ELECTION 18

AP VOTECAST

Assessing AP VoteCast 2018

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AP VoteCast 2018 Executive Summary

AP VoteCast is a modern, innovative survey of the American electorate conducted in all 50 states that was designed to tell the story of the election. VoteCast debuted for the 2018 midterm elections after years of testing and development.

Since the 1960s, media organizations have used exit polls to tell the story of elections, to better understand which populations are voting for what types of candidates and policies, and to serve as a hub in our decentralized election system for synthesizing information and insights for the public. The original methodology for exit polls involved in-person interviews as voters leave the polling place. This method has remained fundamentally unchanged even as elections have seen significant changes in the way people vote. For example, in the 2016 Presidential election, over 40 percent of ballots were cast early, absentee, or by mail, and this figure is on the rise.

VoteCast was designed by NORC at the University of Chicago and The Associated Press to overcome these challenges and provide a new approach to understanding elections. Using a random, probability-based sample of registered voters to carefully calibrate a very large sample from opt-in, online panels, VoteCast delivers the best of both methods - the accuracy of probability-based surveys combined with the scale provided by an opt-in survey that interviews tens of thousands people quickly. Because VoteCast is not based on in-person interviews at the polling booth, it is able to capture the opinions of both people who vote and registered voters who decided not to cast a ballot. It also provides results in every state holding a statewide election, which means VoteCast delivers a broader portrait of the American electorate than any other election survey.

VoteCast was officially rolled out for the 2018 midterm election, and it was an impressive success. Not only did the survey complete a massive number of interviews in a short turnaround, its results were comprehensive and accurate when compared with key benchmarks. Specifically, VoteCast:

- Completed interviews with nearly 140,000 registered voters in just eight days leading up to the election and, for the first time, provided estimates of the electorate in all 47 states with statewide races in the midterm elections;
- Assessed multiple likely voter models in real time with the final model correctly classifying 91 percent of the probability-based sample respondents as voters or nonvoters, according to a voter validation study;
- Produced estimates of the composition of the national electorate within 1-2 percentage points of the 2018 Current Population Survey's Voting and Registration Supplement estimates for all age groups, gender, racial/ethnic groups, and education levels;
- Correctly projected the winner in 92 percent of Senate and governor elections at 5 p.m. on Election Day, which is the critical time for making editorial decisions, a better track record than exit polls in recent years;
- The estimate of the national House vote at 5 p.m. on Election Day had a 9.0 percentage point advantage for Democratic candidates over Republican candidates, and the final vote count had an 8.6 percentage point advantage for Democratic candidates.
- Had an average error of only 1.2 percentage points in favor of the Democratic candidate for Senate and governor races at 5 p.m. on Election Day.

Because of their confidence in the data, both The Associated Press and Fox News used the data to call race outcomes and to explain the mood of the electorate in their election-night coverage.

AP and NORC are committed to transparency of VoteCast's methods and results, as well as the continual improvement of the VoteCast methodology over time. This report provides the results of a thorough assessment of VoteCast's performance in the 2018 midterm elections.

Overview of approach

The VoteCast survey of 138,929 registered voters nationwide was conducted between Oct. 29 and Nov. 6, 2018, concluding as polls closed on Election Day. The survey provided estimates of 35 Senate elections, 36 gubernatorial elections, the national House vote, and the opinions of both voters and nonvoters nationwide. In addition to the AP and Fox News, other VoteCast customers, such as the Washington Post, the Wall Street Journal, and AP member news organizations across the country, used the results to inform their coverage of the election.

VoteCast features a large nationally-representative survey of voters and nonvoters that allows for in-depth analysis of state-level election attitudes and behaviors. The survey combines three different samples: probability-based state samples drawn from voter files, non-probability sample from online panels, and a probability-based sample from a nationally representative panel.

The survey delivered robust samples within each of the 50 states based on a combination of probability- and non-probability based samples. In 25 states with competitive, high-profile governor or Senate races, VoteCast combined interviews of registered voters randomly sampled from state voter files with interviews of self-reported registered voters from opt-in, online panels. Respondents sampled from the voter files were recruited to the survey via postcard and telephone. Respondents were given the option of completing the survey either online or by telephone. Each of these 25 states had about 1,000 probability interviews and between 2,000 and 3,000 non-probability interviews. In the other 25 states[1], VoteCast used opt-in, online panels to collect between 475 and 1,000 interviews of self-reported registered voters in each state. Across all 50 states, 40,153 interviews came from probability-based sampling of state voter files and 93,863 interviews came from non-probability-based, online panels.

In addition to the 50 state surveys, VoteCast used NORC's AmeriSpeak® panel, which is a mixed-mode panel recruited from a probability, address-based sample and designed to be representative of the U.S. population. The total number of interviews from AmeriSpeak was 4,913.

After combining the interviews from AmeriSpeak, the probability-based state samples, and the non-probability cases, the survey included interviews with 116,792 voters and 22,137 nonvoters, with between 475 and 4,000 interviews in each state[2].

For the state samples, VoteCast employed a four-step weighting approach to combine the probability sample with the non-probability sample within each state and to refine estimates at a sub-state level.

[1]In North Dakota, insufficient non-probability sample was available. VoteCast collected 539 interviews from the registered voter list using the same postcard and telephone approach as the registered voter probability sample. These cases were treated as non-probability cases in the weighting steps.

[2]The study interview was available in English or Spanish. Additionally, for all registered voter file cases flagged as likely Hispanic households, the postcards had both English and Spanish text introducing the survey and explaining how to complete it.

The approach features: 1) separate demographic adjustments for the probability and non-probability samples as well as non-response adjustments for the probability sample; 2) multi-level regression and post-stratification (MRP) modeling to calibrate the non-probability sample; 3) small domain modeling to improve estimates of the combined samples at sub-state geographies; and 4) weighting the survey results to the actual vote count at the sub-state level following the completion of the election. For the single, large national survey, the 50 state surveys and the AmeriSpeak survey were combined and weighted together.

Summary of results

After completing the VoteCast survey, we conducted a thorough assessment to evaluate the survey operations, sample performance, accuracy of the vote choice estimates, and composition of the electorate as a way to identify avenues for future methodological improvements.

Data collection for the state probability samples far exceeded the target in all states due to a strong response to the postcard invitations. About three-fourths of completes came from people logging into the website provided on the postcard. Response rates for the probability sample varied across states from 2.9 percent to 6.4 percent (AAPOR Response Rate 3).

Across all of the states with probability samples, strong partisans (both Democrats and Republicans) were more likely to respond to postcard invitations than those with weaker partisan affiliations. The probability sample did well in getting interviews with young adults, but there is a need to continue to explore ways to boost completes among racial/ethnic minorities and those with a high school education or less.

The estimates from the probability samples in the 25 states tended to overstate support for Democratic candidates. The analysis shows that without the additional telephone recruitment of the probability sample, the vote estimates would have been more strongly in favor of Democratic candidates in about half of the states that included probability samples.

The accuracy of the non-probability sample estimates after demographic weighting but before calibration using the MRP model varied considerably across states. The non-probability samples before calibration overestimated the Democratic vote share in about two-thirds of the states and underestimated the Democratic vote share in about one-third of the states.

The calibration of the non-probability sample using the MRP model estimates of partisanship tended to boost Republican vote share, which in most states significantly improved the overall estimates. While the MRP models improve accuracy overall, they do make estimates worse in some states. As a result, research will continue to focus on analyzing different models that allow for more state-level variation and seek a solution that improves estimates across all states.

The small domain modeling adjustments were effective in improving accuracy within states. On average, the small domain models reduced the average absolute error in regions within states by about 30 percent (average error fell from 7 percentage points to 5 percentage points).

The AmeriSpeak survey exceeded data collection targets and helped produce an accurate estimate of the national House vote. The goal was to get 3,000 AmeriSpeak interviews and the survey finished with more than 4,900 completed interviews. The estimate of the national House vote at 5 p.m. on Election

Day had a 9.0 percentage point advantage for Democratic candidates over Republican candidates, and the final vote count had an 8.6 percentage point advantage for Democratic candidates.

