2018 Update to the EPI Methodology

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1 About the MIT Election and Data Science Lab (MEDSL)

By applying scientific principles to how elections are studied and administered, MEDSL aims to improve the democratic experience for all U.S. voters. MEDSL was founded at MIT in 2017 by Charles Stewart III. We are a dedicated group of social scientists and researchers who are committed to improving democracy

in the United States by promoting the application of scientific principles to the understanding of election administration. The 2018 EPI was supported by the efforts of Charles Stewart III, Claire DeSoi, Jack Williams, and John Curiel at MEDSL. Previous versions were also supported by Stephen Pettigrew. MEDSL would like to thank the Pew Charitable Trusts for continuing to support the EPI along with generous funding from the William and Flora Hewlett Foundation, Democracy Fund, and the provost of MIT.

2 Introduction

The Elections Performance Index (EPI) is the first objective measure created to comprehensively assess how election administration functions in each state. This document seeks to add updates to the EPI, not reiterate the methodology of the index. To read the full methodology of the EPI (which includes information about previous years, data sources, missing values, and scaling), please see the 2016 methodology document.

3 Updates to the 2018 EPI

3.1 Data Quality

While EPI indicators are pulled from reliable and consistent sources, changes happen to those sources. The Election Administration and Voting Survey has been a reliable source for years and the quality has greatly improved since the beginning of the EPI in 2008. What is worth mentioning is that compared to previous years of the EPI, 2018 was the first year to see a decrease in the scores for EAVS completeness. This does not change the reliability and consistency of the indicators from the EAVS, but does point to a break in the indicator improving in each consecutive year.

3.2 Changes to Indicators

Three changes were made to the calculation of scores for the EPI in 2018.

First, states that have more than 50 percent of ballots cast by mail are no longer penalized for sending ballots to all registered voters. Consequently, states with all mail voting or over 50% by-mail voting (Arizona, California, Colorado, Oregon, Utah, and Washington), were set to “Not Applicable” for this indicator. To read more about this change see the section on mail ballots unreturned.

Second, states with same-day registration that do not use provisional ballots or with no registration (Idaho, Minnesota, New Hampshire, North Dakota, and Vermont) were set to zero provisional ballots cast and provisional ballots rejected.

To read more about these changes, please see the section on provisional ballots cast.

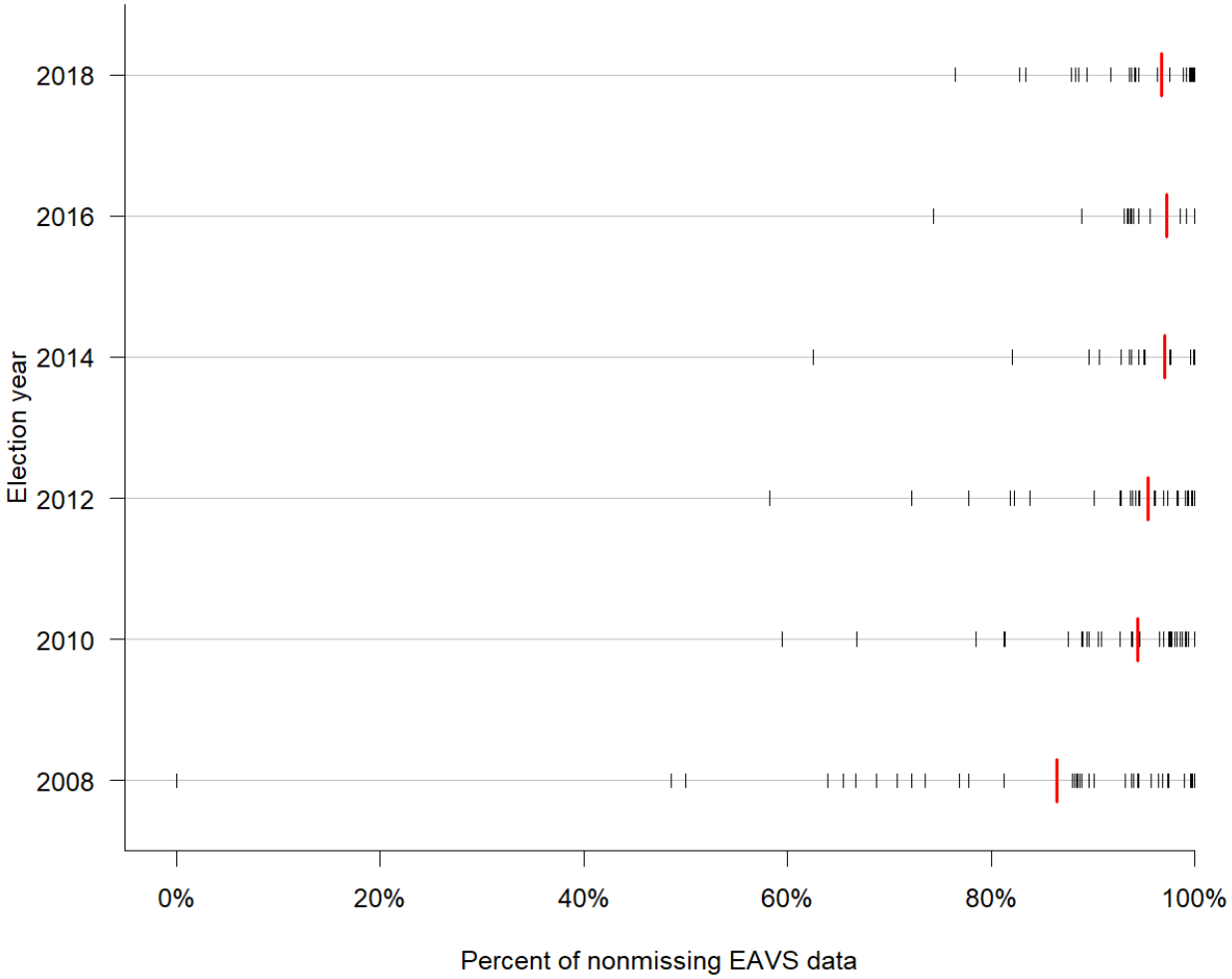
Last, wait times were calculated with a different source than the Survey of American Elections (SPAE) in 2018. This year, wait times are calculated from the Cooperative Congressional Election Study (CCES), a large survey that asks questions about elections. To read more about these changes, please see the section on voting wait time.

4 Indicators in detail

4.1 Data completeness

Data completeness assesses states according the number of counties that report core statistics describing the workload associated with conducting elections. This indicator is based on the degree to which counties in a state reported 18 important metrics from the EAVS. Scores for this indicator are based on a low score of 0 percent from New York in 2008 to a high of 100 percent. For the complete list of variables and information on the data source used to calculate completeness rates, see the 2016 EPI Methodology Document.

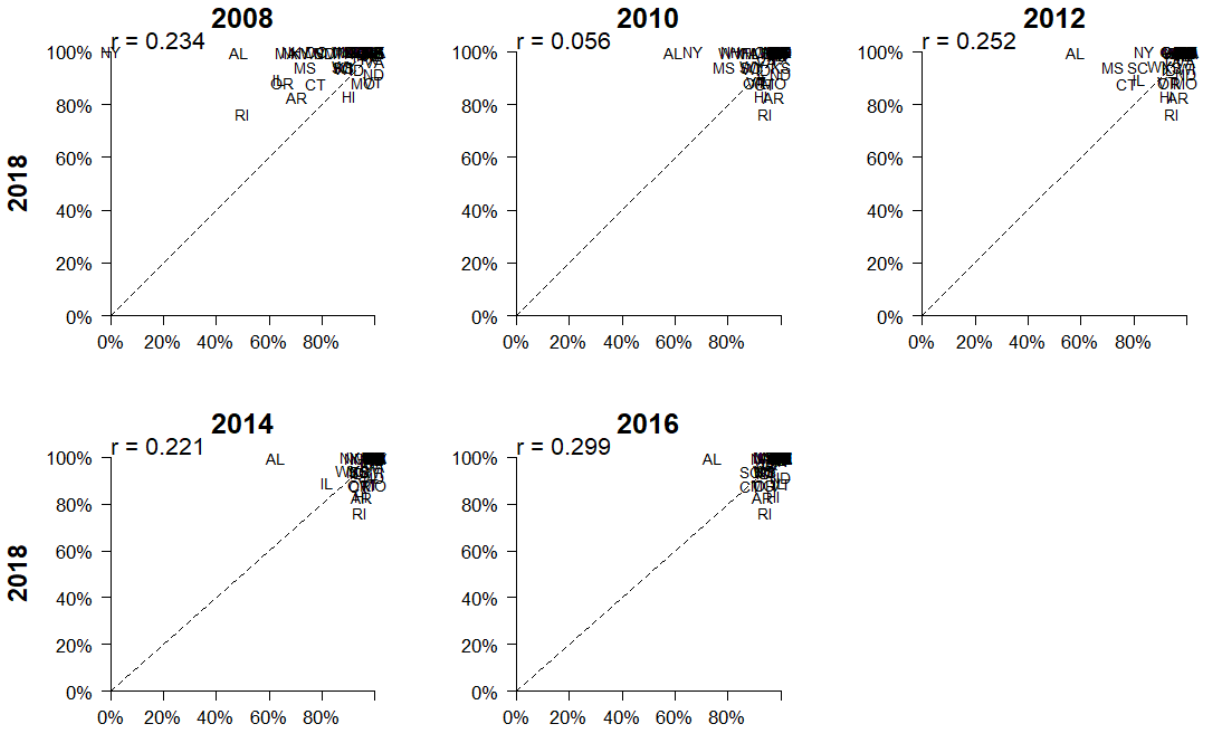
4.1.1 Figure 2: EAVS Data Completeness



As illustrated by Figure 2, which plots completeness rates for all the states from 2008 to 2016 the completeness rate of the 18 EAVS items has risen in each successive release of the index, from an average of 86 percent in 2008 to 96 percent in 2018. Between 2014-2018, there was actually a small decrease of around 1% for the first time in the history of the EPI (The smaller vertical lines in the figure indicate the completeness rate of a particular state. The larger, red lines indicate the average for the year.). Alabama had the biggest jump in completeness scores between 2014 and 2018, as it went from reporting 63 percent to nearly 100 percent of the items.

Figure 3 compares completeness rates across the five other election cycles covered by the EPI through the 2018 election. The dashed lines in the figure indicate where observations for the two years are equal.

4.1.2 Figure 3: Percent Completeness on Key EAVS Questions



4.2 Disability or illness-related voting problems

This indicator is based on responses to the Voting and Registration Supplement of the Current Population Survey, which is conducted by the U.S. Census Bureau. Specifically, it is based on responses to item PES4, which asks of those who reported not voting: "What was the main reason you did not vote?" Table 7 shows the proportion of voters who reported various reasons for not voting.

4.2.1 Table 7: Reasons for Not Voting

Main reason (you/name) did not vote?	2010	2014	2018
Illness or disability (own or family's)	11.7%	11.2%	13.2%
Out of town or away from home	9.5%	9.8%	9.5%
Forgot to vote (or send in absentee ballot)	8.3%	8.5%	5.7%
Not interested, felt my vote wouldn't make a difference	16.9%	16.9%	16.0%
Too busy, conflicting work or school schedule	27.4%	29.1%	27.7%
Transportation problems	2.5%	2.2%	3.0%
Didn't like candidates or campaign issues	8.9%	7.8%	5.5%
Registration problems (or absentee)	3.4%	2.5%	3.2%
Bad weather conditions	0.2%	0.4%	0.6%
Inconvenient hours or polling place; lines too long	2.1%	2.4%	3.4%
Other	9.3%	9.4%	12.1%

Figure 4 illustrates how this indicator changes as we narrow the respondents from the complete nonvoting population to the nonvoting population with disabilities, pooling together data from federal elections between 2010 and 2018. The x-axis represents the indicator as it is currently constructed for the EPI. The y-axis represents the indicator as it would be constructed if we used only the self-identified population with disabilities in the data set.

