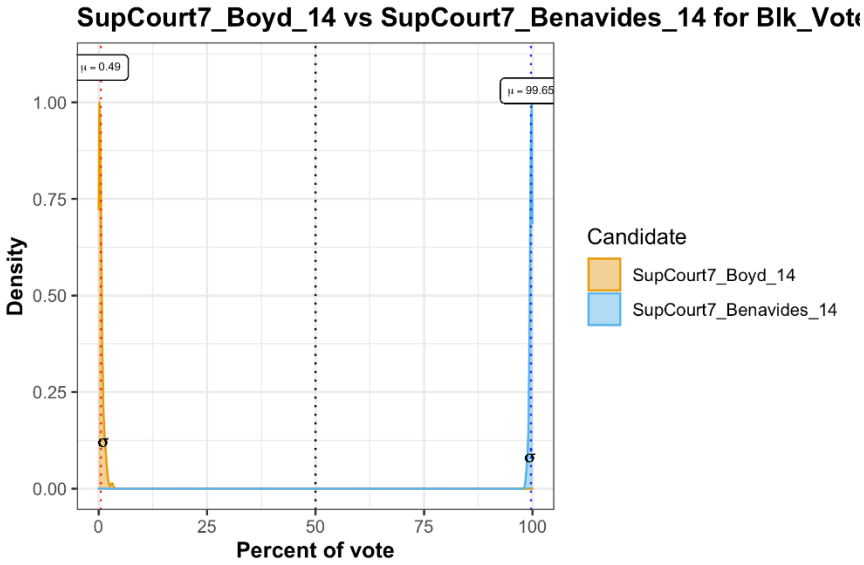
SSTO


SupCourt7_Boyd_14 vs SupCourt7_Benavides_14 for SSTO_1
μ = 13.67
μ = 85.45
σ
σ
1.00
0.75
0.50
0.25
0.00
Density
0
25
50
75
100
Percent of vote
Candidate
SupCourt7_Boyd_14
SupCourt7_Benavides_14

Anglo, Hispanic, and Black (Estimated Actual Vote)

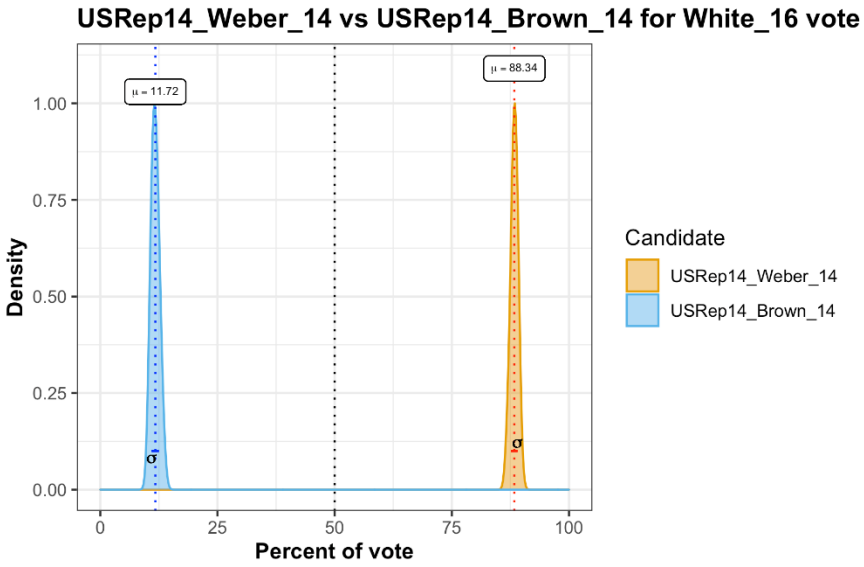


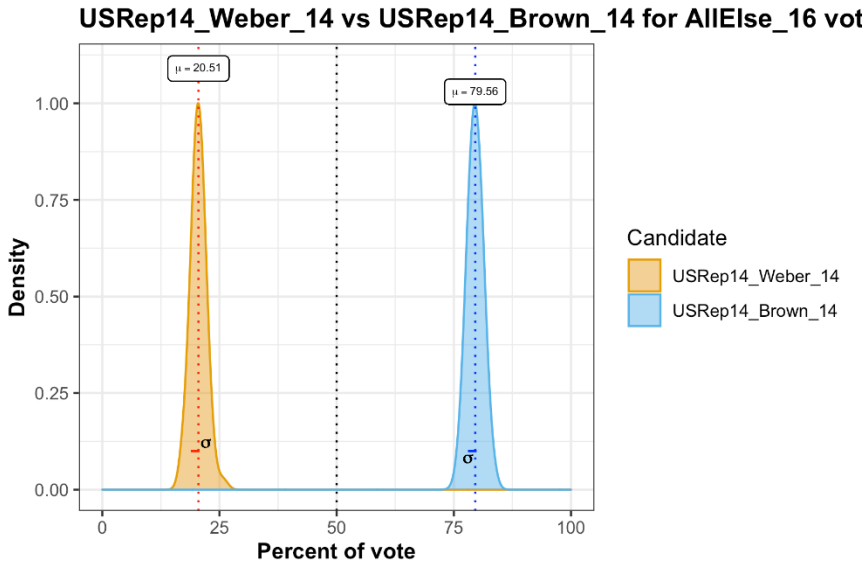




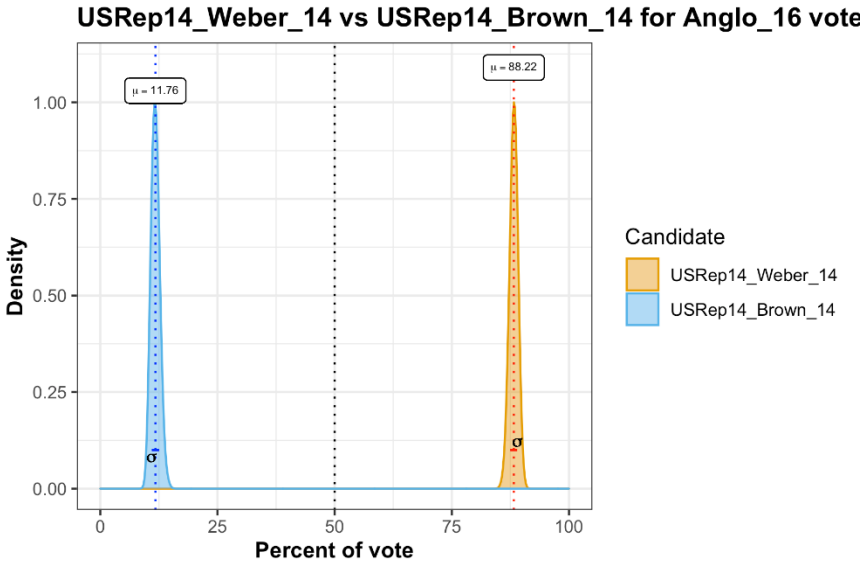
XXIX. 2014 U.S. House of Reps, District #14

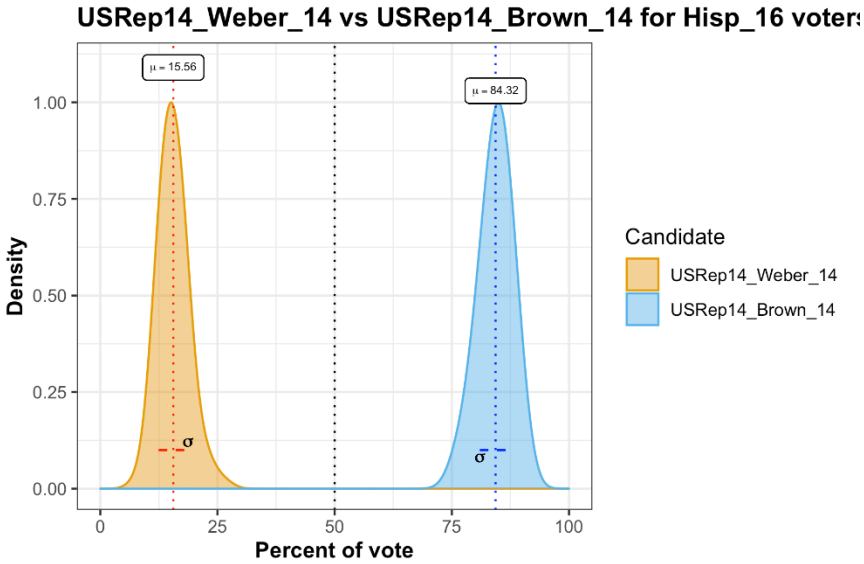
Anglo and Non-Anglo (CVAP)

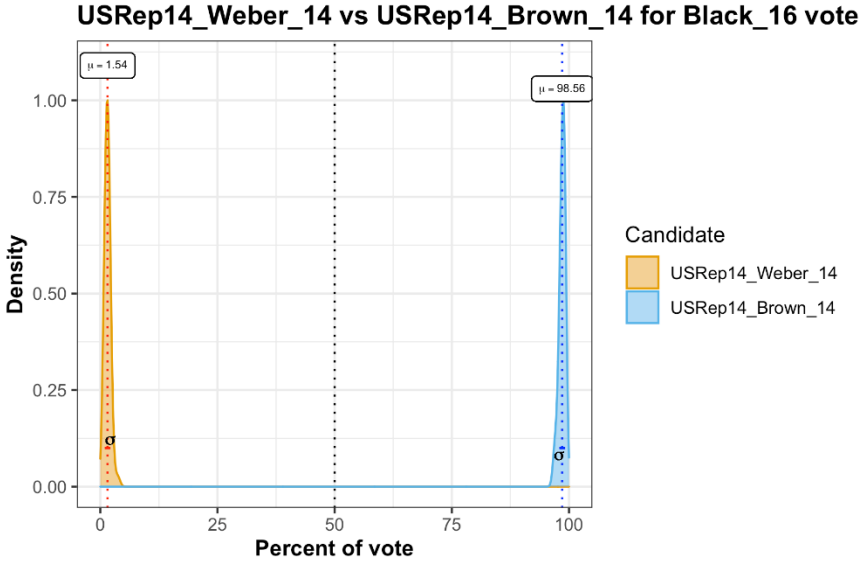




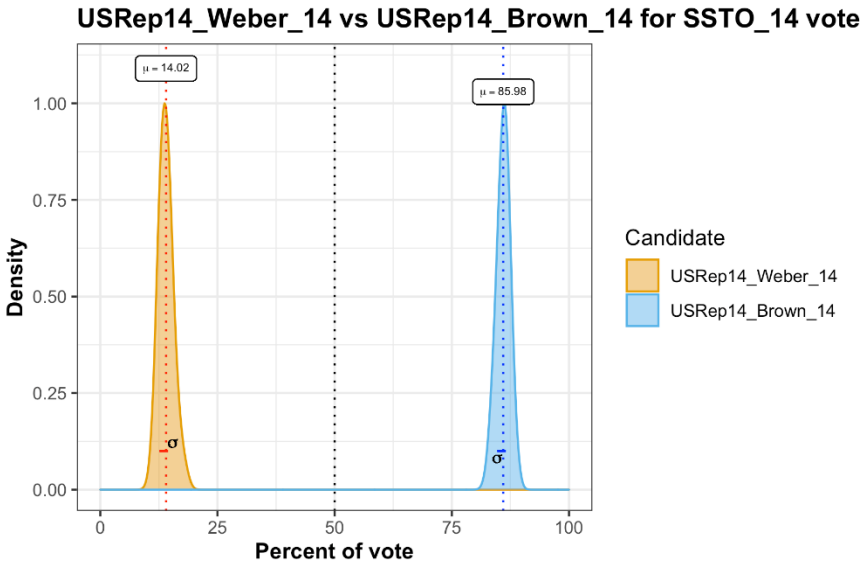
Anglo, Hispanic, and Black (CVAP)



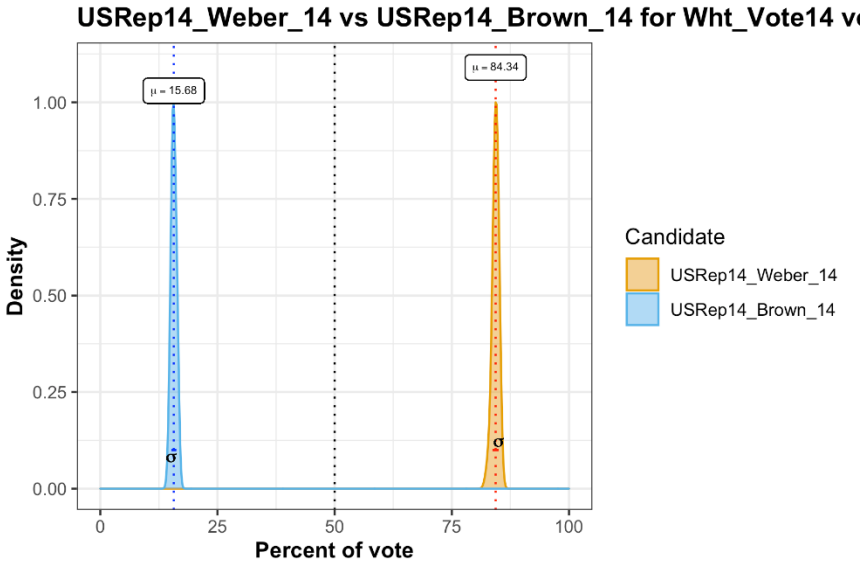


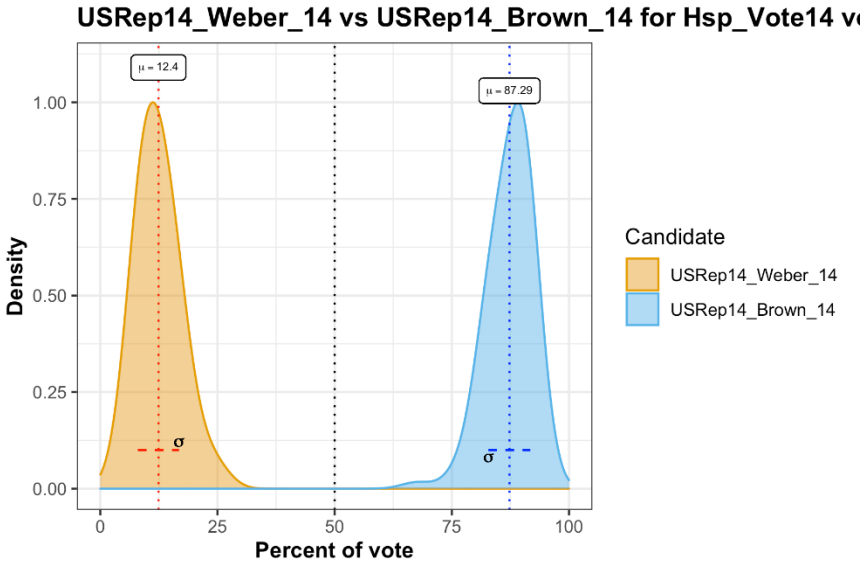


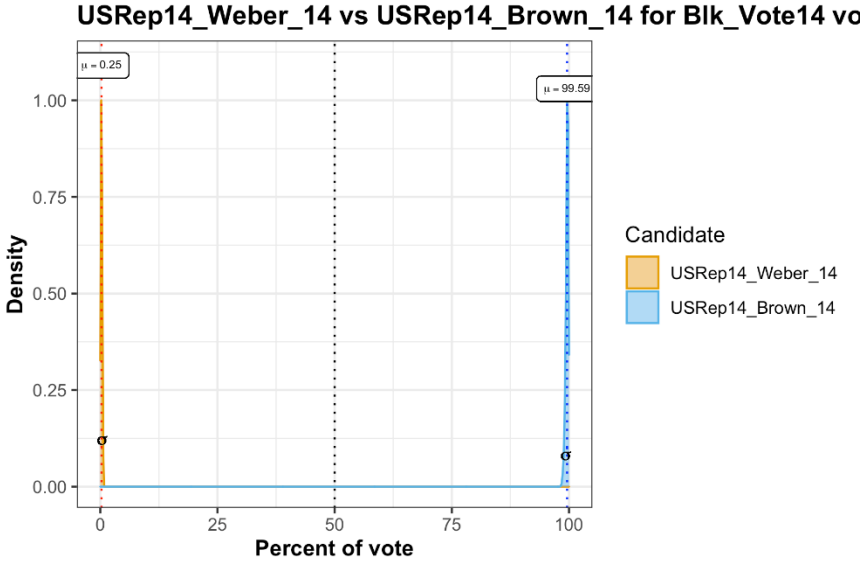
SSTO


USRep14_Weber_14 vs USRep14_Brown_14 for SSTO_14 vote
μ = 14.02
μ = 85.98
σ
σ
Density
1.00
0.75
0.50
0.25
0.00
0
25
50
75
100
Percent of vote
Candidate
USRep14_Weber_14
USRep14_Brown_14

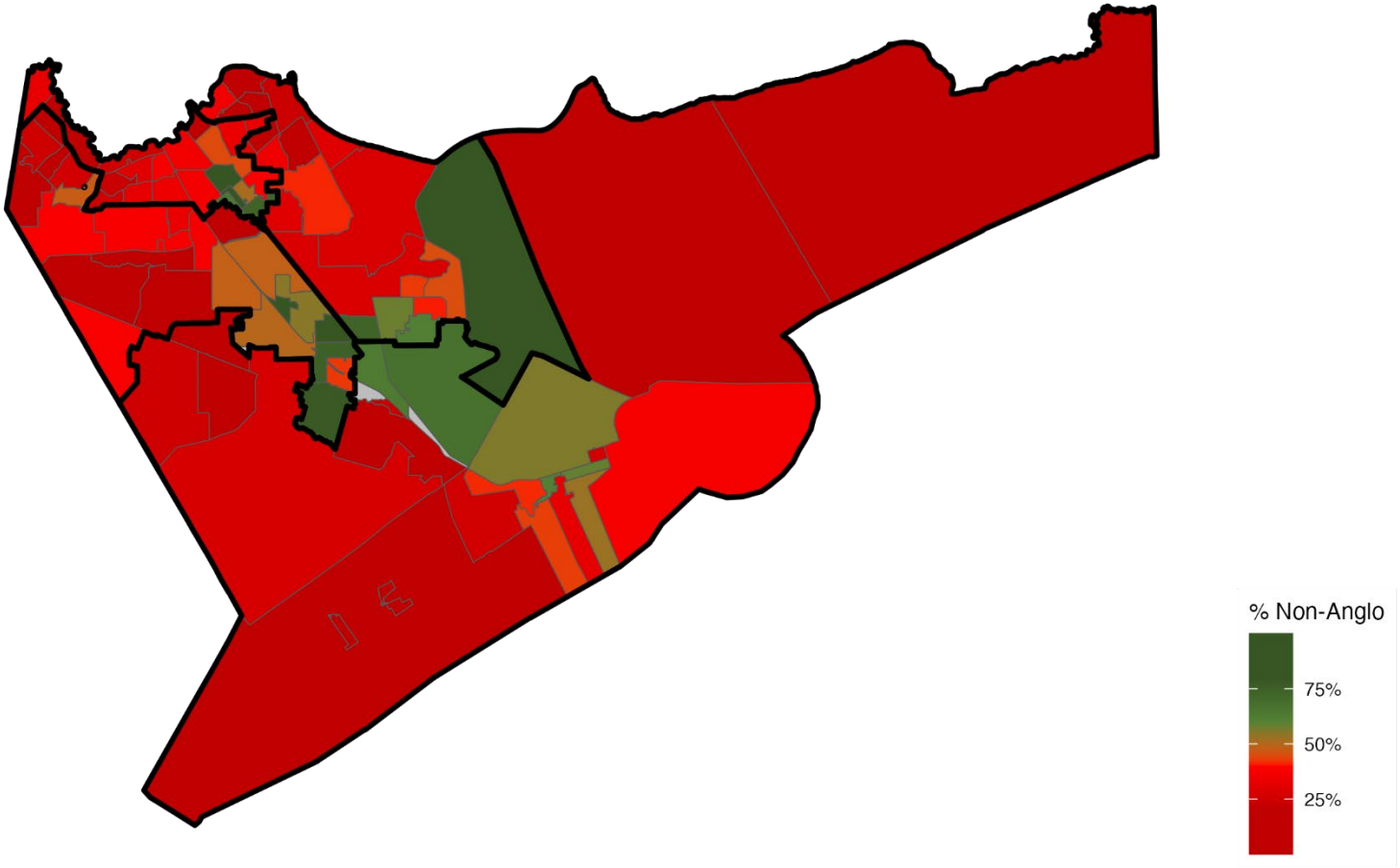
Anglo, Hispanic, and Black (Estimated Actual Vote)







Appendix D: Galveston County Adopted Map Racial Heatmap (2020 CVAP)



Appendix E1: Resume of Matt Barreto, PhD

MATT A. BARRETO – BARRETOM@UCLA.EDU

UNIVERSITY OF CALIFORNIA, LOS ANGELES, 3345 BUNCHE HALL, LOS ANGELES CA 90095 / 909.489.2955

EMPLOYMENT:

Professor, Political Science, University of California Los Angeles (2015 – present)
Professor, Chicana/o Studies, University of California Los Angeles (2015 – present)
Co-Founder & Faculty Director, Latino Policy & Politics Initiative (LPPI)
Co-Founder & Faculty Director, UCLA Voting Rights Project (VRP)

Dept. Political Science, University of Washington
Professor (2014 – 2015)
Associate Professor (2009 – 2014)
Assistant Professor (2005 – 2009)
Co-Founder & Director, Washington Institute for the Study of Ethnicity and Race
Founding Director, Center for Democracy and Voting Rights, UW School of Law

Affiliated Research Centers

Latino Policy & Politics Initiative (LPPI), University of California, Los Angeles

Chicano Studies Research Center (CSRC), University of California, Los Angeles

Center for the Study of Los Angeles (CSLA), Loyola Marymount University

PERSONAL:

Born: June 6, 1976
San Juan, Puerto Rico

High School: 1994, Washburn Rural HS, Topeka, KS

EDUCATION:

Ph.D., Political Science, June 2005
University of California – Irvine
Sub Fields: American Politics / Race, Ethnicity and Politics / Methodology
Thesis: Ethnic Cues: The Role of Shared Ethnicity in Latino Political Participation
Thesis Committee: Bernard Grofman (chair), Louis DeSipio, Katherine Tate, Carole Uhlaner
Thesis Awards: *Ford Foundation Dissertation Fellowship for Minorities, 04-05*
University of California President's Dissertation Fellowship, 04-05
University of California Institute for Mexico & the U.S. Dissertation Grant, 04-05

Master of Science, Social Science, March 2003
University of California – Irvine

Bachelor of Science, Political Science, May 1998
Eastern New Mexico University, Portales, NM
Minor: English. Cumulative GPA: 3.9, *Summa Cum Laude*

PUBLICATION RECORD

Google Scholar citation indices: Cites: 5,372 h-index: 37 i10-index: 65 i100-index: 13 Cites/year: 298

BOOK MANUSCRIPTS:

Barreto, Matt and Christopher Parker. nd. The Great White Hope: Donald Trump, Race, and the Crisis of American Politics. Under Contract, University of Chicago Press. *expected Fall 2023*

Barreto, Matt and Gary Segura. 2014. Latino America: How America's Most Dynamic Population is Poised to Transform the Politics of the Nation. Public Affairs Books. (Sept)

Barreto, Matt and David Leal, editors. 2018. Race, Class, and Precinct Quality in American Cities. Springer Press.

Christopher Parker and Matt Barreto. 2013. Change They Can't Believe In: The Tea Party and Reactionary Politics in America. Princeton University Press. *Winner: APSA Best Book Award for Race, Ethnicity, Politics, 2014*

Barreto, Matt. 2010. Ethnic Cues: The Role of Shared Ethnicity in Latino Political Participation. University of Michigan Press

PEER-REVIEWED ARTICLES

79. MA Barreto, M Cohen, L Collingwood, CW Dunn, S Waknin. 2022. "A Novel Method for Showing Racially Polarized Voting: Bayesian Improved Surname Geocoding" *New York University Review of Law & Social Change.*

78. MA Barreto, GR Sanchez, HL Walker. 2022. "Battling the Hydra: the disparate impact of voter ID requirements in North Dakota." *Journal of Race, Ethnicity, and Politics*, 1-22

77. M Roman, H Walker, M Barreto. 2021. "How Social Ties with Undocumented Immigrants Motivate Latinx Political Participation." *Political Research Quarterly*, 10659129211019473

76. B Gomez-Aguinaga, GR Sanchez, MA Barreto. 2021. "Importance of State and Local Variation in Black–Brown Attitudes: How Latinos View Blacks and How Blacks Affect Their Views" *Journal of Race, Ethnicity, and Politics* 6 (1), 214-252

75. H Walker, M Roman, MA Barreto. 2020. "The Ripple Effect: The Political Consequences of Proximal Contact with Immigration Enforcement" *Journal of Race, Ethnicity and Politics* 5 (3), 537-572.

74. CW Dunn, MA Barreto, M Acevedo, M Cohen, S Waknin. Legal Theories to Compel Vote-by-Mail in Federal Court" *Calif. L. Rev.* 11, 166

73. Reny, Tyler and Matt A. Barreto. 2020. "Xenophobia in the time of pandemic: othering, anti-Asian attitudes, and COVID-19 " *Politics, Groups, and Identities*. 8(2).

72. Flores, Lucy and Matt A. Barreto. 2020. "Latina Voters: The key electoral force" *Journal of Cultural Marketing Strategy*. 4(2).

71. Frasure-Yokley, Lorrie, Janelle Wong, Edward Vargas and Matt A. Barreto 2020. "THE COLLABORATIVE MULTIRACIAL POST-ELECTION SURVEY (CMPS): BUILDING THE ACADEMIC PIPELINE THROUGH DATA ACCESS, PUBLICATION, AND NETWORKING OPPORTUNITIES" *PS: Political Science & Politics.* 53(1)

70. Barreto, Matt, Loren Collingwood, Sergio Garcia-Rios and Kassra Oskooii. 2019. "Estimating Candidate Support: Comparing Iterative EI and EI-RxC Methods" *Sociological Methods and Research*. 48(4).

69. Gonzalez-OBrien, Benjamin, Matt Barreto and Gabriel Sanchez. 2019. "They're All Out to Get Me! Assessing Inter-Group Competition Among Multiple Populations." *Politics, Groups and Identities*. 7(4).