The VoteCast estimates of the composition of the electorate are consistent with an initial comparison to publicly available government records and data. During data collection, we monitored twelve likely voter models and found little difference in the vote choice estimates for the various models. The initial results of a voter validation study of 28,000 probability cases found that 91 percent of VoteCast respondents were correctly classified as voters or nonvoters. The VoteCast estimates for the electoral composition are also very similar to the Current Population Survey's Voting and Registration Supplement estimates for the age, race/ethnicity, gender, and education breakdown of voters in 2018.

Further research

Based on the results from the 2018 VoteCast experience, we plan to undertake the following additional research to improve the survey for the 2020 election cycle:

- Explore ways to increase the share of completes from probability sample respondents least likely to respond to the postcards such as racial/ethnic minorities, those with low education, and those voters with weaker partisan affiliations (i.e., swing voters).
- Analyze potential refinements to the MRP models that could help capture the variation across states.
- Examine adjustments to the small domain models that would improve estimates within states.

The remainder of the report discusses in greater detail the methodological approach and key findings from the comprehensive assessment of the 2018 VoteCast methodology. The results are organized as follows:

- State-level probability samples
- State-level non-probability samples
- Small domain model adjustments
- AmeriSpeak sample
- External validation of data

State-level Probability Samples

Methodological overview

In each of the 25 states in which VoteCast included a probability-based sample, NORC obtained a sample of registered voters from Catalist LLC's registered voter database. This database includes demographic information, as well as addresses and phone numbers for registered voters, allowing potential respondents to be contacted via mail and telephone. The sample was stratified by state, partisanship, age, and race. In addition, NORC attempted to match sampled records to a registered voter database maintained by L2, which provided additional phone numbers and demographic information. After the matching, NORC had at least one phone number available for 86 percent of sampled records, and among records with any phone number, a cell phone number was available for 60 percent.

Prior to dialing, all probability sample records were mailed a postcard inviting them to complete the survey either online using a unique PIN or via telephone by calling a toll-free number. The design of the postcards was based on the results of experiments conducted in June 2018 comparing eight different postcard and letter designs. A total of 1,018,386 postcards were mailed. Postcards were addressed by

name to the sampled registered voter if that individual was under age 35; postcards were addressed to "[State] Registered Voter" in all other cases. For all cases flagged as likely Hispanic households, the postcards had both English and Spanish text introducing the survey and explaining how to complete it. Respondents began receiving the postcards and completing the survey via the web on Oct. 29th and data collection finished in each state at the time of poll close on Election Day.

Before data collection, it was expected that about half of all cases would need to be dialed to reach the targeted number of completed interviews. However, higher than expected response to the postcards resulted in phone interviewers only attempting to call about 35 percent of cases.[3] Among cases with a phone number available, some had only landline numbers available, some had only cell-phone numbers available, and some had both a landline and a cell-phone number available. If both a landline and a cell-phone number were available, the cell number was called first. Telephone interviews were conducted with the adult that answered the phone following confirmation of registered voter status in the state. Interviewers began attempting to call respondents on October 31st, and a majority of the attempted calling took place on the last three days of the election. NORC placed 440,446 outbound dials between October 31st and local poll close on Election Day in each state, which is on average about 40 dials per hour of production.

The final sample included more than 1,000,000 cases from registered voter files across the 25 states, with the goal of about 1,000 completes per state. The number of cases in each state sample varied based on the expected response rate, ranging from 36,342 in New Hampshire to 45,248 in Texas. All respondents were offered an incentive to complete the survey.

The probability sample cases were weighted to reflect the initial probability of selection and to adjust for both differential non-response and demographic imbalances.

First, weights were created in each state to reflect initial probabilities of selection and adjust for differential nonresponse by partisanship category, age and race.

Next, the weights were adjusted to population totals to correct for demographic imbalances of the responding sample compared to the population of registered voters in each state. The population totals were derived from a combination of data from the U.S. Census Bureau's November 2016 Current Population Survey Voting and Registration Supplement, the sample file, and the Census Bureau's 2017 American Community Survey. If there were fewer than 25 survey completes statewide for any particular weighting group, that group was combined with the most appropriate comparable group. The variables used were:

- Sex (male, female)
- Age (18-34, 35-64, 65+)
- Race/ethnicity (Hispanic, NH-White, NH-Black, All Other)
- Education (less than high school/high school grad, some college, 4-year college grad, post-graduate)
- Age * race/ethnicity (18-34, 35-54, 55+ * NH-White, All Other)

[3] After the first few days of data collection, a model using variables from the voter list sample frame such as age, race, gender, education, and partisanship was fit and used to predict the propensity of cases to respond to the postcard. Cases with the highest response propensities were not dialed after that point because that group was completing online via the postcard at higher than anticipated rates.

- Education * race/ethnicity (less than HS/HS grad, some college, 4-year college grad+ * NH-White, All Other)
- Partisanship model score (strong Republican, lean Republican, lean Democrat, strong Democrat).

After adjusting the weights, the probability sample was then combined with the non-probability sample for small domain modeling.

Key results

Overall, the data collection effort for the probability-based, state samples was highly successful. There were 40,153 completes, exceeding the 1,000 per state target. The states with the most completes were Wisconsin (2,256), Minnesota (1,903), and Kansas (1,903). The states with the fewest completes were Nevada (1,138), West Virginia (1,273), and New Hampshire (1,343).

There were 29,761 completes via the web (74 percent of the total), 3,642 completes from respondents who called the toll-free number on the postcard (9 percent of the total), and 6,750 completes from NORC interviewers calling respondents (17 percent of the total).

The overall AAPOR Response Rate 3 for the probability sample was 4.2 percent, and it varied from a low of 2.9 percent in Nevada to a high of 6.6 percent in Wisconsin.

The web yield rate (web completed cases among those mailed the postcard) was 3.0 percent, and the rate ranged from 1.8 percent in Nevada to 4.9 percent in Wisconsin.

After accounting for only probabilities of selection, the probability-based sample was relatively representative with regard to age[4]. Across the 25 states, 27 percent of registered voters are less than 35 years old according to population control totals for registered voters derived from the sample files; among the probability sample in these states, 21 percent are less than 35 years old. These results highlight the effectiveness of the postcard approach with an online option. The probability sample was also relatively representative with regards to sex. Across the 25 states, 54 percent of registered voters are female; among the probability completes in these states, 49 percent are female.

The sample was less representative in regards to race/ethnicity and education before nonresponse and demographic weighting adjustments. Across the 25 states, 12 percent of registered voters are Hispanic and 13 percent are black; among the probability sample, only 8 percent are Hispanic and 7 percent are black. Furthermore, 24 percent of registered voters have a high school degree or less and 13.5 percent have post-graduate degrees; among the probability sample, only 11 percent had a high school or less education and 27 percent had post-graduate degrees.

The analysis shows that respondents identified as strong partisans by the partisanship score on the sample file (either Democrat or Republican) were significantly more likely than those identified as weaker partisans to complete the survey. Among strong partisans, partisanship and vote choice are very highly correlated while the correlation is lower among weaker partisans (i.e., “swing voters”). Improving

[4] The probabilities of selection correct only for the sample design aspects like oversampling young people and do not adjust for non-response or population control totals.

the completion rate among weaker partisans will be important for continuing to improve estimates in future waves of VoteCast.

Table 1. Completion rates by partisanship score on sampling frame

	Web completion rate (%)	Phone completion rate (%)
Strong Democrat	3.2	3.4
Weak Democrat	2.7	2.5
Strong Republican	3.1	3.2
Weak Republican	2.6	2.4

The probability sample estimates on their own tended to overestimate the vote for Democratic candidates and underestimate the vote for Republican candidates. On average, the probability sample overestimated Democratic vote share by about 4 percentage points and underestimated the Republican vote share by about 6 percentage points before the sample was combined with the non-probability sample and the estimates were refined with the small area modeling. As noted below in the discussion of the non-probability samples and small domain modeling steps, when the full VoteCast methodology is applied, the average error at poll close was only 1.3 percentage points in the direction of the Democratic candidates. The full set of poll close estimates is included in Appendix I.