4.2.2 Figure 4: Disability Indicator with All Nonvoters Versus Only Disabled Nonvoters

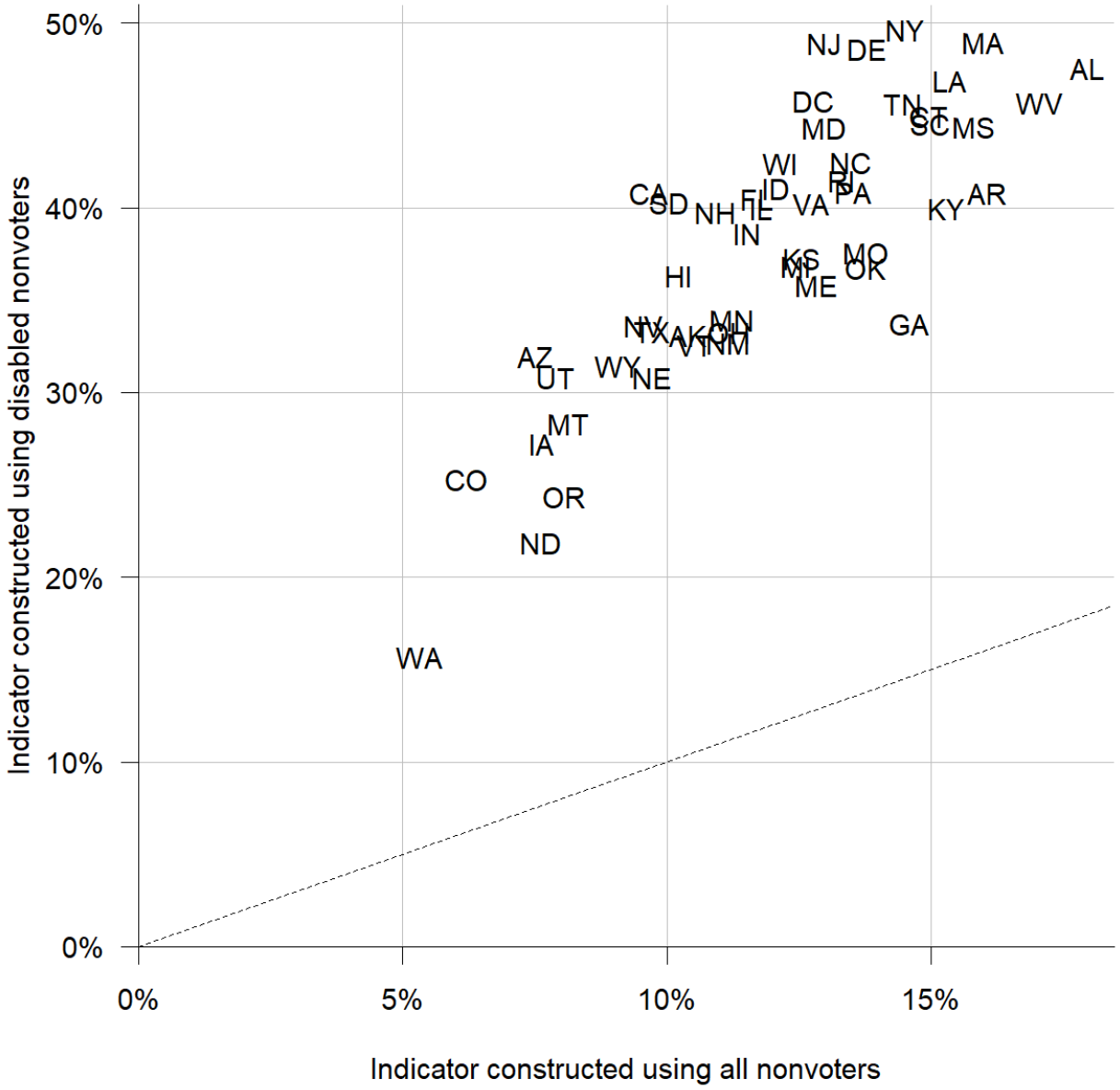
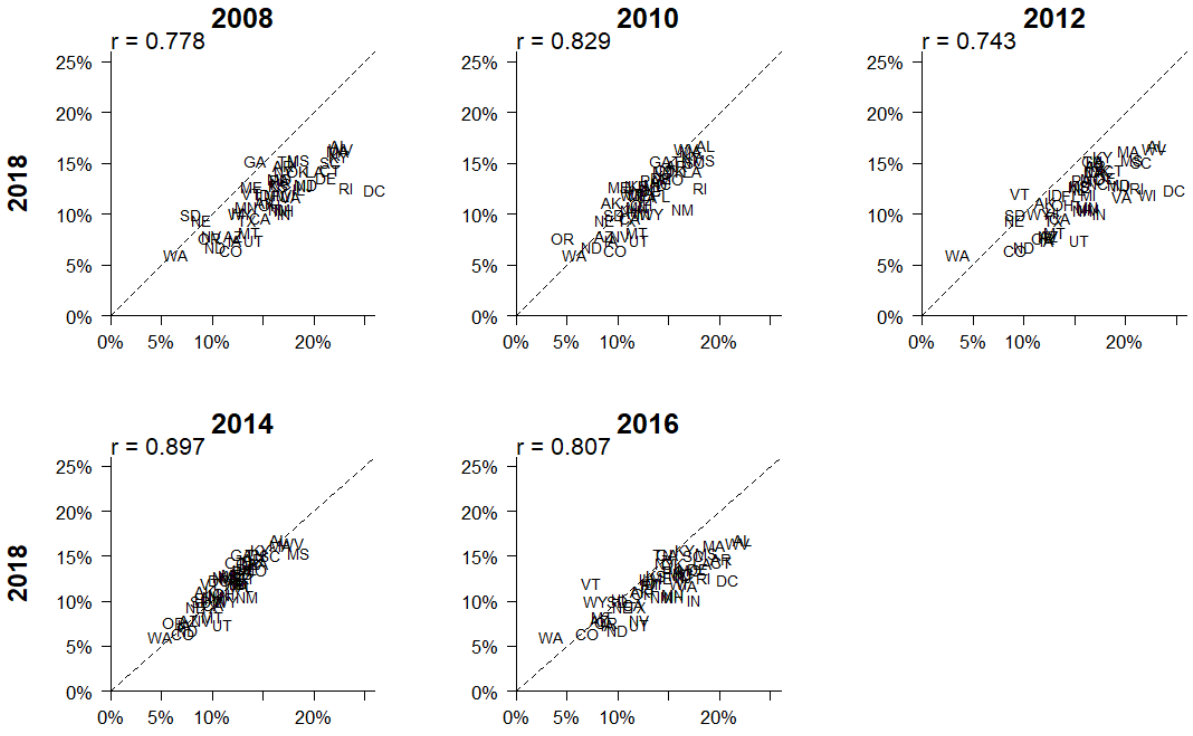


Figure 5 compares the correlations across this measure for each year of the EPI to 2018. When we updated this indicator to include data from the 2018 election, the average state value remained at 11.8 percent, the same level as 2014. Rates for this indicator are made more stable by combining midterm and presidential election data across several elections years. For the more information on this indicator, the stability of rates across time, or how it is calculated, see the 2016 Methodology Document.

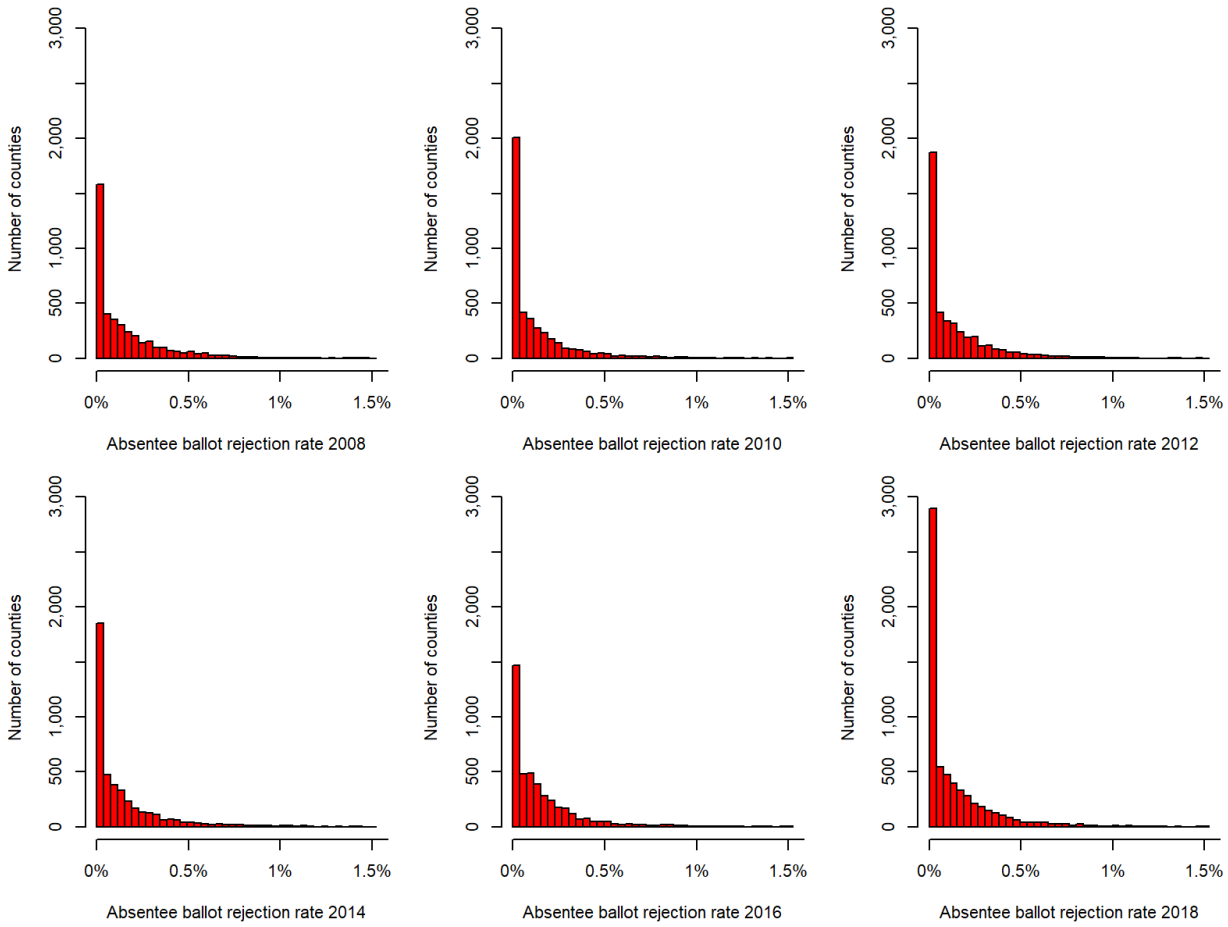
4.2.3 Figure 5: Percent of Nonvoters Due to Disability or Illness



4.3 Mail ballots rejected

This indicator is intended to measure the percent of absentee ballots rejected of all voters in a particular election. As in previous years, reports of mail ballot rejected remained low, around .2 to .3 percent for most counties. In past election cycles, states that reported mail ballot rejection numbers for fewer than 85 percent of their counties were not scored on this indicator. Unlike previous years and for the first time in the history of the EPI, all states provided enough data that we were able to calculate the domestic mail ballot rejection rates for all states. Unfortunately, one state underreported domestic mail ballot rejection, which has been set to “Incomplete” for that state in 2018 EPI.

4.3.1 Figure 6: Domestic Mail Ballot Rejection Rates by County



The raw data exhibit what is known as a pronounced “right skew”; that is, most counties have very low rejection rates, while a few have relatively high rates. This is illustrated in Figure 6, with histograms that show the distribution of rejection rates for each county for which we have the relevant data.

