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DIARY

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HZS C²BRNE DIARY– 2020[©]

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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,

The pandemic adventure is continuing!

Heading to 16 mil cases by the end of July, populated countries are hit hard (USA; Brazil; India) while Africa remains the big question (~700,000cases/15,000 deaths). This is the first and the biggest problem planet Earth is facing. The second problem is local and has to do with consequences of the Turkish bullying in Southeast Mediterranean. These two conditions generate certain questions that need to be answered:

1. The scientific study of viruses and the infections they cause – began in the closing years of the 19th century. Although Louis Pasteur and Edward Jenner developed the first vaccines to protect against viral infections, they did not know that viruses existed. The first evidence of the existence of viruses came from experiments with filters that had pores small enough to retain bacteria. In 1892, Dmitri Ivanovsky used one of these filters to show that sap from a diseased tobacco plant remained infectious to healthy tobacco plants despite having been filtered. Martinus Beijerinck called the filtered, infectious substance a "virus" (Tobacco mosaic virus) and this discovery is considered to be the beginning of virology. After all these decades and the beyond imagination progress in research technology and we still do not know at least the aerodynamic properties of viruses and sprays emitted by human body? It took almost 6 months to declare that Covid-19 is an airborne virus; until now it was thought that it was transmitted with droplets. If you have a few PhDs you can answer the question "What goes *meow-meow on the roof tiles?*" (a Greek saying).
2. What is hidden behind the obsession with molecular tests (RT-PCR) and the denial to rapid antibody tests? PCR is considered the golden standard but a standard with ~70% accuracy and compared with what in order to be the best? A molecular test gives a yes/no answer to the presence of the virus; rapid tests give an idea of what was the reaction of the body when it contacted the virus. Two absolutely complimentary laboratory/POC techniques that combined together give a good clinical estimate. But the ruling infectionist cast choose to use only the PCR declaring that rapid tests are of bad quality. Bad quality with accuracy above 90%! Not to mention the cost, the time and the lab equipment required.
3. Six months in a pandemic were enough to prove the complete absence of EU solidarity. It started during the peak of the pandemic in Europe and continued in the latest meeting of the heads of states in order to decide how they will fund those that lockdowns greatly affected their economies. There is no point to remind the meaning of the word "union" and why the EU is only an ambitious logo introduced by those who want to rule all others – three times in a row!
4. Why people behave the way they do during a pandemic? Why they have to be persuaded by words and fines that they have to do certain simple things like wash their hands, use a mask in crowded environments, keep a distance? Why partying is more important than life – own and those of others?



HZS C²BRNE DIARY – July 2020

5. Last but not least, how long the Western world will tolerate the bullying of a person who wants to be Caliph in the place of Caliph? How long EU will prefer business instead of solidarity? How long the mighty USA will play double games against a friend and ally country accepting, at the same time, to be humiliated by a non-Western country? How long NATO will be two-faced without applying the regulations provided in inter-nations frictions? How long a barbaric nation will attack the values of democracy, peace and religion of the Western world? How long a single person will threaten to turn our reality upside down?

The C²BRNE Diary is not the proper environment to comment on the provocative decision of President Erdogan to turn Hagia Sophia Orthodox Church to a mosque especially the Western world did not show that really care. I will only remind to Eurabia fellow citizens that Islam is not a religion but a way of life.

What to expect for August 2020? First of all, the promicing Oxford covid vaccine that is supposed to be ready and available (soon). Then, the second wave of the pandemic not because the virus is an invisible menace but because people choose to party instead of changing some of their habbits. And third, something really bad either in Libya, or in Greece or in Armenia. In that respect, first responders both medical and defense should be stand-by and ready to do what they know best – protect others at the cost of their own lives!

The Editor-in-Chief

Sivota, Evoia Island, Greece

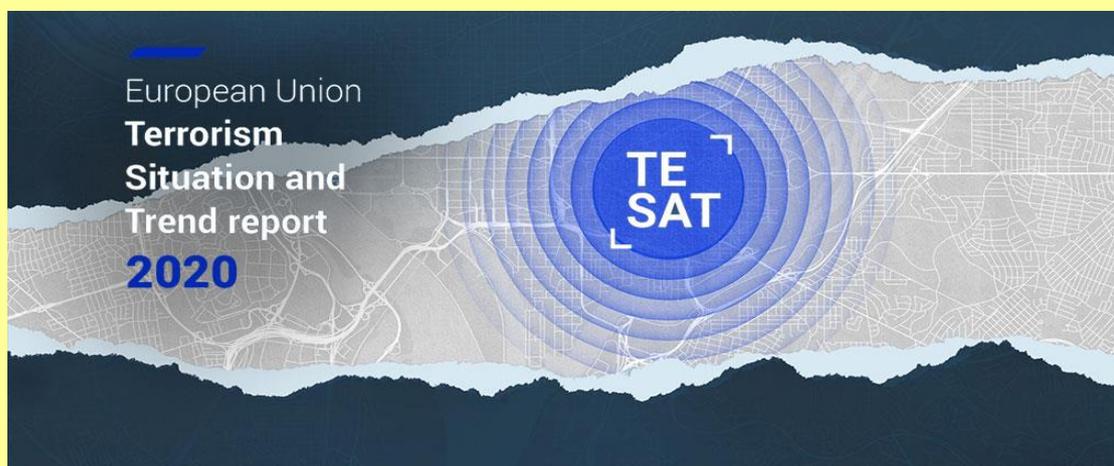


Terrorism in Europe is Geographically Widespread and Multifaceted

Source: <http://www.homelandsecuritynewswire.com/dr20200623-terrorism-in-europe-is-geographically-widespread-and-multifaceted>

June 23 – On Tuesday, Europol publishes the new [EU Terrorism Situation and Trend Report 2020](#), featuring facts, figures and trends regarding terrorist attacks and arrests in the EU in 2019.

Terrorists' ultimate goal is to undermine our societies and our democratic political systems. Terrorism generates fear, empowers political extremes and polarizes societies. [Europol's EU Terrorism Situation and Trend report \(TE-SAT\)](#), published today, pulls together facts and figures on terrorist attacks and arrests in the EU in 2019:



- ❖ A total of 119 foiled, failed and completed terrorist attacks were reported by a total of 13 EU Member States;
- ❖ 1,004 individuals were arrested on suspicion of terrorism-related offences in 19 EU Member States, with Belgium, France, Italy, Spain and the UK reporting the highest numbers;
- ❖ Ten people died because of terrorist attacks in the EU and 27 people were injured.
- ❖ Nearly all of deaths and 26 injuries were the result of jihadist attacks. One person was injured in a right-wing terrorist attack. In addition, several people were killed in right-wing extremist attacks. The number of jihadist attacks continued to see a decrease – meanwhile, right-wing attacks and, in particular, left-wing attacks saw an increase during 2019.

Right-Wing Terrorism: Online Communication Was Observed to Strengthen International Links Between Right-Wing Extremists

After a decline in reported attacks in 2018, in 2019 three EU Member States reported a total of six right-wing terrorist attacks (one completed, one failed, four foiled), compared to only one in 2018. Additionally, several attacks not classified as terrorism under national law committed by right-wing extremists were reported by Germany and claimed the lives of three people. Furthermore, last year right-wing attacks in Christchurch (New Zealand), Poway (USA), El Paso (U.S.), Bærum (Norway) and Halle (Germany) were part of a wave of violent incidents worldwide, the perpetrators of which were part of similar transnational online communities and took inspiration from one another. Violent right-wing extremists maintain international links, for example through participation in concerts and rallies marking historical events in a variety of EU Member States. Right-wing extremist ideology is not uniform and is fed from different sub-currents, united in their rejection of diversity and minority rights. One element of violent right-wing ideology is the belief in the superiority of the “white race,” which will have to fight a “race war.” Right-wing extremists deem this confrontation unavoidable to stop the alleged conspiracy by the ‘system’ to replace white populations through mass immigration.

Jihadist Terrorism: The Situation in Conflict Areas Outside Europe Continued to Impact the Terrorism Situation in Europe

The so-called Islamic State (IS) lost its last territorial enclave in Syria, but transformed into an underground insurgency in Syria and Iraq and maintained its global network of affiliates. Hundreds of European citizens with links to IS remained in Iraq and Syria. Al-Qaeda again displayed its intent and ambition to strike Western targets, while its regional affiliates aim to integrate and coordinate populations and armed factions in conflict areas. Last year, eight EU Member States were hit by jihadist terrorist attacks.

Left-Wing and Anarchist Terrorism: Greece, Italy, and Spain Continued to Be the Epicenter for These Attacks

The number of left-wing and anarchist terrorist attacks in 2019 (26) reached the level of 2016 and 2017 after a decrease in 2018. All attacks took place in Greece, Italy or Spain. The number of arrests on suspicion of left-wing or anarchist terrorism in 2019 more than tripled,



compared to previous years: from 34 in 2018 to 111 in 2019, due to a sharp increase in Italy. Private enterprises along with critical infrastructure and public/governmental institutions were among the most frequent targets for left-wing and anarchist terrorists and extremists. Violent left-wing and anarchist extremists continued to pose a threat to public order in a number of EU Member States. Support for Kurdish populations in Syria remained a central topic, and left-wing extremists and anarchists are believed to have travelled to join Kurdish militias in north-eastern Syria.

How Was Terrorism Funded Last Year?

In 2019, several cases of funding the return of foreign terrorist fighters (FTFs) were observed. FTFs in conflict zones continued to seek financial support from people in Europe for the purpose of covering their expenses or even arranging their return back to Europe. Funding for terrorist groups outside Europe decreased compared to previous years, likely as a result of reduced opportunities for transferring funds to IS. Funds are transferred outside Europe mainly through cash, money services businesses or underground banking, such as *hawala*, and through combinations of these methods. The abuse of virtual currencies, although promoted by some terrorist groups, has been observed mainly to cover expenses of individuals or small cells.

Extremist groups in Europe mainly receive funds from their base of supporters. Right-wing extremists, for example, continued to use a mix of traditional and innovative methods to finance their activities in 2019. Right-wing extremist groups collect fees from members and donations from supporters and sympathizers, via bank accounts, in cash during concerts or, rarely, through the production and distribution of propaganda material.

p.21 (in the report): During 2019, a pro-IS group launched a campaign via a cloud-based instant messaging service promoting the use of biological weapons. Some of the content provided instructions on how to produce biological weapons and suggested how and where to deploy them.

The Methods: Firearms and Explosives

The use of firearms and explosives continued to prevail in ethno-nationalist and separatist terrorist attacks and violent attacks inspired by right-wing ideology. Right-wing extremists and terrorists appeared to be increasingly interested in acquiring knowledge regarding the use of explosives. The explosive devices used in left-wing and anarchist extremist attacks were made from an array of readily available materials.

On the other hand, jihadist terrorists were also observed to show a growing interest in the use of firearms and explosives in addition to bladed weapons. Homemade explosives continued to be used in most of the explosive-related cases suspected of being linked to jihadist terrorism. Knowledge on how to make HMEs was for the most part transferred or facilitated online, including via encrypted cloud-based instant messaging services and social networking sites.

In the EU, there is little evidence to suggest that a nexus between organized crime and terrorism exists on a systematic and formalized basis. However, there are indications of a transaction-based convergence of low-level criminals and extremists, who frequently overlap socially in marginalized areas.

Terrorist Propaganda Continued to Be Produced in 2019

Both jihadist and right-wing extremist propaganda incite individuals to perpetrate acts of violence autonomously and praise perpetrators as 'martyrs' or 'saints', respectively. The impact of official IS media decreased, in terms of volume, content, potency and immediacy, following the loss of most of its territory, media production facilities and personnel. Nevertheless, content supporting IS and containing threats continued to be produced by online supporters of the group under a variety of self-styled online propaganda outlets. Such supporter-generated content and recycled material was continuously disseminated in 2019, thereby partially supplementing the decreased production capacity of official IS media. The measures taken by social media platforms to counter the spread of terrorist propaganda led some groups, to return to 'traditional' ways of online communication, including websites and news portals. Suspects arrested for terrorist propaganda in Europe sometimes had a long involvement in jihadist activities.

Europol has produced the TE-SAT, the EU Terrorism Situation and Trend Report, since 2007. [The European Counter Terrorism Centre \(ECTC\)](#) was established in early 2016 introducing policy and organizational coherence to Europol's support to the EU Member States' fight against terrorism. Europol acts as a central hub of expertise working to provide an effective response to terrorism.



COVID-19 and terrorism: assessing the short-and long-term impacts

Source: <https://www.poolre.co.uk/wp-content/uploads/2020/05/COVID-19-and-Terrorism-report-V1.pdf>



Andrew Silke, Pool Re and Cranfield University's Professor of Terrorism Risk Management and Resilience assesses, in the attached report, the short- and long-term impacts and potential consequences of Covid 19 on terrorist actors, target types and methodologies. This article is very timely and worth digesting at a time when we are quite rightly focussed on the near-term issues and human and economic devastation being caused by this global pandemic. However, Pool Re's core purpose remains the provision of terrorism reinsurance and we need to continue to understand the contemporary terrorist threats as well as horizon scan the future landscape. Pool Re's strategic relationship with Cranfield University underpins the importance we

attach to collaborating with academia in understanding and mitigating against catastrophic perils.

Sudanese Asylum Seeker Shot Dead after Stabbing 6 in Glasgow, Scotland

Source: <http://www.homelandsecuritynewswire.com/dr20200626-sudanese-asylum-seeker-shot-dead-after-stabbing-6-in-glasgow-scotland>

June 26 – A Sudanese asylum seeker who stabbed six people in the Scottish city of Glasgow has been shot dead by police.

Local media said the knife attack unfolded in and around the Park Inn hotel on West George Street, in the heart of the city.

Police Scotland said a police officer was among six others injured.

"A man was shot by armed police and has died. Six other men are in hospital for treatment, including a 42-year-old police officer, who is in a critical but stable condition. The officer's family is aware," Assistant Chief Constable Steve Johnson, of Police Scotland said in a statement.

Johnson confirmed that the other five people were men aged 17, 18, 20, 38 and 53. He also said the incident is not being treated as terrorism.

A government source told the BBC that a total of three people had died, including the attacker

[The Times](#) reports that the hotel where the incident unfolded houses asylum seekers.

The suspect was an asylum seeker who went on a rampage after complaining about the hotel meals served to him during the COVID-19 pandemic. The knifeman had threatened violence against other refugees and complained he was "very hungry" in recent days after being re-housed in the hotel, an activist told [The Telegraph](#).

Johnson said earlier Friday that police are not looking for a second suspect in relation to the incident and that an police officer is receiving treatment in a hospital.

"We would urge the public not to speculate about this incident or share unconfirmed information on social media," he added.

Johnson said he wanted to "reassure the public that this is a contained incident and that the wider public is not at risk."

The Scottish Police Federation said it has notified the family of the stabbed officer.

British Prime Minister Boris Johnson said in a tweet that he was "deeply saddened" over the Glasgow incident and thanked all the emergency services at the scene.

Scottish First Minister Nicola Sturgeon said the reports were "truly dreadful" and that she was being updated. She said that the police is not treating the attack as a terrorist act.

Last week, three people were killed in the southern English town of Reading when a man wielding a 5-inch knife went on the rampage in a park. Police said they were treating that incident as terrorism.



injured



Ex-MP Fiona Onasanya attacks Kellogg's cereal box 'racism'

Source: <https://www.bbc.com/news/uk-england-cambridgeshire-53060894>



June 16 – An ex-MP has questioned breakfast foods giant Kellogg's over its use of a monkey and "white boys" on cereal boxes, suggesting it is racist.

Fiona Onasanya, who was jailed for lying to police about speeding, spoke about her concerns on Twitter.

"So, I was wondering why Rice Krispies have three white boys representing the brand and Coco Pops have a monkey?", the former Peterborough MP wrote.

Kellogg's said the company "stands in support of the black community". Ms Onasanya, who was expelled from the Labour Party and [lost her seat in Parliament in 2019](#), wrote on Twitter that she had emailed



Kellogg's about her concerns, but had not had a reply.

Tweeting to @KelloggsUK [which is not the official Twitter feed for the company] she wrote: "... As you are yet to reply to my email - Coco Pops and Rice Krispies have the same composition (except for the fact CP's are brown and chocolate flavoured) ... so I was wondering why Rice Krispies have three white boys representing the brand and Coco Pops have a monkey?"

Her tweet was widely ridiculed, with a number of people pointing out the "three white boys" were "elves".

One person tweeted: "Elves lives matter".

Another wrote: "I grew up with Coco Pops and Rice Krispies. I never once wondered that. Some of us can tell the real world from the imaginary one."

However, Ms Onasanya responded on Twitter: "Well, given John Harvey Kellogg co-founded the Race Betterment Foundation (the Foundation's main purpose was to study the cause of and cure for "race degeneracy"), it would be remiss of me not to ask..."

Kellogg's pointed out its founder was William Keith Kellogg, "who was a pioneer in employing women in the workplace and reaching across cultural boundaries".

In a statement the company said "We do not tolerate discrimination."

The monkey mascot was created in the 1980s "to highlight the playful personality of the brand", a spokeswoman said, adding it also had "tigers, giraffes, crocodiles, elves and a narwhal" on its cereal boxes.

Ms Onasanya was convicted of perverting the course of justice and was [jailed for three months in January 2019](#).

EDITOR'S COMMENT: Who am I to repeat Albert Einstein's quote about the universe? I can only remind to all of you that we are governed by those we deserve (and vote) ...

Pencil tattoos could be the most natural wearable sensors yet

Source: <https://newatlas.com/wearables/pencil-tattoos-natural-wearable-sensors/>

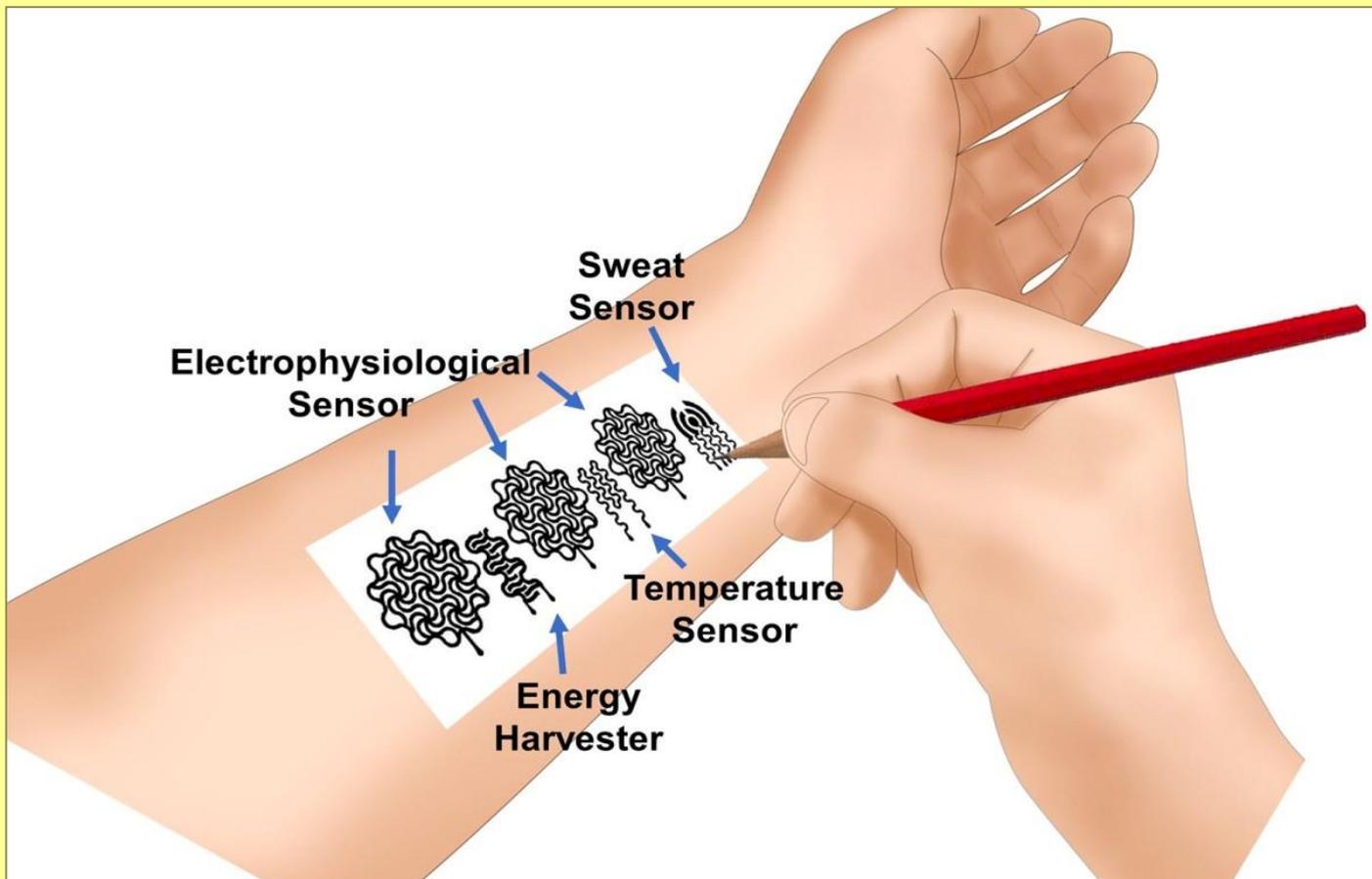
Applying the wearable sensors of the future could be as simple as sketching out a shape on your arm, according to new research that investigates the potential for bioelectronics to be applied through graphite pencil lead and ordinary office copy paper.

While the idea is still some way from being made into a practical reality, you can imagine the possibilities: drawing a shape on your arm to monitor your sleep overnight, or using a small sketch to keep tabs on your heart rate during the day.

The most important part of the setup is the pencil lead. The University of Missouri team behind the new study found that a 93-percent graphite mix was best for the job – the



patterns this pencil lead creates can then act as sensing electrodes picking up signals from the skin, with the paper given the role of a flexible, supporting substrate.



Some form of biocompatible spray-on adhesive, or another similar material or frame, could be used to keep the paper in place. When the sensor is no longer needed, pencil and paper are of course very biodegradable and easy to recycle – you could simply peel the sensor off like a plaster.

In testing, such a setup produced results and fidelity comparable to existing wearable sensors, the researchers claim. The whole setup is self-powered through the use of ambient humidity, though in its current form another device needs to be connected in order to read data from the sensors.

"The conventional approach for developing an on-skin biomedical electronic device is usually complex and often expensive to produce," says Asst. Prof. Zheng Yan. "In contrast, our approach is low-cost and very simple. We can make a similar device using widely available pencils and paper."

Potentially, the sensors could be used to measure skin temperatures, respiratory rates, sweat acidity, glucose levels, heart rates and more. Extra power or sensing capability can be added with extra sheets of paper.

As for the squiggly designs of the graphite electrodes, it helps to keep them functioning on the skin, which can curve and stretch. Through the course of the research, the scientists were able to come up with several working designs for sensors.

There's still plenty of work to do before you'll be replacing [your Fitbit](#) with something like this, but as a proof-of-concept it's impressive. The team intends to do further research with different biomedical components, and wants to add wireless capabilities too.

The beauty of the setup is in the simplicity – it can be applied quickly, using inexpensive and commonly available materials, in hospitals or in the home. If this ends up being the future of wearable sensors, remember where you heard it first.

►► A paper on the research was published in the journal [Proceedings of the National Academy of Sciences](#).



Perspectives on Terrorism Journal

Volume XIV, Issue 3 (June 2020)

Source: <https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2020/issue-3/vol-14-issue-3.pdf>

Special attention

[COVID-19 and Terrorism](#)

By Gary Ackerman and Hayley Peterson

The COVID-19 pandemic presents both challenges and opportunities for terrorists. While the hazards of the disease and disruptions to society inhibit some of their operations, by their very nature as asymmetric adversaries, terrorists tend to adapt quickly and exploit conditions of uncertainty and instability to further their goals. This Research Note provides a preliminary overview of how COVID-19 might affect the state of contemporary terrorism. In so doing, **it introduces and discusses 10 different ways that the pandemic could impact the terrorism landscape** in the short, medium and long term. These range from terrorists leveraging an increased susceptibility to radicalization and inciting a rise in anti-government attitudes, to engaging in pro-social activities and even reconsidering the utility of bioterrorism. Acknowledging the publication of this Research Note in the midst of the pandemic and its necessarily speculative nature in the absence of historical precedent, the discussion nonetheless seeks to draw attention to several possible pathways along which terrorism might evolve in response to COVID-19 and its attendant societal effects.

Gary A. Ackerman is Associate Professor of Emergency Preparedness, Homeland Security and Cybersecurity at the University at Albany (SUNY), where his research focuses on understanding how terrorists and other adversaries make tactical, operational, and strategic decisions, particularly with regard to innovating their use of weapons and tactics. Much of his work in this area is centered on the motivations and capabilities of non-state actors to acquire and use chemical, biological, radiological or nuclear weapons. In addition to his faculty position, he is Associate Dean for Research and Laboratory Development, and the founding director of the Center for Advanced Red Teaming (CART).

