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The Effects of Increased Access to Mail-In and Absentee Voting Due to COVID-19 on Voter Turnout in the 2020 Presidential Election

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Abstract

With new voting policies in the fallout from the 2020 election, it is critical to understand their effects on voter turnout. I use a difference-in-differences approach to study effects of absentee voting policies from the fall of 2020 on voter turnout in four states. Using county-level data on the 2008-2020 presidential elections, I estimate turnout based on the county's policy for the 2020 election. I use three sets of states, and I find positive effects on voter turnout for all three sets, two of which are significant. The results from the Montana policy hold through the robustness checks.

Keywords

COVID-19, presidential election, mail-in voting, absentee voting, voter turnout, voting policies

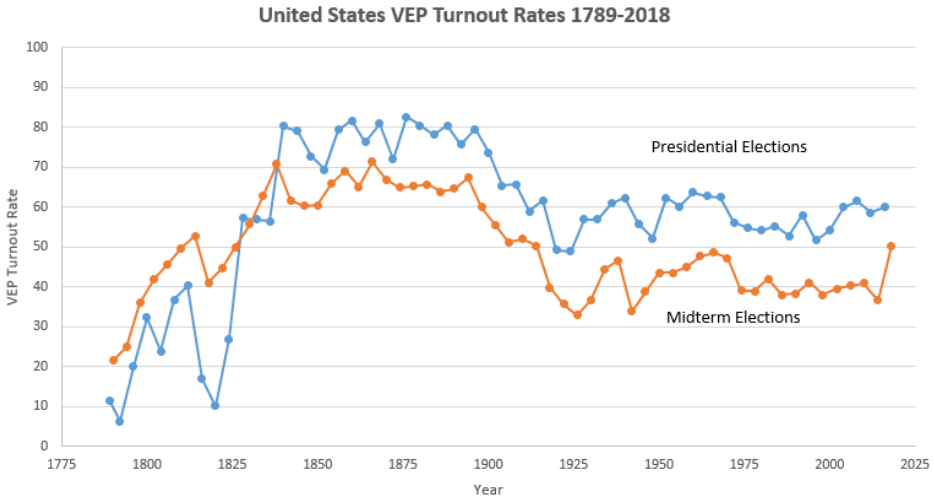
Cover Page Footnote

I would like to acknowledge my advisor Diana Ngo who constantly supported me through my research and Mary Lopez who made sure I knew my work was meaningful. I would also like to thank them for being such strong role models as female economists.

INTRODUCTION

Voter turnout in the US is substantially lower than it was in the 1800s, and it has remained relatively stagnant since the turn of the 20th century, despite the Voting Rights Act of 1965, the National Voter Registration Act of 1993, the Voting Accessibility for the Elderly and Handicapped Act of 1984, and the Help America Vote Act of 2002. In Figure 1, we see that voter turnout in the presidential and midterm elections peaked in the mid to late 1800s, and presidential voter turnout has remained within close to a 15% range since the early 1900s. Even the 2020 presidential election, with a voting eligible population (VEP) voter turnout of 66.1%, turnout is still substantially lower than it was 150 years ago, despite the additional legislation. Voter turnout is a key measure used to help understand how well the democratic system is working for the American people, and changes in voter turnout should be given close attention because many argue that higher voter turnout means democracy is working more effectively. Especially with the current proposals to restrict voting access in some states and Georgia's new voting law, it is important to determine whether voter turnout is impacted by increased access.

Figure 1
Source: United States Elections Project
Note: VEP = Voting Eligible Population



In my research, I look to find the effects of increased access to absentee and mail-in voting due to COVID-19-related policies on voter turnout in the 2020 presidential race in the United States. I use county-level data on the citizen voting age population (CVAP) from the Census, votes cast in the presidential races from 2008 to 2020, and a difference-in-differences framework that controls for county fixed effects and year fixed effects. I also control for race and ethnic populations of each county as a percentage and the number of

COVID-19 cases and deaths reported in each county on the day of the election, one month prior to the election, and two months prior to the election. Lastly, I control for whether a county voted for the Democratic presidential candidate and for whether a county had a senatorial election on the ballot of the general election in any given year.

I use three sets of states in my analysis: the Mountain Group (Montana - treatment, Wyoming, North Dakota, South Dakota, Idaho - controls), the Midwest Group (Kentucky, West Virginia - treatment, Indiana - control), and the Swing-State Group (Wisconsin - treatment, Georgia - control) and each consists of treatment and control state(s) depending on whether the state implemented policies increasing access to mail-in or absentee voting due to the COVID-19 pandemic. Because most states in the US implemented policies around COVID-19 during the 2020 election, to determine my treatment and control groups I start by looking at the few states that did not have any of these policies and thus could serve as controls. From there, I use geographic proximity to determine which states could serve as treatment states for those controls, and then once I compile these three groups, I use political leaning and fall weather patterns to confirm the treatment-control matches. While the Mountain Group states provide the best control-treatment match, I test the other two groups as well to provide further analysis.

The policy enacted in Montana authorized counties to send mail-in ballots automatically to all registered voters for the 2020 general election, and 46 out of Montana's 56 counties chose to hold the election this way (Florio). The 46 participating counties make up the treatment group for the Mountain Group, and the other 10 counties are combined with the control states to form the control group. These 46 counties constitute a valid treatment group because counties did not solely choose to participate in this policy along party lines. While all seven counties that ended up voting for Biden in the 2020 election were part of the 46 counties that participated, the other 39 participating counties voted for Trump, and only ten counties chose not to participate, all of which voted for Trump. With four times more Trump counties choosing to participate in the policy than not, the 46 counties are not significantly politically biased, and thus using them as the treatment group is valid. Prior to the 2020 election, Montana permitted all voters to vote absentee, but they were required to submit an absentee ballot application to county election officials by 12pm the day before the election in order to receive one. Montana also has early voting and requires voter identification which can take on a variety of forms from a driver's license to a paycheck.

The policies enacted in West Virginia and Kentucky suspended eligibility requirements for absentee ballots and allowed all voters "concerned with contracting or spreading COVID-19" to apply for absentee ballots. Kentucky also began early voting in mid-October and had an affidavit option for the voter ID requirement. During non-COVID elections, Kentucky did not previously hold any early in-person voting (they now have new legislation including early voting), and only those with a valid excuse including

"advanced" age, disability, illness, attending school outside the county, incarceration, or employment location, were allowed to vote absentee. Because of COVID-19, West Virginia also implemented an online absentee/mail-in ballot request portal. During non-COVID elections, only certain voters in West Virginia are eligible to vote absentee for a few reasons including illness or injury, disability, "advanced age," incarceration, travel, attending college, work hours, or an inaccessible polling site. The state also holds early voting. One additional change in West Virginia's voting protocol between 2016 and 2020 was enacted in 2018 and allows military service members overseas to vote via an app where they send a video of themselves giving their votes. The policy enacted in Wisconsin due to COVID sent absentee ballot applications to all of its registered voters. During typical elections, all voters can vote absentee, but the state does not typically send the absentee applications to voters. Wisconsin also holds early voting (Ballotpedia).

I find that being treated with one of these policies is associated with a significant increase in voter turnout of 2.74 percentage points for the Mountain Group and 1.64 percentage points for the Midwest Group. There is a 0.931 percentage point increase for the Swing-State Group, but it is not statistically significant. I find that these positive effects remain statistically significant and around the same magnitude for the Mountain Group and Midwest Group after performing multiple checks for robustness. In these checks, I rerun my regression with different calculations for voter turnout by using total county population, registered voters, total ballots cast, and absentee and mail-in ballots returned. My findings suggest that by adopting policies that increase access to mail-in and absentee voting, we may be able to increase access to the democratic process and increase voter turnout in presidential races in the United States.

A few studies have looked at the implementation of "universal vote-by-mail" across several states in the US using difference-in-differences techniques. Universal vote-by-mail is when elections are held primarily by mail, and registered voters are automatically sent ballots without having to request them. As of May, 2021, the states that conduct "all-mail elections" are Colorado, Hawaii, Oregon, Utah, and Washington (Ballotpedia). There are subtle differences between the states' policies as some states also offer in-person voting in addition or ballot drop boxes, and some states include pre-paid postage on the return envelopes, and some do not require postage at all. Thompson et al. (2020) and Barber and Holbein (2020) find slight increases in voter turnout from mandatory vote-by-mail by analyzing between states. These studies most closely match my research design with their difference in differences approach across states and use of location and year fixed effects. These studies rely on only a few treated states, so their results are not necessarily generalizable. Meanwhile, the changes in mail-in voting due to COVID-19 allow for additional states to be studied, and that is a significant way my paper adds to the literature. The states studied in the literature are primarily more liberal states (thus why they were the first states to expand to all-mail voting). My paper is able to focus on conservative states that have not been studied before because of the COVID-

19 election policies. This is important because it is possible that mail-in voting impacts voters of different parties differently.

Many scholars have studied the effects of universal vote-by-mail within individual states. Southwell (2009), Southwell and Burchett (2000), Southwell (2010), Karp and Banducci (2000) and Richey (2008) look at statewide races in Oregon using a variety of frameworks. These studies generally find that universal vote-by-mail has significant, positive effects on voter turnout, but Southwell (2009) finds positive but insignificant effects, and Kousser and Mullin (2007) find that all-mail elections actually reduce voter turnout. COVID-19 voting policies impacted entire states, so I cannot study individual states and mail-in rollout within them, but I use similar states as controls.

Many studies such as Gronke et al. (2007), Holbein and Hillygus (2016), Giammo and Brox (2010), Burden et al. (2014), Wolfinger et al. (2005), and Larocca and Klemanski (2011) study other election laws and voting reforms such as voter ID requirements, required time off to vote, longer voting days, election-day registration, same-day early registration, preregistration, and various forms of early voting, and find varying effects on voter turnout. In addition to increasing access to absentee voting, Kentucky, a treated state in the Midwest Group, also increased early, in-person voting and loosened voter ID requirements, so implementing these additional policies may have had a larger impact on voter turnout when working in tandem. Using specific states instead of the whole US gives more precision to my study, and thus policy implications will be more realistic for the area I study.

In the next section, I explain my conceptual framework and the empirical strategy for my model. I then discuss my data sources and variables. Next, I give the results from my main regression and interpret their direction, magnitude, and significance. I end with a discussion of policy implications and limitations of my paper.