68. Oskooii, Kassra, Karam Dana and Matt Barreto. 2019. "Beyond generalized ethnocentrism: Islam-specific beliefs and prejudice toward Muslim Americans." *Politics, Groups and Identities* 7(3)

67. Vargas, Edward, Gabriel Sanchez, Barbara Gomez-Aguinaga, and Matt Barreto. 2019. "How Latinos' Perceptions of Environmental Health Threats Impact Policy Preferences." *Social Science Quarterly.* 101(1).

66. Walker, Hannah, Marcel Roman and Matt Barreto. 2019. "The Direct and Indirect Effects of Immigration Enforcement on Latino Political Engagement." *UCLA Law Review.* 67.

65. Gutierrez, Angela, Angela Ocampo, Matt Barreto, and Gary Segura. 2019. "Somos Más : How Racial Threat and Anger Mobilized Latino Voters in the Trump Era" *Political Research Quarterly.* 72(4)

64. Chouhoud, Youssef, Karam Dana, and Matt Barreto. 2019. "American Muslim Political Participation: Between Diversity and Cohesion." *Politics and Religion*. 12(S3).

63. Barreto, Matt, Stephen Nuño, Gabriel Sanchez, and Hannah Walker. 2019. "Race, Class and Barriers to Voting in the 21st Century: The Unequal Impact of Voter ID Laws." *American Politics Research*

62. Barreto, Matt. 2018. "The cycle of under-mobilization of minority voters: A comment on 'Selective recruitment of voter neglect?'" *Journal of Race, Ethnicity, and Politics.* 3(1).

61. Ocampo, Angela, Karam Dana and Matt Barreto. 2018. "The American Muslim Voter: Community Belonging and Political Participation." *Social Science Research.* 69(4).

60. Barreto, Matt, Lorrie Frasure-Yokley, Edward Vargas, Janelle Wong. 2018. "Best practices in collecting online data with Asian, Black, Latino, and White respondents: evidence from the 2016 Collaborative Multiracial Post-election Survey." *Politics, Groups & Identities.* 6(1).

59. Barreto, Matt, Tyler Reny and Bryan Wilcox-Archuleta. 2017. "A debate about survey research methodology and the Latina/o vote: why a bilingual, bicultural, Latino-centered approach matters to accurate data." *Aztlán: A Journal of Chicano Studies.* 42(2).

58. Barreto, Matt and Gary Segura. 2017. "Understanding Latino Voting Strength in 2016 and Beyond: Why Culturally Competent Research Matters." *Journal of Cultural Marketing Strategy.* 2:2

57. Dana, Karam, Bryan Wilcox-Archuleta and Matt Barreto. 2017. "The Political Incorporation of Muslims in America: The Mobilizing Role of Religiosity in Islam." *Journal of Race, Ethnicity & Politics*.

56. Collingwood, Loren, Kassra Oskooii, Sergio Garcia-Rios, and Matt Barreto. 2016. "eiCompare: Comparing Ecological Inference Estimates across EI and EI: RxC." *The R Journal*. 8:2 (Dec).

55. Garcia-Rios, Sergio I. and Matt A. Barreto. 2016. "Politicized Immigrant Identity, Spanish-Language Media, and Political Mobilization in 2012" *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 2(3): 78-96.

54. Barreto, Matt, Collingwood, Loren, Christopher Parker, and Francisco Pedraza. 2015. "Racial Attitudes and Race of Interviewer Item Non-Response." *Survey Practice*. 8:3.

53. Barreto, Matt and Gary Segura 2015. "Obama y la seducción del voto Latino." *Foreign Affairs Latinoamérica*. 15:2 (Jul).

52. Barreto, Matt and Loren Collingwood 2015. "Group-based appeals and the Latino vote in 2012: How immigration became a mobilizing issue." *Electoral Studies*. 37 (Mar).

51. Collingwood, Loren, Matt Barreto and Sergio García-Rios. 2014. "Revisiting Latino Voting: Cross-Racial Mobilization in the 2012 Election" *Political Research Quarterly*. 67:4 (Sep).

50. Bergman, Elizabeth, Gary Segura and Matt Barreto. 2014. "Immigration Politics and Electoral Consequences: Anticipating the Dynamics of Latino Vote in the 2014 Election" *California Journal of Politics and Policy*. (Feb)

49. Barreto, Matt and Sergio García-Rios. 2012. "El poder del voto latino en Estados Unidos en 2012" *Foreign Affairs Latinoamérica*. 12:4 (Nov).

48. Collingwood, Loren, Matt Barreto and Todd Donovan. 2012. "Early Primaries, Viability and Changing Preferences for Presidential Candidates." *Presidential Studies Quarterly*. 42:1(Mar).

47. Barreto, Matt, Betsy Cooper, Ben Gonzalez, Chris Towler, and Christopher Parker. 2012. "The Tea Party in the Age of Obama: Mainstream Conservatism or Out-Group Anxiety?." *Political Power and Social Theory*. 22:1(Jan).

46. Dana, Karam, Matt Barreto and Kassra Oskoii. 2011. "Mosques as American Institutions: Mosque Attendance, Religiosity and Integration into the American Political System." *Religions*. 2:2 (Sept).

45. Barreto, Matt, Christian Grose and Ana Henderson. 2011. "Redistricting: Coalition Districts and the Voting Rights Act." *Warren Institute on Law and Social Policy*. (May)

44. Barreto, Matt and Stephen Nuño. 2011. "The Effectiveness of Co-Ethnic Contact on Latino Political Recruitment." *Political Research Quarterly*. 64 (June). 448-459.

43. Garcia-Castañon, Marcela, Allison Rank and Matt Barreto. 2011 "Plugged in or tuned out? Youth, Race, and Internet Usage in the 2008 Election." *Journal of Political Marketing.* 10:2 115-138.

42. Barreto, Matt, Victoria DeFrancesco, and Jennifer Merolla. 2011 "Multiple Dimensions of Mobilization: The Impact of Direct Contact and Political Ads on Latino Turnout in the 2000 Presidential Election." *Journal of Political Marketing.* 10:1

41. Barreto, Matt, Loren Collingwood, and Sylvia Manzano. 2010. "Measuring Latino Political Influence in National Elections" *Political Research Quarterly*. 63:4 (Dec)

40. Barreto, Matt, and Francisco Pedraza. 2009. "The Renewal and Persistence of Group Identification in American Politics." *Electoral Studies*. 28 (Dec) 595-605

39. Barreto, Matt and Dino Bozonelos. 2009. "Democrat, Republican, or None of the Above? Religiosity and the Partisan Identification of Muslim Americans" *Politics & Religion* 2 (Aug). 1-31

38. Barreto, Matt, Sylvia Manzano, Ricardo Ramírez and Kathy Rim. 2009. "Immigrant Social Movement Participation: Understanding Involvement in the 2006 Immigration Protest Rallies." *Urban Affairs Review*. 44: (5) 736-764

37. Grofman, Bernard and Matt Barreto. 2009. "A Reply to Zax's (2002) Critique of Grofman and Migalski (1988): Double Equation Approaches to Ecological Inferences." *Sociological Methods and Research.* 37 (May)

36. Barreto, Matt, Stephen Nuño and Gabriel Sanchez. 2009. "The Disproportionate Impact of Voter-ID Requirements on the Electorate – New Evidence from Indiana." *PS: Political Science & Politics*. 42 (Jan)

35. Barreto, Matt, Luis Fraga, Sylvia Manzano, Valerie Martinez-Ebers, and Gary Segura. 2008. "Should they dance with the one who brung 'em? Latinos and the 2008 Presidential election" *PS: Political Science & Politics.* 41 (Oct).

34. Barreto, Matt, Mara Marks and Nathan Woods. 2008. "Are All Precincts Created Equal? The Prevalence of Low- Quality Precincts in Low-Income and Minority Communities." *Political Research Quarterly.* 62

33. Barreto, Matt. 2007. "*Sí Se Puede!* Latino Candidates and the Mobilization of Latino Voters." *American Political Science Review*. 101 (August): 425-441.

32. Barreto, Matt and David Leal. 2007. "Latinos, Military Service, and Support for Bush and Kerry in 2004." *American Politics Research.* 35 (March): 224-251.

31. Barreto, Matt, Mara Marks and Nathan Woods. 2007. "Homeownership: Southern California's New Political Fault Line?" *Urban Affairs Review.* 42 (January). 315-341.

30. Barreto, Matt, Matt Streb, Fernando Guerra, and Mara Marks. 2006. "Do Absentee Voters Differ From Polling Place Voters? New Evidence From California." *Public Opinion Quarterly*. 70 (Summer): 224-34.

29. Barreto, Matt, Fernando Guerra, Mara Marks, Stephen Nuño, and Nathan Woods. 2006. "Controversies in Exit Polling: Implementing a racially stratified homogenous precinct approach." *PS: Political Science & Politics.* 39 (July) 477-83.

28. Barreto, Matt, Ricardo Ramírez, and Nathan Woods. 2005. "Are Naturalized Voters Driving the California Latino Electorate? Measuring the Impact of IRCA Citizens on Latino Voting." *Social Science Quarterly.* 86 (December): 792-811.

27. Barreto, Matt. 2005. "Latino Immigrants at the Polls: Foreign-born Voter Turnout in the 2002 Election." *Political Research Quarterly.* 58 (March): 79-86.

26. Barreto, Matt, Mario Villarreal and Nathan Woods. 2005. "Metropolitan Latino Political Behavior: Turnout and Candidate Preference in Los Angeles." *Journal of Urban Affairs*. 27(February): 71-91.

25. Leal, David, Matt Barreto, Jongho Lee and Rodolfo de la Garza. 2005. "The Latino Vote in the 2004 Election." *PS: Political Science & Politics.* 38 (January): 41-49.

24. Marks, Mara, Matt Barreto and Nathan Woods. 2004. "Harmony and Bliss in LA? Race and Racial Attitudes a Decade After the 1992 Riots." *Urban Affairs Review.* 40 (September): 3-18.

23. Barreto, Matt, Gary Segura and Nathan Woods. 2004. "The Effects of Overlapping Majority-Minority Districts on Latino Turnout." *American Political Science Review.* 98 (February): 65-75.

22. Barreto, Matt and Ricardo Ramírez. 2004. "Minority Participation and the California Recall: Latino, Black, and Asian Voting Trends 1990 – 2003." *PS: Political Science & Politics.* 37 (January): 11-14.

21. Barreto, Matt and José Muñoz. 2003. "Reexamining the 'politics of in-between': political participation among Mexican immigrants in the United States." *Hispanic Journal of Behavioral Sciences*. 25 (November): 427-447.

20. Barreto, Matt. 2003. "National Origin (Mis)Identification Among Latinos in the 2000 Census: The Growth of the "Other Hispanic or Latino" Category." *Harvard Journal of Hispanic Policy.* 15 (June): 39-63.

Edited Volume Book Chapters

19. Barreto, Matt and Gary Segura. 2020. "Latino Reaction and Resistance to Trump: Lessons learned from Pete Wilson and 1994." In Raul Hinojosa and Edward Telles (eds.) Equitable Globalization: Expanding Bridges, Overcoming Walls. Oakland: University of California Press.

18. Barreto, Matt, Albert Morales and Gary Segura. 2019. "The Brown Tide and the Blue Wave in 2018" In Larry Sabato, Kyle Kondik, Geoffrey Skelley (eds.) The Blue Wave. New York: Rowman & Littlefield.

17. Gutierrez, Angela, Angela Ocampo and Matt Barreto. 2018. "Obama's Latino Legacy: From Unknown to Never Forgotten" In Andrew Rudalevige and Bert Rockman (eds.) The Obama Legacy. Lawrence, KS: University of Kansas Press.

16. Barreto, Matt, Thomas Schaller and Gary Segura. 2017. "Latinos and the 2016 Election: How Trump Lost Latinos on Day 1" In Larry Sabato, Kyle Kondik, Geoffrey Skelley (eds.) Trumped: The 2016 Election that Broke All the Rules. New York: Rowman & Littlefield.

15. Walker, Hannah, Gabriel Sanchez, Stephen Nuño, Matt Barreto 2017. "Race and the Right to Vote: The Modern Barrier of Voter ID Laws" In Todd Donovan (ed.) Election Rules and Reforms. New York: Rowman & Littlefield.

14. Barreto, Matt and Christopher Parker. 2015. "Public Opinion and Reactionary Movements: From the Klan to the Tea Party" In Adam Berinsky (ed.) New Directions in Public Opinion. 2nd edition. New York: Routledge Press.

13. Barreto, Matt and Gabriel Sanchez. 2014. "A 'Southern Exception' in Black-Latino Attitudes?." In Anthony Affigne, Evelyn Hu-Dehart, Marion Orr (eds.) Latino Politics en Ciencia Política. New York: New York University Press.

12. Barreto, Matt, Ben Gonzalez, and Gabriel Sanchez. 2014. "Rainbow Coalition in the Golden State? Exposing Myths, Uncovering New Realities in Latino Attitudes Towards Blacks." In Josh Kun and Laura Pulido (eds.) Black and Brown in Los Angeles: Beyond Conflict and Coalition. Berkeley, CA: University of California Press.

11. Barreto, Matt, Loren Collingwood, Ben Gonzalez, and Christopher Parker. 2011. "Tea Party Politics in a Blue State: Dino Rossi and the 2010 Washington Senate Election" In William Miller and Jeremy Walling (eds.) Stuck in the Middle to Lose: Tea Party Effects on 2010 U.S. Senate Elections. Rowman & Littlefield Publishing Group.

10. Jason Morin, Gabriel Sanchez and Matt Barreto. 2011. "Perceptions of Competition Between Latinos and Blacks: The Development of a Relative Measure of Inter-Group Competition." In Edward Telles, Gaspar Rivera-Salgado and Mark Sawyer (eds.) Just Neighbors? Research on African American and Latino Relations in the US. New York: Russell Sage Foundation.

9. Grofman, Bernard, Frank Wayman and Matt Barreto. 2009. "Rethinking partisanship: Some thoughts on a unified theory." In John Bartle and Paolo Bellucci (eds.) Political Parties and Partisanship: Social identity and individual attitudes. New York: Routledge Press.

8. Barreto, Matt, Ricardo Ramírez, Luis Fraga and Fernando Guerra. 2009. "Why California Matters: How California Latinos Influence the Presidential Election." In Rodolfo de la Garza, Louis DeSipio and David Leal (eds.) Beyond the Barrio: Latinos in the 2004 Elections. South Bend, ID: University of Notre Dame Press.

7. Francisco Pedraza and Matt Barreto. 2008. "Exit Polls and Ethnic Diversity: How to Improve Estimates and Reduce Bias Among Minority Voters." In Wendy Alvey and Fritz Scheuren (eds.) Elections and Exit Polling. Hoboken, NJ: Wiley and Sons.

6. Adrian Pantoja, Matt Barreto and Richard Anderson. 2008. "Politics *y la Iglesia*: Attitudes Toward the Role of Religion in Politics Among Latino Catholics" In Michael Genovese, Kristin Hayer and Mark J. Rozell (eds.) Catholics and Politics. Washington, D.C: Georgetown University Press..

5. Barreto, Matt. 2007. "The Role of Latino Candidates in Mobilizing Latino Voters: Revisiting Latino Vote Choice." In Rodolfo Espino, David Leal and Kenneth Meier (eds.) Latino Politics: Identity, Mobilization, and Representation. Charlottesville: University of Virginia Press.

4. Abosch, Yishaiya, Matt Barreto and Nathan Woods. 2007. "An Assessment of Racially Polarized Voting For and Against Latinos Candidates in California." In Ana Henderson (ed.) Voting Rights Act Reauthorization of 2006: Perspectives on Democracy, Participation, and Power:. Berkeley, CA: UC Berkeley Public Policy Press.

3. Barreto, Matt and Ricardo Ramírez. 2005. "The Race Card and California Politics: Minority Voters and Racial Cues in the 2003 Recall Election." In Shaun Bowler and Bruce Cain (eds.) Clicker Politics: Essays on the California Recall. Englewood-Cliffs: Prentice-Hall.

2. Barreto, Matt and Nathan Woods. 2005. "The Anti-Latino Political Context and its Impact on GOP Detachment and Increasing Latino Voter Turnout in Los Angeles County." In Gary Segura and Shawn Bowler (eds.) Diversity in Democracy: Minority Representation in the United States. Charlottesville: University of Virginia Press.

1. Pachon, Harry, Matt Barreto and Frances Marquez. 2004. "Latino Politics Comes of Age in the Golden State." In Rodolfo de la Garza and Louis DeSipio (eds.) Muted Voices: Latino Politics in the 2000 Election. New York: Rowman & Littlefield

RESEARCH AWARDS AND FELLOWSHIPS

June 2020	WK Kellogg Foundation UCLA Latino Policy & Politics Initiative [With Sonja Diaz]	*$2,500,000 – 24 months*
June 2020	Casey Family Foundation UCLA Latino Policy & Politics Initiative [With Sonja Diaz]	*$900,000 – 18 months*
Aug 2018	Provost Initiative for Voting Rights Research UCLA Latino Policy & Politics Initiative [With Chad Dunn]	*$90,000 – 24 months*
April 2018	Democracy Fund & Wellspring Philanthropic UCLA Latino Policy & Politics Initiative [With Sonja Diaz]	*$200,000 – 18 months*
March 2018	AltaMed California UCLA Latino Policy & Politics Initiative [With Sonja Diaz]	*$250,000 – 12 months*
Dec 2017	California Community Foundation UCLA Latino Policy & Politics Initiative [With Sonja Diaz]	*$100,000 – 12 months*
July 2013	Ford Foundation UW Center for Democracy and Voting Rights	*$200,000 – 12 months*
April 2012	American Values Institute [With Ben Gonzalez] Racial Narratives and Public Response to Racialized Moments	*$40,000 – 3 months*
Jan 2012	American Civil Liberties Union Foundation [With Gabriel Sanchez] Voter Identification Laws in Wisconsin	*$60,000 – 6 months*
June 2011	State of California Citizens Redistricting Commission An Analysis of Racial Bloc Voting in California Elections	*$60,000 – 3 months*
Apr 2011	Social Science Research Council (SSRC) [With Karam Dana] Muslim and American? A national conference on the political and social incorporation of American Muslims	*$50,000 – 18 months*
Jan 2011	impreMedia [With Gary Segura] Latino public opinion tracking poll of voter attitudes in 2011	*$30,000 – 6 months*
Oct 2010	National Council of La Raza (NCLR) [With Gary Segura] Measuring Latino Influence in the 2010 Elections	*$128,000 – 6 months*
Oct 2010	We Are America Alliance (WAAA) [With Gary Segura] Latino and Asian American Immigrant Community Voter Study	*$79,000 – 3 months*
May 2010	National Council of La Raza (NCLR) [With Gary Segura] A Study of Latino Views Towards Arizona SB1070	*$25,000 – 3 months*
Apr 2010	Social Science Research Council (SSRC) [With Karam Dana] Muslim and American? The influence of religiosity in Muslim political incorporation	*$50,000 – 18 months*
Oct 2009	American Association of Retired Persons (AARP) [With Gary Segura] Health care reform and Latino public opinion	*$25,000 – 3 months*
Nov 2008	impreMedia & National Association of Latino Elected Officials (NALEO) [With Gary Segura] 2008 National Latino Post-Election Survey, Presidential Election	*$46,000 – 3 months*

RESEARCH GRANTS AND FELLOWSHIPS CONTINUED…

July 2008	National Association of Latino Elected Officials (NALEO) [With Gary Segura] Latino voter outreach survey – an evaluation of Obama and McCain	*$72,000 – 3 months*
June 2008	The Pew Charitable Trusts, Make Voting Work Project [with Karin MacDonald and Bonnie Glaser] Evaluating Online Voter Registration (OVR) Systems in Arizona and Washington	*$220,000 – 10 months*
April 2008	National Association of Latino Elected Officials (NALEO) & National Council of La Raza (NCLR), 2008 Latino voter messaging survey	*$95,000 – 6 months*
Dec. 2007	Research Royalty Fund, University of Washington 2008 Latino national post-election survey	*$39,000 – 12 months*
Oct. 2007	Brenan Center for Justice, New York University [with Stephen Nuño and Gabriel Sanchez] Indiana Voter Identification Study	*$40,000 – 6 months*
June 2007	National Science Foundation, Political Science Division [with Gary Segura] American National Election Study – Spanish translation and Latino oversample	*$750,000 – 24 months*
Oct. 2006	University of Washington, Vice Provost for Undergraduate Education Absentee voter study during the November 2006 election in King County, WA	*$12,000 – 6 months*
Mar. 2006	Latino Policy Coalition Public Opinion Research Grant [with Gary Segura] Awarded to the Washington Institute for the Study of Ethnicity and Race	*$40,000 – 18 months*
2005 – 2006	University of Washington, Institute for Ethnic Studies, Research Grant	*$8,000 – 12 months*
Mar. 2005	Thomas and Dorothy Leavey Foundation Grant [with Fernando Guerra] Conduct Exit Poll during Los Angeles Mayoral Election, Mar. 8 & May 17, 2005 Awarded to the Center for the Study of Los Angeles	*$30,000 – 6 months*
2004 – 2005	Ford Foundation Dissertation Fellowship for Minorities	*$21,000 – 12 months*
2004 – 2005	University of California President's Dissertation Fellowship	*$14,700 – 9 months*
2004 – 2005	University of California Mexico-US (UC MEXUS) Dissertation Grant	*$12,000 – 9 months*
Apr – 2004	UC Regents pre-dissertation fellowship, University of California, Irvine,	*$4,700 – 3 months*
2003 – 2004	Thomas and Dorothy Leavey Foundation Grant [with Fernando Guerra] Awarded to the Center for the Study of Los Angeles	*$20,000 – 12 months*
2002 – 2003	Ford Foundation Grant on Institutional Inequality [with Harry Pachon] Conducted longitudinal study of Prop 209 on Latino and Black college admittance Awarded to Tomás Rivera Policy Institute	*$150,000 – 12 months*
2002 – 2003	Haynes Foundation Grant on Economic Development [with Louis Tornatzky] Knowledge Economy in the Inland Empire region of Southern California Awarded to Tomás Rivera Policy Institute	*$150,000 – 18 months*
2001 – 2002	William F Podlich Graduate Fellowship, Center for the Study of Democracy, University of California, Irvine	*$24,000 – 9 months*

RESEARCH UNDER REVIEW/WORKING PAPERS:

Barreto, Matt, and Christopher Parker. The Great White Hope: Donald Trump, Race, and the Crisis of American Politics. Under Contract, University of Chicago Press, *expected 2020*

Barreto, Matt and Christopher Parker. "The Great White Hope: Existential Threat and Demographic Anxiety in the Age of Trump." Revise and Resubmit.