Hayley Peterson is currently a graduate student at the University at Albany (SUNY), where she is obtaining a Master of Business Administration (MBA). She serves as a Research Assistant for the Center for Advanced Red Teaming and recently graduated with a Bachelor of Arts in Emergency Preparedness, Homeland Security, and Cybersecurity. Her research interests include red teaming, national security, military and defense policy, and weapons of mass destruction.

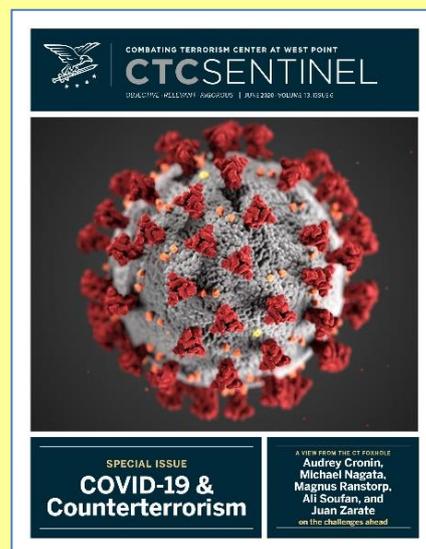
CTCSentinel Journal

Combating Terrorism Center @ West Point

Vol 13 (6); June 2020 | Special issue: Covid-19 and terrorism

Source: <https://ctc.usma.edu/wp-content/uploads/2020/06/CTC-SENTINEL-062020.pdf>

COVID-19 is arguably the biggest crisis the planet has faced since the Second World War and will likely have significant impacts on international security in ways which can and cannot be anticipated. For this special issue on COVID-19 and counterterrorism, we convened five of the best and brightest thinkers in our field for a virtual roundtable on the challenges ahead. In the words of Magnus Ranstorp, “COVID-19 and extremism are the perfect storm.” According to another of the panelists, Lieutenant General (Ret) Michael Nagata, “the time has come to acknowledge the stark fact that despite enormous expenditures of blood/treasure to ‘kill, capture, arrest’ our way to strategic counterterrorism success, there are more terrorists globally today than on 9/11, and COVID-19 will probably lead to the creation of more.” Audrey Kurth Cronin put it this way: “COVID-19 is a boost to non-status quo actors of every type. Reactions to the pandemic—or more specifically, reactions to governments’ inability to respond to it effectively—are setting off many types of political violence, including riots, hate crimes, intercommunal tensions, and the rise of criminal governance. Terrorism is just one element of the growing political instability as people find themselves suffering economically, unable to recreate their pre-COVID lives.” The roundtable identified bioterrorism as a particular concern



moving forward, with Juan Zarate noting that “the severity and extreme disruption of a novel coronavirus will likely spur the imagination of the most creative and dangerous groups and individuals to reconsider bioterrorist attacks.” Ali Soufan warned that “although the barriers to entry for terrorists to get their hands on bio weapons remain high, they are gradually being lowered due to technological advances and the democratization of science.”

The special issue also features five articles. Audrey Alexander examines the security threat COVID-19 poses to the northern Syria detention camps holding Islamic State members, drawing on a wide range of source materials, including recent interviews she conducted with General Mazloum Abdi, the top commander of the SDF, and former U.S. CENTCOM Commander Joseph Votel. Chelsea Daymon and Meili Criezis untangle the pandemic narratives spun by Islamic State supporters online. Christopher Hockey and Michael Jones assess al-Shabaab’s response to the spread of COVID-19 in Somalia. Mark Dubowitz and Saeed Ghasseminejad document how the Iranian regime has spread disinformation relating to the pandemic. Finally, Nikita Malik discusses the overlaps between pandemic preparedness and countering terrorism from a U.K. perspective.

Italy seizes IS-made drugs worth one billion euros

Source: <https://www.wionews.com/world/italy-seizes-is-made-drugs-worth-one-billion-euros-309898>

July 01 – Italian police said Wednesday they had seized a **14-tonne** haul of amphetamines made by the Islamic State group in Syria, calling it the biggest seizure of such drugs in the world.

The drug, in the form of **around 84 million Captagon tablets hidden inside industrial goods within containers, was worth about one billion euros (\$1.12 billion)**, and intended to be sold on the European market “to finance terrorism,” the finance police of Naples said in a statement.



“We know that the Islamic State finances its terrorist activities mainly by trafficking drugs made in Syria which in the past few years has become the world’s largest producer of amphetamines,” the statement said.

Police said three suspect containers had arrived at the port of Salerno, just south of Naples, containing large cylindrical paper rolls for industrial use as well as industrial machinery.

Cutting open the paper rolls and metal gearwheels with chainsaws, police found them filled with tablets. Video images taken by police showed pills spilling out of the rolls and wheels as they were forced open.



"This is the largest seizure of amphetamines in the world," police said.

Jihad drug

Captagon, a brand name, was originally for medical use but illegal versions have been dubbed "the Jihad Drug" -- after being widely used by IS fighters in combat -- the police said.

Citing the US Drug Enforcement Administration (DEA), Naples police said IS "makes extensive use of it in all territories over which it exerts influence and where it controls the drug trade".

Once the plants are established, "it is easy for IS to produce large quantities also for the world market for synthetic drugs, in order to quickly accumulate substantial funding," the statement said.

The number of drugs seized were sufficient to satisfy the entire European market, police said, without providing a time frame.

A "consortium" of criminal groups was likely involved for the distribution of the drugs, including possibly many clans within the infamous Camorra of Naples, police said.

"The hypothesis is that during the lockdown... production and distribution of synthetic drugs in Europe has practically stopped," the statement said.

"Many smugglers, even in consortiums, have turned to Syria where production, however, does not seem to have slowed down."

From anti-vax to anti-mask: School districts brace for parent resistance

Source: <https://www.politico.com/states/california/story/2020/07/02/from-anti-vax-to-anti-mask-school-districts-brace-for-parent-resistance-1295968>

July 02 — California's anti-vaccine movement has a new target: masks.

The same parents who loudly opposed school vaccine requirements in Sacramento last year are turning their attention to mask recommendations that districts are considering as they figure out how to send kids back to the classroom in the middle of a pandemic. The anti-vaccine movement has seized on mask orders and stay-at-home restrictions as similar infringements on their bodily autonomy and constitutional rights. Those arguments could complicate matters when school returns in the fall, as activists become



a vocal force in opposing new mandates on student facial coverings and other preventative efforts.

"Anti-vaxxers are morphing into the anti-anything movement. It's clear to me that some of them are going to have their children show up to schools without masks to prove their point and poke the bear," California Assembly Education Chair Patrick O'Donnell (D-Long Beach) said in an interview. "I don't know what authority schools will have."

At a June legislative hearing in Sacramento on school reopening, parents wore shirts that said "Make pharma liable again" and "I don't want a flu shot!" They voiced concerns about unfounded impacts of masks on children being able to breathe and the potential for a Covid-19 vaccine requirement down the road.

Christina Hildebrand, president and founder of A Voice for Choice, a California organization that opposes childhood vaccine requirements, said parents are against mask rules in school because of potential for detrimental social-emotional and educational impacts, like an "ingrained fear of contagion" and an inability to socialize.

"Wearing an improperly worn cloth mask is likely to have little positive additional health impact on children vs. the detrimental social, emotional and potential health issues of wearing a mask for 7-8 hours a day," Hildebrand said in an email.

The coronavirus appears to have a lower rate of infection in children than adults, but much remains unknown about how children can spread the virus to others. Many child care centers that remained open at the height of the pandemic had [success with social distancing and mask use](#), with little to no reports of child-to-adult transmission.



The Centers for Disease Control and Prevention recommends cloth face coverings for children over 2 years old. As part of its [considerations for schools](#), the CDC says that face coverings should be worn by staff and students, particularly older students.

In California, Gov. Gavin Newsom has made masks a central part of the state's bid to keep the economy open, mandating facial coverings in most public settings in hopes of avoiding another statewide shutdown as infections continue to surge. But even he is undecided on mask requirements for school students.

The California Department of Public Health has said that teachers and school staff are required to adhere to Newsom's statewide mask order, but it's still up to local districts to enforce it for students. State officials have highly encouraged students to wear masks but have so far avoided requiring it, while superintendents clamor for clearer guidance to avoid being inundated with lawsuits. Newsom signaled last week that decision is still up in the air.

Anti-vaccine activists joined conservatives and small business owners in protests over stay-at-home orders designed to curb the spread of the virus. They have also been involved in the [harassment of public health officials](#) whose job is to enforce those orders. Despite no proof of any serious harm caused by masks for the general public, that narrative has continued in the form of arguments for constitutional rights across the nation. [Footage of a public hearing](#) regarding a mask mandate in Florida went viral last week after Palm Beach County residents argued that masks are "killing people."

Rupali Limaye, an associate scientist at the Johns Hopkins Bloomberg School of Public Health, said the anti-vaccine movement is growing and evolving in the pandemic, merging with outrage about government oversight because of mask mandates and quarantine orders.

"We hear this from these parents all the time — I know what's right for my kid, you do not. What we've seen is this idea that science is just another voice in the room," Limaye said. "Now, because of what's going on with Covid-19, unfortunately from a science perspective, their voices are getting stronger."

The anti-vaccine movement reached a crescendo in California last year after the state tightened its requirements for student enrollment by eliminating most medical exemptions. Lawmakers responded to a cottage industry of doctors who had been signing papers allowing families to avoid vaccines and still send their children to public schools.

The crackdown was championed by state Sen. Richard Pan, a Sacramento pediatrician who has led the fight for more state vaccination requirements. While many anti-vaccine protesters were peaceful, a handful turned aggressive. One shoved Pan on a street near the state Capitol, while another tossed a cup of menstrual blood onto the Senate floor on the last night of session. The moves were condemned by Democrats, as well as Republican lawmakers who opposed stricter vaccine requirements.

"Frankly, this is an ideology that's yielded by privilege and selfishness. What they're actually demanding is the privilege of getting other people sick," Pan said. "We don't have a vaccine, so they're opposing masks."

When most schools do reopen their doors, they will take daily temperature checks, increase cleaning and attempt to offer a hybrid model of in-person and distance learning to accommodate social distancing and smaller group sizes. That means parents with various concerns about the virus can likely opt to keep their children home if they are able to do so. But no one is expecting that process to go smoothly.

Mask opponents will fight efforts to force their children to wear face coverings at school, while mask-supporting parents concerned about exposure will make the opposite argument. And teachers unions across the country are demanding more personal protective equipment, voicing concerns about their own health and the potential for bringing home the disease.

School districts, which have to enforce mask rules, fear the potential for liability exposure no matter what they do.

Scott Hatfield, a high school science teacher in Fresno, is already preparing for how he will address a student that refuses to wear a mask in class. The issue has become so politicized that Hatfield compares it to battles with families over teaching evolution.

"It represents an area where they feel they have the power — they're the parent, they have the custodial rights," Hatfield said. "But we are a public government agency. We need to do these things. And if you have issue with that, I would encourage you to take that up outside the classroom and not pick a fight with your local school and teachers."

Illinois and Washington have announced that K-12 students must wear facial coverings when they return to class in the fall. But most states, including [Florida](#), North Carolina and [New Jersey](#), have recommended, but not required, masks in schools.

Unlike with vaccine regulations, schools won't be able to so easily check medical records prior to a student's enrollment. Instead, they will be faced with enforcing mask rules, all while teachers focus on catching students up on the learning lost since most campuses abruptly closed in March due to the pandemic.

"I've yet to hear of a teacher in America who wants to be a mask enforcer. The whole notion that any school district can really enforce masks, or even social distancing, I think people are not being realistic," said Charlie Wilson, president of the National School Boards Association. "The reality is that nobody knows what to do here, and the evidence of that is that governors in virtually every state are leaving it up to local districts."



Terrorism After the Pandemic

By Robin Simcox

Source: <https://foreignpolicy.com/2020/07/02/terrorism-after-the-pandemic/>

July 02 – “Europe has now become the epicenter of the pandemic,” Tedros Adhanom Ghebreyesus [declared](#) back in March. The warning from the head of the World Health Organization (WHO) was stark, but not all countries in the continent reacted with urgency. Some countries were yet to go into lockdown.

But an unlikely voice concurred with Tedros. The Islamic State’s al-Naba newsletter [warned](#) supporters not to set foot in the “land of the epidemic.” That might seem like good news, but there are already plenty of Islamic State supporters—and those animated by a broader jihadi ideology—already living in the continent. That means that the tempo of plots in Europe has remained relatively steady, even during the pandemic.

The most recent example occurred in the United Kingdom on June 20. Khairi Saadallah, who [arrived](#) from Libya as an asylum-seeker in 2012, targeted civilians relaxing in a park in Reading, Berkshire. Three people died and three more injured before Saadallah was restrained by a nearby police officer. Thames Valley Police [described](#) Saadallah’s attack as a “terrorist incident,” and the victims were all gay men, suggesting there was a [potential](#) homophobic element.

Following the attack, British Home Secretary Priti Patel [commented](#) that “it is clear that the threat posed by lone actors is growing.” A new report from Europol [confirmed](#) that “the greatest threat emanates from lone actors or small cells carrying out violence on their own accord without being directed by larger organisations.”

Indeed, radicalized individuals animated by a broader Islamist ideology show no sign of letting up or being deterred by the coronavirus. In addition to Saadallah, there have been at least six additional plots targeting Europe since WHO declared the COVID-19 outbreak a pandemic on March 11.

The first was actually not a lone attacker but a five-man Tajik cell based in Germany. All were allegedly members of the Islamic State and [received](#) instructions from terrorist planners in Syria and Afghanistan. The cell had acquired firearms and had scouted U.S. military bases in Germany as potential targets, along with an unnamed individual they deemed to be critical of Islam, before the authorities thwarted their suspected plans.

This is the most ambitious plot in Europe to be disrupted in the coronavirus era so far. Others were simpler, and some—like Saadallah’s—proved harder to stop.

Take the case of Abdallah Ahmed-Osman, who went on a stabbing rampage in Romans-sur-Isère, in southeastern France, in April. The attack led to two deaths and five injuries. He has since been [charged](#) in France with murder connected to a terrorist enterprise. Ahmed-Osman had [mentioned](#) to investigators that being confined to his studio apartment as a consequence of the lockdown in France was an aggravating factor in his decision to act. Ahmed-Osman struggled to cope with the isolation, and writings discovered at his home-made reference to no longer being able to “live in this land of disbelievers.”

That same month, a man identified in French media as “Youssef T.” injured two police officers in the Parisian suburb of Colombes via a vehicular attack. Prior to striking, Youssef T. [pledged](#) allegiance to Abu Walid al-Sahraoui, the Islamic State’s emir in the Greater Sahara. Days later, Danish authorities announced that there was “no doubt” that domestic intelligence services had [prevented](#) a newly arrested lone actor with a “militant Islamic motive” from carrying out an attack.

The next threat presented itself in Barcelona, where a joint U.S.-Moroccan-Spanish security operation led to the arrest of an Islamic State-linked Moroccan who was [suspected](#) of planning an attack. Then, shortly before Saadallah struck, a 14-year-old boy was [charged](#) with planning an Islamist attack in the United Kingdom.

These plots are noticeable for their simplicity and for being carried out by those seemingly planning to carry out their attack alone. That makes sense. It is already well established that such attacks require little planning and are extremely difficult to thwart. They’ve been the main mode of attack in the last five years: Muhaydin Mire [attempted](#) to behead a commuter at a London Tube station; Mahdi Mohamud [stabbed](#) two civilians and a police officer in Manchester; Usman Khan [stabbed](#) two people to death and injured three others on London Bridge before being disrupted by nearby civilians and then being shot and killed by the police; and Sudesh Amman [stabbed](#) two civilians in London before being shot and killed by the police.

In other words, it seems unlikely that the COVID-19 pandemic has changed the nature of terrorism in Europe. It does, however, present an opportunity for the acceleration of preexisting trends. For example, a recent report by the United Nations Security Council Counter-Terrorism Committee [warns](#) that “[t]he increase in the number of young people engaging in unsupervised Internet usage—particularly on gaming platforms—offers terrorist groups an opportunity to expose a greater number of people to their ideas.”



There are other potential negative consequences. For one, EU Counterterrorism Coordinator Gilles de Kerchove has [warned](#) of how extremists of all stripes could exploit the situation for their own ends: For example, the far-right might blame migrants or ethnic minorities for the spread of the virus. There has already been [reports](#) of an [increase](#) in hate incidents against East Asians. Or governments might be distracted from security issues, which would allow terrorists to regroup. The U.N. counterterrorism report assessed that “[s]ome Member States have already announced the reallocation of resources, including the withdrawal (or planned withdrawal) of foreign armed forces involved in operations against ISIL and Al-Qaida, and the relocation of armed forces to support domestic pandemic relief efforts.” For its part, the Islamic State was [reported](#) as having expressed its hope that with Western countries focused on the pandemic, they would now stop “meddling” in Muslim-related issues.

Yet it is also very possible that terrorism in Europe will continue to look broadly how it does currently. Flare-ups will occur from the far-left, far-right, and various other fringe ideologies. But the primary threat to life will continue to be from Islamists, who now have been targeting Europe with some determination and some success for a [quarter of a century](#). They had been doing so with such success that Europeans were being [warned](#) that terrorism was simply the “new normal” they would have to learn to live with.

Of course, the same has been [said](#) about the coronavirus. So as new coronavirus outbreaks [emerge](#) and fears of a second wave [persist](#), and with terrorism an enduring problem, Europeans will likely be asked to reconcile themselves to the specter of these two new normals grimly coexisting.

That is already a big ask for Europe, jolted as it has been in recent years by the eurozone crisis, a huge influx of asylum-seekers and economic migrants, and a string of electoral successes for nativist or populist political parties. Add in the post-lockdown economic catastrophe that is widely believed to be imminent, and the tensions that have been brought to bear by the killing of George Floyd in the United States, there is no guarantee that it stands ready to meet the challenge.

Robin Simcox is a counterterrorism analyst.

GW Launches ISIS Files Digital Repository

Source: <http://www.homelandsecuritynewswire.com/dr20200703-gw-launches-isis-files-digital-repository>

July 03 – The George Washington University on Monday launched its [ISIS Files repository](#). The virtual public repository features a selection of the 15,000 digitized pages from the documents collected in Iraq by *New York Times* journalist Rukmini Callimachi and a team of Iraqi translators. GW’s [Program on Extremism](#) formed a partnership with the *New York Times* [in 2018](#) to make these documents available to the public. The first collections released by GW focus on ISIS ideology and real estate and taxation.

The Program on Extremism worked with the *Times* and GW’s Libraries and Academic Innovation division to digitize, translate, and analyze the documents. They then were posted on a new website in their original form, accompanied by English translations. The website also includes an introduction and three reports which analyze and contextualize the documents on a specific topic, written by experts on extremism. GW said it will release future batches of documents in the coming months. Each batch will be accompanied by expert analysis.

The *Times* delivered the original documents to the Iraqi government through its embassy in Washington after the files were digitized. GW [says](#) that the ISIS Files project team, with funding from the Andrew W. Mellon Foundation, engaged in eighteen months of planning, research, and consultation with some 300 institutions and experts to craft an ethical foundation for this effort. The team did extensive work to preserve and present the information contained in the ISIS Files in an accurate and impartial manner. The GW project team redacted the documents to remove any personally identifiable information.

The resulting public repository serves as a record of genocide, to aid in a better understanding of one of most dangerous terrorist organizations in decades, providing a sense of how such an entity runs a state, and informing future policies to prevent the rise of the next Islamic State type of group.

“The launch of the ISIS Files repository is the result of a great spirit of collaboration between GW, The New York Times and the hundreds of experts who shared their wisdom and experience,” Geneva Henry, GW’s dean of Libraries and Academic Innovation, said. “The significant ethical considerations involved with creating public access to these documents called for a deep and critical engagement with many professions, a review of archival guidelines and, most notably, guidance from Iraqi citizens.”

“The ISIS Files pulls back the curtain on the inner workings and organization of one of the most violent terrorist organizations in recent history,” GW Vice President for Research Robert H. Miller said. “This public repository puts thousands of original documents at the fingertips of journalists, scholars and policymakers so they can tell a more complete history and formulate new and effective responses to extremism.”



To coincide with the 29 June launch of The ISIS Files website, the Program on Extremism organized an online public event. Discussing the significance of the files were the *New York Times*' Rukmini Callimachi, Program on Extremism director Lorenzo Vidino, Program senior research fellows Devorah Margolin and Hararo Ingram, ISIS Files fellows Aymenn Jawad al-Tamimi and Cole Bunzel, Mosul Eye founder and ISIS Files fellow Omar Mohammed, the Second Secretary of the Embassy of the Republic of Iraq in Washington, D.C. Safaa Yaseem, and Geneva Henry, the Dean of GW Libraries and Academic Innovation. A recording of the event can be found [here](#).

Using George Floyd Protests, al-Qaeda Makes Play for Christian Supporters



By Bridget Johnson

Source: <https://www.hstoday.us/subject-matter-areas/counterterrorism/using-george-floyd-protests-al-qaeda-makes-play-for-christian-supporters/>

July 07 – Al-Qaeda's general command is trying to take advantage of protests against the killing of George Floyd in a communique issued to a Western audience that encourages rebellion within the United States as the government is “subjugating and killing poor, impoverished Christians, the helpers of Jesus.”

The terror group released the four-page statement, “A Message for the Oppressed Masses in the West,” in English and Arabic, addressed to those “who have risen up in revolt in America” and other Western countries.

“We, like the rest of the world, witnessed the horrendous torture and suffering that George Floyd experienced at the hands of his arrogant killers before he breathed his last,” al-Qaeda said, adding the hashtag for George Floyd and his last words “I can’t breathe,” and calling the protests across the country “a matter of great satisfaction for us.”

The terror group added that from their “lofty standpoint” and “as a part of humanity that has for too long endured the oppression of a merciless, inhumane Western ruling elite,” protesters should “persist in your defiance.” They added that “the state of our nation today is no different from that of Jesus Christ,” and compared the U.S. government to the Roman Empire while invoking the crucifixion.

Then al-Qaeda shifts to the blame game as they try to use current events to woo followers. “Perhaps the heavy-handed treatment and repression that you are unfortunately experiencing today is the price of your deafening silence on the crimes and injustice of the leadership in your countries,” the terror group continues. “And as you sow, so shall you reap.”

They call for the overthrow of Western governments from within and warn that “Allah punishes those who fail to live up to their duty” to wage rebellion. They then quote Jesus from the Gospel of Matthew to underscore their claim and slam “specifically the Jews who rejected him,” adding, “It was Islam that affirmed the truth of the message of Christ.”

The al-Qaeda message then makes a pitch for Westerners to convert to Islam, as “we believe that the majority of the American people believe in the existence of the Almighty God” and “this is why we wish for them the best of both worlds,” aka national success and “deliverance in the Hereafter.”

The terror group calls for “all-out revolt” against the government and the “narrow class of capitalists and financiers that holds the reins of the global economy,” claiming that al-Qaeda’s war against the United States “is aimed at bringing an end to injustice and oppression” and is “similar to your reaction” against the killers of George Floyd.

Al-Qaeda has previously tried to capitalize upon protests that are based on goals of ending systemic racism and encouraging police reform. The summer 2015 issue of al-Qaeda in the Arabian Peninsula’s *Inspire* magazine tried to appeal to protesters in the African-American community in an article vowing to “take practical steps to avoid targeting you in our operations” if people of color would in turn fight the government and try to stop U.S. aid to Israel. In the piece tagged “The Blacks in America,” al-Qaeda featured a photo of Abraham Lincoln next to the headline, “The Rights of Blacks: Their State and Challenges.” The terror group also used Michael Brown’s high school graduation photo in the article, and talked about the in-custody death of Freddie Gray in Baltimore and the Charleston church massacre. Brown had been shot by police in Ferguson, Mo., the previous year.

Al-Qaeda said they sympathized with “the oppression and injustices directed towards you” but insisted they were still justified killing blacks in terror attacks: “We advise you to move out of big cities that represent the economy, politics or military strength of America like New York and Washington.” The article then encouraged revolt starting with demonstrations and the “second approach” of “forming small groups that will be responsible for assassinating, targeting these racist politicians.” The terror group said they would “bring to your military consultation” via the magazine, as “one may refer back to the previous issues to find appropriate military ideas.”