The mixed-mode approach to the probability sample - complementing the postcard to web recruitment with outbound dialing - improved the accuracy of the vote choice estimates in a number of states. The analysis shows that removing outbound phone completes would have led to overestimating Democratic vote share by an additional 2 to 4 percentage points in races such as Florida Governor/Senate, Kansas Governor, Montana Senate, Ohio Governor/Senate, Wisconsin Senate/Governor, Tennessee Senate/Governor, and Texas Senate/Governor. However, not having outbound phone completes would have had little impact on estimates of other races such as Georgia Governor, Arizona Governor/Senate, Missouri Senate, Minnesota Senate/Governor, West Virginia Senate, and Indiana Senate. Overall, the outbound phone completes helped improve the accuracy of the probability sample vote choice estimates in many key states.

The analysis illustrates that requiring the respondent to have been the specific individual sampled from the registered voter file rather than just confirming the responding individual was a registered voter would not have significantly improved the vote choice estimates. VoteCast confirmed respondents were registered voters, but did not require probability-based respondents to be the specific individual from the voter sample (e.g., respondents could have been another household member who saw the postcard). Despite not requiring the respondent to be the sampled individual, the sample file provided valuable information about the types of respondents more or less likely to respond and it was used for nonresponse adjustments. In researching possible improvements to VoteCast, we wanted to see if requiring the specific individual on the sample frame to complete the survey would have improved the accuracy of the results by making the nonresponse adjustment more effective. However, the analysis shows such a change would not have increased the accuracy of the estimates.

A little more than 20,000 of the probability-based sample, or 51 percent, were cases in which the respondent was the specific sampled individual. For an additional 11,119 cases, or 28 percent of the total, the respondent lived at the same address as the sampled individual. Even when using only those

respondents who were the sampled individual and adjusting response rates to the sample frame partisan score and demographic variables, the probability sample tends to underestimate the vote share for Republican candidates. In fewer than half the races, requiring the sampled individual to complete the survey would have modestly improved estimates, including the following races: West Virginia Senate (4 percentage points), Michigan Senate (3 percentage points), Michigan Governor (3 percentage points), New Jersey Senate (2 percentage points), and Arizona Governor (2 percentage points). However, requiring the sampled individual to complete the survey would have led to less accurate estimates for Democratic and Republican candidates in races such as the following: Kansas Governor (3 percentage points), Texas Senate (3 percentage points), Virginia Senate (3 percentage points), New Hampshire Governor (3 percentage points), Georgia Governor (2 percentage points), Montana Senate (3 percentage points), and Ohio Senate (3 percentage points). Overall, requiring the sampled individual to complete the survey would not have improved the estimates for the probability sample.

State-level Non-Probability Samples

Methodological overview

Non-probability participants were provided via Nielsen's Harris Panel, including members of its third-party panels. Digital fingerprint software and panel-level ID validation were used to prevent respondents from completing the VoteCast survey multiple times.

The non-probability sample was weighted to adjust to population totals to correct for demographic imbalances of the responding sample compared to the population of registered voters in each state. The adjustment targets were derived from a combination of data from the U.S. Census Bureau's November 2016 Current Population Survey Voting and Registration Supplement, the registered voter sample file, and the Census Bureau's 2017 American Community Survey. If there were fewer than 25 survey completes statewide for any particular weighting group that group was combined with the most appropriate comparable group. The variables included the following:

- Sex (male, female)
- Age (18-24, 25-34, 35-44, 45-54, 55-64, 65+)
- Race/ethnicity (Hispanic, NH-White, NH-Black, NH-All Other)
- Education (less than HS, HS grad, some college, 4-year college grad, post-graduate)
- Income (<= 25K, 25-50K, 50-75K, 75-100K, 100+K)
- Age * race/ethnicity (18-34, 35-54, 55+ * NH-White, All Other)
- Education * race/ethnicity (NH-White, All Other * less than HS/HS grad, some college, 4-year college grad+)
- County grouping using AP's party grouping (generally ranging from high Democrat to high Republican)

All non-probability sample respondents then received a calibration weight. The calibration weight is designed to ensure the non-probability sample is similar to the probability sample in regard to variables that are predictive of vote choice, such as partisanship, that cannot be fully captured through the demographic adjustments. The calibration benchmarks are based on county level estimates from MRP models that incorporate all probability and non-probability cases nationwide.

For the MRP models, national level logistic regression models were fitted using data from all states (both probability and non-probability samples) and the AmeriSpeak survey to make predictions for registered voters at the state-level for partisan distribution (Democrat, independent, Republican) and for attitudes

about whether the country is on the right or wrong track. These state-level predicted estimates are used as calibration benchmarks for the non-probability sample for all states[5]. For predicting state level partisan distribution, separate models were fitted for predicting the proportion of Democrats and proportion of Republicans. In addition, five separate models were fitted based on how the county voted in the 2016 Presidential election (i.e., counties/towns were grouped based on % Trump vote and counties/towns with similar % Trump vote were run together in a model). Models included the following individual level variables and county/town level variables:

- Flag for 18-34 year old registered voter
- Flag for 65+ year old registered voter
- Flag for female registered voter
- Flag for voting for Trump in 2016 Presidential election[1]
- Proportion of non-Hispanic non-White in county/town
- Proportion 25+ years who are college educated in county/town
- Population density in county/town
- Median household income in county/town

After completing the calibration, vote choice estimates for the non-probability sample were calculated. The non-probability sample was then combined with the probability sample for small domain modeling.

Key results

Across the 50 state surveys, there were 93,863 non-probability interviews completed online with self-identified registered voters from opt-in panels, but the availability of non-probability interviews was limited in certain states. The total number of non-probability completes was 97 percent of the nationwide goal of 97,125. However, non-probability completes fell well short of targets in a number of states with small populations: Alaska (477 completes with target of 500), Wyoming (532 out of 750), Vermont (712 out of 1,000), South Dakota (808 out of 825), Montana (1,024 out of 2,000), New Hampshire (1,935 out of 3,000), and West Virginia (2,184 out of 3,000). The shortage of completes in these less populous states highlights the limited number of available opt-in completes with registered voters in such states during a seven-day field period.

The error associated with the non-probability sample after demographic adjustments but before calibration had more variation across states than the probability sample. The non-probability sample more often underestimated the Republican vote share, but did overestimate Republican vote share in other states. The calibration of the non-probability sample using the MRP model estimates of partisanship tended to boost Republican vote share, which in most states significantly improved the overall estimates.

[5] We did not use partisan identification to calibrate Utah. The MRP models predicting partisanship included 2016 presidential vote, and the large share of third-party vote in Utah in the 2016 election (28 percent) led the models to underestimate the share of Republicans and overestimate the share of independents for 2018.

[1] If respondent indicated not voting, we imputed this variable based on response to Trump favorability and other demographic variables. Only 25% of VoteCast respondents were asked who they voted for if they indicated voting in 2016. For respondents who indicated voting in 2016 but were not asked who they voted for, we imputed this variable using the same methodology.

The non-probability sample prior to calibration underestimated the Republican vote share by about 2.5 percentage points on average, and underestimated Republican vote share in about 60 of 71 races. The non-probability sample underestimated the Republican vote share by 5 percentage points or more in 15 races, and the largest underestimates were for the following races: North Dakota Senate (9 percentage points), South Carolina Governor (7 percentage points), and Indiana Senate (6 percentage points).

At the same time, the non-probability sample prior to calibration underestimated Democratic vote share and overestimated Republican vote share in about 10 races. The Democratic underestimation was largest in the following races: Maryland Governor (7 percentage points), Massachusetts Governor (7 percentage points), and New Jersey Senate (7 percentage points).

The calibration of the non-probability samples based on the MRP model estimates of partisanship tended to boost Republican vote share and decrease Democratic vote share, which in most states significantly improved the overall estimates.