Barreto, Matt, Natalie Masuoka, Gabe Sanchez and Stephen El-Khatib. "Religiosity, Discrimination and Group Identity Among Muslim Americans" Revise and Resubmit

Barreto, Matt, Gabe Sanchez and Barbara Gomez. "Latinos, Blacks, and Black Latinos: Competition, Cooperation, or Indifference?" Revise and Resubmit

Walker, Hannah, Matt Barreto, Stephen Nuño, and Gabriel Sanchez. "A comprehensive review of access to valid photo ID and the right to vote in America" [Under review]

Gutierrez, Angela, Angela Ocampo, Matt Barreto and Gary Segura. "From Proposition 187 to Donald Trump: New Evidence that Anti-Immigrant Threat Mobilizes Latino Voters." [Under Review]

Collins, Jonathan, Matt Barreto, Gregory Leslie and Tye Rush. "Racial Efficacy and Voter Enthusiasm Among African Americans Post-Obama" [Under Review]

Oskooii, Kassra, Matt Barreto, and Karam Dana. "No Sharia, No Mosque: Orientalist Notions of Islam and Intolerance Toward Muslims in the United States" [Under Review]

Barreto, Matt, David Redlawsk and Caroline Tolbert. "Framing Barack Obama: Muslim, Christian or Black?" [Working paper]

EXPERT REPORTS:

- Benton, Chelan, Yakima counties signature rejection, 2022-23, *Reyes et al. v. Chilton et al.*
- San Juan County, New Mexico 2022-23, *Navajo Nation v. San Juan County, NM*
- Texas Statewide redistricting, 2022, *LULAC v. Abbott* (on behalf of Mexican American Legislative Caucus)
- Texas Statewide redistricting, 2021-22, *Brooks v. Abbott* Senate District 10 (Tarrant County)
- Baltimore County Council, 2021-22, *NAACP v. Baltimore County*, (on behalf of NAACP and ACLU-MD)
- Maryland Office of Attorney General, 2021-22, racially polarized voting analysis as part of statewide redistricting
- Pennsylvania House Democrats, 2021-22, racially polarized voting analysis as part of statewide redistricting
- Washington State Senate Democrats, 2021-22, racially polarized voting analysis as part of statewide redistricting
- City of San Jose, 2021, racially polarized voting analysis as part of city redistricting
- Santa Clara County, 2021, racially polarized voting analysis as part of county redistricting
- Pennsylvania, 2020, Boockvar v. Trump, Expert for Intervenors, (Perkins Coie) related to voter intimidation
- Missouri, 2020, Missouri NAACP vs. State of Missouri, Expert for plaintiffs related to vote by mail
- Georgia, 2020, Black Voters Matter vs. Raffesnsperger, Expert for plaintiffs related to vote by mail
- New York, 2019, Expert for NYAG New York v. U.S. Immigration and Customs Enforcement 1:19-cv-08876
- North Carolina, 2019, Expert for Plaintiffs in North Carolina voter ID lawsuit, NAACP v. Cooper
- East Ramapo CSD, 2019, Expert for Plaintiffs in Section 2 VRA lawsuit, assessed polarized voting
- New York, 2018, Expert for Plaintiffs in Census Citizenship Lawsuit, New York v. U.S. Dept of Commerce (also an expert related cases: *California v. Ross* and *Kravitz v. Dept of Commerce*)
- Dallas County, TX, 2017, Expert for Defense in Section 2 VRA lawsuit, Harding v. Dallas County
- Kansas, 2016, Expert for Plaintiffs in Kansas voter registration lawsuit, Fish v. Kobach 2:16-cv-02105-JAR
- North Dakota, 2015, Expert for Plaintiffs in North Dakota voter ID lawsuit, Brakebill v. Jaeger 1:16-cv-00008-CSM
- Alabama, 2015, Expert for Plaintiffs in Alabama voter ID lawsuit, Birmingham Ministries v. State of Alabama 2:15-cv-02193-LSC
- Texas, 2014, Testifying Expert for Plaintiffs in Texas voter ID lawsuit, Veasey v. Perry 2:13-cv-00193
- Galveston County, TX Redistricting, 2013, Expert report for Dunn & Brazil, LLC, Demographic analysis, vote dilution analysis, and racially polarized voting analysis for Section 2 lawsuit Galveston County JP/Constable districting
- Pasadena, TX Redistricting, 2013, Expert report for Dunn & Brazil, LLC, Demographic analysis, voter registration analysis, and racially polarized voting analysis for Section 2 lawsuit within Pasadena School District
- Harris County, TX Redistricting, 2011, Testifying Expert for Dunn & Brazil, LLC, Demographic analysis, voter registration analysis, and racially polarized voting analysis for Section 2 lawsuit within Harris County
- Pennsylvania, 2012, Testifying Expert for ACLU Foundation of Pennsylvania in voter ID lawsuit, Applewhite v. Commonwealth of Pennsylvania No. 330 MD 2012
- Milwaukee County, WI, 2012, Testifying Expert for ACLU Foundation of Wisconsin in voter ID lawsuit, Frank v. Walker 2:11-cv-01128(LA)
- Orange County, FL, 2012, Consulting Expert for Latino Justice/PRLDEF, Racially polarized voting analysis in Orange County, Florida

- Anaheim, CA, 2012, Consulting Expert for Goldstein, Demchak & Baller Legal, Racially polarized voting analysis for CVRA redistricting case Anaheim, CA
- Los Angeles County, CA, 2011, Consulting Expert for Goldstein, Demchak & Baller Legal, Racially polarized voting analysis for three redistricting cases in L.A.: Cerritos Community College Board; ABC Unified Schools; City of West Covina
- Harris County, TX Redistricting, 2011, Consulting Expert for Dunn & Brazil, LLC, Demographic analysis, voter registration analysis, for Section 5 objection within Harris County
- Monterey County, CA Redistricting, 2011, Consulting Expert for City of Salinas, Demographic analysis, creation of alternative maps, and racially polarized Voting analysis within Monterey County
- Los Angeles County Redistricting Commission, 2011, Consulting Expert for Supervisor Gloria Molina, Racially Polarized voting analysis within L.A. County
- State of California, Citizens Redistricting Commission, 2011, Consulting Expert, Racially Polarized Voting analysis throughout state of California
- Asian Pacific American Legal Center, 2011, Racially Polarized Voting analysis of Asian American candidates in Los Angeles for APALC redistricting brief
- Lawyers' Committee for Civil Rights and Arnold & Porter, LLP, 2010-12, Racially Polarized Voting analysis of Latino and Asian candidates in San Mateo County, concerning San Mateo County Board of Supervisors
- ACLU of Washington, 2010-11, preliminary analysis of Latino population patterns in Yakima, Washington, to assess ability to draw majority Latino council districts
- State of Washington, 2010-11, provided expert analysis and research for *State of Washington v. MacLean* in case regarding election misconduct and voting patterns
- Los Angeles County Chicano Employees Association, 2008-10, Racially Polarized Voting analysis of Latino candidates in L.A. County for VRA case, concerning L.A. County Board of Supervisors redistricting (6 reports issued 08-10)
- Brennan Center for Justice and Fried, Frank, Harris, Shriver & Jacobson LLP, 2009-10 Amicus Brief submitted to Indiana Supreme Court, *League of Women Voters v. Rokita*, regarding access to voter identification among minority and lower resource citizens
- State of New Mexico, consulting expert for state in *AAPD v. New Mexico*, 2008,
- District of Columbia Public Schools (DCPS), statistical consultant for survey methodology of opinion survey of parents in DCPS district (for pending suit), 2008,
- Brennan Center for Justice, 2007-08, Amicus Brief submitted to U.S. Supreme Court, and cited in Supreme Court decision, *Crawford v. Marion County*, regarding access to voter identification among minority and lower-resource citizens
- Los Angeles County Chicano Employees Association, 2002-07, Racially Polarized Voting analysis of Latino candidates in L.A. County for VRA case, concerning L.A. County Board of Supervisors redistricting (12 + reports issued during 5 years)
- Monterrey County School Board, 2007, demographic and population analysis for VRA case
- Sweetwater Union School District, 2007-08, Racially Polarized Voting analysis, and demographic and population analysis for VRA case
- Mexican American Legal Defense Fund, 2007-08, Racially Polarized Voting analysis for Latino candidates, for City of Whittier city council races, for VRA case
- ACLU of Washington, 2008, preliminary analysis of voting patterns in Eastern Washington, related to electability of Latino candidates
- Nielsen Media Research, 2005-08, with Willie C. Velasquez Institute, assessed the methodology of Latino household recruitment in Nielsen sample

TEACHING EXPERIENCE:

UCLA & UW — 2005 – Present

- Minority Political Behavior (Grad Seminar)
- Politics of Immigration in the U.S. (Grad Seminar)
- Introduction to Empirical/Regression Analysis (Grad Seminar)
- Advanced Empirical/Regression Analysis (Grad Seminar)
- Qualitative Research Methods (Grad Seminar)
- Political Participation & Elections (Grad Seminar)
- The Voting Rights Act (Law School seminar)
- Research methodology II (Law School Ph.D. program seminar)
- U.S. Latino Politics
- Racial and Ethnic Politics in the U.S.
- Politics of Immigration in the U.S.
- Introduction to American Government
- Public Opinion Research
- Campaigns and Elections in the U.S.
- Presidential Primary Elections

Teaching Assistant
University of California, Irvine — 2002 – 2005

- Intro to American Politics (K. Tate)
- Intro to Minority Politics (L. DeSipio)
  Recognized as Outstanding Teaching Assistant, Winter 2002
- Statistics and Research Methods (B. Grofman)
  Recognized as Outstanding Teaching Assistant, Winter 2003

BOARD & RESEARCH APPOINTMENTS

Founding Partner
Barreto Segura Partners (BSP) Research, LLC — 2021 - Present

Founding Partner
Latino Decisions — 2007 – 2020

Board of Advisors
American National Election Study, University of Michigan — 2010 – 2017

Advisory Board
States of Change: Demographics & Democracy Project — 2014 – Present
CAP, AEI, Brookings Collaborative Project

Research Advisor
American Values Institute / Perception Institute — 2009 – 2014

Expert Consultant
State of California, Citizens Redistricting Committee — 2011 – 2012

Senior Scholar & Advisory Council
Latino Policy Coalition, San Francisco, CA — 2006 – 2008

Board of Directors
CASA Latina, Seattle, WA — 2006 – 2009

Faculty Research Scholar
Tomás Rivera Policy Institute, University of Southern California — 1999 – 2009

PHD STUDENTS UCLA & UW

Committee Chair or Co-Chair

- Francisco I. Pedraza – University of California, Riverside (UW Ph.D. 2009)
- Loren Collingwood – University of California, Riverside (UW Ph.D. 2012)
- Betsy Cooper – Public Religion Research Institute, Washington DC (UW Ph.D. 2014)
- Sergio I. Garcia-Rios – Cornell University (UW Ph.D. 2015)
- Hannah Walker – Rutgers University (UW Ph.D. 2016)
- Kassra Oskooii – University of Delaware (UW Ph.D. 2016)
- Angela Ocampo – Arizona State University (UCLA Ph.D. 2018)
- Ayobami Laniyonu – University of Toronto (UCLA Ph.D. 2018)
- Bryan Wilcox-Archuleta – Facebook Analytics (UCLA 2019)
- Tyler Reny – Claremont Graduate University (UCLA 2020)
- Adria Tinin – Environmental Policy Analyst (UCLA Ph.D. 2020)
- Angie Gutierrez – University of Texas (UCLA Ph.D. 2021)
- Vivien Leung – Bucknell University (UCLA Ph.D. 2021)
- Marcel Roman – University of Texas (UCLA Ph.D. 2021)
- Shakari Byerly-Nelson – *in progress* (UCLA)

Committee Member

- Jessica Stewart – Emory University (UCLA Ph.D. 2018)
- Jonathan Collins – Brown University (UCLA Ph.D., 2017)
- Lisa Sanchez – University of Arizona (UNM Ph.D., 2016)
- Nazita Lajevardi – Michigan State University (UC San Diego Ph.D., 2016)
- Kiku Huckle – Pace University (UW Ph.D. 2016)
- Patrick Rock (Social Psychology) – (UCLA Ph.D. 2016)
- Raynee Gutting – Loyola Marymount University (Stony Brook Ph.D. 2015)
- Christopher Towler – Sacramento State University (UW Ph.D. 2014)
- Benjamin F. Gonzalez – San Diego State University (UW Ph.D. 2014)
- Marcela Garcia-Castañon – San Francisco State University (UW Ph.D. 2013)
- Justin Reedy (Communications) – University of Oklahoma (UW Ph.D. 2012)
- Dino Bozonelos – Cal State San Marcos (UC Riverside Ph.D. 2012)
- Brandon Bosch – University of Nebraska (UW Ph.D. 2012)
- Karam Dana (Middle East Studies) – UW Bothell (UW Ph.D. 2010)
- Joy Wilke – *in progress* (UCLA ABD)
- Erik Hanson – *in progress* (UCLA)
- Christine Slaughter – Princeton (UCLA Ph.D. 2021)
- Lauren Goldstein (Social Psychology) – *in progress* (UCLA)
- Barbara Gomez-Aguinaga – University of Nebraska (UNM Ph.D. 2020)
- Bang Quan Zheng – Florida International University (UCLA Ph.D. 2020)

Appendix E2: Resume of Michael Rios, MPP

MICHAEL RIOS

Phone: (909) 465-3947
michaelrios@uclavrp.org

3250 Public Affairs Building
Los Angeles, CA 90065

EDUCATION

Master of Public Policy Degree **June 2020**
University of California, Los Angeles
Luskin School of Public Affairs

Bachelor of Arts, Political Science **June 2017**
University of California, Riverside
Magna Cum Laude

WORK EXPERIENCE

UCLA Voting Rights Project
UCLA Latino Policy and Politics Initiative
- Data Scientist — Feb. 2022 - Present
- Research Analyst — June 2021 - Feb. 2022
- Policy Fellow — June 2019 - June 2021

RESEARCH EXPERIENCE

WHITE PAPERS:
- Riverside County Redistricting Memo (December 2021)
- UCLA VRP Report Urges Changes to Proposed Maps in Yolo County to Preserve the Strength of the Latino Vote (November 2021)
- Georgia: COVID-19 and Language Access Litigation (November 2020)
- Voting and Infection Prevention of COVID-19 (April 2020)

POLICY REPORTS:
- From Eligibility to the Ballot Box: Examining the Racial and Ethnic Voter Turnout Gaps in the U.S. and California (September 2022)
- Vote Choice of Latino Voters in the 2020 U.S. Senate Elections (July 2022)
- UCLA VRP Report Urges Orange County to Create Its First Latino-Majority District During the 2021 Redistricting Process (November 2021)
- Latino Voters in the 2021 Recall Election (September 2021)
- Opportunities and Challenges Facing California with the 2021 California Recall (July 2021)
- Latinas Exiting the Workforce: How the Pandemic Revealed Historic Disadvantages and Heightened Economic Hardship (August 2021)
- Analysis of New York State's Absentee Ballot Laws and Process and the Immediate Need for Absentee Ballot Reform (August 2020)

EXPERT CONSULTING ON VOTING RIGHTS:
- Petteway et al. v. Galveston County, Texas et al. (March 2022)
- Maryland Statewide Redistricting (March 2022)

- Baltimore County Branch of the National Association for the Advancement of Colored People, et al. v. Baltimore County, Maryland (February 2022)
- Navajo Nation, et al. v. San Juan County, New Mexico et al. (February 2022)
- Soto Palmer et al. v. Hobbs et al. (January 2022)
- Brooks et al. v. Abbott et al. (November 2021)
- Dallas County Commissioners Redistricting (November 2021)
- Harris County Commissioners Redistricting (November 2021)
- Fort Bend County Commissioners Redistricting (November 2021)
- Reyes et al. v. Chilton et al. (May 2021)
- Native American Rights Fund on access to absentee ballot dropboxes in Trump et al. vs. Cegavske (September 2020)
- Gabriel et al. v. Franklin County et al. (October 2020)
- Texas League of United Latin American Citizens v. Abbott (October 2020)

April 14, 2023 Rebuttal Declaration of Dr. Matt A. Barreto and Mr. Michael Rios

Pettaway, et al. v. Galveston County, et al.
United States District Court
Southern District of Texas
Case No. 3:22-cv-57-JVB

1. I, Dr. Matt Barreto, pursuant to 28 U.S.C. §1746, Rule 26(a)(B) of the Federal Rules of Civil Procedure, declare as follows:

2. My name is Matt Barreto, and I am currently Professor of Political Science and Chicana/o Studies at the University of California, Los Angeles. I submitted an expert report in this case on January 13, 2023 on behalf of Petteway Plaintiffs.

3. I summarized my qualifications and attached my CV in my initial report, and those remain the same today.

4. Similar to my previous report, Mr. Michael Rios, data scientist at the UCLA Voting Rights Project, co-authored this report. His CV also remains the same today.

5. We have now had the opportunity to review the report submitted by Defendants expert Dr. John Alford and provide our rebuttal to his report here. We also replicate our original analysis to provide racially polarized voting estimates based on the actual voter file for Galveston, which was not provided to us by Galveston County in time to include in the prior report.

I. Dr. Alford's proposed cohesion thresholds are not supported by social science literature or analysis.

6. Dr. Alford starts his rebuttal by offering admittedly untested social science and legal theory as to what constitutes political cohesion among voters. He writes "to date, neither the courts nor the academic literature have provided any bright-line standard." However, Dr. Alford ignores that the Supreme Court provided guidance to political scientists about cohesion, stating "a showing that a significant number of minority group members usually vote for the same candidates is one way of proving the political cohesiveness necessary to a vote dilution claim." A bright line threshold like that advanced by Dr. Alford would be inconsistent with social science practices and standards that typically look for patterns across data, not one single specific threshold.

7. To create a minimum 75% threshold in favor of their preferred candidate would be an unnecessary and artificial bright line. To Dr. Alford's novel theory, what if the minority group was found to be voting at 74% in favor of a preferred candidate, but their candidate always lost due to Anglo bloc voting – is that not evidence of racially polarized voting? From the perspective of representation and candidates of choice, the question is quite simple:

EXHIBIT B

if only Anglos would have voted, who would they have elected? If only non-Anglos would have voted, who would they have elected? *Gingles* does not require the Court to impose any artificial threshold to prove a candidate of choice, it is simply the candidate who is most preferred, understanding that from election to election and candidate to candidate, voting patterns can shift. Instead, one needs to show that "a significant number" of minorities are voting for the same candidate to show cohesion.

8. Specifically, Dr. Alford states that the level of voter cohesion needed to meet the *Gingles* 2 and *Gingles* 3 thresholds is unclear, and that "the halfway point between the complete absence of cohesion at 50% and perfect cohesion at 100% is found at 75%" (page 3). He gives no social science justification for the halfway point. Indeed, published social science research on minority political cohesion does not point to this 75% threshold as important or necessary. According to a political science study published in the journal *Social Science Quarterly* by Dr. Trey M.V. Hood, an expert witness which the State of Texas has hired and relied upon, political cohesion can be defined as simply greater than 50%. Dr. Hood writes: "The second prong concerns the degree to which the minority group in question is politically cohesive. Put another way, does a clear candidate of choice exist for minority voters? How exactly does one define one or another group's '*clear candidate of choice*'? A standard definition is: a clear candidate of choice is the candidate who received a majority of the vote (50.01 percent) from the minority group in question."[1]

9. However, attempting to use a specific threshold can be misleading. Cohesion is simply when a racial group could elect their preferred candidate if only that group of voters voted. For example, in a two-person race where only **racial group A** voted, if **racial group A** is estimated to prefer **candidate 1** by a vote margin of 67 to 33, they are demonstrating that by a 2-to-1 margin they are cohesive around candidate 1. Dr. Alford gives no reason as to why such a showing would not be strong enough to demonstrate racially polarized voting and political cohesion, other than he likes the halfway point of 75.

10. According to Dr. Alford, "cohesion levels below 75% are closer to non-cohesion than they are to complete cohesion" (page 3). Therefore, in an instance where **racial group A** is estimated to prefer **candidate 1** by a vote margin of 74 to 26, Dr. Alford would consider this group non-cohesive. If instead **racial group A** preferred **candidate 1** by a margin of 76 to 24 votes, Dr. Alford would consider this group closer to be cohesive. This further illustrates how using a specific threshold to estimate cohesion is misleading and unnecessary.

11. In any event, we have now been able to conduct a BISG analysis of racially polarized voting in Galveston County, as discussed below. That data show that Both Hispanic and Black voters support the same candidates at rates above 75% for all but one of the 30 elections across all five election cycles. So even if Dr. Alford's cohesion threshold were the rule, it is satisfied here.

[1] "From Legal Theory to Practical Application: A How-To for Performing Vote Dilution Analyses." 2016. *Social Science Quarterly*. (Peter A. Morrison, coauthor).

II. Race, not partisanship, explains the racially polarized voting in Galveston County elections.

12. In his critique of all Plaintiffs' experts, Dr Alford does not refute that racially polarized voting exists. Instead, he opines that Plaintiffs' experts "clearly establish[] that voting in partisan elections in Galveston County is clearly polarized according to the party affiliation of the candidates." Specifically, he claims that polarized voting in Galveston County is a result of partisanship rather than race/ethnicity (pages 6, 7, 9, and 11). He then goes on to say that this polarization is not due to the race of the candidate. While this causation question should not matter, the data indicate that Dr. Alford is wrong—race, not partisanship, explains the phenomenon of racially polarized voting in Galveston County elections.

13. In particular, the data reveals that political party is essentially a proxy for race in Galveston County. Although Dr. Alford criticized our discussion of this topic in our initial report as relying too heavily on national scholarship,[2] the ecological inference data we set forth in our initial report provides significant quantitative support for this conclusion. According to our BISG analysis, across all analyzed elections from 2014 to 2022, an average of just 10% of Galveston County Anglo voters supported the Democratic candidate. Across all analyzed elections from 2014 to 2022, an average of 1-7% of Galveston County Black voters supported the Republican candidate. Likewise, across all analyzed elections, just 12-16% of Galveston County Hispanic voters supported the Republican candidate.

14. The extreme magnitude of the polarization in Galveston County—which is starker than one finds analyzing Texas elections statewide—strongly suggests that political parties in Galveston County are simply a proxy for race.

15. To assess whether political parties are a proxy for race, two questions are important to consider: (1) the percentage of white voters that make up each political party in the jurisdiction and (2) the extent to which the Republican party nominates minority candidates for office in the jurisdiction and, if it does do so, any differences in the level of support among white Republican voters for minority or white Republican candidates.

16. On the first factor, the vast majority of Galveston County Republican voters are white while the vast majority of Galveston County Democratic voters are minorities. This can be seen from the extreme polarization figures from the ecological inference analysis discussed above.

---

[2] Having anticipated criticism about partisanship and polarized voting, we explain the abundance of literature published in political science that has concluded that racial attitudes are inseparable from partisan attachment among Anglos in the original January 13, 2023 report. Especially in the years since the 2008 election of Barack Obama, conservative racial attitudes have been a very strong factor in explaining Anglo support for Republican candidates. In our review of the political science literature, we cite roughly 20 peer-reviewed published studies. Dr. Alford cites no scholarly literature to contradict or refute this claim. This is because there is a consensus among political scientists that racial attitudes explain support for political parties among both Anglos and Minorities.

17. On the second factor, there has never been a minority Republican who has won a primary election to be the party's nominee for Galveston County Judge or County Commissioner. This is stark evidence that political parties are a proxy for race in Galveston County. While Black Republican Robin Armstrong now serves on the Commission, he was appointed after a white Republican (Clark) won the 2022 primary for Precinct 4 and passed away. As there was no Democratic nominee in the precinct, Armstrong was uncontested in the November election. By contrast, the 2022 Democratic candidate for Galveston County Judge (King) was Black, the 2020 Democratic candidate for Galveston County Sheriff (Salinas) was Hispanic, and the only two Black people ever nominated in a primary and subsequently elected to the Galveston County Commission have been Democrats.

18. Given the absence of any minority Republican in a contested election for Galveston County office, it is of some use to consider how Galveston County white voters have cast their ballots for white Republicans versus minority Republicans in statewide elections. In recent elections, Hispanic Republicans have run and been defeated in primary elections by Anglo voters. In 2022, Hispanic Republican George P. Bush lost to Anglo Republican Ken Paxton, winning only 28% of the vote among Galveston County Republicans. Black Republican candidate for Governor Alan West received only 14% of the vote among Galveston County Republicans in the 2022 primary election. In the primary for Land Office, two Hispanic Republicans ran and each received less than 10% of the vote from Galveston County Republicans with Weston Martinez winning 7% and Victor Avila winning 5% in the primary. In the primary election for State Board of Education, District 7, Black Republican Abolaji Ayobami won only 3% of the vote from Galveston County Republicans.

19. Of the 29 elections examined in our initial report, one involved a minority Republican—the 2018 election for the U.S. Senate in which Ted Cruz (a Hispanic man) was the Republican nominee. Notably, Senator Cruz received the lowest share of the Galveston County white vote among any of the 29 Republican candidates assessed across the five election cycles.

20. For this reason, Dr. Alford draws the wrong conclusion regarding the 2018 senate election. Dr. Alford opines that this contest shows that partisanship, not race, explains racially polarized voting in Galveston County because the Hispanic candidate (Cruz) won the white vote while the white candidate (O'Rourke) won the minority vote. The most noteworthy fact is not the rare instance of Republican voters nominated a minority candidate for statewide office, but rather that Galveston County white voters gave that Hispanic Republican candidate the lowest share of their votes among all analyzed elections across all five election cycles.

21. In this particular case, the Galveston County Commission elections are partisan and thus our analysis focuses on them as partisan contests because the Galveston County Commissioners' Court elections are partisan. Looking at voting patterns as correlated with the race of voters in each precinct is the most appropriate type of analysis.
22. Returning to the expectations for political science experts laid out in *Gingles,* expert analysis to assess the *Gingles* conditions is meant to focus on minority's preferred candidate, it does not say to focus on a candidate who is a racial minority. While minority voters may prefer co-ethnic minority candidates in some instances, they are not required to only for vote for

other Black or Latino candidates in order to prove a Section 2 claim. Minority voters are allowed to vote for whichever candidate they *prefer* to represent their community. The proper analysis is meant to focus on how different racial groups of *voters* cast their ballots, not to only focus on the race of the candidate.

23. As we make clear in this rebuttal, Dr. Alford has not conducted any independent analysis to prove that partisanship is the overriding factor. He has simply pointed out that certain candidates are Democrats and other candidates are Republican. He presents the Court with no statistical analysis demonstrating that partisanship, not race, is the factor at play. Clearly, there are wide ranging differences in the candidate preferences of Anglos and Minorities. He is asking whether or not he can explain away race effects by simply pointing out political party affiliation. However, the most relevant question is whether racial and ethnic minorities, as a group, are seeing their preferred candidates lose, relative to Anglos, not the party affiliation of the candidates.

24. Dr. Alford attempts to further his argument that the party of candidates dominates in accounting for the observed voting patterns by using the 2018 U.S. Senate election as an example (page 6). He claims that because our ecological inference analysis showed that Anglo voters supported Ted Cruz, who is Hispanic, and minority voters supported Beto O'Rourke, who is Anglo, that this demonstrates a "pattern entirely consistent with partisan polarization and entirely inconsistent with racial/ethnic polarization" (page 6). To the contrary, the race of the candidates does not dictate racially polarized voting analysis, rather it is the race of the voters and who those voters prefer. Cruz was not a minority-preferred candidate and centered most of his campaign around trying to win over Anglo voters. In the 2018 U.S. Senate election, Beto O'Rourke conducted considerable outreach to Latino voters.[3] Conversely, Ted Cruz positioned himself as largely anti-immigrant.[4] As shown in Table 1 of Appendix A in our original report, ecological inference estimates show that Latino voters largely preferred O'Rourke, therefore he was their candidate of choice regardless of his own race/ethnicity. The fact that there was stark polarization in the 2018 Senate contest is just further evidence of the patterns of racially polarized voting in Galveston County.

[3] Madlin Mekelburg, "Beto O'Rourke Launches First Spanish-Language TV Ad in Texas' Senate Race against Ted Cruz," El Paso Times (El Paso Times, September 18, 2018), https://www.elpasotimes.com/story/news/politics/elections/2018/09/18/beto-orourke-television-spanish-campaign-ad-texas-senate-race-ted-cruz/1340393002/.

[4] "Ted Cruz Again Defends Family Separation, as Beto O'Rourke Plans Vigil at Tornillo Tent Camp," Dallas News, August 24, 2019, https://www.dallasnews.com/news/politics/2018/06/16/ted-cruz-again-defends-family-separation-as-beto-o-rourke-plans-vigil-at-tornillo-tent-camp/.

III. Non-Partisan and primary elections are not particularly probative in this case.

25. Dr. Alford claims that including primary election and non-partisan local election analysis is necessary to separate party polarization and racial polarization from our ecological inference results. However, partisan general elections are the very type of elections before voters in deciding who they will elect to represent them on the Commissioners' Court, and as such they carry the most relevance.

26. Perhaps most critical is that Dr. Alford ignores the fact that with only one exception, (Precinct No. 4 in 2014) the County Commissioners' Court races are regularly unopposed in both the primary and general elections. Primary elections in Galveston County are not regularly contested between Anglo-preferred and Minority-preferred candidates. Therefore, the local primary elections would be less probative since voter turnout is comparatively lower with few contests being contested, and no significant local elections are being decided. As shown in Table 1 below, from 2014 to 2020, primary elections have had fewer than half as many voters turn out compared to general elections in Galveston County.

