

# Forecasting the 2024 US Presidential Election\*

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## 1 Introduction

*A paragraph for the broader context and motivation for the analysis + the gap that we want to address*

*A paragraph for that details what the analysis aims to do (i.e. its objective) + how*

*A paragraph for what was found and why findings are important (i.e. their implications)*

*A paragraph for setting up the rest of the paper*

## 2 Data

### 2.1 Presidential General Election Polls Data

*A detailed description of the poll data (e.g. what the data shows, its variables, the date in which the data was downloaded + tables/graphs showing what the data looks like)*

To simulate, test, download, and clean the Presidential General Election Polls data, the statistical programming language R was used (R Core Team 2023). Specific libraries that assisted the analysis include `tidyverse` (Wickham et al. 2019), `dplyr` (Wickham et al. 2023), `tinytex` (Xie 2019), `ggplot2` (Wickham 2016), and `knitr` (Xie 2015).

### 2.2 Analysis Data

*A detailed description of the clean poll data that was used within the analysis (e.g. what the data shows, why certain variables were chosen + tables/graphs showing what the data looks like)*

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\*Code and data are available at: [https://github.com/JuliaJLee/Forecasting\\_US\\_Election\\_2024.git](https://github.com/JuliaJLee/Forecasting_US_Election_2024.git)

## 2.3 An Account on Measurement

*A investigation into how voters' opinions or stances were translated into percentage of votes (i.e. a value) within the data*

## 3 Model Methodology

*A place to write the purpose of the model (what it is), what it does + how - also include any decisions made (e.g. focusing only on likely voters) and explain those decisions)*

*Within this analysis, a multiple linear regression model that looks to predict the percentage of votes for the Democratic Presidential candidate from high-quality pollsters, the date in which poll data was created, and state.*

## 4 Results

### 4.1 Change in Percentage of Votes over time across Pollsters

This initial analysis aims to see how the percentage of votes for the Democratic Presidential candidate, Harris, has changed over time for various high-quality pollsters. *(a better, more detailed description will be added)*

Figure 1 shows that the percentage of votes for Harris has been steady or has slightly increased over time across various pollsters. *(a better, more detailed description will be added)*

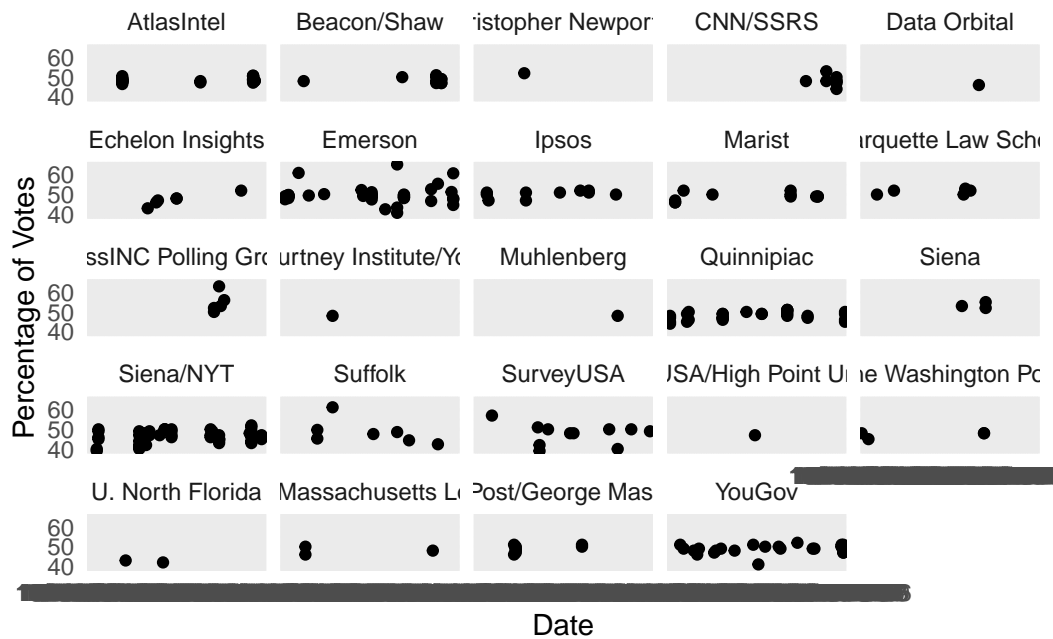


Figure 1: The Percentage of Votes For the Democratic Presidential Candidate Over Time Across Pollsters

