mRNA Vaccines, Once a Trump Boast, Now Face Attacks From Some in GOP

Legislation aimed to ban or limit mRNA vaccines was introduced this year by GOP lawmakers in at least seven states.

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[Editor's note: POZ has covered mRNA approaches being studied for HIV vaccines. Cancer Health has covered promising experimental mRNA vaccines for pancreatic cancer, melanoma, kidney cancer and other malignancies.]

Researchers racing to develop bird flu vaccines for humans have turned to a cutting-edge technology that enabled the rapid development of lifesaving COVID shots.

There's a catch: The mRNA technology faces growing doubts among Republicans, including people around President Donald Trump.

Legislation aimed to ban or limit mRNA vaccines was introduced this year by GOP lawmakers in at least seven states. In some cases, the measures would hit doctors who give the injections with criminal penalties, fines, and possible revocation of their licenses.

Some congressional Republicans are also pressing regulators to revoke federal approval for mRNA-based COVID shots, which President Donald Trump touted as one of the signature achievements of his first term.

The opposition comes at a critical juncture because vaccines using mRNA have applications well beyond avian flu and COVID. They hold the promise of lifesaving breakthroughs to treat many diseases, from melanoma to HIV to Zika, according to clinical trials. The proposed bans could block access to these advances.

Messenger RNA is found naturally in human cells. It is a molecule that carries genetic material and, in a vaccine, trains the body's immune system to fight viruses, cancer cells, and other conditions. An advantage of mRNA technology is that it can be developed more quickly to target specific variants and is safer than developing a vaccine made from inactivated virus.

"Right now, if we had a bird flu pandemic, we would have a shortage of the vaccine we need," said Michael Osterholm, director of the University of Minnesota's Center for Infectious Disease

Research and Policy. “The one thing that could save us is mRNA vaccine. The challenge would be if mRNA is banned. This is truly dangerous policy.”

The pushback conflicts with innovations championed by Trump. He assembled tech tycoons at the White House just after his inauguration to announce Stargate, a $500 billion artificial intelligence initiative that could help transform cancer treatment by creating tumor-targeting mRNA vaccines. The fledging partnership between Oracle, SoftBank Corp., and OpenAI, co-founded by Elon Musk, envisions leveraging AI in part to improve health outcomes. Patients would undergo blood tests and AI would be used to find cancer.

Scientists would examine the DNA and RNA (RNA and mRNA serve different functions in a cell) of a specific patient’s tumor to create a vaccine to teach that person’s immune system to target and destroy cells driving cancer growth.

“Imagine early cancer detection, the development of a cancer vaccine for your particular cancer aimed at you, and have that vaccine available in 48 hours,” Oracle co-founder Larry Ellison said at the White House event.

Scores of mRNA clinical trials for cancer vaccines are underway and some have shown dramatic results, cutting the risk of death and recurrence roughly in half for certain patients. In research led by the Yale School of Medicine, for example, patients with advanced kidney cancer remained cancer-free about three years after an mRNA-based treatment in an early-phase trial.

But some politically conservative doctors, lawmakers, and researchers question the safety of mRNA vaccines, especially COVID shots made with the technology. Robert F. Kennedy Jr. unsuccessfully petitioned the FDA in 2021 to rescind approval for covid shots and called them “the deadliest vaccine ever made” — a controversial statement that has been refuted.

Now that he’s newly confirmed as Health and Human Services secretary, Kennedy is poised to oversee federal approvals of vaccines, with the power to shape policy such as immunization schedules and appoint vaccine opponents to committees that advise on the approval of shots.

Bloomberg reported late last month that Trump administration health officials were reevaluating a $590 million contract for bird flu shots that the Biden administration awarded to Moderna as part of its push to examine spending on mRNA vaccines.

HHS and White House spokespeople didn’t return emails seeking comment.

Support for an mRNA ban is coming from other sources too. Florida Gov. Ron DeSantis on March 5 urged the Centers for Disease Control and Prevention to stop recommending the COVID-19 vaccine for children and called for a state ban on mRNA vaccine mandates. In February, Rep. Thomas Massie (R-Ky.) said on X that the “FDA should immediately revoke approval of these shots,” and Sen. Ron Johnson (R-Wis.) is leading an investigation into the safety of the vaccines. Trump in February signed an order to strip federal funds from schools that require covid shots for attendance.

Vaccine skepticism has become pronounced among Republicans since the pandemic. Four in 10 Republicans who responded to a KFF poll published in January said it was “probably” or “definitely true” that “more people have died from covid-19 vaccines than from the virus itself.” Just a quarter of Republicans reported holding that view in 2023.

The effort is also finding traction at the local level. A district health department outside Boise, Idaho, last year banned its health department from administering COVID-19 vaccines, and local lawmakers in Franklin County, Washington, passed a resolution in February against mRNA vaccines.

The ABCs of mRNA

The CDC recommends COVID vaccines for anyone 6 months and older, especially seniors and people who are immunocompromised. About 29 million doses had been administered to adults in the 2024-25 season in retail pharmacies and doctors’ offices through Feb. 8, based on federal data.

Given as a shot, mRNA enters muscle cells and teaches them to produce a spike protein found on the surface of a virus. The body’s immune system then targets the spike protein, priming it to identify and fight the virus — in this case, the coronavirus that causes COVID. The body’s cells then break down the mRNA and remove it, according to federal health researchers.

More than 13 billion COVID vaccines had been administered worldwide as of August 2024.

