

What is ivermectin, and how did people get the idea it can treat covid?



Ivermectin tablets in Jakarta, Indonesia. The U.S. Food and Drug Administration has warned Americans against taking ivermectin, an anti-parasitic medication, to prevent or treat covid-19. (Dimas Ardian/Bloomberg)

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CORRECTION

In an earlier version of this story, David Boulware incorrectly cited an amount and concentration of animal ivermectin available online and calculated that it would be 100 times the normal human dosage, leading to toxicity. Ivermectin, at the amounts and concentration typically available online, would be more than seven times the normal dosage for an adult human, which could still lead to toxicity. This story has been corrected.

The [idyllic photo](#) of a chestnut horse appeared on the U.S. Food and Drug Administration’s Instagram feed in August, along with a blunt caption: “You are not a horse. Stop it with the #Ivermectin. It’s not authorized for treating #COVID.”

The post was [one of several stark warnings](#) issued about ivermectin — an anti-parasitic medication being promoted by prominent conservative media figures and politicians, as well as some physicians, as an effective treatment for covid-19, despite the lack of scientific evidence showing there are benefits of taking the drug for that purpose.

Interest in ivermectin has surged during this summer’s rapid rise in [coronavirus](#) infections fueled by the highly transmissible delta variant. Prescriptions have soared, and some people have resorted to taking forms of the anti-parasitic intended for large animals, leading to spikes in calls to poison control centers around the country.

For many experts, the ivermectin craze is stirring feelings of pandemic *deja vu*.

“We’ve already had the sad example of [hydroxychloroquine](#), which is used for malaria, which clearly did not show any positive effects,” said Sunil Parikh, an associate professor of epidemiology and infectious diseases at the Yale School of Public Health, referring to the drug [pushed by President Donald Trump](#) and others during the earlier stages of the pandemic.

“I’m afraid at the moment we’re heading down that way with ivermectin,” Parikh said.

WHAT TO KNOW

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What is ivermectin and how is it traditionally used?

Ivermectin tablets are [approved for use in humans by the FDA](#) to treat some parasitic worms, including intestinal roundworms or those that cause river blindness. Topical treatments are also used for external parasites (head lice) and to help with skin conditions (rosacea).

When used appropriately, “it’s a very effective treatment for some of these parasitic infections,” said John O’Horo, an infectious-disease specialist with the Mayo Clinic in Rochester, Minn. The inexpensive and widely available drug is included on the [World Health Organization’s list of essential medicines](#) for several parasitic diseases.

For animals, ivermectin is commonly used as a dewormer, said Gillian Perkins, associate director of the Cornell University Hospital for Animals. The medicine is used to treat a wide range of animals, including dogs, cats, horses and livestock, and comes in a variety of forms, such as injectables, pastes or liquids.

But unlike human ivermectin, which generally requires a prescription for oral and topical treatments, animal formulations can be purchased online or at feed stores with relative ease — prompting concern among experts who are urging people not to self-medicate with these products.

“Animal products are not tested in humans,” Perkins said. Misusing medicine intended for large animals, such as horses and cattle, could cause serious side effects. “You may put yourself in a worse situation than you really were otherwise.”

Does ivermectin have an effect on covid-19?

While there are a few ongoing clinical trials, most experts say that, thus far, there is no high-quality research that would lead them to recommend using ivermectin to prevent or treat covid-19. The FDA has not approved ivermectin for the treatment of any viral infection.

“It hasn’t been proven to be effective,” said Michael Saag, a professor of medicine and infectious diseases at the University of Alabama at Birmingham. “If I saw evidence that it worked, I would be one of the first to use it. But the truth is, there are no data that support its use.”

So how did people get the idea that it can treat covid?

The idea that ivermectin could be a coronavirus treatment began gaining steam in the spring of 2020, when Australian researchers observed that the medicine killed the virus in a laboratory setting. The findings had notable caveats, however. For one, the amount of drug required to have an effect on the virus was much higher than the amount approved for use in humans, and could be fatal. And lab-based tests, where the drug and virus interact in a petri dish, also don’t account for the complexities of the human body.

“You could take many drugs and push them to a high enough concentration that you would see some effect in a laboratory setting against pathogens,” Parikh said. “When we use them in humans, we have to find the sweet spot where the drug has its positive effect, but the risk of any of those side effects is extremely low.”