Table 1: Galveston Voter Turnout in General and Primary Elections from 2014 to 2020

Year	Election	Registered	Voted	Turnout
2020	General	228,382	155,752	68.2%
2020	Primaries	217,842	50,981	23.4%
2018	General	213,061	114,372	53.7%
2018	Primaries	207,657	36,019	17.3%
2016	General	208,387	125,342	60.1%
2016	Primaries	199,310	53,821	27.0%
2014	General	192,382	65,503	34.0%
2014	Primaries	189,900	24,188	12.7%

27. In reviewing historic election data, there has not been a competitive primary election for County Commissioners' Court going back as far as 2012. In the key district in question here, Precinct 3, the minority-preferred candidate, Commissioner Holmes, was unopposed in his primary contests in all three elections last decade – 2012, 2016, and 2020. In fact, on the Democratic side where an overwhelming majority of Galveston minority voters vote, there has not been *any* competitive primary election for any County Commissioners' Court Precinct or County Judge from 2012 – 2022 (see Table 2). Thus, analysis of voting patterns in primaries is not probative, nor would it be possible. In Galveston County, the most probative elections are the general elections.

TABLE 2: Galveston County Commissioners' Court, Primary and General Election Results 2014 – 2022

County Judge, 2022 General – Mark Henry 70,716 votes; William H King III 38,803 votes County Judge, 2022 Dem Primary – William H King III 10,006 votes - **unopposed** County Judge, 2022 GOP Primary – Mark Henry 25,401 votes – **unopposed** County Commiss., Precinct No. 2, 2022 GOP Primary – Joe Giusti 6,630 votes – **unopposed** County Commiss., Precinct No. 2, 2022 Dem Primary – **no candidates** County Commiss., Precinct No. 4, 2022 GOP Primary – Matt Robinson 2,279 votes; Ken Clark 4,762 votes County Commiss., Precinct No. 4, 2022 Dem Primary – **no candidates**
County Commiss., Precinct No. 1, 2020 General – Darrell Apffel 29,486 votes – **unopposed** County Commiss., Precinct No. 3, 2020 General – Stephen D. Holmes 19,669 votes – **unopposed** County Commiss., Precinct No. 1, 2020 GOP Primary – Darrell Apffel 6,486 votes – **unopposed** County Commiss., Precinct No. 1, 2020 Dem Primary – **no candidates** County Commiss., Precinct No. 3, 2020 Dem Primary – Stephen D. Holmes 4,988 votes – **unopposed** County Commiss., Precinct No. 3, 2020 GOP Primary – **no candidates**
County Judge, 2018 General – Mark Henry 77,048 votes – **unopposed** County Commiss., Precinct No. 2, 2018 General – Joe Giusti 23,870 votes – **unopposed** County Commiss., Precinct No. 4, 2018 General – Ken Clark 25,763 votes – **unopposed** County Judge, 2018 GOP Primary – Mark Henry 12,106 votes; Lonnie Cox 11,261 votes County Commiss., Precinct No. 2, 2018 GOP Primary – Joe Giusti 5,228 votes; Kevin O'Brien 2,756 votes County Commiss., Precinct No. 2, 2018 Dem Primary – **no candidates** County Commiss., Precinct No. 4, 2018 GOP Primary – Ken Clark 3,440 votes; Michelle Hatmaker 1,572 votes; Jim Bulgier 1,089 votes; Billy Enochs 1,123 votes County Commiss., Precinct No. 4, 2018 Dem Primary – **no candidates**

County Commiss., Precinct No. 1, 2016 General – Darrell Apffel 22,749 votes – **unopposed**
County Commiss., Precinct No. 3, 2016 General – Stephen D. Holmes 16,096 votes – **unopposed**
County Commiss., Precinct No. 1, 2016 GOP Primary – Darrell Apffel 3,742 votes; Tim Paulissen 3,239 votes; Barbara Meeks 2,212 votes
County Commiss., Precinct No. 1, 2016 Dem Primary – **no candidates**
County Commiss., Precinct No. 3, 2016 Dem Primary – Stephen D. Holmes 3,672 votes – **unopposed**
County Commiss., Precinct No. 3, 2016 GOP Primary – **no candidates**
County Judge, 2014 General – Mark Henry 37,949 votes; William F. Young 15,411 votes
County Commiss., Precinct No. 2, 2014 General – Joe Giusti (IND) 13,199 votes – **unopposed**
County Commiss., Precinct No. 4, 2014 General – Ken Clark 14,702 votes; Robert Hutchins 4,609 votes
County Commiss., Precinct No. 2, 2014 GOP Primary Runodd– Joe Giusti 2,133 votes; Kevin O'Brien 2,018 votes
County Judge, 2014 GOP Primary – Mark Henry 8,904 votes; Michelle Hatmaker 8,339 votes
County Judge, 2014 Dem Primary – **no candidates**
County Commiss., Precinct No. 2, 2014 GOP Primary – Joe Giusti 1,610 votes; Beau Rawlins 483 votes; John Paul Listowski 634 votes; Janet Hoffman 750 votes; Kevin O'Brien 1,504 votes; Andy McDonald 752 votes
County Commiss., Precinct No. 2, 2014 Dem Primary – **no candidates**
County Commiss., Precinct No. 4, 2014 GOP Primary – Ken Clark 4,724 votes – **unopposed**
County Commiss., Precinct No. 4, 2014 Dem Primary – **no candidates**

IV. Ecological inference analysis of adopted County Commissioners' Court precincts using BISG

28. At the time of our original report, we had not been provided the official Galveston County election history voter files in a timely manner for use by January 13, 2023 when our report was due. Since receiving them, we have been able to update our ecological inference analysis utilizing Bayesian Improved Surname Geocoding (BISG) to report estimates on county voters' race and ethnicity. Further, we analyzed 29 federal, statewide, and local elections from 2014 to 2022 countywide, and within each adopted County Commissioners' Court precinct as well as in the Petteway Plaintiffs' demonstrative precincts.

29. BISG was developed by demographic experts[5] and has been widely published and applied in the domain of political science to understand voting trends by race and ethnicity. It has been used by experts in Section 2 voting rights trials and found credible and reliable by a federal district court[6] and the Second Circuit Court of Appeals[7]. It has been published in peer-reviewed political science, social science methodology, and law review journals as an appropriate technique for understanding voter race or ethnicity[8]. The method relies on a combination of Census surname analysis and Census block-level racial demographics to provide an overall probability assessment of the voter's race or ethnicity.[9] Demographers and social scientists already utilize both of these methods separately; matching Census data to geographic units is widely used for understanding racial demographics and density of an area[10], and surname analysis is regularly used against the voter file to understand race and ethnicity.[11] Using both data sources makes it possible to gain a more precise understanding of voter demographics—two pieces of evidence, instead of just one, provides far more reliable estimates.[12]

30. BISG analysis begins by undertaking the surname analysis, a method that federal courts in Texas have found reliable. Indeed, for many years Dr. Alford has regularly used Spanish surname matching[13] to reliably identify Hispanic voters on the voter file for EI analysis. Surname analysis in BISG starts by taking each last name in the voter file and checking it against the published directories created by the Census Bureau.[14] This list, assembled based on research by demographers at the Census Bureau, has created a racial/ethnic probability for

---

[5] Fiscella, Kevin, and Allen M. Fremont. "Use of geocoding and surname analysis to estimate race and ethnicity." *Health services research* 41, no. 4p1 (2006): 1482-1500.

[6] *NAACP vs. East Ramapo Central School District*, No. 17-CV-8943-CS-JCM, May 25, 2020

[7] *Clerveaux v. E. Ramapo Cent. Sch. Dist.* UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT. No. 20-1668. January 6, 2021

[8] Jesse T. Clark, John A. Curiel and Tyler S. Steelman. 2021. Minmaxing of Bayesian Improved Surname Geocoding and Geography Level Ups in Predicting Race. Political Analysis. (Nov); Kevin DeLuca and John A. Curiel. 2022. Validating the Applicability of Bayesian Inference with Surname and Geocoding to Congressional Redistricting. Political Analysis. (May); M Barreto, M Cohen, L Collingwood, C Dunn, S Waknin. 2022. "A Novel Method for Showing Racially Polarized Voting: Bayesian Improved Surname Geocoding" New York University Review of Law & Social Change

[9] Imai, Kosuke, and Kabir Khanna. "Improving ecological inference by predicting individual ethnicity from voter registration records." *Political Analysis* 24, no. 2 (2016): 263-272.

[10] Jorge Chapa, Ana Henderson, Aggie Jooyoon Noah, Werner Schinkiv, & Robert Kengle, The Chief Justice Earl Warren Institute on Law and Social Policy, *Redistricting: Estimating Citizen Voting Age Population* (2011)

[11] Grofman, Bernard, and Jennifer R. Garcia. "Using Spanish Surname to Estimate Hispanic Voting Population in Voting Rights Litigation: A Model of Context Effects Using Bayes' Theorem." *Election Law Journal* 13, no. 3 (2014): 375-393.

[12] Barreto, Matt, Michael Cohen, Loren Collingwood, Chad Dunn, and Sonni Waknin. "A novel method for showing racially polarized voting: Bayesian improved surname geocoding." *New York University Review of Law & Social Change* (2021).

[13] For example in *Cisneros v. Pasadena ISD*, 2013.

[14] Elliott, Marc N., Allen Fremont, Peter A. Morrison, Philip Pantoja, and Nicole Lurie. "A new method for estimating race/ethnicity and associated disparities where administrative records lack self reported race/ethnicity." *Health services research* 43, no. 5p1 (2008): 1722-1736.

each last name in the United States based on the official Census records.[15] When a person fills out the Census form, they record their last name and their self-reported race and ethnicity.[16] The resulting probability estimate for each name can then be cross-referenced with the voter file. So, a surname database can assign a probability for nearly every last name found on a voter file.

31. The second step of BISG relies on the address of the voter from the voter file.[17] Using a procedure known as geocoding, this address information can be cross-referenced with the data from the decennial Census at the block level. The Census data contains the self-reported race of residents, aggregated to the Census block level. Using Census statistics for the racial and ethnic composition for the block in which a voter resides, the block's racial demographic percentages can be used to refine the initial estimate of voter race by surname alone.[18] By using a smaller level of aggregation (i.e., Census block), researchers have more precision in their racial estimates.

32. BISG uses the two proxy sources of voter race information—a voter's name and where they live—to generate an estimate of their race. By employing the Who Are You (WRU) package in R[19] to estimate the probability that a voter is of a certain race, a more detailed analysis can be inferred from the combination of surname and geolocation data—as opposed to using just one or the other.

33. Using the voter file provided to us by Galveston County, we used the software package *eiCompare* to perform Bayesian Improved Surname Geocoding (BISG) and obtain probabilistic estimates of each voter's race in the voter file, which we then used to estimate turnout by race across precinct.[20] Full replication instructions are publicly available at both the WRU and *eiCompare* portals which explain the procedure in-depth with tutorials.

34. As identified in our original report, which used citizen voting-age population (CVAP), Spanish surname turnout (SSTO), and estimated voter turnout data, there is a consistent and statistically significant finding of racially polarized voting in Galveston County and within each of the four commissioner precincts.

35. As shown in Tables 3 and 4 below, for both countywide analysis and within district analysis, Black and Hispanic voters in Galveston are cohesive and vote for their candidates of choice

---

[15] "Decennial Census Surname Files (2010, 2000)." Perma.cc. https://perma.cc/9JLV-7NQJ.

[16] Ibid.

[17] Amos, Brian, and Michael P. McDonald. "A Method to Audit the Assignment of Registered Voters to Districts and Precincts." *Political Analysis* 28, no. 3 (2020): 356-371.

[18] Barreto, Matt, Michael Cohen, Loren Collingwood, Chad Dunn, and Sonni Waknin. "A novel method for showing racially polarized voting: Bayesian improved surname geocoding." *New York University Review of Law & Social Change,* (2022).

[19] Khanna, Kabir, Kosuke Imai, and Maintainer Kabir Khanna. "Package 'wru'." (2019). The WRU package uses Bayes' Rule to compute the probability of each racial category for any given person.

[20] RPVote, "RPVOTE/EiCompare: Comparing Ecological Inference Techniques," GitHub, https://github.com/RPVote/eiCompare.

by roughly a 3-to-1 margin or greater, and always in contrast to Anglo voters who bloc-vote against minority candidates of choice.

Table 3: Galveston County Iterative Ecological Inference (EI) Candidate Choice Estimates by Adopted County Commissioners' Court Precincts

			Countywide		Precinct 1		Precinct 2		Precinct 3		Precinct 4	
Year	Office	Candidate	Anglo	Non-Anglo	Anglo	Non-Anglo	Anglo	Non-Anglo	Anglo	Non-Anglo	Anglo	Non-Anglo
2022	Attorney General	Paxton	88.5	11.0	86.0	21.4	80.6	9.0	82.2	28.8	93.4	11.3
		Garza	11.5	89.3	14.2	78.8	19.3	90.9	17.2	71.0	6.5	89.2
	County Judge	Henry	90.4	12.1	87.6	22.8	81.9	10.6	86.6	24.9	94.2	13.1
		King	9.5	87.8	12.1	76.1	18.1	89.5	13.1	74.3	5.8	86.3
	District Attorney	Roady	91.0	14.5	88.9	23.1	85.6	7.0	86.8	27.9	94.7	14.7
		Dragony	9.1	85.6	11.5	76.3	14.3	93.0	12.9	70.8	5.3	85.6
	District Judge #122	Jones	90.2	12.2	87.0	22.7	84.3	11.1	85.0	27.5	94.4	12.6
		Walsdorf	9.7	87.8	12.6	76.8	18.0	94.2	14.6	72.0	5.6	87.5
	Governor	Abbott	88.7	11.1	85.8	23.0	82.7	5.4	83.4	28.8	93.6	10.6
		O'Rourke	11.2	89.0	14.6	77.9	17.3	94.6	17.2	72.6	6.3	89.2
	Lt. Governor	Patrick	88.2	11.1	85.0	23.6	80.5	8.9	82.2	28.1	93.1	10.6
		Collier	11.8	89.1	15.1	77.1	19.5	91.1	17.7	71.1	6.9	89.5
	U.S. House of Reps, District #14	Weber	90.0	13.2	87.0	24.6	82.3	11.5	85.7	28.9	94.2	13.6
		Williams	9.9	86.8	12.9	76.3	17.7	88.7	15.3	72.5	6.0	86.6
2020	District Judge #405	Robinson	91.6	13.8	93.0	14.2	84.4	11.3	87.9	27.1	97.0	10.6
		Hudson	8.4	86.2	7.0	85.7	15.6	88.8	12.0	73.2	3.0	89.5
	District Judge #56	Cox	92.0	15.8	93.6	15.9	86.7	12.3	87.2	31.3	96.9	12.7
		Lindsey	8.0	84.2	6.4	83.9	13.3	87.7	12.9	69.2	3.2	87.1
	President	Trump	89.3	12.7	92.5	11.1	82.5	10.9	83.8	26.7	94.8	9.8
		Biden	10.7	87.7	7.5	89.0	17.5	89.0	16.3	72.3	5.2	90.3

			Countywide		Precinct 1		Precinct 2		Precinct 3		Precinct 4	
Year	**Office**	**Candidate**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**
	U.S. Senate	Cornyn	90.9	13.9	93.2	13.4	84.2	11.2	87.8	26.1	97.2	9.8
		Hegar	9.0	85.9	6.7	86.4	15.8	88.7	12.3	73.1	2.9	90.2
	County Sheriff	Trochesset	91.9	13.2	93.6	12.4	86.4	11.5	90.4	21.2	97.2	10.2
		Salinas	7.9	86.8	6.4	87.6	13.5	88.5	9.6	78.5	3.0	89.3
	U.S. House of Reps, District #14	Weber	91.3	14.3	93.2	14.6	85.0	10.8	88.7	27.6	96.5	11.9
		Bell	8.5	85.6	6.9	85.4	15.0	89.2	11.6	73.2	3.5	88.0
	Attorney General	Paxton	87.6	8.0	90.1	7.1	78.2	8.7	90.2	12.5	90.8	8.9
		Nelson	12.6	91.9	9.8	92.5	21.8	91.6	9.8	88.1	9.3	91.6
	Galveston Court Judge #2	Foley	90.1	9.6	92.0	9.6	79.9	10.3	95.4	9.4	93.4	10.8
		Pettijohn	9.9	90.5	8.2	90.8	20.3	89.8	4.8	90.8	6.7	89.3
	Governor	Abbott	91.2	15.0	93.0	14.4	83.0	13.0	95.9	15.3	94.8	15.3
		Valdez	8.9	84.9	7.0	86.1	17.0	87.1	4.2	84.9	5.2	84.9
2018												
	Lt. Governor	Patrick	88.8	9.1	90.1	9.7	79.4	10.7	92.2	9.8	91.9	8.8
		Collier	11.3	91.2	9.7	90.0	20.6	89.2	7.8	90.0	8.0	91.5
	U.S. Senate	Cruz	87.4	8.4	89.4	8.6	77.1	10.9	90.7	9.9	91.5	8.8
		O'Rourke	12.7	91.3	10.2	91.8	22.9	89.0	9.7	90.4	8.3	91.2
	U.S. House of Reps, District #14	Weber	89.8	9.7	91.7	9.1	80.5	10.0	95.1	7.8	93.1	11.2
		Bell	10.2	90.3	8.3	90.9	19.7	89.8	5.1	91.8	6.9	89.1
	District Judge #10	Neves	91.4	16.0	94.1	13.0	85.3	7.8	95.7	20.5	94.3	17.5
		Walker	8.5	83.7	5.8	86.9	14.8	91.6	4.2	79.4	6.0	83.5
2016	President	Trump	89.9	12.8	91.2	13.0	80.9	12.1	94.9	12.1	93.0	12.1
		Clinton	10.3	87.3	8.8	86.9	19.0	88.5	5.2	87.9	6.7	88.0
	Supreme Court Justice, Position #5	Green	91.0	15.7	93.2	13.3	83.4	9.5	96.4	19.2	93.5	16.0
		Garza	9.0	84.2	6.8	86.6	16.6	90.4	4.0	81.2	6.2	83.5

			Countywide		Precinct 1		Precinct 2		Precinct 3		Precinct 4	
Year	**Office**	**Candidate**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**
2014	U.S. House of Reps, District #14	Weber	91.4	15.9	94.1	13.4	84.8	7.8	96.2	20.1	94.1	16.5
		Cole	8.7	84.1	6.2	86.6	15.3	92.4	3.8	79.9	5.8	84.2
	Attorney General	Paxton	89.3	11.4	93.1	5.7	78.0	8.1	95.8	17.5	92.6	11.7
		Houston	10.7	88.3	6.8	94.1	21.8	91.6	4.1	82.3	7.3	88.8
	County Judge	Henry	88.5	28.9	90.2	30.0	79.6	21.3	98.2	15.0	93.0	29.5
		Young	11.6	71.7	10.0	69.1	20.0	78.7	1.9	85.6	7.0	70.4
	Governor	Abbott	89.2	7.9	91.5	5.9	79.2	2.2	96.0	12.0	92.4	8.0
		Davis	10.7	92.0	8.5	94.1	20.8	97.8	3.9	87.7	7.3	91.4
	Lt. Governor	Patrick	89.5	8.5	92.6	4.6	78.1	6.9	95.4	13.8	93.1	7.4
		Van De Putte	10.6	91.5	7.3	95.4	21.8	93.1	4.5	86.1	6.9	92.6
	U.S. Senate	Cornyn	91.2	16.7	93.3	13.4	83.0	10.5	96.8	23.6	94.7	14.5
		Alameel	8.8	83.6	6.7	86.6	17.0	90.0	3.3	76.4	5.6	85.8
	Supreme Court Justice, Position #7	Boyd	89.7	11.5	92.7	6.8	78.8	6.2	96.0	17.8	92.7	11.8
		Benavides	10.2	88.8	7.4	92.9	21.1	93.7	4.1	81.7	7.5	88.6
	U.S. House of Reps, District #14	Weber	90.7	14.1	92.7	11.1	81.5	8.9	97.2	19.8	94.3	12.1
		Brown	9.3	85.7	7.0	89.1	18.8	90.6	2.9	80.4	6.0	88.1

36. In elections across Galveston County ecological inference models point to a clear pattern of racially polarized voting. The vast majority of non-Anglo voters in Galveston County are comprised of Hispanic voters and Black voters, and these demonstrate that non-Anglos are unified and vote cohesively, siding for the same candidates of choice with high support. In contrast, Anglo voters strongly bloc vote against minority candidates of choice. Anglo block voting appears to be uniform across elections from 2014 to 2022 with rates over 85% opposition to minority preferred candidates. Anglo voters demonstrate considerable block voting against Hispanic and Black candidates of choice, regularly voting in the exact opposite pattern of Hispanic and Black voters in Galveston. This is consistent with election analysis for Galveston County we presented in our original report.

Table 4: Galveston County Ecological Inference Rows by Columns (RxC) Candidate Choice Estimates by Adopted County Commissioners' Court Districts

			Countywide		Precinct 1		Precinct 2		Precinct 3		Precinct 4	
Year	**Office**	**Candidate**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**
2022	Attorney General	Paxton	88.8	10.4	89.7	13.0	78.7	13.5	85.7	21.7	93.1	11.4
		Garza	11.2	89.6	10.3	87.0	21.3	86.5	14.3	78.3	6.9	88.6
	County Judge	Henry	90.8	11.5	92.2	13.2	80.7	13.3	90.6	17.8	93.5	14.4
		King	9.2	88.5	7.8	86.8	19.3	86.7	9.4	82.2	6.5	85.6
	District Attorney	Roady	91.5	13.0	92.7	15.1	82.5	14.3	91.3	19.0	94.6	14.8
		Dragony	8.5	87.0	7.3	84.9	17.5	85.7	8.7	81.0	5.4	85.2
	District Judge #122	Jones	90.7	11.3	91.7	13.8	81.1	13.1	89.3	19.5	93.7	13.7
		Walsdorf	9.3	88.7	8.3	86.2	18.9	86.9	10.7	80.5	6.3	86.3
	Governor	Abbott	89.1	10.5	89.6	14.3	79.2	13.4	85.7	22.0	93.6	10.6
		O'Rourke	10.9	89.4	10.4	85.7	20.8	86.6	14.3	78.0	6.4	89.4
	Lt. Governor	Patrick	88.4	10.7	89.1	14.4	78.2	14.1	85.2	21.8	92.3	11.8
		Collier	11.6	89.3	10.9	85.6	21.8	85.9	14.8	78.2	7.7	88.2
	U.S. House of Reps, District #14	Weber	90.6	12.0	91.1	15.9	81.2	13.9	88.5	21.3	94.1	13.3
		Williams	9.4	88.0	8.9	84.1	18.8	86.1	11.5	78.7	5.9	86.7
2020	District Judge #405	Robinson	93.1	10.8	91.3	16.8	83.3	13.2	93.2	16.7	96.0	12.0
		Hudson	6.9	89.2	8.7	83.2	16.7	86.8	6.8	83.3	4.0	88.0
	District Judge #56	Cox	92.8	14.4	90.8	20.3	84.6	16.2	92.5	20.5	95.1	16.0
		Lindsey	7.2	85.6	9.2	79.7	15.4	83.8	7.5	79.5	4.9	84.0
	President	Trump	90.1	11.1	89.1	16.4	80.7	14.3	89.2	17.2	93.0	12.7
		Biden	9.9	88.9	10.9	83.6	19.3	85.7	10.8	82.8	7.0	87.3
	U.S. Senate	Cornyn	92.4	11.5	89.8	18.8	82.1	15.2	93.1	15.8	95.4	12.8
		Hegar	7.6	88.5	10.2	81.2	17.9	84.8	6.9	84.2	4.6	87.2

	County Sheriff	Trochesset	93.0	11.3	92.1	14.5	83.9	16.1	93.1	16.0	95.9	12.1
		Salinas	7.0	88.7	7.9	85.5	16.1	83.9	6.9	84.0	4.1	87.9
	U.S. House of Reps, District #14	Weber	92.5	12.5	91.4	17.4	82.7	15.0	93.1	18.3	95.5	13.5
		Bell	7.5	87.5	8.6	82.6	17.3	85.0	6.9	81.7	4.5	86.5
	Attorney General	Paxton	89.7	4.2	89.9	7.7	78.2	8.6	90.0	12.1	92.5	5.9
		Nelson	10.3	95.8	10.1	92.3	21.8	91.4	10.0	87.9	7.5	94.1
	Galveston Court Judge #2	Foley	92.6	5.0	92.7	7.8	80.1	10.1	96.1	7.6	95.6	6.4
		Pettijohn	7.4	95.0	7.3	92.2	19.9	90.0	3.9	92.4	4.4	93.6
	Governor	Abbott	93.3	10.8	92.0	15.9	82.3	14.3	97.4	11.3	96.3	12.2
		Valdez	6.7	89.2	8.0	84.1	17.7	85.7	2.6	88.6	3.7	87.8
2018												
	Lt. Governor	Patrick	90.6	5.6	90.0	10.2	80.1	9.4	91.8	11.0	93.8	5.7
		Collier	9.4	94.4	10.0	89.8	19.9	90.6	8.2	89.0	6.2	94.3
	U.S. Senate	Cruz	89.2	5.2	88.0	11.0	78.0	9.2	88.7	13.4	93.3	5.7
		O'Rourke	10.8	94.8	12.0	89.0	22.0	90.8	11.3	86.6	6.7	94.3
	U.S. House of Reps, District #14	Weber	92.2	5.2	91.4	9.5	80.4	10.0	95.7	6.7	95.4	6.8
		Bell	7.8	94.8	8.6	90.5	19.6	90.0	4.3	93.3	4.6	93.2
	District Judge #10	Neves	94.0	11.4	93.4	14.0	85.8	7.3	98.0	15.7	96.0	13.5
		Walker	6.0	88.6	6.6	86.0	14.2	92.7	2.0	84.3	4.0	86.5
	President	Trump	92.5	7.4	90.5	14.1	81.0	11.4	96.4	8.8	94.9	9.1
		Clinton	7.5	92.6	9.5	85.9	19.0	88.6	3.6	91.2	5.1	90.9
2016												
	Supreme Court Justice, Position #5	Green	93.3	11.3	93.2	13.2	83.7	9.0	97.7	15.6	94.7	14.6
		Garza	6.7	88.7	6.8	86.8	16.3	91.0	2.3	84.4	5.3	85.4
	U.S. House of Reps, District #14	Weber	93.5	11.8	93.7	13.6	84.5	8.1	97.0	18.2	95.6	13.4
		Cole	6.5	88.1	6.3	86.4	15.5	91.9	3.0	81.8	4.4	86.6
	Attorney General	Paxton	91.4	7.0	93.2	5.7	78.7	7.1	97.6	12.7	93.0	10.4
2014		Houston	8.6	93.0	6.8	94.3	21.3	92.9	2.4	87.3	7.0	89.6
	County Judge	Henry	90.4	24.0	94.0	21.8	78.7	24.3	95.1	22.4	94.1	27.3

		Young	9.6	76.0	6.0	78.2	21.3	75.7	4.9	77.6	5.9	72.7
	Governor	Abbott	90.9	4.5	92.6	4.0	76.4	8.4	97.0	9.7	92.1	8.9
		Davis	9.1	95.5	7.4	96.0	23.6	91.6	3.0	90.3	7.9	91.1
	Lt. Governor	Patrick	91.1	5.2	92.4	5.1	78.3	6.6	96.9	10.4	93.0	7.9
		Van De Putte	8.9	94.8	7.6	95.0	21.6	93.4	3.1	89.6	7.0	92.1
	U.S. Senate	Cornyn	94.0	10.5	95.0	9.9	83.7	8.6	97.7	21.1	96.3	11.1
		Alameel	6.0	89.5	5.0	90.1	16.3	91.4	2.4	78.9	3.7	88.9
	Supreme Court Justice, Position #7	Boyd	91.8	6.4	93.8	4.9	78.2	8.3	98.2	12.0	93.3	10.3
		Benavides	8.2	93.6	6.2	95.1	21.8	91.7	1.8	88.0	6.7	89.7
	U.S. House of Reps, District #14	Weber	93.3	8.5	94.7	7.6	82.1	7.5	98.0	16.8	95.1	10.8
		Brown	6.7	91.5	5.3	92.4	17.9	92.5	2.0	83.2	4.9	89.2

37. In Galveston County, Black and Hispanic voters vote cohesively, for like candidates of choice. In particular, the analysis reveals that Black and Hispanic voters are cohesive in local elections regardless of which County Commissioners' Court precinct.

