

How the Wuhan lab-leak theory suddenly became credible

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The source of the coronavirus that has left more than three million people dead around the world remains a mystery.

But in recent months the idea that it emerged from the Wuhan Institute of Virology (WIV) — once dismissed as a ridiculous conspiracy theory — has gained new credence.

How and why did this happen? For one, efforts to discover a natural source of the virus have failed. Second, early efforts to spotlight a lab leak often got mixed up with speculation that the virus was deliberately created as a bioweapon. That made it easier for many scientists to dismiss the lab scenario as tin-hat nonsense.

But a lack of transparency by China and renewed attention to the activities of the Wuhan lab have led some scientists to say they were too quick to discount a possible link at first.

Sen. Tom Cotton, R-Ark., from the start pointed to the lab's location in Wuhan, pressing China for answers, so the history books will reward him if he turns out to be right. The Trump administration also sought to highlight the lab scenario but generally could only point to vague intelligence. The Trump administration's messaging was often accompanied by anti-Chinese rhetoric that made it easier for skeptics to ignore its claims.

The following is a timeline of key events, including important articles, that have led to this reassessment. In some instances, important information was available from the start but was generally ignored.

But in other cases, some experts fought against the conventional wisdom and began to build a credible case, rooted in science, that started to change people's minds. This has led to renewed calls for a real investigation into the lab's activities before the coronavirus emerged.

Early speculation

Dec. 30, 2019: The Wuhan Municipal Health Commission issues an “urgent notice” to medical institutions in Wuhan, saying that cases of pneumonia of unknown cause have emerged from the city's Huanan Seafood Wholesale Market.

Jan. 5, 2020: Earliest known tweet suggesting China created the virus. “18 years ago, #China killed nearly 300 #HongKongers by unreporting #SARS cases, letting Chinese tourists travel around the world, to Asia specifically to spread the virus with bad intention. Today the evil regime strikes again with a new virus.”

Jan. 23: A Daily Mail article appears, headlined: “China built a lab to study SARS and Ebola in Wuhan – and U.S. biosafety experts warned in 2017 that a virus could ‘escape’ the facility that’s become key in fighting the outbreak.”

Jan. 26: The Washington Times publishes an article with the headline: “Coronavirus may have originated in lab linked to China’s biowarfare program.” An editor’s note is added March 25: “Since this story ran, scientists outside of China have had a chance to study the SARS-CoV-2 virus. They concluded it does not show signs of having been manufactured or purposefully manipulated in a lab.”

Jan. 26: A study by Chinese researchers published in the Lancet of the first 41 hospitalized patients in Wuhan who had confirmed infections found that 13 of the 41 cases, including the first documented case, had no link to the seafood marketplace that originally was considered the origin of the outbreak.

Jan 30: Sen. Tom Cotton, speaking at a Senate Armed Services Committee hearing, says: “This coronavirus is a catastrophe on the scale of Chernobyl for China. But actually, it’s probably worse than Chernobyl, which was localized in its effect. The coronavirus could result in a global pandemic.” He adds: “I would note that Wuhan has China’s only biosafety level-four super laboratory that works with the world’s most deadly pathogens to include, yes, coronavirus.”

Feb. 3: WIV researchers report in the journal Nature that the novel coronavirus spreading around the world was a bat-derived coronavirus. The report said SARS-CoV-2 is 96.2 percent identical at the whole-genome level to a bat coronavirus named RaTG13. (This is roughly equivalent to the difference in the genomes of humans and orangutans.)

Feb. 6: Botao Xiao, a molecular biomechanics researcher at South China University of Technology, posts a paper stating that “the killer coronavirus probably originated from a laboratory in Wuhan.” He pointed to the previous safety mishaps and the kind of research undertaken at the lab. He withdrew the paper a few weeks later after Chinese authorities insisted no accident had taken place.

Feb. 9: In response to criticism from China’s ambassador that Cotton’s remarks are “absolutely crazy,” the senator tweets: “Here’s what’s not a conspiracy, not a theory: Fact: China lied about virus starting in Wuhan food market. Fact: super-lab is just a few miles from that market. Where did it start? We don’t know. But burden of proof is on you & fellow communists. Open up now to competent international scientists.”

