


## 'A Dangerous Virus': Bird Flu Enters a New Phase

A pandemic is not inevitable, scientists say. But the outbreak has passed worrisome milestones in recent weeks, including cattle that may have been reinfected.

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When bird flu first struck dairy cattle a year ago, it seemed possible that it might affect a few isolated herds and disappear as quickly as it had appeared.

Instead, the virus has infected more than 900 herds and dozens of people, killing one, and the outbreak shows no signs of abating.

A human pandemic is not inevitable, even now, more than a dozen experts said in interviews. But a series of developments over the past few weeks indicates that the possibility is no longer remote.

Toothless guidelines, inadequate testing and long delays in releasing data — echoes of the missteps during the Covid-19 pandemic — have squandered opportunities for containing the outbreak, the experts said.

In one example emblematic of the disarray, a few dairy herds in Idaho that were infected with bird flu in the spring displayed mild symptoms for a second time in the late fall, The New York Times has learned.

In mid-January, the Department of Agriculture said that no new infections in Idaho herds had been identified since October. But state officials publicly discussed milder cases in November.

That a second bout of infections would produce milder symptoms in cattle is unsurprising, experts said, and could be welcome news to farmers.

But reinfections suggest that the virus, called H5N1, could circulate on farms indefinitely, finding opportunities to evolve into a more dangerous form — a “high-risk” scenario, said Louise Moncla, an evolutionary biologist at the University of Pennsylvania.

“You could easily end up with endemically circulating H5 in dairy herds without symptoms, obscuring rapid or easy detection,” Dr. Moncla said.

It’s impossible to predict whether the virus will evolve the ability to spread among people, let alone when, she and other scientists said. But their worry is that if bird flu finds the right combination of genetic mutations, the outbreak could quickly escalate.

“I’m still not pack-my-bags-and-head-to-the-hills worried, but there’s been more signals over the past four to six weeks that this virus has the capacity” to set off a pandemic, said Richard Webby, an influenza expert at St. Jude Children’s Research Hospital.

Federal officials, too, have subtly altered their tone in discussing the outbreak, now emphasizing how quickly the situation might change.

For the general public, H5N1 is “a low risk, relative to the other risks they face today,” said Dr. Nirav Shah, principal deputy director of the Centers for Disease Control and Prevention. But “100 percent, that could change,” he said. “This is a dangerous virus.”

Health experts emphasize that there are precautions Americans can take. Do not touch sick or dead birds, or other animals; get tested if you have flulike symptoms; do not consume raw milk or meat, or feed them to your pets.

If a larger outbreak were to erupt, the federal stockpile holds a few million doses of vaccine against bird flu. But the vaccine might need updating to match an evolved form of the virus. In either case, officials would have to scramble to produce enough for the population at large.

The C.D.C. recommends treatment with the antiviral Tamiflu, but studies have shown that the drug does very little to ease illness.

Underlining concerns among many experts is that Robert F. Kennedy Jr., who would lead the federal health and human services department if confirmed, was a vocal critic of Covid vaccines and has said the bird flu vaccines “appear to be dangerous.”

Even if the second Trump administration embraces vaccine development, as the first one did when Covid bore down, it’s unclear how many Americans would roll up their sleeves for the shots.

Influenza typically affects children and older adults, and pandemic influenza has sometimes hit young adults the hardest. But the mistrust engendered during Covid-19 may make Americans eschew precautions, at least initially.



A worker at an egg processing plant in Petaluma, Calif., in 2024. Terry Chea/Associated Press

## An evolving threat

Unlike the coronavirus, which caused havoc with its sudden arrival, influenza viruses typically start off in a specific animal species or in certain geographical regions.

When a different version of H5N1 emerged in East Asia nearly three decades ago, it mostly sickened birds. In the years that followed, it infected at least 940 people, nearly all of whom had close, sustained contact with infected birds; roughly half of those people died.

But since January 2022, when the virus was detected in wild aquatic birds in the United States, it has affected more than 136 million commercial, backyard and wild birds, helping to send egg prices soaring.

It has also struck dozens of mammalian species, including cats both wild and domesticated, raccoons, bears and sea lions.

For at least a year, H5N1 has been infecting dairy cattle, which were not known to be susceptible to this type of influenza. In some cows, it has had lasting effects, reducing milk production and increasing the odds of spontaneous abortions.

And in 2024, the virus infected 67 Americans, compared with just one in the years before, in 2022. The sources of these infections are not all known; one person may have transmitted the virus to someone in their household.

