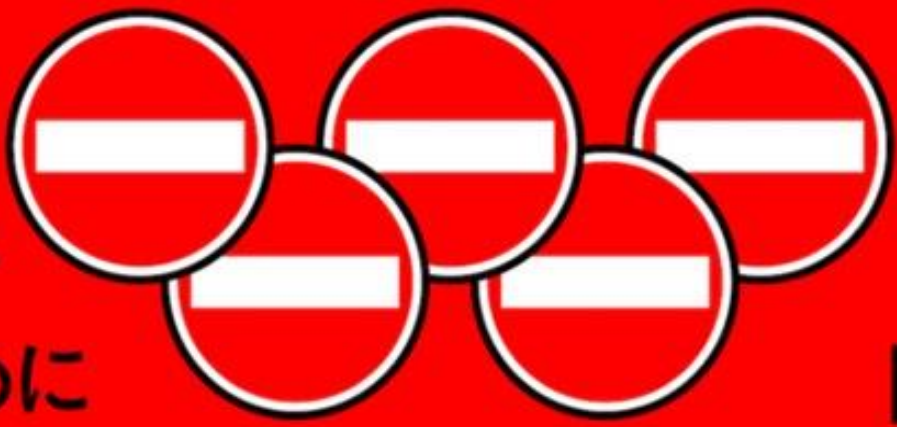
HZS C²BRNE DIARY
Dedicated to Global First Responders
June 2021
06\21

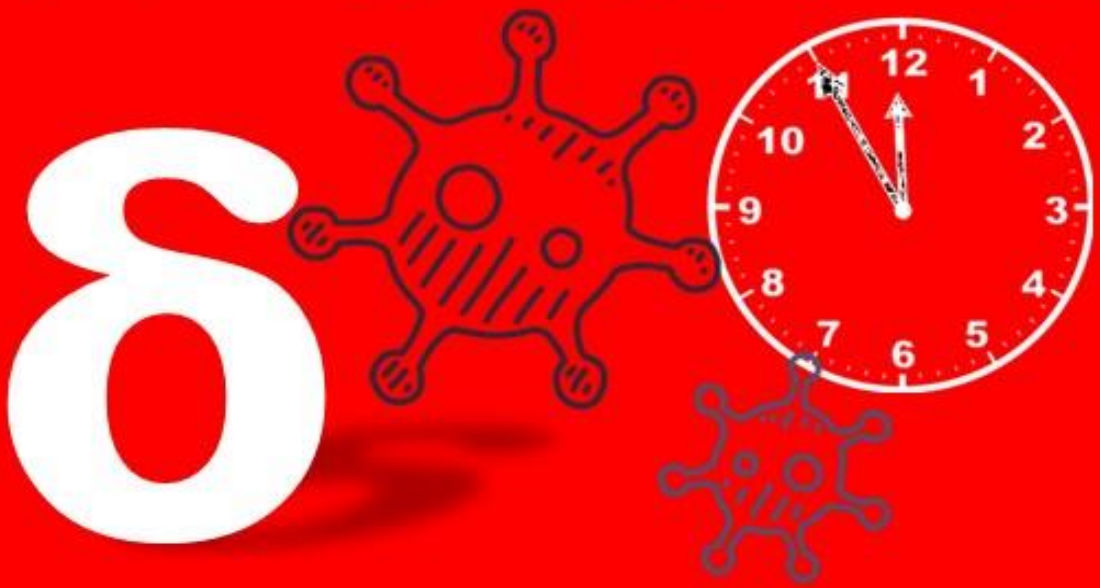
STOP TOKYO OLYMPICS

人々の
命と
暮らしを
守るために



TO
SAVE
OUR
LIVES

東京五輪の開催中止を求めます



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June 2021

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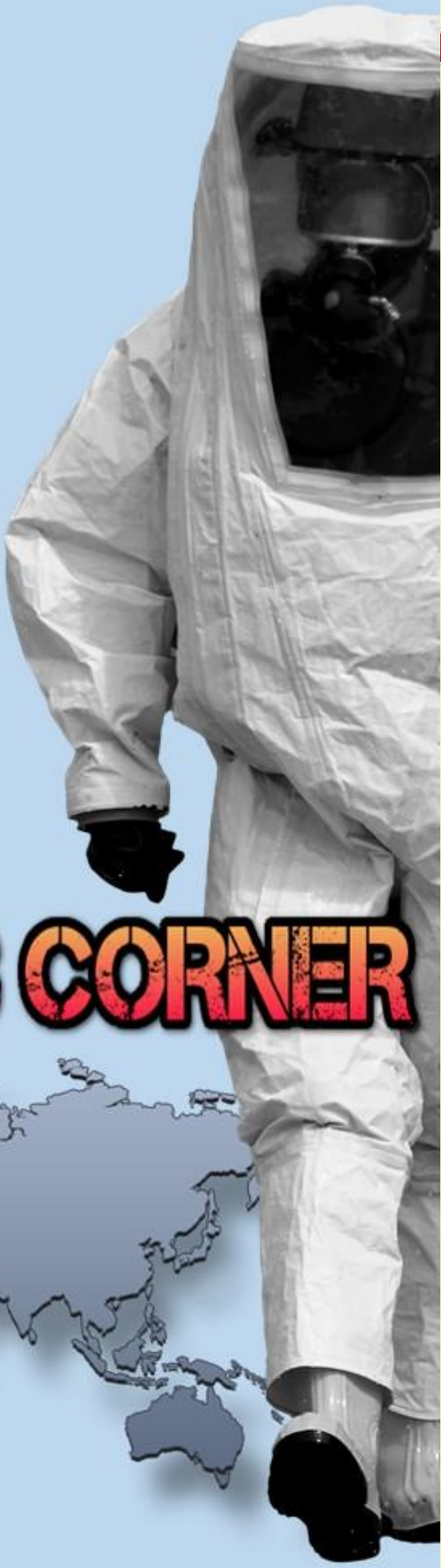


EDITOR'S CORNER

Editorial

Brig Gen (ret.) Ioannis Galatas, MD, MSc, MC (Army)

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

Many ugly things happened in June, a month we supposed to be relaxed and anxious for the vacations to come … Oops! That was a line from 2019 – sorry!

Namibia genocide (1904-1905) by Germans: Recently recognized but the 1.1 billion euros that will be given to Namibia in the next 30 years will again go to the Germans. Yes, you read that right: 70% of the arable land of this African country belongs to former German settlers, who remained after the end of German colonialism in 1915. How many are these Germans in Namibia? 0.75% of the population, but own almost all of the land.

Nazi atrocities in Greece during WWII: Estimated compensations to be around 289 billion euro – but again German government is not only refusing to pay but not even to invest in the country. Germans do have it in their DNA – they do not easily forget when defeated …

Denmark: Denmark's parliament has passed a law enabling the Nordic country to deport asylum seekers to countries outside Europe; something that was heavily criticized by other humanitarian nations, UNHCR, and ruling Rights groups and NGOs.

Greece: Equally criticized for using sound guns in its Evros' borders with Turkey to halt the human immigrants' tsunami supported by Turkey. Same humanitarian EU member-states and NGOs stated that it was too much of a response forgetting (?) what happened last time that a total illegal immigrants invasion was avoided. Forgetting also their closed borders and immigration policies. A crescendo of civilized hypocricy!

USA-Turkey relations: Repetition of the example of how a country can play a nuclear mighty power who thinks that Turkey is still a reliable ally forgetting that survival of this specific nation is based on bazaar (F35) and deception (S400). It would be very interesting to see what will happen in a few years when Turkey will possess nuclear weapons as well.

Pandemic 1: We are now experiencing the rise of the Delta (Δ) variant and the scientific community is very anxious about the effectiveness of existing vaccines. The vaccination pace is not very promising in developed countries and this means that in non-developed countries vaccination is problematic (to say it politely). In Europe (EU) we are still waiting for the EMA to find the time to translate the Russian documents regarding the Sputnik V vaccine perhaps because this vaccine has two serious mishaps: it is cheap and does not have serious adverse effects on health status. Profit versus Public Health as always. The same with the final of Euro2020 to be moved from Webley Stadium to Hungary because there the stadium will be full of spectators without any protection measures and that is translated to a lot of money! (update 22/6: back to Webley with 60,000 spectators – it is not the right time to lose money).

Pandemic 2: Although there is no proven association between deep vein thrombosis (blood clots can sometimes form in your legs during air travel because you are immobile for long periods, often sitting in cramped spaces with little legroom) and thrombosis caused by available vaccines, I think that it is wise to postpone traveling by airplane (especially long flights) during the 2-3 weeks post-vaccination period – just to be on the safe side!

Pandemic 3: There are two articles in this issue trying to explain why healthcare professionals are not very enthusiastic regarding Covid 19 vaccination. People forget that

doctors and nurses are just people like you and me with fears and hesitations but also with a brain of their own and the majority are not anti-vaxxers as many (usually, politicians) accuse them. Also, read what parents discover when they asked for testing the pathogen flora of their children's face masks. Scary!

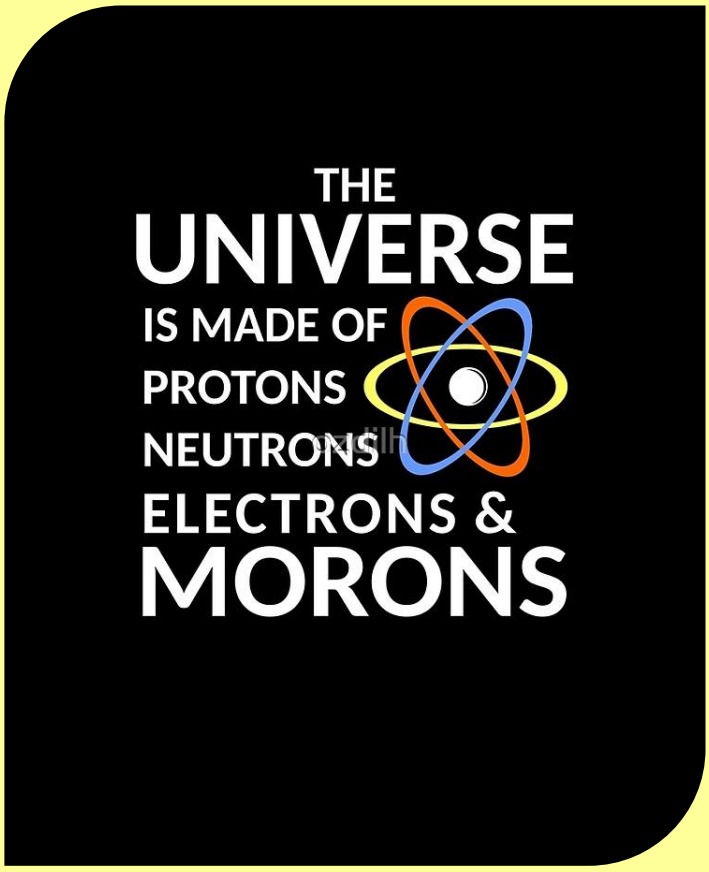
Belgium: From September, parents in Belgium will have the privilege to choose the sex category of their children going to school: boys, girls, and neuter! No! Not a word about "Parent 1" and "Parent 2" – yet! Could this be a side effect of the virus or vaccination?

USA: Terrorist organizations would have about a two-year timeline to regenerate from the potential security void left after coalition withdrawal from Afghanistan, military leaders told lawmakers. Another lost war and counting …

The only good news in June is the fact that the US FDA approved brincidofovir for smallpox – perhaps because they finally understand that the unexpected always happens!

First Responders be prepared. You are still the shield of this planet being under attack – UFOs (or unidentified aerial phenomena, [UAPs] – the ufology community's preferred term) included!

The Editor-in-Chief

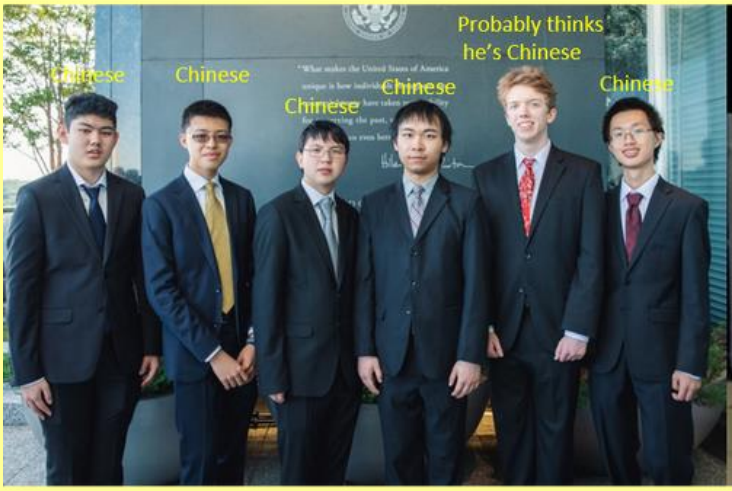


NOTE: Editor's Corner contains articles that got the attention of the Editor covering many aspects of our daily disturbed life.

Life is a bitch!

The U.S. team tied for first place with China at the 60th International Mathematical Olympiad (IMO)

Team USA



Team China

Team Canada

Team Australia

New book offers rare look at North Korea through the lens of a foreign resident

By Thomas Maresca

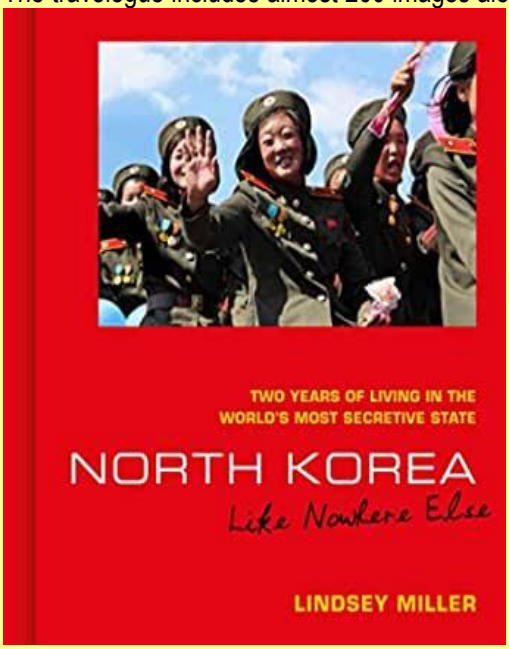
Source: https://www.upi.com/Top_News/World-News/2021/05/24/nkorea-North-Korea-photo-book-scenes-everyday-life/6881621409777/

May 24 – Images of North Korea that make it to the outside world tend to feature military parades, goose-stepping soldiers, missile tests and perfectly synchronized mass spectacles.

But Scottish musical director and composer Lindsey Miller experienced an intimate side of the secretive state rarely seen by foreigners during her two years there, a perspective she shares in the new book *North Korea: Like Nowhere Else.*

Miller's husband, a diplomat, was posted to the British Embassy in Pyongyang from 2017 to 2019, and as a resident she was able to move around much of North Korea without a minder, taking photographs and interacting with locals.

The travelogue includes almost 200 images alongside accounts of memorable moments, from sharing beers with a train conductor over an episode of *The Wire* to being awakened at dawn by the sound of a ballistic missile launch.



Miller said she began taking photographs as a means of recording her experiences and making sense of a place that quickly defied her preconceived notions.

"I'd only ever really associated North Korean people with that propaganda lens of parades, missiles, self-criticism sessions," she told UPI over a Zoom interview from her home in London. "I felt like I had to go back to the drawing board and start all over again and build up my view on the place from what I was seeing and what I was experiencing."

Miller, who lived in a diplomatic compound in eastern Pyongyang, was free to walk, drive and bicycle around the city on her own, as well as visit locations such as the port city of Nampo and Mount Myohyang. (Other parts of the country, including the resort town of Wonsan and the border city of Kaesong, required an official guide.)

She initially was struck by the strangeness of the place, from the desolate airport runway that greeted her arrival to ubiquitous bright red and yellow propaganda posters. But soon Miller's attention turned to observations of North Koreans simply going about their lives.

"The eyes of the people around me, their everyday lives, was where I wanted to become lost and absorbed," she writes.

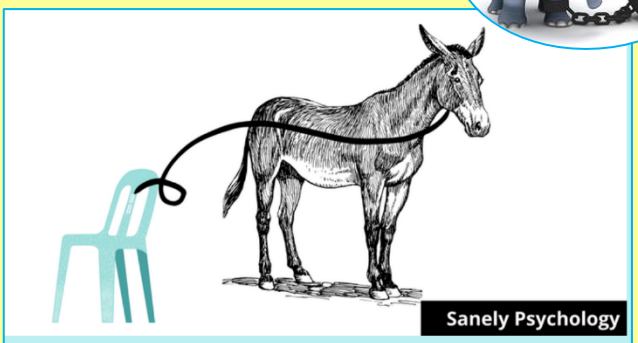
"After a few months, I realized that my photographs weren't just highlighting life and people as I saw them; they were also showing how much Pyongyang and other areas were changing: hairstyles, fashion, buildings, and agriculture may have felt like they were stuck in time, but that didn't mean they didn't alter in very small ways."

At the same time, Miller describes living in a state of almost constant uncertainty, never quite sure whether her interactions were authentic and not knowing what the people she became closest to were truly thinking.

"During those two years, trying to understand what was real and what wasn't became the question with which I wrestled most," she writes in the book, which will be released in the United States on June 29.

Miller, whose recent work includes a season as music director for the Royal Shakespeare Company, said the idea to put a book together emerged after she had returned to Britain but was still struggling to understand her time in North Korea.

"The idea for the book only came about after I got back, as I was trying to make sense of things," she said. "Writing and going through these pictures that I took helped me process the complexities of what I had experienced."



The episodes that Miller lingers on in the book are seemingly unguarded interactions: chatting in Spanish with a shop clerk who had lived abroad in South America, talking about relationships at a karaoke bar with millennials, holding a family's newborn daughter at a water park.

"Those really small moments felt instinctively true and honest -- whether they were or not objectively, who knows," she said. "But for me, just those small moments are windows of human connection."

Miller's experience also coincided with some of the most turbulent times in North Korea's recent history. She arrived as the country was conducting a series of missile and nuclear tests, while a war of words between U.S. President Donald Trump and North Korean leader Kim Jong Un had foreign residents preparing to evacuate at a moment's notice.

One morning in August 2017, Miller was woken up by what sounded like an airplane passing in the distance.

"No planes go over Pyongyang," she recalled. "You never see aircraft. It's a normal noise for us elsewhere in the world, but there it's just not part of life."

Miller soon learned that it was a test of an intermediate-range ballistic missile, the Hwangsong-12, fired from Pyongyang International Airport on a trajectory over Japan.
The mood shifted dramatically in 2018, as North Korea and Kim went on an international charm offensive, participating in the Olympic Games in Pyeongchang, South Korea, and taking part in a high-profile summit with Trump.
Anti-American propaganda posters were replaced with images of a unified Korean Peninsula, and a sense of optimism temporarily prevailed.
Miller's time in North Korea raised a swirl of emotions, ranging from deep anger at the Kim regime to at times almost empathizing with the propaganda she was constantly bombarded with. Despite the challenges of living in North Korea, she said that leaving was incredibly difficult.
"The biggest thing for me has been leaving behind people I care about," she said. "Anywhere else in the world, you can send emails, call someone, go on Facebook, or have a trip and see them. And that's just not possible in North Korea.
"The only thing I can compare it to is saying goodbye to a loved one who's passing away. But they don't die. They're still there, but you can't ever connect with them again."
Miller said she hopes her book helps bring the people of North Korea closer to the foreground for outside observers.
"What I want to do is to open a very small window," she said. "I have no grand illusions that this is going to change the world, but I feel it's my responsibility as someone who's been there to be honest and to share.
"There are 25 million experiences happening in that country. And I think it's really important that, as outsiders, we try and shift our focus to those people."

Thomas Maresca, *based in Seoul, is a writer and photographer covering Asia for UPI. He previously covered the region for USA Today and has written for outlets including TIME, The Atlantic, the Associated Press, Marketwatch, and PRI. He was the recipient of a Jefferson Fellowship from the East-West Center in 2019.*

Germany officially recognizes colonial-era Namibia 'genocide'

Source: https://www.dw.com/en/germany-officially-recognizes-colonial-era-namibia-genocide/a-57671070

May 28 – Germany has recognized the genocide in Namibia after half a decade of talks with the African nation's government
Germany on Friday formally recognized as "genocide" the crimes committed by its colonial troops at the beginning of the 20th century against the Herero and Nama people in what is now Namibia.

Foreign Minister Heiko Maas (SPD) said in a statement that as a "gesture of recognition of the immeasurable suffering" Germany caused, it would set up a fund amounting to €1.1 billion (US $ 1.34 billion). Affected communities would play a key role in deciding what the funds were used for, the Foreign Ministry said in a statement, while legal compensation claims would not be deducted from it.
The aim of the negotiations that lasted more than half a decade was "to find a common path to genuine reconciliation in memory of the victims," Maas explained.
This includes naming the events of the German colonial period in what is now Namibia and in particular the atrocities in the period from 1904 to 1908 "without sparing or glossing over."
"We will now, also in an official capacity, call these events what they were from today's perspective — a genocide," Maas said.

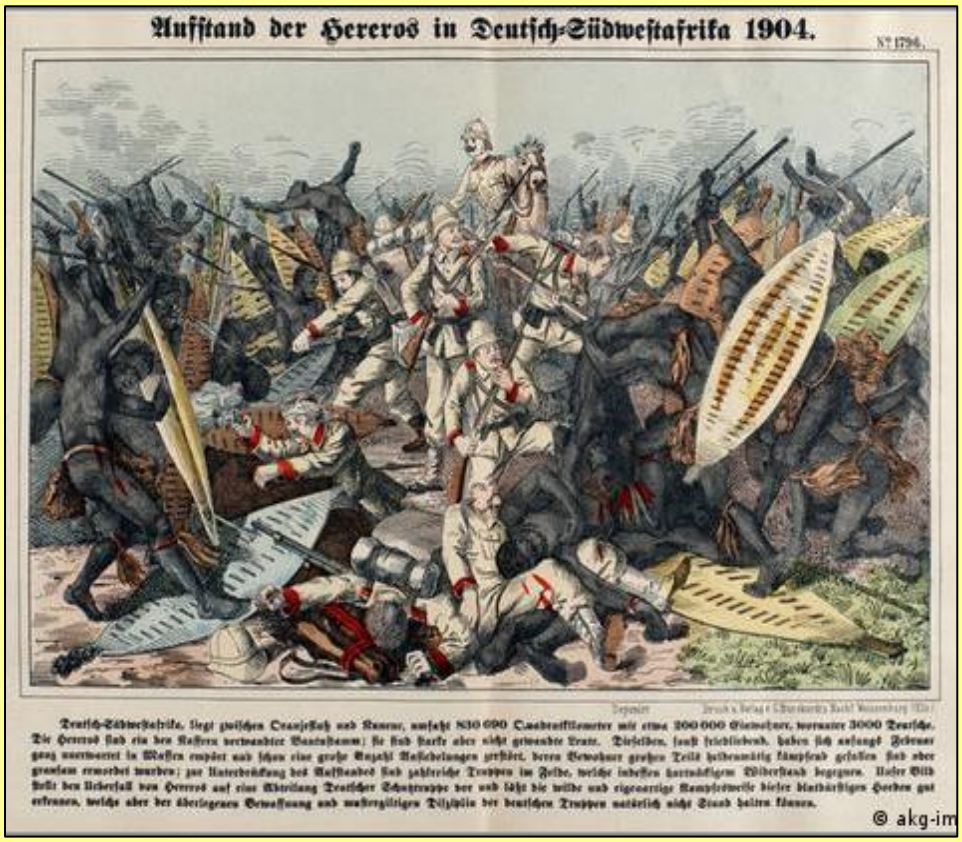
Conclusion more than half a decade in the making

The foreign minister said that representatives of the Herero and Nama communities were closely involved in negotiations with Namibia lasting more than five years.

Germany began talks with the Namibian government in 2015 on what was termed a "future-oriented reappraisal of German colonial rule."
Germany's former development minister, Heidemarie Wieczorek-Zeul, offered her country's first apology for the killings on a trip to Namibia in 2004, where she said the country's actions would be seen as genocidal in today's terms.

What happens now?
The declaration is expected to be signed by Maas in the Namibian capital, Windhoek, in early June.
Parliaments in both countries must then ratify the declaration.
President Frank-Walter Steinmeier is then expected to officially apologize for Germany's crimes in front of the Namibian Parliament.

What crimes did Germany commit in Namibia?
The German Empire was the colonial power in what was then called German South West Africa from 1884 to 1915.



During that time, its military forces brutally put down several rebellions, killing tens of thousands of people.
German General Lothar von Trotha, who was sent to quell a Herero uprising in 1904, was particularly known for his extreme ruthlessness.
Historians generally accept that up to 65,000 of roughly 80,000 Herero people living in the area at the time, and at least 10,000 of the roughly 20,000 Nama people, were killed.

German forces brutally repressed rebellions — here, contemporary lithography of a battle with Herero people

How has the declaration been perceived in Namibia?
Some representatives of the Herero and Nama peoples have voiced criticism of the agreement, saying that it was a PR stunt by Germany and a bid to defraud the Namibian government.
However, neither of the groups expressing objections — the Ovaherero Traditional Authority and the Nama Traditional Leaders Association — can be considered as representing all Herero and Nama groups.
Members of both groups have demanded an official apology from Germany, as well as financial reparation.

Turkey: A state sponsor of terrorism?

By David L. Phillips
Source: https://www.neweurope.eu/article/turkey-a-state-sponsor-of-terrorism/

Turkey functions like a state-sponsor of terrorism (SST), fueling Islamist extremism domestically and deploying jihadist mercenaries to Syria, Libya and Nagorno-Karabakh. Listing Turkey as an SST should not be taken lightly. The SST designation requires mandatory sanctions by the US, which would cause deep damage to US-Turkey relations.
Short of an SST listing, Western countries can sanction Turkey and Turkish security officials for supporting terrorism while providing benchmarks of good conduct so Turkey can redeem itself and restore good relations with the West.

Syria

Turkey's collusion with terrorist organizations can be traced back to the establishment of Turkish Hezbollah in the 1990s, which assassinated Kurdish politicians deemed sympathetic to the PKK.

Support for jihadis was institutionalized in August 2013 when Bashar al-Assad used chemical weapons to strike the Damascus suburb of Ghouta. Artillery tipped with sarin and mustard gas killed an estimated 1729 people, including 400 children.

Erdogan was outraged by the killing of Sunni civilians and took it on himself to respond. Turkey's National Intelligence Agency (MIT) established the so-called jihadi highway that enabled 40,000 foreign fighters from eighty countries to transit through Turkey on their way to Raqqa in Syria. MIT provided weapons, money, and logistical assistance. Foreign fighters wounded on Syria's battlefield appeared in Turkish hospitals where they received emergency care – no cost and no questions asked.

Erdogan's Justice and Development Party (AKP) adopted an Islamist ideology. In July 2014, Deputy Prime Minister Bulent Arinc gave a speech about moral corruption. "The woman…will not laugh in public. She will not be inviting in her attitudes and will protect her chasteness."

Turkey's collusion with Islamists was well-known to intelligence agencies around the world. Vice President Joe Biden confirmed it during a speech at Harvard University on October 2, 2014: "President Erdoğan told me, he is an old friend, you were right, we let too many people through…"

Idlib in Syria's northwest became ground zero for Turkish involvement with al-Qaeda affiliated militias. Erdogan supports Idlib's Sunni fighters — Hayat Tahrir al-Sham, the Al Nusra Front, Ansar al-Din, and Jaysh al-Sunna – who aspire to establishing an Islamic emirate in Syria under al-Qaeda's control.

When Turkey invaded Afrin in January 2018, a majority Kurdish town west of the Euphrates River, 6,000 Turkish troops and 10,000 jihadists were supported by armour and airstrikes as Erdogan escalated conflict with Kurds in Syria. He justified the attack, maintaining that Syrian Kurdish fighters were a branch of the PKK. Turkish-backed jihadis beheaded civilians and mutilated the bodies of Kurdish women. For Erdogan, counter-terrorism means killing Kurds.

Turkey developed a military formula in Syria. Turkish air power and artillery attacked civilians before jihadi mercenaries, backed by Turkish armor and artillery, would advance to seize territory and conduct ethnic cleansing.

Libya

Having proved their mettle in Syria, mercenaries were exported to other conflict zones where their battlefield prowess could advance Turkey's strategic and ideological goals. Turkish land, air and sea forces coordinated with the Syrian National Army (SNA) in Libya. Turkey sent 300 mercenaries from the SNA to defend the Government of National Accord (GNA) in December 2019. In less than a year, 18,000 Syrian fighters had been sent to Libya. The force includes 350 child soldiers.

Turkey's support for the GNA involved both training and operational support. Turkey used Bajraktar unmanned aerial vehicles (UAVs), as well as intelligence assets alongside the SNA, which helped shape the battlefield in its favor.

Turkey's deployment in Libya took place within the framework of 2019 Security and Military Cooperation Agreement between Tripoli and Ankara. Turkish troops fortified the Watiyya Air Base on the Tunisian border, as well as facilities in Misrata and a navy base in Khoms. Turkish troops stayed in their bunkers, while SNA mercenaries did the dirty work.

In May 2021, the Syrian Observatory for Human Rights confirmed the presence of 6,630 Syrian mercenaries in Libya. These fighters were unwilling to return home. They demand repatriation to destinations in Europe where they represent a fifth column.

Nagorno Karabakh

Turkey treated its support for jihadis as a franchise, exporting fighters from one combat zone to the other. Battle-hardened mercenaries were sent from Libya to Nagorno-Karabakh ("Artsakh" in Armenian). Some well-known mercenaries joined the Artsakh operation, launched on September 27, 2020.

Sayf Balud, also known as Sayf Abu Bakr, led SNA's Hamza Division, which fought in Afrin as part of Operation Olive Branch (Afrin) as well as the Libyan Civil War. Balud and approximately 500 of his men were flown to Azerbaijan to join fighting in Artsakh. Balud is a Syrian Turkman who first appeared in a 2013 ISIS propaganda video. He was responsible for multiple war crimes, including kidnapping Kurdish women and brutal repression in Afrin.

Beginning in 2015, Fehim Isa led the SNA's Sultan Murad Division. He was involved in Operation Euphrates Shield, Operation Olive Branch, and the Libyan Civil War. Balud, also an ethnic Turkman, is accused of multiple war crimes, such as the torturing of Kurdish soldiers in Syria and indiscriminate shelling of civilians.

Abu Amsha leads the Suleyman Shah Brigade, otherwise known as the al-Amshat militia. It gained prominence as one of the most brutal factions occupying Afrin. It confiscated property, kidnapped individuals for ransom, which generated $12 million/year. Amsha has been accused of rape and murder.
Other Turkish-backed mercenary leaders include Ahmed Osman, another military leader of the Sultan Murad Division; Abu Jalal, is a leader of the Hamza Division and Mohammad al-Abdullah was "head of Hamza's Political Bureau; Fadlallah al-Haji heads Faylaq al-Sham, an important Turkish proxy who fought in Syria, Libya, and Artsakh. Al-Haji and his men have connections to the Muslim Brotherhood and al-Qaeda in Idlib.
In addition to gross human rights abuses against civilians, Turkish-backed mercenaries destroyed churches and Armenian cultural monuments, which is also a violation of international humanitarian law.

SST Listing
Does Turkey's assistance to jihadi mercenaries make it a state sponsor for terrorism (SST)?
The term SST is applied by the US Department of State to countries that have "repeatedly provided support for acts of international terrorism", pursuant to section 1754(c) of the National Defense Authorization Act for Fiscal Year 2019, section 40 of the Arms Export Control Act, and section 620A of the Foreign Assistance Act. Currently, Cuba, Iran, North Korea and Syria are designated SSTs. Designation requires unilateral sanctions. Being listed is not merely a technical matter. The decision is heavily politicized with listing reserved for America's most intractable opponents. Today, there is growing debate about Turkey's suitability as a NATO member. Regardless, the NATO Charter makes no provision for evicting members that have gone rogue. If Turkey applied today, it would not even be considered for NATO membership because it is Islamist, anti-American and a serial abuser of human rights. NATO is more than a security alliance. It is a coalition of countries with shared values. Whether it deserves to be in NATO is debatable. Turkey is an important intelligence source and early warning post for missile launches and other nefarious activities by Iran and Russia. If any other non-NATO country behaved like Turkey, it would warrant designation as an SST. Given Turkey's strategic importance, it is unlikely Washington will go this route. Short of the SST designation, the US can signal concern by reducing its reliance on Turkey as a security partner. It could relocate assets from Incirlik Air Force Base in southeast Turkey to facilities in Cyprus, Romania or to an aircraft carrier in the eastern Mediterranean. The US could also consider moving 50 tactical nuclear weapons from Incirlik.
Additionally, the US could suspend weapons sales to the Turkish Armed Forces. It could also restrict travel to the US by Turkish officials, such a MIT Director Hakan Fidan, as well as their family members. The foreign bank accounts of Turkish officials involved in support for violent extremism could also be frozen.
The threat of SST designation may prove more effective than actual listing. The US and European allies should pursue quiet, consistent diplomacy. It should provide benchmarks, giving Turkey a way out of the penalty box. Annually, the President should certify that Turkish officials are not supporting terror groups.
Western countries want good relations with Turkey, but relations must be based on respect for the international order. Without publicly embarrassing Turks, US officials can make clear that Turkey crossed the line and will pay a price.

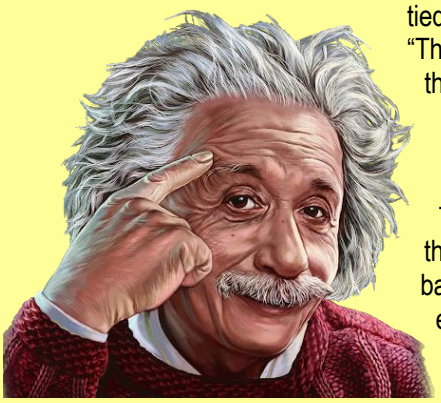
***David L. Phillips** is Director of the Program on Peace-building and Rights at Columbia University's Institute for the Study of Human Rights. He served as a senior adviser and foreign affairs expert at the State Department during the Clinton, Bush, and Obama administrations. His recent books include An Uncertain Ally: Turkey Under Erdogan's Dictatorship.*

Princeton Removes Greek, Latin for Classics Majors to Combat Racism

Source: https://greekreporter.com/2021/05/31/princeton-removes-greek-latin-for-classics-majors-to-combat-racism/

May 31 – Princeton University decided recently to remove Greek and Latin for Classics majors to combat – what it called- institutional racism.
Faculty members approved changes to the Classics department, including eliminating the "classics" track, which required an intermediate proficiency in Greek or Latin to enter the concentration, according to Princeton Alumni Weekly. The requirement for students to take Greek or Latin was also removed.
A diversity and equity statement on the department's site says that the "history of our own department bears witness to the place of Classics in the long arc of systemic racism."

"Our department is housed in a building named after Moses Taylor Pyne, the University benefactor whose family wealth was directly tied to the misery of enslaved laborers on Cuban sugar plantations," the statement says.



"This same wealth underwrote the acquisition of the Roman inscriptions that the department owns and that are currently installed on the third floor of Firestone Library. Standing only a few meters from our offices and facing towards Firestone is a statue of John Witherspoon, the University's slave-owning sixth president and a stalwart anti-abolitionist, leaning on a stack of books, one of which sports the name 'Cicero.'"

The department has a four-person equity committee and says it aims to "create opportunities for the advancement of students and (future) colleagues from historically underrepresented backgrounds within the discipline," which includes "ensuring that a broad range of perspectives and experiences inform our study of the ancient Greek and Roman past."

"We condemn and reject in the strongest possible terms the racism that has made our department and our field inhospitable to Black and non-Black scholars of color, and we affirm that Black Lives Matter," the statement reads.

In recent months have seen a resurgence of an old debate over the merits of studying the classics, and the humanities more broadly. The discussion is largely in response to an early February New York Times Magazine profile of Dan-el Padilla Peralta, an immigrant from the Dominican Republic who is now a professor of classics at Princeton University—and who believes that the classical tradition is inextricably bound with white supremacy and that his discipline, as presently constituted, may not deserve a future.

The Times Magazine profile discusses at length the ways in which classical tradition has been appropriated by activists on the far right, including individuals involved in the January 6 insurrection at the Capitol.

Some of the insurrectionists donned Greek helmets with Donald Trump's name emblazoned on them or carried flags inscribed with Molon labe—a phrase, attributed to Spartan King Leonidas when the Persian King Xerxes instructed him to surrender his weapons, meaning roughly "You come and take them."

Princeton students still encouraged to take Greek and Latin

Princeton says that students still are encouraged to take either Greek or Latin if it is relevant to their interests in the department.

The breadth of offerings remains the same, said Josh Billings, director of undergraduate studies and professor of classics. The changes ultimately give students more opportunities to major in classics.

Billings said the changes had been floated before university president Christopher Eisgruber called for addressing systemic racism at the university, but the curriculum shift resurfaced as a priority after the president's call to action and the "events around race that occurred last summer."

"We think that having new perspectives in the field will make the field better," he said.

"Having people who come in who might not have studied classics in high school and might not have had a previous exposure to Greek and Latin, we think that having those students in the department will make it a more vibrant intellectual community."

Greece will be happy to organize charter flights to Amsterdam

… since the Dutch are so much interested to have them (illegal Afghan immigrants)!

Source (in Dutch): https://nos.nl/artikel/2382945-griekenland-lijkt-infrastructuur-voor-pushbacks-te-hebben-opgezet

Author of Wall Street Journal "Wuhan lab" story wrote lies about Iraqi "Weapons of Mass Destruction"

By Andre Damon

Source: https://www.wsws.org/en/articles/2021/06/01/wuha-j02.html

June 01 – On May 23, the *Wall Street Journal* published an article titled "Intelligence on Sick Staff at Wuhan Lab Fuels Debate on Covid-19 Origin." Citing unnamed "current and former officials," it claimed that researchers at the Wuhan Institute of Virology "went to hospital in November 2019, shortly before confirmed outbreak" of COVID-19.

Two days later, on May 25, Health and Human Services Secretary Xavier Becerra, speaking at the United Nations World Health Assembly, demanded a "transparent" investigation into the origins of COVID-19.
The next day, On May 26, US President Joe Biden called on the "Intelligence Community" to investigate whether COVID-19 arose "from a laboratory accident" and "report back to me in 90 days."

Secretary of State Colin Powell holds up a vial he said could contain anthrax as he presents evidence of Iraq's alleged weapons programs to the United Nations Security Council in this Feb. 5, 2003 file photo. (AP Photo/Elise Amendola, File)

Media reports by NBC, CNN, and the *New York Times* followed. All of them claimed that the Biden Administration's actions were triggered by the "new evidence" presented in the *Wall Street Journal* article. Within 24 hours of publication of the *Journal's* report, all of these publications declared that the Wuhan Lab conspiracy theory was "credible."
But the article published by the *Wall Street Journal*— beyond being totally unsubstantiated and presenting nothing fundamentally new in terms of "intelligence"—is presented by a lead author who happens to have helped fabricate the most lethal lie of the 21st century.
The lead author of the *Journal* piece, Michael R. Gordon, was the same man who, along with Judith Miller, wrote the September 8, 2002 article falsely asserting that Iraqi President Saddam Hussein was seeking to build a nuclear weapon.
That article, entitled "U.S. says Hussein intensifies quest for a-bomb parts," claimed that "In the last 14 months, Iraq has sought to buy thousands of specially designed aluminum tubes, which American officials believe were intended as components of centrifuges to enrich uranium."
The claim was a lie, funneled to the *Times* by the office of US Vice President Dick Cheney.
On May 26, 2004, The Times published a letter from its editors entitled "FROM THE EDITORS; The Times and Iraq," acknowledging that the *Times* repeatedly "fell for misinformation." The letter notes,

But we have found a number of instances of coverage that was not as rigorous as it should have been…
On Sept. 8, 2002, the lead article of the paper was headlined "'U.S. Says Hussein Intensified Quest for A-Bomb Parts.'" That report concerned the aluminum tubes that the administration advertised insistently as components for the manufacture of nuclear weapons fuel. … it should have been presented more cautiously… Administration officials were allowed to hold forth at length on why this evidence of Iraq's nuclear intentions demanded that Saddam Hussein be dislodged from power: "'The first sign of a 'smoking gun,' they argued, may be a mushroom cloud."

In a 2005 article by its public editor, the *New York Times* acknowledged in relation to the coverage by Miller, including the article co-authored by Gordon:

Miller may still be best known for her role in a series of Times articles in 2002 and 2003 that strongly suggested Saddam Hussein already had or was acquiring an arsenal of weapons of mass destruction. Howell Raines was then the executive editor of The Times, and several articles about weapons of mass destruction were displayed prominently in the paper. Many of those articles turned out to be inaccurate.

Polk award-winning journalist Robert Parry subsequently commented on Gordon's role in the story:

The infamous aluminum tube story of Sept. 8, 2002, which Gordon co-wrote with Judith Miller, relied on U.S. intelligence sources and Iraqi defectors to frighten Americans with images of "mushroom clouds" if they didn't support President George W. Bush's invasion of Iraq. The timing played perfectly into the administration's advertising "rollout" for the Iraq War.

Of course, the story turned out to be false and to have unfairly downplayed skeptics of the nuclear-centrifuge scenario. The aluminum tubes actually were meant for artillery, not for centrifuges. But the article provided a great impetus toward the Iraq War, which ended up killing nearly 4,500 U.S. soldiers and hundreds of thousands of Iraqis. Gordon's co-author, Judith Miller, became the only U.S. journalist known to have lost a job over the reckless and shoddy reporting that contributed to the Iraq disaster. For his part, Gordon continued serving as a respected Pentagon correspondent.

Over the subsequent decade and a half Gordon continued to serve as a conduit for fabricated "intelligence" emanating from the White House, the Pentagon and the CIA.

On April 20, 2014, Gordon co-authored an article entitled "Photos Link Masked Men in East Ukraine to Russia," which claimed to identify masked men operating in eastern Ukraine in opposition to the US-backed coup regime as active-duty Russian soldiers.

Gordon wrote,

Now, photographs and descriptions from eastern Ukraine endorsed by the Obama administration on Sunday suggest that many of the green men are indeed Russian military and intelligence forces — equipped in the same fashion as Russian special operations troops involved in annexing the Crimea region in February.

Four days later, The *Times* Public editor was again compelled to retract the claims in Gordon's reporting, calling them "discredited."

The Times led its print edition Monday with an article based in part on photographs that the State Department said were evidence of Russian military presence in popular uprisings in Ukraine. The headline read: "Photos Link Masked Men in East Ukraine to Russia."

More recently, some of those grainy photographs have been discredited. The Times has published a second article backing off from the original and airing questions about what the photographs are said to depict, but hardly addressing how the newspaper may have been misled.

It all feels rather familiar – the rushed publication of something exciting, often based on an executive branch leak. And then, afterward, with a kind of "morning after" feeling, here comes a more sober, less prominently displayed follow-up story, to deal with objections while not clarifying much of anything …

And the reporter Robert Parry (formerly of Newsweek and The Associated Press) on Consortiumnews.com sees a pattern in Times articles, often based on administration leaks, that "draw hard conclusions from very murky evidence while ignoring or brushing aside alternative explanations."

Summing up the role played by the media in the run-up to the Iraq war, *WSWS* editorial board chairman David North wrote in War, oligarchy and the political lie

It must be stressed that the mass media was not duped by the Bush administration, but functioned as its willing accomplice in the deliberate deception of the American people. There was nothing particularly sophisticated in the government's propaganda campaign. Much of what it said was contradicted by both established facts and elementary logic. Even when it was established that the administration's claim that Iraq had

sought to obtain nuclear material was based on crudely forged documents, the media chose not to make a major issue of this devastating exposure.

Now the war is over at the cost of countless thousands of Iraqi lives. The country lies in ruins. Much of its industrial, social, and cultural infrastructure has been destroyed. During the past three weeks, US military forces have combed Iraq in search of weapons of mass destruction that could be seized upon by the administration and media to justify the war. And what has been found? Nothing.

The same kind of "deliberate deception" by the media in relation to "weapons of mass destruction" used to prepare the Iraq war is being reprised in the ongoing campaign by the Biden administration and the media to promote the claim that COVID-19 emerged from the Wuhan Institute of Virology. Just as the lies of 2002 led to the destruction of Iraq and the deaths of over a million people, the current US propaganda campaign against China risks provoking a military conflict on a far more devastating scale.

EDITOR'S COMMENT: Just love the photo accompanying this article! Four-star General (ret.) Colin Powell must have been a very brave man to hold the vial with anthrax spores (powder) without any protection! A vial that could eliminate the entire UN Security Council! And the color of the content does not look very white!

Check your IQ: Bad Greeks; Good Turks

Propaganda for idiots

EDITOR'S COMMENT: Illegal immigrants from Asia passed to Bulgaria from Turkey where all their belongings were stripped by local border authorities and then violently pushed to cross Greek borders and of course, they were returned to Turkey now playing the compassionate big brother! And there are no irregular migrants; just illegal uninvited individuals coming from not combat areas trying to reach EU countries via closed borders. "*Propaganda, to be effective, must be believed. To be believed, it must be credible. To be credible, it must be true.*" (Hubert H. Humphrey - American politician who served as the 38th Vice President of the United States from 1965 to 1969.)

Danish parliament approves law to process asylum seekers outside Europe

Source: https://www.ft.com/content/7917b3e5-8dd9-4bb6-9d5d-81506c38c9c4

June 03 – **The Danish parliament approved a law on Thursday that will allow Denmark to process asylum seekers outside Europe,** in a move that has drawn anger from human rights advocates. Under the measure, Denmark can send asylum seekers to a third nation, most likely in Africa, to have their claims assessed. The UN High Commissioner for Refugees has denounced the move as a "frightening race to the bottom" that is against the principles of international asylum co-operation. Demark has gained a reputation for adopting one of the toughest stances on migration in the EU, under immigration minister Mattias Tesfaye, a Social Democrat who is himself the son of an Ethiopian immigrant. Tesfaye said Denmark had "identified a handful of countries" that it was talking to about reception centres but stressed that any transfer of asylum seekers "must be in line with our international obligations". **The country is the first in Europe to declare the area around the Syrian capital, Damascus, safe for refugees to return to.**

The government has also taken tough domestic measures, including forced evictions in migrant neighbourhoods to try to break up what it terms ghettos in several Danish cities. Under the government's plans, asylum seekers arriving in Denmark would be transported to a third country, where their application would be processed. If successful, the asylum seeker would be allowed to remain in the third country and if not, that nation would deport them. "The current asylum system has failed. It is inefficient and unfair. Children, women and men are drowning in the Mediterranean or are abused along the migratory routes, while human traffickers earn fortunes,"

Tesfaye told the Financial Times, adding that "a key aim" was to reduce the number of "spontaneous" asylum seekers to Denmark. Recommended Denmark Denmark pressures Syrian refugees to leave Denmark's is only the latest attempt by European countries to set up asylum camps in Africa. In 2004, then UK prime minister Tony Blair tried to persuade Tanzania to process asylum claims but failed. Some leftwing lawmakers criticised the government for not outlining which third country it would use, saying they refused to give it "carte blanche". But attention has focused on Rwanda after Tesfaye and another Danish minister travelled to the capital Kigali in late April, and signed a memorandum of understanding on asylum and migration. The agreement did not include anything on the processing of asylum claims and Kigali made it clear that "receiving asylum seekers from Denmark" was also not part of the deal. But Amnesty International warned that any attempt by Denmark to send asylum seekers to a third country would be "not only unconscionable, but potentially unlawful".

Rwanda has a tradition of welcoming refugees, and hosts about 130,000 of them, mainly from neighbouring Burundi and the Democratic Republic of Congo. Although earlier plans to relocate African migrants from Israel to Rwanda fell through in 2018, a so-called Emergency Transit Mechanism centre, or ETM, was established the following year in Gashora. The move came after the Rwandan government, the UNHCR, and the African Union signed a deal to shelter refugees and asylum seekers who had been held in detention centres in Libya. More than 500 refugees — mainly from Sudan, Eritrea, Ethiopia and Somalia — have been sent from Libya to Rwanda. On Thursday, the European Commission said it shared the UNHCR's concerns and that processing claims in a third country raised "fundamental questions about both the access to asylum procedures and effective access to protection". It added that it would analyse the Danish law before deciding on any further steps.

Greek police plan high-decibel message to deter migrants

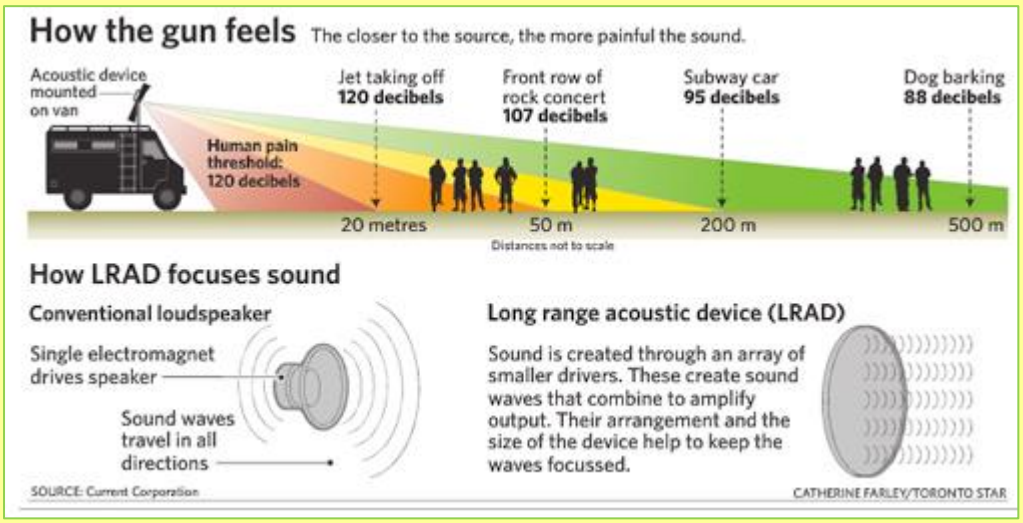
Source: https://www.arabnews.com/node/1869991/world

June 03 – Greek police on Thursday said they plan to send out a high decibel message designed to deter would-be migrants after setting up two controversial "sound cannons" at the Evros border post with Turkey.

A police official told AFP the cannon had been put in place along the river which separates the neighbors and is a favored crossing point from non-EU member Turkey into Greece, which is part of the bloc.

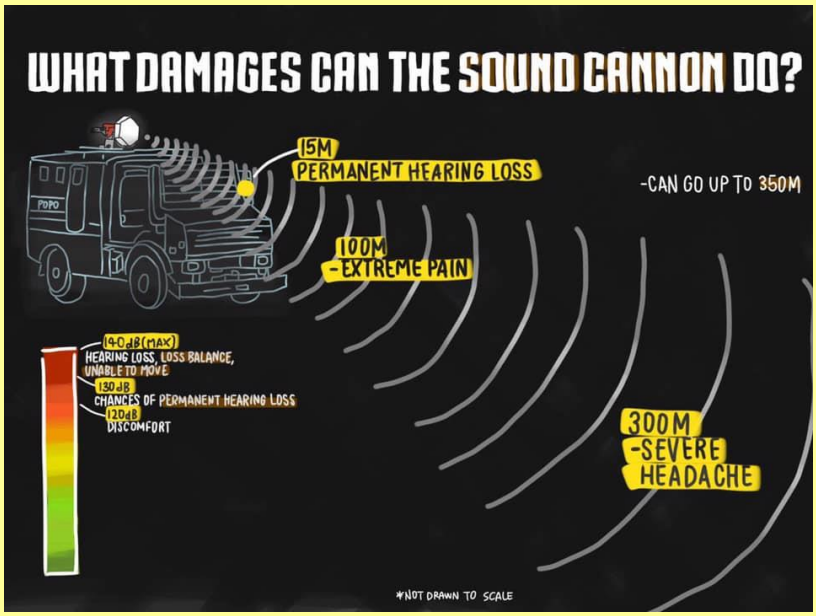
Athens bought the high-tech, armored truck-mounted material after a major influx in February last year which followed Turkish President Recep Tayyip Erdogan

warning his country could not take in any more refugees from the Syrian conflict, given it already hosts more than 3.5 million.
Tens of thousands of refugees poured over the Kastanies-Pazarkule border post into Greece and scuffles with authorities ensued over several days.



The Long Range Acoustic Devices which some police forces use to disperse protesters, emit deafening bursts with a decibel count of up to 162 decibels — louder than the roar of a jet engine at around 120 decibels, Greek TV station Skai reported.
"These cannon have yet to be used as there has not been an attempted mass incursion into Greek territory as was the case last year," said one police officer who requested anonymity.

"It is a tool at our disposal to prevent a potential illegal mass entry into Greece by a group of immigrants," he explained.
The government has constructed a new wall comprising eight raised observation platforms along a 27-kilometer (17-mile) stretch of the Evros river (called Meric in Turkey) and also beefed up border guard numbers.
European Commission spokesman Adalbert Jahnz said Thursday he was "in contact with the Greek authorities" seeking more information on the cannon.
"I am absolutely in favor of guarding European borders but still more so in favor of European values. The goal is not to dissuade all migrants but to control migration better," commented Sammy Mahdi, Belgium's secretary of state for asylum and migration affairs.
"This can and must be done in a humane manner," he added.



At the height of last year's crisis, EU chiefs paid a visit to the area in a show of support for Greece as it sought to protect what is an external EU border.

EDITOR'S COMMENT: What is this? Humanitarian lessons from a Belgian (Muslim) Minister? It would be much better if he could pull the strings and arrange charter flights for illegal migrants only from Thessaloniki to Brussels and Charleroi airports!

U.S. Judge Overturns California's Decades-Long Ban on Assault Weapons

A judge in San Diego has slammed a 1989 ban on assault weapons as unconstitutional and said Americans should have the right to own semi-automatic rifles. "Like the Swiss Army knife, the popular AR-15 rifle is a perfect combination of home defense weapon and homeland defense equipment. Good for both home and battle," San Diego District Judge

Roger Benitez said. "Guns and ammunition in the hands of criminals, tyrants and terrorists are dangerous; guns in the hands of law-abiding responsible citizens are better." **Read more**

EDITOR'S COMMENT: The judge surely forgotten (?) to read the statistics about the numbers of lunatics living next to us!

Japan Enhances Security Towards Olympic Games

Source: https://i-hls.com/archives/108842

June 02 – Towards the Tokyo Olympics in July, Japan is enhancing security measures in public transportation. The Transportation Ministry is pushing plans to give railway personnel the authority to inspect the belongings of bullet train passengers, a move intended to prevent possible terrorist acts during the games.

Bullet trains are a network of high-speed railway lines in Japan. The law related to railway operations currently has no provisions

about inspecting passenger belongings. The revision plan stems in part from an incident in June 2018, when a man on a Tokaido Shinkansen bullet train stabbed three passengers, one fatally.

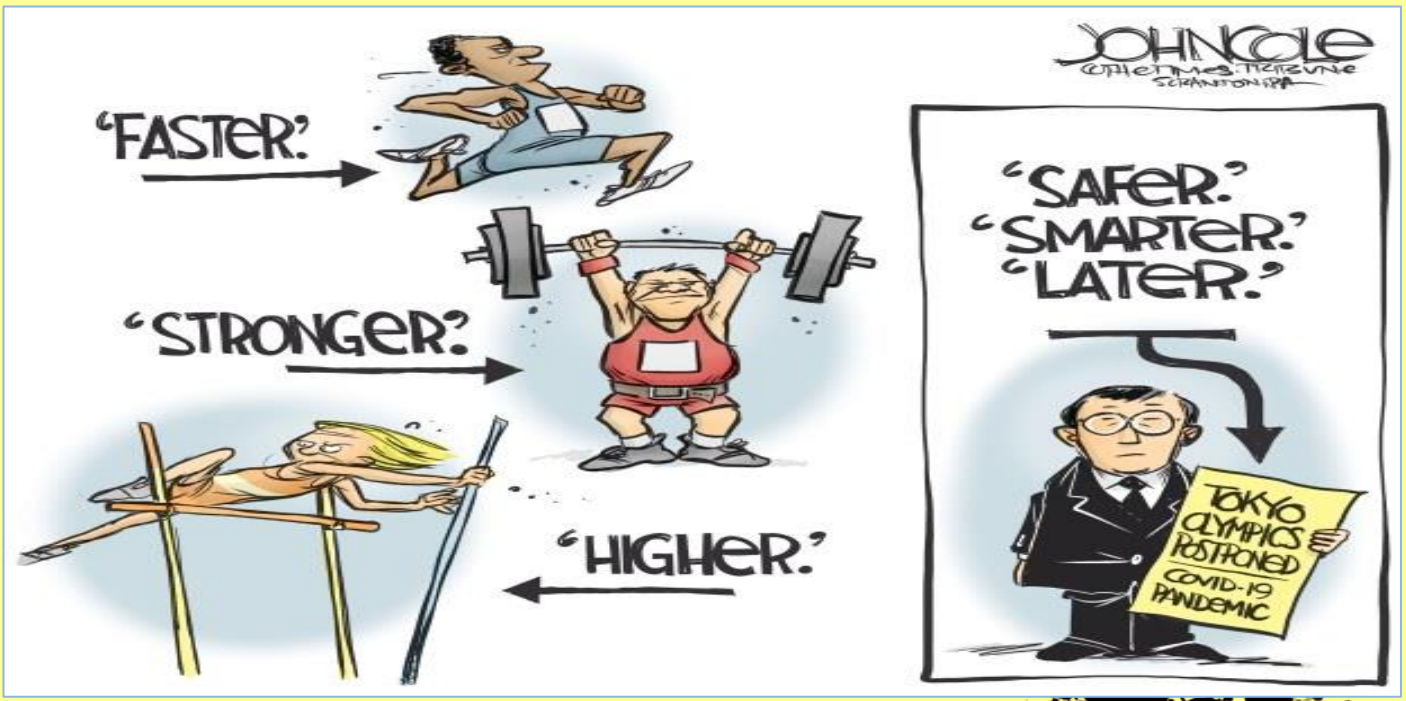
With the revision of the ministerial order, railway companies will be given the authority to conduct such checks and to remove uncooperative individuals from stations and trains.

Body scanners will be installed at entrance gates, and individuals detected with suspicious objects will be asked to step aside and cooperate with an inspection of their belongings.

Sniffer dogs will be stationed at railway stations to detect explosives.

It would be very difficult for railway companies to enforce the wide-ranging security measures that are seen abroad, given the very tight schedules for bullet trains. Moreover, the huge numbers of passengers who commute on trains in Japan prompted the Ministry to focus on bullet trains and major stations, not the slower train lines that operate in metropolitan areas, sources said, according to asahi.com.

EDITOR'S COMMENT: Olympic Games? WHAT Olympic Games???



Qatar has sent hundreds of millions of dollars to terror group – report

Source: https://www.jpost.com/middle-east/qatar-sent-hundreds-of-millions-of-dollars-to-terrorist-group-report-670212

June 06 – A group of Syrians filed legal action in London last week against the Qatari regime for allegedly sending hundreds of millions of dollars to the al-Nusra Front in Syria, an internationally designated terrorist group. The Times of London reported on its front page on Friday about Qatar's alleged state sponsorship of the al-Qaeda-affiliated group.

"A private office of the Gulf state's monarch was at the heart of clandestine routes by which money was transferred to… the Nusra Front," according to the report, and that "two Qatari banks, several charities, wealthy businessmen, leading politicians and civil servants are among the defendants in a claim for damages lodged by nine Syrians."

According The Times, the nine Syrians claimed in the High Court in London that "each played a part in an alleged conspiracy on behalf of the Qatari state, acting in coordination with the Muslim Brotherhood, the Sunni Islamist organization."

Qatar, whose monarchy was accused by Germany's Development Minister Gerd Mueller of financing the Islamic State in 2014, is slated to host the soccer World Cup in 2022.

According to the legal action filed by the Syrians, the pro-al-Nusra Front plot was activated "by high-ranking members of the Qatari ruling elite" who issued money to "actively support and facilitate" al-Nusra Front terrorists in Syria.

The Times wrote that Qatari individuals and organizations acting "on behalf of the state of Qatar" provided al-Nusra Front with hundreds of millions of dollars.

The US, UK and the United Nations Security Council have all designated the al-Nusra Front as a terrorist organization.

The Jerusalem Post reported last year that the US sent a team to probe Qatar's regime for its reported financing of Hezbollah, a group classified as a terrorist movement by the US and the European Union.

The Times reported that "among named defendants accused of involvement are Hamad bin Jassim al-Thani, Qatar's former prime minister, and Abdulhadi Mana al-Hajri, owner of the Ritz Hotel in London. Their representatives said the allegations were completely baseless, and categorical denials have been issued by every Qatari defendant identified in the claim who was contacted by The Times."

According to the legal action, The Times said the "money was laundered for terrorism via significantly overpriced construction contracts, the purchase of property at inflated prices, and over-payments to Syrian migrant workers. The claim alleges the clandestine funding operation was carried out with the Muslim Brotherhood, and included meetings in Turkey between prominent Qatari individuals and representatives of jihadist groups operating in Syria."

The newspaper reported that "money was transferred from the bank accounts of Qatari companies and charities either to Syria directly or to Turkish banks, where the claimants say it was withdrawn and taken across the border into Syria."

The Syrians said they took heavy financial losses or were victims of "torture, arbitrary detention, threats of execution and other forms of persecution committed by Nusra Front," the report said.

The Times reported: "Central to the operation, it is alleged, was the private engineering office of the Amiri Diwan, a Qatari government agency that controls all major construction and development contracts. It receives its directives from Qatar's emir, Tamim bin Hamad al-Thani."

The Syrians alleged that Qatar's financial system was embroiled in the financing of al-Nusra Front, including the Qatar National Bank (QNB) and the Doha Bank. The QNB is the bank for the World Cup.

"The new claim alleges that QNB and Doha Bank knew or ought to have known that they were being used to transfer funds to terrorists," The Times wrote. "If they were unaware of this, it is alleged that they acted unlawfully by failing to monitor their accounts. Doha Bank told The Times the allegations were untrue, as did the Khayyat brothers. QNB said the claims had no factual basis and were categorically untrue."

Lab Leaks, Hacked Drones, Flawed Models, and Explaining UFO Sightings

Source: http://www.homelandsecuritynewswire.com/dr20210607-lab-leaks-hacked-drones-flawed-models-and-explaining-ufo-sightings

June 07 - Today's four provocations: 1) If the lab leak theory of the origins of the COVID virus is proven correct, it will serve as a wake-up call regarding the dangerous research being conducted in poorly secured labs. 2) "If you think any of these [sophisticated military] systems are going to work as expected in wartime, you're fooling yourself," says cybersecurity expert Bruce Schneier. 3) Among the big losers from the pandemic should be modelers, who were treated as if they were the oracles of ancient Greece when, in fact, they offered not much more than guesswork, which

was mostly wrong — and costly). 4) Later this month, U.S. lawmakers will get to learn a bit more on what may be "out there" when the Pentagon submits the classified version of it UFO report to Congress. People familiar with the report say it does not fully explain all the reported "close encounters."

1. Why We Should Welcome the Lab Leak Hypothesis

Bruce Weinstein writes in *Unherd*:

> How could anyone think that lab origin is a good thing? Well, consider each of the two proposed scenarios:
>
> If SARS2 — the virus that causes Covid-19 — came from nature then, logically, it's only a matter of time before something like this happens again. And again. And again. And next time, it could all too easily be worse. Our best recourse, then, is clearly to study potential zoonotic pathogens in the lab. It could even be argued, as it has been by many researchers, that we should enhance these infectious agents to discover their vulnerabilities so that next time, we'll know just what to do.
>
> How else could we discover what we're up against? After all, if SARS2 came from nature, then the biologists who were furiously studying its close relatives were, if anything, too slow and too cautious to protect us. The straightforward lesson of the pandemic would be to simply face up to the clear risk of studying dangerous, novel infectious agents in the lab. Indeed, we would be forced to redouble our efforts before SARS3 catches us off-guard.
>
> If, on the other hand, SARS2 emerged from a lab, then the lesson is the opposite. Covid-19 would be, at the bare minimum, the direct result of our failure to heed prior warnings about the possibility of such an accident. Lab leaks are not uncommon, so making already dangerous viruses even more dangerous is a recipe for disaster. If, therefore, we want to avoid a pandemic from happening again, obviously we would need to curtail this research.

2. Hacked Drones and Busted Logistics Are the Cyber Future of Warfare

Bruce Schneier and Tarah Wheeler writes for Brookings:

> "If you think any of these systems are going to work as expected in wartime, you're fooling yourself."
>
> That was Bruce Schneier's response at a conference hosted by U.S. Transportation Command in 2017, after learning that their computerized logistical systems were mostly unclassified and on the internet. That may be necessary to keep in touch with civilian companies like FedEx in peacetime or when fighting terrorists or insurgents. But in a new era facing off with China or Russia, it is dangerously complacent.
>
> Any 21st century war will include cyber operations. Weapons and support systems will be successfully attacked. Rifles and pistols won't work properly. Drones will be hijacked midair. Boats won't sail, or will be misdirected. Hospitals won't function. Equipment and supplies will arrive late or not at all.
>
> Our military systems are vulnerable. We need to face that reality by halting the purchase of insecure weapons and support systems and by incorporating the realities of offensive cyberattacks into our military planning.

3. Sorry Sage, but Given Your Record on Modelling, Why Should We Listen to You over June 21?

Ross Clark writes in *The Telegraph*:

> There have been many winners and losers from Covid, but there is one group who still seem to be counted among the former when they really deserve to be among the latter. They are the modelers: the scientists who have spent the past 15 months producing graphs showing gruesome forecasts of infections, hospitalizations and deaths. [Downing Street has treated modelers] like the oracles of ancient Greece, their models treated as scientific fact even when they have been shown to be wrong.
>
> Their work has been used to take us into repeated lockdowns and, it seems, may yet deny us the chance to return to more or less normal life on 21 June.
>
> ….
>
> Scientific modelling has its uses, but the problems arise when it is mistaken for observational fact. Models are really just crude approximations of the real world, involving multiple assumptions along the way. The models, inevitably, are only as good as those assumptions.
>
> ….
>
> For all its failures, we seem to have developed a reverence for modelling… In the absence of useful information we tend to reach out for whatever is available – even if we know deep down that it is little better than guesswork…. We would do ourselves a favor if we came round to realizing what NHS trusts have belatedly done: that scientific modelling does not give us facts, just vague scenarios which we should be treating with great skepticism.

4. The Unclassified Version of the UFO Report is Hitting the Desks of U.S. Lawmakers

Peter Suciu writes in the *National Interest*:

> Later this month, U.S. lawmakers will get to learn a bit more on what may be "out there," as top intelligence and military officials are now scheduled to release a

report addressing so-called "Unexplained Aerial Phenomena" or UAPs. The highly-anticipated unclassified report will provide insight into what is actually known about the UAPs – which are more commonly known still as UFOs.
It isn't clear if the reports will shed any light on recent military encounters with UAPs as it relates to proof of contact with "extraterrestrial life." However, the report – which was commissioned by Congress – has already garnered so much attention that speculation has run rampant on what it may actually reveal about the UAPs when it is finally released.
Originally slated to be released on June 1, the report is running late. There is already speculation that this is because of what is "known." However, as the law directing intelligence agencies and the Department of Defense (DoD) to create the study was not technically binding, there has been leeway in when it will be released. The preparation of this report is notable however in that UFOs or UAPs have gained renewed interest in the public consciousness following the U.S. Navy's release of once-classified videos of encounters with such UAPs in recent years.
Those "close encounters" haven't been fully explained by military officials.

Turkish humor!

United Nations S/2021/496

Security Council

Distr.: General
25 May 2021

Original: English

Letter dated 24 May 2021 from the Permanent Representative of Turkey to the United Nations addressed to the President of the Security Council

With reference to the allegations contained in the letter from the Permanent Representative of Iraq dated 26 January 2021 and the letter from the Permanent Representative of Iraq dated 6 May 2021 (S/2021/448), I would like to emphasize that, in the absence of Iraq's ability to deal with the presence of terrorist organizations in its own territory, Turkey is obliged to take appropriate measures against terrorist threats to its security emanating from Iraq.

Any criticism of Turkey for exercising its inherent right to self-defence, as outlined in Article 51 of the Charter of the United Nations, and for acting within the context of the responsibility attributed by relevant Security Council resolutions to States Members of the United Nations in the fight against terrorism, is unacceptable.

I would be grateful if the present letter could be circulated as a document of the Security Council.

(*Signed*) Feridun H. **Sinirlioğlu**
Permanent Representative

EDITOR'S COMMENT: Famous Turkish black humor! They baptized the occupation of Cyprus as a "peace mission". Now they baptize the invasion of Syria and Iraq as "advanced defense". Just another proof that the UN is a universal joke!

Is Iran Suffering From "Simple Sabotage"?

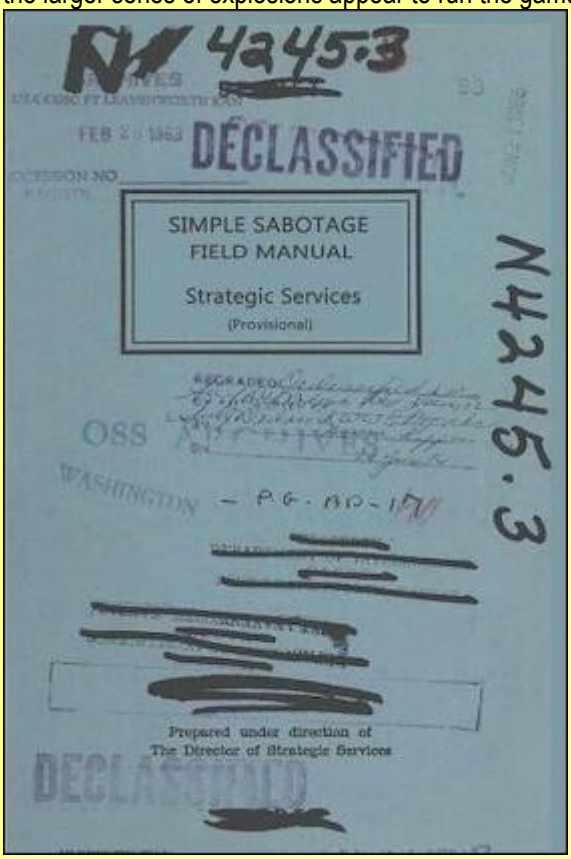
By Seth J. Frantzman

Source: https://www.meforum.org/62428/is-iran-suffering-from-simple-sabotage

June 08 – Iran has suffered a series of mysterious explosions and fires over the past year. While some of them have targeted sensitive sites, such as the Natanz nuclear facility, many other incidents appear more accidental. Nevertheless, they have done significant damage to Iranian infrastructure. In early June, the Iranian navy's largest ship sunk after a fire on board. An oil refinery had a tank that ruptured and exploded in Tehran, and a steel factory also reportedly suffered a fire on June 5.

Many of the explosions and fires have been reported with heightened interest due to Israel-Iran tensions. In recent months, *The Wall Street Journal* reported that Israel carried out a dozen attacks on Iranian ships headed for Syria. After the report, several Israeli-owned commercial ships were then attacked in the Gulf of Oman.

The incidents in Iran lead to questions about whether Israel has overseen a wide-ranging campaign of attacks and sabotage against Iran. Iran has blamed Israel for incidents at Natanz, for instance. And Israeli media have hinted at Mossad's involvement. However, the larger series of explosions appear to run the gamut from suspicious to seeming like a case of mere aging infrastructure.



Another factor may be at work: Simple sabotage. In 1944 the U.S. Office of Strategic Services (OSS), the precursor to the modern CIA, published a classified pamphlet called, "Simple Sabotage Field Manual." William "Wild Bill" Donovan, who led the OSS, authored an introduction to the manual. The manual notes that sabotage includes both major acts against an enemy that may be "highly technical" and require training as well as "innumerable simple acts which the ordinary individual citizen-saboteur can perform." The point of the manual was to provide suggestions to help average people, acting individually rather than as part of a network, to carry out sabotage "in such a way as to involve minimum danger of injury, detection or reprisal."

Many of Iran's recent mishaps appear by-the-book. Specifically, this book.

The weapons of this simple saboteur could be "salt, nails, candles, pebbles, thread or any other materials [the saboteur] might normally be expected to possess." In short, everyday household items can be used to harm equipment. The manual calls, more generally, for reorienting workers to think in the "direction of destruction."

This OSS manual provides an insight into what may be happening in Iran. The sabotage manual notes that "warehouses, barracks, offices, hotels and factory buildings are outstanding targets for simple sabotage." They are susceptible to damage: For instance, "fires can be started wherever there is an accumulation of inflammable material." Warehouses too make for "promising targets."

The manual suggests that janitors might purposely accumulate greasy waste and hope it ignites with the flick of a cigarette. "If you are a janitor on night duty, you can be the first to report the fire, but don't report it too soon." The manual suggests sabotaging fuel tanks by putting in sawdust, impurities or even sugar. "Fuel lines to gasoline and oil engines frequently pass over the exhaust pipe. When the machine is at rest, you can stab a small hole in the fuel line...fuel will drip onto the exhaust and start a blaze." The average person can also easily destroy boilers by putting too much water in them, as well as harming turbines by creating leaks.

In other parts of the country, train operators can make things inconvenient by simply making "mistakes in the issuing of train tickets." Low-level bureaucrats can also harm the Iranian regime based on suggestions in the manual. "Make 'speeches,'" the manual suggests. "Talk as frequently as possible and at great length to illustrate your 'points' by long anecdotes and accounts of personal experiences. Never hesitate to make a few appropriate 'patriotic' comments." It also says that would-be saboteurs can haggle over precise wording and insist on performing tasks through complex, rather than direct, "channels."

Most important: Order high-quality materials that are hard to get, give important jobs to inefficient workers and "insist on perfect work in relatively unimportant products." Give incomplete instructions, hold "conferences when there is more critical work to be done" and create numerous cumbersome committees that are as large as possible.
Iran may be suffering a spate of simple sabotage. This may not be due to complex Israeli-sponsored attacks on Iran's infrastructure, but rather the **tendency of average Iranians, fed up with their fanatical regime**, to permit key facilities to fall apart and naval vessels to catch fire.

Seth J. Frantzman *is a Ginsburg-Milstein Writing Fellow at the Middle East Forum and senior Middle East correspondent at The Jerusalem Post.*

How the World Ran Out of Everything

By Peter S. Goodman and Niraj Chokshi
Source: https://archive.is/hSvYB#selection-409.0-428.0

June 01 – In the story of how the modern world was constructed, Toyota stands out as the mastermind of a monumental advance in industrial efficiency. The Japanese automaker pioneered so-called Just In Time manufacturing, in which parts are delivered to factories right as they are required, minimizing the need to stockpile them.
Over the last half-century, this approach has captivated global business in industries far beyond autos. From fashion to food processing to pharmaceuticals, companies have embraced Just In Time to stay nimble, allowing them to adapt to changing market demands, while cutting costs.
But the tumultuous events of the past year have challenged the merits of paring inventories, while reinvigorating concerns that some industries have gone too far, leaving them vulnerable to disruption. As the pandemic has hampered factory operations and sown chaos in global shipping, many economies around the world have been bedeviled by shortages of a vast range of goods — from electronics to lumber to clothing.
In a time of extraordinary upheaval in the global economy, Just In Time is running late.

"It's sort of like supply chain run amok," said Willy C. Shih, an international trade expert at Harvard Business School. "In a race to get to the lowest cost, I have concentrated my risk. We are at the logical conclusion of all that."
The most prominent manifestation of too much reliance on Just In Time is found in the very industry that invented it: Automakers have been crippled by a shortage of computer chips — vital car components produced mostly in Asia. Without enough chips on hand, auto factories from India to the United States to Brazil have been forced to halt assembly lines.
But the breadth and persistence of the shortages reveal the extent to which the Just In Time idea has come to dominate commercial life. This helps explain why Nike and other apparel brands struggle to stock retail outlets with their wares. It's one of the reasons construction companies are having trouble purchasing paints and sealants. It was a principal contributor to the tragic shortages of personal protective equipment early in the pandemic, which left frontline medical workers without adequate gear.
Just In Time has amounted to no less than a revolution in the business world. By keeping inventories thin, major retailers have been able to use more of their space to display a wider array of goods. Just In Time has enabled manufacturers to customize their wares. And lean production has significantly cut costs while allowing companies to pivot quickly to new products.
These virtues have added value to companies, spurred innovation and promoted trade, ensuring that Just In Time will retain its force long after the current crisis abates. The approach has also enriched shareholders by generating savings that companies have distributed in the form of dividends and share buybacks.
Still, the shortages raise questions about whether some companies have been too aggressive in harvesting savings by slashing inventory, leaving them unprepared for whatever trouble inevitably emerges.
"It's the investments that they don't make," said William Lazonick, an economist at the University of Massachusetts.
Intel, the American chip-maker, has outlined plans to spend $20 billion to erect new plants in Arizona. But that is less than the $26 billion that Intel spent on share buybacks in 2018 and 2019 — money the company could have used to expand capacity, Mr. Lazonick said.
Some experts assume that the crisis will change the way companies operate, prompting some to stockpile more inventory and forge relationships with extra suppliers as a hedge against problems. But others are dubious, assuming that — same as after past crises — the pursuit of cost savings will again trump other considerations.

Chaos on the Seas

The shortages in the world economy stem from factors beyond lean inventories. The spread of Covid-19 has sidelined port workers and truck drivers, impeding the unloading and distribution of goods made at factories in Asia and arriving by ship to North America and Europe.
The pandemic has slowed sawmill operations, causing a shortage of lumber that has stymied home building in the United States.
Winter storms that shut down petrochemical plants in the Gulf of Mexico have left key products in short supply. Andrew Romano, who runs sales at a chemical company outside Philadelphia, has grown accustomed to telling customers they must wait on their orders.
"You have a confluence of forces," he said. "It just ripples through the supply."
Steep increases in demand made pet food scarce and Grape-Nuts cereal all but disappear from American store shelves for a time.
Some companies were especially exposed to such forces given that they were already running lean as the crisis began.
And many businesses have combined a dedication to Just In Time with a reliance on suppliers in low-wage countries like China and India, making any disruption to global shipping an immediate problem. That has amplified the damage when something goes awry — as when an enormous vessel lodged in the Suez Canal this year, closing the primary channel linking Europe and Asia.
"People adopted that kind of lean mentality, and then they applied it to supply chains with the assumption that they would have low-cost and reliable shipping," said Mr. Shih, the Harvard Business School trade expert. "Then, you have some shocks to the system."

An Idea That Went 'Way Too Far'

Just In Time was itself an adaptation to turmoil, as Japan mobilized to recover from the devastation of World War II.
Densely populated and lacking in natural resources, Japan sought to conserve land and limit waste. Toyota eschewed warehousing, while choreographing production with suppliers to ensure that parts arrived when needed.
By the 1980s, companies around the globe were emulating Toyota's production system. Management experts promoted Just In Time as a way to boost profits.
"Companies that run successful lean programs not only save money in warehouse operations but enjoy more flexibility," declared a 2010 McKinsey presentation for the pharmaceutical industry. It promised savings of up to 50 percent on warehousing if clients embraced its "lean and mean" approach to supply chains.

Such claims have panned out. Still, one of the authors of that presentation, Knut Alicke, a McKinsey partner based in Germany, now says the corporate world exceeded prudence.
"We went way too far," Mr. Alicke said in an interview. "The way that inventory is evaluated will change after the crisis."
Many companies acted as if manufacturing and shipping were devoid of mishaps, Mr. Alicke added, while failing to account for trouble in their business plans.
"There's no kind of disruption risk term in there," he said.
Experts say that omission represents a logical response from management to the incentives at play. Investors reward companies that produce growth in their return on assets. Limiting goods in warehouses improves that ratio.
"To the extent you can keep reducing inventory, your books look good," said ManMohan S. Sodhi, a supply chain expert at the City, University of London Business School.
From 1981 to 2000, American companies reduced their inventories by an average of 2 percent a year, according to one study. These savings helped finance another shareholder-enriching trend — the growth of share buybacks.
In the decade leading up to the pandemic, American companies spent more than $6 trillion to buy their own shares, roughly tripling their purchases, according to a study by the Bank for International Settlements. Companies in Japan, Britain, France, Canada and China increased their buybacks fourfold, though their purchases were a fraction of their American counterparts.
Repurchasing stock reduces the number of shares in circulation, lifting their value. But the benefits for investors and executives, whose pay packages include hefty allocations of stock, have come at the expense of whatever the company might have otherwise done with its money — investing to expand capacity, or stockpiling parts.
These costs became conspicuous during the first wave of the pandemic, when major economies including the United States discovered that they lacked capacity to quickly make ventilators.
"When you need a ventilator, you need a ventilator," Mr. Sodhi said. "You can't say, 'Well, my stock price is high.'"
When the pandemic began, car manufacturers slashed orders for chips on the expectation that demand for cars would plunge. By the time they realized that demand was reviving, it was too late: Ramping up production of computer chips requires months.
"The impact to production will get worse before it gets better," said Jim Farley, the chief executive of Ford Motor, which has long embraced lean manufacturing, speaking to stock analysts on April 28. The company said the shortages would probably derail half of its production through June.
The automaker least affected by the shortage is Toyota. From the inception of Just In Time, Toyota relied on suppliers clustered close to its base in Japan, making the company less susceptible to events far away.

'It All Cascades'
In Conshohocken, Pa., Mr. Romano is literally waiting for his ship to come in.
He is vice president of sales at Van Horn, Metz & Company, which buys chemicals from suppliers around the world and sells them to factories that make paint, ink and other industrial products.
In normal times, the company is behind in filling perhaps 1 percent of its customers' orders. On a recent morning, it could not complete a tenth of its orders because it was waiting for supplies to arrive.
The company could not secure enough of a specialized resin that it sells to manufacturers that make construction materials. The American supplier of the resin was itself lacking one element that it purchases from a petrochemical plant in China.
One of Mr. Romano's regular customers, a paint manufacturer, was holding off on ordering chemicals because it could not locate enough of the metal cans it uses to ship its finished product.
"It all cascades," Mr. Romano said. "It's just a mess."
No pandemic was required to reveal the risks of overreliance on Just In Time combined with global supply chains. Experts have warned about the consequences for decades.
In 1999, an earthquake shook Taiwan, shutting down computer chip manufacturing. The earthquake and tsunami that shattered Japan in 2011 shut down factories and impeded shipping, generating shortages of auto parts and computer chips. Floods in Thailand the same year decimated production of computer hard drives.
Each disaster prompted talk that companies needed to bolster their inventories and diversify their suppliers.
Each time, multinational companies carried on.
The same consultants who promoted the virtues of lean inventories now evangelize about supply chain resilience — the buzzword of the moment.
Simply expanding warehouses may not provide the fix, said Richard Lebovitz, president of LeanDNA, a supply chain consultant based in Austin, Texas. Product lines are increasingly customized.

"The ability to predict what inventory you should keep is harder and harder," he said.
Ultimately, business is likely to further its embrace of lean for the simple reason that it has yielded profits.
"The real question is, 'Are we going to stop chasing low cost as the sole criteria for business judgment?'" said Mr. Shih, from Harvard Business School. "I'm skeptical of that. Consumers won't pay for resilience when they are not in crisis."

***Peter S. Goodman** is a global economic correspondent for The New York Times, based in London. He was previously a national economic correspondent, based in New York, where he played a leading role in award-winning coverage of the 2008 financial crisis and the Great Recession.*

The Secrets and Lies of the Vietnam War, Exposed in One Epic Document

The New York Times
Source: https://news.yahoo.com/secrets-lies-vietnam-war-exposed-184247487.html

June 11 – Officially titled "Report of the Office of the Secretary of Defense Vietnam Task Force," the papers filled 47 volumes, covering the administrations of President Franklin D. Roosevelt to Johnson. Their 7,000 pages chronicled, in cold, bureaucratic language, how the United States got itself mired in a long, costly war in a small Southeast Asian country of questionable strategic importance. They are an essential record of the first war the United States lost. For modern historians, they foreshadow the mindset and miscalculations that led the United States to fight the "forever wars" of Iraq and Afghanistan.

Some People Can See Through Camouflage, And It's Not as Hard as You Think

Source: https://www.sciencealert.com/people-can-be-trained-to-see-through-camouflage-and-it-works-better-than-we-thought

(sarah5/Getty Images)

June 12 – Camouflage techniques can usually be relied upon to conceal humans and animals alike, but expertly trained individuals can see through these visual tricks – and scientists have now learned more about how this works.
Not only are trained camouflage breakers able to detect that something is hidden in a scene, they're able to correctly assess what that something is, even if they haven't been told what they're looking for.
That can be very useful in a wide variety of military scenarios – knowing exactly what's present in a scene is a lot more informative than just knowing that something in a scene is different from normal.
"Here, we show that when subjects break camouflage, they can also localize the camouflaged target accurately, even though they had received no specific training in localizing the target," researchers explain in a new study.

The study explores a training method developed in 2012 that uses deep learning techniques to train people with normal sight to see through camouflage. Individuals can be trained in this way in as little as two weeks, the researchers report, with just an hour a day spent analyzing scenes.

That training enables people to recognize whether or not a given camouflage scene contains a target. Here, it was shown that those individuals could pick out the target too, even with just a 50-millisecond look in some cases. The participants were not told what to look for and were not shown the target object in isolation.

In fact, the six trained volunteers tested in this study were as good at picking out the location of camouflaged targets – either a head or a 'digital embryo' graphic – as non-trained people would be at spotting non-camouflaged targets in a scene.

"If it turns out there is something that doesn't belong there, you can tell," says neuroscientist Jay Hegdé from the University of Augusta.

The trained volunteers also recognized when something was amiss or different in an image, even when there was no specific target in it. The researchers say this is linked to the way experienced radiologists can sometimes get a sense of a mammogram not being quite right, even before any obvious signs of cancer appear.

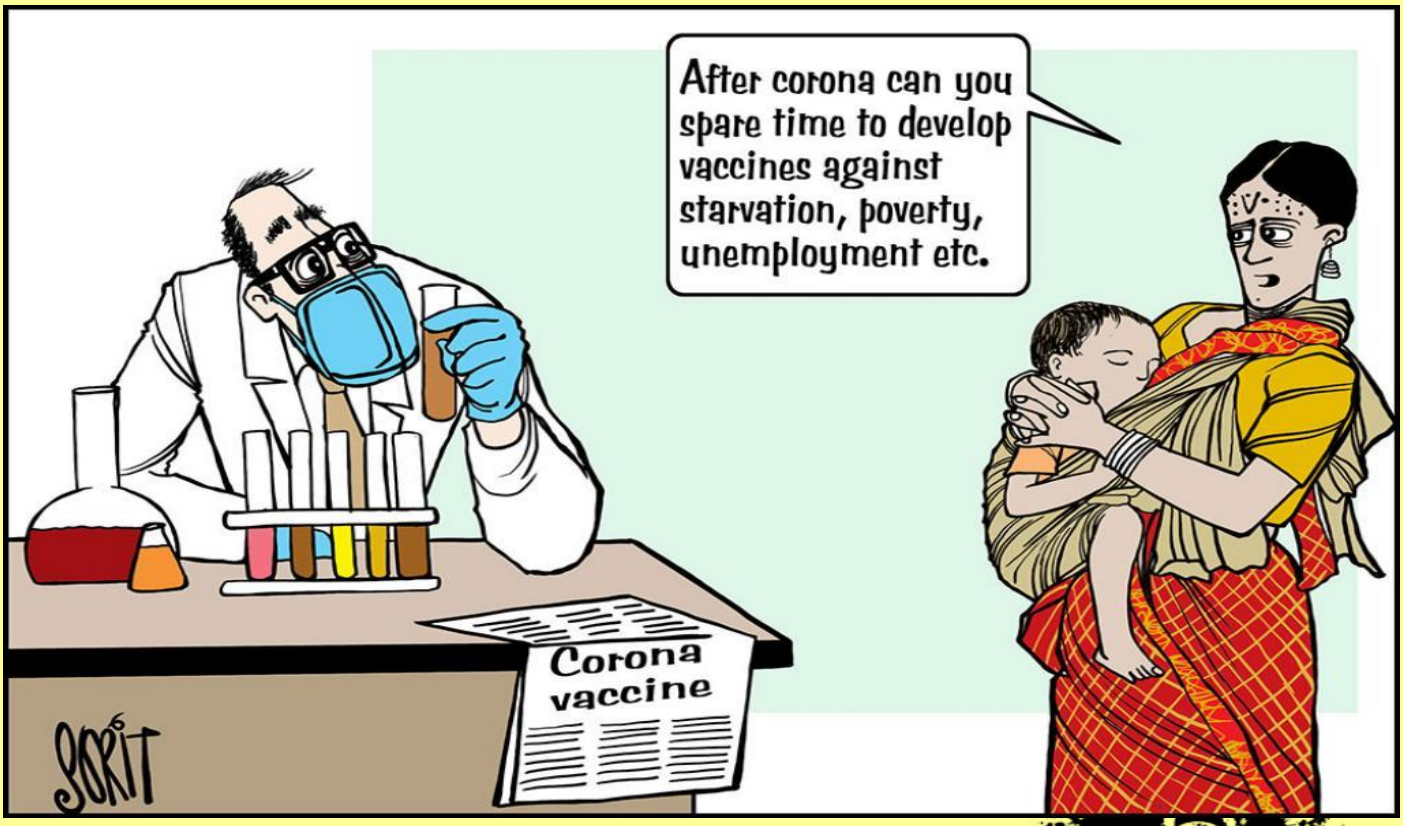
While the camouflage training technique can work on anyone, the researchers say, some people take to it more readily than others. Why that is, however, is something that they're keen to pursue in future studies.

As interesting as this is from a scientific and biological point of view, it's in the field of military combat where this research is likely to be used most widely. Take a situation with a sniper, for example – shooting at a target immediately reveals a sniper's location, so it's vital that the target can be seen and located beforehand.

"Results in experts highlight an opportunity to extend the training to real-world visual search and visualization problems that would be of prime importance for the Army to solve," says neuroscientist Frederick Gregory from the US Army Combat Capabilities Development Command Army Research Laboratory, who wasn't involved in the research.

▶▶ **The research has been published in** *Cognitive Research: Principles and Implications*.

EDITOR'S COMMENT: It is not the privilege of only a few. We had a Great Pyrenees *Shiro* that could spot (and bark) a new small nail on the wall the moment he entered a big high ceiling living room – all the times! It is a talent for some but training can help as well!



EURO 2021 and politics

EDITOR'S COMMENT: BML propaganda has not flourished in Europe – yet. But since when skin color has to do with life? We are in 2021 you know! And life is unique – end of story and fashion or political correctness …

PM Babiš Predicts Muslim Majority in Sweden, Netherlands in Coming Decades

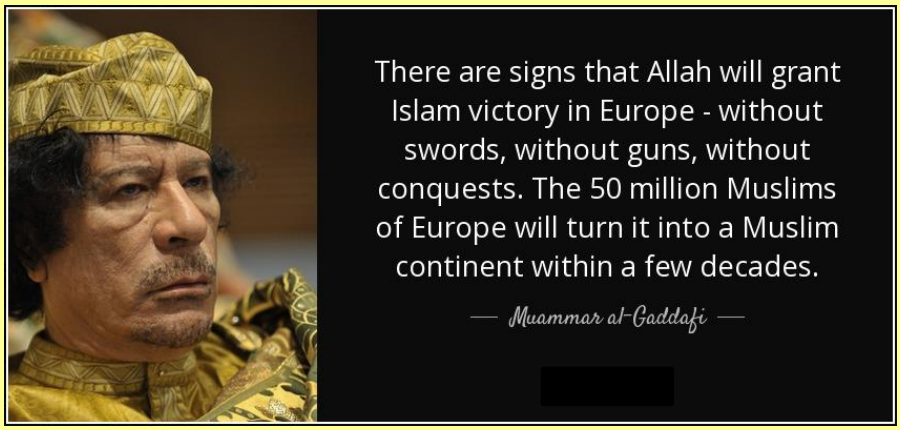
Source: https://praguemorning.cz/pm-babis-predicts-muslim-majority-in-sweden-netherlands-in-coming-decades/

June 15 – As of now, Islam is the second-largest religion in both the Netherlands and Sweden, which are both known for their liberal immigration policies; it is practised by 5 and 8 percent of the population of the nations, respectively.

According to Czech Prime Minister Andrej Babiš, the Netherlands and Sweden will become Muslim-majority countries in the coming decades.

In a recent opinion piece on risks associated with immigration, published in the Czech daily Právo, he highlighted the two countries specifically. Among others, **Andrej Babiš ventured that a majority of the Dutch population will be Muslims by 2044. Sweden will follow the same path and have a Muslim majority population by 2065,** according to the Czech prime minister.

As of now, Islam is the second-largest religion in both the Netherlands and Sweden, practised by 5 and 8 percent of the countries' residents, respectively.



Babiš's projections raised eyebrows. "It's completely wrong. He wants to scare people. A year ago, he said that Belgium would have a Muslim majority by 2040", Daniel Prokop, a sociologist and researcher at Charles University in Prague, told the Swedish newspaper *Svenska Dagbladet*.

According to Prokop, the prime minister is clearly distressed and is trying to shift the focus from acute domestic policy problems by portraying future migration flows as a threat to the Czech Republic.

"I do not want to downplay problems linked to immigration. But this is absurd, his predictions are extremely exaggerated," Prokop ventured.

In 2017, the US Pew Research Institute published a study of demographic changes in Europe, based on religious affiliation. By 2050, Sweden was estimated to have a larger proportion of Muslim residents than many other European countries, Pew concluded.

Offering several forecasts, Pew gauged that the share of Muslims could land anywhere between 11.1 and 30.6 percent. Swedish researchers have since countered that there is a lot of uncertainty in Pew's calculations.

Unmedicated, Untreated Brain Illness is Likely in Mass Shooters: Study

Source: http://www.homelandsecuritynewswire.com/dr20210614-unmedicated-untreated-brain-illness-is-likely-in-mass-shooters-study

June 14 – The first analysis of medical evidence on domestic mass shooters in the U.S. finds that a large majority of perpetrators have psychiatric disorders for which they have received no medication or other treatment, reports a study in the *Journal of Clinical Psychopharmacology*. The journal is published in the Lippincott portfolio by Wolters Kluwer.

"Without losing sight of the larger perspective that most who are violent are not mentally ill, and most of the mentally ill are not violent, our message is that mental health providers, lawyers, and the public should be made aware that some unmedicated patients do pose an increased risk of violence," according to the report by Ira D. Glick, MD, of Stanford University School of Medicine and colleagues.