Researchers say the vaccinations saved countless lives — estimates for the first year alone go as high as 19.8 million — in the throes of a pandemic that had hospitals ordering refrigerated mobile morgues and deliberating over which patients to put on ventilators. Two University of Pennsylvania scientists credited with developing the mRNA technology behind the shots were awarded the Nobel Prize for medicine in 2023.

The FDA says the COVID vaccines are safe, with fewer than 1 in 200,000 vaccinated individuals experiencing a severe allergic reaction or heart problems like myocarditis or pericarditis, and the agency notes that “inaccurate information about these vaccines, particularly the mRNA COVID-19 vaccines, continues to circulate.”

While many people hadn’t heard of the mRNA platform until the COVID shots were rolled out, it was discovered in the 1960s. The first mRNA flu vaccines were tested in mice in the 1990s. A clinical trial involving direct injection of mRNA to fight cancer occurred in 2008. Clinical trials involving the COVID mRNA vaccines involved tens of thousands of volunteers.

Reviews of mortality data showed “no unusual patterns of death were detected that might suggest a potential safety concern,” based on a September 2024 report by a technical working group that provided guidance to the CDC.

But those calling for a ban on all mRNA vaccines say there is a dearth of long-term safety data,

and they say covid vaccines by Pfizer-BioNTech and Moderna were hastily approved without proper vetting. They assert without strong evidence that the vaccines cause serious injuries to the heart, nerves, and immune and reproductive systems, and can lead to cancer.

The vaccine has been linked to rare cases of heart inflammation and inflammation of the sac surrounding the heart, although the severity has varied and most patients fully recovered, the CDC says.

“The allegations are beyond reason,” said Anne Schuchat, a career scientist who worked on COVID and who twice served stints as acting director of the CDC. “The mRNA COVID vaccines were extensively studied after use and do not have those problems.”

“I’m concerned about the whole mRNA technology. I don’t trust anything that fools the body,” said Stephanie Seneff, a computer scientist and anti-vaccine activist at the Massachusetts Institute of Technology. “I’m really glad people are waking up and realizing it’s not the thing to do anymore.”

Vaccines generally work by tricking the body into producing antibodies to fight illnesses.

Pfizer spokespeople didn’t return an email seeking comment. A Moderna spokesperson, Chris Ridley, said legislative efforts to ban or restrict mRNA medicines are largely driven by misunderstandings about their safety profile and mechanism of action. While mRNA-based shots do not modify DNA, for example, that misconception is frequently cited in support of restrictions, Ridley said.

“If enacted, these measures could hinder important research and limit patient access to innovative treatments, potentially delaying life-changing medical advancements,” Ridley said in a written statement.

Networks of Opposition

Groups opposed to the mRNA technology have built a vast and well-funded legal, marketing, and social media network. Members hold conferences to discuss strategies, fund lawsuits against vaccine mandates, and produce reports on the covid vaccines.

As for state legislative efforts, measures introduced this year have varied and their progress has been mixed. Montana’s measure, for instance, was blocked. Idaho lawmakers in February held a hearing on its bill, which calls for a 10-year moratorium on mRNA vaccines. Idaho’s proposal, likely to be amended, as well as Iowa’s and Montana’s have featured criminal penalties for providers who administer all or certain mRNA vaccines. In addition, some state bills, such as legislation in Pennsylvania and Tennessee, focused on the use of the vaccine in livestock and food production.

Various bills are pending in the Texas Legislature to restrict mRNA vaccines in both livestock and humans. South Carolina’s pending bill would require anyone administering certain COVID mRNA vaccines to inform patients that the shot is contaminated with fragments of “bacterial plasmid DNA.”

COVID mRNA shots may have minute amounts of residual DNA from production processes but they are heavily degraded and pose no risk, according to the Global Vaccine Data Network, which evaluates vaccine safety concerns.

Speakers at some legislative proceedings have included representatives from Children's Health Defense, an activist, anti-vaccine group founded by Kennedy.

The Florida surgeon general in January 2024 called for a halt in the use of covid mRNA vaccines. And in Texas, Attorney General Ken Paxton in January moved to appeal a lawsuit he filed claiming Pfizer misrepresented the safety of its mRNA shot.

Efforts to restrict the shots have raised the profile of groups such as the Independent Medical Alliance, which advocates for mRNA-based COVID vaccines to be withdrawn from the market.

"We should stop it and test it more before we move forward," said pediatric cardiologist Kirk Milhoan, a senior fellow at the alliance.

Groups opposed to mRNA shots are pointing to a recent study to urge more caution. Yale University researchers reported in February that they found spike protein still circulating in a subset of individuals with a debilitating, post-vaccination condition. Some of the individuals who experienced chronic illness after getting the shots had detectable levels of spike protein more than 700 days after vaccination. This study was small — 42 participants — and not peer-reviewed.

Its findings also don't show the spike protein is a health risk or a cause of vaccine injury.

"It's an initial, provocative study in which you can't draw conclusions," said William Schaffner, past medical director of National Foundation for Infectious Diseases. "This is one of the most widely used vaccines around the globe. It's the furthest thing from an experimental vaccine."

But what this growing pushback shows, according to some researchers, is that distrust isn't coming only from fringe groups anymore.

"There are truly amazing mRNA cancer vaccines out there," said Kate Broderick, chief innovation officer at Maravai LifeSciences, which works on vaccine development. "My fear as a scientist is that it's been tainted in the public."

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