The calibration adjustments were especially effective in improving accuracy in Florida, Georgia, Indiana, South Carolina, North Dakota, South Dakota, Ohio, Texas, and Iowa. In all nine states, the non-calibrated estimate erroneously showed the Democratic candidate winning while the calibrated estimate provided a more accurate estimate with the Republican candidate winning. For example, the non-probability sample estimate in Iowa prior to calibration had the Democratic candidate winning by 3 percentage points while the calibrated estimate had the Republican winning by 6 percentage points (the Republican won by 3 percentage points). The calibration also improved estimates in closely contested races in Arizona, Missouri, and Montana. However, calibration adjustment did reduce accuracy by underestimating Democratic vote share for the non-probability sample in Kansas, Oregon, Wisconsin, and West Virginia.

Overall, the calibration helped mitigate the overestimation of Democratic vote share in the non-probability sample and improved estimates. Future research will continue to focus on analyzing different models that allow for more state-level variation and seek a solution that improves estimates across all states.

Small Domain Model Adjustments

Methodological overview

Most election polls have samples that are designed and weighted using a small number of very large geographic regions. One of the explanations that has been offered for recent errors in state polls has been that samples are not well designed to represent the diverse pockets of voters that may exist in suburban and rural areas. Given this concern and because of AP's interest in understanding vote choice at the sub-state level to inform its election night operations, VoteCast employed the use of small domain modeling to improve accuracy across sub-state regions.

All cases from the state surveys received a final weight to improve estimates for sub-state geographic regions. This weight combined the weighted probability sample (if available) and the calibrated non-probability sample, and used a small domain model to improve the estimate within sub-regions of a state.

We created between 8 and 30 regions (county groupings[6]) for each state based on AP's political and geographic strata, vote choice in previous elections, demographics, and the number of expected survey completes in each county. We then used these groupings to generate model-based estimates of vote choice among likely voters. For states with two or more statewide races, the small domain model was usually applied to the Senate race.

For each state, there were two models: 1) predicting percent of vote share that goes for either of the two major party candidates for the combined sample estimate, 2) predicting percent of major party vote share that goes for the Democratic/Republican candidate for the combined sample. For each state, we included in the models: 1) the 2016 presidential vote choice, and based on what variables were predictive in the model, 2) a measure of socioeconomic status, 3) at least one demographic or geographic measure. The following variables were used as potential covariates in the model: 2016 Presidential election results, population density, median income, percent below poverty line, percent unemployed, percent college degree, portion on public assistance, percent insurance coverage, percent nonwhite, percent citizen, percent 18-34 years old, percent 65 and older, and percent who have not moved in last year.

These model-based estimates of vote choice by region (within each state) are used to ratio adjust the weights and produce the combined probability/non-probability estimate for states where both sample frames were used.

Key results

The small domain models were effective in improving accuracy within states. On average, the small domain models reduced the average absolute error in regions within states by about 30 percent as the average absolute error dropped from 7 percentage points to 5 percentage points. The effectiveness of the small domain models in reducing error varied across states and did well in states such as Missouri and New Hampshire and did less well in states such as New York and South Carolina. There was no clear pattern in terms of the effectiveness of the models in certain sates versus others states. However, the estimates at the regional level across all states tended to overestimate Democratic vote in areas with high Republican vote and slightly underestimate Democratic vote in areas with high Democratic vote, likely due to the small interview sample sizes in these regions.

AmeriSpeak Sample

Methodological overview

A national survey of registered voters was conducted using the AmeriSpeak® Panel, NORC's probability-based panel designed to be representative of U.S. households. Interviews were conducted in English or Spanish and completed either online or by phone (landline and cell).

During the initial recruitment phase of the AmeriSpeak panel, randomly selected U.S. households were sampled with a known, non-zero probability of selection from the NORC National Sample Frame and then contacted by U.S. mail, email, telephone, and field interviewers (face-to-face). The panel provides sample coverage of approximately 97 percent of the U.S. household population. Those excluded from

[6] We used counties for all states except 6 Northeastern states in which elections are administered by town governments – Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island, and Vermont.

the sample include people with P.O. Box-only addresses, some addresses not listed in the USPS Delivery Sequence File and some newly constructed dwellings.

The AmeriSpeak survey receives a nonresponse-adjusted weight that is then adjusted to national totals for registered voters derived from the U.S. Census Bureau's November 2016 Current Population Survey Voting and Registration Supplement, the registered voter sample file, and the Census Bureau's 2017 American Community Survey. The AmeriSpeak survey was then combined with the 50 state surveys into a national survey.

Key results

The AmeriSpeak survey exceeded data collection targets and helped produce an accurate estimate of the national House vote. The goal was to get 3,000 AmeriSpeak interviews and the survey finished with more than 4,900 completed interviews. The AmeriSpeak sample helped boost the sample sizes for a number of the key policy and issue based questions that were not asked of all respondents on the state surveys.

The combination of the AmeriSpeak survey and the 50 state surveys produced an accurate estimate of the national House vote. The estimate of the national House vote at 5 p.m. on Election Day, which is the critical time for making editorial decisions, was 52 percent for Democratic candidates and 43 percent for the Republican candidate. The final vote count was 53.2 percent for Democratic candidates and 44.6 percent for Republican candidates.

External Validation of Data

Likely voter models

There was little difference in the vote choice estimates of twelve different likely voter models analyzed during data collection, and a voter validation study shows the likely voter model used for the survey correctly classified more than 9 in 10 respondents.

During data collection, we monitored twelve likely voter models and found little difference in the vote choice estimates for the various models across states. For example, the difference in the estimates for the Republican candidate vote share between all twelve models was less than four percentage points in 70 of 72 races. See Appendix II for detailed specifications for all twelve models and a summary of the results.

Ten of the models featured various combinations of two self-reported intent to vote questions, two past vote questions, and a question about interest in the election. Two other models were probabilistic models based on previous vote and intent to vote. The model used for the final estimates classified a respondent as a likely voter if they said they were definitely going to vote or if they said they would probably vote and had voted in either the 2016 or 2014 election. Overall, 84 percent of respondents were classified as likely voters, including 93 percent of probability cases from the voter file and 80 percent of non-probability cases.

The initial results of a voter validation study of the probability-based interviews[7] shows that 91 percent of respondents were correctly classified as voters or nonvoters in the study. Moreover, 94 percent of

[7] Due to privacy concerns, VoteCast was unable to ask non-probability completes from the opt-in panel for the personally identifiable information needed to validate their voter status.

those classified as voters did vote according to state voter files. There was no significant difference in the national House vote estimates of likely voters who actually voted and those who did not vote (59 percent Democrat/39 percent Republican vs. 59 percent Democrat/40 percent Republican).

For the validation study, L2 matched the names and addresses of more than 29,000 respondents to state voter files in 23 states. The study shows that the likely voter model used in the study had the highest percent of cases correctly classified out of the 10 models that classified each individual as a likely or unlikely voter. Seven of the ten models correctly classified at least 89 percent of respondents and all of the models classified at least 83 percent of respondents correctly.

The likely voter model used in the study did well identifying voters across partisanship, gender, race/ethnicity, education, and income groups. The model correctly classified at least 93 percent of voters from each of the three partisan groups (i.e. Democrats, Republicans, and independents). The model worked best in correctly classifying voters age 65 and older (96 percent), those with college degrees (96 percent), and those with annual income of more than $100,000 (96 percent). The model did least well in correctly classifying voters age 18-29 (88 percent), African Americans (89 percent), and those with a high school education (87 percent).

Comparison of VoteCast electorate to CPS estimates

The VoteCast estimates for the composition of the 2018 electorate are very similar to estimates from the 2018 Current Population Survey's Voting and Registration Supplement for age, race/ethnicity, gender, and educational groups.

Table 2 below highlights the comparisons between the CPS estimates for voters nationwide and the VoteCast estimates both at poll close and after weighting the results to the final vote count. Both VoteCast estimates are within 1-2 percentage points of the CPS estimates for all age groups, gender, racial/ethnic groups, and education levels.