CONCEPTUAL FRAMEWORK

Increasing access to absentee and mail-in voting was intended to prevent citizens from having to "choose between their vote or their health" during the 2020 general election (Our Staff, 2020). Local officials attempted to make it "easier to vote by mail" in order to avoid long lines at polling places that could put both voters' and poll workers' health at risk (Vasilogambros and Van Ness, 2020). There is likely to be a positive causal relationship between increased access to mail-in voting and voter turnout because the increased ease of access could cause certain citizens to vote who otherwise would not have voted. The citizens who might vote under these new policies who would not have otherwise could include those with extremely demanding jobs who either do not have time to physically go to the polls or those who do not have the time or energy to fill out an absentee ballot application. These citizens could also include young people who have never voted before and do not know their polling location but may be inclined to vote if an absentee ballot arrives for them in the mail.

Empirically, many previous studies have found increases in voter turnout due to mail-in or absentee voting across California, Oregon, Washington, and Utah including Thompson et al. (2020), Barber and Holbein (2020), Southwell and Burchett (2000), Richey (2008), and Southwell (2010). Far fewer studies have found negative effects on voter turnout from mail-in or absentee voting, and Kousser and Mullin (2007) find this while studying rollout of vote-by-mail-only precincts in California where voters have no in-person options. This leads me to anticipate a positive causal relationship. However, Kousser and Mullin (2007) lead me to believe that a negative relationship could exist if voters' only option is to vote by mail.

The difference-in-differences framework relies on the assumption of parallel trends between the control and treatment groups for each of my state groups: the Mountain Group, Midwest Group, and Swing-State Group. This assumes that voter turnout rates for the treatment and control states in each respective group would have followed the same trend between the 2016 and 2020 presidential elections if the treatment state had received no treatment. More states made COVID-19-related voting changes than not, so I identified states with no changes as control states and then found treatment states that closely matched the control states. For each group, I aimed to find states with similar political climates (measured by the presidential candidate who won the state and their winning margin in 2016), similar geographic locations, and similar temporal climates (measured by average temperature and rainfall in the fall, as this is when general elections occur). In terms of policies on ballots, a 2008 study found that while "moral policies" (policies relating to marriage rights, abortion, stem cell research, etc.) increased turnout for midterm elections, they did not increase voter turnout for presidential elections, so I am not controlling for the presence of these policies on ballots because I only study presidential elections (Grummel). If these policies cause bias in my analysis, it is likely that that bias would be caught in the county fixed effects, so leaving out moral policies is further justified.

Figure 2

State	Margin of victory for winning 2016 Presidential Candidate	Average Fall Temperature (degrees F)	Average Fall Precipitation Per Month (inches)
Mountain Group			
Montana (treatment)	Trump +21	43	1.08
Idaho	Trump +31	44.8	1.48
Wyoming	Trump +46	42.5	0.97
South Dakota	Trump +30	46.4	1.36
North Dakota	Trump +36	42	1.29
Midwest Group			
Indiana	Trump +19	53.8	3.25
West Virginia (treatment)	Trump +42	53.3	3.31
Kentucky (treatment)	Trump +30	57	3.55
Swing-State Group			
Wisconsin (treatment)	Trump + < 1	45.7	2.84
Georgia	Trump +5	64.6	3.47

Figure 2 shows the winning presidential candidate in 2016 in each state and their winning margin (difference in percent of the vote received compared to the major opposite party—Democrat or Republican) as well as the average temperature and average precipitation for the fall for each state. The states comprising the Mountain Group are all located within close geographic proximity of each other and of Montana, the treatment state, so the similarities in temporal climate are unsurprising and mark good matches. While the winning margin in the 2016 presidential election does not show political climates that are exactly equal across the five states, they are all heavily Republican states. The Midwest Group states are also geographically very close in proximity to each other, share similar fall temperatures and precipitation, and are heavily Republican. The presidential winning margin is slightly less consistent between the control and treatment states in this group than the Mountain Group, however, rendering the Midwest Group a slightly worse match, at least in 2016. The Swing-State Group states are obviously not geographically close together and thus have quite different climates. Their presidential winning margin difference is smaller than for any other group, however, so I use this group to present potential results in states that are not heavily Republican, despite the geographic and climate differences.

EMPIRICAL MODEL & IDENTIFICATION STRATEGY

I use a difference-in-differences framework that controls for county fixed effects and year fixed effects. I also control for race and ethnic populations of each county and the number of COVID-19 cases and deaths reported in each county on the day of the election, one month prior to the election, and two months prior to the election. Lastly, I control for whether each county voted for the Democratic candidate and whether they had a senatorial election on the ballot of the general election of any given year. I use the ordinary least squares method to estimate the model.

My empirical model is as follows:

$$Y_{ct} = \alpha_c + \mu_t + \beta_1 Treat_c * Post_t + \beta_2 X_{ct} + \beta_3 Z_{ct} + \beta_4 S_{ct} + \beta_5 D_{ct} + \beta_6 P_{ct} + \varepsilon_{ct}$$

Where Y_{ct} is voter turnout with county and year fixed effects, α_c gives the county fixed effects, μ_t gives the year fixed effects, the coefficient on $Treat_c * Post_t$ gives the impact of being a treated county in 2020, X_{ct} controls for a combination of 10 racial and ethnic demographic variables, and Z_{ct} controls for a combination of six COVID-19 variables. S_{ct} is a dummy variable that controls for the presence of a senatorial race on the ballot, D_{ct} is a dummy variable controlling for whether a county voted for the Democratic candidate, and ε_{ct} is the error term.

A major shortcoming of the model is that I cannot control for the effect of Donald Trump's appearance on the ballot possibly increasing voter turnout and resulting in a bias in my results. However, Trump on the ballot impacted all states, and by grouping states by political climate, I lessen the impact of the "Trump Effect" on my estimates as much as possible, but it is still possible that he impacted voters differently in different states. Additionally, this model does not control for other demographic differences between states or counties including educational attainment, gender, age, or income level because this data was not reported by CVAP until 2018. However, because of the geographic and temporal similarities between the states I grouped together, I attempt to minimize bias to my estimates. Other major differences between states that could cause the parallel trends assumption to not hold could include specific state or local ballot measures or races or differences in advertising, and advocacy groups helping and pushing people to vote. Considering the work done by Stacey Abrams and many others in Georgia specifically in 2020, from that treatment and control pair, I would expect my estimates to be biased down because Georgia serves as the control state.

DATA

My outcome variable of interest is voter turnout which is based on votes cast in presidential races and citizen voting age population (CVAP) by county. Some of the literature, particularly Southwell and Burchett (2000), Southwell (2010), Southwell (2009), and Richey (2008) advocate for using registered voters as the denominator because "if the vote by mail format is to have any impact on voter turnout, it can do so only for those who receive a ballot in the mail, that is, registered individuals" (Southwell, 2009). However, these studies look at reforms within individual states, and I anticipate that other factors, such as voter registration policies, have greater variety when looking across states in a way that makes using registered voters unreliable for my study. Some previous studies, including Southwell (2009), use total ballots cast, but I find that data on total ballots cast is far more irregular in its publication by county between states than votes cast for President, so that is why I use presidential votes. The data I use comes from multiple sources. The data on votes cast in the 2008, 2012, and 2016 presidential races comes from the Voting and Elections Collection of CQ Press, SAGE Publishing. The data on votes cast in the 2020 presidential race came from the New York Times's published election results because the 2020 data has not yet been published by CQ Press, as of May, 2021. The New York Times's data comes from the National Election Pool and Edison Research.

I obtain the sizes of the CVAP by county from the American Community Survey, which is administered by the US Census Bureau, and then I used the population numbers and CVAP totals to calculate the percentages. The ACS is sent out monthly to randomly selected households in the 50 US states, the District of Columbia, and Puerto Rico, and it has a yearly participation of about 3.5 million households. The survey includes questions regarding educational attainment, income, ancestry, age, citizenship, disability, migration, employment, language proficiency, race and ethnicity, and other housing characteristics. The published data gives each county's CVAP, broken down by racial and ethnic populations, as the number of people identifying with each ACS category. Because it does not cover the entire population every year, my data from the ACS are 5-year estimates because single-year estimates only exist for counties with populations above a certain size threshold. The ACS was first conducted in 2005, so the earliest possible 5-year estimate is from 2005-2009 which I use with election data from 2008 because it is the closest option. The 2008-2012 estimate I use with election data from 2012, and the 2012-2016 estimate I use with election data from 2016. As of May, 2021, publication of the 2016-2020 estimate has been "suspended indefinitely" according to the Census Bureau, so I use the 2015-2019 estimate with 2020 election data. I also include the racial composition of each county as a percentage as a control. These are given as 10 categories: American Indian or Alaska Native Alone, American Indian or Alaska Native and Black or African American, American Indian or Alaska Native and White, Asian Alone, Asian and White, Black or African

American Alone, Black or African American and White, Hispanic or Latino, Native Hawaiian or Other Pacific Islander Alone, and White Alone.

Voter turnout in the presidential race is the percent of the citizen voting age population who cast a vote in the presidential race in a given year. Because the election occurred in 2020 and the CVAP I associate with 2020 is the 2015-2019 ACS estimate, it is possible for voter turnout to be greater than one, but it is extremely uncommon. This is my outcome of interest. The data on new COVID-19 cases and deaths are numbers reported on September 3rd, October 3rd, and election day, November 3rd, 2020. The data comes from the New York Times and is based on reports from local health agencies. The data on whether a county held a Senate race or voted for the Democratic candidate in a given year comes from the New York Times. Depending on the year, some of the New York Times data comes from the Associated Press, and some comes from the National Election Pool and Edison Research. Total county population data comes from single-year county population estimates from the US Census Bureau's Population Estimates Program, projecting the population on July 1st of the given year. As population data from 2020 has not yet been published as of May, 2021, I use the 2019 single-year population estimate to stand in for the 2020 population. I have three separate datasets: one for each of my state groups. The Mountain Group contains 968 total observations (242 for each election year), the Midwest Group contains 1,068 total observations (267 for each election year), and the Swing-State Group contains 924 total observations (231 for each election year).