Feb. 16: Cotton, in response to a Washington Post article critical of him, offers four scenarios on Twitter: “1. Natural (still the most likely, but almost certainly not from the Wuhan food market) 2. Good science, bad safety (e.g., they were researching things like diagnostic testing and vaccines, but an accidental breach occurred). 3. Bad science, bad safety (this is the engineered-bioweapon hypothesis, with an accidental breach). 4. Deliberate release (very unlikely, but shouldn’t rule out till the evidence is in). Again, none of these are ‘theories’ and certainly not ‘conspiracy theories.’ They are hypotheses that ought to be studied in light of the evidence.”

Scientists respond

Feb. 19: A statement is published in Lancet by a group of 27 scientists: “We stand together to strongly condemn conspiracy theories suggesting that COVID-19 does not have a natural origin,” the statement says. Scientists “overwhelmingly conclude that this coronavirus originated in wildlife.” The statement was drafted and organized by Peter Daszak, president of EcoHealth Alliance, which funded research at WIV with U.S. government grants. (Three of the signers have since said a laboratory accident is plausible enough to merit consideration.)

March 11: Scientific American publishes a profile of virologist Shi Zhengli, who heads a group that studies bat coronaviruses at WIV. “I had never expected this kind of thing to happen in Wuhan, in central China,” she said. If coronaviruses were the culprit, she remembers thinking, “Could they have come from our lab?” The article said that after the virus emerged, Shi frantically went through her own lab’s records from the past few years to check for any mishandling of experimental materials, but she “breathed a sigh of relief when the results came back: none of the sequences matched those of the viruses her team had sampled from bat caves.” She told the magazine: “That really took a load off my mind. I had not slept a wink for days.”

March 17: An analysis published in Nature Medicine by an influential group of scientists states: “Although the evidence shows that SARSCoV-2 is not a purposefully manipulated virus, it is currently impossible to prove or disprove the other theories of its origin described here. However, since we observed all notable SARS-CoV-2 features, including the optimized RBD [receptor-binding domain] and polybasic cleavage site, in related coronaviruses in nature, we do not believe that any type of laboratory-based scenario is plausible.”

The intelligence community weighs in

March 27: A Defense Intelligence Agency assessment on the origin of the coronavirus is updated to include the possibility that the new coronavirus emerged “accidentally” due to “unsafe laboratory practices.”

April 2: David Ignatius, writing in The Washington Post, notes: “The prime suspect is ‘natural’ transmission from bats to humans, perhaps through

unsanitary markets. But scientists don't rule out that an accident at a research laboratory in Wuhan might have spread a deadly bat virus that had been collected for scientific study.”

April 14: Josh Rogin, writing in *The Post*, reveals that in 2018, State Department officials visited the WIV and “sent two official warnings back to Washington about inadequate safety at the lab, which was conducting risky studies on coronaviruses from bats. The cables have fuelled discussions inside the U.S. government about whether this or another Wuhan lab was the source of the virus – even though conclusive proof has yet to emerge.”

April 22: Yuri Deigin, a biotech entrepreneur, in a long and detailed post on Medium, reviews “gain-of-function” research undertaken at the lab and concludes that “from a technical standpoint, it would not be difficult for a modern virologist to create such a strain” as the new coronavirus. He adds: “The opposite point is worth repeating too: the inverse hypothesis about the exclusively natural origin of the virus does not yet have strong evidence either.”

April 24: Under pressure from the White House, the National Institutes of Health terminates the grant to EcoHealth Alliance that funded study of bat coronaviruses at WIV.

April 30: President Donald Trump tells reporters: “You had the theory from the lab ... There's a lot of theories. But, yeah, we have people looking at it very, very strongly.”

May 3: Secretary of State Mike Pompeo says in an interview with ABC News: “There's enormous evidence that that's where this began. . . . Remember, China has a history of infecting the world, and they have a history of running substandard laboratories. These are not the first times that we have had the world exposed to viruses as a result of failures in a Chinese lab.”

New evidence emerges

July 4: The Times of London reports that a virus 96 percent identical to the coronavirus that causes covid-19 was found in an abandoned copper mine in China in 2012. The bat-infested copper mine in southwestern China was home to a coronavirus that left six men sick with pneumonia, with three eventually dying, after they had been tasked with shoveling bat guano out of the mine. This virus was collected in 2013 and then stored and studied at WIV.