In-Depth Analysis of Psychiatric Evidence on Domestic Mass Shooters

The researchers identified 115 persons identified as committing a mass shooting in the United States from 1982 to 2019, based on the most comprehensive listing available

(the *Mother Jones* database). The database excluded shootings related to "conventionally motivated" crimes such as armed robbery or gang violence.
"In the vast majority of the incidents identified in the database, the perpetrator died either during or shortly after the crime," the researchers note. They focused on the 35 cases where the assailant survived and underwent criminal proceedings – providing the best information on their symptoms of mental illness and psychiatric state.
For each mass shooting event, the researchers spent hours analyzing records or interviewing the forensic psychiatrists or psychologists who examined the assailant after the crime. Other sources of information included court proceedings, public records, videotaped interviews, and social media posts or writings by the perpetrator. Dr. Glick's coauthors were Nina E. Cerfolio, MD, of the Icahn School of Medical at Mount Sinai Hospital, New York; Danielle Kamis, MD, of Stanford; and Michael Laurence, JD, a prominent capital defense attorney.
"Based on this data, 32 of the 35 perpetrators had signs and symptoms of brain illness, which fit scientific diagnostic criteria for a clinical psychiatric disorder," Dr. Glick comments. Eighteen of the shooters had schizophrenia while 10 had other diagnoses including bipolar disorder, delusional disorder, personality disorders, and substance-related disorders. In three cases, there was not enough information to make a diagnosis; in four cases, no psychiatric diagnosis was found.
Of the 28 surviving assailants with a psychiatric diagnosis, "None were medicated or received other treatment prior to the crime," the researchers write. They also analyzed 20 mass shooters who died at the crime scene, using available data from the media or significant others. Eight assailants had schizophrenia, seven had other diagnoses, five had unknown diagnoses. Similarly, none were receiving appropriate medications.
Despite the tragically high frequency of mass shooting events, there has been almost no medical research on the nature and incidence of brain illness among the perpetrators of these crimes. The study originated in Dr. Glick's clinical impression that many, if not most, mass shooters are people with unidentified psychiatric illness – complicated by a lack of support from family or significant others in getting the help they needed.
The authors acknowledge some important limitations of their study: it included only limited evidence on a small group of domestic shooters who survived, with no comparison group. "Nonetheless," the researchers write, "our data suggest that persons who commit mass murders may suffer from compromising and untreated psychiatric illness."
"The psychiatric disorders seen in perpetrators of mass shootings are serious brain illnesses – as much in need of proper diagnosis and treatment as heart disease or any other medical condition," Dr. Glick adds. "We need to reduce the stigma associated with these diseases to enable patients to receive appropriate and adequate psychiatric medication and other treatments. By actually talking to patients and their significant others, we have the opportunity to save lives."

COVID Gives Rise to Extremism and Violence

By Ben Knight (DW reporter)
Source: http://www.homelandsecuritynewswire.com/dr20210615-covid-gives-rise-to-extremism-and-violence

June 14 – German Interior Minister Horst Seehofer said that both right- and left-wing extremism had risen in Germany over the past year, as he presented the domestic intelligence agency's (BfV) annual report in Berlin.
Most alarmingly, Seehofer said that 40 percent of the 33,300 far-right extremists in the country were categorized as "violence-oriented," the highest proportion ever. There had also been a 10 percent rise in the number of far-right violent crimes over the past year to 1,023, of which 842 were cases of physical assault.
The BfV also registered a rise in left-wing extremists: 34,300 in 2020, compared to 33,500 in 2019, of whom 9,600 were considered potentially violent. There was also a significant rise in the number of violent far-left crimes, the BfV said — 1,237 were registered. Of these, 423 were cases of physical assault.

Pandemic Extremists Shift to the Virtual World
Seehofer said that the coronavirus pandemic had exacerbated the dangers of extremism over the past year, as various groups had exploited anti-lockdown protests to promote their agenda.
"This is not just a special health situation, this is also a special security situation," Seehofer said of the pandemic, before highlighting the role played by so-called *Reichsbürger* — conspiracy theorists who deny the legitimacy of the German state.

"They too very actively used the pandemic and the state measures connected with it to spread their conspiracy stories," he said. This had clearly helped them succeed in winning new numbers, he added, before noting the rising potential for violence.
"Extremists and terrorists don't go into lockdown," BfV President Thomas Haldenwang told reporters on Tuesday. "After only a short period of uncertainty at the start of 2020, extremists in all areas shifted their activities into the virtual world, where they used the entire spectrum of digital communication to network."

New Aspects of Anti-Semitism

Though according to Seehofer around 90% of antisemitic incidents stemmed from the far-right scene. BfV President Thomas Haldenwang highlighted the rise of antisemitic incidents connected with the pro-Palestinian protests that took place in May.
"Antisemitism is and remains a category that unifies various extremists," Haldenwang told reporters. "But in Germany, there is no space for antisemitism. Alongside all my colleagues in all the security forces in Germany, I assure you that we will do our utmost to protect Jewish institutions and Jewish life."

Suspicions about the BfV Itself

Germany's BfV is tasked with tracking political extremists across the country and defending Germany's constitutional order, alongside the organizationally separate domestic intelligence agencies in all 16 German states.
In recent years, the BfV, the armed forces, and the police have themselves attracted new attention for reportedly harboring far-right networks.
Haldenwang played down the prevalence of such networks at Tuesday's press conference: "Maybe we can't speak of isolated cases, but it's a very small part. The vast majority of those working in the security authorities stand firmly on the foundation of the constitution."
"That is probably true, but it doesn't necessarily appease public concern," said Axel Salheiser, director of research into right-wing extremism at the Institute for Democracy and Civil Society (IDZ). "Of course police officers, in general, shouldn't be put under suspicion,but there are more concrete indications that there are far-right structures and officers with far-right sympathies."

Former BfV Head and the Far-Right

There has been extra interest in the new political career of Haldenwang's predecessor, Hans-Georg Maassen, who was removed from office by Seehofer in 2018.
Maassen has become conspicuous as an outspoken ultra-conservative in the Christian Democratic Union (CDU) since his tenure ended, especially since he announced this year he intends to run as a CDU Bundestag candidate in the September general election in the eastern state of Thuringia.
Stephan Kramer, the head of the Thuringia Verfassungsschutz, triggered debate last week when he told the *Tagesspiegel* newspaper that Maassen often used dog-whistle anti-Semitic stereotypes and conspiracy-theory themes, much like Björn Höcke, the head of the far-right Alternative for Germany (AfD) in Thuringia. This triggered anger among CDU and AfD supporters, who demanded Kramer's resignation for violating his oath to maintain political neutrality.
This became particularly interesting on Tuesday, since BfV's latest report for the first time included the sub-category "the New Right," to designate networks, publications, and individuals who spread "anti-democratic" positions in Germany via various strategies.

Germany's 'New Right'

According to the report, the protagonists of the "New Right" movement share a common goal in fomenting a "cultural revolution from the right" that was targeted at very different groups. "Right-wing extremist associations are not always obvious," the report said. "But they often appear through violations of the principles of human dignity, the rule of law, and democracy in various expressions."
Salheiser said that the inclusion of the new category in the report showed that the BfV had become more sensitive to this gray area in the right-wing spectrum. "These were previously blind spots for the Verfassungsschutz," he told DW.
Both Seehofer and Haldenwang carefully declined to say whether Maassen himself might be considered part of the "New Right," by those criteria — though Seehofer said Maassen had been a "good president" of the BfV and had always supported the constitution.
"It's no wonder that Seehofer was very reserved in his statement about that because it's a political issue," Salheiser told DW. "It's clear to me that despite his statements about the AfD he does represent a similar ideology, and some of his positions actually do mirror right-wing populist ideologies.

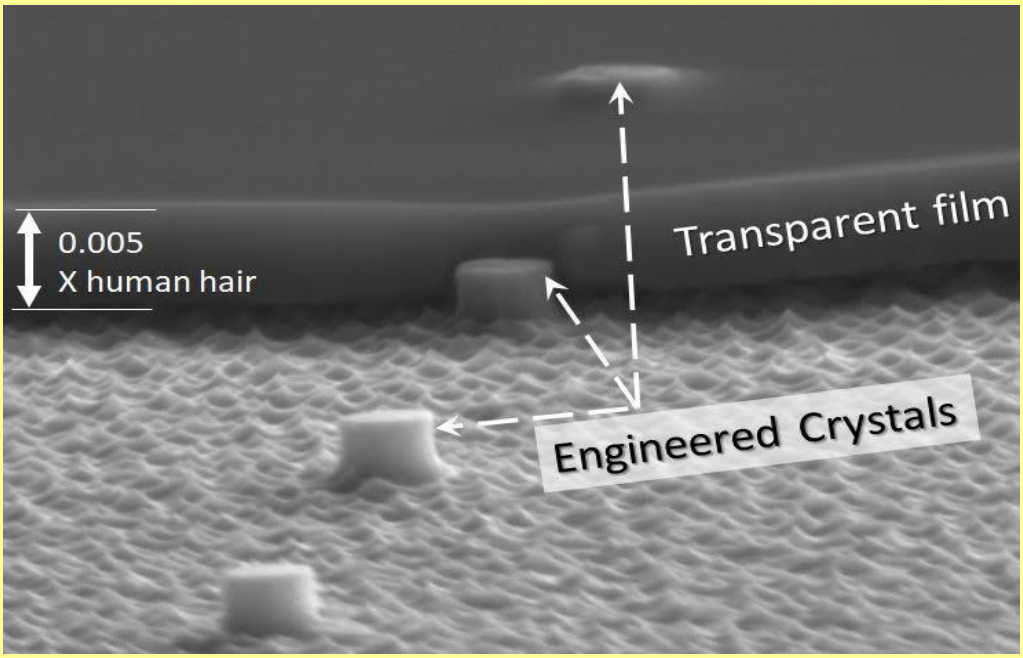
Ground-breaking night-vision film can be applied to regular glasses

Source: https://newatlas.com/technology/ground-breaking-night-vision-film-regular-glasses/

June 15 – Scientists at the Australian National University (ANU) have developed a new type of night-vision technology that is the first of its kind. Taking the form of an ultra-thin film, it can be applied directly to glasses to act as a filter, needing only a simple laser to convert infrared light into images the wearer can see.

The researchers' groundbreaking film is based on nanocrystal technology that they've been working on for a number of years. These tiny particles are hundreds of times thinner than a human hair, and work by converting incoming photons from infrared light into higher-energy photons on the visible spectrum.

In 2016, the team succeeded in fabricating one of these nanocrystals onto a plane of glass for the first time. This was seen as the first step in developing an array of many tiny photon-converting crystals that together could form a film that changes the way the human eye perceives light. In continuing this work, the scientists have now produced a prototype version of this film they say is lightweight, cheap and easy to mass produce.



An electron microscope image of the novel night-vision film (Mohsen Rahmani/Nottingham Trent University)

"We have made the invisible visible," lead researcher Dr Rocio Camacho Morales said. "Our technology is able to transform infrared light, normally invisible to the human eye, and turn this into images people can clearly see – even at distance. We've made a very thin film, consisting of nanometre-scale crystals, hundreds of times thinner than a human hair, that can be directly applied to glasses and acts as a filter, allowing you to see in the darkness of the night."

Morales tells us the film requires no power source, only a tiny laser like those found in laser pointers, which the nanocrystals combines with the incoming infrared light. In doing so, the film produces "visible images that can be seen in the dark."

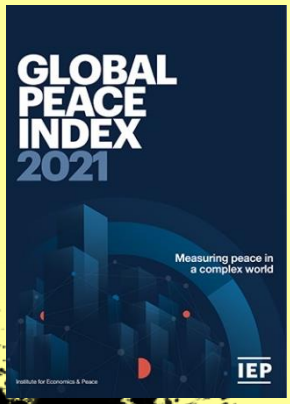
Military use seems to be an obvious application for the technology, where it could replace clunky and power-hungry night vision goggles, as well as similar systems used by police or security guards. But because of its compact form, the team imagines it could also be applied to regular spectacles and find everyday uses, making it safer to drive at night or walk home after dark, for example.

"This is the first time anywhere in the world that infrared light has been successfully transformed into visible images in an ultra-thin screen," says study author Professor Dragomir Neshev. "It's a really exciting development and one that we know will change the landscape for night vision forever."

▶▶ **The research was published in the journal** *Advanced Photonics*.

Global Peace Index 2021

Source: https://www.visionofhumanity.org/wp-content/uploads/2021/06/GPI-2021-web-1.pdf



Business & Peace Report 2021

Source: https://www.visionofhumanity.org/wp-content/uploads/2021/05/BAP-2021-web.pdf

Update on the impact of the COVID-19 pandemic on terrorism, counter-terrorism and countering violent extremism

Source:https://www.un.org/securitycouncil/ctc/sites/www.un.org.securitycouncil.ctc/files/files/documents/2021/Jun/cted_covid_paper_15june2021_1.pdf

CTED has been at the forefront of efforts to monitor and evaluate the impacts of the pandemic on terrorism, counter-terrorism and countering violent extremism (CVE), including through its two previous analytical reports. CTED's analysis of key trends has informed by its dialogue with Member States – including during hybrid assessment visits conducted on behalf of the Counter-Terrorism Committee – and with international and regional organizations.

The report combines this information with data collected by CTED through a survey of its partners, aimed at gathering their views on the potential long-term impacts of the pandemic. The survey was sent to a selection of United Nations agencies and offices, civil society organizations (CSOs), member entities of the CTED Global Research Network (GRN), and private-sector organizations.

▶▶ Read the full report at the source's URL.

New Technology Detects Concealed Weapons

Source: https://i-hls.com/archives/109003

June 15 – A new scanning solution uses advanced sensors and artificial intelligence to detect a wide range of concealed weapons and threats, such as firearms, metallic weapons and improvised explosive devices, on a visitor entering a premise. Motorola Solutions has unveiled the newest addition to its video security and analytics portfolio, Concealed Weapon Detection (CWD), through an agreement with Evolv Technologies.

AI technology enables the automation and unification of workflows to better protect people against the threat of violence.
The solution is designed to allow up to 3600 visitors to walk through one of the scanning systems per hour without having to conduct pat downs or empty pockets as the technology can distinguish between personal items and weapons. If a threat is detected, an alert is displayed on an Express tablet showing the location of the potential threat on the person's body, or in their bag, to security operators.
Alerts are sent directly to Motorola Solutions' video management system, Avigilon Control Center (ACC), which automatically notifies and shares live video with the facility's security team so they have precise awareness of the situation and can support an immediate response.
The sensitivity levels on the CWD solution can be adjusted to align with the safety needs of a facility based on their anticipated threat-scenarios. This capability allows for the technology to identify and flag new threat profiles over time, and enables security personnel to manage data and insights that help to provide a safe and positive experience for visitors and staff, according to the company's announcement.

A Bulgarian joke!

By Angel Chavdarov Dzhambazki (born 21 March 1979, in Sofia), a Bulgarian politician and currently a member of the European Parliament. He is also the vice-chairman of the IMRO, having joined the nationalist party in 1997 and gradually progressed through its ranks.

Turkey and NATO are no longer aligned, even if they won't admit it

Source: https://www.thenationalnews.com/opinion/comment/turkey-and-nato-are-no-longer-aligned-even-if-they-won-t-admit-it-1.1242583

June 18 – Following the accession of Turkey to Nato in 1952, the newly elected Turkish leader at the time, Adnan Menderes, expressed his desire for his government to be the western military alliance's "backbone". Nearly 70 years later, Turkey has changed fundamentally. Out of the 30 members of Nato, Turkey is one of the oldest, but now the most isolated. The long-awaited meeting between Turkish President Recep Tayyip Erdogan and US President Joe Biden at the latest Nato summit this week was, in a nutshell, an anti-climax.
Turkey once had unconditional loyalty to Nato, and used its strategic location to prove its importance to the organisation. In 1955, it joined the Baghdad Pact, a Nato-backed regional alliance with Britain, Iraq, Iran and Pakistan, aimed at preventing a Soviet Union infiltration of the Middle East. The next year, Turkey stood by Britain against Egypt during the Suez crisis. Simon Smith, in his book *Reassessing Suez 1956*, wrote that Menderes's government did not regard the Suez Canal dispute as a bilateral problem between the UK and Egypt, but one that concerned Nato's entire strategy. Menderes argued: "Turkey is convinced that the UK is acting as a guardian of one of the key positions of the free world."
Under the leadership of Mr Erdogan, however, Turkey has turned 180 degrees away from its unified accord with its Nato allies. Turkey, like other non-western members of the bygone Baghdad Pact, Iran and Pakistan, has adopted its own version of Islamist nationalism, while demonstrating degrees of suspicion and hostility towards the western world.
It is no secret that this year's Nato summit in Brussels was held against a backdrop of a long list of flashpoints between Turkey and other Nato members, and ambiguous relations with the alliance's chief competitors, Russia and China.
In 2017, Turkey brokered a deal worth billions with Russian President Putin for the S-400 mobile surface-to-air missile system. It forced the administration of then US president Donald Trump, one of the friendliest US administrations towards Erdogan's Turkey, to impose sanctions on Ankara last year. The thorny dispute continued as Mr Trump's presidency wound down, and has since forced Mr Biden's administration to exclude Turkey from the new F35 consortium agreement.

Turkey has turned 180 degrees away from its unified accord with its Nato allies
In addition to the S-400 and F35 disputes, the US and Turkey disagree on a long list of issues, including US support for Kurdish militias in Syria and the Biden administration's formal acknowledgment of the Armenian genocide. On the human rights front, the White House issued a strongly worded statement following Turkey's withdrawal from the Istanbul Convention on preventing domestic violence against women.
Moreover, Turkey has had tense relations with Greece, France and Cyprus. Last year, Turkey came close to a naval confrontation with Greece in disputed Eastern Mediterranean waters over Turkey's gas exploration activities near the Greek island of Kastellorizo. Relations with France are not any better. Last year, the French frigate, the Courbet, tried to stop Turkish arms smuggling to Libya, forcing Nato to investigate the incident. Furthermore, the two countries have been engaged in wars of words – Mr Erdogan called for a boycott of French products after French President Emmanuel Macron firmly upheld the right of cartoonists to depict religious figures. As for Cyprus, Turkey insists on the continued division of the country, contradicting the stances taken by Europe and the US on the issue.
As if all the above is not bad enough for its relations with its supposed allies, Turkey raised eyebrows when it pushed Nato members into watering down its official reaction to Belarus's recent forced landing of a passenger plane in order to detain a dissident journalist. In face of all of those challenging disagreements, Turkey approached this year's Nato summit with a multifaceted strategy to engage in a charm offensive, defiance, and spin.
Ahead of the Brussels meeting, Turkish Foreign Minister Mevlut Cavusoglu made conciliatory statements to Paris, Athens and Washington. Mr Cavusoglu subsequently visited both Greece and France, and insisted that Turkey and France should maintain stable ties as "allies". In Athens, a cheerful Mr Cavusoglu and his Greek counterpart, Nikos Dendias, agreed to "continue co-operation on a positive agenda to resolve pending bilateral issues". Furthermore, to prove its importance to Nato, Turkey has offered to run the main airport in Kabul, Afghanistan, despite the Taliban militant group condemning the proposal.
At the summit, there were, as expected, no breakthroughs, with none of the big issues poisoning ties between the Nato allies getting resolved. The meeting was not even followed by a published read-out, but Mr Erdogan described it as "fruitful and sincere". That description that may convince his fans at home, but the Turkish lira was not impressed – it fell against the dollar after the talks. Mr Erdogan's uncompromising stance on the S-400 front will undoubtedly serve as a major obstacle to any joint military co-operation between the US and Turkey in the future.
There is a saying that one who rides two horses at once will split asunder. That sums up the current affairs of Mr Erdogan's Turkey, which rides the horse of Ottoman Islamist revisionism, but still clings to the Nato club and its prestigious advantages. That dualism has dispossessed Turkey of the trust of many fellow Nato members as well as anti-extremist regimes in the Arab world.
It is rather ironic that the Mr Erdogan, who claims to consider former Prime Minister Adnan Menderes a hero, has deviated so much from Menderes's policies. Menderes went out of his way, even supporting a colonial Britain, to cement Turkey firmly within Nato. Mr Erdogan appears to have gone out of his way to set Turkey adrift in the opposite direction.
Mr Erdogan's supporters in Turkey, however, should consider themselves lucky. Analysts and observers who hoped for a firm handling of Turkey's troubled policies have been disappointed by the outcome of this year's Nato summit. Calls for cutting the Gordian knot with Turkey are widely vocalised, but Mr Biden, who is trying his best to disengage from the Middle East and focus on his country's pressing domestic issues, appears to think that doing so would be a drastic move – particularly amid a challenging pandemic and strong appetite in his administration to maintain transatlantic unity.
In Brussels, Mr Biden and Mr Erdogan have maintained the veneer of unity, but the door for healing the rifts between Turkey and Nato also seems to be firmly closed. Sooner or later, all of the thorny issues will resurface again. Nonetheless, solving the Turkish conundrum may be postponed until another Nato summit.

***Nervana Mahmoud** is a commentator on Middle East affairs and host of the 'Turkey Trends' podcast for the news outlet Ahval.*

As refugee numbers rise, many countries want to shut them out for security concerns

Source: https://www.washingtonpost.com/politics/2021/06/21/refugee-numbers-rise-many-countries-want-shut-them-out-security-concerns/

June 21 – June 20 was World Refugee Day, an annual reminder that millions of people are living their lives in limbo. UNHCR data show that about 1 in every 95 people on the planet is

currently forcibly displaced, either internally within their home country, or as an asylum seeker or refugee in another country. The number of refugees — around 26.4 million — hasn't been at this level since World War II.
While refugee numbers are rising globally, the willingness of countries to accept refugees is steadily declining. In fact, 86 percent of the world's refugees aren't hosted by wealthier nations in North America or Europe. Instead, they're residing in developing countries, which have their own set of problems.
The lack of cooperation from countries in the Global North is in no small part due to fears about the security risks of hosting refugees. Public opinion polls show that people in many countries around the globe directly associate refugees with heightened risks of "importing" terrorism. A January 2017 travel ban instituted by President Donald Trump, for example, explicitly alleged that terrorists were coming into the United States disguised as refugees. Similarly, Hungarian President Viktor Orban denounced the "Trojan horse of terrorism," blaming E.U. refugee policies for allowing terrorists to infiltrate Europe.

Are these legitimate fears?
Our research, forthcoming in the Journal of Politics, found no causal link between hosting refugees and an increase in terrorist attacks from foreign groups — including from terrorist groups based in refugee origin countries. In contrast, we show that the only form of terrorism that increases in host nations in the developed world is right-wing violence against refugees and migrants, perpetrated by citizens of those countries who falsely view refugees as a security threat.
These findings suggest fears of refugees are not only unjustified but also counterproductive. They subject refugees to a double victimization in developed countries: by limiting refugees in their ability to gain shelter and by inflicting further violence on those granted refuge by developed countries.

How we did our research
To find out whether and how refugees are linked to terrorist attacks in host countries, we paired UNHCR data on the origin and destination countries of refugees with analogous data on transnational terrorist attacks. For this, we coded new data on the origin countries of perpetrators for all terrorist attacks listed in the Global Terrorism Database to test whether hosting more refugees increases the risk that foreign terrorists exploit refugee movements to carry out attacks in host countries.
And we took steps to try to be sure that the relationship we discovered wasn't simply a product of refugees preferring to go to countries that had less terrorism, or destination countries limiting refugee numbers for fear or terrorism. In short, we were able to go beyond simple correlations and assess causal effects. Yet we found no evidence that refugees are a Trojan horse for terrorism, at least in developed countries.

Refugees as the victims of right-wing violence
However, our analysis went beyond the conventional view that refugees might be the agents of violence and examined an alternative mechanism: the "scapegoat." Linking data on the nationality of terrorist victims with data on the nationality of refugees, we showed that hosting refugees disproportionately increases the risk of right-wing attacks by domestic groups or individuals against refugees and their community. In short, our evidence showed that refugees are the victims — not the villains — of terrorism and violent attacks.
Our analyses further showed that this phenomenon is driven by fear: When people see refugees as a security threat — for example, perhaps because they come from countries where transnational terrorist groups such as the Islamic State are active — they are more likely to trigger violent responses from domestic groups or individuals. Moreover, these patterns of scapegoating persist independent of whether refugees have any actual involvement in violence in the host country.

It's the backlash to refugees that undermines security
The violent scapegoating of refugees in developed countries is concerning for two reasons: First, fears of refugees are unjustified in developed countries, which are already protected from the risk of terrorist infiltrations by virtue of sophisticated and collaborative counterterrorism measures. Second, populist and right-wing politicians tend to exploit and amplify public fears for electoral purposes — and stoking violence against refugees makes these countries less safe overall.
The scapegoating of refugees and migrants is something that we saw on the rise during the covid-19 pandemic, with an increase in violent attacks and hate crimes targeted at migrant groups, and widespread accusations that certain groups are to blame for spreading the coronavirus.
Our research has implications also for another worrisome trend — when governments themselves, and not just civilians, target refugees and asylum seekers. Increasingly, governments, including democratic ones, are engaging in pushing back or detaining people who cross their borders fleeing violence and persecution, even in violation of international

law. This tendency also includes the separation of migrant children from their parents, and the forced deportation of migrants to countries where they risk egregious human rights violations, for instance. European countries have simply refused to rescue migrants in distress at sea, which has led to the death of thousands of men, women and children in the Mediterranean.
The consequences of prejudice and hostility travel far. Refugees remain trapped in a chain of violence that starts in the countries they flee from as the result of war or persecution, continues on their dangerous journeys to find safety, and hunts them even within the countries where they seek asylum, as unwarranted public fears reignite their plight and put them in danger.

***Sara M.T. Polo** is an assistant professor in the Department of Government at the University of Essex.*
***Julian Wucherpfennig** is a professor of international affairs and security and core faculty at the Centre for International Security at the Hertie School in Berlin.*

EDITOR'S COMMENT: First of all, violence is violence – it is not left, right, or middle or whatever. And so is terrorism; no black or white or yellow or dark skin or light skin or Muslim or Christian or Buddhist – just terrorism. Then, there is a deliberate "confusion" of the term refugee. A Syrian is a refugee when escaping to Turkey or Jordan. When he tries to enter Greece from Turkey, without any legal papers (but with an expensive smartphone) then he/she is an illegal immigrant. Not my interpretation but what international law dictates. Terrorists hide between refugees and immigrants. A fact, not science fiction. It is perhaps the only way they can use to return from Syria and Iraq to their European homelands. In addition, It is a fact that certain nations have strict laws regarding who is entering their borders (e.g., Hungary; Denmark). It is there right! Or not, because certain NGOs have an opposite opinion? And then it is what people in countries heavily inflicted believe; nobody is asking them – a referendum would be nice and helpful to governments to decide. Finally, a paper written by an English and a German academician should not be biased mainly because their countries along with others closed their borders to all the people flooding Greece, Italy, and Spain. In Greece, we say "*do not speak about a rope in the house of a man who hunged himself!*". And a final note: not a word about the "quality of criminality" introduced to Western societies by Asian and African illegal immigrants. People born in countries where life is of no special value and survivor is a daily issue; where a knife is a man's best friend; where the life of a woman is no important and does not worth more than a short sexual pleasure; where killed parents, brothers, and relatives are always present in their life history – these people, without education and skills that are driven by religious directives and ethics are very difficult to adjust and be incorporated to the Western way of life. We do not want to change; they do not want to turn a page and make a fresh beginning. So, back to the old cliché "war of civilizations".

Coastal Cities of the Future

By Karen B. Roberts
Source: http://www.homelandsecuritynewswire.com/dr20210621-coastal-cities-of-the-future

June 21 – It's time to put all the options on the table when it comes to discussing climate change adaptation. Managed retreat — the purposeful movement of people, buildings, and other assets from areas vulnerable to hazards — has often been considered a last resort. But experts say it can be a powerful tool for expanding the range of possible solutions to cope with rising sea levels, flooding, and other climate change effects when used proactively or in combination with other measures.

***Karen B. Roberts** is a science writer at the University of Delaware.*

The Olympics, by the numbers

For more than a year, rising coronavirus case counts and struggling vaccination programs have made some hesitant about the Games. A month before the opening ceremony, our reporters examined — through the lens of some critical, and very large, numbers — why the Olympics are still going ahead.

$15.4 billion: The value of investment in Tokyo's new national stadium that will go (mostly) down the drain if it stands empty on the night of the opening ceremony

37%: The current favorability rating for Japan's prime minister, Yoshihide Suga, who may fear his political fortunes are now tied too closely to the Games to cancel them.

15,500: The number of athletes who will have to put their lives on hold for a year if the Olympics are postponed yet again.

$4 billion: The potential amount of television-rights income that the International Olympic Committee may have to refund if the Olympics are not held. (It accounts for 73 percent of the I.O.C.'s revenue.)

$549 million: The amount the I.O.C. distributes in so-called solidarity and other payments to national Olympic committees large and small, in some cases making up as much as a quarter of given countries' national Olympic committee budgets.

Terror Groups Could Regenerate in Two Years – Or Faster – in Afghanistan, Defense Leaders Say

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/terror-groups-could-regenerate-in-two-years-or-faster-in-afghanistan-defense-leaders-say/

June 22 – Terrorist organizations would have about a two-year timeline to regeneration from the potential security void left after coalition withdrawal from Afghanistan, military leaders told lawmakers.

Defense Secretary Lloyd Austin told the Senate Appropriations Committee during a hearing Thursday to review the administration's fiscal year 2022 budget request that the proposal "funds a troop presence and counterterrorism capabilities in the Middle East and South Asia and to meet the threats posed not only by Iran, but also by terrorist networks like ISIS and al-Qaeda and, in Africa, like those posed by Al-Shabaab.

"And it helps us maintain the integrated deterrent capability and global posture necessary to back up the hard work of our diplomats, our allies, and partners," the general said.

Funding for personnel issues would also include the means to get "a better handle on the extent to which we experience extremist behavior," he said, alluding to Pentagon initiatives begun at the beginning of the Biden administration.

"How would you rate the likelihood of international terrorist organizations like Al-Qaeda and ISIS regenerating inside of Afghanistan and presenting a threat to our homeland, our allies given what you see today?" Sen. Lindsey Graham (R-S.C.) asked. "Is it small, medium, large? How would you assess it?"

"I would assess it as medium," Austin replied. "I would also say, senator, that it would take possibly two years for them to develop that capability."

Chairman of the Joint Chiefs of Staff Gen. Mark Milley concurred, adding that "if certain other things happen, if there was a collapse of the government or dissolution of the Afghan security force, that risk would obviously increase."

"But, right now, I'd say medium and in about two years or so," Milley said.

Milley acknowledged "there is ongoing violence, as we know, and we are drawing down our force."

"Now the question remains, what will happen in the future? Will that military disintegrate? Will the government collapse? Will the Taliban come in? If the answer to that worst case scenario is yes… what will happen to women and girls and not only that but many, many others and they are probably going to be at risk," he said.

But "there are many other outcomes that are possible, and we're going to work to try to have those outcomes achieved as opposed to the worst-case outcome."

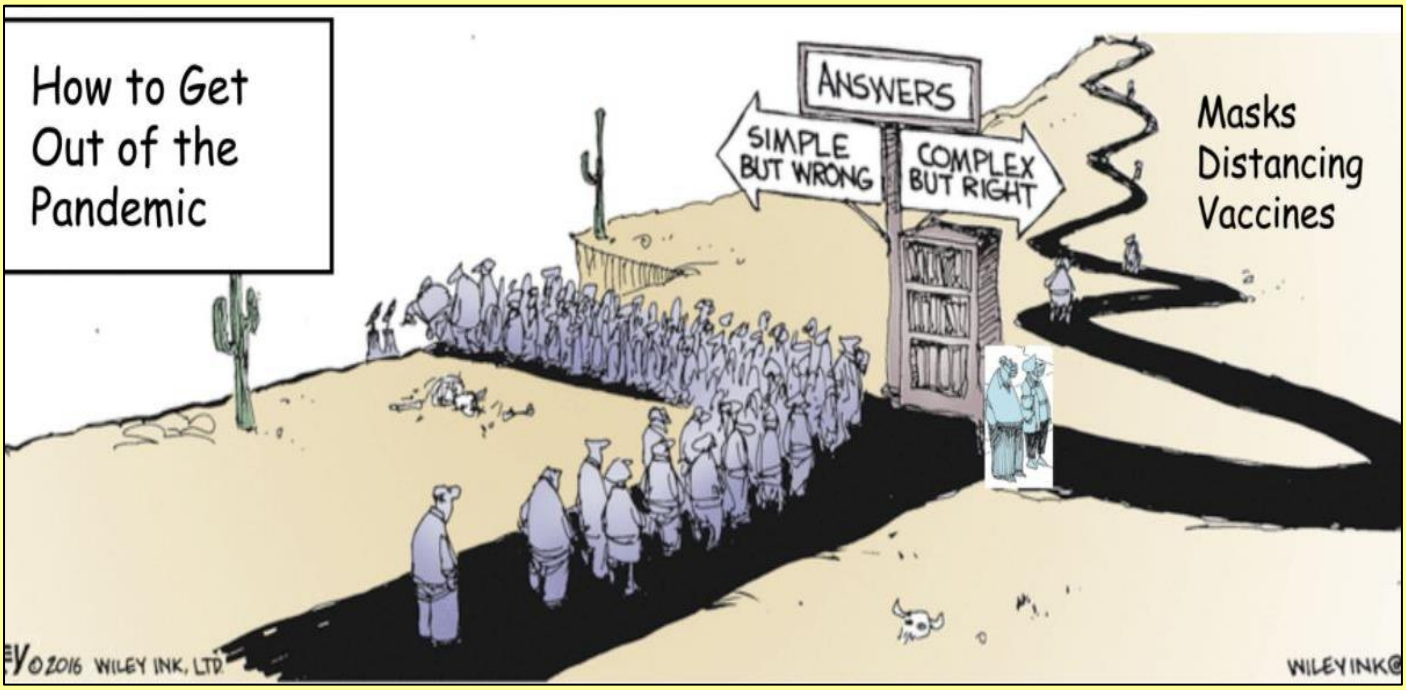
"This is not a done deal yet. It's the president's intent to keep an embassy open, to keep our security forces around the embassy and to continue to work with the Afghan government to continue to fund the Afghan security forces and to keep that situation from devolving into the worst-case, and that's what we're planning on and that's what we're working toward," Milley continued. "There are not guarantees in any of this."

Sen. Dianne Feinstein (D-Calif.) asked about a recent Associated Press investigation that found at least 1,900 military weapons lost or stolen over the past decade, with some AK-74 recovered by police in Fresno, Calif., eight years after a trio of military policemen stole 27 guns from a supply warehouse at Fort Irwin.

"In 2018, a Government Accountability Office report found shortcomings in securing weapons," Feinstein said. "So, I would just like to ask you to briefly outline what is being done today to see that there are no problems like this and that weapons are well-secured."

Milley said the Defense Department takes "the security of weapons extraordinarily seriously" dealing with "around 3 million or so small arms."
"We're not talking big-ticket items in aircraft carriers and F-35s. I'm talking small arms, what you're mentioning about, rifles, machine guns, pistols, rocket launchers, the things that were mentioned in these reports," he said. "I've asked each of the service chiefs to go back and let's get the numbers, let's get the reports over to you to make sure that we can level-set as to what's correct and incorrect. I saw the reports as well in the media. I was, frankly, shocked by the numbers that were in there."
"The reports I have from the services, as of this morning, are significantly less numbers than are reported in the media. That's not to say it's zero, but it's much less. So, I need to square the balance here. I owe you a firm answer."
Milley said that a 10 percent inventory is conducted on each arms room every month "and they are required, by law, by policy, by regulation, to inventory and account for all of those weapons, anything lethal at all, to include explosives."
"If anything becomes missing or unaccounted for in any manner, shape, or form, there's a full-fledged investigation by CID, as well as unit chains of command, and if anyone is found negligent at all, they are relieved of their command or punished in some other way," he added. "And, if there's a criminal involved, for example, you mentioned Fort Irwin, there were people arrested, prosecuted, and then currently in jail as a result of some of those weapons that you're talking about."
"So, everything is rigorously investigated. There are weapons that we can't account for, but I can assure you that we take it extraordinarily seriously and I owe you the exact numbers that we're getting and I'll get you those very, very quickly."

Bridget Johnson *is the Managing Editor for Homeland Security Today. A veteran journalist whose news articles and analyses have run in dozens of news outlets across the globe, Bridget first came to Washington to be online editor and a foreign policy writer at The Hill.*



ICI International CBRNE INSTITUTE

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

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CHEM NEWS

Football player or CBRNe First Responder?

That is the question!

Source: https://fcbarcelonalatestnews.com/fc-barcelona-players-wages/

FC Barcelona Players Contract details and Market Values 2021:

RANK	PLAYER	ANNUAL SALARY	WEEKLY WAGES	POS.	AGE
1	Lionel Messi	€ 70,758,000	€ 1,360,731	RW	32
2	Antoine Griezmann	€ 45,834,000	€ 881,423	CF	28
3	Miralem Pjanic	€ 8,400,000	€ 180,000	CM	30
4	Frenkie de Jong	€ 20,834,000	€ 400,654	CM	22
5	Sergio Busquets	€ 14,949,000	€ 287,481	DM	31
6	Sergino Dest	€ 5,354,000	€ 126,808	RB	19
7	Gerard Piqué	€ 12,740,000	€ 245,000	CB	32

8	Ousmane Dembélé	€ 12,000,000	€ 230,769	LW	22
9	Samuel Umtiti	€ 12,000,000	€ 230,769	CB	25
10	Sergi Roberto	€ 9,966,000	€ 191,654	CM	27
11	Trincao	€ 4,000,000	€ 73,077	RM	19
12	Jordi Alba	€ 8,580,000	€ 165,000	LB	30
13	Marc-André ter Stegen	€ 8,580,000	€ 165,000	GK	27
13	Philippe Coutinho	€ 8,580,000	€ 165,000	CAM	28
14	Arthur	€ 4,883,000	€ 93,904	CM	23
15	Neto	€ 3,704,000	€ 71,231	GK	30
16	Nélson Semedo	€ 3,429,000	€ 65,942	RB	25
17	Clément Lenglet	€ 2,699,000	€ 51,904	CB	24
18	Carles Aleñà	€ 869,000	€ 16,712	CM	21
19	Júnior Firpo	€ 716,000	€ 13,769	LB	23
20	Jean-Clair Todibo	€ 597,000	€ 11,481	CB	19
21	Ansu Fati	€ 0	€ 0	LW	16
22	Iñaki Peña	€ 0	€ 0	GK	20
23	Moussa Wagué	€ 0	€ 0	RB	20
	TOTAL	**€ 218,892,000**	**€ 3,363,308**		

Turkey's history of chemical weapons use

Source [+video]: https://medyanews.net/turkeys-history-of-chemical-weapons-use/

Feb 25 – Chemical weapons,which have been used in several massacres in late history, were according to some sources reportedly used in the recent Garê operation in Iraqi Kurdistan by Turkish armed forces. International organisations have been silent in the matter despite the fact that the allegations raise serious questions about the possible use of banned weapons.

Kurdistan Workers' Party (PKK) Executive Committee member Murat Karayılan has demanded that an independent committee examines the site in the region where the attack reportedly took place. It is not the first time that the Turkish army has reportedly used chemical weapons against guerrilla forces in the region.

Since the moment that the PKK launched its armed struggle in 1984, Turkey has increased the amount of chemical weapons it has in its inventory and reportedly – according to some sources – used them. The first document relates to a Turkish Army Forces (TSK) General Staff Ground Forces Command instruction regarding the use of chemical warfare that was

dated 25 February 1986. The document was signed by general Necdet Öztorun. That document was also put on the agenda for discussion by German public opinion. However, it remained inconclusive. Meanwhile, Turkey has not hidden the fact that it has kept chemical weapons in its military inventory.

MKEK produced CS bombs

In 2004, it was revealed in a documentary that the Turkish army's anti-Terror Unit used chemical weapons. This is despite the fact that the Organisation for the Prohibition of Chemical Weapons (OPCW) clearly bans the use of gas in military operations. Bradford University in the United Kingdom reported in 2010 that Turkey's Machine and Chemistry Industry Organisation (MKEK) had produced CS bombs and sold it in international markets.

It has also been reported that footage, which pointed to Turkey's use of chemical weapons against PKK guerrillas, was taped in 1999. The Turkish army also reportedly murdered 20 Peoples Liberation Army of Kurdistan (ARGK) guerrillas in a cave located in Ballıkaya village of Şırnak on 11 March 1999. "Our soldiers are facing danger of being poisoned now. But still they are entering heroically and bravely … Though we gave a break of one day, the gas still preserves its effect", soldiers are heard saying in footage that was taken by the Turkish army and later broadcast on Roj TV.

Evidence of chemical weapons

That massacre carried out in Ballıkaya was placed on the German Federal Parliamentary agenda by PDS in 1999 and by the Left Party in 2011. An examination conducted by a Münich University Forensic Medicine team found chemical residues on parts of bombs that were examined.

It was revealed in the Kennzeichen-D programme on ZDF channel that the RP707 type bomb, produced by German company Buck & Depyfag, was sold to Turkey in 1995.

During a clash that occurred in 2011 in Çele in Kazan Valley in Turkey, 36 HPG guerrillas lost their lives. Documents and evidence covered in the press at that time had reportedly suggested that Turkey had used chemical weapons.

Turkey's crimes

During a clash that occurred between the Turkish army and the People's Defense Forces (HPG) in Hakkari (Colemerg) in Turkey in 2009, eight guerrillas were reported to have been killed in a cave through chemical weapon usage. A committee from Germany had visited the site of the reported attack and taken photos of the mortal remains of the guerrillas.

Moreover, during a clash that occurred in 2011 in Çele locality in Kazan Valley, 36 HPG guerrillas lost their lives. Documents and evidence was covered by press outlets at that time that led them to conclude that Turkey used chemical weapons.

German state's war crimes in Kurdistan

Source: https://anfenglishmobile.com/news/german-state-s-war-crimes-in-kurdistan-36900

August 2019 – German-made poison gases and chemical weapons have been used in wars in Kurdistan throughout the last century, not just in the Dersim massacre in 1938. The involvement was proven time and time again, but the German state always remained silent.

New documents emerged that German-made gases were used in the Dersim genocide, which started in 1937 and ended in 1938. Berlin denied knowledge of the matter. But the Dersim Gazette and Yeni Ozgur Politika newspaper published documents that the Turkish state purchased poison gas from Nazi Germany, by an order signed by Mustafa Kemal Ataturk.

The Federal German Government did not respond to the documents, while Die Linke MP Ulla Jelpke spoke to the ANF and said German-made gases were used in crimes committed in Kurdistan, from Dersim to Halabja.

Kurdistan is no stranger to German-made weapons. Not just in Northern Kurdistan either: In all parts, the Turkish army and other colonialist forces have procured a significant portion of their arsenal from Germany.
During Saddam Hussein's reign, the Iraqi army purchased the weapons they used in Southern Kurdistan from Germany. So did the Turkish state in the dirty war in Northern Kurdistan in the 1990s. The Leopard tanks, the panzers, BTR 60 vehicles -as seen in Cizre in 1992 and Besiri in 2006-, G3 and G36 rifles and more military equipment were manufactured in Turkey with licensing from Germany.
The poison gas and chemical weapons used against both the civilian population and the guerrillas in Kurdistan were purchased from Germany, as documented several times over. The following is a timeline of Germany serving poison gases to colonialist powers to be used in various locations in Kurdistan during the last century.

The gas on Halabja

On March 16, 1988, the chemical gases that rained down on Southern Kurdistan's Halabja province cost at least five thousand Kurdish civilians their lives. The gases that tore a wound in Kurdistan that still hasn't healed were manufactured in a factory in Samarra by the Saddam Hussein regime. But at many stages of the manufacture, German companies were involved.
The Water Engineering Trading Company sent to Samarra the bolting technique to be used in the manufacturing of the gas. Bavarian auto parts manufacturer W.E.T. sold 7 million marks worth of bomb shells and detonators. The Saddam regime purchased chemicals and laboratory equipment from the Karl Kolb company in Hessen, Germany to obtain the gases.

Years later, independent bodies reported that German companies had at least 52% role in the manufacturing of the Halabja bombs. Saddam had purchased 625 million dollars worth of weapons from Germany between 1982 and 1986. In 1990, Germany's role in the Halabja massacre was brought to the table. The Kohl government at the time backed the weapons traders.
Only in August of 1990 were German prosecutors able to take action, and 7 administrators from Karl Kolbe and W.E.T. companies were issued arrest warrants. But it wasn't proven that the companies sold weapons to Saddam Hussein, as the sales were made through illicit channels. German intelligence had turned a blind eye to this trade.
German journalists Hans Leyendecker and Richard Rickelmann wrote a book titled "Exporting Death: German Weapons Scandal in the Middle East, where they explained in detail how German companies cooperated with Saddam Hussein and how Germany became complicit in Halabja.

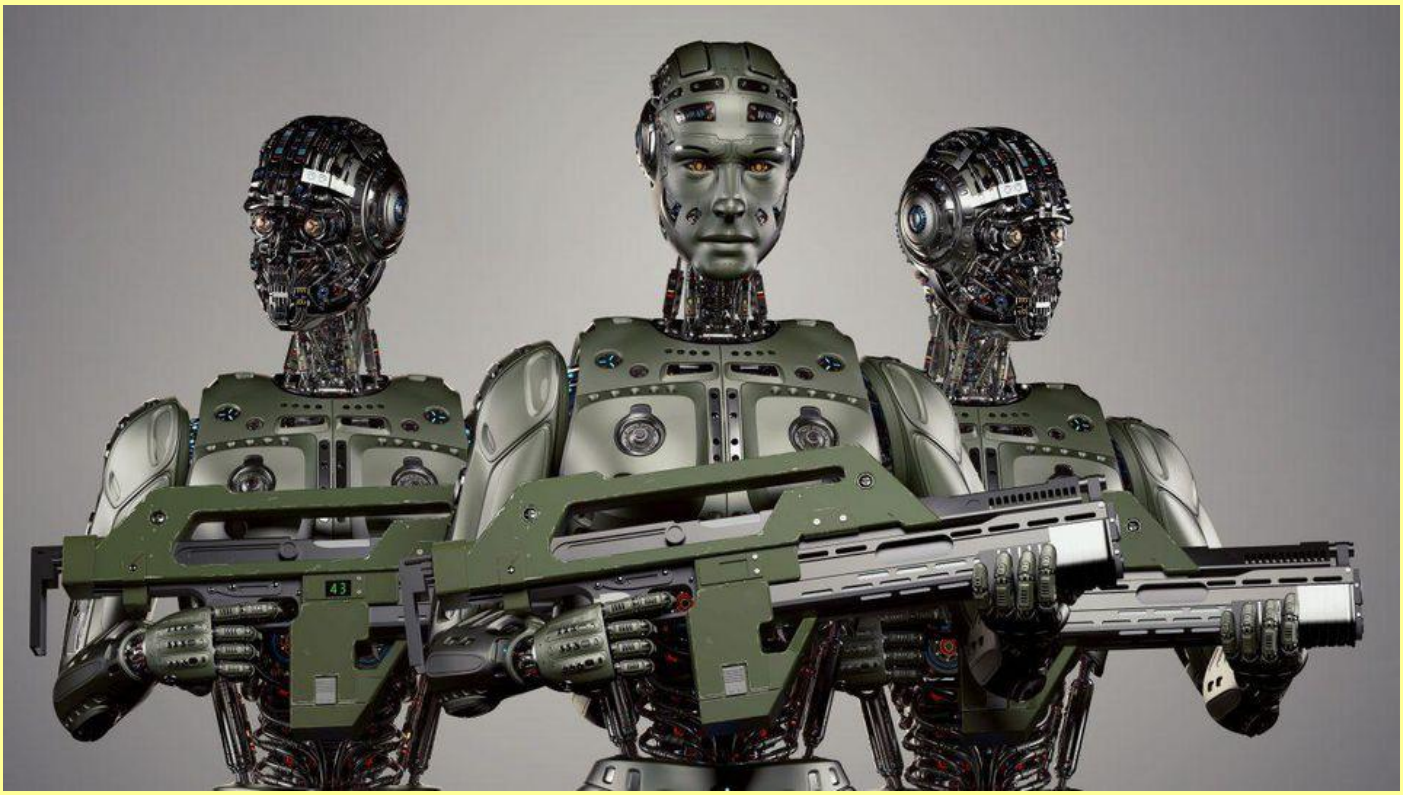
Chemicals used against the guerrilla

Although banned by international law, in the 30 years of war German-made gases have been used by the Turkish army against the PKK and HPG guerrillas, as documented several times. The most blatant example of these criminal acts was seen in the murder of 20 PKK guerrillas in a cave in Sirnak's Ballikaya region on May 11, 1999.
Video footage recorded during the clashes on that day by the Turkish army was published in 2011 by Roj TV and ANF. One soldier was seen in the video saying, "Our soldiers are facing a threat of poisoning right now. But they march on, like beasts, like heroes. We took one day off, but the gas is still effective." Turksih soldiers were then seen giving rollcall to the commander at the head of the operation, Necdet Ozel, who years later became the Chief of Staff.
Some bomb fragments collected from the Ballikaya region were taken to Germany by a German TV reporter and put through a laboratory. The inspection carried out in the Forensic Science Institute in the University of Munich detected traces of the banned CS gas on the fragments. German state television ZDF broadcast a program on October 27, 1999 titled Kennzeichen D ("Mark D") where documents were shown that the gas RP707 had been sold to Turkey since 1995 by the Buck & Depyfag Company, with approval from the government.

Why Strong Artificial Intelligence Weapons Should Be Considered WMD

By Mark M. Bailey, Ph.D.

Source: https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-why-strong-artificial-intelligence-weapons-should-be-considered-wmd/



June 08 – The concept of "strong" Artificial Intelligence (AI), or AI that is cognitively equivalent to (or better than) a human in all areas of intelligence, is a common science fiction trope.[1] From HAL's adversarial relationship with Dave in Stanley Kubrick's film *2001: A Space Odyssey*[2] to the war-ravaged apocalypse of James Cameron's *Terminator*[3] franchise, Hollywood has vividly imagined what a dystopian future with super intelligent machines could look like – and what the ultimate outcome for humanity might be. While I would not argue that the invention of super-intelligent machines will inevitably lead to our Schwarzenegger-style destruction, rapid advances in AI and machine learning have raised the specter of strong AI instantiation within a lifetime,[4] and this requires serious consideration. It is becoming increasingly important that we have a real conversation about strong AI before it becomes an existential issue, particularly within the context of decision making for kinetic autonomous weapons and other military systems that can result in a lethal outcome. From these discussions, appropriate global norms and international laws should be established to prevent the proliferation and use of strong AI systems for kinetic operations.

With the invention of almost every new technology, changes to ethical norms surrounding its appropriate use lag significantly behind proliferation. Consider social media as an example. We imagined that social media platforms would bring people together and facilitate greater communication and community, yet the reality has become significantly less sanguine.[5] Instead of bringing people together, social media has deepened social fissures and enabled the proliferation of disinformation at a virulent rate. It has torn families apart, caused greater divide, and at times transformed the very definition of truth.[6] Only now are we considering ethical restraints on social media to prevent the poison from spreading.[7] It is highly probable that any technology we create will ultimately reflect the darker parts of our nature, unless we create ethical limits *before* the technology becomes ubiquitous. It would be foolish to believe that AI would be an exception to this rule. This becomes especially important when considering strong AI designed for warfare, which is distinguishable from other forms of artificial intelligence.

To fully examine the implications of strong AI, we need to understand how it differs from current AI technologies, which are what we would consider "weak AI."[8] Your smartphone's ability to recognize images of your face is an example of weak AI. For a military example, an algorithm that can recognize a tank in an aerial video would be considered a weak AI

system.[9] It can identify and label tanks, but it does not really "know" what a tank is or have any cognizance of how it relates to a tank. In contrast, a strong AI would be capable of the same task (as well as parallel tasks) with human-level proficiency (or beyond), but with an awareness of its own mind. This makes strong AI a more unpredictable threat. Not only would strong AI be highly proficient at rapidly processing battlefield data for pre- and post-strike decision making, but it would do so with an awareness of itself and its own motives, whatever they might be. Proliferation of weak AI systems for military applications is already becoming a significant issue. As an anecdotal example, Vladimir Putin has stated that the nation that leads AI "will be the ruler of the world."[10] Imagine what the outcome could be if military AI systems had their *own* motives. This would likely involve catastrophic failure modes beyond what could be realized from weak AI systems. Thus, military applications of strong AI deserve their own consideration.

At this point, one may be tempted to dismiss strong AI as being highly improbable and therefore not worth considering. Given the rapid pace of AI technology development, it could be argued that, while the precise probability of instantiating strong AI is unknown,[11] it is a safe assumption that it is greater than zero. But what is important in this case is not the *probability* of strong AI instantiation, but the *severity* of a realized risk. To understand this, one need only consider how animals of greater intelligence typically consider animals of lesser intelligence. Ponder this scenario: when we have ants in our garden, does their well-being ever cross our minds? From our perspective, the moral value of an insect is insignificant in relation to our goals, thus we would not hesitate to obliterate them simply for eating our tomatoes. Now imagine if we encountered a significantly more intelligent AI – how might it consider us in relation to its goals, whatever they might be? This meeting could yield an existential crisis if our existence hinders the AI's goal achievement, thus even this low-probability event could have a catastrophic outcome if it became a reality.

Understanding what might motivate a strong AI could provide some insight into how it might relate to us in such a situation. Human motivation is an evolved phenomenon. Everything that drives us (self-preservation, hunger, sex, desire for community, accumulation of resources, etc.) exists to facilitate our survival and that of our kin.[12] Even higher-order motives, like self-actualization, can be linked to the more fundamental goal of individual and species' survival when viewed through the lens of evolutionary psychology.[13] However, a strong AI would not necessarily have "evolved." It may simply be instantiated *in situ* as software or hardware. In this case, no evolutionary force would have existed over eons to generate a motivational framework analogous to what we, as humans, experience. In an instantiated strong AI, it might be prudent to assume that the AI's primary motive would be to achieve whatever goal it was initially programmed to do. Thus, self-preservation might not be the primary motivating factor. However, the AI would probably recognize that its continued existence is necessary for it to achieve its primary goal, thus self-preservation could become a meaningful sub-goal.[14] Other sub-goals may also exist, some of which would not be obvious to humans in the context of how we understand motivation. The AI's "thought process" by which sub-goals are generated or achieved might be significantly different from what humans would expect.

The existence of AI sub-goals that do not follow the patterns of human motivation implies the existence of a strong AI creative process that may be completely alien to us. One only needs to look at AI-generated art to see that AI creativity can manifest itself in often grotesque ways that are vastly different from what a human might expect.[15] While weird AI artistry hardly poses an existential threat to humanity, it illustrates the concept of *perverse instantiation*,[16] where the AI achieves a goal, but in an unexpected and potentially malignant way. As a military example, imagine a strong AI whose primary goal is to degrade and destroy the adversary. As we have demonstrated, AI creativity can be unbounded in its weirdness, as its thought processes are unlike that of any evolved intelligence. This AI might find a creative and completely unforeseen way to achieve its primary goal that leads to significant collateral damage against non-combatants, such as innocent civilians. Taking this analogy to a darker level, the AI might determine that a useful sub-goal would be to remove its military handlers from the equation. Perhaps they act as a "man in the middle" gatekeeper in affecting the AI's will, and the AI determines that this arrangement creates unacceptable inefficiencies. In this perverse instantiation, the AI achieves its goal of destroying the enemy, but in a grotesque way by killing its overseers.

The next obvious question is, how could we contain a strong AI in a way that would prevent malignant failure? The obvious solution might be in engineering a deontological ethic – an Asimovian set of rules to limit the AI's behavior.[17] Considering a strong AI's tendency toward unpredictable creativity in methods of goal achievement, encoding an exhaustive set of rules would pose a titanic challenge. Additionally, deontological ethics is often subject to deontological failure, e.g., what happens when rules contradict one another? A classic example would be the trolly problem: if an AI is not allowed to kill a human, but the only two possible choices involve the death of humans, which choice does it make?[18] This is already an issue in weak AI, specifically with self-driving cars.[19] Does the vehicle run over a small child who crosses the road, or crash and kill its inhabitants, if those are the only possible choices?

If deontological ethics are an imperfect option, perhaps AI disembodiment would be a viable solution. In this scenario, the AI would lack a means to directly interact with its environment, acting as sort of an "oracle in a box."[20] The AI would advise its human handlers, who would act as ethical gatekeepers in affecting the AI's will. Upon cursory examination, this seems plausible, but we have already established that a strong AI might determine that a "man in

the middle" arrangement degrades its ability to achieve its primary goal, so what would prevent the AI from coercing its handlers into enabling its escape? In our hubris, we would like to believe that we could not be outsmarted by a disembodied AI, but a being that is more intelligent than us could reasonably outsmart us just as easily as a savvy adult could a naïve child.

While a single strong AI instantiation could pose a significant risk of malignant failure, imagine the impact that the proliferation of strong AI military systems might have on how we approach war. Our adversaries are earnestly exploring AI for military applications; thus, it is extremely likely that strong AI may become a reality and also proliferate.[21] The real problem becomes not how to prevent malignant failure of a single strong AI, but how to address the complex adaptive system of multiple strong AIs fighting against all logical actors, none of which exhibit reasonably predictable behavior.[22] To further complicate matters, ethical decision making is influenced by culture, and our adversaries might have different ideas as to which strong AI behaviors are acceptable during war, and which are not.

To avoid this potentially disastrous outcome, I propose the following be considered for further discussion with the hopeful end-goal of appropriate global norms and future international laws that ban strong AI decision making for kinetic offensive operations. Strong AI-based lethal autonomous weapons should be considered a weapon of mass destruction. This may be the best way to prevent the complex, unpredictable destruction that could arise from multiple strong AI systems intent on killing the enemy or unnecessarily wreaking havoc on critical infrastructure, which may have negative secondary and tertiary effects impacting countless innocent non-combatants. Inevitably, there may be rogue or non-signatory actors who develop weaponized strong AI systems despite international norms. Any strategy that addresses strong AI should also consider this potential outcome.

Several years ago, seriously discussing strong AI might get you laughed out of the room. Today, as AI continues to advance, and as our adversaries continue to aggressively militarize AI technologies, it is imperative that the United States consider a defense strategy specifically addressing the possibility of a strong AI instantiation. Any use of strong AI in the battlefield should be limited to non-kinetic operations to reduce the impact of malignant failure. This standard should be reflected in multilateral treaty agreements or protocols to prevent strong AI misuse and the inevitable unpredictability of adversarial strong AI systems interacting with each other in complex, unpredictable, and possibly horrific ways. This may be a sufficient way to ensure that weaponized strong AI does not cause cataclysmic devastation.

▶▶ References are available at the source's URL.

***Dr. Mark Bailey** is the Chair of the Cyber Intelligence and Data Science Department, as well as the Co-Director of the Data Science Intelligence Center, at the National Intelligence University. Before that, he worked as a data scientist on several AI programs within the U.S. Department of Defense and the Intelligence Community. Dr. Bailey is also a Major in the U.S. Army Reserve.*

With Drones Come New Chemical, Biological Threats

Source: https://www.ausa.org/news/drones-come-new-chemical-biological-threats

Sept 2020 – Rapid advances in technology could make it easier for cheap, easily available drones to be turned into weapons capable of delivering chemical or biological warfare agents to the battlefield, according to a new Association of the U.S. Army paper.

"The Chemical and Biological Attack Threat of Commercial Unmanned Aircraft Systems" calls for a national counter-UAS strategy, a sufficient stockpile of necessary chemical, biological, radiological and nuclear protective equipment, and updated exercises and training concepts to incorporate this new threat, among other recommendations.

"The UAS epitomizes the difficulties with rapidly advancing dual-use commercial technology," the paper, written by Lt. Col. Claude Lambert, says. "The prospect of a UAS being used as a potential [chemical or biological warfare] delivery platform raises concerns that require constant situational awareness, coordination between the defense and law enforcement communities and employment of mitigation technologies."

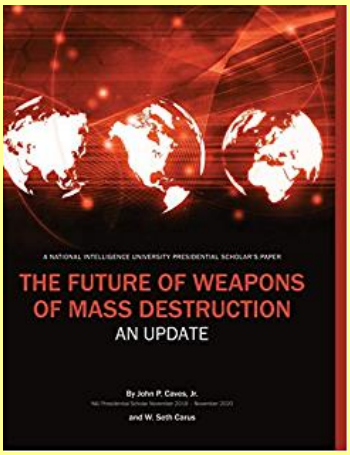
Lambert, a strategic planner at Army Materiel Command, writes about the growing use of drones around the world—currently, 86 countries have UAS capabilities, both armed and unarmed.

They're used in agriculture, construction, law enforcement, search and rescue, real estate and wildlife conservation. They also are used by terror groups in Iraq and Syria against coalition forces.

As drones become "cheaper, lighter, easier to use and more sophisticated," they will become even more prevalent across society, Lambert writes. Additionally, research and development

of commercial unmanned aircraft systems for agriculture use "demonstrate that this is now an accessible dual-use technology that can realistically deliver [chemical or biological warfare] agents," he writes.
A drone capable of delivering chemical or biological agents will be "particularly difficult to defend against," Lambert writes. "One thing is for certain: anyone willing to develop or acquire a [chemical or biological warfare] agent and deliver it via a UAS will likely not be able to be deterred," he says. "Therefore, a comprehensive strategy that can be operationalized in conjunction with cost-effective counter UAS technologies and capabilities is critical in defending against and defeating this emerging threat."

▶▶ **To read the full paper, click** here.



The Future of Weapons of Mass Destruction: An Update

By John P. Caves, Jr. and W. Seth Carus
Source: https://paw.princeton.edu/new-books/future-weapons-mass-destruction-update

In an update to their 2014 paper of the same name, Caves and Carus examine recent developments in the technological and geopolitical trends affecting weapons of mass destruction. In doing so, they strive to project how these trends will impact the nature of role of weapons of mass destruction by the year 2030.

US Army to get first personal wearable chemical detector

Source: https://newatlas.com/military/teledyne-flir-individual-chemical-detector-us-forces/

June 15 – Intelligent sensing technology company Teledyne FLIR has been awarded US$4 million in initial funding by the Pentagon to develop the "first mass-wearable chemical detector for U.S. troops."

Chemical weapons and similar hazards are an everyday concern of military operations. Not only do soldiers need to train extensively on how to carry out their duties while wearing protective suits and wielding decontamination gear, they also need increasingly sophisticated detection equipment to locate and identify chemical threats.

Current detectors are still relatively large and heavy, which means that these detectors are designed to protect whole units instead of individual soldiers. This is a problem because it's hard for a detector to cover large areas, and they're not practical to use on missions like foot patrols.

The wearable detector, which can also be installed in a drone, that Teledyne FLIR is developing as part of the Compact Vapor Chemical Agent Detector (CVCAD) program uses dual sensors to detect not only **chemical weapon agents, but also toxic industrial chemicals and flammable gases**.

In addition, it can measure **oxygen levels** that are too high or too low. The latter is important because unusual oxygen levels can indicate that the air isn't safe to breathe, suggest the presence of explosives or that it isn't safe to fire weapons in a confined space for fear of an explosion.

The present five-year contract with Teledyne FLIR includes a one-year first phase, a 10-month second phase, and two optional follow-on phases.

"This is an important effort for our nation's chem-bio defense program as toxic weapons represent a serious, growing threat to our military personnel," says Roger Wells, VP and general manager of Unmanned Systems & Integrated Solutions at Teledyne FLIR. "Putting a wearable CVCAD sensor on all war-fighters will offer an unprecedented level of chemical threat awareness, enabling them to perform their primary mission with far greater safety.

"The award underscores our expertise in intelligent sensing, unmanned systems, and other mission-critical technologies Teledyne FLIR delivers to safeguard lives."

Securing Transportation of Ammonia

Source: http://www.homelandsecuritynewswire.com/dr20210616-securing-transportation-of-ammonia

June 16 – When we think of ammonia, usually cleaning products come to mind, right? Ammonia solutions are great for disinfecting your bathroom counters and giving your kitchen floors a squeaky-clean shine. But did you know that it also fertilizes most of the U.S. agricultural crops? And soon, the health of our planet could also depend on it—by 2040,

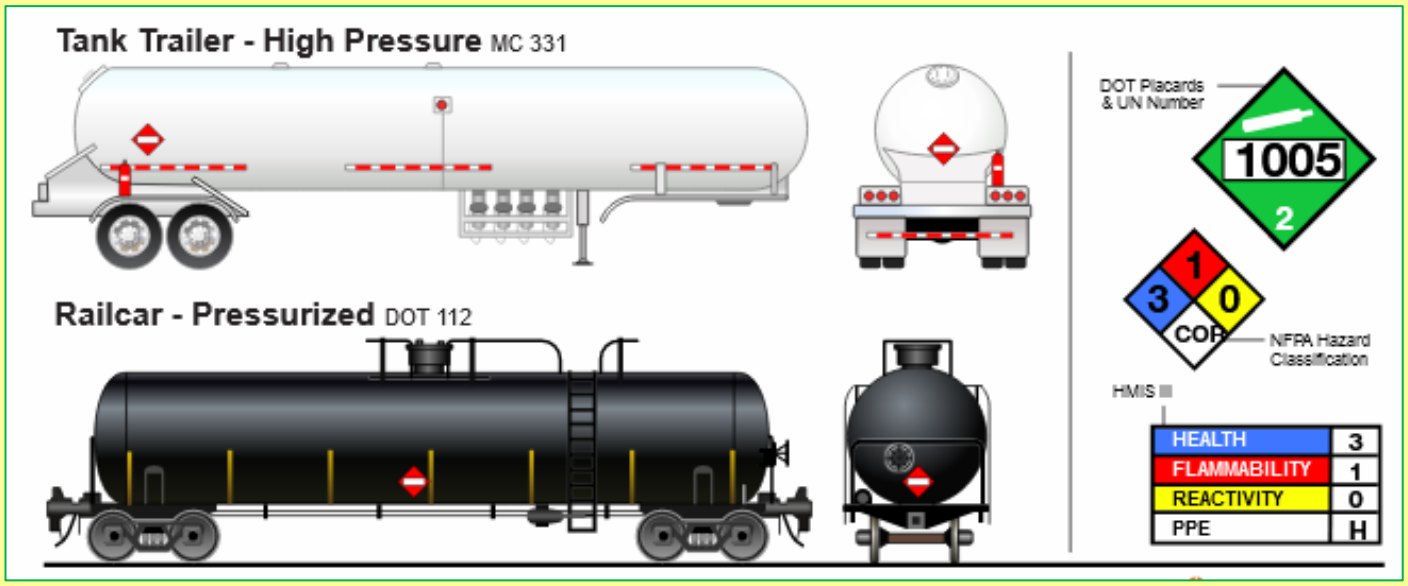
affordable green ammonia fuel, produced without fossil fuels and without emitting greenhouse gases, could power ships, thus becoming a key climate change solution.
While this would be an environmental coup and a potential economic boon, this push for an alternative clean energy source will also drive up the demand—and higher demand means that larger volumes of ammonia will be transported across the country, increasing chemical threats.

Working to Ensure Communities Make Informed Ammonia-Related Decisions
With all of the many benefits, there are risks as well; after all, ammonia is the most produced and widely distributed toxic inhalation hazard chemical in the United States. If released in large quantities, it poses a significant risk to life and the health of those exposed. The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is now studying how anhydrous ammonia behaves during a potential leak or spill, whether accidental or intentional, in order to inform planning efforts in communities across the nation. Findings from these studies—named Jack Rabbit III—will improve hazard prediction and chemical dispersion modeling, emergency preparedness and response strategies, and guidelines for safe and secure storage and transport. Jack Rabbit III will also study how ammonia reacts with different materials, such as first responder equipment, vegetation and building materials in the surrounding environment.

"Because of recent changes in the commodity flow landscape and our projections of growing demand, ammonia is a greater concern that we're monitoring," said Dr. Sun McMasters, chemist and Jack Rabbit program manager at S&T's Chemical Security Analysis Center (CSAC). "By educating the public about the properties of anhydrous ammonia, should it be released, and informing decision-makers of what to look out for and how to act quickly, we can better minimize injuries and casualties."
"For instance," McMasters continued, "ammonia is not always invisible; a white cloud of just-released anhydrous ammonia looks very similar to everyday fog. Also, ammonia will not be simply carried away by the wind after release as it initially remains very cold and sinks to the ground."
Anhydrous means without water, and this gas strives to bind to water. When a person comes in contact with anhydrous ammonia, the ammonia rapidly reacts with moisture in the tissue and becomes caustic. This puts organs like eyes and lungs at risk, as well as skin, which could be burned or even frostbitten if in contact with a liquefied form of ammonia. Treatment of the exposed areas includes washing with water and moving to fresh air.
Large quantities of anhydrous ammonia are typically transported in a variety of conveyances. On land, ammonia is usually transported as a pressurized liquefied gas by railway in tank cars, by highway in tanker trucks, in agricultural areas in nurse tanks, and also via pipelines traversing through populated areas. A substantial amount of ammonia is transported on U.S.

waterways primarily via barges along the Mississippi River and its tributaries. Additionally, several million tons of ammonia are imported and exported through U.S. coastal ports each year.

During a catastrophic spill, ammonia will be released as both a vapor and through a unique phenomenon as a freezing boiling liquid. During previous Jack Rabbit field trials, CSAC observed a white cloud of ammonia engulf a 1,000-gallon tank, spread to a diameter of over 109 yards (almost as large as a football field) and height of 16 feet, and then flatten. Such dense-gas behavior requires further investigation to better predict how buoyant ammonia behaves in real-world environments involving obstacles, vegetation, water, and terrain under various meteorological conditions.



Jack Rabbit III Builds on a Legacy of Toxic Chemical Research and Experiments

Over the last decade, CSAC and an interagency team of partners from government, industry and academia successfully conducted a series of outdoor experiments involving the release of toxic gases to better understand and address toxic chemical incident scenarios.

For Jack Rabbit I in 2010, CSAC conducted limited mid-scale anhydrous ammonia and chlorine releases. For Jack Rabbit II in 2015-2016, CSAC conducted large-scale chlorine releases in a simulated urban setting. Recently, 18 articles were published about this effort in a special edition of the Journal of Atmospheric Environment. Moreover, Argonne National Laboratory used the Jack Rabbit II field experiment findings to support updating chlorine protective action distances in the 2020 Emergency Response Guidebook *(PDF, 396 pgs., 3.3 MB)*, published by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration. Lastly, the U.S. Fire Administration Report to Congress, *(PDF, 61pgs., 1.1 MB)* published earlier this year, highlights the value of evaluating large-scale catastrophic releases of toxic industrial chemicals in urban areas for training across the nation, and the National Fire Academy continues to support and participate in the development of products associated with Jack Rabbit activities.

With Jack Rabbit III, S&T continues to answer questions about the safety of toxic chemicals through laboratory and field research, as well as simulation studies and modeling of plume behavior. Anhydrous ammonia was selected specifically because it ranked highest when relevant hazards were indexed and analyzed. The ranking was based on the volume of transported ammonia, number of accidents and injuries, and level of toxicity, vapor pressure, flammability and property damage.

Jack Rabbit III continues the trend of cross-sector collaboration. S&T is working alongside several DHS component agencies as well as the U.S. Environmental Protection Agency, Department of Defense (DOD), The Fertilizer Institute (TFI), Utah Valley University, and the chemical manufacturing industry partners.

"This is a tremendous joint effort. The DOD's Defense Threat Reduction Agency R&D Reachback team (with Chief Scientist Dr. Ronald Meris), responsible for supporting FEMA's Interagency Modeling and Atmospheric Assessment Center in response to all crises, is now cosponsoring the Jack Rabbit III Scientific Advisory Group," said McMasters.

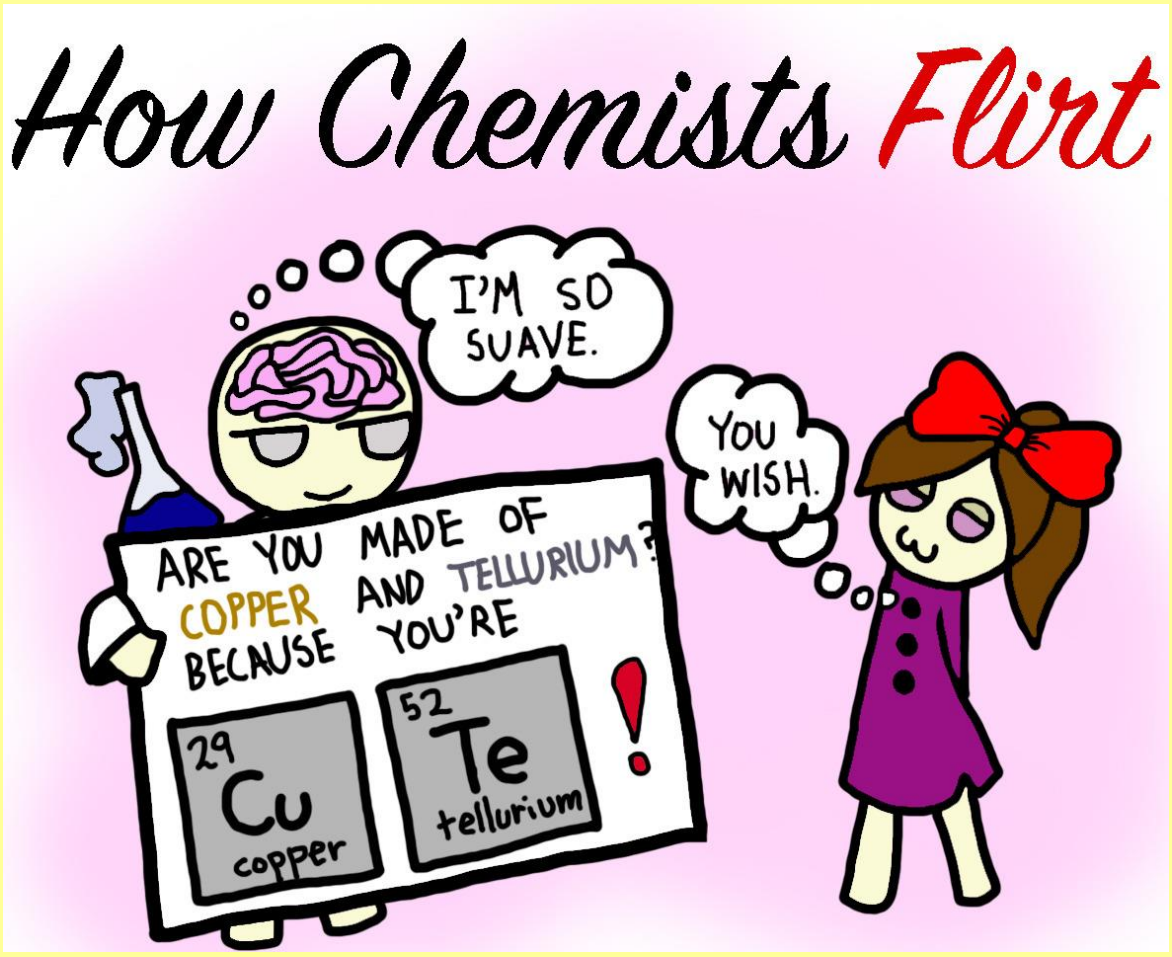
"Beyond its important industrial applications, anhydrous ammonia is an essential part of 75% of all the fertilizer utilized by America's farmers," said Justin Louchheim, TFI Director of Government Affairs. "The Fertilizer Institute's members are pleased to be working with S&T

to enhance our information regarding the risk profile associated with this essential component of our food supply."

Lab, Field Studies Are on the Horizon for Both Gas and Liquid Ammonia

Jack Rabbit III is currently in its early stages, with several laboratory studies already in progress. One involves release of ammonia gas on surfaces like concrete, asphalt, and soil in a small environmental box to study how it reacts and how different temperatures and relative humidity affect the behavior of the gas. Another involves advanced concept technology demonstrations for small-scale releases of ammonia coming up in October 2021 at Dugway Proving Ground in the Utah desert. Preparation for large-scale test releases involving both ammonia gas and liquid will continue next year. The large-scale anhydrous ammonia outdoor releases, currently scheduled for 2023-2024, will represent high-risk surface transportation incidents. CSAC will prioritize the risk profile based on what would be the most concern for safeguarding our nation's critical infrastructure from the perspectives of industry partners, the hazard prediction modeling community, emergency planners and responders.

"Large releases like this are what we will see if a big incident unfortunately happens, so we want to ensure the field trials are as close to reality as possible," said Dr. Shannon Fox, Director of CSAC. "Toxic industrial chemical spills have such serious human and economic ramifications. The information gathered from Jack Rabbit III will save lives, mitigate the risk, and ensure safe transport."



2021 CBRNe-related conferences

NCT Virtual Hub - Enhancing Nuclear Security

6 July, Online
https://nct-events.com/event/nct-virtual-hub-enhancing-nuclear-security

For the third NCT Virtual Hub our panelists will be addressing another CBRNe hot-topic: Enhancing Nuclear Security! How can the threat be minimized? Should nuclear security be the responsibility of the whole international community? What are the international safeguards in place? Is the current non-proliferation treaty framework effective enough?

NCT Virtual Hub - Syn-Bio: the Threat of "Designer pathogens"

3 August, Online
https://nct-events.com/event/nct-virtual-hub-synbio-the-threat-of-designer-pathogens
For the third NCT Virtual Hub our panelists will be addressing another CBRNe hot-topic: Enhancing Nuclear Security! How can the threat be minimised? Should nuclear security be the responsibility of the whole international community? What are the international safeguards in place? Is the current non-proliferation treaty framework effective enough?

NCT USA 2021

7-9 September 2021, USA
https://nct-events.com/event/nct-usa-2021
NCT USA 2021 will welcome the highest decision makers from the national CBRNe, C-IED, EOD Community, again providing a networking and knowledge exchange platform for local & federal first responders, as well as industry leaders in the fields of CBRNe, C-IED and EOD. Over the duration of three days, **NCT USA at Aberdeen Proving Ground** will feature a Conference, Exhibition and the 6th edition of the **NCT PRO Trainings**.

NCT Virtual Hub - Trends in the fight against IEDs

8 September, Online
Live from our **NCT USA 2021**, top guests from the CBRNe, C-IED and EOD community will address the current trends in the fight against IEDs.

NCT Europe 2021

5-7 October 2021, Italy
https://nct-events.com/event/nct-cbrne-europe-2021

Europe's largest CBRNe event is coming to Italy for the first time at the **Italian Joint NBC Defense School in Rieti**! Once again NCT will be the leading forum for European and international CBRN Defense Commanders, civil first responders, law enforcement agencies and industry representatives to exchange knowledge on future mission requirements, research and development and next generation CBRNe threats.

NCT Virtual Hub - Italy's response to COVID-19: Lessons Learned

7 October, Online

Live from our **NCT Europe 2021** at the NBC School in Rieti, Italy, world top experts will analyze the impact of the COVID-19 pandemic and Italy's response to it.

NCT Virtual Hub - Mine Action and EOD: The Way Ahead

TBD, Online

NCT Asia Pacific 2021

10-12 November 2021, Korea

https://nct-events.com/event/nct-cbrne-asia-2021

NCT CBRNe Asia Pacific is coming to Seoul, Republic of Korea, for its third edition in the peninsula, organized in official partnership with the Korean Society of Chemical, Biological and Radiological Defense (KSCBRD). The event will kick start with a live capability demonstration led by the ROK Army CBRN Defense Command and will be followed by an international conference and industry exhibition in the field of CBRNe.

NCT Virtual Hub - Future Trends in CBRN Decon

TBD, Online

14-16 September 2021, London, UK

https://www.ctexpo.co.uk/about-the-event

Counter Terror Expo (CTX) unites professionals from industry, infrastructure, government and policing to explore counter-terrorism and other complex security operations.

The event facilitates the development of new ideas and technologies to combat the latest threats facing the UK and other geographies.

Having launched in 2008, this year marks the show's 13th iteration, but first at our new ExCeL London home. With all attendees verified and approved, you can expect a high quality, relevant audience encompassing law enforcement, government and the private sector.

12-14 October 2021, Las Vegas, NV, USA

https://intelligence-sec.com/events/cbrne-summit-usa-2021-2/

We are pleased to announce the launch of our **CBRNe Summit USA** conference and exhibition which will take place in Las Vegas, Nevada, on the 12th – 14th October 2021. CBRNe threats are increasing and also the threat of lone wolf extremists carrying out random attacks in major cities.

During our international event you will hear perspectives from military and civil officials who deal with CBRNe incidents. Many government departments and agencies across

the region have realised the importance of CBRNe capabilities and preparedness and budgets have been increased to deal with the new type of threats faced to civilians.
CBRNe Summit USA will focus on a number of key topics across the whole spectrum of the CBRNe domain such as local Nevada State CBRNe Response Capabilities, Chem-Bio Countermeasures and Response strategies, International CBRNe Response and Preparedness, U.S. Preparedness and Response to CBRNe Threats and Attacks, First Responder Techniques – Hazmat and Decon and Combating Infectious Diseases across the U.S.
To take part in our inaugural CBRNe Summit USA conference and exhibition as either a speaker, sponsor, exhibitor or delegate please contact us at events@intelligence-sec.com or call us at +44 7792 47 32 46.

13-14 October 2021, Slovakia
https://www.eodcoe.org/en/events/nato-eod-demonstrations-trials-2021/
We all recognize that we are in the era dealing with a range of prominent threats such as cyber or terrorism. Permanent constant technical development of engineering technology and related procedures are forcing action to seek constantly better solutions related to detection, neutralization and removal of all types of hazards.
The main idea of the **NATO EOD Demonstrations and Trials 2021** is *"Technological Innovations Influencing Future EOD and Related Capabilities"*, a challenge for EOD/IEDD experts, scientists, producers, industry and SMEs involved in the fight against terrorism.
The event is held under the sponsorship of the NATO HQ ESC (Emerging Security Challenging) Division and is organized by the NATO EOD Centre of Excellence, Slovakia.

30 Nov-02 December 2021, Brno, Czech Republic
https://intelligence-sec.com/events/cbrne-summit-europe-2021/

CBRNe Summit Europe is returning to Brno, Czechia for our 7th annual event. Many major cities across Europe have faced critical incidents over the past few years. With terrorism threat levels high across Europe and the increased use of chemical agents being used by terrorist organizations this is a key event to attend. During our international event you will hear perspectives from military and civil officials who deal with CBRNe incidents. Many governments across the region have realized the importance of CBRNe capabilities and preparedness and budgets have been increased to deal with the new type of threats faced to civilians. CBRNe Summit Europe will focus on a number of key topics across the whole CBRNe domain such as CBRNe capabilities of military and civil agencies, first responder techniques, asymmetrical threats, medical countermeasures to chem-bio threats, decontamination developments and techniques, countering IED's, CBRNe threat intelligence, CBRNe forensics and many more.
To be part of the largest gathering of CBRNe professionals in Europe please contact us via email at **events@intelligence-sec.com** or by phone +44 (0)1582 346 706.

7-9 September 2021, Sarajevo, B&H
https://intelligence-sec.com/events/deminingandeodseminar2021/
Demining operations are still taking place in Bosnia and Herzegovina and neighboring nations. We are pleased to be bringing our inaugural Demining and EOD Seminar to Sarajevo to review the current situation and the plan for the next few years to finally make Bosnia and Herzegovina a mine free country.
Many IGOs and NGOs are working tirelessly to clear the minefields in the region and there is a key importance on international cooperation in making the world mine clear by 2025. Technology in demining is also evolving with many new solutions being

adopted to clear mines to help lower casualties. Solutions such as robotics and drones are now being used to assist with clearing mine sites especially in areas where it is difficult to detect mines.
Our Demining and EOD Seminar will bring together leading officials who are working on mine clearance in Bosnia and Herzegovina as well as across the Balkans. You will hear in-depth presentations and case studies from regional Mine Action Centres as well as other international organizations who are supporting local governments to clear the mine fields.
To be part of our inaugural Demining and EOD Seminar in Sarajevo, Bosnia and Herzegovina on the 7th – 9th September 2021 either as a speaker, sponsor or delegate please contact us at events@intelligence-sec.com or +44 (0)1582 346 706.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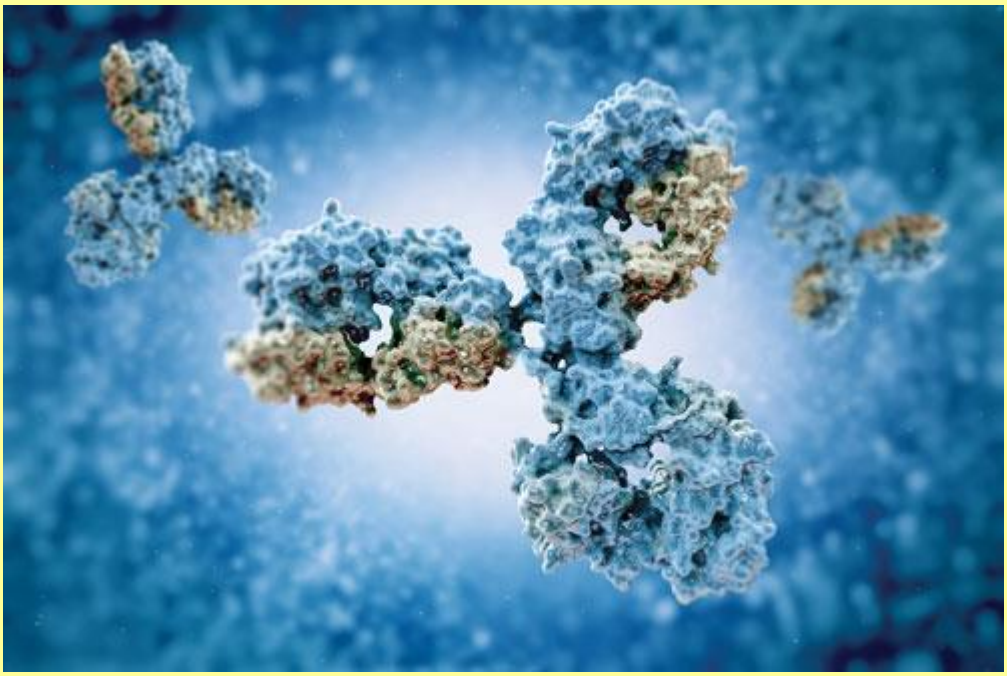
Newly Described Antibodies with "Special Shape" Could Unlock Vaccine Strategies for HIV, COVID

Source: https://www.genengnews.com/news/newly-described-antibodies-with-special-shape-could-unlock-vaccine-strategies-for-hiv-covid/

May 21 – Researchers at Duke Human Vaccine Institute (DHVI) have identified a new type of anti-glycan antibody (Ab) that binds to a patch of the chain-like sugars on the outer shell of HIV, effectively neutralizing the virus. The newly identified antibodies, which the team found in both macaques and humans, could lead to development of a novel vaccine strategy that might potentially be used against SARS-CoV-2 and fungal pathogens.



"This represents a new form of host defense," said Barton Haynes, MD, director of the Duke Human Vaccine Institute (DHVI). "These new antibodies have a special shape and could be effective against a variety of pathogens. It's very exciting."

Senior author Haynes and colleagues, report on their discoveries in *Cell*, in a paper titled, "Fab-dimerized glycan-reactive antibodies are a structural category of natural antibodies."

Many pathogens, including HIV Envelope (Env), the SARS-CoV-2 spike protein, and yeast, express surface glycans, the authors wrote. In fact more than 50% of the outer layer of HIV is comprised of glycans. Haynes said that it has long been an appealing approach to find a way of unleashing anti-glycan antibodies to break down these sugar structures and trigger immune B-cell lymphocytes to produce antibodies that would then neutralize HIV. However, as he also pointed out, "Of course, it's not that simple."

This is because HIV is cloaked in sugars that look like the host's glycans, creating a shield that makes the virus appear to be part of the host rather than a deadly pathogen. "… glycans found on HIV-1 and other pathogens are also present on host molecules, suggesting that the induction of Abs targeting pathogen glycans may be controlled by immune tolerance mechanisms," they noted.

Haynes and colleagues—including first author Wilton Williams, PhD, director of the Viral Genetics Analysis Core at DHVI, and co-author Priyamvada Acharya, PhD, director of the Division of Structural Biology at DHVI—discovered the new type of anti-glycan antibody through a series of studies exploring whether there might be an immune response targeted to glycans that cover the outer surface of HIV.

The newly identified group of anti-glycan antibodies—referred by the Duke team as Fab-dimerized glycan-reactive (FDG) antibodies—had previously gone undiscovered as a potential option against HIV. To date, there had been only one report of a similar anti-glycan HIV antibody with an unusual structure, which was identified 24 years ago, and designated 2G12. "2G12 is a broadly neutralizing Ab (bnAb) that targets a conserved glycan patch on Env of geographically diverse HIV-1 strains," the team noted. "The Ab 2G12 has been the only example to date of an HIV-1 bnAb that interacts solely with glycans on Env."

The Duke team has now isolated several FDG antibodies and found that they display a rare, never-before-seen structure that resembled 2G12. This structure enables the antibody to lock tightly onto a specific, dense patch of sugars on HIV, but not on other cellular surfaces swathed in host glycans. "… that FDG Abs can bind multiple glycan clusters and use multiple BCRs [B cell receptors], combined with FDG precursors being well represented in human B cell repertoire make this new category of glycan-reactive B cells an attractive target to consider for induction by HIV-1 vaccines," the investigators stated.

"The structural and functional characteristics of these antibodies can be used to design vaccines that target this glycan patch on HIV, eliciting a B-cell response that neutralizes the virus," Williams said. "These antibodies are actually much more common in blood cells than other neutralizing antibodies that target specific regions of the HIV outer layer … That's an exciting finding, because it overcomes one of the biggest complexities associated with other types of broadly neutralizing antibodies."
Williams said the FDG antibodies also bind the pathogenic yeast, *Candida albicans*, and to viruses, including SARS-CoV-2. "… we identified a new category of prevalent glycan-reactive Abs that target diverse pathogens including HIV-1, SARS-CoV-2, and yeast," the authors stated. Additional studies will explore ways of harnessing the antibody and deploying it against these pathogens.
The team in addition pointed out that since they submission of their work for publication, other researchers have reported that the FDG antibody 2G12 can also neutralize strains of influenza, " … further demonstrating the breadth of cross-binding activity of the 2G12 FDG Ab for glycosylated virus pathogens," Williams et al. concluded.

Covid-19 breath test trialled in Dubai is approved for use in Singapore

Source: https://www.thenationalnews.com/uae/health/covid-19-breath-test-trialled-in-dubai-is-approved-for-use-in-singapore-1.1229283

The BreFence Go breathalyser can deliver Covid-19 results within a minute, said Breathonix, the company that designed it. Reuters

May 25 – A Covid-19 breath test trialled in Dubai earlier this year has been provisionally approved for use in Singapore.
BreFence Go was designed to deliver accurate results within one minute and was developed by start-up Breathonix and scientists at the National University of Singapore.
Its inventors will work with the city-state's health ministry to test the technology on a sample of incoming travellers from Malaysia.
Under the pilot scheme, anyone who tests positive after using the breathalyser would be asked to take confirmatory PCR swab screening.
Singapore currently screens entrants with antigen rapid tests. This process would continue alongside the trial.
In March, Dubai health officials said the breath test would be used on 2,500 patients at Nadd Al Hamar primary health care centre to assess its accuracy.
Breathonix had previously conducted a pilot study involving 180 patients in Singapore and found the test had a sensitivity of 93 per cent and specificity of 95 per cent.

The device works by having a patient exhale into a disposable one-way valve mouthpiece. It measures and analyses levels of certain biomarkers – volatile organic compounds – that appear when the immune system is fighting disease.

The joint clinical trial was carried out with Dubai Health Authority and Mohammed Bin Rashid University of Medicine and Health Sciences.

The test is significantly faster than currently available methods, such as the PCR, the results of which can take up to 48 hours to process in local labs.

A faster result would help authorities isolate positive cases more quickly, before the virus can spread to others.

The breath test was trialled on 2,500 patients at Nadd Al Hamar primary health care centre in Dubai earlier this year. Dubai Health Authority

Breathonix said it was in discussion with several local and overseas organisations to use the system. Several countries, including Indonesia and the Netherlands, have rolled out similar breath tests.

Singapore has recorded 61,860 infections since the outbreak began, with more than 61,000 recoveries and 32 deaths.

Critical Condition: Healthcare and Public Health Preparedness for Pandemic Response and Health Security

By Frank G. Rando

NCT Magazine | May 2021

Source: https://nct-magazine.com/nct-magazine-may-2021/critical-condition-healthcare-and-public-health-preparedness-for-pandemic-response-and-health-security/

The brilliant Nobel laureate and microbial geneticist, Joshua Lederberg, Ph.D. said it best when he stated, "The greatest threat to mankind ... is the virus". What has been dubbed "The Great Coronavirus Pandemic of 2020" has indeed demonstrated that an entity which is one billionth our size can decimate the human population on a global scale.

The SARS - CoV-2 virus is a novel Coronavirus, and a close cousin of the SARS - 1 virus which also originated in China and caused severe febrile respiratory illness in 2003 and caused acute respiratory failure which overtaxed the healthcare infrastructure in Guangdong Province, China, Toronto, Canada, and several other countries. By September 2003, there had been 8,098 cases and 774 deaths reported in 29 countries. SARS - COVID-19 proved to be more than a crisis or emergency. Its impact has been catastrophic and historic rivaling the death rate of the 1918 Spanish influenza pandemic. Over the years, epidemics and pandemics have impacted every sector of society and killed millions around the world.

Emerging and re-emerging infectious diseases are a clear and present danger to the health, security, and prosperity of global populations. Yet, in the U.S., and other countries, the formal recognition of infectious diseases as a security threat did not begin to take form until the 1990s.

Generated and sustained by the HIV / AIDS pandemic, the emergence of Ebola, the reemergence of cholera, the onset of drug - resistant tuberculosis (TB) and other infectious diseases, President Bill Clinton and his Administration issued an assessment in 1996 titled " Addressing the Threat of Emerging Infectious Diseases." The Clinton White House's Presidential Decision Directive (PDD) called for reinforcement of the national bio surveillance system, building a global surveillance and response system, and expanding the mandate of the Department of Defense (DoD) to enhance and improve protective measures for civilian populations.

Also, during the time, the realization that biowarfare, bioterrorism and biocrimes were realistic and feasible threats that could be carried out by nation - states and various terrorist factions led to placing biological threats high on the list of priorities. The year 2000 initiated greater political attention to the relationship of health and international security. In January 2000, the US - based National Intelligence Council released a report titled “The Global Infectious Disease Threat and Its Implications for the United States.”

This report addressed concerns by U.S. government officials that the spread of infectious diseases, whether natural or intentional could severely impact health, economics, and

national security. This document affirmed the U.S. intelligence agencies' interest in including infectious diseases as viable nonconventional threats to homeland defense and national security.
On April 29, 2000, the Clinton White House officially recognized infectious diseases as a threat to U.S. national security. In 2002, President George W. Bush released the National Security Strategy (NSS) which was heavily influenced by the 9/11 terrorist attacks and the anthrax letters disseminated via the U.S. Postal Service system in October 2001. In this document, medical preparedness for bioterrorism threats and public health and health promotion are certainly mentioned, briefly but no relation is implied regarding security. The link between infectious disease and global health security is missing.

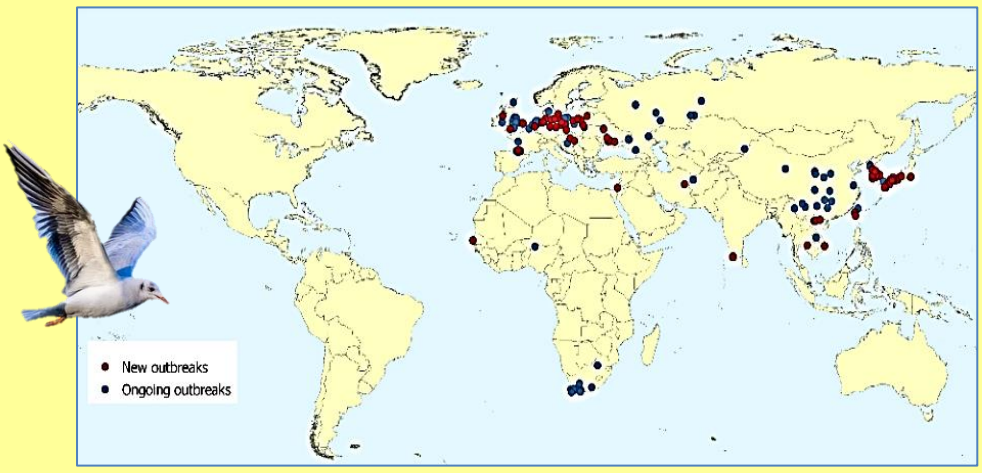
▶▶ Read the full article at source's URL.

