

Statistics Can Help Ensure Accurate Elections

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Through the American Statistical Association's Science and Public Affairs Advisory Committee and special interest group on volunteerism, a number of statisticians are working to improve the accuracy of elections. What follows is a summary of the role of statistics in elections. Work is ongoing to address these points in detail.

Election officials need to make sure the person elected winner is the person the most voters want. Studies have shown computer vote tallies can be wrong; their accuracy must be verified with meaningful audits. Volunteers of the ASA are working to show how election audits can be done effectively and efficiently. Election results are most trustworthy when the entire election process can be audited, not just the vote counts. Following are areas where statistics can help.

Statistical Accuracy

Key to economical and effective auditing is a focus on statistical accuracy. Very close results (e.g., within 0.5%) should automatically trigger a recount. In other situations, the audit should have the statistical power to trigger additional action at least nine out of 10 times when the wrong winner is declared. Similarly, the audit should provide statistical confidence in the reported results that it will not trigger additional action at least nine out of 10 times when the correct winner is declared. Taking a fixed percent of the total votes will not do the job. That produces too few cases for the desired accuracy in small jurisdictions and unnecessarily many cases in big ones. Officials must use random samples, not convenient samples, for the results to be scientifically valid.

Public Accountability

Key registration statistics should be made publicly available on the internet before each election. Detailed election data should be posted in well-documented, computer-friendly (and human-friendly) form immediately after each election. These data should include poll records of how many registered voters showed up, as compared to the number of ballots cast at each polling place. Published data also should include precinct descriptions and initial precinct-level tallies by type of ballot (e.g., standard, absentee, etc.) for each candidate and ballot proposition. Elections should be certified as official only after statistical audits have been performed and made public. Public data on revised tallies and documentation of the audit procedures must be suitable for peer review. Federal and state legislatures can boost public confidence in elections by requiring and standardizing such information.

Voter Registration

Each eligible citizen should have an equal chance to vote. No group should be discouraged from voting due to race, gender, poverty, geographic location, etc. Election officials can compare registration rolls with relevant census data, corrected for losses of eligibility. Such losses include people who have died or moved to other voting areas. In many states, people convicted of a felony also lose their eligibility to vote. Statistical audits can help make sure ineligible persons are not registered and eligible voters are not denied the chance to vote. Vital statistics and reliable criminal justice statistics can help officials audit corrections to the voter rolls.

Voter Accessibility

It is not easy to give equal voting opportunity to everybody who has the right to vote. Some people are partially disabled, poor, or impaired in their ability to read and follow directions. We can survey such people statistically to find out how effectively they are able to vote now. To the extent that any group is not well-served, we can find out how to give its members better access to voting. We need scientifically designed random sample surveys in order to get this information.

Voting Equipment

Voting officials must ensure voting equipment is designed, configured, and maintained to meet voters' needs. Such issues are being studied by a technical guidelines development committee, chaired by the National Institute of Standards and Technology. Most computer experts agree we cannot just trust computers and software to record and count votes accurately. They, like many ordinary citizens, believe we need auditable

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paper records, verified by voters when they vote, so we can audit the machine tallies. Good records of how well the equipment worked at each polling place also are needed. Statistical analyses of such records can reveal which machines are most reliable and helpful to voters.



Voting Operations

Statistical methods can help officials ensure trained and qualified workers and well-functioning voting machines are distributed fairly. Plans must address peak voting hours at each site, so all eligible voters can vote in a reasonable amount of time. Using principles from survey questionnaire design, ballot designs need to be checked in advance to find and fix design-induced errors. Ideally, voting machines should detect voter errors and make them easy to fix. Official, standardized data also are needed on how well each voting site works. Qualified poll observers should fill out forms showing how well each part of the election plan worked at each polling place. Plans for future elections should rely on statistical analyses of such data to clarify how well the election system served the voters and help identify needed improvements.

Post-Election Surveys

Exit polls and post-election surveys are inherently statistical. As always, samples must be random and scientifically designed. Proper analysis and interpretation of such data can help explain results that appear wrong on the surface. Maintaining checks on every election is the best way to make sure any errors or problems with an election process are found and fixed.

These requirements may seem burdensome. Yet, food safety monitoring, industrial quality control, sales research, weather forecasting, and medical research all depend on such records and statistical analyses. The public demands responsible quality control for consumer products. Our democracy deserves no less. ■