Al-Qaeda isn’t the only group to attempt to capitalize on officer-involved shootings, though: the Ferguson shooting and subsequent protests unfolded soon after the declaration of the



HZS C²BRNE DIARY – July 2020

caliphate, and as ISIS carved out its online operations relying on adherents who to this day push messaging and conduct recruitment on social media they [hijacked hashtags](#) being used by activists tweeting about the shooting. “Hey blacks, ISIS will save you,” said one tweet, while another vowed to “send u soldiers that don’t sleep” if protesters vowed allegiance to ISIS; another message that circulated online “From #IS 2 Ferguson” said that “we heard your call, we are ready to respond.” And a nearly hourlong 2016 Al-Shabaab video tried to convince African-Americans to come join their ranks and flee “racial profiling and police brutality” in the United States.

Pro-Islamic State Media and the Coronavirus

Although the coronavirus (COVID-19) pandemic brought much of the world to a stand-still, the internet has allowed people to remain virtually connected and updated on the latest COVID-19-related news, including violent extremist groups and terrorist organizations. In the case of the Islamic State, unofficial media networks, consisting of decentralized Islamic State supporters online, have produced a wide range of responses to the pandemic. Documenting these narratives offers insights into how a decentralized media ecosystem allows space for supporters to converge and diverge from the viewpoints presented in official propaganda, tailor messages for a global audience, boost morale among supporters, and utilize the momentum of a catastrophic event to expand upon carefully shaped narratives previously developed by the terrorist organization.

The authors’ dataset identified 11 themes and narratives in online Islamic State supporter content, which provides a framework for closer analysis on how Islamic State supporters are reacting to COVID-19. The authors argue that Islamic State supporters are essential elements in the Islamic State’s messaging, helping shape narratives and ideals among the broader Islamic State community. During a global pandemic, this serves a number of purposes, such as developing a stronger sense of community; maintaining and shaping in-groups, out-groups, and notions of the “other;” supporting and advising; and offering opportunities to express anger, fear, and antipathy in an uncertain world. This article provides a detailed explanation of the themes and narratives found in the dataset, offering a comprehensive overview of pro-Islamic State unofficial media responses to the coronavirus. Although a number of official Islamic State media products—including issues of its Al Naba newsletter and an audio message from May 28, 2020, by the Islamic State’s official spokesman, Abu Hamza al-Qurashi¹—make references to the virus, understanding what the Islamic State’s central media is saying about COVID-19 is important; knowing what the group’s wider community is saying may be even more so.

Bridget Johnson is the Managing Editor for Homeland Security Today.

BLM Leader Yusra Khogali: ‘White People Are Genetic Defects’

Source: <https://clarionproject.org/blm-leader-yusra-khogali-white-people-genetic-defects/>



EDITOR’S COMMENT: Do NOT panic! It has not been proven so far!

A North Korean law

If an individual commits a crime and get caught, automatically his/her family is equally procecuted!

Drivers Are Hitting Protesters as Memes of Car Attacks Spread

Source: <http://www.homelandsecuritynewswire.com/dr20200709-drivers-are-hitting-protesters-as-memes-of-car-attacks-spread>

July 09 – *The latest vehicular attack incident took place in Seattle on Saturday, when 27-year old Dawit Kelete drove his vehicle at a high rate of speed toward a group of protesters, killing one of them and injuring another. On Wednesday, Kelete was charged with vehicular homicide, vehicular assault, and reckless driving. His bail was set at \$1.2 million.*



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The motive of Kelete, who was born in Eritrea and is a naturalized U.S. citizen, is not clear, but prosecutors said Kelete's actions indicate he intended to kill protesters. To get to section of the interstate highway (I-5) where the protesters were standing, Kelete drove the wrong way on the Stewart Street off-ramp to enter the interstate, which had been partially shut down in response to protesters. He could not get on the highway on the on-ramp because the on-ramp was closed by the police to prevent vehicles from getting on I-5. After he got on the highway, he swerved around three police vehicles positioned as a barrier to protect protesters across the I-5 lanes. He "continued driving at freeway speeds on the shoulder," passing the barricade of cars, the prosecutor's office [said](#). "Before him were running pedestrians," and Mr. Kelete "veered sharply left and directly into" two demonstrators "who were not able to run off the road," the prosecutor's office said.

The police said that tests show that Kelete was not impaired by drugs or alcohol during the incident.

Dozens of vehicular attacks on racial justice protesters have occurred across the United States in recent weeks, although it is difficult to assess which attacks were premeditated and driven by far-right ideology, and which attacks were prompted by "road rage," when drivers find their route blocked by crowd of protesters. Neil MacFarquhar writes in the [New York Times](#) that the tactic of vehicular attacks has previously been used mostly by extremist jihadist groups like ISIS and Al Qaeda, and is currently being used regularly by Palestinian militants against both Israeli security forces and Jewish settlers in the territory Israel occupied in 1967

"It is not just an extremist thing here, but there are social media circles online where people are sharing these and joking about them because they disagree with the protests and their methods," [Ari E. Weil](#), the deputy research director at the [Chicago Project on Security and Threats](#) of the University of Chicago, told MacFarquhar. "Sharing memes and joking about running over people can lead to real danger."

There have been at least 66 car attacks nationwide since George Floyd was killed by a Minneapolis policeman on 25 May, Weil said. MacFarquhar adds:

Supporters of far-right organizations — as well as the occasional government official or law enforcement officer — have been circulating memes and slogans online encouraging such attacks.

....

Vehicular attacks have proliferated in recent weeks. Experts believe it is because of the combination of widespread protests across the country and the circulation of dangerous memes among extremist groups about running over pedestrians.

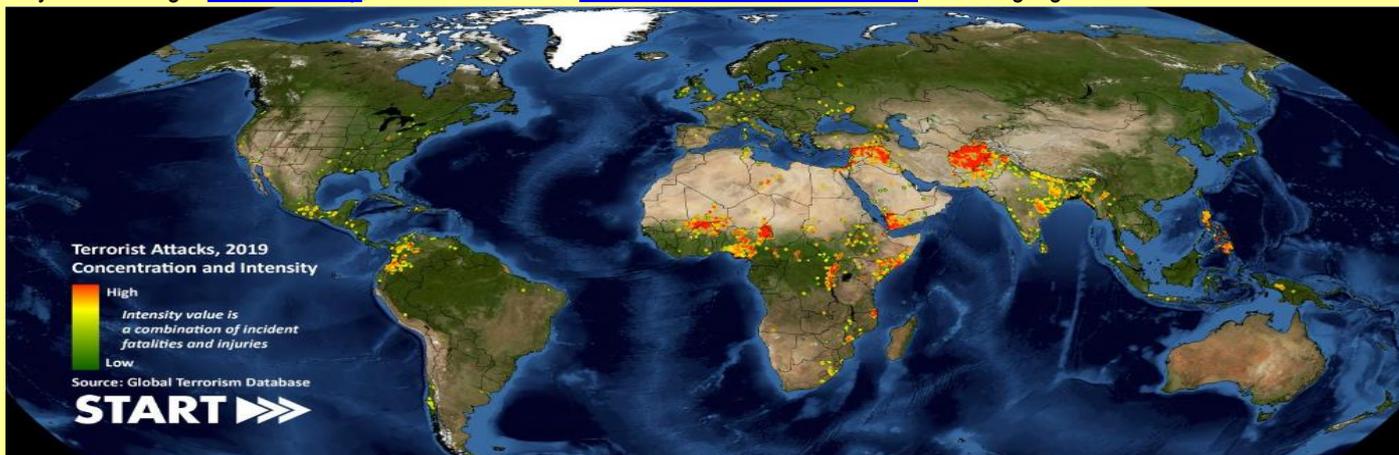
"There has been an increasing amount of propaganda online calling for vehicular attacks on protesters, targeting the Black Lives Matter movement in particular," said Josh Lipowsky, a senior researcher at the Counter Extremism Project. "It is being used as a form of intimidation against them to get them to halt their protests."

Attacks with vehicles are easy to conduct, he said, because they do not require a lot of planning or financial resources.

2019: Global Terrorism Overview

Source: https://www.start.umd.edu/pubs/START_GTD_GlobalTerrorismOverview2019_July2020.pdf

July 09 – During a [webinar 9 July](#), START released a [new Global Terrorism Overview](#) which highlights trends in worldwide terrorism



in 2019. In 2019, there were nearly 8,500 terrorist attacks around the world, which killed more than 20,300 people, including 5,460 perpetrators and 14,840 victims. 2019 was the

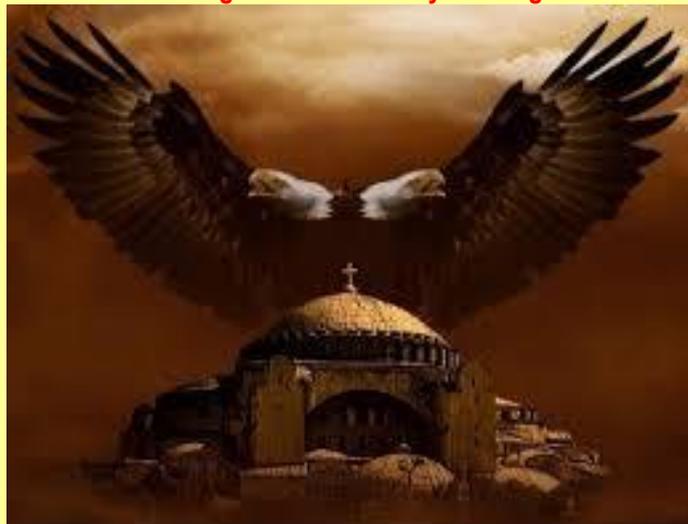


fifth consecutive year of declining global terrorism since terrorist violence peaked in 2014 at nearly 17,000 attacks and more than 44,000 total deaths. The total number of terrorist attacks worldwide decreased 50 percent between 2014 and 2019, and the total number of deaths decreased 54 percent.

Turkish Court Rules to Let Iconic Hagia Sophia a former cathedral to Return as Mosque

Source: <https://www.news18.com/news/world/turkish-court-rules-to-let-iconic-hagia-sophia-return-as-mosque-2710547.html>

July 10 – **The Council of State threw its weight behind a petition brought by a religious group and annulled a 1934 cabinet decision that changed the 6th century building into a museum**



Turkey's highest administrative court issued a ruling Friday that paves the way for the government to convert Istanbul's iconic Hagia Sophia - a former cathedral-turned-mosque that now serves as a museum - back into a Muslim house of worship.

Φρίξον ήλιε, στέναξον γη, εάλω η Πόλις, εάλω η Πόλις!

The Council of State threw its weight behind a petition brought by a religious group and annulled a 1934 cabinet decision that changed the 6th century building into a museum. The ruling allows the government to restore the Hagia Sophia's previous status as a mosque.

The decision was in line with the Turkish president's calls to turn the hugely symbolic world heritage site into a mosque despite widespread international criticism, including from the United States and Orthodox Christian leaders.

The decision could deepen tensions with neighboring Greece, which also called on Turkey to maintain the structure's status as a museum.

The religious group had contested the legality of the 1934 decision by the modern Turkish republic's secular government ministers and argued that the building was the personal property of Ottoman Sultan Mehmet II, who conquered Istanbul in 1453.

Hagia Sophia and Turkey's Supremacism

By Burak Bekdil

Source: <https://www.meforum.org/61266/hagia-sophia-and-turkey-supremacism>

July 14 - According to his fans and [political allies](#), Turkey's Islamist president, Recep Tayyip Erdoğan, conquered Istanbul for the second time when he signed a decree to convert the monumental Hagia Sophia cathedral in Istanbul, built in 537, into a mosque. With that logic, he became the first statesman who conquered a city that already belongs to his country.

"First, you should fill Sultanahmet (Blue Mosque, Istanbul) ... This is a plot, this is sheer provocation," Erdoğan [told](#) a crowd as recently as in March 2019 when party fans demanded the conversion of Hagia Sophia into a mosque. He was right. Most of Istanbul's nearly 3,000 mosques (one mosque per 5,000 population) do not attract crowds. Sixteen months later, Erdoğan changed his mind. In this theater-like play, he said the supreme court would decide on the fate of Hagia Sophia. Under a constitutional amendment in 2010, Erdoğan won the authority to appoint all members of that court, the Council of State. Erdoğan said he would respect the court's verdict in "whichever direction it comes."

And, unsurprisingly, the verdict came in the direction Erdoğan wanted: On July 9, the Council of State decided to void a cabinet decision, signed in 1934 by Mustafa Kemal Atatürk, the founder of modern Turkey, designating Hagia Sophia as a museum, in a show of respect for Christianity. Only an hour after the verdict was announced, Erdoğan signed a decree for the conversion into a mosque of the monument on UNESCO's World Heritage List.



Hagia Sophia Timeline

- 537: Byzantine Emperor Justinian I build Hagia Sophia as a cathedral in then Constantinople.
- 1453: Ottoman Sultan Mehmet II (Mehmet the Conqueror) converts Hagia Sophia into a mosque after taking Constantinople from the Byzantines.
- 1453-1934: Hagia Sophia remains a mosque.
- June 7, 1931: The cabinet of the infant Turkish Republic signs a decree for the restoration of priceless mosaic frescoes at Hagia Sophia. The decree gave the job to Thomas Whittemore, an American Byzantine specialist.
- Aug. 25, 1934: Turkish Education Minister Abidin Özmen writes a letter to Prime Minister İsmet İnönü to inform him that he had received a verbal order from Atatürk for the conversion of Hagia Sophia into a museum.
- Nov. 24, 1934: The Turkish cabinet signs a decree that "un-mosques" Hagia Sophia.
- 1980: Turkish Prime Minister Süleyman Demirel allows Muslim prayers at an annex of Hagia Sophia.
- [1981](#): The military junta bans Muslim prayers at Hagia Sophia.
- [1991](#): Prime Minister Süleyman Demirel re-opens the annex to Muslim prayers.
- 2005-2020: The Council of State rejects three applications for the conversion of Hagia Sophia into a mosque.
- July 9, 2020: The Council of State rules in favor of the fourth application to make Hagia Sophia a mosque.
- July 24, 2020: Hagia Sophia will open as a mosque, with a Greek name and Orthodox frescoes on its walls.

Erdoğan comes from the ranks of political Islam, which made its debut in Turkey in the late 1960s – and was not then on the global radar. In the 1970s, Islamists of all flavors, including Erdoğan's mentor, Turkey's first Islamist prime minister, Necmettin Erbakan, made the "Hagia Sophia Mosque" a symbol of the completion of Istanbul's conquest. The iconic church also became a symbol in the Islamists' fight against Atatürk's secularism.

Erdoğan possibly thought the move could reverse the ongoing erosion of his popularity.

Why now? Erdoğan possibly thought the move could reverse the ongoing erosion of his popularity due, among others, to a looming economic crisis. All the same, it appears to be wrongly timed, as presidential and

parliamentary elections are three years from now and Turks are notorious for not having a good memory. Praying at the Hagia Sophia Mosque will not turn a hungry man into a happy man.

The conversion of Hagia Sophia into a mosque has once again underlined the insane racism of the majority in Turkey against the sanity of a dwindling minority.

One Muslim theologian, Cemil Kılıç, [argued](#) against the decision: "This is against the Quranic commandments," he said. "Prophet Mohammed never converted a Jewish or Christian house of prayer into a mosque."

His voice came against an abundance of racist comments on [social media](#):

- "Jewish and Christian bastards will now understand who we are."
- "Erdoğan is correcting what Jewish, Shabbetaist (Jews who converted to Islam), atheist crowds have done in the past century."
- "You Jews, are you having fun?"
- "Day of mourning for Crusaders and Jewish converts."
- "Cry, you Greeks! And wait for your turn, you Jews!"
- "Sad day for Zionists."
- "A Shabbetaist Jew from Thessaloniki [Ataturk, born in Thessaloniki] closed it [to Muslim prayers] and man from Black Sea (Erdogan) opened it."
- "You Jewish dogs, it will come to Al-Aqsa Mosque [in Jerusalem] too."

This much of national sentiment reflects sheer ignorance, a hatred for "the religious other," a self-isolationist thinking and a century-long desire to challenge all things non-Turkish, with an emphasis on "the Jew." An Islamist leader decides to convert a monumental cathedral into a mosque, and his fans are spilling out hatred against Jews. This is Turkey's new normal.

Turkey: How Erdoğan's Migrant Blackmail Failed

By Burak Bekdil

Source: <https://www.meforum.org/61260/turkey-how-erdogan-migrant-blackmail-failed>

July 10 – Greece has finally done the right thing and deprived Turkish President Recep Tayyip Erdoğan of his perpetual threats to blackmail the European Union.



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On February 27, Erdoğan's government was on the threshold of executing its threat to flood Europe with millions of (mostly Syrian) migrants and opening its northwestern borders with Greece and Bulgaria. Hundreds of thousands of migrants began flocking to the border. In a few days, by the beginning of March, they would be in EU territory, to be followed by hundreds of thousands of others. Things, however, did not go as planned by Ankara.



Illegal immigrants in Turkey throw rocks at a Greek firetruck after setting a fire at the Pazarkulke Border crossing on March 6, 2020. (Chris McGrath/Getty)

By the next day, Greece was not only operating 52 Navy ships to guard its islands close to Turkey; it had also mobilized additional troops on land. Its security forces were able to block 10,000 migrants from entering Greece by way of the Turkish land border. Some migrants were stuck in the no-man's land between the two countries and eventually had to return to the Turkish side. Greek officials reported only 76 illegal entries, whom they detained and prosecuted. In his social media

account, Turkey's Deputy Foreign Minister Yavuz Selim Kiran compared the alleged treatment of migrants seeking to cross illegally into Greece with conditions at Nazi death camps at Auschwitz. The Central Board of Jewish Communities in Greece immediately condemned and denounced the statement.

All the same, on March 6, Turkish Interior Minister Süleyman Soylu claimed that a total of 142,175 migrants had successfully crossed the border into Greece. In reality, the border had been meticulously protected by Greek security; only a handful of migrants had illegally managed to get through. In a private conversation, a UNHCR official mocked the minister: "Two questions to Minister Soylu: How did he count the number of entries into Greece? And how did those 142,175 people vanish; they are not in Greece?"

The Greek government, rallying EU support, has since deployed riot police and military patrols to the land border as well as naval and coast guard vessels to conduct around-the-clock patrols off the Greek coast near Turkey. The Greek government also scrambled to seal the land border, tripling the size of an existing 12-kilometer fence, including the addition of pylons with thermal and surveillance cameras.

Tassos Hadjivassiliou, a conservative member of Greek parliament, said: "Once this fence goes up, Turkey will be severely compromised in its ability to push through migrants. And if that happens, then Ankara will have lost its most powerful tool of leverage against Europe ... and its chances, therefore, of clinching a new deal with Brussels, plus added financial support will fade."

Eventually, at the end of March, Turkish authorities had to withdraw the remaining migrants that were amassed at the border. In May, nevertheless, Turkish Foreign Minister Mevlüt Çavuşoğlu said that Turkey's "open-gate" policy would continue, and suggested that migrants and refugees would shortly return to the frontier as the two countries emerge from coronavirus lockdowns. In early June, there were reports that illegal immigrants were seen arriving by buses to the Turkish city of Edirne and the border town of Ipsala. Also, in June, a video released by Greece's coast guard, showed Turkish coast guard vessels escorting dinghies carrying refugees and migrants arriving in Greek territorial waters.

Many migrants have learned from experience that the Turkish-Greek border cannot easily be crossed.

prepared to confront a new wave of migrants. And third, because it will be a much easier task to block a few thousand than the hundreds of thousands in March.

As Margaritis Schinas, European Commission's vice president, said: "Events on the Greek-Turkish border in the Evros region showed that Ankara does not have the power to exploit refugees to get its way politically."

There has not been a new wave of refugee flow to the islands since the Evros crisis in late February. There are two reasons to explain why: 1- Around-the-clock patrols by the Greek Coast Guard, assisted also by the EU's border control agency, Frontex; and 2-

The new blackmail will not work for a number of reasons. First, because many migrants in Turkey have learned from experience that the Turkish-Greek border can no longer easily be crossed. And second, because the Greek security forces are now better equipped and better

Greek security forces are now better prepared to confront a new wave of migrants.



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An informal communications network among potential migrants in Turkey that has spread the word "sea borders are difficult, so don't try." This author has witnessed scores of calls and messages going to Syrian migrants in Turkey from the Greek island of Lesbos. It is always physically possible for the Greek government to minimize, if not altogether stop, illegal migrants arriving at the islands by a number of means. This is not always too easy and can be an expensive task. Hence a need for EU's help. Naval blockades around four "primary target islands" (Lesvos, Chios, Samos, Kos) would help minimize illegal arrivals though they will not altogether stop them. Here, one problem comes from within the EU -- the "EU rules" that dictate Greece "not to push back illegal migrants." In July, the EU [called](#) on Greece to investigate violent pushbacks of refugees by its security forces once they have entered Greek territory. The EU should not discourage Greece to fight illegal migration. On the contrary, it should help Greece fight illegal migration.

Burak Bekdil is an Ankara-based political analyst and a fellow at the Middle East Forum.

EDITOR'S COMMENT: I follow Burak Bekdil for some years and I always wonder how comes he is still out of prison!

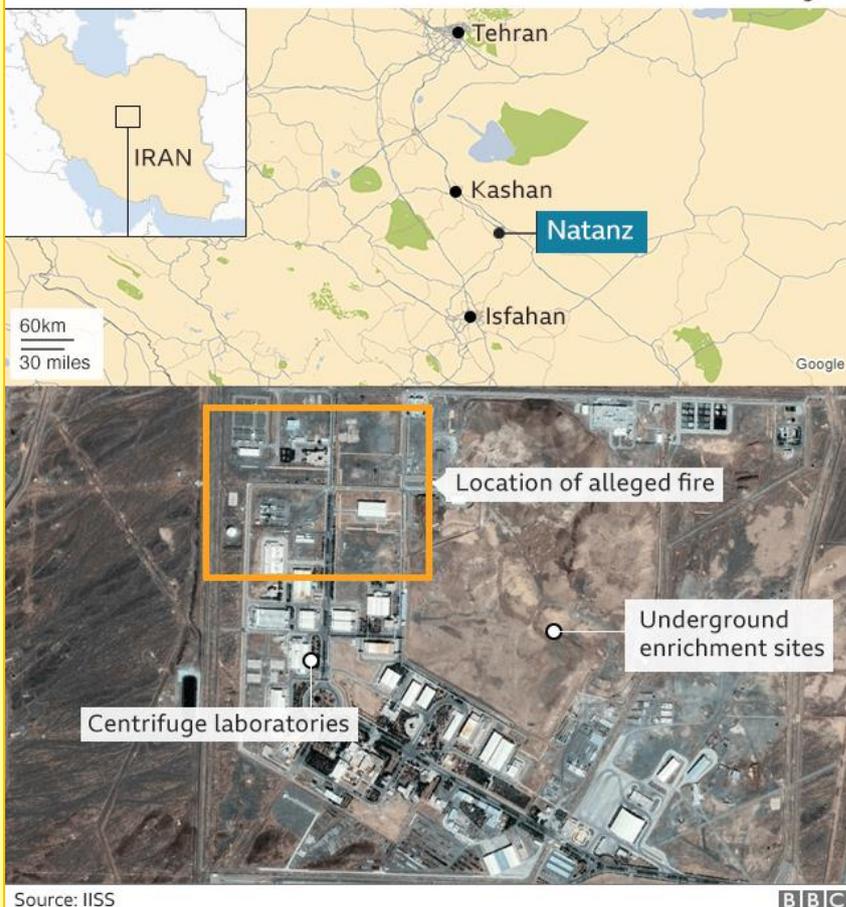
A series of unusual events in Iran point to sabotage. How will Tehran respond?

By Borzou Daragahi

Source: <https://www.atlanticcouncil.org/blogs/iransource/a-series-of-unusual-events-in-iran-point-to-sabotage-how-will-tehran-respond/>

July 10 – A firefighter helps an injured woman at the site of an explosion at a medical clinic in the north of the Iranian capital Tehran, Iran, June 30, 2020. Tasnim News Agency/Handout via REUTERS

Incident at Natanz uranium enrichment facility



Something strange has been happening in Iran. A spate of explosions has struck highly secure and sensitive sites, as well as regular industrial locales, including factories and gas pipelines, and even a clinic in a fancy part of north Tehran.

On July 2, an explosion and fire struck the most crucial target yet—a Natanz nuclear facility workshop, with even Iran admitting that the destruction had caused a major setback. The workshop is used to design and assemble advanced centrifuges, which is essential for enriching uranium for possible industrial and military uses. *The New York Times* [cited](#) an unnamed Middle Eastern intelligence official saying that Israel was behind the bombing. Asked about the fire, Israeli defense minister Benny Gantz [said](#), "Not every incident that transpires in Iran necessarily has something to do with us."

In addition to the industrial accidents, Iran has [recorded](#) hundreds brush fires and wildfires this year, a large number that has led some to conclude that at least a portion of those were caused by arson. "In our view, a percentage of these fires is intentional," Colonel Ali Abbasnejad, commander of Iran's park rangers, said in June, according to local media.