Table 2. Comparison of CPS and VoteCast estimates for composition of 2018 electorate nationwide

	CPS estimate for percent of electorate	VoteCast estimate at poll close	VoteCast estimate after final vote count
Age			
18 to 24	7	6	6
25 to 34	14	15	14
35 to 44	15	15	14
45 to 64	37	38	38
65+	27	26	27
Gender			
Male	47	48	48
Female	53	52	52
Race/ethnicity			
White	73	72	73
Black	12	13	12
Hispanic	10	9	9
Other	5	6	6
Education			
Less than HS diploma	4	3	3
High school graduate	23	24	23
Some college or associate's degree	30	32	32
Bachelor's degree	27	26	26
Advanced degree	17	15	16

The VoteCast estimates are also similar to CPS estimates for age, gender, and race/ethnicity at the state level. The tables below show the high degree of similarities between CPS and VoteCast estimates for the four largest and most diverse states: California, New York, Texas, and Florida.

Texas	CPS estimate for percent of electorate	VoteCast estimate at poll close	VoteCast estimate after final vote count
Age			
18 to 24	8	8	7
25 to 34	15	15	16
35 to 44	16	16	16
45 to 64	36	37	37
65+	25	23	23
Gender			
Male	46	49	47
Female	54	52	53
Race/ethnicity			
White	61	58	58
Black	14	13	13
Other	4	6	6
Hispanic	22	23	23

New York	CPS estimate for percent of electorate	VoteCast estimate at poll close	VoteCast estimate after final vote count
Age			
18 to 24	7	6	7
25 to 34	14	14	14
35 to 44	15	14	13
45 to 64	35	38	39
65+	29	27	27
Gender			
Male	45	46	48
Female	55	54	52
Race/ethnicity			
White	68	65	68
Black	17	16	15
Other	5	6	5
Hispanic	11	12	11

Florida	CPS estimate for percent of electorate	VoteCast estimate at poll close	VoteCast estimate after final vote count
Age			
18 to 24	6	6	5
25 to 34	11	15	13
35 to 44	12	14	14
45 to 64	38	35	35
65+	33	30	31
Gender			
Male	46	48	49
Female	54	52	51
Race/ethnicity			
White	67	66	67
Black	14	14	14
Other	2	4	4
Hispanic	18	16	15

California	CPS estimate for percent of electorate	VoteCast estimate at poll close	VoteCast estimate after final vote count
Age			
18 to 24	6	6	5
25 to 34	11	15	13
35 to 44	12	14	14
45 to 64	38	35	35
65+	33	30	31
Gender			
Male	47	48	49
Female	53	52	51
Race/ethnicity			
White	54	53	55
Black	7	9	8
Other	14	15	14
Hispanic	25	23	23

Appendix I: Vote Choice Estimates for Each State with a 2018 Statewide Election

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
AK	gov	democrat	42.4	44.5	44.5
AK	gov	republican	49.7	51.6	51.5
AK	gov	independent		2	2
AK	gov	other	7.9	1.9	1.9
AL	gov	democrat	35.0	40.5	40.2
AL	gov	republican	61.4	59.6	59.3
AL	gov	other	3.6		0.5
AR	gov	democrat	28.4	31.8	31.6
AR	gov	republican	66.9	65.3	65
AR	gov	independent		2.9	2.9
AR	gov	other	4.7		0.5
AZ	gov	democrat	41.1	41.9	41.8
AZ	gov	republican	55.2	56	56.4
AZ	gov	other	3.6	2.1	1.8
AZ	sen	democrat	50.4	50	50
AZ	sen	republican	45.0	47.6	47.6
AZ	sen	other	4.6	2.4	2.4
CA	sen	democrat	55.2	54.2	54.3
CA	sen	republican	32.4	45.8	45.3
CA	sen	other	12.4		0.4
CA	gov	democrat	62.2	62	61.6
CA	gov	republican	33.2	38.1	37.9
CA	gov	other	4.6		0.5
CO	gov	democrat	48.8	53.4	53.4
CO	gov	republican	43.5	42.8	42.8
CO	gov	other	7.6	3.8	3.8
CT	sen	democrat	59.3	56.8	59.8
CT	sen	republican	35.3	39.4	39.2
CT	sen	other	5.3	3.8	1
CT	gov	democrat	46.7	48.1	49.4
CT	gov	republican	43.2	44.4	46.2
CT	gov	other	10.0	7.5	4.4

[8] All of the survey estimates were adjusted to match vote count data as of January 24, 2019. Some states such as Connecticut and Oklahoma made small adjustments to the final vote estimates after that date, which explains why some of the final survey estimates don't exactly match the final vote numbers shown in the table.

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
DE	sen	democrat	60.3	60	60
DE	sen	republican	33.4	37.8	37.8
DE	sen	other	6.3	2.2	2.2
FL	gov	democrat	51.7	49.2	49.3
FL	gov	republican	44.6	49.6	49.4
FL	gov	other	3.7	1.2	1.3
FL	sen	democrat	50.1	49.9	49.7
FL	sen	republican	46.0	50.1	49.8
FL	sen	other	3.9		0.5
GA	gov	democrat	50.2	48.8	48.6
GA	gov	republican	46.7	50.2	50
GA	gov	independent		0.9	0.9
GA	gov	other	3.1		0.5
HI	sen	democrat	74.7	71.2	71.2
HI	sen	republican	25.3	28.9	28.8
HI	gov	democrat	64.6	62.7	62.7
HI	gov	republican	30.1	33.7	33.7
HI	gov	other	5.3	3.6	3.6
IA	gov	democrat	44.1	47.5	47.5
IA	gov	republican	49.6	50.3	50.3
IA	gov	independent		1.6	1.6
IA	gov	other	6.3	0.6	0.6
ID	gov	democrat	37.9	38.2	38.2
ID	gov	republican	56.7	59.8	59.8
ID	gov	independent		1.1	1.1
ID	gov	other	5.5	1	1
IL	gov	democrat	51.6	54.5	54.3
IL	gov	republican	35.3	38.8	38.6
IL	gov	independent		4.2	4.2
IL	gov	Independent		2.4	2.4
IL	gov	other	8.7		0.5
IN	sen	democrat	46.3	45.1	44.9
IN	sen	republican	45.8	51	50.8
IN	sen	independent		3.9	3.9
IN	sen	other	7.9		0.5
KS	gov	democrat	47.1	48	48

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
KS	gov	republican	41.4	43	43
KS	gov	independent		6.5	6.5
KS	gov	other	11.6	2.5	2.5
MA	gov	democrat	29.0	33.2	32.8
MA	gov	republican	68.2	66.8	67
MA	gov	other	2.8		0.2
MA	sen	democrat	61.7	60.4	60.1
MA	sen	republican	32.2	36.2	36
MA	sen	independent		3.4	3.4
MA	sen	other	6.1		0.5
MD	sen	democrat	62.0	64.9	64.8
MD	sen	republican	27.4	30.3	30.2
MD	sen	independent		3.7	3.9
MD	sen	other	10.6	1	1.1
MD	gov	democrat	37.9	43.5	43.5
MD	gov	republican	58.9	55.4	55.4
MD	gov	other	3.3	1.1	1.1
ME	sen	democrat	59.2	54.3	54.1
ME	sen	republican	29.4	35.2	35.1
ME	sen	independent		10.4	10.4
ME	sen	other	11.4		0.4
ME	gov	democrat	50.1	50.9	50.9
ME	gov	republican	37.4	43.2	43.2
ME	gov	other	12.4	5.9	5.9
MI	gov	democrat	55.1	53.3	52.7
MI	gov	republican	39.2	43.8	43.8
MI	gov	other	5.8	2.9	3.5
MI	sen	democrat	53.8	52.3	52.3
MI	sen	republican	41.3	45.8	45.8
MI	sen	other	4.9	2	2
MN	gov	democrat	56.5	53.9	53.8
MN	gov	republican	38.9	42.4	42.5
MN	gov	other	4.6	3.7	3.7
MN	sen	democrat	61.9	60.3	62
MN	sen	republican	33.7	36.2	34
MN	sen	other	4.3	3.5	4

