

News in focus

director-general Tedros Adhanom Ghebreyesus (who was not directly involved with the investigation) posted a statement saying that he looks forward to future studies of the virus's animal origins – but that he wasn't content with the examination of a possible laboratory leak. "I do not believe that this assessment was extensive enough," he wrote. "This requires further investigation, potentially with additional missions involving specialist experts."

Over 4 weeks from mid-January, 34 scientists from nations including China, Japan, the United States and the United Kingdom gathered in Wuhan and assessed data. The team has now published its findings in a 300-page report.

Much of it is devoted to cases occurring in December 2019 and January 2020. Of the 170-odd people who had symptoms in December, two-thirds reported having been exposed to live or dead animals shortly beforehand, and 10% had travelled outside Wuhan.

Chinese researchers sequenced SARS-CoV-2 from some of the people in this group, finding that eight of the earliest sequences were identical, and that infected people were linked to the Huanan market. This suggests an outbreak there, according to the report.

However, researchers also found that these genomes varied slightly from those in a few other early cases. Some linked to the market; others did not. This means that the coronavirus might have been spreading under the radar in communities, evolving along the way, and coincidentally occurring in people linked to the market, says the report.

Another possibility is that an outbreak occurred at a farm that provided animals to the Huanan market, suggests Holmes. Several infected animals – with slightly different variations of SARS-CoV-2 – might have then been sold at markets in Wuhan, sparking multiple infections in humans.

Plenty of animals were sold at the Huanan market. Records from December 2019 list poultry, badgers, rabbits, giant salamanders, two kinds of crocodile and more. Chinese officials said that the market didn't sell live mammals or illegal wildlife, the report adds. But it also references unverified media reports suggesting that such animals were sold, and refers to photographs that Holmes published after a trip there in 2014, of animals such as live raccoon dogs.

Chinese teams collected nearly 1,000 samples from the Huanan market in early 2020, swabbing doors, rubbish bins, toilets, stray cats and mice, and stalls that sold vegetables and animals. The majority of samples that tested positive were from stalls that sold seafood, livestock and poultry. The researchers also took samples from 188 animals across 18 species at the market, all of which tested negative.

But these animals don't represent everything sold in the Huanan market, notes WHO team member Peter Daszak, president

of the non-profit research organization EcoHealth Alliance in New York City. "A thousand samples is a great start, but there's more to do," he says. He points out that researchers traced farmed animals at the market back to three provinces in China where pangolins and bats carrying coronaviruses similar to SARS-CoV-2 had been found. Although the pangolin

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and bat viruses proved too distant to be the direct progenitors of SARS-CoV-2, Daszak says that the animals might provide a clue that outbreaks among animals started in those places.

The WHO report also concludes that it's highly unlikely that the coronavirus escaped from a lab at the Wuhan Institute of Virology. Most scientists say that evidence overwhelmingly favours SARS-CoV-2 having spilled over from animals into humans, but a few have backed the idea that the virus was intentionally or accidentally leaked from a lab.

When the team visited the institute, its scientists told them that no one in the lab had antibodies against SARS-CoV-2, ruling out the possibility that someone there had

been infected in an experiment and spread it to others. The Wuhan researchers also said they hadn't kept any virus strains similar to SARS-CoV-2. And in their discussions with the team, they pointed out that similar viruses exist in animals in China, rather than in their lab.

Nevertheless, the findings might be contested. A group of scientists have written to the media saying that they wouldn't trust an investigation overseen by China's government.

But others say that the WHO's conclusions seem solid. "I'm sure people will say that the Chinese researchers are lying, but it strikes me as honest," argues Holmes. Matthew Kavanagh, a global-health researcher at Georgetown University in Washington DC, says that he's heard no evidence pointing to a lab. "But the sceptics are going to want a deeper investigation than the Chinese government allowed."

Some studies have suggested that COVID-19 was spreading among people before December 2019. To explore that possibility, the report authors looked at analyses of SARS-CoV-2 sequences collected from people in January 2020, and estimated that they evolved from a common ancestor between mid-November and early December of 2019. That estimate roughly corroborates the findings of a report published in *Science* last month (J. Pekar *et al.* *Science* <https://doi.org/f4cm>; 2021).

OUTRAGE OVER VACCINE-TRIAL SCANDAL AT PERUVIAN UNIVERSITIES

Researchers gave shots to politicians and family members, violating trial regulations.

By Luke Taylor

A clinical trial of COVID-19 vaccines in Peru has sparked outrage and triggered a series of high-profile resignations at universities and in government. Politicians, researchers and some of their family members who were not enrolled as trial participants nevertheless received vaccines – breaching standard protocols. Investigations are ongoing as the country struggles to inoculate its general population with limited doses.

The scandal emerged on 10 February, when local media revealed that, in October 2020, then-president Martín Vizcarra had received two doses of a vaccine developed by the Chinese state-owned pharmaceutical group Sinopharm. At the time, a phase III clinical trial was under way to test the vaccine at two

universities in Peru; Vizcarra was not part of the trial.