Admittedly, Iran's infrastructure is in bad shape and accidents happen. I once [covered](#) a bizarre 2004 incident in which a train loaded with chemicals blew up in Neyshabur in northeastern

Iran, killing at least two hundred people. However, it is highly unusual for so many explosions and fires to occur in such a short period of time. And, given the geopolitical climate, it is reasonable to surmise that some outside group or groups—possibly backed by one of Iran's



many state enemies—may be behind them. Perhaps, their goal is to sow discord in the country or provoke the leadership to retaliate in a conflict that would draw in the United States.

Every analyst, diplomat, and spy with a focus on Iran is considering that possibility, as is Iran's Supreme National Security Council, which includes Supreme Leader Ayatollah Ali Khamenei, President Hassan Rouhani, and the head of the Islamic Revolutionary Guard Corps.

"When you have [these] many accidents that close together, one's mind automatically goes to who benefits from this," said one senior Western diplomat involved in Iran negotiations. "If anyone benefits from this type of madness and chaos it's the countries that are concerned about Iran's supposed mad dash for the bomb—Israel and the United States."

The question now is how Iran will respond. Will it be goaded into taking action? That somewhat depends on the nature of the alleged attacks.

At first glance, many of the explosions appear straight out of the [US intelligence handbook](#) for covertly undermining unfriendly regimes; pinprick attempts aimed at slowing productivity and sowing confusion and fear. "Try to commit acts for which large numbers of people could be responsible," says the US manual on sabotage. "For instance, if you blow out the wiring in a factory at a central fire box, almost anyone could have done it."

It is very much within the realm of possibility that the US has authorized clandestine operations to sow chaos in Iran. Washington reportedly [elevated](#) CIA operative Mike D'Andrea, nicknamed Ayatollah Mike, recently, in its efforts to spy on and combat Iran's ambitions. The individuals who populate the upper echelons of the "maximum pressure" policy in the Trump administration are just the sort of Washington hawks who would attempt to provoke Iran into a conflict, drive it out of the 2015 Joint Comprehensive Plan of Action once and for all, or compel it to the negotiating table by launching clandestine attacks.

It is also conceivable that Israel would undertake such an operation. Stuxnet, the Trojan horse malware that badly damaged Iran's centrifuges, was regarded as the [brainchild](#) of Israel and the US.

Saudi Arabia may be another potential culprit. In Denmark, they have been [accused](#) of bankrolling Iranian Arab exiles, who have allegedly been involved in terrorist activities in Iran, by prosecutors.

Iran has frequently absorbed terrorist attacks by groups with potential foreign backing—including Kurdish, Arab, and Baluchi militants—without overreacting. But the incident at Natanz, which may have destroyed a major part of Iran's nuclear research infrastructure, could have crossed the line.

Yet, even in that incident, the nature of the attack matters. Did someone smuggle a bomb into the facility? That would be very provocative. Could someone have caused such a blast simply by using cyber tools? That would be less provocative and would prompt a less kinetic response, say experts.

"This has happened before where someone crossed signals to blow up a gas pipeline totally from remote," claimed one cybersecurity expert who works with a Western government. "This is possible. You can interfere with the controls of the system and cause something that looks like an accident."

Someone is almost certainly trying to goad Iran into miscalculation, one former US intelligence official said in an interview. Iran continues to remain sore over the assassination of Quds Force commander Qasem Soleimani in January. A hardline parliament eager to make its mark has just been sworn in. If it were six months ago, Iran would most likely have retaliated—as it did in response to the Soleimani killing—in accordance with its policy of matching escalation with escalation.

European interlocutors have been urging Iran to exercise restraint, but often have little access or influence beyond the pragmatists at the Iranian foreign ministry under Mohammad Javad Zarif. China's relations with Tehran have strengthened in recent months, and they are likely counseling patience and caution in the hopes of preventing both a destabilizing conflict in the Middle East and a crisis which could lead to a second Trump term.

The wild card is Russia, say analysts and diplomats, which may see a further increase of tensions in the Middle East as in its interests, and may be more sanguine than other nations of the world at the prospect of another four years of Trump.

So far, the Iranians appear to be biding their time. In addition to the November elections, Iran is nervously awaiting the October expiration of a decade-long United Nations arms embargo. Washington is attempting desperately to get the rest of the Security Council to extend the ban while Iran is trying to be on its best behavior.

"Staying patient is what we've been saying to the Iranians for years," said the Western diplomat. "They could have chosen to react in various ways. They have been pretty calm and restrained. My gut tells me they don't want to be sucked into anything in the run-up to September and October."

While losing the Natanz facility, which was only made operational in 2018, was a loss, the Iranians will likely choose to hold off on any response for now. Even the perpetrators of the alleged bombing appear to have refrained from taking credit in a likely attempt to discourage

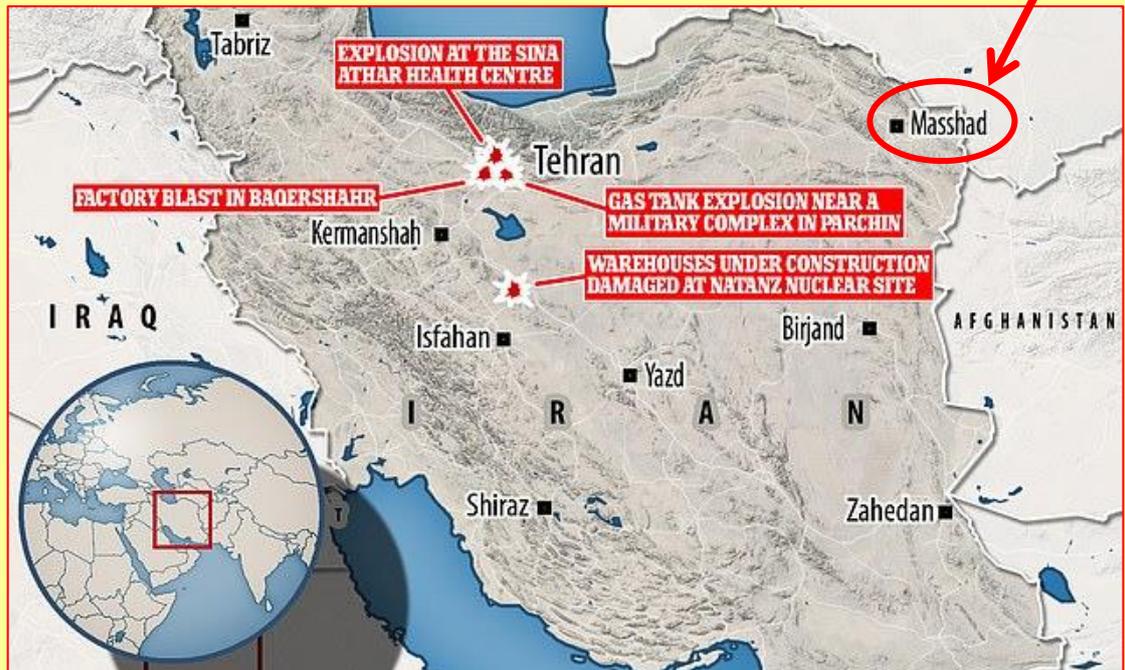


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reprisal. If a response comes, it will likely come after the elections—perhaps, in the weeks before inauguration day.

“They need first of all to make up their minds [on] what caused this,” the former Israeli Defense Force military intelligence chief General Yossi Kuperwasser said in an interview. “They would probably rather wait until Trump is over to respond. The major goal they have in their mind is to see Trump disappear. Natanz is one of the problems out of many Iran has to face, the main problem is the ‘maximum pressure’ campaign from the Americans. It causes them much more problems.”

UPDATE (July 13): A fire broke out at Kavian Fariman industrial complex, 32 kilometers south of the city of Mashhad in northeast Iran where gas condensate storage tanks are sited, one of which exploded.

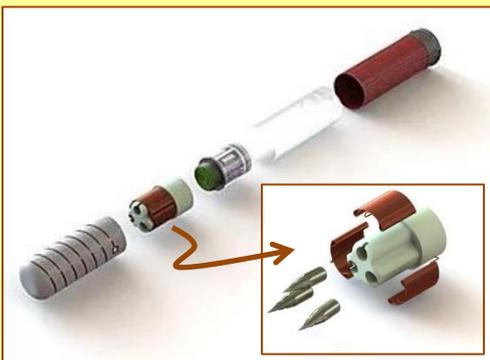


Borzou Daragahi is an international correspondent for The Independent. He has covered the Middle East and North Africa since 2002. He is also a Nonresident Fellow with the Atlantic Council’s Middle East Security Initiative.

New Non-Lethal Weapon Fills Operational Gap

Source: <https://i-hls.com/archives/102780>

July 16 – Coping with crowd control missions, security and military forces often lack safe, non-lethal weapons with sufficient range.



While rubber bullets are only effective out to about 50 meters and, as recent events in the US have shown, can injure or even kill, tear gas has limited effectiveness; a determined individual can fight through the effects. Electroshock weapons like the ubiquitous TASER are far more effective. They overwhelm the peripheral nervous system and even the most violent suspect cannot resist — but only if their electrode darts make a good contact. And their range is limited by the need for wires.

A new non-lethal weapon will fill this gap in the military ‘spectrum of force,’ providing an intermediate option between shooting and shouting. And it could change the balance of power in future riots, according to inhomelandsecurity.com.

The Pentagon’s Joint Intermediate Force Capabilities Office (JIFCO) is acquiring a long-range projectile delivering TASER-like stun effects.

With JIFCO funding, Harkind Dynamics’ developed a projectile fired from a 12-gauge

shotgun and known as **SPECTER**. It leaves the muzzle at relatively high speed but slows down before impact with a parachute braking system to minimize risk of injury.

Aerodynamic surfaces spin the projectile in flight, making it accurate enough to hit a human-sized target at “100-plus meters” according to the developers.

SPECTER is now in the second phase of development and will deliver a batch of 100 rounds to the US Marine Corps for testing. SPECTER can be fired from any standard 12-gauge, or



from an M26 underbarrel shotgun attachment fitted to a rifle so there is no need to carry an additional weapon.

Saudi-led coalition in Yemen says explosive boats destroyed in Red Sea

Source: <https://counteriedreport.com/saudi-led-coalition-in-yemen-says-explosive-boats-destroyed-in-red-sea/>

July 09 – The Saudi-led military coalition fighting the Iran-aligned Houthi group in Yemen destroyed two explosive-laden boats in the Red Sea on Thursday, its spokesman said.



The two **remotely controlled boats** belonged to Houthi forces and were threatening navigation, his statement carried on Saudi state news agency SPA said.

They were destroyed 6 km (3.7 miles) south of the **Yemeni port of Salif** in the early hours of Thursday morning, he said.

The coalition has previously accused the Houthi movement of trying to attack vessels off the coast of Yemen with unmanned boats laden with explosives.

Yemen's Houthis say Saudi oil facility hit in overnight attack

Source: <https://counteriedreport.com/yemens-houthis-say-saudi-oil-facility-hit-in-overnight-attack/>

July 13 – Yemen's Houthi rebels say they have attacked a large oil facility in an industrial complex south of the Saudi Arabian city of Jizan as part of an overnight operation.

The Saudi-led military coalition fighting the Houthis said on Monday it intercepted and destroyed **four missiles and six bomb-laden drones** launched by Houthi rebels towards the kingdom.

The missiles and drones were launched from Yemen's **capital Sanaa** and directed at civilian targets, coalition spokesman Turki al-Malki said in a statement carried by the official Saudi Press Agency.

EDITOR'S COMMENT: The Word Bank states (2020):

After almost five years of escalating conflict, Yemen continues to face an unprecedented humanitarian, social and economic crisis. Significant damage to vital public infrastructure has contributed to a disruption of basic services, while insecurity has delayed the rehabilitation of oil exports — which had been the largest source of foreign currency before the war — severely limiting government revenue and supply of foreign exchange for essential imports. The bifurcation of national capacity, including the Central Bank of Yemen (CBY), between the conflicting parties, and adhoc policy decisions by them further compound the economic crisis and humanitarian suffering from violence.

Economic and social prospects in 2020 and beyond are uncertain and hinge critically on the political and security situations. Affordability of food is a rapidly emerging threat to household welfare, as preexisting global food price increases and rial depreciation is now interacting with COVID-19 related trade restrictions by food exporters. Yemen's import dependence is exacerbated by the impact of desert locusts on the cropping season. A cessation of the ongoing violence and eventual political reconciliation, including the reintegration of vital state institutions, would improve the operational environment for the private sector, facilitating the reconstruction of the economy and rebuilding of social fabric.

Yemen continues to face significant risks of renewed macroeconomic volatility. Without stable sources of foreign exchange, the Yemeni rial is vulnerable to downward pressures. KSA's deposit, which financed essential imports, is close to depletion and increased hydrocarbon exports are highly uncertain due to the bleak outlook of the global oil market, and the fragmented multiple exchange rate regimes. A further rial depreciation would immediately have a knock-on effect on the prices of imported commodities with dire economic and humanitarian consequences. A COVID-19 related global and regional economic slowdown may affect Yemen through reduced remittances from the GCC.

Despite all the above, this nation has a drone factory, armed drones, missiles, remotely controlled boats and tons of weapons! A miracle or you know who is supporting the ongoing bloodshed?



Gerald Steinberg: The EU Awakes to Terror-Linked NGOs, then Goes Back to Sleep

By Marilyn Stern and Gary C. Gambill

Source: <https://www.meforum.org/61281/eu-awakes-to-terror-linked-ngos>

July 16 – Gerald Steinberg, founder and president of NGO Monitor, a policy analysis think tank focusing on non-governmental organizations, spoke to participants in a June 8 Middle East Forum webinar ([video](#)) about the European Union's funding of Palestinian NGOs affiliated to terrorist organizations.

The EU grants around two to three billion Euros a year to hundreds of NGOs around the world, of which at least 150 million Euros is allocated for humanitarian aid. NGO Monitor's investigations reveal that over the last seven years at least 25 million Euros have gone to Palestinian groups affiliated with the Popular Front for the Liberation of Palestine (PFLP), an organization designated as a terrorist group by the European Union.

Steinberg highlighted three examples of NGOs funded by both the EU and EU member governments that have ties to the PFLP:

- **Al-Haq**, an NGO ostensibly dedicated to documenting human rights violations, is led by Shawan Jabarin, who was convicted by Israel's High Court in the 1980s of being a member of the PFLP and subsequently was prohibited from traveling abroad based on evidence he was recruiting for the PFLP.
- **Defense for Children International Palestine** (DCI-P), a local branch of the Geneva-based Defense for Children International, is closely associated with the PFLP. At least three figures with alleged ties to PFLP have been employed or appointed as board members by DCI-P.
- **The Union of Agricultural Work Committees** (UAWC) was identified in a USAID report as the "agricultural arm of the PFLP." UAWC personnel with ties to the PFLP include an accountant who negotiated funding from the European Union and an administrative manager, both of whom are currently under indictment for the August 2019 murder of 17-year-old Israeli Rina Shnerb.

Last year, the EU introduced a provision into its grant agreements designed to ensure that entities on the EU's terrorism blacklist, known as a "restrictive list," don't benefit from EU funds. This caused an uproar among Palestinians. The Palestinian NGO Network (PNGO), which represents the above groups and many others with dubious affiliations, "went to the European Union office that's in charge of relations with the Palestinians and said, 'We have totally opposed this. We won't let you. We refuse to allow you to apply this regulation to the funding that we're getting!'"

EU officials soon backed down. In March 2020, the EU's representative to the Palestinians, Sven Kühn von Burgsdorff, issued a clarification letter saying, "it is understood that a natural person affiliated to, sympathizing with, or supporting any of the groups or entities mentioned in the EU restrictive lists is not excluded from benefiting from EU-funded activities, unless his/her exact name and surname (confirming his/her identity) corresponds to any of the natural persons on the EU restrictive lists."

In plainer English, said Steinberg, this means Shawan Jabarin and other PFLP members who pose as "human rights defenders" are allowed to benefit from EU funding so long as their *individual names* are not on the EU blacklist, which it so happens does not list any individuals (i.e. "natural persons"). Von Burgsdorff's letter assures Palestinian NGOs that affiliates connected to EU-designated terrorist groups like the PFLP not only can continue to receive EU funding but are now afforded "legitimacy" by Brussels.

The Israeli government contested this dodge and continues to insist that the Europeans end funding "that can be readily siphoned off to the terrorist organizations like the PFLP," explained Steinberg. "The European commissioner in charge of relations with Israel ... said, 'We're going to investigate this.' Now we're going to see if there's going to be an investigation or not. There may. That's why I leave the question, did the European Union go to sleep or not?"

Marilyn Stern is communications coordinator at the Middle East Forum.

Gary C. Gambill is general editor at the Middle East Forum.

EDITOR'S COMMENT: [From Wikipedia] NGOs are a subgroup of independent of government involvement organizations founded by citizens, which include clubs and associations which provide services to its members and others. They are usually nonprofit organizations. Many NGOs are active in humanitarianism or the social sciences. Surveys indicate that NGOs have a



high degree of public trust, which can make them a useful proxy for the concerns of society and stakeholders. However, NGOs can also be lobby groups for corporations, such as the World Economic Forum. According to NGO.org (the non-governmental organizations associated with the United Nations), "[an NGO is] any non-profit, voluntary citizens' group which is organized on a local, national or international level ... Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bring citizen concerns to Governments, advocate and monitor policies and encourage political participation through provision of information." Some NGOs rely on paid staff; others are based on volunteers. NGOs are usually funded by donations, but some avoid formal funding and are run by volunteers. NGOs may have charitable status, or may be tax-exempt in recognition of their social purposes.

In other words, NGOs fill the gaps of a government in various aspects mainly in social services. This does not mean that they are not supervised by the government – especially those with international structure and funding. Take illegal immigration for example: Despite awaiting law regulation regarding NGOs activated in immigrants and refugees NGOs especially in the islands facing the Turkish coastline are totally out of control to the point that some of them provide even debarkation GPS locations for illegal immigrants invading Greece. With huge flow of these people over the years a NGO-terrorism-trafficking nexus is surely not surprising.

Deadly Terrorist Threats Abound in U.S. and Abroad. Here Are Key Dangers

By Brian Michael Jenkins

Source: <https://www.rand.org/blog/2020/07/deadly-terrorist-threats-abound-in-us-and-abroad-here.html>

July 20 – **While the world battles the microscopic coronavirus, terrorists have not moved on to a peaceful retirement. It would be a mistake to forget about the continuing threat they pose while our attention is understandably focused on the battle against COVID-19.**

Spectacular events dominate our recollection of terrorism: coordinated airline hijackings, airliners bombed out of the sky, large-scale hostage seizures, huge truck bombs, mass shootings, nerve gas dispersed on subways, and, of course, the Sept. 11, 2001 terrorist attacks.

From the 1970s on, terrorist attacks increased in number, even as death tolls in the bloodiest incidents escalated from the tens to the hundreds to the thousands. That terrorists would eventually acquire biological or nuclear weapons capable of killing tens of thousands was seen as inevitable—“not if, but when,” to use the well-worn phrase.

But looking back from 2020, 9/11 turned out to be a statistical outlier—a high point in death and destruction rather than an indicator of worse to come. Terrorist attacks continued after 9/11, but with casualties at pre-9/11 levels.

By focusing on the pinnacles of terrorism past or the doomsday apprehensions of terrorism future, we overlook some of the tectonic developments.

Instead of the vertical escalation anticipated after 9/11, we have seen a “horizontal escalation”—the proliferation of low-level attacks. Indeed, terrorism has become so widespread, repetitious, and familiar in the 21st century that we are almost inured to its effects.

Following the wave of terrorist attacks in the late 1970s, a group of analysts at the RAND Corporation, including me, looked at military arsenals to anticipate which sophisticated weapons terrorists might acquire and use.

Terrorism has become so widespread, repetitious, and familiar in the 21st century that we are almost inured to its effects.

One of our major concerns, for example, was shoulder-fired, surface-to-air missiles with precision-guided munitions. In the hands of terrorists, these could bring down commercial airliners taking off or landing at airports.

But we failed to identify the technology that would have the greatest impact on terrorism—the internet, still then in its infancy. In fact, terrorism is just as much about communications as weapons. Terrorists have successfully exploited the internet, and later social media, to communicate with one another and their intended audiences worldwide without any intermediating authority.

Terrorism was an international phenomenon even before the internet, of course. Plenty of extremists in the late 1960s regarded themselves as vanguards of international movements.

Even earlier generations of anarchist assassins and bomb-throwers in the late 19th and early 20th centuries portrayed themselves as an international movement on behalf of the world's oppressed.

But it was the internet that facilitated the creation of truly global terrorist enterprises. Earlier movements worked hard to recruit allies and supporters abroad, but today's movements easily create transnational online communities of like-minded individuals.



This has led to a profound shift in terrorist recruiting and tactics. Through the internet and social media, today's jihadist groups have been able to reach further, recruit followers remotely, and persuade at least a small number of them to carry out actions.

Remotely inspiring people to carry out terrorist attacks, however, is a low-yield enterprise. In contrast to the 1970s, when anyone trying to join an armed struggle underwent careful vetting to keep out infiltrators and unreliable members, today recruiting is increasingly by exhortation. Membership in the group is offered *ex post facto* to anyone who carries out an attack.

Digital media may allow terrorist organizations to reach millions, but they also promote vicarious participation. Jihadist groups, notably the Islamic State of Iraq and Syria (ISIS) took advantage of this, pumping out a high volume of written and visual content.

And yet, many online jihadists gratify themselves with gruesome terrorist videos, beat their chests, and hurl threats and boasts; only a small number of them push back from their computer monitors to take action. (When I made a [similar observation](#) previously, online operatives of Al Qaeda were offended by the accusation of substandard commitment.)

Through the internet and social media, today's jihadist groups have been able to reach further, recruit followers remotely, and persuade at least a small number of them to carry out actions.

While potentially lethal, these self-selected terrorists are generally low-quality recruits. Their ideological devotion is thin. They are a particular type of “true believer”—as described by Eric Hoffer in [his 1951 book](#) of that name—those who can easily slide from one extremist belief system to another.

Their “indoctrination” reflects internal urges as much as external provocation. Many are driven less by commitment to a cause than by their attraction to violence. (The great appeal of ISIS propaganda was its emphasis on visual atrocities.)

Many recent terrorists have histories of aggression, crime, substance abuse, and mental issues. Terrorists are not “crazy” in the clinical or legal sense, but it might be that no bright shining line separates fanatics from the mentally disordered.

In the United States and other Western countries, jihadists, white supremacists, anarchists, involuntary celibates, and others with political grievances or personal discontents comprise floating populations of unmoored malcontents.

The various ideologies in circulation provide opportunities to forge a new identity and participate in an epic struggle. The organization offers wannabe terrorists the prospect of attention, acclaim, approval, applause, and acknowledgement. It is an appealing fantasy. Which ones turn to violence, however, will depend mostly on their personal circumstances.

Another attribute of online recruiting is that self-selecting terrorists operate alone or in tiny conspiracies—similar to the concept of “leaderless resistance” popularized by white supremacists in the 1980s.

Large hierarchical organizations like the Ku Klux Klan could be (and were) infiltrated by the authorities. For self-preservation, the organizational model became small cells of people inspired by a common ideology, but independent of one another or a central organization.

Violent anarchists operate in a similar fashion: There is a central idea, not a central command. The 1995 Oklahoma City bombing fits this profile.

Unless they have served in the military or participated in armed robberies, online terrorism recruits have little actual experience in violence. Encouraged by terrorist propaganda to do what they can with resources readily available, they resort to primitive forms of attack—shootings where guns are available, stabbings, ramming crowds with vehicles.

These novice terrorists select easy targets—random violence aimed at killing anyone, anywhere. There is no symbolic value. This is “pure terrorism,” indiscriminate carnage to express personal discontents: “I have killed, therefore I exist. I will be remembered for my deeds.”

Today's terrorists are looking for opportunities to demonstrate their prowess with slaughter. Propelled by a mixture of personal grievances and psychological problems, with a veneer of ideological motives that justify their violence, they act autonomously, unmoored from central direction.

Driving terrorist activity down to the level of individual perpetrators is an improvement compared with well-organized multi-person attacks.

“No group ordered my attack. I make the decision myself,” wrote the man responsible for killing 51 people at mosques in New Zealand, in his online screed. Mass murderers with manifestos, they compete for high body counts that will attract an audience for their deeds.

For the most part, however, crowd-sourcing terrorism means many small contributions. Terrorist organizations thought they could overcome this through volume. Instead of strategic attacks killing thousands, thousands of small attacks could achieve the same effect.

Small-scale terrorist attacks indeed appeared to have a disproportionate psychological effect on already anxious populations. But the turnout was meager. So whether more small-scale attacks would increase the level of terror—or simply dull the senses—was never tested.