Data for the additional regressions I run comes from a variety of sources. I first calculate turnout as the percentage of registered voters casting votes in the presidential race. I perform this test because of the substantial literature emphasizing the importance of measuring voter turnout using registered voters, despite the fact that I am not sure it is a reliable measure when looking at effects across multiple states. The voter registration data comes from the Secretary of State websites of each individual state, as this data is not published on a federal level. However, because this data is state-published, I only use 2016-2020 data and am unable to include North Dakota or Kentucky, so these data sets are smaller: the Mountain Group has 378 total observations (189 per year), and the Midwest Group has 294 total observations (147 per year).

I also calculate turnout using total ballots cast (as opposed to votes cast for President) divided by CVAP because election policies impact anyone voting in the election, not only people who vote for President. However, the data is inconsistent as it is reported by county level officials, so I run this turnout calculation as an additional test, not as my main regression. The data on total ballots cast for the 2008 through 2016 elections comes from the US Election Assistance Commission's Election Administration and Voting Survey. This survey is completed and returned by each county, and it asks questions about types of votes cast, ways of voting, poll workers, and other election-related questions. Results from the survey for the 2020 election are not yet available, as of May, 2021, so the 2020 data comes directly from the Secretary of State for

each state. I was unable to locate 2020 data for Kentucky, so Kentucky is left out of this test. Wisconsin publishes this data on a town level instead of county level, so I do not collect data for the Swing-State Group.

I then calculate absentee and mail-in turnout, or the percentage of the CVAP who returned a ballot by mail, to analyze the extent to which the overall impacts of these policies on voter turnout were driven by changes in absentee and mail-in turnout due to the policies. Data on absentee and mail-in ballots cast comes from the same sources as total ballots cast. However, because data on absentee and mail-in ballots and total ballots cast are reported by individual counties, many counties report ballots *returned*, which can include ballots that are ultimately rejected. This leads to the possibility of voter turnout being greater than one. This happens far more frequently for Wyoming counties than other counties. However, assuming that the counties' method of reporting this data does not change between 2008 and 2020, controlling for county fixed effects should reduce any bias from this odd data. Additionally, the differences (if any) between "absentee ballots" and "mail-in ballots" differ between states and is unclear. To illustrate this, counties in some states report all "absentee" and "mail-in" ballots as one category: absentee. However, counties in other states report "absentee" and "mail-in" ballots as separate categories. For the purposes of my research, for the states that report these categories separately, I use their sums as the total absentee/mail-in ballots from a given county. Again, I was unable to locate 2020 data from Kentucky, so Kentucky is left out of this test, and again, I do not test the Swing-State Group because Wisconsin reports this data by town instead of county.

The following figures give the summary statistics for each set of treatment and control states. Figure 3 shows Mountain Group data, Figure 4 shows Midwest Group data, and Figure 5 shows Swing-State Group data.

Figure 3

Mountain Group means	2008: Treat	2008: Control	2012: Treat	2012: Control	2016: Treat	2016: Control	2020: Treat	2020: Control
Votes cast for President	10115 (2395)	8333 (1231)	9941 (2354)	8237 (1231)	10220 (2453)	8610 (1326)	12435 (3053)	10004 (1676)
Citizen Voting Age Population (CVAP)	15017 (3537)	12980 (1870)	15626 (3698)	13598 (1877)	16254 (3886)	14315 (2150)	16754 (4060)	14794 (2305)
Population	20122 (4727)	18331 (2714)	20698 (4902)	19174 (2875)	21499 (5173)	20081 (3107)	22087 (5383)	20741 (3320)
Turnout (%)	69.0 (1.15)	66.2 (0.607)	65.0 (1.18)	63.0 (0.611)	64.1 (1.29)	62.3 (0.637)	73.6 (1.48)	68.3 (0.730)
Race / Ethnicity Variables (percentage of CVAP)								
American Indian or Alaska Native Alone	7.93 (2.14)	6.06 (1.12)	8.21 (2.24)	6.21 (1.16)	8.44 (2.30)	6.43 (1.15)	8.37 (2.33)	6.71 (1.19)
American Indian or Alaska Native and Black or African American	0.0384 (0.0138)	0.0160 (0.00552)	0.0128 (0.134)	0.0153 (0.00354)	0.00983 (0.00360)	0.0229 (0.00502)	0.0229 (0.00754)	0.0198 (0.00431)
American Indian or Alaska Native and White	1.09 (0.172)	0.851 (0.0592)	1.13 (0.134)	0.846 (0.0576)	1.08 (0.108)	0.944 (0.080)	1.35 (0.131)	0.901 (0.0507)
Asian Alone	0.185 (0.030)	0.275 (0.0267)	0.221 (0.0357)	0.298 (0.0244)	0.290 (0.0454)	0.339 (0.0305)	0.307 (0.0502)	0.449 (0.0522)
Asian and White	0.0551 (0.0130)	0.0773 (0.0118)	0.0839 (0.0187)	0.105 (0.0138)	0.111 (0.0220)	0.129 (0.0127)	0.191 (0.0466)	0.175 (0.0169)
Black or African American Alone	0.21 (0.0425)	0.259 (0.030)	0.160 (0.0309)	0.302 (0.0315)	0.187 (0.0351)	0.459 (0.0462)	0.250 (0.0413)	0.516 (0.0506)
Black or African American and White	0.0414 (0.011)	0.0593 (0.0134)	0.0786 (0.0187)	0.0581 (0.00739)	0.116 (0.0343)	0.0960 (0.0132)	0.133 (0.0285)	0.107 (0.0125)
Hispanic or Latino	1.48 (0.161)	2.25 (0.200)	1.49 (0.142)	2.56 (0.224)	1.86 (0.121)	3.21 (0.252)	2.31 (0.178)	3.58 (0.270)
Native Hawaiian or Other Pacific Islander Alone	0.0351 (0.0121)	0.0351 (0.00866)	0.0974 (0.0334)	0.0350 (0.00597)	0.0672 (0.0521)	0.0452 (0.00955)	0.0311 (0.00995)	0.0729 (0.0142)
White Alone	88.9 (2.31)	90.1 (1.14)	88.5 (2.36)	89.5 (1.18)	87.7 (2.37)	88.2 (1.17)	86.9 (2.40)	87.4 (1.18)
COVID-19 variables								
COVID-19 cases reported on September 3rd, 2020							167 (55.2)	329 (78.8)
COVID-19 deaths reported on September 3rd, 2020							2.37 (1.03)	3.76 (0.973)
COVID-19 cases reported on October 3rd, 2020							307 (89.6)	498 (97.4)
COVID-19 deaths reported on October 3rd, 2020							3.98 (1.61)	5.38 (1.17)
COVID-19 cases reported on November 3rd, 2020 (election day)							739 (195)	915 (149)
COVID-19 deaths reported on November 3rd, 2020 (election day)							8.43 (2.36)	8.96 (1.48)
Observations	46	195	46	196	46	196	46	196
se in parentheses								

Figure 4

Midwest Group means	2008: Treat	2008: Control	2012: Treat	2012: Control	2016: Treat	2016: Control	2020: Treat	2020: Control
Votes cast for President	14515 (2245)	29903 (5161)	14101 (2163)	28528 (4947)	15069 (2266)	29728 (5034)	16751 (2501)	32970 (5563)
Citizen Voting Age Population (CVAP)	26220 (3438)	50087 (8345)	26796 (3568)	51226 (8542)	27240 (3688)	52441 (8802)	27334 (3741)	53295 (9003)
Population	35030 (4758)	69835 (12005)	35676 (4923)	71062 (12365)	35824 (5039)	72112 (12678)	35770 (5050)	73176 (12942)
Turnout (%)	52.8 (0.531)	58.2 (0.575)	50.5 (0.524)	54.2 (0.594)	53.7 (0.513)	56.2 (0.618)	59.6 (0.539)	61.4 (0.720)
Race / Ethnicity Variables (percentage of CVAP)								
American Indian or Alaska Native Alone	0.194 (0.0173)	0.224 (0.0202)	0.180 (0.0156)	0.197 (0.0170)	0.188 (0.0152)	0.215 (0.0184)	0.215 (0.0164)	0.203 (0.0206)
American Indian or Alaska Native and Black or African American	0.0189 (0.00398)	0.0239 (0.00509)	0.0192 (0.00328)	0.0256 (0.00673)	0.0255 (0.00441)	0.0201 (0.00441)	0.0211 (0.00444)	0.0239 (0.00472)
American Indian or Alaska Native and White	0.423 (0.0384)	0.528 (0.0595)	0.469 (0.0394)	0.498 (0.444)	0.464 (0.0256)	0.444 (0.0250)	0.428 (0.0223)	0.480 (0.0288)
Asian Alone	0.247 (0.0223)	0.385 (0.0409)	0.230 (0.0239)	0.416 (0.0501)	0.290 (0.0264)	0.493 (0.0587)	0.326 (0.0296)	0.612 (0.0721)
Asian and White	0.0603 (0.00732)	0.0784 (0.00879)	0.0697 (0.00753)	0.0949 (0.0121)	0.0783 (0.00787)	0.114 (0.0117)	0.0905 (0.0103)	0.161 (0.0152)
Black or African American Alone	3.21 (0.292)	2.32 (0.430)	3.23 (0.286)	2.41 (0.443)	3.32 (0.290)	2.47 (0.449)	3.34 (0.290)	2.27 (0.214)
Black or African American and White	0.0912 (0.00999)	0.111 (0.0127)	0.145 (0.0127)	0.141 (0.0160)	0.198 (0.0152)	0.215 (0.0222)	0.254 (0.0193)	0.290 (0.0297)
Hispanic or Latino	0.636 (0.0377)	1.41 (0.149)	0.827 (0.0509)	1.62 (0.168)	0.985 (0.0591)	1.99 (0.189)	1.07 (0.0666)	2.27 (0.214)
Native Hawaiian or Other Pacific Islander Alone	0.0322 (0.00818)	0.0104 (0.00283)	0.0295 (0.00588)	0.0145 (0.00297)	0.0282 (0.00516)	0.0226 (0.00460)	0.0359 (0.00674)	0.0210 (0.00379)
White Alone	95.1 (0.327)	94.9 (0.554)	94.8 (0.337)	94.5 (0.596)	94.4 (0.352)	93.8 (0.622)	94.1 (0.362)	93.2 (0.649)
COVID-19 variables								
COVID-19 cases reported on September 3rd, 2020							371 (88)	1076 (245)
COVID-19 deaths reported on September 3rd, 2020							7.19 (1.82)	36.2 (9.63)
COVID-19 cases reported on October 3rd, 2020							526 (119)	1374 (294)
COVID-19 deaths reported on October 3rd, 2020							9.12 (2.05)	39.9 (10.0)
COVID-19 cases reported on November 3rd, 2020 (election day)							795 (166)	2071 (401)
COVID-19 deaths reported on November 3rd, 2020 (election day)							11.7 (2.53)	48.3 (10.7)
Observations	175	92	175	92	175	92	175	92
se in parentheses								

