Per Politico [a], five of the U.S. Supreme Court’s six conservative Justices have recently voted to overturn the landmark Roe v. Wade decision from 1973. As phrased, the opinion clearly indicates that the authors believe that roughly half of people are strictly inferior to the other roughly half. In addition to the flagrant assault on women’s rights, the draft states that many other rights established in Supreme Court cases based on similar legal arguments are at risk. Many defenses against the threat posed by this partisan power exist, and this paper (and author) does not wish to disparage any of them, but it will focus on the vote.

It is well established that women vote prefer candidates who are more liberal than men’s preferred candidates. It makes sense, then, that women tend to vote for Democrats more than men, according to exit polling data from CNN [b]. However, women denied the right to abortion (and soon, potentially, other healthcare) will face an additional barrier to voting, as pregnancy and child rearing require time and effort that, to understate reality, could inhibit one’s availability on a particular Tuesday in November during whatever limited hours happen to be allocated to democracy. I hypothesize that these two facts will disadvantage Democrats in federal elections and perform computational analysis to support this hypothesis.

All substantial computation is performed in R; some additional background computation is performed in Microsoft Excel. For computational simplicity, it is assumed that only men and women participate in elections. Although this assumption is demonstrably incorrect, it does not substantially affect analysis. Data are collected describing the proportion of men and women who voted for each major (Democratic and Republican) party candidate in the 2020 election using exit polling data from CNN. No major news outlet collected data describing every state, so data describing states not included in CNN’s analysis are extrapolated by averaging the gender gap of the states for which gendered data is available (without weighting by state population magnitude) and assuming that all other states have a gender gap that matches this average. Although this assumption is not ideal, it does not obviously sway the analysis in any meaningful way. Each state has associated with it an assumed proportion of women and men who vote for each candidate for a total of 200 data points. These data points are used as the means of normal distributions from which samples are drawn in order to carry out simulations.

Both presidential and senatorial elections are simulated. It is assumed that the popular vote in an election cycle determines the outcome of the presidential race and both senatorial seats; although false, this assumption allows for computational analysis that need not explain Joe Manchin’s ability to win in West Virginia for no apparent reason. House elections are not simulated due to the granularity that would be required. Winners of federal elections are determined according to the Electoral College in the case of presidential races and majority, using Electoral College to break ties, in the senate. Federal elections consist of 50 state elections and one election in Washington D.C. which is assumed to be won by the Democratic party. Simulation of a state election consists of drawing from a normal distribution a value for each gender’s proportion of votes for each state. These values are weighted using the expected turnout of each gender, where turnout of women is lower when abortion bans play a greater role.

State election outcomes are drawn from four normal distributions, one for each intersection of candidate and voting gender. The centers of these four distributions per state do not change between simulations; they are always centered at the value estimated by CNN’s exit polling (for those states polled) or a value extrapolated from those that were polled. These extrapolated values were computed by starting from Fivethirtyeight’s pre-election polling averages and adding or subtracting half of the computed gender gap, as appropriate. It is again assumed in this computation that women vote for Democratic candidates than men. As an example, Fivethirtyeight estimated that 35% of the vote in Arkansas would go to Biden and that 62% would go to Trump. Using a gender gap computed as about 8 percentage points, it is estimated that 31% of men in Arkansas vote for Biden on Average; that 66% of men in Arkansas vote for Trump; that 39% of women vote for Biden; and that 58% vote for Trump. It should be noted that CNN conducted exit polling for exactly those states commonly thought to be close calls; estimates in other states, therefore, are very unlikely to change any outcomes. In the example given, no reasonable simulation should ever claim that Biden wins in Arkansas. The spread of the distributions is chosen by multiplying the mean proportion by the mean proportion subtracted from one (mu\*(1-mu)). This approach is used because it assigns lower spread to states whose outcomes are more certain and higher variance to those states which could go either way. The product was then scaled by a constant factor which resulted in a baseline estimate in which Biden is predicted to win about 90% of the time; this proportion is chosen because it matches Fivethirtyeight’s prediction and is assumed to most closely represent reality. The scale factor chosen is 0.047.