#### 4.2 Change in Percentage of Votes over time across States

Figure 2 shows that support for Harris within each state remained fairly constant over time with minimal fluctuations. This also seems to be the case for the percentage of votes for Harris with the national polls. *(a better, more detailed description will be added)*

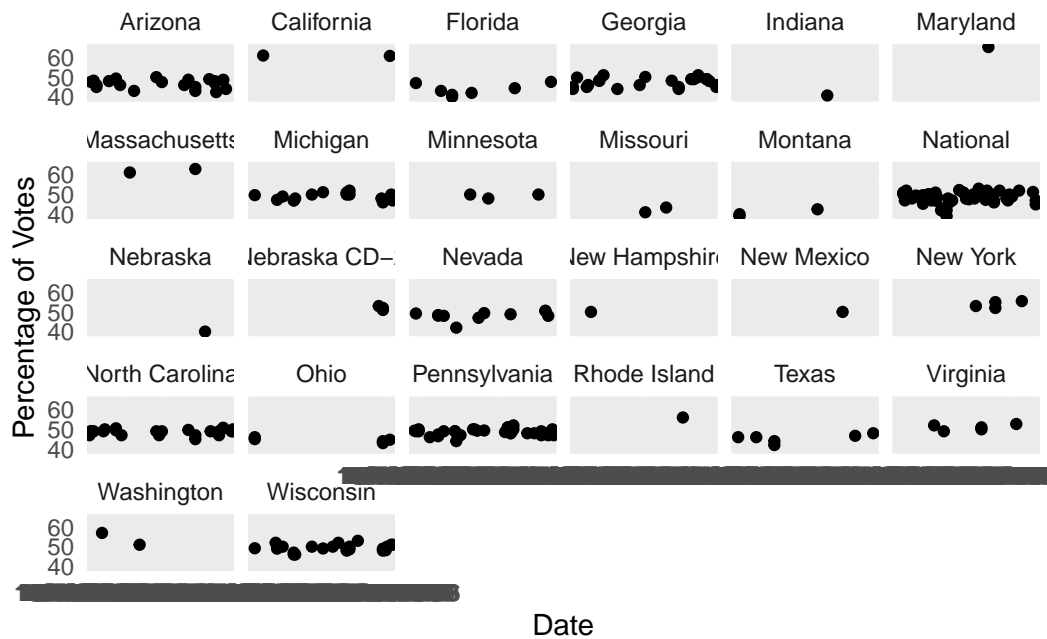


Figure 2: The Percentage of Votes For the Democratic Presidential Candidate Over Time Across States