David Boulware, a professor of medicine in the Division of Infectious Diseases and International Medicine at the University of Minnesota, agreed. “Just because it works in the lab doesn’t mean that it works in humans,” said Boulware, who is involved in two ongoing large-scale clinical trials examining the effect of ivermectin on people with covid.

“People believe it’s either a miracle cure or that it’s highly dangerous and the reality is it’s neither of those two,” he said. “When used in normal human doses, it’s a relatively safe medicine, but we just don’t know if there’s any benefit” to treating covid.

Other clinical trials conducted so far have been controversial. Findings have been complicated by concerns over issues with the research, such as plagiarism, methodological flaws and small sample sizes. At least one large study that reported benefits has been withdrawn following complaints about plagiarism and data manipulation.

According to Boulware, the best data currently available is from [a trial in Brazil](#), which has not formally published its findings. In that study, ivermectin performed similarly to the placebo, he said, meaning there was no apparent clinical benefit to taking the medicine.

Merck, a pharmaceutical company that manufactures ivermectin, said its scientists are continuing to review available data. But at this point, they have found “no scientific basis for a potential therapeutic effect” against covid, “no meaningful evidence for clinical activity or clinical efficacy” in people with covid, and “a concerning lack of safety data in the majority of studies,” Merck said.

“The use of ivermectin in some ways reflects desperation,” Boulware said. “People want a therapy, need a therapy, and they don’t really have access to other therapies. ... [Ivermectin] had a little bit of data, a little bit of science behind it, where propaganda could take off and really kind of exploit the pseudoscience to really promote it.”

What is the difference between human and animal ivermectin?

Animal ivermectin often comes in much higher concentrations than humans need or can safely tolerate, experts said.

Boulware said someone purchasing ivermectin for horses online, for example, could wind up with more than seven times the normal approved human dose, which could lead to toxicity.

There are also concerns about the purity of animal formulations. “You really don’t know what you’re getting when you take these,” Parikh said. “You’re likely getting a higher dose. You’re likely getting something that’s maybe not as pure a drug. You might have other stuff in there, so it’s really dangerous.”

What are the risks of misusing ivermectin?

High doses of human and animal ivermectin can be toxic to people, and it is possible to overdose, [according to the FDA](#). Too much ivermectin can cause nausea, vomiting, diarrhea, low blood pressure, allergic reactions, dizziness, problems with balance, seizures, coma and death. Additionally, even at approved doses, ivermectin can interact with other medications, such as common blood thinners. And long-term use hasn’t been rigorously studied.

For people with covid, using ivermectin instead of a proven therapy “represents an opportunity cost,” said Saag, the Alabama doctor.

Even if the ivermectin doesn’t cause direct harm, he said, someone using it might not take advantage of “treatments that actually work, like monoclonal antibodies.” [Monoclonal antibodies](#) have been shown to be most effective when administered early in the course of a coronavirus infection.

While there is currently [no shortage](#) of human ivermectin, and experts say people who need the medicine for approved uses still should be able to get it, skyrocketing sales of the animal version have concerned some vets. “It’s a great example of how these things should be requiring a prescription and not be readily available,” Perkins said.

How are doctors and health agencies responding?

The absence of high-quality data showing that ivermectin can treat covid has done little to quell the demand. This summer, prescriptions in the United States jumped from an average of 3,600 weekly prescriptions before the pandemic to more than 88,000 in one week in August, according to the Centers for Disease Control and Prevention.

Meanwhile, calls about ivermectin exposure to poison control centers nationwide were five times the normal levels in July, The Washington Post reported, citing data from the American Association of Poison Control Centers.

Alarmed by such developments, public health agencies such as the FDA, the WHO and the National Institutes of Health, as well as medical associations, have issued warnings about the medication.

“There’s a lot of misinformation around, and you may have heard that it’s okay to take large doses of ivermectin,” the FDA wrote on its webpage. “It is not okay.”

In a joint statement, the American Medical Association, American Pharmacists Association and American Society of Health-System Pharmacists called for an “immediate end” to prescribing or dispensing ivermectin to prevent or treat covid outside a clinical trial.

While worried about the public response, experts say it’s not surprising, given the pandemic. “For those who are frustrated, anxious, scared, it’s understandable to try to find something,” Parikh said. “But we have something that has already jumped through all the regulatory hoops and all the high-level reviews — and that’s the vaccine.”