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
MN	sen_special	democrat	54.6	53	53
MN	sen_special	republican	40.1	42.4	42.4
MN	sen_special	other	5.3	4.6	4.6
MO	sen	democrat	45.9	45.6	45.6
MO	sen	republican	48.6	51.4	51.4
MO	sen	independent		1.1	1.1
MO	sen	other	5.5	1.9	1.9
MS	sen_special	democrat	38.9	39.1	40.9
MS	sen_special	republican	36.5	41.2	40.7
MS	sen_special	republican_2	16.8	16.4	16.7
MS	sen_special	independent		1.5	1.4
MS	sen_special	other	7.8		0.3
MS	sen	democrat	36.2	39.5	39.5
MS	sen	republican	54.0	58.5	58.5
MS	sen	other	9.7	2	2
MT	sen	democrat	54.5	50.3	50.3
MT	sen	republican	42.9	46.8	46.8
MT	sen	other	2.6	2.9	2.9
ND	sen	democrat	38.5	44.5	44.3
ND	sen	republican	58.4	55.5	55.2
ND	sen	other	3.1		0.5
NE	gov	democrat	35.4	41	40.6
NE	gov	republican	61.3	59	58.9
NE	gov	other	3.3		0.5
NE	sen	democrat	37.0	38.7	38.6
NE	sen	republican	58.9	57.7	57.7
NE	sen	other	4.1	3.6	3.6
NH	gov	democrat	45.4	45.8	45.8
NH	gov	republican	51.7	52.8	52.8
NH	gov	other	2.9	1.4	1.4
NJ	sen	democrat	49.9	54	54
NJ	sen	republican	41.7	42.8	42.8
NJ	sen	other	8.5	3.2	3.2
NM	gov	democrat	57.2	57.2	57
NM	gov	republican	38.5	42.8	42.5
NM	gov	other	4.3		0.5

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
NM	sen	democrat	50.1	54.1	53.8
NM	sen	republican	28.3	30.5	30.4
NM	sen	independent		15.4	15.3
NM	sen	other	21.6		0.5
NV	gov	democrat	46.7	49.4	49.3
NV	gov	republican	42.1	45.3	45.4
NV	gov	independent		0.9	0.9
NV	gov	independent		1.4	1.4
NV	gov	none of these		1.9	2.2
NV	gov	other	7.4	1	0.8
NV	sen	democrat	48.6	50.4	50.4
NV	sen	republican	42.8	45.4	45.4
NV	sen	none of these		1.6	1.6
NV	sen	other	4.1	2.6	2.6
NY	sen	democrat	68.1	67	66.9
NY	sen	republican	25.8	33	32.4
NY	sen	other	6.1		0.7
NY	gov	democrat	63.1	59.6	59.6
NY	gov	republican	29.5	36.2	36.2
NY	gov	other	7.4	4.2	4.2
OH	gov	democrat	46.3	46.7	46.5
OH	gov	republican	47.4	50.4	50.5
OH	gov	independent		1.8	2
OH	gov	other	6.3	1.1	1
OH	sen	democrat	52.5	53.4	53.1
OH	sen	republican	42.6	46.6	46.4
OH	sen	other	5.0		0.5
OK	gov	democrat	34.9	42.2	43.7
OK	gov	republican	65.1	54.3	56.3
OR	gov	democrat	45.1	50.1	50.1
OR	gov	republican	45.3	43.7	43.7
OR	gov	other	9.5	6.1	6.1
PA	sen	democrat	56.6	55.7	55.7
PA	sen	republican	39.1	42.6	42.8
PA	sen	other	4.3	1.6	1.5
PA	gov	democrat	58.6	57.8	57.8

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
PA	gov	republican	37.5	40.7	40.7
PA	gov	other	3.9	1.5	1.5
RI	sen	democrat	58.8	61.6	63.5
RI	sen	republican	35.1	38.4	36.1
RI	sen	other	6.1		0.5
RI	gov	democrat	46.6	52.8	52.8
RI	gov	republican	37.7	37.3	37.3
RI	gov	independent		4.4	4.4
RI	gov	other	15.6	5.5	5.5
SC	gov	democrat	41.2	46	45.8
SC	gov	republican	53.0	54	53.8
SC	gov	other	5.8		0.5
SD	gov	democrat	47.5	47.6	47.6
SD	gov	republican	50.9	51	51
SD	gov	other	1.6	1.4	1.4
TN	gov	democrat	38.7	38.6	38.6
TN	gov	republican	58.8	59.6	59.9
TN	gov	other	2.5	1.9	1.5
TN	sen	democrat	43.3	43.9	43.9
TN	sen	republican	54.5	54.7	54.7
TN	sen	other	2.1	1.4	1.4
TX	gov	democrat	38.2	42.5	42.3
TX	gov	republican	58.2	55.8	55.8
TX	gov	other	3.6	1.7	1.9
TX	sen	democrat	47.3	48.3	48.3
TX	sen	republican	50.3	50.9	50.9
TX	sen	other	2.4	0.8	0.8
UT	sen	democrat	33.1	30.9	30.9
UT	sen	republican	59.7	62.6	62.6
UT	sen	other	7.3	6.5	6.5
VA	sen	democrat	58.5	57.1	56.8
VA	sen	republican	37.0	41.1	40.9
VA	sen	independent		1.8	1.8
VA	sen	other	4.5		0.5
VT	sen	democrat	72.3	67.4	67.4
VT	sen	republican	24.1	27.5	27.5

State	Race	Party	NORC Poll Close Estimate	Actual Result (via AP Vote Count)	NORC Estimate after Final Vote Count[8]
VT	sen	other	3.6	5.1	5.1
VT	gov	democrat	39.0	40.4	39
VT	gov	republican	54.6	55.4	55
VT	gov	other	6.5	4.2	6
WA	sen	democrat	60.9	58.4	58.1
WA	sen	republican	36.7	41.6	41.4
WA	sen	other	2.4		0.5
WI	sen	democrat	57.1	55.4	55.2
WI	sen	republican	39.1	44.6	44.3
WI	sen	other	3.7		0.5
WI	gov	democrat	51.4	49.6	49.6
WI	gov	republican	44.3	48.5	48.5
WI	gov	independent		0.8	0.8
WI	gov	other	4.3	1.2	1.2
WV	sen	democrat	46.5	49.6	49.6
WV	sen	republican	47.4	46.3	46.3
WV	sen	other	6.0	4.2	4.2
WY	gov	democrat	21.0	27.7	27.8
WY	gov	republican	72.9	67.5	67.5
WY	gov	other	6.0	4.8	4.7
WY	sen	democrat	25.7	30.2	30.1
WY	sen	republican	69.4	67.1	67.1
WY	sen	other	5.0	2.8	2.8
US	house	democrat	51.6	53.2	51
US	house	republican	43.2	44.6	46
US	house	other	5.2	1.7	3

Appendix II: Likely Voter Models for 2018 and Summary of Results

Questions used for Likely Voter Model

LVA.

[TEXT IF NOT ELECTIONDAY]

How interested are you in the election on November 6th in [STATENAM]?

[TEXT IF ELECTIONDAY]

How interested are you in the election taking place today in [STATENAM]?

RESPONSE OPTIONS:

1. Extremely interested
2. Very interested
3. Somewhat interested
4. Only a little interested
5. Not at all interested

LVB.

There are a range of reasons why people do or do not vote. We're interested in hearing from voters and non-voters. How likely are you to vote in the election?

RESPONSE OPTIONS:

1. Definitely will vote
2. Probably will vote
3. Probably will not vote
4. Definitely will not vote
5. I already voted

LV.

[TEXT IF CAWI]

On a scale from zero to 10, where 10 means you're certain you will vote and zero means there is no chance you will vote, please indicate how likely it is that you will vote in this election.

[TEXT IF CATI]

On a scale from zero to 10, where 10 means you're certain you will vote and zero means there is no chance you will vote, please tell me how likely it is that you will vote in this election.