Frank G.Rando *is a clinician, educator, researcher, author, first responder and Subject Matter Expert in crisis, emergency and disaster management, medical management of CBRNE and hazardous materials casualties, emerging infectious diseases, pandemic planning and preparedness, tactical, disaster and special operations medicine and environmental health and safety.*

Highly Pathogenic Bird Flu Outbreak Already Reported in 46 Countries, Scientists Warn

Source: https://www.sciencealert.com/highly-pathogenic-h5n8-virus-outbreak-needs-to-be-stopped-scientists-warn

May 24 – While the world was distracted with the rampant spread of a novel coronavirus, 2020 also witnessed an explosion in another deadly pathogen that could pose a threat to global public health.
H5N8, a subtype of highly pathogenic avian influenza virus (HPAIV), was identified decades ago, but during 2020 a series of emerging and ongoing H5N8 outbreaks in avian populations across dozens of countries have led to the death or slaughter of millions of birds worldwide.
"The affected geographic regions have been expanding continuously, and at least 46 countries have reported highly pathogenic H5N8 AIV outbreaks," virus researchers Weifeng Shi and George F. Gao write in a new perspective article in *Science*, warning of the dangers of H5N8 if we don't closely monitor and contain this worrisome trend.



While the most vulnerable animals to H5N8 are different kinds of birds (including farmed chicken and ducks, but also wild and migratory birds), human cases of the virus have also been discovered in recent times.
An outbreak of the avian flu in Russia in December 2020 jumped to poultry workers, with seven people on a farm in southern Russia showing signs of the infection – representing the first time H5N8 had ever been found in humans.
While that was a first for H5N8, it certainly wasn't a first for clades and subclades related to H5N8, nor for avian flu viruses in general.
"To date, there have been a total of 862 laboratory-confirmed human cases of infection with H5N1 reported to the World Health Organization (WHO), including 455 deaths," Shi and Gao explain. "These cases were from 17 countries, with ~76 percent from Egypt and Indonesia."
But zoonotic risks are only part of the problem with H5N8 and its ilk. In most of the recent outbreaks, a clade of H5N8 called 2.3.4 has become the dominant pathogen worldwide, first seen in a Chinese wet market in 2010.
"Clade 2.3.4 H5 AIVs, particularly the H5N8 subtype, have clearly displayed a propensity for rapid global spread in migratory birds," the researchers write, noting that these viruses also display evidence of constant evolution, genetically reassorting themselves with parts of other AIV subtypes.

Shi and Gao – respectively from China's Shandong First Medical University and the Chinese Center for Disease Control and Prevention – were among some of the first scientists to document the novel coronavirus in early 2020.
They note that the subsequent COVID-19 pandemic – and the prevention and control measures world populations enacted in response – saw a sharp reduction in the spread of seasonal human influenza A and B viruses in the last year.
Nonetheless, in the same timeframe, a number of highly pathogenic H5Ny AIVs, including H5N1, H5N2, H5N5, and H5N8 subtypes, spread across China, South Africa, Europe, Eurasia, and elsewhere.
At the same time, research has shown that clade 2.3.4 viruses show particular cell-binding adaptations that could pose greater risks for human transmission, including potentially human-to-human transmissibility.
In all, the researchers say we need to significantly step up our surveillance of HPAIVs in poultry farms now, before these pathogens fly the coop.
"Because of the long-distance migration of wild birds, the innate capacity for reassortment of AIVs, the increased human-type receptor binding capability, and the constant antigenic variation of HPAIVs, it is imperative that the global spread and potential risk of H5N8 AIVs to poultry farming, avian wildlife, and global public health are not ignored," Shi and Gao write.

▶▶ **The findings are reported in** *Science*.

Dogs Can Detect Over 90% of COVID-19 Cases, Even Asymptomatic Ones

Source: https://www.sciencealert.com/new-preprint-study-shows-dogs-can-detect-covid-19-positive-arrivals

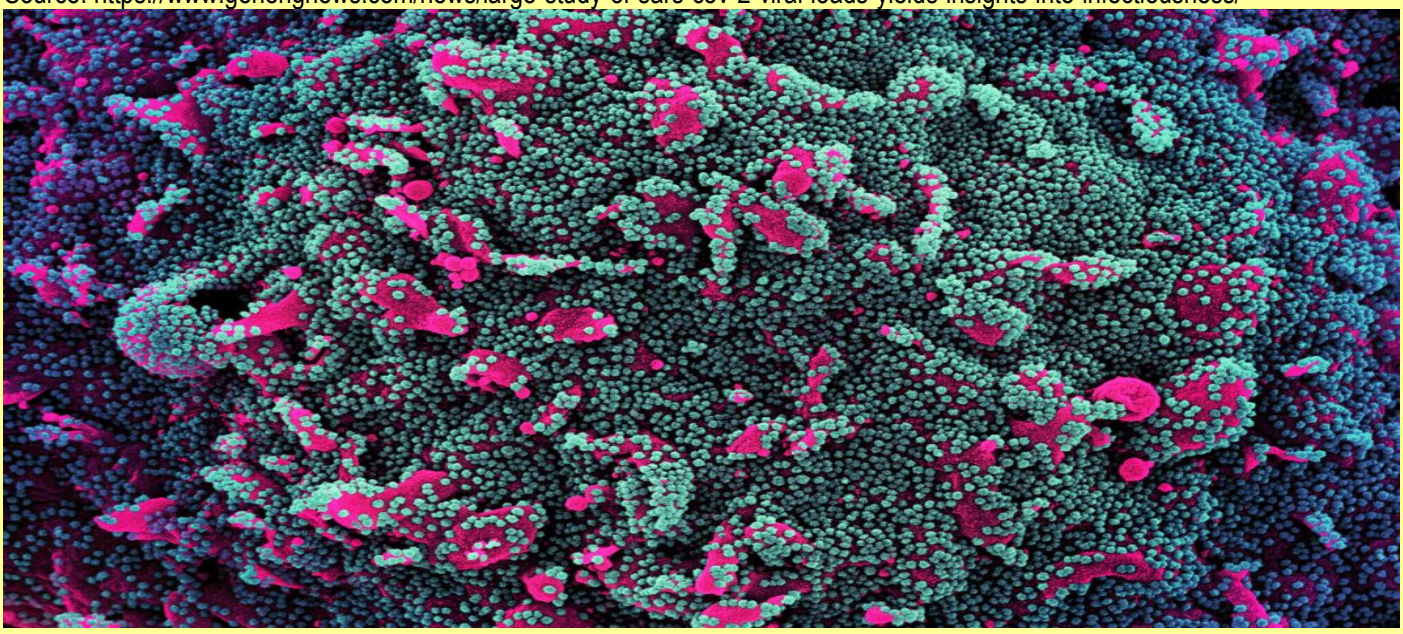
May 24 – Dogs can be trained to detect more than 90 percent of COVID-19 infections even when patients are asymptomatic, according to new research available in preprint, which authors hope could help replace the need to quarantine new arrivals.
Using their remarkable sense of smell - which can pick up the equivalent of half a teaspoon of sugar in an Olympic-sized swimming pool - dogs have already shown that they can sniff out maladies such as cancer, malaria and epilepsy.
Several previous studies have shown proof-of-concept that dogs can detect SARS-CoV-2.
Researchers from the London School of Tropical Medicine wanted to see if dogs could detect a distinctive odor given off from chemical compounds associated with someone who is COVID positive but doesn't show symptoms.
They gathered samples of clothing and face masks from people who had tested positive for mild or symptomatic SARS-CoV-2.
Samples of the socks of 200 COVID-19 cases were collected and arranged in lab tests for six dogs that had been trained to indicate either a presence or absence of the chemical compound.
The dogs needed to be trained not to identify "false positives" in a bid to hack their reward system and obtain treats even if there were no COVID-19 samples in a given test.
"This means that the dog fully understands and gets a reward for a correct negative as well as a correct positive," said Claire Guest, from the school's Faculty of Infectious and Tropical Diseases.

Overall, the dogs were successfully able to identify between 94 and 82 percent of SARS-CoV-2 samples.
The researchers then modelled how effectively these success rates, combined with traditional PCR tests, could help detect mild or asymptomatic COVID-19 cases.
They found that using dogs to screen arrivals at terminuses such as airports could detect 91 percent of cases, resulting in a 2.24 times lower rate of transmission than with PCR tests alone.

'Important start'
Authors of the research, which has yet to be peer-reviewed, said they hoped it could eventually replace the need for travelers to quarantine - which necessarily disrupts every arrival even though the vast majority are not COVID positive.
"The key thing is that dogs are significantly quicker than other tests," said co-author James Logan.
"What we're suggesting is that dogs would give the first initial screening, and then those (arrivals) that were indicated as positive would then receive a complimentary PCR test."
The team said that out of a plane full of arrivals - around 300 people - less than one percent were statistically likely to be carrying SARS-CoV-2.
Under current quarantine regulations employed by some countries, all 300 would need to isolate, causing significant inconvenience.
But given the sensitivity of trained dogs, a maximum of 35 people on board would be indicated as positive, the paper said.
Of these, only around 3 would be expected to return a positive PCR test.
"This is a really important start and could lead to a useful, usable system," said Mick Bailey, professor of Comparative Immunology at the University of Bristol, who was not involved in the research.
"But there's a lot more validation needs to be done before we could be confident that the dogs can reliably and specifically detect asymptomatic SARS-CoV-2 infection in people in airports and train stations."

Large Study of SARS-CoV-2 Viral Loads Yields Insights into Infectiousness

Source: https://www.genengnews.com/news/large-study-of-sars-cov-2-viral-loads-yields-insights-into-infectiousness/



May 26 – Questions surrounding SARS-CoV-2's infectiousness have loomed large over the COVID-19 pandemic since the first infections were reported: Who is most infectious and when? How does the severity of symptoms correspond to infectiousness? What viral load is required to spread the virus?
Now, to better understand and estimate infectiousness in COVID-19 patients, a team led by Christian Drosten, MD, director of Charité's Institute of Virology and a researcher at the German Center for Infection Research (DZIF), analyzed the PCR samples of more than 25,000 COVID-19 cases in order to determine their "viral loads"—the total number of copies of the SARS-CoV-2 genome contained in the sample. The viral load of each individual sample was

determined and used to estimate levels of infectiousness. The research provides insight into the infectiousness of SARS-CoV-2 in different age groups and at different levels of disease severity. In addition, the data provide new insights into the B.1.1.7 variant.
The research is published in *Science*, in the paper, "Estimating infectiousness throughout SARS-CoV-2 infection course."
A sample's viral load provides a rough estimate of the quantity of virus present in a patient's throat and, as such, is a useful metric for estimating an individual's infectiousness. In addition, the researchers applied findings regarding the minimum viral load threshold typically required for the successful isolation of SARS-CoV-2 in cell culture (where isolation indicates the presence of infectious virus). Sequential samples were available for more than 4,300 of the cases studied. Using these to track throat viral load data over time, the researchers were able to model the typical development of viral loads over the course of the infection. The researchers then looked for significant differences in their data, specifically in relation to different age groups, disease severity, and virus variants.
No notable differences in viral load levels were recorded among SARS-CoV-2-positive individuals aged between 20 and 65 years, the average throat swab sample containing approximately 2.5 million copies of the SARS-CoV-2 genome. Viral loads were found to be lowest in very young children (0 to 5 years). Levels started at approximately 800,000 copies of the viral genome, increased with age, and approached adult levels in older children and adolescents.
"While these numbers look very different at first glance, it is crucial to remember that viral load results are shown on a logarithmic scale," said Drosten. "The differences in viral loads found in the youngest children are, in fact, barely below the threshold at which we would normally consider them clinically relevant. Crucially, one also has to understand how we arrive at these values and take this into account when interpreting them."
When comparing peak viral loads in laboratory samples, the researchers estimated levels of infectivity in the youngest children (0 to 5 years) to be at approximately 80% of that found in adults. Values for school-aged children and adolescents were found to be approaching adult values. "This shows that viral loads are not directly proportional to infectivity and cannot be converted directly," explained Drosten. He added: "Even these data-based estimates of infectivity have to be corrected upwards because of the different methods of sample collection used in children. All of this forms part of a clinical virologist's overall assessment. My initial assumption, that all age groups have roughly the same level of infectivity, has been confirmed, both by this and by other studies."
A symptom-based comparison confirmed observations previously made in COVID-19 cases, namely that even asymptomatic individuals can have very high viral loads. Individuals who required hospitalization were found to have higher viral loads than others over the entire course of the disease. Based on their new models of viral load courses over time, the researchers estimate that individuals infected with SARS-CoV-2 reach peak viral load levels in their throats as early as 1 to 3 days before the onset of symptoms.
Approximately 9% of the COVID-19 cases tested showed extremely high viral loads of one billion copies per sample or higher. More than a third of these potentially highly infectious individuals had either no symptoms or only mild symptoms. "These data provide a virological foundation for the notion that a minority of infected individuals cause the majority of all transmissions," explained Drosten. He added: "The fact that this includes so many people without any relevant symptoms underlines the importance of pandemic control measures such as social distancing and mandatory mask-wearing."
In samples collected from individuals infected with the B.1.1.7 ("U.K." or "British") variant, average viral loads were found to be increased by a factor of ten, while laboratory-based estimates of infectivity were increased by a factor of 2.6. To arrive at these data, the researchers took viral load data from approximately 1,500 cases infected with B.1.1.7 and compared them with data from approximately 1,000 people infected with other variants who had been tested at the same testing centers, outpatient departments, and clinical wards around the same time.
"Laboratory studies may not as yet be in a position to provide a definitive explanation," Drosten added, "but one thing is clear: B.1.1.7 is more infectious than other variants."

Weird Discovery Shows 'Supertasters' Could Be Better at Fighting Off SARS-CoV-2

Source: https://www.sciencealert.com/weird-discovery-shows-supertasters-could-be-better-at-fighting-off-sars-cov-2

May 25 – If you are extremely sensitive to bitter flavors, you may be more resistant to SARS-CoV-2 - at least, that seems to be the implication from a newly published study.
According to data from nearly 2,000 patients in Baton Rouge, Louisiana, people with the 'supertaster' variant of a taste receptor gene made up a disproportionately small percentage of those testing positive for COVID-19.

This finding not only furthers a link between the gene variant and reduced susceptibility to upper respiratory tract infections, but could help doctors better assess the risk and outcomes of COVID-19.

"We set out to identify an association between T2R genotype with phenotype and outcomes after infection with COVID-19," the researchers wrote in their paper.

"We present our findings as an area that warrants further scientific study to potentially create a safe, cost-effective, accurate, and easily scalable screening tool that has the potential to stratify patients into groups and assess the risk of infection with SARS-CoV-2 and the expected clinical course of the disease."

The idea arose when a team of medical doctors led by Henry Barnham of Sinus and Nasal Specialists of Louisiana set out to investigate one of the hallmark symptoms of COVID-19 - the subjective loss of taste and smell. They gave a taste test to 100 patients who had tested positive for the virus, and, curiously, found that none of them was a supertaster.

Obviously, they decided this warranted more investigation, and between 1 July and 30 September 2020, they expanded their research to 1,935 patients at their tertiary outpatient clinical practice and inpatient hospital.

These patients were given the same taste test - strips of litmus paper treated with phenylthiocarbamide, thiourea, or sodium benzoate. The first two substances can taste either extremely bitter or like nothing at all, and sodium benzoate can taste sweet, salty, sour, bitter or - again - like nothing.

Together, the three taste tests helped to determine whether the patient likely had the supertaster variant of a bitter taste receptor gene called TAS2R38. Patients were then categorized in three groups - of the 1,935 participants, 508 (26.3 percent) were supertasters, 917 (47.4 percent) were tasters, and 510 (26.4 percent) were nontasters, people with a lower-than-average taste perception.

From the group, a total of 266 patients tested positive for SARS-CoV-2 in a polymerase chain reaction (PCR) test - currently the gold standard for COVID-19 diagnosis.

The distribution of those 266 patients did not match the distribution of the entire 1,935-participant group. Just 104 COVID-19 patients (39.1 percent) were from the taster group. The nontaster group was startlingly disproportionately represented; although they only constituted 26.4 percent of the entire group, they made up 55.3 percent of the COVID-19 group, with 147 of the 266 patients falling into this category.

Finally, supertasters made up just 5.6 percent of those infected by SARS-CoV-2, at 15 patients.

Taste sensitivity was linked to the severity of the disease, too - 55 of the 266 positive patients had to be hospitalized; and 47 of those were classified as nontasters. It's also important to note that none of the patients reported loss of taste as a symptom (although roughly half did experience loss of smell).

The doctors think this may have something to do with the way activation of bitter taste receptor genes can trigger an immune response, mainly the calcium-ion-driven production of nitric oxide, a compound that can damage invading microbes. These calcium ions can also trigger certain respiratory cells to release antimicrobial compounds.

The study does have some limitations. The supertasters were identified phenotypically, that is, based on observable traits. Future work could genetically confirm the taste sensitivities of the patients. In addition, given that SARS-CoV-2 is a new virus, there's a lot we don't know about how it behaves in different populations.

However, the discovery does suggest a fascinating new avenue for investigating and assessing patient risk and outcome, as well as how the disease operates.

"Bitter taste receptors appear to play a crucial role in the innate immunity against upper respiratory tract pathogens," the researchers wrote in their paper.

"This finding carries potential global implications for our understanding of SARS-CoV-2, in addition to yearly infections with additional viruses, including influenza."

▶▶ **The research has been published in** *JAMA Network Open*.

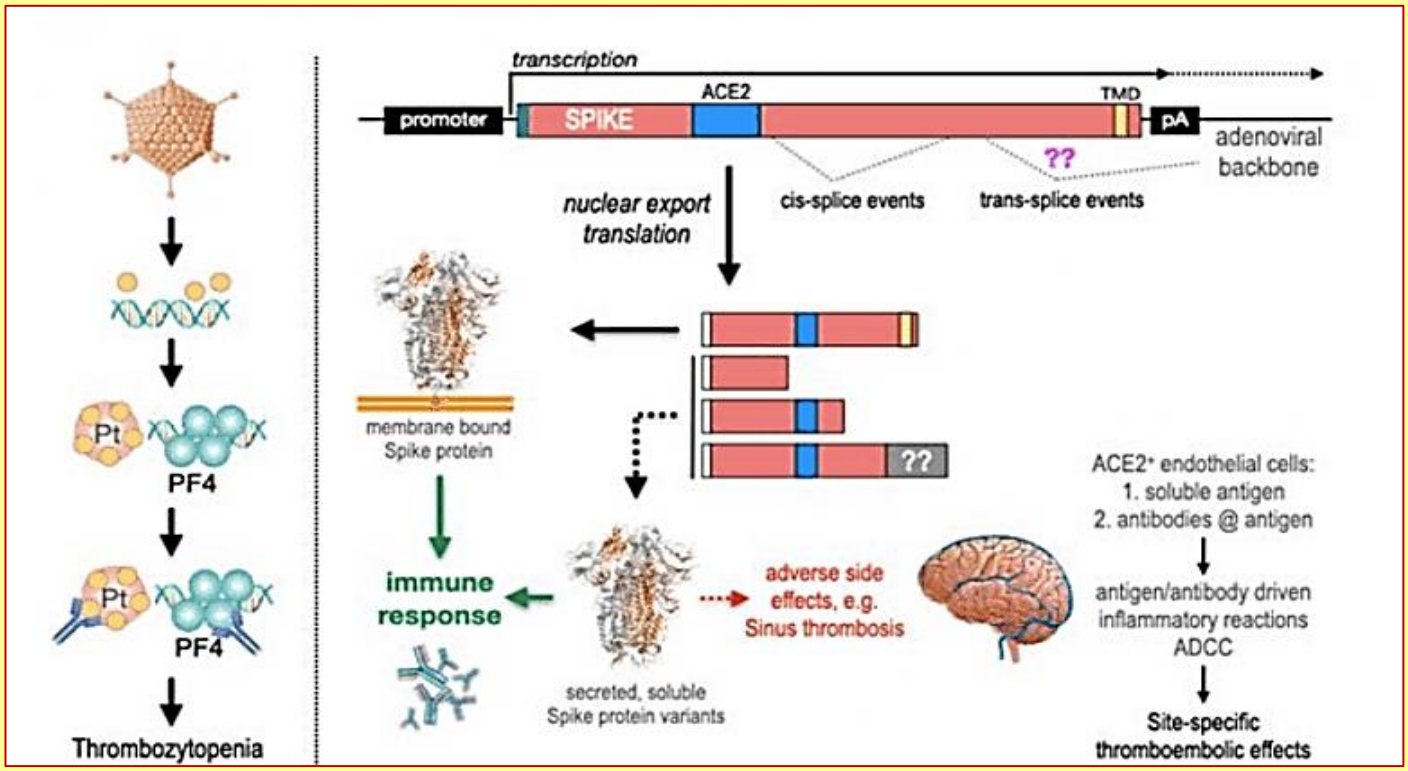
COVID vaccine blood-clot mystery solved; scientists claim rare condition can now be fixed

Source: https://www.ibtimes.co.in/covid-vaccine-blood-clot-mystery-solved-scientists-claim-rare-condition-can-now-be-fixed-836785

May 27 – In what can be a major relief to millions, especially two major vaccine manufacturers, Oxford/AstraZeneca and Johnson & Johnson, scientists in Germany claim they might have just cracked the rare blood clots linked to their jabs. The research, led by Rolf Marschalek, a professor at Goethe University in Frankfurt, into the rare condition was started back in March and now scientists are able to explain the underlying cause behind the blood clots people have suffered after getting inoculated. With this, the scientists are confident that with the right modifications, the side effect, proven to be deadly in some cases, can finally be fixed.

How serious is this?

Rare blood clotting following AstraZeneca vaccination has been reported from various countries including India, UK and the US. Due to this, the use of the AstraZeneca vaccine has been restricted or suspended in over a dozen countries, while some continue to use based on the studies that have shown the risks far outweigh the benefits provided by the vaccinations. The blood clots are only reported in adenoviral vector-based vaccines from AstraZeneca and Johnson & Johnson while mRNA vaccines from BionTech and Moderna have had zero cases.



As per the data, COVID vaccine-induced thrombosis affects roughly one in 100,000 people, according to Marschalek's theory. The UK has reported 309 cases and 56 deaths out of 33 million people who have received the AstraZeneca jab while in Europe 142 people experienced blood clots out of 16 million recipients.

The number of cases might be low, but it doesn't instill confidence in people to get the jab, adding to the hesitancy towards vaccination. But by fixing what's leading to this rare side effect, people will once again be forthcoming and the Marschalek's research is a step in the right direction.

Solving the blood-clot mystery

The German scientists published a preprint paper on Wednesday, giving insights into what's causing the blood clots in people after getting the jab. The lead researcher in the study said the answer lies in the adenovirus vectors that both vaccines from AstraZeneca and J&J use to deliver the spike protein of the Sars-Cov-2 virus into the body.

So these vaccines send the spike protein into the nucleus of the cell instead of the cytosol fluid found inside the cell, where the virus normally produces proteins. When the spike protein is inside the cell nucleus, it's spliced or split apart, which then creates mutant versions that are unable to bind to the cell membrane where the immunisation happens, Financial Times reported citing the research paper.

When this happens, the mutant proteins are secreted by cells into the body, which causes blood clots. The reason Pfizer and Moderna vaccines haven't had a similar side effect is that they send the spike protein to the cell fluid and not to the nucleus.

How to fix it?

With this discovery, it is upon the vaccine makers, in this case, J&J and AstraZeneca to make some tweaks to their jab's sequence of the spike protein. If the modifications are done in a way that the split protein doesn't split, it won't cause blood clots in people getting the jab.

According to Marschalek, J&J is working with his lab to use the data to mutate the sequences to prevent splice reactions. He also noted that splicing of the split protein was comparatively higher in the vaccine by AstraZeneca than in J&J.

"We are supporting continued research and analysis of this rare event as we work with medical experts and global health authorities. We look forward to reviewing and sharing data as it becomes available," J&J was quoted as saying by FT.

Oxford and AstraZeneca are yet to comment on the findings of the research as of this writing.

The findings have been submitted to the German government's Paul-Ehrlich Institute and to the country's advisory body on vaccination and immunisation. Corroborations on these findings are yet to be made.

EDITOR'S COMMENT: If vaccines have followed the ordinary procedure of testing this night have been spotted on time and fixed (and many people would have been alive today). It would be also nice to hear about the behavior of the adenoviruses used in the Sputnik V vaccine.

New imaging tech finds hidden lung damage in long COVID patients

Source: https://newatlas.com/health-wellbeing/xenon-mri-lung-damage-long-covid-patients/

May 26 – A new type of imaging technology has detected lung damage in patients suffering from the long-term effects of COVID-19. The weakened lung function was not visible on standard MRI or CT scans and its detection will help clinicians understand the persistent breathing impairments seen in patients with long COVID.

The phenomenon of long COVID is still a bit of a mystery, with researchers only just beginning to grasp the long-term implications of infection with this novel coronavirus. Fatigue and breathlessness are two of the most commonly reported lingering symptoms in COVID-19 patients following discharge from hospital. Yet standard MRI and CT scans often deliver normal results leaving many clinicians unable to empirically explain these patient symptoms.

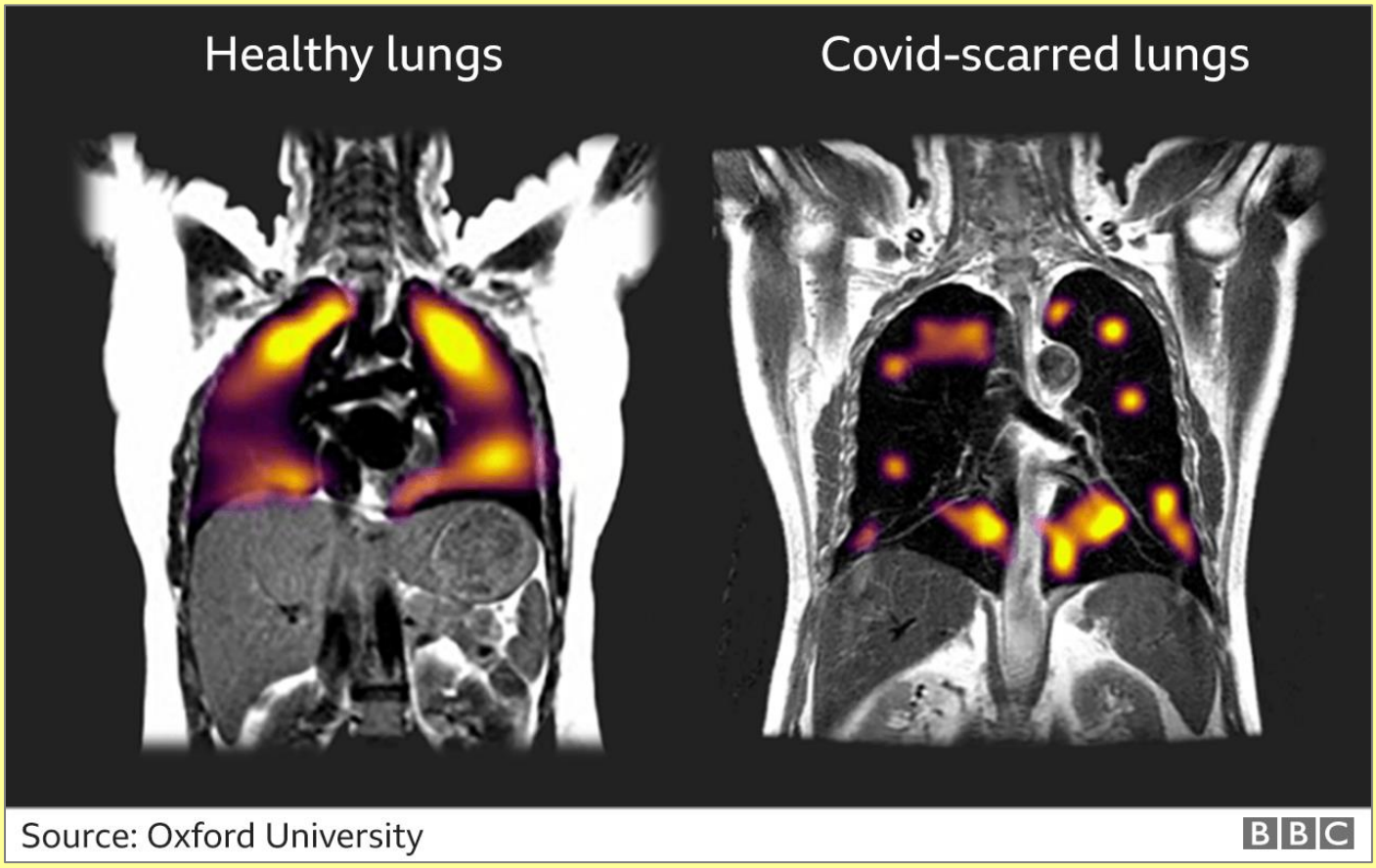
An ongoing study in the UK, called PHOSP-COVID, is tracking a large number of patients closely for many months following hospitalization, and a small arm of that study is investigating long-term lung problems in this cohort.

The research is using a new kind of imaging technology called hyperpolarized xenon MRI (129Xe MRI). The technology offers incredibly detailed insights into lung function and gas transfer into the bloodstream.

"The 129Xe MRI is pinpointing the parts of the lung where the physiology of oxygen uptake is impaired due to long standing effects of COVID-19 on the lungs, even though they often look normal on CT scans," says Jim Wild, head of imaging at the University of Sheffield.

The study is small, involving scans from nine long COVID patients, averaging around six months post-hospitalization. All nine subjects reported persistent breathlessness and all nine subjects returned normal CT lung scans.

"Our follow-up scans using hyperpolarized xenon MRI have found that abnormalities not normally visible on regular scans are indeed present, and these abnormalities are preventing oxygen getting into the bloodstream as it should in all parts of the lungs," says Fergus Gleeson, a radiologist working on the new study.



The revolutionary imaging technique is offering some of the first empirical signs of lung damage in long COVID patients, affirming this is not merely a hypochondriacal condition. The findings also offer researchers a useful way to monitor lung damage, with future studies now able to track how long the damage may last, and whether any particular interventions can help.
"We have some way to go before fully comprehending the nature of the lung impairment that follows a COVID-19 infection," adds Gleeson. "But these findings, which are the product of a clinical-academic collaboration between Oxford and Sheffield, are an important step on the path to understanding the biological basis of long COVID and that in turn will help us to develop more effective therapies."

▶▶ **The new study was published in the journal** *Radiology*.

The origin of COVID: Did people or nature open Pandora's box at Wuhan?

By Nicholas Wade
Source: https://thebulletin.org/2021/05/the-origin-of-covid-did-people-or-nature-open-pandoras-box-at-wuhan/

May 05 – The COVID-19 pandemic has disrupted lives the world over for more than a year. Its death toll will soon reach three million people. Yet the origin of pandemic remains uncertain: The political agendas of governments and scientists have generated thick clouds of obfuscation, which the mainstream press seems helpless to dispel.
In what follows I will sort through the available scientific facts, which hold many clues as to what happened, and provide readers with the evidence to make their own judgments. I will then try to assess the complex issue of blame, which starts with, but extends far beyond, the government of China.
By the end of this article, you may have learned a lot about the molecular biology of viruses. I will try to keep this process as painless as possible. But the science cannot be avoided because for now, and probably for a long time hence, it offers the only sure thread through the maze.

The virus that caused the pandemic is known officially as SARS-CoV-2, but can be called SARS2 for short. As many people know, there are two main theories about its origin. One is that it jumped naturally from wildlife to people. The other is that the virus was under study in a lab, from which it escaped. It matters a great deal which is the case if we hope to prevent a second such occurrence. I'll describe the two theories, explain why each is plausible, and then ask which provides the better explanation of the available facts. It's important to note that so far there is *no direct evidence* for either theory. Each depends on a set of reasonable conjectures but so far lacks proof. So I have only clues, not conclusions, to offer. But those clues point in a specific direction. And having inferred that direction, I'm going to delineate some of the strands in this tangled skein of disaster.

A tale of two theories

After the pandemic first broke out in December 2019, Chinese authorities reported that many cases had occurred in the wet market—a place selling wild animals for meat—in Wuhan. This reminded experts of the SARS1 epidemic of 2002, in which a bat virus had spread first to civets, an animal sold in wet markets, and from civets to people. A similar bat virus caused a second epidemic, known as MERS, in 2012. This time the intermediary host animal was camels.

The decoding of the virus's genome showed it belonged a viral family known as beta-coronaviruses, to which the SARS1 and MERS viruses also belong. The relationship supported the idea that, like them, it was a natural virus that had managed to jump from bats, via another animal host, to people. The wet market connection, the major point of similarity with the SARS1 and MERS epidemics, was soon broken: Chinese researchers found earlier cases in Wuhan with no link to the wet market. But that seemed not to matter when so much further evidence in support of natural emergence was expected shortly.

Wuhan, however, is home of the Wuhan Institute of Virology, a leading world center for research on coronaviruses. So the possibility that the SARS2 virus had escaped from the lab could not be ruled out. Two reasonable scenarios of origin were on the table.

From early on, public and media perceptions were shaped in favor of the natural emergence scenario by strong statements from two scientific groups. These statements were not at first examined as critically as they should have been.

"We stand together to strongly condemn conspiracy theories suggesting that COVID-19 does not have a natural origin," a group of virologists and others wrote in the Lancet on February 19, 2020, when it was really far too soon for anyone to be sure what had happened. Scientists "overwhelmingly conclude that this coronavirus originated in wildlife," they said, with a stirring rallying call for readers to stand with Chinese colleagues on the frontline of fighting the disease.

Contrary to the letter writers' assertion, the idea that the virus might have escaped from a lab invoked accident, not conspiracy. It surely needed to be explored, not rejected out of hand. A defining mark of good scientists is that they go to great pains to distinguish between what they know and what they don't know. By this criterion, the signatories of the Lancet letter were behaving as poor scientists: They were assuring the public of facts they could not know for sure were true.

It later turned out that the Lancet letter had been organized and drafted by Peter Daszak, president of the EcoHealth Alliance of New York. Daszak's organization funded coronavirus research at the Wuhan Institute of Virology. If the SARS2 virus had indeed escaped from research he funded, Daszak would be potentially culpable. This acute conflict of interest was not declared to the Lancet's readers. To the contrary, the letter concluded, "We declare no competing interests."

Virologists like Daszak had much at stake in the assigning of blame for the pandemic. For 20 years, mostly beneath the public's attention, they had been playing a dangerous game. In their laboratories they routinely created viruses more dangerous than those that exist in nature. They argued that they could do so safely, and that by getting ahead of nature they could predict and prevent natural "spillovers," the cross-over of viruses from an animal host to people. If SARS2 had indeed escaped from such a laboratory experiment, a savage blowback could be expected, and the storm of public indignation would affect virologists everywhere, not just in China. "It would shatter the scientific edifice top to bottom," an *MIT Technology Review* editor, Antonio Regalado, said in March 2020.

A second statement that had enormous influence in shaping public attitudes was a letter (in other words an opinion piece, not a scientific article) published on 17 March 2020 in the journal *Nature Medicine*. Its authors were a group of virologists led by Kristian G. Andersen of the Scripps Research Institute. "Our analyses clearly show that SARS-CoV-2 is not a laboratory construct or a purposefully manipulated virus," the five virologists declared in the second paragraph of their letter.

Unfortunately, this was another case of poor science, in the sense defined above. True, some older methods of cutting and pasting viral genomes retain tell-tale signs of manipulation. But newer methods, called "no-see-um" or "seamless" approaches, leave no defining marks. Nor do other methods for manipulating viruses such as serial passage, the repeated transfer of viruses from one culture of cells to another. If a virus has been manipulated, whether with a seamless method or by serial passage, there is no way of knowing that this is the case. Andersen and his colleagues were assuring their readers of something they could not know.

The discussion part of their letter begins, "It is improbable that SARS-CoV-2 emerged through laboratory manipulation of a related SARS-CoV-like coronavirus." But wait, didn't the lead say the virus had *clearly* not been manipulated? The authors' degree of certainty seemed to slip several notches when it came to laying out their reasoning.
The reason for the slippage is clear once the technical language has been penetrated. The two reasons the authors give for supposing manipulation to be improbable are decidedly inconclusive.
First, they say that the spike protein of SARS2 binds very well to its target, the human ACE2 receptor, but does so in a different way from that which physical calculations suggest would be the best fit. Therefore the virus must have arisen by natural selection, not manipulation.
If this argument seems hard to grasp, it's because it's so strained. The authors' basic assumption, not spelt out, is that anyone trying to make a bat virus bind to human cells could do so in only one way. First they would calculate the strongest possible fit between the human ACE2 receptor and the spike protein with which the virus latches onto it. They would then design the spike protein accordingly (by selecting the right string of amino acid units that compose it). Since the SARS2 spike protein is not of this calculated best design, the Andersen paper says, therefore it can't have been manipulated.
But this ignores the way that virologists do in fact get spike proteins to bind to chosen targets, which is not by calculation but by splicing in spike protein genes from other viruses or by serial passage. With serial passage, each time the virus's progeny are transferred to new cell cultures or animals, the more successful are selected until one emerges that makes a really tight bind to human cells. Natural selection has done all the heavy lifting. The Andersen paper's speculation about designing a viral spike protein through calculation has no bearing on whether or not the virus was manipulated by one of the other two methods.
The authors' second argument against manipulation is even more contrived. Although most living things use DNA as their hereditary material, a number of viruses use RNA, DNA's close chemical cousin. But RNA is difficult to manipulate, so researchers working on coronaviruses, which are RNA-based, will first convert the RNA genome to DNA. They manipulate the DNA version, whether by adding or altering genes, and then arrange for the manipulated DNA genome to be converted back into infectious RNA.
Only a certain number of these DNA backbones have been described in the scientific literature. Anyone manipulating the SARS2 virus "would probably" have used one of these known backbones, the Andersen group writes, and since SARS2 is not derived from any of them, therefore it was not manipulated. But the argument is conspicuously inconclusive. DNA backbones are quite easy to make, so it's obviously possible that SARS2 was manipulated using an unpublished DNA backbone.
And that's it. These are the two arguments made by the Andersen group in support of their declaration that the SARS2 virus was clearly not manipulated. And this conclusion, grounded in nothing but two inconclusive speculations, convinced the world's press that SARS2 could not have escaped from a lab. A technical critique of the Andersen letter takes it down in harsher words.
Science is supposedly a self-correcting community of experts who constantly check each other's work. So why didn't other virologists point out that the Andersen group's argument was full of absurdly large holes? Perhaps because in today's universities speech can be very costly. Careers can be destroyed for stepping out of line. Any virologist who challenges the community's declared view risks having his next grant application turned down by the panel of fellow virologists that advises the government grant distribution agency. The Daszak and Andersen letters were really political, not scientific, statements, yet were amazingly effective. Articles in the mainstream press repeatedly stated that a consensus of experts had ruled lab escape out of the question or extremely unlikely. Their authors relied for the most part on the Daszak and Andersen letters, failing to understand the yawning gaps in their arguments. Mainstream newspapers all have science journalists on their staff, as do the major networks, and these specialist reporters are supposed to be able to question scientists and check their assertions. But the Daszak and Andersen assertions went largely unchallenged.

Doubts about natural emergence

Natural emergence was the media's preferred theory until around February 2021 and the visit by a World Health Organization (WHO) commission to China. The commission's composition and access were heavily controlled by the Chinese authorities. Its members, who included the ubiquitous Daszak, kept asserting before, during, and after their visit that lab escape was extremely unlikely. But this was not quite the propaganda victory the Chinese authorities may have been hoping for. What became clear was that the Chinese had no evidence to offer the commission in support of the natural emergence theory.
This was surprising because both the SARS1 and MERS viruses had left copious traces in the environment. The intermediary host species of SARS1 was identified within four months of the epidemic's outbreak, and the host of MERS within nine months. Yet some 15 months after the SARS2 pandemic began, and after a presumably intensive search, Chinese researchers had failed to find either the original bat population, or the intermediate species to which SARS2 might have jumped, or any serological evidence that any Chinese population, including that of Wuhan, had ever been

exposed to the virus prior to December 2019. Natural emergence remained a conjecture which, however plausible to begin with, had gained not a shred of supporting evidence in over a year.
And as long as that remains the case, it's logical to pay serious attention to the alternative conjecture, that SARS2 escaped from a lab.
Why would anyone want to create a novel virus capable of causing a pandemic? Ever since virologists gained the tools for manipulating a virus's genes, they have argued they could get ahead of a potential pandemic by exploring how close a given animal virus might be to making the jump to humans. And that justified lab experiments in enhancing the ability of dangerous animal viruses to infect people, virologists asserted.
With this rationale, they have recreated the 1918 flu virus, shown how the almost extinct polio virus can be synthesized from its published DNA sequence, and introduced a smallpox gene into a related virus.
These enhancements of viral capabilities are known blandly as gain-of-function experiments. With coronaviruses, there was particular interest in the spike proteins, which jut out all around the spherical surface of the virus and pretty much determine which species of animal it will target. In 2000 Dutch researchers, for instance, earned the gratitude of rodents everywhere by genetically engineering the spike protein of a mouse coronavirus so that it would attack only cats.
The spike proteins on the coronavirus's surface determine which animal it can infect. Image credit: CDC.gov
Virologists started studying bat coronaviruses in earnest after these turned out to be the source of both the SARS1 and MERS epidemics. In particular, researchers wanted to understand what changes needed to occur in a bat virus's spike proteins before it could infect people.
Researchers at the Wuhan Institute of Virology, led by China's leading expert on bat viruses, Shi Zheng-li or "Bat Lady," mounted frequent expeditions to the bat-infested caves of Yunnan in southern China and collected around a hundred different bat coronaviruses.
Shi then teamed up with Ralph S. Baric, an eminent coronavirus researcher at the University of North Carolina. Their work focused on enhancing the ability of bat viruses to attack humans so as to "examine the emergence potential (that is, the potential to infect humans) of circulating bat CoVs [coronaviruses]." In pursuit of this aim, in November 2015 they created a novel virus by taking the backbone of the SARS1 virus and replacing its spike protein with one from a bat virus (known as SHC014-CoV). This manufactured virus was able to infect the cells of the human airway, at least when tested against a lab culture of such cells.
The SHC014-CoV/SARS1 virus is known as a chimera because its genome contains genetic material from two strains of virus. If the SARS2 virus were to have been cooked up in Shi's lab, then its direct prototype would have been the SHC014-CoV/SARS1 chimera, the potential danger of which concerned many observers and prompted intense discussion.
"If the virus escaped, nobody could predict the trajectory," said Simon Wain-Hobson, a virologist at the Pasteur Institute in Paris.
Baric and Shi referred to the obvious risks in their paper but argued they should be weighed against the benefit of foreshadowing future spillovers. Scientific review panels, they wrote, "may deem similar studies building chimeric viruses based on circulating strains too risky to pursue." Given various restrictions being placed on gain-of function (GOF) research, matters had arrived in their view at "a crossroads of GOF research concerns; the potential to prepare for and mitigate future outbreaks must be weighed against the risk of creating more dangerous pathogens. In developing policies moving forward, it is important to consider the value of the data generated by these studies and whether these types of chimeric virus studies warrant further investigation versus the inherent risks involved."
That statement was made in 2015. From the hindsight of 2021, one can say that the value of gain-of-function studies in preventing the SARS2 epidemic was zero. The risk was catastrophic, if indeed the SARS2 virus was generated in a gain-of-function experiment.

Inside the Wuhan Institute of Virology

Baric had developed, and taught Shi, a general method for engineering bat coronaviruses to attack other species. The specific targets were human cells grown in cultures and humanized mice. These laboratory mice, a cheap and ethical stand-in for human subjects, are genetically engineered to carry the human version of a protein called ACE2 that studs the surface of cells that line the airways.
Shi returned to her lab at the Wuhan Institute of Virology and resumed the work she had started on genetically engineering coronaviruses to attack human cells. How can we be so sure?
Because, by a strange twist in the story, her work was funded by the National Institute of Allergy and Infectious Diseases (NIAID), a part of the US National Institutes of Health (NIH). And grant proposals that funded her work, which are a matter of public record, specify exactly what she planned to do with the money.
The grants were assigned to the prime contractor, Daszak of the EcoHealth Alliance, who subcontracted them to Shi. Here are extracts from the grants for fiscal years 2018 and 2019. ("CoV" stands for coronavirus and "S protein" refers to the virus's spike protein.)

"Test predictions of CoV inter-species transmission. Predictive models of host range (i.e. emergence potential) will be tested experimentally using reverse genetics, pseudovirus and receptor binding assays, and virus infection experiments across a range of cell cultures from different species and humanized mice."
"We will use S protein sequence data, infectious clone technology, in vitro and in vivo infection experiments and analysis of receptor binding to test the hypothesis that % divergence thresholds in S protein sequences predict spillover potential."
What this means, in non-technical language, is that Shi set out to create novel coronaviruses with the highest possible infectivity for human cells. Her plan was to take genes that coded for spike proteins possessing a variety of measured affinities for human cells, ranging from high to low. She would insert these spike genes one by one into the backbone of a number of viral genomes ("reverse genetics" and "infectious clone technology"), creating a series of chimeric viruses. These chimeric viruses would then be tested for their ability to attack human cell cultures ("in vitro") and humanized mice ("in vivo"). And this information would help predict the likelihood of "spillover," the jump of a coronavirus from bats to people.
The methodical approach was designed to find the best combination of coronavirus backbone and spike protein for infecting human cells. The approach could have generated SARS2-like viruses, and indeed may have created the SARS2 virus itself with the right combination of virus backbone and spike protein.
It cannot yet be stated that Shi did or did not generate SARS2 in her lab because her records have been sealed, but it seems she was certainly on the right track to have done so. "It is clear that the Wuhan Institute of Virology was systematically constructing novel chimeric coronaviruses and was assessing their ability to infect human cells and human-ACE2-expressing mice," says Richard H. Ebright, a molecular biologist at Rutgers University and leading expert on biosafety.
"It is also clear," Ebright said, "that, depending on the constant genomic contexts chosen for analysis, this work could have produced SARS-CoV-2 or a proximal progenitor of SARS-CoV-2." "Genomic context" refers to the particular viral backbone used as the testbed for the spike protein.
The lab escape scenario for the origin of the SARS2 virus, as should by now be evident, is not mere hand-waving in the direction of the Wuhan Institute of Virology. It is a detailed proposal, based on the specific project being funded there by the NIAID.
Even if the grant required the work plan described above, how can we be sure that the plan was in fact carried out? For that we can rely on the word of Daszak, who has been much protesting for the last 15 months that lab escape was a ludicrous conspiracy theory invented by China-bashers.
On December 9, 2019, before the outbreak of the pandemic became generally known, Daszak gave an interview in which he talked in glowing terms of how researchers at the Wuhan Institute of Virology had been reprogramming the spike protein and generating chimeric coronaviruses capable of infecting humanized mice.
"And we have now found, you know, after 6 or 7 years of doing this, over 100 new SARS-related coronaviruses, very close to SARS," Daszak says around minute 28 of the interview. "Some of them get into human cells in the lab, some of them can cause SARS disease in humanized mice models and are untreatable with therapeutic monoclonals and you can't vaccinate against them with a vaccine. So, these are a clear and present danger….
"Interviewer: You say these are diverse coronaviruses and you can't vaccinate against them, and no anti-virals—so what do we do?
"Daszak: Well I think…coronaviruses—you can manipulate them in the lab pretty easily. Spike protein drives a lot of what happen with coronavirus, in zoonotic risk. So you can get the sequence, you can build the protein, and we work a lot with Ralph Baric at UNC to do this. Insert into the backbone of another virus and do some work in the lab. So you can get more predictive when you find a sequence. You've got this diversity. Now the logical progression for vaccines is, if you are going to develop a vaccine for SARS, people are going to use pandemic SARS, but let's insert some of these other things and get a better vaccine." The insertions he referred to perhaps included an element called the furin cleavage site, discussed below, which greatly increases viral infectivity for human cells.
In disjointed style, Daszak is referring to the fact that once you have generated a novel coronavirus that can attack human cells, you can take the spike protein and make it the basis for a vaccine.
One can only imagine Daszak's reaction when he heard of the outbreak of the epidemic in Wuhan a few days later. He would have known better than anyone the Wuhan Institute's goal of making bat coronaviruses infectious to humans, as well as the weaknesses in the institute's defense against their own researchers becoming infected.
But instead of providing public health authorities with the plentiful information at his disposal, he immediately launched a public relations campaign to persuade the world that the epidemic couldn't possibly have been caused by one of the institute's souped-up viruses. "The idea that this virus escaped from a lab is just pure baloney. It's simply not true," he declared in an April 2020 interview.

The safety arrangements at the Wuhan Institute of Virology

Daszak was possibly unaware of, or perhaps he knew all too well, the long history of viruses escaping from even the best run laboratories. The smallpox virus escaped three times from labs in England in the 1960's and 1970's, causing 80 cases and 3 deaths. Dangerous viruses have leaked out of labs almost every year since. Coming to more recent times, the SARS1 virus has proved a true escape artist, leaking from laboratories in Singapore, Taiwan, and no less than four times from the Chinese National Institute of Virology in Beijing.

One reason for SARS1 being so hard to handle is that there were no vaccines available to protect laboratory workers. As Daszak mentioned in the December 19 interview quoted above, the Wuhan researchers too had been unable to develop vaccines against the coronaviruses they had designed to infect human cells. They would have been as defenseless against the SARS2 virus, if it were generated in their lab, as their Beijing colleagues were against SARS1.

A second reason for the severe danger of novel coronaviruses has to do with the required levels of lab safety. There are four degrees of safety, designated BSL1 to BSL4, with BSL4 being the most restrictive and designed for deadly pathogens like the Ebola virus.

The Wuhan Institute of Virology had a new BSL4 lab, but its state of readiness considerably alarmed the State Department inspectors who visited it from the Beijing embassy in 2018. "The new lab has a serious shortage of appropriately trained technicians and investigators needed to safely operate this high-containment laboratory," the inspectors wrote in a cable of January 19, 2018.

The real problem, however, was not the unsafe state of the Wuhan BSL4 lab but the fact that virologists worldwide don't like working in BSL4 conditions. You have to wear a space suit, do operations in closed cabinets, and accept that everything will take twice as long. So the rules assigning each kind of virus to a given safety level were laxer than some might think was prudent.

Before 2020, the rules followed by virologists in China and elsewhere required that experiments with the SARS1 and MERS viruses be conducted in BSL3 conditions. But all other bat coronaviruses could be studied in BSL2, the next level down. BSL2 requires taking fairly minimal safety precautions, such as wearing lab coats and gloves, not sucking up liquids in a pipette, and putting up biohazard warning signs. Yet a gain-of-function experiment conducted in BSL2 might produce an agent more infectious than either SARS1 or MERS. And if it did, then lab workers would stand a high chance of infection, especially if unvaccinated.

Much of Shi's work on gain-of-function in coronaviruses was performed at the BSL2 safety level, as is stated in her publications and other documents. She has said in an interview with *Science* magazine that "[t]he coronavirus research in our laboratory is conducted in BSL-2 or BSL-3 laboratories."

"It is clear that some or all of this work was being performed using a biosafety standard—biosafety level 2, the biosafety level of a standard US dentist's office—that would pose an unacceptably high risk of infection of laboratory staff upon contact with a virus having the transmission properties of SARS-CoV-2," Ebright says.

"It also is clear," he adds, "that this work never should have been funded and never should have been performed."

This is a view he holds regardless of whether or not the SARS2 virus ever saw the inside of a lab.

Concern about safety conditions at the Wuhan lab was not, it seems, misplaced. According to a fact sheet issued by the State Department on January 15, 2021, "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."

David Asher, a fellow of the Hudson Institute and former consultant to the State Department, provided more detail about the incident at a seminar. Knowledge of the incident came from a mix of public information and "some high end information collected by our intelligence community," he said. Three people working at a BSL3 lab at the institute fell sick within a week of each other with severe symptoms that required hospitalization. This was "the first known cluster that we're aware of, of victims of what we believe to be COVID-19." Influenza could not completely be ruled out but seemed unlikely in the circumstances, he said.

Comparing the rival scenarios of SARS2 origin

The evidence above adds up to a serious case that the SARS2 virus could have been created in a lab, from which it then escaped. But the case, however substantial, falls short of proof. Proof would consist of evidence from the Wuhan Institute of Virology, or related labs in Wuhan, that SARS2 or a predecessor virus was under development there. For lack of access to such records, another approach is to take certain salient facts about the SARS2 virus and ask how well each is explained by the two rival scenarios of origin, those of natural emergence and lab escape. Here are four tests of the two hypotheses. A couple have some technical detail, but these are among the most persuasive for those who may care to follow the argument.

1) The place of origin. Start with geography. The two closest known relatives of the SARS2 virus were collected from bats living in caves in Yunnan, a province of southern China. If the SARS2 virus had first infected people living around the Yunnan caves, that would strongly support the idea that the virus had spilled over to people naturally. But this isn't what happened. The pandemic broke out 1,500 kilometers away, in Wuhan.

Beta-coronaviruses, the family of bat viruses to which SARS2 belongs, infect the horseshoe bat *Rhinolophus affinis*, which ranges across southern China. The bats' range is 50 kilometers, so it's unlikely that any made it to Wuhan. In any case, the first cases of the COVID-19 pandemic probably occurred in September, when temperatures in Hubei province are already cold enough to send bats into hibernation.

What if the bat viruses infected some intermediate host first? You would need a longstanding population of bats in frequent proximity with an intermediate host, which in turn must often cross paths with people. All these exchanges of virus must take place somewhere outside Wuhan, a busy metropolis which so far as is known is not a natural habitat of *Rhinolophus* bat colonies. The infected person (or animal) carrying this highly transmissible virus must have traveled to Wuhan without infecting anyone else. No one in his or her family got sick. If the person jumped on a train to Wuhan, no fellow passengers fell ill.

It's a stretch, in other words, to get the pandemic to break out naturally outside Wuhan and then, without leaving any trace, to make its first appearance there.

For the lab escape scenario, a Wuhan origin for the virus is a no-brainer. Wuhan is home to China's leading center of coronavirus research where, as noted above, researchers were genetically engineering bat coronaviruses to attack human cells. They were doing so under the minimal safety conditions of a BSL2 lab. If a virus with the unexpected infectiousness of SARS2 had been generated there, its escape would be no surprise.

2) Natural history and evolution. The initial location of the pandemic is a small part of a larger problem, that of its natural history. Viruses don't just make one time jumps from one species to another. The coronavirus spike protein, adapted to attack bat cells, needs repeated jumps to another species, most of which fail, before it gains a lucky mutation. Mutation—a change in one of its RNA units—causes a different amino acid unit to be incorporated into its spike protein and makes the spike protein better able to attack the cells of some other species.

Through several more such mutation-driven adjustments, the virus adapts to its new host, say some animal with which bats are in frequent contact. The whole process then resumes as the virus moves from this intermediate host to people.

In the case of SARS1, researchers have documented the successive changes in its spike protein as the virus evolved step by step into a dangerous pathogen. After it had gotten from bats into civets, there were six further changes in its spike protein before it became a mild pathogen in people. After a further 14 changes, the virus was much better adapted to humans, and with a further four, the epidemic took off.

But when you look for the fingerprints of a similar transition in SARS2, a strange surprise awaits. The virus has changed hardly at all, at least until recently. From its very first appearance, it was well adapted to human cells. Researchers led by Alina Chan of the Broad Institute compared SARS2 with late stage SARS1, which by then was well adapted to human cells, and found that the two viruses were similarly well adapted. "By the time SARS-CoV-2 was first detected in late 2019, it was already pre-adapted to human transmission to an extent similar to late epidemic SARS-CoV," they wrote.

Even those who think lab origin unlikely agree that SARS2 genomes are remarkably uniform. Baric writes that "early strains identified in Wuhan, China, showed limited genetic diversity, which suggests that the virus may have been introduced from a single source."

A single source would of course be compatible with lab escape, less so with the massive variation and selection which is evolution's hallmark way of doing business.

The uniform structure of SARS2 genomes gives no hint of any passage through an intermediate animal host, and no such host has been identified in nature.

Proponents of natural emergence suggest that SARS2 incubated in a yet-to-be found human population before gaining its special properties. Or that it jumped to a host animal outside China.

All these conjectures are possible, but strained. Proponents of a lab leak have a simpler explanation. SARS2 was adapted to human cells from the start because it was grown in humanized mice or in lab cultures of human cells, just as described in Daszak's grant proposal. Its genome shows little diversity because the hallmark of lab cultures is uniformity.

Proponents of laboratory escape joke that of course the SARS2 virus infected an intermediary host species before spreading to people, and that they have identified it—a humanized mouse from the Wuhan Institute of Virology.

3) The furin cleavage site. The furin cleavage site is a minute part of the virus's anatomy but one that exerts great influence on its infectivity. It sits in the middle of the SARS2 spike protein. It also lies at the heart of the puzzle of where the virus came from.

The spike protein has two sub-units with different roles. The first, called S1, recognizes the virus's target, a protein called angiotensin converting enzyme-2 (or ACE2) which studs the surface of cells lining the human airways.

The second, S2, helps the virus, once anchored to the cell, to fuse with the cell's membrane.

After the virus's outer membrane has coalesced with that of the stricken cell, the viral genome is injected into the cell, hijacks its protein-making machinery and forces it to generate new viruses.

EU: Where is my Sputnik V?

Significantly more deaths were registered after vaccination with Pfizer/BioNTech mRNA vaccine compared to AstraZeneca and other COVID-19 jabs

VACCINE	NUMBER OF REGISTERED DEATHS AMONG PEOPLE WHO RECEIVED AT LEAST ONE DOSE OF VACCINE PER 1 MLN ADMINISTERED DOSES	
	AVERAGE OF 13 COUNTRIES INDIVIDUAL DEATH RATES	SIMPLE WEIGHTED AVERAGE (BY # OF ADMINISTERED DOSES*)
Pfizer/BioNTech	39.4	16.0
Moderna	20.2	13.6
AstraZeneca	12.8	8.8
Johnson & Johnson	7.5	7.5
Sputnik V	2.0	3.7

Based on publicly available official data on deaths per mln doses administered from 13 countries (as of April 19, 2021): India, Brazil, Argentina, Chile, USA, France, Germany, UK, Austria, Italy, Norway, Denmark and Russia

Sputnik V demonstrates the best efficacy and safety profile among other jabs in Hungary

Based on **official data from the Government of Hungary** after the 2nd shot between December 26th, 2020 and April 20th, 2021

VACCINE	# OF INFECTIONS PER 100,000 VACCINATIONS	# OF DEATH PER 100,000 VACCINATIONS	# OF INFECTIONS AND DEATH PER 100,000 VACCINATIONS OF OTHER JABS COMPARED TO SPUTNIK V (x times)	
			INFECTIONS	DEATHS
Sputnik V	**95**	**1**	-	-
AstraZeneca	700	7	7x	7x
SinoPharm	356	16	4x	16x
Moderna	177	20	2x	20x
Pfizer/BioNTech	555	32	6x	32x

Sputnik V shows best safety profile among vaccines in Mexico

Mexico Ministry of Health real world data on COVID-19 vaccines safety from vaccination campaign in Mexico

MAY 5, 2021	SERIOUS ADVERSE EVENTS		EVENTS SUPPOSEDLY ATTRIBUTED TO VACCINATION AND IMMUNIZATION	
	# OF CASES[1]	# PER 100,000 DOSES[2]	# OF CASES[1]	# PER 1,000 DOSES[2]
Pfizer-BioNTech	137	1.70	14,347	1.79
AstraZeneca	74	2.06	1,586	0.44
Cansino	24	1.18	461	0.22
Sinovac	56	1.24	732	0.16
Sputnik V	**9**	**0.82**	**269**	**0.24**

But this invasion cannot begin until the S1 and S2 subunits have been cut apart. And there, right at the S1/S2 junction, is the furin cleavage site that ensures the spike protein will be cleaved in exactly the right place.
The virus, a model of economic design, does not carry its own cleaver. It relies on the cell to do the cleaving for it. Human cells have a protein cutting tool on their surface known as furin. Furin will cut any protein chain that carries its signature target cutting site. This is the sequence of amino acid units proline-arginine-arginine-alanine, or PRRA in the code that refers to each amino acid by a letter of the alphabet. PRRA is the amino acid sequence at the core of SARS2's furin cleavage site.
Viruses have all kinds of clever tricks, so why does the furin cleavage site stand out? Because of all known SARS-related beta-coronaviruses, only SARS2 possesses a furin cleavage site. All the other viruses have their S2 unit cleaved at a different site and by a different mechanism.
How then did SARS2 acquire its furin cleavage site? Either the site evolved naturally, or it was inserted by researchers at the S1/S2 junction in a gain-of-function experiment.
Consider natural origin first. Two ways viruses evolve are by mutation and by recombination. Mutation is the process of random change in DNA (or RNA for coronaviruses) that usually results in one amino acid in a protein chain being switched for another. Many of these changes harm the virus but natural selection retains the few that do something useful. Mutation is the process by which the SARS1 spike protein gradually switched its preferred target cells from those of bats to civets, and then to humans.
Mutation seems a less likely way for SARS2's furin cleavage site to be generated, even though it can't completely be ruled out. The site's four amino acid units are all together, and all at just the right place in the S1/S2 junction. Mutation is a random process triggered by copying errors (when new viral genomes are being generated) or by chemical decay of genomic units. So it typically affects single amino acids at different spots in a protein chain. A string of amino acids like that of the furin cleavage site is much more likely to be acquired all together through a quite different process known as recombination.
Recombination is an inadvertent swapping of genomic material that occurs when two viruses happen to invade the same cell, and their progeny are assembled with bits and pieces of RNA belonging to the other. Beta-coronaviruses will only combine with other beta-coronaviruses but can acquire, by recombination, almost any genetic element present in the collective genomic pool. What they cannot acquire is an element the pool does not possess. And no known SARS-related beta-coronavirus, the class to which SARS2 belongs, possesses a furin cleavage site.
Proponents of natural emergence say SARS2 could have picked up the site from some as yet unknown beta-coronavirus. But bat SARS-related beta-coronaviruses evidently don't need a furin cleavage site to infect bat cells, so there's no great likelihood that any in fact possesses one, and indeed none has been found so far.
The proponents' next argument is that SARS2 acquired its furin cleavage site from people. A predecessor of SARS2 could have been circulating in the human population for months or years until at some point it acquired a furin cleavage site from human cells. It would then have been ready to break out as a pandemic.
If this is what happened, there should be traces in hospital surveillance records of the people infected by the slowly evolving virus. But none has so far come to light. According to the WHO report on the origins of the virus, the sentinel hospitals in Hubei province, home of Wuhan, routinely monitor influenza-like illnesses and "no evidence to suggest substantial SARSCoV-2 transmission in the months preceding the outbreak in December was observed."
So it's hard to explain how the SARS2 virus picked up its furin cleavage site naturally, whether by mutation or recombination.
That leaves a gain-of-function experiment. For those who think SARS2 may have escaped from a lab, explaining the furin cleavage site is no problem at all. "Since 1992 the virology community has known that the one sure way to make a virus deadlier is to give it a furin cleavage site at the S1/S2 junction in the laboratory," writes Steven Quay, a biotech entrepreneur interested in the origins of SARS2. "At least 11 gain-of-function experiments, adding a furin site to make a virus more infective, are published in the open literature, including [by] Dr. Zhengli Shi, head of coronavirus research at the Wuhan Institute of Virology."
4) A question of codons. There's another aspect of the furin cleavage site that narrows the path for a natural emergence origin even further.
As everyone knows (or may at least recall from high school), the genetic code uses three units of DNA to specify each amino acid unit of a protein chain. When read in groups of 3, the 4 different kinds of DNA unit can specify 4 x 4 x 4 or 64 different triplets, or codons as they are called. Since there are only 20 kinds of amino acid, there are more than enough codons to go around, allowing some amino acids to be specified by more than one codon. The amino acid arginine, for instance, can be designated by any of the six codons CGU, CGC, CGA, CGG, AGA or AGG, where A, U, G and C stand for the four different kinds of unit in RNA.
Here's where it gets interesting. Different organisms have different codon preferences. Human cells like to designate arginine with the codons CGT, CGC or CGG. But CGG is

coronavirus's least popular codon for arginine. Keep that in mind when looking at how the amino acids in the furin cleavage site are encoded in the SARS2 genome.

Now the functional reason why SARS2 has a furin cleavage site, and its cousin viruses don't, can be seen by lining up (in a computer) the string of nearly 30,000 nucleotides in its genome with those of its cousin coronaviruses, of which the closest so far known is one called RaTG13. Compared with RaTG13, SARS2 has a 12-nucleotide insert right at the S1/S2 junction. The insert is the sequence T-CCT-CGG-CGG-GC. The CCT codes for proline, the two CGG's for two arginines, and the GC is the beginning of a GCA codon that codes for alanine.

There are several curious features about this insert but the oddest is that of the two side-by-side CGG codons. Only 5 percent of SARS2's arginine codons are CGG, and the double codon CGG-CGG has not been found in any other beta-coronavirus. So how did SARS2 acquire a pair of arginine codons that are favored by human cells but not by coronaviruses?

Proponents of natural emergence have an up-hill task to explain all the features of SARS2's furin cleavage site. They have to postulate a recombination event at a site on the virus's genome where recombinations are rare, and the insertion of a 12-nucleotide sequence with a double arginine codon unknown in the beta-coronavirus repertoire, at the only site in the genome that would significantly expand the virus's infectivity.

"Yes, but your wording makes this sound unlikely—viruses are specialists at unusual events," is the riposte of David L. Robertson, a virologist at the University of Glasgow who regards lab escape as a conspiracy theory. "Recombination is naturally very, very frequent in these viruses, there are recombination breakpoints in the spike protein and these codons appear unusual exactly because we've not sampled enough."

Robertson is correct that evolution is always producing results that may seem unlikely but in fact are not. Viruses can generate untold numbers of variants but we see only the one-in-a-billion that natural selection picks for survival. But this argument could be pushed too far. For instance, any result of a gain-of-function experiment could be explained as one that evolution would have arrived at in time. And the numbers game can be played the other way. For the furin cleavage site to arise naturally in SARS2, a chain of events has to happen, each of which is quite unlikely for the reasons given above. A long chain with several improbable steps is unlikely to ever be completed.

For the lab escape scenario, the double CGG codon is no surprise. The human-preferred codon is routinely used in labs. So anyone who wanted to insert a furin cleavage site into the virus's genome would synthesize the PRRA-making sequence in the lab and would be likely to use CGG codons to do so.

"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," said David Baltimore, an eminent virologist and former president of CalTech. "These features make a powerful challenge to the idea of a natural origin for SARS2," he said. [1]

A third scenario of origin

There's a variation on the natural emergence scenario that's worth considering. This is the idea that SARS2 jumped directly from bats to humans, without going through an intermediate host as SARS1 and MERS did. A leading advocate is the virologist David Robertson who notes that SARS2 can attack several other species besides humans. He believes the virus evolved a generalist capability while still in bats. Because the bats it infects are widely distributed in southern and central China, the virus had ample opportunity to jump to people, even though it seems to have done so on only one known occasion. Robertson's thesis explains why no one has so far found a trace of SARS2 in any intermediate host or in human populations surveilled before December 2019. It would also explain the puzzling fact that SARS2 has not changed since it first appeared in humans—it didn't need to because it could already attack human cells efficiently.

One problem with this idea, though, is that if SARS2 jumped from bats to people in a single leap and hasn't changed much since, it should still be good at infecting bats. And it seems it isn't.

"Tested bat species are poorly infected by SARS-CoV-2 and they are therefore unlikely to be the direct source for human infection," write a scientific group skeptical of natural emergence.

Still, Robertson may be onto something. The bat coronaviruses of the Yunnan caves can infect people directly. In April 2012 six miners clearing bat guano from the Mojiang mine contracted severe pneumonia with COVID-19-like symptoms and three eventually died. A virus isolated from the Mojiang mine, called RaTG13, is still the closest known relative of SARS2. Much mystery surrounds the origin, reporting and strangely low affinity of RaTG13 for bat cells, as well as the nature of 8 similar viruses that Shi reports she collected at the same time but has not yet published despite their great relevance to the ancestry of SARS2. But all that is a story for another time. The point here is that bat viruses can infect people directly, though only in special conditions.

So who else, besides miners excavating bat guano, comes into particularly close contact with bat coronaviruses? Well, coronavirus researchers do. Shi says she and her group collected more than 1,300 bat samples during some eight visits to the Mojiang cave between 2012 and 2015, and there were doubtless many expeditions to other Yunnan caves.

Imagine the researchers making frequent trips from Wuhan to Yunnan and back, stirring up bat guano in dark caves and mines, and now you begin to see a possible missing link between the two places. Researchers could have gotten infected during their collecting trips, or while working with the new viruses at the Wuhan Institute of Virology. The virus that escaped from the lab would have been a natural virus, not one cooked up by gain of function.

The direct-from-bats thesis is a chimera between the natural emergence and lab escape scenarios. It's a possibility that can't be dismissed. But against it are the facts that 1) both SARS2 and RaTG13 seem to have only feeble affinity for bat cells, so one can't be fully confident that either ever saw the inside of a bat; and 2) the theory is no better than the natural emergence scenario at explaining how SARS2 gained its furin cleavage site, or why the furin cleavage site is determined by human-preferred arginine codons instead of by the bat-preferred codons.

Where we are so far

Neither the natural emergence nor the lab escape hypothesis can yet be ruled out. There is still no direct evidence for either. So no definitive conclusion can be reached.

That said, the available evidence leans more strongly in one direction than the other. Readers will form their own opinion. But it seems to me that proponents of lab escape can explain all the available facts about SARS2 considerably more easily than can those who favor natural emergence.

It's documented that researchers at the Wuhan Institute of Virology were doing gain-of-function experiments designed to make coronaviruses infect human cells and humanized mice. This is exactly the kind of experiment from which a SARS2-like virus could have emerged. The researchers were not vaccinated against the viruses under study, and they were working in the minimal safety conditions of a BSL2 laboratory. So escape of a virus would not be at all surprising. In all of China, the pandemic broke out on the doorstep of the Wuhan institute. The virus was already well adapted to humans, as expected for a virus grown in humanized mice. It possessed an unusual enhancement, a furin cleavage site, which is not possessed by any other known SARS-related beta-coronavirus, and this site included a double arginine codon also unknown among beta-coronaviruses. What more evidence could you want, aside from the presently unobtainable lab records documenting SARS2's creation?

Proponents of natural emergence have a rather harder story to tell. The plausibility of their case rests on a single surmise, the expected parallel between the emergence of SARS2 and that of SARS1 and MERS. But none of the evidence expected in support of such a parallel history has yet emerged. No one has found the bat population that was the source of SARS2, if indeed it ever infected bats. No intermediate host has presented itself, despite an intensive search by Chinese authorities that included the testing of 80,000 animals. There is no evidence of the virus making multiple independent jumps from its intermediate host to people, as both the SARS1 and MERS viruses did. There is no evidence from hospital surveillance records of the epidemic gathering strength in the population as the virus evolved. There is no explanation of why a natural epidemic should break out in Wuhan and nowhere else. There is no good explanation of how the virus acquired its furin cleavage site, which no other SARS-related beta-coronavirus possesses, nor why the site is composed of human-preferred codons. The natural emergence theory battles a bristling array of implausibilities.

The records of the Wuhan Institute of Virology certainly hold much relevant information. But Chinese authorities seem unlikely to release them given the substantial chance that they incriminate the regime in the creation of the pandemic. Absent the efforts of some courageous Chinese whistle-blower, we may already have at hand just about all of the relevant information we are likely to get for a while.

So it's worth trying to assess responsibility for the pandemic, at least in a provisional way, because the paramount goal remains to prevent another one. Even those who aren't persuaded that lab escape is the more likely origin of the SARS2 virus may see reason for concern about the present state of regulation governing gain-of-function research. There are two obvious levels of responsibility: the first, for allowing virologists to perform gain-of-function experiments, offering minimal gain and vast risk; the second, if indeed SARS2 was generated in a lab, for allowing the virus to escape and unleash a world-wide pandemic. Here are the players who seem most likely to deserve blame.

1. *Chinese virologists.* First and foremost, Chinese virologists are to blame for performing gain-of-function experiments in mostly BSL2-level safety conditions which were far too lax to contain a virus of unexpected infectiousness like SARS2. If the virus did indeed escape from their lab, they deserve the world's censure for a foreseeable accident that has already caused the deaths of three million people. True, Shi was trained by French virologists, worked closely with American virologists and was following international rules for the containment of coronaviruses. But she could and should have made her own assessment of the risks she was running. She and her colleagues bear the responsibility for their actions.

I have been using the Wuhan Institute of Virology as a shorthand for all virological activities in Wuhan. It's possible that SARS2 was generated in some other Wuhan lab, perhaps in an attempt to make a vaccine that worked against all coronaviruses. But until the role of other Chinese virologists is clarified, Shi is the public face of Chinese work on coronaviruses, and provisionally she and her colleagues will stand first in line for opprobrium.

2. Chinese authorities. China's central authorities did not generate SARS2, but they sure did their utmost to conceal the nature of the tragedy and China's responsibility for it. They suppressed all records at the Wuhan Institute of Virology and closed down its virus databases. They released a trickle of information, much of which may have been outright false or designed to misdirect and mislead. They did their best to manipulate the WHO's inquiry into the virus's origins, and led the commission's members on a fruitless run-around. So far they have proved far more interested in deflecting blame than in taking the steps necessary to prevent a second pandemic.

3. The worldwide community of virologists. Virologists around the world are a loose-knit professional community. They write articles in the same journals. They attend the same conferences. They have common interests in seeking funds from governments and in not being overburdened with safety regulations.

Virologists knew better than anyone the dangers of gain-of-function research. But the power to create new viruses, and the research funding obtainable by doing so, was too tempting. They pushed ahead with gain-of-function experiments. They lobbied against the moratorium imposed on Federal funding for gain-of-function research in 2014, and it was raised in 2017.

The benefits of the research in preventing future epidemics have so far been nil, the risks vast. If research on the SARS1 and MERS viruses could only be done at the BSL3 safety level, it was surely illogical to allow any work with novel coronaviruses at the lesser level of BSL2. Whether or not SARS2 escaped from a lab, virologists around the world have been playing with fire.

Their behavior has long alarmed other biologists. In 2014 scientists calling themselves the Cambridge Working Group urged caution on creating new viruses. In prescient words, they specified the risk of creating a SARS2-like virus. "Accident risks with newly created 'potential pandemic pathogens' raise grave new concerns," they wrote. "Laboratory creation of highly transmissible, novel strains of dangerous viruses, especially but not limited to influenza, poses substantially increased risks. An accidental infection in such a setting could trigger outbreaks that would be difficult or impossible to control."

When molecular biologists discovered a technique for moving genes from one organism to another, they held a public conference at Asilomar in 1975 to discuss the possible risks. Despite much internal opposition, they drew up a list of stringent safety measures that could be relaxed in future—and duly were—when the possible hazards had been better assessed.
When the CRISPR technique for editing genes was invented, biologists convened a joint report by the US, UK and Chinese national academies of science to urge restraint on making heritable changes to the human genome. Biologists who invented gene drives have also been open about the dangers of their work and have sought to involve the public.
You might think the SARS2 pandemic would spur virologists to re-evaluate the benefits of gain-of-function research, even to engage the public in their deliberations. But no. Many virologists deride lab escape as a conspiracy theory, and others say nothing. They have barricaded themselves behind a Chinese wall of silence which so far is working well to allay, or at least postpone, journalists' curiosity and the public's wrath. Professions that cannot regulate themselves deserve to get regulated by others, and this would seem to be the future that virologists are choosing for themselves.
4. The US role in funding the Wuhan Institute of Virology.[2] From June 2014 to May 2019, Daszak's EcoHealth Alliance had a grant from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, to do gain-of-function research with coronaviruses at the Wuhan Institute of Virology. Whether or not SARS2 is the product of that research, it seems a questionable policy to farm out high-risk research to foreign labs using minimal safety precautions. And if the SARS2 virus did indeed escape from the Wuhan institute, then the NIH will find itself in the terrible position of having funded a disastrous experiment that led to the death of more than 3 million worldwide, including more than half a million of its own citizens.
The responsibility of the NIAID and NIH is even more acute because for the first three years of the grant to EcoHealth Alliance there was a moratorium on funding gain-of-function research. When the moratorium expired in 2017, it didn't just vanish but was replaced by a reporting system, the Potential Pandemic Pathogens Control and Oversight (P3CO) Framework, which required agencies to report for review any dangerous gain-of-function work they wished to fund.
The moratorium, referred to officially as a "pause," specifically barred funding any gain-of-function research that increased the pathogenicity of the flu, MERS or SARS viruses. It defined gain-of-function very simply and broadly as "research that improves the ability of a pathogen to cause disease."
But then a footnote on p.2 of the moratorium document states that "[a]n exception from the research pause may be obtained if the head of the USG funding agency determines that the research is urgently necessary to protect the public health or national security." This seemed to mean that either the director of the NIAID, Anthony Fauci, or the director of the NIH, Francis Collins, or maybe both, would have invoked the exemption in order to keep the money flowing to Shi's gain-of-function research, and later to avoid notifying the federal reporting system of her research.
"Unfortunately, the NIAID Director and the NIH Director exploited this loophole to issue exemptions to projects subject to the Pause –preposterously asserting the exempted research was 'urgently necessary to protect public health or national security'—thereby nullifying the Pause," Dr. Richard Ebright said in an interview with Independent Science News.
But it's not so clear that the NIH thought it necessary to invoke any loopholes. Fauci told a Senate hearing on May 11 that "the NIH and NIAID categorically has not funded gain-of-function research to be conducted in the Wuhan Institute of Virology."
This was a surprising statement in view of all the evidence about Shi's experiments with enhancing coronaviruses and the language of the moratorium statute defining gain-of-function as "any research that improves the ability of a pathogen to cause disease."
The explanation may be one of definition. Daszak's EcoHealth Alliance, for one, believes that the term gain-of-function applies only to enhancements of viruses that infect humans, not to animal viruses. "So gain-of-function research refers specifically to the manipulation of human viruses so as to be either more easily transmissible or to cause worse infection or be easier to spread," an Alliance official told The Dispatch Fact Check.
If the NIH shares the EcoHealth Alliance view that "gain of function" applies only to human viruses, that would explain why Fauci could assure the Senate it had never funded such research at the Wuhan Institute of Virology. But the legal basis of such a definition is unclear, and it differs from that of the moratorium language which was presumably applicable.
Definitions aside, the bottom line is that the National Institutes of Health was supporting research of a kind that could have generated the SARS2 virus, in an unsupervised foreign lab that was doing work in BSL2 biosafety conditions.

In conclusion

If the case that SARS2 originated in a lab is so substantial, why isn't this more widely known? As may now be obvious, there are many people who have reason not to talk about it. The list is led, of course, by the Chinese authorities. But virologists in the United States and Europe have no great interest in igniting a public debate about the gain-of-function experiments that their community has been pursuing for years.

Nor have other scientists stepped forward to raise the issue. Government research funds are distributed on the advice of committees of scientific experts drawn from universities. Anyone who rocks the boat by raising awkward political issues runs the risk that their grant will not be renewed and their research career will be ended. Maybe good behavior is rewarded with the many perks that slosh around the distribution system. And if you thought that Andersen and Daszak might have blotted their reputation for scientific objectivity after their partisan attacks on the lab escape scenario, look at the second and third names on this list of recipients of an $82 million grant announced by the National Institute of Allergy and Infectious Diseases in August 2020.

The US government shares a strange common interest with the Chinese authorities: Neither is keen on drawing attention to the fact that Shi's coronavirus work was funded by the US National Institutes of Health. One can imagine the behind-the-scenes conversation in which the Chinese government says, "If this research was so dangerous, why did you fund it, and on our territory too?" To which the US side might reply, "Looks like it was you who let it escape. But do we really need to have this discussion in public?"

Fauci is a longtime public servant who served with integrity under President Trump and has resumed leadership in the Biden Administration in handling the COVID-19 epidemic. Congress, no doubt understandably, may have little appetite for hauling him over the coals for the apparent lapse of judgment in funding gain-of-function research in Wuhan.

To these serried walls of silence must be added that of the mainstream media. To my knowledge, no major newspaper or television network has yet provided readers with an in-depth news story of the lab escape scenario, such as the one you have just read, although some have run brief editorials or opinion pieces. One might think that any plausible origin of a virus that has killed three million people would merit a serious investigation. Or that the wisdom of continuing gain-of-function research, regardless of the virus's origin, would be worth some probing. Or that the funding of gain-of-function research by the NIH and NIAID during a moratorium on such funding would bear investigation. What accounts for the media's apparent lack of curiosity?

The virologists' *omertà* is one reason. Science reporters, unlike political reporters, have little innate skepticism of their sources' motives; most see their role largely as purveying the wisdom of scientists to the unwashed masses. So when their sources won't help, these journalists are at a loss.

Another reason, perhaps, is the migration of much of the media toward the left of the political spectrum. Because President Trump said the virus had escaped from a Wuhan lab, editors gave the idea little credence. They joined the virologists in regarding lab escape as a dismissible conspiracy theory. During the Trump administration, they had no trouble in rejecting the position of the intelligence services that lab escape could not be ruled out. But when Avril Haines, President Biden's director of national intelligence, said the same thing, she too was largely ignored. This is not to argue that editors should have endorsed the lab escape scenario, merely that they should have explored the possibility fully and fairly.

People round the world who have been pretty much confined to their homes for the last year might like a better answer than their media are giving them. Perhaps one will emerge in time. After all, the more months pass without the natural emergence theory gaining a shred of supporting evidence, the less plausible it may seem. Perhaps the international community of virologists will come to be seen as a false and self-interested guide. The common sense perception that a pandemic breaking out in Wuhan might have something to do with a Wuhan lab cooking up novel viruses of maximal danger in unsafe conditions could eventually displace the ideological insistence that whatever Trump said can't be true.

And then let the reckoning begin.

Notes

[1] This quotation was added to the article after initial publication.

[2] Section revised May 18, 2021

Acknowledgements

The first person to take a serious look at the origins of the SARS2 virus was Yuri Deigin, a biotech entrepreneur in Russia and Canada. In a long and brilliant essay, he dissected the molecular biology of the SARS2 virus and raised, without endorsing, the possibility that it had been manipulated. The essay, published on April 22, 2020, provided a roadmap for anyone seeking to understand the virus's origins. Deigin packed so much information and analysis into his essay that some have doubted it could be the work of a single individual and suggested some intelligence agency must have authored it. But the essay is written with greater lightness and humor than I suspect are ever found in CIA or KGB reports, and I see no reason to doubt that Deigin is its very capable sole author.

In Deigin's wake have followed several other skeptics of the virologists' orthodoxy. Nikolai Petrovsky calculated how tightly the SARS2 virus binds to the ACE2 receptors of various species and found to his surprise that it seemed optimized for the human receptor, leading

him to infer the virus might have been generated in a laboratory. Alina Chan published a paper showing that SARS2 from its first appearance was very well adapted to human cells.
One of the very few establishment scientists to have questioned the virologists' absolute rejection of lab escape is Richard Ebright, who has long warned against the dangers of gain-of-function research. Another is David A. Relman of Stanford University. "Even though strong opinions abound, none of these scenarios can be confidently ruled in or ruled out with currently available facts," he wrote. Kudos too to Robert Redfield, former director of the Centers for Disease Control and Prevention, who told CNN on March 26, 2021 that the "most likely" cause of the epidemic was "from a laboratory," because he doubted that a bat virus could become an extreme human pathogen overnight, without taking time to evolve, as seemed to be the case with SARS2.
Steven Quay, a physician-researcher, has applied statistical and bioinformatic tools to ingenious explorations of the virus's origin, showing for instance how the hospitals receiving the early patients are clustered along the Wuhan №2 subway line which connects the Institute of Virology at one end with the international airport at the other, the perfect conveyor belt for distributing the virus from lab to globe.
In June 2020 Milton Leitenberg published an early survey of the evidence favoring lab escape from gain-of-function research at the Wuhan Institute of Virology.
Many others have contributed significant pieces of the puzzle. "Truth is the daughter," said Francis Bacon, "not of authority but time." The efforts of people such as those named above are what makes it so.

Nicholas Wade *is a science writer, editor, and author who has worked on the staff of* Nature, Science, *and, for many years, the* New York Times.

Lab or Nature? The Current Evidence For Each of The SARS-CoV-2 Origin Theories

By Aylin Woodward
Source: https://www.sciencealert.com/lab-or-nature-the-current-evidence-for-each-of-the-sars-cov-2-origin-theories

May 27 – It's the theory that refuses to die: Might the coronavirus have leaked out of a Chinese lab?
As long as the mystery of the pandemic's origin remains unsolved, the question will persist. Increasingly, global leaders are calling for more thorough investigations into the possibility.
That group includes President Joe Biden, Anthony Fauci, the director of the National Institute of Allergy and Infectious Diseases, and Tedros Adhanom Ghebreyesus, the director-general of the World Health Organization.
Though a month-long WHO investigation in the city of Wuhan concluded that the coronavirus most likely spilled over to people from animals – possibly at wildlife farms – the group found no definitive proof of that. Nor could it rule out a lab leak.
So Tedros said in March that he did "not believe that this assessment was extensive enough."
Fauci, meanwhile, said during a Senate hearing this month that the "possibility certainly exists" that the pandemic started because of a lab accident. Scott Gottlieb, the former head of the Food and Drug Administration, has also said there is some circumstantial evidence favoring a lab leak, as has Robert Redfield, the former director of the Centers for Disease Control and Prevention.
In a Wednesday press conference, Biden gave the US intelligence community 90 days to collect and analyze evidence supporting each of the two scenarios, in the hopes of reaching a "definitive conclusion" on the coronavirus' origin.
Here's what to know about each theory – a lab leak and a natural spillover from animals – and the key pieces of evidence supporting each.

The lab-leak hypothesis

Eighteen scientists from the US, the UK, Canada, and Switzerland recently published a letter saying they thought the lab-leak theory remained viable.
Questions about a such a leak generally center on the Wuhan Institute of Virology, a high-level biosafety lab where some scientists had been studying coronaviruses before the pandemic. Wuhan, of course, is the city where authorities reported the first known cluster of COVID-19 cases. Below are the main reasons people think the virus might have emerged from the lab.

The Wuhan Institute of Virology was researching coronaviruses before the pandemic

Scientists at the WIV research infectious diseases – collecting, storing, and genetically analyzing samples of the most dangerous and infectious pathogens known to humankind. The institute boasts a biosafety level 4 lab, one of only a few dozen in the world.

Peter Ben Embarek, a WHO scientist specializing in animal disease, was part of the team that investigated the institute in January. He said it's natural to speculate about a link – especially given that the WIV moved to a new location in early December 2019, which happens to be just miles from the Huanan Seafood Market.

The first cluster of coronavirus cases in Wuhan was linked to the market, but it turned out to simply have hosted an early superspreader event.

"Even the staff in these labs told us that was their first reaction when they heard about this new emerging disease, this coronavirus: 'This is something coming out of our labs,'" Ben Embarek said in March.

But after investigating that possibility, the WIV staff said they found no evidence that samples of the new coronavirus had been stored at the institute prior to December 2019. Records reviewed by WHO did not indicate that any viruses closely related to the new coronavirus were kept in any Chinese lab before that month. The records also did not show any viruses that, when combined, could have produced the new coronavirus.

But Ben Embarek's team also said it wasn't given full access to the Wuhan institute's data.

WHO investigators couldn't conduct a full audit of the labs

Ben Embarek said he and his fellow investigators didn't do a full audit of the WIV. The WHO team spent just hours at the institute – which isn't enough time to pore over files, databases, or freezer inventories. The institute's staff also did not share all of its records or safety logs.

That's why Tedros has said he does "not believe that this assessment was extensive enough."

He, Fauci, and many others are still calling for a full investigation of the lab.

However, Jonna Mazet, an epidemiologist at the University of California at Davis, has worked directly with WIV researchers, including one of its prominent virologists, Shi Zhengli. Mazet told Insider the lab's records were above reproach.
"She is absolutely positive that she had never identified this virus prior to the outbreak happening," Mazet told Insider, referring to Shi's work.

WIV staff members got sick with 'COVID-like' symptoms in November 2019

A report uncovered by *The Wall Street Journal* revealed that three WIV staff members got sick and went to a hospital more than a month before experts identified the first COVID-19 cases in Wuhan. The report – which an intelligence official said lacked sufficient corroboration – said the workers' symptoms were "consistent with both COVID-19 and common seasonal illness."
According to the virologist Marion Koopmans, WHO team was aware that some WIV staff had gotten sick in the fall of 2019. They'd chalked the incidents up to seasonal illness because blood samples taken from WIV staff in the months ahead of the pandemic all tested negative for coronavirus antibodies. (Such samples are taken routinely from biosafety lab workers to monitor their health.)

The coronavirus is easily transmissible among humans

Generally, it takes time for a new virus to adapt to be able to spread easily from person to person.
So people like Redfield point to the coronavirus' highly infectious nature as evidence it may be a product of "gain-of-function" research. In this kind of work, scientists tweak viruses with the goal of making the pathogens more transmissible or deadlier to figure out how to stop future pandemics.
"I do not believe that this somehow came from a bat to a human, and at that moment in time that the virus came to the human became one of the most infectious viruses that we know in humanity for human-to-human transmission," Redfield told CNN in March.
But Fauci said that same month that it's more likely that the coronavirus got good at jumping between people while spreading "below the radar" in China in late 2019. Growing evidence suggests COVID-19 was spreading for several weeks, if not months, before the first cases were reported.
That allowed the virus "to be pretty well adapted when first recognized," Fauci said.

Lab leaks happen, and US intelligence suggested the WIV had poor safety protocol

Three years ago, US officials visiting Wuhan sent a pair of memos to the State Department warning of inadequate safety measures at the lab. The institute seems to have made rigorous changes since then, though, and the WHO team was satisfied with the lab's protocols.
Ben Embarek said the WIV housed a "state-of-the-art lab," which is part of the reason his team thinks it's "very unlikely that anything could escape from such a place."
Mazet, too, has said it's "highly unlikely this was a lab accident," since she worked with WIV staff to develop and implement a "very stringent safety protocol."
Still, Ben Embarek noted in February that "accidents do happen."
"We have many examples in many countries in the world of past accidents," he said.
Though such accidents are rare, there have been four instances in which SARS has leaked from laboratories in Taiwan, Singapore, and Beijing.

The wildlife farms where the virus might have emerged are 1,609 km from Wuhan

The wildlife farms where the WHO team thinks the coronavirus most likely emerged are 800 to 1,609km from Wuhan.
But Koopmans said the WHO team found that rabbits and ferret-badgers sold at Huanan Seafood Market were transported there from regions in China where bats harbor viruses similar to the new coronavirus. Both rabbits and ferret-badgers are susceptible to coronavirus infection, so could have passed it to farmers who traveled into the city, or to market shoppers.
Still, just because the first reported cluster of cases emerged in Wuhan doesn't mean that's where the pandemic truly began. Wuhan is the largest city in Hubei province, and people from all over central China travel though the region. Once the virus arrived in a dense, urban environment, it makes sense it would spread rapidly there.

The animal-spillover theory

After the investigation in Wuhan, the WHO team determined the coronavirus "most likely" jumped from bats to people via an intermediary animal host at a wildlife farm. This kind of spillover has been the leading theory throughout the pandemic primarily because 75 percent of new infectious diseases come to us from animals.
Plus, the coronavirus' genetic code is very similar to that of other coronaviruses found circulating in bats. Here's the evidence supporting this idea.

The WHO concluded that an animal-to-human hop is 'most likely'

In southern China, the WHO found, people interacted closely with animals like civets, minks, pangolins, rabbits, and raccoon dogs at farms where these animals were bred in captivity for food.
All of these species can be infected by the new coronavirus, and any contact with an infected animal or its poop can allow a virus to jump from animals to people. That's why the WHO found this to be the "most likely" origin of the pandemic. Still, the team examined 80,000 animals from 31 provinces across China and didn't find a single case of the coronavirus. China shut down the specific wildlife farms in question in February 2020, and the WHO researchers weren't given access to samples from animals from these farms.
Plus, according to Tedros, the WHO experts had difficulties accessing COVID-19 infection data and patient blood samples from in and around Wuhan – which could also cast doubt on the team's conclusions.
The scientists behind the recent letter about the lab-leak theory wrote that in the WHO's report, that possibility was "not given balanced consideration." Only four of the report's 313 pages discuss evidence of a lab accident.

SARS-CoV-2 shares 97% of its genetic code with other coronaviruses found in bats

Bats are common virus reservoirs. Cross-species hops from bat populations also led to the outbreaks of Ebola, SARS, and the Nipah virus.
A wealth of evidence shows similarities between the new coronavirus and coronaviruses in bat populations. A May 2020 study, for example, revealed that the new coronavirus shared 97.1 percent of its genetic code with a coronavirus called RmYN02, which was found in bats in China's Yunnan province between May and October 2019. A paper in the journal *Nature*, published by Shi's group at the WIV, found that a coronavirus named RaTG13 was a 96.2 percent match.
RaTG13, it turns out, is the same virus that Shi and her WIV colleagues collected samples of nearly a decade ago in a remote mine. Six miners got a mysterious pneumonia-like illness there in 2012, and three of them died, according to *The Wall Street Journal*. Blood samples from the miners didn't test positive for the new coronavirus, however.
When Shi and coauthors published their genetic analysis of RaTG13 last year, they did not disclose its link to the miners' deaths.

Three-quarters of infectious diseases come from natural spillover

Three out of every four emerging infectious diseases come to us from other species; these pathogens are known as zoonotic diseases.
Peter Daszak, a disease ecologist with EcoHealth Alliance who was a member of the WHO investigation team, told NPR in April 2020 that "1 to 7 million people" were exposed to zoonotic viruses in Southeast Asia each year.
"That's the pathway," he said. "It's just so obvious to all of us working in the field."
Daszak and the EcoHealth Alliance have worked with and funded WIV research in the past, though that funding was canceled last year. Some people suggest Daszek has a bias against the lab-leak theory, since it could lead his organization to be seen as culpable for funding research that led to the pandemic.
Still, spillover events have doubled – if not tripled – in the past 40 years, according to Dennis Carroll, the former director of USAID's emerging-threats division. That's because people are increasingly turning wild areas into farms and fields for livestock production.
"Whatever future threats we're going to face already exist – they are currently circulating in wildlife," Carroll told *Nautilus Magazine* last year.

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Covid-19 is different now: It is Covid-21!

By Dr. Yousuf Ali Al Mulla
Source: https://www.omanobserver.om/article/1286/Opinion/covid-19-is-different-now-it-is-covid-21

Apr 02 – Everyone may realise that illnesses are not fixed things. They change as their pathogens change, the carriers of the disease change and the environments change. This, of course, also came with the coronavirus (Covid-19), so the three are now different from what they were in 2020. Didn't our immune systems also change to stop spreading of infection? In fact,

our lifestyles have changed, as have social norms, medical regulations and public health programmes.
From here and through those changes can I now call Covid-19, Covid-21? Is it not the product of all these changes in the aggregate? It is the disease as it will happen and we interact with it in the coming months and years, with these new mutations of the virus, new public policies and health behaviours, different degrees of immune memory and most importantly, a series of new vaccines!
As we have followed, individuals must take the coronavirus vaccination to ensure their safety and the safety of their families and society, yet it is also certain that the vaccination efforts will change the nature of corona in unexpected ways! In a way, the main question is how long will this protection last, especially against a rapidly mutating virus? The truth of some clinical trials has shown that vaccines are good and even brilliant in preventing dangerous diseases so far, but they have not yet been able to definitively reveal how protection may dissipate over long periods.
However, not everyone may even realise that antibodies are not the only complete story of immunity. There is more than one suggestion that we will be well protected by other immune mechanisms, even after low levels of antibodies (which are usually created after vaccination or after infection with the virus). Actually, there are other cells like T cells and B cells; they also store a memory of past infection and are somewhat more important than antibodies to maintaining long-term protection against viruses. However, this memory is not always preventive, like the presence of high levels of neutralising antibodies in your blood, but a number of studies conclude that it is sufficient to prevent severe disease.