This atomization of violence, in one sense, represents progress. Although the attacks are often lethal and sometimes cause high casualties, driving terrorist activity down to the level of individual perpetrators is an improvement compared with well-organized multi-person attacks. However, it complicates counterterrorism.

Individual actors, relying on primitive methods, are harder to identify by intelligence efforts, and are especially difficult to protect against. In that sense, they are closer to mass shooters. Community-based prevention will not reach them.

Some terrorists—but not all—may be identified by their internet activity, which is how many homegrown terrorist plots are now uncovered. That raises the perennial question of to what degree the internet should be left open as a forum for exhibiting (and exposing) hate. On the one hand, it is a channel for incitement. On the other hand, absent an X-ray to the soul, it is often the only window to what potentially dangerous individuals might be thinking.

Terrorist organizations eventually can be defeated through combinations of political measures, legal suppression, and—when necessary—military operations, although the contests could last generations and military victories in the traditional sense remain elusive. Counterterrorism campaigns aimed at terrorist groups will continue.

But resolving political demands or addressing root causes will not likely dissuade today's self-selecting solo terrorists. These are individual actors answering only to their God: whether seeking to destroy all government, pursuing racial separation or genocidal goals, expressing sexual dissatisfaction, or simply wanting to leave their mark. Military operations are irrelevant. This is a deeper societal problem.

It might even be worth asking whether the terrorism challenge to come may be to educate society that there is a level of violence and even death that a resilient society can tolerate—and that more intrusive preventive measures could have unintended consequences, including the further erosion of democracy as we see in nations determined to tighten social control.

Brian Michael Jenkins is a senior adviser to the president of the nonprofit, nonpartisan RAND Corporation. He also directs the National Transportation Security Center at the Mineta Transportation Institute.

Is Turkey a Bad Actor in Regard to ISIS Prisoners Being Held in SDF Territory?

By Anne Speckhard and Molly Ellenberg

Source: <https://www.hstoday.us/subject-matter-areas/counterterrorism/is-turkey-a-bad-actor-in-regard-to-isis-prisoners-being-held-in-sdf-territory/>

July 20 – According to [our ICSVE research interviews with 240 ISIS members](#), including [an ISIS emir who claims to have worked with Turkish military and intelligence](#), Turkey has long been involved with and supporting ISIS in terms of [allowing over 40,000 foreign fighters' transit across Turkey into Syria](#), allowing supplies to flow into ISIS, negotiating agreements with ISIS including about water supply allowing for electricity generation, and letting ISIS fighters arrange medical care and recovery in Turkey and then return to the group.

During their Fall 2019 incursions into northeast Syria, Turkey claimed that the Syrian Democratic Forces (SDF) was a terrorist group, yet the Turkish-backed rebels [acted as terrorists killing civilians and carrying out multiple human rights abuses](#), as we see now also in [Turkish-backed rebel-occupied Afrin](#). Likewise, SDF camps and prisons were shelled in Turkey's October 2019 incursion into northeast Syria, [causing over 950 women and children to flee SDF-held Camp Ain Eisa](#), many of them to Turkish-backed rebel held territory and some then into Turkey. Now [we see clear bragging from Turkey about repatriating a Moldovan woman from al Hol](#), not by respecting the international coalition forces made up of and led by NATO member countries, but by smuggling her illegally out of the camp into Turkish-held areas. This is occurring while Turkey accuses the SDF of being a terrorist organization when they are in fact our strongest international ally against ISIS, who lost their lives on the ground, as together in partnership with the U.S.-led Global Coalition to Defeat Daesh (ISIS) we defeated ISIS territorially in



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Syria. They are also our partner in holding the captured ISIS prisoners while the world decides what to do with them. At considerable effort to itself, the SDF has been keeping these former ISIS cadres safe from escape and regrouping to attack, as Abu Bakr al Baghdadi called for them to do and as ISIS's precursor organization, Islamic State in Iraq, is well known for doing in their *Breaking the Walls* campaigns which formed the basis of ISIS ever being able to emerge on the global stage.

Natalia Barkal, a Moldovan woman, and her four children, recently smuggled out of Camp al Hol, were unabashedly reported upon in the Turkish press, by [Anadolu Agency](#) for one, with claims that Turkish and Moldovan intelligence agencies had “rescued” them from Camp al Hol. Barkal and her Syrian-origin husband lived and worked in Moldova's capital Chisinau until 2013 when they moved together to Syria's Manbij district in Aleppo province during the rise of ISIS. [Moldovan security sources said Barkal's husband was killed](#) in military fighting in late 2017 and Barkal and her four children arrived at Camp al Hol on January 2019. He is believed to have been an ISIS fighter and Barkal was being held in Camp al Hol as an ISIS wife. Indeed, Maldivian Jezimah Muhammad, an ISIS wife in Camp al Hol, [told North Press](#) that she personally witnessed and knew of Natalia Barkal being among the women who followed ISIS all the way to Baghouz, finally surrendering to the SDF when ISIS was defeated there. Natalia's ties to ISIS are therefore believed to have been strong and she is unquestionably an ISIS suspect.

Nevertheless, President of Moldova Igor Dodon proudly shared photos of himself and the repatriated family at Chisinau airport via [Twitter](#) and [he is reported to have said](#) “I thank President Erdogan for his extensive efforts to bring back our citizens and for his support.” While she was certainly “rescued” from the well-documented [dire conditions at al Hol](#), she was being held as a detainee in Camp al Hol as an ISIS fighter's wife. Thus, offering her assistance to escape from Camp al Hol appears to fly in the face of international agreements among the 82 countries, including Turkey, that are partners of the U.S.-led Global Coalition to Defeat Daesh (ISIS). The U.S. and the Coalition have been supporting the SDF in holding the ISIS detainees captured both during and following the territorial defeat of ISIS and also in working with their home countries to try and repatriate their citizens who for the most part



illegally entered Syria ultimately to join and support ISIS. For all intents and purposes Natalia Barkal appears to have been one of these, although she may have entered the country legally with her Syrian husband.

Located in **Hasaka province, al-Hol camp** is home to around to 60,000 Iraqis and Syrians, and 10,000 ISIS-related foreign nationals, 8,000 of them from Europe. The majority of the camp's residents, who are predominantly women and children, were arrested during the battles in Baghouz in March 2019 when ISIS was finally

territorially defeated, making it quite likely that most were married to ISIS fighters and may have been integrally supporting ISIS in some capacity. The SDF and the Kurdish-led Autonomous Administration of North and East Syria (AANES) have repeatedly called on the international community to repatriate their foreign nationals or to support either running an international tribunal in the area or to help local courts carry out trials of suspected ISIS members, but there has been little action in either domain.

It is easy to understand why the ISIS women captured by the SDF and the U.S.-led Global Coalition to Defeat Daesh (ISIS) now held in Camps Roj and Camp al-Hol want to escape from the dire conditions in which they are held, facing disease, malnutrition, bombardments, [attacks from ISIS enforcers](#), and poor living conditions. Nor can one blame them for being extremely frustrated with not being able to face actual charges and judicial proceedings rather than being held indefinitely in a difficult legal limbo. However, there are clear means of requesting repatriation of foreign terrorist fighters and their families, which Moldova never used. Sinam Mohamad, the U.S. representative of the Syrian Democratic Council (SDC), the SDF's political wing, says Moldova ignored these procedures, telling Voice of America, “The global coalition asked the countries to get their citizens back [with] no response. Moldova did not ask for this woman.”



[Abdulkarim Omar, co-chair of foreign affairs](#) for the AANES, referred to the “rescue” as an “abduction” and said it “confirms Turkey’s support to terrorism.” The SDF has long confirmed that [women escape weekly from Camp al Hol with the assistance of smugglers](#). [Speaking to Rudaw news agency](#), Abdulkarim Omar added, “This also confirms that Turkey is behind all abductions in the NES. This proves that Turkey wants to abduct all women in order to use them for its own regional agenda.”

Security sources in the SDF admit that 200 foreign families have escaped from Camp al Hol, many suspected to have been helped by Turkish forces, and that the SDF does not know their current whereabouts. A [statement released by the NES](#) described Turkey’s actions as a “new form of support for ISIS,” with “mercenaries” working with the Turkish-backed militias under the Syrian National Army umbrella in areas they control in Syria: “We call on the international community to hold Turkey responsible for the smuggling and receipt of ISIS members.”

[Abdulkarim Omar also pointed out](#) that, during their incursions into north east Syria in October 2019, the Turkish military [shelled Camp Ain Issa, allowing ISIS women to escape the camp](#). According to local monitor [Rojava Information Center](#), 950 foreign ISIS-linked women and children escaped at that time. While [some went to their consulates in Turkey and were repatriated](#), others have disappeared. The SDF also told ICSVE researchers that Turkey’s bombardments during the same time period hit prisons in Qamishlo and Derreck, allowing ISIS male fighters to escape, although they were recaptured.

Turkey, which vociferously refuses to acknowledge the SDF as a valued ally in the fight against ISIS, instead insisting that they are a terrorist group affiliated with the PKK,^[1] would understandably not want to ask permission from the SDF for repatriations of their own citizens and the SDF would be unlikely to grant them out of fear that Turkey might allow them freedom to redeploy. However, this woman was not Turkish. Moreover, as a member of NATO, a member of the 82-member, U.S.-led Global Coalition to Defeat Daesh (ISIS), and as a signatory to The European Convention on the Suppression of Terrorism (1977, amended 2003) as well as the Convention of the Organisation of the Islamic Conference on Combatting International Terrorism (adopted 1999, entered into force 2002) UN agreements, Turkey, in taking out such actions as this smuggling and “rescue” operation, is clearly not showing any type of allyship behavior. These resolutions in regard to cooperating with other signatories on matters of counter terrorism are binding in terms of not supporting, financing or allowing financing of terrorism.

The material support laws in regard to terrorism, the strongest of which are in the United States, have been defined by at least one judge in the U.S. (in the case of [Hoda Muthana’s](#) citizenship case) as precluding even her own father from providing financing, through the SDF, to her for food, suntan lotion, or other necessities for herself and her sickly toddler son who are surviving on a diet of lentils, dried beans, spaghetti and cooking oil. Likewise, [Kimberly Pullman’s](#) family in Canada has also been warned not to send money to her while she is held in the camps. While it has not been established in any court of law that either woman served ISIS, these women are being treated, at least by U.S. law, as ISIS suspects and the court is ruling that giving them support is considered material support to terrorists. Whether or not this will ultimately hold up is debatable; however, it is clear that U.S. courts are forbidding giving aid to these women. Likewise, it is important to note that still-committed ISIS women in Camp al Hol have been [fundraising over Instagram and Telegram](#) and using Paypal and informal hawala networks to raise sufficient funds to bribe their way out of the camp, in which cases many make their way into Turkish-held territory in Syria or Turkey itself.

Thus far, the spokesman for the Global Coalition has been silent about Turkey’s recent actions, as have most Western governments who appear not to want to engage in any spat with Turkish President Erdogan over the incident. However, given the U.S. judiciary’s views on not even giving money for food to ISIS women in the camps, for Turkey to help this woman smuggle out of Camp al Hol would logically be seen then by the same laws and judiciary as clear material support to terrorism and would also be seen as Turkey defying UN agreements with both European and other Muslim countries and by NATO in defiance to binding agreements to fight terrorism. **While Turkey is a strategic partner for the U.S. and many other countries, this alongside many other actions demonstrate they are also a malign actor in Syria. Clearly something is terribly wrong in this regard.**

Anne Speckhard, Ph.D., is Director of the International Center for the Study of Violent Extremism (ICSVE) and serves as an Adjunct Associate Professor of Psychiatry at Georgetown University School of Medicine. She has interviewed over 700 terrorists, their family members and supporters in various parts of the world including in Western Europe, the Balkans, Central Asia, the Former Soviet Union and the Middle East. In the past three years, she has interviewed ISIS (n=239) defectors, returnees and prisoners as well as al Shabaab cadres (n=16) and their family members (n=25) as well as ideologues (n=2), studying their trajectories into and out of terrorism, their experiences inside ISIS (and al Shabaab), as well as developing the Breaking the ISIS Brand Counter Narrative Project materials from these interviews which includes over 175 short counter narrative videos of terrorists denouncing their groups as un-Islamic, corrupt and brutal which have been used in over 125 Facebook campaigns globally.



Molly Ellenberg is a Research Fellow at ICSVE, working on coding data from qualitative interviews, developing trainings for use with the Breaking the ISIS Brand Counter Narrative Project videos, and assisting with the creation and analysis of the Facebook campaigns.

Talking to People Who Do Not Believe Bad Things Can Happen

By William Kaewert

Source: <https://www.domesticpreparedness.com/commentary/talking-to-people-who-do-not-believe-bad-things-can-happen/>



February 2015 – Soldiers, law enforcement officers, emergency responders, and others whose professions involve responding to or mitigating catastrophic events tend to think about “bad things” more often than the average person because they either deal with life-and-death issues regularly or have received training to do so. The term “bad things” in this article refers to high-impact threats to the well-being of a large number of people in a wide area – for example, any natural disaster or deliberate attack with the potential to cause cascading infrastructure failure. When receiving bad news, there are different ways in which less concerned people can unrealistically minimize threats, which include but are not limited to:

- Those who believe that bad news happens all the time and, as a result, they may tune out the media.
- Those inexperienced with disasters and, therefore, do not believe until it is too late that they could be affected.
- Those who believe that, if the situation deteriorates, the government will take care of them.

Common Barriers to Communication

Each of the above behaviors or attitudes can cause the people who embrace them to be unprepared for disasters. Communicating about high-impact threats to people who do not want to hear about them can be a challenge. However, there are common-sense approaches that can improve the odds of successful communication and perhaps lead to positive action. The benefits of communicating about bad things accrue to both parties. Becoming more self-sufficient enables citizens to better endure disasters while experiencing less stress. Emergency responders benefit because a well-prepared citizenry means reduced demand for emergency services during a disaster.

When confronted with a new problem or threat for the first time, some people may become defensive. At an EMPact America conference in September 2009, Peter Huessey, senior defense consultant of the National Defense University Foundation, described four types of barriers people erect when confronted with new information: (a) “Not invented here”



(distrustful attitude); (b) “How often has that happened?” (sarcastic attitude); (c) “What are you selling?” (skeptical attitude); and (d) “How come I haven’t heard of this before?” (defensive attitude).

These barriers may be conveyed by words or body language and include an underlying attitude behind the behavior. There are effective techniques for addressing these types of resistance. Depending on the situation (group presentation, tabletop exercise, or one-on-one discussion), one or more of the following approaches may be helpful in breaking through the other party’s preconceived notions that underlie their defensiveness.

Paul Benjamin Auster is an American writer and film director.

Tell a Story

Personal stories about problems and how they affect presenters and listeners often are more effective than lectures for communicating a concept about which the person may not be an expert, such as a politician discussing the possibility of an extended power outage.

Conveying that a friend’s wife would die without her diabetes medication more powerfully illustrates the problem of an extended power failure than lecturing about maintaining sufficient reserve supplies. Personal stories combined with sincere feelings help listeners relate to the presenter, thus reducing the chance of confrontation.



You think it will never happen to you, that it cannot happen to you, that you are the only person in the world to whom none of these things will ever happen, and then, one by one, they all begin to happen to you, in the same way they happen to everyone else.

— Paul Auster —

AZ QUOTES

Be Credible

Allaying fears about the presenter’s motives can improve the relationship between presenter and participants by reducing suspicion of a hidden agenda. If the target audience does not already know the presenter well, providing them with information about the presenter’s background, training, and organizational affiliation boosts credibility, as does telling the truth, preparing thoroughly, and attributing all research material to relevant sources.

In addition, audiences often relate well to presenters who explain from whom they learned about a particular problem, display an appropriate level of humility, such as admitting when they do not have answers, and refraining from telling people that everything “is under control” or “will be all right” when no such assurance is possible. Sometimes listeners feel embarrassed when they think they know less than others and, as a result, may act defensively. Presenters can help listeners overcome this hurdle by explaining they once did not know about the threat being discussed, and sharing where they learned of it.

Choose Wisely

An obvious example of the wrong time to initiate the subject of catastrophic threats is at a cocktail party, where people reasonably expect to relax and unwind. The chance of having a successful conversation about bad things increases when saying the right thing to the right people at the right time. Three points to consider are:

- *Timing* – Initiate conversations when the audience sends clear signals that it is receptive, not when the presenter feels like talking.
- *Research* – Understanding the audience can pay big dividends by helping a presenter tailor an appropriate message. Presenting a disaster scenario that fits the listener’s worldview, for example, can reduce the problem of listeners “tuning out” the presenter.
- *Discernment* – Sometimes presenters face unexpectedly difficult listeners. A shrewd presenter asks questions to discern the listener’s motives, and adjust his or her approach accordingly – including disengaging from people that the presenter’s information will not help.

Get Help

There is a wealth of published information about the causes of, preparation for, and recovery from nearly any disaster imaginable. Reports are available from government, nonprofit, university, think-tank, corporate, and other sources. Some carefully researched novels based on a variety of disasters from financial system meltdown to electromagnetic pulse attack can be powerful triggers of the imagination. Leaving trustworthy reading material behind after an exercise or presentation can reinforce the message.



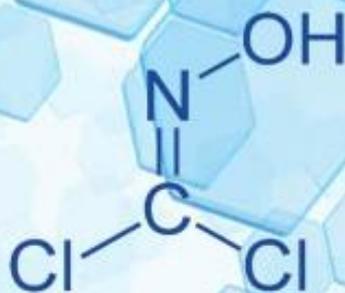
Ask for Action

After successful communication, the next step is to ask for action, such as developing an emergency plan, writing to elected representatives, or improving neighborhood relationships. The earlier this goal is defined when planning any interaction or presentation with the target audience, the more likely the goal will be achieved. The primary goal of such presentations is to help people imagine what a disaster would mean for them and encourage them to respond by taking small steps toward becoming more self-sufficient. As their preparedness grows, they will be in better shape when disaster strikes and less of a burden on emergency-response systems that could well be overstressed during the next “bad thing.”

William Kaewert is the founder of two power protection companies and has over 30 years of experience applying technology-based solutions that assure continuity of electrical power to critical applications. He is currently president and chief technology officer of Colorado-based Stored Energy Systems LLC (SENS), an industry-leading supplier of nonstop DC power systems essential to electric power generation and other critical infrastructures. The company also produces commercial off-the-shelf (COTS)-based power converters used in military systems hardened for electromagnetic pulse (EMP), including ground power for the Minuteman III ballistic missile system and the Terminal High Altitude Area Defense (THAAD) missile interceptor. He received his AB in history from Dartmouth College and MBA from Boston University. He serves on the board of directors of the Electrical Generation Systems Association and on the management team of the FBI InfraGard Electromagnetic Pulse Special Interest Group.

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CHEM NEWS



Growing Terrorism Threats: Iran-backed groups, IS in Africa, and White Supremacists: State Dept. Report

Source: <http://www.homelandsecuritynewswire.com/dr20200625-growing-terrorism-threats-iranbacked-groups-is-in-africa-and-white-supremacists-state-dept-report>

June 25 – The State Department on Wednesday released its annual [Country Reports on Terrorism](#), detailing key developments in 2019 in the global fight against ISIS, al-Qaeda, Iranian proxies, and other international terrorist groups.

The report notes that the United States and its partners made significant strides to defeat and degrade international terrorist organizations in 2019. Along with the Global Coalition to Defeat ISIS, the United States completed the destruction of the so-called caliphate in Iraq and Syria in March. In October, ISIS leader Abu Bakr al-Baghdadi died following a U.S. military raid on his compound in Syria. In April, the Secretary of State designated Iran's Islamic Revolutionary Guard Corps, including its Qods Force, as a Foreign Terrorist Organization – the first-time part of a foreign government has been so designated. In September, President Trump ordered the most significant update of U.S. terrorism designation authorities since the aftermath of 9/11. And throughout the year, a number of governments in the Western Hemisphere and Europe announced the terrorist designations of Hezbollah.

The report also discusses U.S. efforts to address new and ongoing challenges, including the repatriation of foreign terrorist fighters, particularly to Western Europe; the expansion of ISIS branches and networks in Africa; and the threat of racially or ethnically motivated terrorism.

The report also touches on the growing threat posed by far-right extremists and white nationalists, noting:

The threat posed by racially or ethnically motivated terrorism (REMT), particularly white supremacist terrorism, remained a serious challenge for the global community. Continuing a trend that began in 2015, there were numerous deadly REMT attacks around the world in 2019, including in Christchurch, New Zealand; Halle, Germany; and El Paso, Texas.

The September 2019 updating and expansion of the U.S. government's terrorism designation led, in April 2020, to the United States designating the ultranationalist Russian Imperial Movement (RIM), along with three of its leaders, as terrorists, marking the first time the classification has been applied to a white supremacist group.

▶▶ [Chapter 3 – The Global Challenge of Chemical, Biological, Radiological, or Nuclear Terrorism](#) (pp.201-202)

Gear Treated with “Forever Chemicals” Poses Risk to Firefighters

Source: <http://www.homelandsecuritynewswire.com/dr20200625-gear-treated-with-forever-chemicals-poses-risk-to-firefighters>

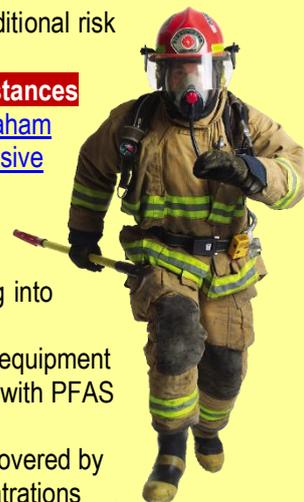
June 25 – Firefighters face occupational hazards on a daily basis. Now, new research shows they face additional risk just by gearing up.

Fabric used for firefighter turnout gear tested positive for the presence of **per- and polyfluorinated alkyl substances (PFAS)**, according to the study published in [Environmental Science and Technology Letters](#), led by [Graham Peaslee](#), professor of physics at the University of Notre Dame. Peaslee embarked on a [more extensive study, after initial tests](#) on gear samples showed significantly high levels of fluorine.

“When we ran our initial tests, the fluorine content was so high, there was little question as to whether or not we'd find PFAS in a larger sample of gear,” said Peaslee. “Our primary concern — as is always the case when it comes to these particular chemicals — became how much of it is coming off the gear and getting into the environment?”

Notre Dame [says](#) that Peaslee's team tested more than 30 samples of used and unused personal protective equipment (PPE) from six specialty textile manufacturers in the United States and found them to be treated extensively with PFAS or constructed with fluoropolymers, a type of PFAS used to make textiles oil and water resistant.

Firefighter's PPE or “turnout gear” is comprised of three layers — a thermal layer, worn closest to the skin, covered by a moisture barrier designed for water resistance and the outer shell. Peaslee and his team found high concentrations of fluorine on the moisture barrier and outer shell. Some of these chemicals have the ability to migrate off treated surfaces and materials, meaning the PFAS in the moisture barrier and outer shell PPE could potentially contaminate the thermal layer and come in direct contact with skin.



“If they touch the gear, it gets on their hands, and if they go fight a fire and they put the gear on and take it off and then go eat and don’t wash hands, it could transfer hand to mouth,” said Peaslee. “And if you’re sweating and you have sweat pores, could some of these chemicals come off on the thermal layer and get into the skin? The answer is probably.” Peaslee’s study is the first to identify this potential source of PFAS exposure in firefighting PPE and argues that more studies are needed.

Known as “forever chemicals” PFAS have been found in [fast food wrappers](#) and containers, nonstick cookware, child car seats and firefighting foams. The use of PFAS-based foam fire suppressants has been linked to the contamination of drinking water systems, leading the United States Department of Defense to switch to an environmentally safer alternative foam before 2023. In a previous study, co-authored by Peaslee, researchers found the chemicals accumulate in the body after entering the bloodstream, and PFAS have been linked to four of the top eight cancers which have been found more commonly in firefighters including testicular cancer, mesothelioma, non-Hodgkin’s lymphoma and prostate cancer.

The study also presented evidence of the potential hazard of these chemicals in PPE in two other ways. Dust samples taken from a PPE distribution facility in one fire district also tested positive for fluorine, consistent with the ability of these chemicals to shed off the gear onto other surfaces. The team also observed fluorine transfer from the outer shell onto gloved hands upon handling, proving that this could be an exposure source from PFAS to firefighters.

“Further work needs to be done to assess the extent of this risk to firefighters,” said Peaslee, an affiliated member of the [Eck Institute for Global Health](#) and the [Environmental Change Initiative](#). “But until this risk is estimated, operational steps can be taken to minimize occupational exposure to these PFAS while still using the PPE to keep the firefighters safe on the job.” Peaslee suggests that the long-term solution would be to find a healthier alternative to PFAS which can provide equivalent water resistance to the gear.

This is just the latest study in a building collection of literature highlighting the danger and persistence of PFAS in contamination of the environment and threat to public health.