[CATI] [SHOW IF LVB=77, 98, 99] If you have already voted, please just say so.

RESPONSE OPTIONS:

1. 0-Certain will not vote
2. 1
3. 2
4. 3
5. 4
6. 5
7. 6
8. 7
9. 8
10. 9
11. 10-Certain will vote
12. Already voted

QPVVOTE.

In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time. Which one of the following statements best describes you?

RESPONSE OPTIONS:

1. I did not vote in the 2016 presidential election.
2. I thought about voting in the 2016 presidential election, but didn't.
3. I usually vote, but I didn't in the 2016 presidential election.
4. I'm sure I voted.

QPVVOTE3.

What about voting in the 2014 election for Congress? Which one of the following statements best describes you?

RESPONSE OPTIONS:

1. I did not vote in the 2014 election for Congress.
2. I thought about voting in the 2014 election for Congress, but didn't.
3. I usually vote, but I didn't in the 2014 election for Congress.
4. I'm sure I voted.

Specifications for 12 Likely Voter Models

- LV_alt1 (Model used for estimates)
  - Likely voters are: (Definitely and 10) or (Probably/definitely, 8-10, and 2014/2016 vote)
  - Likely voters are: (LVB=1 and LV=10) or (LVB=1 or 2, LV=8-10, and QPVVOTE=4 or QPVVOTE3=4)
- LV_alt2
  - Likely voters are: (Definitely, 10, and very/extremely interested) or (Probably/definitely, 8-10, 2014/2016 vote, and somewhat/very/extremely interested)

    - Likely voters are: (LVB=1, LV=10, and LVA=1 or 2) or (LVB=1 or 2, LV=8-10, QPVVOTE=4 or QPVVOTE3=4, and LVA=1-3)
- LV_alt3
    - Likely voters are: (Definitely and very/extremely interested) or (Probably/definitely, 2014/2016 vote, and somewhat/very/extremely interested)
    - Likely voters are: (LVB=1 and LVA=1 or 2) or (LVB=1 or 2, QPVVOTE=4 or QPVVOTE3=4, and LVA=1-3)
- LV_alt4
    - Likely voters are: (10 and very/extremely interested) or (8-10, 2014/2016 vote, and somewhat/very/extremely interested)
    - Likely voters are: (LV=10, and LVA=1 or 2) or (LV=8-10, QPVVOTE=4 or QPVVOTE3=4, and LVA=1-3)
- LV_alt5
    - Likely voters are: (Probably/definitely, 8-10, and somewhat/very/extremely interested)
    - Likely voters are: (LVB=1 or 2, LV=8-10, and LVA=1-3)
- LV_alt6
    - Likely voters are: (voted 2014/2016 vote)
    - Likely voters are: (QPVVOTE=4 or QPVVOTE3=4)
- LV_alt7
    - Likely voters are: (Probably/definitely, 8-10, 2014/2016 vote, and somewhat/very/extremely interested)
    - Likely voters are: (LVB=1 or 2, LV=8-10, QPVVOTE=4 or QPVVOTE3=4, and LVA=1-3)
- LV_alt8
    - Likely voters are: (Definitely, 10, and very/extremely interested)
    - Likely voters are: (LVB=1, LV=10, and LVA=1 or 2)
- LV_alt9
    - Likely voters are: (10 and 2014/2016 vote)
    - Likely voters are: (LV=10 and QPVVOTE=4 or QPVVOTE3=4)
- LV_alt10
    - Likely voters are: (Definitely, 10, very/extremely interested, and 2014/2016 vote)
    - Likely voters are: (LVB=1, LV=10, and LVA=1 or 2, and QPVVOTE=4 or QPVVOTE3=4)
- LV_prob_alt1
    - Past probabilistic model: Use voter file data from 2017 Virginia Governor's election to model how age, gender, race, vote 2016 and vote 2014 predict likelihood to vote. Apply these coefficients across the country.
    - This election was chosen because it had turnout like a midterm, two standard candidates, was a demographically diverse states, and was recent/in the age of Trump.
    - Each respondent gets a likelihood to vote from 0-1 and the survey weights are adjusted based on the likelihood to vote.
- LV_prob_alt2
    - Current probabilistic model: Use survey data to predict intent to vote (0-10 scale) based on the following self-reported variables: age, race, gender, education, partisanship, interest in election, voted in 2014, and voted in 2016. In addition, the model controls for the competiveness of the statewide election.

- Each respondent gets a likelihood to vote from 0-1 and the survey weights are adjusted based on the likelihood to vote.

