

Recommendations for Improving Election Data Transparency

HIGHLIGHTS

Although the federal government regularizes certain components of election administration, most election administration falls under state and local government control. This decentralization has led to a patchwork of policies and disparities in administrative capacity and resources. One area in which there is significant regional variation is election data transparency. Election data transparency is crucial to affirming the fairness and accuracy of our election processes as well as protecting voting rights of traditionally marginalized communities. In this report, we review the current policies across multiple states, summarize nationwide best practices, and recommend a series of science-based policies designed to improve election data transparency.

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June 2024

www.ucsusa.org/resources/improving-election-data-transparency

<https://doi.org/10.47923/2024.15500>

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Executive Summary

Although the federal government regulates certain components of election administration, most election administration falls under state and local government control. This decentralization has led to a patchwork of election policies and disparities in administrative capacity and resources. One area in which there is significant regional variation is election transparency processes and procedures, including how jurisdictions collect, store, share, and secure election data. Election data transparency is crucial to affirming the fairness and accuracy of our electoral processes and protecting voting rights, particularly the voting rights of traditionally marginalized communities, and, in turn, ensuring a quality democracy. In this report, intended for those who study and administer elections, we review current policies across multiple states, including five states of particular interest: Michigan, North Carolina, Ohio, Pennsylvania, and Wisconsin. We summarize nationwide best practices and recommend a series of science-based policies designed to improve multiple components of election data transparency that can be adopted in any state or locality.

Overview of Recommendations

Together, these recommendations were chosen as they represent the broadest sample of what science suggests are the best ways to increase data transparency, ensure electoral accuracy and fairness, protect voting rights, uphold democratic legitimacy, and improve the quality of democracy.

Voter File Maintenance

State and/or local election officials should

- use multiple methods to contact voters about their possible removal from voter lists;
- institute methods to track additions, deletions, and other changes made to lists;
- publish inactive/removed voter registration records at least 30 days prior to registration deadlines and 30 days prior to Election Day;
- work with community organizations and other entities to update information and conduct voter outreach;
- use cross-state uniform codes for registration status and reasons for removal for any voter removed from rolls;
- publish precinct-level geographic shapefiles (.shp) at least 30 days prior to Election Day so that ballot processing can be analyzed and data shared prior to the conclusion of elections; and
- implement penalties for commercial and political misuse of data, and limit or remove voter history from public files.

Ballot Processing

State and/or local election officials should

- release unofficial election counts—including mail-in and/or in-person ballots received, counted, challenged, rejected, and identified for curing and reasons for rejections—in comma separated values (CSV) format, on at least a weekly basis after voting begins, prior to election certification;
- update voter files daily upon receipt of the earliest returned ballot;
- adopt ballot tracking technology for mail-in/absentee ballots to ensure that voters can track their ballots through every stage of ballot processing;
- publish digital precinct shapefiles (.shp) at least one month before any votes are cast; and
- implement policies permitting public observation of ballot processing and counting procedures, but specify limits on the number of observers and prohibited activities.

Ballot Curing, Auditing, and Certification

State and/or local election officials should

- have an expansive list of curable ballot errors (including but not limited to missing signatures and/or dates, incorrectly placed signatures and/or dates, and the absence of secrecy envelopes);
- promptly notify voters eligible for curing via email, phone, and mailer;
- release names of voters who need to cure ballots, giving enough time for voters to fix their ballots, vote early, or vote on Election Day;
- collaborate with local organizations on ballot curing outreach;
- allow ballot curing through in-person correction, mail, and electronic attestation, while providing curing assistance and working with community groups for outreach support;
- conduct voter education on ballot errors and curing;
- dedicate resources to collect data efficiently and store them securely, including joining data sharing agreements that would allow third party auditing;
- conduct statewide risk-limiting audits (RLAs) and, when possible, audit a set number of randomly or systematically selected counties or precincts before elections are certified;
- train local officials on audit procedures and provide detailed implementation guidance;

- publish audit reports in accessible format prior to election certification; and
- Protect voter privacy when releasing cast vote records (CVRs): where geocoded data make it easy to identify individual voters, records should be merged with larger geographies for analysis purposes.

Introduction

A strong and healthy democracy empowers society to make social choices and ensures that elected officials and policymakers are held accountable by voters at the ballot box for the decisions they undertake (Diamond and Morlino 2004). Our ability to hold elected leaders accountable relies on a number of democratic procedures (Dahl 2005). First and foremost, voters must be able to cast ballots for the candidate or party of their choosing, and each individual's vote must have equal weight, regardless of how or where their ballot is cast (Knight and Johnson 2011; McGann 2006). Second, inclusive freedom of expression should ensure that individuals have the right and ability to express criticism of officials, the government, the socioeconomic order, and the prevailing ideology, and people must have the capacity to form independent organizations and political parties. Most important for the discussion below, people must have access to information (Dahl 2005). These factors are independent but overlap such that threats to one produce threats to others; that is, if people lack access to information, they cannot vote freely or fairly.

The United States, like any democracy, is imperfect. However, as eminent democracy scholar Robert Dahl wrote, “the challenge to citizens in the older democracies [such as the United States] is to discover how they might achieve a level of democratization beyond [their current level]” (2005, 197). One such path in the United States is to increase access to election information.

Currently, many in the United States lack access to electoral information that, if provided, would improve our ability to vote, increase trust in elections, and provide communities with the capacity to organize under-represented groups. Research shows that voter files are prone to errors and missing information necessary to certify eligible ballots and that voters of color face more substantial burdens from administrative errors (Ansolabehere and Hersh 2014; Huber et al. 2021; Merivaki and Smith 2020). Data transparency shortfalls make it difficult for voters to determine their eligibility to vote and registration status, thereby increasing obstacles to casting a ballot. Erroneous voter files also produce obstacles for community groups in understanding who has voted, what voting procedure they use, and whose ballots are more likely to be rejected. This has important downstream effects for community groups, increasing the difficulties they face in helping potential voters cast ballots.