Figure 5

Swing-State Group means	2008: Treat	2008: Control	2012: Treat	2012: Control	2016: Treat	2016: Control	2020: Treat	2020: Control
Votes cast for President	41436 (8195)	24682 (4312)	42617 (8575)	24529 (4249)	41335 (8039)	25879 (4562)	45797 (8668)	31446 (5552)
Citizen Voting Age Population (CVAP)	57710 (11071)	40729 (6673)	58553 (11109)	42101 (6624)	59907 (11427)	44426 (7195)	60644 (11560)	46267 (7581)
Population	78347 (15353)	59779 (9832)	79444 (15763)	62273 (10486)	80175 (15973)	64792 (11131)	80867 (16007)	66776 (11487)
Turnout (%)	68.6 (0.724)	56.9 (0.671)	68.6 (0.771)	53.8 (0.704)	66.7 (0.711)	53.7 (0.719)	74.4 (0.797)	62.4 (0.859)
Race / Ethnicity Variables (percentage of CVAP)								
American Indian or Alaska Native Alone	2.32 (1.06)	0.245 (0.0247)	2.41 (1.07)	0.210 (0.01940	2.51 (1.15)	0.199 (0.0175)	2.51 (1.12)	0.189 (0.0158)
American Indian or Alaska Native and Black or African American	0.0216 (0.00601)	0.0436 (0.00731)	0.0271 (0.00661)	0.0510 (0.00651)	0.0292 (0.00505)	0.0504 (0.00689)	0.0263 (0.00600)	0.0777 (0.0131)
American Indian or Alaska Native and White	0.389 (0.0393)	0.290 (0.0242)	0.456 (0.0488)	0.292 (0.0192)	0.526 (0.0478)	0.323 (0.0198)	0.565 (0.0554)	0.353 (0.0436)
Asian Alone	0.566 (0.0652)	0.616 (0.0659)	0.659 (0.0812)	0.707 (0.0780)	0.770 (0.0982)	0.796 (0.0907)	0.866 (0.113)	0.855 (0.0975)
Asian and White	0.0680 (0.00802)	0.0597 (0.00876)	0.103 (0.00965)	0.0835 (0.00965)	0.137 (0.0129)	0.0993 (0.00939	0.178 (0.0137)	0.142 (0.0151)
Black or African American Alone	1.25 (0.350)	27.3 (1.34)	1.36 (0.271	27.7 (1.37)	1.44 (0.377)	28.0 (1.37)	1.55 (0.379)	28.4 (1.39)
Black or African American and White	0.0688 (0.0107)	0.110 (0.0170)	0.117 (0.0152)	0.146 (0.0136)	0.146 (0.0144)	0.197 (0.0169)	0.176 (0.0180)	0.266 (0.0224)
Hispanic or Latino	1.293 (0.153)	1.66 (0.130)	1.51 (0.160)	2.26 (0.160)	1.85 (0.181)	2.74 (0.189)	2.12 (0.203)	3.22 (0.238)
Native Hawaiian or Other Pacific Islander Alone	0.0277 (0.00826)	0.0239 (0.00464)	0.0236 (0.00503)	0.250 (0.00471)	0.0193 (0.00345)	0.0449 (0.00830)	0.0256 (0.00455)	0.0519 (0.0116)
White Alone	93.9 (1.21)	69.6 (1.32)	93.3 (1.20)	68.5 (1.35)	92.5 (1.29)	67.4 (1.35)	91.9 (1.27)	66.3 (1.36)
COVID-19 variables								
COVID-19 cases reported on September 3rd, 2020							1092 (360)	1627 (278)
COVID-19 deaths reported on September 3rd, 2020							15.9 (7.05)	36.1 (5.36)
COVID-19 cases reported on October 3rd, 2020							1917 (497)	1910 (314)
COVID-19 deaths reported on October 3rd, 2020							19.1 (7.78)	43.8 (6.05)
COVID-19 cases reported on November 3rd, 2020 (election day)							3489 (761)	2368 (380)
COVID-19 deaths reported on November 3rd, 2020 (election day)							30.3 (8.77)	49.3 (6.56)
Observations	72	159	72	159	72	159	72	159
se in parentheses								

Key features of this data shows that the Mountain Group (Montana, South Dakota, North Dakota, Wyoming, and Idaho) has a consistent difference in turnout between the treatment and control group with the treatment group having around 2-3% higher turnout rates for the 2008, 2012, and 2016 elections. This gap jumps to around 5% for the 2020 election. Additionally, the CVAP race and ethnicity percentages match very well for both the control and treatment group for the Mountain Group which helps solidify my determination that those states would make good matches. In 2020, the largest difference was 1.6% between the respective American Indian or Alaska Native Alone populations, and in 2008 the largest difference was 1.8% between the same populations. In both 2012 and 2016, the largest difference was 2% between the respective American Indian or Alaska Native Alone populations.

The same is true for the Midwest Group (Indiana, Kentucky, and West Virginia), where the largest race or ethnic differential in any year is 1.2%. This cannot be said for the Swing-State Group (Wisconsin and Georgia), where the largest race or ethnic differential in any year is 26.9% between the respective Black or African American Alone populations. Perhaps this shows that this treatment/control match is not the best match. These two groups also do not have voter turnout differentials that remain as constant as the case with the Mountain Group, which also may show that these two groups are not as close matches.

The following figures show the trends in my outcome variable of interest, voter turnout as calculated by votes cast for President divided by the citizen voting age population, from the 2008 to 2020 elections for each treatment / control set I study.