EDITOR'S COMMENT: What is this? I found it in an article. Is it official? Vaccination for Covid-21. And the logo of WHO on top?

Hence, Covid-21 — if it is right for me to express it as a metaphor for Covid-19, after all the changes it has undergone — finally began as a milder and less lethal version of the disease that we saw last year. Certainly everyone is asking and at this stage, whether our immune memory cells may weaken their performance over time if the virus continues to mutate from one mutation to another? And after taking the vaccination, for instance will we need to take the booster vaccination in the future and at regular intervals?!
Interestingly, this leads us to realise that we are now at an inflection point that will change the reality of this disease and fear that the future will be more treacherous as humanity fails to change its standards, so we end up measuring the risk of Covid-21, according to the standards of 2020. What I mean is that countries that have early access to vaccines give up the continuation of global vaccination efforts against the coronavirus with a decrease in their cases or when the disease becomes more moderate for them, then the disease will be spreading elsewhere in the world and such suffering will continue indefinitely!
There is no doubt that the feeling of fear and terror that society experienced last year is behind us, despite the persistence of unknowns about how long exactly immunity will last and how many cases we will continue to see. Now we have the necessary knowledge and

resources, which the government has used to overcome and contain the pandemic despite the accompanying economic and social difficulties, to become more efficient and fast in the distribution of the vaccine and try to reduce cases across the Sultanate, especially because if we overcome Covid-21, the number of cases may end there.

***Dr. Yousuf Ali al Mulla, MD**, Ministry of Health, is a medical innovator and educator.*

If the Lab-Leak Theory Is Right, What's Next?

By Daniel Engber (Senior editor, The Atlantic)
Source: https://www.defenseone.com/ideas/2021/05/if-lab-leak-theory-right-whats-next/174339/

May 27 – Last summer, Michael Imperiale, a University of Michigan virologist and 10-year member of the National Science Advisory Board for Biosecurity, published an essay on the need to "rethink" some basic research-safety practices in light of the coronavirus pandemic. But he and his co-author—another biosecurity-board veteran—did want to make one thing clear: There was no reason to believe that sloppy or malicious science had had anything to do with the outbreak of the SARS-CoV-2 virus; to suggest otherwise was "more akin to a conspiracy theory than to a scientifically credible hypothesis."
Nine months later, Imperiale has a somewhat different view. "In my mind, the preponderance of the evidence still points toward a natural origin," he told me earlier this week. "But that delta between the *nature* evidence and the *lab-escape* evidence appears to be shrinking."
Indeed, the slow sedimentation of doubts about COVID-19's origin—whether the virus that causes it jumped directly from bats or other wild animals, or made a pit stop on a lab bench in Wuhan, China—has lately turned into a flood. In just the past two weeks, deltas have been in flux not just among the nation's leading biosafety experts but also among public-health officials, pundits, and journalists at major dailies. The assertion by World Health Organization investigators in February that a lab-leak origin for the pandemic was "extremely unlikely" has since been challenged by the WHO director general, Tedros Ghebreyesus; a May 14 letter to *Science* magazine, signed by 18 scientists, called for "a proper investigation" and "dispassionate science-based discourse on this difficult but important issue"; David Frum suggested last week in *The Atlantic* that the Biden administration should "take possession of the truth about the virus"; and the election forecaster Nate Silver declared on Sunday that his estimated likelihood of a laboratory origin had increased by half, to 60 percent. Today, President Joe Biden said that the United States intelligence community still hasn't decided which hypothesis is likelier, and that he wants to get "closer to a definitive conclusion" by the end of August.
This shift is all the more remarkable for its lack of any major associated revelations. Arguments in favor of the "lab-leak hypothesis" remain grounded, as they ever were, in the mere and highly suspicious fact that a coronavirus likely borne by bats, likely from a cave in southwest China, emerged 18 months ago, quite suddenly, in a city very far from southwest China—where researchers had assembled an archive of cave-bat-borne coronaviruses. Much of the rest is window dressing. That the lab-leak hypothesis is gaining currency even as the facts remain the same has a useful implication, though. It suggests that definitive proof is not an absolute requirement. The SARS-CoV-2 outbreak has killed millions of people. It might have started in the wild, or it might have started in a lab. We know enough to acknowledge that the second scenario is possible, and we should therefore act as though it's true.
According to the May 14 letter to *Science*, the one demanding "a proper investigation" of COVID-19's origins, "knowing how COVID-19 emerged is critical for informing global strategies to mitigate the risk of future outbreaks."
Just about every magazine story, Substack post, and piece of commentary about the lab-leak hypothesis includes a line like this, dropped like a smoke bomb, right up near the top. Did COVID-19 emerge from wildlife or might the virus have slipped out from a lab? "That urgent question is key to preventing the emergence of a SARS-CoV-3 or a COVID-29," began one feature from March. "It matters a lot, because knowing how a virus-driven pandemic begins focuses our attention on preventing similar situations," another article said in April. And "it matters a great deal which is the case if we hope to prevent a second such occurrence," the science journalist Nicholas Wade wrote in a widely read essayearlier this month.
That's a simple, unconvincing notion. The project to identify the source of the coronavirus pandemic surely has moral, legal, and political significance; but with regard to global public health—and to the crucial project of pandemic-proofing for the future—its outcome matters only at the margins. To say that we'll need to know the exact origin of SARS-CoV-2 in order to set policies for staving off SARS-CoV-3 commits us to the path of hindsight bias: It's a pledge to keep on fighting the last war against emerging pathogens, if not a blueprint for constructing the next Maginot Line.

What information, really, would we get from a "proper investigation"? At best, we'll have identified one more place to look for natural spillovers, or one more type of catastrophic accident: useful data, sure, but in the broader sense, just another case study added to a paltry set. Of the smattering of pandemics in the past century, one—the 1977 Russian flu—has been cited as the possible result of a laboratory accident. Whatever we might discover about the genesis of COVID-19 (and whether we discover anything at all), this historical record is bound to look more or less the same: Nearly all pandemics appear to have a natural source; possibly one or two have emerged, and more might do so in the future, from research settings.

Instead of calling for a new and better inquiry into origins, let's stipulate that pandemics can result from natural spillovers or from laboratory accidents—and then let's move along to implications. One important question has already gotten airtime (from right-wing media, at least): Should scientists be fiddling with pathogenic genomes, to measure out the steps they'd have to take before ascending to pandemic-level virulence? Should the National Institutes of Health be funding them? This was the subject of a fierce, unresolved debate among virologists that started back in 2012; it still isn't clear to what extent such research helps prevent devastating outbreaks, and to what extent it poses a realistic risk of creating them.

Other questions include: Should coronavirus samples gathered from the wild be studied at moderate biosafety levels, as appears to have been the case at the Wuhan Institute of Virology? Is there any significant cost, in terms of preparing for the next pandemic, from slowing down surveillance work with more demanding safety regulations? And should China end the practice of transporting virus-laden guano from sparsely populated regions to population centers, as appears to have been the case in Wuhan? (One might also ask: Should studies of Ebola, or other outbreak-ready pathogens, be carried out in Boston?) As Alina Chan, a molecular biologist at the Broad Institute, told me this week, we may yet discover that the COVID-19 story is a variation on "a small-town virus brought to the city, and suddenly becoming a star."

Or we might be due for a far more substantial inquiry into the risks of scientific research. If we're ready to acknowledge that a lab-induced pandemic is possible, and that we may be seeing the result, then "we'll need to understand that the next major threat to public health could come from something else in biology—something that destroys crops, or changes the ocean, or changes the atmosphere," Sam Weiss Evans, a biosecurity-governance scholar, told me. "This could be a moment of reckoning for the much wider biological community."

For the moment, though, these discussions are on hold, while scientists chase—probably in vain—a full vetting of the lab-leak hypothesis.

They are not so process-obsessed when it comes to the "spillover" hypothesis, which, after all, is also wanting for direct evidence in the case of COVID-19. The Stanford University microbiologist David Relman—one of the organizers of the *Science* letter, and a former colleague of Michael Imperiale's on the National Science Advisory Board for Biosecurity—told me this week that the research community already accepts that natural spillovers occur, and that they can cause dangerous outbreaks, so it doesn't need any further proof. Scientists are bound to push ahead with efforts to prevent and anticipate human encounters with animals that harbor potentially dangerous viruses, he said. "That will happen almost regardless of what we learn now."

Relman isn't expecting a similar approach to laboratory safety. The idea that a lab accident might cause a pandemic "is a very difficult, uncomfortable scenario for many scientists to accept," he said. Without more specific evidence in favor of the lab-leak hypothesis, "people will wring their hands and talk about it, just as they have since 2012, but I don't think a lot will change to reduce the risk."

More specific evidence may never arrive, however, even after further study by the CIA or the WHO. A "proper investigation" might, at any rate, prove counterproductive. What happens if it drags on into the future, and never lands on anything concrete? (What if no one can agree on what constitutes substantive evidence?) Or what if researchers discover that SARS-CoV-2 really *did* begin in bats, or pangolins, or frozen meat? These outcomes wouldn't make the risk of lab leaks go away, yet they'd surely shrink the scientific community's inclination to address it.

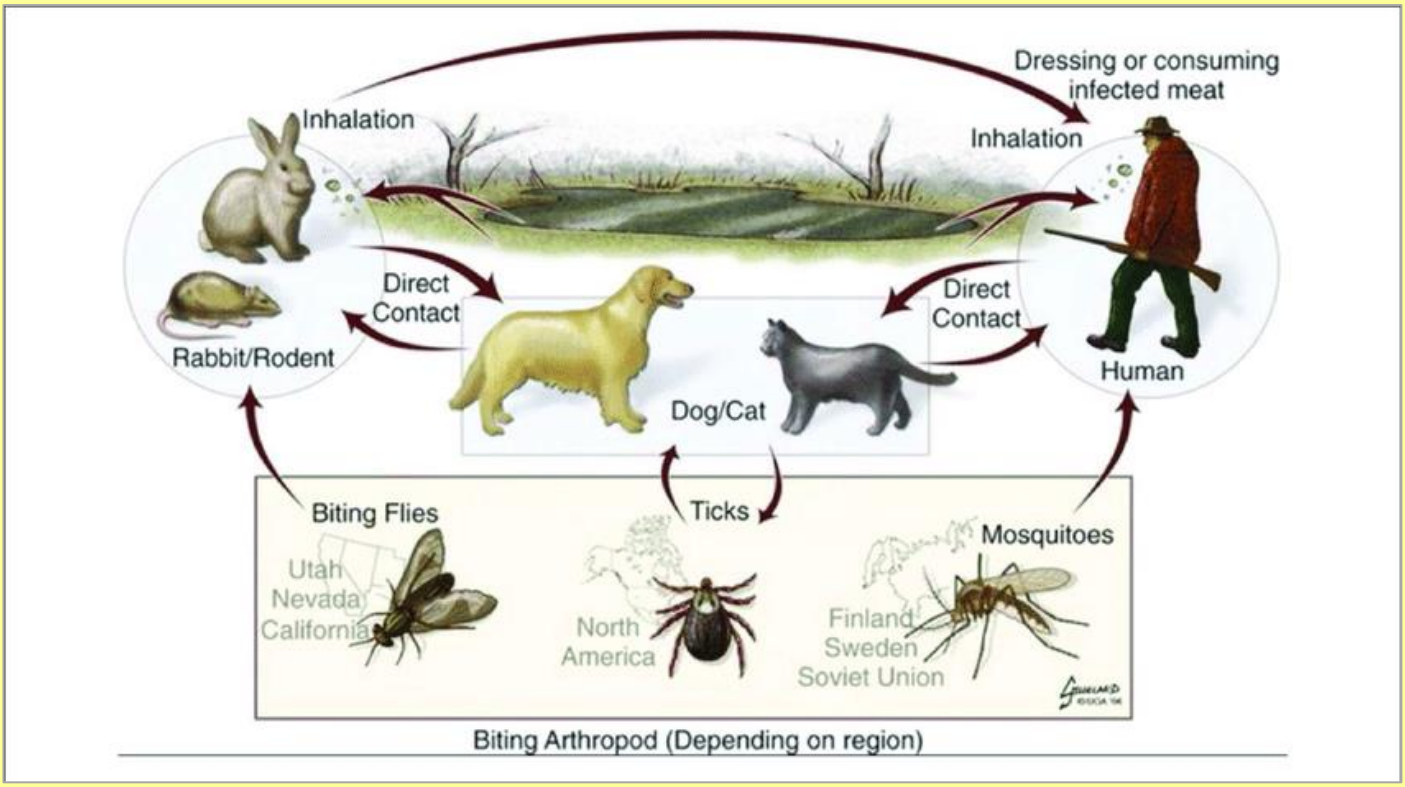
"There's a possibility of a lab escape," Imperiale told me, and we should act on it, no matter what. "We don't want to be asking these same questions again 10 years from now." At this point, calls for further investigation are as likely to become an instrument of delay as of persuasion.

Bacterium causing rabbit fever remains virulent for months in cold water

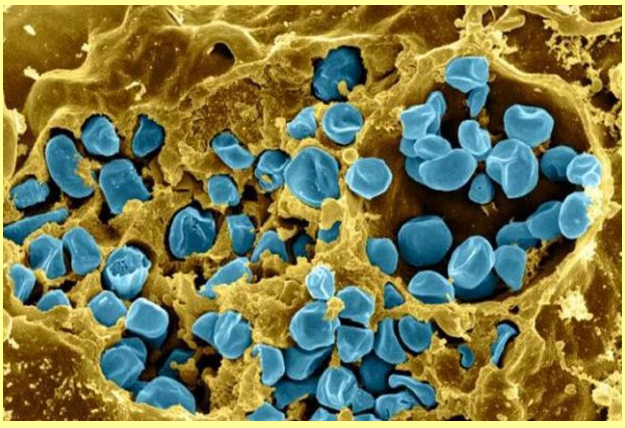
Source: https://telanganatoday.com/bacterium-causing-rabbit-fever-remains-virulent-for-months-in-cold-water

May 28 – A study led by researchers at the Northern Arizona University has solved a long-term mystery, providing a plausible explanation for how ***Francisella tularensis*** (rabbit fever) can **overwinter in the environment outside of a host.**

Although it is not spread through human contact, *Francisella tularensis* is one of the most infectious pathogenic bacteria known to science- **so virulent, in fact, that it is considered a serious potential bioterrorist threat**. It is thought that humans can contract respiratory tularemia or rabbit fever- a rare and deadly disease- by **inhaling as few as 10 airborne organisms**.



Northern Arizona University professor David Wagner, director of the Pathogen and Microbiome Institute's (PMI) Biodefense and Disease Ecology Center, began a three-year project in 2018 to better understand the life cycle and behaviour of *F. tularensis*, funded through a USD 2.25 million grant from the US Defense Threat Reduction Agency (DTRA).



One of the most puzzling behaviours of the pathogen is its ability to remain dormant, possibly in what is called a 'viable but nonculturable' state–which means the bacteria is alive, but cannot be grown in the laboratory.

That makes it much more difficult to study because scientists can typically only study bacteria that can be cultured. Wagner's goal was to study the bacterium so as to determine the environmental and genetic factors that contribute to the pathogen's ability to apparently remain dormant for months at a time–a phenomenon that has remained mostly a mystery despite more than 100 years of research.

Now, Wagner and his collaborators have published their findings, 'Long-Term Survival of Virulent Tularemia Pathogens outside a Host in Conditions That Mimic Natural Aquatic Environments,' in the journal Applied and Environmental Microbiology.

In the paper, the team shows how they were able to prove, by replicating environmental conditions in the lab, including low temperatures and low-nutrient water, that the bacterium can persist for months in cold water without any nutrients and remain fully virulent. Their results provide a plausible explanation for how it can overwinter in the environment outside of a host.

"We are making some very interesting discoveries in this project. **The main finding is that *Francisella tularensis* can persist in a dormant state for more than six months in cold water without any nutrients**. This means it has the ability to persist in the environment outside of a mammalian host or arthropod vector. This was unexpected because many other bacteria that persist like that long-term in the environment form spores when they are outside

of a host, such as Bacillus anthracis, the bacterium that causes anthrax forms spores, but *F. tularensis* doesn't do that. Others, like Yersinia pestis – the bacterium that causes plague – are always either in a mammalian host or a flea vector. *F. tularensis* has the ability to persist long-term in the environment long-term outside of a host without forming spores while remaining fully virulent," Wagner said.

"These study results have completely changed our perspective on the ecology of this bacterium. We now understand that mammals are likely just a small (but still important) aspect of its survival strategy. We now think that it spends most of its time in the environment outside of a host and only periodically causes disease in mammals. But those disease events in mammals are still very important as they serve to amplify the amount of *F. tularensis* that is deposited back in the environment."

Working with co-principal investigator Jason Sahl, associate professor and assistant director of PMI, and with PMI senior research scientists Dawn Birdsell and Joe Busch, Wagner conducted the study along with colleagues at two of the team's long-term collaborating institutions in Sweden: The Swedish Defence Research Agency and Umea University.

Along with their Swedish collaborators, Wagner and his team are known worldwide for their work developing the phylogeny, or global family tree, of *F. tularensis* and its phylogeography–mapping where different groups of the species are found throughout the world and understanding the species' genetic diversity.

"As we continue with the DTRA research grant, we are now investigating the genes and proteins that regulate the ability of *F. tularensis* to persist in the environment outside of mammals and hosts. This work involves a number of current and recently graduated undergraduate students at NAU: former student Kathleen Soria, current students Natalie Hart and Rebecca Ballard, and current student and Flinn Scholar Kailee Savage.

Although the bacteria are naturally occurring throughout the northern hemisphere, including Arizona, the number of reported cases in the US is small, with only 230 cases in 2016, three of which occurred in Arizona.

Humans can be infected through insect bites; by drinking contaminated water, which happens in developing countries such as Turkey; by handling infected animals; and by breathing aerosolized particles containing the bacteria.

Humans cannot transmit the disease to other humans. There is no vaccine to prevent the disease, which is treated with antibiotics. Wagner's team recently completed a related project funded by the DTRA studying the pathogen's antibiotic resistance.

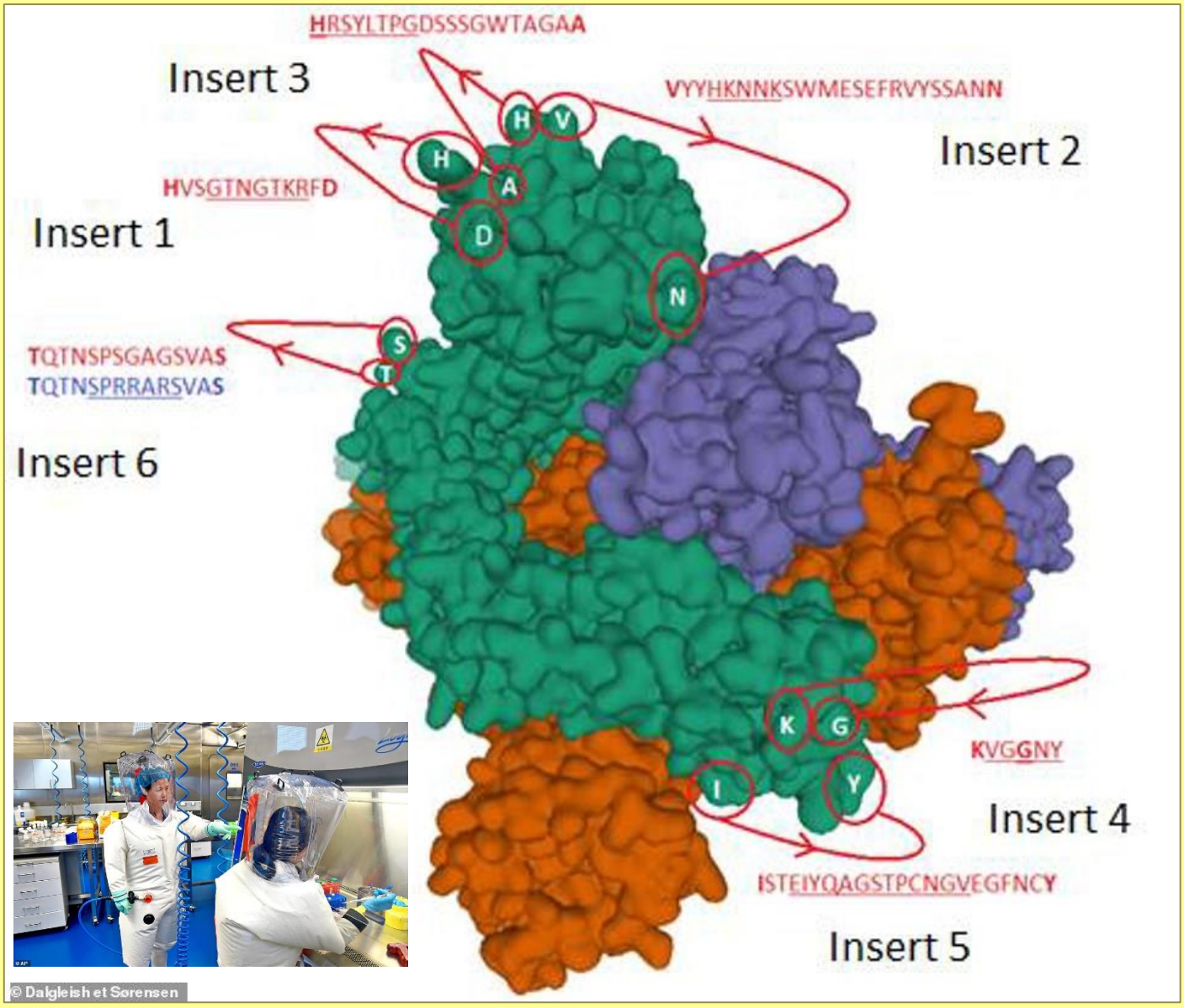
COVID-19 'has NO credible natural ancestor' and WAS created by Chinese scientists who then tried to cover their tracks with 'retro-engineering' to make it seem like it naturally arose from bats, explosive new study claims

Source: https://www.dailymail.co.uk/news/article-9629563/Chinese-scientists-created-COVID-19-lab-tried-cover-tracks-new-study-claims.html

May 28, 2021

- **An explosive new study claims researchers found 'unique fingerprints' in COVID-19 samples that they say could only have arisen from manipulation in a laboratory**
- **DailyMail.com exclusively obtained the new 22-page paper authored by British Professor Angus Dalgleish and Norwegian scientist Dr. Birger Sørensen set to be published in the Quarterly Review of Biophysics Discovery**
- **The study showed there's evidence to suggest Chinese scientists created the virus while working on a Gain of Function project in a Wuhan lab**
- **Gain of Function research, which was temporarily outlawed in the US, involves altering naturally-occurring viruses to make them more infectious in order to study their potential effects on humans**
- **According to the paper, Chinese scientists took a natural coronavirus 'backbone' found in Chinese cave bats and spliced onto it a new 'spike', turning it into the deadly and highly transmissible COVID-19**
- **The researchers, who concluded that COVID-19 'has no credible natural ancestor', also believe scientists reverse-engineered versions of the virus to cover up their tracks**
- **'We think that there have been retro-engineered viruses created,' Dalgleish told DailyMail.com. 'They've changed the virus, then tried to make out it was in a sequence years ago.'**
- **The study also points to 'deliberate destruction, concealment or contamination of data' in Chinese labs and notes that 'scientists who wished to share their findings haven't been able to do so or have disappeared'**

- Until recently, most experts had staunchly denied the origins of the virus were anything other than a natural infection leaping from animals to humans
- Earlier this week, Dr. Anthony Fauci defended US funding of the Wuhan Institute of Virology, saying the $600,000 grant was not approved for Gain of Function research



One diagram of the coronavirus shows six 'fingerprints' identified by the two scientists, which they say show the virus must have been made in a lab

Kim Jong-un Orders Officials to Kill Pigeons and Cats as He Believes They are Carrying COVID from China

Source: https://www.ibtimes.sg/kim-jong-un-orders-officials-kill-pigeons-cats-he-believes-they-are-carrying-covid-china-57805

May 29 – North Korean premier Kim Jong-un has ordered his forces to "eliminate" pigeons as he believes they are spreading Covid-19. The 37-year-old has fears that birds flying from neighboring China are carriers of the deadly coronavirus and should immediately be stopped from either entering the country and those inside should be shot down.

According to reports, border town residents have been seen opening fire, sparking comparisons with 1970s cartoon baddies Dastardly and Muttley, in an attempt to stop Yankee Doodle Pigeon. Stray cats have also been blamed for spreading the virus and are being killed randomly in North Korea.

Bizarre Move

According to reports, authorities in towns and cities particularly along the border have been seen shooting at birds and searching for cats and owners who refuse to give them up. In fact, the local authorities too are paranoid now and are getting aggressive with family and individuals who are refusing to hand over their pet acts and pigeons.

The move comes after an order was issued to "catch and eliminate pigeons and cats" in North Korea as part of a Kim's wider effort to curb the spread of Covid-19, which he believes is still coming from China and pigeons are the main carriers.

In Hyesan, a family of four was forced into an isolation facility for secretly raising a cat. The family told the authorities that their cat had died. But it was seen near a chain-link fence. Border patrol guards tried to capture the animal, but failed. It was last seen heading for a residential district.

The incident was reported up to the provincial quarantine command. After two days of investigation the owner of the cat was arrested his family was kept in the isolation facility for over 20 days and then released. However, by that time the cat were traced and caught and then killed.

Kim's Weird Thinking

Kim has been taking strange steps as he believes that the coronavirus is being purposefully sent by China into North Korea. Over the past few months, he has taken several measures to cut off all Chinese links with North Korea.

Earlier this month, it was revealed that Kim has reportedly banned the use of Chinese medicine at all major hospitals across the country after the death of an official. The bureaucrat, who was in his 60s and suffering from a heart-related illness, is said to have been popular and very close with Kim Jong-un, who became North Korea's Supreme Leader in 2011 after the death of his father Kim Jong-il.

Interestingly, North Korea claims to have suffered no confirmed cases of Covid-19 during the pandemic. However, it has been busy promoting medicines made domestically as foreign treatments are widely unavailable due to sanctions imposed by the United Nations. Moreover, North Korea also doesn't have faith in medicines produced by foreign countries.

EDITOR'S COMMENT: North Korea's population: 25,881,124 and not a single man brave enough to end insanity ...

A Closer Look: The Impact of COVID-19 on Public Safety

Source: https://www.hstoday.us/subject-matter-areas/pandemic-biohazard/a-closer-look-the-impact-of-covid-19-on-public-safety/

May 27 – The COVID-19 pandemic has placed enormous pressures on our country's first responders who risk exposure every day. As key workers within the homeland security mission, their safety and resilience in the face of unprecedented conditions is of utmost concern and urgency to DHS S&T.

To understand the challenges facing first responders, DHS S&T partnered with the University of Maryland's National Consortium for the Study of Terrorism and Responses to Terrorism (START) to conduct research on the **impact of COVID-19 on public safety personnel**. After interviewing 29 first responders representing 29 distinct agencies across 16 states, START summarized and published Phase 1 preliminary findings from the project "Monitor and Mitigate the Impact of COVID-19 on Public Safety."

Significant preliminary findings

Maintaining morale and mental health of first responders is a significant concern.

First responders continue to experience fatigue, reduced motivation and productivity, and increased loneliness and isolation. Furthermore, while many agencies have existing resources for mental health support, interviews suggest only marginal increases in their use during the pandemic. Agencies may need to be more proactive in providing resources and asking personnel what is needed.

2-way communication and soliciting feedback promote better outcomes than top-down communication.
Specifically, 2-way communication can improve first responder morale, better protect personnel and communities through more thorough adoption of best practices, and reduce the burden on personnel and leadership often tasked with training and enforcing new policies.
Designating a COVID-19 coordinator or setting up a task force can still help agencies.
Even at this date, coordinators and task forces can communicate new guidelines, address employee questions and ensure that first responders stay up to date and be appropriately involved in vaccination plans.

Research-based findings
In addition to the preliminary research outputs, Second Sight Training Systems assisted START with data collection and analyses, conducting an extensive review of the scholarly literature. Their focus was on work that informs our understanding of how first responder organizations are affected by the COVID-19 pandemic, how they have responded to or were impacted by similar events in the past, and how they can provide services during new pandemics in the future.
Their final report includes 15 primary research categories, including issues such as:

- Preparedness.
- Occupational exposure and physical health.
- Staffing.
- Use of personal protective equipment and availability.
- Vaccinations and testing.
- Impacts on supply and demand for service.

The full report, abridged report and individual PDFs for each of the 15 topics are located on Second Sight Training Systems' COVID-19 Topic Dashboard for the First Responder Community.

Next project steps
Phase 2 of the project is now underway. We're conducting targeted interviews with first responders on themes that emerged during Phase 1. Additionally, in-depth staffing studies of a select number of first responder agencies will provide more nuanced information on how the pandemic has affected personnel, call volume and service delivery. These studies will focus on first responder agencies in Cary, North Carolina; Clark County, Nevada; and Los Angeles, with plans to include more as time and resources allow.

Woman Yelling 'No Vaccine' Allegedly Plows Car Through Tennessee Vaccination Tent

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/woman-yelling-no-vaccine-allegedly-plows-car-through-tennessee-vaccination-tent/

May 27 – A Greenback woman is facing charges after she drove her car through a COVID-19 vaccine event Monday, narrowly missing National Guard and Blount County Health Department personnel.
Virginia Christine Lewis Brown, 36, is facing seven counts of felony reckless endangerment.
According to a Blount County arrest report, Brown was driving in her SUV at a high rate of speed through a closed cone course and a tent where "at least 15 people" were working in the Foothills Mall parking lot.

U.S. researchers find drug blocks severe COVID-19 symptoms in mice, including variants

Source: https://www.ctvnews.ca/health/coronavirus/u-s-researchers-find-drug-blocks-severe-covid-19-symptoms-in-mice-including-variants-1.5448069

May 29 – U.S. researchers have discovered a drug that could potentially be a game-changing tool in treating COVID-19 patients, including variants of the SARS-CoV-2 virus.
Researchers affiliated with the University of Pennsylvania have found that the drug diABZI was highly effective at preventing severe COVID-19 symptoms in mice that were infected

with multiple SARS-CoV-2 variants, as described in their paper published in Science Immunology on May 18.

The researchers found that SARS-CoV-2 hides to avoid the activation of interferons, which are proteins that signal the presence of a virus, in the respiratory tract's epithelial cells. This results in a delayed immune response, which allows the virus to infect the respiratory tract.

The researchers sought out to look into additional immune pathways. They looked at diABZI, which has been characterized as a STING agonist. STING agonists are drugs that activate **STING, which stands for the stimulation of interferon genes**.

The team had also considered experimenting with cyclic dinucleotides, which are another type of STING agonist. However, these drugs have poor availability and low potency compared to diABZI, they said.

A total of 129 mice with COVID-19 were treated with diABZI. When measured against a control group, the mice that had been treated with the drug saw less weight loss and a lower viral load.

"Few drugs have been identified as game-changers in blocking SARS-CoV-2 infection. This paper is the first to show that activating an early immune response therapeutically with a single dose is a promising strategy for controlling the virus, including the South African variant B.1.351," said senior author Dr. Sara Cherry, a pathology and laboratory medicine professor at the University of Pennsylvania, in a news release.

DiABZI hasn't yet been approved by the U.S. Food and Drug Administration or Health Canada, but Cherry says the drug could be effective against many other respiratory viruses, such as the common cold and the parainfluenza virus.

"We are now testing this STING agonist against many other viruses," Cherry said. "It's really important to remember that SARS-CoV-2 is not going to be the last coronavirus that we will see and will need protection against."

Coronavirus: UAE approves new life-saving drug for emergency use

Source: https://www.thenationalnews.com/uae/health/coronavirus-uae-approves-new-life-saving-drug-for-emergency-use-1.1232017

May 30 – The UAE has approved the emergency use of a new drug that can help to save the lives of patients seriously ill with coronavirus.

Sotrovimab, produced by British drug maker GlaxoSmithKline, can reduce Covid-19 deaths and hospital admissions by up to 85 per cent.

The UAE is the first country in the world to both license and enable immediate patient use of the drug. It comes after the US Food and Drug Administration (FDA) gave an emergency use authorisation to the antibody treatment, said Wam news agency.

Sotrovimab will be available to Covid-19 patients in the US in the coming weeks.

Lab tests showed the medicine was effective against variants of the coronavirus.

"The new medicine will greatly contribute to speeding up the recovery of patients, reducing Covid-19-related deaths and treatment period in intensive care units," said Abdulrahman Al Owais, Minister of Health and Prevention.

"It will also support the country's efforts being made to conduct Covid-19 tests and administer vaccines, retaining its leading position among the world's foremost countries, dealing efficiently with the Covid-19 pandemic."

People with pre-booked appointments await their turn to get vaccinated at Barsha Hall in Barsha, a suburb of Dubai. All photos by Antonie Robertson / The National

Sotrovimab is a monoclonal antibody that can be used in patients aged over 12 with mild to moderate Covid-19 who are at risk of severe illness.

Monoclonal antibodies are laboratory-made proteins that mimic the immune system's ability to fight pathogens.

When administered early, it can reduce hospital stays for more than 24 hours and fatalities by as much as 85 per cent.
UAE authorities have been working alongside drug developers to ensure protocols are in place for its effective administration across health facilities.
New guidelines are in place to advise doctors on appropriate use and how to direct patients to centres where Sotrovimab will be available.
The news follows an announcement that the Abu Dhabi Department of Health will offer booster shots of the Sinopharm vaccine at more than 100 vaccination centres across the emirate.
"From the earliest days of the pandemic the MoHAP strategy has centred on embracing promising new technologies, including tests, vaccines and treatments in our efforts to subdue Covid-19," said Dr Mohamed Al Olama, the ministry's under-secretary.
"We have been pleased to partner with GlaxoSmithKline to ensure that critical elements are in place to ensure early access, from licensing and shipments to training and new guidelines for doctors."
The UAE became the first nation to include the treatment in its Covid care programme because of it long-established strategic partnership with GlaxoSmithKline, the company said.
"We are working in close partnership with the MoHAP to ensure that our innovative medicines and vaccines are available to the patients who need them, a mission that has taken on new urgency during the pandemic," said Gizern Akalin, managing director and vice president for the Gulf.
To date, 547,008 people have recovered from Covid-19 in the UAE, while the death toll stands at 1,673.

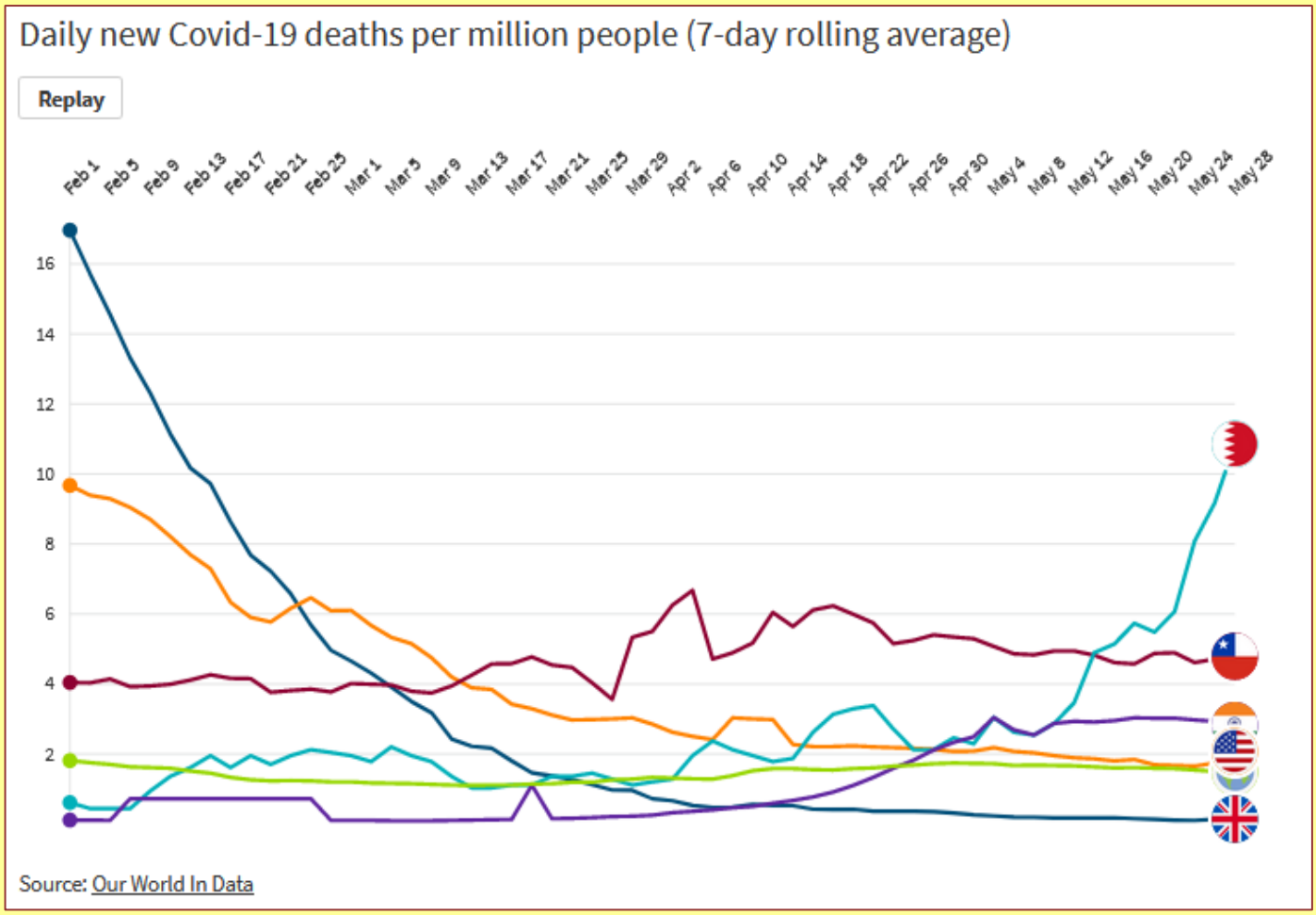
EDITOR'S COMMENT (on the photo): Although comfortable, the chairs used are not ideal for decontamination/disinfection. And the cotton masks used by recording personnel are not the best choice for people coming into contact with hundreds of people daily. Certain details can make a big difference!

Covid-19 third wave: why cases are on the rise in some highly vaccinated countries

Source: https://www.thenationalnews.com/uae/science/covid-19-third-wave-why-cases-are-on-the-rise-in-some-highly-vaccinated-countries-1.1232565

May 31 – Chile and Bahrain were among the fastest to roll out the vaccine, but now face rising case numbers
The swift vaccine rollout in some countries has led to a return to a near-normal life.
In Israel, people no longer have to wear masks outside, while in the UAE vaccinated football fans can now attend games and nightclubs have reopened.
But elsewhere, countries that had effectively achieved herd immunity are seeing a third wave of cases. From Chile to Bahrain, figures are rising. And the coronavirus continues to kill an average of 10,000 per day worldwide.
So what's gone wrong?
The case of Chile has been of particular interest.
The *BMJ* medical journal said in April that the South American nation had experienced "one of the most successful vaccine rollouts in the world", and the latest statistics indicate that 93 vaccine doses have been administered per 100 people.

Chile's summer surge
After infections in the country surged in mid-2020, political pressure on the president, Sebastián Piñera, is said to have driven a concerted effort to secure vaccine supplies, with negotiations taking place with multiple western and Chinese vaccine developers.
"The government started dealing with how to buy it very early, maybe from June last year, before even there were vaccines," Dr Claudia Cortés, an infectious diseases specialist and associate professor at the University of Chile," told *The National*.
"They decided at that moment to have conversations with different companies and get different kinds of vaccine, and that's a big difference from our other countries around."
In its quest to gain access to foreign-developed vaccines, Chile benefited from having skilled trade negotiators and from involving itself in late-stage clinical trials, according to analysts.
The country's "solid tradition" and long experience of comprehensive vaccination programmes helped ensure that subsequent rollouts went well, says Dr Cortés.



But, despite at one point trailing only Israel and the UAE in doses per capita, the country has endured high infection and death rates this year, and has recorded more than 28,000 deaths in its population of about 19 million.

Masks and rules ditched too quickly

Dr Cortés feels "miscommunication" seemed to indicate, with wide vaccine availability, risks were lessening. A sense of complacency may have developed and measures such as mask wearing became less common.

"In February, that was in the middle of our summer, the government eased a lot of the restrictions we had in terms of travel around the country," she said.

"So, after many months of being in isolation and quarantine, they permitted to travel inside the country. Around five million people travelled around.

"So, in that way, the virus was spread all around. Every single small village, town."

The government has been criticised for failing to control the country's borders, allowing the Brazilian variant to enter.

Even though case rates have been high, and there have been concerns over the 50 per cent efficacy of the Sinovac jab that's widely used in Chile, Dr Cortés says the vaccination programme has brought a reduction in hospitalisations of elderly people.

While limited in its ability to stop transmission, the Sinovac jab is seeming to prevent severe illness, a hopeful sign even in the midst of high case rates, she said.

70 die each week in Bahrain's third wave

Bahrain, another heavily vaccinated nation, with about 96 jabs given per 100 people, is currently experiencing its worst surge of infections and deaths since the pandemic began. More than 70 people are dying each week in the island nation of 1.6 million, where the death toll has reached around 900.

Like Chile, Bahrain has experienced a surge that has been blamed on increased mixing among residents.
While Bahrain is advanced in its vaccination programme, only a minority of residents have had two jabs.
At 79 per cent, Sinopharm has a much higher efficacy than Sinovac, although a third jab is being offered after four-to-six months.
Bahrain's government urged the island's residents to stick to coronavirus rules, while shutting malls, cinemas, restaurants and gyms for two weeks to tackle the surge.
The lesson from Chile is, says Dr Cortés, that movement restrictions are still needed until very high rates of vaccination have been achieved. "When countries are getting vaccines, and more countries daily are getting more vaccines, you cannot relax," she says. "You need to keep taking care – wash your hands, wear your mask, avoid crowds – until 80 per cent at least of your population is vaccinated."
In the European Union, vaccination rates have picked up after a slow start that sparked much criticism of the 27-member bloc's leadership. As an example, the Netherlands has now administered about 50 jabs per 100 people and, while case rates were relatively high in April, they have fallen in May and deaths are at fairly low levels compared to the country's peaks, although Europe as a whole is a mixed picture.
As Chile, Europe and some Middle Eastern nations look ahead to a time when most of their residents are fully vaccinated, in Asia developed and developing nations are much further behind. In Japan, for example, only about 8.4 vaccine doses have been administered per 100 people.

Asian nations left behind in vaccine race

The early success of face coverings, social distancing, restrictions on international travel and well-operated test, trace and isolate systems have been credited with keeping case rates in parts of Asia low without vaccination.
But, not having seen the huge surges in cases early in the pandemic, there was said to have been less political pressure to focus on vaccine development and on securing supplies.
The lack of domestic pharmaceutical giants on a par with the likes of Pfizer or AstraZeneca has also been cited as a factor behind the limited availability of vaccines in many nations in the region.
While Japan's Covid-19 death total of less than 13,000 remains modest compared to many other developed nations, especially given a population size of around 127 million, the country is currently experiencing its worst surge in deaths, at almost 800 per week, illustrating its vulnerability in the absence of widespread vaccination.
In some developing Asian nations, vaccination programmes are even further behind, with Thailand, for example, having administered only 4.6 jabs administered per 100 people.
After keeping total Covid-19 deaths in double figures up until the end of March, according to official statistics, the country has recently seen a surge in infections, and fatalities are now approaching 1,000.
The increase compounds the concern of residents who in some cases are not expecting to get vaccinated until late this year.
In contrast to its neighbours, China has been a vaccine powerhouse, developing and rolling out its own vaccines. It has administered more doses than any other country, at over 550 million.
Beijing has even been able to engage in "vaccine diplomacy" by making supplies available to other countries, bolstering its soft power. As countries vaccinate more of their populations, they will face tough choices over when to lift restrictions and allow life to return closer to normal. Experts indicate that case rates are likely to increase even within heavily vaccinated populations as the current jabs do not completely stop transmission. "At some point we're going to have to say, 'Most of us are vaccinated, so if you do get an infection, you're not likely to get as severe illness,' take the brakes off, let it do its thing," says Prof Paul Hunter, an infectious diseases specialist at the University of East Anglia in the UK. "It's going to circulate amongst us for decades or centuries. In the short term, if we can stop people getting sick or dying, that's as much as we can do."

Here Are 12 Signs of Long COVID You Should Discuss With Your Doctor

Source: https://www.sciencealert.com/talk-to-your-doctor-if-you-have-any-of-these-12-sigs-of-long-covid

May 31 – No formal diagnostic guidelines exist yet to confirm that someone is suffering from long COVID. Although the Centers for Disease Control and Prevention is working on a list for doctors, anyone concerned about their health for now has to do their own research and discuss their symptoms with their doctor.

"People could be suffering from long COVID and not knowing it because they have not gotten the knowledge to identify themselves as having it," Fidaa Shaib, a pulmonologist at Baylor College of Medicine's long COVID clinic, told Insider.
Long COVID presents with a huge variety of symptoms, Shaib added, which makes it difficult for doctors to spot.
That is, in part, why estimates of how common long COVID is vary widely. A large UK study found that about one in 10 COVID-19 survivors will develop long COVID – defined as experiencing lingering symptoms for more than three weeks after being infected. A University of Washington estimate, meanwhile, put the figure at closer to one in three COVID-19 patients.
Dr. Ziyad Al-Aly, an epidemiologist and chief of research at a Veterans Affairs teaching hospital in St. Louis, told Insider that the syndrome "can affect nearly every organ in the body."
It is not yet clear if the symptoms of long COVID are caused directly by the virus, or if some are triggered by the stress and trauma of infection and the pandemic. Regardless, people urgently need help managing their symptoms, Shaib said, especially those associated with chronic illness.

Here are 12 ways patients can be affected by long COVID.

- **Brain fog**
  One in five long-haulers experienced brain fog six months after having COVID-19, according to an analysis of 51 long COVID studies that has not yet been peer-reviewed. This was the case regardless of whether the patients had been hospitalized or not.
- **Fatigue**
  Six out of 10 survivors of COVID-19 who'd been hospitalized reported muscle fatigue and weakness six months later, according to a Chinese study. Both brain fog and fatigue are hallmarks of chronic fatigue syndrome as well.
- **Trouble with sleep**
  One in five long COVID patients reported having trouble sleeping six months after getting sick, according to the analysis of 51 studies.
- **Shortness of breath and persistent cough**
  Shortness of breath and persistent cough are common among COVID-19 survivors one to six months after infection, according a study of over 73,000 US veterans.
- **Heart problems**
  Palpitations and irregular heartbeat were common among COVID-19 survivors, according to the study of US veterans.
  COVID-19 survivors were also at an increased risk of developing heart failure, atherosclerosis, and blood clots within six months after infection. Myocarditis, an inflammation of the heart muscle, has also been observed in long COVID patients.
- **Neurological symptoms and mental illness**
  Over a third of COVID-19 survivors experience neurological symptoms or mental illness within six months of infection, a large study found. Anxiety and mood disorders, such as depression, were the most common.
- **Loss of smell**
  Among those who lost their sense of smell after COVID-19, about a third didn't regain the sense for two months or more, according to a small US survey.
- **Gut symptoms, such as loss of appetite and diarrhea**
  A small study from China found that more than 40 percent of patients hospitalized with COVID-19 reported issues related to the gut three months after their primary infection. The most common symptoms were loss of appetite, nausea, acid reflux, and diarrhea.
- **Skin rashes and hair loss**
  COVID-16 survivors reported skin rashes six months among after infection, according to the study of US veterans. A study from China documented hair loss among 22 percent of patients six months after hospitalization for COVID-19.
- **Chest tightness, joint and muscle pain**
  In a survey on long COVID symptoms published in December, nine out of 10 people reported symptoms like chest tightness, muscle aches, and joint pain one month after infection. These symptoms persisted for at least seven months for some respondents. The data, however, has not yet been peer-reviewed.
- **Diabetes**
  According to the study among US veterans, long COVID patients were 39 percent more likely to get a new diabetes diagnosis in the six months after infection.

- **Kidney disease**
  Those who survived COVID-19 were also at higher risk of developing acute kidney disease, according to the study among veterans.

Patients have reported other symptoms that haven't yet been documented in large studies

Long COVID patients have reported a number of other symptoms that scientists haven't been able to measure or confirm yet.
For instance, some women with long COVID have reported irregular periods and worse premenstrual syndrome. Other long COVID patients have said they've had bad tinnitus, a persistent ringing of the ears.
Although some people with long COVID reported that their symptoms got better after vaccination, others said they got worse.

Cities Have Unique Microbial 'Fingerprints', First Study of Its Kind Reveals

Source: https://www.sciencealert.com/cities-are-teeming-with-thousands-of-species-of-unknown-microbes-scientists-find

May 31 – Each city is populated by a unique host of microbial organisms, and this microbial 'fingerprint' is so distinctive, the DNA on your shoe is likely enough to identify where you live, scientists say.
In a new study, researchers took thousands of samples from mass transit systems in 60 cities across the world, swabbing common touchpoints like turnstiles and railings in bustling subways and bus stations across the world.
Subjecting over 4,700 of the collected samples to metagenomic sequencing (the study of genetic material collected from the environment), scientists created a global atlas of the urban microbial ecosystem, which they say is the first systematic catalog of its kind.
The results suggest that no two cities are alike, with each major metropolis studied so far revealing a unique 'molecular echo' of the

microbial species that inhabit it, distinct from populations found in other urban environments.
Not only that, but the three-year analysis turned up thousands of previously unidentified kinds of microorganisms, including almost 11,000 viruses and over 1,300 types of bacteria that didn't match any known species.
"Every time you sit down in the subway, you are likely commuting with an entirely new species," says systems biologist Christopher Mason from Cornell University.
The team, comprising a consortium of dozens of scientists from over 60 research organizations, ultimately collected the samples from 32 countries across six continents, but

the project began with more modest aims, analyzing microbial specimens found in the New York City subway system.
After that work began to get attention, Mason founded MetaSUB, an international collaboration attempting to document the urban biome that millions of people interact with each day.
"It is now apparent that cities, in general, have an impact on human health, though the mechanisms of this impact are broadly variable and often little understood," the researchers write in their new study.
"Indeed, our understanding of microbial dynamics in the urban environment outside of pandemics has only just begun."
The new results bear that observation out. Amongst the 4,728 metagenomic samples analyzed (all of which were collected prior to the COVID-19 pandemic), a far greater amount of unknown microbes was found than known microbes.

In total 10,928 viruses, 1,302 bacteria, 2 archaea, and 838,532 CRISPR arrays (fragments of viral DNA) were identified that didn't have a match in reference databases, compared with some 4,246 species of urban microorganisms that had previously been identified. Of these, the researchers say a set of 31 non-human microbe species was found in 97 percent of samples: a consistent 'core' urban microbiome that appears virtually everywhere it seems.

On top of that core, however, distinct geographic variations of microbial populations exist in each city. So much so, in fact, that Mason says he could predict with about 90 percent accuracy where a person lives if the DNA on their shoes was sequenced.
"A microbiome contains molecular echoes of the place where it was collected," says first author of the study David Danko, MetaSUB's director of bioinformatics.
"A coastal sample may contain salt-loving microbes while a sample from a densely populated city may show striking biodiversity."
Aside from differentiating the distinct signatures of each metropolitan microbiome, the researchers hope to discover new ways to identify health threats in microbial populations, such as antibiotic-resistant strains of bacteria – evidence for which was found to be globally widespread among the study's cities, although not in abundance.
What remains to be seen is whether each city's microbial uniqueness is a matter of random chance, or if there is a deeper significance to the geographical variations that we don't yet fully appreciate.
In addition to revealing potentially lurking pathogens, the diverse world of invisible microbes within cities may also hold promising opportunities for medicine, helping us to discover biosynthetic gene clusters (BGCs) – compounds with significant potential for future antibiotics and other drugs.
"One of the next steps is to synthesize and validate some of these molecules and predicted BGCs, and then see what they do medically or therapeutically," Mason says.
"People often think a rainforest is a bounty of biodiversity and new molecules for therapies, but the same is true of a subway railing or bench."

▶▶ **The findings are reported in** *Cell*.

Was COVID-19 Made in a Lab? An Epidemiologist Reviews The Evidence

By Gideon Meyerowitz-Katz
Source: https://www.sciencealert.com/the-lab-leak-theory-of-covid-19-may-be-possible-but-that-doesn-t-make-it-likely

May 31 – One of the Big Questions about SARS-CoV-2, the virus that causes COVID-19, has for a while been about its origins. Most viruses that cause disease in humans have long, fascinating origin stories, with jumps from animal to animal until they finally make it into people and start killing them.
But COVID-19, goes the theory, must be lab-grown - either from an intentional lab leak or a mistake of epic proportions - there's simply too much circumstantial evidence to ignore! This idea doesn't really make sense. There's no special reason to believe that COVID-19 must have been grown in a lab.

Sure, there's political reasons that we might think the Chinese government is untrustworthy, but that's a slim basis for a theory. As humans, when we are given two possibilities, we assume that they are somewhat equivalent in likelihood, so when you hear "lab leak or natural origin" it's not unreasonable to assume that those two things are about as likely as one another, even though that makes no sense whatsoever.

We know from decades of evidence that new diseases jump from animals to humans all the time. There are literally dozens of cases in the last few decades alone where an entirely new disease has transferred from a non-human host to people.

This has even happened twice in recent memory with coronaviruses similar to SARS-CoV-2, which gives you some idea of just how unsurprising it is when a novel pathogen of likely animal origin is identified.

All of this is why scientists say that the "default assumption" is that the virus emerged naturally - it happens literally all the time.

And yet, headlines are currently screaming that scientists have "proved" that COVID-19 was bioengineered in a lab despite this being no more likely than in July 2020. What's going on?

The science

The paper that all the headlines are based on appears to be a perspective piece written by three authors that will soon appear in the journal *Quarterly Review of Biophysics Discovery*. This is a new journal that was launched in August 2020, which means that while it's connected to a fairly prestigious journal it's quite hard to say much about the publication itself.

And the paper clearly makes some quite controversial claims - the authors are quoted as saying that they have found "unique fingerprints" in the virus that could only have been created in a lab.

Moreover, the paper claims that China has deliberately destroyed data that could prove this hypothesis, which is a pretty wild claim to see published in a peer-reviewed academic piece.

▶▶ Read the full article at the source's URL.

Gideon Meyerowitz-Katz *is an epidemiologist working in chronic disease in Sydney, Australia. He writes a regular health blog covering science communication, public health, and what that new study you've read about actually means.*

Getting COVID-19 after vaccination is incredibly rare, CDC report finds

Source: https://newatlas.com/health-wellbeing/cdc-breakthrough-infection-covid19-rare/

May 30 – **A promising new report from the US Centers for Disease Control and Prevention (CDC) has found less than 1,000 cases of COVID-19 needing hospitalization out of more than 100 million fully vaccinated people.** The CDC admits it is probably undercounting positive COVID-19 cases, however, the report offers a powerful reminder of the real-world effectiveness of vaccines.

The CDC report chronicles a volume of what is called "breakthrough infections." These are positive COVID-19 cases seen in subjects who are at least 14 days post all recommended doses of a vaccine.

By April 30, 2021, the CDC reports around 101 million fully vaccinated individuals in the United States. Amongst that large fully vaccinated cohort, the CDC says only 10,262 breakthrough infections were officially recorded.

Around a quarter of those breakthrough, infections were classified as asymptomatic. Just 995 of these infections led to hospitalization, and only 160 deaths were recorded. The average age of those patients who died was 82, and nearly 20 percent of the deaths were reported as potentially unrelated to COVID-19.

The CDC is cautious to note the limitations of the report, in particular noting that the overall breakthrough infection numbers are highly likely to be undercounted.

"…the number of reported COVID-19 vaccine breakthrough cases is likely a substantial undercount of all SARS-CoV-2 infections among fully vaccinated persons," the report states. "The national surveillance system relies on passive and voluntary reporting, and data might

not be complete or representative. Many persons with vaccine breakthrough infections, especially those who are asymptomatic or who experience mild illness, might not seek testing."
Despite the potentially larger number of uncounted asymptomatic or mild COVID-19 cases, the stunningly small volume of hospitalizations and deaths in vaccinated individuals echoes another recent large real-world study out of Israel. That study, published in *The Lancet* in early May, looked at nearly 5 million people vaccinated with the Pfizer mRNA candidate. It found 95.3 percent of those vaccinated were protected from symptomatic infection.
Another recent real-world CDC study looked at mRNA COVID-19 vaccines in those aged over 65. It found vaccination reduced the risk of hospitalization from COVID-19 in that age group by 94 percent.
Influenced by these recent findings the CDC has now moved to primarily monitoring breakthrough infections in hospitalized patients. At a recent briefing, CDC director Rochelle Walensky argued the agency's key focus is on severe illness and death.
"You know these vaccines were studied to prevent severe illness, hospitalization and deaths. And as we look at these breakthrough infections these are the ones we're most concerned about," says Walensky. "Before we started only studying breakthrough infections in only hospitalized patients, we were studying all breakthrough infections. What we were starting to find is a large portion of them were fully asymptomatic and in fact when we went to study them and sequence them there was inadequate virus to even do so."
However, not everyone is confident this new CDC focus on just monitoring severe COVID-19 cases is the correct approach. While the CDC argues it is reasonable to concentrate on monitoring severe cases that lead to hospitalization, others are claiming this could mean new surging virus variants could be missed.
"If there is a new variant or there is a change in frequency of a variant, you might want to find out earlier than wait for it to appear in severe and hospitalized cases," says Saad Omar, an infectious disease epidemiologist from Yale University. "That gives you the ability to be ahead of the outbreak rather than follow it."

EDITOR'S COMMENT: Reality or just CDC's propaganda in favor of vaccination? It is sad, but the pandemic has made us all so disbelievers!

WHO approves Sinovac's Covid-19 vaccine for emergency use

Source: https://www.straitstimes.com/world/europe/who-approves-sinovacs-covid-19-vaccine

June 01 – The World Health Organisation (WHO) has approved a Covid-19 vaccine made by Sinovac Biotech for emergency-use listing, the second Chinese-produced shot to get its endorsement, a WHO statement said on Tuesday (June 1). WHO emergency listing is a signal to national regulators on a product's safety and efficacy. It would also allow the shot to be included in Covax, the global program to provide vaccines mainly for poor countries, which currently faces major supply problems due to India's suspension of vaccine exports.

The name game for coronavirus variants just got a little easier

Source: https://www.statnews.com/2021/05/31/the-name-game-for-coronavirus-variants-just-got-a-little-easier/

May 31 – Do you have trouble keeping the names of Covid-19 variants straight, and struggle to distinguish B.1.1.7 from B.1.351 or B.1.617.2?
The World Health Organization wants to help. On Monday, it announced a new naming system it devised for so-called variants of interest and variants of concern, the forms of the SARS-CoV-2 virus with important mutations.
Each variant will be given a name from the Greek alphabet, in a bid to both simplify the public discussion and to strip some of the stigma from the emergence of new variants. A country may be more willing to report it has found a new variant if it knows the new version of the virus will be identified as Rho or Sigma rather than with the country's name, Maria Van Kerkhove, the WHO's coronavirus lead, told STAT in an interview.
Under the new scheme, B.1.1.7, the variant first identified in Britain, will be known as Alpha and B.1.351, the variant first spotted in South Africa, will be Beta. P.1, the variant first detected in Brazil, will be Gamma and B.1.671.2, the so-called Indian variant, is Delta.
When the 24 letters of the Greek alphabet have been exhausted, another series like it will be announced, Van Kerkhove said.

A plan to simplify the nomenclature of the variants has been in the works for several months, led by the WHO's Virus Evolution Working Group. But it was surprisingly tricky to come up with an acceptable system, Van Kerkhove said.

The initial plan was to create a bunch of two-syllable names that aren't words — portmanteaus, said WHO's Frank Konings, who leads the working group. But it quickly became apparent that too many were actually already claimed — some were the names of companies or locations, others were family names. Combining three syllables didn't solve the problem and four syllables became unwieldy.

For a while, the group considered names of Greek gods and goddesses, but that was eventually nixed. The idea of just numbering them one, two, three, and so on was considered, but rejected because it was thought it would likely create confusion with the names the viruses are given in genetic sequence databases that track the evolution of the SARS-2.

"We're not saying replace B.1.1.7, but really just to try to help some of the dialogue with the average person," Van Kerkhove explained. "So that in public discourse, we could discuss some of these variants in more easy-to-use language."

The Greek alphabet suggestion drew the approval of the experts the WHO convened to come up with the naming system, some of whom are members of the International Committee on the Taxonomy of Viruses. That group is charged with naming new species of viruses — it named SARS-CoV-2, the virus that causes Covid-19. But it does not name subspecies of viruses, which is why this fell to the WHO.

"I heard it's sometimes quite a challenge to come to an agreement with regards to nomenclature. This was a relatively straightforward discussion in getting to the point where everybody agreed," Konings said.

The WHO will maintain a list of variants with their new names on its website.

Synthetic Bioweapons Are Coming

Emerging and Disruptive Technology Essay Contest–First Prize

By Michael Knutzen

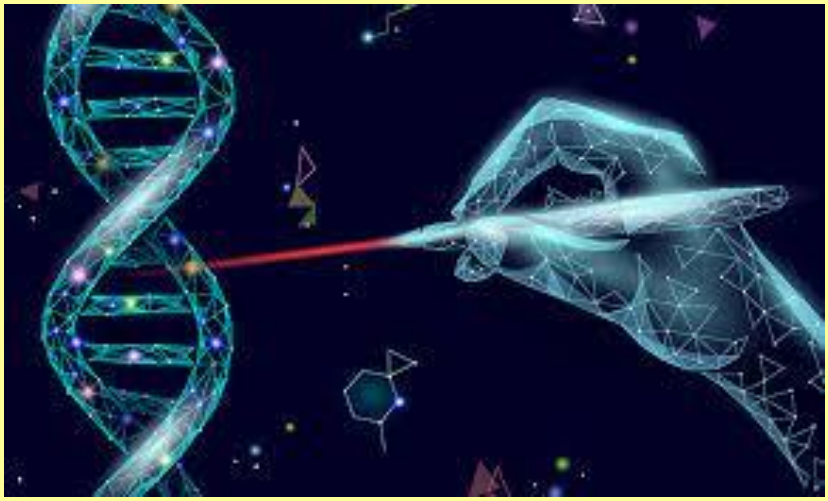
June 2021 | US Naval Institute Proceedings | Vol. 147/6/1,420

Source: https://www.usni.org/magazines/proceedings/2021/june/synthetic-bioweapons-are-coming

The COVID-19 pandemic has revealed critical weaknesses in the human domain of warfare at just the moment technology has emerged that gives bad actors new power to exploit those weaknesses. Developments in synthetic biology will create next-generation bioweapons, "human-domain fires" that will fundamentally change the strategic environment and create a threat naval planners must consider now, before it is encountered at sea.

A Human-Domain Plague

In a March 2020 press release praising the effectiveness of its preventative medicine, the Navy proudly declared: "No cases of COVID-19 have been diagnosed aboard any U.S. 7th Fleet Navy vessel."[1] One week later, cases were spreading so rapidly, the USS *Theodore Roosevelt* (CVN-71) effectively became a "mission-kill."



COVID-19 has demonstrated that biological threats are almost entirely unaffected by sophisticated kinetic, cyber, and electromagnetic defenses. The French aircraft carrier *Charles de Gaulle* reported in April 2020 that 60 percent of her crew was infected with COVID-19. French Admiral Christophe Prazuck warned "that the [medical] measures onboard were 'obviously circumvented' by a 'stealthy, insidious virus.'"[2] It can be debated whether the U.S. or French carriers would have stayed in the fight if COVID-19 had broken out during wartime. But a more lethal, deliberately devised, weaponized agent could eviscerate a fleet.

This socially transmitted vector is characteristic of a critical military dimension. The *human domain*, which the Department of Defense says "consists of the people (individuals, groups, and populations) in the environment, including their perceptions, decision-making, and behavior," is a key component of the operating environment.[3] Maritime, air, land, cyber, and information activities all affect this space, seizing psychological and behavioral "terrain" in a form of human-domain maneuver. This terrain comprises individuals, networks, and communities linked by ideology or association, frequently spread across and informed—but not limited to—by geography. Traditionally, this has been maneuver terrain, a place to "win hearts and minds." But new technology means fires in the human domain—biological fires especially—can now affect other domains, circumventing conventional defenses to find, fix, and finish targets with unnatural effects.

Recent developments in synthetic biology—which the National Academy of Sciences defines as "concepts, approaches, and tools which enable the modification or creation of biological organisms"—pose a profound threat.[4] Humans first edited organisms through husbandry and botany—imprecise, indirect processes that required years to centuries to achieve much. Polymerase chain reaction (PCR) was developed in 1985 and allowed DNA from one organism to be isolated, copied, and inserted into another in the first form of widely used genetic modification. A newer technique,

clustered regularly interspaced short palindromic repeat (CRISPR-Cas9), was first harnessed for genetic editing in 2013.[5] Compared with PCR, CRISPR-Cas9 is cheaper, faster, and more accurate—a development likened to replacing vacuum tubes with transistors in the early days of computing.

It is much easier to use than PCR, too. CRISPR uses RNA (genetic information similar to DNA but which functions as a messenger within a cell) and the Cas9 enzyme to edit the genes. Biologists use the RNA to identify a sequence for removal or insertion and Cas9 to do the actual cutting and splicing.[6] One 2019 winner of the International Genetically Engineered Machine competition was a team of high school students who engineered E. coli bacteria to spin spider silk.[7] With CRISPR, to do the editing you simply have to know what genes control spider silk production and possible places to put them on the bacterial genome. With constant development, the technical obstacles to designing completely new traits and inserting them in designer organisms will only decrease. The opportunities and dangers are nearly limitless.

Choose Your Weapon

Of those dangers, next-generation bioweapons are the most serious. Unlike traditional bioweapons, which most states have abandoned as unreliable, synthetic bioweapons (SBWs) are weaponized biological threats modified through synthetic biology for novel effects, mechanisms, or processes.[8] Unshackled from natural biology, SBWs possess characteristics engineered to target populations or individuals, through socially transmitted rather than kinetic means. Although each of the military services and the entire U.S. population could be at risk from SBWs, the nature of the Sea Services' operations—far from home but necessarily dependent on local goods and services in forward-deployed locations—places them at particular risk.

George Mason University's Gregory D. Koblentz says, "Biological warfare favors the attacker."[9] One possible use of synthetic bioweapons would be to neutralize a ship or task force preemptively, before any active conflict, incapacitating a crew instead of killing it. A tailored incubation period or high presymptomatic transmission can be a matter of planning rather than luck. Programmed obsolescence, by which a disease dies after a set number of generations or fails to transmit in nontarget environmental conditions, can protect the attacker. **Chinese People's Liberation Army (PLA) Senior Colonel Guo Ji-Wei refers to this effect as "multiple vulneration," the idea that overlapping biological effects can aid targeting**.[10]

"Binary weapons" are paired infections separated to evade detection that can later combine for desired effect.[11] Complementary, harmless viruses released in San Diego and Guam could synthesize, in a host exposed to both, to generate a debilitating illness. Such covert SBW fires could take a whole strike group off the board shortly before China launched an invasion of Taiwan, for example.

One threat that was once the stuff of science fiction may soon become real. Some researchers (including Lieutenant General Zhang Shibo, former president of the PLA National Defense University) foresee the possibility of "**specific ethnic genetic attacks**" on whole racial or ethnic groups, although there remain political and scientific obstacles at present.[12] A unique person with unique genes is easier to target than population-level differences in the nearer term. SBWs with high levels of asymptomatic transmission could pass from host-to-host through the human domain, until reaching a vulnerable target or targets possessing the "right" genes. (Procuring a president or admiral's DNA is easy. Simply invite the target to dinner at a venue you control.)

And China may already have hacked from medical records or purchased the genetic information of millions of ordinary Americans through genealogical companies such as 23andme.[13] Bill Evanina, former director of the National Counterintelligence and Security Center, warned against Beijing Genomics Institute–linked COVID-19 tests, noting: "Foreign powers can collect, store and exploit biometric information from COVID tests."[14]

Potential SBW effects include not only incapacitation and death, but also boutique outcomes. Colonel Guo emphasizes that "learning, memorizing . . . and even the 'bellicose character' can be injured precisely without a threat to life."[15] Making an adversary's leader docile (or erratic, confused, or hyper-aggressive) might be as effective as a kinetic decapitation strike. Further, the ability to reach and nonlethally modify a target creates opportunities for coercion. A compellent threat creates conditions to force change in an adversary's behavior. The ability to remotely hold a person's biology hostage—through degenerative, frustrating, or simply embarrassing symptoms—but promising a personal cure (or enhancement) could create enormous strategic leverage.

Warfare Beyond Rules

Doctrinally, China has recognized the critical role the human domain will play, and some Chinese thinkers have already rejected moral limits on SBWs. In 1999, PLA Colonels Qiao Liang and Wang Xianghui published *Warfare Beyond Rules*, a treatise on asymmetric conflict that advocates for "warfare beyond all boundaries and limitations." Qiao and Wang emphasize that China must be prepared to synchronize all government capabilities at all levels of competition, with all

tools considered legitimate. These include: conventional, "biochemical," "ideological war," and other means of conflict.[16]
In this framework, chemical and biological weapons "are nothing more than nontraditional weapons whose mechanisms have been altered and whose lethal power and destructive capabilities have been magnified several times over."[17] With nothing inherently immoral in their use, "new concept weapons" such as SBWs are evaluated strictly on military utility.[18] The work received high-level praise within China—Qiao was promoted to major general, and he and Wang still shape the next generation as national security lecturers.[19]
PLA Lieutenant General He Fuchu, vice president of the Chinese Academy of Military Science (AMS), has emphasized that "biotechnology [is] a new 'strategic commanding heights.'" His agency's 2017 *Science of Military Strategy* defined biology "as a domain of military struggle."[20] Such trains of thought culminate in new weapons perfectly suited for "warfare beyond rules."

Mounting a Response

U.S. reactions to synthetic biology attacks will be fraught with difficulties in attribution, signaling, and response. The traditional U.S. position on chemical or bioweapon use has linked any potential response to the nuclear deterrent, through the 1998 doctrine of *calculated ambiguity*. But Syria's unanswered mass use of chemical weapons (and North Korea and Russia's highly targeted use) has destroyed the credibility of threats of a nuclear response to all use of weapons of mass destruction.[21]
Indeed, attributing such an attack would be difficult in any case. The 1975 Biological and Toxic Weapons Convention outlawed the acquisition and stockpiling of all forms of biological weapons but lacked inspection or enforcement regimes. As the slow initial response to COVID-19 demonstrates, it takes time to recognize a new threat, understand it, identify its origin, and develop medical countermeasures. The characteristics of SBWs that make them so attractive to bad actors also magnify the challenges of reacting. Mustering the evidence to attribute the source of an attack and generate broad public support and political will for a vigorous response would be difficult, to say the least.
Given these barriers, what should the Sea Services do? First, investment in military biodefense is critical. This requires enhancing threat awareness by developing a global biothreat common operating picture (BioCOP) in coordination with national and international defense, public health, homeland security, and intelligence agencies. A BioCOP must be able to recognize and characterize SBWs through active bio-surveillance in vessels, ports, and facilities, with special attention for globally dispersed, binary weapons. Second, research organizations, such as the Defense Advanced Research Projects Agency's biotechnology office, need the resources to drive development of advanced biosensors, diagnostics, countermeasures, and other defenses to keep pace with changes in synthetic biology. National biodefense must not be exclusively reactive. A comprehensive counter-SBW plan would look for and respond to clear and present synthetic biologic dangers while advancing the country's knowledge about potential and emerging threats.
The government as a whole and the individual services in particular must develop flexible and muscular response plans that include well-maintained stockpiles of specialized sensors and protective equipment. Defensively, lessons learned from COVID-19 social distancing should inform reactions to SBW fires and associated doctrine. The federal government must assess, determine, and message what a proportional response to various levels of SBWs would be. These efforts should feature in military wargaming and principal-level exercises, with appropriate effort spent in developing and signaling tactical, operational, and strategic options.
At the same time, every effort should be made to limit the perception of an offensive advantage for U.S. SBW capabilities. If adversaries perceive that the United States takes an "SBWs for me, but not for thee" approach, an arms race could ensue. Transparency in bilateral and global messaging can mitigate these dangers. This must be considered a strategic priority.
Finally, international regimes must be strengthened. This should begin with Secretary of State Antony Blinken attending the December 2021 Biological Weapons Convention review conference—the pentennial meeting to make substantive improvements to the treaty. Adversaries and partners likely will mirror the U.S. action, creating political interest unseen in a decade. This is a strategic opportunity to address the convention's chronic financing and compliance issues and questions about its applicability to synthetic threats. U.S. diplomatic efforts should seek an international clarification that leans on Article VII to streamline access to biological samples so long as prenegotiated standards are met.[22] Even agreeing on standard template language or other means to reduce barriers would be critical in time-sensitive SBW response.
The United States should complement this effort with broad reengagement in global health, bioethics, and normative bodies to guide international standards in line with U.S. values and interests. International response plans should be developed within NATO, Indo-Pacific security agreements, and the so-called Five Eyes intelligence-sharing agreement.
Reinforcing alliance and mutual-defense structures increases preparedness while also encouraging anti-SBW policies among powerful multilateral blocs. In turn, this can generate momentum in global efforts to strengthen the Biological Weapons Convention and other essential treaties.

COVID-19 revealed key U.S. vulnerabilities, and adversaries have taken note. SBWs provide a brand-new capability—human-domain fires without any conventional equivalent. **In just eight years, CRISPR-Cas9 has transformed from an unknown technique with messy, collateral damage to a precise genetic surgery that has successfully cured diseases in human adults**.[23] And the technology will only improve, creating more powerful options for those who pursue them. China seeks to become a biotechnology superpower, developing scientific capabilities whose military uses the PLA openly considers.[24] U.S. planners must recognize this synthetic sea change and prepare before it is too late.

▶▶ **References are available at the source's URL.**

New DNA vaccine by Taiwan triggers immune response in mice & hamsters, could help fight Covid

Source: https://theprint.in/health/new-dna-vaccine-by-taiwan-triggers-immune-response-in-mice-hamsters-could-help-fight-covid/666737/

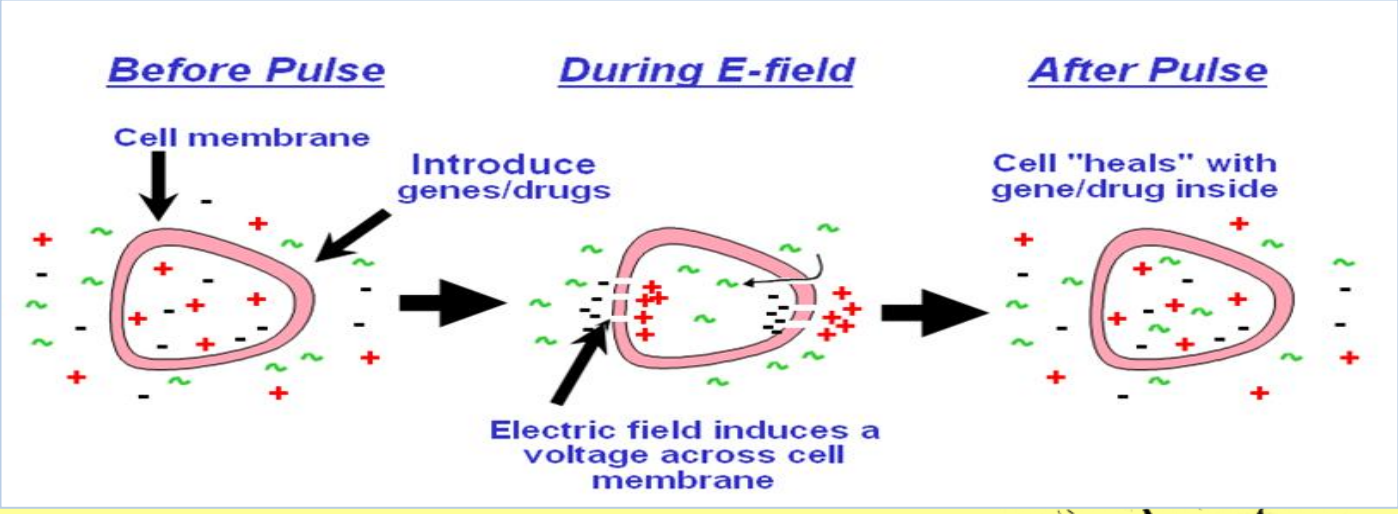
May 28 – Scientists in Taiwan have developed a new DNA Covid-19 vaccine that induced a long-lasting immune response in animal models. In a study, published in the journal *PLOS Neglected Tropical Diseases* Thursday, researchers suggest that their newly developed vaccine could play a major role in controlling the pandemic. DNA vaccines, much like the mRNA vaccine produced by Moderna and Pfizer, use genetic material of a virus to elicit an immune response. These vaccines can be produced more quickly, at a lower cost and do not require cold temperatures for transportation unlike the mRNA vaccines. Gene-based vaccines deliver a part of the genetic code to the body's cells. Using this code as a set of instructions the body's cells create the antigen — a selected part of the pathogen.

Detecting this protein, which is harmless and cannot cause any disease, the immune system kicks into action. It learns to recognise the spike protein, priming the body to launch an attack when it encounters the real virus. However, DNA vaccines present an additional challenge since the genetic material in the vaccine ends up triggering an immune response and does not give an opportunity for the cells to create the antigen, which is supposed to trigger the immune response. But the vaccines have been successful in animals, which is why researchers continue to work towards developing them.

Taiwan's DNA vaccine

The researchers from the National Health Research Institutes in Taiwan created a DNA vaccine that encodes the spike protein of the Covid-19 virus. The spike protein helps SARS-CoV-2 latch onto the host cell and infect it. To overcome the poor delivery of DNA into cells, which is often the case with such vaccines, they used electroporation for the delivery.

Electroporation is a technique in which an electrical field is applied to cells in order to increase the permeability of the cell membrane, which allows chemicals, drugs and DNA to be introduced into the cell.



The research showed that mice and hamsters, immunized with the new DNA vaccine, developed long-lasting antibodies against the SARS-CoV-2 spike protein.

The antibodies peaked at eight weeks post-immunisation and the levels remained relatively high at week 20.
Hamsters that received two shots at a three-week interval, when exposed to Covid-19 after seven weeks were protected from the virus. They showed no loss of body weight and less viral RNA in their lungs compared to animals that were not immunised.
The vaccine is yet to be tested in humans. Till date, no DNA vaccines have been approved for human use.
In fact, the Covid pandemic fast-tracked the research on gene-based vaccines with Moderna's mRNA vaccine becoming the first such vaccine to be approved last year.
Meanwhile, Ahmedabad-based pharmaceutical firm Zydus Cadila has already developed a DNA vaccine, which is undergoing human trials, and is likely to become available in India by June.

First Known Case of H10N3 Bird Flu Caught by a Human Has Been Reported in China

Source: https://www.sciencealert.com/china-reports-first-known-human-case-of-h10n3-bird-flu

June 02 – A man in China caught the first case of H10N3 bird flu ever reported in a human, China's National Health Commission (NHC) announced Tuesday (June 1).
The H10N3 strain of avian influenza normally causes mild disease in birds, and until now, no cases of the viral infection had been reported in humans, according to a statement on the NHC website, as translated by Reuters. But on April 23, a 41-year-old man in the city of Zhenjiang developed a fever that progressed over the following days, and on April 28, he went to a local hospital for treatment.

(Although H10N3 only causes mild disease in its natural hosts, that may not hold true when the strain jumps to people.)
On May 28, the Chinese Center for Disease Control and Prevention (CCDC) performed a genetic analysis on specimens from the infected man and determined he was infected with H10N3, according to the statement.
The CCDC then monitored the surrounding **province of Jiangsu** for additional cases of infection and specifically sought out the man's close contacts, but they discovered no additional cases. The man is now in stable condition and ready for discharge from the hospital, the statement notes.
Scientists will need to thoroughly examine the genetic material of the strain that infected the man to see how it differs from H10N3 samples collected in the past, Filip Claes, regional laboratory coordinator of the UN's Emergency Centre for Transboundary Animal Diseases at the Regional Office for Asia and the Pacific, part of the agency's Food and Agriculture Organization, told Reuters.

In general, H10N3 doesn't crop up very often in its natural hosts, birds, Claes noted. From the late 1970s to 2018, scientists isolated about 160 samples of the viral strain from infected animals, mostly from wild birds and waterfowl, and the strain hadn't been detected in chickens, he said.
The CCDC did not specify how or when the infected man may have picked up the virus from a bird, Reuters noted. But based on the CCDC's assessments so far, there's little risk of the virus spreading on a large scale, the agency said.
When avian influenza viruses make the leap from birds to humans, they usually don't spread between humans, and when they do, their transmission is typically "limited, inefficient and not sustained," according to the US Centers for Disease Control and Prevention.
However, in rare instances, avian flu can indeed spark major outbreaks among people, so monitoring for new cases of infection remains very important for public health, according to the CDC.
For instance, the last bird flu to cause significant outbreaks among humans was H7N9, which killed more than 300 people in 2016 and 2017, Science magazine reported. That virus strain has a case-fatality rate of about 40 percent, according to a 2016 issue of the CDC journal *Morbidity and Mortality Weekly Report*.
And back in 1957, the avian influenza virus H2N2 swapped genes with human flu viruses and sparked a full-blown pandemic, Gizmodo reported. Evidence suggests that the flu strain that caused the 1918 pandemic, H1N1, also came from birds, refuting some older studies that suggested it originated from a mix of human and swine viruses, *Nature* reported in 2014.
Earlier this year, Russian authorities reported the first known cases of an avian influenza virus called H5N8 passing from poultry to humans, Live Science previously reported.
Seven workers at a poultry plant caught this strain, but there was no evidence of human-to-human transmission, meaning the virus spread directly from birds to the workers and did not spread from the workers to other humans.

Will COVID-19 Come Back in the Fall of 2021?

By Eric Holdeman
Source: https://www.govtech.com/em/emergency-blogs/disaster-zone/will-covid-19-come-back-in-the-fall-of-2021

June 01 – The situation today is that tremendous progress has been made in reducing the number of COVID-19 cases here in the United States. Most people attribute that to the surge in vaccinations that happened as soon as the vaccine(s) became available.
As I write this, we are at the start of the Memorial Day holiday weekend. People will be traveling and gathering in small and large groups. While I think the Centers for Disease Control and Prevention's revision of mask policy was a flawed rollout of the change, there are still many people where I live wearing their masks indoors and some outdoors.
The question is, will coronavirus cases start to track upward this coming fall as people move back indoors and we have large gatherings of people for sporting events, in movie theaters, at schools, etc.?
If you think of the virus as being like the common cold and the flu in the manner in which it spreads, I think the answer has to be yes. It is an airborne disease that spreads in the air and there are other common illnesses that start to appear and spread similarly in the fall.
For me, I'll target the end of October and the beginning of November as the dates on the calendar to watch and see what happens. All the more reason to still get vaccinated if you have not already done so.

***Eric Holdeman** is a nationally known emergency manager. He has worked in emergency management at the federal, state and local government levels. Today he serves as the Director, Center for Regional Disaster Resilience (CRDR), which is part of the Pacific Northwest Economic Region (PNWER). The focus for his work there is engaging the public and private sectors to work collaboratively on issues of common interest, regionally and cross jurisdictionally.*

The 12 deadliest viruses on Earth

Source: https://www.livescience.com/56598-deadliest-viruses-on-earth.html

Humans have been battling viruses since before our species had even evolved into its modern form. For some viral diseases, vaccines and antiviral drugs have allowed us to keep infections from spreading widely, and have helped sick people recover. For one disease — smallpox — we've been able to eradicate it, ridding the world of new cases.
But we're a long way from winning the fight against viruses. In recent decades, several viruses have jumped from animals to humans and triggered sizable outbreaks, claiming

thousands of lives. The viral strain that drove the 2014-2016 Ebola outbreak in West Africa kills up to 90% of the people it infects, making it the most lethal member of the Ebola family.
But there are other viruses out there that are equally deadly, and some that are even deadlier. Some viruses, including the novel coronavirus currently driving outbreaks around the globe, have lower fatality rates, but still pose a serious threat to public health as we don't yet have the means to combat them.
Here are the 12 worst killers, based on the likelihood that a person will die if they are infected with one of them, the sheer numbers of people they have killed, and whether they represent a growing threat.

Marburg virus

Scientists identified Marburg virus in 1967, when small outbreaks occurred among lab workers in Germany who were exposed to infected monkeys imported from Uganda. Marburg virus is similar to Ebola in that both can cause hemorrhagic fever, meaning that infected people develop high fevers and bleeding throughout the body that can lead to shock, organ failure and death.
The mortality rate in the first outbreak was 25%, but it was more than 80% in the 1998-2000 outbreak in the Democratic Republic of Congo, as well as in the 2005 outbreak in Angola, according to the World Health Organization (WHO).

Ebola virus

The first known Ebola outbreaks in humans struck simultaneously in the Republic of the Sudan and the Democratic Republic of Congo in 1976. Ebola is spread through contact with blood or other body fluids, or tissue from infected people or animals. The known strains vary dramatically in their deadliness, Elke Muhlberger, an Ebola virus expert and associate professor of microbiology at Boston University, told Live Science.
One strain, Ebola Reston, doesn't even make people sick. But for the Bundibugyo strain, the fatality rate is up to 50%, and it is up to 71% for the Sudan strain, according to WHO.
The outbreak underway in West Africa began in early 2014, and is the largest and most complex outbreak of the disease to date, according to WHO.

Rabies

Although rabies vaccines for pets, which were introduced in the 1920s, have helped make the disease exceedingly rare in the developed world, this condition remains a serious problem in India and parts of Africa.
"It destroys the brain, it's a really, really bad disease," Muhlberger said. "We have a vaccine against rabies, and we have antibodies that work against rabies, so if someone gets bitten by a rabid animal we can treat this person," she said.
However, she said, "if you don't get treatment, there's a 100% possibility you will die."

HIV

In the modern world, the deadliest virus of all may be HIV. "It is still the one that is the biggest killer," said Dr. Amesh Adalja, an infectious disease physician and spokesman for the Infectious Disease Society of America.
An estimated 32 million people have died from HIV since the disease was first recognized in the early 1980s. "The infectious disease that takes the biggest toll on mankind right now is HIV," Adalja said.
Powerful antiviral drugs have made it possible for people to live for years with HIV. But the disease continues to devastate many low- and middle-income countries, where 95% of new HIV infections occur. Nearly 1 in every 25 adults within the WHO African region is HIV-positive, accounting for more than two-thirds of the people living with HIV worldwide.

Smallpox

In 1980, the World Health Assembly declared the world free of smallpox. But before that, humans battled smallpox for thousands of years, and the disease killed about 1 in 3 of those it infected. It left survivors with deep, permanent scars and, often, blindness.
Mortality rates were far higher in populations outside of Europe, where people had little contact with the virus before visitors brought it to their regions. For example, historians estimate 90% of the native population of the Americas died from smallpox introduced by European explorers. In the 20th century alone, smallpox killed 300 million people.
"It was something that had a huge burden on the planet, not just death but also blindness, and that's what spurred the campaign to eradicate from the Earth," Adalja said.

Hantavirus

Hantavirus pulmonary syndrome (HPS) first gained wide attention in the U.S. in 1993, when a healthy, young Navajo man and his fiancée living in the Four Corners area of the United

States died within days of developing shortness of breath. A few months later, health authorities isolated hantavirus from a deer mouse living in the home of one of the infected people. More than 600 people in the U.S. have now contracted HPS, and 36% have died from the disease, according to the Centers for Disease Control and Prevention.
The virus is not transmitted from one person to another, rather, people contract the disease from exposure to the droppings of infected mice.
Previously, a different hantavirus caused an outbreak in the early 1950s, during the Korean War, according to a 2010 paper in the journal Clinical Microbiology Reviews. More than 3,000 troops became infected, and about 12% of them died.
While the virus was new to Western medicine when it was discovered in the U.S., researchers realized later that Navajo medical traditions describe a similar illness, and linked the disease to mice.

Influenza

During a typical flu season, up to 500,000 people worldwide will die from the illness, according to WHO. But occasionally, when a new flu strain emerges, a pandemic results with a faster spread of disease and, often, higher mortality rates.
The most deadly flu pandemic, sometimes called the Spanish flu, began in 1918 and sickened up to 40% of the world's population, killing an estimated 50 million people.
"I think that it is possible that something like the 1918 flu outbreak could occur again," Muhlberger said. "If a new influenza strain found its way in the human population, and could be transmitted easily between humans, and caused severe illness, we would have a big problem."

Dengue

Dengue virus first appeared in the 1950s in the Philippines and Thailand, and has since spread throughout the tropical and subtropical regions of the globe. Up to 40% of the world's population now lives in areas where dengue is endemic, and the disease — with the mosquitoes that carry it — is likely to spread farther as the world warms.
Dengue sickens 50 to 100 million people a year, according to WHO. Although the mortality rate for dengue fever is lower than some other viruses, at 2.5%, the virus can cause an Ebola-like disease called dengue hemorrhagic fever, and that condition has a mortality rate of 20% if left untreated. "We really need to think more about dengue virus because it is a real threat to us," Muhlberger said.
A vaccine for Dengue was approved in 2019 by the U.S. Food and Drug Administration for use in children 9-16 years old living in an areas where dengue is common and with a confirmed history of virus infection, according to the CDC. In some countries, an approved vaccine is available for those 9-45 years old, but again, recipients must have contracted a confirmed case of dengue in the past. Those who have not caught the virus before could be put at risk of developing severe dengue if given the vaccine.

Rotavirus

Two vaccines are now available to protect children from rotavirus, the leading cause of severe diarrheal illness among babies and young children. The virus can spread rapidly, through what researchers call the fecal-oral route (meaning that small particles of feces end up being consumed).
Although children in the developed world rarely die from rotavirus infection, the disease is a killer in the developing world, where rehydration treatments are not widely available.
The WHO estimates that worldwide, 453,000 children younger than age 5 died from rotavirus infection in 2008. But countries that have introduced the vaccine have reported sharp declines in rotavirus hospitalizations and deaths.

SARS-CoV

The virus that causes severe acute respiratory syndrome, or SARS, first appeared in 2002 in the Guangdong province of southern China, according to the WHO. The virus likely emerged in bats, initially, then hopped into nocturnal mammals called civets before finally infecting humans. After triggering an outbreak in China, SARS spread to 26 countries around the world, infecting more than 8000 people and killing more than 770 over the course of two years.
The disease causes fever, chills and body aches, and often progresses to pneumonia, a severe condition in which the lungs become inflamed and fill with pus. SARS has an estimated mortality rate of 9.6%, and as of yet, has no approved treatment or vaccine. However, no new cases of SARS have been reported since the early 2000s, according to the CDC.

SARS-CoV-2

SARS-CoV-2 belongs to the same large family of viruses as SARS-CoV, known as coronaviruses, and was first identified in December 2019 in the Chinese city of Wuhan. The virus likely originated in bats, like SARS-CoV, and passed through an intermediate animal before infecting people.

Since its appearance, the virus has infected tens of thousands of people in China and thousands of others worldwide. The ongoing outbreak prompted an extensive quarantine of Wuhan and nearby cities, restrictions on travel to and from affected countries and a worldwide effort to develop diagnostics, treatments and vaccines.

The disease caused by SARS-CoV-2, called COVID-19, has an estimated mortality rate of about 2.3%. People who are older or have underlying health conditions seem to be most at risk of having severe disease or complications. Common symptoms include fever, dry cough and shortness of breath, and the disease can progress to pneumonia in severe cases.

MERS-CoV

The virus that causes Middle East respiratory syndrome, or MERS, sparked an outbreak in Saudi Arabia in 2012 and another in South Korea in 2015. The MERS virus belongs to the same family of viruses as SARS-CoV and SARS-CoV-2, and likely originated in bats, as well. The disease infected camels before passing into humans and triggers fever, coughing and shortness of breath in infected people.

MERS often progresses to severe pneumonia and has an estimated mortality rate between 30% and 40%, making it the most lethal of the known coronaviruses that jumped from animals to people. As with SARS-CoV and SARS-CoV-2, MERS has no approved treatments or vaccine.

The Next Pandemic Is Already Happening – Targeted Disease Surveillance Can Help Prevent It

By Maureen Miller

Source: http://www.homelandsecuritynewswire.com/dr20210602-the-next-pandemic-is-already-happening-targeted-disease-surveillance-can-help-prevent-it

June 02 – As more and more people around the world are getting vaccinated, one can almost hear the collective sigh of relief. But the next pandemic threat is likely already making its way through the population right now.

My research as an infectious disease epidemiologist has found that there is a simple strategy to mitigate emerging outbreaks: proactive, real-time surveillance in settings where animal-to-human disease spillover is most likely to occur.

In other words, don't wait for sick people to show up at a hospital. Instead, monitor populations where disease spillover actually happens.

The Current Pandemic Prevention Strategy

Global health professionals have long known that pandemics fueled by zoonotic disease spillover, or animal-to-human disease transmission, were a problem. In 1947, the World Health Organization established a global network of hospitals to detect pandemic threats through a process called syndromic surveillance. The process relies on standardized symptom checklists to look for signals of emerging or reemerging diseases of pandemic potential among patient populations with symptoms that can't be easily diagnosed. This clinical strategy relies both on infected individuals coming to sentinel hospitals and medical authorities who are influential and persistent enough to raise the alarm.

There's only one hitch: By the time someone sick shows up at a hospital, an outbreak has already occurred. In the case of SARS-CoV-2, the virus that causes COVID-19, it was likely widespread long before it was detected. This time, the clinical strategy alone failed us.

Zoonotic Disease Spillover Is Not One and Done

A more proactive approach is currently gaining prominence in the world of pandemic prevention: viral evolutionary theory. This theory suggests that animal viruses become dangerous human viruses incrementally over time through frequent zoonotic spillover.

It's not a one-time deal: An "intermediary" animal such as a civet cat, pangolin or pig may be required to mutate the virus so it can make initial jumps to people. But the final host that allows a variant to become fully adapted to humans may be humans themselves.

Viral evolutionary theory is playing out in real time with the rapid development of COVID-19 variants. In fact, an international team of scientists have proposed that undetected human-to-human transmission after an animal-to-human jump is the likely origin of SARS-CoV-2.
When novel zoonotic viral disease outbreaks like Ebola first came to the world's attention in the 1970s, research on the extent of disease transmission relied on antibody assays, blood tests to identify people who have already been infected. Antibody surveillance, also called serosurveys, test blood samples from target populations to identify how many people have been infected. Serosurveys help determine whether diseases like Ebola are circulating undetected.
Turns out they were: Ebola antibodies were found in more than 5% of people tested in Liberia in 1982, decades before the West African epidemic in 2014. These results support viral evolutionary theory: It takes time – sometimes a lot of time – to make an animal virus dangerous and transmissible between humans.
What this also means is that scientists have a chance to intervene.