The collection and dissemination of ballot processing data is also inadequate in many jurisdictions. Ballot tracking data is not always communicated to voters, leaving many voters not knowing whether their ballots were received and counted. Voters are also left with little information about how many ballots were cast, the means by which they were cast, how many ballots have been processed, and how many have been rejected. Lack of information allows disinformation to spread, sowing doubt and degrading public trust in elections, which may then be used to justify more restrictive election laws (Hajnal, Lajevardi, and Nielson 2017; Astor 2021). More restrictions increase barriers to free and fair voting, which reduces voters' ability to hold elected officials accountable.

Lack of data transparency in ballot curing, auditing, and certification has also contributed to diminishing public trust in elections. For example, some states do not have procedures in place to cure mail-in ballot errors, such as missing signatures, and do not communicate to voters that they must take additional action, or their ballots will not be counted. This deprives some citizens of the ability to participate in elections freely and fairly, and, by extension, the ability to hold elected officials accountable, diminishing the quality of democracy.

Mis- and disinformation has been found to contribute to the erosion of the public's trust in US elections (Sanchez and Middlemass 2022). Research has also found that a lack of trust in elections, such as that brought on by disinformation, can decrease voter perception of electoral accuracy and, in turn, democratic legitimacy (Alvarez, Hall, and Llewellyn 2008). If voters question the accuracy and validity of elections, they may begin to question representative government as a whole (Atkeson, Alvarez, and Hall 2015; Hasen 2012), driving down voter turnout (Alvarez, Hall, and Llewellyn 2008), and diminishing the quality of US democracy. In other words, public access to election data is a key component of a strong and healthy democracy and help answer question essential to elections as seen in Box 1.

In light of these threats to the quality of US democracy, this white paper provides a systematic review of literature related to election data transparency and communications across multiple states. Based on the review, this paper provides a set of recommendations to ensure that election data is transparent and easily accessible to everyone.¹ We focus our recommendations on the three key components of election data transparency: voter file maintenance; ballot tracking and processing; and ballot curing, auditing, and certification.

Given the decentralized structure of election administration in the United States, state and local governments determine much of how elections are conducted, resulting in a disparate patchwork of election transparency policies across the country. Many experts have observed that this vast array of policies across jurisdictions is one of the main challenges of improving our data transparency (Gronke and Caudell-Feagan 2008; Willis, Merivaki, and Ziogas 2022). This makes it impossible to discuss election data transparency and communication in the United States as a whole. Therefore, this white paper focuses on key states: Michigan, North Carolina, Ohio, Pennsylvania, and Wisconsin.

¹ As this literature review sought to systematically search for, appraise, and synthesize research evidence. Our search for existing research involved an exhaustive search through top journals focused on elections and electoral analysis, including, but not limited to, *Social Science Quarterly*; *The Journal of Politics*, *Election Law Journal: Rules, Politics, and Policy*; *Scientific Data*; *Journal of Experimental Political Science*; *State Politics and Policy Quarterly*; *Journal of Democracy*; and *The ANNALS of the American Academy of Political and Social Science*. Further, we examined manuscripts published by top academic presses: Cambridge University Press, Yale University Press, Princeton University Press, and the University of Michigan Press. Additionally, we sought research from government entities and nongovernment organizations, including, but not limited to, the Election Assistance Commission, the Brennan Center for Justice, the Pew Center on the States, the MIT Election Data Science Lab, the Michigan Secretary of State, the Milwaukee County Clerks, and the North Carolina State Board of Elections. Finally, we searched through popular news to put the existing research in context. These news sources include, but are not limited to, *The Guardian*, *The New York Times*, and *AP News*.

Box 1. Questions that Election Data Transparency Answers

About Voters:

- Who is eligible ?
- Who is registered ?
- Who has been removed from voter lists ?
- Who votes and how ?

About Elections:

- How many mail/absentee ballots have been sent and received ?
- How many ballots have been processed and challenged ?
- How many ballots are rejected any why ?
- How many ballots have been cured ?
- How confident can we be in election results ?

Voter File Maintenance

By federal law, states must maintain voter files, which are digital databases containing information on the state's voters and act as the official list of eligible voters (NASEM 2018). With one exception, all US states require citizens to register to vote. However, requiring voters to register is a policy choice that has its origins in racist and classist practices meant to limit who can vote (Keyssar 2022; Litt 2020; Tokaji 2008). North Dakota is the exception to required voter registration and shows that registration is not necessary to effectively administer elections; it instead maintains a statewide list of residents who have been issued government identification cards, which are required to cast a ballot (NDSOS n.d.). Generally, voter files are intended to provide jurisdictions information about a voter's identity, eligibility, and contact information (Urahn et al. 2010). Maintaining these voter files is critical to ensuring that every eligible voter can cast a ballot.

Effective voter file maintenance reduces wait times, decreases voter confusion, lowers the number of provisional ballots, helps election officials prepare for elections, and assists in postelection auditing (EAC n.d.; NASEM 2018). Moreover, campaigns and grassroots organizations are increasingly using voter files to conduct voter outreach and to target mobilization efforts (Kim and Fraga 2022; Green and Gerber 2005; Cooper, Haspel, and Knotts 2009).

The Election Assistance Commission (EAC) classifies state voter files access as open, mixed, or restricted (EAC 2020a). Thirty states are classified as open. Sixteen states are classified as mixed, because their voter files are available only to specific groups. Finally, four states are classified as restricted; access to their files is prohibited to certain groups. It is important to note that mixed and restricted access to voter files can create or exacerbate information asymmetry between campaigns and other organizations (Green 2014).

The information provided in voter files varies enormously across states. Minimally, publicly available voter records contain a record identifier, name, jurisdiction (typically county), and voting precinct identifiers. The most comprehensive files may additionally contain resident address; birthdate; sex; gender; race; phone number; email address; registration date; registration status; party registration; partisan primary, general, and special election voting history; current placement in electoral districts; and voter tabulation district at time of election (EAC 2020a).