As previously stated, in the baseline case, where Roe remains intact, Biden wins 90.5% of 10,000 simulations. Simulations are repeated with varied changes; in each, some proportion of women voters are removed and outcomes are recomputed accordingly. 10,000 simulations were run under each chosen parameter set; results are summarized in Figure 1.

**Figure 1: Simulation Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reduction in female voters | Presidential Outcome | Senatorial Outcome | Popular Vote  (Average) | Popular Vote (Biden Wins) |
| 0 | 0.905 | 0.1705 | 0.5127 | 1 |
| 0.02 | 0.8788 | 0.1406 | 0.5123 | 1 |
| 0.05 | 0.8411 | 0.0998 | 0.5117 | 1 |
| 0.1 | 0.75 | 0.0516 | 0.5107 | 1 |
| 0.4 | 0.0281 | 0 | 0.5029 | 0.9943 |
| 1 | 0 | 0 | 0.4725 | 0 |

Data in the figure describes Biden’s winning and vote percentages. The last two rows in the table are included illustratively, as they demonstrate the magnitude of the voting gender gap. At a glance, the hypothesis appears to be supported. There is a clear downward trend in Biden’s chances of winning as the proportion of female voters decreases. The same trend is exhibited in the Senate. In addition to this trend, the analysis supports the commonly held belief of an implicit disadvantage of the Democratic party in the Senate, as, even with more than a 90% chance of winning in the electoral college, Democrats hold the majority in the Senate in fewer than 18% of simulations. Lastly, the table demonstrates the implicit Republican advantage in the electoral college, as Biden consistently performs much better in the popular vote than in the electoral college. This inconsistency can be compared to the inconsistencies deliberately created by gerrymandering, as, in effect, the entire country is gerrymandered to the benefit of the Republican party. The Senate’s outcome exhibits an exaggerated version of this effect.

These results are not without caveats, perhaps the most glaring of which is the assumption that election outcomes of different states within the same simulation are independent. It is, of course, untrue that Biden’s odds in New Hampshire are unchanged given that he is known to do very well in Texas. Similarly, there is no reasonable outcome in which Biden wins in Georgia and Trump wins in Michigan, although either event is perfectly reasonable without the other. Similarly, if one candidate in one state within a given simulation exceeds expectations with one gender, it is very likely they will exceed expectations with the other gender in that state and with that same gender in other states.

Another false assumption made is that of the relationship between senatorial and presidential races within a single state. Voters do not always vote straight ticket, and they frequently choose senators and presidents from different parties. In the 2020 election, Maine elected Susan Collins and allocated (most of) their electoral votes to Joe Biden. This assumption could be part of the reason for the strength of the discrepancy observed between Senate and presidential outcomes observed in Figure 1.

Although many assumptions made by the model presented in this paper do not hold, many of its conclusions are valid. Historical trends have made evident the existence of partisan advantages in different branches and portions of government; the overturning or weakening of the Roe decision would exacerbate these problems. Justices involved in the decision and the opinion supplied by Politico understand the implications of their actions, and they know they are increasing the implicit Republican bias in the mathematics. That the opinion mentions additional cases relevant to voting rights, racial justice, and many other essential human rights makes clear their intent to rule in ways that will make voting more difficult and erode democracy. This claim is not meant to minimize the many other harmful effects of this and other potential decisions; instead, it is meant to emphasize the reason behind the decision. The Court’s six ruling Justices will continue to erode choice, be it the choice to carry a fetus to term or the choice of one’s representatives, as long as they are permitted to continue.

**References**

[a] <https://www.politico.com/news/2022/05/02/read-justice-alito-initial-abortion-opinion-overturn-roe-v-wade-pdf-00029504>

[b] https://www.cnn.com/election/2020/exit-polls/president/national-results