Election experts are concerned that problems with database name-matching algorithms may unfairly disqualify some voters in the upcoming election.

Electronic voting machines have been the focus of much controversy the last few years. But another election technology has received little scrutiny yet could create numerous problems and disenfranchise thousands of voters in November, election experts say.

This year marks the first time that new, statewide, centralized voter-registration databases will be used in a federal election in a number of states.

The databases were mandated in the 2002 Help America Vote Act, which required all election districts in a state or U.S. territory to consolidate their lists into a single database electronically accessible to every election office in the state or territory.

But the databases, some created by the same companies that make electronic voting machines, aren't federally tested or certified and some have been plagued by missed deadlines, rushed production schedules, cost overruns, security problems, and design and reliability issues.

Last year, in Larimer County, Colorado, election workers got an error message when they tried to access the state's database to process absentee ballots, and had to log off for 20 minutes. In a mock election four months ago, clerks in other counties had trouble accessing the database from polling locations. Those who could connect said the system was sluggish.

Election officials in several counties said they didn't trust the system, and planned to load the database to county computers and use printed poll books on Election Day rather than access the central database in
real time.

"The voter-registration databases are an underlying part of the voting technology revolution that has taken place in this country that has been the least noticed," says Kim Alexander, president and founder of the California Voter Foundation. "We don't know how much of a problem (they've) been across the country. My guess is that there have been technical problems with statewide databases all across the country that have gone unreported."

This year, during primaries in several states, longtime voters phoned a national voter hotline complaining their party affiliation had changed from Democrat or Republican to unaffiliated, preventing some from casting ballots in states without open primaries. Others complained they weren't on the voter roll, though they'd lived and voted at the same location for years. One Maryland woman said the birth date in her voter record was several decades off her real age. Others were listed as "inactive," although they'd voted in the previous federal election. And one woman who said she voted in 2006 was told she wasn't registered and couldn't cast a ballot. Election officials told her the voter ID number she had belonged to a man.

But election experts say the real concern is how states are conducting database matches of new voters under HAVA.

The law requires each voter to have a unique identifier. Since 2004, new registration applicants have had to provide a driver's license number or the last four digits of a Social Security number to register (voters who don't have them are assigned a unique number by the state). States are required to try to authenticate the numbers with motor vehicle records and the Social Security Administration database.

But databases are prone to errors such as misspellings and transposed numbers, and applicants are prone to make mistakes or write illegibly on applications. The Social Security Administration has acknowledged that matches between its database and voter-registration records have yielded a 28.5 percent error rate.

States vary in how they treat applicants whose records don't match, and experts say rules in some states could prevent thousands of eligible voters from casting ballots or having their votes counted in November. Those who don't match in Oregon, for example, can cast a ballot, but their vote for president or any other federal race on a ballot won't be counted. There are currently about 9,500 voters in Oregon who fall into this category, but a state spokesman says matching issues will be resolved with most of them before November so they can vote in federal races. Fewer than 500 voters were affected by this during the state's primary.

"One of the big problems is that states just haven't been very transparent about how they're operating their new database," says Dan Tokaji, law professor at the Ohio State University's Moritz College of Law. "So it's really hard to tell how this is going to play out. A few states have implemented overly stringent matching rules, the consequence of which could be that some citizens' votes don't get counted."

In the 2000 election, about 1.3 million registered voters said they didn't vote due to trouble with their registration, according to a U.S. Census Bureau survey, which didn't elaborate on the nature of the troubles. In an election when record numbers of new voters are expected to participate, experts say the number of voters who find they can't cast a ballot this year could be higher.

Voter registration databases are central to the democratic process in every state except North Dakota -- which doesn't require registration. Everywhere else, the registration roll is the gatekeeper determining eligibility to vote in an election. Voter lists aren't used just for elections, however. Shortly after the Sept. 11 terrorist attacks in 2001, before statewide databases were mandated, then-Attorney General John Ashcroft reportedly ordered that voter registration lists be checked for links to terrorists.

Until HAVA, each county or election district in most states maintained its own voter list, which often resulted in duplicate registrations when voters moved and re-registered -- creating opportunities for fraud. States were supposed to consolidate their lists by Jan. 1, 2004, but most got an extension to 2006. Creating a statewide system that interfaces with multiple county registration databases built by different companies proved to be difficult. About a dozen states missed the 2006 deadline, and four were sued by the Justice Department.

There have also been a number of issues involving companies that make the systems. Some states built databases in-house; others outsourced to companies like Election Systems & Software (which also makes voting machines), and the Bermuda-based Accenture. Accenture was hired by several states, but lost contracts in all but one for missed deadlines and other issues.
Colorado -- a crucial swing state -- completed its $13 million database this year after firing Accenture in 2005. A little-known Oregon company named Saber, which has created databases for 11 states, replaced it. Accenture retained its contract in Pennsylvania, though problems occurred there as well. In 2005, one state official called the $20 million system "seriously if not fatally flawed."

HAVA requires databases to have "adequate technological security" but doesn't specify details, such as encryption. And although the databases interface with every county election office, access controls haven't been developed in some states.

A 2006 audit of Florida's registration system found that the state hadn't established adequate access levels for various users and had no process for maintaining or monitoring audit logs, making records vulnerable to theft and manipulation. A June 2008 follow-up found some of the same problems. One former election office employee, for example, still had access to the database three months after leaving his job.

In 2006 in Denver, electronic poll books made by Sequoia Voting Systems crashed extensively, causing long lines that resulted in an estimated 20,000 voters leaving polls without voting. During Georgia's primary this year problems with e-poll books made by Diebold Election Systems led to voting delays up to three hours long.