As voter file content varies by state, so too does files' quality and accuracy. Several studies have demonstrated that voter files contain errors and missing information (Ansolabehere and Hersh 2010; Ansolabehere and Hersh 2014; Merivaki 2020; Merivaki and Smith 2020; PCS 2012). A 2012 Pew Center report estimated that there were 24 million voter registration inaccuracies (i.e., 24 million voter registrations that were no longer valid or that contained substantial inaccuracies) in voter files across states (PCS 2012). An examination of voter files using the EAC's Election Administration Voting Survey (EAVS) found that local jurisdictions' data on voter registrations and list-maintenance activities are severely lacking (Stewart 2018).

Evidence from California, Georgia, and Ohio elections shows that these errors and information gaps have caused voters to be excluded from elections (Liptak 2018; Merivaki 2020; Myers

2018; Scott 2018). Administrative errors as minor as a misspelled name or a duplicate record can result in voters being turned away on Election Day, their ballots going uncounted, or necessitating the use of provisional ballots; in some cases, these errors can result in a voter's removal from voting lists (Alvarez and Hall 2014; Merivaki and Smith 2020; Merivaki 2020).

States have considerable discretion in determining how they adhere to federal guidelines on voter file maintenance, including how they decide registration form validation methods and determine when and how voters should be removed from voting lists (NASEM 2018), and local administrators bear the brunt of voter file maintenance work, including voter additions and removals (Merivaki 2020). Election administrators in many states monitor US Postal Service records to track when voters move residences, while a decreasing number of states receive information from the Election Registration Information Center, a nonpartisan, intrastate organization designed to facilitate voter registration maintenance (Draeger 2022; ERIC n.d.).

Election officials are generally required by the National Voter Registration Act of 1993 (NVRA) to send address confirmation mailers to the voter's original address to determine if that voter has moved. (Six states, including Wisconsin, are exempt from the NVRA [Draeger 2022]). If voters confirm their residence, no changes are made; if they return the card from a new address, the old registration is canceled; and if they fail to respond, election officials are permitted to change their voting status to "inactive" (Draeger 2022). In at least 19 states, election officials remove voters who remain inactive for multiple elections from voter rolls (Draeger 2022; NCSL 2023b). Because election administrators in each state have substantial latitude in voter file maintenance, the decisions undertaken by each individual state election administrator likely produce varying effects

Notably, a national study found that during the period of November 2020 to July 2021, a majority of counties enacting the most aggressive purges disproportionately removed people of color (Garland 2021). This means the likelihood of being purged from voter rolls is not equal across all voters. Voters of color are more likely to be purged than White voters (Demos 2023; Garland 2021; Gaughan 2019; Huber et al. 2021).

The Voting Rights Act of 1965 had a preclearance requirement, in which states and localities that have historically engaged in racial discrimination were required to submit election law and map changes to the federal government for review before they could go into effect. This was designed to address the abuses of the Jim Crow era, which included laws designed to make voting more difficult for Black citizens.

The 2013 *Shelby County* Supreme Court decision—which struck down the Voting Rights Act preclearance requirement—was followed by significantly higher purge rates (Brater et al. 2018). The Brennan Center for Justice found that median purge rates were 40 percent higher in jurisdictions previously covered under Section V of the Voting Rights Act (Morris 2019). As many as 1.1 million voters would have been kept on voter rolls in these jurisdictions during these years if previous preclearance jurisdictions purged voters at similar rates as non-preclearance counties (Morris 2019).

Forty of North Carolina's 100 counties were covered by Section V of the Voting Rights Act before the *Shelby County* decision (Morris and Pérez 2018). Between September 2016 and May 2018, the state removed 11.7 percent of voters from voter rolls, with people of color purged at disproportionate rates in 90 of the state's 100 counties (Morris and Pérez 2018). Several

studies have also found evidence of wrongful purges of voters, particularly Black voters, in Ohio (Demos 2023; Gaughan 2019; Casey 2019; Levine 2021; Herman 2023). Unfortunately, state legislatures in several states have recently passed new laws that could make purging even easier (Brower 2022).

North Carolina removes voters from files after four consecutive years of inactivity, and state law mandates that county boards send address confirmations to any voter who does not vote in biyearly congressional elections unless they have otherwise confirmed their eligibility (VRL n.d.). If voters fail to respond to the confirmation notice within 30 days or if the mailer is undeliverable, voters are declared “inactive” (Demos 2023; VRL n.d.). This provides voters an opportunity to confirm their registration and remain on the voter rolls.

Unfortunately, voters are likely to miss a single mail notice, especially given the rising rate of junk mail (Gaughan 2019). Additionally, the 2020 EAVS found that 70 percent of voters designated as “inactive” were so designated because of undeliverable mail, and 62 percent of inactive voters were designated as such due to a failure to return a confirmation notice (EAC 2023).

Additionally, North Carolina also has an open voter file (EAC 2020a). Demos rates North Carolina’s data accessibility at 100 percent because it offers free access to voter files (Demos 2023; EAC 2020a). North Carolina’s complete voter files, including information on voters’ race, voter ID number, and voter history, are available to the public, are updated weekly, and can be downloaded in electronic format (Demos 2023; EAC 2020a).

Recommendations

Given research showing that voters often fail to notice confirmation mailers, we recommend that election officials use multiple methods of contacting voters, especially emails, to notify them of their possible removal from voter rolls (Jaffe 2023). Additionally, we recommend administrators institute methods to track additions, deletions, and other changes made to lists (Kim and Fraga 2022; “Voter Purge” 2023). For example, North Carolina law mandates that registration information be available to the public for free and monitors for wrongful and/or discriminatory purges by recording data such as race, voter status, and status reason codes (“Voter Purge” 2023).