38. In addition to looking within each of the four individual Commissioner Court precincts, we can use BISG analysis of the race of the actual voters to provide Anglo, Black, Hispanic vote choice estimates for Galveston County as a whole. Dr. Alford has not produced any separate independent analysis of voting patterns by race in Galveston, nor has he disputed that elections are polarized among Anglo, Black, and Hispanic voters. Using BISG we can obtain a more precise estimate of voting patterns because here we are relying only on data among the actual people who voted, to correlate with candidate support levels.

39. In Table 5 below, we present results of ecological inference analysis using both King's Iterative and RxC models for Anglo, Black, and Hispanic voting patterns in Galveston County elections for the county as a whole. The vote estimates using BISG are quite consistent for Anglo and Black voters as found in the CVAP estimates in our original report of January 13. However, for Hispanic voters which are documented to have lower rates of voter turnout, the BISG estimates report even higher rates of political cohesion, almost always at the 80% cohesive rate for their candidates of choice. This is because BISG eliminates non-voters from the analysis and confines the regression model to only account for the relationship between the race of actual voters and votes for candidates.

Table 5: Galveston County Ecological Inference Candidate Choice Estimates Using BISG for Anglo, Black, Hispanic Voters, 2014 – 2022

Year	Office	Candidate	Anglo - EI	Black - EI	Hispanic - EI	Anglo - RxC	Black - RxC	Hispanic - RxC
2022	Attorney General	Paxton	88.6	0.6	9.8	85.7	7.2	20.3
		Garza	11.4	99.2	89.3	14.3	92.8	79.7
	County Judge	Henry	90.4	0.4	13.6	88.1	7.9	20.5
		King	9.5	99.5	87.9	11.9	92.1	79.5
	District Attorney	Roady	91.0	1.1	12.9	89.4	8.1	22.9
		Dragony	9.0	99.2	87.0	10.6	91.9	77.1
	District Judge #122	Jones	90.3	0.5	12.5	87.9	7.8	20.1
		Walsdorf	9.7	99.3	87.8	12.1	92.2	79.9
	Governor	Abbott	88.6	0.6	9.9	86.4	7.9	19.1
		O'Rourke	11.3	99.0	89.5	13.6	92.1	80.8
	Lt. Governor	Patrick	88.2	0.6	10.5	85.9	7.7	21.7
		Collier	11.8	99.4	88.8	14.1	92.3	78.3
	U.S. House of Reps, District #14	Weber	90.1	0.5	10.2	88.0	6.7	22.6
		Williams	9.8	99.5	89.0	12.0	93.3	77.4
2020								
	County Sheriff	Trochesset	92.1	0.5	10.2	91.5	6.7	17.0
		Salinas	7.8	99.3	89.6	8.5	93.3	83.0
	District Judge #405	Robinson	91.7	0.5	12.3	91.3	6.4	16.8
		Hudson	8.5	99.3	87.8	8.7	93.6	83.2
	District Judge #56	Cox	92.2	0.8	13.2	90.9	7.4	23.8
		Lindsey	7.8	99.3	86.8	9.1	92.6	76.2
	President	Trump	89.3	1.3	21.2	87.7	6.8	19.2
		Biden	10.6	99.2	78.9	12.3	93.2	80.8
	U.S. House of Reps, District #14	Weber	91.3	0.5	11.5	91.3	5.8	18.7
		Bell	8.4	99.5	88.3	8.7	94.2	81.3

	U.S. Senate	Cornyn	91.0	0.8	12.2	90.4	7.0	17.9
		Hegar	8.9	99.4	87.2	9.6	93.0	82.1
2018	Attorney General	Paxton	87.6	1.0	14.0	86.5	5.1	10.8
		Nelson	12.5	98.9	85.9	13.5	94.9	89.2
	Galveston Court Judge #2	Foley	90.0	0.6	15.7	90.6	4.0	9.7
		Pettijohn	10.0	99.2	84.0	9.4	96.0	90.3
	Governor	Abbott	91.1	0.5	14.5	92.3	5.7	14.5
		Valdez	8.9	99.7	84.8	7.7	94.3	85.5
	Lt. Governor	Patrick	88.9	0.9	15.2	88.2	5.5	11.7
		Collier	11.1	98.5	85.3	11.8	94.5	88.3
	U.S. House of Reps, District #14	Weber	89.8	0.8	15.3	90.6	4.1	8.5
		Bell	10.2	98.9	84.4	9.4	95.9	91.5
	U.S. Senate	Cruz	87.3	0.8	13.8	86.2	5.4	11.7
		O'Rourke	12.7	98.7	85.3	13.8	94.6	88.3
2016	District Judge #10	Neves	91.5	0.2	3.9	92.9	6.3	12.5
		Walker	8.6	99.4	96.1	7.1	93.7	87.5
	President	Trump	89.8	1.0	6.2	91.0	6.0	9.8
		Clinton	10.3	99.2	93.8	9.0	94.0	90.2
	Supreme Court Justice, Position #5	Green	91.0	0.2	5.8	92.8	6.1	9.8
		Garza	9.0	99.5	94.4	7.2	93.9	90.2
	U.S. House of Reps, District #14	Weber	91.4	0.2	5.5	92.6	5.2	11.9
		Cole	8.7	99.6	94.4	7.4	94.8	88.1
2014	Attorney General	Paxton	89.3	0.2	2.6	89.5	5.0	10.4
		Houston	10.7	99.6	97.6	10.5	95.0	89.6
	County Judge	Henry	88.7	10.9	27.3	88.2	21.4	36.6
		Young	11.3	88.7	72.8	11.8	78.6	63.4

	Governor	Abbott	89.3	0.8	15.6	88.6	4.8	8.8
		Davis	10.7	99.1	84.9	11.4	95.2	91.2
	Lt. Governor	Patrick	89.5	0.4	15.9	89.1	4.7	10.0
		Van De Putte	10.6	99.7	84.2	10.9	95.3	90.0
	Supreme Court Justice, Position #7	Boyd	89.7	0.2	5.9	89.8	5.0	10.2
		Benavides	10.2	99.8	93.8	10.2	95.0	89.8
	U.S. House of Reps, District #14	Weber	90.8	0.3	7.4	92.0	5.1	8.8
		Brown	9.3	99.5	92.5	8.0	94.9	91.2
	U.S. Senate	Cornyn	91.1	0.2	6.4	92.4	5.4	11.4
		Alameel	8.6	99.7	92.9	7.6	94.6	88.6

V. Minority Cohesion in Petteway Plaintiffs' Demonstrative Maps

40. In addition to updating the ecological inference analysis on adopted County Commissioners' Court precincts using BISG race and ethnicity estimates, we have provided ecological inference analysis on Precinct 3 of Petteway Plaintiff demonstrative maps 1, 2, 3 in Tables 6 and 7 below. This analysis shows that in each of the three demonstrative maps, non-Anglo voters combine as a cohesive voting bloc, in favor of their preferred candidates.

41. In direct contrast to Dr. Alford's guess that low rates of Minority cohesion in the 60% range makes it hard to draw a performing district, the actual statistical evidence demonstrates that there will not be a hypothetical problem of lower rates of cohesion. In all three demonstrative maps, the proposed minority district reports combined non-Anglo cohesion in the 90% range and is consistent across all elections. Thus, we can be confident that the minority district will have a strong non-Anglo voting bloc to support minority-preferred candidates.

Table 6: Galveston County Iterative Ecological Inference (EI) Candidate Choice Estimates by Petteway Plaintiffs' Proposed County Commissioners' Court Precincts

			Proposed Map 1		Proposed Map 2		Proposed Map 3	
Year	**Office**	**Candidate**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**
2022	Attorney General	Paxton	83.4	9.5	77.6	11.8	81.8	9.4
		Garza	16.5	90.0	21.9	88.6	18.3	91.0
	County Judge	Henry	85.0	10.7	79.7	12.3	83.1	10.1
		King	14.6	89.2	20.3	87.5	16.6	89.9
	District Attorney	Roady	85.8	11.9	81.1	13.8	82.7	11.2
		Dragony	14.0	87.8	19.3	86.4	16.5	88.4
	District Judge #122	Jones	84.9	10.7	79.4	12.5	81.8	10.9
		Walsdorf	15.5	88.9	19.8	87.1	18.1	89.3
	Governor	Abbott	83.5	10.7	78.0	12.2	81.0	9.8
		ORourke	16.8	89.5	22.0	87.6	18.7	89.8
	Lt. Governor	Patrick	83.2	10.3	77.8	11.8	81.2	9.8
		Collier	16.9	88.9	22.3	88.1	19.1	90.0
	U.S. House of Reps, District #14	Weber	85.1	11.4	80.1	13.2	83.0	10.9
		Williams	14.7	88.7	20.3	87.1	17.8	88.8
2020	District Judge #405	Robinson	85.0	10.3	81.7	10.7	91.6	11.6
		Hudson	15.1	89.6	19.1	89.4	8.6	88.5
	District Judge #56	Cox	88.8	11.5	84.3	12.6	92.0	13.7
		Lindsey	11.2	88.5	15.7	87.5	8.0	86.3
	President	Trump	83.4	11.1	79.7	11.3	89.0	11.9
		Biden	16.5	88.9	20.3	88.8	11.1	88.4
	U.S. Senate	Cornyn	84.8	10.8	80.9	11.4	89.9	13.4
		Hegar	15.3	89.1	18.9	88.7	10.0	86.6

	County Sheriff	Trochesset	87.3	10.2	84.4	10.1	92.0	10.9
		Salinas	12.6	89.8	15.2	89.9	8.3	89.0
	U.S. House of Reps, District #14	Weber	85.0	11.0	80.9	11.5	91.4	12.3
		Bell	14.9	89.0	18.6	88.3	8.7	87.8
	Attorney General	Paxton	76.5	6.8	73.1	7.2	86.7	6.7
		Nelson	23.0	92.7	27.0	92.7	13.2	93.3
	Galveston Court Judge #2	Foley	78.1	7.6	74.6	7.6	89.7	7.9
		Pettijohn	21.9	92.4	25.6	92.2	10.4	91.7
	Governor	Abbott	82.4	10.9	78.2	10.9	91.8	11.3
		Valdez	17.6	89.4	22.2	88.9	8.2	88.6
2018								
	Lt. Governor	Patrick	78.8	8.0	75.5	8.3	88.8	7.5
		Collier	21.8	92.1	24.3	92.0	11.5	92.5
	U.S. Senate	Cruz	77.1	7.3	73.1	7.5	87.0	7.2
		ORourke	23.3	92.1	25.9	92.5	13.1	92.9
	U.S. House of Reps, District #14	Weber	78.8	7.8	74.4	8.7	89.1	8.0
		Bell	21.6	92.0	25.3	91.8	11.0	92.0
	District Judge #10	Neves	77.9	10.9	74.0	11.8	90.3	13.8
		Walker	22.0	89.0	26.0	88.2	9.4	86.3
	President	Trump	76.2	10.3	73.3	10.4	87.2	13.5
		Clinton	23.9	89.6	27.0	89.8	12.6	86.8
2016								
	Supreme Court Justice, Position #5	Green	77.7	9.6	74.4	9.1	89.9	12.6
		Garza	22.9	91.0	25.8	90.7	9.8	87.5
	U.S. House of Reps, District #14	Weber	78.8	10.7	75.5	11.1	89.4	13.4
		Cole	21.5	89.7	25.0	89.5	10.5	86.5
	Attorney General	Paxton	73.2	7.5	72.9	4.8	88.7	8.3
2014		Houston	27.0	91.8	26.8	95.2	11.2	91.2
	County Judge	Henry	75.7	33.0	87.4	22.6	87.3	29.9

		Young	23.6	66.9	13.3	78.3	12.8	70.5
	Governor	Abbott	73.5	6.0	71.9	4.7	87.8	7.7
		Davis	26.7	93.5	28.1	95.3	12.2	92.5
	Lt. Governor	Patrick	74.7	6.4	73.2	5.2	88.2	8.1
		VanDePutte	25.4	93.4	26.7	94.7	11.8	92.1
	U.S. Senate	Cornyn	77.5	8.9	75.8	7.0	90.7	12.9
		Alameel	22.4	91.0	23.8	92.6	9.3	87.2
	Supreme Court Justice, Position #7	Boyd	73.7	6.1	72.7	3.9	88.9	8.1
		Benavides	26.0	94.1	27.1	95.9	10.9	91.6
	U.S. House of Reps, District #14	Weber	76.8	7.8	75.4	6.1	90.4	10.3
		Brown	23.4	92.2	24.8	94.0	10.0	89.5

Table 7: Galveston County Ecological Inference Rows by Columns (RxC) Candidate Choice Estimates by Petteway Plaintiffs' Proposed County Commissioners' Precincts

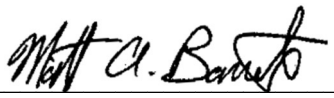
			Proposed Map 1		Proposed Map 2		Proposed Map 3	
Year	**Office**	**Candidate**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**	**Anglo**	**Non-Anglo**
2022	Attorney General	Paxton	80.3	11.9	75.2	13.6	78.7	10.9
		Garza	19.7	88.1	24.8	86.4	21.3	89.1
	County Judge	Henry	82.0	12.6	75.5	15.5	78.4	12.9
		King	18.0	87.4	24.5	84.5	21.6	87.1
	District Attorney	Roady	82.2	14.5	76.3	17.0	77.0	15.3
		Dragony	17.8	85.5	23.7	83.0	23.0	84.7
	District Judge #122	Jones	81.6	12.8	74.8	15.8	78.1	12.7
		Walsdorf	18.4	87.2	25.2	84.2	21.9	87.3
	Governor	Abbott	80.1	12.6	76.4	13.4	78.4	11.7
		ORourke	19.9	87.4	23.6	86.6	21.6	88.3
	Lt. Governor	Patrick	80.0	12.2	74.1	14.5	77.4	11.8

		Collier	20.0	87.8	25.9	85.5	22.6	88.2
	U.S. House of Reps, District #14	Weber	80.0	14.6	75.7	16.0	78.1	13.7
		Williams	20.0	85.4	24.3	84.0	21.9	86.3
2020								
	District Judge #405	Robinson	82.6	11.7	76.6	13.6	91.1	12.1
		Hudson	17.4	88.3	23.4	86.4	8.9	87.9
	District Judge #56	Cox	81.8	15.7	76.6	17.2	90.6	15.6
		Lindsey	18.2	84.3	23.4	82.8	9.4	84.4
	President	Trump	81.5	12.2	75.3	14.0	87.8	13.3
		Biden	18.5	87.8	24.7	86.0	12.2	86.7
	U.S. Senate	Cornyn	81.8	12.6	76.9	13.8	89.9	13.5
		Hegar	18.2	87.4	23.1	86.2	10.1	86.5
	County Sheriff	Trochesset	83.7	12.2	79.9	12.9	91.3	11.7
		Salinas	16.3	87.8	20.1	87.1	8.7	88.3
	U.S. House of Reps, District #14	Weber	82.2	12.7	77.0	14.0	90.0	14.1
		Bell	17.8	87.4	23.0	86.0	10.0	85.9
2018								
	Attorney General	Paxton	80.0	5.0	73.8	7.0	87.2	6.5
		Nelson	20.0	95.0	26.2	93.0	12.8	93.5
	Galveston Court Judge #2	Foley	79.4	6.6	76.6	6.5	89.4	8.4
		Pettijohn	20.6	93.4	23.4	93.5	10.6	91.6
	Governor	Abbott	82.7	10.2	77.6	11.5	91.8	11.0
		Valdez	17.3	89.8	22.4	88.6	8.2	89.0
	Lt. Governor	Patrick	80.3	7.0	76.1	7.7	88.6	7.7
		Collier	19.7	93.0	23.9	92.3	11.4	92.3
	U.S. Senate	Cruz	79.3	6.0	78.6	4.2	86.9	7.2
		ORourke	20.7	94.0	21.4	95.8	13.1	92.8
	U.S. House of Reps, District #14	Weber	79.8	7.1	75.8	7.6	88.6	8.8
		Bell	20.2	92.9	24.2	92.4	11.5	91.2

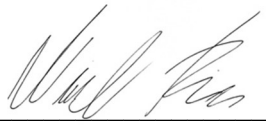
2016	District Judge #10	Neves	80.0	9.9	74.1	11.7	92.2	11.1
		Walker	20.0	90.1	25.9	88.3	7.8	88.9
	President	Trump	77.0	10.0	72.7	10.7	88.3	11.8
		Clinton	23.0	90.0	27.3	89.3	11.7	88.2
	Supreme Court Justice, Position #5	Green	78.6	8.5	74.2	9.2	91.5	10.5
		Garza	21.4	91.5	25.8	90.8	8.5	89.5
	U.S. House of Reps, District #14	Weber	79.8	9.7	75.4	10.6	91.1	11.1
		Cole	20.2	90.3	24.6	89.4	8.9	88.9
2014	Attorney General	Paxton	76.7	4.9	72.3	5.4	90.1	6.6
		Houston	23.3	95.2	27.7	94.6	9.9	93.4
	County Judge	Henry	79.9	30.1	76.5	31.2	89.7	24.7
		Young	20.1	69.9	23.5	68.8	10.3	75.3
	Governor	Abbott	73.8	6.1	70.4	5.9	88.7	6.3
		Davis	26.2	93.9	29.6	94.1	11.3	93.7
	Lt. Governor	Patrick	77.6	4.7	73.1	5.2	89.3	6.2
		VanDePutte	22.4	95.3	26.9	94.8	10.7	93.8
	U.S. Senate	Cornyn	81.4	6.2	77.2	6.6	92.7	9.4
		Alameel	18.6	93.8	22.8	93.4	7.3	90.6
	Supreme Court Justice, Position #7	Boyd	75.2	5.3	71.9	5.0	89.6	7.2
		Benavides	24.8	94.7	28.1	95.0	10.4	92.8
	U.S. House of Reps, District #14	Weber	80.3	5.3	77.0	4.9	91.5	8.3
		Brown	19.7	94.7	23.0	95.1	8.5	91.7

42. If new or additional data becomes available that is relevant to this inquiry, we will provide additional data and analysis of population statistics and election results to supplement this report.

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



Dr. Matt A. Barreto
Agoura Hills, California
April 14, 2023



Mr. Michael Rios
Rancho Cucamonga, California
April 14, 2023

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
GALVESTON DIVISION

TERRY PETTEWAY, et al., Plaintiff, vs. GALVESTON COUNTY, TEXAS, et al., Defendant.	:	Civil Action No 3:22-CV-00057 (Consolidated)
UNITED STATES OF AMERICA, Plaintiff, vs. GALVESTON COUNTY, TEXAS, et al., Defendant.	:	3:22-CV-00093
DICKINSON BAY AREA BRANCH NAACP, et al., Plaintiff, vs. GALVESTON COUNTY, TEXAS, et al., Defendant.	:	3:22-CV-00117

Zoom Deposition of MATTHEW BARRETO, taken on behalf of defendant by Shawn Sheehy of Holtzman Vogel Baran, commencing at 9:23 a.m., on Thursday, April 20, 2023, before Linda C. Marshall, CSR, RPR.

APPEARANCES:

FOR THE PLAINTIFF (PETTEWAY):	BERNADETTE REYES, Esquire ALEXANDRA COPPER, Esquire VALENCIA RICHARDSON, Esquire
FOR THE UNITED STATES:	THARANI JAYARMAN, Esquire K'SHAANI SMITH, Esquire
FOR THE DEFENDANT:	SHAWN SHEEHY, Esquire Holtzman, Vogel, Baran

EXHIBIT C

Q Correct, but you're here as an expert on behalf of the Petteway plaintiffs, correct?
A Yes.
Q Okay. Do you notice the spelling error in the case caption?
A I think there might be an E, where there's supposed to be an A.
Q Well, it's P-E-T-T-E and you have an A?
A Right, right.
Q Just keeping it clear.
A Thank you.
Q You're welcome. You let me know if my question doesn't make sense. If I see a spelling goof, I'll point that out as well.

Let's go to page eight of this report, specifically paragraph 28. Do you see paragraph 28, professor?
A Yes, sir.
Q Okay. Here it says, at the time of our original report, we had not been provided the Official Galveston County Election History Voter files in a timely manner, for use by January 13th, 2023, when our report was due. Since receiving them, we have been able to update our ecological inference analysis utilizing the Bayesian Improved Surname Geo-coding to report estimates on county voters race and ethnicity. Further, we analyzed 29 federal, statewide and local elections from 2014

to 2022, countywide and within each adopted county commissioners court precinct as well as in the Petteway plaintiff's demonstrative precincts. Did I read that correctly?

A Yes.

Q Okay. So, it says here, you did not have the election history voter file in time for your January 13th, report, correct?

A Correct.

Q Are you aware that plaintiff's counsel didn't ask for this report until, approximately, mid-December?

MS. REYES: Objection, form.

THE WITNESS: I don't believe that that statement is true.

BY MR. SHEEHY:

Q What about that statement is not true?

A My understanding is that the file was first requested in October or November.

Q Okay. Are you aware that a Request for Production of the voter file was not submitted until early to mid-December?

MS. REYES: Objection, form, misstates the record.

THE WITNESS: My understanding is that, the file was requested and that the defendants refused to turn it over and so, more formal matters had to proceed.

BY MR. SHEEHY:

Q Okay. Well, I will dispute that, but that's fine.

Let me ask you this, had you received the voter history file on or around January 1st, 2023? Would you have been able to include your Bayesian Improved Surname Geo-coding in your report for January 13th?

MS. REYES: Objection, form.

THE WITNESS: I believe we would have liked to received it, at least, a full month before the due date of our report.

BY MR. SHEEHY:

Q Okay. Once you have the voter listing file, how long does it take you to run the analysis?

A It depends on the size of the file.

Q And how long did it take you to run Galveston County's Voter History File for your Bayesian Improved Surname Geo-coding?

A I don't recall specifically but it might have been somewhere, around two weeks before we had data that we could work with.

Q Can you explain to me how that process works? You receive the voter history file and then, you use that voter history file to run a Bayesian Improved Surname Geo-coding Analysis. How does that process work from when you receive the voter history file?

A I would look in at the next few paragraphs. If you could just scroll down a bit, it might be easier to follow along.

you're starting anew. So there a lot of different variables involved in how quickly or how much time it takes in fully running it.

Q Well, you worked on this report, rebuttal report. So, I guess, I'm just asking, given what you know about the voter file and this process, how much time did it take for you to take that report, take the voter file, run the geo-coding analysis and produce a report?

A I think I've already said a few minutes ago that I, my recollection is that it was about a couple weeks, but that was back at the beginning of the year and so, I don't have detailed time sheets on any of that, but I know it was an intensive process.

Q Okay. What was lacking, I guess? Because in your original report you got Spanish surname registered voters and surname turnout data from the Texas Legislative Counsel. What was lacking in that data that required you to have the Galveston County voter file?

A Well, the TLC data is just an aggregate output that someone else has run. It's not the actual voter file. And the TLC output only gives you an estimate of the number of voters that have a Spanish surname. It doesn't allow you to say anything about any lower Black voters in comparison. So it's not as precise and it's only based on one of the tools, surname matching.

Q But the voter file from Galveston County gives you both surname and address, correct?
A Yes, both of those fields are necessary for BISG.
Q Okay. The 29 federal statewide and local elections that you analyzed from 2014 to 2022, that's the same, the same 29 elections that you analyzed in your January 13th report?
A I think so, that's right.
Q Okay. I just want to make sure that you didn't analyze any different elections in your rebuttal report from the ones you analyzed in your original report?
A Not in the BISG section, no.
Q How about in any section of your rebuttal report?
A I do refer to other elections in other sections of the rebuttal report.
Q Such as the republican primary elections?
A Yes.
Q Other than the rebuttal -- republican primary elections, did you analyze any other elections in your rebuttal report?
A Not that I recall, no.
MS. REYES: Counsel, I'm wondering if now would be a good time to take a break? I know we had a really short one before but I think, we could have, maybe, a minute break to allow us to use the restroom.
MR. SHEEHY: Professor, would you like to take a break?