4.3.2 Figure 7: Logged Domestic Mail Ballot Rejection Rates by County

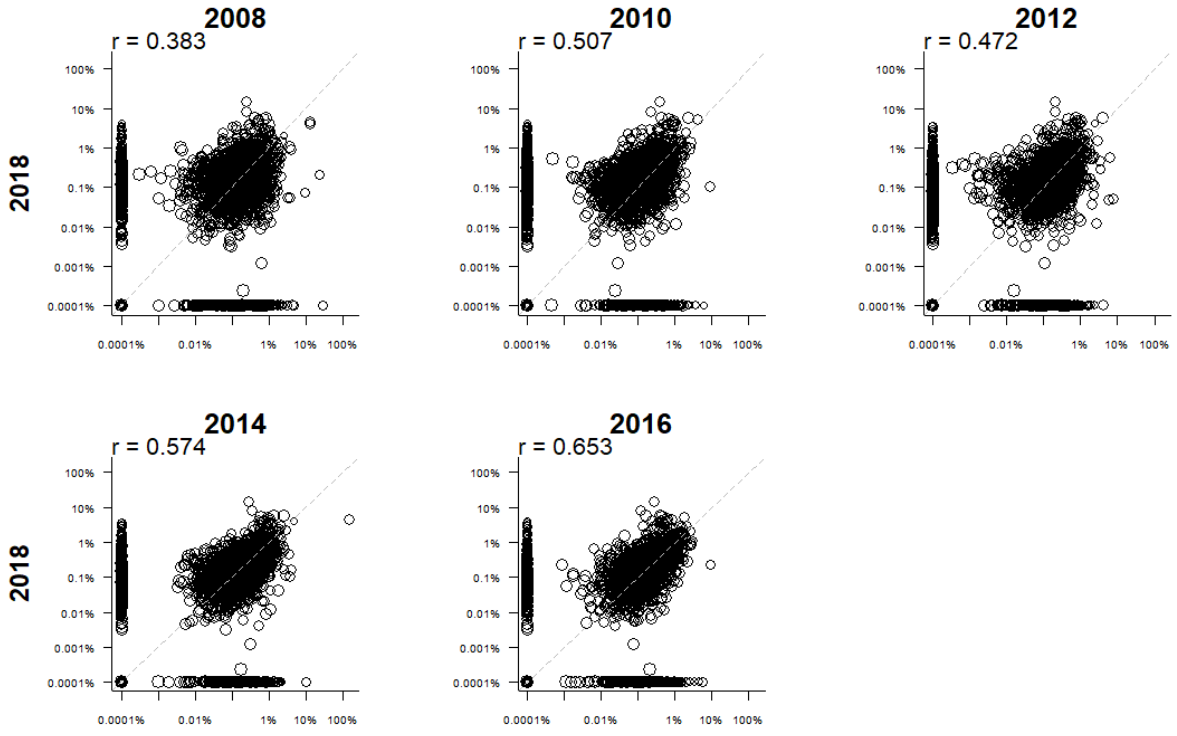


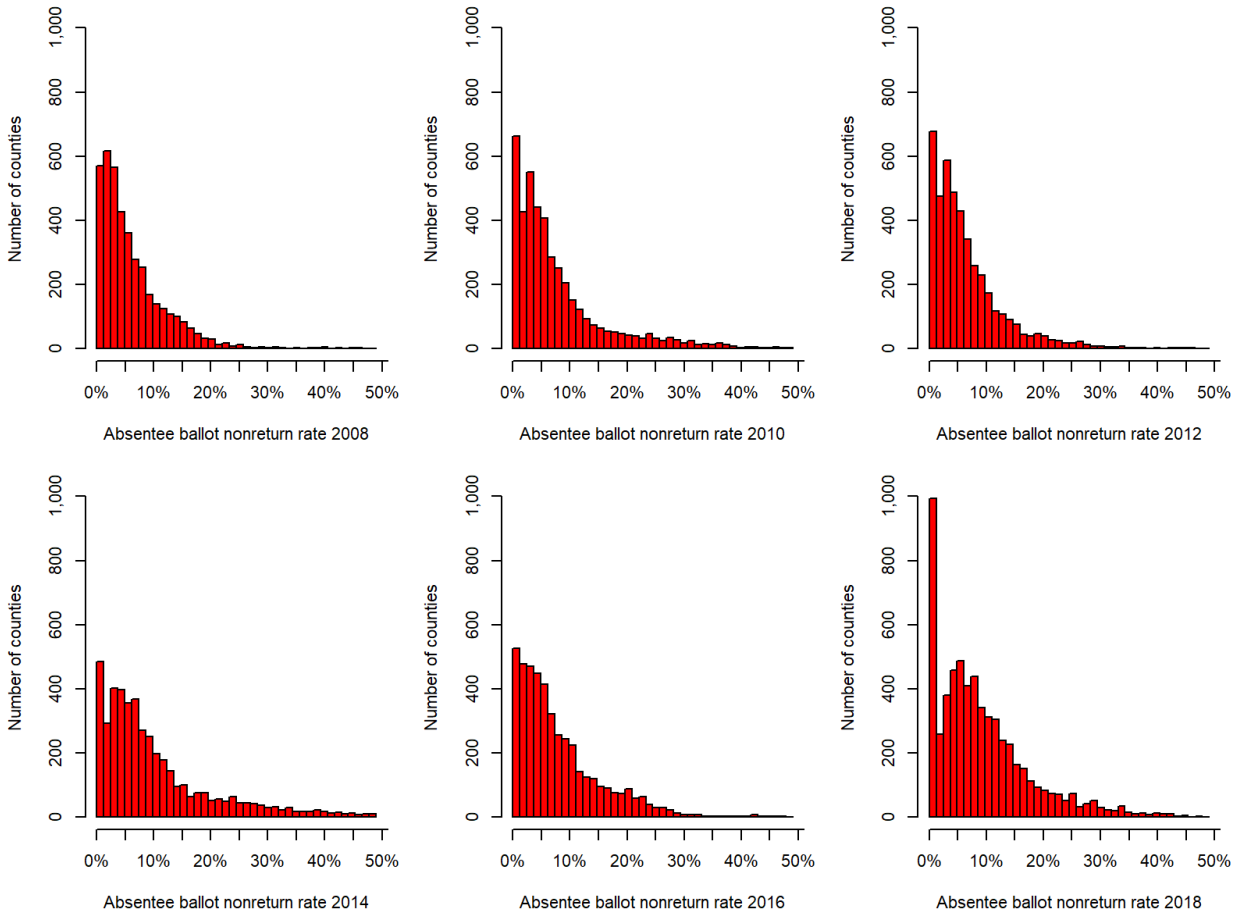
Figure 7 illustrates, that for counties that reported the necessary data, rejection rates in 2018 are similar to other EPI years when they are compared. The Pearson correlation coefficients across these figures range from 0.383 to 0.653. While the county-level data is noisier, it becomes more consistent when we aggregate to the state level. Figure 8 shows the same correlations aggregated to the state level. For more information on this indicator, how it is calculated, or the stability of rates across time, see the 2016 EPI Methodology Document.

4.3.3 Figure 8: Logged Mail Ballot Rejection Rates by State

4.4 Mail ballots unreturned

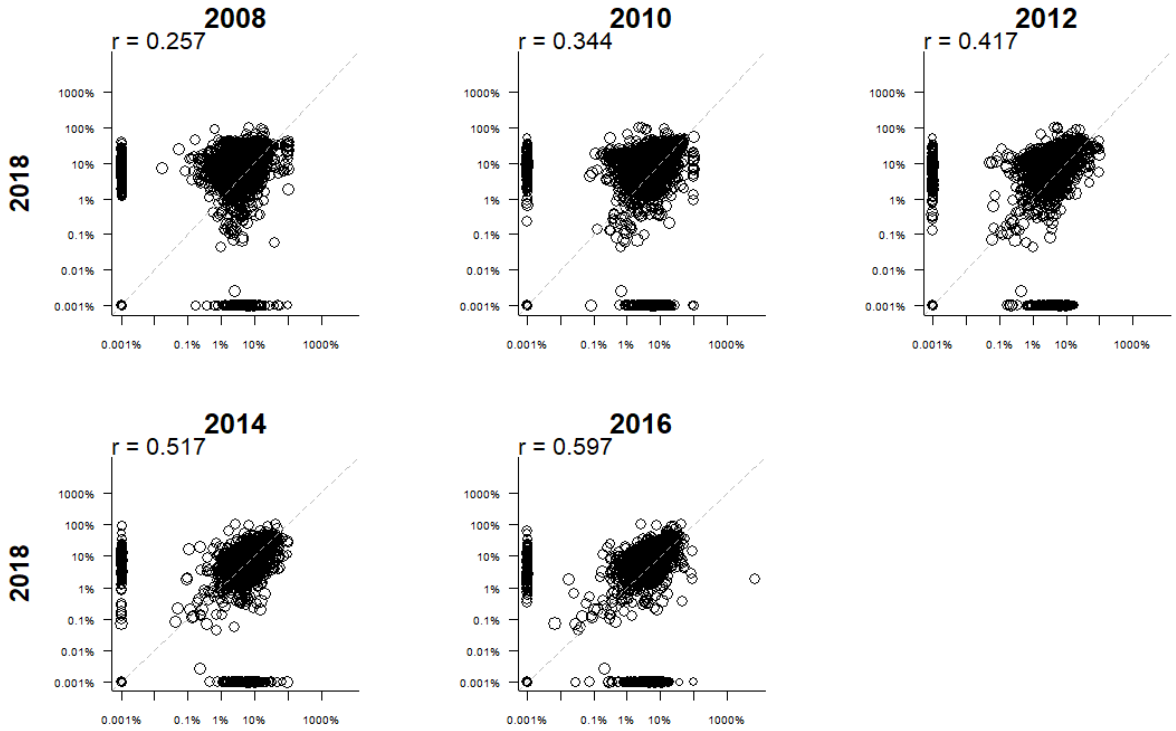
This indicator measures the percent of ballots not returned of all ballots transmitted in a given election. The raw data exhibit what is known as a pronounced "right skew"; that is, most counties have very low nonreturn rates, while a few have relatively high rates. This is illustrated in Figure 9: histograms that show the distribution of nonreturn rates for all EPI years for each county for which we have the relevant data. Like 2016, all states provided enough data to calculate the mail ballots unreturned indicator. Unlike 2016 and for the first time in EPI history, states with all mail voting or over 50% by-mail voting (Arizona, California, Colorado, Oregon, Utah, and Washington), were set to "Not Applicable" for this indicator.

4.4.1 Figure 9: Domestic Mail Mallot Nonreturn Rates by County



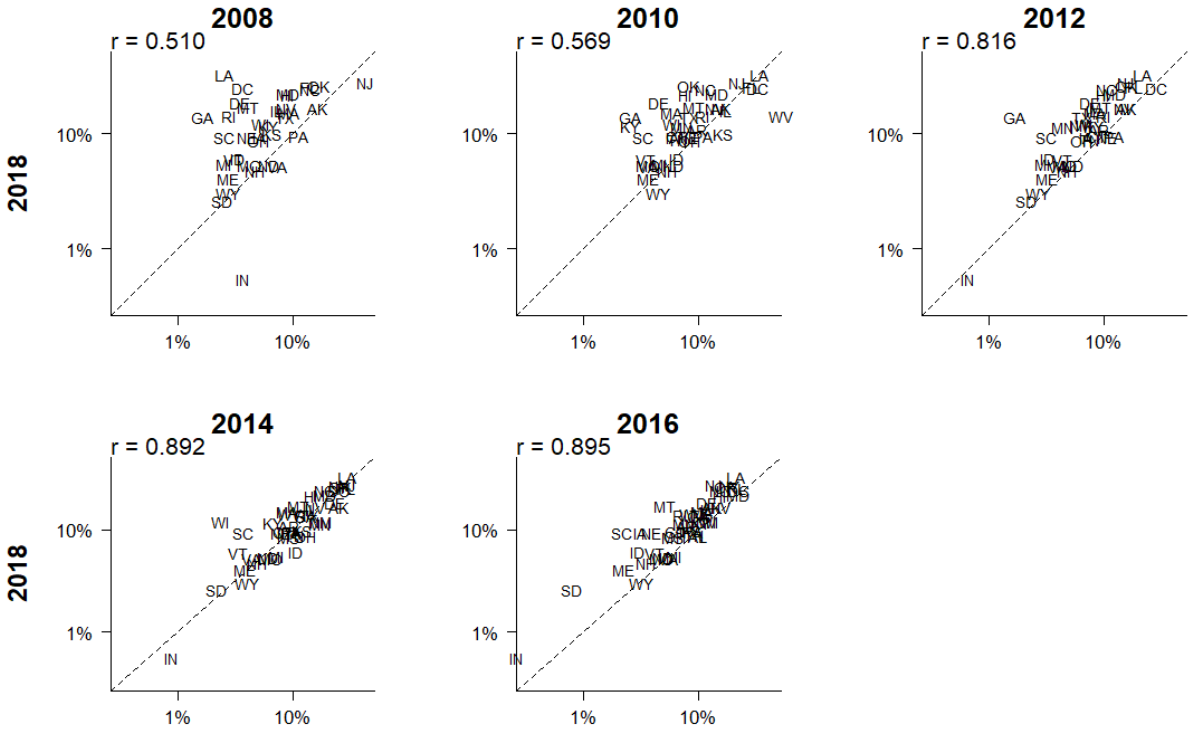
As Figure 10 illustrates, for counties that reported the necessary data, the nonreturn rates are similar when they are compared across years. The Pearson correlation coefficients, which measure the degree of similarity across these two election cycles, ranges between 0.257 and 0.597.

4.4.2 Figure 10: Logged Domestic Mail Ballot Nonreturn Rates by County‘



As with the measure calculated at the county level, the indicator calculated at the state level is stable across years, as seen in Figure 11. The average state value of the indicator ranges from 8% in 2008 to 15% in 2014. The average state value decreased by nearly 2% from 2014 to 13% of mail ballots unreturned in 2018.