We further recommend that states publicly release voter registration files, complete with inactive registrations and removals, 30 days before registration deadlines and 30 days before every election to allow voters adequate time to address disputes and removals (CC n.d.a). One way to help state and local officials effectively track changes to registrants’ addresses is use of the National Change of Address data reported by the US Postal Service—a method that 30 states and DC employed, according to the 2020 EAVS (EAC 2023; EAC 2020a). The EAC also recommends that official election mailers include a place on the envelope for the resident to mark that the addressee does not live at the address and encouragement to return it to election offices, as has been done in Arizona (EAC 2023).

Since moving residences is such a common reason for voter removal or registration, the EAC also suggests that officials make targeted outreach efforts to organizations likely to interact with frequent movers, such as colleges, utility companies, and property managers (EAC 2023). Moreover, alterations to a voter’s information can be recorded during the in-person voting

process and used to update files immediately or after the election (EAC 2023). Finally, we also recommend that states adopt uniform codes for voter registration data, including reasons for removal of voters from rolls (“Voter Purge” 2023).

Increased data sharing can improve the accuracy of voter files (LCCHR 2023). Community-based organizations can play a key role in keeping voter files up to date by registering new voters, re-registering voters who have moved, and updating residency and other voter information (EAC 2023; Hardina 2003). A growing body of research shows that public and nonprofit community health centers, nonpartisan civic groups, and election administrators would benefit from stronger partnerships focused on registering eligible voters and sharing information to improve the accuracy of voter registration files (Brown, Raza, and Pinto 2020; Kusner et al. 2021; Stanicki et al 2023).

In order to analyze registration and election data prior to and during elections, and to identify irregularities or possible errors in registration and ballot processing, we further recommend that states or jurisdictions provide digital records of precinct boundaries, or shapefiles, at least 30 days prior to Election Day. Shapefiles are digital files that allow geographic data to be combined with election results, allowing users to map results and other election-related data. They are essential to analyzing election outcomes, especially to studying racial and economic inequities in registration, turnout, and other key election variables. Without shapefiles, it is difficult to visualize where these inequities occur. While some states and research organizations produce and release precinct shapefiles for every election, others do not (Baltz et al. 2022). Jurisdictions frequently provide digital maps and locations of precinct voting places, but shapefiles will greatly improve analysts’ capacity to evaluate the quality of elections as ballot processing is occurring and will provide an effective way of analyzing election results while maintaining voter confidentiality after election certification.

Lastly, consideration must be given to the potential for voter file misuse and distortion of voter file information. Such actions could further perpetuate inequalities, exploit voter data for nefarious purposes, feed misinformation and conspiracy theories, and undermine public confidence (Green 2014; Huber et al. 2021; Ross and Spencer 2022). To defend against these possibilities, states should establish monetary or other penalties for frivolous registration challenges, voter harassment, privacy violations, and other instances of election data misuse and/or distortion and remove voter history from public files (Green 2014).

Ballot Processing

Ballot Tracking

Ballot tracking, which has become more common in recent elections, allows voters to track the status of their mail-in or drop box ballots using envelope barcodes (Bergeron-Boutin et al. n.d.). Alvarez, Cao, and Li (2021) found that voters who mail their ballots have lower confidence that their ballots are counted correctly than those who vote in person. Ideally, allowing voters to track ballots should increase public confidence and election transparency as well as assist election officials ensure electoral accuracy and security (BallotTrax 2021; Bergeron-Boutin et al. n.d.). One poll found that 97 percent of Democratic respondents, 94 percent of independent respondents, and 78 percent of Republican respondents said that receiving ballot tracking notifications would increase their confidence in our elections (BallotTrax 2021). Another study found that 40 percent of those who voted by mail in the last election reported using ballot tracking (Stewart 2023).

In response to concerns about voting irregularities and increased use of mail-in voting options in 2020, election officials across the country implemented ballot tracking for the first time or made improvements to their ballot tracking processes (Altamirano and Wang 2022; Biggers et al. 2023). States with ballot tracking during the 2020 general election had lower ballot rejection rates than the national average, while states without tracking had rates substantially higher than the national average (Altamirano and Wang 2022). Currently, only three states—Illinois, Montana, and Wyoming—do not offer statewide ballot tracking (USVF n.d.). County-level tracking is available for select jurisdictions in Wyoming and Illinois, while Montana has no ballot tracking options (USVF n.d.).

During the 2020 presidential election, Michigan, Ohio, and Pennsylvania had state portals with ballot tracking.² Wisconsin had state-level ballot tracking, and North Carolina had a state ballot tracking system with voter notification (BallotTrax 2021). Indeed, North Carolina law requires that absentee ballot envelopes include barcodes that enable tracking.³ In addition to North Carolina, several other states—such as California, Colorado, and Virginia—have legal provisions establishing ballot tracking (NVHI n.d.).

Ballot Processing

Ballot processing, which includes the counting of ballots, is a key aspect of election administration. Every ballot cast is linked to a voter in a precinct. Therefore, collecting comprehensive election data at the precinct level is of paramount importance not only to accurate and timely reporting of election results, but also to the efforts of community groups and researchers to identify points where election administration can be strengthened.

² Michigan's ballot tracking was instituted before the 2020 presidential election (Ballotpedia n.d.). It should also be noted that the city of Detroit uses BallotTrax (City of Detroit n.d.).

³ An Act to Make Various Changes Regarding Elections Law. General Assembly of North Carolina. Session Law No. 2023-140, § 163-166.40-166.50. <https://www.ncleg.gov/Sessions/2023/Bills/Senate/PDF/S747v6.pdf>

Comprehensive precinct-level data is also crucial to approaches aimed at increasing voter participation.

Unfortunately, there are several barriers to collecting and sharing comprehensive precinct-level election results. These include the availability of data on voting method, whether a formal public record request is required, whether states or localities charge fees for access, and whether the data are disseminated by the state election officer, counties, or a combination of both (Willis, Merivaki, and Ziogas 2022).

