

Primary Election Turnout Forensics: Orange County, June 5, 2018

July 20, 2018

1 Final Analysis of June 25, 2018 Turnout Data

Post-election forensics tools can be helpful for finding anomalies in election administration data that can be further studied. There are a number of different forensics methodologies, ranging from visual examination of elections data to more complex machine learning approaches.¹ Here we present a visual examination of precinct-by-precinct turnout data from the June 5, 2018 primary election in Orange County. This is the fourth and final version of this report for the June 2018 primary election in Orange County.

In this study, we provide a visual analysis of the precinct-by-precinct turnout data. In this visual analysis we plot the distribution of turnout (the percentage of voters who cast ballots divided by the number of registered voters in the precinct) in a histogram. We expect to see a distribution of voter turnout that looks like a “normal” distribution — one that is single-peaked, is not skewed in either direction, and which doesn’t have “outliers” (i.e. precincts that are well outside the turnout distribution).

For example, we expect to see a distribution of turnout across precincts that looks like the hypothetical distribution shown in Figure 1. Here the hypothetical data has a clear “normal” distribution between 0 and 100 percent — the distribution is clearly unimodal, and there are no significant outliers.

The data we use in this analysis comes from the precinct turnout reports that the Orange County Registrar of Voters (OCRV) has made available on their website in the post-primary period.² The final turnout report was made available by OCRV on June 25, 2018, using that pdf report (“Run 27”), we transformed the information in it into comma-separated data. We then removed from the

¹For a summary of these approaches, see Ines Levin, Julia Pomares, and R. Michael Alvarez, “Using Machine Learning Algorithms to Detect Election Fraud”, in R. Michael Alvarez, Editor, *Computational Social Science: Discovery and Prediction*, New York: Cambridge University Press, 2016.

²<https://www.ocvote.com/results/detailed-data-and-reports/reports-and-results/>

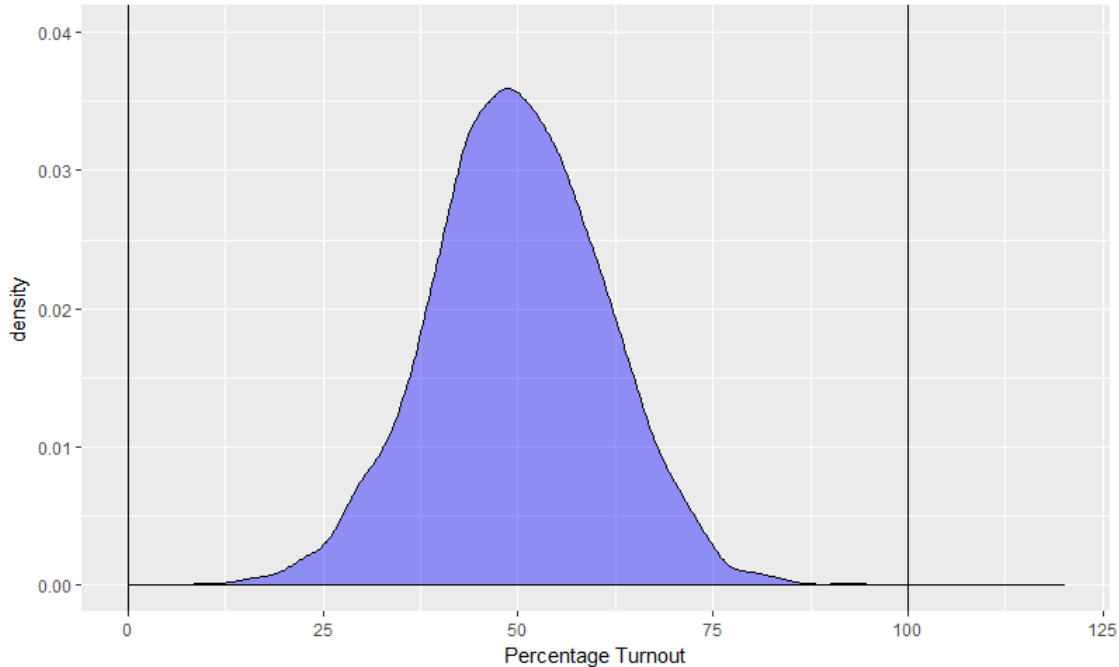


Figure 1: Hypothetical precinct turnout data

data the mail ballot precincts.³ The attached histogram Figure 2 provides the distribution of voter turnout provided in the most recent OCRV primary election turnout report.