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Alabama Governor	Alaska Governor	Arkansas Governor	Arizona Senate	Arizona Governor	California Senate	California Governor	Colorado Governor	Connecticut Senate	Connecticut Governor	Delaware Senate
ALT1 (default)	-26%	-7%	-38%	5%	-14%	21%	28%	5%	24%	3%	27%
ALT2 (Include interest)	-26%	-8%	-38%	5%	-14%	21%	29%	6%	27%	7%	27%
ALT3 (No 0-10)	-25%	-8%	-37%	5%	-14%	21%	28%	6%	28%	8%	27%
ALT4 (No definitely)	-26%	-8%	-38%	5%	-13%	21%	29%	6%	28%	7%	27%
ALT5 (No past vote, loose)	-26%	-7%	-36%	5%	-13%	21%	29%	6%	28%	8%	28%
ALT6 (Past vote only)	-27%	-8%	-37%	5%	-14%	21%	26%	5%	24%	0%	25%
ALT7 (Past vote, middle)	-26%	-8%	-37%	6%	-14%	21%	28%	6%	27%	5%	26%
ALT8 (No past vote, tight)	-24%	-8%	-36%	5%	-13%	21%	31%	6%	29%	11%	29%
ALT9 (Past vote, 10)	-25%	-10%	-38%	5%	-14%	21%	28%	6%	26%	6%	28%
ALT10 (Past vote, tight)	-25%	-8%	-36%	5%	-13%	21%	30%	6%	28%	9%	28%
PROB_ALT1 (Past)	-27%	-4%	-35%	6%	-14%	23%	28%	6%	24%	4%	27%
PROB_ALT2 (Intent)	-27%	-7%	-35%	5%	-14%	21%	29%	6%	27%	8%	28%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Florida Senate	Florida Governor	Georgia Governor	Hawaii Senate	Hawaii Governor	Iowa Governor	Idaho Governor	Illinois Governor	Indiana Senate	Kansas Governor	MA Senate	MA Governor
ALT1 (default)	4%	7%	4%	49%	34%	-6%	-19%	16%	0%	6%	29%	-38%
ALT2 (Include interest)	4%	7%	4%	48%	35%	-3%	-20%	16%	1%	6%	30%	-38%
ALT3 (No 0-10)	4%	7%	5%	48%	34%	-5%	-21%	16%	1%	4%	29%	-37%
ALT4 (No definitely)	4%	7%	4%	48%	34%	-3%	-20%	16%	1%	6%	30%	-38%
ALT5 (No past vote, loose)	5%	8%	4%	49%	35%	-4%	-20%	15%	1%	5%	30%	-36%
ALT6 (Past vote only)	3%	6%	3%	46%	31%	-9%	-22%	16%	-1%	3%	26%	-39%
ALT7 (Past vote, middle)	4%	7%	3%	48%	35%	-5%	-21%	17%	0%	5%	29%	-39%
ALT8 (No past vote, tight)	6%	8%	4%	51%	38%	-2%	-14%	19%	2%	8%	32%	-35%
ALT9 (Past vote, 10)	5%	7%	2%	46%	36%	-5%	-16%	19%	0%	7%	29%	-38%
ALT10 (Past vote, tight)	6%	8%	3%	50%	39%	-4%	-15%	20%	1%	8%	31%	-37%
PROB_ALT1 (Past)	4%	7%	2%	48%	36%	-4%	-21%	19%	1%	7%	29%	-39%
PROB_ALT2 (Intent)	5%	8%	4%	49%	36%	-5%	-20%	16%	1%	6%	30%	-37%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Maryland Senate	Maryland Governor	Maine Senate	Maine Governor	Michigan Senate	Michigan Governor	Minnesota Senate	Minnesota Special Senate	Minnesota Governor	Missouri Senate
ALT1 (default)	34%	-21%	30%	13%	12%	16%	28%	14%	17%	-3%
ALT2 (Include interest)	34%	-20%	30%	13%	13%	16%	28%	15%	18%	-2%
ALT3 (No 0-10)	35%	-20%	31%	13%	13%	16%	28%	14%	17%	-2%
ALT4 (No definitely)	34%	-20%	30%	13%	13%	16%	28%	15%	18%	-2%
ALT5 (No past vote, loose)	35%	-20%	30%	14%	13%	16%	28%	14%	18%	-2%
ALT6 (Past vote only)	34%	-20%	30%	9%	11%	14%	27%	12%	15%	-4%
ALT7 (Past vote, middle)	34%	-21%	30%	13%	12%	15%	28%	14%	17%	-4%
ALT8 (No past vote, tight)	36%	-18%	30%	16%	15%	18%	30%	18%	20%	-1%
ALT9 (Past vote, 10)	35%	-20%	28%	12%	13%	15%	29%	16%	18%	-3%
ALT10 (Past vote, tight)	36%	-18%	30%	15%	14%	17%	29%	17%	20%	-2%
PROB_ALT1 (Past)	36%	-20%	32%	13%	12%	14%	30%	15%	18%	-4%
PROB_ALT2 (Intent)	35%	-19%	31%	14%	13%	16%	28%	15%	17%	-2%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Mississippi Senate	Mississippi Special Senate	Montana Senate	North Dakota Senate	Nebraska Senate	Nebraska Governor	New Hampshire Governor	New Jersey Senate	New Mexico Senate	New Mexico Governor
ALT1 (default)	-18%	-14%	11%	-19%	-22%	-26%	-6%	8%	21%	18%
ALT2 (Include interest)	-18%	-14%	11%	-19%	-22%	-25%	-6%	9%	21%	18%
ALT3 (No 0-10)	-18%	-13%	11%	-19%	-23%	-27%	-8%	8%	21%	17%
ALT4 (No definitely)	-18%	-14%	11%	-19%	-22%	-25%	-6%	9%	20%	17%
ALT5 (No past vote, loose)	-18%	-14%	11%	-19%	-19%	-23%	-6%	9%	21%	19%
ALT6 (Past vote only)	-18%	-14%	11%	-20%	-24%	-28%	-10%	6%	17%	13%
ALT7 (Past vote, middle)	-18%	-14%	11%	-19%	-22%	-25%	-7%	8%	20%	16%
ALT8 (No past vote, tight)	-17%	-14%	12%	-21%	-24%	-27%	-2%	12%	24%	19%
ALT9 (Past vote, 10)	-17%	-13%	11%	-21%	-25%	-26%	-5%	10%	19%	13%
ALT10 (Past vote, tight)	-17%	-14%	12%	-21%	-25%	-26%	-2%	12%	23%	16%
PROB_ALT1 (Past)	-20%	-17%	12%	-18%	-22%	-25%	-6%	9%	19%	15%
PROB_ALT2 (Intent)	-18%	-14%	11%	-19%	-21%	-25%	-6%	9%	20%	16%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Nevada Senate	Nevada Governor	New York Senate	New York Governor	Ohio Senate	Ohio Governor	Oklahoma Governor	Oregon Governor	Pennsylvania Senate	Pennsylvania Governor
ALT1 (default)	6%	5%	41%	33%	10%	-1%	-30%	0%	17%	21%
ALT2 (Include interest)	6%	5%	41%	33%	10%	-1%	-30%	0%	18%	21%
ALT3 (No 0-10)	6%	5%	41%	33%	10%	-1%	-28%	-1%	17%	20%
ALT4 (No definitely)	6%	5%	41%	33%	10%	-1%	-30%	0%	18%	21%
ALT5 (No past vote, loose)	7%	6%	41%	33%	10%	-1%	-30%	0%	18%	22%
ALT6 (Past vote only)	5%	5%	39%	32%	9%	-2%	-30%	0%	14%	17%
ALT7 (Past vote, middle)	5%	5%	41%	32%	10%	-2%	-31%	1%	16%	20%
ALT8 (No past vote, tight)	6%	5%	44%	37%	11%	2%	-29%	6%	19%	22%
ALT9 (Past vote, 10)	5%	4%	42%	35%	10%	0%	-29%	4%	17%	20%
ALT10 (Past vote, tight)	5%	5%	44%	37%	11%	1%	-31%	7%	17%	20%
PROB_ALT1 (Past)	5%	5%	42%	34%	11%	0%	-30%	4%	16%	20%
PROB_ALT2 (Intent)	6%	5%	42%	34%	11%	0%	-30%	1%	17%	21%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Rhode Island Senate	Rhode Island Governor	South Carolina Governor	South Dakota Governor	Tennessee Senate	Tennessee Governor	Texas Senate	Texas Governor	Utah Senate	Virginia Senate
ALT1 (default)	24%	9%	-12%	-3%	-11%	-20%	-3%	-20%	-26%	21%
ALT2 (Include interest)	24%	10%	-13%	-3%	-11%	-20%	-3%	-20%	-26%	21%
ALT3 (No 0-10)	23%	8%	-12%	-2%	-10%	-19%	-3%	-19%	-28%	20%
ALT4 (No definitely)	24%	10%	-13%	-4%	-11%	-20%	-3%	-19%	-26%	21%
ALT5 (No past vote, loose)	23%	10%	-13%	-4%	-10%	-19%	-2%	-18%	-25%	22%
ALT6 (Past vote only)	19%	3%	-15%	-5%	-11%	-20%	-5%	-21%	-28%	19%
ALT7 (Past vote, middle)	21%	5%	-14%	-6%	-12%	-20%	-5%	-21%	-26%	21%
ALT8 (No past vote, tight)	24%	12%	-12%	0%	-11%	-19%	-3%	-19%	-20%	23%
ALT9 (Past vote, 10)	18%	5%	-14%	-4%	-12%	-20%	-5%	-20%	-23%	22%
ALT10 (Past vote, tight)	20%	7%	-13%	-3%	-11%	-20%	-5%	-20%	-19%	23%
PROB_ALT1 (Past)	22%	7%	-15%	-4%	-11%	-20%	-6%	-22%	-25%	20%
PROB_ALT2 (Intent)	22%	9%	-13%	-3%	-10%	-19%	-3%	-19%	-25%	21%

Percentage point spread between Democrat and Republican candidates for each of the likely voter models

	Vermont Senate	Vermont Governor	Washington Senate	Wisconsin Senate	Wisconsin Governor	West Virginia Senate	Wyoming Senate	Wyoming Governor
ALT1 (default)	48%	-16%	24%	18%	7%	-1%	-44%	-52%
ALT2 (Include interest)	49%	-15%	24%	18%	8%	-1%	-43%	-52%
ALT3 (No 0-10)	49%	-14%	24%	18%	6%	-1%	-43%	-52%
ALT4 (No definitely)	49%	-15%	24%	18%	8%	-1%	-43%	-52%
ALT5 (No past vote, loose)	50%	-15%	24%	18%	7%	0%	-44%	-52%
ALT6 (Past vote only)	51%	-15%	22%	16%	3%	-2%	-43%	-52%
ALT7 (Past vote, middle)	51%	-15%	23%	18%	7%	-2%	-44%	-53%
ALT8 (No past vote, tight)	48%	-10%	25%	20%	11%	-1%	-42%	-51%
ALT9 (Past vote, 10)	51%	-12%	23%	19%	9%	-3%	-42%	-52%
ALT10 (Past vote, tight)	50%	-10%	25%	20%	11%	-2%	-43%	-52%
PROB_ALT1 (Past)	50%	-12%	24%	19%	7%	0%	-40%	-50%
PROB_ALT2 (Intent)	50%	-14%	24%	18%	7%	0%	-43%	-51%