The standard across states has been to provide election results as images (e.g., graphs, plots, or maps). Although this approach has been changing, it is still difficult for those who study elections to easily access this data in an analyzable format (Willis, Merivaki, and Ziogas 2022). The provision of analyzable precinct-level election data is infrequent, with one study finding that fewer than half of US states publicly share precinct-level election results in machine-readable data files (Willis, Merivaki, and Ziogas 2022). Moreover, what precinct-level election data is collected varies by county and state. For instance, data important to examining the use of different voting methods (such as the number of absentee and provisional ballots cast) and data important to assessing ballot design (such as the number of over and under votes) are frequently not recorded (RDH n.d.). Despite these challenges, providing easy access to precinct-level election results is possible. State election officials in Michigan and Florida require local administrators to publicly publish precinct-level results on state government websites in machine-readable format (Willis, Merivaki, and Ziogas 2022).

In terms of data transparency, North Carolina probably comes closest to achieving best practices, with early voting, absentee, provisional, and Election Day ballots processed by precinct, with instructions on how to generate precinct- and county-level data results (NCSBOE n.d.a.). Regarding visualization, North Carolina's Election Results Dashboard allows the public to filter results by election, county, office, and contest. Further, the dashboard shows tables with contest/candidate/percentage of votes along with the percentage of precincts reported and ballots cast (NCSBOE n.d.a). It also provides maps that allow users to click on counties to view summaries (NCSBOE n.d.a). The dashboard updates every 5 to 10 minutes after polls close on election day (NCSBOE n.d.a).

Wisconsin, on the other hand, does not have a statewide system for reporting results on Election Day and does not have a central location where results are reported (WEC n.d.). Instead, state law requires county clerks to post unofficial results on their websites (WEC n.d.). Milwaukee County, the state's most populous county, has results dating back to 2016 posted on its government website in pdf format (MCC n.d.). Posted results provide only the total number of votes per candidate and do not provide early voting numbers, provisional ballot totals, or ballot rejection rates (MCC 2020).

In addition to reporting precinct-level election result data, being more transparent during the entire ballot processing period could increase public trust in the accuracy and fairness of elections (Bergeron-Boutin et al. n.d.). Several counties, such as Maricopa County in Arizona, Shasta County in California, and Philadelphia County in Pennsylvania, livestream the ballot counting process (NTFEC 2022). However, there is evidence suggesting that video recording ballot counting practices can be used to propagate false claims of election fraud, as happened in Fulton County, Georgia, during the 2020 general election (Bergeron-Boutin et al. n.d.).

An alternative to livestreaming ballot processing procedures is vote canvass observers. The Brennan Center for Justice argues that transparency policies that open election processes such as ballot counting and canvassing “help protect the fairness and integrity of elections” (Miller and Weiser 2022). In most states, representatives from political parties, candidates, citizen groups, and nonprofits are permitted to watch election processes (NCSL 2022a). Some states extend access to members of the public (NCSL 2022a). Michigan, North Carolina, and Wisconsin have laws permitting public observation of ballot counting and recounts (NCSL 2022a). In Ohio, however, public access is limited to voting equipment testing and postelection audits (NCSL 2022a). Although Pennsylvania law does not explicitly allow public observation of election procedures, county board of elections sessions are generally open to the public (Miller and Weiser 2022).

Pre-Election Data Management

In addition to ballot tracking and ballot processing, pre-election data management strategies can be useful in increasing election data transparency. Most importantly, election administrations can provide precinct-level shapefiles. Despite shapefiles’ importance to investigating and improving elections, many local election officials lack the organizational or staff capacity to produce and publicly share them. Additionally, nongovernment researchers may face hurdles in producing shapefiles because precinct boundary data are provided in a variety of paper and electronic formats and sometimes not maintained by local officials after elections (RDH n.d.). North Carolina, however, provides redistricting shapefiles on the General Assembly’s website, including precinct-level shapefiles (NCGA n.d.).

Recommendations

State and local election officials should offer election counts in CSV files, as Ohio already does. Election results should be updated daily with total candidate vote counts, the number of over- and undervotes, the number of ballots returned, the number of ballots returned but not counted, the number of challenged ballots, and the number of ballots identified for curing at the precinct level (CC n.d.a) Moreover, voter files should be updated daily after receipt of the earliest returned ballots.

To increase election transparency, states and localities should institute ballot tracking technology. There are a variety of vendors offering ballot tracking technology. Two are Ballot Scout from Democracy Works, which is used in almost 200 state and local election offices across the United States, and BallotTrax, which is used in more than 500 counties across 26 states (BallotTrax n.d.; DW n.d.).

Further, ballot processing and counting processes should be open to the public, with important caveats. Policies that permit public observation must prohibit public interference in election procedures and designate other prohibited activities (Miller and Weiser 2022). Additionally, public observation policies should also set “reasonable limits” on the number of observers permitted access, dependent on capacity constraints, and establish rotation procedures to allow extensive access (Miller and Weiser 2022).

Finally, most US voters expect election results to be reported within three days after polls close and question results that are reported a week or more after the election (VRL 2020). To

facilitate the rapid analysis and visualization of election results, state and local election officials should generate and publicly release precinct- and district-level shapefiles at least one month prior to the date on which voting begins.

Ballot Curing, Auditing, and Certification

Ballot Curing

Ballot curing allows voters who have errors on their mail-in or absentee ballots to address those errors, ensuring the ballot is counted. Thirty states permit ballot curing, and at least 24 states' curing laws *require* election officials to contact voters eligible for curing (NCSL 2023a; Meredith and Kronenberg 2023). However, local election officials and administrators have considerable discretion in how state curing policies are implemented at the local level, including determining which ballots are valid, contacting voters eligible for curing, and deciding curing methods (Altamirano and Wang 2022).

Research on ballot rejection rates conducted across several states has shown that new registrants, inexperienced and younger voters, voters of color, and other historically marginalized voters are more likely to have their ballots rejected (Baringer, Herron, and Smith 2020; Curiel and Dagonel 2020; Smith 2021; Shino, Suttman-Lea, and Smith 2022; Walker 2022). Relatedly, research indicates that some groups are more likely to cure their ballots. As part of a Southern Coalition for Social Justice report, Smith (2021), and Meredith and Kronenberg (2023) found that Black voters are more likely to cure their ballots.