Press Release: Assembled Chemical Weapons Alternatives Program Mission Halfway Complete

Source: <https://www.peoacwa.army.mil/2020/06/25/press-release-assembled-chemical-weapons-alternatives-program-mission-halfway-complete/>

June 25 — The [Program Executive Office, Assembled Chemical Weapons Alternatives](#) (PEO ACWA) mission is halfway complete, with a combined 1,568 U.S. tons of safely destroyed chemical agents in Colorado and Kentucky as of June 20, 2020.

This empty igloo at the Blue Grass Army Depot housed the last of the 8-inch GB projectiles and signifies progress the Program Executive Office, Assembled Chemical Weapons Alternatives is making toward complete destruction of the remaining U.S. chemical weapons stockpile.

“We are at the halfway point in accomplishing the overall ACWA mission,” said Program Executive Officer [Michael S. Abaie](#), PEO ACWA. “Reaching this milestone while successfully protecting workers, communities and the environment is a major accomplishment for the program. With each munition destroyed, the risk of continued storage is reduced.”

More than 2.5 million chemical munitions have been destroyed overall with approximately 615,000 munitions remaining.

“The safe and environmentally sound destruction of approximately 95% of the original U.S. chemical weapons stockpile is an outstanding achievement for the U.S. Chemical Demilitarization Program,” said [Dr. Charles J. Ball](#), Deputy Assistant Secretary of Defense for Threat Reduction and Arms Control. “With each milestone we achieve, we are one step closer towards the goal of eliminating an entire class of weapons of mass destruction and fully meeting our [Chemical Weapons Convention](#) commitment.”

The U.S. Army [Chemical Materials Activity \(CMA\)](#) destroyed nearly 90% of the original U.S. chemical weapons stockpile by 2012, which was stored at six U.S. Army installations across the U.S. and on Johnston Atoll in the Pacific. PEO ACWA is responsible for destroying what was the remaining 10% of the stockpile located in Colorado and Kentucky.



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“Each time we empty a storage igloo in Colorado and Kentucky is a testament to the dedication of the entire workforces and our partners to destroy these obsolete weapons,” said [Col. Kelso C. Horne III](#), director, CMA.

While PEO ACWA and CMA are separate organizations, they share the goal of destroying the nation’s chemical weapons. CMA maintains the safe and secure storage of the U.S. chemical weapons stockpile at the [Blue Grass Army Depot](#) near Richmond, Kentucky, and the [U.S. Army Pueblo Chemical Depot](#) in Pueblo, Colorado.



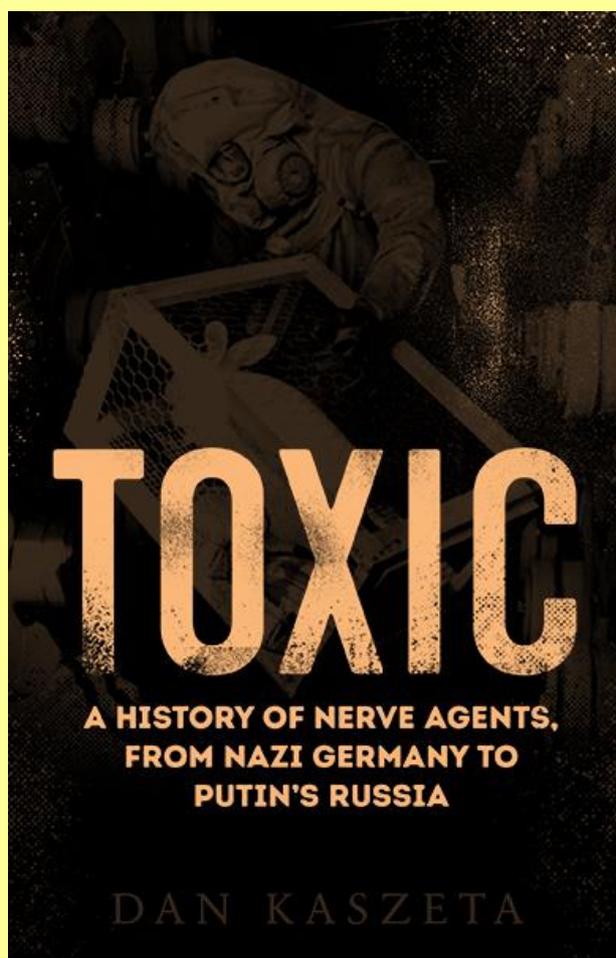
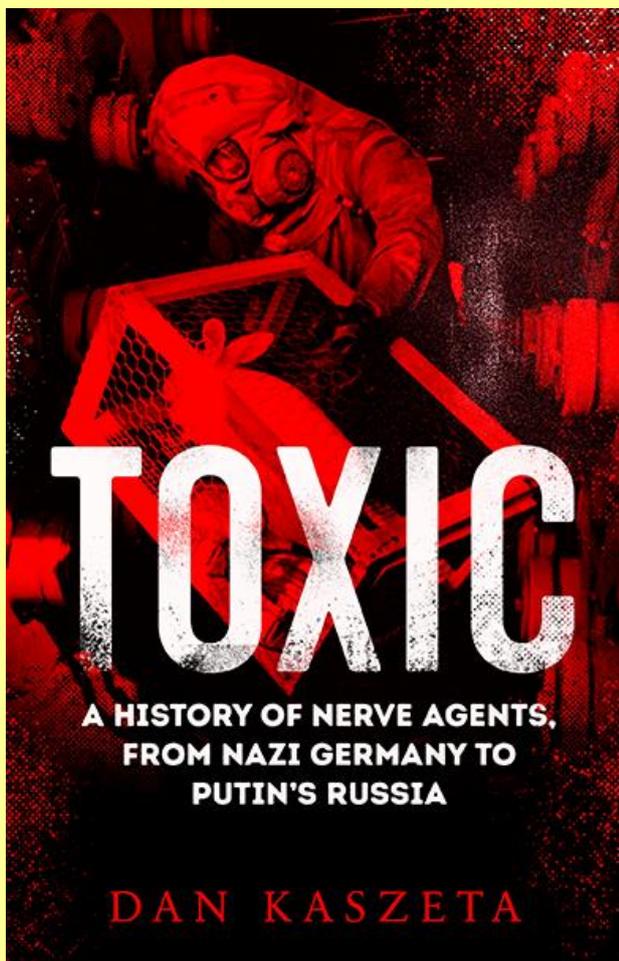
Pueblo Chemical Agent-Destruction Pilot Plant ordnance technicians pose for a photo within the plant. They support various aspects of agent round processing, from receiving to neutralization.

“Our highly trained workforce’s implementation of strict safety procedures has resulted in meeting the ACWA mission halfway complete milestone,” said [Walton Levi](#), site project manager, Pueblo Chemical Agent-Destruction Pilot Plant.

Abaie said that the combined efforts within the U.S. Chemical Demilitarization Program enabled the program to reach this milestone, with lessons learned from other chemical weapons subject matter experts and previous facility experiences. PEO ACWA oversees contracts led by [Bechtel National, Inc.](#) at the Colorado site and a [Bechtel-Parsons Joint Venture](#) at the Kentucky site.

“The expertise of the Blue Grass workforce is responsible for the program’s success in meeting this momentous halfway milestone,” said Site Project Manager [Dr. Candace Coyle](#), Blue Grass Chemical-Agent Destruction Pilot Plant. “I am proud of the focused dedication from this team as we work to safely destroy these obsolete weapons and make the world a better place.”

Chemical stockpile destruction operations began in Colorado in March 2015 and in Kentucky in June 2019. Both facilities are on target to complete operations by 2023.



Trio receive jail term for dumping mustard gas bombs in a Lincolnshire Lake

Source: <https://www.lincs.police.uk/news-campaigns/news/2020/trio-receive-jail-term-for-dumping-mustard-gas-bombs-in-a-lincolnshire-lake/>

June 12 – A trio of wartime memorabilia hunters have received jail sentences for dumping WWII mustard gas bombs in a Lincolnshire Lake – making them the first in the country to be sentenced for possession of a chemical weapon.

Martyn Tasker, 40, was jailed for five years for possession of firearms, plus 16 months' concurrent sentence for possession of a chemical weapon. His wife Michaela Tasker, 32, and friend Stuart Holmes, 50, were both handed a 12-month jail sentence suspended for two years for possession of a chemical weapon.



They messaged a friend who used to repair weapons in the Territorial Army to ask what they'd found, but didn't get an immediate identification.

Ten days later, the pair returned with Mr Holmes and uncovered a total of 16 canisters and three earthenware bottles.

One bottle was prised open – exposing what Mr. Tasker called 'really smelly oil' inside – before his friend texted, confirmed the containers were full of mustard gas, and advised alerting the authorities.

But Holmes had already poured the three bottles of mustard gas onto the ground so he could take the empty bottles home with him, along with 10 unopened canisters. The group left the other six canisters, but didn't report their find – despite knowing what a dangerous substance they'd uncovered.

Later that day, they decided to dump the canisters in Stixwold Lake, where Holmes worked. They secretly took a dinghy, rowed out into the lake, and left the containers to sink to the bottom, before burning their clothes.

The next day, Martyn Tasker sought treatment for blisters on his forearms and soon after, Michaela Tasker was treated for breathing difficulties.

Only then did the pair alert the police – but they lied about the circumstances and still didn't tell officers about the bombs they dumped in the lake.

They all pleaded guilty to breaching environmental laws by dumping hazardous material in the lake in addition to the chemical weapons charge.

Holmes also pleaded guilty to dumping a substance likely to harm human health or pollute the environment.

High Court Judge the Honourable Mr Justice Jeremy Baker in Nottingham Crown Court today passed sentence on the joint prosecution by the Environment Agency and the Crown Prosecution Service.

During sentencing, he highlighted that the trio's acts had 'huge and wide-ranging consequences', sparking the largest multi-agency response of its kind – and the situation only came to light when two of the three sought medical help for burns and trouble breathing.

The court heard that in September 2017, the Taskers came across wartime memorabilia in Roughton Woods, near Woodhall Spa – land which was historically requisitioned by the MoD for military training – and dug up a half-buried box of mustard gas bombs.





removing the bombs from the lake while keeping themselves, and nearby residents, safe.

Environment Agency sonar equipment usually used for fish surveys finally determined the bombs' location in the lake before Royal Navy divers were sent in to safely retrieve them.

The bombs were immediately transferred to the specialist defense science and technology lab in Porton Down. There, testing confirmed that the containers were still sealed and had not leaked. Everyone involved risked exposure and nasty side effects including burns, blisters, respiratory damage, vomiting and diarrhea. Multiple public meetings were held to address concerned local residents.

Following the sentencing, Ben Thornely, Incident Management Lead at the Environment Agency, said:

"Mustard gas is extremely toxic, so dumping it in a lake near people's homes and in a popular woodland enjoyed by Scouts and dog-walkers was appallingly dangerous.

"Luckily the old, corroded containers didn't leak and were safely disposed of by professionals who showed bravery, ingenuity and collaboration to keep people safe.

"This incident was entirely unique, so it's satisfying the judge recognized the grave threat posed and we hope this sentence sends a clear message – we won't hesitate to take action against those who so carelessly put people and our precious environment at risk."

Chief Inspector Phil Vickers, of Lincolnshire Police, said:

"This operation challenged the emergency services, military and partner agencies in ways that we have never experienced in Lincolnshire before – in fact some of the issues had never been faced anywhere before.

"The operation was testament to the planning and preparation that goes on behind the scenes to protect our communities in times of need, and whilst that has meant flooding and extreme weather in the past, the same principles applied when faced with this new challenge.

"Bringing together 27 agencies to protect the community of Woodhall Spa and surrounding area was no mean feat – everyone pulled together and we witnessed bravery from our military, insight from our specialist advisors, ingenuity from the Environment Agency and commitment from all involved.

"This was truly a successful multi-agency team effort – we achieved our aim of protecting the community from harm, and used our wide range of skills and experience to do so.

"I would like to take this opportunity to thank all of the partners who worked on 'Operation Saddleback' in the initial response and then into the recovery stage led by East Lindsey District Council – Most of all I would like to thank the local community for their patience and support throughout."

But it wasn't long until inconsistencies emerged from their stories and all three were arrested.

Authorities then launched a major operation to secure the woods, lake, and suspects' homes, and to recover the hazardous chemical.

In what has since been hailed the biggest operation of its kind, Lincolnshire Police led more than two dozen organisations including the Environment Agency, emergency services, and the Army, in an 11-day response.

It saw roads closed, drones deployed, safety cordons put in place, and at least one home evacuated while teams worked around the clock to tackle the tactical challenges of safely



OPCW Executive Council Adopts Decision Addressing the Possession and Use of Chemical Weapons by the Syrian Arab Republic

Source: <https://www.opcw.org/media-centre/news/2020/04/opcw-releases-first-report-investigation-and-identification-team>

July 09 — The Organization for the Prohibition of Chemical Weapons' (OPCW) Executive Council (EC) adopted by vote a decision addressing the possession and use of chemical weapons by the Syrian Arab Republic.

The Council expressed its deepest sympathies for the victims of chemical weapons use and condemned the use of chemical weapons as reported by the OPCW Investigation and Identification Team (IIT), which [concluded](#) that there are reasonable grounds to believe that the **Syrian Arab Republic used chemical weapons in Ltamenah, Syria in March 2017**.



The decision expresses the deep concern of the Council that the use of chemical weapons by the Syrian Arab Republic, by direct implication, establishes that the Syrian Arab Republic failed to declare and destroy all of its chemical weapons and chemical weapons production facilities, and demands that the Syrian Arab Republic immediately cease all use of chemical weapons. It also expresses deep concern that the Syrian Arab Republic did not cooperate with, and provide access to, the IIT, as required by United Nations Security Council resolution 2118 (2013), and demands that the Syrian Arab Republic fully cooperate with the OPCW's Technical Secretariat.

In order to redress the situation and pursuant to paragraph 36 of Article VIII of the Convention, the Council decided to request that the Syrian Arab Republic complete all of the following measures within 90 days:

(a) declare to the Secretariat the facilities where the chemical weapons, including precursors, munitions, and devices, used in the 24, 25, and 30 March 2017 attacks were developed, produced, stockpiled, and operationally stored for delivery;

(b) declare to the Secretariat all of the chemical weapons it currently possesses, including sarin, sarin precursors, and chlorine that is not intended for purposes not prohibited under the Convention, as well as chemical weapons production facilities and other related facilities; and

(c) resolve all of the outstanding issues regarding its initial declaration of its chemical weapons stockpile and program.

The Council decided that the Director-General, within 100 days, will report to the Council and all States Parties to the Chemical Weapons Convention on whether the Syrian Arab Republic has completed all of these measures. If the Syrian Arab Republic has not fully completed all of the measures within the specified period of 90 days, the Director-General will report to all regular sessions of the Council on the status of the implementation of this decision. Furthermore, the Council decided, pursuant to paragraph 36 of Article VIII of the Convention, that if the Syrian Arab Republic fails to redress the situation by

completing the measures set out in the decision, to recommend to the Conference to adopt a decision at its next session which undertakes appropriate action, pursuant to paragraph 2 of Article XII of the Convention, with respect to the Syrian Arab Republic.

The Council also decided that the Technical Secretariat will conduct inspections twice a year, until the Council decides to cease them, at **two sites identified in the IIT report as directly involved in launching chemical weapons attacks—the Shayrat airbase and the Hama airbase of the Syrian Arab Republic (see map above)**.



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The Council also reaffirmed that those individuals responsible for the use of chemical weapons must be held accountable, and emphasized the importance of bringing to justice those individuals responsible for the uses of chemical weapons found by the IIT to have been perpetrated by the Syrian Arab Republic, including those who ordered such attacks.

The Council decided that the Director-General will regularly report to the Council on the implementation of the decision and provide a copy of this decision and its associated reports to all States Parties and to the United Nations Security Council and United Nations General Assembly through the United Nations Secretary-General.

Background

The Executive Council is the executive organ of the OPCW and consists of 41 members from the five regional groups. The EC is responsible to the 193 members of the Conference of the States Parties. The EC promotes the effective implementation of the Chemical Weapons Convention (CWC), and compliance with it. The EC also supervises the activities of the Technical Secretariat. The Council cooperates with the National Authorities of Member States and facilitates consultations and cooperation among them at their request.

As the implementing body for the Chemical Weapons Convention, the OPCW, with its 193 Member States, oversees the global endeavour to permanently eliminate chemical weapons. Since the Convention's entry into force in 1997, it is the most successful disarmament treaty eliminating an entire class of weapons of mass destruction.

Over 98% of all chemical weapon stockpiles declared by possessor States have been destroyed under OPCW verification.

Coping with COVID Across the Force

Source: <https://www.airforcemag.com/article/coping-with-covid-across-the-force/>

July 01 – USAF is keeping the tip of the spear sharp, despite pandemic challenges.

“Just below the surface in our history and culture is a great starting point from which to adjust operations in this new environment,” Air Force Chief of Staff Gen. David L. Goldfein wrote in an April 28 letter to commanders. “It’s time to dust off those Ability to Survive and Operate manuals. Many of us grew up in the age of Apple Orchards, MOPP levels, operations with PPE, aircraft decontamination



procedures, etc. While we have not required it in recent years given our focus in the Middle East, the ability to survive and operate [ATSO] in a CBRN environment is in our DNA.”

Airmen at Moody Air Force Base, Ga., check their mission-oriented protective posture (MOPP) gear during chemical, biological, radiological, nuclear, and explosive defense training on Feb. 4. During CBRN training, they learn the different alarm colors and which MOPP gear corresponds with each alarm. **Airman Megan Estrada**

Goldfein sent out an order: Major commands and wings should take advantage of the “new

abnormal” and plan new exercises to adjust procedures for operating in that chemical, biological, radiological, nuclear, and explosive threat environment. Because experts don’t project a vaccine to be widely available until as late as December 2021, the Air Force needs to “find ways to survive and operate with a virus likely to return a few times between now and then.



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I certainly hope I'm wrong and a vaccine comes earlier ... but hope is not a course of action. We must prepare for the long haul." The pandemic has hit different regions and communities differently, and each base has a unique mission, so Goldfein's directive provides wide leeway to individual commanders.

"No two bases will be exactly the same," he wrote. "Different missions. Different demographics. Different communities. Different leadership. It is why we have continually worked to push decision authority to you and your subordinate commanders. ... We must have trust throughout the organization. [Air Force] Secretary [Barbara] Barrett and I absolutely trust you to get the job done. ... As we have said since the beginning, don't wait for us. Take the decision authority you have been given and move out as you in turn push decision authority to your subordinate command teams."

Commands and wings quickly followed through. Some are following in the momentum of previous exercises, while others are creating new, large-scale training events or changing the overarching goals of planned events.

Bringing CBRN to the Forefront

CBRN defense has long been a part of the Air Force, with groups of dedicated Airmen researching and training for the threats. However, this has been back of mind for the bulk of the service, relegated to once a year exercises and computer-based training. As COVID-19 spread, however, it became a major focus quickly.



Air Force Chief of Staff Gen. David Goldfein bumps elbows with Airmen of the 91st Missile Security Operations Squadron at Minot Air Force Base, N.D. **Airman 1st Class Jesse Jenny**

EDITOR'S COMMENT: Why bumping elbows when they can salute each other AS USUAL?

"The CBRN community has always been there, always working, and there's a ton of expertise in the world. But ... CBRN and the WMD threat weren't front and center," said Maj. Ryan Ruediger, the chief of air operations in the Air Force's countering weapons of mass destruction division. "And then, as we're working in the periphery and continuing to build



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capabilities, design better equipment, better detectors, do all of these things, all of a sudden COVID gave us an opportunity to bring these capabilities front and center.”

In the past few years as part of an overall push toward full-spectrum readiness, the Air Force has taken a closer look at CBRN defense, rewritten guidance, and thought more deeply on what needs to be exercised, said Col. Leanne Moore, the chief of countering weapons of mass destruction in the office of the deputy chief of staff for strategic deterrence and nuclear integration.

“Our role is to optimize air power, and one of the unique things that we try to do at the Air Staff is to understand the science and behavior of the threat and characterize the hazard,” she said.

At the outset of the outbreak, CBRN experts received calls constantly, asking about the right protective equipment to wear, about how to properly sanitize aircraft, and other protective measures to take. For the Airmen responsible for training for the threats, there was a lot of “connective tissue” between the outbreak and what CBRN threats the service needs to be ready for, Ruediger said.

“We have incredible masks, equipment, and capability that will protect our Airmen in a dangerous chemical or biological environment. But it’s overkill for COVID,” Moore said. “We had a lot of people who wanted [to] pull out their chem gear and get suited up from head to toe and operate that way. When we realized that the threat really could be (mitigated) with washing your hands, wearing gloves, and just wearing a cotton face mask, we could protect our Airmen so they could continue to operate.”

The COVID-19 reality gives the Air Force the chance to better educate itself about CBRN threats, and real-world training to more effectively face similar threats in future CBRN scenarios, said Lt. Col. Paul Hendrickson, the Agile Combat Support Directorate’s AF Chemical, Biological, Radiological, and Nuclear Defense Systems Branch materiel leader.

“So, how do we leverage this new focus on the B in CBRN and turn it into a comprehensive readiness look so that we can make sure

that we’re ready for when it really is that chemical or biological interchange with a peer adversary trying to deter or demoralize us,” he said.



Senior Airman Michael Ottaviano (left) and Staff Sgt. Brandon Staines make masks in the aircrew flight equipment shop at the New Jersey Air National Guard Base in Atlantic City in April. The shop sewed and distributed face masks for mission-essential Airmen, their families, and the wider community in response to COVID-19. Staff Sgt. Cristina Allen/NJANG

EDITOR’S COMMENT: The make masks for the airmen but they wear scarfs or pieces of T-shirts! Interesting!

The Air Force needs to “deliberately train the right way,” by leveraging its experts at

the base-level, he said. Training is needed so Airmen understand that if they face a CBRN threat, they can still operate.

“There seems to be a pervasive belief that when a chem attack or a biological attack happens, the whole base is slimed and you just can’t operate, which couldn’t be further from the truth. With proper warning, sensing, and communication, there is a whole spectrum of operations that can continue.”

Several months into the outbreak, COVID-19 has shown where the Air Force was not ready and the service is working to ensure it is ready in the future to meet a threat, no matter what it is, said Chief Master Sergeant Joseph Trenholm, the Air Force emergency management career field manager. The outbreak “opened up the aperture now on how do we do business” with the threats that exist, he said.

“So, if the CBRN Defense community is given the opportunity to share and shape with what we have available, then the momentum is not lost,” Hendrickson said. “That’s really where you get your bang for the buck. It’s all fun and games to say we’re going [to] practice it, but if we’re going do it, we have got do it in the right way. And I think if we can—if we can get over that hump and make it a part of our DNA again, we can ensure our forces are prepared for the next conflict where a CBRN threat is employed.”



177th Fighter Wing

New Jersey was among the hardest-hit states in the early stages of the COVID-19 outbreak in the United States, and that created a unique challenge for the Air National Guard's 177th Fighter Wing at Atlantic City International Airport.

The wing's F-16s sit alert for the North American Aerospace Defense Command's Operation Noble Eagle mission, ready to launch to protect the nation's airspace in a region including New York City. The wing acted early to adjust its operations—having pilots quarantine before coming in for alert duty, for example—while also sending Guardsmen out into New Jersey's communities to help where needed as cases multiplied.

Coronavirus created a “biologically contested environment right here in our backyard,” said Wing Commander Col. Bradford Everman, in an interview. “We can't just shut down for a week or for a month. ... We don't have that option. We have to continue getting the job done.”

The 177th was forced to cancel a major exercise—an agile combat employment event in which the wing was to “forward deploy” to a base in Michigan and quickly stand up operations—but with that off the books, the wing is reshaping its October exercise to practice operating in a biological threat environment at home. Wings across the Air Force are required to conduct an ability to survive and operate exercise for CBRN threats, and this will be it.

“We're going to look at it—rather than looking at it as being in Central Command, or being in Pacific Command, or somewhere around the globe—now we're gonna look at it as what if we had to operate right here in a true biological warfare environment on the 177th Fighter Wing proper, defend it in three dimensions, and then go out and do our mission from our local base,” Everman said. “And you really can't write the script any better than in a biologically contested environment, which is the world that we live in, day in and day out right now.”

Alaska Defense

Like the 177th, the 3rd Wing at Joint Base Elmendorf-Richardson, Alaska, stands alert to protect the homeland. Indeed, the wing's F-22s launched several times in response to Russian aircraft encroaching on Alaska's airspace this past spring and summer. The wing has adjusted daily operations and worked with social distancing to safely keep pilots on alert, and in May, joined with the Air National Guard's 176th Wing at JBER to launch 26 F-22s, two C-12s, two C-130s, two E-3 Sentrys, and three C-17s in a giant “Moose Walk” to demonstrate readiness. Pilots and maintainers worked through distancing and PPE requirements, along with the need to sterilize cockpits, to conduct the event.