4.4.3 Figure 11: Logged Domestic Mail Ballot Nonreturn Rates by State



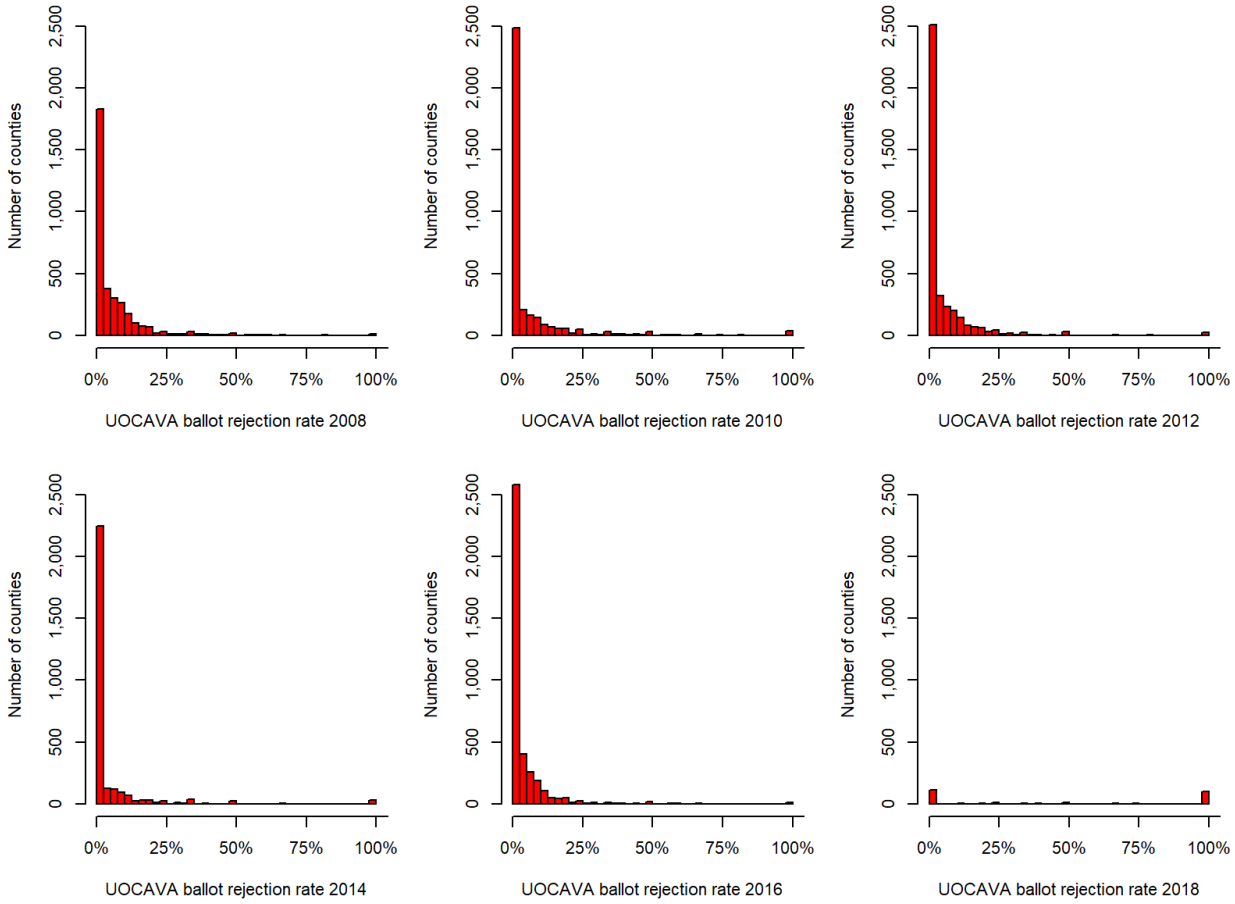
4.5 Military and overseas ballots rejected

In recent years, increasing attention has been paid to the ability of overseas voters, especially those serving in the U.S. military, to vote in federal elections. Military and overseas voters face a number of obstacles to voting. A measure of these obstacles is the fraction of ballots rejected of those returned by military and overseas voters.

By far, the principal reason ballots sent to UOCAVA voters are rejected is that the ballots are received by election officials after the deadline for counting. Despite the passage of the MOVE Act, the percentage of UOCAVA ballots rejected because they missed the deadline has not obviously declined. Within the period covered by the EPI, the average percentage of ballots rejected for missing the deadline has been 43.7% (2008), 32.4% (2010), 40.4% (2012), 48.9% (2014), 44.4% (2016) and 46.3% (2018).

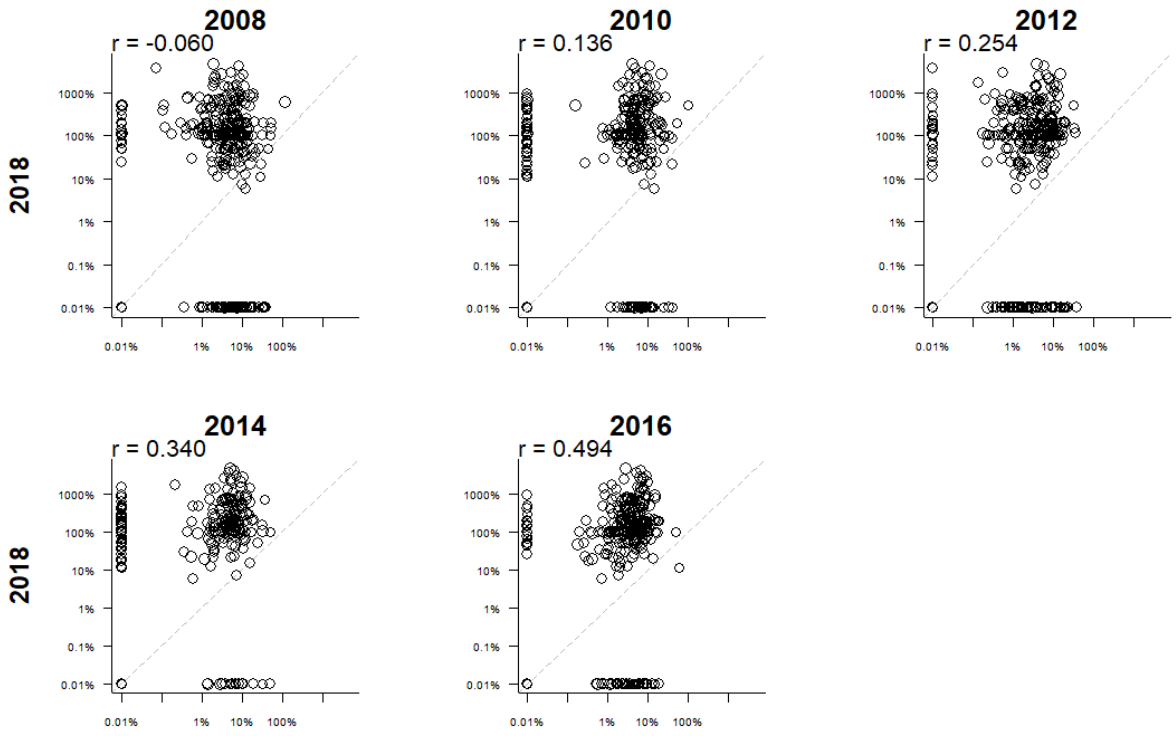
Because of missing data, it was not possible to compute UOCAVA ballot rejection rates in five states in 2018. Table 19 reports states with missing values for this indicator from 2008 to 2018.

4.5.1 Figure 12: UOCAVA Ballot Rejection Rates by County



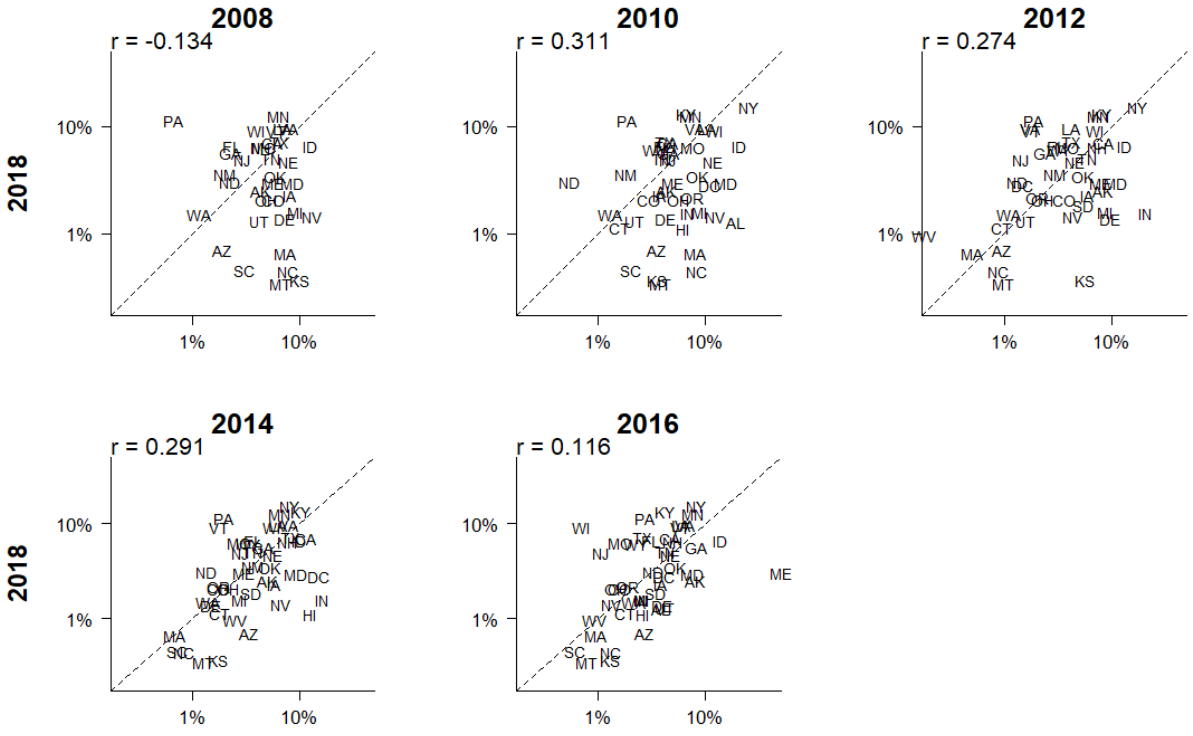
We begin by comparing domestic mail ballot rejection rates, measured at the county level, for all EPI years. The raw data exhibit what is known as a pronounced "right skew"; that is, most counties have very low rejection rates, while a few have relatively high rates. This is illustrated in Figure 12: histograms that show the distribution of rejection rates for each county for which we have the relevant data.

4.5.2 Figure 13: Logged UOCAVA Ballot Rejection Rates by County



As Figure 13 illustrates, for counties that reported the data necessary to calculate rejection rates, rates are weakly correlated across years. The Pearson correlation coefficient, which measures the degree of similarity across these two election cycles, ranges between -0.060 and 0.494.

4.5.3 Figure 14: Logged UOCAVA Ballot Rejection Rates by State

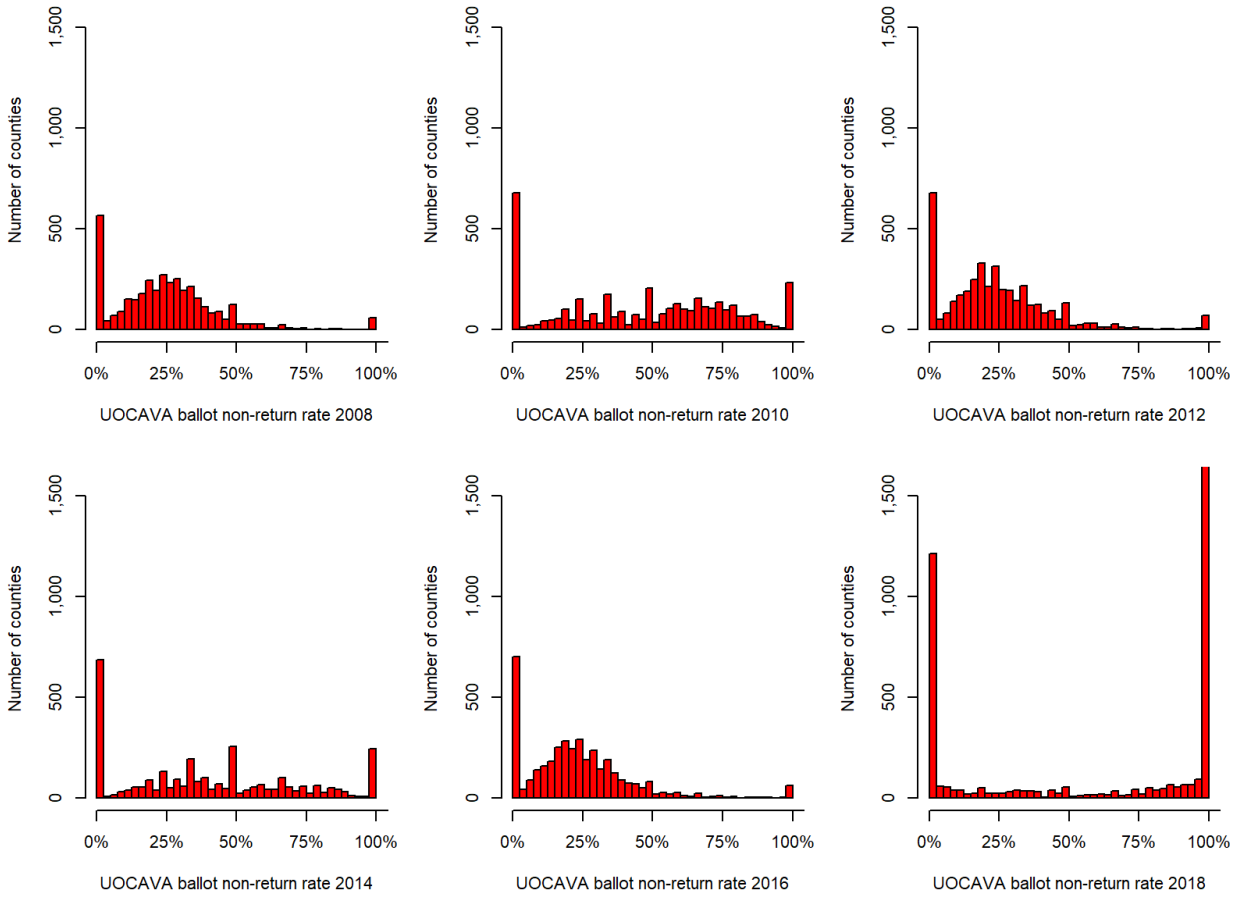


As seen in Figure 14, the UOCAVA rejection rate measure exhibits a relatively low interyear correlation at the state level, much as it does at the local level. We suspect that these low to moderate interyear correlations are due to a combination of unsettled law and unsettled record keeping.