Leading into the 2020 election, many states made conscious efforts to make mail-in voting more accessible, including allowing curing for the first time or expanding curing deadlines (Altamirano and Wang 2022). States that implemented these policy changes saw declines in mail-in ballot rejection rates (Altamirano and Wang 2022). Overall, states that had more restrictive policies had higher ballot rejection levels (Altamirano and Wang 2022). Arkansas, Louisiana, and Mississippi had some of the highest rejection rates in the country (and they use a dual verification process that consists of signature matching and/or witness requirement) (Altamirano and Wang 2022). Researchers found that states that had curing policies in 2020 had an average rejection rate of 0.79 percent, while those that did not have curing policies had an average rejection rate of 0.84 percent (Altamirano and Wang 2022). States that had drop boxes also had lower rejection rates than the national average, while states that did not have drop boxes had higher rejection rates (Altamirano and Wang 2022).

Ballot curing deadlines vary by state. Among the states detailed in this report, only North Carolina and Ohio have ballot curing policies enshrined in state law while Michigan added an amendment to the state constitution mandating equitable ballot curing in 2022. North Carolina, for example, added a ballot curing policy in 2020 after a series of legal actions (Meredith and Kronenberg 2023). The policy requires that county boards of elections “promptly notify” eligible voters of the curing process and gives those boards discretion to determine curing process details, including curing deadlines (NCSL 2023a). Ohio law requires that election officials mail notices to eligible voters about curing options and gives voters until four days after Election Day to fix their ballots (NCSL 2023a).

Following the *NC Alliance of Retired Americans v. NC State Board of Elections* decision in 2020, the North Carolina State Board of Elections (NCSBOE) expanded the list of curable errors and

instructed local officials to include ballots missing voter or witness signatures, having incorrectly placed voter or witness signatures, or missing printed names or printed addresses (NCSBOE 2020). Officials in North Carolina were required to notify voters via mailer, email, and/or phone of a ballot error and the curing process within one business day of identifying the error (Meredith and Kronenberg 2023). Most North Carolina voters who had errors on their 2020 presidential election ballots were able to submit an Absentee Cure Certification (ACC) form, which could be submitted in a variety of ways, including fax, email, or commercial carrier (Meredith and Kronenberg 2023). ACC-eligible voters who were sent mailers to their registration zip codes were more likely to cure their ballots than those sent mailers to the address from which the ballot was mailed (Meredith and Kronenberg 2023). The authors also found evidence suggesting that voters are more likely to cure their ballots when they receive them with enough time to allow in-person curing methods (Meredith and Kronenberg 2023).

Altogether, North Carolina's adoption of ballot curing had a significant impact on elections. In the 2020 presidential primaries, conducted before North Carolina permitted curing, local county boards of elections rejected 14.6 percent of absentee ballots across the state, 41 percent of which were mail-in ballots rejected for reasons that were later designated as curable after the aforementioned lawsuit led to the expansion of the types of ballot errors eligible for curing (Meredith and Kronenberg 2023; SCSJ 2021).

North Carolina rejected fewer mail-in ballots in 2020 compared to both 2016 and 2018 (NCSL 2023a; Altamirano and Wang 2022). The Southern Coalition for Social Justice (2021) found that more than 10,000 North Carolina voters who were notified about errors on their mail-in ballots successfully voted in person in the 2020 general election. The statewide absentee ballot rejection rate was 0.76 percent, a little under the national average of 0.79 percent, while mail-in rejections decreased 5.3 percent from 2018 to 2020 (Chin 2021; Altamirano and Wang 2022). However, rejection rates vary widely across counties. On average, counties east of Charlotte rejected more mail-in ballots compared to the rest of the state (Altamirano and Wang 2022). Columbus County, for example, had one of the highest rates of absentee ballot rejections in 2020 at 2.52 percent (Chin 2021).

Auditing

According to researchers at the MIT Election Lab, election audits “should be considered the cornerstone in the complex system of election administration” (Alvarez et al. 2023, 1). Election auditing permits election officials to ensure that election outcomes are valid, to ascertain that elections were properly conducted, and to detect instances of voter irregularities or election interference (Alvarez et al. 2023). Audits in several states, including Michigan and Wisconsin, failed to identify discrepancies following conspiracy theories that former president Trump won the 2020 general election (Bauer 2022; Eggert 2021; Tindall 2023).

The EAC differentiates between three general types of audits of election results: traditional tabulation audits, machine-assisted audits, and risk-limiting audits (RLAs) (Alvarez et al. 2023). Most states require traditional audits, although RLAs have become more common in recent years (NCSL 2022b). Traditional audits compare the results from a certain percentage of voting machines or precincts to the original vote count (Alvarez et al. 2023).

RLAs are often called the gold standard of postelection tabulation audits (Roest 2023). RLAs review a sample of ballots to ensure that the correct number of ballots have been cast based on the audit trail (Alvarez et al. 2023; EAC 2020c). The number of ballots audited is determined by a preset “risk limit,” a number between zero and one that represents the highest probability that the election certified the incorrect winner (Alvarez et al. 2023; EAC 2020c). The risk limit is most often established by those responsible for conducting the audit (NCSL 2022b). RLAs are also incremental, meaning that the smaller the margin of victory, the larger the number of ballots audited (NCSL 2022b; Roest 2023).

Multiple studies have recommended RLAs. The 2018 Senate Intelligence Committee’s report cited RLAs as a best practice to mitigate election cyberattacks. Both the 2014 Presidential Commission on Election Administration and the 2018 National Academies of Science, Engineering, and Medicines report also endorsed RLAs (Garland et al. 2018). Although there is little systematic research on whether postelection audits increase voters’ trust and confidence in elections, there is some evidence that it has such potential: Republicans in Maricopa County, Arizona, reported being significantly more trusting of election results after local officials disclosed details about postelection auditing procedures (BLW 2021).