Many of these developments are classic steps toward a pandemic, said Dr. James Lawler, a director at the University of Nebraska's Global Center for Health Security. But, he noted, "where those were really supposed to trigger accelerated and amplified actions at the federal, state and local level, we've just kind of shrugged when each milestone has passed."

Infections in dairy herds, which first emerged in Texas, appeared to be declining last summer. But in late August, California announced its first case. The state's figures soon rose sharply, prompting Gov. Gavin Newsom to declare a public health emergency in December.

"That was sort of a flag to me, like, 'OK, this hasn't gone away,'" said Dr. Manisha Juthani, commissioner of the Connecticut Department of Public Health.

"Over the last couple of months, it has felt like the tempo has increased," she said.

Several other recent events have raised the level of alarm among experts. In early December, scientists reported that in a lab setting, a single mutation helped the virus infect human cells more efficiently.

And late last year two people, a 13-year-old Canadian girl and a Louisiana resident older than 65, became seriously ill with bird flu. Previously, most people infected with H5N1 in the current outbreak had not experienced severe symptoms.

The Louisiana patient, who had health conditions and cared for sick and dying birds, died in early January.

The girl was placed on life support because of organ failure, but eventually recovered. Scientists still do not know how she became infected; her only risk factor was obesity.

Both patients had contracted a new version of the virus that is distinct from the one in dairy cattle and is now widespread in birds. In both individuals, the virus gained mutations during the course of infection that might allow it to better infect people.

"We are clearly now getting novel viruses forming in the wild bird reservoir," Dr. Moncla said. "It's become challenging to keep a handle on all of the various threats."

Some experts see it as particularly worrisome that the virus seems to be in food sources like raw milk and raw pet food. Domesticated cats have died in numerous states, prompting the recall of at least one brand of pet food and new federal guidelines on pet food quality.

“The raw-pet-food thing to me is, I think, quite alarming,” said Dr. Jeanne Marrazzo, director of the National Institute of Allergy and Infectious Diseases.

Pasteurization kills live virus, as does cooking meat at high temperatures. Still, neither procedure is perfect, Dr. Marrazzo noted: “There’s no way that you can police production and sterilization in a way that’s going to make sure 100 percent of the time that food supply is going to be safe.”

## A flawed response

In the year since the outbreak began, federal officials have announced other measures to prevent or prepare for a pandemic. But each is deeply flawed, experts said.

The Department of Agriculture was slow to begin testing H5N1 vaccines for cows, leaving interested companies in limbo. Dr. Marrazzo said that the department had released genetic information from virus samples but had not said where or when they were collected — details that would help scientists track the virus’s evolution.

It is also unclear how many herds are reinfected or have been battling monthslong infections. In Idaho, some herds infected in the spring seemed to recover but showed milder symptoms again in November.

“From the data we have to date, we do not see evidence of new infections or reinfections in previously affected herds, but rather a lack of clearance of the original infection,” a spokesman for the U.S.D.A. said in an emailed response.

But outside experts said that the trajectory of symptoms suggested a second round of illness.

The U.S.D.A.’s program to test bulk milk began in December — nearly a year after the outbreak began — and still does not include Idaho. Engaging outside companies may help the program move faster.

Ginkgo Bioworks, a company that worked with federal agencies during the Covid pandemic, already works with a partner that assesses roughly half the nation’s commercial milk supply for bacteria, antibiotics and other substances.

Adding H5N1 to the list would be straightforward, so “why wouldn’t we just add assays into this infrastructure that we already have?” said Matt McKnight, a manager at the company’s biosecurity division.

Earlier this month, the Biden administration announced \$306 million in new funding, about one-third of it for surveillance, testing and outreach to farmworkers.

But farmworkers in some places like the Texas Panhandle are still unaware of what bird flu is, how it spreads and why it should matter to them, said Bethany Alcauter, director of research and public health programs at the National Center for Farmworker Health.

As a result, she said, many workers still do not use protective gear, including in milk parlors where the virus is thought to spread.

Human testing has been voluntary, and infections have been missed. Few farmworkers have opted to be tested, out of fear of immigration officials or their own employers.

“If you don’t look for it, you won’t find it, right?” said Dr. Deborah Birx, who served as White House Coronavirus Response Coordinator under President Trump.

“This is not about lockdowns or restricting activity. It’s about protecting the individual American by empowering them with the information.”

**Apoorva Mandavilli** reports on science and global health, with a focus on infectious diseases, pandemics and the public health agencies that try to manage them. More about Apoorva Mandavilli

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