### 4.3 Considering the Percentage of Votes with Time, Pollsters, and State

*A better, more complex model will be added*

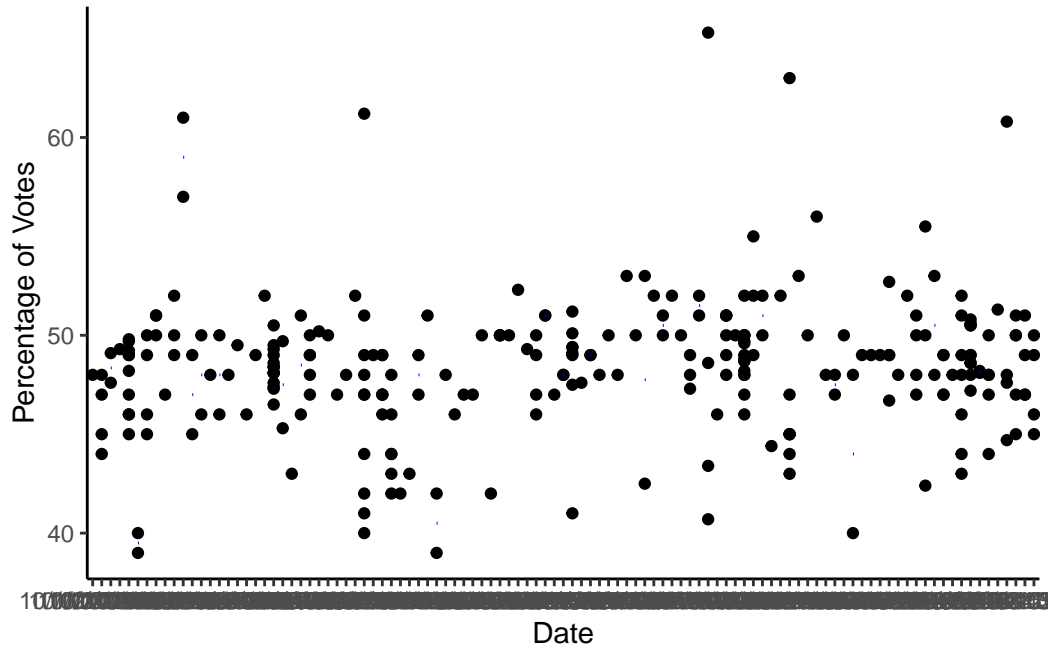


Figure 3: Model

## 5 Discussion

### 5.1 Summary

*A paragraph that summarizes what was done in the analysis and a brief overview of the main findings*

### 5.2 Implications

*A paragraph about what the main findings imply about the election - why they are relevant*

### 5.3 Limitations

*A paragraph about the limitations of the model - shortcomings due to the decisions that were made in the model*

### 5.4 Future Directions

*A paragraph about what can be done in the future*

## A Appendix

### A.1 Pollster Methodology

We selected YouGov, a polling organization, and discussed its survey methodology and its main features, strengths, and weaknesses. From the data obtained, the population of YouGov surveys is American voters, especially citizens who are eligible to vote. YouGov’s framework is usually participants who voluntarily register and participate in surveys regularly. These panel members express their opinions in the form of online questionnaires. The sample is a part of YouGov’s online panel. In the data, we see some specific stratification information, such as political parties (DEM, REP, etc.), which indicates that YouGov may use stratified sampling to ensure the diversity of the sample. YouGov’s sample is recruited through a voluntary online panel. Users can actively register to become panel members and accept survey invitations at any time. This recruitment method is non-random, but the cost is relatively low and the number of people is large.

YouGov uses stratified sampling, which stratifies respondents according to demographic variables, such as age, gender, political party, etc., to ensure that each subgroup in the sample is fully represented. Stratified sampling can ensure that different groups (such as party supporters, different age groups, etc.) are properly represented, avoid a single group dominating, improve estimation accuracy, and reduce sampling errors. However, if the stratification criteria are not properly chosen or there are large individual differences within the strata, stratified sampling may increase sampling errors. It may be more time-consuming to design and implement than simple random sampling, and more resources are required to determine the stratification and sampling scheme, especially when the population size is large.

YouGov uses weighting to adjust when dealing with non-response issues. When some people do not respond or the response rate of certain groups is low, YouGov will weight the responses of these groups according to demographic data to ensure that the final survey results can more accurately reflect the overall situation. This can help correct the bias caused by the low response rate of certain groups and make the results more representative. YouGov’s questionnaire is answered online, which can quickly obtain a large amount of data, and the population (people who answer the questionnaire) is distributed in various places, which improves flexibility and efficiency. The questionnaire also covers a variety of candidates and political parties, and distinguishes the support rates of different political parties. The content of the questionnaire can be changed according to different groups to ensure that the survey questions are relevant to the background of the respondents. At the same time, there are some potential problems with the questionnaire. First, since the questionnaire is answered online, some people may not answer the questionnaire seriously, which may affect the accuracy of the questionnaire. Secondly, since it is voluntary to participate in the questionnaire, some groups may be under-represented or over-represented, which will also lead to biased survey results.

## **A.2 Idealized Pollster Methodology**

Survey Form Link: <https://forms.gle/S4cyiZNej46zfxq29>

### **A.2.1 Introduction**

In this appendix, I present a detailed survey methodology designed to predict the outcome of the upcoming U.S. presidential election. The design leverages a \$100K budget and focuses on achieving a representative, accurate, and methodologically robust sample. The survey will use mixed-mode recruitment (in person, phone, online, and SMS), with a sample size of 3,000 respondents. Detailed weighting adjustments and validation strategies will ensure the integrity of the data, while aggregation with other polls will provide a more accurate forecast.