4.6 Military and overseas ballots unreturned

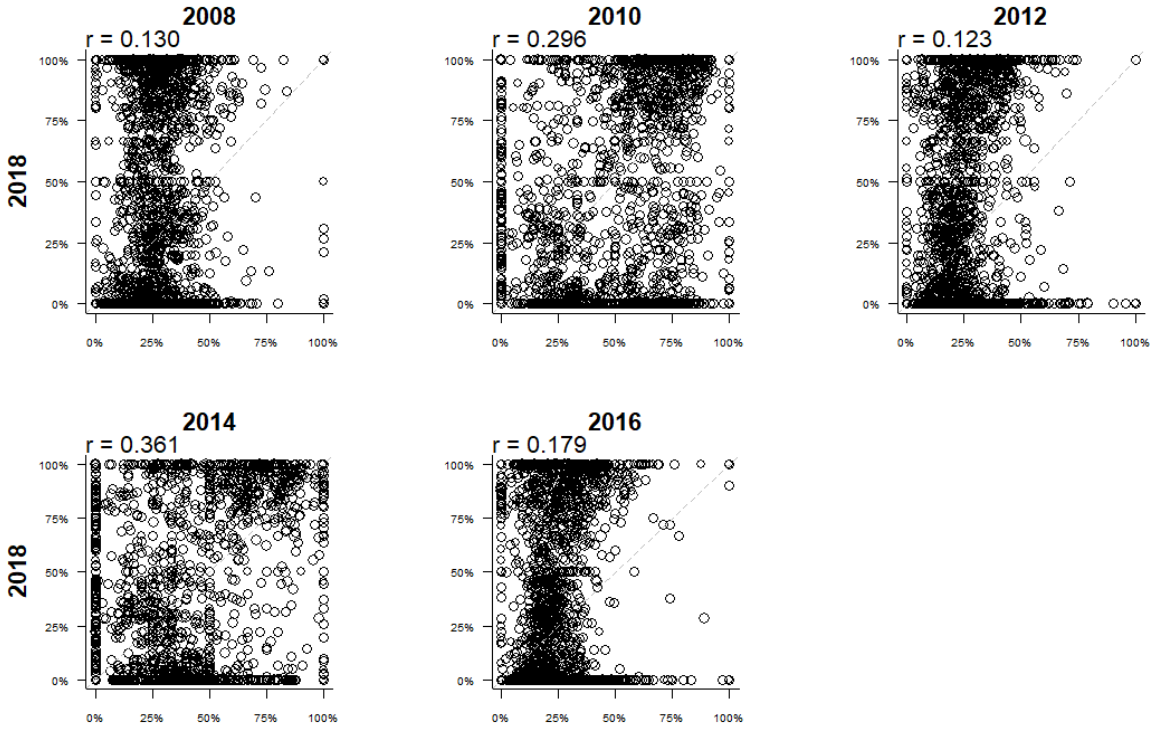
Similar to domestic mail ballots unreturned, this indicator measures the percent of ballots not returned of all ballots transmitted, but this indicator only measures military and overseas ballots. Because of missing data, it was not possible to compute UOCAVA ballot nonreturn rates for eight states in 2018. Table 22 reports states with missing values for this indicator from 2008 to 2018. Comparing UOCAVA ballot nonreturn rates, the histograms in Figure 15 show the distribution of nonreturn rates for each county for which we have the relevant data for all EPI years. Although there are outliers for all years, on the whole the data series does not exhibit the pronounced skew that is evident with many indicators based on EAVS data.

4.6.1 Figure 15: UOCAVA Ballot Nonreturn Rates by County



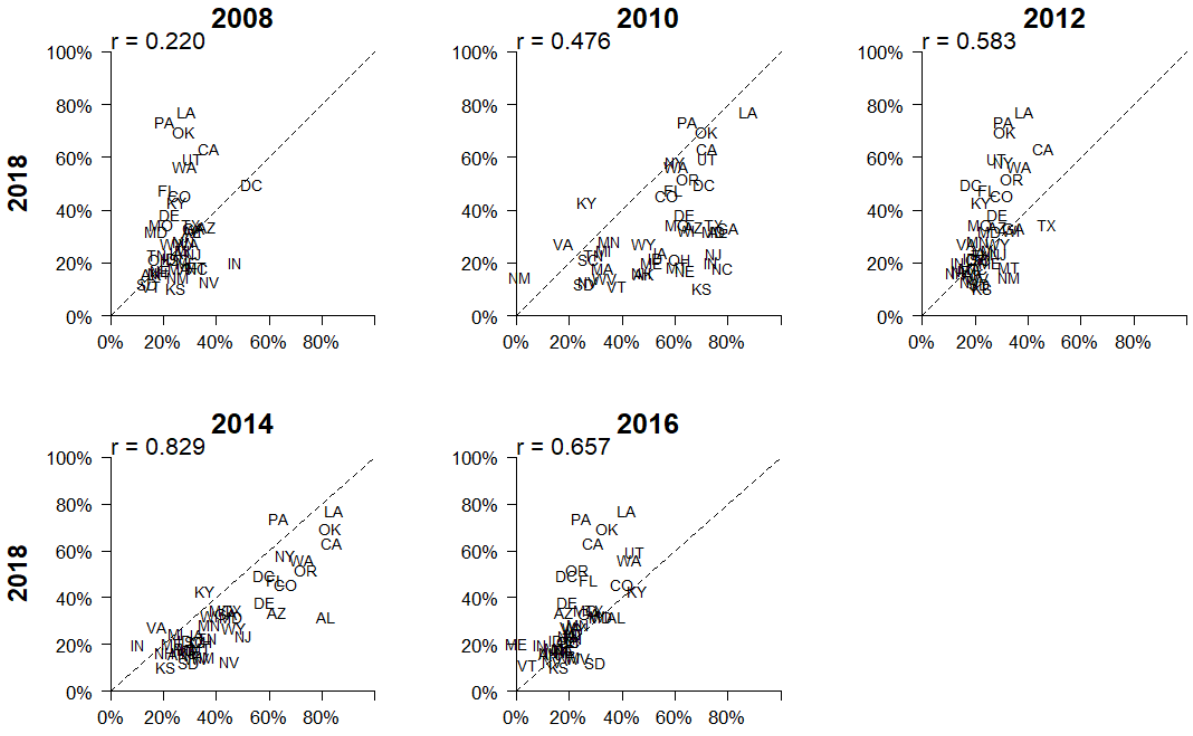
The scatterplots in Figure 16 show the nonreturn rates measured at the county level from all EPI years and plotted against 2018. Because the data do not exhibit a pronounced skew, we use the raw (rather than logged) rates. For counties that reported the data necessary to calculate nonreturn rates, there is a weak relationship between nonreturn rates when we compare other years to 2018. The Pearson correlation coefficients comparing previous elections to 2018 range between 0.123 and 0.361.

4.6.2 Figure 16: UOCAVA Ballot Nonreturn Rates by County



The EPI reports UOCAVA ballot nonreturn rates at the state level. Figure 17 compares nonreturn rates at the state level in 2008, 2010, 2012, 2014, 2016, and 2018. As with the measures calculated at the county level, the indicator calculated at the state level is not very stable when we compare across years.

4.6.3 Figure 17: UOCAVA Ballot Nonreturn Rates by State



4.7 Online registration available

Increasingly, business transactions have migrated online, which has resulted in savings for businesses and greater convenience for consumers. Voter registration, in a sense, is a similar type of transaction; one which can benefit both election offices and voters by moving online. Compared with traditional paper processes, online registration has been shown to save money, increase the accuracy of voter lists, and streamline the registration process. In addition to reducing state expenditures, online tools can also be more convenient for voters.

We consider a state as having online voter registration if it offers the option of an entirely paperless registration process that is instituted in time for eligible voters to register online for the corresponding election. If the state has a tool that helps a voter fill out the form online but he or she still has to print it (and possibly physically sign it) before returning it to a local election office, this does not constitute online voter registration. States that have an e-signature program that electronically populates the voter registration record from information on file with a different state agency (for example, Department of Motor Vehicles) also are not included. Beginning with the 2014 release of the index, we give states that allow voter registrations to be updated online "half credit" for having online registration. North Dakota, the only state without voter registration, is not given a score for this indicator.

4.8 Postelection audit required

This measure is based simply on the binary coding of whether the state requires a postelection audit of vote totals. The requirement may come from statute, administrative rule, or administrative directive. The primary data source is the Statutory Overview portion of the EAC's Election Administration and Voting Survey, supplemented by direct communication with state election offices. It is not based on a further coding of the specific provisions in state law, nor is it based on the findings of the audits themselves.

4.9 Provisional ballots cast

This indicator is meant to measure the percent of all ballots cast that were cast provisionally, where voter eligibility status was under dispute. Because of missing data, it was not possible to compute provisional participation rates in seven states in 2018. Table 25 reports states with missing values for this indicator from 2008 to 2018. Further, states with same-day registration that do not use provisional ballots or with no registration (Idaho, Minnesota, New Hampshire, North Dakota, and Vermont) were set to zero provisional ballots cast.

We begin by comparing provisional ballot usage rates, measured at the county level. The data are right-skewed; most counties have very low usage rates, while a few have relatively high rates. This is illustrated in Figure 18, which shows the distribution of usage rates for each county for which we have the relevant data.