Figure 6

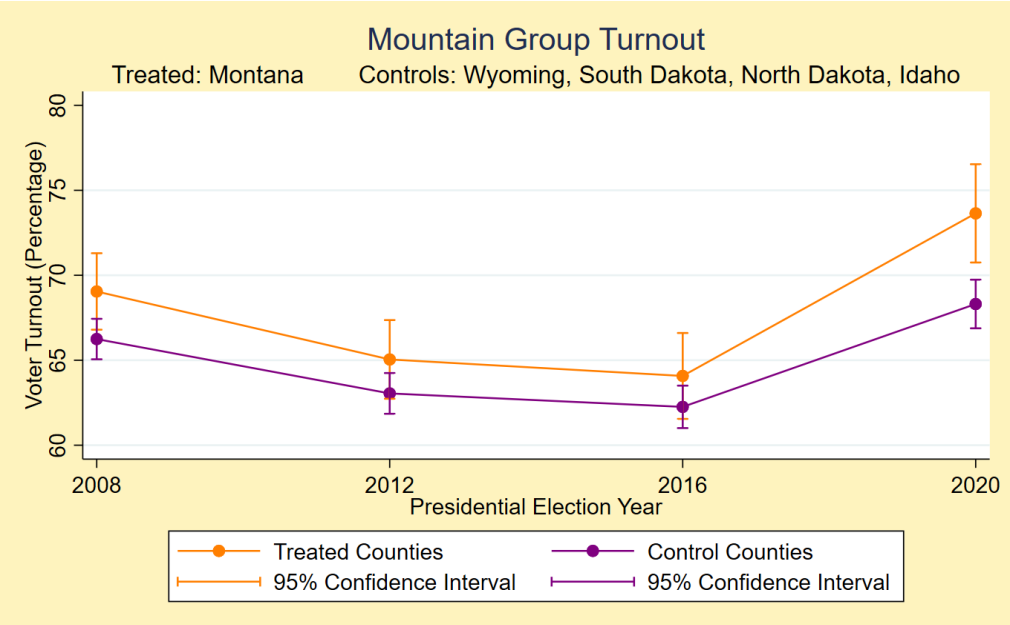


Figure 7

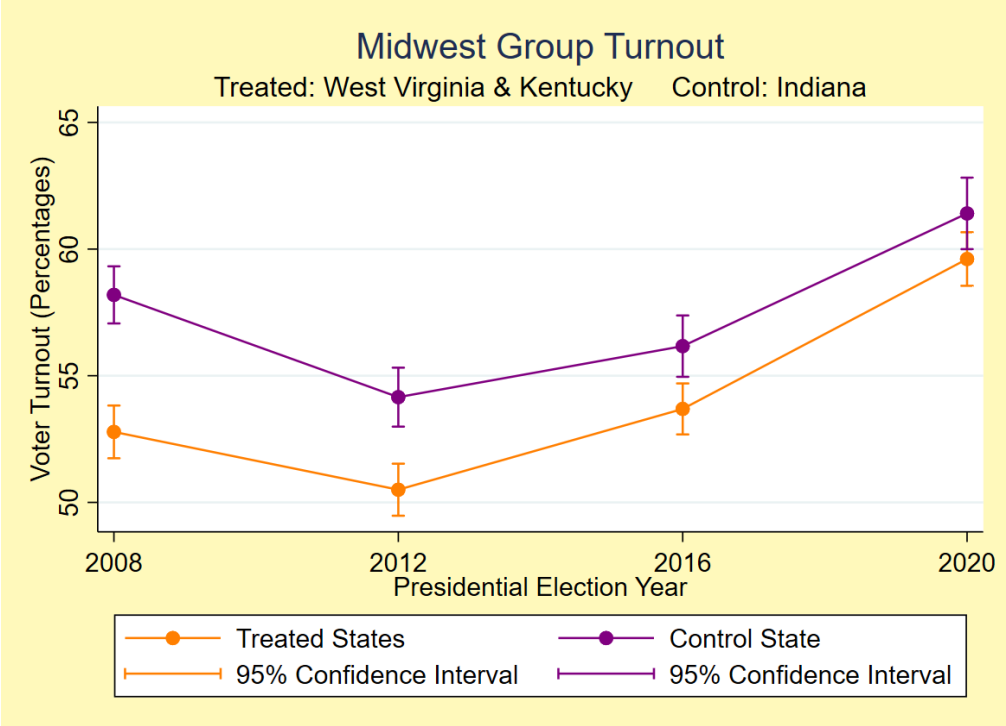
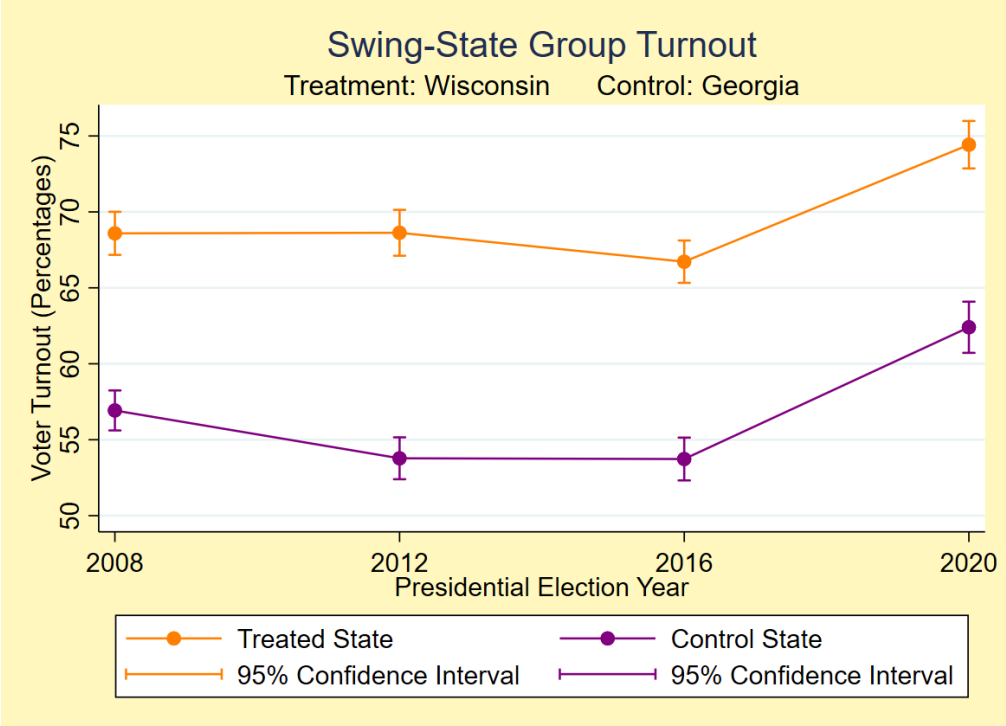


Figure 8



From Figure 6, we see that voter turnout trends extremely closely between the treated and control counties in the Mountain Group from the 2008 through 2016 elections. The jump in the 2020 election mirrors the jump in turnout we see in the summary statistics of the data. This jump suggests that the treatment of the Montana policy appears to have positive effects on voter turnout in the 2020 election. From Figure 7, voter turnout trends for the Midwest Group appear to show turnout slowly coming together between the control and treated states since the 2008 election, so from looking at the graph, it does not appear that the 2020 policies had an effect on voter turnout. In Figure 8, we see that the states in the Swing-State Group did not trend closely prior to 2020, and their gap in voter turnout remained about the same in 2020 as it was in 2016, which does not suggest effects on voter turnout from the policy in Wisconsin. Despite the lack of matching trends in voter turnout, I continue to study the Midwest Group and Swing-State Group because I may see effects after controlling for fixed effects and other controls that the simple graph cannot depict.

RESULTS

I find that being treated with a COVID-related policy increasing access to mail-in or absentee voting is associated with significant, positive effects on voter turnout for both the Mountain Group and the Midwest Group. Specifically, being treated with these policies is associated with voter turnout increasing by 2.74 percentage points for the Mountain Group (Figure 9, column 1) and 1.64 percentage points for the Midwest Group (Figure 10, column 1). These were the expected results from my outcome of interest.

In contrast to previous literature on the impact of Senatorial races, I find that having a Senate race on the ballot is associated with a significant positive effect on voter turnout for both the Mountain Group and the Swing-State Group. From my results, a Senate race on the ballot is associated with a 1.31 percentage point increase in voter turnout in the Mountain Group (Figure 9, column 1) and a 1.6 percentage point increase in voter turnout in the Swing-State Group (Figure 11, column 1). Percival et. al (2007) found no effect of Senate races on the presidential election ballot on voter turnout between 1992 and 2000, and Boyd (1989) found no significant effect of Senate races on turnout in the 1976-1984 presidential elections. Springer (2012) did find a significant increase in voter turnout on average in the US and specifically in "non-South" states from a Senate race on the ballot in presidential elections between 1920 and 2000. My significant positive result could be due to the fact that my research focuses on states in specific regions as opposed to the entire country. It could also be due to the increasingly large partisan gap and a growing awareness by the public of political issues and their representatives' roles, as my data is from an entirely different set of presidential election years compared to most of the existing literature.

For both the Mountain Group and Midwest Group, the effect of a county voting for the Democratic candidate is positive and quite significant. In the Midwest Group, it is associated with a 1.56 percentage point increase in voter turnout (Figure 10, column 1) and in the Mountain group it is associated with a 1.58 percentage point increase (Figure 9, column 1). I find that the 2020 election saw significant, large, positive effects on voter turnout for all three state groups simply by being the 2020 general election. This was expected because the heated election between Trump and Biden inspired many people to vote in 2020 for a variety of political reasons. There were also significant Get Out the Vote rallies and other outreach efforts because this election had very personal implications for many people.

I find mixed results regarding an increase in racial or ethnic population percentages, but all the statistically significant results are positive. Multiple racial categories have significant results across multiple state groups. I find that a 1 percentage point increase in the White Alone's share of the population is associated with a 1.85 percentage point increase in voter turnout in the Midwest Group (Figure 10, column 1) and a 1.49 percentage point increase in the Swing-State Group (Figure 11, column 1). Meanwhile, a 1 percentage point increase in the American Indian or Alaska Native and White's share of the population is associated with a 1.97 percentage point increase in voter turnout in the Midwest Group (Figure 10, column 1) and a 1.94 percentage point increase in the Swing-State Group (Figure 11, column 1). Lastly, a 1 percentage point increase in the Asian Alone's share of the population is associated with a 1.72 percentage point increase in the Swing-State Group (Figure 11, column 1). I did not expect any coefficients on the racial or ethnic categories to be significantly different from zero. This result may mean that certain racial and ethnic groups have higher preferences for voting.

I find that more COVID-19 cases or deaths being reported one and two months prior to the election and on election day in 2020 is associated with both increases and decreases in voter turnout. The most striking, significant result is an increase of 100 deaths reported on election day being associated with a 6.12 percentage point decrease in voter turnout in the Midwest Group (Figure 10, column 1). There are few other significant effects of COVID-19 cases and deaths on voter turnout. The coefficients on COVID-19 cases and deaths that are negative were expected, but the positive coefficients were not expected. The positive coefficients are likely the impact of increased absentee and mail-in voting due to COVID-19 cases and deaths occurring far enough in advance of the election where people still had enough time to vote via mail. I investigate this in one of my further tests (column 7) where I run my regression with absentee and mail-in turnout as the outcome variable. I expect positive effects of COVID-19 cases and deaths in September and October on absentee/mail-in turnout, but the only significant coefficient I find is negative. I find that 100 additional COVID-19 deaths reported on September 3rd is associated with a 25 percentage point decrease in voter turnout in the Midwest Group (Figure 10, column 7).

Kentucky data is not included in this result, so a possible explanation for this is West Virginia citizens' fear of COVID-19 impacting their trust of government or election processes in general. Most citizens are used to voting at the polls, so a distrust in the system could reduce absentee voting simply because West Virginia citizens are not as comfortable with it. A similar explanation can also be used to explain the highly significant, negative effect of 15.6 percentage points on absentee and mail-in turnout from my coefficient of interest, having a mail-in/absentee policy in 2020 in the Midwest Group (Figure 10, column 7). This is an unexpected result, but there is a possible explanation. In the 2020 West Virginia primary, all voters were automatically sent absentee ballot applications (WHSV Newsroom). However, following the primary, the Secretary of State announced that there had been a "fraud scheme," so no one was automatically sent an application for the general election (Office of the Secretary of State). If voters were expecting an application to arrive in the mail but never received one and thus did not vote by mail, that could have resulted in the negative coefficient for absentee voting. Additionally, if they worried that fraud meant their mail-in ballots might not be counted, that could have frightened people away from voting by mail. By contrast, in the Mountain Group, I find that having a mail-in/absentee policy in 2020 has a highly significant, positive effect of 26.3 percentage points on absentee and mail-in turnout (Figure 9, column 7). This result suggests that the positive effects of a mail-in/absentee policy in 2020 on presidential voter turnout overall is driven by the dramatic increases in absentee and mail-in turnout.

Other robustness checks I perform involve recalculating voter turnout using different data. I calculate turnout with total county population as the denominator instead of CVAP (as shown in column 2), and the effects of the absentee/mail-in policy on turnout shrink slightly for the Swing-State Group (now 0.314ppts, shown in Figure 11) and the Midwest Group (now 1.35ppts, shown in Figure 10), but remain very close for the Mountain Group (now 2.70ppts, shown in Figure 9).

I also calculate turnout with registered voters as the denominator because much of the literature, especially Southwell's papers, argue that policies only impact those who would have been voting already, i.e., registered voters. Therefore, by not measuring registered voters alone, I may underestimate the effects on voter turnout. I did not want registered voters to be the calculation of voter turnout in my main regression, however, because I was looking across states, and voter registration laws and their implementation varies across states in a way that is not a concern when studying policies within states, as Southwell does. In the Mountain Group, voter turnout increases by 6.27 percentage points (Figure 9, column 4) while in the Midwest Group it decreases by 1.27 percentage points due to a mail-in or absentee policy in 2020 (Figure 10, column 4). The increase in the coefficient of interest for the Mountain Group is likely due to what Southwell and her colleagues discuss in terms of underestimating the effects of policies when measuring voter turnout by more than only the people registered (as the non-registered eligible

population may not change their behavior, no matter the policy). The negative effect seen in the Midwest Group suggests that the pool of eligible voters changed over the course of 2008-2020 in a way that means overall turnout increased, despite registered voter turnout decreasing. This result might be specific to these states with certain voter registration policies. Again, due to differences between states, I do not use registered voters in my main regression.