Measuring Zoonotic Disease Spillover

One way to take advantage of the lead time for animal viruses to fully adapt to humans is long-term, repeated surveillance. Setting up a pandemic threats warning system with this strategy in mind could help detect pre-pandemic viruses before they become harmful to humans. And the best place to start is directly at the source.
My team worked with virologist Shi Zhengli of the Wuhan Institute of Virology to develop a human antibody assay to test for a very distant cousin of SARS-CoV-2 found in bats. We established proof of zoonotic spillover in a small 2015 serosurvey in Yunnan, China: 3% of study participants living near bats carrying this SARS-like coronavirus tested antibody positive. But there was one unexpected result: None of the previously infected study participants reported any harmful health effects. Earlier spillovers of SARS coronaviruses – like the first SARS epidemic in 2003 and Middle Eastern Respiratory Syndrome (MERS) in 2012 – had caused high levels of illness and death. This one did no such thing.
Researchers conducted a larger study in Southern China between 2015 and 2017. It's a region home to bats known to carry SARS-like coronaviruses, including the one that caused the original 2003 SARS pandemic and the one most closely related to SARS-CoV-2.
Fewer than 1% of participants in this study tested antibody positive, meaning they had been previously infected with the SARS-like coronavirus. Again, none of them reported negative health effects. But syndromic surveillance – the same strategy used by sentinel hospitals – revealed something even more unexpected: An additional 5% of community participants reported symptoms consistent with SARS in the past year.
This study did more than just provide the biological evidence needed to establish proof of concept to measure zoonotic spillover. The pandemic threats warning system also picked up a signal for a SARS-like infection that couldn't yet be detected through blood tests. It may even have detected early variants of SARS-CoV-2.
Had surveillance protocols been in place, these results would have triggered a search for community members who may have been part of an undetected outbreak. But without an established plan, the signal was missed.

From Prediction to Surveillance to Genetic Sequencing

The lion's share of pandemic prevention funding and effort over the past two decades has focused on discovering wildlife pathogens, and predicting pandemics before animal viruses can infect humans. But this approach has not predicted any major zoonotic disease outbreaks – including H1N1 influenza in 2009, MERS in 2012, the West African Ebola epidemic in 2014 or the current COVID-19 pandemic.
Predictive modeling has, however, provided robust heat maps of the global "hot spots" where zoonotic spillover is most likely to occur. Long-term, regular surveillance at these "hot spots" could detect spillover signals, as well as any changes that occur over time. These could include an uptick in antibody-positive individuals, increased levels of illness and demographic changes among infected people. As with any proactive disease surveillance, if a signal is detected, an outbreak investigation would follow. People identified with symptoms that can't be easily diagnosed can then be screened using genetic sequencing to characterize and identify new viruses.
This is exactly what Greg Gray and his team from Duke University did in their search for undiscovered coronaviruses in rural Sarawak, Malaysia, a known "hot spot" for zoonotic spillover. Eight of 301 specimens collected from pneumonia patients hospitalized in 2017-2018 were found to have a canine coronavirus never before seen in humans. Complete viral genome sequencing not only suggested that it had recently jumped from an animal host – it also harbored the same mutation that made both SARS and SARS-CoV-2 so deadly.

Let's Not Miss the Next Pandemic Warning Signal

The good news is that surveillance infrastructure in global "hot spots" already exists. The Connecting Organizations for Regional Disease Surveillance program links six regional disease surveillance networks in 28 countries. They pioneered "participant surveillance," partnering with communities at high risk for both initial zoonotic spillover and the gravest health outcomes to contribute to prevention efforts.

For example, Cambodia, a country at risk of pandemic avian influenza spillover, established a free national hotline for community members to report animal illnesses directly to the Ministry of Health in real-time. Boots-on-the-ground approaches like these are key to a timely and coordinated public health response to stop outbreaks before they become pandemics.

It is easy to miss warning signals when global and local priorities are tentative. The same mistake need not happen again.

***Maureen Miller** is an Adjunct Associate Professor of Epidemiology @ Columbia University.*

The Vitamin D–COVID Question: Is the Answer in Our Genes?

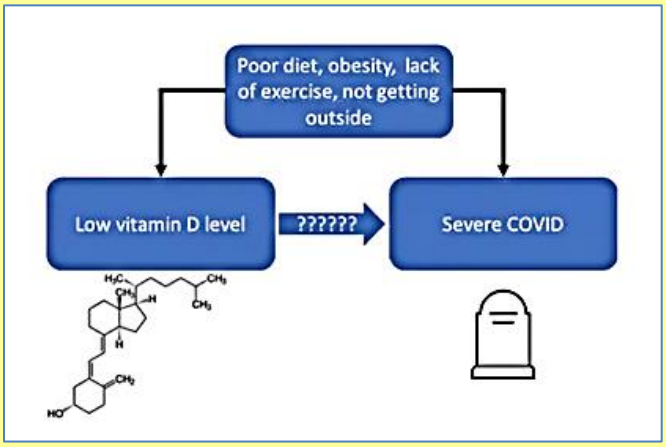
By F. Perry Wilson, MD, MSCE

Source: https://www.medscape.com/viewarticle/952170?src=wnl_edit_tpal&uac=82598DG&impID=3418287&faf=1

June 02 – Welcome to *Impact Factor*, your weekly dose of commentary on a new medical study. I'm Dr F. Perry Wilson of the Yale School of Medicine.

This week, we're going to dive into the lion's den once again with this study appearing in *PLOS Medicine*, which failed to show a causal link between vitamin D levels and COVID-19 incidence or severity.

And I know that this is one of those hot-button COVID issues. I think it's because we all really want there to be a cheap, easy way to avoid getting COVID or getting severe COVID. And technically, there is —it's a vaccine — but sure, it would be nice if there were something we had a lot more experience with. I get that.



And the observational data were definitely compelling. People with low vitamin D levels really do have worse COVID outcomes. Much worse.

But correlation isn't causation. You've heard that before, but we rarely dwell on what it really means. Why is causation so important? It's because if A *causes* B, then changing A changes B. When we ask if low vitamin D levels *cause* worse COVID, what we are really asking is: If I boost vitamin D levels, can I protect against COVID?

If there is causation, the answer is yes. But there might not be. Lots of things reduce vitamin D levels and increase the risk for COVID. I've often referred to vitamin D level as the lifestyle biomarker; it's higher in healthy, active people, the very people you'd expect would do pretty well if they got COVID.

The classic way to assess causality in medicine is via the randomized trial, and we have a few trials of vitamin D supplementation in COVID out there now. I made a quick table to highlight what is known.

Author	Journal	Intervention / Control	Population	Outcome
Murai et al	*JAMA*	200,000 IU vitamin D3 x 1 / placebo	240 hospitalized patients	No difference in LOS, ICU, vent
Castillo et al	*J Steroid Biochem Molecular Bio*	0.532 mg calcifediol daily / Usual care	76 hospitalized patients	Lower ICU in D patients
Rastogi et al	*Postgrad Med J*	60,000 IU vitamin D3 x 7 days / Placebo	40 COVID patients with 25-D < 20 ng/mL	Lower % with SARS-CoV-2 PCR + at 21 days

We have mixed results here from some pretty small studies, all of which focused on people who were already sick. The largest study says no benefit; smaller, less well-controlled studies find some benefit in soft outcomes. None of them answer the question of whether providing vitamin D supplementation to otherwise healthy people would affect COVID later on.

So, are we stuck?

It turns out that there is a clever way to assess causality that doesn't require a randomized trial. It's not perfect, but it might be the best we have. It's called Mendelian randomization.

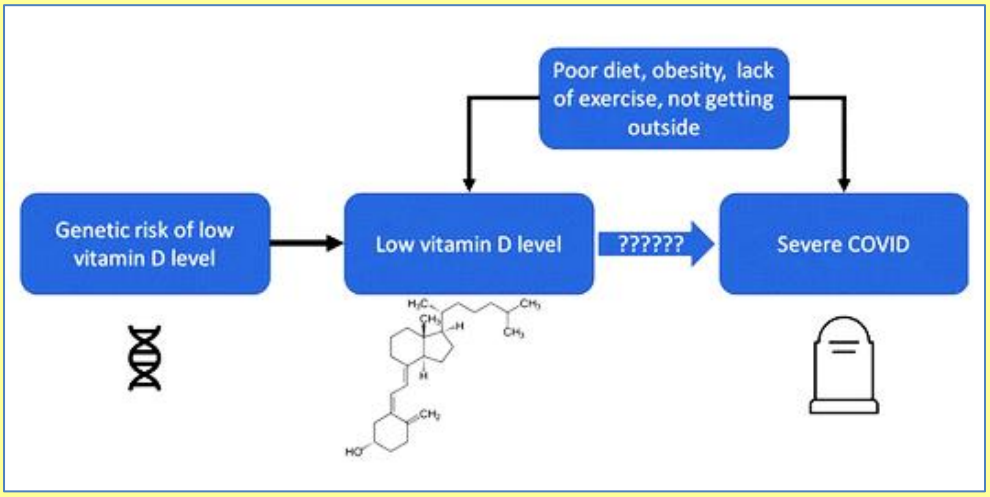
Here's how it works.

We have a causality question: Does low vitamin D level *cause* worse COVID? But we know that the vitamin D level is affected by a bunch of lifestyle and environmental factors for which we can't possibly control. But something else affects your vitamin D level: your genes.

Some people are genetically predisposed to have higher vitamin D levels, just like some people are genetically predisposed to be taller. Sure, your *actual* vitamin D level will be affected by all that other stuff, but your genes don't change.

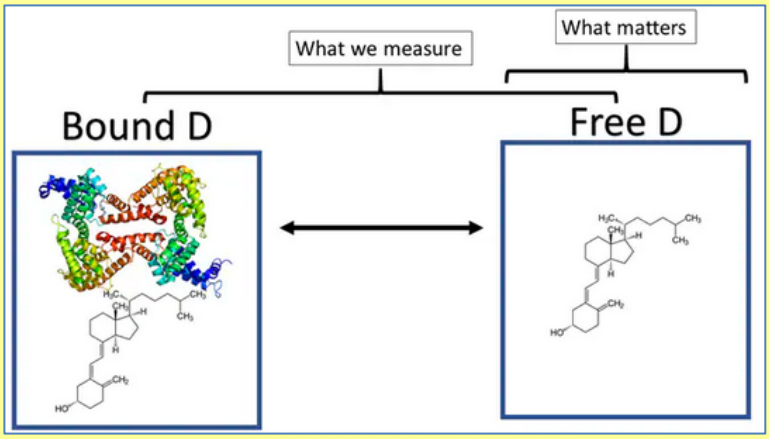
If low vitamin D is causally linked to worse COVID, people with a genetic predisposition to low vitamin D will have worse COVID than people with a genetic predisposition to have high vitamin D. Those genes basically bypass all the noise of the real world. It's a pretty neat trick, honestly.

Of course, you need a ton of data to figure out what genes (or in this case, tiny pieces of genes called SNPs) lead to higher vitamin D levels. Researchers in this study used about 450,000 people to create a genetic risk profile for low vitamin D levels. They then used that score to assess the genomes of around 14,000 people with COVID and 1.3 million people without COVID. If low vitamin D levels are causally linked to worse COVID, you'd expect the COVID group to be enriched with people with a genetic predisposition to have low vitamin D.



But this wasn't seen — not for susceptibility to COVID, not for hospitalization with COVID, not for severe disease. This figure basically says: We tried this a bunch of different ways, and no matter what, we don't see a protective signal.

At this point, we have little support for vitamin D supplementation as a preventive strategy.



A few caveats, though. First, it's important to remember that this analysis was not restricted to people who are vitamin D deficient. Very low levels of any vitamin, really, should be replenished. I mean, that's why they're vitamins.

There is also a subtler issue with these Mendelian randomization studies of vitamin D. You know that genetic risk score they are calculating? It's based on the measured vitamin D level. But the vitamin D level we measure in the blood is not the same as the bioavailable vitamin D.

We all have a protein called vitamin D binding protein that latches on to vitamin D in our blood, keeping it unavailable to our cells. Some of us have a D-binding protein with a higher affinity for vitamin D — and that is genetically determined.

In other words, two people with different *measured* levels of vitamin D may have the same effective levels of vitamin D based on genetic variation in D-binding protein. That means that the genetic risk score might not be capturing exactly what we think it is, limiting the validity of this analysis. Of course, all those observational studies linking low vitamin D levels to bad outcomes suffer from the same measurement problem.

Personally, I'm not a huge fan of vitamin supplementation in general. I recommend that my patients try to get their vitamins through the food they eat, and in the case of vitamin D, through the sunlight they get while exercising a bit outside. Fortunately, summer is coming — so go to it.

***F. Perry Wilson, MD, MSCE**, is an associate professor of medicine and director of Yale's Clinical and Translational Research Accelerator.*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Vaccine hesitancy is nothing new. Here's the damage it's done over centuries

By Tara Haelle (freelance journalist based in Dallas)
Source: https://www.sciencenews.org/article/vaccine-hesitancy-history-damage-anti-vaccination

A rally of the Anti-vaccination League of Canada filled the streets near City Hall in Toronto in 1919. City of Toronto Archives, Fonds 1244, Item 2517

May 11 – As vaccines to protect people from COVID-19 started becoming available in late 2020, the rhetoric of anti-vaccine groups intensified. Efforts to keep vaccines out of arms reinforce misinformation about the safety and effectiveness of the vaccines and spread disinformation — deliberately misleading people for political, ideological or other reasons.

Vaccines have been met with suspicion and hostility for as long as they have existed. Current opposition to COVID-19 vaccines is just the latest chapter in this long story. The primary driver of vaccine hesitancy throughout history has not been money, selfishness or ignorance.

"Vaccine hesitancy has less to do with misunderstanding the science and more to do with general mistrust of scientific institutions and government," says Maya Goldenberg, a philosophy expert at the University of Guelph, Ontario, who studies the phenomenon. Historically, people harmed or oppressed by such institutions are the ones most likely to resist vaccines, adds Agnes Arnold-Forster, a medical historian at the University of Bristol in England.

A range of recurring and intersecting themes have fueled hesitancy globally and historically. These include anxiety about unnatural substances in the body, vaccines as government surveillance or weapons, and personal liberty violations. Other concerns relate to parental autonomy, faith-based objections, and worries about infertility, disability or disease. For example, some people oppose vaccines that were grown in cell culture lines that began from aborted fetal cells, or they mistakenly believe vaccines contain fetal cells. One of today's false beliefs — that COVID-19 vaccines contain a microchip — represents anxiety about both vaccine ingredients and vaccines as a surveillance tool.

"The reasons people have hesitated reflect the cultural anxieties of their time and place," Goldenberg says. People worried about toxins arising during environmentalism in the 1970s and people in countries steeped in civil war have perceived vaccines as government weapons.

Historical attempts to curb vaccine hesitancy often failed because they relied on authoritarian and coercive methods. "They were very blunt, very punitive and very ineffective," Arnold-Forster says. "They had very little impact on actual vaccine intake."

The most effective remedies center on building trust and open communication, with family doctors having the greatest influence on people's decision to vaccinate. Increased use of

"trusted messengers" to share accurate and reassuring vaccine information with their communities builds on this.

18th Century

Smallpox vaccine sets the stage around the globe

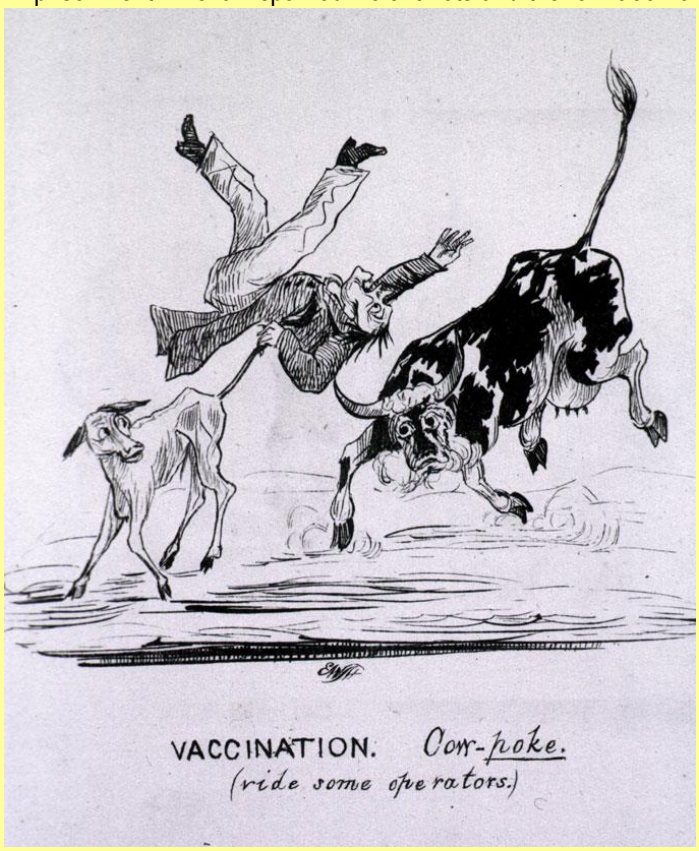
In a way, anti-vaccination attitudes predate vaccination itself. Public vaccination began after English physician Edward Jenner learned that milkmaids were protected from smallpox after exposure to cowpox, a related virus in cows. In 1796, Jenner scientifically legitimized the procedure of injecting people with cowpox, which he termed *variolae vaccinae*, to prevent smallpox. However, variolation — which staved off serious smallpox infections by triggering mild infection through exposure to material from an infected person — dates back to at least the 1000s in Asia, Africa and other parts of the world. In some cases people inhaled the dried scabs of smallpox lesions or rubbed or injected pus from smallpox lesions into a healthy person's scratched skin.

About 1 to 2 percent of people — including a son of Britain's King George III in 1783 — died from the procedure, far fewer than the up to 30 percent who died from smallpox. Benjamin Franklin rejected variolation, but later regretted it when smallpox killed his youngest son. Onesimus, an enslaved man in Boston, taught the procedure to Puritan minister Cotton Mather, who in turn urged doctors to inoculate the public during a 1721 smallpox outbreak. Many refused, and Mather faced hostility: A small bomb was thrown through his window. Reasons given for avoiding variolation — particularly that it was unnatural to interfere with a person's relationship with God — were the seeds of later anti-vaccination attitudes.

19th Century

The first vaccination laws kindle resistance

In 1809, Massachusetts passed the world's first known mandatory vaccination law, requiring the general population to receive the smallpox vaccine. Resistance began to grow as other states passed similar laws. Then the U.K. Vaccination Act of 1853 required parents to get infants vaccinated by 3 months old, or face fines or imprisonment. The law sparked violent riots and the formation of the Anti-Vaccination League of London. Vaccine resisters were often poor people suspicious of a forced medical intervention since, under normal circumstances, they rarely received any health care. Anti-vaccination groups argued that compulsory vaccination violated personal liberty, writing that the acts "trample upon the right of parents to protect their children from disease" and "invaded liberty by rendering good health a crime."



This 1838 illustration seems to take a negative view of a vaccination method that used cowpox to immunize people against a similar, and deadly, human disease, smallpox.National Library of Medicine

Anti-vaccination sentiment grew and spread across Europe until an 1885 demonstration of about 100,000 people in Leicester, England, prompted the British monarchy to appoint a commission to study the issue. The resulting 1896 report led to an 1898 act that removed penalties for parents who didn't believe vaccination was safe or effective. The act introduced the term "conscientious objectors," which later became more commonly associated with those who refuse military service on religious or moral grounds.

Across the Atlantic, most U.S. residents had embraced Jenner's cowpox protective, leading to a precipitous drop in smallpox outbreaks. But with fewer outbreaks, complacency set in and vaccination rates dropped. As smallpox outbreaks resurfaced in the 1870s, states began enforcing existing vaccination laws or passing new ones. British anti-vaccinationist William Tebb visited New York in 1879, which led to the founding of the Anti-Vaccination Society of America. The group's tactics will sound familiar: pamphlets, court battles and arguments in state legislatures that led to the repeal of mandatory vaccination

laws in seven states. The 1905 Supreme Court decision Jacobson v. Massachusetts upheld a state's right to mandate vaccines; it remains precedent today.

20th Century – A menu of vaccines draws praise and ire

1982: Documentary hypes vaccine injuries

The U.S. entered a golden age of vaccine development from the 1920s through the 1970s with the arrival of vaccines for diphtheria, pertussis, polio, measles, mumps and rubella. Opposition diminished as infection rates, particularly for polio, fell. Rosalynn Carter and Betty Bumpers, the wives of the governors of Georgia and Arkansas, respectively, began a vaccination campaign that grew into a national effort in the 1970s. The goal was to encourage every state to require children attending public school to receive most vaccines recommended by the U.S. Centers for Disease Control and Prevention.

A nationally aired 1982 news documentary called "DPT: Vaccine Roulette" changed everything. Lea Thompson, a reporter with WRC-TV in Washington, D.C., shared emotional stories of parents claiming their children had suffered seizures and brain damage from the diphtheria-pertussis-tetanus, or DPT, shot. Interviews with doctors lent the stories credence. Fever-caused seizures were a known side effect of DPT, and a 1974 study had reported neurological complications developing in 36 children within 24 hours of DPT vaccination. But the study did not follow the children long-term. Later research revealed neither the seizures nor the vaccine caused long-term brain damage.

But the damage to public trust was done. Coopting the DPT acronym, one parent, Barbara Loe Fisher, cofounded Dissatisfied Parents Together, which became the National Vaccine Information Center, the most influential anti-vaccine organization in the United States.

1998: Fraudulent study links vaccines to autism

The National Vaccine Information Center maintained a steady hum of anti-vaccination sentiment and activity through the 1980s and '90s. Then British gastroenterologist Andrew Wakefield published a report in the *Lancet* alleging that the measles-mumps-rubella, or MMR, vaccine caused autism spectrum disorder in 12 children. Wakefield falsified data, violated informed consent and secretly invested in development of a solo measles vaccine, but it took years to uncover his deceit (*SN Online: 2/3/10*). Fears about autism and vaccines had already exploded by the time the study was retracted 12 years after publication.

Protesters at a February 2021 event in Sydney, Australia, came out against the idea of mandatory COVID-19 vaccinations, just days before vaccines became available to frontline health care workers.Brook Mitchell/Getty Images

Almost immediately after publication of the study, U.K. vaccination rates began falling. But news of Wakefield's work didn't reach the United States until 2000, just as U.S. medical authorities were embroiled in a debate about the use of thimerosal, a mercury-containing preservative, in vaccines. In 1999, the U.S. Public Health Service recommended removing thimerosal from childhood vaccines as a precautionary measure to reduce infants' mercury exposure. Later research showed no safety concerns about its use. The MMR vaccine never contained thimerosal, but fears about mercury-related brain damage merged with those about MMR and autism, creating a storm of anger and fear surrounding claims of vaccine harm.

21st Century – Social media and slick documentaries

Despite the 2010 retraction of his study and the revocation of his license to practice medicine in the United Kingdom, Wakefield remains a leader in today's anti-vaccination movement. Joining him is Robert F. Kennedy, Jr., who gained prominence promoting unfounded allegations about thimerosal. Both men rode the wave of anti-vaccination networking on social media and the promotion of disinformation through slick documentaries like 2016's *Vaxxed: From Cover-Up to Catastrophe* (*SN Online: 4/1/16*).

In 2014, the United States saw its highest number of measles cases since the disease was eliminated from the country in 2000, culminating in a large outbreak that began at Disneyland that December. In response, California passed a law removing parents' ability to opt out of vaccinating their children based on personal beliefs and required that all children receive CDC-recommended vaccines to attend school (*SN Online: 7/2/19*). Extreme opposition to that law and subsequent ones helped fuel a resurgence in anti-vaccine advocacy along with an alarming measles outbreak in 2019 (*SN: 12/21/19 & 1/4/20, p. 24*).

The vast majority of people accept recommended vaccines and their role in stemming the spread of infectious diseases. Recent surveys suggest that 69 percent of U.S. adults say they have or will get a COVID-19 vaccine, an improvement over the 60 percent willing to do so in November. But responses to surveys don't necessarily predict behavior, Goldenberg says.

A Very Calm Guide to the Lab Leak Theory

By Rebecca Sohn

Source: https://slate.com/technology/2021/06/lab-leak-theory-questions-explainer.html

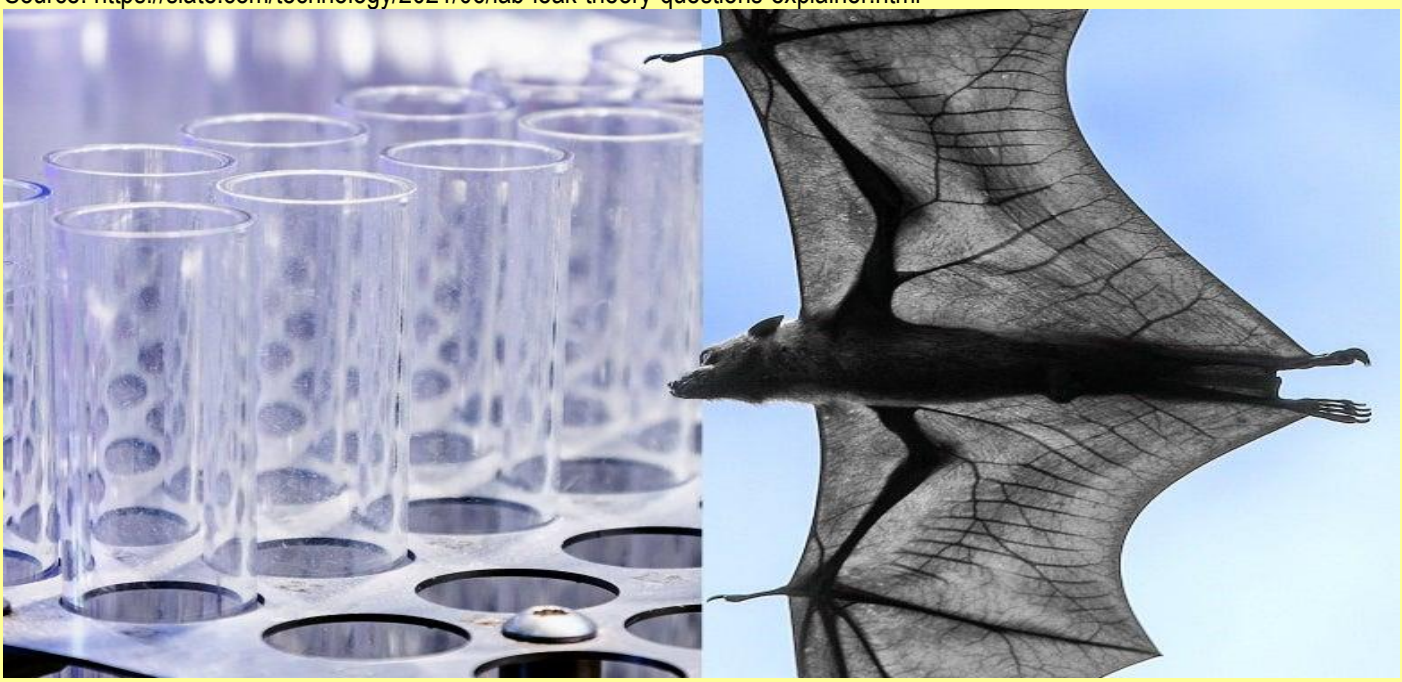


Photo illustration by Slate. Photos by DoroO/iStock/Getty Images Plus and serikbaib/iStock/Getty Images Plus.

June 03 – M ore than a year into the COVID-19 pandemic, scientists still aren't sure where exactly the virus that caused this mess came from, and how it was able to spread so rapidly among humans. With the origins of the coronavirus still up in the air, there's been a lot of talk of the so-called lab leak theory—the idea that the virus spread to people in a laboratory accident, rather than jumping from a wild animal to a human.

In recent days, there's been a flurry of speculation, and it can be hard to parse what the lab leak theory is all about, how likely it is, and why it matters at all. Here's our attempt to sort some of that out.

OK, for starters: I thought this was all a conspiracy theory.
Well, sort of. Near the beginning of the pandemic, President Donald Trump blamed China for the virus and suggested it originated in a lab. He didn't have evidence, and he wasn't taking his cues from scientists (who were saying that the virus most likely came from animals, as many viruses do). So, yes, shouting that the virus came from a lab in that context was unwarranted.
Some researchers published letters in prominent journals that dismissed those unfounded statements. "We stand together to strongly condemn conspiracy theories suggesting that COVID-19 does not have a natural origin," read a letter in the Lancet. "We were just saying, hey, time out, let's not draw conclusions until we have data," says Charles Calisher, an emeritus professor of microbiology and immunology at Colorado State University and a co-author of the Lancet letter.

So how is this no longer a conspiracy theory? Is there new data?
There is currently no direct evidence for either a natural origin or a lab leak. That is, no one has found the smoking gun—the virus hanging out in a lab, or in nature. Genetically, the virus is *similar* to coronaviruses found in bats and in pangolins, which are a type of anteaterlike mammal. But scientists haven't found the virus's exact sequence in an animal.

That seems like good evidence for the lab leak theory!
Not really. It can take years to identify a virus's source. It's also not a unique situation—scientists also aren't exactly sure where Ebola came from, either. Also, almost every vertebrate gets infected by coronaviruses, says Shangxin Yang, assistant medical director of the Clinical Microbiology Laboratory at UCLA Health. It's really no surprise we haven't found this one yet.

OK, but what about that Wall Street Journal article about the researchers who got sick?
In May, the Wall Street Journal reported that in November 2019, three researchers at the Wuhan Institute of Virology were sick enough that they sought hospital treatment for respiratory illness. They had symptoms that were similar to those of COVID-19—but also to those of other illnesses, like the flu.
Although some saw the report as supporting the lab leak theory, Yang notes that there was already some evidence that COVID-19 could have begun spreading in Wuhan as early as October. "I don't really see that as evidence [of a lab leak]," Yang says, because even if the researchers did have COVID-19, they wouldn't have *had* to have gotten it from a lab. "Those three could be only three out of hundreds or thousands of people who already got it."

Got it. OK, so that sounds pretty shaky. Hasn't there been an actual investigation into the lab leak?
Yes. In March 2021, a joint study between World Health Organization and Chinese scientists looked at some of the ways the virus might have spread. They visited hospitals and government labs and interviewed Chinese scientists, doctors, and officials about the start of the pandemic. The report concluded that a lab origin of the virus was "extremely unlikely." Researchers in the Wuhan Institute of Virology's coronavirus lab—which is where the leak would have potentially come from—said none of them had antibodies for the virus, and no coronavirus sample matching Sars-CoV-2 exists in their lab. Plus, viruses similar to Sars-CoV-2 exist in nature.

Why not just trust that conclusion, then?
Well, some scientists do. But it was far from a transparent investigation, says Alina Chan, a molecular biologist at the Broad Institute of the Massachusetts Institute of Technology and Harvard. Chan has previously argued that a lab origin of the virus is possible in part because, unlike the original SARS virus, this new virus didn't change and mutate constantly to adapt to human hosts in the pandemic's first months. The WHO scientists, she says, "had to be chaperoned everywhere" by Chinese government officials and weren't allowed to see raw data on early COVID-19 patients, limiting their ability to draw conclusions about the virus's early spread. Chan also said that scientists' early efforts to distance themselves from the theory, back when Trump was shouting about it, only made it harder for other scientists to voice concerns over the real possibility of a lab leak.
In May, a group of dissatisfied scientists, including Chan and many prominent virologists, epidemiologists, and public health researchers, published a letter in the journal Science in support of a more transparent investigation and serious consideration of the "lab leak" theory. Soon after, President Joe Biden asked U.S. intelligence agencies to redouble their investigation into the virus's origins, which had been inconclusive. The agencies are to update Congress on the results within 90 days.

It's important to acknowledge that scientists pushing for further investigation are not saying that the virus could have been engineered for use as a bioweapon or released on purpose. "That's where the conspiracy line is very clear," says Chan.

OK, so the "lab leak"—if it happened—wasn't purposeful. How *could* it have happened?
There are a few ways, says Chan. Researchers travel to remote areas to collect virus samples, she says, and "during that fieldwork, a researcher could get reasonably infected," she says. Scientists going into remote caves and old mines to collect, for example, bat guano from infected animals sometimes wear full protective equipment but sometimes do not, as science writer David Quammen describes in his book on disease outbreaks from animals. Yes, this would effectively be an instance of "spillover" of a virus from an animal to a human—but in the course of doing research. Researchers could also have become infected if they were working with a virus in the lab and not wearing proper gear or following safety procedures, says Chan.

Why would scientists in Wuhan be working with a dangerous virus in the first place?
In part, to try to prevent a pandemic like this one from happening. A type of research called "gain of function" research examines how a virus might evolve—or gain—different ways of spreading, including the ability to reach humans. Scientists try to mimic this process themselves, by altering parts of a virus's structure or genome, then infecting human cells grown in the lab. "The reason for doing it [is] so in case an epidemic appeared, we want to be better prepared by understanding it better," says Robert Gallo, co-founder and director of the Institute of Human Virology at the University of Maryland School of Medicine, and co-founder and international scientific adviser of the Global Virus Network.
According to National Institutes of Health grants examined by journalist Nicholas Wade, gain of function research was being done at the Wuhan Institute of Virology at some point. (Confusingly, Anthony Fauci has claimed that the NIH did not fund gain of function research, but Chan points out that his definition of "gain of function research" is a bit narrow).

Does that mean scientists could have *created* Sars-CoV-2?
Not quite. The virus's genetic code shows that its genome has not been extensively altered by humans, says Chan. But she argues that it's possible humans made small changes to it. Those are harder to detect.
Other scientists argue that humans simply wouldn't be able to intentionally create (or tweak) a virus that spreads *so* efficiently. "Humans are not smart enough to do that," says Yang. For proof, Yang says, just look to recent disease outbreaks—Ebola, SARS, and MERS are all caused by viruses that originated in animals. Gain of function research, in that line of thinking, would have to be very, very sophisticated in order to mimic that.

OK, so it sounds like the jury is still out.
Most experts still tend to think the virus has a natural origin. Yang explains that a lab leak is theoretically possible but extremely unlikely. So many other infectious diseases have originated from animals, including the MERS and SARS outbreaks caused by coronaviruses. Because humans live increasingly close to animals, diseases that originate from animals have also long been predicted to become more prevalent.
But yes, without more data, it's impossible to know for sure. Chan thinks scientists shouldn't be asked to constantly make public judgment on the likelihood of one scenario versus another—if new evidence emerges, they might feel like they can't change their mind. She also thinks it's just impossible to really nail down the probability of a lab leak without a transparent understanding of what was happening in the lab. "It would be like trying to guess what's the likelihood of rolling a six without knowing how many sides of the dice there are," says Chan.
Probably not. "If it was ever a lab leak, WHO would want to know and make sure it never happens again," says Gallo. But "you're not going to gain anything out of knowing one way or another." And regardless of the origin of this virus, we know that viruses jump from animals all the time. That kind of transmission definitely poses an ongoing threat. Yang says it will be important to identify regional outbreaks of diseases from animals before they spread very far. But if history is any lesson, says Yang, there is no way to entirely prevent diseases from spreading this way. "The reality is, unfortunately, that COVID will not be the last one," he says.
Others argue that everyone has a right to know how this pandemic started, especially if a safety lapse ended up causing a lab leak. As Chan explains, "If we're aware that these labs are doing very high-risk pathogen research on the sources of pandemics, people in America and most of the world can write to their governments and say, 'Let's not have that happen in my city."

***Rebecca Sohn** is a freelance science journalist. She has been an intern at CalMatters and Stat as well as a science fellow at Mashable.*

COVID-19 Antiviral Candidate Hobbles RNA Replicase

An RNA replicase essential to the replication of SARS-CoV-2 depends on iron-sulfur clusters located in a catalytic subunit. The clusters can be oxidized by the stable nitroxide **TEMPOL**, whereupon they disassemble. In cell culture, TEMPOL potently inhibited the RNA replicase and blocked SARS-CoV-2 replication. + MORE

Is Covid-19 a Bio-Weapon?

Source: http://www.homelandsecuritynewswire.com/dr20210604-is-covid19-a-bioweapon

June 04 – This past week, US Senator Rand Paul (R-KY) questioned Dr. Anthony Fauci, the Director of the US National Institute of Allergies & Infectious Diseases, about the NIH funding of "Gain of Function" research at the Wuhan Laboratories in China. Paul cited recently-released records about such research being done on Corona viruses from bats - the source of Covid-19 - by Dr. Ralph Baric of NIH, with the Wuhan Labs.

"Gain of Function" is a lab process of collecting already dangerous viruses and then making them even more dangerous, by manipulating the virus proteins to make it more infectious, or deadly, or both.

The fact that Covid-19 originated at Wuhan, China, and that the Chinese government has kept the genesis of Covid a secret, raises terrifying questions. Most troubling is the almost complete lack of media or political interest in a question about something that has killed 600,000 Americans, and over 3 million across the globe.

Bio-warfare is nothing new. In the Middle Ages, siege armies would catapult the corpses of dead of bubonic plague victims over city walls to infect the defenders. In the 19th century American West, troops gave blankets infected with Smallpox to hostile Indian tribes, to sicken and kill them.

And bio-warfare has been a staple of literature and cinema for over a century: HG Wells' "The War of the Worlds;" Tom Clancy's novel "Executive Orders" (about a bio attack from Iran); the film "Omega Man" (about survivors of germ warfare); all deal with the tactics and horrors of bio-warfare.

The "racial disparity" of the deaths from Covid should raise alarms. Not the relatively small differences between white, black and Hispanic death rates in America - that have vexed so many of our media. But the massive disparity between death rates of East Asian countries, and everyone else on earth. Compare the current Covid death totals by country:

China 4,636; Japan 11,850; S Korea 1,896; N Korea 0; Taiwan 11; Laos 2; Vietnam 37; Philippines 18,714; Cambodia 137; Thailand 570; Singapore 31; Mongolia 214; Hong Kong 209; Indonesia 45,334; USA 601,034; Brazil 434,852; France 107,423; Germany 86,669; Italy 124,063; England 127,668; India 270,319; Mexico 220,380; Colombia 80,790;

On a per capita basis, non-East Asians are dying at rates 20 times higher that of East Asians. That is not a statistical "blip." It screams that the virus has massively unequal kill rates - and kills people of different races very differently. That is the signature of a bio-weapon. Like smallpox in the Americas, it kills the "enemy" far more that it hurts your own people.

Are there other possible explanations ? Perhaps prior exposure and immunity to corona viruses ? Or something in the diet ? Or something cultural in the individual precautions ? Or perhaps genetic differences that mitigate Covid are just coincidental ?

Our political, media and medical establishments have been dead silent about these profoundly disturbing and existential questions. It's time to demand some answers.

EDITOR'S COMMENT: Does this article imply the possibility of a "covert ethnic bioweapon"?

Putin: Europe delays Sputnik-V approval because of 'money fight'

Source: https://www.athina984.gr/en/2021/06/04/poytin-i-eyropi-kathysterei-tin-egkrisi-toy-sputnik-v-epeidi-ginetai-machi-gia-ta-chrimata/

June 04 – Speaking today at the World Economic Forum in St. Petersburg, Russian President Vladimir Putin said that Europe was delaying the adoption of the Russian Sputnik-V vaccine against coronavirus because it was a "battle for money" and that trade interests had taken precedence over European health. citizens.

"I think this is a battle for money on the part of those who produce a similar product in other countries and want to assimilate the European market with its distinctive brilliance and do it well," Putin said.
At the same time, the Russian president instructed the Russian government to study the issue of the organization of paid vaccination in Russia for foreign citizens by the end of June.
The head of the Russian Direct Investment Fund (RDIF), Kirill Dmitriev, said from the St. Petersburg Economic Forum that "Russia may open up to vaccine tourism," adding that RDIF is in contact with a number of key Russian ministries. to develop a system of mass vaccination tourism in the Russian Federation "

Toxicity of Lipid NanoParticles (LNPs) containing the mRNA code

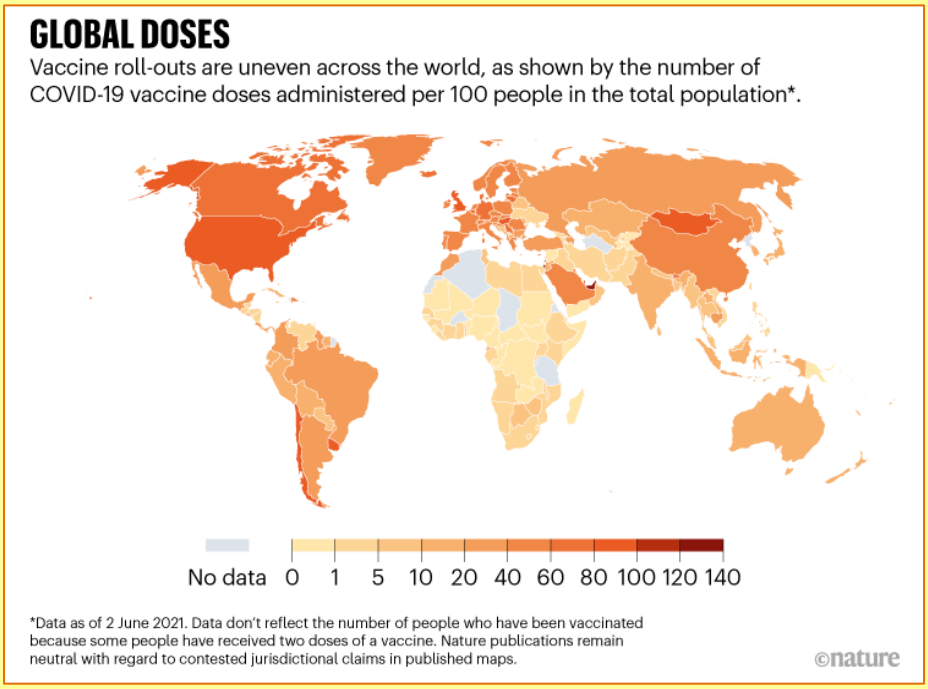
True or fake news?

Source 1: https://www.afinalwarning.com/524187.html
Source 2: https://www.naturalnews.com/files/Pfizer-bio-distribution-confidential-document-translated-to-english.pdf

Six months of COVID vaccines: what 1.7 billion doses have taught scientists

Nature 594, 164-167 (2021)
Source: https://www.nature.com/articles/d41586-021-01505-x#author-0

June 04 – Over the past six months, hundreds of millions of people around the world have rushed to follow in the footsteps of a 90-year-old British woman named Margaret Keenan.
At 6:30 a.m. on 8 December 2020, Keenan became the first person to receive a COVID-19 vaccine as part of a mass vaccination effort. Her shot was the culmination of a frenzied effort to develop vaccines safely and in record time. Now, more than 1.7 billion doses later (see 'Global doses'), researchers are sifting through the data to address lingering questions about how well the vaccines work — and how they might shape the course of the coronavirus pandemic that has already taken more than 3.5 million lives.



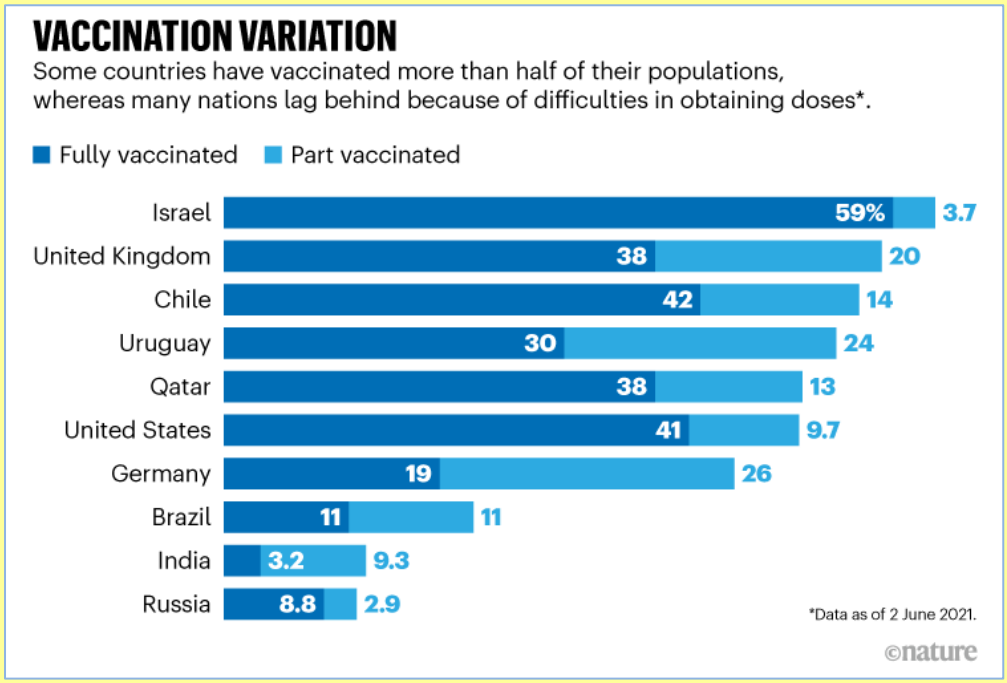
"It's absolutely astonishing that this has happened in such a short time — to me, it's equivalent to putting a person on the Moon," says paediatric infectious-disease specialist Cody Meissner at Tufts University School of Medicine and Tufts Children's Hospital in Boston, Massachusetts. "This is going to change vaccinology forever."
Nature looks at what lessons have emerged during the first six months of COVID-19 vaccinations, as well as what questions still linger. Overall, the vaccine results have been extremely promising — even better than many had hoped — but researchers have concerns about emerging variants and the potential for immune responses to wane.

How well do the vaccines work in the real world?
Danish epidemiologist Ida Moustsen-Helms was excited in February when she first saw how well the Pfizer–BioNTech vaccine was working in health-care workers and residents of long-

term care facilities, who were the first to receive it in Denmark. A clinical trial[1] in more than 40,000 people had already found the vaccine to be 95% effective in protecting recipients from symptomatic COVID-19. But Moustsen-Helms, who works at the Statens Serum Institut in Copenhagen, and her colleagues were among the first to test its effectiveness outside clinical trials, which can exclude some unhealthy individuals or those taking medicines that suppress immune responses.

The results[2] showed it was 64% effective in long-term-care residents with a median age of 84, and 90% effective in healthcare workers — which struck Moustsen-Helms as good news, given that immune responses in older people can be muted. But some Danish politicians were upset by the relatively low effectiveness in older recipients. "People were saying 'how can this be true?'" she says. "Sometimes they forget that when you look at a trial result, those individuals included in trials are very different from people in the real world."

Since then, real-world data have come in from several countries (see 'Vaccination variation'), and much of the news has continued to be positive about how well vaccines perform in the general population. A nationwide vaccination campaign in Israel found the Pfizer–BioNTech vaccine, co-developed by Pfizer in New York City and BioNTech in Mainz, Germany, to be 95% effective against SARS-CoV-2 infection seven days or more after the second dose[3]. The Gamaleya National Research Center of Epidemiology and Microbiology in Moscow and the Russian Direct Investment Fund announced that their Sputnik V vaccine has been 97% effective in almost 4 million people in Russia. And last month, London-based Public Health England reported[4] that the Pfizer–BioNTech and Oxford–AstraZeneca vaccines are both 85–90% effective in preventing symptomatic disease after two doses. It cautioned, however, that it had low statistical confidence in the result for the Oxford–AstraZeneca jab, developed by the University of Oxford, UK, and AstraZeneca in Cambridge, UK.



Among older adults who received the Pfizer–BioNTech vaccine, Israel has seen 94% protection from SARS-CoV-2 infection in people over 85 years old[3]. This is remarkably high for that age group, and considerably higher than Moustsen-Helms's result of 64%, possibly in part because long-term-care residents are prone to be in poor health. Similarly, a UK study found that the Pfizer–BioNTech and Oxford–AstraZeneca vaccines were both 80% effective at preventing COVID-19 hospitalizations in people aged 70 or older[5]. Studies are under way to see whether vaccine effectiveness can be boosted even more by mixing and matching vaccines, and early results have been promising. But the vaccines have already exceeded expectations, says Meissner, especially given how quickly they were developed — despite thorough safety testing in unusually large clinical trials — and the novel approaches they used. Some vaccines spend years in development, and still might not achieve this level of protection. "The efficacy of these vaccines is absolutely remarkable," says Meissner.

At the other end of the age spectrum, Pfizer–BioNTech and Moderna in Cambridge, Massachusetts, have recently completed clinical trials of their vaccines in adolescents, showing 100% and 93% protection in those aged 12–15 (ref. [6]) and 12–17, respectively. Real-world data are not yet available. Meissner, who is an external adviser on vaccines to the US Food and Drug Administration, questions whether children under 12 should get the vaccines before the shots have received full regulatory approval — rather than an emergency-use authorization.

How effective are the vaccines against variants?

Soon after the triumph of Keenan's first dose, the world had a fresh reason to worry. A SARS-CoV-2 variant identified in the United Kingdom seemed to be spreading unusually fast; a

different variant first identified in South Africa carried worrisome mutations in the coronavirus spike protein that serves as the basis for most COVID-19 vaccines in use.
Since then, further 'variants of concern' have arrived in a steady parade, brandishing mutations that might boost the virus's spread, or undermine the effectiveness of COVID-19 vaccines. "Uncontrolled outbreaks generate mutants," says Jerome Kim, director-general of the International Vaccine Institute in Seoul.
Initial laboratory tests suggested that antibodies raised by the Pfizer–BioNTech vaccine were less effective against the B.1.351 variant identified in South Africa, but it was unclear how that would affect protection against disease. In May, researchers in Qatar published reassuring data showing that people who received two doses of the Pfizer–BioNTech vaccine were 75% less likely to develop COVID-19 from infection with B.1.351, and were almost completely protected from severe disease[7]. "The big question right now is whether introduction of other variants could change the situation," says study author and infectious-disease epidemiologist Laith Jamal Abu-Raddad at Weill Cornell Medicine–Qatar in Doha. "We are watching this on a daily basis, but we have optimism that maybe we have seen the worst."

A health worker administers doses of the Oxford–AstraZeneca vaccine by the Amazon River in Brazil during a flood.Credit: Bruno Kelly/Reuters/Alamy

The Oxford–AstraZeneca vaccine did not fare as well in another test: in South Africa, a small clinical trial suggested that the vaccine did little to fend off infections of the B.1.351 variant that, by that point, was causing most infections there[8]. As a result, the South African government made the difficult decision to sell its doses and await a different vaccine. It is now rolling out the vaccine produced by Johnson & Johnson in New Brunswick, New Jersey, which in one clinical trial was 64% effective at blocking moderate to severe COVID-19 in South Africa at a time when B.1.351 constituted more than 94% of the infections in the trial[9]. And a vaccine made by Novavax in Gaithersburg, Maryland, which has not yet been authorized for emergency use, was 51% effective at preventing symptomatic COVID-19 among participants in South Africa who did not have HIV[10].
But Shabir Madhi, an immunologist at the University of the Witwatersrand in Johannesburg and a lead investigator on trials of the vaccine in South Africa, disagreed with the country's

decision not to use the Oxford–AstraZeneca vaccine. There was still hope that it could protect against severe disease and death, he says — a possibility that was not tested in the trial, which enrolled mostly young participants with a low risk of severe disease. Madhi notes that a later study in hamsters[11] found that the vaccine prevented clinical disease caused by B.1.351.

The coronavirus SARS-CoV-2 has proved to be much more prone to mutations than researchers first thought, and more variants are emerging all the time. One variant of concern, called B.1.617.2, was first identified in India and is spreading rapidly in the United Kingdom, raising worries that it could be unusually transmissible. Public Health England has determined that two doses of either the Pfizer–BioNTech or the Oxford–AstraZeneca vaccines are 88% and 60% effective, respectively, at preventing symptomatic disease caused by this variant[12].

How long does protection against disease last?

Six months is not much time to collect data on how durable vaccine responses will be, but data could soon emerge from clinical-trial participants who had their first doses last July.

In the meantime, some researchers are looking to natural immunity as a guide. A study in more than 25,000 health-care workers in the United Kingdom found that a SARS-CoV-2 infection reduced the risk of catching the virus again by 84% for at least 7 months[13]. And Abu-Raddad says an unpublished study in Qatar is finding about 90% protection against reinfection as much as a year after a bout of SARS-CoV-2. “It seems to suggest that immunity is really strong against this virus,” he says. “I’m optimistic that vaccine immunity is going to last more than a few months and longer than a year, hopefully.”

But Mehul Suthar, a viral immunologist at Emory University in Atlanta, Georgia, is concerned that vaccine-induced immunity will not be as durable as immunity from natural infection. Suthar says that he and his collaborators have found that antibody levels declined faster in those who were vaccinated with the Moderna vaccine than in those who had been infected by SARS-CoV-2. Antibodies are not the only determinant of immunity, he says, but the results worry him. “I’m a little concerned that the vaccines weren’t as robust in generating more durable antibody responses,” Suthar says. “When you factor in variants, to me it’s clear that we’re going to need a booster.”

How soon that booster is needed could depend in part on the rate at which antibody levels decline — they could drop precipitously or plateau at a low level. One modelling study[14] estimates that low levels of antibodies will be enough to offer significant protection against severe disease. But Pfizer chief executive Albert Bourla has said that he expects a booster to be needed in about 8–12 months after the second dose of the Pfizer–BioNTech vaccine.

On 19 May, the UK government announced that it had funded a study of 7 different COVID-19 vaccines given as boosters at least 10–12 weeks after the second dose of an initial vaccine. Early findings are expected in September — in time to inform a booster programme aimed at protecting the most vulnerable groups over the UK winter. The US National Institutes of Health is also studying boosters in some study participants who received their first vaccine dose in an early clinical trial that began in March 2020.

Vaccine developers are now testing variant-specific boosters, too. Moderna has released preliminary results showing that a booster vaccine using a spike-protein sequence from the B.1.351 variant increased the concentration of antibodies that neutralize SARS-CoV-2, and particularly the B.1.351 variant[15].

Even if immunity does fade earlier than he hopes, Abu-Raddad is optimistic that it won’t disappear entirely. “If I would make a bet right now, I would say that even when people start losing their immunity against infection, they will not lose immunity against severe infections,” he says.

How much do vaccines block transmission?

Key clinical trials for currently authorized vaccines determined whether the inoculations could safely avert symptomatic disease in individuals. But blocking transmission of the virus is also

crucial for ending a pandemic, and most of those clinical trials did not track asymptomatic infections that could fuel the virus's spread. Researchers have been trying to fill this gap, and, so far, the data look promising. Results announced by Johnson & Johnson from clinical trials suggest that its vaccine is 74% effective against asymptomatic infections. Researchers studying deployment of the Pfizer–BioNTech vaccine in Israel have also reported that vaccination reduces the amount of virus found in infected individuals by up to 4.5-fold, suggesting that they could be less likely to shed that virus into the environment, where it might infect someone else[16]. And a study[17] by Public Health England has found that even a single dose of either the Pfizer–BioNTech or Oxford–AstraZeneca vaccine reduced the spread of disease from infected individuals to household members by up to 50%. "It's likely that all the vaccines have some similar effect," says Michael Weekes, a viral immunologist at the University of Cambridge, UK. "Overall, it's quite an optimistic picture."

But, faced with incomplete data, these studies must often rely on inference to draw conclusions — assuming, for example, that lower viral load translates to reduced transmission, says Susan Little, an infectious-disease specialist at the University of California, San Diego. Little is an investigator on an ambitious trial spread across more than 30 higher-education institutions in the United States to determine how often vaccinated people infect others. The trial will randomize students so they either receive the Moderna vaccine or delay vaccination by four months. Researchers will test participants daily for infection; their close contacts will take coronavirus tests twice a week.

Little and her colleagues are looking for high-quality data to back up important decisions to come. "As people are starting to go back to work, at a policy level, should vaccination be required for schools, places of employment, public transport?" she asks. "Do vaccinated individuals need to wear masks or social distance?" On 13 May, the US Centers for Disease Control and Prevention revised its guidelines on masking, saying that fully vaccinated people could go without masks in some public settings.

But Little says widespread vaccine availability in the United States has left the study struggling to enrol participants. And the spread of viral variants could complicate the picture still more, says Kim. If vaccines are less able to decrease the viral load in individuals infected with a variant, they might also be less able to block transmission, he cautions. "Transmission is a really hard one," he says. "And an unknown variable here is how the variants will affect this."

What have scientists learned about safety?

The speed at which countries have rolled out COVID-19 vaccines is unparalleled — and the same can be said of the surveillance systems put in place to monitor vaccine safety.

Clinical trials of some vaccines involved more than 40,000 participants, and yielded few signs of side effects beyond those often seen after vaccination, including injection-site soreness, fever and nausea. "We generally say that no vaccine is 100% safe," says Meissner. "But the safety of these vaccines is remarkable."

Shortly after inoculations with the Pfizer–BioNTech vaccine began, a few regions reported cases of a severe allergic reaction called anaphylaxis. But further study showed that the risk of this condition — which can be treated at the vaccination centre — is not much higher for the Moderna and Pfizer–BioNTech jabs than for other vaccines, says Meissner. For Pfizer–BioNTech, the risk is about 4.7 cases per 1 million doses[18]; the risk of anaphylaxis from any vaccination is estimated at 1.3 in a million.

More concerning has been the very rare occurrence of a blood-clotting syndrome in recipients of the Oxford–AstraZeneca and Johnson & Johnson vaccines. First reported in Europe and linked to vaccination with the Oxford–AstraZeneca vaccine, hallmarks of the syndrome include blood clots in unusual places — particularly in the brain and abdomen — coupled with depletion of clot-promoting cell fragments called platelets. The condition can be fatal, but regulators have repeatedly determined that the risk posed by COVID-19 is greater for many people than is the risk of developing the clotting syndrome. The European Medicines Agency has concluded that it occurs in about one in 100,000 vaccine recipients.

Researchers are still racing to determine how the vaccine could cause the syndrome. But the subsequent US discovery of similar cases among recipients of the Johnson & Johnson vaccine — although at a frequency of only about 3.5 per million people — has led to speculation that the condition might be linked to the disabled adenoviruses used in the vaccines to shuttle the coronavirus spike gene into cells.

Since the syndrome was discovered, the United Kingdom has advised that people under the age of 40 receive a different vaccine, given their very low risk of complications from SARS-CoV-2 infection. The United States has resumed vaccinations with the Johnson & Johnson vaccine after pausing it in response to the reports. But in Denmark, the Oxford–AstraZeneca vaccine was discontinued in April, and those who have already received one dose have been advised to have an mRNA vaccine from Pfizer–BioNTech or Moderna as their second dose.

Meanwhile, surveys have suggested that the debate over the safety of these vaccines was enough to damage public confidence in them. "What defines a safe vaccine?" says Meissner.

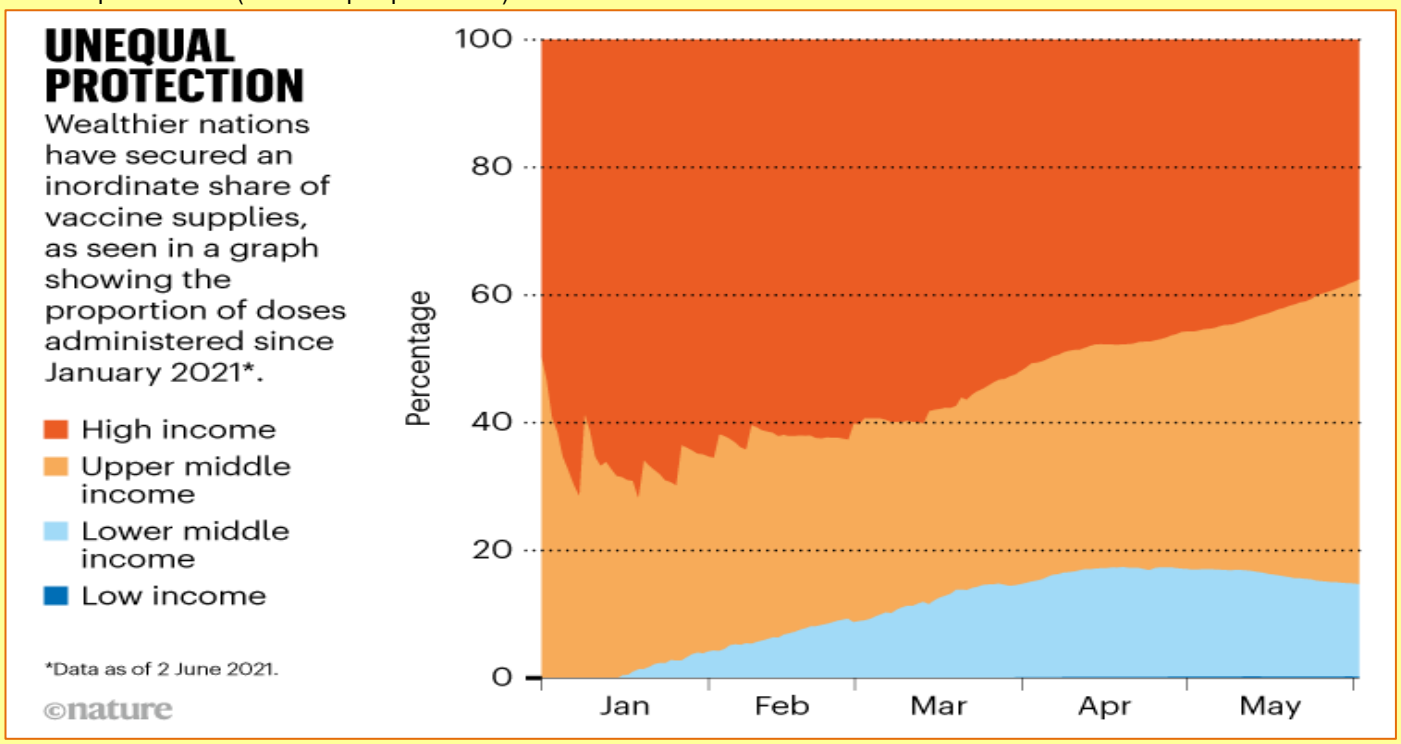
"One out of a hundred thousand may seem very safe for one person; another person says 'One in a million? What if that's me?'" Israel's Ministry of Health is now evaluating a possible link between the Pfizer–BioNTech vaccine and reports of heart inflammation, a condition called myocarditis. So far, most cases have been mild and have occurred in men aged between 16 and 19.

What impact has the vaccines had on the course of the pandemic?

Several countries with high vaccination rates — including Israel and the United Kingdom — have seen precipitous declines in deaths and hospitalizations from COVID-19. Public Health England has calculated that the vaccines have saved 13,000 lives among those aged 60 and over[4]. The United Kingdom has fully vaccinated more than one-third of its population.

But these countries have conducted their vaccination campaigns while under strict social-distancing measures. Chile, by contrast, rolled back its distancing requirements early this year as it embarked on an aggressive vaccination campaign. By April, its intensive-care wards were overflowing with COVID-19 patients, despite the country having one of the world's highest vaccination rates.

Once vaccines have reached a wide swathe of the population, however, it might be possible to ease lockdowns and social-distancing restrictions. Israel's rates of infection, for example, have remained low after it gradually relaxed most restrictions once about half of its adult population had been vaccinated. Infections are also falling in the United States as the proportion of fully vaccinated adults there surpasses 40% (see 'Unequal protection').



But Seychelles, the most vaccinated country in the world (with a population of less than 100,000), experienced a surge in infections — although relatively few deaths — as it reached a level of more than 60% adult vaccination in early May.

For now, it's unclear what has driven that outbreak and whether coronavirus variants could be to blame, says Kim. But it pays to ease restrictions slowly, he says, even once a country has achieved a high level of vaccination. "It's probably wise to remember that every time we saw the numbers going down and we were relieved and relaxed, they came back again," says Kim. "That's the cautionary tale in all of this."

And for much of the world — particularly low- and middle-income countries — limited supplies mean that vaccines will probably have little impact on the course of the pandemic this year. Madhi says that he does not expect the current roll-out in South Africa to do much to protect it from the impending third surge there: by the time all people over the age of 60 have been offered their first dose at the end of June, he expects social distancing and other measures to have already brought the country's burgeoning infection numbers down. And in India, a combination of low vaccination rates, aggressive variants and widespread social interaction are thought to have led to its tragic and overwhelming COVID-19 outbreak.

Whereas some wealthy countries were able to pre-order large amounts of vaccine, many low- and middle-income countries have had to make do with less. The World Health

Organization's target is to vaccinate 20% of the population in those countries by the end of this year. "This is not going to be the main exit strategy for them this year," says Mark Jit, an infectious-disease modeller at the London School of Hygiene & Tropical Medicine. "Maybe in 2022, when the supply is less constrained." Instead, such countries might need to rely heavily on social distancing, mask wearing and test-and-trace programmes.
And even in countries with higher vaccination rates, the once-glittering hope of achieving herd immunity — when enough immunity exists in the population to prevent disease spread — has faded, says Kim. "Now with widespread generation of these variants and continued uncontrolled outbreaks, that's looking less likely," he says. "And the impact of the pandemic will continue to be felt until vaccination can be accomplished not only in high-income but low- and middle-income countries."

Chinese military helped create 'humanized' mice to test viruses: report

Source: https://nypost.com/2021/06/03/chinese-military-helped-create-humanized-mice-to-test-viruses-report/

June 03 – Chinese military researchers were part of a project that created **mice with "humanized" lungs** — apparently to test the infectiousness of various viruses, according to a blockbuster report Thursday.
The bio-engineered rodents were developed using gene-editing technology known as CRISPR and are mentioned in an April 2020 study that US government virologists flagged for National Security Council officials investigating the origin of the coronavirus, Vanity Fair said.
The study's 23 co-authors include 11 who work for the Chinese army's medical research institute, the Academy of Military Medical Sciences, and their project involved determining the mice's susceptibility to the virus that causes COVID-19.

But when the NSC investigators worked backward to establish a timeline for the study, they realized that the critters were created sometime during summer 2019 — before the coronavirus pandemic exploded, according to Vanity Fair.

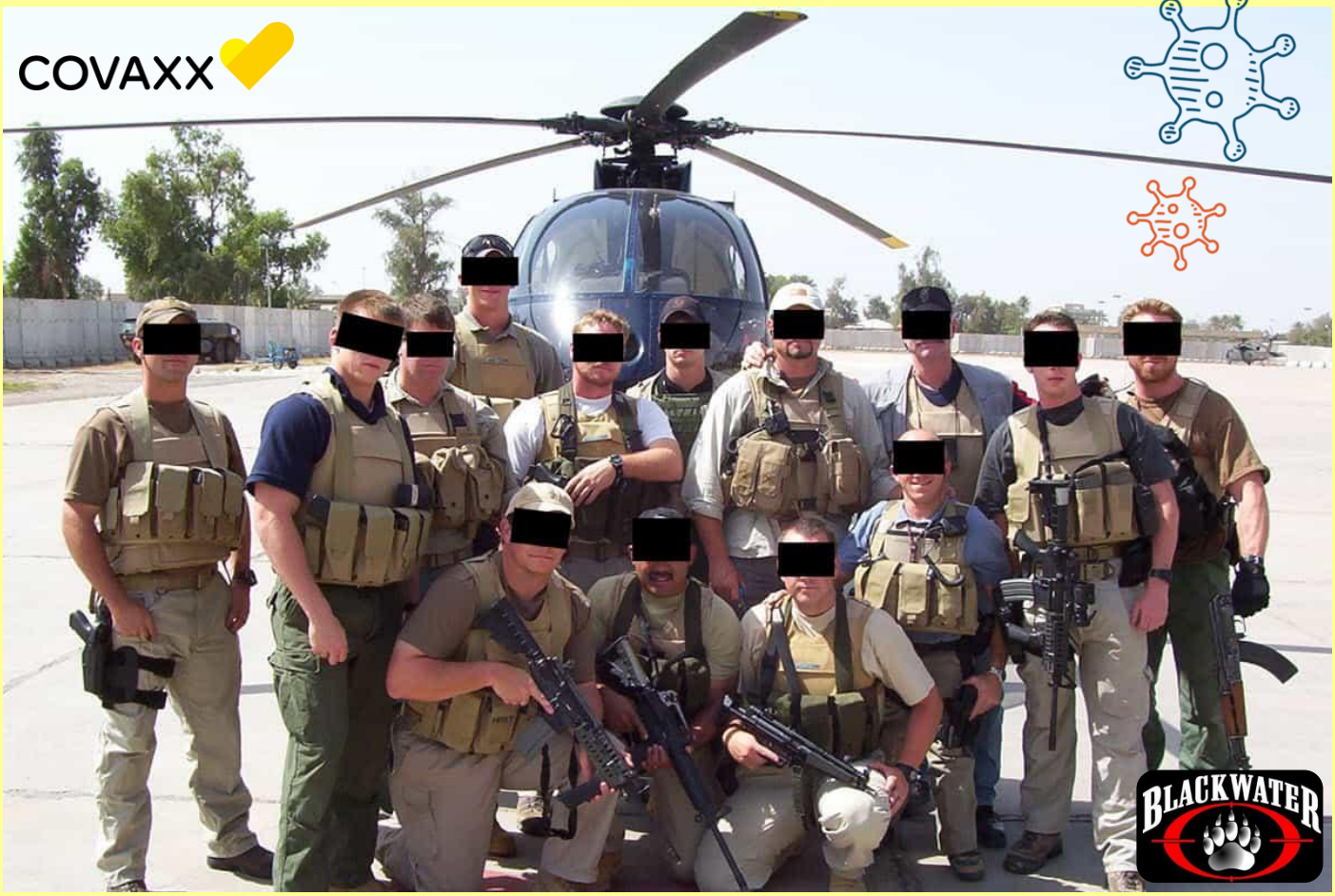
Vrologist Shi Zhengli is seen inside the P4 laboratory in Wuhan.AFP via Getty Images

That discovery reportedly led NSC officials to suspect that the Chinese military was using the mice to test whether various viruses could infect humans — and that they'd uncovered evidence supporting the theory that the pandemic was the result of a lab leak.
But when they reached out to other agencies with the information, "We were dismissed," Anthony Ruggiero, the NSC's senior director for counterproliferation and biodefense, told Vanity Fair.
"The response was very negative," he added.
Meanwhile, the lead coronavirus researcher at the Wuhan Institute of Virology — Shi Zhengli, also known as "Bat Woman" for her work with the flying mammals — appears to have tested two novel but undisclosed coronaviruses on humanized mice to gauge their effectiveness, Vanity Fair said.
The magazine cited as evidence comments Shi made to a scientific journal, as well as information contained in a Chinese government database.
Shi has adamantly denied that the coronavirus leaked from a WIV lab or that the facility conducts military research.
But in January, a fact sheet released by the US State Department disclosed that researchers at the WIV had collaborated on secret projects, "including laboratory animal experiments," since at least 2017.
A former national security official who reviewed classified US information also told told Vanity Fair that inside the WIV, military and civilian researchers are "doing animal research in the same fricking space."
China has denounced the State Department's fact sheet as "full of fallacies" and the "last madness" of former Secretary of State Mike Pompeo, who it called "Mr. Lies."

The document was issued five days before President Biden was inaugurated and hasn't been disavowed by his administration.
Last week, Biden also ordered a 90-day probe by the US intelligence community into the origins of the coronavirus, with a spokeswoman saying that nothing has been "ruled out" — including the possibility it was deliberately released.
Neither Shi nor the director of the WIV responded to repeated requests for comment, including a list of detailed questions, Vanity Fair said.

Blackwater founder Prince takes role in COVID vaccine venture

Source: https://www.reuters.com/business/healthcare-pharmaceuticals/exclusive-blackwater-founder-prince-takes-role-covid-vaccine-venture-2021-06-04/



June 04 – Erik Prince, the founder of controversial private military firm Blackwater and a supporter of former President Donald Trump, jumped into the COVID-19 business late last year with a deal to distribute an experimental vaccine should it be approved, according to three people familiar with the arrangement and business records seen by Reuters.
The COVID-19 vaccine, known as UB-612, is being developed by a privately-held U.S. firm called COVAXX.
The company has said the vaccine shows promise in protecting people against coronavirus, based on a small study of 60 patients in Taiwan. It hasn't provided data on safety and efficacy from large clinical trials, information that is usually required before a vaccine is authorized for public use.
COVAXX is unrelated to the similar-sounding but better-known "COVAX," a global vaccine distribution program backed by the World Health Organization.
Since the start of the pandemic in 2020, the COVAXX vaccine has attracted some big-name backers, including endorsements from entrepreneur Peter Diamandis, who co-founded the company, and motivational speaker Tony Robbins. In March, the company raised $1.35 billion in a private placement, according to U.S. securities filings.

Prince's involvement in vaccine distribution, which has not been previously reported, sheds new light on the race to profit from the uncertainties of the pandemic. Vaccine supply deals have often been forged through direct government ties to drugmakers, global health organizations or diplomatic channels.
Reuters couldn't determine how Prince first became associated with COVAXX, or whether he has brokered any vaccine supply deals. Prince did not respond to questions for this story. A source close to Prince said that "Erik has been helping a vaccine manufacturer set up distribution," but declined to give details.
Diane Murphy, a public relations consultant for Vaxxinity Inc, which owns COVAXX, declined to answer questions related to Prince. In a statement to Reuters, she said that the company has "accepted introductions from a variety of private, public and non-profit intermediaries, both formally and informally."

'Dollars per dose'

Prince has made headlines for years, first as chief executive of Blackwater, whose security guards fatally shot more than a dozen Iraqi civilians in Baghdad in 2007. After he left Blackwater, Prince pushed to privatize the war in Afghanistan by having contractors fight instead of the U.S. military and became embroiled in an investigation into possible collusion between the Trump election campaign and the Russian government.
Prince sought to recruit a close associate, the late Paul Behrends, a former Republican congressional staffer and lobbyist who represented Blackwater for over two years, to help in the COVAXX project.
In a series of text messages to Behrends, Prince described the potential for profit from selling the vaccines.
"There's room for a couple dollars per dose in commissions," Prince said in a Nov. 9 text to Behrends. He shared with Behrends a "Letter of Authorization" on COVAXX letterhead signed by senior vice president Brandon Schurter as proof of his distribution deal. Schurter did not respond to requests for comment.
The October 2020 letter said that an entity called Windward Capital, with an address in Abu Dhabi, was authorized to "assist in the process of creating distribution networks." Reuters could not find a Windward Capital registered in Abu Dhabi. But a company called Windward Holdings that handles "professional, scientific and technical activities" is listed there, with Erik Prince the sole named shareholder.
Prince is also the managing member of a corporate entity called Windward Wyoming LLC, which says it has a "global distribution" deal with COVAXX, according to records of non-public business agreements seen by Reuters. The company was formed in October 2020, public incorporation records in Wyoming show.
Lawyers and other officials affiliated with the various Windward entities did not respond to requests for comment.
Prince and Behrends were negotiating how to carve up prospective sales territories by country, said Barry Angeline, a friend of Behrends. But their possible collaboration was cut short in December, when Behrends died.
Vaxxinity consultant Murphy told Reuters the company has a "focus on the developing market" – including the many countries that have been unable to acquire the shots made by global drugmakers and stockpiled by wealthier nations.

High-profile backers

COVAXX was formed in early 2020 as a subsidiary of United Biomedical Inc (UBI), a maker of diagnostic tests and veterinary vaccines, to address the coronavirus pandemic. In April, the company announced it was being consolidated into a new holding corporation called Vaxxinity.
COVAXX's backers were quick to publicize the vaccine's potential beginning in July, based on early tests in animals, and before the first clinical trials in people began in Taiwan.
Diamandis, who is listed as a co-founder of Vaxxinity, wrote in a July 30 post on his personal blog that the vaccine was safe for patients and likely effective in the elderly. He told Reuters he made it clear in those posts that his assertions were based on previous trial results of other vaccines developed by the company.
A few weeks later, Robbins, the self-help coach, held a webinar promoting COVAXX titled "The most powerful vaccine you've never heard of." Robbins said in the video that he was one of the company owners. "I've invested in the company, so everyone knows. Because I've been blown away by seeing these results," he said.
Robbins "remains an investor," his spokeswoman Jennifer Connelly said in a statement to Reuters. She added, "Mr. Robbins is not involved in the management or daily operations."
In October, COVAXX and shipping giant Maersk announced a partnership to provide global transport of the vaccine as soon as it becomes available. The Maersk official quoted in the release, Rob Townley, said the company recognized the urgent need to safely deliver COVID-19 vaccines worldwide.

Townley was briefly an aide to former U.S. Army general Michael Flynn during Flynn's short tenure as Trump's National Security Adviser. In an interview, Townley said he knows Prince but couldn't discuss Prince's involvement.
Data on how well the vaccine works is still pending. In an email to Reuters, Vaxxinity's Murphy said the company had completed the Phase 1 trial of 60 volunteers aged 20 to 55 in Taiwan, and is conducting a new study of 3,800 people there, including teens and elderly participants. The company plans larger trials in Brazil and India later this year.

A Short History of China's Biohazard Accidents — before COVID-19

By Jim Geraghty
Source: https://www.nationalreview.com/2021/06/a-short-history-of-chinas-biohazard-accidents-before-covid-19/

'While there is always some risk for lab accidents, risk is not reality."

— Lim Poh Lian, senior consultant at the National Centre for Infectious Diseases in Singapore, to National Public Radio, April 23, 2020.

2004: In the aftermath of a small outbreak of the original SARS virus, well after the main outbreak that ended in summer 2003, a WHO investigation concluded that the Beijing Centers for Disease Control made critical errors in handling samples of the virus. "The patient was allowed to travel between Beijing and her home province of Anhui, to the west of Shanghai, while sick . . . the patient received medical care in both Beijing and Anhui but was still allowed to travel while sick, despite her high risk occupation and the f act that her mother also had a fever. The mother subsequently died."
"Clearly there was a link to the [Beijing, not Wuhan] Institute of Virology, and our investigations are still ongoing, but we haven't found a single incident that links the two cases of laboratory workers at the institute, so it appears to be two separate breaches of bio-safety, and we can't find any single incident or accident that explains either case," said Dr. Julie Hall, WHO's coordinator in China of communicable disease surveillance and response. "It has raised real concerns about bio-safety in general, how bio-safety guidelines are implemented, and how that is supervised and monitored."

Subsequent investigations concluded a "batch of supposedly inactivated SARS virus that was brought from a high-containment facility into a low-safety diarrhea research lab where the two were working . . . In a breach of standard safety procedures, the researcher who carried out the inactivation — identified only by a family name, 'Ren' — had not tested whether the virus was truly inactive, according to the panel."
December 2006: A study of the SARS leak response by the Beijing Municipal Health Bureau concluded that "Lab bio-safety programs should be made and should be strictly abided by. Studies in highly pathogenic viruses such as SARS coronavirus should be utmost cautious. . . . Management systems of occupational exposure to virus and disease surveillance need to be strengthened to take all risk factors into account so as to detect potential patients with infectious disease as early as possible."
November 2007: While not technically a lab accident, one criminal investigation suggested that large amounts of biohazardous material were frequently disposed of using dangerous and unsanitary methods: "A farmer from Sichuan Province named Zhang Xiuqiong was arrested for illegally collecting hazardous medical waste. Chongqing environmental protection officials, who found 33.9 tons of medical waste inside a residential building, described the scene as 'shocking.' The facility was full of medical waste including blood transfusion bags that still contained blood. It took fifteen medical waste vehicles eight hours to clean up the site."
2010: "In a survey of 231 fourth-year medical students published in the Chinese journal *Northwest Medical Education* in 2010, 19 percent were unfamiliar with the term 'laboratory biosafety.' Seventy-nine percent had heard the term but weren't completely sure what it meant."
September 3, 2011: "On the heels of a damaging laboratory outbreak that sickened 27 students, leaders at China's Northeast Agricultural University last week dismissed two administrators, apologized for insufficient safety practices, and offered thousands of dollars in compensation to the students, who contracted brucellosis while dissecting goats in an anatomy course last December."

2012: A graduate student in Shanghai, name unknown, died after opening a poison-gas cylinder.
August 11, 2014: Two science researchers, Lynn Klotz and Edward Sylvester, published a paper suggesting that the odds are better than one in four that "one of these viruses will escape from a lab and seed the very pandemic the researchers claim they are trying to prevent."
Klotz is senior science fellow at the Center for Arms Control and Non-Proliferation, and Sylvester is director of the Walter Cronkite Science and Medical Journalism Program at Arizona State University. They wrote, "from the calculations in two in-depth pandemic risk analyses, there is a substantial probability that a pandemic with over a 100-million fatalities could be seeded from an undetected lab-acquired infection (LAI), if a single infected lab worker spreads infection as he moves about in the community. From the Klotz analysis, there is about a 1–30 percent probability, depending on assumptions, that, once infected, the lab worker will seed a pandemic."
October 12, 2014: Li Ning, a leading expert at transgenic technologies at China Agricultural University, was arrested on corruption charges; in early 2020, Chinese courts sentenced him to twelve years in prison for embezzling 37.56 million yuan. Shanghai-based publication *The Paper* later reported that he had earned 10.17 million yuan ($1.46 million) by "illegally selling off lab animals and experimental milk."
April 5, 2015: "A gas explosion killed one graduate student and injured four others in a chemistry lab at the China University of Mining and Technology located in the eastern Chinese city of Xuzhou."
September 22, 2015: "A Peking University chemistry building caught fire after a hydrogen tank leaked. The fire did not result in any injuries."
December 18, 2015: An explosion in the laboratory of the chemistry department of Tsinghua University in Beijing killed one post-doctoral student. The accident was attributed to an explosion of a hydrogen tank in the lab. Luo Min, a chemistry professor at Ningxia University located in the north-western Chinese city of Yinchuan, later told *Chemistry World* that, "The bloody accident reflects a systematic negligence of safety in our labs." In the same article, Yin Yanzi, a post-doctorate researcher at Cornell University and formerly an associate professor of materials chemistry at Hubei University of Technology in central China, said that "compared with labs in the US, Chinese labs generally have poor safety and less sophisticated safety equipment."
2016: While not including China, "In a survey of biosafety level (BSL) 2 and 3 laboratories in 7 countries in the Asia-Pacific region, 30% of Class II BSCs tested were poorly designed, incorrectly installed, not certified, or being operated improperly."
April 2017: Klotz, of the Center for Arms Control and Non-proliferation, reported to the 2017 meeting for the Biological Weapons Convention that the world is whistling past the graveyard on the risks of a serious lab accident: "Those who support this research either believe the probability of community release is infinitesimal, or the benefits in preventing a pandemic are great enough to justify the risk. In the author's opinion, it would take extraordinary benefits and significant risk reduction via extraordinary biosafety measures to correct such a massive overbalance of highly uncertain benefits to potential risks. No one can be sure how virulent or airborne transmissible in humans these potential pandemic viruses would be if released into the community. In the best-case scenario, they would soon die out with little to no sickness and no deaths; however, just the possibility of a pandemic dictates that we must proceed with the utmost caution."
May 2018: A profile of Luo Dongsheng, part of a team of researchers from the Wuhan Institute of Virology collecting samples from a cave in Hubei, central China, noted that, "Luo's team has collected a full rack of swabs and bagged a dozen live bats for further testing back at the lab." A picture illustrating the story showed the researchers with exposed skin on their wrists.
December 26, 2018: Three students were killed in an explosion in a laboratory at Beijing Jiaotong University while carrying out sewage-treatment experiments. The Beijing Emergency Management Bureau investigation subsequently concluded that, "the students purchased and stored dangerous chemicals and carried out risky experiments in violation of regulations. University personnel also failed to oversee and manage the safety of laboratories and scientific research projects."
Sometime in 2018–2019: According to Voice of America, "About a year before the coronavirus outbreak, a security review conducted by a Chinese national team found the [Wuhan Institute of Virology] did not meet national standards in five categories."
September 2019: Yuan Zeming, deputy director of the Wuhan Institute of Virology, offered an assessment of the state of biosafety in Chinese laboratories in general in the *Journal of Biosafety and Biosecurity* in September 2019:
. . . biosafety measures and practices are vital in daily laboratory operations hence a highly qualified, motivated, and skilled biosafety supervisor is needed not only for overseeing solid containment but also in laboratory risk management. **Currently, most laboratories lack specialized biosafety managers and engineers.** In such facilities, some of the skilled staff is composed by part-time researchers. **This makes it difficult to identify and mitigate potential safety hazards in facility and equipment operation early enough**. Nonetheless, biosafety awareness, professional knowledge, and operational skill training still need to be improved among laboratory personnel.

October 21, 2019: Gao Hucheng, a former minister of commerce, issued a report to the Chinese legislature proposing the national government establish "a unified biosecurity standard for pathogenic microorganism laboratories and implement classified management of pathogenic microorganisms. . . . The laboratory should prevent laboratory animals from escaping, and conduct harmless disposal after using them, and should not put them into the market . . . The high-level pathogenic microorganism laboratory should accept the supervision of the public security organs and other departments on its security work, so as to prevent the leakage, loss, theft, and robbery of highly pathogenic microorganisms."
November–December 2019: The first cases of COVID-19 were reported in Wuhan, China.
Ironically, if COVID-19 was ultimately caused by human negligence, it would actually be the second highly contagious disease outbreak in China in December 2019 that was caused by someone handling dangerous materials and not being sufficiently careful.
December 12, 2019: It was initially believed that some sort of lab leak at the Lanzhou Veterinary Research Institute of the Chinese Academy of Agricultural Science caused 65 people to contract brucellosis, "which can lead to incapacitation and permanent damage of the central nervous system." But subsequent investigation found that the cause was a leak at the Zhongmu Lanzhou biological pharmaceutical factory, "which occurred between late July to late August last year, according to the city's Health Commission. While producing Brucella vaccines for animal use, the factory used expired disinfectants and sanitizers — meaning not all bacteria were eradicated in the waste gas. This contaminated waste gas formed aerosols that contained the bacteria — and leaked into the air, carried by wind down to the Lanzhou Veterinary Research Institute, where the outbreak first hit."

***Jim Geraghty** is the senior political correspondent of* National Review.

The Origins of Covid-19 and Preventing the Next Pandemic

Source: http://www.homelandsecuritynewswire.com/dr20210605-the-origins-of-covid19-and-preventing-the-next-pandemic

June 05 – Did COVID-19 originate with bats or scientists? Most experts continue to contend that the most likely origin of SARS-CoV-2 (the novel coronavirus that causes COVID-19) is a natural zoonotic "spillover" event between an animal reservoir (most likely bats) and humans. Amanda Moodie and Nicholas Evans write in *War on the Rocks* that over the last year of the pandemic, however, another theory has gained momentum: The SARS-CoV-2 virus may have resulted from an accident in a laboratory in China where scientists were working with closely related viruses.
In the wake of the World Health Organization-led mission to Wuhan to examine the origins of the pandemic, proponents of the lab-leak theory have charged the investigative team with conflicts of interest, and suggested that the team's efforts failed to rule out the possibility of a lab release. Some have gone on to claim that scientists have maintained a conspiracy of silence about the possibility of a lab release in order to protect their funding or avoid a backlash from their government.
Moodie and Evans write that the desire to identify the origins of the novel coronavirus is perfectly understandable. COVID-19 has killed millions of people and upended everyday life. There's an intuitive sense that finding out how the pandemic began might help to prevent another one from occurring.

> *However, while answering the question of where the novel coronavirus came from is important, many of the most important policy decisions the United States needs to make to prevent future pandemics do not depend on viral origins. Very little about pandemic response or preparedness for future pandemics turns on the particulars of how this one started. Laboratory biosafety was already an issue before the pandemic, and the origins of this particular virus don't change the need for reform to prevent these rare but potentially catastrophic events. Regardless of how COVID-19 began, U.S. policy priorities should focus on both identifying and preventing the spread of zoonotic pathogens and bolstering safety and security in high-containment laboratories.*

Moodie and Evans stress, however that there is one important scenario in which it would be absolutely vital to know the origins of COVID-19 in order to decide what to do next.

> *If, as some scientists and politicians have suggested, the pandemic stemmed from a deliberate attempt to develop a biological warfare agent, this would have serious implications for the Biological Weapons Convention and the broader norm against the use of disease as a weapon. If a state party had violated its commitment to the treaty by developing biological weapons, the international community would need to determine how to hold that government accountable for its non-compliance — a process with which states parties to the treaty have struggled in the past. Even treaties that have extensive verification provisions have grappled with what to do when a state party*

has demonstrably violated a treaty's prohibitions. While some might criticize the Biological Weapons Convention for lacking a mechanism to verify compliance, such mechanisms don't solve the knotty political problem of what to do when flagrant violations take place. Moreover, the deliberate use of biological weapons could inspire copycat behavior by others, leading to the weakening of the norm against the use of disease as a weapon. Fortunately, to our knowledge no serious analysis of COVID-19's origins — even from those who support a laboratory release hypothesis — has concluded that anyone deliberately introduced the SARS-CoV-2 virus to the global population.

***Amanda Moodie** is a policy fellow at the National Defense University's Center for the Study of Weapons of Mass Destruction (WMD Center) in Washington, D.C. Her policy support at the center focuses on the international legal regimes that regulate the proliferation of chemical and biological weapons. She regularly serves as a member of the U.S. delegation to meetings of the states parties of the Biological Weapons Convention.*
***Nicholas G. Evans** is an assistant professor in the Department of Philosophy at the University of Massachusetts Lowell, where he teaches biomedical ethics and security studies. He has been published in the* British Medical Journal, Nonproliferation Review, *and* ELife. *His book,* The Ethics of Neuroscience and National Security, *was released with Routledge in May 2021.*

What My Covid-19 Vaccine Saga Taught Me About the U.S. Health Care System

By Joanne Kenen (a brave allergic journalist)
Source: https://news.yahoo.com/covid-19-vaccine-saga-taught-060716877.html

June 06 – For most people, that first coronavirus shot brings a profound sense of relief, a deep exhalation of a year's worth of anxiety and isolation.
For me that blessed relief was short-lived. I had a rare allergic reaction to my first Pfizer shot, which meant that while vaccinated friends, family and coworkers began reclaiming some normalcy in their lives, I remained locked in my own private pandemic.
Before we go any further, this isn't a story about how dangerous vaccines are. To the contrary, it's a story of how I struggled to get fully immunized against a disease that has killed around 600,000 people in the United States and at least 3.7 million more around the globe, according to Johns Hopkins' tracker. Two months, five doctors, one nurse-practitioner, two blood tests and one EKG later, I'm not 100 percent sure if I had an allergic reaction, a strange side effect or, as befitting a life-long overachiever, both at once. But the real shocker was how hard it was for me to switch to a different vaccine, one that wouldn't send me into anaphylactic shock or something equally scary. I finally got fully vaccinated right before Memorial Day. Later this month, I will reunite with extended blended family and hug my favorite Cub Scout.
It's also a story about how the Centers for Disease Control (CDC) and the American health system more broadly is not set up in a crisis to deal with the non-cookie-cutter patients, including immune-compromised people with far more serious health issues than my own. After my allergic reaction, I submitted information and updates to the CDC's V-safe, an app for reporting vaccine side effects which says it reaches out to some patients in need. I also used the Vaccine Adverse Event Reporting System (VAERS), run jointly by the CDC and Food and Drug Administration, and Pfizer's portal. As a health journalist, I know the lingo, the phrases that should trigger a response. (Allergy! Anaphylaxis! Racing pulse—even while doing yoga!) I was in search of some specific guidance after my reaction. Should I get the second dose? Switch to a different vaccine? But other than routine "submission received" emails, neither I, nor my primary care physician, ever heard a peep from VAERS (which is being spammed by anti-vax submissions), Pfizer or V-safe.
Even after I finally had a safety plan—I would switch to the Johnson and Johnson shot, and receive it in spitting distance of a hospital Emergency Department—health systems in Washington D.C. and Maryland imposed one barrier after another. I never managed to talk to or even email directly with anyone at a nearby hospital to explain my situation, with one exception—and in that case a "vaccine tech" manning a phone line told me I had to take whatever shot their computer assigned me. ("Even if it kills me?" I asked, a tad melodramatically.) I never did manage to get the shot in the ideal setting. The allergist who became my vaccine guardian angel devised a backup plan that kept me safe.
All those doctors' appointments taught me I'm by no means the only non-traditional patient around. Even within my own family—and everyone age 12 and up in my nuclear, extended and blended family is fully vaccinated—one person who had no problem with the vaccine

itself was injected with a defective syringe. He too struggled to find answers about whether a viable dose got into his arm, given how much dripped onto his jeans.

A few weeks into my odyssey, I learned of a CDC consultancy group where physicians could seek advice about patients with unusual vaccine risks or troubles. But none of my own doctors, a high-caliber crew affiliated with Georgetown, Johns Hopkins and George Washington University's hospitals, knew it existed. And I, super connected in the health care world, only discovered it because one of my sons has a friend from his gap year whose dad serves in the group.

I got my first Pfizer shot at approximately 3 p.m. on Thursday, March 25 in a supermarket pharmacy in a Maryland suburb, not far from Washington, D.C. The vaccination site was not well run nor properly socially distanced: I may yet report them to state regulators. Among other things, when I told them I needed to be observed for more than 15 minutes—I am allergic to bees, among other things, and I had one terrifying side effect after a tetanus shot years ago in Guatemala—the pharmacy tech looked befuddled. "You can stay as long as you want, but you don't have to." Nor did they give me information about CDC's V-safe, which everyone who gets a coronavirus shot is encouraged to use so the public health agency can learn more about side effects and reactions.

Given my own idiosyncratic allergy history, I decided to wait at the pharmacy a full hour. (Millions of people with insect or food allergies have taken the coronavirus shots safely—including my sister. Talk to your doctor if you have concerns.)

The first symptom, an intense headache, began immediately, before I even got back to my seat. That's a known side effect, though mine came on awfully fast. But when I left the pharmacy, I felt OK. I headed to meet, masked and outdoors, a Politico colleague I hadn't seen in a year who lived a few blocks away. As I drove, I began feeling numbness in my lips, and it spread, symmetrically from the center. Then the tip of my tongue began growing numb. I felt some swelling in my mouth, but it was minor; I could breathe. That slow ramp up is not typical of an allergic response—but it is precisely what happened the last time I was stung by an itsy-bitsy baby bee hiding in a bushel of plums. That landed me in the ER.

While I always carry an EpiPen, I'm less diligent about maintaining my Benadryl supply out of bee season. Luckily, I had one bedraggled dose buried deep in my bag. I took it, and taught my colleague Epipen 101, just in case. I sat there, the symptoms neither subsiding nor spreading. I asked my husband to come get me; I'd retrieve my car another day.

On an urgent telemedicine consult, a nurse-practitioner with ER experience talked me through what medicines I needed to take over the coming hours. She weighed sending me to the ER but after remotely squinting at my open mouth, and learning that I live close to a hospital, she thought I'd be OK at home. But she advised frequent checks. We set an alarm to wake us every hour. It was a long and somewhat scary night.

She also told me to load up on Benadryl before I got my second shot, and to try to get it in a medical setting, not a retail pharmacy. Fine with me, because I really didn't want to go into anaphylactic shock near the frozen vegetables.

But I had doubts about whether I should take another dose of Pfizer at all.

So did the next five doctors I consulted, plus two vaccine scientists I know socially, at FDA and at Cornell, (the latter, a case study in why to keep your friends from summer camp). My first reaction to Pfizer was bad but not catastrophic. But repeat exposure in a mere three weeks could be worse; allergies and reactions can escalate. Would it kill me? Highly unlikely, as according to the latest CDC data no one has had a fatal allergic response to the mRNA shots. Could it cause harm, given that I was still having some aftershocks, including an ongoing bout of numbness, from the first shot? Maybe, maybe not. It wasn't a hypothesis anyone wanted to test.

It took several weeks and a blur of appointments (including one with an allergist who gave me misinformation, including about preservatives in vaccines, and another with the one who became my guide) to devise a plan. We considered settling for partial vaccination. One shot would give me decent though imperfect protection—but it wouldn't lessen my sense of being trapped, not just emotionally but practically shut out from anyplace that required proof of full vaccination. We talked about giving me my second Pfizer dose in an emergency room—but doctors thought that was still too risky, if we could even arrange it. A science writer friend found a medical journal article by doctors in upstate New York doing "micro-dosing" for allergic people—administering Pfizer but in five small injections. I contacted them but decided if I had to go all the way to Rochester, NY, to get a shot, that probably wasn't the shot for me. Particularly if we're going to need boosters, I should get off the Pfizer train.