In general, in Figure 2 we see what we expect: the distribution of voter turnout across precincts has a single-peak, and is smoothly distributed around that peak. In the latest turnout report, turnout is 42.87%, which roughly corresponds to the central tendency that we see in the figure. In general, this histogram of voter turnout appears to be smoothly distributed, and has a single mode. As in the earlier analyses that we have conducted on previous reports of OC voter turnout in the primary election, we see one outlier precinct, which is precinct 63383, with a reported turnout of 83.82%. In earlier reports, we discussed this outlying precinct and interested readers can learn more about the hypothesis for this outlying precinct in the appendix of this report.

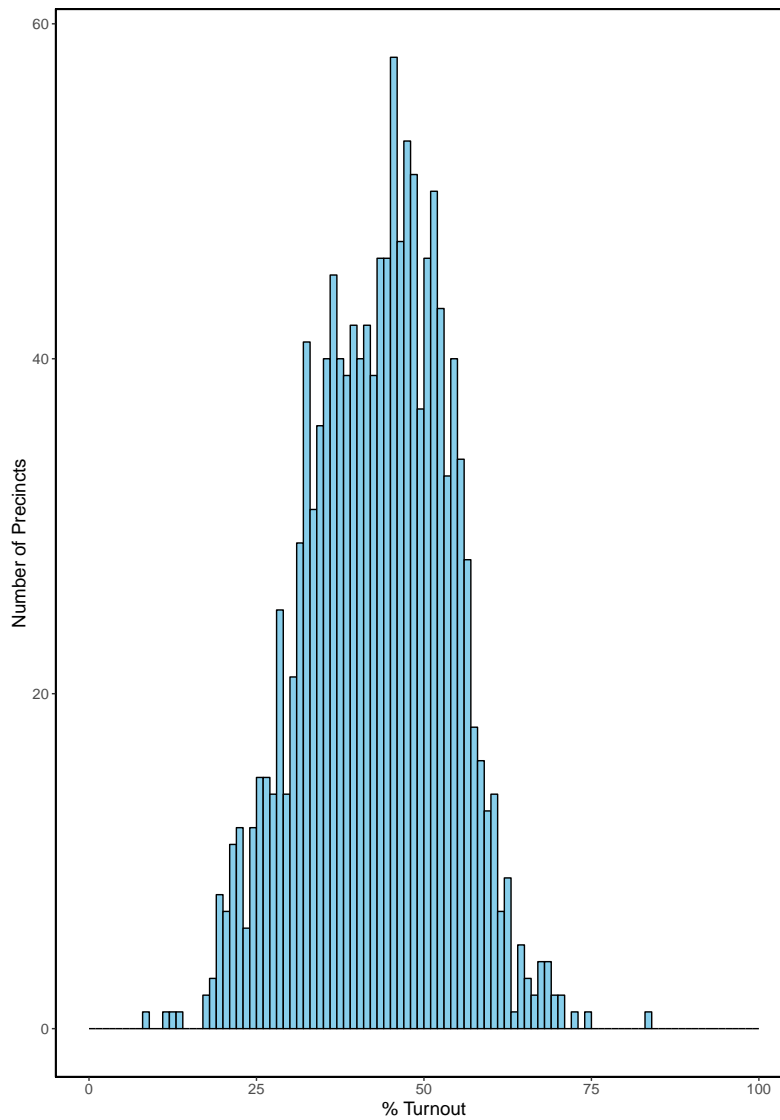
2 Conclusion

Precinct turnout forensics are a helpful tool for easily assessing the integrity of an election. Simple visualizations of precinct-by-precinct voter turnout have been shown to be a helpful diagnostic tool, as they can quickly and easily provide a means to understand whether there are multi-modalities or outliers in voter turnout in a jurisdiction that might require additional analysis or investigation. Our use of this type of tool in the June 2018 primary election in Orange County has indicated that