4.9.1 Figure 18: Provisional Ballot Participation Rates by County

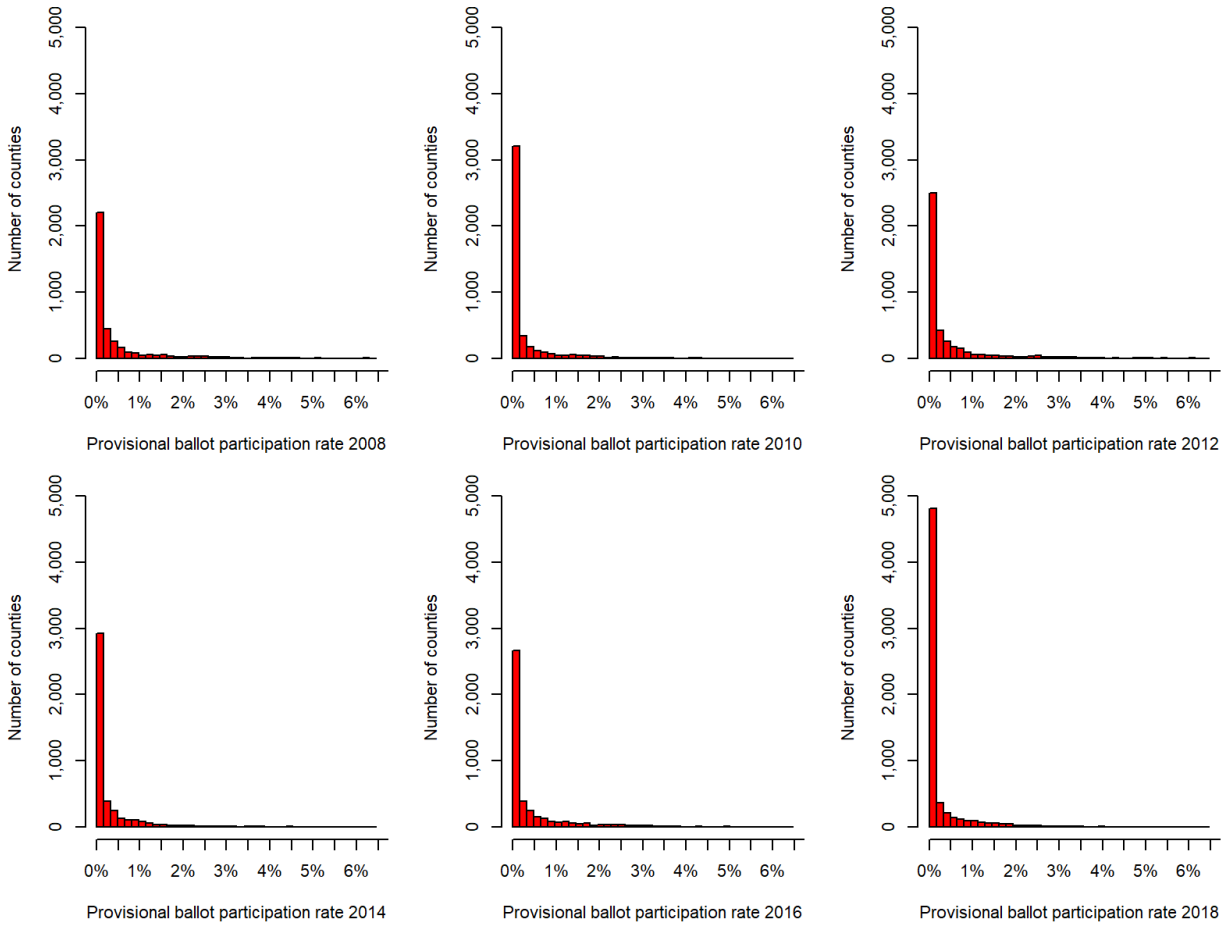
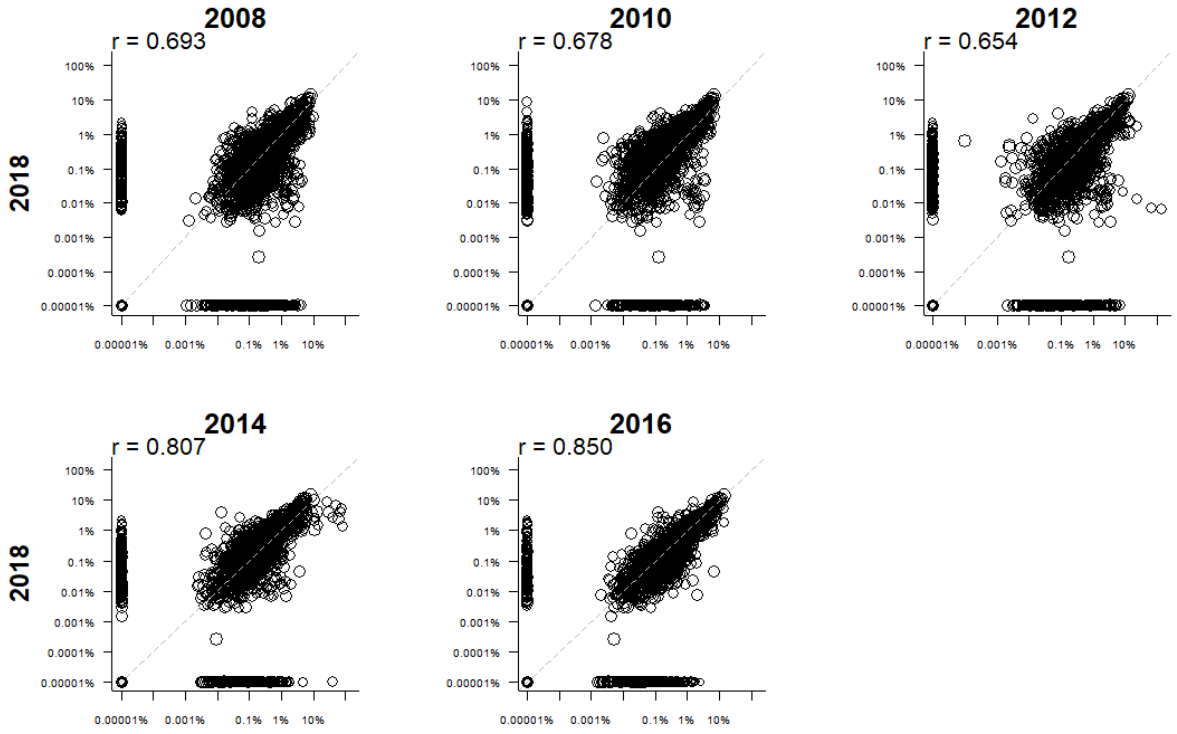
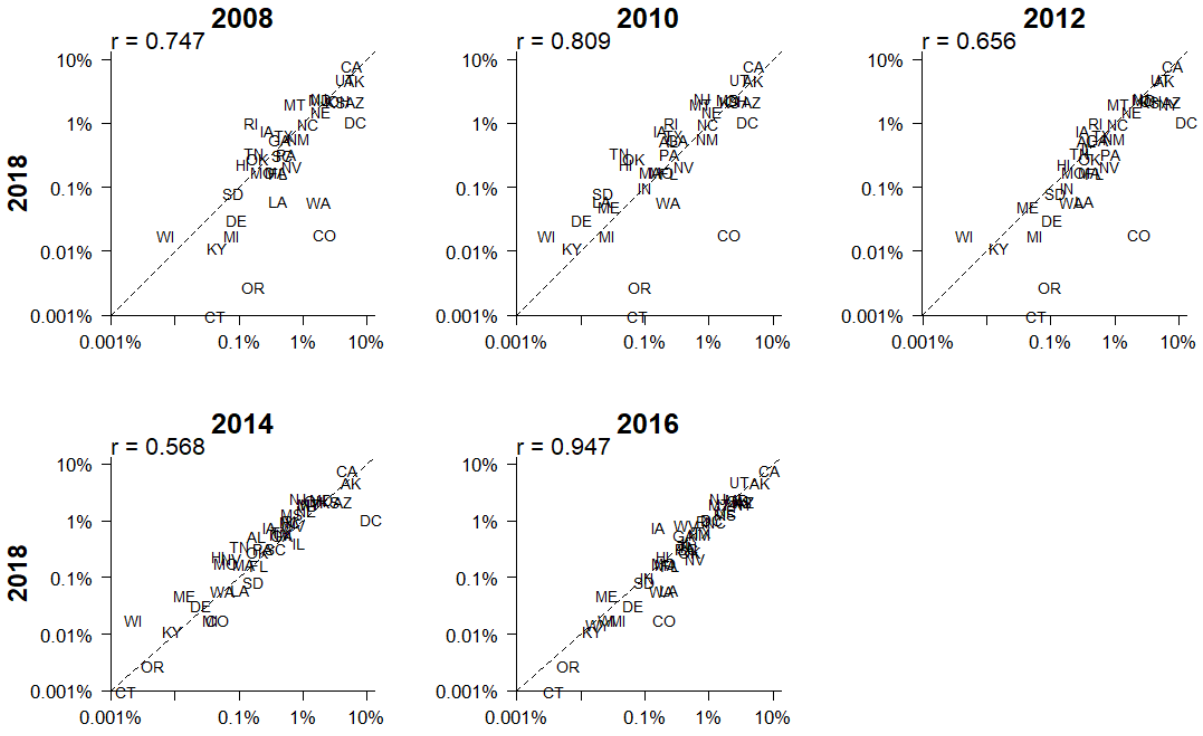


Figure 19 illustrates, for counties that reported the necessary data, that usage rates are very similar when compared to 2018. The Pearson correlation coefficient, which measures the degree of similarity across these five election cycles to the 2018 election, ranges between 0.654 and 0.850. When we aggregate provisional ballot usage rates to the state level, as seen in Figure 20, we see that the degree of similarity remains relatively high with Pearson scores ranging from 0.568 to 0.947.

4.9.2 Figure 19: Provisional Ballot Participation Rates by County



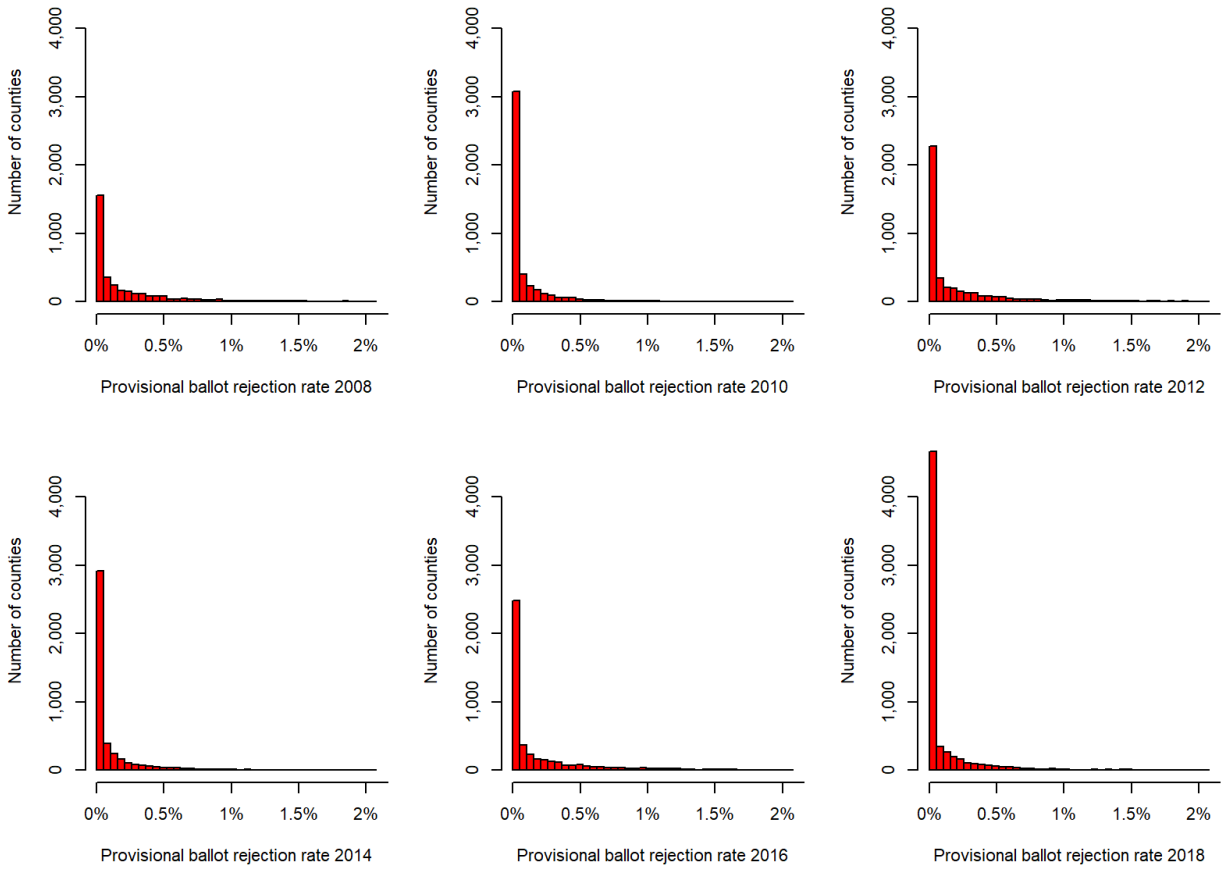
4.9.3 Figure 20: Provisional Ballot Participation Rates by State



4.10 Provisional ballots rejected

This indicator is meant to measure the total number of provisional ballots rejected of all participants in an election. As provisional ballots already make up a miniscule small part of all ballots cast, the number of provisional ballots rejected are going to be low for most counties. Further, states with same-day registration that do not use provisional ballots or with no registration (Idaho, Minnesota, New Hampshire, North Dakota, and Vermont) were set to zero provisional ballots rejected.

4.10.1 Figure 21: Provisional Ballot Rejection Rates by County



The raw data exhibit a pronounced right skew, with most counties having very low rejection rates and a few counties having relatively high rejection rates. This is illustrated in Figure 21, which shows the distribution of rejection rates for 2008, 2010, 2012, 2014, 2016, and 2018 for each U.S. county for which we have the relevant data.