Days later, it emerged that a group of around 470 other people – including 100 high-profile individuals such as Peru's minister of health and Vizcarra's wife and brother – also got a jab while the trial was in progress. The shots came from a batch of about 2,000 doses that Peruvian officials reportedly negotiated with Sinopharm to protect the medical staff running the trial.

It is not standard practice to vaccinate anyone other than trial participants while a trial is under way – including the medical staff running it, says Euzebiusz Jamrozik, a bio-ethicist at the Ethox Centre at the University of Oxford, UK.

The laws regulating clinical trials in Peru state that imported, experimental research products such as unapproved vaccines are to

be used exclusively for research.

One of the universities running the trial – the National University of San Marcos in Lima – issued a statement condemning the vaccinations of people not enrolled as participants. “Normative and ethical principles of the current regulations and good clinical practices [a set of international medical standards] have been flagrantly violated by using the vaccine in people who are not subjects of research,” said the university’s Faculty of Medicine.

On 19 February, Peru’s National Health Institute (INS) suspended the Center for Clinical Studies at the second university involved, Cayetano Heredia University in Lima, from running new clinical trials. Cayetano has since appointed a panel of former faculty members to investigate the breaches of protocol.

Both universities’ rectors were among the group of non-participants who received shots. Cayetano’s has resigned, but San Marcos’s has not, sparking student protests.

“We share the indignation and deep pain of the [university] community and Peruvian society over the events related to the administration of the additional batch of experimental vaccines sent by Sinopharm,” said Cayetano’s new rector and vice-rector of research in a press release on 1 March.

Members of Peru’s Congress are overseeing an investigation into the vaccinations.

The violation of protocol, and what is seen by many as an abuse of political power by senior officials, has dented confidence in Peru’s politicians and its scientific community, says Mateo Prochazka, a Peruvian epidemiologist working in the United Kingdom. “At a time when we’re creating policies to control the transmission of the virus, we need the public to trust institutions and science, so this is a huge blow for our pandemic control,” he says.

Negotiated doses

The scandal and investigations follow a period of political instability for Peru, in which Vizcarra was impeached and removed from office over bribery charges. The country is struggling to contain the COVID-19 pandemic: it has officially reported more than 1.5 million cases of COVID-19 and 51,000 deaths.

The public had seen the vaccine trial, and a subsequent deal for 38 million Sinopharm vaccine doses to be distributed in Peru, as a turning point in the battle against COVID-19. As in other low- and middle-income countries, Peru paved a path for itself to obtain vaccines by running the trial. It began administering 300,000 of the Sinopharm doses to health-care workers in February.

When news of Vizcarra’s vaccination came out, he said he had made the “brave decision” to volunteer for the trial. But Cayetano and the INS have since confirmed that he and the other prominent people who received vaccinations from October onwards were not among the



Martín Vizcarra received a vaccine during the clinical trial, but was not a participant.

study’s 12,000 participants – half of whom received placebos.

Nature’s requests for comment from Vizcarra went unanswered. In a press release from February, Vizcarra said it was a “great surprise” that Cayetano had not included him as a trial participant, and that he did not make his vaccination public “since it would have jeopardized the normal development” of the trial.

The researcher leading the clinical trial was Germán Málaga – an internal-medicine specialist at Cayetano who is a prominent figure in the medical community.

He oversaw the administration of some of the doses to politicians, including personally attending the vaccination of Vizcarra and his wife at the presidential palace after they requested it, he told a congressional committee investigating the vaccinations on 16 February. He also gave shots to members of his own family.

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Cayetano has suspended Málaga from his role as principal investigator of the trial, and from all university activities.

Málaga denies that he broke protocol in administering vaccines to researchers and prominent people. He points out that the trial protocol he wrote states that the additional batch of vaccines would be “administered voluntarily to the research team and study-related personnel”.

The INS approved this protocol. It did not respond to *Nature’s* requests for comment.

Málaga tells *Nature*: “We used as criteria the protection of ‘study personnel and related personnel’ in a broad way, and in that extension we included the network of infections of the people we wanted to protect.” He admits that this included members of his family, but points out that it also covered medical staff who were working on the front line and thus, in his opinion, needed protection.

According to a press statement released by the INS, Málaga and his staff also administered three doses, rather than the prescribed two, to some individuals outside the trial, to see whether an extra booster shot would improve protection against the coronavirus.

In response to *Nature’s* queries about administering unauthorized doses, Málaga defended his choice. He pointed out that when he administered the shots last September and December, the Sinopharm vaccine had not yet been proved efficacious, and thus trying out extra doses on individuals wouldn’t have been taking them away from the public.

“Including an additional dose is a serious, arbitrary breach of protocol” and violates the “fundamental principles of medical ethics”, says Ignacio Maglío, coordinator of science ethics for the UNESCO Bioethics Network, who is based in Buenos Aires.

Clarifying how and why vaccinations were administered outside the trial could help restore confidence in Peru’s science community, says Prochazka, but investigations are complicated by the fact that so many institutions are implicated.

The events in Peru aren’t the only instances in which members of the elite have jumped vaccine queues during the pandemic. In Argentina, for example, a similar list has emerged, resulting in the health minister’s resignation and a national investigation.

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