My last additional check is calculating voter turnout using the total ballots cast instead of only votes cast for President (seen in column 6). This test produces small, insignificant effects on voter turnout in the Midwest Group but a significant 2.22 percentage point increase in turnout for the Mountain Group. Looking at my additional checks as a whole, the 2.74 percentage point increase in voter turnout from my variable of interest in the Mountain Group is significantly strengthened. Further checks in the Midwest Group suggest that the results from my main regression might not be as strong, and the single additional check in the Swing-State Group confirms the insignificance of the very small, positive effect of a mail-in/absentee policy in 2020 on voter turnout. I do not perform as many additional checks for the Swing-State Group because of a lack of data on Georgia and Wisconsin.

Figure 9 - Mountain Group: Voter Turnout Results (main regression and further checks)

Change in voter turnout (percentage points) - Mountain Group	(1) CVAP Turnout (main regression)	(2) Population Turnout	(3) CVAP Turnout (data used for column 4)	(4) Registered Voters Turnout	(5) CVAP Turnout (data used for columns 6 & 7)	(6) Total Ballots Cast Turnout	(7) Absentee / Mail-in Turnout
Mail-in / absentee policy in 2020	2.74***	2.70***	2.10**	6.27***	2.47***	2.22**	26.3***
	(0.749)	(0.479)	(0.90)	(0.889)	(0.774)	(0.868)	(1.36)
Total population (per 1000)	0.0542	-0.0188	0.969***	0.447**	0.0552	0.0621	0.177*
	(0.0568)	(0.0363)	(0.225)	(0.222)	(0.0573)	(0.0643)	(0.101)
Voted Democrat	1.58**	1.84***	-2.17	-1.61	1.72**	1.13	-0.117
	(0.774)	(0.495)	(1.88)	(1.86)	(0.836)	(0.938)	(1.47)
Senate race on the ballot	1.31***	0.611***	0.128	-5.02***	1.42***	1.36***	-0.503
	(0.284)	(0.182)	(0.758)	(0.748)	(0.300)	(0.336)	(0.527)
Year variables							
2012	-2.67***	-1.44***			-2.71***	-2.79***	1.66**
	(0.37)	(0.23)			(0.384)	(0.430)	(0.675)
2016	-3.02***	-1.37***			-2.85***	-2.80***	2.09***
	(0.42)	(0.27)			(0.443)	(0.497)	(0.779)
2020	3.47***	3.21***	7.6***	6.05***	3.76***	3.39***	19.36***
	(0.50)	(0.32)	(0.423)	(0.418)	(0.537)	(0.603)	(0.945)
Race/Ethnicity variables							
American Indian or Alaska Native Alone	-0.0411	-0.200	1.87*	-0.379	0.226	-0.581	-0.863
	(0.665)	(0.425)	(1.00)	(0.987)	(0.717)	(0.804)	(1.26)
American Indian or Alaska Native and Black or African American	-1.55	-1.77	6.66*	-1.25	-0.360	2.09	2.99
	(2.64)	(1.69)	(3.89)	(3.84)	(2.73)	(2.06)	(4.80)
American Indian or Alaska Native and White	0.441	0.185	2.12**	-0.193	0.914	-0.382	-0.114
	(0.689)	(0.441)	(1.03)	(1.01)	(0.750)	(0.841)	(1.32)
Asian Alone	1.04	0.170	2.45**	1.07	1.40*	0.467	1.24
	(0.736)	(0.470)	(0.999)	(0.986)	(0.779)	(0.873)	(1.37)
Asian and White	-0.349	0.401	1.99	0.893	-0.0894	-1.17	-4.39**
	(1.17)	(0.746)	(1.55)	(1.53)	(1.21)	(1.35)	(2.12)
Black or African American Alone	-0.422	-0.982**	1.38	-0.793	-0.299	-0.937	-1.58
	(0.761)	(0.486)	(1.08)	(1.06)	(0.811)	(0.910)	(1.43)
Black or African American and White	-0.659	-0.494	-0.671	-0.352	-0.507	-0.729	-1.87
	(1.12)	(0.716)	(1.56)	(1.54)	(1.18)	(1.32)	(2.07)
Hispanic or Latino	-0.0910	0.0114	1.91*	-0.159	0.189	-0.402	-0.789
	(0.684)	(0.438)	(1.06)	(1.05)	(0.739)	(0.829)	(1.30)
Native Hawaiian or Other Pacific Islander Alone	-0.429	-0.448	1.51	0.497	-0.161	-0.720	-0.157
	(1.19)	(0.759)	(1.43)	(1.42)	(1.22)	(1.37)	(2.15)
White Alone	0.454	0.0511	2.21**	-0.0750	0.752	0.0181	-0.527
	(0.656)	(0.419)	(0.971)	(0.958)	(0.711)	(0.798)	(1.25)
COVID-19 variables							
COVID-19 cases reported on September 3rd, 2020 (per 100)	0.178	0.222	-0.254	0.404	0.102	0.000714	-0.300
	(0.318)	(0.203)	(0.400)	(0.395)	(0.324)	(0.363)	(0.570)
COVID-19 deaths reported on September 3rd, 2020 (per 100)	-10.2	-9.76	4.41	2.90	-7.47	-4.46	12.1
	(13.3)	(8.47)	(19.5)	(19.2)	(13.4)	(15.0)	(23.5)
COVID-19 cases reported on October 3rd, 2020 (per 100)	-0.0137	-0.112	-0.111	-0.766*	0.0318	0.0473	1.05
	(0.389)	(0.249)	(0.441)	(0.435)	(0.398)	(0.447)	(0.0701)
COVID-19 deaths reported on October 3rd, 2020 (per 100)	10.9	14.3	15.5	2.67	11.3	10.0	-27.2
	(15.0)	(9.59)	(17.5)	(17.3)	(15.3)	(17.2)	(26.9)
COVID-19 cases reported on November 3rd, 2020 (election day) (per 100)	0.0205	0.0248	0.0591	0.0903	0.0177	0.0239	-0.222
	(0.110)	(0.0700)	(0.111)	(0.109)	(0.111)	(0.125)	(0.195)
COVID-19 deaths reported on November 3rd, 2020 (election day) (per 100)	-10.9	-9.91**	-11.6	7.76	-11.9	-13.0	-5.89
	(7.56)	(4.84)	(8.44)	(8.33)	(7.89)	(8.85)	(13.9)
R-squared	0.246	0.340	0.0037	0.0731	0.300	0.254	0.415
Observations	967	967	374	374	862	862	862

se in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01

Figure 10 - Midwest Group: Voter Turnout Results (main regression and further checks)

Change in voter turnout (percentage points) - Midwest Group	(1) CVAP Turnout (main regression)	(2) Population Turnout	(3) CVAP Turnout (data used for column 4)	(4) Registered Voters Turnout	(5) CVAP Turnout (data used for columns 6 & 7)	(6) Total Ballots Cast Turnout	(7) Absentee / Mail-in Turnout
Mail-in / absentee policy in 2020	1.64***	1.35***	0.836***	-1.27*	1.62***	1.14	-15.6***
	(0.351)	(0.242)	(0.309)	(0.665)	(0.534)	(0.793)	(1.50)
Total population (per 1000)	0.0472*	-0.0261	0.340***	0.0823	0.0846***	0.0901**	0.173**
	(0.0241)	(0.0166)	(0.0636)	(0.137)	(0.0275)	(0.0409)	(0.0774)
Voted Democrat	1.56***	1.13***	-2.87**	-0.309	1.34**	1.34	3.20**
	(0.451)	(0.311)	(1.13)	(2.42)	(0.548)	(0.815)	(1.53)
Senate race on the ballot	-0.0894	-0.0405	(correlated with 2020)	(correlated with 2020)	-0.380	0.429	3.50***
	(0.170)	(0.117)			(0.253)	(0.376)	(0.712)
Year variables							
2012	-2.57***	-1.42***			-3.79***	-4.89***	-4.98***
	(0.191)	(0.132)			(0.293)	(0.435)	(0.823)
2016	0.609***	1.51***			-1.19***	-0.950**	3.58***
	(0.226)	(0.0234)			(0.298)	(0.442)	(0.835)
2020	5.61***	5.32***	5.53***	8.45***	4.22***	3.26***	22.4***
	(0.356)	(0.246)	(0.241)	(0.519)	(0.411)	(0.611)	(1.15)
Race/Ethnicity variables							
American Indian or Alaska Native Alone	1.67*	1.28**	2.09	-1.56	1.64	2.12	4.21
	(0.882)	(0.609)	(1.50)	(3.22)	(1.46)	(2.18)	(0.712)
American Indian or Alaska Native and Black or African American	0.356	0.475	-0.360	-10.7	-0.558	0.806	6.23
	(1.89)	(1.30)	(3.33)	(7.15)	(2.84)	(4.22)	(7.93)
American Indian or Alaska Native and White	1.97**	1.25**	1.97	-1.38	2.28*	3.38*	3.21
	(0.808)	(0.557)	(1.34)	(2.84)	(1.35)	(2.01)	(3.77)
Asian Alone	1.35	0.987*	1.96	-1.63	1.73	2.16	4.67
	(0.865)	(0.597)	(1.32)	(2.84)	(1.41)	(2.10)	(3.95)
Asian and White	0.661	0.680	2.07	-4.30	1.59	0.939	4.37
	(1.11)	(0.769)	(1.65)	(3.55)	(1.68)	(2.52)	(4.79)
Black or African American Alone	1.56**	1.25**	1.64	-2.13	1.59	2.48	2.64
	(0.788)	(0.543)	(1.26)	(2.71)	(1.31)	(1.95)	(3.66)
Black or African American and White	0.833	0.541	2.14	-4.77	0.216	0.427	4.50
	(0.908)	(0.627)	(1.53)	(3.30)	(1.53)	(2.28)	(4.27)
Hispanic or Latino	1.11	0.937*	1.81	-2.63	1.80	3.22	3.46
	(0.817)	(0.563)	(1.31)	(2.81)	(1.36)	(2.02)	(3.79)
Native Hawaiian or Other Pacific Islander Alone	-0.129	0.420	3.61	-9.89*	0.806	2.48	4.75
	(1.35)	(0.931)	(2.53)	(5.43)	(2.87)	(4.27)	(8.01)
White Alone	1.85**	1.33**	2.25*	-1.52	1.98	2.85	3.19
	(0.789)	(0.544)	(1.28)	2.74)	(1.32)	(1.96)	(3.69)
COVID-19 variables							
COVID-19 cases reported on September 3rd, 2020 (per 100)	0.211	0.111	0.180	0.0360	0.297*	0.114	0.487
	(0.150)	(0.103)	(0.119)	(0.256)	(0.164)	(0.243)	(0.457)
COVID-19 deaths reported on September 3rd, 2020 (per 100)	-3.04	-0.642	-11.5***	-13.7	-9.87*	-7.70	-25.0*
	(4.39)	(3.03)	(3.98)	(8.55)	(5.42)	(8.05)	(15.1)
COVID-19 cases reported on October 3rd, 2020 (per 100)	-0.355**	-0.201*	-0.204	0.0746	-0.477***	-0.335	-0.796
	(0.151)	(0.104)	(0.128)	(0.275)	(0.179)	(0.266)	(0.500)
COVID-19 deaths reported on October 3rd, 2020 (per 100)	8.89	6.28	17.84***	18.3	15.4**	11.4	22.0
	(5.93)	(4.09)	(5.26)	(11.3)	(7.42)	(11.0)	(20.7)
COVID-19 cases reported on November 3rd, 2020 (election day) (per 100)	0.138*	0.0883	0.0593	-0.0514	0.119	0.103	0.144
	(0.0815)	(0.0562)	(0.0670)	(0.144)	(0.000956)	(0.142)	(0.267)
COVID-19 deaths reported on November 3rd, 2020 (election day) (per 100)	-6.12*	-5.73**	-7.62**	-6.03	-4.46	-1.69	6.71
	(3.40)	(2.34)	(2.99)	(6.43)	(4.16)	(6.18)	(11.6)
R-squared	0.151	0.0973	0.0321	0.0954	0.110	0.0752	0.202
Sample size	1068	1068	294	294	524	524	523
se in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01							