THE WITNESS: Yeah, if I could stretch my legs a little bit, it would be nice. I'll be sitting in this chair for the next few hours. It will be a long day, so but just ten minutes is totally fine, no more than that.

MR. SHEEHY: All right. Well, it's 1:43 pm on the East Coast. We'll come back at 1:53 pm on the East Coast and we'll try to push it to 2:30, 3:00 for lunch, sound good?

MS. REYES: Okay. Thank you.

MR. SHEEHY: Thank you.

THE DEPUTY CLERK: This is the end of media number one. We are going off the record. The time is 12:43 p.m.

(Brief recess.)

THE DEPUTY CLERK: The time is 12:54 p.m. and this the beginning, beginning of media labeled number two. We are back on the record.

BY MR. SHEEHY:

Q Professor Barreto, do you understand you're still under oath?

A Yes, I do.

Q And during the break, did you have any substantive conversations with anyone about your testimony?

A No, I did not.

Q Did you have conversations with anyone regarding your testimony while on break?

A Yes. I spoke with Ms. Reyes and she asked me if case was

okay and if I was doing okay break-wise and that was it.

Q Okay, fair enough.

We were talking about the Bayesian Improved Surname Geo-coding analysis, correct, before we went on break?

A Yes. I believe we were on paragraph 29 of the rebuttal report.

Q Yes. And you testified that for your analysis in Galveston, you had the names of the Galveston County registered voters, is that correct?

A From the voter file, we had the names and addresses.

Q With the addresses, you're able to then obtain the census block where the voter lives, is that correct?

A Yes. That's part of the geo-locating process, that it attempts to fit each address inside a census block.

Q Okay. You did not have the voter's party, registered party, correct?

A I don't believe so. I don't believe that's available.

Q I don't, I don't think Texas registers by party, correct?

A That's my understanding.

Q So names and addresses and from the address you get the census block, correct?

A From the address you geocode the file, to try to find out the census block that the voter lives in.

Q Okay. And the BISG, so we don't have to say it every time, so the Bayesian Improved Surname Geo-coding, BISG, this is

intended to predict the race of individuals by using their, surname and address, correct?

A It creates a probability estimate for every observation and it assigns them a probability of different racial or ethnic groups.

Q So it assigns a probability estimate for whether or not a voter belongs to a certain racial or ethnic group. Am I understanding that correctly?

A More or less.

Q Okay. What else am I missing?

A The signs of probability that a voter might be of each of the four main racial groups that the census provides a wide amount of data on. So, for each row, which is a voter, it might have given them a probability of being White, non-Hispanic, Black, Hispanic, Asian-American or something else. So each individual observation has multiple probabilities after running the BISG.

Q Now this paragraph 29, you say in the middle of it, that the method relies on a combination of census surname analysis and census block-level racial demographics, to provide an overall probability assessment of the voters race or ethnicity. Did I read that correctly?

A Yes, I believe you did.

Q Okay. And then you have a footnote nine that cites to an article by Kosuke Imai and Kabir Khanna, improving ecological

inference by predicting individual ethnicity from voter registration records and that's in Political Analysis 24, number two, 2016, pages 263 to 272, correct?

A Kosuke is his first name --

Q Oh.

A -- but the rest of it was correct.

Q Thank you very much, Kosuke. Thank you. Well, let's go to Exhibit Four.

(Exhibit No. 4, marked for identification.)

MR. SHEEHY: And while we're putting that up, for the benefit of the court reporter that's, K-O-S-U-K-E, and then the last name Imai, I-M-A-I.

THE COURT REPORTER: Thank you.

(Exhibit No. 4, marked for identification.)

BY MR. SHEEHY:

Q So we have a copy of Exhibit Four in front of you, professor, and we'll go ahead and scroll down to page two. And this is the article that you were referencing, correct?

A That's what it looks like.

Q Okay. Let's go to page six, just maybe one more. Yes.

So here, in this article that you cite, there is a table here. The title is, The Empirical Validation Of Individual Race Classification using Florida Registration Records and on the top it has the type of information that you have. So you have name, name precinct, name block, name precinct party, name block party

A Well, it's included in there, as I mentioned, it assigns probabilities of each different racial and ethic group and then, we sum those to precincts.

Q And is your error rate -- well, no you're assigning probabilities, correct?

A Correct.

Q Probabilities and error rate is the same thing?

A Contained within the BISG estimate is some amount of variance. That's why there's probabilities for each of the different racial or ethnic groups. And then, we take those and sum them to aggregate precincts, which is the recommendation of all of the literature and the conclusion is that when you do that, at the aggregate level, the estimates are extremely close matches to self-reported validated race.

Q In table one you have footnote ten at the bottom of the page. It says, we examined the self-reported race of voters. We incorrectly classified as Whites i.e. false positives. We find that voters misclassified as Whites are 50-percent Black, 18-percent Latinos, 7-percent Asians and 25-percent others. Among Black voters who are misclassified i.e. false negatives, 94-percent are misclassified as Whites. Did I read that correctly.

A I don't know. It wasn't on the screen in front of me.

Q Oh, sorry about that. If we just scroll down a little bit to footnote ten. There you go.

So, did I read that correctly?

A I'm going to assume you did. I didn't have it in front of me but it sounds like you got it right.

Q Okay. So here, on this table one, if we can put that up, for Latinos it has a 16.2-percent false negative rate for Latinos, when you have name, block and party. Is that correct?

A I think you have correctly read the number in the final column but as I said, without having access to this article and being able to read it, I can't tell you exactly what they are trying to conclude in one table, in their analysis about the State of Florida.

Q And what the false negative just means is that, the BISG incorrectly predicted a Latino person as not being Latino 16.2 percent of the time. Is that what that means?

A I don't know exactly, without reading their full article and their methodology, if they've described all of those details. So, I would need to have some time to, to read this and then I could give you a report on it.

Q Well, you cited this in your, in your report, as part of your method for how you conducted BISG in Galveston County, correct?

A Yes. I am using the methodology that they have outlined in applying it to Galveston County. I did not cite it for purposes of memorizing some tables about the State of Florida, though.

Q Well, and this was footnote nine in your rebuttal report

from April 14th, 2023, correct?

A Can you pull up the rebuttal?

Q Yes. So that's Exhibit Three.

Okay. So footnote nine in your rebuttal report from April 14th, 2023?

A I see that.

Q Okay. Do you make it a habit of citing reports that you don't fully comprehend what they're saying in their reports and their --

MS. REYES: Objection, form. Counsel, objection, form.

THE WITNESS: Can you restate that question?

BY MR. SHEEHY:

Q Of course. Do you make it a habit of submitting expert reports that cite political science journals, that you fully don't understand what those reports or those articles are saying?

MS. REYES: And objection, form.

THE WITNESS: I don't believe I ever said I don't comprehend the article. I said I wasn't prepared without giving myself a chance to read their article and only being shown one table to reinterpret it on the fly. That would not be consistent with good social science practice.

BY MR. SHEEHY:

Q You submitted --

referenced error rate for the BISG analysis run in Florida, right?

A I remember looking at that article.

Q So, in that article you, you cited that article as a way of, as authority, I should say, as authority for the method you used here in Galveston County for your BISG analysis, correct?

A Correct.

Q Okay. So, I guess what I would like to know is, is either, A, what the error rate is for these numbers that you have here on table five, or --

MS. REYES: I'm sorry. Mr. Sheehy, you're cutting out.

THE WITNESS: I agree. Get the microphone a little closer, maybe.

BY MR. SHEEHY:

Q Here we go.

A All right. Great.

Q Excellent. So, table five, I guess, what I would like to know is, what your error rate is for the numbers that you show on table five?

A And I believe I heard you before but before I answer, I want to clarify your question. So, please correct me if I'm wrong. You're referring to a comparison to the table in the Imai and Khanna article that we were looking at, is that right?

Q Not making a comparison, I'm simply saying, the, there were

error rates reported in the Imai and Khanna article and I would like to know similar information for the numbers that you reported here, on table five?

A But I believe you were referring to a comparison to a BISG probability as compared to a self-reported race on the voter file, is that right?

Q Well, the self-reported for -- Texas doesn't have registration by race, correct?

A Right. So I believe you just answered your own question. It's not possible to replicate that in Texas because they don't have race on the voter file.

Q Okay.

A Therefore, we would not have completed such a table.

Q So, I would like to be able to see the probability estimates for the numbers that you have reported on table five in your rebuttal report?

A The main probability estimates for each individual voter in Galveston County?

Q Yes.

A Okay. So that can easily be done if you replicate the code that we've included in our footnotes, something that Dr. Alford has done before. When you run the BISG, you can tell it to stop at a certain point and extract those probabilities, and you can look at them.

Q All right. So let's go to page four of the rebuttal report

and paragraph 17. You have paragraph 17 in front of you, professor?

A Yes, I see that. Thank you.

Q You're welcome. On the second factor, there has never been a minority republican who has won a primary election to be the parties nominee for Galveston County judge or county commissioner. I read that correctly?

A Yes.

Q Can we pull up Exhibit Six, please?

(Exhibit Six No. 6, marked for identification.)

BY MR. SHEEHY:

Q All right. Professor, we put in front of you Exhibit Six. If you scroll down, this will be Professor Trounstine's expert report in this case. And if we could go to page 41, please?

MS. REYES: I'm sorry. Mr. Sheehy, you're still cutting out for me.

BY MR. SHEEHY:

Q Okay. So we're going to go to page 41 of Exhibit Six. See if we can scroll down.

So here, professor --

I think we need to scroll down -- up, sorry, page 17, up.

So here, professor, we have the general elections for county commissioners and I want you to look at the November 2nd, 2004 election, between Stephen Holmes and Lewis Parker, Junior. Do you see that race?

decades ago by a scholar named David Sears and others have advanced and replicated that work. And to ask Americans a couple specific questions about views toward African-Americans and then they can categorize people on a scale of racial resentment.

Q Okay. So, I guess I'm trying to understand what is meant by racial resentment. And what I'm understanding from you is, is that there was a study done by David Sears when?

A I don't know off top of my head the first year that it was published, but decades ago and attempting to understand Americans attitudes toward African-Americans and whether or not these racial attitudes played any sort of independent effect in the way that Americans associated the rest of their politics.

And so, the scale, ultimately, is more commonly today used as a four question scale and it's probably in many of the papers that I cited as one of the variables in understanding white Americans' attitudes towards their affinity of the Republican or Democratic party.

Q And what are those four questions?

A I don't have them in front of me. When we're off the record, I could probably find them in about 30 seconds online, but they are questions asking your views towards whether African-Americans have faced discrimination, whether they are just not trying hard enough to get ahead in America, whether there have been things holding them back and topics like that.

And then the respondent will say whether they strongly agree, somewhat agree or all the way down to strongly disagree with the statement. And after understanding your answers to those four questions, it's been found that that item among others -- there's ones on immigration and lots of other things, this is just one example but your attitude on racial resentment are highly predictive of partisan attachment in vote choice.

I would say, probably, almost nobody disagrees with that in political science. It would be very hard to find someone who disagrees with the findings on racial resentment.

Q Okay. Now, did you cite any studies like the Sears study for voters in Galveston County?

A Now, voters in Galveston County are undoubtedly included in many of the studies. Some of the studies have over samples in Texas. Most are national studies in which all Americans in every county in the U.S. are randomly sampled to be included. Some of the studies do specifically have Texas over samples and sometimes they talk about that.

Q But do any of them mention samples taken from Galveston County?

A I would have to go back and look. Usually, they just describe them as national random samples, which would mean that everyone everywhere has an opportunity and is included. But most of the studies are either national in scope or tend to focus on southern states or states that used to be section five

states.

Q What is the response rate on those studies?

A It varies. I mean, these are studies done over time and with different methodology. They are all published in political science journals and regularly relied upon by other social scientists.

Q If we can go to Exhibit Three, the rebuttal report.

So on page six of your rebuttal report, paragraph 26 and table one, do you see that?

A I see that.

Q You say in paragraph 26, "Therefore, the local primary elections would be less probative since voter turn out is comparatively lower with few contests being contested and no significant local elections are being decided."

And then table one shows your turnout rates for both general and primary elections, correct?

A That looks right.

Q So, in 2014, you had 12.7 percent for turnout in the primary?

A That's correct.

Q And 27 percent in 2016 and 23.4 percent for 2020, correct?

A Yes.

Q It's your position that turnout rates between a low of 12.7 percent and a high of 27 percent is too low to be probative? Am I understanding your position correctly?

A No.
Q Okay, what am I missing?
A I'm not establishing or creating any sort of threshold. Nothing in the paragraph says that.
Q Okay.
A What I'm stating is that primary elections in Galveston County are, A, not regularly contested, so there's not a lot of action whether turnout is 100 percent or 0 percent. We can't learn a lot when they're not contested.

B, there is relatively low turnout, because there's not a lot of action and so these elections are not that informative to us. The voters who show up are not showing up to decide Galveston County politics. And the table demonstrates that in fact far less voters are showing up.

Q You could have analyzed Galveston County primary elections for statewide office, correct?
A There are statewide primary elections, that's true. We did not report the results of those because as I said before, the central question here is not whether or not this is a contested primary district, but whether rather or not it is a performing general election district.
Q But don't you need primary elections to analyze cohesion between Latino voters and African-American voters?
A No.
Q And why not?

VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

Veritext Legal Solutions complies with all federal and State regulations with respect to the provision of court reporting services, and maintains its neutrality and independence regardless of relationship or the financial outcome of any litigation. Veritext requires adherence to the foregoing professional and ethical standards from all of its subcontractors in their independent contractor agreements.

Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at www.veritext.com.

From: Shawn Sheehy
To: Bernadette Reyes
Cc: Valencia Richardson; Hilary Harris Klein; Dallin Holt; Vall-Ilobera, Diana; Sarah Chen; Jason Torchinsky; bob.boemer@co.galveston.tx.us; Angela Olalde; dloesq@aol.com; Jordan Raschke; joe@nixonlawtx.com; Joseph Russo; Mark Gaber; Neil Baron; Simone Leeper; Sonni Waknin; Chad Dunn; Silberstein, Andrew; Hani Mirza; Suriani, JoAnna; Joaquin Gonzalez; Garrett, Kathryn; Polizzano, Michelle; Zhu, Molly; Nickolas Spencer; Mancino, Richard; Gear, Bruce (CRT); Jayaraman, Tharuni (CRT); Newkirk, Zachary (CRT); Mateo Forero; Smith, K"Shaani (CRT); Wake, Brittany (CRT); Alexandra Copper
Subject: RE: Petteway v. Galveston County, 3-22-cv-57 - Petteway Plaintiffs" Expert Reports
Date: Friday, April 28, 2023 5:27:30 PM

Bernadette,

As you are aware, Rule 26(a)(2)(B)(ii) requires that Professor Barreto provide the facts and data he considered when forming his opinion. Professor Barreto testified that his analysis for each name on the voter file produced a probability that the person was African American, Latino, or White. Those probabilities were created and used by Dr. Barreto to reach his results. But they are not produced in his report and have not been provided to us for examination. We cannot replicate Dr. Barreto's work and test his results without disclosure of each step taken, each assumption made and variable applied and without seeing those probabilities.

To state this further, we cannot replicate what Professor Barreto did without his exact R script that he used to produce the results of his BISG analysis. The actual R script that Professor Barreto used to generate the results contains the data he considered in producing his report. Plaintiffs either need to produce the actual R script or withdraw the report whose results are derived from the script. Instructing an opposing expert to go do his own work is unacceptable, particularly where assumptions and variables are applied.

Frankly, the materials being sought is a pretty simple ask and, we expect, would be fairly easy to provide. Why you and Professor Barreto refuse to produce facts and data he relied upon, including the actual R script that Professor Barreto used in arriving at his conclusions, is unknown to us, but we cannot properly analyze Dr. Barreto's results without it, and should not have to guess at how they were created.

Please comply with the expert disclosure rules promptly.

Thank you,

Shawn Sheehy
Holtzman Vogel Baran Torchinsky & Josefiak PLLC
Mobile:
202-941-6421

Washington DC Office
2300 N Street, NW, Ste 643-A
Washington, DC 20037
(202) 737-8808

EXHIBIT D

Virginia Office
15405 John Marshall Highway
Haymarket, VA 20169
(540) 341-8808

Holtzman Vogel
HOLTZMAN VOGEL BARAN TORCHINSKY & JOSEFIAK PLLC

From: Bernadette Reyes <bernadette@uclavrp.org>
Sent: Friday, April 28, 2023 3:48 PM
To: Shawn Sheehy <ssheehy@holtzmanvogel.com>
Cc: Valencia Richardson <VRichardson@campaignlegalcenter.org>; Hilary Harris Klein <hilaryhklein@scsj.org>; Dallin Holt <dholt@holtzmanvogel.com>; Vall-llobera, Diana <DVall-llobera@willkie.com>; Sarah Chen <schen@texascivilrightsproject.org>; Jason Torchinsky <jtorchinsky@holtzmanvogel.com>; bob.boemer@co.galveston.tx.us; Angela Olalde <aolalde@greerherz.com>; dloesq@aol.com; Jordan Raschke <jraschke@greerherz.com>; joe@nixonlawtx.com; Joseph Russo <JRusso@greerherz.com>; Mark Gaber <MGaber@campaignlegalcenter.org>; Neil Baron <neil@ngbaronlaw.com>; Simone Leeper <SLeeper@campaignlegalcenter.org>; Sonni Waknin <sonni@uclavrp.org>; Chad Dunn <chad@brazilanddunn.com>; Silberstein, Andrew <ASilberstein@willkie.com>; Hani Mirza <hani@texascivilrightsproject.org>; Suriani, JoAnna <JSuriani@willkie.com>; Joaquin Gonzalez <joaquin@texascivilrightsproject.org>; Garrett, Kathryn <KGarrett@willkie.com>; Polizzano, Michelle <MPolizzano@willkie.com>; Zhu, Molly <MZhu@willkie.com>; Nickolas Spencer <nas@naslegal.com>; Mancino, Richard <RMancino@willkie.com>; Gear, Bruce (CRT) <Bruce.Gear@usdoj.gov>; Jayaraman, Tharuni (CRT) <Tharuni.Jayaraman@usdoj.gov>; Newkirk, Zachary (CRT) <Zachary.Newkirk@usdoj.gov>; Mateo Forero <mforero@holtzmanvogel.com>; Smith, K'Shaani (CRT) <K'Shaani.Smith@usdoj.gov>; Wake, Brittany (CRT) <Brittany.Wake@usdoj.gov>; Alexandra Copper <ACopper@campaignlegalcenter.org>
Subject: Re: Petteway v. Galveston County, 3-22-cv-57 - Petteway Plaintiffs' Expert Reports

Shawn-

You have yet to explain why you require this new information. As I mentioned in my prior email and as Dr. Alford testified April 27th, Defendants have more than enough information to recreate the

BISG analysis. Dr. Alford admitted in deposition that he has the vote history file and that he has experience running BISG with the wru package in R. Further, as Judge Edison explained in the hearing weeks ago, rebuttal reports were allowed so long as they were submitted on the deadline of April 14, 2023 at noon. The rebuttal contains no new theory of the case and indeed adequately responds to Dr. Alford's claims on the degree of Hispanic voter cohesion.

As you may recall, Petteway Plaintiffs reminded Defendants in November and December 2022 of their responsibility to provide the voter file pursuant to U.S. and NAACP First Request for Production #1(d), served in August 2022. Defendants disagreed that the voter file was responsive to the Plaintiffs' requests and forced Plaintiffs to serve a second request. The voter file was not produced by Defendants until January 11, 2023 – two days before Dr. Barreto's report was due. In their January 13 report, Dr. Barreto and Mr. Rios indicated they planned to do additional analysis if more data was provided. They did not receive all data in time. Defendants, therefore, have had clear notice that Dr. Barreto and Mr. Rios needed the voter files to run this type of analysis.

As for your specific requests, the full details of BISG and requisite code has been produced in our prior email and the April 14, 2023 rebuttal report. The code is from the Imai and Khanna wru package, as Dr. Barreto testified about this during his deposition. Dr. Barreto additionally reiterated that BISG analysis is done from the wru code, and that his report contains a direct citation to a "how to" guide and full code repository for BISG. Your request for "intermediate results" is similarly puzzling and unnecessary. "Intermediate results" are, by definition, not the code you need to run the wru package. It is an optional "output" during the middle - or in your words - intermediate step of the program that does not automatically save as a set of results. Indeed, by your own language, these "results" are not part of the code needed to run any BISG analysis.

As Dr. Alford is, I am sure, aware though his work as an expert, intermediate results are not produced by experts when they are not necessary to recreate any analysis. Indeed, in his own work as an expert, Dr. Alford often runs a surname analysis against the voter file, and in prior cases in Texas he has not produced any such "intermediate results" of his analysis of the voter file after flagged with Spanish surnames. Like most experts, Dr. Alford simply uses the information from the Spanish surname analysis as input into his EI models - the norm and standard practice.

Nevertheless, to ease Dr. Alfords replication of a BISG analysis on Galveston County, attached please find the exact BISG code for conducting such analysis, which we have previously provided a direct link to in our April 14, 2023 report.

Best,

On Thu, Apr 27, 2023 at 1:31 PM Shawn Sheehy <ssheehy@holtzmanvogel.com> wrote:

> Bernadette,
>
> Defendants request Professor Barreto's complete, actual R script that he used to produce the results in his rebuttal report, particularly the BISG analysis. Defendants also request Professor Barreto's input parameters and his commands, and any and all intermediate results produced by

that analysis (the complete voter file with each voter coded to racial and ethnic probabilities, and the precinct level data set with the aggregate level probabilities, including the precinct level BISG estimates for the proportion of the turned out vote in the precinct in each of the racial or ethnic categories).

If we do not receive this data by COB tomorrow (Friday), Defendants will move to strike Professor Barreto's rebuttal report because it contains new analysis.

Thank you,

Shawn Sheehy
Holtzman Vogel Baran Torchinsky & Josefiak PLLC
Mobile:
202-941-6421

Washington DC Office
2300 N Street, NW, Ste 643-A
Washington, DC 20037
(202) 737-8808

Virginia Office
15405 John Marshall Highway
Haymarket, VA 20169
(540) 341-8808

From: Bernadette Reyes <bernadette@uclavrp.org>
Sent: Thursday, April 27, 2023 2:02 PM
To: Shawn Sheehy <ssheehy@holtzmanvogel.com>
Cc: Valencia Richardson <VRichardson@campaignlegalcenter.org>; Hilary Harris Klein <hilaryhklein@scsj.org>; Dallin Holt <dholt@holtzmanvogel.com>; Vall-llobera, Diana <DVall-llobera@willkie.com>; Sarah Chen <schen@texascivilrightsproject.org>; Jason Torchinsky

<jtorchinsky@holtzmanvogel.com>; bob.boemer@co.galveston.tx.us; Angela Olalde <aolalde@greerherz.com>; dloesq@aol.com; jraschke@greerherz.com; joe@nixonlawtx.com; Joseph Russo <JRusso@greerherz.com>; Mark Gaber <MGaber@campaignlegalcenter.org>; neil@ngbaronlaw.com; Simone Leeper <SLeeper@campaignlegalcenter.org>; sonni@uclavrp.org; Chad Dunn <chad@brazilanddunn.com>; Silberstein, Andrew <ASilberstein@willkie.com>; Hani Mirza <hani@texascivilrightsproject.org>; Suriani, JoAnna <JSuriani@willkie.com>; Joaquin Gonzalez <joaquin@texascivilrightsproject.org>; Garrett, Kathryn <KGarrett@willkie.com>; Polizzano, Michelle <MPolizzano@willkie.com>; Zhu, Molly <MZhu@willkie.com>; nas@naslegal.com; Mancino, Richard <RMancino@willkie.com>; Gear, Bruce (CRT) <Bruce.Gear@usdoj.gov>; Jayaraman, Tharuni (CRT) <Tharuni.Jayaraman@usdoj.gov>; Newkirk, Zachary (CRT) <Zachary.Newkirk@usdoj.gov>; Mateo Forero <mforero@holtzmanvogel.com>; Smith, K'Shaani (CRT) <K'Shaani.Smith@usdoj.gov>; Wake, Brittany (CRT) <Brittany.Wake@usdoj.gov>; Alexandra Copper <ACopper@campaignlegalcenter.org>
Subject: Re: Petteway v. Galveston County, 3-22-cv-57 - Petteway Plaintiffs' Expert Reports

Good afternoon,

We understand that your expert is asking for explicit code to replicate our Bayesian Improved Surname Geocoding (BISG) estimates on the Galveston County voter files, but our experts have already provided in detail the necessary instructions, and links to code, that any Political Scientist expert witness can use to conduct the BISG analysis.

On page 9 of their report, Dr. Barreto and Mr. Rios state that BISG "relies on a combination of Census surname analysis and Census block-level racial demographics to provide an overall probability assessment of the voter's race or ethnicity." The above statement includes a footnote to the "Improving ecological inference by predicting individual ethnicity from voter registration records" paper by Dr. Imai and Dr. Khanna. In this report, Dr. Imai and Dr. Khanna explain that the methods introduced in their paper used "the R package, wru: Who Are You? Bayesian Prediction of Racial Category Using Surname and Geolocation," which "is freely available for download at https://cran.r-project.org/package=wru." This report both details the underlying BISG methodology and provides directions on where to access the package needed to conduct the analysis.

Furthermore, on page 9 of their report, Dr. Barreto and Mr. Rios reference a paper titled "A novel method for showing racially polarized voting: Bayesian improved surname geocoding," in which Dr. Barreto was a co-author. Beginning on page 31 of the mentioned report, the authors detail the techniques of BISG and again reference Dr. Imai and Dr. Khanna's report and the R package, wru: Who Are You?.

Pages 9 to 10 of the Barreto-Rios Rebuttal report detail the two primary steps of BISG analysis, including geocoding voter addresses and the surname matching process. Geocoding can be done by various free tools, including the R package: censusxy with descriptions on installation and instructions at https://chris-prener.github.io/censusxy/articles/censusxy.html. Geocoding can also be done by multiple paid services such as Geocodio, Opencage, and others.

Voter surname matching is built into the repeatedly referenced R package: wru. Detailed instructions on package installation and use can be found at https://github.com/kosukeimai/wru.