4.10.2 Figure 22: Provisional Ballot Rejection Rates by County

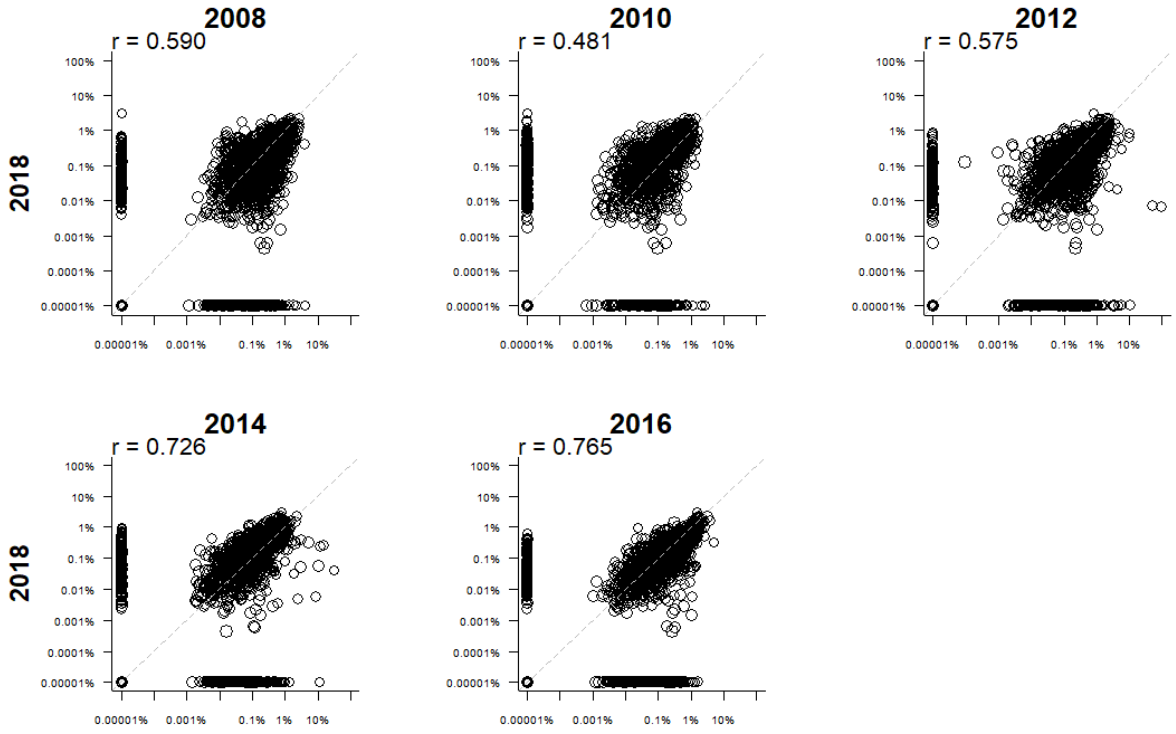
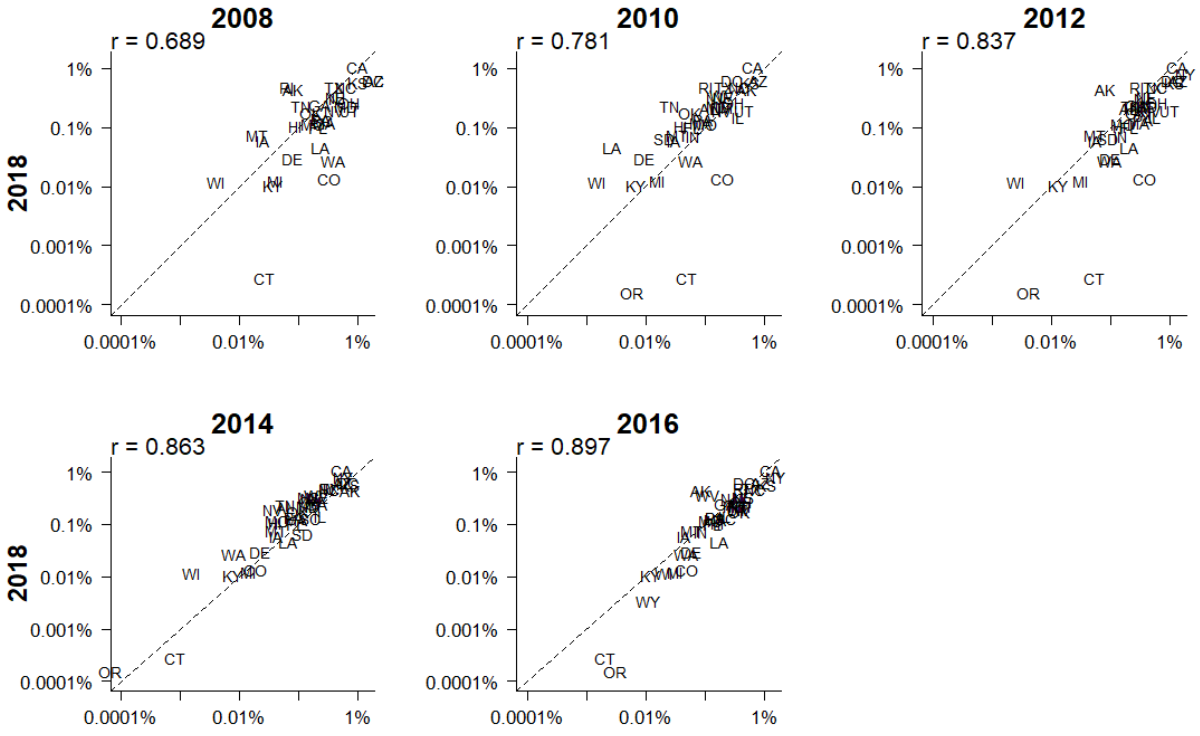


Figure 22 illustrates, for counties that reported the necessary data, that usage rates are somewhat similar when compared to 2018. The Pearson correlation coefficient, which measures the degree of similarity across these five election cycles to the 2018 election, ranges between 0.481 and 0.765. When we aggregate provisional ballot usage rates to the state level, as seen in Figure 23, we see that the higher degree of similarity with Pearson scores ranging from 0.689 to 0.897.

4.10.3 Figure 23: Provisional Ballot Rejection Rates by State



4.11 Registration or absentee ballot problems

This indicator is based on responses to the Voting and Registration Supplement of the Current Population Survey, which is conducted by the U.S. Census Bureau. Specifically, it is based on responses to item PES4, which asks of those who reported not voting: "What was the main reason you did not vote?" Table 7 shows the proportion of voters who reported various reasons for not voting.

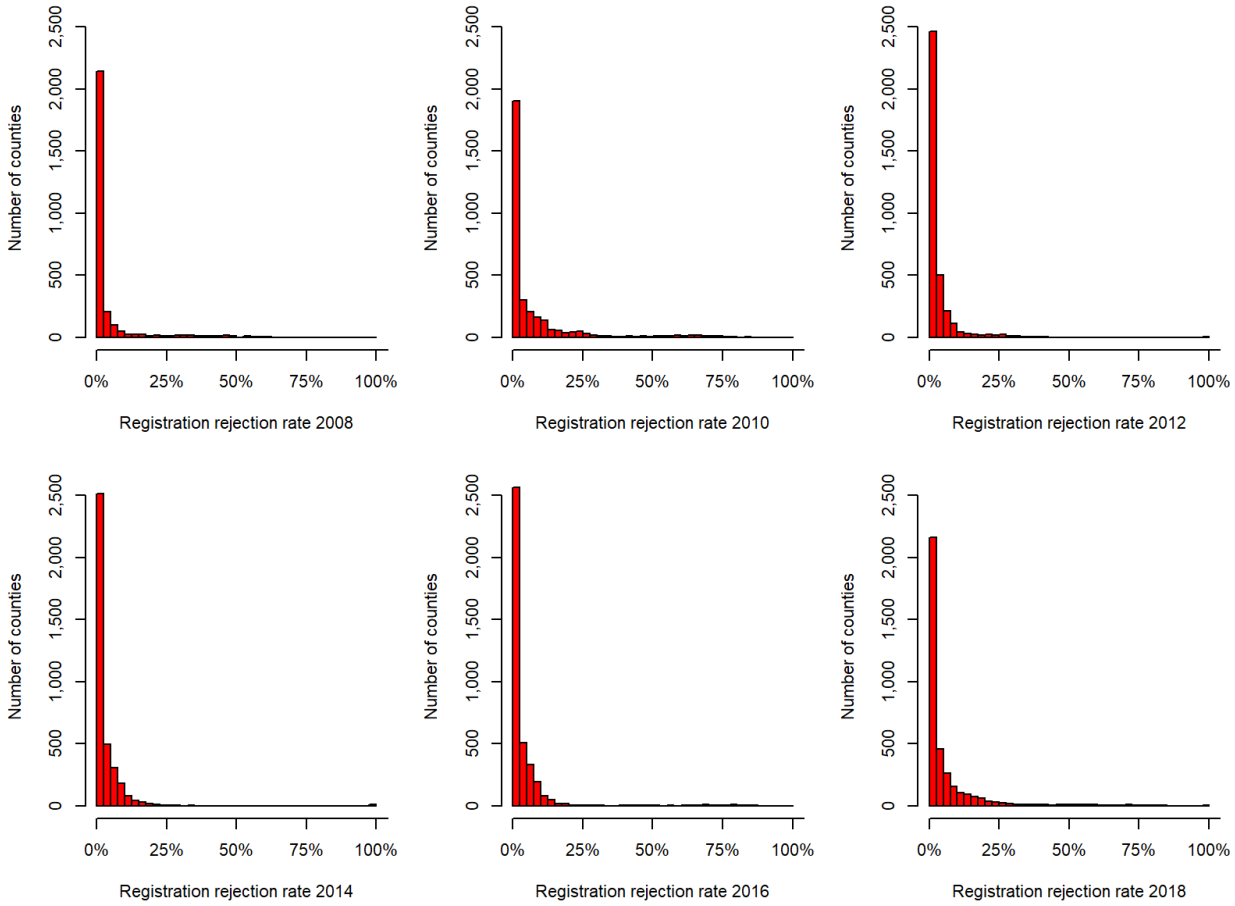
Figure 24 compares the correlations across this measure for each year of the EPI to 2018. When we updated this indicator to include data from the 2018 election, the average state value decreased mildly from 3.4 to 3 percent. Rates for this indicator are made more stable by combining midterm and presidential election data across several elections years. For the more information on this indicator, the stability of rates across time, or how it is calculated, see the 2016 Methodology Document.

4.11.1 Figure 24: Percent of Nonvoters Due to Registration Problems

4.12 Registrations rejected

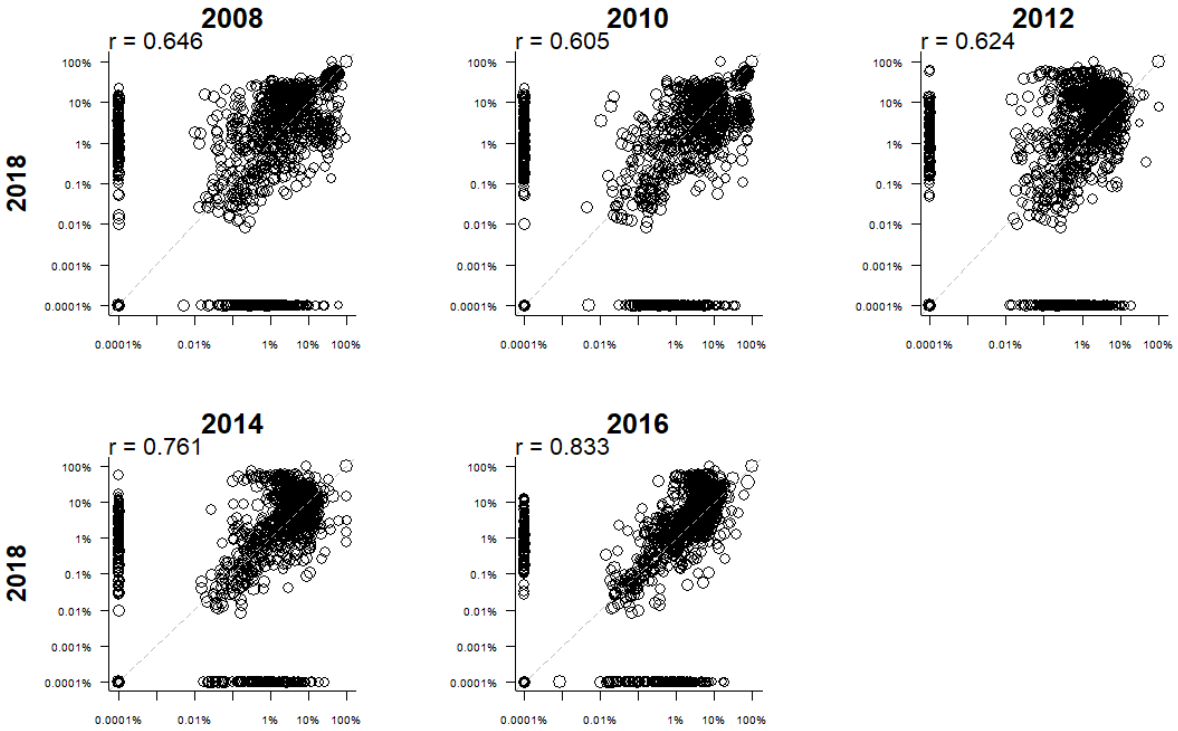
This indicator measures the number of invalid/rejected registrations of all rejected/invalid and valid registrations combined. The histograms in Figure 25 show the distribution of rejection rates for 2008, 2010, 2012, 2014, 2016, and 2018 for each county in the United States for which we have the relevant data. The data exhibit what is known as a pronounced “right skew.”