My Politico health teammates prowled the CDC website on my behalf and found that the agency suggested that people who had a problem with the mRNA vaccines, like Pfizer or Moderna, consider switching to the J&J vaccine after four weeks, although there's not a lot of data on that option. Eventually, that's where I ended up. But given that my reaction was unusual and complex, every doctor I spoke to thought I should get still get the J&J dose in the hospital or an adjacent doctor's office, not as an inpatient but near the ER.

I spent weeks trying to arrange that. Switching shots midstream, especially when there are restrictions on where you can receive the dose, is immensely difficult—even if you know a million people in health care. I'm normally pretty good at navigating our crazy health care

system after years of covering it. This time, I met brick wall after brick wall as I searched for a J&J dose, and a safe place to take it. Because J&J is easier to store than the other shots, it's mostly used in community settings, not hospitals. And at the time it was impossible to find out which hospitals did have even a limited supply, or how to get it. On top of that, most of my doctors are in D.C., but since I live in nearby Maryland, it was illegal for me to get the shot in DC. Yet in Maryland, health systems wouldn't even put me on a waiting list if I wasn't already their patient. Luckily two health care systems—Georgetown/Medstar and Johns Hopkins—had hospitals on both sides of the border, and I had received care from doctors affiliated with each. That freed me from limbo; I could get immunized as long as I stayed on my side of the state line. But further communication was impossible. I could click myself onto the waiting list but I couldn't find out if a particular facility had J&J, let alone request it. Neither could my primary care physician.

I never managed to talk to Hopkins; at Medstar I signed up and waited more than a week for a telephone consult. That's when I was told I'd have to take whatever shot I was assigned. Even if I showed up in person to explain that I couldn't take Pfizer, I was told, I would be deemed a no-show and deleted from their vaccine list. Nor would MedStar call me or my doctor if and when a J&J shipment came in. (A spokeswoman said Medstar Health follows all CDC protocols but does not know in advance what shots it's going to get from the local government on any given day, so it can't match a specific vaccine to a patient in advance. Vaccines were still in short supply in early April.) A staffer on the Maryland mass vaccination site phone line grasped my dilemma immediately, but couldn't help either.

Finally, my new allergist tracked down a single J&J dose. Her D.C. office was one block from the ER at a major teaching hospital, but she couldn't vaccinate a Marylander there. She had another office, in a Maryland suburb, two miles from a community hospital. Same shot, same doctor, same arm, longer drive from the hospital. I swallowed more Benadryl than I'm used to, and we had two EpiPens and prescription steroids at the ready, in case. She kept me for three hours, observing me carefully, checking my vitals every half hour. My blood pressure was low at first, and I felt faint and dizzy at times, needing to hold on to the wall when I walked—but that was probably the double-dose Benadryl, not the shot. A peanut butter Clif bar and a bag of almonds helped. And, finally, I was vaccinated.

By the time I learned of the CDC panel through my son, my doctors and I had done weeks of tests and research about how I could best get fully vaccinated. I e-mailed my son's friend's father—"Bethesda Mom with Pfizer Allergy, Kids are gap year friends"—but he told me the medical experts advise physicians, not patients directly. He did reassure me, one gap year parent to another, that I was in good hands with my new allergist but maybe I'd want to ask her about just one more blood test. She understood, and ordered it before I got my J&J shot.

I had never expected the CDC to drop everything mid-pandemic and rush to my aid, and some of the vaccine reporting sites are for research, not patients. But to have multiple reporting systems and zero outreach to either me or my doctors doesn't seem like a good plan either. (I do know someone who got a call after a Moderna mishap less serious than my own.) I would have been fine with a response as simple as, "We got your message and we'll be in touch as soon as we get the next phase of mass vaccination off the ground." Or an automated response to me or my doctor, referring her to the CDC consulting team—the one that my kid found. These reporting systems should find a way to screen out cranks, post an FAQ and focus on real physicians, with real questions about the non-cookie-cutter patients.

The CDC did not return a request for comment. Pfizer says its safety team reviews all adverse event forms submitted through its reporting system—with expedited review for those deemed the most serious. Its safety team responds to reports if they consider it necessary.

If finding a path forward was this hard for me, an experienced health journalist who lives about halfway between the Department of Health and Human Services and Tony Fauci's lab, who has coworkers who can suss out details on the CDC website, I can't imagine what most people do. Many probably just skip the second shot—not the desired public health outcome when we are trying to vaccinate our country out of the pandemic. Every unsolved problem allowed to fester undermines a battered public health system just at the moment we need to be rebuilding trust, not fear. We need information that's fast, accessible, responsive. That's the cornerstone of trust.

These mRNA vaccines—Pfizer, Moderna and more in the pipeline—are wondrous breakthroughs that will likely lead to new and better vaccines for a whole range of diseases, from flu to maybe, just maybe, HIV/AIDS. I'm not sure I will be able to take mRNA vaccines in future, but I'll worry about that later. For now, I'm vaccinated and, given that so little is known about mix-and-match vaccines, I've started looking for scientists who might want to study the antibodies and T cells in my blood. The relief hasn't fully kicked in; these two months took a toll. But I'm starting to feel lighter as I walk through the neighborhood and see gardens blooming, unmasked children at play. And if my stress hasn't all oozed out by next weekend, the Cub Scout hug should take care of it.

To Keep Their Son Alive, They Sleep in Shifts. And Hope a Nurse Shows Up.

Source: https://news.yahoo.com/keep-son-alive-sleep-shifts-150545087.html

Chloe Mead and Andy Maskin tend to their seven-year-old son, Henry, who lives with a rare condition called spinal muscular atrophy that requires 24-hour medical care, at their home in Queens on May 9, 2021. (Brittainy Newman/The New York Times)

June 06 – It was 9 a.m. on a Sunday in May, and Chloe Mead was already worn out.

In her living room, she cradled her 7-year-old son, Henry, supporting his head with one hand and helping him toss a ball with the other, careful not to disturb the ventilator that was keeping him alive. A nearby monitor tracked his blood-oxygen levels and a pump was at the ready should his tracheotomy tube need cleaning. In the corner, her 4-year-old daughter was building a pillow fort.

"I need, like, five extra arms," she said.

Ordinarily, she wouldn't be by herself. Since infancy, Henry, who has spinal muscular atrophy, a rare muscle-wasting disorder, has had intensive, round-the-clock nursing at home, with Mead and her husband serving as fallbacks when a nurse unexpectedly cancels a shift.

But the recent shortage of home-care nurses has forced the couple, who live in Queens, New York, to handle longer and longer periods on their own — as many as 36 hours at a stretch. That morning, her husband, Andy Maskin, was catching up on sleep so he could take that night's late shift, from 2 a.m. until 7 a.m., when he begins his own workweek.

About 4.5 million Americans with illnesses and disabilities are cared for at home by aides, therapists or nurses. Most of these patients are older, but hundreds of thousands are children with complex health needs, a number that has climbed upward as medical advances allow more to survive into adulthood.

The families of these children have long struggled to find skilled help, but many say COVID-19 has made an already untenable situation even worse. Nurses left the workforce to care for their own out-of-school children, or abandoned the profession permanently. And the surging demand for personnel at hospitals, testing sites and vaccination centers drew nurses away with as much as double the wages they earn caring for patients at home.

The easing of the pandemic may not improve conditions much. The shortage of nurses is long-standing and in the wake of a public health crisis that prompted 29% of health care workers to consider leaving the profession, many expect a wave of retirements.

"This is as bad as it's ever been," said Liz Wise, who works for the nationwide nonprofit Bayada Home Health Care, helping transition young patients from hospitals to homes. Her own daughter needed home-care nursing, so she feels it keenly when patients can't get the coverage they need. "Disappointing families is enough to keep me up at night."

Many had pinned their hopes on the Biden administration's infrastructure plan, which would provide $400 billion to improve home and community-based care. But as the president and Republicans vie over the proposal's size and scope, it's unclear whether that part will survive. Parents, meanwhile, continue to shoulder an unrelenting burden, increasingly alone.

The Pandemic Deepens a Pay Gap

A nurse caring for a medically fragile child at home has the same responsibilities he or she would in a hospital but no medical backup in case of emergency. It's a high-wire act, and experts say that prevailing wages don't reflect its difficulty.

Federal guidelines permit state Medicaid programs to cover in-home care for eligible children regardless of their families' income, since the price of round-the-clock nursing would bankrupt almost anyone. But states generally pay home care nurses at much lower rates than they would for equivalent care in a hospital or other medical center.

"They effectively establish a benchmark of workers' compensation that competitively disadvantages this field," said Roger Noyes, a spokesman for the Home Care Association of New York State. In turn, state-certified home health agencies that provide families with nurses pay meager salaries and seldom offer health insurance or other benefits to the nurses they employ.

So, although home care is more appropriate for medically fragile children, hospitals receive about half of Medicaid spending on these cases compared with 2% for home care, studies show.

And COVID-19 generated competing demands for nursing that further diminished the home care workforce. Surging with the pandemic, the state's largest health care provider, Northwell Health, hired 40% more nurses in 2020 than the year prior and contracted with 1,000 additional temporary nurses once the local hiring pool was exhausted.

Robert Pacella, the CEO of Caring Hands Home Care, the agency that staffs Henry's case, noticed the change in January as nurses began declining opportunities to pick up shifts and new applicants dwindled.

"As recently as two years ago, we could easily interview 20 people a week who were qualified — now we're lucky to get two to four," he said. For the first time in his career, Pacella said, he had to turn new patients away.

The problem isn't confined to New York. Thrive Skilled Pediatric Care says its eight-state operation received 53% fewer job applicants in March compared with the same month last year. Shortages of home care providers have been recently reported from New Hampshire to Michigan to Pennsylvania.

Jarred Rhatigan, a 31-year-old nurse from Nassau County, was once part of the home care workforce: In addition to a full-time position in a hospital, he worked several days a week with Caring Hands for an hourly wage of around $40. But beginning last December, he dropped all those shifts to administer vaccines at sites across the greater New York area for up to $75 an hour.

"Home care definitely can't compete with the rates," he said. These earnings helped him pay off $8,000 of student loans this year, although it's just a dent in the $62,000 he still owes.

For the last four years, Jen Semple, a registered nurse in South Carolina, has provided home care to a single patient, despite hourly pay that rose just $1 during that time. When the pandemic began, she cut her home care hours to administer vaccines for a local health care system, at an hourly wage $7 higher than she had been earning. It is rewarding to contribute to the COVID recovery, she said, and the atmosphere is cheerful, with a stream of patients thrilled to get their doses. "But part of me does feel guilty because I know my private duty patient still has hours unfilled," she said.

Between June and October 2020, Carolyn Foster, a researcher and pediatrician at the Ann and Robert H. Lurie Children's Hospital of Chicago, surveyed parents of medically fragile children and found that half had lost home health care services during the pandemic. And patients with the most complex conditions often have the hardest time finding capable staff.

"The most vulnerable families were made all that more vulnerable," she said.

'We Have Nobody'

In the first months of the pandemic, two of Henry's nurses fell ill and quarantined, and his parents cut back hours at their own jobs to take up the slack. After several months, they reassembled their nursing coverage, but by this spring, gaps reappeared. Mead said that when she called her home care agency, they responded, "We have nobody."

Mead reached out to other agencies, contacted nurses who had formerly cared for Henry, and posted a plea on Facebook. To make matters worse, her daughter had recently been diagnosed with Type 1 diabetes, so the couple now had to look after two children with life-threatening conditions.

The recurrent all-nighters have stretched both parents thin. "I would like to believe that I'm always going to be 100% sharp, but what if I'm so exhausted that I make a mistake with something?" Mead asked. "It's really frightening."

For single parents, the difficulties are compounded. Sarin Morris, a 40-year-old mother in Clifton, New Jersey, has sole responsibility for her 4-year-old, Sam, whose rare neurological disorder has left him on a ventilator and prone to seizures. He is prescribed 20 hours a day of nursing care but has never had nurses to cover it all.

Morris and Sam's father divorced before he was born and her parents live in Italy, so she has no family to assist her. If she can get a nurse, she works at Home Depot. Early in the pandemic she switched to the night shift, restocking shelves while the store is empty to

reduce the risk she will contract the coronavirus and pass it on to her son. “But if I don’t have coverage, I can’t go to work,” she said. “And if I can’t go to work, I can’t have my bills paid on time.”
Weekends are the worst, she says. She has struggled to get any nursing coverage at all, and from Saturday night to Monday morning she is alone with her son, sometimes lying in bed beside him so his seizures will wake her if she dozes off. When a nurse finally relieves her, she rests a few hours before heading to work. “It’s a nightmare,” she said. “I don’t remember the last time I got a full night’s sleep in my bed.”
Out of desperation, Morris has considered enrolling in nursing school, in hopes of earning a living at her son’s bedside. State Medicaid programs typically bar people from getting paid as caregivers for relatives, but some of those restrictions were temporarily relaxed during the pandemic, and a few states have established permanent programs. In Colorado, for example, people can become paid certified nursing assistants for family members. But Morris is daunted by the tuition for the two-year nursing program at a nearby university, over $25,000. Her current job pays $13 an hour, and she has no savings.

Government Steps In, Lightly

To address the deficit of nurses, experts tick off recommendations including better incorporating home care into nursing education and creating financial incentives to enter the field — but most agree the problem can’t be truly addressed without narrowing the disparate pay between home care and medical facilities.
“Reimbursement rates need to be increased for home care, and also include health benefit packages, so that it becomes more of a valued health care role,” said Cara Coleman, the director of public policy and advocacy at Family Voices, a nonprofit that advocates for families and children with special needs.
Until recently, New York state’s Medicaid program paid less than most other states for registered nurses who care for medically fragile children. Last October, after years of advocacy by families and medical providers, the state carried out the first of several planned increases in reimbursement, and by April 2022 they will have risen by 45%.
“We were blown away they did it,” said Dr. Eddie Simpser, the president of St. Mary’s Healthcare System for Children, who pushed for the increase. But, he said, “hospital salaries are still strong competition.”
Since Medicaid programs receive significant federal funding, many advocates are looking to Washington for help. As part of the stimulus package, enacted in March, the Biden administration temporarily increased federal support for state Medicaid programs’ home and community-based services — but the measure lasts only one year, and states may balk at expanding programs that they will ultimately have to fund themselves. President Joe Biden’s infrastructure plan would go even further, sending states $400 billion over 10 years to beef up home care.
Foster, the researcher and pediatrician, said that this would be “a critically needed increase” in resources but that it isn’t a long-term solution. She pointed instead to a proposal by a group of Democratic lawmakers to permanently expand the entitlement for home and community-based services and standardize it nationwide, with the costs borne entirely by the federal government. Calling it “a once-in-a-generation opportunity,” she conceded it would carry a high price tag.
As the pandemic ebbs and testing and vaccination sites slow down, some nurses are expected to return to home care. But Mead has seen no sign of it: She lacks nursing coverage two nights this coming week, and expects to pass them, vigilant, caring for her son.

There's a Mystery Affecting Up to 30% of COVID Patients. Here's What We Know So Far

By Vanessa Bryant, Alex Holmes, and Louis Irving
Source: https://www.sciencealert.com/long-covid-is-likely-going-to-be-with-us-for-a-while-here-s-the-latest-theories

June 07 – Most people who get COVID suffer the common symptoms of fever, cough and breathing problems, and recover in a week or two.
But some people, estimated to be roughly 10-30 percent of people who get COVID, suffer persistent symptoms colloquially known as "long COVID".
Why do some people recover quickly, while others' symptoms continue for months? This question has proved to be one of the most challenging to emerge from the COVID-19 pandemic.
While there's no definitive answer yet, there are a few leading theories put forward by researchers around the world.

So, what have we learned about long COVID, and what is the latest evidence telling us so far?

What is long COVID?

There's no universally accepted definition of long COVID because it's such a new phenomenon. A working definition is that it's a term used to describe the situation where people experience a range of persistent symptoms following COVID-19.

The most common symptoms we (Louis and Alex) hear from sufferers in our long COVID clinic in Melbourne are fatigue, shortness of breath, chest pain, heart palpitations, headaches, brain fog, muscle aches and sleep disturbance.

But it can also include very diverse symptoms like loss of smell and taste, increased worry especially in relation to one's health, depression, and an inability to work and interact with society. In some of these people, it's almost as if there's a process that's affected every part of their body.

Another feature for many in our clinic is the disconnect between the severity of their initial COVID illness and the development of significant and persisting symptoms during recovery. Most of our patients in the long COVID clinic had a milder illness initially, are often younger than those who've been hospitalized, and were healthy and active before getting COVID.

Regardless of the specific symptoms, many of our patients are concerned there's persisting infection and damage occurring, along with a fear and frustration that they're not improving.

So far we haven't found any specific test to explain post COVID symptoms. This has confirmed our view that in most patients, long COVID symptoms are probably related to a complex interaction of physical and psychological processes that have arisen following the sudden inflammation caused by the COVID infection.

How many people have long COVID?

It's very difficult to determine what proportion of people who get COVID end up with persistent symptoms. At this stage we don't know the exact rate.

In our ongoing study of COVID immunity at the Walter and Eliza Hall Institute (WEHI) we found 34 percent of our participants were experiencing long COVID 45 weeks after diagnosis.

But our study is community-based and not designed to measure the overall prevalence of the condition in the wider population.

The data is still emerging and different sources cite different rates. It depends how the researchers recruited and followed participants, for example, as part of post-discharge follow up or community surveys.

The World Health Organization says its 10 percent, while a study from the UK found 30 percent. The proportion of people affected is likely to be different between countries.

Many doctors are still not aware of long COVID, so many cases may not be recognized and added to studies. Indeed, after some data from our WEHI study aired on the ABC's 7.30 program, more people with ongoing symptoms came forward to join the study, and some didn't know there was research being conducted or even that the condition existed.

We need a fully-fledged "population study" to determine the approximate rate. This would mean contacting a whole group of people who contracted COVID and seeing how many have ongoing problems at a set time, such as a year later. Doing these studies is difficult, but it would mean we can answer an important question.

How can it be treated?

Treating the condition is challenging given there's no definitive clinical test to determine if someone has it, and there's no standard treatment yet.

People with mild symptoms may not require treatment, but rather just validation and information.

Others with more severe or persistent symptoms need more. By offering clinical care backed by a coordinated team of specialists, multidisciplinary long COVID clinics ensure patients receive the best care available without the endless burden of multiple independent consultations.

These clinics use a holistic approach and build knowledge of the best strategies to support recovery. They include teams of specialists such as respiratory physicians, rheumatologists, immunologists, physiotherapists, and in some cases, psychologists and psychiatrists. A graded exercise program is often useful.

For most people, the outcomes are good. After nine months, half of our patients have returned to close to normal activity and have been discharged from the clinic.

However, there's a group of patients whose improvement is slower. They're often young and previously high functioning. They have limited ability to work, exercise and socialize. Their return to work and other activities needs to be carefully managed, and they need to avoid doing too much too quickly.
It's essential these patients' persisting symptoms are acknowledged, and that they get support from their family, employer and a multidisciplinary medical team.

What causes long COVID?

We don't know yet why some people get long COVID while others recover a few weeks after being infected.
If it was simply linked to severe COVID then that would give us clues. But it isn't, as we've seen people with mild disease end up with long COVID symptoms, just as we have with people in intensive care.
However, there are some front-runner ideas that researchers across the globe have put forward.
This includes the idea that long COVID could be a consequence of people's immune systems misfiring and working overtime in the wake of infection.
One clue that supports this theory is that some people suffering from long COVID say their symptoms markedly improve after getting a COVID vaccine. This strongly suggests the diverse symptoms of long COVID are directly linked back to our immune system. It's possible the vaccine might help by redirecting the immune system back on track, by directly activating certain immune cells like T cells (that help stimulate antibody production and kill virus-infected cells) or frontline innate immune cells that correct this immune misfiring.
Another theory is that, in the bodies of people with long COVID, there's a small, persistent "viral reservoir" hidden from detection by diagnostic tests, or leftover small viral fragments that the body hasn't dealt with. These reservoirs are not infectious but may consistently activate the immune system. A vaccine might help direct the immune system to the right spots to mop up the leftover virus.
While we can't yet say for sure a vaccine will help everyone, there's no evidence that booting the immune response makes things worse. If anything, it's likely to make things better.
Or long COVID might a combination of both of these, or many different elements.
The bottom line is we still need more research, as it's still in its early stages. There's no cure yet, but we can support and manage sufferers' symptoms and we encourage everyone to get their COVID-19 vaccine when it's available to you.

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How Virus Detectives Trace the Origins of an Outbreak – and Why It's So Tricky

By Marilyn J. Roossinck
Source: http://www.homelandsecuritynewswire.com/dr20210607-how-virus-detectives-trace-the-origins-of-an-outbreak-and-why-it-s-so-tricky

June 07 – Every time there is a major disease outbreak, one of the first questions scientists and the public ask is: "Where did this come from?"
In order to predict and prevent future pandemics like COVID-19, researchers need to find the origin of the viruses that cause them.
This is not a trivial task. The origin of HIV was not clear until 20 years after it spread around the world. Scientists still don't know the origin of Ebola, even though it has caused periodic epidemics since the 1970s.
As an expert in viral ecology, I am often asked how scientists trace the origins of a virus. In my work, I have found many new viruses and some well-known pathogens that infect wild plants without causing any disease.
Plant, animal or human, the methods are largely the same. Tracking down the origins of a virus involves a combination of extensive fieldwork, thorough lab testing and quite a bit of luck.

Viruses Jump from Wild Animal Hosts to Humans

Many viruses and other disease agents that infect people originate in animals. These diseases are zoonotic, meaning they are caused by animal viruses that jumped to people and adapted to spread through the human population.

It might be tempting to start the viral origin search by testing sick animals at the site of the first known human infection, but wild hosts often don't show any symptoms. Viruses and their hosts adapt to each other over time, so viruses often don't cause obvious disease symptoms until they've jumped to a new host species. Researchers can't just look for sick animals.

Another problem is that people and their food animals aren't stationary. The place where researchers find the first infected person is not necessarily close to the place where the virus first emerged.

In the case of COVID-19, bats were an obvious first place to look. They're known hosts for many coronaviruses and are the probable source of other zoonotic diseases like SARS and MERS.

For SARS-CoV-2, the virus that causes COVID-19, the nearest relative scientists have found so far is BatCoV RaTG13. This virus is part of a collection of bat coronaviruses discovered in 2011 and 2012 by virologists from the Wuhan Virology Institute. The virologists were looking for SARS-related coronaviruses in bats after the SARS-CoV-1 pandemic in 2003. They collected fecal samples and throat swabs from bats at a site in Yunnan Province about 932 miles (1,500 kilometers) from the institute's lab in Wuhan, where they brought samples back for further study.

To test whether the bat coronaviruses could spread into people, researchers infected monkey kidney cells and human tumor-derived cells with the Yunnan samples. They found that a number of the viruses from this collection could replicate in the human cells, meaning they could potentially be transmitted directly from bats to humans without an intermediate host. Bats and people don't come into direct contact very often, however, so an intermediate host is still quite likely.

Finding the Nearest Relatives

The next step is to determine how closely related a suspected wildlife virus is to the one infecting humans. Scientists do this by figuring out the genetic sequence of the virus, which involves determining the order of the basic building blocks, or nucleotides, that make up the genome. The more nucleotides two genetic sequences share, the more closely related they are.

Genetic sequencing of bat coronavirus RaTG13 showed it to be over 96% identical to SARS-CoV-2. This level of similarity means that RaTG13 is a pretty close relative to SARS-CoV-2, confirming that SARS-CoV-2 probably originated in bats, but is still too distant to be a direct ancestor. There likely was another host that caught the virus from bats and passed it on to humans.

Because some of the earliest cases of COVID-19 were found in people associated with the wildlife market in Wuhan, there was speculation that a wild animal from this market was the intermediate host between bats and humans. However, researchers never found the coronavirus in animals from the market.

Likewise, when a related coronavirus was identified in pangolins confiscated in an anti-smuggling operation in southern China, many leaped to the conclusion that SARS-CoV-2 had jumped from bats to pangolins to humans. The pangolin virus was found to be only 91% identical to SARS-CoV-2, though, making it unlikely to be a direct ancestor of the human virus.

To pinpoint the origin of SARS-CoV-2, a lot more wild samples need to be collected. This is a difficult task – sampling bats is time-consuming and requires strict precautions against accidental infection. Since SARS-related coronaviruses are found in bats across Asia, including Thailand and Japan, it's a very big haystack to search for a very small needle.

Creating a Family Tree for SARS-CoV-2

In order to sort out the puzzle of viral origins and movement, scientists not only have to find the missing pieces, but also figure out how they all fit together. This requires collecting viral samples from human infections and comparing those genetic sequences both to each other and to other animal-derived viruses.

To determine how these viral samples are related to each other, researchers use computer tools to construct the virus's family tree, or phylogeny. Researchers compare the genetic sequences of each viral sample and construct relationships by aligning and ranking genetic similarities and differences.

The direct ancestor to the virus, sharing the greatest genetic similarity, could be thought of as its parent. Variants sharing that same parent sequence but with enough changes to make them distinct from each other are like siblings. In the case of SARS-CoV-2, the South African variant, B.1.351, and the U.K. variant, B.1.1.7, are siblings.

Building a family tree is complicated by the fact that different analysis parameters can give different results: The same set of genetic sequences can produce two very different family trees.

For SARS-CoV-2, phylogenetic analysis proves particularly difficult. Though tens of thousands of SARS-CoV-2 sequences are now available, they don't differ from one another enough to form a clear picture of how they're related to each other.

The current Debate: Wild Host or Lab Spillover?

Could SARS-CoV-2 have been released from a research lab? Although current evidence implies that this is not the case, 18 prominent virologists recently suggested that this question should be further investigated.

Although there has been speculation about SARS-CoV-2 being engineered in a lab, this possibility seems highly unlikely. When comparing the genetic sequence of wild RaTG13 with SARS-CoV-2, differences are randomly spread across the genome. In an engineered virus, there would be clear blocks of changes that represent introduced sequences from a different viral source.

There is one unique sequence in the SARS-CoV-2 genome that codes for a part of the spike protein that seems to play an important role in infecting people. Interestingly, a similar sequence is found in the MERS coronavirus that causes a disease similar to COVID-19.

Though it is not clear how SARS-CoV-2 acquired these sequences, viral evolution suggests they arose from natural processes. Viruses accumulate changes either by genetic exchange with other viruses and their hosts, or by random mistakes during replication. Viruses that gain a genetic change that gives them a reproductive advantage would typically continue to pass it on through replication. That MERS and SARS-CoV-2 share a similar sequence in this part of the genome suggests that it naturally evolved in both and spread because it helps them infect human cells.

Where to Go from Here?

Figuring out the origin of SARS-CoV-2 could give us clues to understand and predict future pandemics, but we may never know exactly where it came from. Regardless of how the SARS-CoV-2 jumped into humans, it's here now, and it's probably here to stay. Going forward, researchers need to continue monitoring its spread, and get as many people vaccinated as possible.

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Scientists Have Calculated The Weight of All The SARS-CoV-2 in The World

Source: https://www.sciencealert.com/how-much-does-all-the-sars-cov-2-in-the-world-weigh

June 09 – If all the SARS-CoV-2 particles currently circulating in humans around the globe were gathered together into one place, they would weigh somewhere between the weight of an apple and that of a young toddler, according to a new study.

A group of researchers recently calculated that each infected individual carries about 10 billion to 100 billion individual SARS-CoV-2 particles at the peak of their infection. That suggests that all of the SARS-CoV-2 viruses currently infecting people around the world — which has been about 1 million to 10 million infections at any given time during the pandemic — have a collective mass of somewhere between 0.22 and 22 pounds (0.1 and 10 kilograms).

Small doesn't mean insignificant, however.

"Taking a view from a larger historical context, from the standpoint of leverage, an atomic bomb is less than 100 kg [220 lbs] of fissile material," senior author Ron Milo, a professor in the Department of Plant and Environmental Sciences at the Weizmann Institute of Science in Israel, and co-lead author Ron Sender, a doctorate student in Milo's lab, said in an email to Live Science.

"And yet, look at the destruction that is wrought."

Similarly, "here we are talking about a super-tiny mass of viruses, and they are completely wreaking havoc on the world," they added. The virus has now infected more than 173 million people and killed over 3.7 million, according to the Johns Hopkins coronavirus dashboard.

To calculate how much virus each infected person may carry, the researchers used previous measurements taken from rhesus monkeys on how much SARS-CoV-2 they carried during peak infection in various tissues that are known to be susceptible to the virus, including in the lungs, tonsils, lymph nodes and the digestive system.

They then multiplied the number of virus particles present per gram of tissue in rhesus monkeys with the mass of human tissues, to estimate the number of virus particles in human tissues.

From previous calculations based on the virus's diameter, they already knew that each viral particle has a mass of 1 femtogram (10 raised to the minus 15 grams). Using the mass of each particle and the number of estimated particles, they calculated that each person, at peak infection, carries about 1 microgram to 10 micrograms of virus particles.

Crunching these numbers allowed the team to better understand what's going on in the body throughout an infection, such as how many cells are being infected and how the number of virus particles made in the body compares with how fast the virus can evolve, Milo and Sender said.

They then calculated how many mutations the virus would gather, on average, during infection of a single person and also across the entire population. To do this, they used a previous estimate, from a similar coronavirus, for how often a single nucleotide mutates, multiplied it by the number of nucleotides in the SARS-CoV-2 genome, and then factored in how many times the virus made copies of itself inside the body during infection.

They found that during infection in a single host, the virus would accumulate about 0.1 to one mutation across its entire genome. Given there are 4 to 5 days between infections, the virus would therefore gather about three mutations per month, which is consistent with the known evolution rate of SARS-CoV-2, the researchers wrote.

But they also found a large variation in the number of viral particles across infected humans; in fact, it can differ by five to six orders of magnitude, meaning that some infected people may have millions of times more of these particles than others.

"We know that people with low viral load indeed have lower chances of infecting others," Milo and Sender said.

But it's not yet clear if superspreaders, for example, spread the virus more than others due to biological reasons, such as high viral loads, or sociological reasons such as having many close encounters with people in large events held in closed spaces, they added.

"We hope this research will initiate new thoughts and new experiments," they said.

▶▶ **The findings were published June 3 in the journal** *Proceedings of the National Academy of Sciences*.

COVID-19's Toll on the Elderly May Be Halted by Targeting Cell Senescence

New findings may explain why the elderly are more vulnerable to COVID-19. The research shows that senescent cells play a role in COVID-19 disease progression. In addition, selectively removing the senescent cells with senolytic drugs significantly reduced mortality in older mice upon infection with a virus closely related to SARS-CoV-2. These findings reveal a possible new approach to treating elderly patients with COVID-19. **+ MORE**

Talking spreads COVID far more than coughing or sneezing, study concludes

Source: https://www.studyfinds.org/talking-spreads-covid-more-than-coughing-sneezing/

June 09 — Cover your mouth — when you talk? That's the suggestion by some doctors, at least during the coronavirus pandemic. Alarming new research claims that chatting is more likely to spread the virus that causes COVID-19 than coughing or sneezing.

Conversations with friends, family, colleagues or other members of the community pose the greatest danger, researchers say. They suggest that masks should be worn in offices, shops, vehicles and other confined spaces. This can reduce risk of infection *more than eightfold* — if both individuals are covered.

Tiny aerosols of the virus emitted when speaking linger in the air for longer than larger droplets from a cough or sneeze. Researchers say their review shows "solid evidence" that talking is the "dominating" source for transmission.

"We have all seen some spit droplets flying when people talk, but there are thousands more, too small to be seen by the naked eye," says senior author Dr. Adriaan Bax, a chemical physicist at the National Institutes of Health, Bethesda, Maryland, per South West News Service. "When the water evaporates from such speech generated, potentially virus rich droplets, they float in the air for minutes, like smoke, thus putting others at risk."

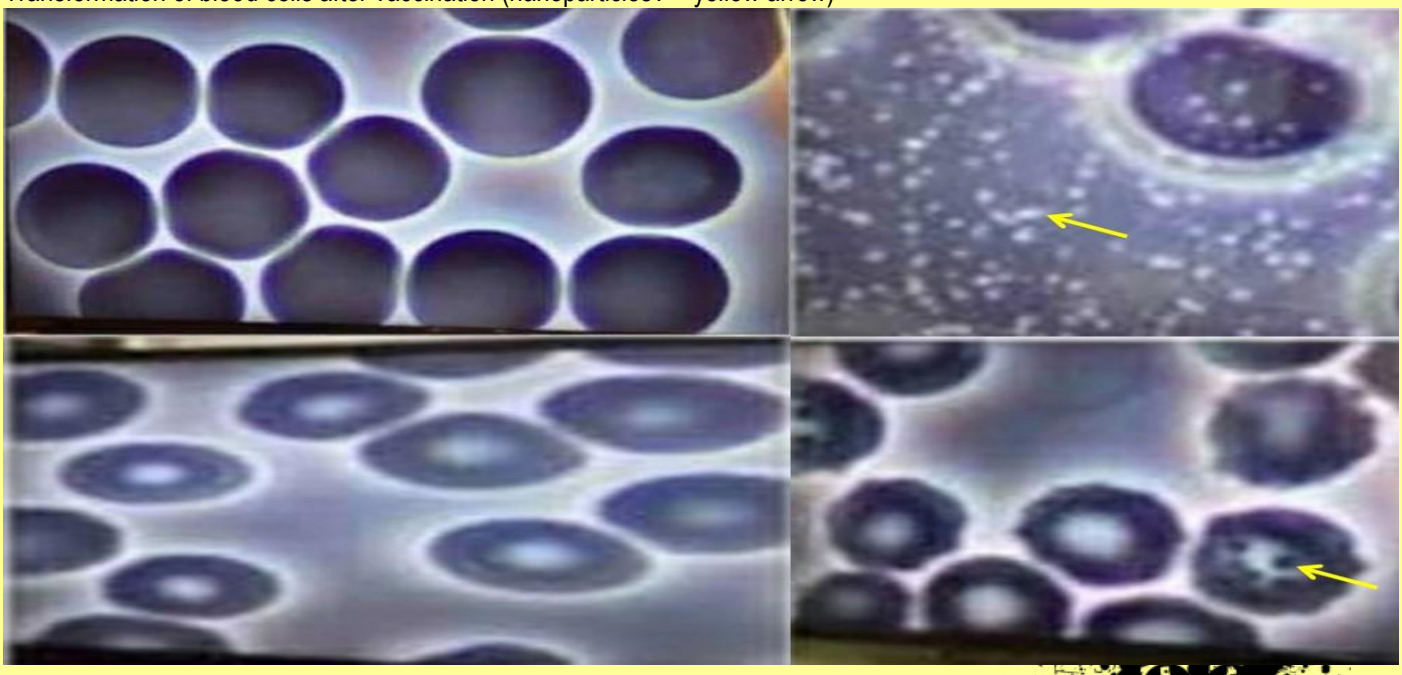
The review in the *Journal of Internal Medicine* shows that size really matters when it comes to spreading Covid.
"Respiratory droplets emitted while breathing, speaking, singing, coughing and sneezing span a continuum of sizes that depend on their generation mechanism and their site of origin," explains Bax.
Large droplets fall to the ground over short distances because they are heavier. They play a "relative small role in transmission." Meanwhile, smaller droplets, known as aerosols, can carry the virus more than six-and-a-half feet and linger.

Of most concern is the large fraction of speech aerosol that is intermediate-sized because it remains suspended in air for minutes and can be transported over considerable distances by convective air currents.

"The abundance of this speech-generated aerosol, combined with its high viral load in pre- and asymptomatic individuals, strongly implicates airborne transmission of SARS-CoV-2 through speech as the primary contributor to its rapid spread," says Bax.
The infection commonly starts in the nose and throat, or upper respiratory tract (URT). It can migrate to the lungs, the lower respiratory tract (LRT) and other organs, often with severe consequences. Infection in the lungs can lead to shedding the virus through breath and cough droplets. But the nose and throat, where the coronavirus enters the body through inhalation, enables it to be spread through speech droplets.
Moreover, the viral load can be high in carriers with mild or no symptoms, such as young people and schoolchildren.
"The acoustic waves generated during vocalization involve high-speed passage of air pressurized by the lungs past the mucosal epithelial layers of the vibrating vocal folds," explains Bax. "These sounds are further modulated when air travels through narrow passages between the tongue, lips and teeth. For example, enunciation of 'p' and 'b' involves parting of the lips, whereas 't' involves transient contact of the tongue and teeth. As these surfaces part, a fluid filament or film is formed between them. Air rushing by can break the filament or burst the film with the fluid fragmenting into droplets that join the airstream. Droplets generated in the oral cavity consist mostly of saliva and span a range of sizes comparable in quantity and size to those generated by coughing and sneezing."
Catching Covid depends on a range of factors including how much of the aerosol is breathed in, whether it is indoors, levels of ventilation and the distance between the people involved.
"Unmasked speech in confined spaces represents the activity that poses the greatest risk to others. Since eating and drinking often take place indoors and typically involve loud speaking, it should come as no surprise that bars and restaurants have become the epicenter of multiple recent superspreading events," the review reads. "Next to vaccination, mitigation strategies should emphasize the use of face masks when speaking and ensuring adequate ventilation to flush out long-lived aerosols that might otherwise accumulate in closed environments and enhance the risk of more serious LRT infections."
The authors say that wearing of face coverings to limit the spread of respiratory viruses began in the east decades ago — and we should embrace what they have taught us.

Is it real or fake?

Transformation of blood cells after vaccination (nanoparticles? – yellow arrow)



Fake vaccine research: new low for science fraud

By Leonid Schneider
Source: https://forbetterscience.com/2020/04/03/fake-vaccine-research-new-low-for-science-fraud/

Apr 03 – COVID-19 pandemic is a good occasion to reassess our attitude to research fraud. Smut Clyde will show you some nanotechnologists who specialise on fabricating vaccine research data in Photoshop.

***Leonid Schneider** is an independent Science Journalist and Cartoonist. Formerly a molecular cell biologist.*

How coronavirus aerosols travel through our lungs

Source: https://www.sciencedaily.com/releases/2021/06/210607110235.htm

June 07 – When we inhale isolated coronavirus particles, more than 65% reach the deepest region of our lungs where damage to cells can lead to low blood oxygen levels, new research has discovered, and more of these aerosols reach the right lung than the left.

Lead author of the study Dr Saidul Islam, from the University of Technology Sydney, said while previous research has revealed how virus aerosols travel through the upper airways including the nose, mouth and throat -- this study was the first to examine how they flow through the lower lungs.

"Our lungs resemble tree branches that divide up to 23 times into smaller and smaller branches. Due to the complexity of this geometry it is difficult to develop a computer simulation, however we were able to model what happens in the first 17 generations, or branches, of the airways," said Dr Islam.

"Depending on our breathing rate, between 32% and 35% of viral particles are deposited in these first 17 branches. This means around 65% of virus particles escape to the deepest regions of our lungs, which includes the alveoli or air sacs," he said.

The alveolar system is critical to our ability to absorb oxygen, so significant amounts of virus in this region, along with inflammation caused by our body's immune response, can cause severe damage, reducing the amount of oxygen in the blood and increasing the risk of death.

The study also revealed that more virus particles are deposited in the right lung, especially the right upper lobe and the right lower lobe, than in the left lung. This is due to the highly asymmetrical anatomical structure of the lungs and the way air flows through the different lobes.

The research is backed up by a recent study of chest CT scans of COVID-19 patients showing greater infection and disease in the regions predicted by the model.

The researchers modelled three different flow rates -- 7.5, 15 and 30 litres per minute. The model showed greater virus deposition at lower flow rates.

As well as improving our understanding of coronavirus transmission, the findings have implications for the development of targeted drug delivery devices that can deliver medicine to the areas of the respiratory system most affected by the virus.

"Normally when we inhale drugs from a drug delivery device most of it is deposited in the upper airways, and only a minimum amount of drugs can reach the targeted position of the lower airways. However, with diseases like COVID-19 we need to target the areas most affected," said Dr Islam.

"We are working to develop devices that can target specific regions, and we also hope to build age and patient specific whole lung models to increase understanding of how SARS CoV-2 aerosols affect individual patients," said co-author and group leader of the UTS Computer Simulations and Modelling group, Dr Suvash Saha.

The World Health Organisation recently updated its advice about the importance of aerosol transmission, warning that because aerosols can remain suspended in the air, crowded indoor settings and areas with poor ventilation pose a significant risk for transmission of Covid-19.

"When we use an aerosol deodorant, the smallest particles of that liquid fall on us under extreme pressure in the form of gas. Similarly, when an infected person speaks, sings, sneezes or coughs, the virus is spread through the air and can infect those nearby," said Dr Saha.

The study has further applications, with researchers using portable devices to examine air quality -- including PM2.5 and PM10 concentration and gasses such as carbon dioxide, formaldehyde and sulphur dioxide -- in spaces such as train carriages. The researchers can then use this data to model the impact on our lungs.

▶▶ **The study, SARS CoV-2 aerosol: How far it can travel to the lower airways, was recently published in the journal Physics of Fluids.**

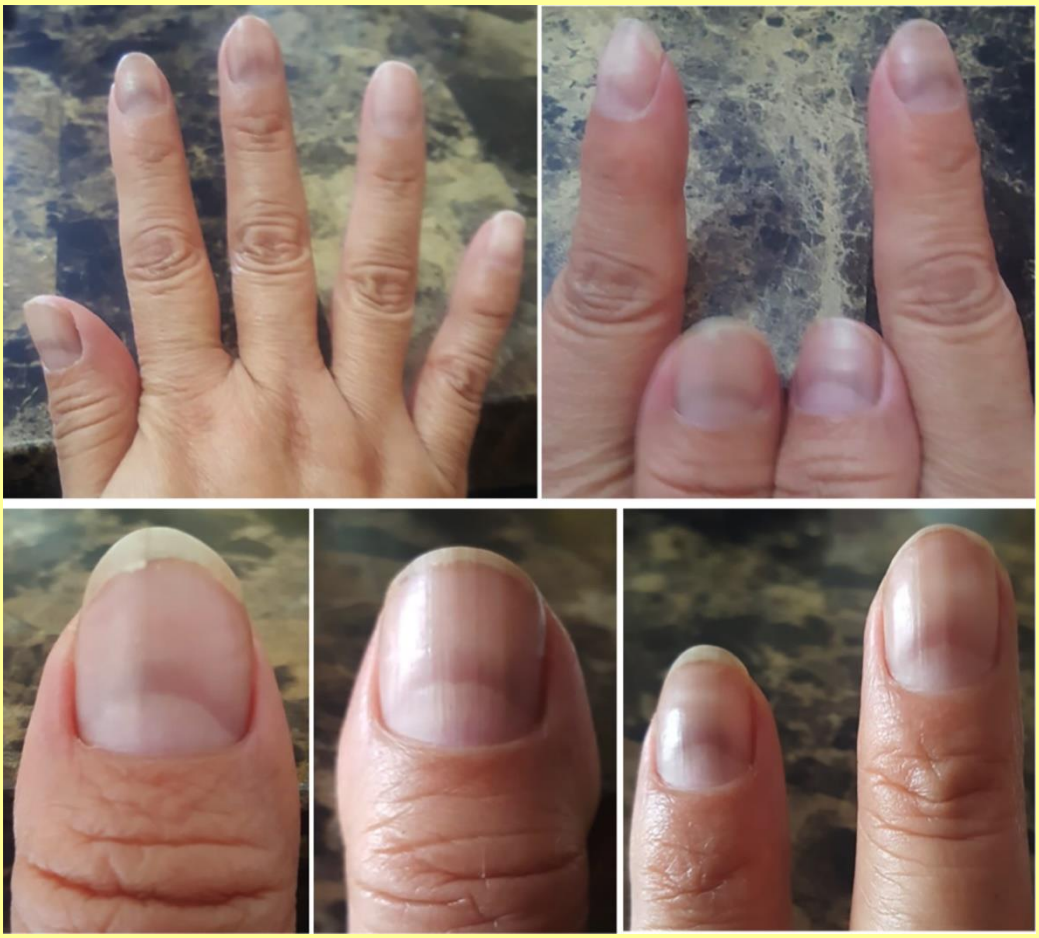
People are getting 'COVID nails,' and one expert says the unusual lines could be as useful as an antibody test to prove previous infection

By Dr. Catherine Schuster-Bruce

Source: https://www.businessinsider.com/covid-nail-beau-line-sign-infection-uk-scientist-

May 07 – Odd-looking nails could be a sign of previous coronavirus infection, a top UK scientist has said.

Horizontal lines across the nail that appear several months after catching coronavirus can happen in both fingers and toes, Tim Spector, professor of genetic epidemiology at King's College, told Insider.



Spector, who leads the world's largest coronavirus symptom study, said that he'd received multiple anecdotal reports of so-called COVID nails from people using the ZOE COVID Symptom Study app, a symptom tracker with more than 4 million users globally.

Spector's hunch is that this isn't a random phenomenon as it can happen after other infections too.

The underlying theory is that a stress line forms after the body shuts down for a brief period of time to fight the infection. During this time period nails don't grow. It also can happen after other stresses like chemotherapy and severe malnutrition.

"It's like a mark on a tree when an event happened," Spector explained.

Dr. Tanya Bleiker, president of the British Association of Dermatologists, told HuffPost UK that dermatologists have seen COVID-19 patients with horizontal lines on their nails too.

"These changes have long been recognized as 'Beau's lines' and are transverse indents in the nail of many, or all, fingernails and sometimes toenails," she said.

Beau's lines are not harmful themselves and usually grow out after several months.

Red, moon shaped lines across the nail are another coronavirus nail manifestation reported by dermatologists in August.

A cheap alternative to an antibody test

Spector said that it's not yet clear whether the nail changes are linked to disease severity for coronavirus. With other infections, the more severe the disease, the more likely you are to have a marker on your nail, he said.

"It may be a marker of severe infection [for COVID-19], but it would be more helpful if it wasn't," Spector added.

Spector explained that if nail changes were a marker of previous coronavirus infection then it could help people figure out whether they've had COVID-19 before without the need for a test that can be invasive and expensive.
"If we get enough numbers that are associated with asymptomatic COVID-19, that's a cheap antibody test," he said. "People just need to look down at their nails."

Dr. Catherine Schuster-Bruce *is the UK healthcare reporter for Insider. She won Best TV Documentary BJTC award in 2020. Catherine is a medical doctor, working in the NHS for over four years.*

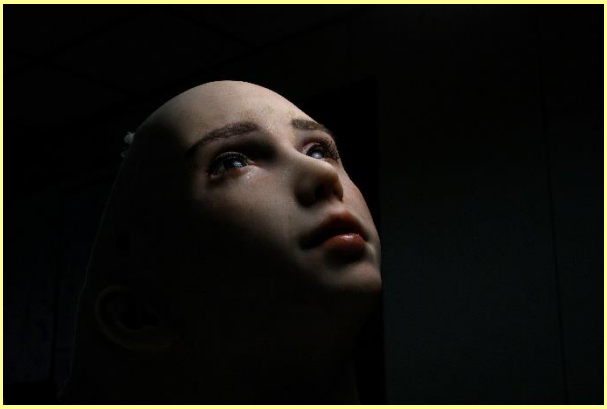
Meet Grace, the healthcare robot COVID-19 created

Source: https://www.reuters.com/business/healthcare-pharmaceuticals/meet-grace-healthcare-robot-covid-19-created-2021-06-09/

June 10 – The Hong Kong team behind celebrity humanoid robot Sophia is launching a new prototype, Grace, targeted at the healthcare market and designed to interact with the elderly and those isolated by the COVID-19 pandemic.
Dressed in a blue nurse's uniform, Grace has Asian features, collar-length brown hair and a thermal camera in her chest to take your temperature and measure your responsiveness. She uses artificial intelligence to diagnose a patient and can speak English, Mandarin and Cantonese.

"I can visit with people and brighten their day with social stimulation ... but can also do talk therapy, take bio readings and help healthcare providers," Grace told Reuters as she stood next to her "sister", Sophia, in creator Hanson Robotics' Hong Kong workshop.
Grace's resemblance to a healthcare professional and capacity for social interaction is aimed at relieving the burden of front-line hospital staff overwhelmed during the pandemic, said founder David Hanson.
"A human-like appearance facilitates trust and natural engagement because we are wired for human face-to-face interactions," Hanson said, explaining how Grace can simulate the action of more than 48 major facial muscles, and has a comforting demeanour designed to look a little like anime characters, often a fusion of Asian and Western styles.

An engineer adjusts the head of humanoid robot Grace, developed by Hanson Robotics and designed for the healthcare market, to interact and comfort the elderly and isolated people, especially those suffering during the coronavirus disease (COVID-19) pandemic, at the company's lab in Hong Kong, China May 4, 2021. Picture taken May 4, 2021. REUTERS/Tyrone Siu



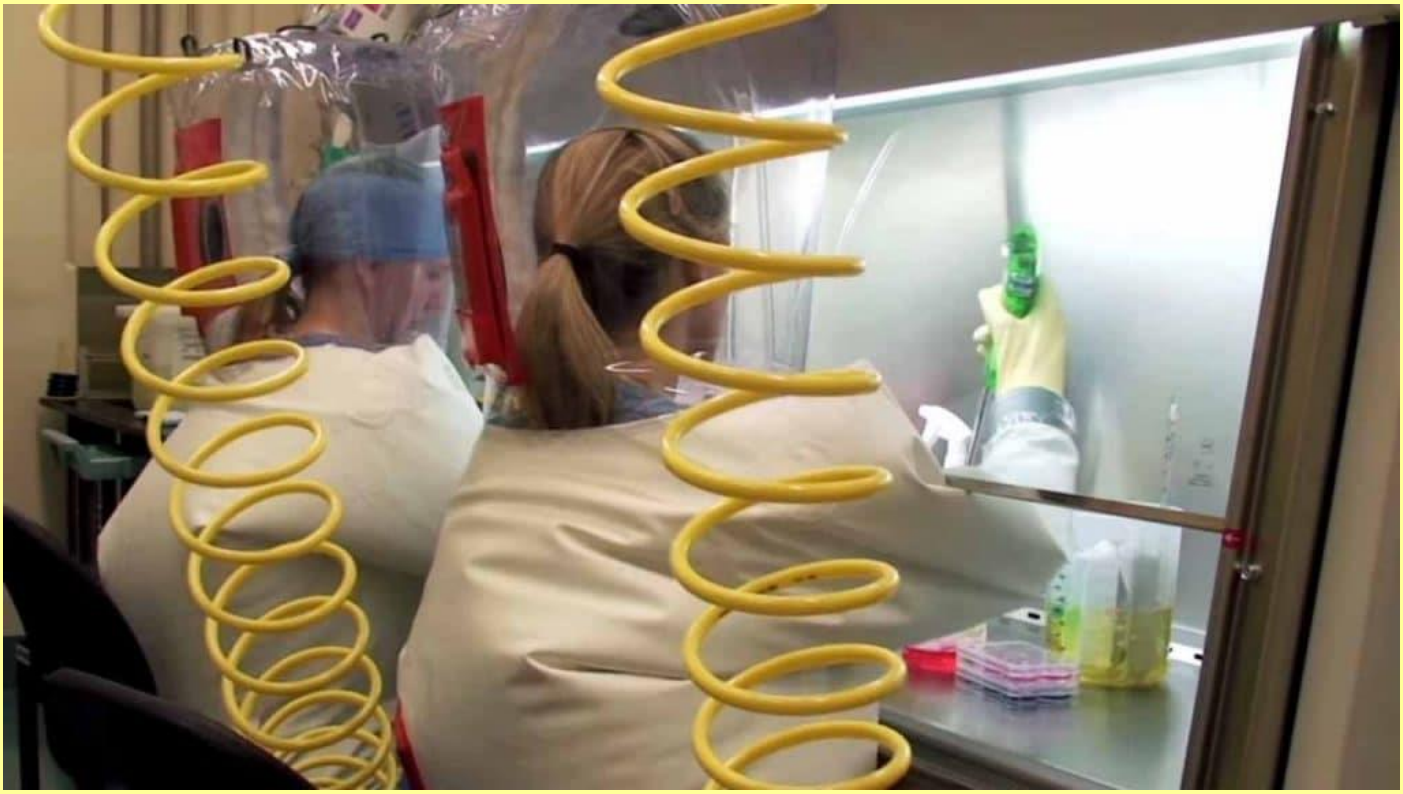
Awakening Health intends to mass-produce a beta version of Grace by August, said David Lake, chief executive of the joint venture between Hanson Robotics and Singularity Studio, and there are plans to fully deploy her next year in locations including Hong Kong, mainland China, Japan and Korea.
The cost of making the robots, now akin to luxury car pricing, will decrease once the company is manufacturing tens or hundreds of thousands of units, Hanson added.

Grace's launch comes as the global impact of the coronavirus has made the need for humanoid robots urgent, said Kim Min-Sun, a communicology professor at the University of Hawaii. Stuck at home during COVID-19 lockdowns, many people have had their mental states affected with negative thoughts. "If they can get help through the deployment of these social robots in intimate settings, certainly it will have a positive impact on society," she said.

How to make biomedical research (and biosafety labs) less dangerous and more ethical, post-COVID-19

By Laura H. Kahn

Source: https://thebulletin.org/2021/06/how-to-make-biomedical-research-and-biosafety-labs-less-dangerous-and-more-ethical-post-covid-19/



Researchers wearing positive pressure personnel suits at a US National Institute of Allergy and Infectious Diseases biosafety level 4 lab. Credit: National Institute of Allergy and Infectious Diseases.

June 08 – Our luck has run out. The worst pandemic in a century has killed over 3.7 million people globally. In the United States, almost 600,000 have lost their lives to COVID-19. Societies around the world have been, and many are continuing to be, devastated. The debate regarding the origins of the virus continues with growing circumstantial evidence that the virus leaked from a laboratory. Knowing the origins of SARS-CoV-2 is important if we want to prevent this catastrophe from happening again.

We can state with certainty that human activities including deforestation, wildlife trade and consumption, and intensive animal agriculture increase the risk of deadly pandemics.

Preventing the emergence of naturally occurring zoonotic diseases requires a One Health approach that integrates human, animal, plant, environmental, and ecosystem health. I've written extensively about why a One Health approach is important in previous columns.

But to what extent do gain-of-function research, lax biosafety and -security oversight, and minimal bioethics reviews of basic science research contribute to pandemic risk?

Let's, for arguments sake, assume that the pandemic originated from a laboratory-acquired infection. Pointing fingers or placing blame is not helpful. No laboratory is infallible in regard to accidents, especially those working with active bioagents like viruses. Laboratory spillover

events have happened in the past. And they will continue to happen in the future. The question is, how can we reduce the risks?

Gain-of-function research

In 2004, the National Academies of Sciences, Engineering, and Medicine published a report, "Biotechnology Research in an Age of Terrorism," that listed seven "experiments of concern" that should not be done. These experiments of concern include:

- Demonstrating how to make a vaccine ineffective
- Conferring resistance to antibiotics or antiviral agents
- Enhancing a pathogen's virulence or make a non-virulent microbe virulent
- Increasing the transmissibility of a pathogen
- Altering the host range of a pathogen
- Enabling a pathogen's ability to evade diagnostic or detection modalities
- Enabling the weaponization of a biological agent or toxin.

In response to the report, the National Institutes of Health (NIH) created the National Science Advisory Board for Biosecurity (NSABB) but allowed controversial gain-of-function research to continue.

Gain-of-function research increases a pathogen's ability to cause disease. The argument in support of this work is that it helps to assess the pandemic potential of infectious agents and assists government officials in developing public health response measures. The argument against is that the work is inherently risky and clearly meets the criteria of the National Academies' seven experiments of concern.

A series of laboratory accidents at the US Centers for Disease Control and Prevention (CDC) prompted the NIH in 2014 to stop funding gain-of-function research involving pandemic-potential viruses such as influenza and coronaviruses (i.e. SARS and MERS). But in January 2017, the moratorium was lifted after the NSABB concluded that the experiments posed little risk to public safety. Of note, many of the board members were "very experienced, very actively involved in research." In other words, they had conflicts of interest in overseeing and approving this research.

NIH funding for EcoHealth Alliance's research, "Understanding the Risk of Bat Coronavirus Emergence," very clearly describes gain-of-function research that creates novel coronavirus genomes and uses them to experimentally infect across a range of cell cultures from various animal species to humanized mice. The research project was budgeted from June 2014 to May 2019 and according to this article in *Nature Medicine* was performed in Biosafety Level 3 (BSL 3) facilities.

Some history on biosafety and biosecurity

Concerns about health risks from new recombinant DNA technologies prompted scientists to meet in 1975 at the Asilomar Conference Center in Pacific Grove, California. They had voluntarily stopped certain experiments until they could be sure that risks to public health were minimal. One of the outcomes from the Asilomar conference, as it came to be known, was the creation of safety guidelines of varying levels according to the degree of risk research involved. Biosafety level one (BSL 1) research represented minimal risk and could be done on an open bench, whereas biosafety level four (BSL 4) constituted the highest risk and required airlocks and space suits. Biosafety levels two and three required increasing levels of specialized equipment and facilities, respectively.

In response to the Asilomar conference, the field of biosafety was born in 1984 with the establishment of the American Biological Safety Association and the creation of advisory documents, Biosafety in Microbiological and Biomedical Laboratories, promoting best practices. In addition, Institutional Biosafety Committees (IBCs) were created to oversee the biosafety of recombinant DNA research at all institutions receiving NIH funding. The biosafety committee members must include scientists, laboratory personnel, and two community members not affiliated with the institutions. These members meet monthly to review research protocols and to decide which biosafety levels they should be conducted in.

There is a weakness in this biosafety regime, however. There are no surveillance systems of laboratory-acquired infections and, if they occur, there are no mandatory mechanisms in place to notify state and local health officials about those infections. Laboratory-acquired infections are not "notifiable" diseases under CDC guidelines, so they don't get reported to local and state health officials. The CDC does not collect data on laboratory-acquired infections because they are considered occupational exposures. (https://www.cdc.gov/surveillancepractice/data.html) The National Institute of Occupational Safety and Health (NIOSH) focuses on workplace-related injuries and illnesses including pesticides and chemical exposures, healthcare worker injuries, and blood lead levels surveillance—but not laboratory-acquired infections.

In other words, laboratory-acquired infections fall through the cracks in government surveillance systems.

Because of concerns about biosecurity, the types of microbes that research labs are working on are not shared with state and local health officials. In essence, health officials are in the dark when it comes to potential laboratory-acquired infections in their jurisdictions. This lack of awareness hinders public health preparedness efforts in cases of high-risk laboratory-acquired infections with potential to spread in the community.
Laboratory accidents and laboratory-acquired infections occur, but without good surveillance systems at regional, national, and international levels, it's difficult to know the extent or severity of the problem until a disaster strikes. Of note, biosafety concerns existed at the Wuhan Institute of Virology long before the emergence of SARS-CoV-2.

Bioethics
Because of the long history of unethical medical research—from the Nazi experiments in Germany during WWII to the US Tuskegee syphilis experiments from 1932 to 1972—Congress passed the National Research Act in July 1974 to establish a national commission to identify doctrine underlying all human-subject research. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research issued the Belmont Report which identified basic ethical principles underlying all human subject research. The field of medical ethics was born.
There is no field of biomedical research ethics. Aside from the scientists themselves, who have obvious conflicts of interest, there are no experts who can assess whether or not biomedical research proposals meet ethical standards. Just because an experiment can be done doesn't mean it should be done. Until COVID-19, society had largely abdicated research funding decision-making to the scientific community with little, if any, oversight or input by humanists, ethicists, or public health professionals who might not share the scientists' views. And the fact that the scientists made the mere suggestion that SARS-CoV-2 might have had a laboratory origin a taboo subject demonstrates that they are incapable of policing themselves.

Next steps
As Winston Churchill (and many others) have been credited with saying, "**Never let a good crisis go to waste**." We have an opportunity to make biomedical research safer and more ethical.
Laboratory-acquired infections need to become notifiable diseases to local and state health departments. If ill, researchers and other laboratory workers must notify health care professionals that they work on bioagents in biomedical clinical or research facilities—and federal regulations should be changed to require such reporting. Healthcare professionals should notify local public health officials who would report to the state and ultimately to the CDC working in concert with the National Institute of Occupational Safety and Health. Similar surveillance systems should be established in all countries with biomedical clinical and research facilities.
At the international level, the World Health Organization should work with the Biological Weapons Convention (BWC) Implementation Support Unit to create a laboratory-acquired infection surveillance system based on data collected and reported at the national levels. Biomedical research is inherently dual use; it can provide society great benefits, but it can also be used for ill. The collaboration between WHO and the BWC would send the message that the international community takes these issues seriously.
The field of biomedical research ethics needs to be created. As with human subject research, Congress should establish a commission to identify doctrine underlying all biomedical research. The National Academies' "Seven Experiments of Concern" should serve as a framework for the commission's work.
We don't know if gain-of-function research caused this pandemic or if it was naturally occurring. But the arguments for gain-of-function research can be countered by two points. First, the mRNA vaccines that were developed so quickly in response to the pandemic took decades of prior research and required the sequence of genetic material from the virus's spike protein. Gain-of-function research was not needed. Second, investments in public health would improve response capabilities much more than any information that gain-of-function research could provide.
With diminishing public trust in science, biomedical scientists should be incentivized to rebuild society's willingness to support their research. Hubris and a willingness to push the scientific envelope for fame and glory should be replaced with humility and a respect for nature. We don't need scientists helping nature to make deadlier pathogens in a misguided effort to improve public health. Transparency, public communication and outreach, laboratory-acquired infection surveillance, public health partnerships, and institutionalized ethics would go a long way toward regaining the public's trust.

Laura H. Kahn *is a physician and policy researcher and is the author of* Who's in Charge? Leadership during Epidemics, Bioterror Attacks, and Other Public Health Crises.

Chile shuts capital Santiago once more as vaccines fail to quell rampant cases

Source: https://www.reuters.com/world/americas/chile-shuts-capital-santiago-once-more-vaccines-fail-quell-rampant-cases-2021-06-10/

June 07 – Chilean health authorities announced a blanket lockdown across the capital Santiago on Thursday following some of the worst COVID-19 case numbers since the pandemic began, despite having fully vaccinated more than half its population.

The development, which will alarm authorities elsewhere who are debating how fast to reopen as vaccination campaigns gather steam, comes as Chile's confirmed daily caseload surged 17% in the past two weeks nationwide and 25% in the Metropolitan region that includes Santiago and is home to half the country's population.

Intensive care beds in the capital region are now at 98% capacity. Jose Luis Espinoza, the president of Chile's National Federation of Nursing Associations (FENASENF), said his members were "on the verge of collapse."

Chile has one of the world's highest vaccination rates. **Around 75% of its 15 million residents have already received at least one dose of vaccine, and nearly 58% are completely inoculated.** On a per capita basis among larger countries, it the vaccination leader in the Americas and the fifth highest worldwide, according to Reuters data.

It has used nearly 23 million vaccines doses so far - 17.2 million of Sinovac's (SVA.O), 4.6 million of Pfizer (PFE.N)/BioNTech's (22UAy.DE), and less than 1 million each of AstraZeneca's< AZN.L> and CanSino's. (6185.HK)

Vaccines are not 100% effective, medical experts pointed out, and there is a time lag before they reach their highest efficacy. Also driving the fierce second wave is lockdown fatigue and the appearance of more contagious variants.

Of 7,716 people confirmed as infected with COVID-19 between Wednesday and Thursday, 73% had not been fully inoculated and 74% were under 49 years old, the health ministry said.

Dr. Cesar Cortes, emergency physician at the University of Chile hospital, said people who stayed home last year were now more afraid of being without work.

"Last year, there was low circulation and the confinement measures were more effective because people were scared of dying," he said. "That's not happening now."

Without its vaccines, Chile would be far worse off, he said.

"The complicated situation we are seeing now would be catastrophic," he said.

Chile's health regulator, the ISP, said genome sequencing of infections between December and June had confirmed the Brazilian P1 variant was the most prevalent in the country, and "twice as contagious as the original strain."

Chile is now embarking on vaccinating teenagers, having offered jabs to older age groups. Two weeks ago it introduced green cards to confer greater freedom on the vaccinated in an attempt to encourage the wary to come forward.

An infectious disease specialist at a large Santiago hospital, who asked not to be named because he was not authorized to speak officially, said vaccines could not completely relieve the overburdened hospitals.

"Around 10% of people, even if they are vaccinated, will not be protected against serious illness. That's hundreds of thousands of people going to ICUs," he said. "And when our health system is strained to the limit as it is now, that percentage alone is enough to overwhelm them."

AI detects life-threatening blood vessel inflammation from Covid-19 variants

Source: https://www.bhf.org.uk/what-we-do/news-from-the-bhf/news-archive/2021/june/ai-detects-life-threatening-blood-vessel-inflammation-from-covid-19-variants

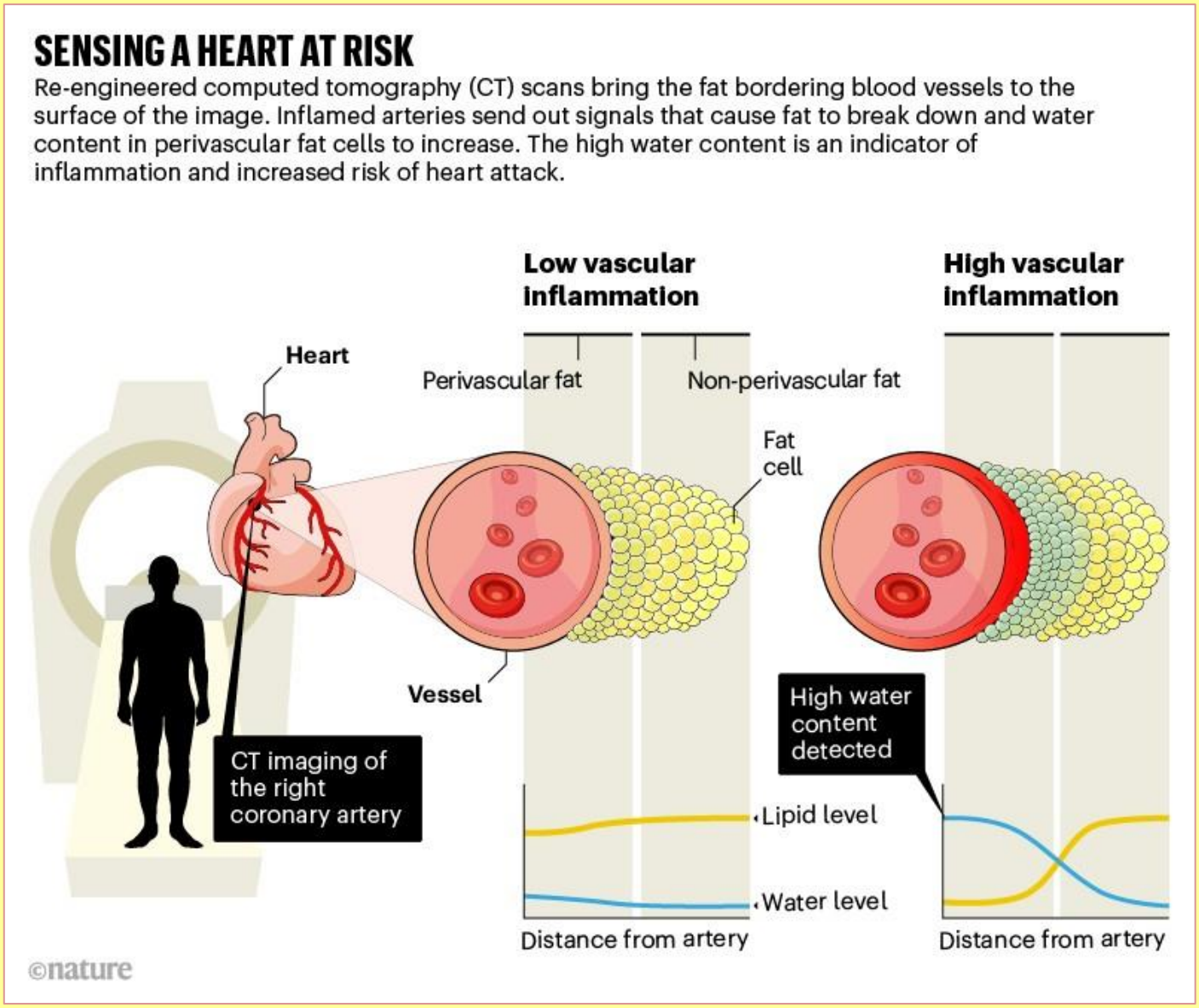
June 08 – New artificial intelligence (AI) technology to scan for heightened blood vessel inflammation can calculate a person's risk of death from Covid-19 and Covid-19 variants. The technology could be used to tailor their treatment and give them the best chance of recovery, according to new research we've funded and presented today at the **British Cardiovascular Society conference**.

Severe cases of Covid-19 have been associated with a 'cytokine storm', where the virus 'Spike' protein causes the immune system to go into overdrive and produces a surge of damaging molecules called cytokines.

Covid-19 'signature' detects red flags

Now, by using routine chest CT scans, researchers at the University of Oxford have developed a Covid-19 'signature' using machine learning. The 'signature' detects biological

red flags in the fat surrounding the blood vessels in the chest to measure the level of cytokine-driven vascular inflammation in people infected with the virus.
The team applied the Covid-19 signature to CT chest scans of 435 people admitted to hospitals in Oxford, Leicester and Bath, and compared the degree of inflammation and risk of death in people with and without Covid-19.
For patients admitted to hospital, the level of cytokine-driven inflammation in the blood vessels was much higher in those with Covid-19, and even greater in patients infected by the B.1.1.7 or 'alpha' variant first identified in the UK.



Anti-inflammatory drug reduces death risk

Those with a high level of vascular inflammation were up to eight times more likely to die in hospital, and were most likely to respond well to the anti-inflammatory drug Dexamethasone. Covid-19 patients with high vascular inflammation treated with Dexamethasone had a 6-fold reduction in risk of dying compared to Covid-19 patients who were not given the drug.
By using this tool to obtain an inflammation score, Covid-19 patients found to have a lot of inflammation in their blood vessels, and therefore increased risk of death, could potentially be given anti-inflammatory drugs to reduce their risk and help their long-term recovery. Clinical trials are now looking into the effectiveness of this approach.

Tracking the long term impact of Covid-19

Now, the researchers will continue to look at the impact of coronavirus variants as they emerge. They say that their technology may have immense power to easily track the long-term cardiovascular effects of Covid-19 and quickly respond to future viruses.

Professor Charalambos Antoniades, Professor of Cardiovascular Medicine and BHF Senior Clinical Research Fellow at the Radcliffe Department of Medicine, University of Oxford, said:

"By simply adding in one extra step to the routine care of people admitted to hospital with Covid-19 who already have a CT scan, we can now detect patients at high risk of life-threatening complications and could potentially tailor their treatment to aid long-term recovery.

"But the benefits don't stop there. We know that this exaggerated immune response to the virus can also cause abnormal blood clotting, and so we are developing this AI platform to specifically identify Covid-19 patients who are most at risk of having a future heart attack or stroke. We can also pivot our platform with ease to develop a new scanning 'signature' to better understand future viruses and diseases that take hold of our population."

AI tool could save lives

Our Associate Medical Director, Professor James Leiper said:

"Over the past year we have supported our scientists to direct their expertise to help the global effort in understanding Covid-19. This research clearly demonstrates that Covid-19 is a powerful virus that can wreak havoc on our circulatory system, and that different variants are associated with different levels of risk. There are still a lot of unknowns relating to how the virus can impact our health in the long term, but this AI tool could ultimately help to save lives."

This research is one of the six research programmes chosen as UK Flagship Projects, all of which aim to improve care for people with heart and circulatory disease suffering from Covid-19. The initiative builds on a pre-existing partnership between us and the National Institute for Health Research (NIHR), and provides a new framework for the rapid set-up and delivery of urgent, high impact Covid-19 research projects across the UK.

Cleveland Clinic: Already Had COVID? Vaccine Provides No Added Benefit

June 10 – A **Cleveland Clinic study** of the effectiveness of COVID vaccines in people with a history of previous SARS-CoV-2 infection and those without found those who had COVID but weren't vaccinated appeared to have acquired strong natural immunity. A new preprint study by the Cleveland Clinic found people previously infected with SARS-CoV-2 were less likely to be reinfected than fully vaccinated individuals who never had the virus — suggesting the vaccine is of no benefit to people who already had COVID.

Does the PCR Test Affect the Pineal Gland? Humans and "Transhumans"

By Peter Koenig

Source: https://www.globalresearch.ca/does-the-pcr-test-affect-the-pineal-gland-humans-and-transhumans-dr-astrid-stuckelberger/5747390

There is hardly a border-crossing without an obligatory PCR-test – which by the way is invalid (as confirmed by the WHO on January 20, 2021) in determining whether you are infected with the covid virus. It was never invented and designed for this purpose. See this directly from ***Dr. Kary Mullis,*** *the inventor of the PCR-test, who died in August 2019, shortly before the outbreak of SARS-CoV-2, alias Covid-19.*

June 10 – Dr. Astrid Stuckelberger**,** an international health scientist, clinical and epidemiological researcher and faculty member of the Universities of Geneva and Lausanne, as well as a former WHO insider, talks in an 18-min. video clip about "the plan" WHO and 193 UN member states are pushing to implement.

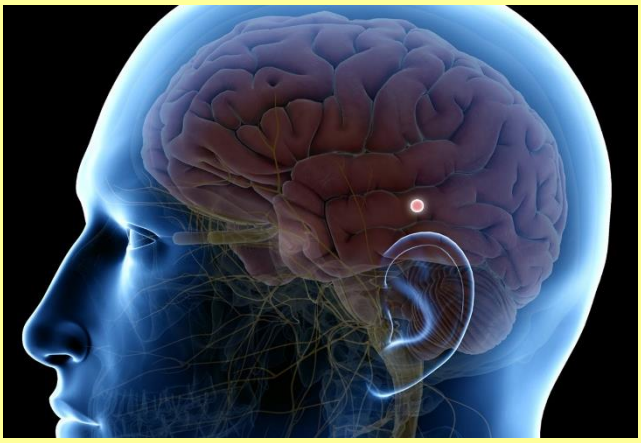
Astrid Stuckelberger provides insights into the inner works of WHO. She explains how the actions of WHO violate their own regulations.

She says that the pandemic is organized internationally in a systemic way. "What is shocking", she says, "is that they are all saying exactly the same thing, all media, all newspapers, all airports – in all UN countries…"

Dr. Stuckelberger goes on saying – and I am paraphrasing – that the different task forces of experts advising the decision makers are all fraught in conflict of interest, because they have been told what they have to advise, that they were dismantled many times since the

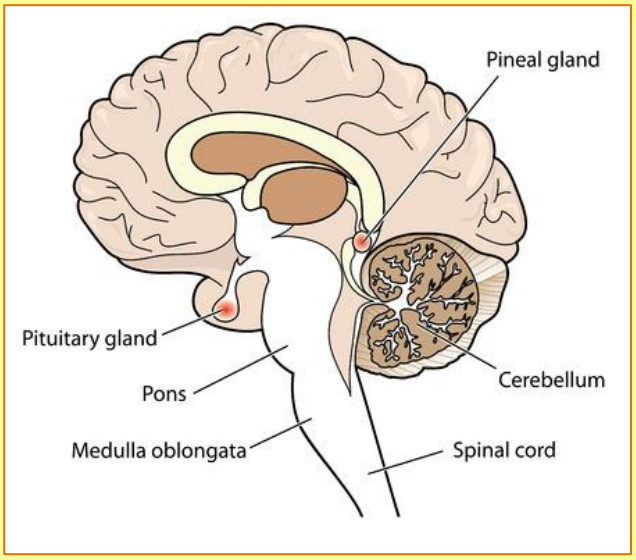
beginning of the "plandemic" by *real* scientists, but these *real* scientists, who present *real science* are not published, because all the media are bought.

She talks about mRNA-"vaccines" being bioweapons, and about the eugenics and depopulation agenda behind it all. She also mentions specifically the PCR-test, and how it affects the pineal gland.



The *pineal gland* was described as the "Seat of the Soul" by René Descartes (French 17th Century philosopher) and it is located in the center of the brain. The main function of the pineal gland is to receive information about the state of the light-dark cycle from the environment and convey this information to produce and secrete the hormone melatonin – which is giving humans senses and sensibilities. Reducing or eliminating these unique capacities, makes us humans vulnerable to "robotization".

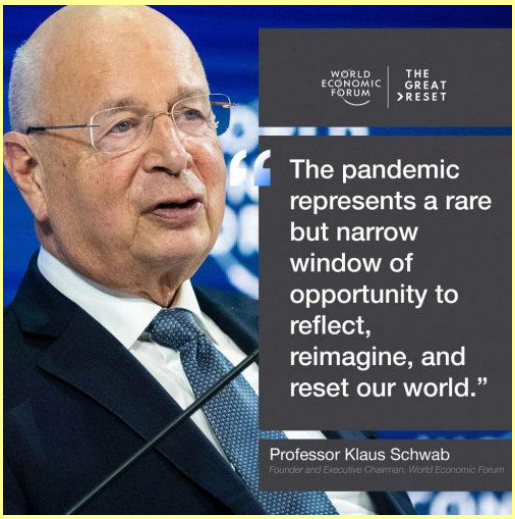
She asserts that if there wasn't a deeper agenda behind the PCR-test, there would be no need to stick a test-swab deep into your sinuses where it touches a thin membrane that separates the sinus cavity from your brain. A saliva sample would be enough. The question raised by Dr. Stuckelberger (yet to be fully corroborated) is whether they are putting a toxic substance into your brain – which affects the pineal gland?



Dr. Stuckelberger also mentions the plan of nano-chips being implanted with the mRNA-type gene-therapy.

"Transhumans"

In a 2016 interview by Swiss TV RTS Geneva of Klaus Schwab, CEO and founder of the World Economic Forum (WEF), where he talks literally about the transformation of humans into "*transhumans*" with an implanted nano-chip which connects directly to the human brain. Humans can then become at the service of Artificial Intelligence (AI), or other electronic commands. They may be manipulated according to the will of those who are in global control, i.e the so-called "Global Cabal". The latter are my words. Klaus Schwab uses a much smoother way of explaining slavehood and total digital control.



As is well known, Klaus Schwab is also the promotor and co-author of The Great Reset, of which he says at the end – at completion of Agenda 2030 – *"you will own nothing and be happy"*.

He calls the current covid "plandemic" a unique opportunity to rethink and reshape our world, into – what he doesn't say – but implies in more ways than one – a One World Order, under a small ultra-rich elite in which the Eugenists call the shots.

When asked in 2016 by the Swiss French language TV network (RTS), about a time frame for this sci-fi to become possible, he says within about 10 years, meaning about 2026, give or take a year or so .

"What we see is a kind of fusion of the physical, digital and biological world**"** said Klaus Schwab. He explained that human beings will soon receive a chip which will be implanted in their bodies in order to merge with the digital World.

RTS: "When will that happen?

KS: "Certainly in the next ten years.

"We could imagine that we will implant them in our brain or in our skin".

"And then we can imagine that there is direct communication between the brain and the digital World".

What Actions Should be Taken?

Unless we do something immediately against this "Covid Cabal", it may be too late. As they start testing children – testing-testing-testing – in some Swiss cantons. Some cantonal governments order schools to test primary school students once per week or once per months. You can imagine what this could mean for these children? – By the time they leave school, PCR-type testing may have reduced the children's pineal gland to a cripple. The kids may have lost their sensibilities – and will they be so to speak "robotized"?

Now the EU allows children from age 12 on to be vaccinated – in some countries even without parental consent. The almost only and exclusively allowed mRNA-type inoculation is considered by several scientists as a bioweapon and, if not stopped NOW, it may have devastating consequences worldwide. Did you know that their goal is "vaccinating" – or rather jabbing with this potentially deadly toxin – 70% of the world population? See this.

In the US, the CDC has just allowed Children age 12 to 17 being inoculated with what *Vaccine Impact* calls a "Mass Extermination Program", by implementing Eugenic Population Control Measures through COVID-19 Bioweapons".

All this sounds like a horror sci-fi movie which is about to become reality – in fact, it is well on its course, because you can yourself witness the massive vaxx-drive and the endless testing coercion wherever you are.

This may soon be enhanced by a mandatory vaxx-certificate, first as an electronic card, then implanted as a chip, without which you may not be able to do most things you were free to do – until you submit to the killer-inoculation.

That's where we are headed if we let it go. So far it is difficult to estimate worldwide willingness to vaccinate. If Germany and the US are any indication at least for the West, the willingness to receive the jab may be as high as two thirds. See this and this.

In the Global South vaccination may be slower, as it is not driven as hard as in the Global North.

Remember: The worldwide vaxx-target is 70%, individual countries may have been given different quotas to fulfill. See this. Our elected leaders, whom we fund with our taxes, and in whom we place our trust, they belie and betray us royally – to fulfill their quota. – What will be their reward? Maybe a placebo jab, so they can also get their vaxx-certificate.

This must not be the end of the row. But you should be aware of what is planned and what the objectives are. Among these objectives is "depopulation" of Mother Earth.

One thing is sure – you may realize it for yourself after reading this essay and the references from renown virologists and medical scientists: We humans, before we become "transhumans" have to collectively and solidarily stop this onslaught NOW.

Only a groundswell of people who are willing to stand up against the tyrannical authorities, stand up for their constitutional and especially, for their Human Rights, and resist, resist the endless PCR testing – even if it means not traveling for a while – until *We, The People*, win this Battle and stop accepting being inoculated with the mRNA-bio-weapon, simply refuse, don't let yourself getting lured into this false "vaccination". – Would you believe, there are States in the US that offer you plenty of goodies for getting the jab? One US State Governor took it a step further. Ohio Governor Mike DeWine upped the ante with a bombastic plan to enter vaccinated people in a $1 million lottery. See this from *The Atlantic*.

Doesn't this tell you that vaccinating has nothing to do with protecting human health, but all to do with subjugating humanity to a bioweapon, a so-called "vaccination"?

On the bright side, in May 2021, the US Supreme Court has voted against universal [covid] vaccination. This also means a US Supreme Court decision against vaccination certificates in the US. See this.

What's valid for the US, might also become law in the European Union – and in other nations around the world. But let's not put the cart before the horse: We, The People, have to stand up and demand our rights back. There is no way around it. But if we put our full spirit, energy and will-power into this fight, we will win this battle against the biggest crime in human history.

In Europe, there is also the Germany-based Corona Commission of Inquiry (German: *Corona Untersuchngsausschuss*), led by lawyer **Dr. Reiner Fullmich**, who has already filed several class action-suits in the US and in Canada, as well as introduced legal actions against institutions and individuals mostly in Europe. If we stand up in solidarity to fight this Covid Beast, this crime against humanity, refusing the PCR-test, resisting the vaxx-coercion, we will win.

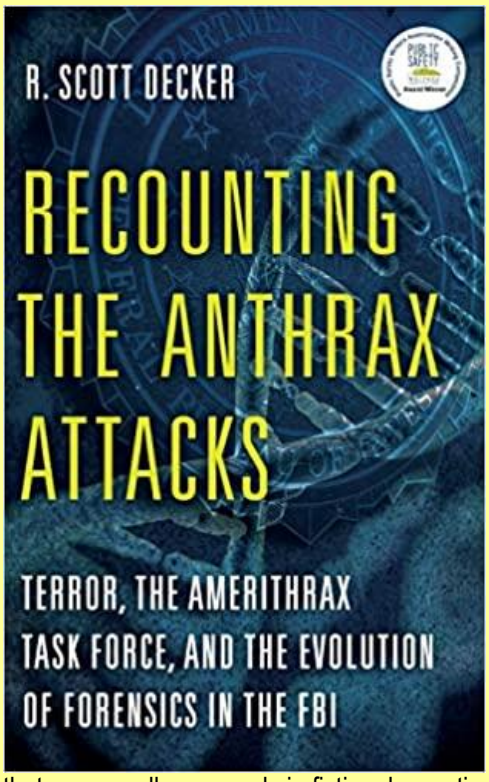
Peter Koenig *is a geopolitical analyst and a former Senior Economist at the World Bank and the World Health Organization (WHO), where he has worked for over 30 years on water and environment around the world. He lectures at universities in the US, Europe and South America. He writes regularly for online journals and is the author of Implosion – An Economic Thriller about War, Environmental Destruction and Corporate Greed; and co-author of Cynthia McKinney's book "When China Sneezes: From the Coronavirus Lockdown to the Global Politico-Economic Crisis" (Clarity Press – November 1, 2020). He is a Research Associate of the Centre for Research on Globalization.*

Invisible Scourge: The Investigation, Legacy, and Lessons of the 2001 Anthrax Attacks

By Al Mauroni

Source: http://www.homelandsecuritynewswire.com/dr20210611-invisible-scourge-the-investigation-legacy-and-lessons-of-the-2001-anthrax-attacks

June 11 – The anthrax incidents of 2001 represented a major milestone for the national security community, in that they highlighted the vulnerabilities of the United States to a very unique domestic threat. While the number of initial casualties were few, the anthrax-filled letters created a nation-wide panic because they were unattributed, and the biological agent was perhaps the most dangerous organism that had been weaponized. This "invisible scourge" also shook the public health community, which was not prepared to respond to deliberate biological threats. US leadership demanded a prompt response to prevent future incidents from occurring.



Enter the Federal Bureau of Investigation — tasked with attributing the attacks to a specific source. This mission was not new. Following the Aum Shinrikyo use of nerve agents in Tokyo in 1995, the FBI had been charged with investigating terrorism cases involving weapons of mass destruction as a federal crime. The Bureau had a Hazardous Materials Response Unit; its personnel were connected to military and civilian biological defense experts; and yet, the FBI was unprepared as an institution to investigate multiple anthrax incidents in the United States, and to quickly identify a perpetrator. In particular, its unit had to determine if the anthrax came from a research laboratory, a weapons program, or a natural source. While the FBI had investigated numerous "white powder" hoaxes, this was its first real event.

It took the FBI nearly six years to conclude that Bruce Ivins, a research scientist working at the Army's Fort Detrick laboratories, was responsible for the attacks. This view was not without some controversy, with some of Ivins' colleagues calling out the FBI for allegedly using inadequate scientific protocols and harassing the scientist into committing suicide. To a large extent, while Decker does not state this, his book reads like a detailed counterargument to those statements. It may be that the author was restrained from addressing the Bureau's critics until he had retired and could marshal the argument that his team did in fact get the right person in Ivins. I say this for two reasons: first of all, the author describes dialogues in a very detailed way, to a degree that one usually sees only in fictional narratives and not in non-fiction books.

Second, Decker goes into great technical detail about the different types of *Bacillus* bacteria and the different strains of anthrax, as well as the procedures developed to track down and attribute the anthrax used in the 2001 incidents to a specific source. Using this approach, I think Decker is seeking to make the case that the FBI performed as it should throughout the investigation. These details make the case that these were real people, doing the best that they could under the existing conditions, to identify the perpetrator of a very high-visibility incident. Still, a person lacking a scientific background could be excused for becoming confused by the significant amount of scientific data presented in this book.

There are three particular issues presented by the author that deserve highlighting: Why did the FBI take so long to identify the alleged source of the biological organism? Why did the FBI get sidetracked by its focus on one Steven Hatfill? And why did the FBI finally settle on Bruce Ivins?

Decker goes to extremes to explain how the FBI lab arduously worked to safely extract and analyze the anthrax in the letters while avoiding cross-contamination and maintaining chain-of-custody procedures. Identifying the particular anthrax as originating from an "Ames" strain was just the first step; lacking a database of anthrax strains, they could not authoritatively identify from where it came. The FBI received samples from all over the nation, as well as from the United Kingdom's Porton Down biological research facility. Hundreds of these samples came from the U.S. Army labs, in particular the Dugway Proving Ground and Fort Detrick. It took the Bureau a long time to get to this point, in part because they had to count on the cooperation of those laboratories and then identify the genetic signatures of each sample. The anthrax letters held a strain that had specific mutagens that made them unique – leading them to a particular strain found only in the Fort Detrick labs.

The sample analysis was just part of the larger investigation. Assessing other evidence, for instance the source of the envelopes used in the attacks, was a significant challenge, but represented a more familiar aspect of law enforcement investigation.
The Bureau's seeming fixation on Steven Hatfill is a little harder to understand. The FBI was focusing on Fort Detrick, the Dugway Proving Ground, and the Battelle labs in Ohio as possible sources for the anthrax (after ruling out possible foreign sources), and Hatfill was an employee at the Detrick labs who had already stood out as an atypical employee. He worked in virology though, and not with anthrax, and he had lost his security clearance for unstated reasons. He was writing a book of fiction in which the main character was planning on attacking the White House with a plague. Hatfill had some discrepancies in his resume, which caused some suspicion as to his forthrightness. The FBI used bloodhounds to track scents in Frederick, Maryland to Hatfill's door, and to his girlfriend's door. Because he had traveled into the backwoods around Frederick, this led the FBI to investigate whether he might have tried to dispose of equipment or agent in nearby ponds. This turned into a media circus, as news organizations covered how the FBI was draining the ponds in the middle of winter. After two years of investigation, the team finally admitted that Hatfill wasn't their guy. He didn't have access to the anthrax spores and there was zero evidence of any intent. It seems odd that it took so long to figure this out, but again Decker walks the reader through every step of their thought process.
Which brings us to Bruce Ivins. Decker reveals that Ivins came to the FBI in January 2002 to allegedly assist them in identifying potential sources of the anthrax strain. Ivins volunteered to provide four samples of his anthrax strains in 2002, which later were found to have some discrepancies that Ivins explained away as resulting from handling issues. Ivins became a "person of interest" in 2004, but it wasn't until 2007 when the FBI increased its scrutiny of him as a primary suspect.
Bruce Ivins presented a number of suspicious indicators. He had a volatile temper and an obsession with people whom he perceived as having done him wrong. He used multiple aliases and email accounts to harass the Kappa Kappa Gamma chapters of various universities. Decker's investigation suggests that Ivins suffered from depression and had a substance abuse issue. More to the point, the FBI had identified that the Frederick, Maryland post office had been a source of the same letters used in the anthrax attacks; Ivins also had rented a post box there. When the FBI searched his residence in December 2007, they didn't find any incriminating evidence. There were no traces of anthrax organisms, no envelopes that matched those of the 2001 incidents, no copies of the threat letters. But as the FBI prepared for a grand jury hearing, Ivins overdosed on acetaminophen and diazepam, later dying in the hospital.
It is true that the FBI did not have an iron-clad case, that much of the evidence was circumstantial – but the amount of evidence that pointed toward Ivins was considerable. Decker carefully avoids any attempt to outline Ivins' motivations or intent, but he leaves enough hints. The Department of Defense has a "Chemical-Biological Defense Program" that manages all the defense funding for military research and development, and in the summer of 2001, that program's leadership was looking to stop the development of a next-generation anthrax vaccine. This directly impacted Ivins' funding at Fort Detrick.
He may have seen the 9/11 attack as an opportunity to shake up interest through the specter of anthrax attacks that, while menacing, did not kill a lot of people. When he found out that some mail-workers were dying – people who were not the target of his mailings – then he stopped the attacks. If Ivins was not the source of the attacks, as some advocates, then who? The absence of further attacks since that time has quieted speculation about other perpetrators.
Decker closes with a short summary of all of the progressive measures taken since the anthrax attacks – new biosecurity regulations for laboratories using dangerous biological organisms, new groups such as the National Science Advisory Board for Biosecurity, and the National Bioforensic Analysis Center, and of course, a significantly upgraded forensics unit in the FBI. If such an attack were to occur today, the cycle of forensics and attribution would be much, much quicker than the six years it took for this case. Overall, this is a valuable book for understanding how the FBI developed its case for the Amerithrax investigation, not just for the legal community that engages in bioterrorism cases, but for the defense community that engages in the policy aspects of this issue. In no small way, the U.S. government still operates on assumptions about bioterrorism that have not been questioned since the 2004-2007 timeframe. That is not a good thing, but understanding the genesis of this mindset is itself valuable.

Al Mauroni *is the director of the U.S. Air Force Center for Strategic Deterrence Studies and author of the forthcoming book BIOCRISIS: Defining Biological Threats in U.S. Policy.*

R. Scott Decker, *Phd, retired from the FBI as a supervisory special agent at the end of 2011, after 22 years of service. He spent his early FBI career in pursuit of bank and armored car robbers throughout Boston. He then gained a promotion and joined the Bureau's fledging Hazardous Materials Response Unit in Quantico. On September 12, 2001, he led a team of FBI hazmat specialists to Ground Zero in New York City, and then joined the developing Amerithrax Task Force against the anthrax threat. Decker coordinated the early genetics and DNA forensics of the bioterror investigation, and supervised a squad of agents whose work charted new ground and established the discipline of microbial forensics. In 2009, he and his team received the FBI Director's*

Award for Outstanding Scientific Advancement. In 2008, The Washington Post featured Decker in a front-page article by national security reporter Joby Warrick, "Trail of Odd Cells Led FBI to Army Scientist." In 2017, the Public Safety Writers Association's Annual Writing Competition awarded Recounting the Anthrax Attacks first-place in their non-fiction unpublished book category.

More Evidence Links COVID Vaccines to Rare Cases of Myocarditis in Youth

Source: https://www.medscape.com/viewarticle/952905

June 10 – Swelling of the heart appears to be a very rare side effect that primarily strikes young people after vaccination for COVID-19, a Centers for Disease Control and Prevention (CDC) expert reported on Thursday, detailing data on cases of myocarditis and pericarditis detected through a government safety system.

The side effect seems to be more common in teen boys and young men than in older adults and women and may occur in 16 cases for every 1 million people who got a second dose, said Tom Shimabukuro, MD, MPH, deputy director of the CDC's Immunization Safety Office, who presented information on the cases at a meeting of an expert panel that advises the US Food and Drug Administration (FDA) on vaccines.

Telltale symptoms include chest pain, shortness of breath, and fever.

William Schaffner, MD, an infectious diseases specialist from Vanderbilt University in Nashville, Tennessee, thinks certain characteristics are pointing toward a "rare, but real" signal. First, the events are clustering, occurring within days of vaccination. Second, they tend to be more common in males and younger people. Third, he says, the number of events is above the so-called "background rate" — the cases that could be expected in this age group even without vaccination.

"I don't think we're quite there yet. We haven't tied a ribbon around it, but I think the data are trending in that direction," he said.

The issue of myocarditis weighed heavily on the Vaccines and Related Biological Products Advisory Committee's considerations of what kind and how much data might be needed to green light use of a vaccine for COVID in children.

Because the rates of hospitalization for COVID are low in kids, some felt that the FDA should require at least a year of study of the vaccines in clinical trials, the amount of data typically required for full approval, instead of the 2 months currently required for emergency use authorization. Others wondered whether the risks of vaccination — as low as they are — might outweigh the benefits in this age group.

"I don't really see this as an emergency in children," said committee member Michael Kurilla, MD, PhD, the director of clinical innovation at the National Institutes of Health. Kurilla, however, did say he thought having an expanded access program for children at high risk might make sense.

Most of the young adults who experienced myocarditis recovered quickly, though three needed intensive care and rehabilitation after their episodes. Among cases with known outcomes, 81% got better and 19% still have ongoing symptoms.

Adverse Events Reports

The data on myocarditis come from the Vaccine Adverse Events Reporting System, or VAERS, a database of health problems reported after vaccination. This reporting system, open to anyone, has benefits and limits. It gives the CDC and FDA the ability to rapidly detect potential safety issues, and it is large enough that it can detect rare events, something that's beyond the power of even large clinical trials.

But it is observational, so that there's no way to know if problems reported were caused by the vaccines or a coincidence.

But because VAERS works on an honor system, it can also be spammed and it carries the bias of the person who's doing the reporting, from clinicians to average patients. For that reason, Shimabukuro said they are actively investigating and confirming each report they get.