That being said, Dr. Barreto and Mr. Rios have already explained how to replicate the BISG estimates referenced in their report, either directly in their rebuttal or by pointing to detailed guides that are free and publicly accessible. Indeed, during his deposition today Dr. Alford confirmed that he and his associate Dr. Stevenson were familiar with and had successfully run a BISG analysis before and were familiar with and have utilized the wru: Who Are You package before. He is also familiar with BISG due to work on a case with Dr. Barreto himself. Importantly, Dr. Alford testified that he had all the data necessary to run a BISG analysis for Galveston County. Please revisit Petteway Plaintiffs rebuttal report and see the sources mentioned or this email for further guidance.

Best,
Bernadette

On Tue, Apr 25, 2023 at 1:46 PM Shawn Sheehy <ssheehy@holtzmanvogel.com> wrote:

> Valencia,
>
> Please provide the actual R code Professor Barreto used for his BISG analysis. Please also provide the output files from Professor Barreto's BISG procedure.
>
> Thank you,
>
> **Shawn Sheehy**
> **Holtzman Vogel Baran Torchinsky & Josefiak PLLC**
> **Mobile:**
> 202-941-6421
>
> **Washington DC Office**
> 2300 N Street, NW, Ste 643-A
> Washington, DC 20037
> **(202) 737-8808**
> **Virginia Office**
> 15405 John Marshall Highway
> Haymarket, VA 20169
> **(540) 341-8808**

From: Valencia Richardson <VRichardson@campaignlegalcenter.org>
Sent: Friday, April 14, 2023 12:12 PM
To: Shawn Sheehy <ssheehy@HoltzmanVogel.com>; Hilary Harris Klein <hilaryhklein@scsj.org>; Dallin Holt <dholt@HoltzmanVogel.com>; Vall-llobera, Diana <DVall-llobera@willkie.com>; Sarah Chen <schen@texascivilrightsproject.org>; Jason Torchinsky <jtorchinsky@HoltzmanVogel.com>; bob.boemer@co.galveston.tx.us; Angela Olalde <aolalde@greerherz.com>; dloesq@aol.com; jraschke@greerherz.com; joe@nixonlawtx.com; Joseph Russo <JRusso@greerherz.com>; bernadette@uclavrp.org; Mark Gaber <MGaber@campaignlegalcenter.org>; neil@ngbaronlaw.com; Simone Leeper <SLeeper@campaignlegalcenter.org>; sonni@uclavrp.org; Chad Dunn <chad@brazilanddunn.com>; Silberstein, Andrew <ASilberstein@willkie.com>; Hani Mirza <hani@texascivilrightsproject.org>; Suriani, JoAnna <JSuriani@willkie.com>; Joaquin Gonzalez <joaquin@texascivilrightsproject.org>; Garrett, Kathryn <KGarrett@willkie.com>; Polizzano, Michelle <MPolizzano@willkie.com>; Zhu, Molly <MZhu@willkie.com>; nas@naslegal.com; Mancino, Richard <RMancino@willkie.com>; Gear, Bruce (CRT) <Bruce.Gear@usdoj.gov>; Jayaraman, Tharuni (CRT) <Tharuni.Jayaraman@usdoj.gov>; Newkirk, Zachary (CRT) <Zachary.Newkirk@usdoj.gov>; Mateo Forero <mforero@HoltzmanVogel.com>; Smith, K'Shaani (CRT) <K'Shaani.Smith@usdoj.gov>; Wake, Brittany (CRT) <Brittany.Wake@usdoj.gov>; Alexandra Copper <ACopper@campaignlegalcenter.org>
Subject: RE: Petteway v. Galveston County, 3-22-cv-57 - Petteway Plaintiffs' Expert Reports

Good afternoon,

Please see attached the Rebuttal Report of Matt Barreto and Michael Rios.

Thank you,
Valencia

From: Valencia Richardson
Sent: Friday, January 13, 2023 10:27 PM
To: Shawn Sheehy <ssheehy@HoltzmanVogel.com>; Hilary Harris Klein <hilaryhklein@scsj.org>; Dallin Holt <dholt@HoltzmanVogel.com>; Vall-llobera, Diana <DVall-llobera@willkie.com>; Sarah Chen <schen@texascivilrightsproject.org>; Jason Torchinsky <jtorchinsky@HoltzmanVogel.com>; bob.boemer@co.galveston.tx.us; Angela Olalde <aolalde@greerherz.com>; dloesq@aol.com; jraschke@greerherz.com; joe@nixonlawtx.com; Joseph Russo <JRusso@greerherz.com>; bernadette@uclavrp.org; Mark Gaber <MGaber@campaignlegalcenter.org>; neil@ngbaronlaw.com; Simone Leeper <SLeeper@campaignlegalcenter.org>; sonni@uclavrp.org; Chad Dunn

<chad@brazilanddunn.com>; Silberstein, Andrew <ASilberstein@willkie.com>; Hani Mirza <hani@texascivilrightsproject.org>; Suriani, JoAnna <JSuriani@willkie.com>; Joaquin Gonzalez <joaquin@texascivilrightsproject.org>; Garrett, Kathryn <KGarrett@willkie.com>; Polizzano, Michelle <MPolizzano@willkie.com>; Zhu, Molly <MZhu@willkie.com>; nas@naslegal.com; Mancino, Richard <RMancino@willkie.com>; Gear, Bruce (CRT) <Bruce.Gear@usdoj.gov>; Jayaraman, Tharuni (CRT) <Tharuni.Jayaraman@usdoj.gov>; Newkirk, Zachary (CRT) <Zachary.Newkirk@usdoj.gov>; Mateo Forero <mforero@HoltzmanVogel.com>; Smith, K'Shaani (CRT) <K'Shaani.Smith@usdoj.gov>; Wake, Brittany (CRT) <Brittany.Wake@usdoj.gov>
Subject: Petteway v. Galveston County, 3-22-cv-57 - Petteway Plaintiffs' Expert Reports

Counsel—

Please see attached Plaintiffs' expert reports for experts Matt Barreto, Michael Rios, and Tye Rush. The expert report of Dr. Traci Burch will be served on January 27, 2022, per the parties' agreement.

Best,
Valencia

Valencia Richardson
Legal Counsel, Voting Rights
she/her/hers

Check out CLC's new podcast: Democracy Decoded

202.266.2574
318.573.8984 (cell)

Campaign Legal Center
1411 K St. NW, Suite 1400
Washington, DC 20005
campaignlegalcenter.org

Facebook | Twitter

--
Bernadette Reyes
(she/her/hers)
Voting Rights Counsel
UCLA Voting Rights Project

--
Bernadette Reyes

(she/her/hers)
Voting Rights Counsel
UCLA Voting Rights Project

Advance Access publication March 17, 2016

Political Analysis (2016) 24:263–272
doi:10.1093/pan/mpw001

Improving Ecological Inference by Predicting Individual Ethnicity from Voter Registration Records

Kosuke Imai
Department of Politics and Center for Statistics and Machine Learning, Princeton University, Princeton, NJ 08544
e-mail: kimai@princeton.edu; URL: http://imai.princeton.edu (corresponding author)

Kabir Khanna
Department of Politics, Princeton University, Princeton, NJ 08544

Edited by Justin Grimmer

In both political behavior research and voting rights litigation, turnout and vote choice for different racial groups are often inferred using aggregate election results and racial composition. Over the past several decades, many statistical methods have been proposed to address this ecological inference problem. We propose an alternative method to reduce aggregation bias by predicting individual-level ethnicity from voter registration records. Building on the existing methodological literature, we use Bayes's rule to combine the Census Bureau's Surname List with various information from geocoded voter registration records. We evaluate the performance of the proposed methodology using approximately nine million voter registration records from Florida, where self-reported ethnicity is available. We find that it is possible to reduce the false positive rate among Black and Latino voters to 6% and 3%, respectively, while maintaining the true positive rate above 80%. Moreover, we use our predictions to estimate turnout by race and find that our estimates yields substantially less amounts of bias and root mean squared error than standard ecological inference estimates. We provide open-source software to implement the proposed methodology.

1 Introduction

In political behavior research as well as voting rights litigation, it is often of interest to infer turnout and vote choice among different racial groups. For instance, political scientists estimate turnout by race in order to study disparities in political participation (e.g., Gay 2001; Hajnal and Trounstine 2005), mobilization efforts (e.g., Barreto 2007), and the effects of co-ethnic candidates and representatives (e.g., Herron and Sekhon 2005). In voting rights cases, litigants wish to estimate turnout and vote choice among ethnic groups to build empirical evidence for the existence of racial polarization (e.g., Greiner 2007).

However, such efforts face a well-known methodological obstacle, known as the ecological inference problem. Since the race of individual voters is typically unknown, one must infer turnout by race from aggregate data. A number of statistical methods have been developed to address this problem (e.g., Goodman 1953; King 1997; King, Rosen, and Tanner 2004; Wakefield 2004; Greiner and Quinn 2008; Imai, Lu, and Strauss 2008). Nevertheless, all of these methods suffer from a fundamental problem of indeterminacy, and as a result, in recent years, methodologists have turned to the idea of combining aggregate data with individual-level data (e.g., Wakefield 2004; Imai Lu, and Strauss 2008; Greiner and Quinn 2010).

Authors' note: We thank Bruce Willsie, the CEO of L2, for the data and answering numerous questions, and the participants of "Building the Evidence to Win Voting Rights Cases" conference at the American Constitutional Society for Law and Policy for their helpful comments. Two anonymous reviewers provided helpful suggestions. The **R** package, wru: Who Are You? Bayesian Prediction of Racial Category Using Surname and Geolocation, is freely available for download at https://cran.r-project.org/package=wru. Replication files for this study are available on the *Political Analysis* Dataverse at http://dx.doi.org/10.7910/DVN/SVY5VF. Supplementary materials for this article are available on the *Political Analysis* Web site.

In this article, we propose to improve upon ecological inference by predicting individual race from voter registration records. Building on the existing methodological literature in public health (Fiscella and Fremont 2006; Elliott et al. 2008, 2009), we use Bayes's rule to combine the Census Bureau's Surname List with information in geocoded voter registration records. By incorporating additional information such as party registration, this methodological framework offers improvements over the common practice of using surname alone or surname and geolocation to predict individual ethnicity (e.g., Michelson 2003; Barreto, Segura, and Woods 2004; Tam Cho, Gimpel, and Dyck 2006; Fieldhouse and Cutts 2008; Henderson, Sekhon, and Titiunik 2014; Enos 2015; Harris 2015). We also explicate and probe the assumptions that underlie the existing and proposed methods. Although some scholars have turned to proprietary methods of estimating voter race (e.g., Ansolabehere and Hersh 2003; Fraga 2013, 2016), we believe that methodological transparency is important for academic research, and these assumptions reveal the promise and limitations of the methods discussed here.[1] To implement the proposed methodology, the **R** package, `wru: Who Are You? Bayesian Prediction of Racial Category Using Surname and Geolocation`, is freely available for download at https://cran.r-project.org/package=wru.

Finally, this article reports the results of a large-scale empirical validation study. We examine the performance of various methods of estimating individual-level race, as well as turnout by race at the precinct and district levels. Specifically, we use the Florida voter file, predicting the race of over nine million voters and validating our predictions using self-reported race data.[2] We choose Florida because self-reported race is collected on voter registration cards by law.[3] Florida also has a relatively large number of Blacks and Latinos, enabling us to empirically validate the accuracy of the proposed method and other methods at the individual level among these minority groups. We show that the proposed method reduces the false positive rate among Black and Latino voters to 6% and 3%, respectively, while maintaining the true positive rate at above 80%. Moreover, we find that the bias and root mean squared error (RMSE) of our estimated turnout by racial groups are substantially less than those of the standard ecological inference estimates.

2 The Methodology

We begin by describing the existing Bayesian method in public health that combines the surname list with the geocoded location of individual residence. We then describe our extension, which allows researchers to incorporate the various information in voter registration records.

2.1 *The Bayesian Prediction*

Researchers interested in measuring racial disparities in healthcare have developed a methodology to combine surname analysis and geocoded data to estimate individual race via Bayes's rule (Fiscella and Fremont 2006; Elliott et al. 2008, 2009). We begin by describing the Bayesian method developed by Elliott et al. (2009). Let the surname and geolocation of voter i be denoted by S_i and G_i, respectively. We use R_i to represent an unobserved variable indicating the racial group voter i belongs to. Let $\mathcal{R}$, $\mathcal{G}$, and $\mathcal{S}$ represent the set of all racial groups, all geolocations, and all surnames, respectively.

We are interested in estimating $\Pr(R_i = r | S_i = s, G_i = g)$, or the conditional probability that voter i belongs to racial group r given his/her surname s and geolocation g. Using the data from the Census Bureau, we have the racial composition of frequently occurring surnames, that is,

[1] In addition, unlike the Bayesian methods, the Catalist's race prediction method does not offer a formal probabilistic prediction and instead utilizes an informal scheme of "Highly Likely," "Likely," and "Possibly."

[2] Fraga (2016) conducts an empirical validation of Catalist's proprietary race prediction method. There are several differences between the current validation and that of Fraga (2016). For example, Catalist bases its predictions on self-reported race in the voter file whenever it is available. In contrast, our goal is to predict individual race when such information is not available. To do this, we utilize other available information in the voter file, such as surname, geolocation, and party registration.

[3] Voter registration cards in Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina ask voters to identify their race/ethnicity. Pennsylvania and Tennessee provide an optional blank field for race.

$\Pr(R_i = r|S_i = s)$, the racial composition of each geolocation (e.g., Census blocks and voting precincts), that is, $\Pr(R_i = r|G_i = g)$, and the population proportion of each geolocation, that is, $\Pr(G_i = g)$.

The method assumes that geolocation and surname are statistically independent conditional on race. That is, once we know a voter's race, her surname is not informative about where she lives.[4] We formalize this assumption as follows:

$$G_i \perp\!\!\!\perp S_i|R_i. \tag{1}$$

Assuming equation (1) holds, Bayes's rule implies

$$\Pr(R_i = r|S_i = s, G_i = g) = \frac{\Pr(G_i = g|R_i = r)\Pr(R_i = r|S_i = s)}{\sum_{r' \in \mathcal{R}} \Pr(G_i = g|R_i = r')\Pr(R_i = r'|S_i = s)}, \tag{2}$$

where using Bayes's rule again we can calculate $\Pr(G_i = g|R_i = r)$ as $\Pr(R_i = r|G_i = g)\Pr(G_i = g)/\sum_{g' \in \mathcal{R}} \Pr(R_i = r|G_i = g')\Pr(G_i = g')$. Thus, the method provides a probabilistic prediction of individual ethnicity.

2.2 *The Proposed Extension*

We propose to extend the above Bayesian prediction method by incorporating a set of individual-level covariates available in the voter files. In this article, we focus on age, gender, and party registration, which are often available in voter files. However, under the proposed framework, other information can be incorporated in a similar manner. Let X_i represent our two demographic variables, that is, age and gender. Furthermore, let P_i represent the party registration of voter i.

To incorporate the demographic variables X_i, we replace the assumption given in equation (1) with the following:

$$\{G_i, X_i\} \perp\!\!\!\perp S_i|R_i. \tag{3}$$

This assumption states that given a voter's race, his/her surname does not contain any information about his/her geolocation and demographics. It could be violated, for example, if the rate of interracial marriage is correlated with surname and geolocation through age or gender within each racial category.[5] As with equation (1), we view the validity of this assumption as an empirical question.

If equation (3) holds, it is straightforward to predict individual race using Bayes's rule,

$$\Pr(R_i = r|S_i = s, G_i = g, X_i = x) = \frac{\Pr(G_i = g, X_i = x|R_i = r)\Pr(R_i = r|S_i = s)}{\sum_{r' \in \mathcal{R}} \Pr(G_i = g, X_i = x|R_i = r')\Pr(R_i = r'|S_i = s)}, \tag{4}$$

where $\Pr(G_i = g, X_i = x|R_i = r)$ can be obtained from the Census Summary File.

We further extend this method to incorporate party registration as well as demographics by considering two possibilities. The first approach requires that researchers have information about the population distribution of party registration given each racial category, that is, $\Pr(P_i = p|R_i = r)$ for all $p \in \mathcal{P}$ and $r \in \mathcal{R}$, where $\mathcal{P}$ is the set of all parties.[6] For example, we may obtain an estimate of this quantity from a national survey. This approach is based on the following conditional

[4]There are different ways in which this assumption could be violated. For example, surnames may be associated with wealth, which may be predictive of where people live, even within a racial group. Another scenario is that within racial groups, families cluster together in neighborhoods. While recognizing these possibilities, ultimately, we view the validity of this assumption as an empirical question. Our analysis shows that by conditioning on race, we can account for much of the association between surname and geolocation (see Supplementary Appendix A.3). We also find that our predictions of race are quite accurate, suggesting that equation (1) is reasonable.

[5]We thank an anonymous reviewer for pointing out this possibility.

[6]We classify voters as Democrats, Republicans, or Other. Other includes Independents and members of minor parties. Knowing that a voter is not registered with a major party is informative, because the racial composition of this group differs from the racial composition of registered Democrats and Republicans.

independence assumptions:

$$\{G_i, P_i, X_i\} \perp\!\!\!\perp S_i | R_i \tag{5}$$

$$\{G_i, X_i\} \perp\!\!\!\perp P_i \,|\, R_i. \tag{6}$$

Equation (5) implies that once we know a voter's race, his/her surname is not informative about his/her geolocation, party registration, and demographics. Similarly, the second assumption in equation (6) states that given a voter's race, his/her party registration does not provide any additional information about his/her geolocation and demographics. Under these assumptions, we can apply Bayes's rule to predict individual ethnicity:

$$\begin{aligned} &\Pr\,(R_i = r | S_i = s, G_i = g, X_i = x, P_i = p) \\ &= \frac{\Pr\,(G_i = g, X_i = x | R_i = r)\Pr\,(P_i = p | R_i = r)\Pr\,(R_i = r | S_i = s)}{\sum_{r' \in \mathcal{R}} \Pr\,(G_i = g, X_i = x | R_i = r')\Pr\,(P_i = p | R_i = r')\Pr\,(R_i = r' | S_i = s)}. \end{aligned} \tag{7}$$

Unlike the first approach, the second approach for incorporating party registration allows one to predict race without additional information. This alternative strategy is based on the following independence assumption as well as the assumption given in equation (1):[7]

$$\{X_i, P_i\} \perp\!\!\!\perp S_i | G_i, R_i, \tag{8}$$

which implies that given a voter's geolocation and race, her surname has no predictive power for her demographics and party registration. Under these assumptions, the application of Bayes's rule yields:

$$\begin{aligned} &\Pr\,(R_i = r | S_i = s, G_i = g, P_i = p, X_i = x) \\ &= \frac{\Pr\,(P_i = p, X_i = x | G_i = g, R_i = r)\Pr\,(G_i = g | R_i = r)\Pr\,(R_i = r | S_i = s)}{\sum_{r' \in \mathcal{R}} \Pr\,(P_i = p, X_i = x | G_i = g, R_i = r')\Pr\,(G_i = g | R_i = r')\Pr\,(R_i = r' | S_i = s)}, \end{aligned} \tag{9}$$

where we model the first term in the numerator and denominator as:

$$\begin{aligned} &\Pr\,(P_i = p, X_i = x | G_i = g, R_i = r) \\ &= \Pr\,(P_i = p | X_i = x, G_i = g, R_i = r)\Pr\,(X_i = x | G_i = g, R_i = r). \end{aligned} \tag{10}$$

The second term of this equation can be calculated directly from the Census data as $\Pr\,(X_i = x | G_i = g, R_i = r) = \Pr\,(X_i = x, R_i = r | G_i = g) / \sum_{x' \in \mathcal{X}} \Pr\,(X_i = x', R_i = r | G_i = g)$. The first term is unknown but models the party registration as a function of demographics, geolocation, and race. To estimate this model and obtain a maximum likelihood estimate of individual race via equation (9), we use the standard Expectation-Maximization algorithm by treating race as missing data (Dempster, Laird, and Rubin 1977) (see Supplementary Appendix A.2 for details).

3 Empirical Validation

In this section, we present an empirical validation study of the methods described above and assess the accuracy of their prediction relative to that of the existing methods.

[7] Technically, the assumption given in equation (8) can be slightly relaxed using the following set of sequential independence assumptions, although in our empirical study they do not appear to make substantial differences:

$$X_i \perp\!\!\!\perp S_i \,|\, R_i, G_i$$

$$P_i \perp\!\!\!\perp S_i \,|\, R_i, G_i, X_i.$$

3.1 *Data*

We analyze voter registration data from Florida, which include approximately ten million individual records. Our data are based on statewide voter files and come from L2 (formerly Labels & Lists, Inc.), a leading nonpartisan firm and the oldest organization in the United States that supplies voter data and related technology to candidates, political parties, pollsters, and consultants for use in campaigns. For every active registered voter in the state, we have gender, birth date, original registration date, address, district, precinct, party registration, and turnout history.[8]

We also use the 2010 U.S. Census Summary File for Florida, which contains the joint distribution of individual characteristics, including age, gender, and race, at the levels of various geographical units, including blocks, tracts, and precincts. The summary file contains raw counts of individuals, which we aggregate by various geographical units and then use to calculate $\Pr(G_i|R_i = r)$ and $\Pr(G_i, X_i|R_i = r)$. As explained in more detail in Barber and Imai (2013), we geocode voters in the L2 data using their addresses so that we know the geographical unit to which each voter belongs. We also verify that the Census data accurately reflect the racial composition of voting precincts in the L2 data (see Figure 3 in Supplementary Appendix A.4).

The Census Bureau also provides data on the racial distribution of surnames in the United States. In 2007, the Census Bureau released the percent of individuals who are White, Black, Latino, Asian, and so on for each surname occurring at least 100 times in the 2000 Census. The list contains a total of 151,671 names, capturing 90% of the population enumerated in the 2000 Census. We supplement this list with Census's Spanish Surname List, which contains 12,500 common Latino surnames, about half of which are on the 2007 Census Surname List. From this data, we can calculate $\Pr(R_i = r|S_i)$ for well over 150,000 surnames in the U.S. See Supplementary Appendix A.1 for details.

We divide race into five categories: White, Black, Latino, Asian, and Other. These are similar to the racial groups used in the Census data and self-reported race in the voter files. The major difference is that we do group American Indian/Alaska Native with Other, because American Indians and Alaska Natives jointly constitute less than 1% of records in the Florida voter file. Moreover, we find that our misclassification rate is approximately equal among the American Indian/Alaska Native and Other groups.[9]

3.2 *Validation of Race Predictions*

To validate the proposed methodology, we compare the race predictions from each method with voters' self-reported race, which is available for approximately nine million voters in Florida. For each voter, we find the race with the greatest predicted probability and classify the voter as belonging to that racial group. The goal of this validation exercise is to examine whether and how additional information, such as geolocation and party registration, improves the race predictions.

We assess the performance of each method by calculating the overall error rate, which simply represents the proportion of voters whose racial group it incorrectly classifies. We also compute the two types of group-specific error rates: false positives (Type I errors) and false negatives (Type II errors). For example, with respect to Latinos, classifying a non-Latino voter as Latino would be a false positive, whereas classifying a Latino voter as non-Latino would be a false negative. Although the goal is to minimize both types of error, there is a clear trade-off between the two.

Table 1 displays the error rates for five sets of predictions based on different sets of information. We begin with a name-only prediction that classifies race on the basis of the Census Surname List. We then enhance the prediction by incorporating voters' geolocation, testing both voting precinct

[8]The data contain all active registrants as of July 2012. L2 removes voters who were classified as inactive by the Secretary of State's Office. Inactive voters are those who did not vote in the past several elections or respond to an official request to confirm their address and registration. See Barber and Imai (2013) for details. Replication files are available at http://dx.doi.org/10.7910/DVN/SVY5VF.

[9]We combine the Census Mixed Race category with Other, because our voter files do not have a separate mixed-race category. However, in theory, researchers may use Census data to identify the growing mixed-race population, which is over nine million or 2.9% of the U.S. population in 2010.

Table 1 Empirical validation of individual-level race classification using the Florida registration records

		Name	*Name Precinct*	*Name Block*	*Name Precinct Party*	*Name Block Party*
Overall error rate		0.215	0.158	0.152	0.151	0.145
White (68%)	False negative	0.047	0.060	0.059	0.065	0.061
	False positive	0.523	0.294	0.266	0.257	0.237
Black (13%)	False negative	0.839	0.381	0.320	0.290	0.249
	False positive	0.011	0.027	0.026	0.033	0.029
Latino (13%)	False negative	0.193	0.150	0.155	0.158	0.162
	False positive	0.037	0.039	0.038	0.038	0.037
Asian (2%)	False negative	0.540	0.519	0.533	0.520	0.532
	False positive	0.006	0.007	0.007	0.007	0.007
Other (4%)	False negative	0.991	0.989	0.969	0.989	0.968
	False positive	0.001	0.001	0.002	0.001	0.002

Notes: The table displays the overall classification error rate as well as false negative (Type I error) and false positive (Type II error) rates for White, Black, Latino, Asian, and Other voters using our proposed prediction method. We classify each registered voter to the racial category with the greatest predicted probability. Each column corresponds to the results based on different sets of information. We start with the information based on the Census Surname List only and then add the voter's geolocation and party registration. The total sample size is 9,247,810.

and Census block. Finally, we include voters' party registration as an individual-level covariate. We use publicly available Gallup polling data to obtain the distribution of partisanship by race, that is, $\Pr(P_i = p|R_i = r)$ (Newport 2013).

The first row of Table 1 displays each prediction method's overall classification error rate, measuring the accuracy of each prediction across all voters. We find that the additional information reduces the overall error rate from approximately 22%, which is obtained when only voters' names are used, to 15% when their geolocation and party registration are incorporated. In particular, the prediction based on voters' name, block, and party registration performs best according to this measure. We also find that using demographics does not substantially change our predictions. In addition, our second method of incorporating party registration, which does not require external data on the distribution of partisanship by race, performs slightly worse than the ones presented here (see Table 4 in Supplementary Appendix A.5 for a full set of results).