³The mail ballot precincts typically have few registered voters, in the single or double-digits, and have very different turnout patterns than the typical voting precinct in Orange County.

throughout the post-election canvass period, that the distribution of voter turnout has not yielded evidence that significant additional analyses nor investigations are required.

Our team will continue to provide similar analyses for the 2018 November general election in Orange County.



June 25, 2018 data.

Preliminary turnout data from the Orange County Registrar of Voters.

These figures are estimates, and may not reflect the final totals.

Figure 2: Final Preliminary Analysis

Appendix: Previously Published Preliminary Analyses

In this appendix we provide the first three graphics that we have previously disseminated, as well as the written explanations for the previous three preliminary versions of this report.

Original Analysis of June 7, 2018 Turnout Data

There is a single outlier in Figure 3: precinct 63383, reporting 65.44% turnout (this precinct had 408 registered voters, with a reported turnout of 267 voters). This is one of two precincts that were consolidated into a single voting location, the other precinct being one with a large number of registered voters (1,948) of whom 458 are reported to have turned out (precinct 63384, with reported turnout of 23.51%). After consultation with the OCRV team, we believe that in this consolidated polling place, more voters might have been assigned by pollworkers to one precinct in reporting turnout than to the other precinct. As both of these precincts had the same ballot style, voters would have received the correct ballot regardless of which precinct they were assigned to in this location.⁴

We will continue to update this report as additional turnout reports are generated for the June 2018 primary election.

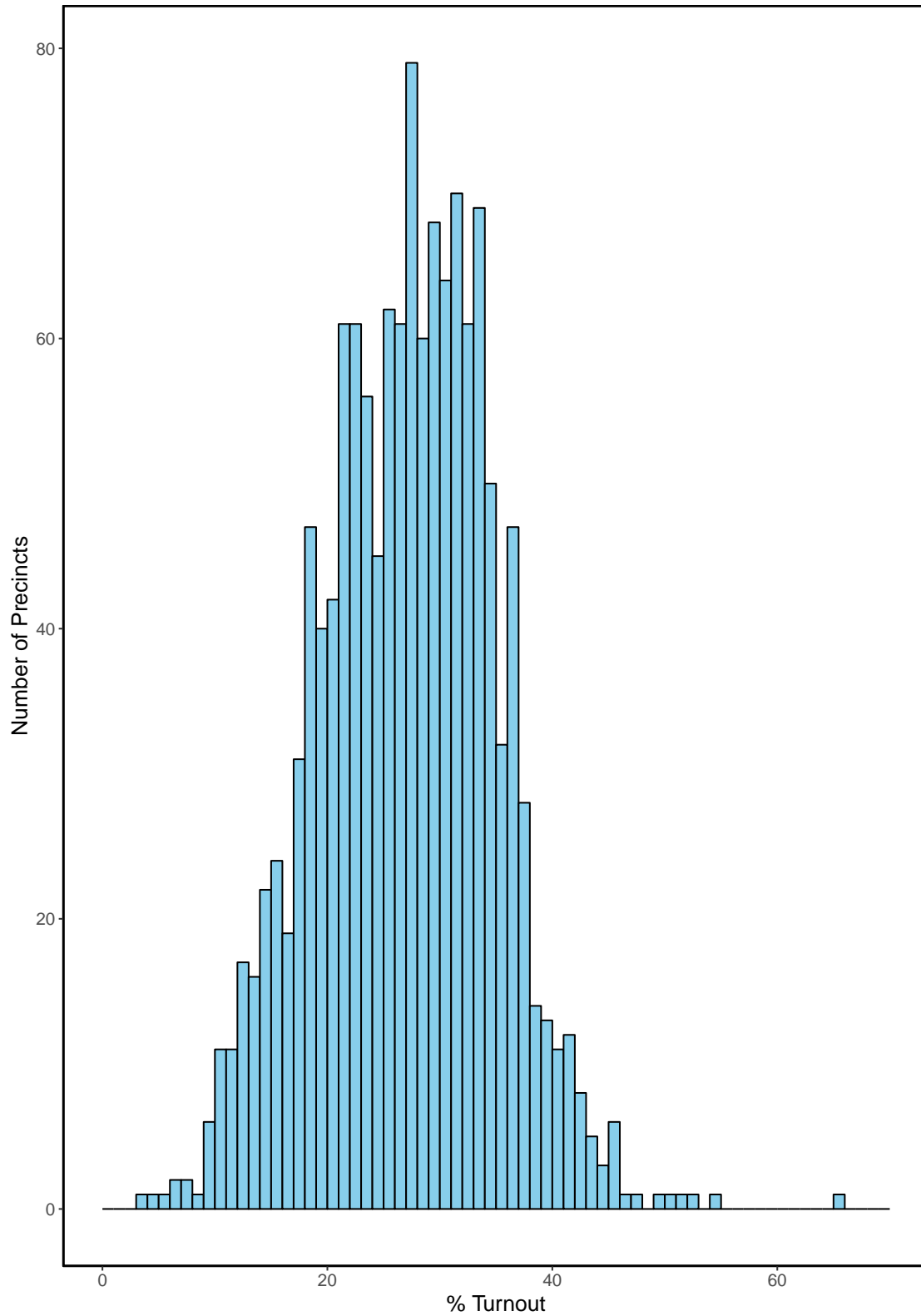
Updated Analysis of June 11, 2018 Turnout Data