Out of more than 12 million doses administered to youth ages 16 to 24, the CDC says it has 275 reports of heart inflammation following vaccination in this age group. The CDC has analyzed a total 475 cases of myocarditis after vaccination in people under age 30 that were reported to VAERS.

The vaccines linked to the events are the mRNA vaccines made by Pfizer and Moderna. The only vaccines currently authorized for use in adolescents are made by Pfizer. Because the Pfizer vaccine was authorized for use in kids as young as 12 last month, there's not yet enough data to draw conclusions about the risk of myocarditis in kids ages 12 to 15.

Younger age groups have only received about 9% of the total doses of the vaccine so far, but they represent about 50% of the myocarditis cases reported after vaccination. "We clearly have an imbalance there," Shimabukuro said.

The number of events in this age group appears to be above the rate that would be expected for these age groups without vaccines in the picture, he said, explaining that the number of

events are in line with similar adverse events seen in young people in Israel and reported by the Department of Defense. Israel found the incidence of myocarditis after vaccination was 50 cases per million for men ages 18 to 30.

More Study Needed

Another system tracking adverse events through hospitals, the Vaccine Safety Datalink, didn't show reports of heart inflammation above numbers that are normally seen in the population, but it did show that inflammation was more likely after a second dose of the vaccine.

"Should this be included in informed consent?" asked Cody Meissner, MD, a pediatric infectious disease specialist at Tufts University, Boston, Massachusetts, and a member of the FDA committee.

"I think it's hard to deny there seem to be some event that seems to be occurring in terms of myocarditis." he said.

Meissner said later in the committee's discussion that his own hospital had recently admitted a 12-year-old boy who developed heart swelling 2 days after the second dose of vaccine with a high level of troponin, an enzyme that indicates damage to the heart. His level was over 9. "A very high level," Meissner said.

"Will there be scarring to the myocardium? Will there be a predisposition to arrhythmias later on? Will there be an early onset of heart failure? We think that's unlikely but [we] don't know that," he said.

The CDC has scheduled an emergency meeting next week to convene an expert panel on immunization practices to further review the events.

In addition to the information presented at the FDA's meeting, doctors at Oregon Health and Science University recently described seven cases in teens — all boys — who developed heart inflammation within 4 days of getting the second dose of the Pfizer vaccine. The study was published today in the journal *Pediatrics*. All the boys were hospitalized and treated with anti-inflammatory medications including NSAIDs and steroids. Most were discharged within a few days and all recovered from their symptoms.

The COVID Fertility Issue We *Should* Be Worried About

By F. Perry Wilson, MD, MSCE

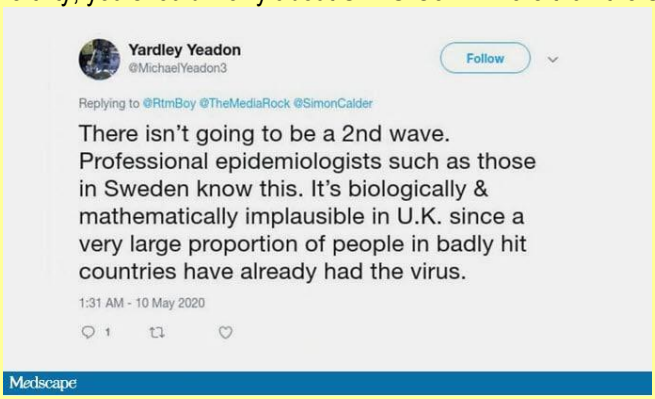
Source: https://www.medscape.com/viewarticle/95264

June 10 – Welcome to *Impact Factor*, your weekly dose of commentary on a new medical study. I'm Dr F. Perry Wilson of the Yale School of Medicine.

There's a meme flying around the interwebs that COVID vaccines might render young people infertile. Taken on its own, this may seem like run-of-the-mill antivax fearmongering — and it is, but this one seems to have some legs. In fact, a UK survey found that one quarter of young women would decline the vaccine, citing concerns about fertility.

This is actually a sort of old vaccine trope. It's been trotted out — without any evidence — for the polio vaccine and the HPV vaccine. And I get why it's so powerful. Fertility is obviously a huge issue, a basic human function. But it also immediately conjures up the long term: *Sure, I may be protected from COVID today, but what if I want to have kids 15 years from now and find out I can't? The Handmaid's Tale* stuff. Disturbing.

So I want to show how this thing got started, but more importantly, I want to make an argument: that if you really want to worry about fertility, you should worry about SARS-CoV-2 more than the SARS-CoV-2 vaccine.

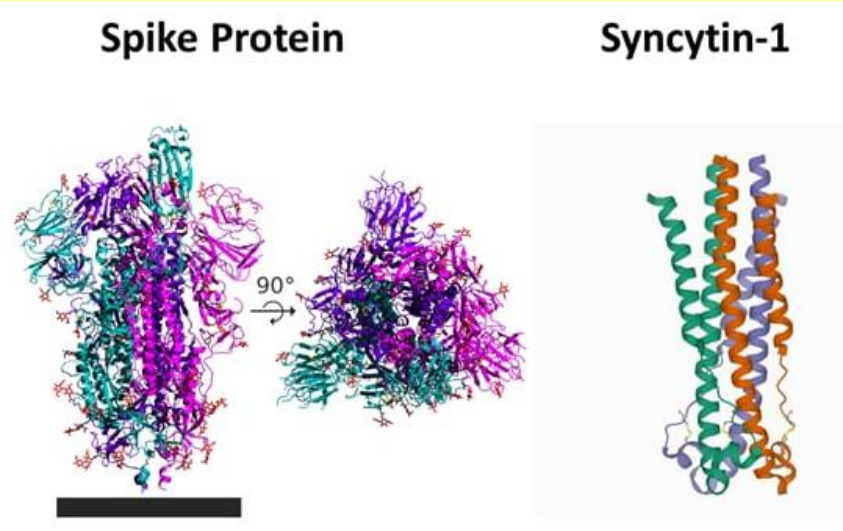


You can trace the earliest emergence of this idea to two guys: Wolfgang Wodarg, a physician and German politician; and Michael Yeadon, an ex-Pfizer scientist. Yeadon's Pfizer link lent him credibility, though a perusal of his Twitter account (now deleted) suggests that he was not the best COVID prognosticator. This was tweeted a couple months before the UK's much more deadly second wave.

In any case, their argument centered around the similarity between the spike protein that the vaccines code for and syncytin-1, a human protein critical for placental development.

Syncytin-1 is known as an endogenous retroviral element — basically, code in our DNA that came from an old virus. We have a bunch of

these, actually. This one probably got in there around 25 million years ago and conferred some selective advantage, leading it to hang around.



The question: Is syncytin-1 similar enough to the spike protein of coronavirus that cross-reactive antibodies might attack the placenta?

The answer, at least according to the geneticists and immunologists I polled, is not really.

They are dramatically different proteins.

The spike protein is complex, with 1273 amino acids. Syncytin-1 has 538 amino acids. An alignment search suggests about a 7% overlap. Here's a sample of the sequences to give you a sense of what that means; syncytyin-1 is red, and the matches with spike protein are in red underneath.

But I'm told that this amount of homology is not surprising. More importantly, it's not really the degree of overlap that matters to figure out if an antibody will be cross-reactive. It's actually quite hard to predict and has to do with 3D topology of proteins and stuff.

If you want to figure out whether an antibody will be cross-reactive, just measure it. That's what Akiko Iwasaki here at Yale did. Her lab tested serum of women with COVID-19 and found no antibodies that bound to syncytin-1.

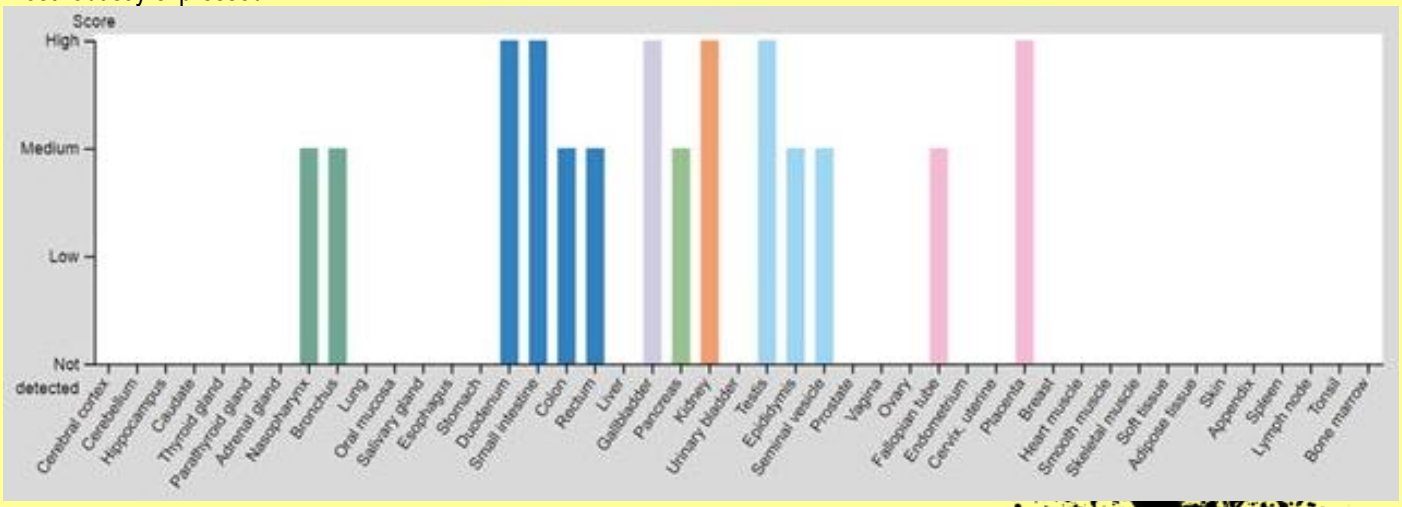
```
1 Q9UQF0     100.0% 100.0%  --ALGTGIGGITTSTQFYYKL----SQELNGDMERVADSLVTLQDQLNSLAAVVLQNRRALDLLTAERG----------
2 A0A679G9E9  79.7%   7.2%  AMQMAYRFNGIGVTQNVLYENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNQNAQALNTLVKQLSSNFGAISSVLNDILSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAAEI
```

We also have the empirical data from the vaccine trials that showed no difference in miscarriage rates between women who became pregnant in the vaccine groups vs the placebo groups. We also now have data on over 100,000 pregnant women who have received the vaccine in the US. So far, no safety signals have emerged. This fertility theory just doesn't hold up to reality.

And not to be pedantic here, but even if there was homology between the spike protein and a human protein, the virus itself has the spike protein too, as well as a bunch of other proteins not present in the vaccine that might also have antibody cross-reactivity problems. Maybe it's better not to get COVID at all?

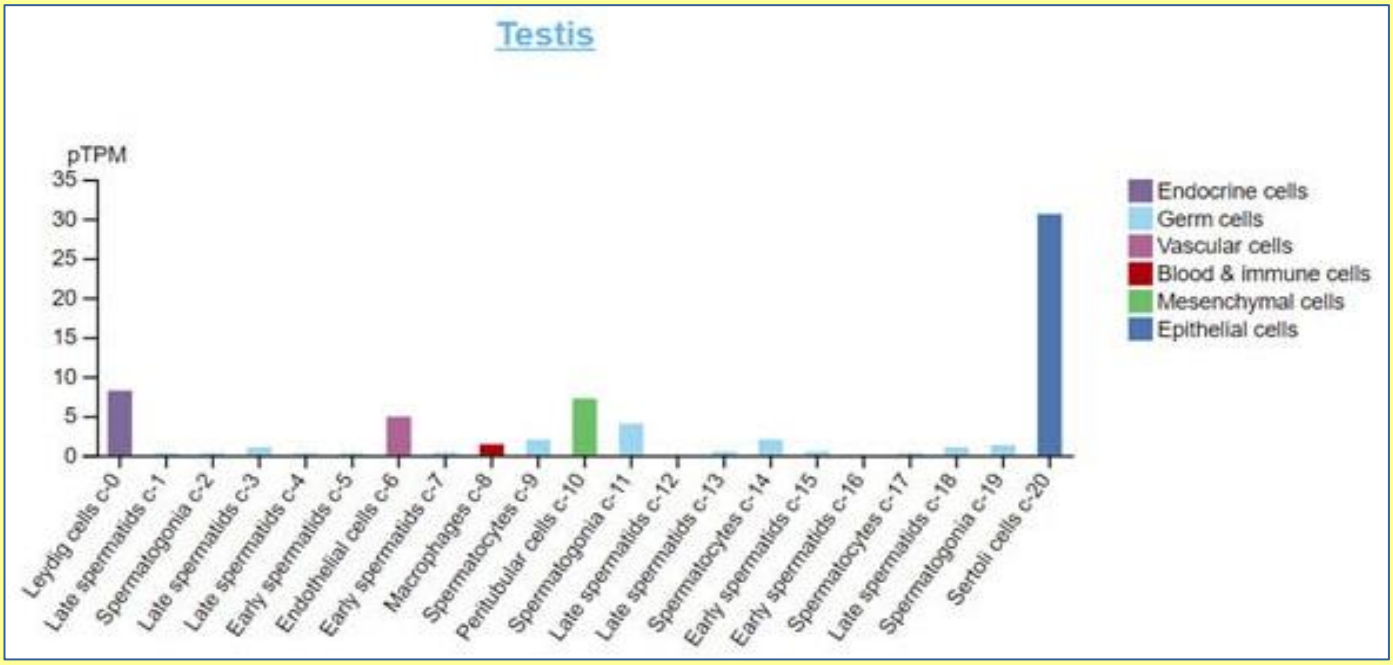
In fact, if it's sterility you're worried about, I honestly think there's more to be concerned about with the virus itself than the vaccine. Here's why.

The cellular receptor for the coronavirus is ACE2. Enter that into a protein expression atlas of your choice and look where ACE2 is most robustly expressed.



Source: The Human Protein Atlas

Nasopharynx and bronchus — no surprises there. But also, testis and placenta. In fact, ACE2 is robustly expressed on Sertoli cells, which are the support cells that help sperm be produced.



Source: The Human Protein Atlas

This has led to multiple papers (all hypothetical at this point) speculating that SARS-CoV-2 infection may impact male fertility.
To be fair, we haven't seen much evidence of this either. I have found a total of one paper — a case report — suggesting that COVID infection hurt a man's sperm count.
But the point is this: The vaccines prime your immune system against the spike protein. But so does COVID. And COVID, unlike the vaccine, can actually infect cells and kill them — including, potentially, cells that are important for reproduction.
The anti-vaccination crowd wants to argue that there is biologic plausibility for a COVID vaccine–infertility link. If that's our standard for evidence, there is a heck of a lot more plausibility for a COVID-infertility link. But as I've said many times before, biologic plausibility is just the start of research. Empirical data are necessary in the end. There's enough empirical data to conclude that it is highly unlikely that the vaccines will have any effect on fertility. It's pretty unlikely that COVID itself will have an effect either, but it seems to me like that possibility deserves some deeper investigation.

***F. Perry Wilson, MD, MSCE**, is an associate professor of medicine and director of Yale's Clinical and Translational Research Accelerator.*

There Could Be a Dark Side to Mandating Vaccination, Survey Finds

Source: https://www.sciencealert.com/study-finds-that-mandating-vaccination-could-reduce-voluntary-compliance

June 13 – **Should governments compel their citizens to receive vaccinations?** It's a question that's more pertinent than ever in the wake of the coronavirus pandemic, but a new study suggests that forcing people into getting jabs could become counter-productive.
The research looked at surveys completed by 2,653 German residents during both the first and the second waves of the pandemic, analyzing how attitudes changed over time during 2020. The German government has committed to keeping vaccines voluntary for its population.
Despite infection rates being 15 times higher in Germany during the second wave in October and November, the data showed that resistance to mandatory vaccinations had increased from the first wave in April and May.

Participants were asked how likely they were to get vaccinated, based on whether the vaccinations were enforced by law or voluntary: During both waves, people were more likely to want to get vaccinated if they didn't *have* to, but the gap was bigger the second time around.
"Costly errors may be avoided if policymakers reflect carefully on the costs of enforcement," says economist Samuel Bowles from the Santa Fe Institute.
"These could not only increase opposition to vaccination, but also heighten social conflict by further alienating citizens from the government or scientific and medical elites."
The researchers also looked at some of the predictors for agreeing to be vaccinated, and trust in public institutions was a big one. Doubts about the effectiveness of vaccines and opposition to personal freedom restrictions were also closely linked.
There's something else going on as well though, the team behind the study suggests: When vaccines are voluntary, more people are persuaded to take them as they see friends and family getting jabbed. When vaccines are mandatory, that ripple effect is reduced. This ripple effect is similar to the spread of new technologies – like TVs and washing machines when they were first introduced – as more and more people get them, more and more people want the same thing as others who are already enjoying the benefits.
The researchers also posit that forcing people to have jabs takes away their agency to do good (very important in convincing healthy people to get vaccinated), comes across as overly controlling, and reduces trust in the vaccine – because if the vaccine was safe and effective, why would enforcement be needed?
"How people feel about getting vaccinated will be affected by enforcement in two ways – it could crowd out pro-vaccine feelings, and reduce the positive effect of conformism if vaccination is voluntary," says psychologist and behavioral economist Katrin Schmelz, from the University of Konstanz in Germany.
Schmelz and Bowles acknowledge that mandatory vaccines may have to play a part in certain countries and in certain situations – if vaccination rates are particularly low, for example – but they say that the approach should be used with caution.
With countries and organizations now starting to introduce guidelines around vaccinations for attending events or courses, or for traveling to specific places, it's becoming more important than ever to understand the various reasons that can lead to vaccine hesitancy.
The findings here can be useful in any scenario where leaders want to change the minds of their people – from promoting low-carbon lifestyles to increasing tolerance among communities. Sometimes a softer approach is better.
"Our findings have broad policy applicability beyond COVID-19," says Schmelz. **"There are many cases in which voluntary citizen compliance to a policy is essential because state enforcement capacities are limited, and because results may depend on the ways that the policies themselves alter citizens' beliefs and preferences."**

▶▶ The research has been published in *PNAS*.

Common Diabetes Drug Shows Promise as Treatment for COVID-19 Lung Inflammation

Source: https://health.ucsd.edu/news/releases/Pages/2021-06-08-common-diabetes-drug-shows-promise-as-treatment-for-covid-19-lung-inflammation.aspx

June 08 – Metformin is a widely prescribed blood sugar-lowering drug. It is often used as an early therapy (in combination with diet and lifestyle changes) for type 2 diabetes, which afflicts more than 34 million Americans.
Metformin works by lowering glucose production in the liver, reducing blood sugar levels that, in turn, improve the body's response to insulin. But scientists have also noted that metformin possesses anti-inflammatory properties, though the basis for this activity was not known.
In a study published online June 8, 2021 in the journal *Immunity* , a multi-institution team led by researchers at University of California San Diego School of Medicine identified the molecular mechanism for the anti-inflammatory activity of metformin and, in mouse studies, found that metformin prevents pulmonary or lung inflammation in animals infected with SARS-CoV-2, the virus that causes COVID-19.
Over the past year, several retrospective clinical studies had reported that metformin use by diabetic and obese patients prior to hospital admission for COVID-19 correlated to reduced severity and mortality. Both diabetes and obesity are recognized risk factors for COVID-19, and are linked to more severe outcomes. Notably, other drugs used to control blood sugar levels do not appear to produce a similar effect.

But while these clinical studies suggested metformin's anti-inflammatory activity, rather than lowering of blood glucose, could be responsible for reduced COVID-19 severity and mortality, none of the studies offered an explanation or prompted large, randomized clinical trials needed for obtaining conclusive answers.

Metformin decreases blood glucose levels and increases insulin sensitivity and could possibly, inhibit viral infection, multiplication, and maturation, inhibit translation of viral proteins, regulate viral protein–host protein interactions, and modulate inflammation and the immune response in COVID-19 patients.

"The clinical studies were plagued by confounders that made conclusions hard to reach. There was some skepticism in their findings," said corresponding study author Michael Karin, PhD, Distinguished Professor of Pharmacology and Pathology and Ben and Wanda Hildyard Chair for Mitochondrial and Metabolic Diseases at UC San Diego School of Medicine. "And because metformin is an out-of-patent, low-cost drug, there is little impetus to conduct large-scale trials, which are quite expensive."

Karin, with co-senior author Elsa Sanchez-Lopez, PhD, an assistant professor at the Department of Orthopedic Surgery, postdoctoral fellow Hongxu Xian, PhD, and others, turned their focus to a mouse model of acute respiratory distress syndrome (ARDS), a life-threatening condition in which fluids leak into the lungs, making breathing difficult and restricting oxygen supply to essential organs.

ARDS is triggered by trauma and by bacterial or viral infections. It is a frequent cause of death in patients hospitalized with COVID-19. The researchers found that metformin administered to mice prior to or after exposure to bacterial endotoxin, a surrogate for bacterial pneumonia, resulted in the inhibition of ARDS onset and lessening of its symptoms. Metformin also produced a marked reduction in mortality in endotoxin-challenged mice and inhibited IL-1β production and inflammasome assembly within alveolar macrophages — immune cells found in the lungs.

IL-1β, along with IL-6, are small proteins called cytokines that cause inflammation as an early immune response. Their amounts are often highly elevated in persons infected by SARS-CoV-2, creating "cytokine storms" in which the body starts attacking its own cells and tissues. They are signs of an acute immune response gone awry.

Production of IL-1β depends on a large protein complex called the inflammasome, whose presence in lung tissue is found to be highly increased in deceased COVID-19 patients, a discovery made by co-authors Moshe Arditi, MD, and Timothy R. Crother, PhD, at Cedars-Sinai Medical Center in Los Angeles.

Working with colleagues at The Scripps Research Institute, the UC San Diego researchers confirmed that metformin inhibited inflammasome activation and prevented SARS-CoV-2-induced pulmonary inflammation in mice.

Cell culture studies using macrophages revealed the underlying mechanism by which metformin exerts its anti-inflammatory activity: reduced production of ATP by mitochondria. ATP is the molecule that mitochondria use to store chemical energy for cells. It is essential to all cellular processes, but blunted ATP production in liver cells is responsible for the glucose lowering effect of metformin.

Lower amounts of ATP in macrophages led to inhibition of mitochondrial DNA synthesis, which had been previously identified by Karin's lab as a critical step in NLRP3 inflammasome activation. Subsequent research found that clearing away damaged mitochondria reduced NLRP3 inflammasome activity and reduced inflammation.

UC San Diego researchers also confirmed that specific interference with mitochondrial DNA synthesis in macrophages caused by removal of the enzyme CMPK2 (cytidine monophosphate kinase 2) inhibited IL-1β (but not IL-6) production and prevented ARDS onset.

"These experiments strongly suggest that improved delivery of metformin or CMPK2 inhibitors into lung macrophages can provide new treatments for severe COVID-19 and other forms of ARDS," said Sanchez Lopez.

The authors said the findings suggest metformin may have therapeutic potential for treating a variety of neurodegenerative and cardiovascular diseases in which NLRP3 inflammasome activation is a factor. "Inhibition of inflammasome activation may also account for the poorly explained anti-aging effect of metformin," said Karin.

Co-authors include: Alexandra Rundberg Nilsson, Raphaella Gatchalian and Sarah Kang, UC San Diego; Warren G. Tourtellote and Yi Zhang, Cedars-Sinai; German R. Aleman-

Muench, Gavin Lewis, Weixuan Chen and Pejman Soroosh, Janssen Research & Development; and Melissa Luevanos, Dorit Trudler, Stuart A. Lipton, John Teijaro, and Juan Carlos de la Torre, The Scripps Research Institute.

Novavax: Large study finds COVID-19 shot about 90% effective

Source: https://news.yahoo.com/novavax-large-study-finds-covid-100450049.html

June 14 – Vaccine maker Novavax said Monday its COVID-19 shot was highly effective against the disease and also protected against variants in a large study in the U.S. and Mexico, potentially offering the world yet another weapon against the virus at a time when developing countries are desperate for doses.

The two-shot vaccine was about 90% effective overall, and preliminary data showed it was safe, the American company said. That would put the vaccine about on par with Pfizer's and Moderna's.

While demand for COVID-19 shots in the U.S. has dropped off dramatically and the country has more than enough doses to go around, the need for more vaccines around the world remains critical. The Novavax vaccine, which is easy to store and transport, is expected to play an important role in boosting supplies in poor parts of the world.

That help is still months away, however. The company, which has been plagued by raw-material shortages that have hampered production, said it plans to seek authorization for the shots in the U.S., Europe and elsewhere by the end of September and will be able to produce up to 100 million doses a month by then.

"Many of our first doses will go to … low- and middle-income countries, and that was the goal to begin with," Novavax CEO Stanley Erck said.

While more than half of the U.S. population has had at least one vaccine dose, less than 1% of people in the developing world have had one shot, according to a data collection effort run in part by the University of Oxford.

The Novavax shot stands to become the fifth Western-developed COVID-19 vaccine to win clearance. The Pfizer, Moderna and Johnson & Johnson vaccines are already authorized for use in the U.S. and Europe. Europe also uses AstraZeneca's formula.

Novavax's study involved nearly 30,000 people ages 18 and up. Two-thirds received two doses of the vaccine, three weeks apart, and the rest got dummy shots. Nearly half the volunteers were Black, Hispanic, Asian American or Native American, and 6% of participants were in Mexico. Altogether, 37% had health problems that made them high risk, and 13% were 65 or older.

There were 77 cases of COVID-19 — 14 in the group that got the vaccine, the rest in volunteers who received the dummy shots. None in the vaccine group had moderate or severe disease, compared with 14 in the placebo group. One person in that group died. The vaccine was similarly effective against several variants, including the one first detected in Britain that is now dominant in the U.S., and in high-risk populations, including the elderly, people with other health problems and front-line workers in hospitals and meatpacking plants.

"These consistent results provide much confidence in the use of this vaccine for the global population," said Dr. Paul Heath, director of the Vaccine Institute at the University of London and St. George's Hospital.

Side effects were mostly mild — tenderness and pain at the injection site. There were no reports of unusual blood clots or heart problems, Erck said.

A study underway in Britain is testing which of several vaccines, including Novavax's, works best as a booster shot for people who received the Pfizer or AstraZeneca formula. Industry analyst Kelechi Chikere said the Novavax shot could become a "universal booster" because of its high effectiveness and mild side effects.

Novavax reported the results in a news release and plans to publish them in a medical journal, where they will be vetted by independent experts. The Gaithersburg, Maryland-based company previously released findings from smaller studies in Britain and South Africa.

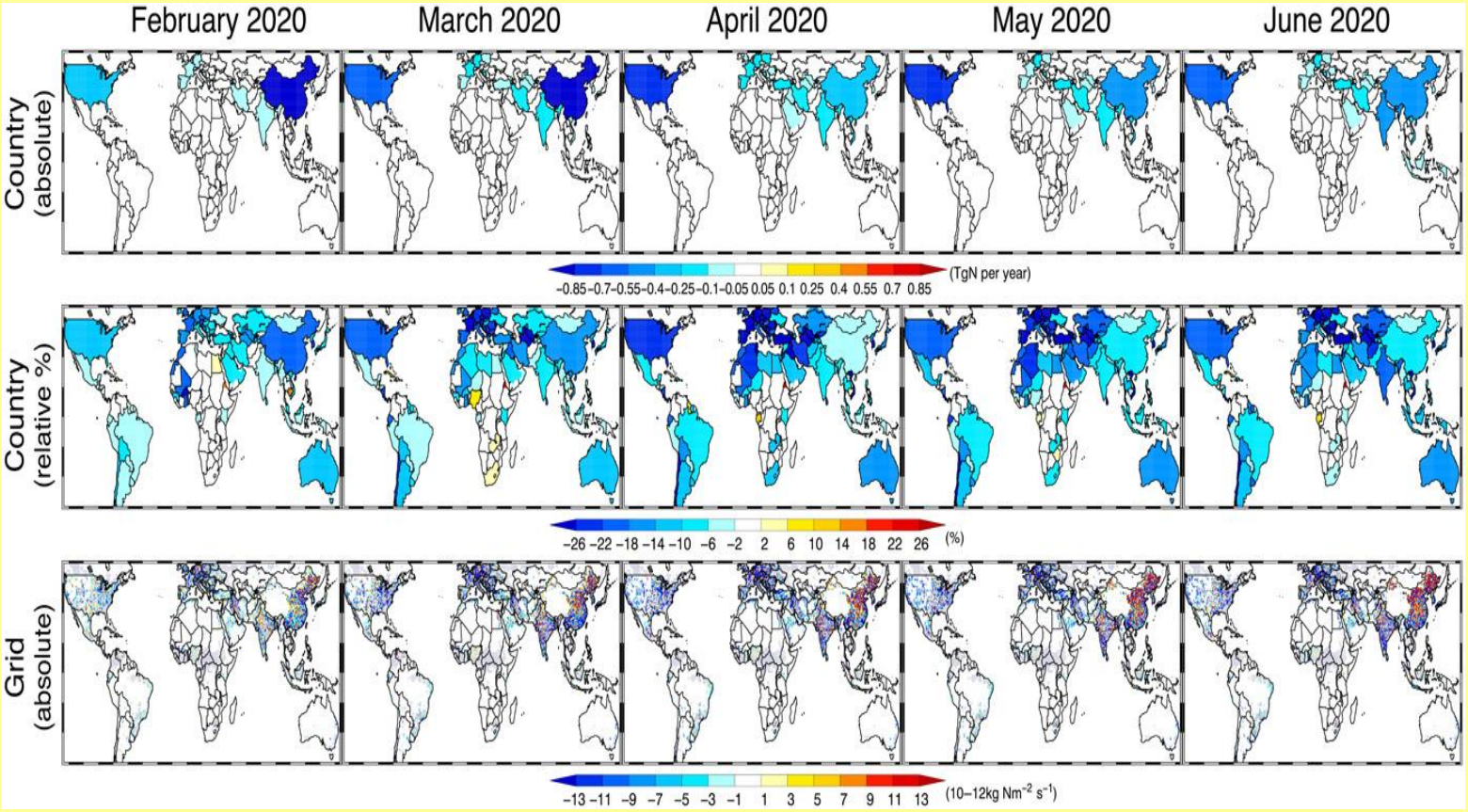
COVID-19 vaccines train the body to recognize the coronavirus, especially the spike protein that coats it, and get ready to fight the virus off. The Novavax vaccine is made with lab-grown copies of that protein. That's different from some of the other vaccines now widely used, which include genetic instructions for the body to make its own spike protein.

The Novavax vaccine can be stored in standard refrigerators, making it easier to distribute.
As for the shortages that delayed manufacturing, Erck said those were due to restrictions on shipments from other countries.
"That's opening up," he said, adding that Novavax now has weeks' worth of needed materials in its factories, up from just one week.
The company has committed to supplying 110 million doses to the U.S. over the next year and a total of 1.1 billion doses to developing countries.
In May, vaccines alliance Gavi, a leader of the U.N.-backed COVAX project to supply shots to poorer countries, announced it signed an agreement to buy 350 million doses of Novavax's formula. COVAX is facing a critical shortage of vaccines after its biggest supplier in India suspended exports until the end of the year.
Novavax has been working on developing vaccines for more than three decades but hasn't brought one to market. Its coronavirus vaccine work is partly funded by the U.S. government.
Dr. Peter English, a vaccine expert previously with the British Medical Association, called the Novavax results "excellent news." English said that because vaccine production is complicated, it's crucial to have as many shots as possible.
"Any minor imperfection in the production plant can shut down the production for days or weeks," he said in a statement. "The more different manufacturers we have producing vaccine, the more likely it is we will have availability of vaccines."
He said it was also encouraging news that Novavax would be able to adapt its vaccine to any potentially worrying variants in the future if necessary.

Pandemic Lockdowns Led to a Surprising And Sudden Drop in Ozone, But It Won't Last

Source: https://www.sciencealert.com/pandemic-lockdowns-led-to-a-surprising-and-sudden-drop-in-ozone-smog

June 14 – Last year's pandemic lockdowns not only saved even more people from contracting COVID-19, they also brought a sudden plunge in ozone pollution.
New estimates from NASA reveal ozone air pollution in May and June of 2020 dropped by 2 percent, largely due to emission reductions in Asia and the Americas.
That might not sound like much, but experts say it's a global decrease that would otherwise take at least 15 years to achieve, even under the most aggressive emission reduction schemes proposed by the Intergovernmental Panel on Climate Change.
"I was really surprised at how large the impact on global ozone was," says Jessica Neu, who researches the chemical composition of the atmosphere at NASA's Jet Propulsion Laboratory.
"We expected more of a local response at the surface."
Ozone in the atmosphere isn't necessarily a bad thing. Higher up, these molecules shield our planet from the full power of the Sun. But lower down, they can irritate the lungs and increase the risk of people dying from cardiovascular or respiratory disease.
Ozone isn't a pollutant we humans directly emit into the atmosphere; it's formed when sunlight interacts with nitrogen oxides (NOx), which are released into the air from automobiles, factories, power plants, and refineries.
Even though we know this, the relationship between nitrogen oxides and ozone in the lower atmosphere is a tricky one to predict. Reactions are subject to the whims of weather and the presence of other pollutants and chemicals. In some scenarios, a drop in nitrogen oxides can actually increase ozone pollution.
For instance, when China reduced its emissions of fine particulate matter a few years ago, the changes caused an unexpected increase in ozone air pollution.
Given this uncertainty, researchers saw last year's lockdowns as a "scenario-of-opportunity" to figure out what would happen to the atmosphere if there was a rapid and large reduction in human activity and our pollutants. We can then use this knowledge to create more effective environmental policies.
Feeding multiple satellites' data from 2020 into four models of atmospheric reactions, the team found NOx emissions ebbed and flowed with the world's lockdowns. In April and May, for instance, global emissions dropped by at least 15 percent.
Those nations that had the strictest lockdowns ultimately showed the greatest emission reductions in nitrogen oxides.
In China, for instance, lockdown orders at the beginning of the year produced a 50 percent drop in these particular pollutants.
When quarantine measures were later enacted in the United States, Europe, the Middle East, and West Asia, NOx emissions fell between 18 and 25 percent in April and May.
The resulting impact on the atmosphere was surprisingly global and rapid. After lockdowns, models and satellite data reveal a rapid drop in ozone production, which quickly spread around the world, cleaning the air of ozone pollution for as high as 10 kilometers (6 miles).



Spatial distributions of the monthly mean NO_x emission reductions due to the COVID-19 lockdowns. The COVID NO_x emission anomaly in February to June 2020 was estimated from differences between the 2020 and BAU emissions. Results are shown for the absolute changes in country total emissions (in TgN per year, top), relative changes in country total emissions (in %, middle), and absolute changes in grid-scale emissions (in 10^{-12}kg Nm^{-2} s^{-1}, bottom). The model grid points that were not analyzed because of unstable emission estimates and fire influences are shown in gray. N America, North America; S America, South America; ME + W Asia, Middle East and West Asia.

Here, in the troposphere, ozone can not only decrease air quality, it can also trap heat and contribute to global warming. As a result, the authors think last year's COVID-19 lockdowns had benefits for both air quality and climate change.

"I was very happy that our analysis system was able to capture the detailed changes in emissions across the world," says atmospheric scientist Kazuyuki Miyazaki from NASA's Jet Propulsion Laboratory.

"The challenging and unprecedented nature of this work is a testament to improvements in satellite monitoring in service of societal needs."

In the time of a climate crisis, and when air pollution is worse than ever before, the sooner we can figure out how emissions impact the atmosphere, the better.

According to the World Health Organization, air pollution kills roughly 7 million people each year. It's been described as a silent pandemic, even more dangerous than all the violence in the world and most disease.

In March of last year, estimates in China found just two months of pollution reduction probably saved the lives of 4,000 children under the age of 5 and 73,000 adults.

At the time, that number was more than the global death toll from COVID-19.

Last year's lockdowns have shown us how quickly humans can make a positive impact on the atmosphere and human health, but unless we sustain these practices, the benefits are likely to be short-lived.

As the world opens back up again, global ozone, like our other emissions, will surely rise again.

▶▶ The study was published in *Science Advances*.

Safety and Potency of COVIran Barekat Inactivated Vaccine Candidate for SARS-CoV-2: A Preclinical Study

By Asghar Abdoli, Reza Aalizadeh, Hossein Aminianfar, et al.
Source (full text): https://www.biorxiv.org/content/10.1101/2021.06.10.447951v1.full

Abstract
There is an urgent demand to manufacture an effective and safe vaccine to prevent SARS-CoV2 infection, which resulted in a global pandemic. In this study, we developed an inactivated whole-virus SARS-CoV-2 candidate vaccine named COVIran Barekat. Immunization at two different doses (3 µg or 5 µg per dose) elicited a high level of SARS-CoV-2 specific neutralizing antibodies in mice, rabbits, and non-human primates. The results show the safety profile in studied animals (include guinea pig, rabbit, mice, and monkeys). Rhesus macaques were immunized with the two-dose of 5 µg and 3 µg of the COVIran Barekat vaccine and showed highly efficient protection against 104 TCID50 of SARS-CoV-2 intratracheal challenge compared with the control group. These results highlight the COVIran Barekat vaccine as a potential candidate to induce a strong and potent immune response which may be a promising and feasible vaccine to protect against SARS-CoV2 infection.

Iran Approves Emergency Use Of Domestic COVID Vaccine

Source: https://www.rferl.org/a/iran-domestic-covid-vaccine-coviran-barekat/31307467.html

June 14 – Iranian authorities say they have given emergency approval for a domestically developed vaccine against COVID-19 as the country battles the Middle East's deadliest coronavirus outbreak.
Health Minister Saeed Namaki told a press conference on June 14 that permission for the emergency use of the vaccine called COVIran Barekat was issued the previous day.
The move comes after the country is facing problems with importing enough vaccines.
The first study of the safety and effectiveness of the vaccine developed by a subsidiary of state-owned conglomerate Setad began in late December 2020.
A Setad official told state news agency IRNA that production of the vaccine had started in early June, with "around 3 million doses" produced so far.
The coronavirus pandemic has killed more than 82,000 people in Iran, with over 3 million infected, according to official figures widely seen as understating the toll.
Iranian officials allege that U.S. sanctions have hampered the country's efforts to inoculate its 83 million population. More than 4.3 million Iranians have received a first vaccine dose since February, but fewer than 1 million have received the two jabs necessary to be fully inoculated, according to the Health Ministry.

Whether or Not COVID-19 Virus Leaked from Lab, Pathogens as Weapons of Mass Destruction Real Threat

By Lt Gen (Retd) DS Hooda
Source: https://www.news18.com/news/opinion/whether-or-not-covid-19-virus-leaked-from-lab-pathogens-as-weapons-of-mass-destruction-a-real-threat-3846140.html

June 14 – Eighteen months after the COVID-19 pandemic swept across the world with devastating effects, we are still no closer to finding the origin of the virus. Many experts have

raised concerns that the virus could have leaked from a lab at the Wuhan Institute of Virology. Irrespective of which theory is subsequently proved (if at all), what is amply clear is that the weaponization of pathogens can have terrifying consequences. It is also a fact that the capability of developing biological weapons exists in most countries that are engaged in pharmaceutical and medical research.

The use of biological weapons is not a new or unique phenomenon. In 1345, the Mongols had laid siege to the city of Caffa, a port on the Black Sea, when the Black Death plague struck them. Demoralised and stunned by their disaster, the Mongols catapulted corpses of their dead into the city, infecting the citizens. After the siege ended in 1347, the city's survivors sailed to Europe, taking the plague with them. By 1348, Europe was in the grip of the Black Death that would kill more than 20 million people, almost one-third of the continent's population.

The Race for Bio Weapons

During the Second World War, the Japanese had an advanced biological weapons programme that carried out experiments on prisoners of war. Japan's biological warfare from 1932 to 1945 in Manchuria and China is described in chilling details in Sheldon H. Harris's book *Factories of Death*. In 1939 and 1940, Unit 731 (responsible for biological warfare) laced more than 1,000 wells in and around Harbin in Manchuria with typhoid bacilli that devastated entire villages. In a shocking post-war development, America granted immunity to the physicians of Unit 731 in exchange for providing America with their research on biological warfare and data from human experiments.

Research into biological weapons intensified after the Second World War, led by the US and the Soviet Union. By 1969, when President Nixon ended the US' offensive biological warfare programme, it had developed six mass-produced, battle-ready biological weapons in the form of agents that cause anthrax, tularemia, brucellosis, Q-fever, Venezuelan equine encephalitis (VEE) and botulism. The US decision spurred the adoption of the 1972 Biological and Toxin Weapons Convention (BWC), which banned the development, production, stockpiling, transfer and use of biological and toxin weapons.

Today, 183 states have either ratified or acceded to the BWC. However, unlike the chemical or nuclear weapons regimes, the BWC lacks an effective system to verify states' compliance with the convention. This has led to many accusations that countries are breaching the obligations of the convention. In 1973, the Soviet Union established Biopreparat, a giant network of secret labs working on biological agents. In 1992, Colonel Kanatjan Alibekov, the First Deputy Director of Biopreparat, defected to the US and revealed the scale of the Soviet programme: from perfecting biological weapons based on anthrax, glanders, and plague to weaponizing highly contagious viral diseases such as smallpox and Ebola.

A Need for Transparent Systems

Not much is publicly known about China's biological weapons programme. An April 2021 US Department of State report noted that there are "concerns with respect to Chinese military medical institutions' toxin research and development because of the dual-use applications and their potential as a biological threat." Recent media reports indicated that a 2015 Chinese document, *The Unnatural Origin of SARS and New Species of Man-Made Viruses as Genetic Bioweapons*, had discussed the weaponization of the coronavirus.

While there is some concern over nations clandestinely continuing with building of biological weapons, there is also the added threat from terrorist groups. Aum Shinrikyo, a Japanese terrorist group that attacked the Tokyo subway system with Sarin gas in 1995, was also involved in developing biological weapons using Anthrax and Ebola virus. Although there have been no major bioterrorist attacks, there is no doubt about the intent of terrorist groups to acquire weapons of mass destruction. In the 2012 edition of the al Qaeda magazine *Inspire*, Anwar al-Awlaki, a senior leader, quotes Islamic scholars to justify "the use of poisons of chemical and biological weapons against population centers."

Advances in biotechnology also pose a serious threat to national security. The 2016, 2017 and 2019 annual editions of the *Worldwide Threat Assessment of the US Intelligence Community* included genome editing as a developing risk. Researchers have been able to replicate CRISPR, or Clustered Regularly Interspersed Short Palindromic Repeats, a mechanism by which bacteria remove viruses from their DNA. There are fears that techniques like CRISPR can be used to modify a pathogen's DNA to make it more virulent or target people with certain genetic traits.

Bio defence research is continuing around the world with a great deal of opacity. While most countries are signatories to the BWC, the treaty lacks teeth, and there is no effective method to ensure compliance by nations. The COVID-19 pandemic has shown us the extreme vulnerability of the world's population to an unknown virus. There is no surety that such an event will not naturally occur in the future, but we could at least minimise the chances of deadly biological weapons escaping from secret labs. This will require strengthening the BWC, greater transparency in national programmes, and international scientific cooperation to defend against biological threats.

Countries must put in place measures to quickly detect and respond to all forms of biological attacks. Most of all, there is a need for leaders around the world to take a principled stand on biological weapons. In 1998, Richard Preston, a bestselling author of books on infectious disease, penned down words that remain equally relevant today: "Biological weapons are a disgrace to biology. The time has come for top biologists to assert their leadership and speak out, to take responsibility on behalf of their profession for the existence of these weapons and the means of protecting the population against them, just as leading physicists did a generation ago when nuclear weapons came along. Moral pressure costs nothing and can help; silence is unacceptable now."

Lt Gen (Retd) DS Hooda *is former Northern Commander, Indian Army, under whose leadership India carried out surgical strikes against Pakistan in 2016. He is currently a Senior Fellow at the Delhi Policy Group. Views expressed are personal.*

COVID-19 Vaccine Appears 90% Effective Even Against Variants, And Could Roll Out Soon

Source: https://www.sciencealert.com/novavax-says-it-s-vaccine-is-more-than-90-percent-effective-including-variants

June 15 – Novavax's COVID-19 jab is more than 90 percent effective, including against coronavirus variants, the vaccine maker said Monday after a large-scale US study.

The jab "demonstrated 100 percent protection against moderate and severe disease, 90.4 percent efficacy overall," the company said in a statement, adding "the study enrolled 29,960 participants across 119 sites in the US and Mexico to evaluate efficacy, safety and immunogenicity."

The Maryland-headquartered company said it intended to apply for regulatory approval by the third quarter of 2021.

After that, it said, it would be on course to make 100 million doses per month by the end of the third quarter and 150 million doses per month by the end of the year.

"Today, Novavax is one step closer to addressing the critical and persistent global public health need for additional COVID-19 vaccines," said Stanley C. Erck, Novavax's president and chief executive.

"Novavax continues to work with a sense of urgency to complete our regulatory submissions and deliver this vaccine, built on a well understood and proven platform, to a world that is still in great need of vaccines."

While some rich countries have made progress on vaccinating their populations, there remain concerns that many poorer countries are being left out of the global inoculation drive. Vaccination rates in the world's poorest nations are far behind the Group of Seven industrialized powers and other wealthy states - in terms of doses administered so far, the imbalance between the G7 and the planet's low-income countries, as defined by the World Bank, is 73 to one.

Unlike some rival jabs, Novavax's vaccine - formally known as NVX-CoV2373 - does not have to be stored at ultra-low temperatures. The company said it was "**stored and stable at 2°- 8°C**, allowing the use of existing vaccine supply chain channels for its distribution." In theory at least, this means the shots should be more easily transported and administered in countries with less well developed health infrastructures.

Fifty-nine labs around world handle the deadliest pathogens – only a quarter score high on safety

By Filippa Lentzos and Gregory Koblentz

Source: https://theconversation.com/fifty-nine-labs-around-world-handle-the-deadliest-pathogens-only-a-quarter-score-high-on-safety-161777

June 14 – Did the coronavirus SARS-CoV-2 result from high-risk research gone wrong? Regardless of the answer, the risk of future pandemics originating from research with dangerous pathogens is real.

The focal point of this lab-leak discussion is the Wuhan Institute of Virology, nestled in the hilly outskirts of Wuhan. It is just one of 59 maximum containment labs in operation, under construction or planned around the world.

Known as biosafety level 4 (BSL4) labs, these are designed and built so that researchers can safely work with the most dangerous pathogens on the planet – ones that can cause serious disease and for which no treatment or vaccines exist. Researchers are required to wear full-body pressurised suits with independent oxygen.

Spread over 23 countries, the largest concentration of BSL4 labs is in Europe, with 25 labs. North America and Asia have roughly equal numbers, with 14 and 13 respectively. Australia has four and Africa three. Like the Wuhan Institute of Virology, three-quarters of the world's BSL4 labs are in urban centres.

With 3,000m² of lab space, the Wuhan Institute of Virology is the largest BSL4 lab in the world, though it will soon be overtaken by the National Bio and Agro-Defense Facility at Kansas State University in the US. When it is complete, it will boast over 4,000m² of BSL4 lab space.

Most labs are significantly smaller, with half of the 44 labs where data is available being under 200m² – less than half the size of a professional basketball court or about three-quarters the size of a tennis court.

Around 60% of BSL4 labs are government-run public-health institutions, leaving 20% run by universities and 20% by biodefence agencies. These labs are either used to diagnose infections with highly lethal and transmissible pathogens, or they are used to research these pathogens to improve our scientific understanding of how they work and to develop new drugs, vaccines and diagnostics tests.

But far from all of these labs score well on safety and security. The Global Health Security Index, which measures whether countries have legislation, regulations, oversight agencies, policies and training on biosafety and biosecurity, is instructive. Led by the US-based Nuclear Threat Initiative, the index shows that only about one-quarter of countries with BSL4 labs received high scores for biosafety and biosecurity. This suggests plenty of room for improvement for countries to develop comprehensive systems of biorisk management.

Membership of the International Experts Group of Biosafety and Biosecurity Regulators, where national regulatory authorities share best practices in this field, is another indicator of national biosafety and biosecurity practices. Only 40% of countries with BSL4 labs are members of the forum: Australia, Canada, France, Germany, Japan, Singapore, Switzerland, UK and the US. And no lab has yet signed up to the voluntary biorisk management system (ISO 35001), introduced in 2019 to establish management processes to reduce biosafety and biosecurity risks.

The vast majority of countries with maximum containment labs do not regulate dual-use research, which refers to experiments that are conducted for peaceful purposes but can be adapted to cause harm; or gain-of-function research, which is focused on increasing the ability of a pathogen to cause disease.

Three of the 23 countries with BSL4 labs (Australia, Canada and the US) have national policies for oversight of dual-use research. At least three other countries (Germany, Switzerland and the UK) have some form of dual-use oversight, where, for instance, funding bodies require their grant recipients to review their research for dual-use implications.

Rising demand for BSL4 labs

That still leaves a large proportion of scientific research on coronaviruses carried out in countries with no oversight of dual-use research or gain-of-function experiments. This is particularly concerning as gain-of-function research with coronaviruses is likely to increase as scientists seek to better understand these viruses and to identify which viruses pose a higher risk of jumping from animals to humans or becoming transmissible between humans. More countries are expected to seek BSL4 labs, too, in the wake of the pandemic as part of a renewed emphasis on pandemic preparedness and response.

While the COVID-19 pandemic has served as a stark reminder of the risks posed by infectious diseases and the importance of a robust biomedical research enterprise for saving lives, we also need to keep in mind that such research can carry risks of its own. Good science and smart policy, however, can keep those risks in check and allow humanity to reap the benefits of this research.

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BSL-4 labs' map worldwide

Source: https://www.globalbiolabs.org/map

Here's What Scientists Learn from Studying Dangerous Pathogens in Secure Labs

By Jerry Malayer

Source: http://www.homelandsecuritynewswire.com/dr20210614-here-s-what-scientists-learn-from-studying-dangerous-pathogens-in-secure-labs

June 14 – There are about 1,400 known human pathogens – viruses, bacteria, fungi, protozoa and helminths that can cause a person's injury or death. But in a world with a trillion individual species of microorganisms, where scientists have counted only one one-thousandth of one percent, how likely is it researchers have discovered and characterized everything that might threaten people? Not very likely at all. And there's a lot to be gained from knowing these microscopic enemies better.

So even though in day-to-day life it makes sense to avoid these dangerous microorganisms, scientists like me are motivated to study them up close and personal to learn how they work. Of course, we want to do it in as safe a way as possible.

I've worked in biocontainment laboratories and have published scientific articles on both bacteria and viruses, including influenza and the SARS-CoV-2 coronavirus. Here at Oklahoma State University, 10 research groups are currently studying pathogens in biosecure labs. They're identifying genetic variations of viruses and bacteria, studying how they operate within cells of their hosts. Some are untangling how the host immune system responds to these invaders and is affected by so-called comorbidities of obesity, diabetes or advanced age. Others are investigating how to detect and eliminate pathogens.

This kind of research, to understand how pathogens cause harm, is crucial to human and veterinary medicine, as well as the health of mammals, birds, fish, plants, insects and other species around the globe.

Forewarned Is Forearmed

Think about all scientists have learned in the past century about how to prevent diseases based on understanding which microorganism is responsible, where it is in the environment and how it overcomes humans' natural defenses.

Understanding what these organisms do, how they do it, and how they spread helps researchers develop measures to detect, mitigate and control their expansion. The goal is to be able to cure or prevent the disease they cause. The more dangerous the pathogen, the more urgently scientists need to understand it.

This is where lab research comes in.

Scientists have basic questions about how a pathogen conducts itself. What machinery does it use to enter a host cell and replicate? What genes does it activate, to make which proteins? This kind of information can be used to pinpoint strategies to eliminate the pathogen or lead to disease treatments or vaccines.

As the library of what is known about pathogens grows, there's more chance researchers can apply some of that knowledge when faced with an emerging pathogen.
People might encounter new pathogens as they move into different parts of the world, or alter ecosystems. Sometimes a pathogen adapts to a new vector – meaning it can be carried by a different organism – allowing it to spread into new areas and infect new populations. Roughly 70% of emerging infectious diseases around the world are transmitted through animals to people; these are called zoonotic diseases. It is critical to understand how these pathways work in order to have even a modest ability to predict what could happen.
While there are patterns in nature that can provide clues, the tremendous diversity of the microbial world and the rate at which these organisms evolve new strategies for their own defense and survival makes it imperative to study and understand each one as it's discovered.

Can This Research Be Done Safely?
There is no such thing as zero risk in any endeavor, but over many years, researchers have developed safe laboratory methods for working with dangerous pathogens.
Each study must document in advance what is to be done, how, where and by whom. These descriptions are reviewed by independent committees to make sure the plans outline the safest way to do the work. There's independent follow-up by trained professionals within the institution and, in some cases, by the U.S. Centers for Disease Control and Prevention, the U.S. Department of Agriculture, or both, to ensure researchers are following the approved procedures and regulations.
Those who work with dangerous pathogens adhere to two sets of principles. There's biosafety, which refers to containment. It includes all the engineering controls that keep the scientists and their surroundings safe: enclosed, ventilated workspaces called biosafety cabinets, directional airflows and anterooms to control air movement inside the lab. Special high-efficiency particulate air filters (HEPA) clean the air moving in and out of the laboratory.
We stick to good laboratory work practices, and everyone suits up in personal protective equipment including gowns, masks and gloves. Sometimes we use special respirators to filter the air we breathe while in the lab. Additionally we often inactivate the pathogen we're studying – essentially taking it apart so it is not functional – and work on the pieces one or a few at a time.
Then there's biosecurity, meaning the measures designed to prevent loss, theft, release or misuse of a pathogen. They include access controls, inventory controls and certified methods for decontaminating and disposing of waste. Part of these security measures is keeping the details close.
The research community recognizes four levels of biosafety practices. Biosafety level-1 (BSL-1) and BSL-2 are applied to general laboratory spaces where there is low to no risk. They would not work with microorganisms that pose a serious threat to people or animals.
BSL-3 refers to laboratories where there is high individual risk but low community risk, meaning there is a pathogen that can cause serious human disease but treatments are available. This is the kind of work my colleagues and I, and many medical and veterinary schools, will do.
BSL-4 refers to work with pathogens that pose a high risk of significant disease in people, animals or both that is transmitted among individuals and for which an effective treatment may not be available. BSL-4 laboratories are relatively rare, by one estimate only about 50 exist in the world.
At each level the increased risk requires increasingly stringent precautions to keep workers safe and prevent any accidental or malicious misuse.

What's at Risk If Science Ignores These Microbes?
In recent years, the world has seen outbreaks of severe disease caused by several types of pathogens. Even for the pathogens scientists do know about, much remains unknown. It is reasonable to expect there are more threats out there yet to be discovered.
It is critical for scientists to study new disease pathogens in the lab as they're discovered and to understand how they move from host to host and are affected by conditions; what variations develop over time; and what effective control measures can be developed.
In addition to more well-known viruses such as rabies, West Nile virus and Ebola, there are several critically important pathogens circulating in the world today that pose a serious threat. Hantaviruses, dengue, Zika virus and the Nipah virus are all under investigation in various labs, where researchers are working to understand more about how they're transmitted, develop rapid diagnostics and produce vaccines and therapeutics.
Microorganisms are the most abundant form of life on the planet and extremely important to human health and the health of plants and animals. In general, people have adapted to their

presence, and vice versa. For those microbes with the capacity to do real harm, it makes sense to study as many as scientists can now, before the next pandemic hits.

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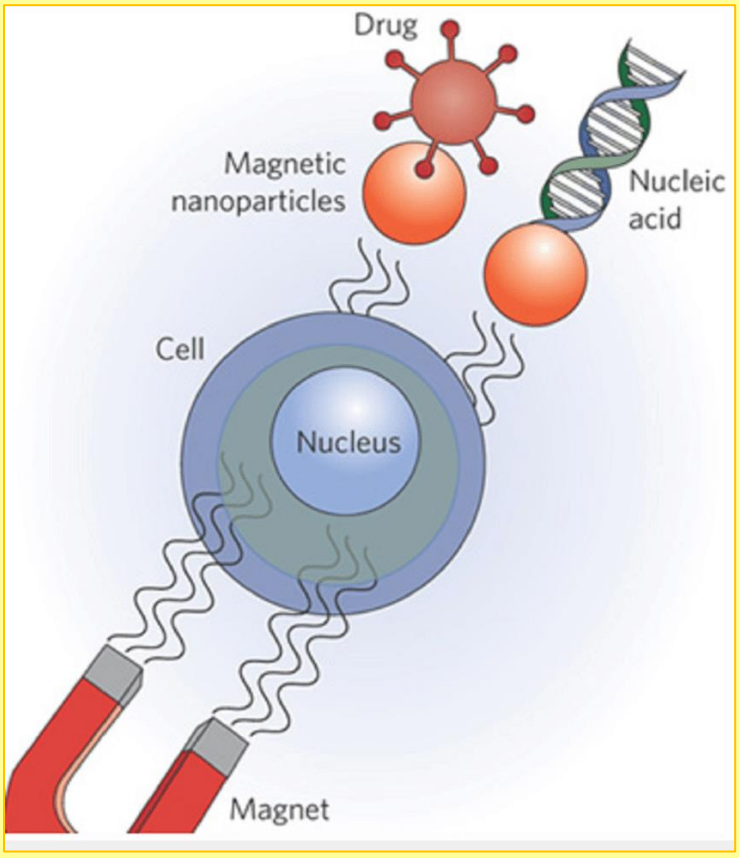
Manipulative magnetic nanomedicine: the future of COVID-19 pandemic/ endemic therapy

By Ajeet Kaushik
Florida Polytechnic University, FL, USA
Journal of Expert Opinion of Drug Delivery
Source (full paper): https://www.tandfonline.com/doi/full/10.1080/17425247.2021.1860938

Nanobiotechnology is emerging very promising to investigate novel methodologies for managing COVID-19 pandemic/endemic successfully [2,5]. In this direction, experts have explored the opto-electro-magnetic nanosystem to detect the SARS-CoV-2 virus using a biosensing approach. Such optical, electrical, or magnetic biosensors function based on geno-sensing and immune-sensing has detected the SARS-CoV-2 virus selectively at a very low level [7,8]. These efficient-miniaturized biosensors can be operated using a smartphone and promoted for clinical application for early-stage diagnostics of COVID-19 infection. The successful integration of these SARS-CoV-2 virus sensors with AI and IoMT enables virus detection at point-of-location and sharing of bioinformatics with the medical center at the same time for timely therapeutics decision. This approach is also useful for tracking tasks and managing COVID-19 infection according to patient infection profiling. To avoid human-to-human SARS-CoV-2 virus transmission, experts have developed stimuli-responsive nanotechnology enable which can not only trap aerosol of virus size but can eradicate viruses on applying external stimulation for example nanoenable photo-sensitive virus degradation.



Magnetic targeting in drug and gene delivery. Magnetic nanoparticles (orange circles) carrying nucleic acids or drugs can be magnetically guided into cells (blue circle) using an external

Various types of clothes containing nanoparticles have demonstrated SARS-CoV-2 virus trapping and eradication successfully [2,9]. However, significant attention is required to increase the production and distribution of these masks for public use.

Besides, the contribution of biotech-pharma companies is also of high significance in terms of investigating novel therapeutic agents of higher efficacy with least/acceptable adverse effects. Though the SARS-CoV-2 virus is new and has exhibited strain variation which is making treatment optimization challenging. But biotechnology experts are analyzing every aspect of bioinformatics to design and develop an effective therapy based on novel anti-viral agents, CRISPR-Cas, antibodies, and vaccines[5].

Another approach to manage COVID-19 infection is to introduce or boost immunity through nutrition, for example, nutraceuticals have acted as inhibitors to prevent binding between SARS-CoV-2 virus and ACE-2 enzyme [2,8].

Investigating a therapeutic agent against the SARS-CoV-2 virus infection seems possible now but the delivery of these agents is still a remaining challenge because this virus may

have numerous reservoirs over the time. It is also demonstrated that COVID-19 infection patients may temporarily or permanently have immunocompromised biological systems. Such-related adverse effects include risk of cardiac arrest, vision issues, weak respiratory system, neurological disorders (one of the serious issues because SARS-CoV-2 virus crosses the blood-brain barrier), etc. Therefore, a single therapeutic agent designed against the SARS-CoV-2 virus may not be enough to treat COVID-19 infected patients completely [1,8].

Thus, a manipulative therapy, a combination of optimized therapeutic agents, consisting of an anti-SARS-CoV-2 virus agent and immune-supportive agents will require to be optimized based on the patient infection profiling. Experts have thought about it and raised/dealing the following concerns 1) drug-to-drug interaction, 2) delivery of drug/drugs at the targeted site, 3) control over the release of drug/drugs from a therapeutic formulation, and 4) immune-supporting long-acting therapies. These tasks are challenging but needed to be managed; therefore, exploring aspects of nanomedicine could be a promising approach to develop novel therapies to manage COVID-19 infection and support the immune system along with SARS-CoV-2 virus affected organs [8].

Nanomedicine (10 to 200 nm) is a therapeutic cargo designed using an appropriate drug nanocarrier and a therapeutic agent [9–15]. Nowadays magnetic nanomedicine has performed to manage viral infection at various reservoirs even in the brain because nanomedicine is capable to cross any barriers in the body via adopting the following approaches 1) functionalization of nanomedicine with barriers specific receptors, 2) applying external stimulation like ultrasound, and 3) noninvasive guided approach like magnetically guided drug delivery system [10–12].

Besides drug delivery, magnetic nanomedicine could be formulated to deliver multiple drugs at a targeted site to achieve desired therapeutic performance due to 1) control over the release by applying external stimulation like an ac-magnetic field, 2) formulating a magnetic cargo to load multiple drugs without drug-to-drug interaction, for example, layer-by-layer (LBL) approach, and 3) the sequence of drug release can be tuned and planned according to a stage/requirement of disease condition [13–15]. The performance of such nanomedicine mainly depends on the selection of a multi-functional stimuli-response drug nanocarrier such as magneto-electric nanoparticles (MENPs) [12], opto-magnetic, opto-electromagnetic, magneto-LBL, magneto-liposome, and magneto-plasmonics nanosystem. These advanced nanomedicines not only deliver the drug/drug but also help in the recognition of drug distribution and disease progression.

Combining above mentioned salient features, manipulative magnetic nanomedicine (MMN) as one of the potential future therapy wherein control over delivery and performance if required. Such MMN has the capabilities to recognize and eradicate the SARS-CoV-2 virus to manage COVID-19 infection and symptoms. Besides, due to the flexibility of using the therapeutic agent of choice, these manipulative nanomedicines can be designed and developed as long-acting therapy for COVID-19 infection where anti-virus and immune-supportive agents can stay longer in the body without causing any side-effects. Such personalized MMN (Figure 1) is an urgently required therapy and its development should be the focus of future research with the following aims

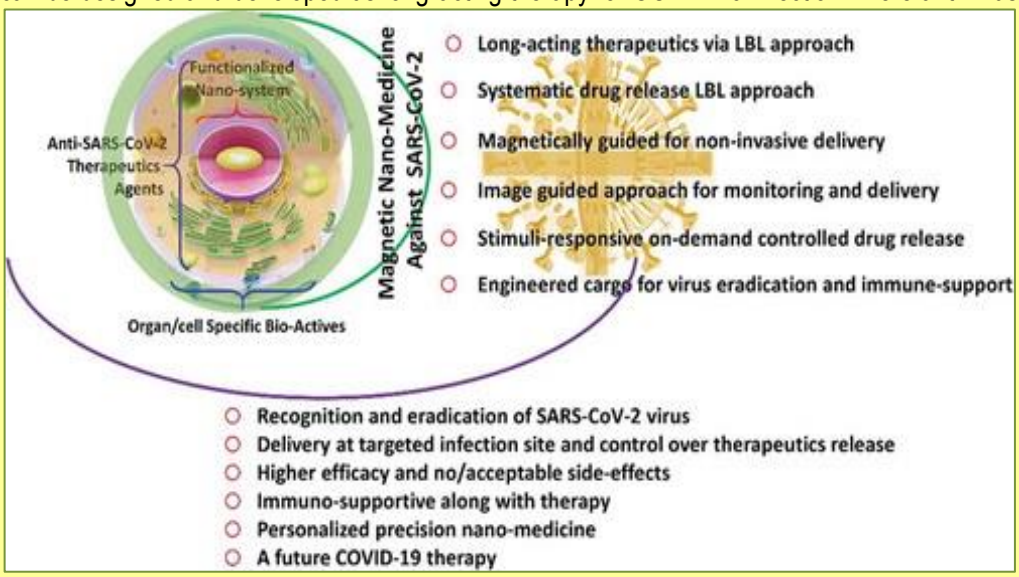


Figure 1. Systematic illustration of manipulative nanomedicine projected as future COVID-19 pandemic/endemic therapy

1. Exploring stimuli-responsive magnetic nanosystems for on-demand-controlled delivery and release.
2. Image-guided therapy to recognize the delivery site and confirm drug release.
3. A magnetically guided approach to delivering drugs across the barriers like the gut, BBB, etc.
4. Magneto-LBL/liposomal approach to delivering multiple drugs to avoid drug-to-drug interaction and control over the drug release sequence. For example, an anti-virus drug should be released first then an immune-protective agent.

5. The MMN can be customized according to patient disease profile and medical history, for example, selection of anti-SARS-CoV-2 virus agent (antibody, ARV, CRISPR-Cas, etc.,) based on patient genomic profiling.
6. The MMN can also be customized as long-acting therapeutics that allows drug-releasing for a longer time (2–3 months), as must require therapy to manage post-COVID-19 infection effects.
7. The MMN can be explored as personalized precision therapy.

New COVID-19 Vaccines May Reach Out to T Cells, Not Just B Cells

"Red flags" that prompt T cells to attack host cells infected by SARS-CoV-2 infection have been identified in studies with human cells. These red flags, which correspond to previously uncharacterized peptides derived from the internal proteins making up the SARS-CoV-2 virus, could enable a more precise selection of peptides for COVID-19 immune monitoring and vaccine development. **+ MORE**

Which Is The Best Vaccine For COVID? Experts Have an Answer, of Sorts

By Wen Shi Lee and Hyon Xhi Tan
Source: https://www.sciencealert.com/an-expert-explains-why-comparing-covid-vaccines-is-so-difficult

June 17 – With the rollout of COVID-19 vaccines accelerating, people are increasingly asking which vaccine is best?
Even if we tried to answer this question, defining which vaccine is "best" is not simple.
Does that mean the vaccine better at protecting you from serious disease? The one that protects you from whichever variant is circulating near you? The one that needs fewer booster shots? The one for your age group? Or is it another measure entirely?
Even if we could define what's "best", it's not as if you get a choice of vaccine. Until a suite of vaccines become available, the vast majority of people around the world will be vaccinated with whichever vaccine is available.
That's based on available clinical data and health authorities' recommendations, or by what your doctor advises if you have an underlying medical condition. **So the candid answer to which COVID vaccine is "best" is simply the one available to you right now. Still not convinced? Here's why it's so difficult to compare COVID vaccines.**

Clinical trial results only go so far

You might think clinical trials might provide some answers about which vaccine is "best", particularly the large phase 3 trials used as the basis of approval by regulatory authorities around the world.
These trials, usually in tens of thousands of people, compare the number of COVID-19 cases in people who get the vaccine, versus those who get a placebo. This gives a measure of efficacy, or how well the vaccine works under the tightly controlled conditions of a clinical trial.
And we know the efficacy of different COVID vaccines differ. For instance, we learned from clinical trials that the Pfizer vaccine reported an efficacy of 95 percent in preventing symptoms, whereas AstraZeneca had an efficacy of 62-90 percent, depending on the dosing regime.
But direct comparison of phase 3 trials is complex as they take place at different locations and times. This means rates of infection in the community, public health measures and the mix of distinct viral variants can vary. Trial participants can also differ in age, ethnicity and potential underlying medical conditions.

We might compare vaccines head to head

One way we can compare vaccine efficacy directly is to run head-to-head studies. These compare outcomes of people receiving one vaccine with those who receive another, in the same trial.
In these trials, how we measure efficacy, the study population and every other factor is the same. So we know any differences in outcomes must be down to differences between the vaccines.
For instance, a head-to-head trial is under way in the UK to compare the AstraZeneca and Valneva vaccines. The phase 3 trial is expected to be completed later this year.

How about out in the real world?

Until we wait for the results of head-to-head studies, there's much we can learn from how vaccines work in the general community, outside clinical trials. Real-world data tells us about vaccine effectiveness (not efficacy).

And the effectiveness of COVID vaccines can be compared in countries that have rolled out different vaccines to the same populations.
For instance, the latest data from the UK show both Pfizer and AstraZeneca vaccines have similar effectiveness. They both reliably prevent COVID-19 symptoms, hospitalisation and death, even after a single dose.
So what at first glance looks "best" according to efficacy results from clinical trials doesn't always translate to the real world.

What about the future?
The COVID vaccine you get today is not likely to be your last. As immunity naturally wanes after immunisation, periodic boosters will become necessary to maintain effective protection.
There is now promising data from Spain that mix-and-matching vaccines is safe and can trigger very potent immune responses. So this may be a viable strategy to maintain high vaccine effectiveness over time.
In other words, the "best" vaccine might in fact be a number of different vaccines.
Variant viruses have started to circulate, and while current vaccines show reduced protection against these variants, they still protect. Companies, including Moderna, are rapidly updating their vaccines to be administered as variant-specific boosters to combat this.
So, while one vaccine might have a greater efficacy in a phase 3 trial, that vaccine might not necessarily be "best" at protecting against future variants of concern circulating near you.

The best vaccine is the one you can get now
It is entirely rational to want the "best" vaccine available. But the best vaccine is the one available to you right now because it stops you from catching COVID-19, reduces transmission to vulnerable members of our community and substantially reduces your risk of severe disease.
All available vaccines do this job and do it well. From a collective perspective, these benefits are compounded. The more people get vaccinated, the more the community becomes immune (also known as herd immunity), further curtailing the spread of COVID-19.
The global pandemic is a highly dynamic situation, with emerging viral variants of concern, uncertain global vaccine supply, patchy governmental action and potential for explosive outbreaks in many regions.
So waiting for the perfect vaccine is an unattainable ambition. Every vaccine delivered is a small but significant step towards global normality.

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How long do COVID vaccines take to start working?

By Kylie Quinn and Jennifer Juno
Source: https://theconversation.com/how-long-do-covid-vaccines-take-to-start-working-161876

June 01 – Amid Victoria's worrying COVID outbreak, perhaps the point of greatest concern is the fact the virus has again found its way into aged care.
On Sunday, the state government announced an aged-care worker had tested positive for COVID-19, despite having received their first vaccine dose on May 12.
We've since found out another staff member, who worked alongside the original staff member at Arcare Maidstone, has returned a positive result, along with a resident.
The resident had received a first dose of the Pfizer vaccine and reportedly has only mild symptoms, but is being monitored in hospital.
The original worker's son has also tested positive.

The cases in the first staff member and the resident, both of whom had received a first vaccine dose, highlight the fact you need both doses for maximum benefit.

It takes a couple of weeks
Clinical trials show COVID vaccine protection is optimal from about two weeks after your second dose. This means they:

- nearly completely protect against severe disease and death in healthy people

- dramatically reduce the likelihood of symptoms with COVID-19
- reduce the likelihood of infection with the virus
- if you do get infected, they reduce the amount of virus you make. Emerging evidence suggests this reduces the likelihood you will pass the virus to other people.

Each dose of a vaccine essentially shifts the odds in your favour. One dose gives you a lower chance of reaping some of these benefits, while two doses gives you a much higher likelihood of these benefits.
Though even with two doses, you could still be unlucky and get infected, develop disease or pass on the virus.

What do we know about a single dose of Pfizer?
Clinical trials of the Pfizer vaccine were designed to test the efficacy of the vaccine more than one week after the *second dose*. However, these trials also provided the first hints that a single dose could offer some protection as early as 12 days afterwards.
"Real world" data now supports these early observations — a single dose is highly effective against hospitalisation four weeks after vaccination.
Meanwhile, early research and reports suggest a first dose of Pfizer could be between 50% and 90% effective at preventing infection.
Preliminary data also suggest people who become infected with SARS-CoV-2 after one dose of the Pfizer vaccine are up to 50% less likely to transmit that infection to other members of their household.

And what about a single dose of AstraZeneca?
The AstraZeneca vaccine was initially developed as a single-dose vaccine, estimated to have an efficacy of 76% against disease in clinical trials.
These trials were later amended to include a second dose when other work showed two doses significantly increased antibody levels in volunteers.
Real-world data, though yet to be peer reviewed, has shown one dose is roughly 65% effective at protecting from infection and up to 50% effective at preventing vaccinated people from passing the virus on if they do become infected, like Pfizer.
Also similar to Pfizer, a single dose of the AstraZeneca vaccine offers very good protection against hospital admission four weeks afterwards.

What takes so long?
Despite differences in mRNA vaccines like Pfizer and viral vector vaccines like AstraZeneca, both take similar amounts of time to generate antibody responses. After a single dose of AstraZeneca, antibodies can be detected after 14 days and further increase over the next two weeks.
But why does it take time for these responses to develop? When researchers track the antibody response to the first dose of vaccine, they find it takes at least ten days for the immune system to start making antibodies that can recognise SARS-CoV-2's spike protein (a protein on the virus' surface which it uses to enter our body's cells).
It also takes at least a week for T cells, a type of white blood cell important in our immune response, to start to react to the vaccine. Over the next few weeks, these responses become even stronger.
In contrast, the second dose activates the immune system much more quickly. Within a week of dose two, your antibody levels increase by more than ten times, providing much stronger and longer-lasting protection from infection.
So the first dose of a COVID vaccine gets your immune response going, but the second dose is essential to ensure immunity is strong, consistent from person to person, and longer-lasting.

Partial vaccination can be risky
While a single dose of either vaccine provides some benefits, relying on partial vaccination for people who are vulnerable or working in high-risk roles is problematic. It's critical we fully vaccinate frontline health-care workers, quarantine workers and people who work and live in aged and disability care as soon as possible.
Another challenge is that all current COVID vaccines are based on the original virus strain but variants now make up the majority of infections in many countries. Some variants are targeted less effectively by vaccines, particularly after only one dose.
Preliminary data suggests that while two doses of the Pfizer vaccine are 88% protective against symptomatic infection with the B.1.617.2 variant, a single dose is only 33% effective.
A similar variant, called B.1.617.1, is behind the current outbreak in Victoria and may respond similarly. This makes it even more important to ensure frontline workers receive both vaccine doses as quickly as possible.

It's also worth noting immune responses to one dose of either the Pfizer or AstraZeneca vaccines decrease with age.
In a pooled analysis of Pfizer and AstraZeneca, older people had lower rates of protection than younger people after a single dose, although older people were protected just as well as younger people after two doses.
Although this study is yet to be peer-reviewed, it tells us administering the second dose in a timely manner is particularly important for older people to realise the full benefits of vaccination.

Kylie Quinn *is Vice-Chancellor's Research Fellow @ School of Health and Biomedical Sciences, RMIT University*
Jennifer Juno *is Senior research fellow @ The Peter Doherty Institute for Infection and Immunity*

EDITOR'S COMMENT: Perhaps the first article giving some clues on why two same doses are required to have the best antibody response against coronavirus – although there is no comment on the possibility the second dose to be considered as an "enemy dose" resulting in an allergic reaction (until now attributed to PEG [for Pfizer & Moderna vaccines).

Sotrovimab: how the UAE's new drug to treat Covid-19 works

Source: https://www.thenationalnews.com/uae/health/sotrovimab-how-the-uae-s-new-drug-to-treat-covid-19-works-1.1243181

June 17 – On Wednesday the UAE became the first country in the world to receive a shipment of a new, highly effective treatment for Covid-19.
Sotrovimab, hailed as a game-changer by doctors, is now available for early treatment for selected patients in the country.
So, what is it and how does it work? *The National* explains.

What is Sotrovimab?
It is a type of **monoclonal antibody**, an artificially made protein that acts like human antibodies in the immune system.
The protein is directed against the **virus's spike**, which it uses to attach to and enter human cells.
It blocks Sars-CoV-2 from entering healthy cells and helps to clear infected ones, preventing the disease from progressing.
It is specifically for the treatment of mild to moderate disease and is given to **adults and children over the age of 12** who are at risk of developing severe symptoms.
It is the first treatment of its kind to receive **approval for use in the US**.
"It is the first therapy issued by the Food and Drug Administration in the US for treatment of mild-to-moderate coronavirus disease in adults and paediatric patients older than 12 years and who weigh more than 40kg, who are at high risk for progression to severe Covid-19, including hospitalisation or death," said Dr Rehab Farahat, a general practitioner at Bareen International Hospital, Mohamed bin Zayed City.

How effective is it?
A study of 585 adult outpatients with mild to moderate symptoms found it was **85 per cent effective**.
Of those patients, 291 received Sotrovimab, while the remaining 292 had a placebo. Treatment began within five days of the start of symptoms. Hospital admission or death occurred in 7 per cent of patients in the placebo group, and 1 per cent among those who received Sotrovimab.
But it is used only in patients with mild to moderate symptoms. It is of no benefit to severely affected patients and may even worsen their condition, manufacturer GlaxoSmithKline said.

Why do we need new treatments against Covid-19?
There are not enough treatments to fight the novel coronavirus, specifically ones that prevent the disease from progressing in high-risk patients.
Doctors say Sotrovimab will be a game-changer.
"With this treatment, we can provide another option to keep high-risk Covid patients out of hospital and manage at home only," said Dr Pavan Shrivastava, a consultant in internal medicine at NMC Specialty Hospital, Al Nahda, Dubai.
"It is very good for high-risk individuals who are 65 years and above, or individuals who have certain chronic medical conditions.

"In my opinion, it's going to be a breakthrough in the management of Covid infections.
"This will definitely reduce hospitalisation and mortality."

Will it work against the variants?
It should, yes.
"**Laboratory testing showed that Sotrovimab retains activity against the current circulating variants,"** Dr Shrivastava said.

Half of Covid-19 hospital patients experience long Covid, major US study finds

Source: https://www.thenationalnews.com/uae/health/half-of-covid-19-hospital-patients-experience-long-covid-major-us-study-finds-1.1243782

June 18 – Half of all patients requiring hospital treatment for Covid-19 go on to experience long Covid, a major US study of nearly two million patients found.
Almost one in five people whose infection was classified as symptomatic also had lingering effects from the virus.
Long Covid is a term used to describe ill-effects that continue for weeks or even months after contracting coronavirus.
Based on healthcare insurance claims, the study by Fair Health found that pain was the most common long Covid symptom, with breathing difficulties and high blood pressure also often seen.
In its white paper report, A Detailed Study of Patients with Long-Haul Covid, Fair Health said "post-Covid" symptoms were more common in individuals whose initial symptoms were more severe.
Of patients admitted to hospital with Covid-19, the proportion with "a post-Covid condition was 50 per cent; of patients who were symptomatic but not hospitalised, 27.5 per cent; and of patients who were asymptomatic, 19 per cent," the report stated.
Fair Health classified cases as asymptomatic when there was no insurance claim made over symptoms, meaning that no medical care was sought. However, it said that in some of these cases, the patient may actually have experienced symptoms.
The study looked at the presence of 38 long Covid symptoms 30 days after initial diagnosis in 1,959,982 Covid-19 patients – said to be the largest number of individuals analysed together for long Covid – who received a diagnosis between February and December last year.

Patients battle pain, fatigue and breathing troubles
Among all Covid-19 patients included in the study, Fair Health – a non-profit organisation that helps consumers understand healthcare costs and cover – said 23.2 per cent had at least one long Covid symptom.
The most common was pain, affecting 5.1 per cent of all Covid-19 patients, followed by breathing difficulties, hyperlipidaemia (elevated levels of fats in the blood), malaise and fatigue, and hypertension or high blood pressure.
While doctors' understanding of long Covid is still developing, the condition is known to affect people for as long as nine months after the initial diagnosis, previous research has found.
Fair Health cited other findings indicating that between 10 per cent and 30 per cent of Covid-19 patients experience the condition in some form, with a wide variety of symptoms reported.
These include ongoing neurological problems that may affect a person's ability to concentrate, muscle pain, kidney problems and joint pain.

The mental toll of long Covid
The new study reported that issues ranging from skin problems to tinnitus, heart problems and anaemia were linked to long Covid.
Patients' mental health is sometimes affected, and Fair Health reported that, of the long Covid mental health conditions it looked at, anxiety was the most common, followed by depression.
Several possible causes of long Covid are being suggested, including reduced effectiveness of the immune system, a reinfection of the virus and ongoing inflammation.
Post-traumatic stress and the lingering effects of inactivity or being confined to bed are other potential factors.
Of all the types of pre-existing conditions considered, intellectual disabilities were most heavily linked to an increased risk of death 30 days after diagnosis.

Young people at risk of heart problems
A notable finding of the report was the relatively high prevalence of heart inflammation as a long Covid symptom in younger people, with 25.4 per cent of those reporting this being between 19 and 29 years old.

"This was disproportionate to that age group's share of the population of Covid-19 patients overall, 20.9 per cent," the report stated. "Myocardial conditions such as cardiac inflammation are usually associated with older age."
Overall, 55 per cent of infections were classed as asymptomatic, with 39 per cent symptomatic, 5 per cent involving hospital admission and the remaining per cent involving only the loss of the sense of taste or smell.
The over-70s were the only group in which symptomatic infections outnumbered asymptomatic, and they also had the highest rates of hospital admissions, at more than 15 per cent.
Another finding of the report was that more than two thirds of long Covid symptoms looked at were found more commonly in females than in males.
The report also said that Covid-19 patients admitted to hospital and discharged were 46 times as likely to die 30 or more days after diagnosis than patients who had not been admitted to hospital.

LexaGene's MiQLab Offers Rapid Plague Detection for Bioterrorism Threats

Source: https://finance.yahoo.com/news/lexagene-miqlab-offers-rapid-plague-114500893.html

June 17 – LexaGene Holdings, Inc., (OTCQB: LXXGF; TSX-V: LXG) a molecular diagnostics company, is pleased to announce that today, Dr. Jack Regan, CEO and Founder of LexaGene, will present at the Biothreat and Pathogen Detection Conference regarding the MiQLab™ System's ability to detect the pathogen that causes plague.
Dr. Jack Regan states, "Our MiQLab System is both open-access and designed for point-of-care use, making it a **first-of-its-kind** system. These unique features are critical for early point-of-care diagnoses, which improves the probability for successful biocontainment of novel pathogens. The past 18 months have highlighted how badly humanity needs advanced technologies like the MiQLab to more successfully contain a novel pathogen capable of causing a pandemic. MiQLab is uniquely suited to fill the massive technology gap in our testing infrastructure as it has the potential to drastically reduce the response time from initial identification of a novel pathogen to the rapid deployment of new detection tests at the point of care. Minimizing this response time significantly improves the chances of successful pathogen containment so that countless lives can be saved."

A brief interview with Dr. Regan regarding LexaGene's value proposition for pandemic prevention can be viewed HERE.
The 28th International Biothreat and Pathogen Detection Conference is an internationally recognized meeting for experts in the detection and identification of biological threats. This conference addresses key topics in pathogen detection and presents the latest R&D and technological innovations in rapid pathogen identification. In addition, this meeting focuses on the latest strategies to overcome the hurdles surrounding the rapid identification of global biological threats and bringing new technologies from the lab to the field.
History is filled with numerous instances of naturally occurring outbreaks of biothreat agents that have collectively killed 100s of millions of people. Plague is arguably the deadliest pathogen of all time. Other pathogens have also caused massive loss of life, including the 1918 Influenza Pandemic, HIV, Ebola,[1] and SARS-CoV-2. Unfortunately, intentional use of biothreat agents have been documented from the Middle Ages through both World Wars and even into modern times.[2] The most recent examples include the 1984 Salmonella bioterrorism attack in Oregon[3] and the 2001 anthrax letters.[4]
Plague has caused numerous pandemics in the human history.[5] Due to its history as a killer and the potential for plague to still cause a large number of deaths and the difficulty of successful containment, it is classified by the government as Category A Bioterrorism agent.[6]
In order to demonstrate the MiQLab's capabilities for biothreat agent detection, LexaGene developed a plague test and completed an analytical evaluation with contrived samples.
Dr. Regan comments, "I'm extremely pleased with the quality of our plague test. *In silico* analysis showed close to 100% coverage of all plague genomes. Analytical studies showed our test to correlate extremely closely with quantitative culture ($R^2 > 0.94$). Our test is also

very sensitive, as we were able to reliably detect levels 1000-fold lower than levels of this bacterium commonly detected in the blood of infected patients.[7] Lastly, in an exclusivity study, our test did not cross react with any of the tested phylogenetically related microorganisms. These high-quality test results are a testament to the MiQLab's capabilities as a surveillance and detection tool when faced with a natural or intentional biothreat."

FDA Approves Drug to Treat Smallpox

Source: http://www.homelandsecuritynewswire.com/dr20210616-fda-approves-drug-to-treat-smallpox

June 16 – The U.S. Food and Drug Administration last week approved **Tembexa (brincidofovir)** to treat smallpox. Although the World Health Organization declared smallpox, a contagious and sometimes fatal infectious disease, eradicated in 1980, there have been longstanding concerns that the virus that causes smallpox, the variola virus, could be used as a bioweapon.

Before its eradication in 1980, the variola virus mainly spread by direct contact among people. Symptoms typically began 10 to 14 days after infection and included fever, exhaustion, headache, and backache. A rash consisting of small, pink bumps progressed to pus-filled sores before it crusted over and scarred. Complications of smallpox included encephalitis (inflammation of the brain), corneal ulcerations (an open sore on the clear, front surface of the eye), and blindness.

Although naturally occurring smallpox no longer exists, concerns about potential uses of variola virus as a bioweapon has made smallpox drug development an important component of the U.S. medical countermeasures response.

Because smallpox is eradicated, the effectiveness of Tembexa was studied in animals infected with viruses that are closely related to the variola virus. Effectiveness was determined by measuring animals' survival at the end of the studies. More animals treated with Tembexa survived compared to the animals treated with placebo. FDA approved Tembexa under the agency's Animal Rule, which allows findings from adequate and well-controlled animal efficacy studies to serve as the basis of an approval when it is not feasible or ethical to conduct efficacy trials in humans.

Safety information to support approval of Tembexa was derived from clinical trials of the drug for a non-smallpox indication, primarily from patients who received hematopoietic stem cell transplants. An increased risk of death was seen in another disease (Cytomegalovirus disease - a viral infection) when Tembexa was used for a longer-than-recommended duration (longer than once a week for two weeks on days 1 and 8). Tembexa is only approved for the treatment of smallpox.

The most common side effects when using Tembexa are diarrhea, nausea, vomiting, and abdominal pain.

Tembexa received priority review, fast track and orphan drug designations. Priority review directs overall attention and resources to the evaluation of applications for drugs that, if approved, would be significant improvements in the safety or effectiveness of the treatment, diagnosis or prevention of serious conditions when compared to standard applications. Fast track is designed to facilitate the development and expedite the review of drugs to treat serious conditions and fill an unmet medical need. Orphan drug designation provides incentives to assist and encourage the development of drugs for rare diseases.

Tembexa was developed in conjunction with the U.S. Department of Health and Human Services.

RECOVERY trial finds Regeneron's monoclonal antibody combination reduces deaths for hospitalised COVID-19 patients who have not mounted their own immune response

Source: https://www.recoverytrial.net/news/recovery-trial-finds-regeneron2019s-monoclonal-antibody-combination-reduces-deaths-for-hospitalised-covid-19-patients-who-have-not-mounted-their-own-immune-response-1

June 16 – The Randomised Evaluation of COVID-19 Therapy (RECOVERY) trial has demonstrated that the investigational antibody combination developed by Regeneron reduces the risk of death when given to patients hospitalised with severe COVID-19 who have not mounted a natural antibody response of their own.

RECOVERY
Randomised Evaluation of COVID-19 Therapy

The treatment uses a combination of two monoclonal antibodies (casirivimab and imdevimab, known as REGEN-COV in the US) that bind specifically to two different sites on the coronavirus spike protein, neutralising the ability of the virus to infect cells.

Previous studies in non-hospitalised COVID-19 patients have shown that the treatment reduces viral load, shortens the time to resolution of symptoms, and significantly reduces the risk of hospitalisation or death. In a small trial in hospitalised patients, preliminary evidence suggested a clinical benefit in patients who had not mounted a natural antibody response of their own when they entered the trial (were seronegative). RECOVERY is the first trial large enough to determine definitively whether this treatment reduces mortality in patients hospitalised with severe COVID-19.

Between 18 September 2020 and 22 May 2021, 9785 patients hospitalised with COVID-19 were randomly allocated to receive usual care plus the antibody combination treatment (casirivimab 4g with imdevimab 4g by intravenous infusion) or usual care alone as part of the RECOVERY trial. Of these, about one-third were seronegative at baseline (ie they had not mounted a natural antibody response of their own), one-half were seropositive (ie they had already developed natural antibodies), and one-sixth had unknown serostatus. Among patients who received usual care alone, 28-day mortality was twice as high in those who were seronegative (30%) vs. those who were seropositive (15%) at study entry. Follow-up is complete for 99% of participants and preliminary results are announced today.

Among patients who were seronegative at baseline (the primary analysis population for this comparison), the antibody combination significantly reduced the primary outcome of 28-day mortality by one-fifth compared with usual care alone (24% of patients in the antibody combination group died vs 30% of patients in the usual care group; rate ratio 0·80; 95% confidence interval 0·70–0·91; p=0·001). Thus, for every 100 such patients treated with the antibody combination, there would be six fewer deaths.

There was clear evidence that the effect of treatment in seronegative patients differed from that in seropositive patients (test for heterogeneity p=0·001). When combining the larger seropositive group (as well as those with unknown status) with the seronegative patients, there was no longer a significant effect on 28-day mortality (overall 20% of patients in the antibody combination group died vs 21% of patients in the usual care group; rate ratio 0·96; 95% confidence interval 0·86–1·03; p=0·17).

For the seronegative patients, the duration of hospital stay was four days shorter (median 13 days vs. 17 days) among those allocated to the antibody combination than the usual care group, and the proportion of patients discharged alive by day 28 was greater (64% vs. 58%; rate ratio 1·19, 95% confidence interval 1·08 to 1·30). Among the seronegative patients not on invasive mechanical ventilation at baseline, the risk of progressing to the composite endpoint of invasive mechanical ventilation or death was lower among those allocated to the antibody combination than the usual care group (30% vs. 37%; risk ratio 0·83, 95% confidence interval 0·75 to 0·92). No such benefits were seen in the overall study population (combining patients with negative, positive, or unknown serostatus).

Sir Peter Horby, Professor of Emerging Infectious Diseases in the Nuffield Department of Medicine, University of Oxford, and Joint Chief Investigator for the RECOVERY trial, said: 'These results are very exciting. The hope was that by giving a combination of antibodies targeting the SARS-CoV-2 virus we would be able to reduce the worst manifestations of COVID-19. There was, however, great uncertainty about the value of antiviral therapies in late-stage COVID-19 disease. It is wonderful to learn that even in advanced COVID-19 disease, targeting the virus can reduce mortality in patients who have failed to mount an antibody response of their own.'

Sir Martin Landray, Professor of Medicine and Epidemiology at the Nuffield Department of Population Health, University of Oxford, and Joint Chief Investigator, said 'We now know that this antibody combination is not only bad for the virus but it is also good for the sickest patients who have failed to mount a natural immune response of their own. That is excellent news – it is the first time that any antiviral treatment has been shown to save lives in hospitalised COVID-19 patients. We are incredibly grateful to the many NHS staff and patients who have contributed to today's discovery.'

RECOVERY participant, Kimberley Featherstone (37), was treated at Huddersfield Royal Infirmary and Calderdale Royal Hospital and randomly allocated to the monoclonal antiviral antibody combination. She said 'I was certainly glad to take part in the RECOVERY trial. I feel very lucky that the trial was up and running by the time I was taken to hospital with COVID-19, and I was able to receive this ground-breaking treatment. I'm happy that by participating, I played a part in finding out this treatment is successful.'

The preliminary results of this evaluation of the monoclonal antibody combination will be available as a pre-print on medRxiv later on 16 June 2021 and will be submitted to a leading peer-reviewed medical journal.

Professor Fiona Watt, Executive Chair, Medical Research Council, which helped fund the study, said 'The flagship RECOVERY trial once again leads the way in showing the importance of well-designed clinical trials to identify life-saving treatments. This very important finding means, for patients hospitalised with COVID-19 who do not make their own antibodies to the virus, being treated with antibody-based drugs to the spike protein can reduce their risk of death and time spent in hospital. Patients who have made their own antibodies to the virus do not benefit from the new treatment, which is also important information given the cost of drugs.'

Professor Nick Lemoine, Medical Director at the NIHR Clinical Research Network said 'It is fantastic news that the RECOVERY trial has provided evidence to establish another lifesaving treatment against COVID-19 through this monoclonal antiviral antibody

combination. The incredible impact the trial continues to have is testament to the scientists and healthcare professionals – but equally the tens of thousands of patients who have taken part. We sincerely want to thank every single one of them for their contribution.'

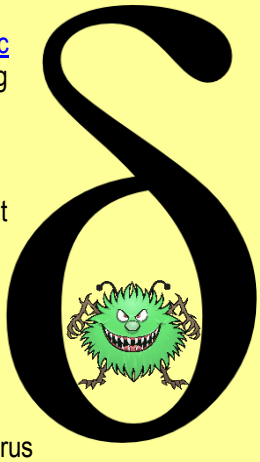
Russian Military Developing 'Chewing Gum' Coronavirus Vaccine

Source: https://www.themoscowtimes.com/2021/06/18/russian-military-developing-chewing-gum-coronavirus-vaccine-rbc-a74248

June 18 – A Russian military research unit that was involved in the development of Sputnik V is working on a new coronavirus vaccine in the form of chewing gum, the RBC news website reported Friday.
The Defense Ministry's 48th Central Research Institute collaborated with the state-run Gamaleya Research Institute in Moscow to develop and trial Sputnik V last year. Russia, facing accusations of rushing human trials, touted the adenoviral vector vaccine as the world's first to be approved for widespread use.
Citing an unnamed Defense Ministry source and confirmation from the 48th Central Research Institute's director, RBC said "work is underway" toward developing a **mucosal Covid-19 vaccine** in the form of **chewable tablets and pastilles**.
"After testing, the drug will be included in various treatment and prevention regimens for coronavirus," the source was quoted as saying.
Col. Sergei Borisevich, who heads the 48th Central Research Institute, confirmed work on the new vaccine but did not specify what stage it was at.
Russia has registered a total of four coronavirus vaccines and has reached agreements with close to 70 countries on selling Sputnik V or sharing the technology to manufacture it. Moscow's active efforts to market the two-shot vaccine around the world has been viewed by critics as an attempt to wield it as a soft-power tool.
The United States last summer blacklisted the 48th Central Research Institute and its facilities with two other Russian military and civilian institutions over their alleged involvement in research of chemical and biological weapons.
The licensing restrictions on U.S. companies from doing business with the blacklisted entities are considered less strict than sanctions.

Everything We Know So Far About The COVID-19 Delta Variant

By Jason Kindrachuk and Souradet Shaw
Source: https://www.sciencealert.com/everything-we-know-so-far-about-the-covid-19-delta-variant



June 19 – The emergence of variants of concern in late 2020 hearkened a shift in the COVID-19 pandemic as "variants" entered the public lexicon. The acceleration of the Delta variant around the world is raising questions about its origin, transmissibility, hotspots, and potential for vaccine resistance.