We further examine the performance of the proposed methodology for each racial category. Among Whites, the name-only prediction results in a substantially high false positive rate of over 50%. Incorporating voters' geolocation and party registration, we are able to reduce this to approximately 25% without substantially increasing the false negative rate. Among Blacks, the false negative rate for the name-only prediction exceeds 80%, while incorporating additional information reduces this by more than half. In both cases, adding party registration as well as geolocation appears to be beneficial.[10]

For Latinos and Asians, the improvement in accuracy due to the additional information appears to be minimal. Among Latinos, the name-only prediction already has a relatively low false negative rate of about 19%.[11] Indeed, incorporating voters' geolocation and party registration further decreases the false negative rate, but only by three to four percentage points. Among Asians, who consist of only 2% of Florida registered voters, there is little performance difference across the

[10]We examined the self-reported race of voters we incorrectly classified as Whites (i.e., false positives). We find that voters misclassified as Whites are 50% Blacks, 18% Latinos, 7% Asians, and 25% Others. Among Black voters who are misclassified (i.e., false negatives), 94% are misclassified as Whites.

[11]We examined whether using the Spanish Surname List helps identify Latinos. We find that whether or not we use this list in conjunction with the full Census Surname List, our accuracy among Latinos remains nearly identical. We recomputed the Name and Precinct and the Name, Precinct, and Party predictions without using the Spanish Surname List and obtained the almost same overall error rate and false negative and positive rates as we report in Table 1. We suspect that this is because the Census Surname List contains many prominent Spanish surnames.

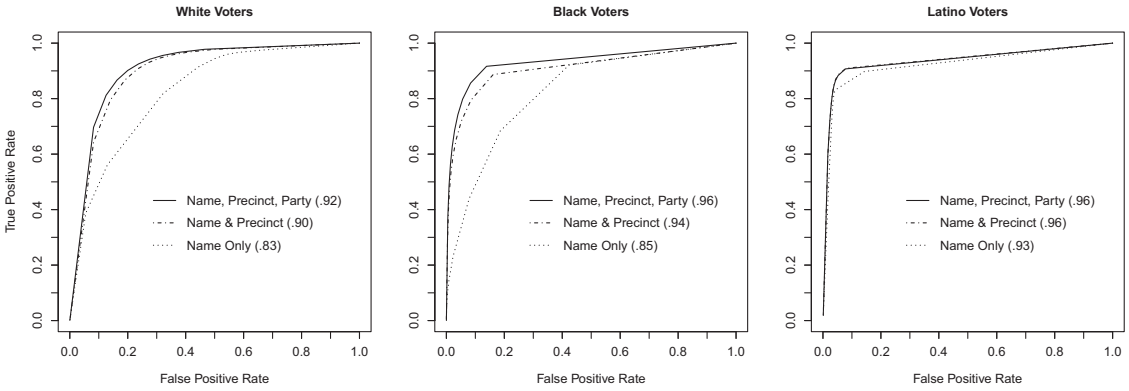


Fig. 1 ROC curves for the proposed race prediction methods. ROC curves plot true positive rate (vertical axis) against false positive rate (horizontal axis) for all possible thresholds used for classification. The area under the ROC curves, given in the legend, summarizes the overall classification success. Among White and Black voters, using voter precinct (denoted as "Precinct") in addition to surname ("Name") substantially improves classification accuracy. Adding voter party registration ("Party") results in further improvements. Among Latino voters, surname alone yields a high success rate and adding other information produces minor improvements.

methods. All methods have a high false negative rate, suggesting that it is difficult to identify Asian voters from the set of information considered in this article alone.[12]

A more comprehensive comparison of predictions, while recognizing the trade-off between false negatives and false positives, is to examine the receiver operating characteristic (ROC) curve for each prediction method. Rather than classifying voters on the basis of the greatest predicted probability, ROC curves display the true positive rate (sensitivity) against the false positive rate (specificity) for a variety of classification thresholds. Since it is desirable to have a higher true positive rate given a false negative rate (or a lower false negative rate given a true positive rate), the area under the ROC curve can be used to evaluate the performance.

In Figure 1, we plot ROC curves for three predictions among White, Black, and Latino voters. Among Whites and Blacks, we observe that the information about voters' geolocation significantly improves the accuracy of race prediction while adding the party registration yields only a modest improvement. Among Latinos, as we saw earlier, the name-only prediction performs relatively well. The figure shows that it is possible to reduce the false negative rate among Blacks and Latinos to 0.06 and 0.03, respectively, while maintaining the true positive rate above 0.8. This means that our method correctly classifies over 80% of Blacks and Latinos, while only misclassifying 6% of non-Blacks as Black and 3% of non-Latinos as Latino.

3.3 *Validation of the Turnout Estimates*

We now estimate voter turnout by racial category and validate our estimates against actual turnout by race at the precinct and congressional district levels in Florida. The goal is to investigate whether individual-level racial predictions improve the race-specific turnout rates obtained from the standard ecological inference techniques widely used in academia and elsewhere (i.e., Goodman 1953; King 1997).

We focus on turnout among White, Black, Latino, Asian, and Other registered voters in the 2008 presidential election. We estimate aggregate turnout for each racial group using the predicted probabilities directly. Specifically, we calculate the aggregate turnout for each race as the weighted average of turnout, where the predicted probabilities serve as weights. Formally, for each racial group r, we compute $\sum_{i=1}^{n} \Pr(R_i = r|S_i, G_i, P_i) Y_i / \sum_{i=1}^{n} \Pr(R_i = r|S_i, G_i, P_i)$, where Y_i is the binary

[12] As was the case with Black voters, the vast majority of false negatives among Latinos (86%) and Asians (75%) are misclassified as Whites.

Table 2 Bias and RMSE of predicted turnout by race across 8,828 precincts and 25 congressional districts in Florida

	Goodman's regression		*King's EI*		*Name-only prediction*		*Bayesian prediction*	
	Bias	*RMSE*	*Bias*	*RMSE*	*Bias*	*RMSE*	*Bias*	*RMSE*
Precincts								
Whites	0.003	0.069	0.041	0.062	−0.003	0.015	−0.003	0.012
Blacks	−0.102	0.162	−0.133	0.217	−0.009	0.043	−0.007	0.039
Latinos	−0.114	0.251	−0.163	0.250	0.016	0.042	0.011	0.035
Asians	0.017	0.713	−0.470	0.550	0.041	0.116	0.040	0.111
Others	−0.214	0.499	−0.338	0.450	0.068	0.109	0.048	0.094
Districts								
Whites	0.008	0.037	0.047	0.058	−0.007	0.012	−0.001	0.004
Blacks	−0.147	0.197	−0.215	0.267	0.009	0.020	−0.006	0.010
Latinos	−0.272	0.463	−0.300	0.354	0.045	0.052	0.017	0.021
Asians	0.072	0.808	−0.459	0.530	0.055	0.058	0.043	0.046
Others	−0.229	0.527	−0.342	0.448	0.073	0.078	0.042	0.053

Notes: Goodman's regression, King's EI, name-only prediction (based on the Census Surname List), and our proposed Bayesian prediction method. Although Goodman's regression and King's EI use precinct-level turnout and racial composition data only, the proposed Bayesian methodology uses the name, residence location, and party registration of voters. Precinct-level bias and RMSE are weighted by the number of voters for each precinct. Generally, the proposed Bayesian method performs best, though the name-only prediction also yields a reasonable performance.

turnout variable for voter i. For the purpose of comparison, we also compute the prediction based on the Census surname alone and compute $\sum_{i=1}^{n} \Pr(R_i = r|S_i) Y_i / \sum_{i=1}^{n} \Pr(R_i = r|S_i)$.

We validate our estimates against true precinct-level and district-level turnout, which can be computed using the self-reported race for each voter. In addition to the name-only prediction, we compare the performance of our methodology against the two standard ecological inference techniques, that is, Goodman's ecological regression (Goodman 1953), and the King's EI (King 1997). Goodman's method regresses overall turnout on the proportion of voters of a particular race to estimate turnout for that race. The method assumes that the average turnout rate for each racial group does not depend on racial composition. We fit Goodman's ecological regression using precinct-level data in each congressional district. We fit a separate univariate model for each of the five racial groups.[13] This yields the estimates of turnout by race that can be used at both the precinct and district levels. The second standard technique is King's EI, which yields precinct-level turnout estimates (King and Roberts 2012). We fit a separate 2×2 EI model for each racial group, one district at a time. We then aggregate the estimated turnout among precincts within a district to estimate district-level turnout.

Table 2 reports the bias and RMSE of turnout estimates at both the precinct and district levels for each method. We begin by considering the two standard techniques. Goodman's regression does not perform well, underestimating turnout among Blacks, Latinos, and Others by over ten percentage points at the precinct level on average. The bias increases at the district level. Moreover, the RMSE is large for all groups but Whites. King's EI also performs poorly at the precinct and district levels, yielding large bias and RMSE. It is particularly biased for Others, underestimating turnout by over thirty percentage points on average.[14]

The name-only prediction and the proposed Bayesian approach significantly improve the results of the aforementioned standard methods. Both have much smaller bias and RMSE. In general, the proposed Bayesian methodology performs best, providing essentially unbiased estimates for Whites, Blacks, and Latinos. The magnitude of bias is somewhat larger for Asians and Others,

[13] We also fit a multivariate linear regression, regressing the overall turnout on the proportions of all racial groups. These results are substantively similar to the univariate results presented here (see Table 5 in Supplementary Appendix A.5).

[14] We also examine the performance of these methods in racially homogeneous precincts (defined as having over 90% of one race). In our data, the vast majority (92%) of such precincts are homogeneously White. The Bayesian predictions significantly outperform the other methods (see Table 6 in Supplementary Appendix A.5).

but is still less than five percentage points. In Table 5 provided in Supplementary Appendix A.5, we also present the results based on the name-only and Bayesian classifications, which classify each voter to a racial group and then aggregate turnout. As expected, these methods, which do not incorporate the uncertainty in the predictions, perform slightly worse than the corresponding methods presented here.

The name-only prediction does surprisingly well despite the fact that its classification error rate is greater than that of the Bayesian method. Indeed, the performance of the name-only prediction method is roughly comparable to that of the Bayesian method. This apparent inconsistency can occur because the turnout rate is approximately equal among false negative and false positive voters. That is, the classification error based on the Census Surname List is roughly independent of turnout (see Table 7 in Supplementary Appendix A.5). However, in other settings, such independence may not hold. As such, we recommend that applied researchers and litigators use the proposed Bayesian methodology.

4 Concluding Remarks

This article reviews and extends the methodology for predicting the race of an individual by incorporating name, geocoded residence, and other information from voter files. Our validation study has shown that the proposed Bayesian methodology provides accurate individual-level predictions and significantly improves the estimation of aggregate-level turnout for each racial group relative to the standard ecological inference methods. We believe that this methodology enables academic researchers and litigators to conduct more reliable ecological inference in states where registered voters are not asked to report their race. A straightforward and yet useful extension of the proposed methodology is to incorporate vote choice from survey data for predicting candidate choice as well as turnout by racial groups.

References

Ansolabehere, S., and E. Hersh. 2003. Gender, age, race, and voting: A research note. *Politics and Governance* 1(2):132–37.

Barber, M., and K. Imai. 2013. Estimating neighborhood effects on turnout from geocoded voter registration records. Working Paper available at http://imai.princeton.edu/research/neighbor.html (accessed February 24, 2016).

Barreto, M. A. 2007. Si Se Puede! Latino candidates and the mobilization of Latino voters. *American Political Science Review* 101(3):425–41.

Barreto, M. A., G. M. Segura, and N. D. Woods. 2004. Mobilizing effect of majority-minority districts. *American Political Science Review* 98(1):65–75.

Dempster, A. P., N. M. Laird, and D. B. Rubin. 1977. Maximum likelihood from incomplete data via the EM algorithm (with discussion). *Journal of the Royal Statistical Society, Series B, Methodological* 39(1):1–37.

Elliott, M. N., A. Fremont, P. A. Morrison, P. Pantoja, and N. Lurie. 2008. A new method for estimating race/ethnicity and associated disparities where administrative records lack self-reported race/ethnicity. *Health Services Research* 43(5p1):1772–36.

Elliott, M. N., P. A. Morrison, A. Fremont, D. F. McCaffrey, P. Pantoja, and N. Lurie. 2009. Using the Census Bureau's surname list to improve estimates of race/ethnicity and associated disparities. *Health Services and Outcomes Research Methodology* 9(2):69–83.

Enos, R. D. 2015. Testing the elusive: A field experiment on intergroup competition and voting. Working Paper, Department of Government, Harvard University.

Fieldhouse, E., and D. Cutts. 2008. Diversity, density and turnout: The effect of neighbourhood ethno-religious composition on voter turnout in Britain. *Political Geography* 27(5):530–48.

Fiscella, K., and A. M. Fremont. 2006. Use of geocoding and surname analysis to estimate race and ethnicity. *Health Services Research* 41(4p1):1482–500.

Fraga, B. 2013. Winning the race, losing the base? Demobilization, competitiveness, and electoral influence. Working Paper, Department of Political Science, Indiana University.

———. 2016. Candidates or districts? Reevaluating the role of race in voter turnout. *American Journal of Political Science* 60(1):97–122.

Gay, C. 2001. The effect of black congressional representation on political participation. *American Political Science Review* 95(3):589–602.

Goodman, L. 1953. Ecological regressions and behavior of individuals. *American Sociological Review* 18:663–66.

Greiner, J. D. 2007. Ecological inference in voting rights act disputes: Where are we now, and where do we want to be? *Jurimetrics* 47(2):115–67.

Greiner, D. J., and K. M. Quinn. 2008. R × c ecological inference: bounds, correlations, flexibility and transparency of assumptions. *Journal of the Royal Statistical Society, Series A* 172(1):67–81.

———. 2010. Exit polling and racial bloc voting: Combining individual level and ecological data. *Annals of Applied Statistics* 4(4):1774–96.

Hajnal, Z. L., and J. Trounstine. 2005. Where turnout matters: The consequences of uneven turnout in city politics. *Journal of Politics* 67(2):515–35.

Harris, J. A. 2015. What's in a name? A method for extracting information about ethnicity from names. *Political Analysis* 23(2):212–24.

Henderson, J. A., J. S. Sekhon, and R. Titiunik. 2014. Cause or effect? Turnout in Hispanic majority-minority districts. Department of Political Science, University of California, Berkeley.

Herron, M. C., and J. S. Sekhon. 2005. Black candidates and black voters: Assessing the impact of candidate race on uncounted vote rates. *Journal of Politics* 67(1):154–77.

Imai, K., Y. Lu, and A. Strauss. 2008. Bayesian and likelihood inference for 2 × 2 ecological tables: An incomplete data approach. *Political Analysis* 16(1):41–69.

Khanna, K., and K. Imai. 2016. Replication data for: Improving ecological inference by predicting individual ethnicity from voter registration records. http://dx.doi.org/10.7910/DVN/SVY5VF, Harvard Dataverse, V1 (accessed February 24, 2016).

King, G., 2004. *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*. Princeton, NJ: Princeton University Press.

King, G., and M. Roberts. 2012. Ei: A(n r) program for ecological inference.

King, G., O. Rosen, and M. Tanner, eds. 2004. *Ecological inference: New methodological strategies*. Cambridge: Cambridge University Press.

Michelson, M. R. 2003. Getting out the Latino vote: How door-to-door canvassing influences voter turnout in rural central California. *Political Behavior* 25(3):247–63.

Newport, F. 2013. Democrats racially diverse; Republicans mostly white—Gallup. http://www.gallup.com/poll/160373/democrats-racially-diverse-republicans-mostly-white.aspx (accessed January 24, 2015).

Tam Cho, W. K., J. G. Gimpel, and J. J. Dyck. 2006. Residential concentration, political socialization, and voter turnout. *Journal of Politics* 68(1):156–67.

Wakefield, J. 2004. Ecological inference for 2 × 2 tables (with discussion). *Journal of the Royal Statistical Society, Series A* 167:385–445.

```
#Required packages
install.packages(c("tidyverse","tidygeocoder","eiCompare","wru","tigris","data.ta
ble","readxl"))

#Libraries
library(tidyverse)
library(tidygeocoder)
library(eiCompare)
library(wru)
library(tigris)
library(data.table)
library(readxl)

#### Tidygeocoder: Geocode Voter File ####
#*All geocoding can be done via Geocodio website
#*https://www.geocod.io/upload/
#*Upload each individual voter file to website
#
#*RStudio method for geocoding:

#Load in voter file excel spreadsheet
#This R script points to November 2022 vote history file produced by Galveston
County
#This should be replicated for each individual vote history year
data_22 <- read_xlsx("~/Documents/Training Session/DEFS00031067.xlsx")

#Create unique ID for voter file
n <- length(data_22$`Voter Name`)

data_22$unique_id <- 1:n

#Replace street types that contain asteriks to NA
data_22$`Residence Address`[data_22$`Residence Address` == "*****"] <- NA

#Split data into batches of 10,000 (geocodio has a batch limit of 10k)
data_22 <- split(data_22, (seq(nrow(data_22))-1) %/% 10000)

#Get number of batches in data
n <- length(data_22)

#Geocode using tidygeocoder
for(i in 1:n) {
  data_22[[i]] <- tidygeocoder::geocode(data_22[[i]],
                                        address = "Residence Address",
                                        method = 'geocodio')
}

#Bind voter file batches back into a dataframe
data_22 <- do.call(rbind.data.frame, data_22)

#Seperate out missing addresses
no_address_22 <- data_22 %>%
  filter(is.na(lat) & is.na(long))

#Filter missing addresses
data_22 <- data_22 %>%
  filter(!is.na(lat) & !is.na(long))
```


EXHIBIT F

```
#Load up Texas census blocks to join to voter file
tx_blocks <- blocks("TX", year = 2020)

#Merge voter file and Texas census blocks
data_22 <- merge_voter_file_to_shape(data_22,
                                     tx_blocks,
                                     coords = c("long","lat"),
                                     voter_id = "unique_id")

#Revert back to dataframe object from shapefile for WRU
data_22 <- as.data.frame(data_22)

#Seperate out missing blocks
no_blocks_22 <- data_22 %>%
  filter(is.na(BLOCKCE20))

#Filter missing blocks
data_22 <- data_22 %>%
  filter(!is.na(BLOCKCE20))

#Merge missing addresses and missing blocks
no_address_22 <- full_join(no_address_22, no_blocks_22, by = NULL)

#Create two-character abbreviation for state for WRU
data_22$state <- "TX"

#Rename geofips columns for WRU
data_22 <- data_22 %>%
  rename(county = COUNTYFP20,
         tract = TRACTCE20,
         block = BLOCKCE20)

rm(tx_blocks, i, n, no_blocks_22)

#Getting census block data
#tx_census <- wru::get_census_data(
#states = "TX",
#year = "2020",
#census.geo = "block",
#retry = 3)

load("~/Documents/Training Session/Texas-Census-Data.RData")

#### WRU: BISG Voter File ####
#Create surname column for WRU
data_22 <- separate(data = data_22, col = "Voter Name", into = c("Last_Name",
"First_Middle"), sep = ",", remove = F)
data_22$surname <- toupper(data_22$Last_Name)

#Probabilistic race/ethnicity estimates from WRU
data_22 <- predict_race(
  voter.file = data_22,
  census.data = tx_census,
  census.geo = "block",
  year = "2020")

#Create surname column for WRU - missing addresses
no_address_22 <- separate(data = no_address_22, col = "Voter Name", into =
```

```
c("Last_Name", "First_Middle"), sep = ",", remove = F)
no_address_22$surname <- toupper(no_address_22$Last_Name)

#Probabilistic race/ethnicity estimates from WRU - missing addresses
no_address_22 <- predict_race(
  voter.file = no_address_22,
  surname.only = T)

#Merge BISG dataframes
bisg_22 <- full_join(data_22, no_address_22, by = NULL)

#Select variable inputs for eiCompare
bisg_22 <- bisg_22 %>%
  select(Precinct, unique_id, pred.whi, pred.his, pred.bla, pred.asi, pred.oth)

rm(data_22, no_address_22, tx_census)

#Aggregate to precinct-level to feed into eiCompare
bisg_22 <- precinct_agg_combine(
  bisg_22,
  group_col = "Precinct",
  include_total = T) %>%
  mutate(
    Total_Voters = pred.whi_total + pred.his_total + pred.bla_total +
pred.asi_total + pred.oth_total,
    pred.oth_prop = 1 - (pred.whi_prop + pred.bla_prop + pred.his_prop),
    pred.nonanglo_prop = 1 - pred.whi_prop) %>%
  filter(Total_Voters >= 10)

#### Load Election Data ####
#Load 2022 election results
election_22 <- fread("~/Documents/Training Session/Canvass Results-11-21-2022
02-57-38 PM.csv")

#Remove commas and make vote totals numeric
election_22$Votes <- as.numeric(gsub(",","",election_22$Votes))

#Filter for 2022 Attorney General / Governor election results
election_22 <- election_22 %>%
  select(Precinct, Choice, Votes) %>%
  filter(Choice %in% c("Ken Paxton, REP", "Rochelle Mercedes Garza, DEM", "Greg
Abbott, REP", "Beto O'Rourke, DEM")) %>%

  #Turn candidate names from rows to columns
  pivot_wider(names_from = Choice, values_from = Votes)

#Separate precinct column to match voter file format
election_22 <- separate(election_22, col = "Precinct", into = "Precinct", sep = "
")

#Aggregate vote totals by precinct level
election_22 <- election_22 %>%
  group_by(Precinct) %>%
  summarise(Paxton = sum(`Ken Paxton, REP`),
            Garza = sum(`Rochelle Mercedes Garza, DEM`),
            Abbott = sum(`Greg Abbott, REP`),
            ORourke = sum(`Beto O'Rourke, DEM`)) %>%
  rowwise() %>%
```

```
  #Create percentages to feed into eiCompare
  mutate(AG_Total = sum(Paxton, Garza, na.rm = T),
         Pct_Paxton = Paxton / AG_Total,
         Pct_Garza = Garza / AG_Total,
         Governor_Total = sum(Abbott, ORourke, na.rm = T),
         Pct_Abbott = Abbott / Governor_Total,
         Pct_ORourke = ORourke / Governor_Total) %>%

  #Filter out precincts where no votes were cast
  filter(AG_Total > 0 & Governor_Total > 0)

#Merge voter file with election results
merged_22 <- left_join(bisg_22, election_22, by = NULL)

rm(bisg_22, election_22)

#### eiCompare Iterative Model: Anglo & Non-Anglo - Attorney General ####
#Create vector for candidates' vote share by precinct for Attorney General
election
cands <- c("Pct_Paxton","Pct_Garza")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.nonanglo_prop")

#Create vector for total votes cast by precinct for Attorney General election
total <- "AG_Total"

#Execute Model: EI Iterative
ei_1.1 <- ei_iter(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "Iterative")

#View model results
summary(ei_1.1)

#### eiCompare RxC Model: Anglo & Non-Anglo - Attorney General ####
#Create vector for candidates' vote share by precinct for Attorney General
election
cands <- c("Pct_Paxton","Pct_Garza")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.nonanglo_prop")

#Create vector for total votes cast by precinct for Attorney General election
total <- "AG_Total"

#Execute Model: EI RxC
rxc_1.1 <- ei_rxc(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "RxC")

#View model results
summary(rxc_1.1)
```

```
#### eiCompare Iterative Model: Anglo & Non-Anglo - Governor ####
#Create vector for candidates' vote share by precinct for Governor election
cands <- c("Pct_Abbott","Pct_ORourke")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.nonanglo_prop")

#Create vector for total votes cast by precinct for Governor election
total <- "Governor_Total"

#Execute Model: EI Iterative
ei_1.2 <- ei_iter(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "Iterative")

#View model results
summary(ei_1.2)

#### eiCompare RxC Model: Anglo & Non-Anglo - Governor ####
#Create vector for candidates' vote share by precinct for Governor election
cands <- c("Pct_Abbott","Pct_ORourke")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.nonanglo_prop")

#Create vector for total votes cast by precinct for Governor election
total <- "Governor_Total"

#Execute Model: EI RxC
rxc_1.2 <- ei_rxc(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "RxC")

#View model results
summary(rxc_1.2)

#### eiCompare Iterative Model: Anglo, Black, Hispanic, & Other - Attorney
General ####
#Create vector for candidates' vote share by precinct for Attorney General
election
cands <- c("Pct_Paxton","Pct_Garza")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.bla_prop", "pred.his_prop", "pred.oth_prop")

#Create vector for total votes cast by precinct for Attorney General election
total <- "AG_Total"

#Execute Model: EI Iterative
ei_2.1 <- ei_iter(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
```

```
                  name = "Iterative")

#View model results
summary(ei_2.1)

#### eiCompare RxC Model: Anglo, Black, Hispanic, & Other - Attorney General ####
#Create vector for candidates' vote share by precinct for Attorney General
election
cands <- c("Pct_Paxton","Pct_Garza")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.bla_prop", "pred.his_prop", "pred.oth_prop")

#Create vector for total votes cast by precinct for Attorney General election
total <- "AG_Total"

#Execute Model: EI RxC
rxc_2.1 <- ei_rxc(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "RxC")

#View model results
summary(rxc_2.1)

#### eiCompare Iterative Model: Anglo, Black, Hispanic, & Other - Governor ####
#Create vector for candidates' vote share by precinct for Governor election
cands <- c("Pct_Abbott","Pct_ORourke")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.bla_prop", "pred.his_prop", "pred.oth_prop")

#Create vector for total votes cast by precinct for Governor election
total <- "Governor_Total"

#Execute Model: EI Iterative
ei_2.2 <- ei_iter(data = merged_22,
                  cand_cols = cands,
                  race_cols = race,
                  totals_col = total,
                  name = "Iterative")

#View model results
summary(ei_2.2)

#### eiCompare RxC Model: Anglo, Black, Hispanic, & Other - Governor ####
#Create vector for candidates' vote share by precinct for Governor election
cands <- c("Pct_Abbott","Pct_ORourke")

#Create vector for demographic breakdown by precinct
race <- c("pred.whi_prop", "pred.bla_prop", "pred.his_prop", "pred.oth_prop")

#Create vector for total votes cast by precinct for Governor election
total <- "Governor_Total"

#Execute Model: EI RxC
rxc_2.2 <- ei_rxc(data = merged_22,
```

```
                cand_cols = cands,
                race_cols = race,
                totals_col = total,
                name = "RxC")

#View model results
summary(rxc_2.2)
```