As of 2022, only three states—Colorado, Rhode Island, and Virginia—required RLAs by law (NCSL 2022b). Colorado was the first, initiating RLAs in 2017 (Roest 2023). However, there are statutory pilot programs in several other states, including Georgia (NCSL 2022b). Additionally, there are administrative pilot programs in Michigan, New Jersey, and Pennsylvania and optional RLAs are permitted in California, Ohio, Oregon, and Washington. Finally, Maine will permit election officials to conduct statewide RLAs starting in 2025 (NCSL 2022b).

One potential RLA benefit in comparison to traditional tabulation audits is that RLAs require a smaller number of ballots to be counted. However, any audit requires substantial administrative capacity and resources (Alvarez et al. 2023).

According to the EAC, there are two RLA methodologies: ballot polling and ballot comparison (EAC 2020c). Ballot polling is comparable to election exit polling, wherein a collection of randomly selected ballots is counted and compared to candidate totals (EAC 2020c; NCSL 2022b). Ballot polling audits do not require voting system information, can be established for minimal cost, can be used no matter a jurisdiction’s voting equipment or voting method, and are best suited to review contests having margins smaller than 10 percent (EAC 2020c). These benefits explain why ballot polling is the most common audit first piloted in states (Roest 2023).

Ballot comparison audits, on the other hand, require a CVR for each ballot that contains information connecting the record with the original paper ballot. This type of audit also requires that ballots are stored in the order they were scanned. Not all precincts are able to meet these requirements (EAC 2020c; Roest 2023; NCSL 2022b). However, ballot comparison audits can be conducted with fewer human resources and are suited for contests with a range of margins (EAC 2020c). In 2021, Georgia, Michigan, and Pennsylvania piloted ballot comparison audits (Roest 2023).

Pennsylvania law mandates county boards oversee traditional hand or electronic audits during the canvassing period (NCSL 2024 NASS 2021). In 2019 and 2020, the Pennsylvania

Department of State (PDOS) conducted a series of statewide and county-level pilot RLAs designed with the input of experts from several organizations, including the Brennan Center for Justice and the National Vote at Home Institute (PDOS n.d.). Subsequently, the PDOS directed that every county conduct RLAs after each primary and general election starting with the 2022 general election (PDOS n.d.). Reports summarizing audit results are available on the PDOS website (PDOS n.d.).

Michigan statute mandates procedural audits conducted by county clerks after canvassing and election certification that include a review of at least one contest in a set number of randomly selected precincts and at least one statewide contest of ballot measure (NASS 2021; NCSL 2024). Following a referendum passed by Michigan voters in 2018, Michigan conducted a statewide RLA after the 2020 presidential election (NCSL 2024 MSS 2021). This audit was led by county clerks and involved the review of about 18,000 randomly selected ballots across more than 1,300 local jurisdictions and a full hand count audit of all the presidential ballots in Antrim County (MSS 2021).

Recommendations

Curing rules vary by state and county, with some state and local election officials and administrators having substantial discretion over which ballots can be cured. In some instances, this leads to a patchwork of rules that vary for voters across state and even county lines. As Meredith and Kronenberg (2023) argue, state laws should be considered *minimum* requirements. We recommend that officials adopt the most expansive list of errors eligible for curing, notify eligible voters as soon as possible, publish lists of curing eligible voters, permit multiple curing methods, and use multiple notification methods, including working with political parties and local community groups to conduct voter outreach.

Errors eligible for curing should include, but not be limited to, missing signatures and/or dates, incorrectly placed signatures and/or dates, missing printed names and/or addresses, and absence of a secrecy envelope. Officials should publicly publish lists of the names of voters who have curable errors, and these lists should be released early enough to give voters enough time either to fix their ballots or vote in-person early or on Election Day.

Officials should promptly notify voters of errors on their ballots. Research has shown that simply relying on mailers to inform eligible voters about the cure process is inadequate and is likely either to be missed by voters or to be mistaken as a scam (Markus 2022; Spears 2022). Additionally, election officials should actively collaborate with local organizations to help reach out to voters about the need to cure their ballots. State election officials should implement voter education campaigns about mail-in voting and the ballot curing process, as was done in Pennsylvania and North Carolina in 2020 (Altamirano and Wang 2022).

Officials should give voters a variety of ways to cure their ballots. Moreover, officials should either unilaterally implement or work with local organizations to implement practices that help reduce the curing costs for voters. Examples include automatically sending eligible voters new ballots, electronic attestation, assistance filling out curing paperwork, and providing transportation to polling places and/or election offices (Meredith and Kronenberg 2023). Election officials should either send eligible voters new mail-in ballots and information about in-person voting or mail the flawed ballots back to the voter with information on how to correct errors. While many state curing laws limit the amount of time voters have to cure their

ballots, administrators can institute attestation practices that have more flexible deadlines and that would address instances when voters' ballot errors are not discovered until after Election Day (Meredith and Kronenberg 2023).

Recognizing that state and local election officials have limited ability to conduct RLAs, we recommend statewide RLAs and, when possible, a set number of randomly or systematically selected county or precinct-level RLAs before officials certify elections. Moreover, state election officials should provide training for local officials on audit procedures and provide adequate detail concerning how local officials should implement audits (EAC 2020c). Audit results should be publicly accessible, written such that voters can understand the audit process, and be released before election certification (Alvarez et al. 2023; CC n.d.b). Finally, states should allocate more resources to counties and precincts so that they can accurately collect and securely store data; states should also consider joining data sharing agreements that permit third party auditing (Alvarez et al. 2023). Finally, if election officials release CVRs in official election results, they must protect voter privacy and, where geocoded data makes it easy to identify individual voters, records should be merged with larger geographies for analysis purposes.