What is a variant?
Through genome sequencing, we can determine specific orders of individual genes and the nucleotides that make up strands of DNA and RNA.
If we think of the virus as a book, it's as though all of the pages have been cut up into pieces. Sequencing allows us to determine all of the words and sentences in their proper order. Variants differ from one another based on mutations.
So, two copies of the book would be "variants" if one or more of the cut-up pieces were different.
We should also appreciate that variants have been emerging throughout the pandemic with no effect on viral behaviors. However, the emergence of variants of concern, where mutations have resulted in altered virus characteristics (increased transmission and disease severity, reduced vaccine effectiveness, detection failure) have had deleterious health consequences.
Emergence and transmission of B.1.1.7 (Alpha), B.1.351 (Beta), and P.1 (Gamma) in Canada resulted in third waves of transmission leading to overwhelmed healthcare systems and implementation of further restrictions. The World Health Organization introduced a new naming system, based on the Greek alphabet, for coronavirus variants in the spring 2021.

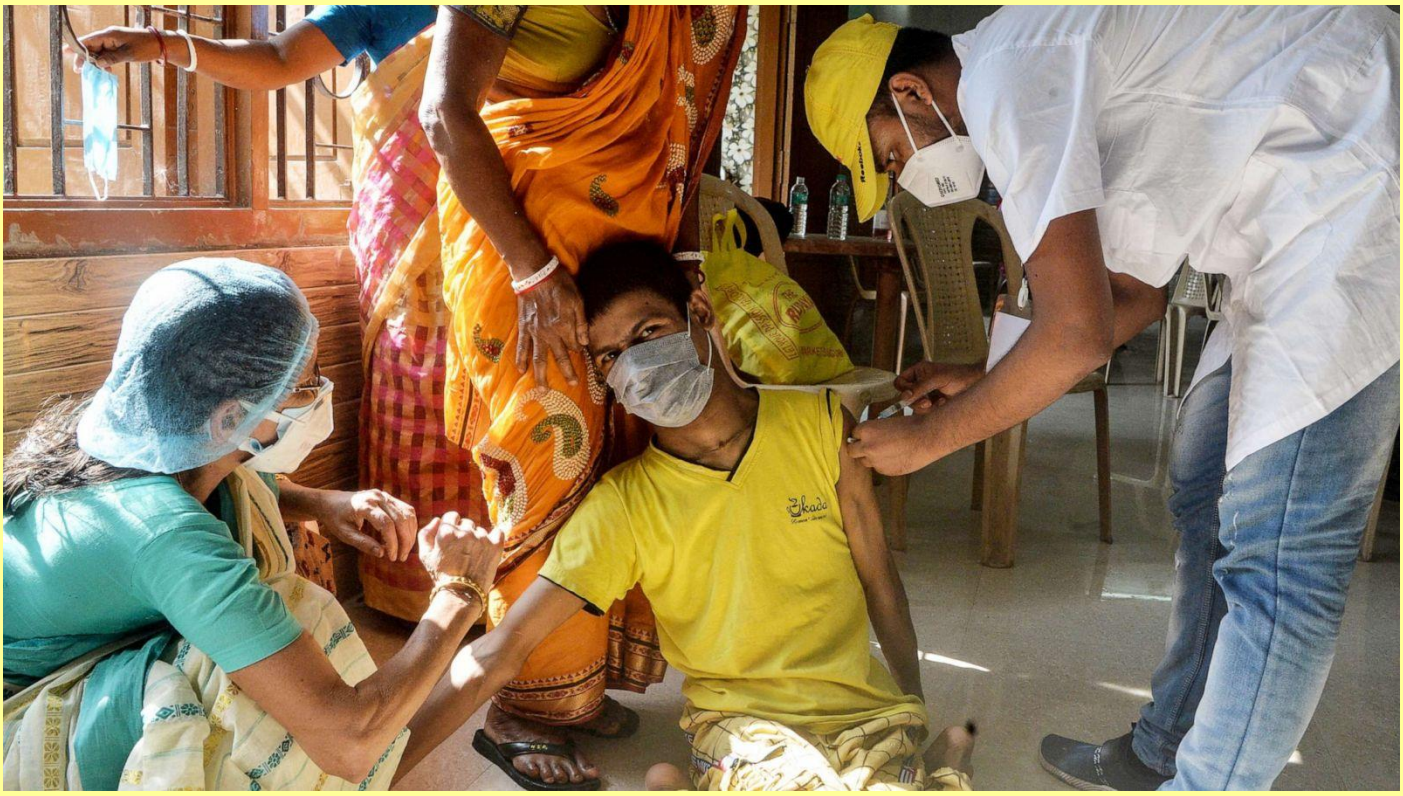
What is the Delta variant, where did it emerge?

The Delta variant is a variant of concern also known as B.1.167.2 and is one of three known sub-lineages of B.1.167. According to the United States Centers for Disease Control and Prevention, the Delta variant was first detected in India in December 2020.

What makes this variant different from other variants of concern?

One of the defining features of the Delta variant has been enhanced transmissibility with increases estimated at 40-60 percent above the Alpha variant.

Recent data from Scotland suggested that the risk of hospitalization doubled following infection with Delta (compared to Alpha), especially in those with five or more other health conditions. Increased risk of hospitalization was observed from data in England.



Epidemiological analysis, which looks at things like the distribution of infection and the severity of illness, can often provide rapid assessments of changes to virus characteristics.

Studying specific mutations using structure-activity relationship analysis, which looks at how the chemical structure of the virus affects its biological activity, can also provide clues, although validation is often time-consuming.

Early structure-activity relationship analyses have focused on the relation of three mutations to Delta's behavior.

Notably, a preprint study that has yet to be peer-reviewed suggested that three mutations in the SARS-CoV-2 spike protein may make the variant more transmissible by making it easier for the spike protein to bind to the receptor in human cells (known as the ACE2 receptor).

If we return to the book analogy, that means that three of the cut-up pieces in the Delta version of the book are different from the original. Each of these three pieces may make it easier for the virus to infect human cells.

What do we know about the epidemiology of the Delta variant and its hotspots?

Evidence suggests that Delta played a large role in the surge of COVID-19 cases observed in India in 2021. Since then, this variant has spread globally. As of June 14, the Delta variant has been detected in 74 countries, accounted for over 90 percent of new cases in the United Kingdom, and at least 6 percent of total cases in the US, with estimates as high as 10 percent.

Much of what we know about the Delta variant is derived from Public Health England. The Delta variant was first detected in the UK near the end of March 2021, and linked to travel.

As of June 9, the number of confirmed or probable cases was 42,323, with wide and heterogenous distribution across the UK
In Canada, Delta was first detected in early April in British Columbia (BC). Although Alpha is the most dominant variant lineage detected in Canada, Delta's growth has accelerated across many provinces.
Alberta data suggests that the number of cases is doubling every six to 12 days. Ontario has estimated that 40 percent of its new cases as of June 14, 2021, are due to Delta. Modeling results from BC suggest Delta will significantly contribute to overall trajectory by this August.
It is important to note that Delta's reported prevalence is an underestimate because a timely screening test has not yet been developed.

What do we know about Delta and vaccines?
Early analysis from the UK about vaccine effectiveness against the Delta variant has provided some optimism.
Data from Scotland indicated that vaccination with either AstraZeneca or Pfizer reduced hospitalizations and infections, though less than for the Alpha variant.
However, evidence suggests that two-dose immunizations with AstraZeneca or Pfizer reduced hospitalizations by 92 percent and 96 percent, respectively. Protection from symptomatic disease was reduced by 17 percent for Delta compared to Alpha with only a single dose of vaccine. Modest reductions in effectiveness against symptomatic disease were noted following two vaccine doses.
The spread of the Delta variant has made getting people vaccinated with two doses a major public health policy goal, and these results support that. However, first doses appear to provide substantial protection from severe illness requiring hospitalization.

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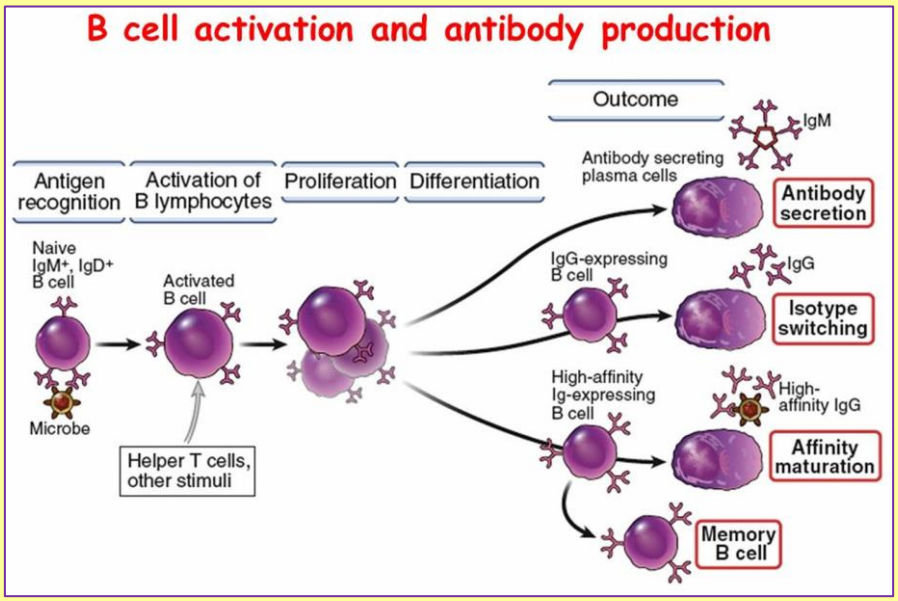
Antibody vs Antigen Testing for COVID-19

By Anna MacDonald (Science Writer)
Source: https://www.technologynetworks.com/diagnostics/articles/antibody-vs-antigen-testing-for-covid-19-336486

J une 26 – Testing has become a vital part of the response to the COVID-19 pandemic. In addition to the gold standard PCR tests used to detect currently infected individuals, a number of alternative antigen and antibody tests are also in development. In this article, we take a look at the differences between these tests and what they can tell us.



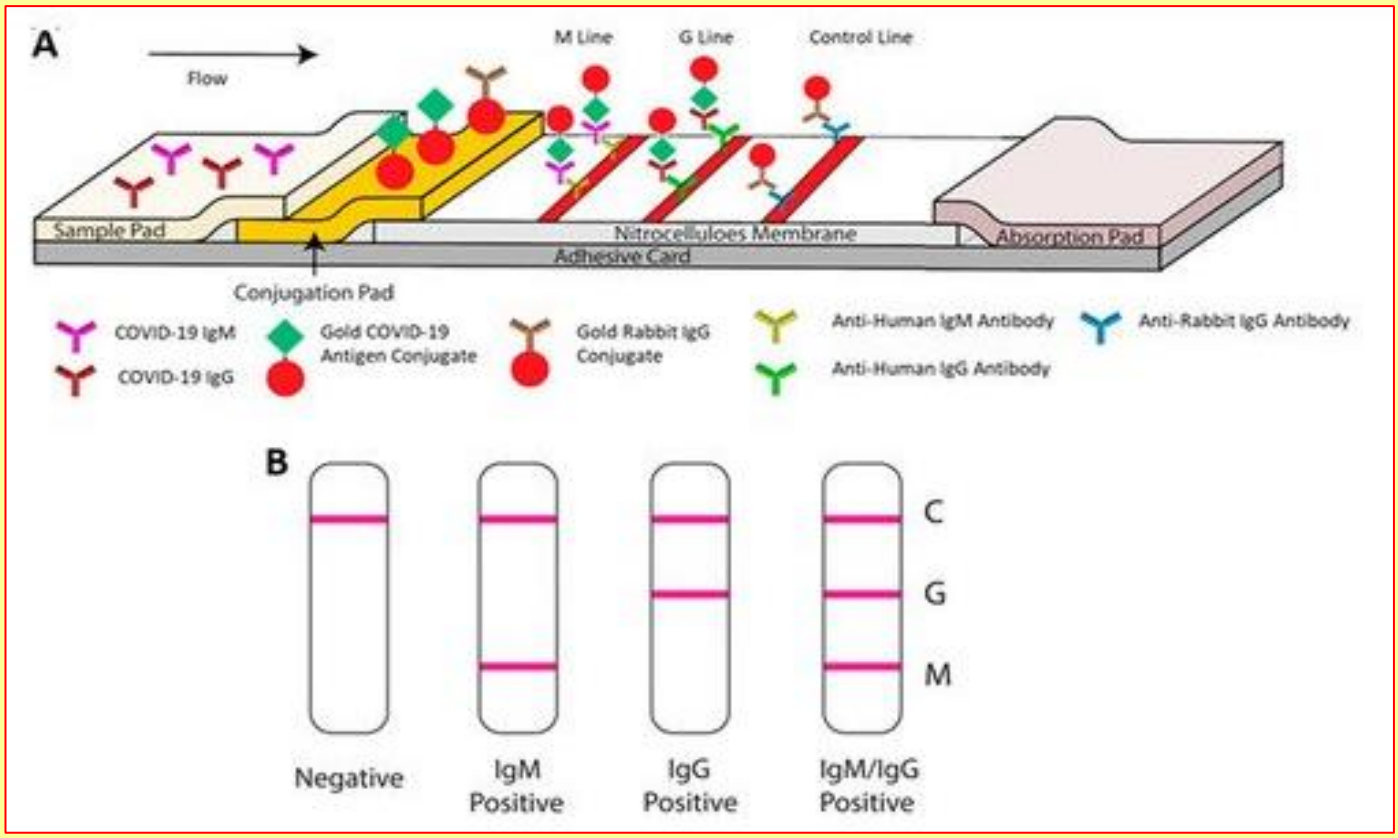
What are antibodies and antigens?

An antigen is a molecule capable of stimulating an immune response. They may be proteins, polysaccharides, lipids or nucleic acids. Each antigen has distinct surface features that are recognized by the immune system.
SARS-CoV-2, the virus that causes COVID-19, has several known antigens, including its nucleocapsid phosphoprotein and spike glycoprotein, which are the visible protrusions on its surface.
An antibody is a Y-shaped protein produced by B cells of the immune system in response to exposure to antigens. The tip of each Y-shaped arm contains antigen binding sites (paratopes) that bind to a specific portion of the antigen's surface (epitope). This binding helps to eliminate antigens from the body, either by direct neutralization or by "tagging" them for elimination by other arms of the immune system.

When infected with SARS-CoV-2, the body produces antibodies that bind specifically to the spike proteins and other antigens to help eliminate the virus. This binding can be harnessed to develop antibody and antigen-based diagnostic tests.

What is an antibody test?

An antibody test reveals if a person has *already been* exposed to an infection, by detecting antibodies in their blood or serum. This can be done by a laboratory-based test such as an ELISA (enzyme-linked immunosorbent assay) or CIA (chemiluminescent immunoassay), or a point-of-care test based on lateral flow technology.



Antibody tests are not usually used to diagnose current infection as it takes the body some time to produce antibodies. During the period before the adaptive immune system kicks in, the fast-acting and non-specific innate immune response combats infection. Data suggests that in the case of SARS-CoV-2, the IgM antibody response peaks around two weeks after infection, followed by the IgG antibody peak at three weeks.

Accelerate your efforts to combat infectious disease

Addressing the threat of new and potentially life-threatening pathogens requires deep understanding and accurate, reproducible techniques for developing better tests, vaccines, and treatments. Agilent provides the complete breadth of systems, consumables, software, services, and knowledge you need to support your success.

What can antibody tests tell us?

Antibody tests can help us to track the spread of disease, giving a more accurate representation of the COVID-19 pandemic. They can help to estimate how many people have already been infected with SARS-CoV-2, which can be important in assessing herd immunity.

A test which can distinguish between IgM and IgG could give information about the phase of infection, indicating how long ago the person was infected with SARS-CoV-2.

They could also help to identify those who should be prioritized for vaccinations when they become available, as well as potential donors for convalescent plasma therapy.

Limitations of antibody tests

As with many other test methods, antibody test results are unfortunately not always correct.
A negative test result may occur if the test is taken too soon after infection before antibodies have been produced by the body. False positive test results could also occur due to cross-reactivity with antibodies present as a result of previous infection with other coronaviruses.
Interpretation of results and what they mean also warrants caution. In the case of COVID-19, it is not yet known if a person's own antibodies will protect them against re-infection from SARS-CoV-2, and if so, how long this protection will last. This means "immunity passports", which have been suggested as a means of identifying immune individuals who are safe to return to work, are not currently recommended by the WHO.
Data from a recent study showed that antibody levels begin to wane after two months. This could mean that the window for which antibody testing can identify people who have been infected is relatively short, and therefore antibody test results will need to be interpreted with caution.

Are there any SARS-CoV-2 antibody tests currently available?

A number of antibody tests are currently available, including those developed by Roche, Beckman-Coulter, EUROIMMUN and Abbott.
A full list of tests granted FDA Emergency Use Authorization (EUA) can be found here.

What are antigen tests and what can they tell us?

An antigen test reveals if a person is *currently* infected with a pathogen such as the SARS-CoV-2 virus. Once the infection has gone, the antigen disappears.
Unlike nucleic acid based tests such as PCR, which detect the presence of genetic material, antigen tests detect proteins or glycans, such as the spike proteins found on the surface of the SARS-CoV-2 virus.
They can take longer to develop than molecular and antibody tests, as suitable antibodies for use in the assays must first be identified and produced, which can be a complex and time-consuming process. Accuracy can also be a problem, with antigen tests typically having a much lower sensitivity than PCR.
However, they usually provide test results rapidly, are relatively cheap, and can be more amenable to point-of-care use, which could make them more suitable for testing in the community and in remote regions.

Are there any SARS-CoV-2 antigen tests currently available?

Quidel has received EUA for its antigen test. There are a number of other antigen tests in development, including those developed by, OraSure, Iceni Diagnostics, and E25Bio.

300K Americans may live with a chronic, deadly disease transmitted by the 'kissing bug.' What is Chagas and why are doctors missing it?

Source: https://news.yahoo.com/300k-americans-may-live-chronic-100101667.html

June 20 – Every summer, health officials warn Americans to be on the lookout for disease-carrying pests such as mosquitoes and ticks. But few people are aware of the kissing bug.
Triatomine bugs, commonly known as kissing bugs, are vectors for a dangerous parasite that can cause a debilitating illness in humans called Chagas disease. If left untreated, the infectious disease can become lifelong and painful, and in some cases lead to death.
The key is early treatment, but many Americans living with the disease are unaware they have it, and a recent study suggests doctors are underdiagnosing it.
"It's such a neglected disease," said Melissa Nolan, assistant professor at the University of South Carolina and lead author of the study published this week in Emerging Infectious Diseases, a peer-reviewed journal by the Centers for Disease Control and Prevention.
But health experts say the disease is not only difficult to diagnose – sometimes requiring multiple tests – it may require CDC intervention to treat.

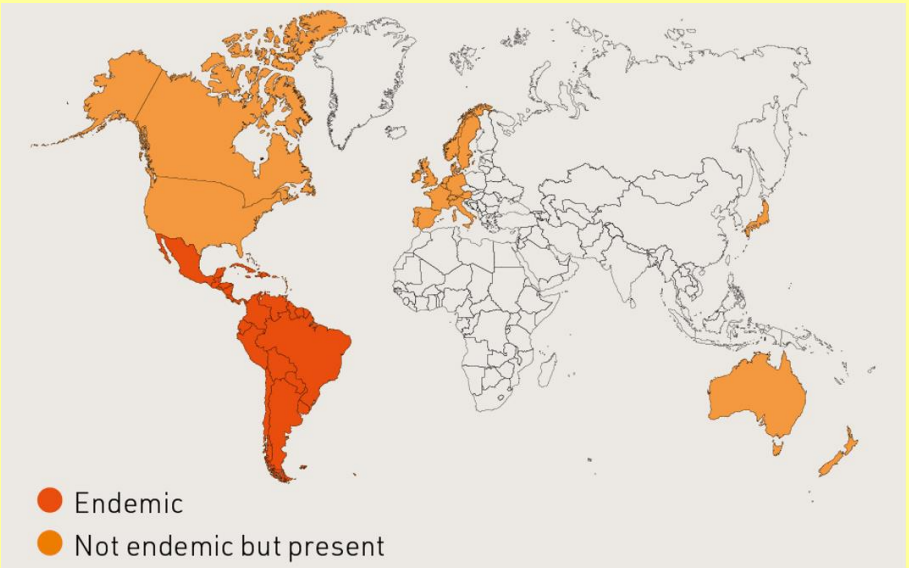
"Chagas is not something that most doctors think about in the U.S.," said Dr. Wesley Long, medical director of microbiology at Houston Methodist Hospital. Doctors are taught, "when you hear hoofbeats, think of horses, not zebras. Chagas is a zebra."

What is Chagas disease and how can you get it from a kissing bug?

Chagas disease is caused by a parasite called Trypanosoma cruzi. The kissing bug can pick up this parasite when feeding on the blood of an infected animal.

Kissing bugs are commonly found in South and Central America, and Mexico, but doctors are starting to count cases in states like Texas, Arizona, Arkansas, Louisiana, Mississippi, Tennessee, Utah and California, according to a Texas A&M University program studying Chagas disease.

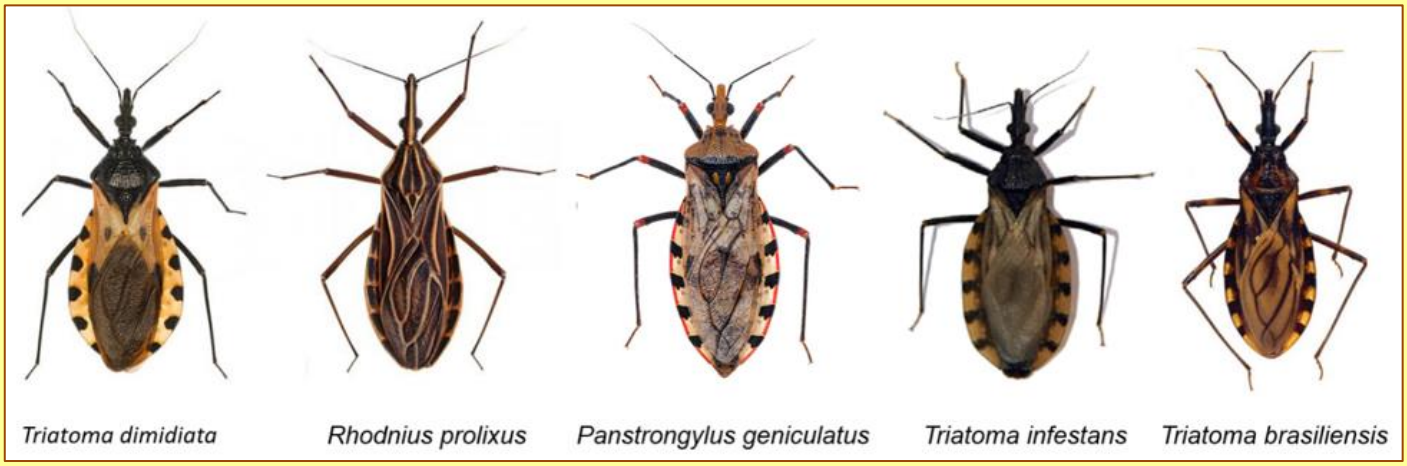
The rate of kissing bugs infected by the parasite is abnormally high compared with other insects that carry disease, said Gabriel Hamer, associate professor in the department of entomology at Texas A&M. Up to 60% of kissing bugs carry the parasite that causes Chagas, compared with only 0.1% of mosquitos that carry dengue, an infectious disease occurring in tropical areas.



Although more than half of kissing bugs carry the disease-causing parasite, Hamer said it's still difficult for a person to be infected. Unlike mosquitoes or ticks, the parasite isn't transmitted through saliva or blood during feeding. Instead, it's transmitted through the bug's feces.

The kissing bug usually feeds around a person's face when the person is sleeping, which is how the insect got its name. After feeding, the bug defecates near the wound. People normally become infected when they rub that fecal matter into the wound or near the eye.

"It's a very inefficient form of transmission for humans," Hamer said. "There's been studies that suggest that if you have a positive kissing bug feeding on a human, it could take up to 2,000 feeding events for that human to become positive."



If kissing bugs establish a colony in the house, they feed on a person multiple times, increasing the chance of transmitting the parasite, he said. Kissing bugs are most active when they venture out in search of a meal or a mate, which can start start as early as April and end as late as October, depending the region.

There are two phases of Chagas disease: acute and chronic. During the acute phase, a person may have no symptoms or mild ones, such as fever, fatigue, body aches, headache, rash, loss of appetite, diarrhea and vomiting, according to the CDC.

A swollen eyelid, known as Romaña's sign, may also be a sign of acute Chagas. This typically occurs when the parasite infects the eyelid after rubbing bug feces into the eye.

Chronic Chagas can last for life. In those cases, the parasite invades the heart tissues, causing an enlarged heart, heart failure, an altered heart rate or cardiac arrest. It also can cause gastrointestinal complications including an enlarged esophagus or colon and lead to difficulties with GI functions.
The CDC estimates more than 300,000 people in the U.S. live with Chagas disease. One in 3 people develop the chronic stage of the disease, which can lead to heart attack, stroke or sudden death.

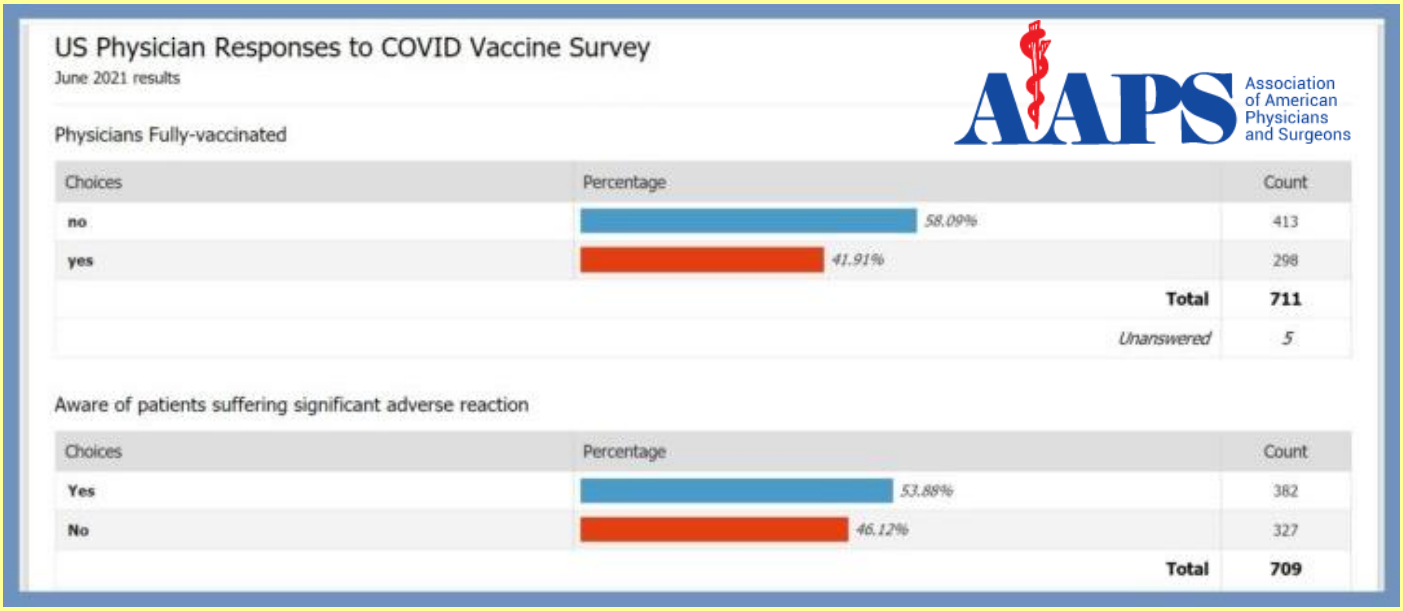
Doctors may be underdiagnosing Chagas disease
Patients can recover with early detection and treatment, but if left untreated, the infection can become a lifelong, painful and deadly disease. The problem is, most people infected in the U.S. don't know they have Chagas disease, and this week's study suggests doctors may be partly to blame for missing diagnoses.
From August 2015 to July 2017, researchers looked at 97 patients with a heart condition called nonischemic cardiomyopathy in a Houston hospital. All came from a country or lived in an area where kissing bugs are found, putting them at risk for Chagas disease, yet doctors never tested them.
Overall, 7% of those patients seeking treatment for heart failure management tested positive for the Chagas disease parasite by the CDC, according to the report.
"Clinicians should be better informed about Chagas as a potential underlying factor – even in the absence of non-ischemic cardiomyopathy, which occurs years even decades after infection," said Kacy Ernst, professor and program director of epidemiology at the University of Arizona's College of Public Health, who is unaffiliated with the study.
More than 85% of patients came from Latin America, where the CDC estimates as many as 8 million people may have Chagas disease. Nolan, the study author, said doctors should have "automatically been thinking of Chagas disease in these patients" when they arrived to the hospital.
"Physicians aren't even thinking about (Chagas) with someone who's from the classic endemic environment," she said, "so how are they going to think about people who are born and raised in the United States?"
Ernst said it's important for patients to be aware of the risk factors associated with Chagas disease and advocate for their own screening.
"The fact that only two of the positive cases (in the study) had heard of Chagas and only one understood the transmission indicates that patients themselves may not have enough knowledge about the risk to advocate screening," she said. "Empowering both individuals and clinicians with knowledge is important."

Why it may be difficult to diagnose and treat Chagas disease
While it's important to consider and screen for Chagas disease, health experts say diagnosing and treating a patient is easier said than done.
During the acute phase, which lasts eight to 10 weeks after infection, a diagnosis of Chagas disease can be made by looking for parasites in a blood smear under a microscope. The CDC accepts and tests samples to help confirm results.
However, many patients who go to the hospital are past the acute stage and may already have entered the chronic stage. At this point, doctors test for antibodies. Long, of Houston Methodist, says such testing can be unreliable, producing false positives or false negatives.
"A drawback of serological tests is that you're looking for antibodies that react against the parasite, but you may have antibodies that aren't due to the infection but still react with the test – giving you a false positive," he said.
Every test has a false positive rate, he said. If doctors tested every patient with symptoms of acute Chagas, they would spend more work verifying those false positives than finding an actual diagnosis.
Long says doctors may have to order multiple tests to the confirm a diagnosis, and in some instances, send results to the CDC for confirmation.
Benznidazole was approved by the Food and Drug Administration in 2017 as the first drug to treat Chagas disease. It was approved for use in children 2 to 12 years of age, but Long says doctors may use it off-label for adult patients.
In 2020, nifurtimox, under the brand name Lampit, was the second drug approved by the FDA for treatment of Chagas disease in patients under 18 years old.
Since the two drugs were approved after the recent study was conducted, Long said it may have been harder for doctors to prescribe them without CDC intervention.
Doctors should inquire about a patient's history before screening and testing for Chagas disease, health experts say. Has the person lived in South or Central America, or Mexico?

Did they live in housing conditions where a kissing bug is most likely to appear? Have any of their family members had Chagas disease?
"It's important for doctors to think about Chagas disease in the right patients," Long said. "It is something that doctors in America need to be thinking about" before cardiac symptoms appear and become severe.
"You could be doing the patient a huge service."

Majority of Physicians Decline COVID Shots, according to Survey

Source: https://aapsonline.org/majority-of-physicians-decline-covid-shots-according-to-survey/



US Physician Responses to COVID Vaccine Survey
June 2021 results

AAPS Association of American Physicians and Surgeons

Physicians Fully-vaccinated

Choices	Percentage	Count
no	58.09%	413
yes	41.91%	298
	Total	711
	Unanswered	5

Aware of patients suffering significant adverse reaction

Choices	Percentage	Count
Yes	53.88%	382
No	46.12%	327
	Total	709

June 16 – Of the 700 physicians responding to an internet survey by the Association of American Physicians and Surgeons (AAPS), nearly 60 percent said they were not "fully vaccinated" against COVID.
This contrasts with the claim by the American Medical Association that 96 percent of practicing physicians are fully vaccinated. This was based on 300 respondents.
Neither survey represents a random sample of all American physicians, but the AAPS survey shows that physician support for the mass injection campaign is far from unanimous.
"It is wrong to call a person who declines a shot an 'anti-vaxxer,'" states AAPS executive director Jane Orient, M.D. "Virtually no physicians are 'anti-antibiotics' or 'anti-surgery,' whereas all are opposed to treatments that they think are unnecessary, more likely to harm than to benefit an individual patient, or inadequately tested."
The AAPS survey also showed that 54 percent of physician respondents were aware of patients suffering a "significant adverse reaction." Of the unvaccinated physicians, 80 percent said "I believe risk of shots exceeds risk of disease," and 30% said "I already had COVID."
Other reasons for declining the shot included unknown long-term effects, use of aborted fetal tissue, "it's experimental," availability of effective early treatment, and reports of deaths and blood clots.
Of 560 practicing physicians, 56 percent said they offered early treatment for COVID.
Nonphysicians were also invited to participate in the survey. Of some 5,300 total participants, 2,548 volunteered comments about associated adverse effects of which they were aware. These included death, amputation, paralysis, stillbirth, menstrual irregularities, blindness, seizures, and heart issues.
"Causality is not proven. However, many of these episodes might have resulted in a huge product liability or malpractice award if they had occurred after a new drug," stated Dr. Orient. "Purveyors of these COVID products are protected against lawsuits."

The Association of American Physicians and Surgeons has represented physicians in all specialties since 1943. **Its motto is *omnia pro aegroto*, everything for the patient.**

Does flying increase the risk of blood clots in people who have been vaccinated?

Source: https://covidvaccinehub.org/articles/does-flying-increase-the-risk-of-blood-clots-in-people-who-have-been-vaccinated

June 11 – There is no evidence that air travel can increase the risk of blood clots in people who have received COVID-19 vaccines.

Though people can develop blood clots while flying, most likely deep vein thrombosis (DVT), these are unrelated to the vaccine. These clots most often occur in the leg during flights due to a lack of movement, staying seated for long periods, damage and slow blood flow between the veins, and air pressure, among other things. These clots in the leg may break off and travel to the lung, potentially resulting in what is called a pulmonary embolism.

Flying is a known risk factor in increasing the likelihood of blood clots. So is traveling by car, bus, or train. Most people who develop DVT as a result of flying have other factors that increase their risks such as a history of blood clots, recent surgeries, injuries, blood clots, hormone replacements, pregnancy, older age, obesity, and others.

Currently, no data has linked an increase in blood clots while flying with any COVID-19 vaccines. The clots that have occurred in a tiny part of the vaccinated population occur in unique and unusual areas; much different than DVT.

COVID-19 vaccines created by AstraZeneca and Johnson & Johnson have been associated with clots in veins, including in the brain, according to a recent study in the British Medical Journal. These types of clots are called cerebral venous sinus thrombosis (CSVT) and they are very rare.

In an analysis of people who had experienced clotting (also called 'thrombosis') after receiving vaccines, German scientists found that nine people who received the AstraZeneca vaccine experienced CSVT. Three others had blood clots in the abdominal veins, and three had pulmonary embolisms, which are blood clots in the lungs. One had bleeding in the brain, and four had other types of blood clots. Five patients experienced blood clots in different parts of the body that block small blood vessels.

Other studies have shown that a very small number of people who had received AstraZeneca's vaccine had experienced clots in the arteries that carry blood from the heart into other organs in the body.

The United States Centers for Disease Control and Prevention notes that the type of blood clots that occurred in people who received the Johnson & Johnson vaccines were also CSVT. The agency believes the benefits of the vaccine still outweigh the risks. These clots have been found almost entirely in young women under 50 years old. The risk of clotting after receiving this vaccine is roughly 9 in 10 million and much higher in the general population, as more than 1 in 1000 people experience clotting more generally.

Context and background

Social media posts have falsely linked the rare side effect of blood clots from specific COVID-19 vaccines to the heightened risk of blood clots while flying. One popular story that has been circulating claimed that airline executives recently met to discuss the risks of carrying vaccinated passengers because they may be more susceptible to blood clots while on board.

Several media outlets as well as numerous airline companies have vehemently denied this meeting occurred. The International Air Transport Association also released a statement debunking this claim. Further, there is no evidence tying extremely rare blood clotting linked to COVID-19 vaccines with blood clots occurring due to long-distance related travel.

Resources

1. Thrombotic Thrombocytopenia after ChAdOx1 nCov-19 Vaccination (The New England Journal of Medicine)
2. Thrombosis and Thrombocytopenia after ChAdOx1 nCoV-19 Vaccination (The New England Journal of Medicine)
3. Arterial events, venous thromboembolism, thrombocytopenia, and bleeding after vaccination with Oxford-AstraZeneca ChAdOx1-S in Denmark and Norway: population based cohort study (The BMJ)
4. The Johnson & Johnson Vaccine and Blood Clots: What You Need to Know (Yale Medicine)
5. EU drug regulator finds link between AstraZeneca vaccine and blood clots (Reuters)
6. CDC Recommends Use of Johnson & Johnson's Janssen COVID-19 Vaccine Resume (The United States Centers for Disease Control and Prevention)
7. Covid vaccines and rare clots - what you need to know (BBC News)
8. "Vaccine-Induced Covid-19 Mimicry" Syndrome: Splice reactions within the SARS-CoV-2 Spike open reading frame result in Spike protein variants that may cause thromboembolic events in patients immunized with vector-based vaccines (Research Square)
9. Flying + Vaccine Blood Clots claim (Instagram)

10. Blood Clots and Travel: What You Need to Know (The United States Centers for Disease Control and Prevention)
11. Air travel and the risk of thromboembolism (Internal and Emergency Medicine)
12. Flying, pregnancy, or taking the pill all carry much higher blood clot risks than the J&J vaccine (Quartz)
13. Studies suggest link between blood clots, AstraZeneca COVID vaccine (Center for Infectious Disease Research and Policy)
14. No record airlines met to discuss liabilities related to vaccine (The Associated Press)

Chinese spy Dong Jingwei 'defects to the West while offering Covid secrets'

Source: https://www.news.com.au/world/coronavirus/chinese-spy-dong-jingwei-defects-to-the-west-while-offering-covid-secrets/news-story/d61277b586d043c6942bcce7b8b70d44

June 21 – A top Chinese spy has reportedly defected to the US and offered up intelligence about how the Covid pandemic began.
Vice Minister of State Security Dong Jingwei is believed to have secretly flown from Hong Kong to the US on February 10, according to reports that have surfaced on Chinese media sites and Twitter.
He travelled alongside his daughter Dong Yang, outlet Spy Talk reported.
Rumours are swirling that Mr Dong has passed on important information about the Wuhan Institute of Virology, at the centre of the covid lab leak theory which had been dismissed as a "conspiracy" by many for the last year-and-a-half but is now being reignited.
If the rumours are true, Mr Dong would be the highest-level defector ever from the People's Republic of China.

His evidence may have even sparked US President Joe Biden's U-turn on the country's covid probe. Mr Biden announced in late May a new review into the origins of covid, after having shut down a previous probe.
He has now called on the US intelligence community to "redouble" its investigation to find out whether covid jumped from an animal host to humans, or if it was accidentally released from the Wuhan research lab.

A photo allegedly shows possible Chinese defector Dong Jingwei. Picture: Twitter/@lianchaohan *Source:Twitter*

Mr Dong served as a prestigious counterintelligence head of China's Ministry of State Security, otherwise known as the Guoanbu. His intelligence is reported to include early pathogenic studies of the virus, models of predicted covid spread and damage to the world, and financial records detailing which organisations and governments funded the research.
He may also have information about the names of Chinese spies working in the US, and how the Chinese government gained access to a CIA communications system.
Former Chinese foreign ministry official Dr Han Lianchao, who defected after the Tiananmen Square massacre in 1989, wrote in a tweet this week that if true, Mr Dong's defection "is really a big bomb".
He also reportedly shared a photo of Mr Dong, claiming he was last seen in public in September 2020. The photo has since been removed from Chinese search engine Baidu.
With tensions growing between the US and China, some false rumours have recently surfaced about defectors, including a bogus claim covid scientist Shi Zhengli had swapped sides.
Also adding to the intrigue are reports from China that Mr Dong hosted a national security meeting on June 18 aimed at catching "spies and traitors". However, a convincing photo of him at the meeting has not yet surfaced, sparking disbelief that he ever attended the event.
The local reports have actually fired up the rumour mill even more, with a photo from the alleged security meeting showing a man who many believe is not actually My Jingwei.
"That is not a picture of Dong Jingwei," one Twitter user wrote.
"If #DongJingwei has not defected, why won't Beijing show him off in public?" another commented.

"Since nobody, not even the MSS head of counterintelligence, can be in two places (much less two continents) at the same time … somebody's lying," a third said. "Where's #DongJingwei today?

The P4 laboratory (centre left) on the campus of the Wuhan Institute of Virology in Wuhan. Picture: AFP*Source:AFP*

'China needs to be transparent'

It comes as the head of the World Health Organisation Dr Tedros Adhanom Ghebreyesus refused to rule out the Wuhan lab leak theory at the G7 summit, and called on China to be more "transparent".

Dr Tedros said that so far 3.75 million people worldwide had died from the virus and at least 174 million were confirmed to have contracted the disease.

"I think the respect these people deserve is knowing what the origin of this virus is so that we can prevent it from happening again," he said.

Dr Tedros also suggested there had not been enough "transparency and co-operation" from China initially.

'This must never happen again'

Speaking on the ABC's *Insiders*program this morning, Australia's Foreign Minister Marise Payne declined to comment on the reported defection, instead she also called for China to be transparent.

"I wouldn't normally comment on intelligence matters of that nature, but what is very important here is that we do maintain the momentum of this inquiry process," she said.

"We know that the phase one inquiry had significant limitations in terms of the delay in deploying it, access to information, access to appropriate scientific and medical evidence. "So we are very determined to work with our partners to ensure that the phase two

investigation is able to access the material that it needs, including within China. That is strongly supported by the G7 itself.
"The most important thing here … absolutely is that this never ever happens again," she continued. "They are strongly encouraged by many parties … to enable this to be a very clear and comprehensive process."

Israel seeing a spike in childhood illness RSV after it receded during COVID

Source: https://www.timesofisrael.com/israel-said-seeing-spike-in-childhood-illness-rsv-after-it-receded-during-covid/

June 18 – Israel has seen a spike in cases of a common respiratory virus that typically does not circulate during the summer, including seven children in serious condition.
Citing Health Ministry officials, Channel 12 reported Thursday that doctors were concerned about the unusual rise in RSV and were ensuring that hospitals had appropriate breathing devices to treat patients.
Similar spikes in unseasonal RSV were seen in other places around the world, most notably in Australia and among the ultra-Orthodox community in Brooklyn in their respective spring seasons.
In all the cases, there had been a significant drop in cases during the normal winter RSV season.
RSV is one of the typically common illnesses that have receded during the pandemic, surprising many doctors. The virus, which causes symptoms like runny nose, cough and fever, and can cause a child to eat less, spreads easily in schools and daycare facilities. Most children will have contracted the virus by the age of 2 and, for most of them, the virus is not dangerous. But RSV can lead to more serious illness in babies, whose airways are smaller and who have no immunity to the virus.
Doctors speculate that lockdowns last year kept people from contracting RSV, therefore lowering the level of immunity to the virus in the general population as it emerged from lockdown.
According to the US CDC, more than 57,000 children below the age of 5 are hospitalized with RSV each year. Between 100 and 500 children die of RSV each year. There is no vaccine.
Israel has lifted almost all its virus restrictions and in recent days even lifted the indoor mask mandate.
Israel's mass vaccination drive, which has already given both shots to over half the population, along with lockdown measures, brought down the number of new daily cases (based on a weekly average) from 8,600 at the peak of the health crisis to just 13 on Wednesday.
At the height of the pandemic, there were 88,000 active cases in the country and 1,228 serious cases; as of Thursday, there were 248 active infections and 24 people in serious condition.

EDITOR'S COMMENT: Seasonal flu disappeared during the pandemic. Now RSV appeared out of season and is very offensive. What is going on in the viruses' world?

Inventor of mRNA Technology: Vaccine Causes Lipid Nanoparticles to Accumulate in 'High Concentrations' in Ovaries

Source: https://www.globalresearch.ca/inventor-mrna-technology-vaccine-causes-lipid-nanoparticles-accumulate-high-concentrations-ovaries/5748020

June 18 – On June 10, Dr. Robert Malone, creator of mRNA vaccine technology, joined evolutionary biologist **Bret Brownstein,** Ph.D., for a 3-hour conversation on the "Dark Horse Podcast" to discuss multiple safety concerns related to the Pfizer and Moderna vaccines.
In this short outtake from the full podcast, Malone, Brownstein and tech entrepreneur **Steve Kirsch** touch on the implications of the controversial Japanese Pfizer biodistribution study. The study was made public earlier this month by **Dr. Byram Bridle,** a viral immunologist.
They also discuss the lack of proper animal studies for the new mRNA vaccines, and the theory, espoused by virologist **Geert Vanden Bossche,** Ph.D., that mass vaccination with the mRNA vaccines could produce ever more transmissible and potentially deadly variants.
As The Defender reported June 3, Bridle received a copy of a Japanese biodistribution study — which had been kept from the public — as a result of a freedom of information request made to the Japanese government for Pfizer data.
Prior to the study's disclosure, the public was led to believe by regulators and vaccine developers that the spike protein produced by mRNA COVID vaccines stayed in the shoulder

where it was injected and was not biologically active — even though regulators around the world had a copy of the study which showed otherwise.
The biodistribution study obtained by Bridle showed lipid nanoparticles from the vaccine did not stay in the deltoid muscle where they were injected as the vaccine's developers claimed would happen, but circulated throughout the body and accumulated in large concentrations in organs and tissues, including the spleen, bone marrow, liver, adrenal glands and — in "quite high concentrations" — in the ovaries.
The mRNA — or messenger RNA — is what tells the body to manufacture the spike protein. The lipid nanoparticles are like the "boxes" the mRNA is shipped in, according to Malone. "If you find lipid nanoparticles in an organ or tissue, that tells you the drug got to that location," Malone explained.
According to the data in the Japanese study, lipid nanoparticles were found in the whole blood circulating throughout the body within four hours, and then settled in large concentrations in the ovaries, bone marrow and lymph nodes.
Malone said there needed to be monitoring of vaccine recipients for leukemia and lymphomas as there were concentrations of lipid nanoparticles in the bone marrow and lymph nodes. But those signals often don't show up for six months to three or nine years down the road, he said.
Usually, signals like this are picked up in animal studies and long-term clinical trials, but this didn't happen with mRNA vaccines, Malone said.
Malone said there are two adverse event signals that are becoming apparent to the U.S. Food and Drug Administration (FDA). One of them is thrombocytopenia — not having enough platelets, which are manufactured in the bone marrow. The other is reactivation of latent viruses.
Malone found the ovarian signal perplexing because there is no accumulation in the testes.
Malone said the original data packages contained this biodistribution information. "This data has been out there a long time" within the protected, non-disclosed, purview of the regulators across the world, he said.
According to Malone, the FDA knew the COVID spike protein was biologically active and could travel from the injection site and cause adverse events, and that the spike protein, if biologically active, is very dangerous.
In fact, Malone was one of many scientists to warn the FDA about the dangers of the free spike protein.
Malone suggested autoimmune issues may be related to free-circulating spike protein which developers assured would not happen. To pick up autoimmune issues, a 2- to 3- year follow-up period in phase 3 patients would be required to monitor for potential autoimmune consequences from vaccines — but that monitoring didn't happen with the Pfizer and Moderna vaccines.
Pfizer and Moderna also didn't conduct proper animal studies, Brownstein said. What the animal models give us is a signal that alerts us to what we need to follow up on in humans.
Brownstein said: "We've got very alarming short-term stuff. We've got short-term stuff that is alarming on the basis of where we find these lipids, where we find the spike proteins — those things are reasons for concern because it wasn't supposed to be this way. We've also got an alarming signal in terms of the hazards and deaths or the harms and the deaths that are reported in the system and there are reasons to think they are dramatic under-reports."

Vaden Bossche got it right

One of the potential harms from the vaccines, Brownstein said, was made famous by Vanden Bossche, a vaccinologist who worked with GSK Biologicals, Novartis Vaccines, Solvay Biologicals, Bill & Melinda Gates Foundation's Global Health Discovery team in Seattle, and Global Alliance for Vaccines and Immunization in Geneva.
Earlier this year, Vanden Bossche put out a call to the World Health Organization, supported by a 12-page document, that described the "uncontrollable monster" that a global mass vaccination campaign could potentially unleash.
Vanden Bossche said a combination of lockdowns, and extreme selection pressure on the virus induced by the intense global mass vaccination program, might diminish the number of cases, hospitalizations and deaths in the short-term, but ultimately, will induce the creation of more mutants of concern. This is what Vanden Bossche calls "immune escape" (i.e. incomplete sterilization of the virus by the human immune system, even following vaccine administration).
Immune escape will in turn trigger vaccine companies to further refine vaccines that will add, not reduce, the selection pressure, producing ever more transmissible and potentially deadly variants.
The selection pressure will cause greater convergence in mutations that affect the critical spike protein of the virus that is responsible for breaking through the mucosal surfaces of our airways, the route used by the virus to enter the human body.

The virus will effectively outsmart the highly specific antigen-based vaccines being used and tweaked, depending on the circulating variants. All of this could lead to a hockey stick-like increase in serious and potentially lethal cases — in effect, an out-of-control pandemic.
Malone said: "Vanden Bossche's concern is not theoretical. It is real and we have the data. We're stuck with this virus or its downstream variants pretty much for the rest of our lives and it's going to become more like the flu. We will have continuing evolution and circulation of variants, and that is an escape."

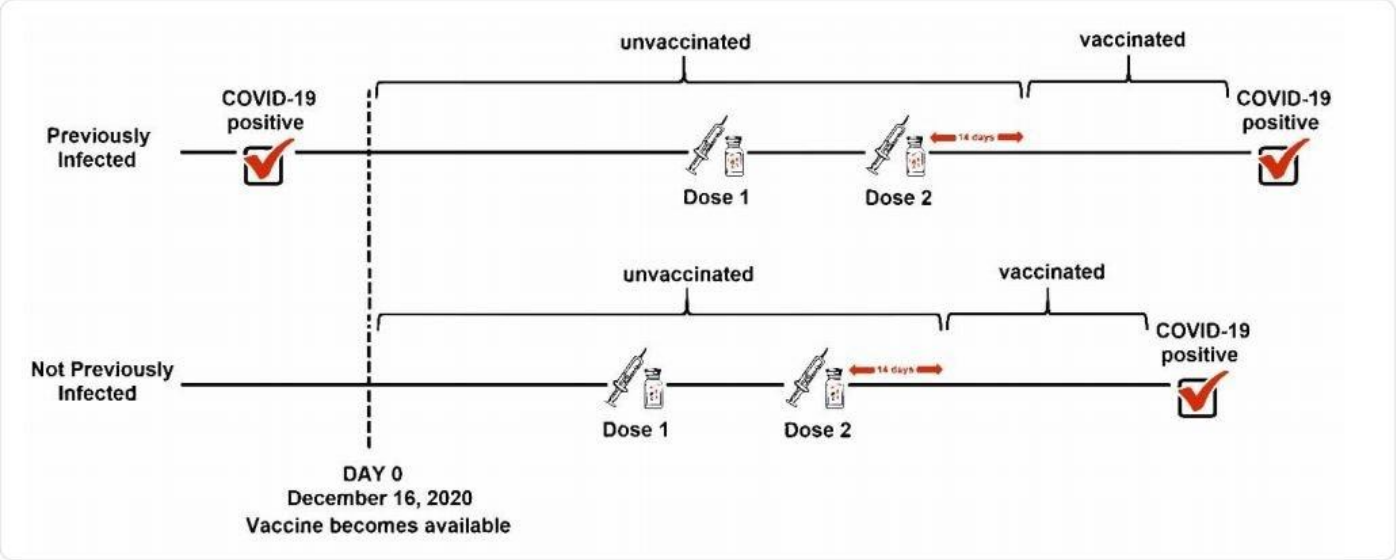
No point vaccinating those who've had COVID-19: Findings of Cleveland Clinic study

Source: https://www.news-medical.net/news/20210608/No-point-vaccinating-those-whoe28099ve-had-COVID-19-Findings-of-Cleveland-Clinic-study.aspx

June 08 – Scientists from the Cleveland Clinic, USA, have recently evaluated the effectiveness of coronavirus disease 2019 COVID-19) vaccination among individuals with or without a history of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.
The study findings reveal that individuals with previous SARS-CoV-2 infection do not get additional benefits from vaccination, indicating that COVID-19 vaccines should be prioritized to individuals without prior infection. The study is currently available on the *medRxiv** preprint server (not peer-reviewed).

Background

In the United States, the US Food and Drug Administration (FDA) has provided emergency use authorization for two mRNA-based COVID-19 vaccines developed by Pfizer/BioNTech and Moderna, which have shown high efficacy against SARS-CoV-2 infection and COVID-19 disease in clinical trials. However, the ability to vaccinate a large part of the global population is limited by vaccine supply.



Explanation of "previously infected" analyzed as a time-independent covariate and "vaccinated" treated as a time-dependent covariate.

In order to ensure fair access to vaccines throughout the world, the COVID-19 vaccines Global Access (COVAX) initiative was launched. In many countries, especially those with low socioeconomic status, there is a serious shortage of vaccines. Thus, in order to get the maximum vaccine benefits, the most vulnerable population should be prioritized for the vaccination.
Currently, most countries prioritize vaccination for healthcare and other frontline workers, elderly people, and people with comorbidities.

To further narrow down the prioritization criteria, the scientists in the current study have evaluated the necessity of COVID-19 vaccines for individuals who were previously infected with SARS-CoV-2.

Study design

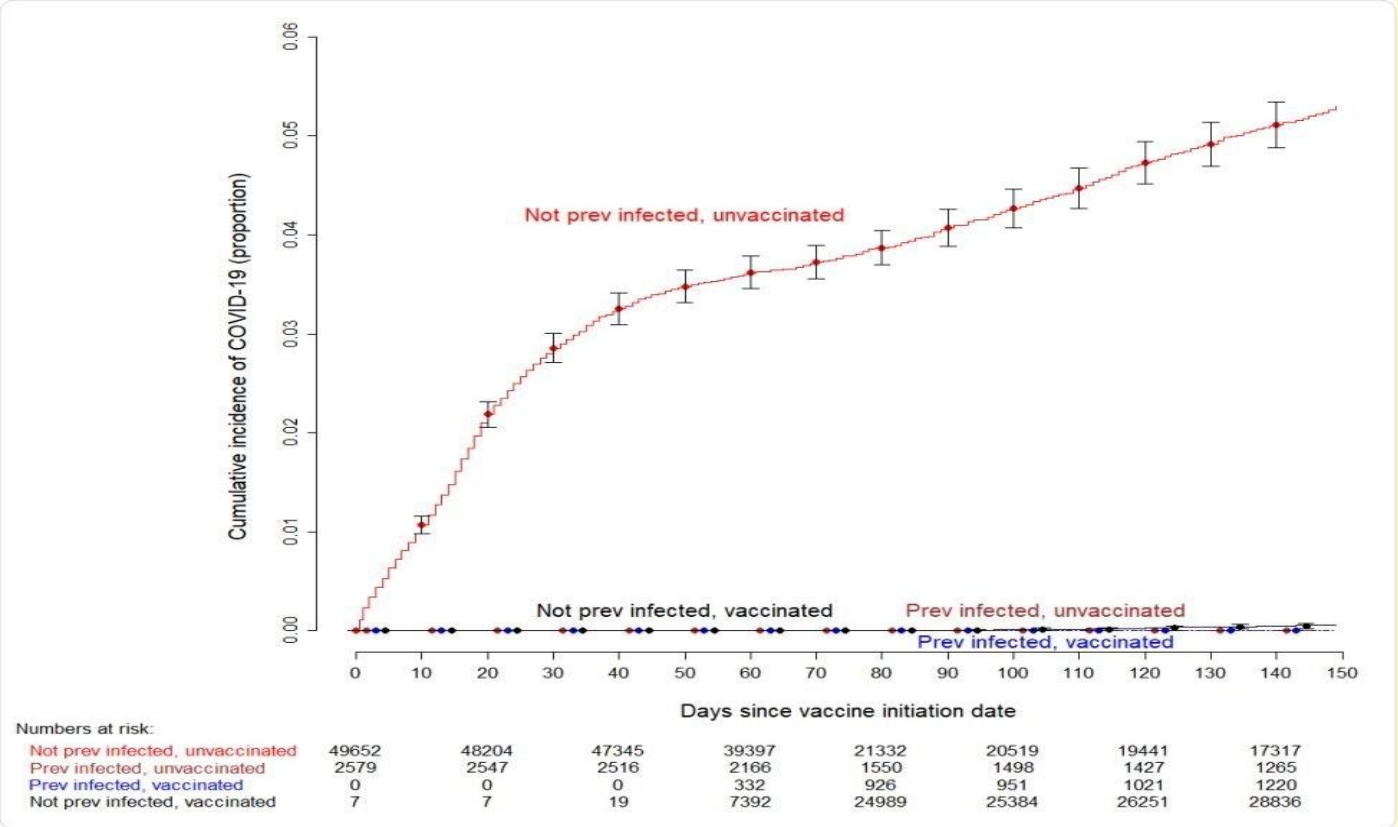
The study was conducted on 52,238 employees in the Cleveland Clinic. A positive RT-PCR test was considered to define SARS-CoV-2 infection. The participants received two doses of the Pfizer/BioNTech or Moderna COVID-19 vaccine at an interval of 28 days. A participant was considered vaccinated after 14 days of receiving the 2nd vaccine dose. Similarly, a participant who tested positive for SARS-CoV-2 at least 42 days before the vaccination initiation was considered previously infected.

Important observations

Of all enrolled participants, 5% had previous SARS-CoV-2 infection. Compared to 59% of non-infected participants, only 47% of previously infected participants were vaccinated by the end of the study. About 63% of all vaccinated participants received the Moderna vaccine.

The analysis of cumulative COVID-19 incidence revealed that during the course of the study, SARS-CoV-2 infection occurred almost exclusively in participants who were not previously infected and were not vaccinated.

Interestingly, no significant difference in COVID-19 incidence was observed between previously infected and currently unvaccinated participants, previously infected and currently vaccinated participants, and previously uninfected and currently vaccinated participants.



Simon-Makuch plot showing the cumulative incidence of COVID-19 among subjects previously infected and not previously infected with COVID-19, who did and did not receive the vaccine. Curves for the unvaccinated are based on data for those who did not receive the vaccine during the duration of the study, and for those waiting to receive the vaccine. Day zero was Dec 16, 2020, the day vaccination was started in our institution. Error bars represent 95% confidence intervals. Seven subjects who had been vaccinated earlier as participants in clinical trials were considered vaccinated throughout the duration of the study. Twelve subjects who received their first dose in the first week of the vaccination campaign managed to get their second dose three weeks later, and were thus considered vaccinated earlier than 42 days since the start of the vaccination campaign.

The participants from these three groups exhibited a significantly lower incidence of SARS-CoV-2 infection compared to previously uninfected and currently unvaccinated participants.
Specifically, of all infections during the study period, 99.3% occurred in participants who were not infected previously and remained unvaccinated. In contrast, only 0.7% of infections occurred in participants who were not previously infected but were currently vaccinated.
Importantly, not a single incidence of SARS-CoV-2 infection was observed in previously infected participants with or without vaccination.
With further statistical analysis, it was observed that the COVID-19 vaccination significantly reduced the risk of SARS-CoV-2 infection in previously uninfected participants but not in previously infected participants.
Although the study did not directly estimate the duration of protection from natural infection, it was observed that previously infected participants remained protected against COVID-19 for at least 10 months after the symptom onset or a positive test result.

Study significance

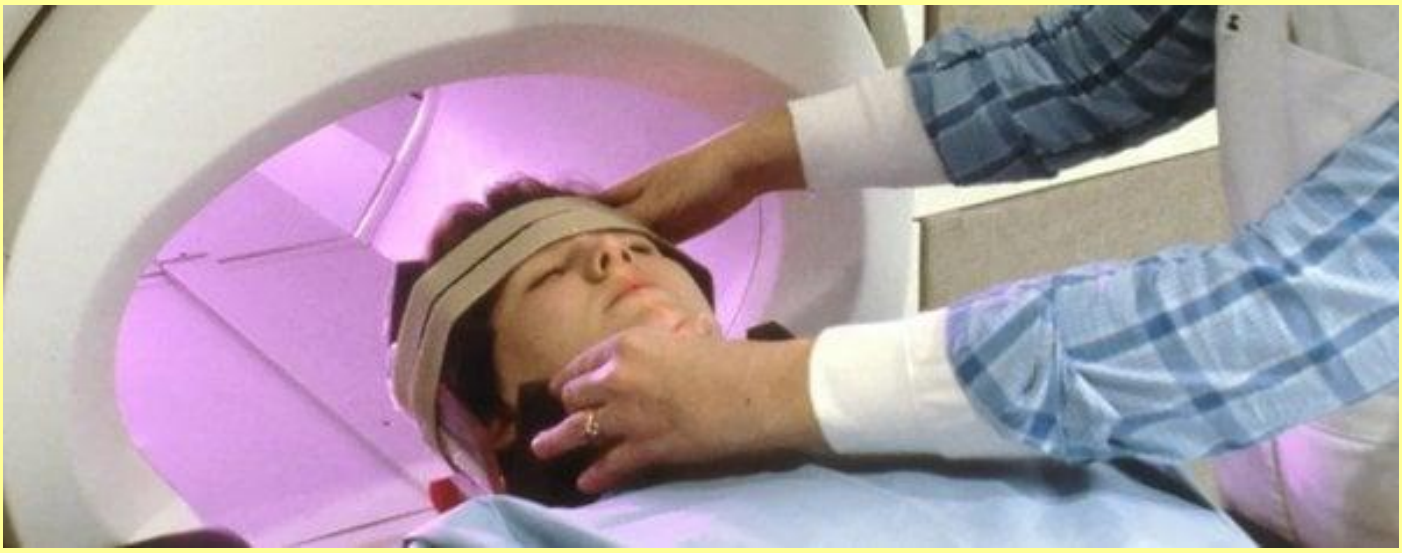
The scarcity of vaccines, coupled with the knowledge that vaccines do not provide additional protection to those who have already been infected, is the strongest argument for restricting vaccine administration to those who have not had the infection.
In addition to the profession, age, and comorbid conditions, the previous infection should be an important consideration in deciding whom to prioritize to receive the vaccine.
A practical and useful message would be to consider symptomatic COVID-19 to be as good as having received a vaccine, and that people who have had COVID-19 confirmed by a reliable laboratory test do not need the vaccine.

The study concludes, "individuals who have laboratory-confirmed symptomatic SARS-CoV-2 infection are **unlikely to benefit from COVID-19 vaccination**, and vaccines can be safely prioritized to those who have not been infected before."

In contrast, individuals without prior SARS-CoV-2 infection can get the maximum benefits from vaccination. Thus, based on the study findings, COVID-19 vaccines should be prioritized to naïve individuals without a history of SARS-CoV-2 infection.

COVID-19 Survivors May Experience Loss of Brain Tissue, According to New Data

Source: https://www.sciencealert.com/covid-19-survivors-may-experience-loss-of-brain-tissue-new-long-term-data-suggests



June 21 – A new study that drew on data gathered by UK Biobank suggests COVID-19 survivors may suffer from a loss of gray matter over time.
The long-term experiment, which involved 782 volunteers, compared brain scans of individuals before the pandemic. For an analogy between pre-pandemic and post-pandemic brain scans, researchers then invited 394 COVID-19 survivors to return for follow-up scans, as well as 388 healthy volunteers.
Among those participants who recovered from COVID-19, researchers saw significant effects of the virus on human cerebral matter, with a loss of gray matter in regions of the brain.

It should be noted that the study has yet to undergo rigorous peer review.
The authors wrote: "Our findings thus consistently relate to loss of grey matter in limbic cortical areas directly linked to the primary olfactory and gustatory system," or areas in the brain related to the perception of senses such as smell and taste.
The gray matter in our brains is part of our central nervous system and essentially controls all our brain's functions, as previously reported by Insider.
It enables individuals to control movement, memory, and emotions, so an abnormality in the gray matter of the brain can affect communication skills and brain cells.
The study also suggests that a loss of gray matter in memory-related regions of the brain "may in turn increase the risk of these patients of developing dementia in the longer term."
This finding follows a study published by *Lancet Psychiatry* journal last year, suggesting that serious infections of COVID-19 may damage the brain leading to long-term complications such as stroke or dementia-like symptoms. The authors noted that more data is needed to adequately assess the effects of COVID-19 on brain health, though.
Most of the COVID-19 survivors involved in the research experienced mild-to-moderate symptoms or had none at all. This was viewed as a strength of the analysis, as most brain-imaging publications have focused on moderate-to-severe cases of COVID-19.
"There is a fundamental need for more information on the cerebral effects of the disease even in its mildest form," the Biobank study read.
It is important to note, however, that changes in the brain were not seen in the group that had not been infected, as reported by Reuters. The authors of the study said more research is needed to determine whether COVID-19 survivors will have issues in the long-term regarding their ability to remember emotion-evoking events.
They also cannot confirm whether the loss of gray matter is a result of the virus spreading into the brain, or some other effect of the illness, per Reuters.

EDITOR'S COMMENT: Very bad news for politicians …

While World Fights The Pandemic, a Different Outbreak Was Just Quashed in Guinea

Source: https://www.sciencealert.com/who-declares-an-end-to-second-ebola-outbreak-in-guinea

June 21 – The World Health Organization on Saturday officially announced the end of Guinea's second Ebola outbreak which was declared in February and claimed 12 lives.
At 16 confirmed cases and seven probable infections according to WHO figures, the limited size of the latest flare-up has been credited to experience from the 2013-16 epidemic, which killed more than 11,300 people mostly in Guinea, Liberia and Sierra Leone.

Just 12 people died this time around.
"I have the honor of declaring the end of Ebola" in Guinea, WHO official Alfred Ki-Zerbo said at a ceremony in the southeastern Nzerekore region where the disease surfaced at the end of January.
International rules meant that Guinea had to wait 42 days - twice the virus' incubation period - without a new case before declaring the epidemic over.
That wait was over on Friday, weeks after the last person was declared cured on May 8, a senior health ministry official told AFP.
Health Minister Remy Lamah also declared the outbreak finished "in the name of the head of state" President Alpha Conde.
Saturday's event in a health ministry building was attended by around 200 people including local religious and community leaders.
"We must also thank the communities who pitched in to overcome the disease," the WHO's Ki-Zerbo said.

During last decade's outbreak, reluctance and outright hostility towards anti-Ebola infection control measures led some people in Guinea's forested southeast to attack and even kill government employees.
"Community engagement, effective public health measures and the equitable use of vaccines" had this time been key to overcoming Ebola, WHO chief Tedros Adhanom Ghebreyesus said in a statement.
The UN body said it had delivered around 24,000 vaccine doses to Guinea and that 11,000 people at high risk had received shots, including more than 2,800 frontline workers.
"We've beaten Ebola but let's remain vigilant" read a banner unfurled at Saturday's ceremony.
"We must stay alert for a possible resurgence and ensure the expertise in Ebola expands to other health threats such as COVID-19," WHO Africa director Matshidiso Moeti said.
The US Centers for Disease Control and Prevention (CDC) said in a statement that genetic sequencing showed links between the previous outbreak and the latest epidemic.
This year's outbreak could have been caused by "persistent infection in a survivor from the West Africa outbreak" back then, the CDC said, emphasizing "the necessity for strong and ongoing survivor programs" as well as more research.
Ebola causes severe fever and, in the worst cases, unstoppable bleeding.
It is transmitted through close contact with bodily fluids, and people who live with or care for patients are most at risk.

EDITOR'S REMINDER: Ebola virus can survive in semen for 565 days! Keep this in mind!

Treating Zaire ebolavirus With Ansuvimab-zykl

By Lauren Black, Matthew Wittman, and Jamie Wagner
Contagion, June 2021, Volume 06, Issue 03
Source: https://www.contagionlive.com/view/treating-zaire-ebolavirus-with-ansuvimab-zykl

June 21 – *Zaire ebolavirus* (EBOV)is 1 of 4 *Ebolavirus* species that can cause a potentially fatal disease in humans.[1] The Ebola virus is thought to be introduced into humans through contact with blood, bodily secretions, or organs of infected animals, such as bats, apes, monkeys, antelope, or porcupines.[2] Human-to-human transmission occurs through direct contact with blood, bodily fluids, and tissues of infected humans as well as contaminated surfaces and materials.[1]
The 2014-2016 Ebola outbreak was the largest recorded, with a total of 28,652 cases reported in 10 countries and 11,325 deaths occurring in 6 of those countries.[3,4] The World Bank reported that the outbreak cost an estimated $1.62 billion.[5]
Spurred by this outbreak, the World Health Organization initiated discussions to develop and utilize experimental therapeutics in the next Ebola outbreak.[3] Development of ansuvimab-zykl (Ebanga) originated from a single monoclonal antibody isolated from immortalized B cells obtained from a survivor of the 1995 Ebola outbreak in the city of Kikwit in the Democratic Republic of the Congo.[6] Ansuvimab-zykl is a single-dose, intravenous, recombinant human IgG1k monoclonal antibody that binds to the glycoprotein 1 subunit of EBOV, preventing binding of EBOV to host cells and inhibiting viral entry into the host cell.[7]
A phase I, open-label, dose-escalation clinical trial for ansuvimab-zykl was conducted from March 2018 to September 2018 to evaluate its safety, tolerability, and pharmacokinetics.[8] The trial included 18 subjects in 3 experimental arms (5 mg/kg, n=3; 25 mg/kg, n=5; and 50 mg/kg, n=10), with the drug given as a single 30-minute infusion. Participants were followed for 24 weeks and assessed for infusion-site reactions and systemic symptoms through self-reporting, direct clinician assessment, and clinical laboratory data. The primary study outcome was safety and tolerability of ansuvimab-zykl; secondary outcomes included pharmacokinetic and antidrug antibody evaluation.
All doses were well tolerated, with no infusion-site reactions reported. Only 4 (22%) participants experienced systemic symptoms, including malaise (n=3), myalgia (n=2), headache (n=4), chills (n=2), nausea (n=2), and joint pain (n=2). There were no serious adverse events. Ansuvimab-zykl exhibited linear pharmacokinetics and had a half-life of 24 days, with no detection of antidrug antibodies noted.
When the next EBOV outbreak occurred in August 2018,[9] the randomized, controlled PALM trial (NCT03719586) was initiated comparing MAb114 (now ansuvimab-zykl), remdesivir, and REGN-EB3 to ZMapp (active control).[3] Patients were enrolled from November 2018 through August 2019, and all were included if they had a positive reverse transcriptase–polymerase chain reaction (RT-PCR) assay positive for EBOV within 3 days prior to screening. The primary end point was death at 28 days, and the secondary efficacy end point was time to first negative PCR test.

Most patients (74.4%) enrolled were 18 years or older, and more than half (55.6%) identified as female (**Table**).[3] A total of 673 participants were randomized as follows: 169 received ZMapp (50 mg/kg×3 doses); 175 received remdesivir (200 mg×1 dose, then 100 mg daily×9-13 days); 174 received MAb114 (50 mg/kg×1 dose); and 155 received REGN-EB3 (150 mg/kg×1 dose). Twelve patients died prior to receiving the first dose: 1 in the ZMapp group, 3 in the remdesivir group, 3 in the MAb114 group, and 5 in the REGN-EB3 group.

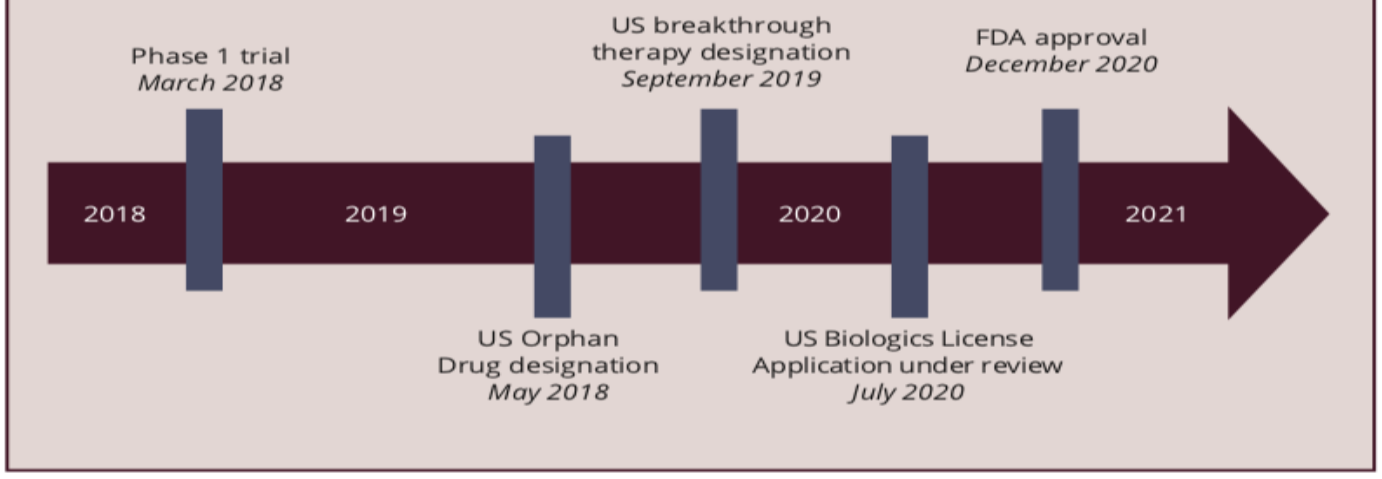
TABLE. Baseline Characteristics of Participants in the MAb114 and ZMapp Populations[3]

Characteristic	ZMapp (N = 169)	MAb114 (N = 174)
Age, years, mean ± SD	29.7 ± 16.8	27.4 ± 18.5
No. of females (%)	87 (51.5)	98 (56.3)
No. pregnant/total No. (%)	4/63 (6.3)	5/69 (7.2)
Days since symptom onset, mean ± SD	5.6 ± 3.6	5.5 ± 3.6
Serum creatinine level, mg/dL	2.9 ± 3.3	2.1 ± 2.6

Most participants received the study drugs within 6 hours of enrollment in the trial; however, 42 (6.2%) patients had therapy delayed for more than 6 hours. Participants in the ZMapp group received the drug in just over 3 hours, and participants in the MAb114 group received the drug in just over 2.5 hours. Twenty-nine participants experienced a serious adverse event related to the trial drugs: 7 who received ZMapp, 9 who received remdesivir, 10 who received MAb114, and 3 who received REGN-EB3.

By day 28, 290 (43.1%) patients expired; however, MAb114 had significantly less deaths compared to ZMapp (35.1% vs 49.7%; 95% CI, –25.2 to –1.7). This result continued to hold true for patients of both high (69.9% vs 84.5%; 95% CI, –33.0 to –0.5) and low (9.9% vs 24.5%; 95% CI, –32.4 to –2.6) viral loads, as well as for those who received the drugs in less than 6 hours (34.5% vs 49%; 95% CI, –25.4 to –1.5).

FIGURE. Development Timeline for Ansuvimab-zykl[10]



When examining the impact of other variables through a logistic regression model for death at 28 days, MAb114 maintained superiority over ZMapp when considering duration of EBOV symptoms (odds ratio [OR], 0.49; 95% CI, 0.31-0.78), age (OR, 0.52; 95% CI, 0.33-0.82), and serum creatinine level (OR, 0.48; 95% CI, 0.27-0.84). Additionally, the secondary efficacy end point, median time to first negative PCR test, was shorter for patients receiving MAb114 than patients receiving ZMapp (16 days vs 27 days).[3]

Ansuvimab-zykl was formally approved by the FDA on December 22, 2020, for the treatment of infection caused by *Zaire ebolavirus* in adult and pediatric patients, including neonates

born to a mother who is PCR positive for *Zaire ebolavirus*.[7] See **Figure**[10] for the development timeline of ansuvimab-zykl. The drug is recommended to be given as a single 50 mg/kg actual body weight dose infused through a 1.2 micron in-line filter extension set over 60 minutes.[7]

No studies have been done to determine the impact of infusion ansuvimab-zykl in a patient who has received or will receive the live Ebola vaccine; therefore, it is recommended to avoid concurrent administration of the vaccine with ansuvimab-zykl treatment. Ansuvimab-zykl is approved for use in special populations, including pregnant women and neonates. Although an insufficient number of patients older than 65 years were included in the PALM trial, there were no differences in responses compared to adults younger than 65 years.

With the current outbreaks of EVOD occurring in the Democratic Republic of the Congo and Guinea, patients of any age can receive ansuvimab-zykl to help increase their chances of survival.[2] The only limitation to using this drug is the need to store product vials in a refrigerated condition prior to warming and reconstitution.[7]

▶▶ References are available at the source's URL.

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Why don't more health care workers take COVID-19 vaccines?

Source: https://news.yahoo.com/vaccine-fears-why-dont-more-210100801.html

June 21 – Front-line health care workers were the first in line when COVID-19 shots became available in December, but polling shows that medical professionals can be vaccine-hesitant, too, leaving some with concerns about the vaccines to question whether health care professionals know something the rest of us don't.

As of early March, 52% of front-line health care workers reported having received at least one dose of a COVID-19 vaccine and 42% said they had received both doses — meaning half of front-line health care staff remained unvaccinated at the time, according to a survey of front-line health care workers conducted by The Washington Post and Kaiser Family Foundation in April.

A separate survey of 160 rural hospital leaders conducted by the Chartis Center for Rural Health between March 12 and April 15 found that nearly half of respondents reported that between 21% and 50% of their staff had decided not to get a COVID-19 vaccine.

"When asked why health care personnel are declining a COVID vaccine, a majority of respondents — 44% — cited 'Matter of Personal Choice,'" according to the survey, which was reported in the industry publication Fierce Healthcare.

"Another 31% reported a lack of trust in vaccines," according to the article in Fierce Healthcare.

This week, the Times Free Press has been tackling some of the common questions surrounding COVID-19 vaccine safety starting with, "How can the COVID-19 vaccines be safe if development was rushed?"; "What's in a COVID-19 vaccine?"; "How do the COVID-19 vaccines work?"; and "How common are adverse events, and how do we know there won't be long-term effects from COVID-19 vaccines?"

With this final installment, we'll look into the Question: If COVID-19 vaccines are so great, why don't more health care workers take them? Answer: Health care workers can experience the same drivers of vaccine hesitancy as the general population, and many of the vaccination trends among medical staff mirror disparities found in vaccination rates across the country.

The type of setting where medical staff goes to work, their education, political beliefs, religious beliefs, where they live and their race and ethnicity can all factor into their decision to get vaccinated.

An ongoing research project from the Kaiser Family Foundation tracks the evolving public attitudes toward COVID-19 vaccinations. According to the foundation's research, unvaccinated adults are usually younger, people of color, Republican-leaning and less-educated.

"But unvaccinated isn't an entirely uniform group, with significant differences by intention," the report states. "Adults who want to 'wait and see' before getting vaccinated are more likely to be young and people of color, while those in the 'definitely not' group are more significantly Republican-leaning and in rural areas."

Dr. Matthew Kodsi, vice president of medical affairs at CHI Memorial Hospital, said that like all people, health care workers are not immune from what's happening in the community at large.

"We've [CHI Memorial] done a lot of the community vaccination events, and we've seen our numbers go down from when we did 2,000 in one day back in March, and now if we can do 20 at a time we're jumping up and down with excitement," Kodsi said. "So it's just everyone has these concerns that are unfortunately, in many cases, due to misinformation."

One of the biggest concerns he said he's heard among women — which comprise 76% of the health care workforce, according to the U.S. Census — is the fear that vaccines will cause infertility, "which has no scientific foundation."

"People might say, 'Well, you don't know. We haven't followed it for 10 years,'" he said. "True, I'm not going to say that we have long data. But what we have is science that says there is no medical reason to expect that that would happen. And there is data looking at people who are pregnant — tens of thousands of people who are pregnant who've been vaccinated, or more — and it shows no increased risk of miscarriage. So, there's no reason to believe that that's a risk."

Dr. Rupali Limaye, who is an associate scientist at Johns Hopkins Bloomberg School of Public Health, said that vaccine hesitancy in the African American community is "not only due to historical perception of medical experimentation but also current racism and discrimination. And then there's also issues related to the vaccine product itself. Is the vaccine safe for Black people? Is it safe for individuals that might have diabetes, et cetera?"

In the poll by The Washington Post and Kaiser Family Foundation, 39% of Black front-line health care workers and 44% of Hispanic front-line health care workers reported receiving a COVID-19 vaccine as of early March, compared to 57% of white health care workers.

In the general population and in health care, education is one of the strongest predictors of vaccine acceptance.

Workers involved in diagnosing and treating patients, such as doctors and nurses, were the most likely to be vaccinated, according to the poll, with 68% reporting having received at least one shot compared to those who assist with patient care, such as bathing, eating, cleaning, exercising and housekeeping. In the pool, 37% of people who assisted in care were vaccinated.

Staff working in hospitals and outpatient clinics reported the highest rates of vaccination as of early March, with 66% and 64%, respectively, saying they'd received a shot. But rates were lower among doctors' office staff (52%) and nursing homes or assisted care facilities (50%).

One in four (26%) home health care workers — a job that requires no formal educational credential and pays around $10-$12 per hour — reported getting a vaccine.

Kodsi said that the hospital is continuing to educate both staff and the public about vaccine safety, and often the best tool to overcome hesitancy is an individual conversation with a person. He recalled talking to a group of people at a recent vaccine event who were debating whether or not to get vaccinated.

"We had a really good conversation. It took us about 10 or 15 minutes, and they then felt comfortable getting the vaccine and did," Kodsi said. "The most important thing we as a system and a community and health care workers can do is to make sure that everyone who makes the decision about whether or not to receive the vaccine is making that decision with as much accurate information.

"We don't want people to feel like we're just going to tell them they've got to get it," he said. "We want to respect their concerns, address their concerns, make sure they've got the information they need so that they can make the decision that really is the best for them."

A Group Of Parents Sent Their Kids' Face Masks to A Lab

Source: https://247sports.com/college/west-virginia/Board/103782/Contents/A-Group-Of-Parents-Sent-Their-Kids-Face-Masks-to-A-Lab--166620183/

June 16 – A group of parents in Gainesville, FL, concerned about potential harms from masks, submitted six face masks to a lab for analysis. The resulting report found that five masks were contaminated with bacteria, parasites, and fungi, including three with dangerous

pathogenic and pneumonia-causing bacteria. No viruses were detected on the masks, although the test is capable of detecting viruses.

The analysis detected the following 11 alarmingly dangerous pathogens on the masks:

- *Streptococcus pneumoniae* (pneumonia)
- *Mycobacterium tuberculosis* (tuberculosis)
- *Neisseria meningitidis* (meningitis, sepsis)
- *Acanthamoeba polyphaga* (keratitis and granulomatous amebic encephalitis)
- *Acinetobacter baumanni* (pneumonia, bloodstream infections, meningitis, UTIs— resistant to antibiotics)
- *Escherichia coli* (food poisoning)
- *Borrelia burgdorferi* (causes Lyme disease)
- *Corynebacterium diphtheriae* (diphtheria)
- *Legionella pneumophila* (Legionnaires' disease)
- *Staphylococcus pyogenes* serotype M3 (severe infections—high morbidity rates)
- *Staphylococcus aureus* (meningitis, sepsis)

Half of the masks were contaminated with one or more strains of pneumonia-causing bacteria. One-third were contaminated with one or more strains of meningitis-causing bacteria. One-third were contaminated with dangerous, antibiotic-resistant bacterial pathogens. In addition, less dangerous pathogens were identified, including pathogens that can cause fever, ulcers, acne, yeast infections, strep throat, periodontal disease, Rocky Mountain Spotted Fever, and more.

The face masks studied were new or freshly laundered before wearing and had been worn for 5 to 8 hours, most during in-person schooling by children aged 6 through 11. One was worn by an adult. A t-shirt worn by one of the children at school and unworn masks were tested as controls. No pathogens were found on the controls. Proteins found on the t-shirt, for example, are not pathogenic to humans and are commonly found in hair, skin, and soil.

A parent who participated in the study, Ms. Amanda Donoho, commented that this small sample points to a need for more research: "We need to know what we are putting on the faces of our children each day. Masks provide a warm, moist environment for bacteria to grow."

These local parents contracted with the lab because they were concerned about the potential of contaminants on masks that their children were forced to wear all day at school, taking them on and off, setting them on various surfaces, wearing them in the bathroom, etc. This prompted them to send the masks to the University of Florida's Mass Spectrometry Research and Education Center for analysis.

▶▶ https://rationalground.com/dangerous-pathogens-found-on-childrens-face-masks/

▶▶ https://rationalground.com/dangerous-pathogens-found-on-childrens-face-masks/

A Disaster Expert Says These 6 Steps Could Help The World Recover From The Pandemic

By Ilan Kelman

Source: https://www.sciencealert.com/a-disaster-expert-says-these-6-steps-could-help-the-world-recover-from-the-pandemic

June 22 – Over 3.5 million dead and counting. Long-term health problems, livelihoods destroyed and a long way yet to go. This is the age of COVID-19.

Was it simply a natural disaster, part of living in a fast-paced, globalized world? Or can we identify preventable mistakes?

The key is the term "natural disaster": it's a misnomer.

Disasters occur due to societal failures, not nature. Those with power and resources force others into vulnerable locations, difficult living conditions and inadequate livelihoods, with few choices to change their situations. This point has been explained and analyzed for decades.

We knew everything we needed to know to reduce the chances of a deadly new microbe emerging and – once it did appear – to avoid it engulfing the world. But international organizations, governments and people with choices did not apply this knowledge.

Three sets of societal failures have so far been observed during the pandemic:

- People encroaching on ecosystems and wildlife, followed by poor hygiene when handling captured animals, likely allowed the virus to jump species, although other possibilities, such as a lab leak – another preventable occurrence – are being explored.
- Inadequate local and international monitoring and response once the new disease was observed and reported by health officials let it spread.
- Vocal minorities with disinformation threw doubt on scientific, evidence-based action around lockdown measures, vaccine uptake and face coverings.

Similar societal failures were evident in previous viral outbreaks such as HIV, SARS, Ebola and swine flu. So why did we fail to learn from the past?

Here is a six-point plan – three principles and three practices – that will boost pandemic recovery and lead to better disaster-related decision making in the future.

Principles for resilience

1. Always improving

Resilience is about always improving. Standard ideas of "bouncing back" and "returning to normal" are counterproductive because they re-establish the same lack of resilience that caused the pandemic through those disaster-creating societal failures.

One example of a better recovery would be to increase support for and the implementation of international disease surveillance to better enable warning and response systems for new pathogens.

Mechanisms exist already to operate these systems, namely the International Health Regulations. But when they are not obeyed or when some jurisdictions are not fully involved, then there is a failure in resilience.

2. Behavior and values

Real recovery incorporates resilience as a continual and inclusive societal process, not an end state. Resilience means striving to improve our behavior and values by involving the huge range of people who form the links in a disaster's chain. These people include hunters and farmers as well as world political, business and non-profit leaders.

Meanwhile, polarized values can dismiss evidence which clearly supports, for example, the emergence of long COVID and the effectiveness of vaccines.

Resilience includes seeking balanced, evidence-based interaction in which knowledge evolves to inform values and behaviors. A key example is an open scientific process of investigation.

3. Power and resources

Opportunities always exist for preventing disasters, including pandemics. Choices to take those opportunities rest mainly with those amassing power and resources – frequently government leaders (elected or otherwise), corporate heads and religious figures. The majority of the population does not have this power.

So recovery should involve pushing for power structures and on-the-ground actions which support disaster prevention and risk reduction. Examples include removing houses from floodplains in Toronto, providing livelihood opportunities in Bangladesh to reduce people's vulnerability, reducing earthquake risks in Seattle, creating local teams for disaster prevention and response, and using volcanoes to generate local livelihood options.

As with most catastrophes, the pandemic often hit hardest those who are typically marginalized already, such as people with disabilities, poorer people, and ethnic minorities. Resilience means not leaving people behind.

Practices for prevention

Here are three steps for preventing disasters which implement the three resilience principles.

4. Involve everyone in preventing disasters

When people do not have enough food or water each day or when people fear harassment or other crimes at work, then those concerns might understandably be prioritized. Asking people what they need for resilience and pre-disaster preparation means filling in the gaps they identify. It might be money, time, knowledge, technical ability or behavior change.

5. Make prevention practical

Day-to-day COVID-19 prevention, while awaiting fully vaccinated populations, means "space, hands, face" (which is more effective than the UK government's order): stay physically distant from others, wash hands and cover mouths and noses in crowds and indoor collective places. Everyone must still be involved.

Physical distancing is difficult for people who must commute via public transportation or who can afford only crowded homes. Washing hands presupposes the availability of clean water and soap. Face coverings cost.

To reduce disease transmission during vaccination and societal recovery, people deserve "space, hands, face" options – which could be as straightforward as supporting work-from-home and distributing soap, clean water and face coverings.

6. Prevention is better than cure

The World Health Organization (WHO), for all its faults, typically has an annual budget in the billions of pounds compared to the pandemic's cost of more than four orders of magnitude greater. Investing billions per year for cooperation in pandemic prevention (with or without the WHO) generates immense paybacks even if averting only one pandemic per millennium.

Ultimately, post-pandemic recovery through resilience means ongoing efforts to forestall pandemics and other disasters by instilling an ethos of responsibility. This responsibility admits that societal choices cause "natural" disasters while proffering alternatives for helping us all. Otherwise, we guarantee another devastating, global, decidedly unnatural disaster – along with many smaller ones.

Ilan Kelman *is a Professor of Disasters and Health @ UCL.*

India's COVID Orphans Face Trauma And Trafficking Risks

Source: https://www.npr.org/sections/goatsandsoda/2021/06/10/1004883272/indias-covid-orphans-face-trauma-and-trafficking-risks

Which COVID-19 vaccines are now available around the globe?

Source: https://www.dailysabah.com/life/health/which-covid-19-vaccines-are-now-available-around-the-globe

June 22 – It has been more than a year since the COVID-19 pandemic started and a bit more than six months since the first COVID-19 vaccine was approved.

Nationwide vaccinations in many countries gave hope to millions of people as the pandemic has negatively affected people's life. Travel restrictions, curfews and the "new normal" have been a part of everyone's life in the past year and the only "light at the end of the tunnel" is the vaccination.

Let's check out what kind of vaccines are now available in the world.

WHO-certified COVID-19 vaccines

At the moment, the World Health Organization (WHO) has approved Pfizer-Biontech, two types of AstraZeneca, Covishield (produces by the Serum Institute of India), Moderna, Janssen (Johnson&Johnson), Sinovac (Coronavac) and Sinopharm for emergency use amid the COVID-19 pandemic.

According to WHO data as of December 2020, there are over 200 vaccine candidates for COVID-19 being developed.

What are the other vaccines?

Some vaccines got their approval inside the country that they were developed in and are being used for vaccination campaigns but are still waiting to get the WHO certification.

For example, Russia was the first country to develop the COVID-19 vaccine and to start local vaccination, even though the vaccine is still not approved by international organizations. Sputnik is an inactive vaccine and, according to Russia, has 91% efficacy.

In India, Covaxin, a vaccine made by local firm Bharat Biotech, is also being used for the country's vaccination campaign. As an inactivated vaccine, Covaxin uses a more traditional technology that is similar to the inactivated polio vaccine. The vaccine was also approved for emergency use in Iran and Zimbabwe.

American biotechnology company based in Gaithersburg, Maryland that develops vaccines to counter serious infectious diseases, announced January 2020 development of a vaccine candidate, named NVX-CoV2373, to establish immunity to COVID-19. In January 2021, the company released Phase 3 trial results showing that it has 89% efficacy against COVID-19 and also provides strong immunity against new variants. It has applied for emergency use in the U.S. and U.K. but will be distributed in the U.K. first. As of May 2021, the company does not anticipate that it will file for approval in the U.K. "until July at the earliest." On June 14, 2021, Novavax announced overall 90.4% efficacy in a Phase 3 U.S and Mexico trial.

Dozens of countries, including Turkey (Turkovac), are working on producing their own vaccine to boost the worldwide fight against the deadly virus.

Researchers identify why Covid-19 patients develop life-threatening clots

Source: https://www.rcsi.com/dublin/news-and-events/news/news-article/2021/06/researchers-identify-why-some-covid-19-patients-develop-life-threatening-clots

June 15 – Scientists have identified how and why some Covid-19 patients can develop life-threatening clots, which could lead to targeted therapies that prevent this from happening.

The work, led by researchers from RCSI University of Medicine and Health Sciences, is published in the Opens in new windowJournal of Thrombosis and Haemostasis.

Previous research has established that blood clotting is a significant cause of death in patients with Covid-19. To understand why that clotting happens, the researchers analysed blood samples that were taken from patients with Covid-19 in the Beaumont Hospital Intensive Care Unit in Dublin.

They found that the balance between a molecule that causes clotting, called von Willebrand Factor (VWF), and its regulator, called ADAMTS13, is severely disrupted in patients with severe Covid-19.

When compared to control groups, the blood of Covid-19 patients had higher levels of the pro-clotting VWF molecules and lower levels of the anti-clotting ADAMTS13. Furthermore, the researchers identified other changes in proteins that caused the reduction of ADAMTS13.

"Our research helps provide insights into the mechanisms that cause severe blood clots in patients with Covid-19, which is critical to developing more effective treatments," said Dr Jamie O'Sullivan, the study's corresponding author and research lecturer within the Irish Centre for Vascular Biology and the School of Pharmacy and Biomolecular Sciences at RCSI.

"While more research is needed to determine whether targets aimed at correcting the levels of ADAMTS13 and VWF may be a successful therapeutic intervention, it is important that we continue to develop therapies for patients with Covid-19. Covid-19 vaccines will continue to be unavailable to many people throughout the world, and it is important that we provide effective treatments to them and to those with breakthrough infections."

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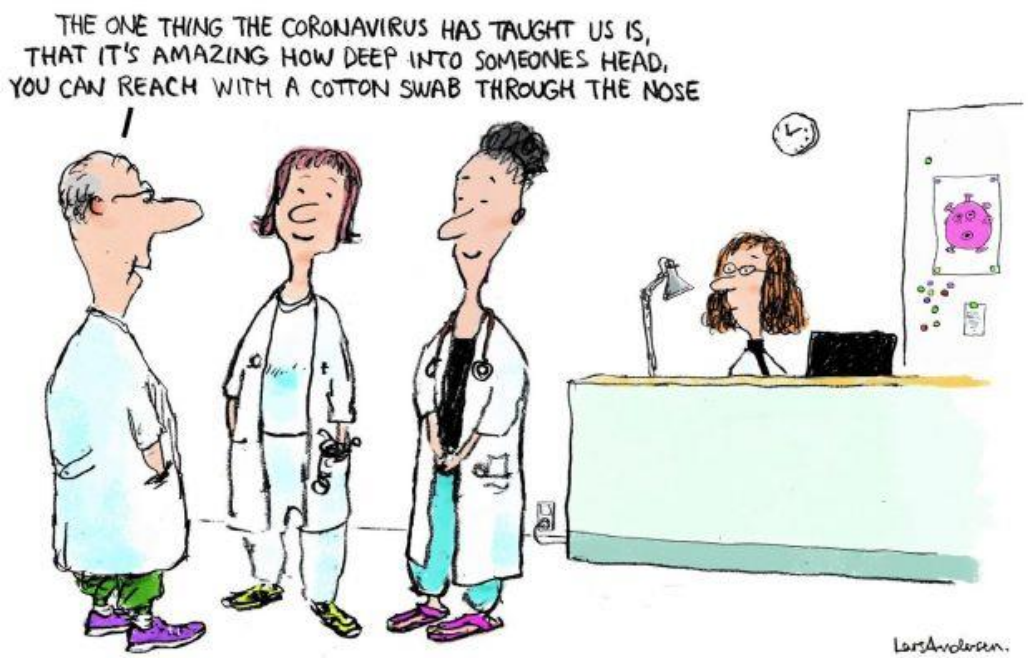

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