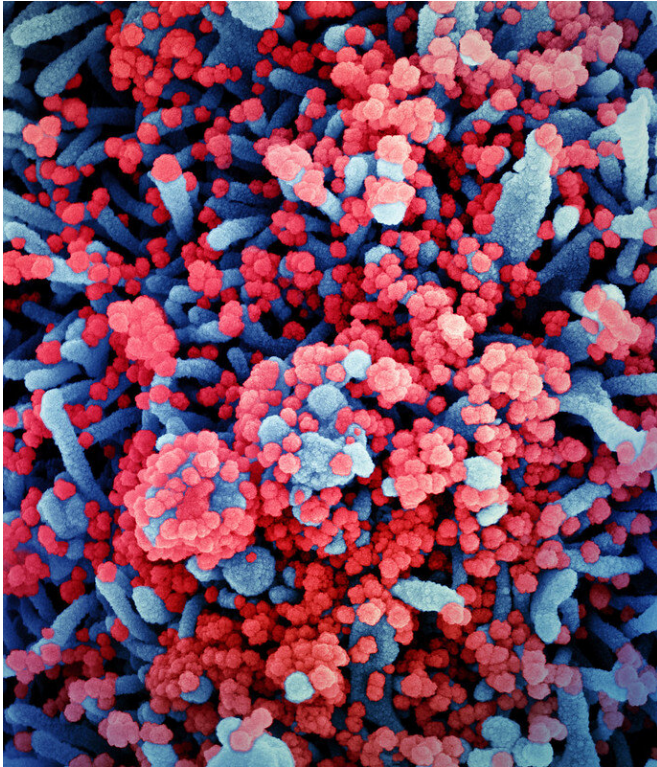


Covid origins mystery continues to spark speculation and tension

2 June 2021



Colorized scanning electron micrograph of a cell (blue) heavily infected with SARS-CoV-2 virus particles (red), isolated from a patient sample. Image captured at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID

The coronavirus SARS-CoV-2 has scorched its way across the world killing millions and bringing economies to a standstill. But where exactly did it come from?

With few clear answers, speculation has persisted since the beginning of the pandemic, spawning misinformation and [conspiracy theories](#) as well as sharp diplomatic tensions.

Here is a look at leads scientists are following—and others they have rejected—in trying to determine

how the [virus](#) made the leap to humans. Finding the right answer, they say, could help avoid the next pandemic.

Animals

Bats were identified early on as the probable origin of COVID-19.

But scientists think the virus would have passed from the winged mammals to another species before reaching humans.

The pangolin was singled out as a suspect because it is one of the wild animal species sold at the market in the Chinese city of Wuhan, which was linked to most of the first known cases of coronavirus.

However, uncertainty about this [theory](#) persists.

A joint investigation by World Health Organization (WHO) experts and Chinese scientists who visited Wuhan in January 2021 was supposed to help shed light on the theory but did not find the missing link.

Other animal intermediaries have come under suspicion, including minks and the ferret-badger.

Man-made

Another idea floated early on was that the virus did not reach people through animals but was engineered.

This idea often went hand-in-hand with the theory that the virus had leaked from a secure biolab in Wuhan. The idea spread widely online with some help from former US president Donald Trump.

One version of this theory alleges that the virus was created and spread on purpose.

Some internet publications have claimed that the existence of coronavirus patents offer "proof" of this, although in reality they are pointing to patented research on other coronaviruses.

The idea that the other pathogens had been spliced into the virus has also proved popular, even though scientists say such genetic manipulation would be visible in the SARS-CoV-2 genome.

Professor Olivier Schwartz of the Pasteur institute calls such ideas "completely unfounded".

Lab leak

The idea that a virus of natural origins—taken from a bat, for example—could have escaped from a secure biolab has been under increased consideration in recent weeks.

The WHO team that travelled to Wuhan in January said in their report that animal transmission was "likely to very likely" while a lab leak was "extremely unlikely".

But WHO chief Tedros Ghebreyesus has said the laboratory leak theory "requires further investigation, potentially with additional missions involving specialist experts, which I am ready to deploy".

In May, a group of 18 experts echoed the sentiment in an editorial that appeared in the journal *Science*.

"We must take hypotheses about both natural and laboratory spillovers seriously until we have sufficient data," they wrote.

"A proper investigation should be transparent, objective, data-driven, inclusive of broad expertise, subject to independent oversight, and responsibly managed to minimise the impact of conflicts of interest."

Citing a US intelligence report, *The Wall Street Journal* reported in May that three workers from the Wuhan Institute of Virology were hospitalised with a seasonal illness in November 2019, a month before Beijing disclosed the existence of a mysterious pneumonia outbreak.

Days later US President Joe Biden gave intelligence agencies three months to report to him on whether the COVID-19 virus first emerged in China from an animal source or from a laboratory accident.

Experts point out, however, that the renewed interest in this theory comes from a lack of information—not from new evidence.

"There is no new factual element that has moved the needle one way or the other," says Schwartz at the Pasteur Institute, noting that the natural transmission theory remains "the most plausible" explanation.

Diplomacy and geopolitics

Assigning blame for the pandemic has had Beijing and Washington eager to point the finger at one another.

As host country to the world's first identified cases, China has come under intense scrutiny.

Western countries have accused it of lacking transparency, both in its initial response and in its cooperation with investigations into the origins of the virus.

Tensions between the US and China were already high in the spring of 2020 when Trump raised the lab-leak theory—a charge Beijing answered with its own hypothesis that the virus came from an American lab.

Last week, WHO emergencies chief Michel Ryan told reporters that the finger-pointing was not helping investigations to go forward.

"This whole process is being poisoned by politics," he warned.

The WHO says understanding how an epidemic began is "essential to preventing further introductions to the human population".

But at the end of last year, even before its team embarked to Wuhan, the organisation warned that the process of tracing how a disease jumped from

animals "is a riddle that can take years to solve".

"The introduction of a new virus to the human population is one of the greatest mysteries an epidemiologist can hope to unravel," it said.

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APA citation: Covid origins mystery continues to spark speculation and tension (2021, June 2) retrieved 6 September 2022 from <https://medicalxpress.com/news/2021-06-covid-mystery-speculation-tension.html>

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