“The message is that we're ready—we've always been ready,” said 3rd Wing Commander Col. Robert Davis in an Air Force Magazine interview. “And the challenges associated with COVID-19 have not prevented us from being ready to defend the nation in our NORAD alert mission, or to be able to project air power, to deliver air power to combatant commanders.”

The “Moose Walk”—an Alaskan tweak to the more familiar “Elephant Walk”—was the first major exercise for JBER in the COVID-19 environment. The wing does CBRN-related training events on a “routine basis,” Davis said, and while recent training was canceled as the pandemic began, the wing is rescheduling to train “some of the CBRN skills” soon.

The 176th Wing has kept track of COVID-19 impacts to its operations, relative to operating in the CBRN threat environment, said Wing Commander Col. Anthony Stratton.

“COVID is, to a lesser degree, very similar to how we operate in a chemical and biological environment,” he explained. “In that environment we typically double the amount of time that it takes us to do a task, just as our base-level planning factor.” Every step needed to generate a sortie—supply, fuel, operations, and maintenance—had to work through the complications imposed by requiring PPE and social distancing in setting up the Moose Walk.

“We want to illustrate to anybody that's out there, that may be considering that our combat capability or capacity to generate [air power might be] ... degraded due to COVID: That's absolutely not the case,” Stratton said.

Out in the Pacific

Pacific Air Forces is planning to focus on CBRN and potential outbreaks in multinational training exercises. Future training events in 2021 and 2022 with the Philippines and Thailand will focus on the CBRN threat, applying lessons from the COVID-19 experience, including aeromedical evacuation.

Mobility

Air Mobility Command is applying its CBRN training experience to its COVID-19 response.

“AMC wings have been conducting local, large-scale exercises that emphasize ATSO skills, including proficiency in MOPP levels and use of personal protective equipment,” AMC



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spokeswoman Capt. Nicole Ferrara said in a statement. “Now, AMC is applying these skills to the current operating environment, to help mitigate the threat posed by coronavirus.”

For example, the day after Goldfein’s letter, McConnell Air Force Base, Kan., assigned a KC-46 aircrew to test the aircraft’s intercom voice communications while wearing chem-bio flight gear. Engineers from Edwards Air Force Base, Calif., remotely monitored the test, collecting data with which to create TTPs [tactics, techniques, and procedures] for operating the aircraft in a CBRN environment. The command hosts its premier exercise, Mobility Guardian, every two years, and trained extensively for a CBRN environment in 2019, including decontamination procedures. The command is planning more of that for its next event scheduled for summer 2021. Air Force CBRN experts tout Little Rock Air Force Base, Ark., as the standard-bearer for CBRN training. The base conducts monthly ATSO “rodeos” including representatives from many career fields and its C-130s, along with regular radiological recovery training, and exercises to deploy and operate in a threatened environment. The base even has “Thunder Thursdays” when an alarm goes off during a regular day, and Airmen who are a part of the exercise need to quickly put on their protective gear and continue working. “You roll on base on a Thursday, it’s not weird to see somebody walking around in their gear,” Hendrickson said. “Everybody just says ‘Oh yeah, well, that poor soul’s part of the exercise this quarter.’”

The pandemic prompted research into how CBRN threats affect mobility aircraft and a study on the airflow in mobility aircraft to understand how a virus could spread from the cargo hold to the cockpit, and what can be done to stop it. A new Negatively Pressured Conex system approved for production this spring will be able to transport more highly contagious patients than the existing Transport Isolation System developed after the 2014 Ebola outbreak.

“From adapting aircrew protection measures to implementing aircraft decontamination procedures as needed, AMC has and will continue to seek ways of reducing risk to personnel and passengers flying on our aircraft,” Ferrara said.

Bases across U.S. Air Forces in Europe-Air Forces Africa were among the first to face the COVID-19 threat. For example, Aviano Air Base, Italy, locked down in early March as the pandemic hit northern Italy hard. The base had to change its flying schedule so pilots and maintainers could alternate on-days to avoid crowding and personal contact. The base’s F-16 squadrons, used to flying alongside Italian aircraft and other local allies, instead focused on local training in its own ranges.

Fighting COVID in the U.K.

The story was similar at RAF Lakenheath, U.K., where the 492nd Fighter Squadron broke into teams that operated on alternating weeks. That decreased flying time by about 50 percent, said Capt. Alexandra Deerr, flight commander and instructor pilot with the 492nd FS.

By late May, USAFE had canceled 14 exercises, but decided it needed to go forward with large-scale training amid the pandemic and conducted a major exercise in the North Sea with 38 aircraft from Lakenheath, Aviano, and Spangdahlem Air Base, Germany, along with a NATO E-3 AWACS and the 603rd Air Operations Center at Ramstein Air Base, Germany. Planning was done remotely, with aircrews operating as if facing biological threats. Maintainers worked in shifts and aircraft were decontaminated.

“This is really the first large force exercise (LFE), that I know of, since COVID started,” Capt. Alex Travers, the 52nd Fighter Wing’s electronic combat pilot who flew in the exercise, said in an interview. “All things considered, with the displaced planning and different units coming together for the first time in several months, it went off very well and we got some great training out there. There’s nothing like being at 1.2 Mach and 30,000 feet, and looking over and just seeing all the [USAF] contrails and thinking: ‘This is America This is awesome.’ So, I had a great time today.”

“The goal of this was to integrate across multiple platforms, multiple fighters in this case, to ... get into some contested, degraded operations where we can essentially go to another airspace where we’ve never met the people, in person, that we’re fighting with, and actually integrate with them and apply our joint tactics and doctrine with those guys, without having to be physically present for the mission planning,” said Capt. Michael Shaw, an F-16 pilot with Aviano’s 510th Fighter Squadron, in an interview.

The May LFE was the first in a series of similar events to be held throughout the year across USAFE, with each wing taking turns planning.

USAFE Commander Gen. Jeffrey L. Harrigian told Air Force Magazine that the pandemic provides a chance to get back to “our fundamentals” and train in a way “that forces our Airmen to work through problem sets.”

“As we look at these large force exercises and some of the other internal exercises that we’re going to do inside of USAFE I think, ultimately, what we want to look at is: Recognize that the virus is not going away, it’s gonna come back,” Harrigian said in an interview.

“We’re gonna have to work our way through that. And so as we look at these exercises, how do we continue to employ the techniques that we’ve learned over the last couple months, to be able to generate sorties, generate combat power, while operating in this environment? That’s ultimately the key to our success while also looking at some of the other challenges associated with a chem or bio environment.”



New Nontoxic Ammunition

Source: <http://www.homelandsecuritynewswire.com/dr20200717-new-nontoxic-ammunition>



July 17 – **Every time a gun fires, lead leaches into the air.** A scientific advancement could provide a comparable replacement for lead-based explosive materials found in ammunition, protecting soldiers and the environment from potential toxic effects.

[Purdue University](#) researchers, in collaboration with the U.S. Army Combat Capabilities Development Command's Army Research Laboratory, developed two new lead-free materials that function as primary explosives, which are used to ignite powder inside a gun cartridge.

The work, funded by the Army Research Office, appears in a paper published in [Chemistry – A European Journal](#).

“Right now, whenever you are shooting, you’re going to be spreading lead into the air around you,” said [Davin Piercey](#), a Purdue assistant professor of [materials engineering](#) and [mechanical engineering](#). “Any use of lead is going to end up polluting the environment in small amounts. The more lead you remove, the better it is for the environment.”

A [past study](#) found that people who have been shooting a lot could have elevated lead levels. But so far, the use of lead in explosives has been inevitable.

When a gun trigger is pulled, a metal firing pin strikes a cup containing a primary explosive. The force from the firing pin deforms the cup, crushing the primary explosive and causing it to detonate. This explosion sets off a secondary explosive that burns and helps complete the rest of the firing sequence, accelerating the bullet out of the gun.

Because primary explosives are found in the cartridge of just about anything that fires a bullet, the Army has been searching for solutions for many years to develop **lead-free versions of these explosives that satisfy environmental regulations** associated with lead contamination.

“The development of these materials provides a potential pathway toward lead-free technology,” said Jesse Sabatini, an Army researcher who led the project’s investigation of which molecules to use for these new materials.

What enables the materials to be lead-free is a chemical structure that has not been used in primary explosives before. One material is made of silver salts while the other material contains no metal at all – just the basic ingredients for an explosive. These ingredients include carbon, hydrogen, nitrogen and oxygen.

“Toxicity-wise, silver is an improvement over lead, but it’s still a little toxic. So, we also made a nonmetal material that does not have heavy metal toxicity associated with it. Metal is dead weight, energetically speaking, and doesn’t contribute much to an actual explosion,” Piercey said.

The chemical structure used in these materials makes them very dense, meaning that only a small amount of either material would be needed to create an explosion.

Researchers at the Army Research Laboratory modeled these materials to get a sense of how explosive they would be. Piercey’s lab at the [Purdue Energetics Research Center](#) (PERC) made the materials and conducted experimental tests demonstrating that they work as primary explosives.

According to the researchers’ calculations, the materials they created have a detonation performance similar to or higher than commonly-used primary explosives.

The CCDC-Armaments Center at Picatinny Arsenal, New Jersey, is interested in exploring these compounds for primary explosive-based applications for bullets and gun propellants. Purdue and Army researchers will continue to gather the data needed for determining which lead-based weapons systems these materials can replace.

“At PERC, our theme is ‘molecules to munitions.’ Our labs can do everything from designing and testing molecules to formulating and manufacturing those molecules into a useful compound,” said [Steve Beaudoin](#), director of PERC and a Purdue professor of [chemical engineering](#).

“Our partners can then take that useful compound and put it into a warhead, missile, rocket or whatever it needs to be.”

EDITOR’S COMMENT: Everybody happy! We can shoot without compromising the environment or the health of our people in the field!



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BIO NEWS



Problems identified (so far) during the ongoing coronavirus pandemic

By the Editor of C²BRNE Diary

Medical intelligence: When the finger was pointing to the moon, some were focusing on the finger! The severity of the initial cluster was not evaluated properly and neither was its threat potential.

Human and governance perception: Still, in 2020, some countries thought that they are very far away to affected by the virus even when it was evident that this time things would be different and not just another flu (e.g. Europe; USA).

Preparedness: Personal protective equipment and critical ICU equipment became a major problem that during the initial phases of the pandemic costed lives. Specialized training was an accompanying problem because most of the healthcare personnel thought that a mask and a pair of gloves would be enough. Production of these items at national level was absent.

Virus identification: There is something fishy here! Molecular testing (aka RT-PCR) can identify if the virus is present or not in a body. The thing is that we do not know when to do the test before the appearance of the clinical symptoms (asymptomatic phase). In addition, a negative PCR does not mean “you are OK; you can travel abroad or can go to work”. On the other hand, rapid IgM/IgG tests can give a hint on how the body reacted when contacted with the virus (active phase; recovery phase; immunity). Is it so difficult to see that these two technologies are complementary and different? It is so easy to come to unfair conclusions such as that PCR requires expensive equipment while rapid tests cost ~10 euros.

Planning: Planners missed two operational rules: (1) we plan based on what people will actually do; not on what they should or have to do; and (2) we plan with what we have at hand and not on what we would like to have. These two pitfalls together with the Clausewitz’s principle that no plan is good enough in front of the enemy, greatly contributed to the managerial chaos produced. The most important player in all emergencies or disasters, that is the population, is usually left out from planning. The best we can do so far is to provide some training for earthquakes and usually, that is all – with some minor exceptions of course. We do not dare to address CBRN issues thinking that we will panic the people that something bad is on the way. People in high places love to be surprised mainly because deep inside them they all believe that “the unexpected will not happen to them” or “it is so exotic to happen” forgetting that the unexpected always happens.

Governance: Infectious diseases’ specialists “peacefully” took over the governments and implement policies and guidelines focusing exclusively on medical issues and less to none on the social and financial implications of the pandemic. These decisions are beginning to be visible globally in the post-lockdown era. It is not always black and white; there is also “grey” and this is where politicians know better but they prefer to play it safely without exhibiting sufficient governance qualities and capabilities.

Quarantine/lockdown effects: Quarantine duration – meantime: 2-3 months – was not long enough to bring citizens to their limits requiring more cinematographic measures shown in Hollywood movies – i.e. martial law; shoot to kill escapees; massive lootings and public arrest and resistance (expected in a more severe bioterrorism attack). Nevertheless, it was proven that compliance with quarantine rules was not real but a result of fines and other related punishments. When the lockdown was removed, there was only one word around the globe: PARTY!!!

Distancing: Planners should realize that there are three main categories of distancing: (1) personal distancing (I keep a distance from mass gatherings or people exhibiting any symptoms I consider probable or suspicious); (2) professional distancing (I adjust my personal distancing to that of my working environment because there is no alternative and I have to return to work), and (3) recreational distancing (practically, there is no distancing at all; bars, clubs, festivals, etc. pretend that they take all measures (some do) but the flood of people nullifies all regulations and protocols – in that respect it is up to the individual to party or not. One might argue that this behavior might contribute to the further spread of the virus. The answer is: who cares about society; the important thing is to party! Therefore, any plan trying to impose social distancing in everyday life is meant to fail if people do not or cannot understand the magnitude of threat or the impact of own behavior to others.



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Spreading prevention: Have you seen the video showing a simulation of virus' spread inside a supermarket. The droplets plume I spread on almost 3 corridors overriding the selves. In that respect, all the plexiglass that invaded our lives literally offer minimum protection. But it is a new fashion and we all must wear it whether it fits or not!

Fake news: "Infodemic" was so intense and never been seen to this extent in previous incidents like SARS, H1N1, or MERS. It should be taken seriously and addressed properly in a future, similar social environment in order to avoid mistakes, disinformation and conspiracy theories of the present.

Bioterrorism: The main problem of tomorrow is not the Covid-19 consequences or the more deaths to be seen in the two continents not highly – for the time being – affected: South America and Africa. The problem is the dual use of modern biotechnologies in combination with the ego of many research scientists that might lead to a global catastrophe if final products are mishandled or used for malicious purposes.

In any occasion, we repeat emphatically that "preparedness is better than treatment". This pandemic might be a gold global opportunity to move from theory to praxis because tomorrow we might be not as lucky as with Covid-19! Unfortunately, after every catastrophe societies relax and the "it will not happen (again) to us" attitude resumes place as life goes on ...

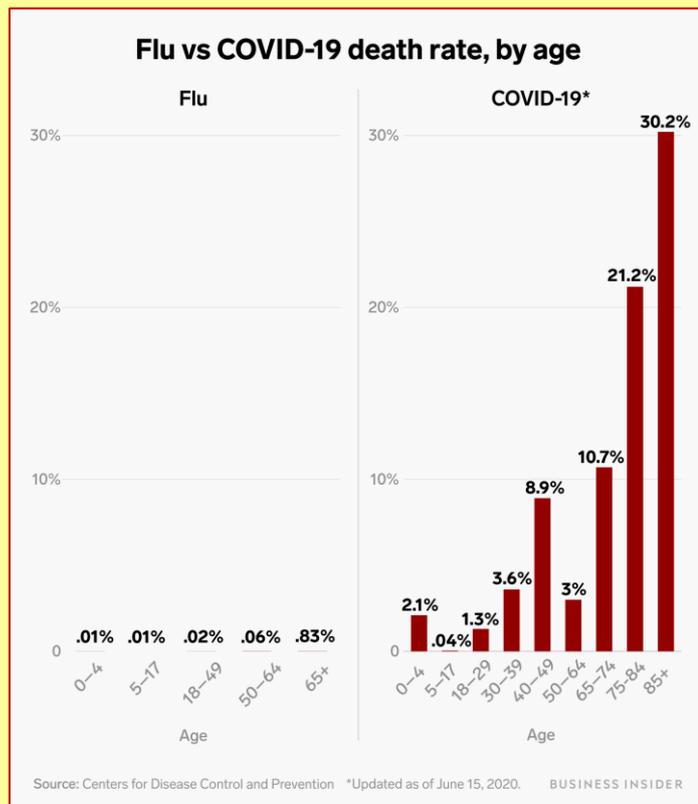
The US Death Rate from The Coronavirus Is 49 Times Higher Than the Flu

Source: <https://www.sciencealert.com/the-us-death-rate-for-covid-19-is-50-times-higher-than-the-flu>

June 23 – Though some [symptoms](#) of the flu and the [coronavirus](#) overlap, comparing the death rates of the two shows just how much worse the coronavirus is.

While about 0.1 percent of people who got the flu died in the US last year, according to the Centres for Disease Control and Prevention, the coronavirus' death rate is currently about 4.9 percent, based on the reported totals of cases and deaths. That makes the coronavirus' average death rate 49 times higher than that of the flu.

Death rates of both the flu and the coronavirus vary widely between age groups, and both seem to be most fatal among people over 65.



The chart (left) shows how they compare.

Although the breakdown reveals that a smaller percentage of infected people from 50-64 years old have died of [COVID-19](#) relative to most other age groups, that bracket represents the highest share of confirmed cases overall (more than 475,000). Globally, [coronavirus](#) cases have topped 9 million and more than 469,000 people have died. So no, this new disease isn't "just another flu."

The flu infects millions of people every year and kills thousands. The number of people killed by influenza each year isn't reported the same way that COVID-19 deaths are – a discrepancy that can cause confusion when comparing the numbers.

The CDC estimates the total number of flu infections in the US via its influenza-surveillance system, which gathers data from state and local partners and projects nationwide totals using infectious-disease models.

The [estimations](#) are meant to account for flu deaths that occur outside hospitals and other circumstances in which a person dies without getting a flu test. For that reason, the totals can lag by up to two years because it takes CDC researchers a while to collect flu data and look through death certificates.

During the 2018-19 flu season, about 35



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million people in the US contracted the flu and about 34,000 died, according to the [CDC](#). In that season, about one out of every 1,000 people who got the flu died.

Breaking down the numbers by age range reveals a more complex story. Among children, there was about one death per every 10,000 cases. For adults between 50 and 64 years old, about six out of every 10,000 people who got the flu died. For those 65 and older, the rate rose to about 83 out of 10,000 people.

The flu's death rate varies depending on the strains circulating each year. The flu [virus](#) mutates rapidly, so people catch different strains, which is why the vaccine isn't 100 percent effective and new vaccines are needed every year.

Over 30 percent of US coronavirus patients over 85 have died

Because of the newness of the coronavirus, calculations of the disease's death rate come from dividing the number of confirmed COVID-19 deaths by the total of confirmed cases. The numbers in the chart above come from the CDC's most [recent June report](#).

In the US, the coronavirus has infected more than 2.3 million people since the [first case was reported on January 22](#). But that case total likely far undercounts the true scope of the outbreak because it includes only those who have gotten tested.

Preliminary data on [excess deaths](#) and frontline observations from funeral directors and emergency responders in New York City suggest that [the US is undercounting deaths](#) from the virus as well.

The coronavirus' death rate changes constantly, and many health experts [have predicted that the rate could drop](#) if more mild and asymptomatic cases are tested and confirmed.

A trend that is unlikely to change with more robust testing, however, is the degree to which the coronavirus is especially deadly for older people and those with [preexisting health problems](#). Because the virus primarily spreads via droplets when people are in [close contact](#) and is most fatal for people over 80, nursing homes have become dangerous breeding grounds.

Stopping the flu and the coronavirus from spreading

The flu and coronavirus [spread in the same way](#): via viral particles that travel between people in tiny droplets of saliva or mucus. If a sick person sneezes, coughs, or speaks loudly within 5 feet of someone healthy, the particles could land on the healthy person; if the particles enter the person's eyes, nose, or mouth, the person can become infected.

An average coronavirus patient infects two to 2.5 others. That also makes COVID-19 more contagious than the seasonal flu.

Social distancing limits the risk of infection, however, as does proper hand-washing and avoiding touching your face. A growing [body of research](#) also shows masks can significantly prevent coronavirus transmission.

Public Perceptions and Risk Communications for Botulism

By Deborah Glik, Kim Harrison, Mehrnaz Davoudi, and Deborah Riopelle

Biosecur Bioterror. 2004;2(3):216-23.

Source: <https://pubmed.ncbi.nlm.nih.gov/15588060/>

Formative research findings from 10 focus group interviews on botulism are described. Data were collected from a diverse sample of people throughout the United States in 2003, as part of a collaborative multisite initiative sponsored by the Centers for Disease Control and Prevention to improve communications materials on bioterrorism agents. Focus group guides included questions on knowledge, action, emotions, and information seeking in response to a series of scenarios on a hypothetical terrorist attack using botulinum toxin. Data were collected, transcribed, coded, and analyzed using content domains based on risk and health communications theories. Initial participant responses to scenarios were emotional, changing into immediate health and survival concerns conceptualized as information specific to the agent and event. Knowledge about botulism was low, and participants wanted clear, concise, and actionable messages. Broadcast media, the internet, and community-based sources were cited as sources of information. Findings have implications for botulism preparedness messages and for general public risk communications.

How to Tell if Your Cough Is a Sign of The Coronavirus or Something Else

By Maja Husaric and Vasso Apostolopoulos

Source: <https://www.sciencealert.com/how-to-tell-if-your-cough-is-a-sign-of-the-coronavirus-or-something-else>

June 23 – For centuries, doctors and care givers have listened to the different types of cough in search of clues to help [diagnose](#) underlying disease.

Coughs are a valuable diagnostic tool, but how do you know if you've got a relatively harmless cough, a [coronavirus](#) cough – or something else altogether?



An occasional cough is healthy, but one that persists for weeks, produces bloody mucus, causes changes in phlegm colour or comes with [fever](#), dizziness or fatigue may be a sign you need to see a doctor.

Cough questions

If you've gone to see a doctor about a cough, he or she will want to know:

- how long has the cough lasted? Days, weeks, months?
- when is the cough most intense? Night, morning, intermittently throughout the day?
- how does the cough sound? Dry, wet, barking, hacking, loud, soft?
- does the cough produce symptoms such as vomiting, dizziness, sleeplessness or something else?
- how bad is your cough? Does it interfere with daily activities, is it debilitating, annoying, persistent, intermittent?

COVID-19 cough: dry, persistent and leaves you short of breath

The most prominent symptoms of [COVID-19](#) are fever and fatigue, and you may feel like you have a cold or flu. Cough is present in about half of infected patients.

Considering that COVID-19 irritates lung tissue, the cough is dry and persistent. It is accompanied with shortness of breath and muscle pain.

As disease progresses, the lung tissue is filled with fluid and you may feel even more short of breath as your body struggles to get enough oxygen.

Wet and phlegmy or dry and hacking?

A wet cough brings up phlegm from the lower respiratory tract (the lungs and lower airways, as opposed to your nose and throat) into the mouth.

The "wet" sound is caused by the fluid in the airways and can be accompanied by a wheezing sound when breathing in. The lower airways have more secretory glands than your throat, which is why lower respiratory tract infections cause a wet cough.

A dry cough doesn't produce phlegm. It usually starts at the back of the throat and produces a barking or coarse sound. A dry cough does not clear your airways so sufferers often describe it as an unsatisfactory cough.

Nose and throat infections cause irritation to those areas and produce a hacking dry cough with sore throat. These types of cough are often seen in flu or cold.

Sometimes a cough can start off dry but eventually turn wet.

For example, the lung infection [pneumonia](#) often begins with a dry cough that's sometimes painful and can cause progressive shortness of breath. As infection progresses, the lung air sacs (alveoli) can fill up with inflammatory secretions such as lung tissue fluid and blood, and then the cough will become wet. At this stage, sputum becomes frothy and blood-tinged.

What about whooping cough?

Whooping cough is caused by bacterial infection that affects cells in the airways and causes irritation and secretion.

Symptoms include coughing fits that end in a loud, "breathing in" noise that often sounds like a long "whoop" and leaves you gasping for air. Mucus is often expelled.

Prolonged, forceful coughing can damage your airways, or cause rib fractures or muscle tears – so it's important to know when medical help is required.

So whatever your cough sounds like, keep an eye on it and see a doctor (either in person or via a [telehealth](#) appointment) if it doesn't go away or gets worse.

Maja Husaric is Lecturer @, Victoria University.

Vasso Apostolopoulos is Adjunct Professor and Sessional Academic @ Victoria University.

Scientists estimate the speed and distance of coronavirus transmission when people cough, sneeze, speak — and run

Source: <https://www.marketwatch.com/story/scientists-examine-speed-and-distance-of-coronavirus-transmission-when-people-cough-sneeze-speak-and-run-2020-06-23>

June 24 – There's a lot scientists know — and a lot they don't.

In "[Coughs and Sneezes: Their Role in Transmission of Respiratory Viral Infections, Including SARS-CoV-2](#)," released Tuesday, researchers describe the various types and sizes of virus-containing droplets present in sneezes and coughs, and how some medical procedures and devices may spread these droplets. "Coughs and sneezes create respiratory



droplets of variable size that spread respiratory viral infections,” according to the article, which was published online in the American Thoracic Society’s American Journal of Respiratory and Critical Care Medicine.