Challenges and Areas for Future Research

All democracies have imperfections. The challenge for those living in a democracy is to improve the system's quality continuously. A key feature of a quality democracy is voters' ability to hold elected leaders accountable for the decisions they make (Malcolm 2023). A number of factors work together to build a high-quality democracy, including free and fair elections, freedom of expression, associational autonomy, inclusive citizenship, and access to information (Dahl 2005). Each of these factors is independent, but they overlap significantly, such that an improvement in one factor's quality also improves the others' quality.

This white paper has focused on election data transparency and communication as one path to improving the quality of US democracy. Complete and accurate local-level election data is crucial to effective election administration and voting rights protection (Alvarez, Cao, and Li2021; Gold 2024). In turn, protecting voting rights allows voters to participate freely and fairly, thereby holding elected officials accountable.

However, despite its importance, election data often goes unshared and remains inaccessible. Given our country's decentralized electoral system, we recommend a series of science-based best practices designed to increase election data transparency and improve voter file maintenance, ballot processing, auditing and certification. In light of the best practices suggested in this report, we also recommend that state governments allocate more funds to state and local election offices to institute new procedures, improve processes, and implement new technology (IRG 2024; Deluzio et al. 2019).

State and local officials are tasked with undertaking increasingly complex work in the face of intense scrutiny and without adequate resources (Cassidy 2024; Stewart 2022). Pennsylvania, for example, is one of the most populous states in the country but has a “disproportionately small budget for elections” (Pressley 2024). Inadequate resources pose a substantial barrier to achieving election data transparency (Gronke and Caudell-Feagan 2008). Without proper funding, officials are unable to upgrade registration databases and other essential election technology, conduct comprehensive postelection audits, and effectively train administrators and staff on election procedures (Deluzio et al. 2019; IRG 2024).

The existing research on election data suggests that the above recommendations would substantially improve the performance of US democracy for all voters and potential voters—if they are implemented and properly funded. If election outcomes accuracy and access to election data improve, residents can more readily see how democracy works in their own neighborhoods, understand how elections are administered, and better use the electoral process to hold their governments accountable. Civic groups and election administrators can work together to educate the public through enhanced data sharing capacity, and potential voters can be kept up to date about the status of their registration and how their ballots are processed. Administrative and human errors can be reduced, resulting in election outcomes that voters can more easily trust. Further, increasing election data transparency allows organizations like ours to identify inequities in our electoral system and, more importantly, work to address those inequities to achieve a more free and fair democracy.

Areas for Future Research

Due to the copiousness of election data policies and their level of complexity, there are many areas ripe for future investigation and study. Within the area of election data transparency, evaluations of cybersecurity are needed, including assessments of vulnerabilities within voter registration databases and election result manipulation (Alvarez, Cao, and Li 2021). Relatedly, research should evaluate which technology is best for facilitating secure flow of information across geographies (Alvarez, Cao, and Li 2021). Further, advances in our understanding of how technology can improve election performance should lead to national policy changes that will reduce burdens on election administrators while improving electoral participation and outcome accuracy (McDonald 2018; Ross and Spencer 2022).

Further study could focus on which forms of visualization and which election result dashboards most effectively and clearly communicate the results of elections to the public while maintaining voters' privacy and properly securing elections (Alvarez, Cao, and Li 2021; Alvarez et al. 2023). Research should also be dedicated to determining which audit methodologies of election results state and local election officials can effectively administer, including what technological advances are needed to complete RLAs. Finally, experts should devise secure ways to store and retain election reports and data long term (Alvarez et al. 2023).

The absence of systematic analyses of how data transparency policies influence voters' perception of electoral accuracy and fairness makes the analysis regarding how our recommendations impact voters' trust in electoral processes an interesting avenue for future study. Similarly, researchers should attempt to determine which election procedures affect ballot curing rates; this research should include but not be limited to community organizers involvement's effect on voter notification rates and which curing deadlines yield the most fixed ballots and do not delay election certification (Altamirano and Wang 2022).

With improved election data transparency, both election administrators and the public can have greater access to and knowledge about how elections unfold in their own communities. For example, the Center for Science and Democracy is expected to analyze precinct-level election data for the 2016, 2020, and 2024 elections. This precinct-level analysis will allow people to compare voter eligibility, participation, ballot processing, and administrative performance at the neighborhood or precinct level so that it will be possible to detect irregularities and inequalities where they occur and so that people can have confidence in the accuracy of election outcomes (Gordon-Rogers, Latner, and Williams Forthcoming).

A free, fair, and healthy democracy requires increased election data transparency. Recognizing the decentralized structure of election administration in the United States, our recommendations in the areas of voter file maintenance; ballot processing; and ballot curing, auditing, and certification seek to improve transparency at the state and local levels.

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Acknowledgments

This report was made possible through the generous support of the Bernard F. and Alva B. Gimbel Foundation, Democracy Fund, the Wilburforce Foundation, Caldera Foundation, and UCS members.

We want to thank all the UCS staff who contributed to and provided feedback for this project, especially Lindsey Berger and Dominique Sanders. We also wish to thank the members of our Election Science Task Force, particularly Kathy Boockvar, Derek Bowens, Mitchell Brown, Sharon Dolente, Aghogho Edevbie, Jo Lukito, Alec Ramsey, Scott Seeborg, Quentin Turner, and Thomas Whitaker, for their expertise and valuable input in the development and refinement of our recommendations.

Finally, we wish to thank the organizations and their representatives that assisted us at various stages of the process: All Voting is Local, All Voting is Local Michigan, All Voting is Local Pennsylvania, Chelsea Jones and Kevin Morris of the Brennan Center for Justice, Center for Civic Design, Common Cause, Common Cause Michigan, Detroit Action, Fair Count, League of Conservation Voters Michigan, League of Women Voters Michigan, Make the Road PA, Moon Duchin from MGGG Redistricting Lab, Michigan AFL-CIO, Michigan United, Pennsylvania Voice, Progress Michigan, and Promote the Vote.

Organizational affiliations are listed for identification purposes only. The opinions expressed herein do not necessarily reflect those of the organizations that funded the work or the individuals who reviewed it. The Union of Concerned Scientists bears sole responsibility for the report's contents.

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