We've updated the analysis, using data from "Run 14" (June 11, 2018). The updated graphic is in Figure 4. As additional ballots are included in the tabulation, current reported turnout continues to increase in many Orange County precincts. In the June 7 report, county turnout was 27.71%, in the June 11 data it is 31.16%. The data shown in Figure 4 reflect this, we see that the histogram is shifting to the right, reflecting the additional ballots being included in the tabulation. Precinct 63383 continues to be an outlier, with turnout now reported as 68.63%. The account for why this precinct is reporting high turnout was provided in the earlier report (above).

⁴Some simple calculations also show that this explanation makes sense. Assume that turnout in precinct 63383 was 25%, which is typical for precincts in this election. That would be 102 voting in this precinct of the 408 registered voters. Reallocating the remaining 165 voters from precinct 63383 to precinct 63384 would increase the number voting in the latter precinct by 165 voters, to a total of 623 voting in precinct 63384. That would increase the reported turnout in precinct 63384 to 31.98%, which is consistent with other high-turnout precincts in Orange County. These estimates would also then be consistent with other nearby precincts in Orange County, for example precincts 63038 (27.59%), 63373 (19.50%), 63023 (29.74%) or 63353 (32.91%).

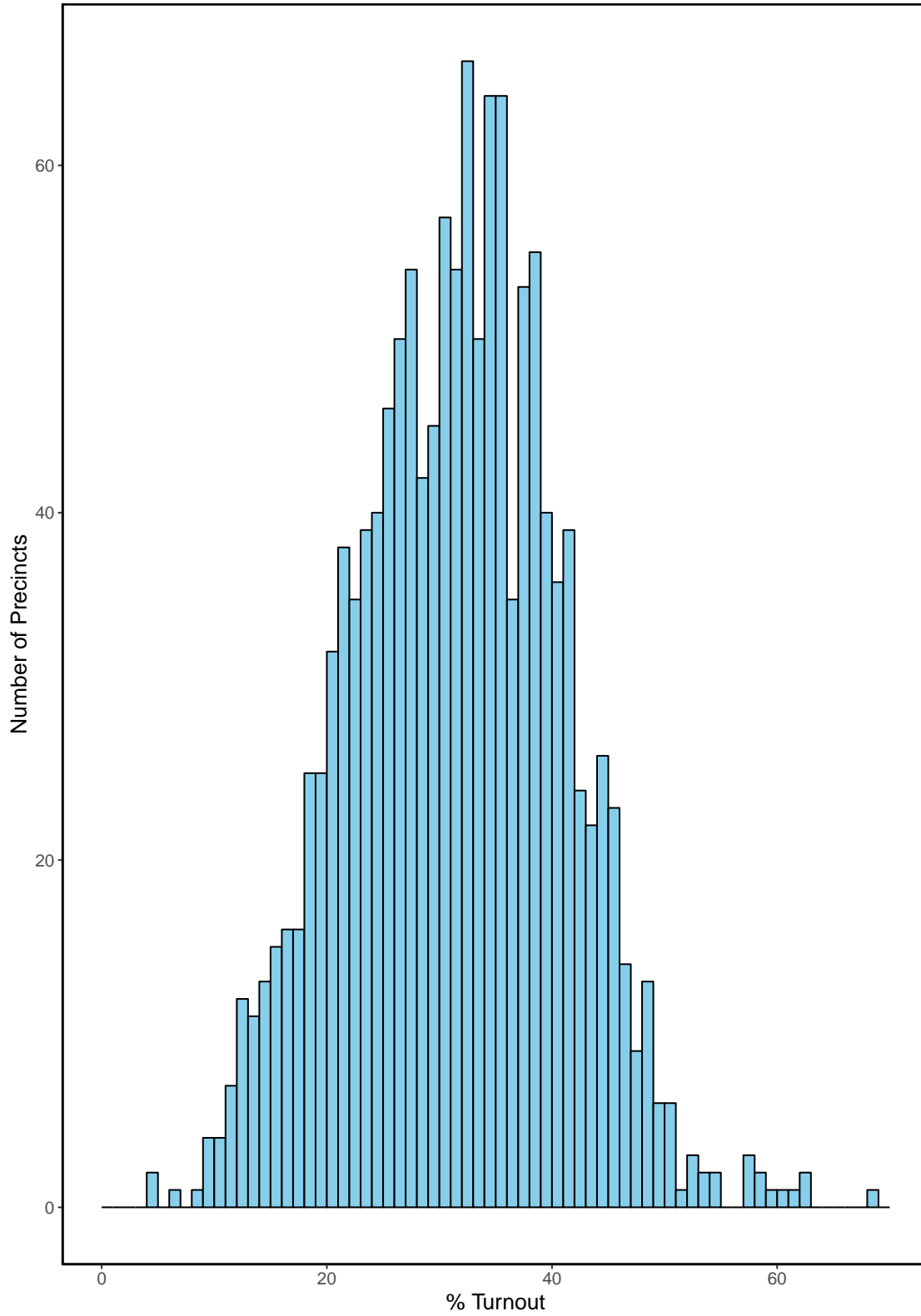
Updated Analysis of June 18, 2018 Turnout Data

We've updated the analysis with data from "Run 19" (June 15, 2018). We see again that the distribution of turnout across the precincts in this analysis continues to have a relatively smooth distribution. The distribution of turnout continues to move to the right, as additional ballots are being included in the tabulation. As of June 15, 2018, the OCRV is reporting 39.25% turnout in the primary election.