### **A.2.2 Sampling Approach**

#### **A.2.2.1 Target Population**

The survey targets the U.S. voting-age population, defined as U.S. citizens aged 18 and older. The target population includes both already voted voters and those who plan to vote.

#### **A.2.2.2 Sample Size and Confidence**

As for sample size, a total of 3,000 respondents will be surveyed. This provides a margin of error of  $\pm 2\%$  at a 95% confidence level, ensuring reliable predictions at the national level. As for the confidence, the larger the sample size, the smaller the margin of error. Given the \$100K budget, this is an optimal balance between cost and statistical reliability.

#### **A.2.2.3 Stratified Sampling Approach**

To ensure representativeness, the sample will be stratified across key demographic factors like their age group, gender, race, education level, job type, income level, house situation, political party, living state and so on. Specifically, for those Swing states (such as Nevada, Arizona, Wisconsin, Michigan, Pennsylvania, North Carolina, and Georgia) will be over-sampled to ensure an accurate prediction in these battleground regions, where small shifts in voter behavior can heavily influence the election outcome. For example, instead of targeting only 8% of the sample in swing states (proportional to the population), we might over-sample to 20%.

#### **A.2.2.4 Bias**

Firstly, relying too much on online survey may skew results towards who are younger and more internet-savvy respondents. To solve this, a portion of the budget will be dedicated to reaching older and rural voters via phone surveys and in person survey. Besides, We will solve non-response bias by offering incentives.

### **A.2.3 Recruitment Strategy**

#### **A.2.3.1 Mixed-Mode Recruitment**

The recruitment strategy uses a mix of recruitment channels to ensure diverse participation across demographic groups.

1. Phone Recruitment (Random Digit Dialing - RDD) or in person survey: Budget: \$30,000 Goal: Target older voters, particularly those 65+ and rural populations, who are less likely to respond to online surveys. Method: RDD will include both land-lines and mobile numbers to maximize reach, especially among older voters. Response Rate: Assuming a 10-15% response rate, we expect to recruit around 1,000 respondents via phone interviews.
2. Online Panel Recruitment: Budget: \$40,000 Goal: Capture younger, more tech-savvy respondents (ages 18-44) and urban populations who are more likely to participate in online surveys. Method: Use reputable online panels such as YouGov or Ipsos. These panels provide access to a large pool of respondents pre-screened for voter eligibility. Response Rate: With a budget of \$20,000, we expect to recruit about 1,500 respondents from these panels.
3. Text-to-Web Invitations (SMS Surveys): Budget: \$15,000 Goal: Reach respondents through mobile-friendly surveys, targeting younger voters (18-34) and those who prefer mobile interaction. Method: Send SMS invitations with a link to the online survey (via Google Forms), targeting respondents in both urban and rural areas. Response Rate: We expect to recruit 500 respondents via SMS links.

#### **A.2.3.2 Incentives for Participation**

To improve response rates, we will offer \$5 digital gift cards as an incentive to complete the survey. Budget: \$15,000 for approximately 3,000 respondents. This will particularly help increase participation among hard-to-reach groups, such as low-income individuals and rural populations.



## **A.2.4 Data Validation**

### **A.2.4.1 Weighting Adjustments**

Post-stratification weighting will be used to adjust the sample to reflect the actual U.S. voting population. This ensures that underrepresented groups (e.g., younger voters, minorities) are appropriately represented in the final analysis. Weights will be calculated based on age, race, gender, education, and some other factors by using Census data as a benchmark.

### **A.2.4.2 Screening Questions**

The survey will include key screening questions to ensure eligibility:

“Are you a U.S. citizen eligible to vote in the ongoing U.S. presidential election?” “Are you at least 18 years old, making you eligible to vote in the ongoing U.S. presidential election?” “Have you already voted in the 2024 U.S. presidential election?” Respondents who do not meet these criteria will be excluded from the analysis.

### **A.2.4.3 Fraud Detection**

To ensure high-quality responses:

1. Consistency Checks: Use validation questions to ensure the consistency of answers. For example, responses on party affiliation and voting intention will be cross-checked to identify inconsistencies.
2. Re-contacting: Randomly re-contact a subset of respondents to verify their initial responses.

## References

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