July 31: Science magazine publishes an interview with Shi Zhengli of WIV. She said it was impossible for anyone at the institute to have been infected, saying “to date, there is ‘zero infection’ of all staff and students in our institute.” She added: “President Trump's claim that SARS-CoV-2 was leaked from our institute totally contradicts the facts. It jeopardizes and affects our academic work and personal life. He owes us an apology.” In the interview, she admitted that some

coronavirus research was conducted at biosafety level 2, not the more restrictive BSL-4.

Nov. 17: An influential paper written by Rossana Segreto and Yuri Deigin is published: “The genetic structure of SARS-CoV-2 does not rule out a laboratory origin.” The paper noted that “a natural host, either direct or intermediate, has not yet been identified.” It argues that certain features of the coronavirus “might be the result of lab manipulation techniques such as site-directed mutagenesis. The acquisition of both unique features by SARS-CoV-2 more or less simultaneously is less likely to be natural or caused only by cell/animal serial passage.” The paper concluded: “On the basis of our analysis, an artificial origin of SARS-CoV-2 is not a baseless conspiracy theory that is to be condemned,” referencing the Lancet statement in February.

Nov. 17: WIV researchers, including Shi, post an addendum to their Feb. 3 report in Nature, acknowledging that RaTG13, the bat coronavirus closely associated with the coronavirus, was found in a mine cave after several patients had fallen ill with “severe respiratory disease” in 2012 while cleaning the cave.

Jan. 4, 2021: New York magazine publishes a lengthy article by Nicholson Baker, who reviews the evidence and concludes the lab-leak scenario is more compelling than previously believed.

Jan. 15: Days before Trump leaves office, the State Department issues a “fact sheet” on WIV that states: “The U.S. government has reason to believe that several researchers inside the WIV became sick in autumn 2019, before the first identified case of the outbreak, with symptoms consistent with both covid-19 and common seasonal illnesses. . . . The WIV has a published record of conducting ‘gain-of-function’ research to engineer chimeric viruses. But the WIV has not been transparent or consistent about its record of studying viruses most similar to the covid-19 virus, including ‘RaTG13,’ which it sampled from a cave in Yunnan Province in 2013 after several miners died of SARS-like illness.”

Jan. 20: Joe Biden becomes president.

Feb. 9: A joint report by the World Health Organization and China declares: “The findings suggest that the laboratory incident hypothesis is extremely unlikely to explain introduction of the virus into the human population.”

Feb. 11: WHO Secretary General Tedros Adhanom Ghebreyesus refuses to rule out the lab-leak scenario. “Some questions have been raised as to whether some hypotheses have been discarded,” he said. “I want to clarify that all hypotheses remain open and require further study.”

Feb. 19: National security adviser Jake Sullivan issues a statement about the WHO report: “We have deep concerns about the way in which the early findings of the COVID19 investigation were communicated and questions about the

process used to reach them. It is imperative that this report be independent, with expert findings free from intervention or alteration by the Chinese government. To better understand this pandemic and prepare for the next one, China must make available its data from the earliest days of the outbreak.”

March 22: The Australian newspaper reports: “Wuhan Institute of Virology researchers working on coronaviruses were hospitalized with symptoms consistent with COVID-19 in early November 2019 in what U.S. officials suspect could have been the first cluster.”

May 5: Former New York Times science reporter Nicholas Wade, writing in the Bulletin of the Atomic Scientists, reviews the evidence and makes a strong case for the lab-leak theory. He focuses in particular on the furin cleavage site, which increases viral infectivity for human cells. His analysis yields this quote from David Baltimore, a virologist and former president of the California Institute of Technology: “When I first saw the furin cleavage site in the viral sequence, with its arginine codons, I said to my wife it was the smoking gun for the origin of the virus. These features make a powerful challenge to the idea of a natural origin for SARS2.”

May 14: Eighteen prominent scientists publish a letter in the journal Science, saying a new investigation is needed because “theories of accidental release from a lab and zoonotic spillover both remain viable.” One signer is Ralph Baric, a virologist who worked closely with Shi.

May 17: Another former New York Times science reporter, Donald G. McNeil Jr., posts on Medium: “How I Learned to Stop Worrying And Love the Lab-Leak Theory.” He quotes W. Ian Lipkin of Columbia University — who had signed the March 2020 letter in Nature Medicine — as saying his mind had changed in light of new information.

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