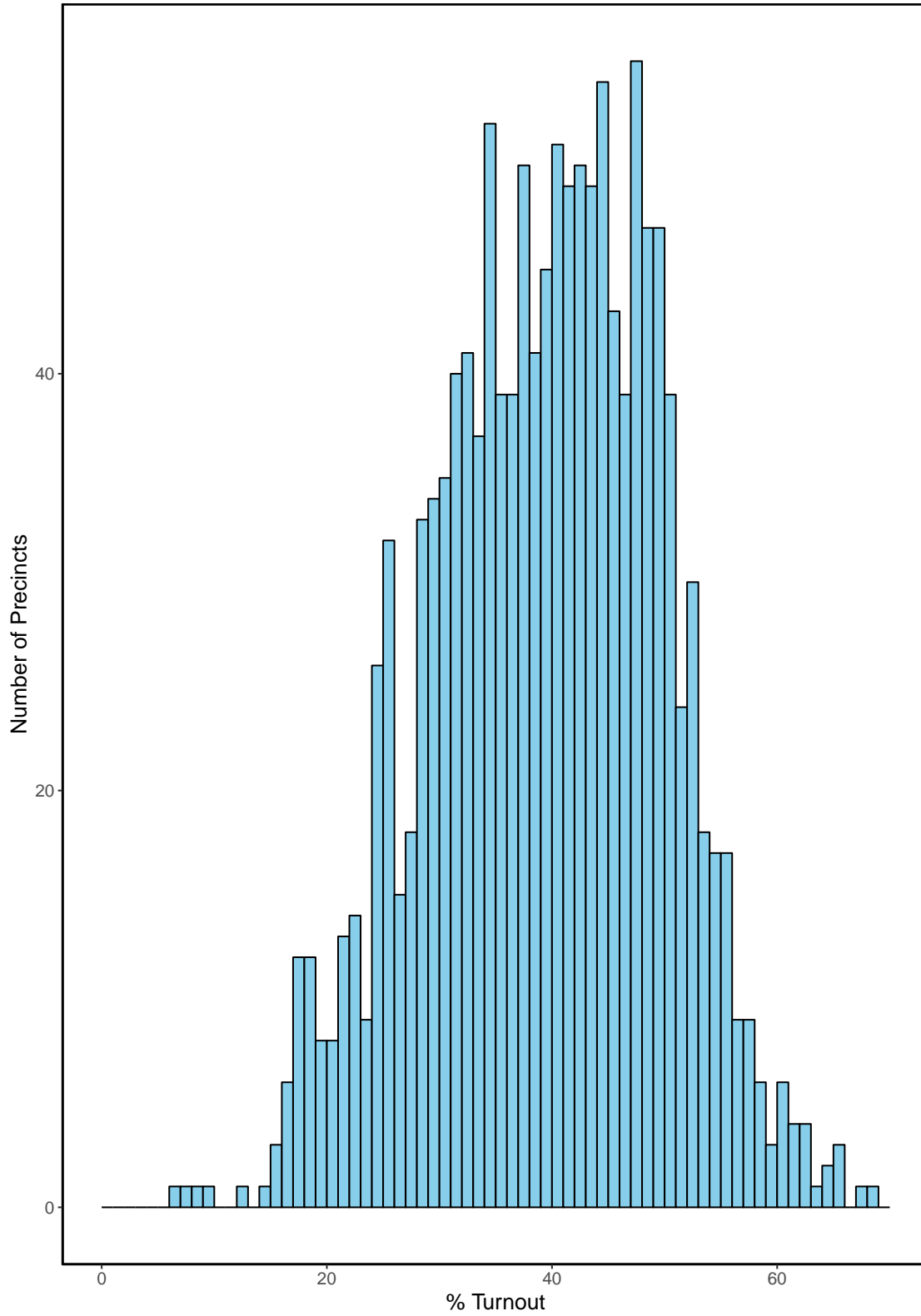
June 7, 2018 data.
Preliminary turnout data from the Orange County Registrar of Voters.
These figures are estimates, and may not reflect the final totals.

Figure 3: First Preliminary Analysis



June 11, 2018 data.
Preliminary turnout data from the Orange County Registrar of Voters.
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Figure 4: Second Preliminary Analysis



June 15, 2018 data.
Preliminary turnout data from the Orange County Registrar of Voters.
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Figure 5: Third Preliminary Analysis