Despite various issues, Kay Stimson, spokeswoman for the National Association of Secretaries of State, says the registration databases are ready, and states are confident they'll perform well for the election. She acknowledges, however, that issues over HAVA matches are still a concern. "Generally speaking, the uncertainty that hangs over the process, including uncertainty that results from election challenges and litigation introduced shortly before Election Day, creates a greater likelihood for problems or confusion at the polls," she said.

HAVA leaves it to states to decide how to conduct matches. Some states require an exact match with the Social Security Administration database and only a substantial match with motor records. Others require an exact match for a voter's Social Security number, first and last name, and month and year of birth.

Exact matching, however, could mean that a woman who recently married and changed her name would fail to match government records containing her maiden name. Voters who have double last names or unusually spelled names might also fail. Everything depends on how a state's matching algorithm is designed.

Last month Wisconsin, whose database just became operational, conducted a test of 20,000 voter names against motor vehicle records and found 20 percent with mismatches, due mainly to typos and transposed numbers. Among those who failed to match were four members of the state's Government Accountability Board (.pdf), which conducted the test. Thomas Cane, the board's chairman and a retired judge, failed because he was listed by his full name, R. Thomas Cane, in his driver's record.

A recent report from the Academies of Sciences noted that "many (if not most) of the matching procedures used by the states have been developed on the basis of intuitive reasoning without further systematic validation or mathematically rigorous analysis, do not reflect the state of the art in matching techniques, and have not been validated in the market, scientifically, or otherwise."

Herbert Lin, one of the authors of the report, told Wired.com that the method states use to develop their procedures often involves "a bunch of guys sitting around a table saying 'Let's try this' and 'Yeah that seems reasonable.'"

The federal Election Assistance Commission advises states not to leave final matching decisions to algorithms, and to have humans examine records that fail and contact voters to resolve discrepancies.

HAVA doesn't say what to do with applicants when matching issues can't be resolved. It says only that first-time voters who register by mail, rather than in person, and whose records can't be matched, must show ID at the poll.

Most states will register applicants who fail a match and let them cast a regular ballot after showing ID at the polls. But three states -- Iowa, Louisiana and South Dakota -- won't register applicants who fail. Iowa does, however, permit Election Day registration, which may allow a rejected applicant to reapply for registration at the poll and cast a regular ballot. Louisiana and South Dakota let the rejected applicants vote after showing ID at the poll but only on a provisional ballot, which may or may not be counted, depending on circumstances and state law. A survey of the 2004 general election showed that states varied in the percentage of provisional ballots that were cast and counted. Most states fell in the 30-70 percent range.
"Provisional ballots are really problem ballots; we don't want people to use them if there's a way not to," says Michael Slater, executive director of Project Vote, a voting integrity group.

Last week Florida, a battleground state, announced a new policy that voting groups say will likely disenfranchise numerous voters. A state law passed in 2005 initially prohibited applicants whose records didn't match from either being registered or voting. But after some 13,000 voters were blocked for bad matches in 2006, and more were blocked in 2007, the state was sued by several groups, forcing it to change its plan.

Beginning Sept. 8, new registration applicants who fail a HAVA match must mail a copy or bring a hard copy of their ID to an election office before Nov. 4 to show that the ID number on their registration application is correct. Officials plan to send a letter to such voters explaining what to do. Voters who forget or never receive instructions can cast a provisional ballot on Election Day, but it will be counted only if they bring or send a copy of their ID to an election office within 48 hours. ID presented at the poll will not be accepted, which could create confusion since Florida law already requires everyone to show ID at the polls.

Election experts say the policy places an unfair burden on voters who may fail a match through no fault of their own, especially since most states get huge spikes in registration applications just before registration deadlines, increasing the likelihood that harried clerks will make data-entry errors.

"Allowing voters to return within 48 hours is worrisome because, the truth is, a lot of them won't," says Tokaji. "Maybe, if it comes down to Florida deciding the presidency, God help them, they will return. But … the more complicated you make things, the more votes won't be counted."

Critics of the policy predict it will affect 10 to 20 percent of new registration applicants.

"That's tens of thousands of people in a state that decided a presidential contest by a few hundred votes (in 2000)," says Slater, whose group was one of the parties that sued Florida.

Florida's voter-registration list isn't new to controversy, of course. In 2000 a contractor hired to weed out convicted felons used broad criteria to match voter names against correctional records and swept up thousands of the wrong people. The same problem occurred in 2004.

Slater cites another troubling trend emerging with the implementation of statewide databases.

Several states have begun comparing databases for duplicate records of existing voters, then purging voters they believe have moved and registered in another state. The problem, Slater says, is the methods used can yield false positives, and officials are deleting voters without contacting them to verify that they've moved, or waiting for two federal election cycles to pass, which are requirements under the National Voter Rights Acts of 1993.

In 2006, Kentucky's attorney general successfully sued his state's board of elections after officials compared their list to ones from South Carolina and Tennessee and purged about 8,000 voters who appeared to have registered in those states at a later date than their registration in Kentucky and were presumed to have moved.

Project Vote is investigating Kansas, Louisiana and South Dakota for similar activity. Minnesota, Iowa, Missouri and Nebraska have also been comparing lists.

"That is a trend that will accelerate, but there are inadequate safeguards, and I think it's very, very dangerous," Slater says.

To address some of the issues that may arise at polls in November, voting groups are advising voters to double-check their registration status before their state's registration deadline (.pdf), to bring ID to the polls in case questions arise about their eligibility, and call 866.MYVOTE1 to report problems.