Figure 11 - Swing-State Group: Voter Turnout Results (main regression and further checks)

Change in voter turnout (percentage points) - Swing-State Group	(1) CVAP Turnout (main regression)	(2) Population Turnout
Mail-in / absentee policy in 2020	0.931 (0.73)	0.314 (0.407)
Total population (per 1000)	0.0489*** (0.0179)	-0.00121 (0.00989)
Voted Democrat	0.476 (0.485)	0.586** (0.270)
Senate race on the ballot	1.60*** (0.304)	0.783*** (0.169)
Year variables		
2012	-1.42*** (0.314)	0.217 (0.175)
2016	-2.94*** (0.348)	-0.107 (0.194)
2020	6.07*** (0.479)	6.6*** (0.266)
Race/Ethnicity variables		
American Indian or Alaska Native Alone	1.30 (0.871)	0.877* (0.485)
American Indian or Alaska Native and Black or African American	2.78* (1.52)	1.60* (0.846)
American Indian or Alaska Native and White	1.94** (0.957)	0.975* (0.533)
Asian Alone	1.72* (0.908)	0.744 (0.506)
Asian and White	2.69* (1.43)	1.57** (0.798)
Black or African American Alone	1.25 (0.831)	0.963** (0.463)
Black or African American and White	0.297 (1.10)	0.272 (0.610)
Hispanic or Latino	1.24 (0.943)	1.09** (0.469)
Native Hawaiian or Other Pacific Islander Alone	-1.17 (1.84)	0.342 (1.03)
White Alone	1.49* (0.828)	1.07** (0.461)
COVID-19 variables		
COVID-19 cases reported on September 3rd, 2020 (per 100)	0.137 (0.0955)	0.141*** (0.0531)
COVID-19 deaths reported on September 3rd, 2020 (per 100)	-6.44 (4.73)	-4.11 (2.63)
COVID-19 cases reported on October 3rd, 2020 (per 100)	-0.0439 (0.127)	-0.0538 (0.0708)
COVID-19 deaths reported on October 3rd, 2020 (per 100)	1.58 (6.96)	-1.40 (3.88)
COVID-19 cases reported on November 3rd, 2020 (election day) (per 100)	0.0357 (0.0522)	-0.0257 (0.0291)
COVID-19 deaths reported on November 3rd, 2020 (election day) (per 100)	1.92 (3.99)	2.75 (2.22)
R-squared	0.295	0.227
Sample size	924	924
se in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01		

DISCUSSION

My findings of significant positive effects of increased access to mail-in voting on voter turnout confirm what is seen in the literature. The increase in voter turnout seen from the possibility of universal mail-in voting in the Mountain Group is larger than the "modest" increases observed in the literature comparing states using difference-in-differences analyses, but the magnitude of the results of the Midwest Group align with the literature. However, the Mountain Group result confirms the literature on individual states' universal mail-in elections. It is possible that the fact that my results are larger than other cross-state difference-in-difference studies in the literature is impacted by the fact that I study Republican-heavy populations that have not previously been studied. The lack of significant results from the Swing-State Group does not match the literature, and this is probably due to the fact that Wisconsin and Georgia are not sufficient matches for the parallel trends assumption to hold, which is not surprising.

The robustness of the Mountain Group results suggests that Montana's COVID-19 policy of sending pre-paid mail-in ballots to registered voters was effective in increasing voter turnout, specifically absentee and mail-in turnout. It is possible that other states similar to Montana, perhaps the control states in the Mountain Group, would see similar effects on voter turnout if they were to implement a policy automatically mailing ballots to its voters. The lack of robustness of the Midwest Group results suggests that perhaps the control/treatment matches are not as strong, but it also suggests that perhaps the policies adopted by Kentucky and West Virginia were not as helpful to voters in reducing the "cost" of voting, in terms of voters' time, money, and energy. Perhaps with a more aggressive policy like Montana's, we would see larger, more robust effects in the Midwest Group states. Similar conclusions can be drawn about the Swing-State Group. It is possible that the lack of significant results for my variable of interest is due to a poor treatment/control match, but it is also possible that Wisconsin's policy of mailing absentee ballot applications to registered voters was not significantly impactful. I anticipate that the results of the Swing-State Group are a product of both explanations, perhaps with more emphasis on a poor treatment/control match, but I anticipate that the Midwest Group results are more due to weak policies.

Future research in this area could continue to study places where ballots are automatically mailed, but voters still have the option of dropping them off in person or even voting at the polls instead. Given the current political climate and the resistance of many Republican leaders to adopting more inclusive voting policies including universal mail-in voting, it is important that future research studies policies that increase voter access while also giving a variety of voting options. In the meantime, policy implications from my findings and the existing literature could involve increasing automatic receipt of mail-in ballots by voters. Further, the COVID-19 election policies could be made permanent in Montana. However, as I write this in May, 2021, some Republican

lawmakers in Montana are advocating for reducing voter access by implementing voter ID laws, annual review of voter registration, and removing election-day registration. Meanwhile, some Democrat lawmakers in Montana are advocating for state-paid postage on absentee ballots (as was the case in the November 2020 election) (Stein). Further research can also focus specifically on the effects of prepaid postage on absentee and mail-in ballots on voter turnout.

The increase in voter turnout seen from the increase in absentee/mail-in eligibility, online mail-in application, and early, in-person voting in the Midwest Group does not confirm nor contrast the existing literature because I cannot determine the effect of each change by itself, as they occurred collectively in West Virginia and Kentucky. Burden et al. (2014) finds that early voting is associated with lower turnout when implemented alone, but that is not how it was implemented for the November 2020 election. Because the general findings in the literature regarding election reform are mixed, the small, significant increase in voter turnout that I find from these policies is not surprising and does not necessarily contrast the literature. In order to aid policymakers, future research should continue to find ways to study voting policies separately until we have a stronger body of research on each type of election reform. In the meantime, if people are interested in increasing voter turnout, the COVID-19 election policies could be made permanent in Kentucky and West Virginia, or they could be adopted by Indiana, the control state in the Midwest Group. In fact, Kentucky recently passed a law expanding voting access. Their new law creates three days of early voting, establishes new voting centers, implements an online portal for registration and requesting absentee ballots, and permits voters to fix problems with their absentee ballots (Corasaniti). West Virginia created this type of online portal for the 2020 election, so perhaps Kentucky saw benefits from that policy and adopted it, as I am recommending.

There are a few limitations to my analysis. After the release of the 2020 census data, more specific CVAP data will be available that will allow some of the population estimates to be more accurate. Additionally, if CVAP data for educational attainment, median household income, or age were available prior to 2018, I would be able to control for those additional demographics, but those data were not reported until 2018. This increase in CVAP data available will be very helpful for future research using demographics. It is also possible that my results would differ if I began my analysis prior to the 2008 election if CVAP racial/ethnic data was reported prior to 2009. However, given the various additional tests I performed, I would expect that I would still have positive results, although the magnitude could change, or the effect may become insignificant.

Another limitation of my study is the "Trump Effect"—that is, did the fact of having Donald Trump on the presidential ballot impact voters differently in different states? Were the voters in states that passed COVID-19 voting policies already more likely to vote than voters in other states because of

Trump? I do my best to mitigate this by including year fixed effects and political leaning of counties, but this is certainly possible. Similarly, did the existence of the COVID-19 pandemic impact voters differently in different states that directly impacted their likelihood to vote in a way that I cannot account for? I attempted to mitigate this by including some COVID-19 case and death data, but it remains likely that the pandemic impacted my results in some way. If any states keep their COVID-19 election policies, we may be able to determine if my results are significantly skewed by either the Trump Effect or by COVID-19.