4.12.1 Figure 25: Registration Rejection Rates by County

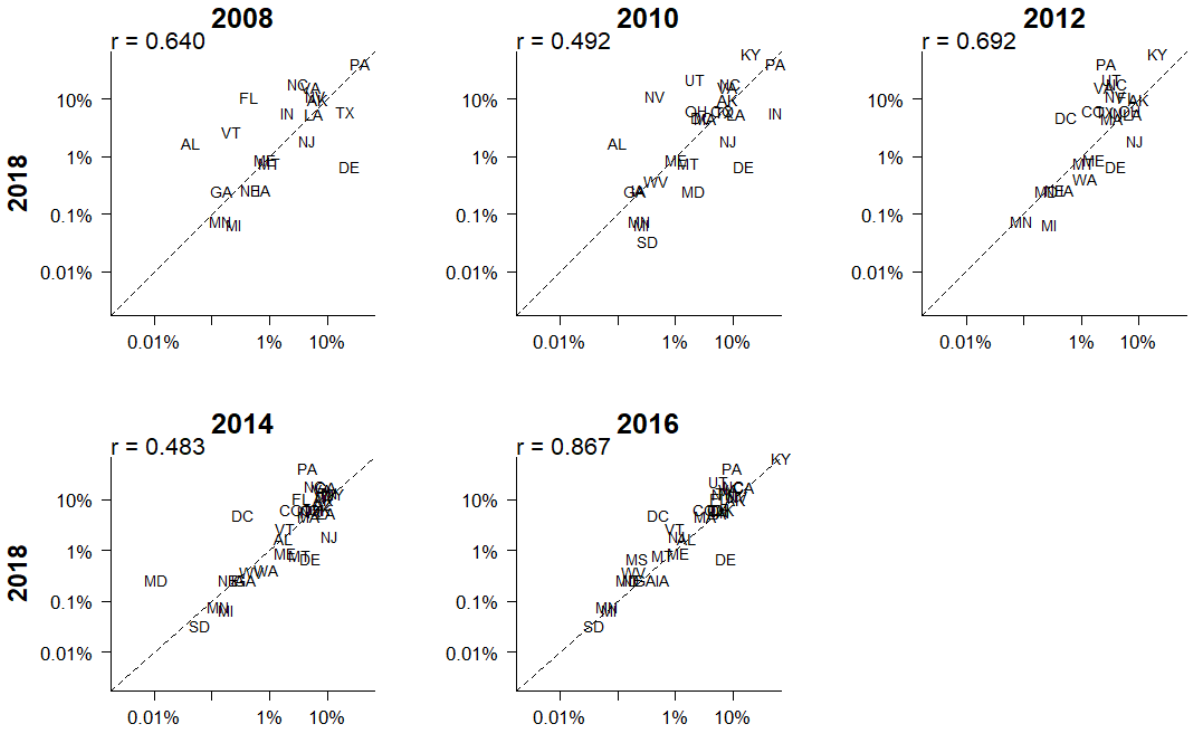


As Figure 26 illustrates, for counties that reported the data necessary to calculate rejection rates for all EPI years rejection rates are very similar to 2018. The Pearson correlation coefficient, which measures the degree of similarity across two election cycles, ranges between 0.605 and 0.833. When we aggregate rejection rates to the state level, as seen in Figure 27, it retains much of the degree of similarity with Pearson scores ranging from 0.483 to 0.867.

4.12.2 Figure 26: Logged Registration Rejection Rates by County



4.12.3 Figure 27: Registration Rejection Rates by State



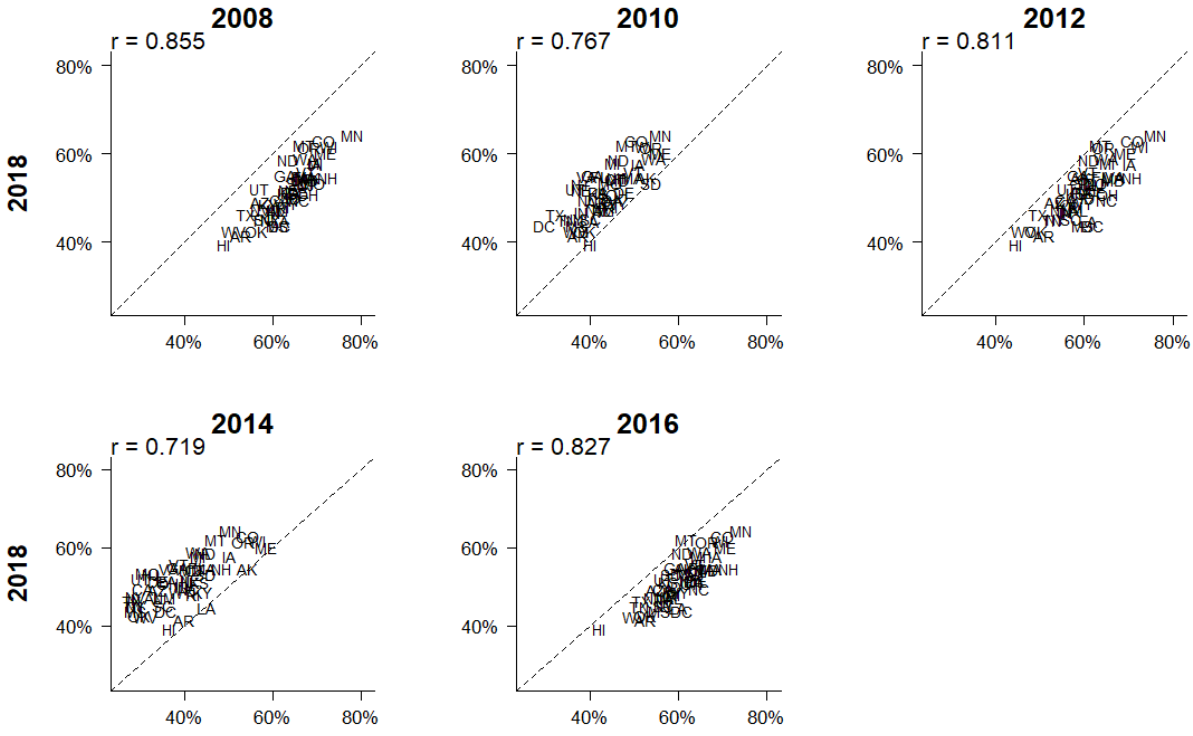
4.13 Residual vote rate

This indicator is only calculated during presidential election years. For the more information on this indicator, the stability of rates across time, or how it is calculated, see the 2016 Methodology Document.

4.14 Turnout

This indicator is based on data collected by the University of Florida's Michael McDonald and reported on the United States Elections Project website. The numerator is the state's reported turnout or votes for the highest office. The denominator is the voting-eligible population (VEP) as calculated by McDonald. The average indicator score for turnout increased from 39.8 percent in 2014 to 51.6 percent in 2018.

4.14.1 Figure 28: Turnout Rate by State



The graphs in Figure 28 show the turnout rate for all states in the 2008, 2010, 2012, 2014, and 2016 elections plotted against 2018. With historically high midterm turnout in 2018, the Pearson correlation coefficient remains relatively high for both midterms and presidential elections, ranging between 0.719 and 0.855.

4.15 Voter registration rate

This indicator is based on responses to the VRS of the Census Bureau's CPS. It is based on a combination of three variables (PES1, PES2, and PES3) that help determine the number of registered voters of the number of eligible voters. For more information on the question or methodology please see the 2016 Methodology Document.

4.15.1 Figure 29: Registration Rate by State

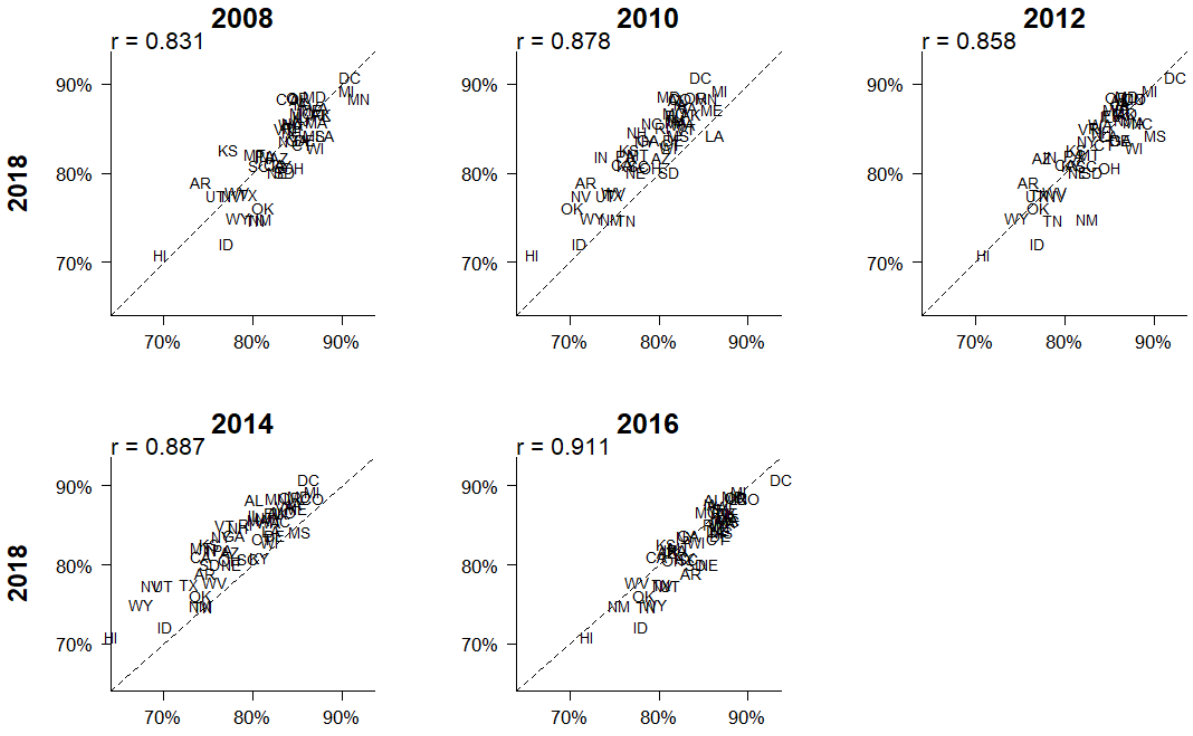


Figure 29 shows the estimated registration rate (using the VRS data) for all states, comparing all past EPI election years to 2018. The high correlations show that this method produces estimates of voter registration rates that are reliable across time.

4.16 Voting information lookup tool availability

The examination of online tools for the EPI extends five measures that measures the availability of internet resources on elections. These measures are then aggregated to an indicator that is meant to measure the availability of online tools in a given state. For more information on these measures or their measurement please see the 2016 Methodology Document. When updating this measure for 2018, we see that scores for this indicator remain increased from 2014, with states on average providing around 4 out of 5 of the tools available (3.2 if only 4 are available and 2.4 if 3 are available). While scores increased from 2014 to 2018, they remain nearly the same between 2016 and 2018.

4.17 Voting wait time

Voting wait time was the only indicator to see an adjustment the source of its data in 2018. In previous years, it relied on data supplied from the Survey of

the Performance of American Elections (SPAE), which along with many questions asked how long voters waited to vote. Notably, it also asked how long the wait was if voters voted by mail or in person and that information helped give wait times for vote-by-mail states. This year, wait times are calculated from the Cooperative Congressional Election Study (CCES), a large survey that asks questions about elections. Since the CCES does not differentiate between wait times in its survey, the scores for wait time are segmented into the porportion of votes cast in person and by mail. Then, we weight the percent of votes cast in person with the 2018 CCES and the percent of ballots cast by mail with 2016 SPAE mail wait times. What's left is added together to give us wait times for 2018.

4.17.1 Figure 30: Wait Times by State