A more specific limitation to my study is the fact that the Montana governor ran as an incumbent in the 2016 election, but he did not run in the 2020 election. Because incumbents often see lower voter turnout (as evidenced by the negative coefficients on voter turnout from the election being in 2012, when Obama ran for President as the incumbent), it is possible that the jump in voter turnout that Montana experiences between 2016 and 2020 is impacted by the lack of an incumbent governor on the 2020 ballot. However, the 2008 Montana gubernatorial election also contained an incumbent while the 2012 election did not, and we do not see a jump in voter turnout between those years, we actually see a large decrease, as shown in Figure 6. Therefore, I do not think that incumbent governor status impacts my results enough for me to question whether the effects I find are due to Montana's election policy.

I believe my results are indicative of a positive relationship between policies that increase access to mail-in and absentee voting and voter turnout, particularly within the Mountain Group in which the states most closely match each other. Additionally, because I find significant, positive effects on voter turnout from increased access to mail-in and absentee voting in both the Mountain Group and Midwest Group, both of which are comprised of strongly Republican states, my results may be indicative of a larger relationship for other Republican states as well, but my results may not hold for Democratic states because of inherent differences in the voting population.

A few other states implemented COVID-related election policies similar to those in the states in my study. Alabama, South Carolina, Missouri, and Massachusetts implemented policies similar to West Virginia and Kentucky, where eligibility requirements for absentee and mail-in voting were suspended, and all voters could vote by mail if they chose to in the 2020 general election. Arkansas, New York, and New Hampshire had similar policies where any voter was allowed to use COVID-19 concerns as an excuse for absentee voting, which essentially allowed anyone to vote absentee. Similar to the Montana policy, California, New Jersey, Vermont, and Nevada sent mail-in ballots to all voters automatically. Exactly like the Montana policy, New Mexico authorized each county to send mail-in ballots to all voters automatically if the county chose to. In a combination of the Wisconsin and West Virginia/Kentucky policies, Connecticut sent mail-in ballot applications automatically to all voters, and absentee/mail-in eligibility was given to all voters. Like Wisconsin, Delaware sent mail-in ballot applications automatically to all voters. Illinois adopted the

same policy as well, and so did Maryland, Nebraska, Rhode Island, and Michigan. A few states also provided prepaid postage on mail-in ballots (like Montana did) including Pennsylvania, Virginia, and South Carolina (Ballotpedia).

Because of the significant, robust, positive effects on voter turnout I find in the Mountain Group, I would expect similar results in California, New Jersey, Vermont, Nevada, and New Mexico where policies very similar to the Montana policy were adopted. However, because these states are Democratic states, it is possible that the results would not match those in Montana. As there were not robust results from the Midwest Group or Swing-State Group, I would not expect significant results from the states that had similar policies as West Virginia, Kentucky, and Wisconsin because these policies do not seem like they were as impactful.

CITATIONS

"2020 Election Administration and Voting Survey." United States Election Assistance Commission. https://eavsportal.com/.

Ballotpedia. November 19, 2020. https://ballotpedia.org/Main_Page.

Barber, Michael and John B. Holbein. "The participatory and partisan impacts of mandatory vote-by-mail." Science Advances. 26 Aug 2020: Vol. 6, no. 35, eabc7685 DOI: 10.1126/sciadv.abc7685.

Boyd, Richard W. "The Effects of Primaries and Statewide Races on Voter Turnout." The Journal of Politics 51, no. 3 (1989): 730-39. Accessed March 18, 2021. http://www.jstor.org/stable/2131504.

Burden, Barry C., David T. Canon, Kenneth R. Mayer, and Donald P. Moynihan. "Election Laws, Mobilization, and Turnout: The Unanticipated Consequences of Election Reform." American Journal of Political Science 58, no. 1 (2014): 95-109. Accessed March 25, 2021. http://www.jstor.org/stable/24363471.

Corasaniti, Nick. "Why Kentucky Just Became the Only Red State to Expand Voting Rights." The New York Times, April 7, 2021. https://www.nytimes.com/2021/04/07/us/politics/kentucky-voting-law.html.

"Fall Precipitation Averages for Every State." Current Results: weather and science facts, 2021. https://www.currentresults.com/Weather/US/average-state-precipitation-in-fall.php.

"Fall Temperature Averages for Every State." Current Results: weather and science facts, 2021. https://www.currentresults.com/Weather/US/average-state-temperatures-in-fall.php.

Florio, Gwen. "46 Montana counties file mail ballot plans." Missoulian, September 4, 2020. https://missoulian.com/news/state-and-regional/govt-and-politics/46-

montana-counties-file-mail-ballot-plans/article_b14cfead-9bbc-5601-95c3-d69c0a0563f0.html.
Giammo, Joseph D., and Brian J. Brox. "Reducing the Costs of Participation: Are States Getting a Return on Early Voting?" Political Research Quarterly 63, no. 2 (2010): 295-303. Accessed March 25, 2021. http://www.jstor.org/stable/20721491.
Gronke, Paul, Eva Galanes-Rosenbaum, and Peter A. Miller. "Early Voting and Turnout." PS: Political Science and Politics 40, no. 4 (2007): 639-45. Accessed March 25, 2021. http://www.jstor.org/stable/20452043.
Grummel, John A. "Morality Politics, Direct Democracy, and Turnout." State Politics & Policy Quarterly 8, no. 3 (2008): 282-92. Accessed January 11, 2021. http://www.jstor.org/stable/40421614.
Holbein, John B., and D. Sunshine Hillygus. "Making Young Voters: The Impact of Preregistration on Youth Turnout." American Journal of Political Science 60, no. 2 (2016): 364-82. Accessed March 25, 2021. http://www.jstor.org/stable/24877627.
Idaho Secretary of State. https://sos.idaho.gov/.
Indiana Secretary of State. https://www.in.gov/sos/.
KARP, JEFFREY A., and SUSAN A. BANDUCCI. "Absentee Voting, Mobilization, and Participation." American Politics Research 29, no. 2 (March 2001): 183–95. https://doi.org/10.1177/1532673X01029002003.
Kousser, Thad, and Megan Mullin. "Does Voting by Mail Increase Participation? Using Matching to Analyze a Natural Experiment." Political Analysis 15, no. 4 (2007): 428-45. http://www.jstor.org/stable/25791905.
Larocca, Roger, and John S. Klemanski. "U.S. State Election Reform and Turnout in Presidential Elections." State Politics & Policy Quarterly, vol. 11, no. 1, 2011, pp. 76–101. JSTOR, www.jstor.org/stable/41575814
McDonald, Michael P. United States Elections Project. http://www.electproject.org/.
Montana Secretary of State. https://sosmt.gov/.
New York Times. https://www.nytimes.com/.
North Dakota Secretary of State. https://sos.nd.gov/.
Office of the Secretary of State. "Absentee Ballot Fraud Scheme in WV Referred to U.S. Attorney for Prosecution." West Virginia Secretary of State, May 21, 2020. https://sos.wv.gov/news/Pages/05-21-2020-A.aspx
Our Staff. "Montana will move toward a vote-by-mail November election." The Fulcrum, August 7, 2020. https://thefulcrum.us/voting/montana-vote-by-Mail.
Percival, Garrick L., Mary Currin-Percival, Shaun Bowler, and Henk Van Der Kolk. "Taxing, Spending, and Voting: Voter Turnout Rates in Statewide Elections in Comparative Perspective." State & Local

Government Review 39, no. 3 (2007): 131-43. Accessed March 18, 2021. http://www.jstor.org/stable/25130415.

Richey, Sean. "Voting by Mail: Turnout and Institutional Reform in Oregon." Social Science Quarterly, vol. 89, no. 4, 2008, pp. 902–915. JSTOR, www.jstor.org/stable/42956352.

South Dakota Secretary of State. https://sdsos.gov/.

SOUTHWELL, PRISCILLA L., and JUSTIN I. BURCHETT. "The Effect of All-Mail Elections on Voter Turnout." American Politics Quarterly 28, no. 1 (January 2000): 72–79. https://doi.org/10.1177/1532673X00028001004.

Southwell, Priscilla L. (2009) Analysis of the turnout effects of vote by mail elections, 1980–2007, The Social Science Journal, 46:1, 211-216, DOI: 10.1016/j.soscij.2008.12.010

Southwell, Priscilla L. (2010), Voting Behavior in Vote-by-Mail Elections. Analyses of Social Issues and Public Policy, 10: 106-115. https://doi.org/10.1111/j.1530-2415.2010.01218.x

Springer, Melanie J. "State Electoral Institutions and Voter Turnout In Presidential Elections, 1920–2000." State Politics & Policy Quarterly 12, no. 3 (2012): 252-83. Accessed March 18, 2021. http://www.jstor.org/stable/24710885.

Stein, Perrin. "State lawmakers debate changes to Montana's elections." Bozeman Daily Chronicle, March 4, 2021. https://www.bozemandailychronicle.com/news/mtleg/state-lawmakers-debate-changes-to-montanas-elections/article_e9ac0683-503b-515d-aaac-8cc7bc5f6fa5.html.

Thompson, Daniel M., Jennifer A. Wu, Jesse Yoder, & Andrew B. Hall. "Universal vote-by-mail has no impact on partisan turnout or vote share." Proceedings of the National Academy of Sciences. Jun 2020, 117 (25) 14052-14056; DOI: 10.1073/pnas.2007249117 https://www.pnas.org/content/117/25/14052.short.

United States Census Bureau. https://data.census.gov/cedsci/.

Vasilogambros, Matt, & Lindsey Van Ness. "States Expanded Voting Access for the Pandemic. The Changes Might Stick." Stateline, November 6, 2020. https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2020/11/06/states-expanded-voting-access-for-the-pandemic-the-changes-might-stick.

"Voting and Elections Collection." CQ Press. https://library.cqpress.com/elections/.

West Virginia Secretary of State. https://sos.wv.gov/Pages/default.aspx.

WHSV Newsroom. "Absentee ballot applications in the mail for all West Virginia voters." Gray Television Inc., April 20, 2020. https://www.whsv.com/content/news/Absentee-ballot-applications-in-the-mail-for-all-West-Virginia-voters-569480661.html.

Wolfinger, Raymond E., Benjamin Highton, and Megan Mullin. "How Postregistration Laws Affect the Turnout of Citizens Registered to Vote." State Politics & Policy Quarterly 5, no. 1 (2005): 1-23. Accessed March 25, 2021. http://www.jstor.org/stable/40421535.

Wyoming Secretary of State. https://sos.wyo.gov/default.aspx.