‘While most respiratory droplets are filtered by the nose or deposit in the oropharynx, the smaller droplet nuclei become suspended in room air and individuals farther away from the patient may inhale them.’

“Because these droplets are forcefully expelled, they are dispersed in the environment and can be exhaled by a susceptible host. While most respiratory droplets are filtered by the nose or deposit in the oropharynx, the smaller droplet nuclei become suspended in room air and individuals farther

away from the patient may inhale them,” said Rajiv Dhand, professor and chair of the Department of Medicine and associate dean of clinical affairs at University of Tennessee Graduate School of Medicine, and co-author of the paper.

Among the researchers’ recommendations: “Health care providers should stay six feet away from infected patients, especially when the patient is coughing or sneezing. For spontaneously breathing patients, placing a surgical mask on the patient’s face or using tissue to cover his or her mouth, especially during coughing, sneezing or talking, may reduce the dispersion distance or viral load. While ideally,

infected patients should be in single rooms to prevent droplet dispersion, it is acceptable for two patients with the same infection that is spread by respiratory droplets to be in the same room.”

The contagiousness of speech droplets

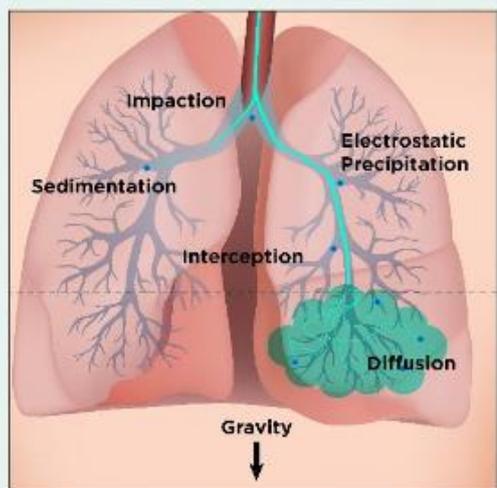
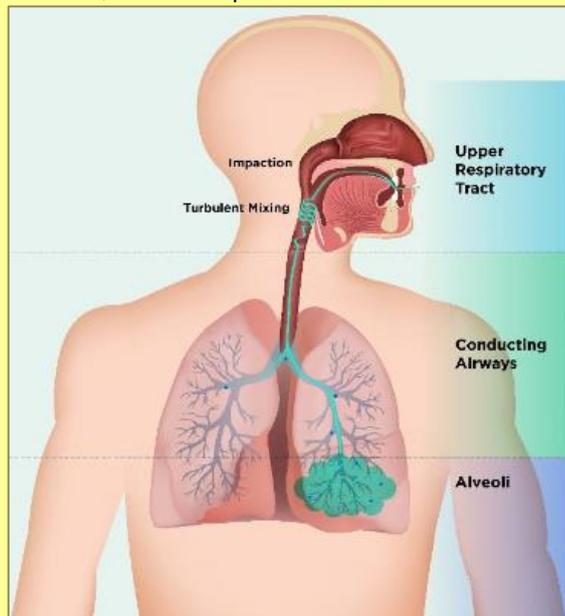
“Speech droplets generated by asymptomatic carriers of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are increasingly considered to be a likely mode of disease transmission,” [a separate study](#) published in the latest edition of the peer-reviewed Proceedings of the National Academy of Sciences, the official journal of the National Academy of Sciences, found. “Highly sensitive laser light scattering observations have revealed that loud speech can emit thousands of oral fluid droplets per second.”

In a closed, stagnant-air environment, droplets disappear from view after eight to 14 minutes, “which corresponds to droplet nuclei of ca. 4µm diameter, or 12µm to 21µm droplets prior to dehydration,” the researchers wrote. One micrometer, µm, is equivalent to one millionth of a meter. The coronavirus is 0.125 µm. The scientists said that, while it’s long been recognized that respiratory viruses such as coronavirus can be transmitted via droplets generated by coughing or sneezing, it’s less widely known that normal speaking does too. High viral loads of SARS-CoV-2 have been detected in oral fluids of COVID-19–positive patients, including asymptomatic ones.

How far coronavirus droplets can travel

Social distancing has been defined for people that are standing still. “It does not take into account the potential aerodynamic effects introduced by person movement, such as walking fast, running and cycling,” researchers wrote in another study titled, “Towards aerodynamically equivalent COVID-19, 1.5 meters social distancing for walking and running.” Bert Blocken, a professor of civil engineering at Eindhoven University of Technology in the Netherlands and Katholieke Universiteit Leuven in Flanders, Belgium, and his co-authors recommend that people avoid walking or running in the slipstream of a walker or runner in the park and street.

“In the absence of head wind, tail wind and cross-wind, for walking fast at 4 kilometers per hour, this distance is about 5 meters (16 feet) and for running at 14.4 kilometers per hour, this distance is about 10 meters (32 feet),” the study, which has not been peer reviewed, found. The smaller the distance between the runners, the larger the fraction of droplets to which the trailing runner is exposed.” If people wish to run behind and/or overtake other



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walkers and runners with regard for social distance, “they can do so by moving outside the slipstream into staggered formation,” it added.

Factors indoor contributing to contagion

Factors affecting whether the virus remains “stable” and contributing to transmission: Humidity and temperature of the room, air-conditioning, whether or not there are open windows, general air quality, size of the room and, of course, how many people are present and how close they are to each other. “In contrast to SARS-CoV-1, most secondary cases of the new SARS-CoV-2 transmission appear to be occurring in community settings rather than health-care settings,” a recent study published in the *New England Journal of Medicine* found.

The COVID-19 pandemic, which was first identified in Wuhan, China in December, had infected 9,273,773 people globally and 2,347,102 in the U.S. as of Tuesday. It had claimed at least 477,807 lives worldwide, 121,225 of which were in the U.S., according to Johns Hopkins University’s Center for Systems Science and Engineering. The Dow Jones Industrial Index [DJIA, -2.40%](#) and the S&P 500 [SPX, -2.32%](#) were slightly higher Tuesday, as investors weighed progress in COVID-19 vaccine research amid fears of a surge of coronavirus in U.S. states that have loosened restrictions.

Frequency of routine testing for COVID-19 in high-risk environments to reduce workplace outbreaks

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Source: <https://www.medrxiv.org/content/10.1101/2020.04.30.20087015v3.full.pdf>

Shelter-in-place policies have been considered effective in mitigating the transmission of the virus SARS-CoV-2. To end such policies, routine testing and self-quarantine of those testing positive for active infection have been proposed, yet it remains unclear how often routine testing would need to be performed among workers returning to workplaces, and how effective this strategy would be to meaningfully prevent continued transmission of the virus. We simulated SARS-CoV-2 polymerase chain reaction testing to estimate the frequency of testing needed to avert continued epidemic propagation as shelter-in-place orders are relaxed. We find that testing strategies less frequent than daily (e.g. weekly testing or testing once prior to returning to work) are unlikely to prevent workforce outbreaks without additional interventions. Even given unlimited testing capacity, the impact of frequent testing may not be sufficient to reliably relax shelter-in-place policies without risking continued epidemic propagation, unless other measures are instituted to complement testing and self-isolation.

National Pandemic Planning – The Forgotten Scenarios

By Rick C. Mathews

DomPrep Journal – June 2020

Source: <https://www.domesticpreparedness.com/journals/june-2020/>

“Are we prepared?” is a simple question with a not-so-simple answer. There are generally two times this question arises: (1) when funding is being requested, and (2) after an incident occurs where the preparedness comes under review. Both timings are appropriate, but arguably not the best time to raise the question. The best time to ask this question is that “sweet spot” between a request for funding and an actual need arises. However, this ideal time is frequently missed or avoided. Some would say it is human nature to avoid tough questions unless forced to face them; other times, it is because of the preparedness issue conflicting with other priorities that comprise the agendas of most agencies, governments, and private sector managers.

▶▶ Read this article at source’s URL.



Rick C. Mathews is a principal in the Mathews Group LLC and serves as a public service professor in the Rockefeller College of Public Affairs and Policy at the University at Albany SUNY. He has over 40 years of experience in the areas of safety, security, counterterrorism, and emergency preparedness. He has trained emergency responders across the nation and has conducted research in emergency preparedness, homeland security, and critical infrastructure interdependencies. He serves as a consultant to both public and private sector clients, the media, and emergency responder agencies.

The Dynamics of Human Trafficking: Before & After COVID-19

By Michael Breslin

DomPrep Journal – June 2020

Source: <https://www.domesticpreparedness.com/journals/june-2020/>

These are challenging times. The immediate impacts of the coronavirus pandemic are impossible to ignore when viewed in terms of the sickness and death it has brought upon the world community. It continues to impact the global economy and social norms. The long-term impacts of this virus and subsequent mitigation efforts may not be completely understood for quite some time. What is known is the pandemic has impacted almost every aspect of daily life, from social distancing rules, interrupted supply chains, longer waits at the supermarket, school closures, cancelled milestones, record unemployment, remote learning, and telework to the closure of places of worship. The COVID-19 pandemic has been a transformative event.

▶▶ Read this article at source's URL.

Michael Breslin is the strategic client relations director for LexisNexis Risk Solutions, government. He has 24 years of federal law enforcement experience working with the United States Secret Service and the Department of Homeland Security. He holds a Bachelor of Arts from St. John's University, Queens, New York. He also holds a Master of Science degree in national security strategy and a graduate certificate in business transformation and decision making from the Industrial College of the Armed Forces, as well as a Master of Public Administration from John Jay College of Criminal Justice.

Universal Flu Vaccine May Be More Challenging than Expected

Source: <http://www.homelandsecuritynewswire.com/dr20200623-universal-flu-vaccine-may-be-more-challenging-than-expected>

June 23 – Some common strains of influenza have the potential to mutate to evade broad-acting antibodies that could be elicited by a universal flu vaccine, according to a study led by scientists at Scripps Research. The findings highlight the challenges involved in designing such a vaccine, and should be useful in guiding its development.

In the study, [published in Science](#), the researchers found evidence that one of the most common flu subtypes, H3N2, can mutate relatively easily to escape two antibodies that were thought to block nearly all flu strains. Conversely, they found it is much more difficult for another common subtype, H1N1, to escape from the same broadly neutralizing antibodies.

One of the main goals of current influenza research is to develop a universal vaccine that induces broadly **neutralizing antibodies, also known as "bnAbs,"** to give people long-term protection from the flu.

"These results show that in designing a universal flu vaccine or a universal flu treatment using bnAbs, we need to figure out how to make it more difficult for the virus to escape via resistance mutations," says the study's senior author [Ian Wilson, DPhil](#), Hansen Professor of Structural Biology and Chair of the Department of Integrative Structural and Computational Biology at Scripps Research.

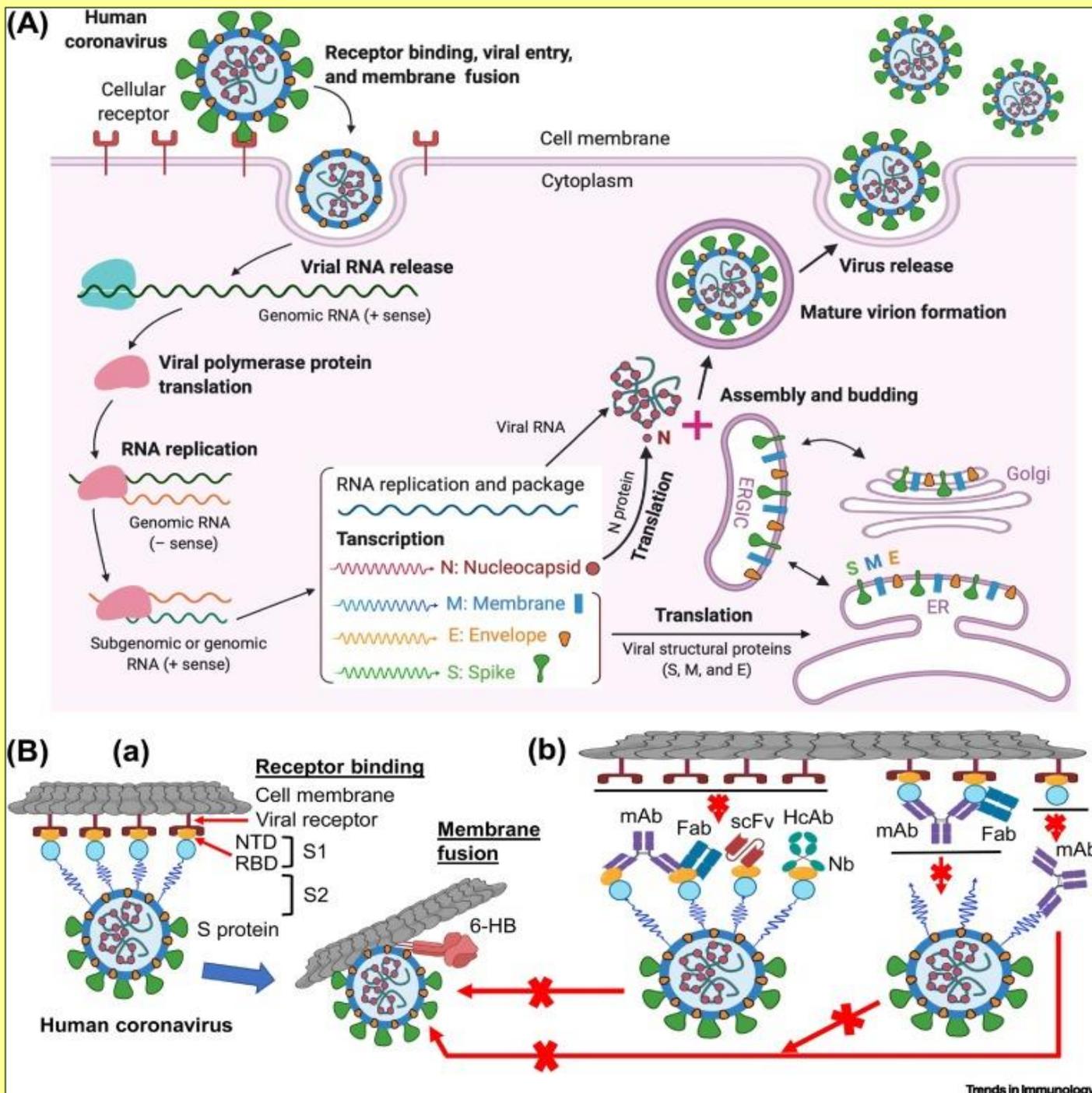
The Promise of a Universal Vaccine

Influenza causes millions of cases of illness around the world every year and at least several hundred thousand fatalities. Flu viruses have long posed a challenge for vaccine designers because they can mutate rapidly and vary considerably from strain to strain.

The mix of strains circulating in the population tends to change every flu season, and existing flu vaccines can induce immunity against only a narrow range of recently circulating strains. Thus, current vaccines provide only partial and temporary, season-by-season protection.

Nevertheless, scientists have been working toward developing a universal flu vaccine that could provide long-term protection by inducing an immune response that includes bnAbs. Over the past decade, several research groups, including Wilson's, have discovered these





multi-strain neutralizing antibodies in recovering flu patients, and have analyzed their properties. But to what extent circulating flu viruses can simply mutate to escape these bnAbs has not been fully explored.

In the study, first-authored by postdoctoral research associate Nicholas Wu, PhD, and staff scientist Andrew Thompson, PhD, the team examined whether an H3N2 flu virus could escape neutralization by two of the more promising flu bnAbs that have been discovered so far.

Known as CR9114 and Fl6v3, these antibodies bind to a critical region on the virus structure called the hemagglutinin stem, which doesn't vary much from strain to strain. Because of their broad activity against different flu strains, they've been envisioned as antibodies that a universal flu vaccine should be designed to elicit, and also as ingredients in a future therapy to treat serious flu infections.



Using genetic mutations to methodically alter one amino acid building-block of the protein after another at the stem site where the bnAbs bind, Wu and colleagues found many single and double mutations that can allow H3N2 flu to escape the antibodies' infection-blocking effect.

The team also found a few instances of these "resistance mutations" in a database of gene sequences from circulating flu strains, suggesting that the mutations already happen occasionally in a small subset of ordinary flu viruses.

Escape Skills Vary by Flu Strain

Although experiments and analyses suggested that H3N2 viruses are broadly capable of developing resistance mutations, the same was not true for H1N1 viruses. The researchers tested several H1N1 viruses and found that none seemed able to mutate and escape, except for rare mutations with weak escape effects. The H3N2 and H1N1 subtypes account for most of the flu strains circulating in humans.

The researchers used structural biology techniques to show how differences in the hemagglutinin stem structure allow H3N2 flu viruses to develop resistance mutations to the two stem-binding antibodies more easily than H1N1 viruses.

"If it's relatively easy for H3N2 to escape those bnAbs, which are the prototype antibodies that a universal flu vaccine should induce, then we probably need to think more carefully and rigorously about the design of that universal flu vaccine against certain influenza subtypes," Wu says. "The good news is that a universal flu vaccine should at least work well against the H1N1 subtype."

The researchers now plan to conduct similar studies with other flu subtypes and bnAbs. They say that in principle, a vaccine eliciting multiple bnAbs that attack different sites on flu viruses or are more accommodating to changes in the virus could help mitigate the problem of resistance mutations.

Political casualties of the COVID-19 pandemic

Editorial: The Lancet; Vol 20(7), p.755, July 01, 2020

Source: [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30496-5/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30496-5/fulltext)

After implementing to varying degrees of success non-pharmaceutical interventions to control the COVID-19 outbreak, countries around the world are now lifting restrictions, many seemingly without heed of epidemic curves, reproductive number estimates, or regional differences in these. Economic pressures are driving these decisions, with the detrimental effects of an economic crisis anticipated to outweigh the damage caused by the virus. There is some justification for this concern: the [World Bank](#) estimates that at least 71 million people will be pushed into extreme poverty, itself a public health issue, as a result of the pandemic. Thus, for some countries it seems lifting lockdown restrictions is not a choice but a necessity. All countries, however, should endeavour to lift restrictions in a way that considers the scientific evidence. Any increase in cases and deaths resulting from relaxing restrictions too quickly will likely diminish public trust at a time when public confidence in decision makers is already low.

In the UK, which as of June 10 ranks fourth in the world in number of COVID-19 cases and second in number of deaths, public approval of the Conservative Government's handling of the COVID-19 outbreak has declined steadily during lockdown. According to a [YouGov](#) survey, only 41% of people in the UK on May 29 said they thought the government was handling the issue of COVID-19 very or somewhat well, compared with a high of 72% on March 27. Loss of confidence in the UK Government results in part from confusing and inconsistent messaging at the government's daily media briefings, a lack of transparency around the scientific evidence and who exactly is informing policy, neglect of care homes as cases and deaths in hospitals rose, and refusal to acknowledge the dearth of personal protective equipment available to health-care workers. Prime Minister Boris Johnson's continued support of his chief advisor Dominic Cummings after Cummings broke lockdown rules was perhaps the final nail in the coffin of public trust. Unsurprisingly, hypocrisy and an attitude of "one rule for us, another for them" does not win public favour.

Elsewhere, public confidence in country leadership is similarly declining. Unpopular internationally and domestically before the outbreak, support for Brazil's President Jair Bolsonaro has since taken a further nosedive because of his failure to acknowledge the seriousness of the pandemic and his open flouting of lockdown rules while thousands of Brazilians die from COVID-19. Bolsonaro's actions have sown confusion and dissent among the Brazilian population, made worse by the government's decision on June 5 to cease publishing cumulative totals of COVID-19 cases and deaths and to remove months of data from the public domain. After public outrage, accusations of censorship, and a ruling by a Supreme Court judge, these data were quickly reinstated, but the damage had already been done.

In the USA, President Donald Trump has made clear from the beginning of the outbreak that the US economy is his priority, and with encouragement from the president, many states had entirely lifted lockdown restrictions by the end of May. Lifting these measures occurred despite infections still increasing in some states and the country's ranking as worst affected



in the world. The human toll of the pandemic in the USA, combined with disastrous press briefings, Trump's decision to terminate the USA's relationship with WHO, and his aggressive response to Black Lives Matter demonstrations, has led Trump's popularity to slump.

Public distrust of authorities has detrimental effects on control of infectious diseases. Not only does it permit conspiracy theories to take hold, but it also fosters vaccine hesitancy. It is not clear when a COVID-19 vaccine will be ready to deploy, but its success will to a great extent be determined by people's acceptance of immunisation. Vaccine hesitancy has been on the rise, and evidence from a survey in France suggests the situation is no different for COVID-19. 26% of respondents to the survey said they would not use a vaccine if one became available, with differences in acceptance related to the candidate who respondents voted for in the first round of the 2017 presidential election. This finding demonstrates the integral role of politicians in acceptance of public health interventions. Public mistrust in leadership could also undermine the public's compliance with, and so success of, responses to a second wave of infections.

Governments and political leaders around the world might become casualties of COVID-19. How they have responded to the outbreak and listened to and communicated with their citizens will be important in deciding their fates in future elections. Public trust must be earned, and COVID-19 has made clear who is and is not worthy of that trust.

Recent successes in therapeutics for Ebola virus disease: no time for complacency

By Patrick L Iversen, Christopher D Kane, Xiankun Zeng, et al.

Source: [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30282-6/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30282-6/fulltext)

The PALM trial (Pamoja Tulinde Maisha [Swahili for together save lives]) in the Democratic Republic of the Congo identified a statistically significant survival benefit for two monoclonal antibody-based (mAb114 or REGN-EB3) therapeutics in the treatment of acute Ebola virus disease; however, substantial gaps remain in improving the outcomes of acute Ebola virus disease and for the survivors. Ongoing efforts are needed to develop more effective strategies, particularly for individuals with severe disease, for prevention and treatment of viral persistence in immune-privileged sites, for optimization of post-exposure prophylaxis, and to increase therapeutic breadth. As antibody-based approaches are identified and advanced, promising small-molecule antivirals currently in clinical stage development should continue to be evaluated for filovirus diseases, with consideration of their added value in combination approaches with bundled supportive care, their penetration in tissues of interest, the absence of interaction with glycoprotein-based vaccines, and filoviral breadth.

Don't Get Too Excited About a 'Green Revolution' Thanks to The Pandemic. Here's Why

Source: <https://www.sciencealert.com/this-pandemic-might-not-be-a-silver-lining-for-climate-change-after-all>

June 25 – Measures to contain the global [pandemic](#) have [caused our global carbon emissions to plummet](#), and some think this unprecedented event might actually help us to tackle [climate change](#). But new research has put a more realistic spin on this rosy outlook by looking at the development of clean energy alternatives.

For now, people around the world might be [breathing cleaner air](#), but new research focused on the United States suggests that won't come close to outweighing the fatality of this [virus](#). In all likelihood, the environmental benefits of the global health crisis will be short lived.

If the threat of the current pandemic can be mediated relatively quickly, the US economy will no doubt rebound and there will be few long-term consequences, the authors argue. We'll just go right back to burning fossil fuels again.

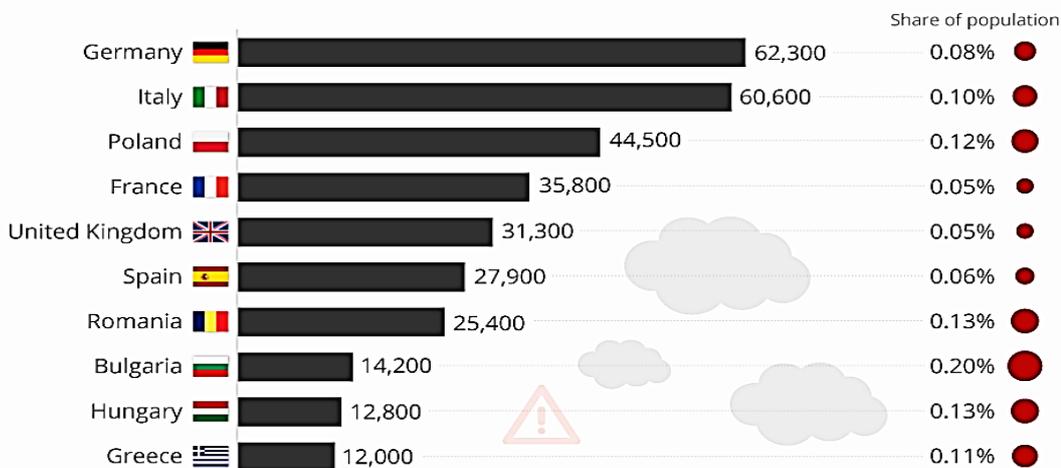
But if the viral threat continues unabated, even if just for a single year, it will cause a persistent global recession, which could further undermine investments in clean technology. Not only will this set back our green energy future, researchers say it will outweigh any emissions reductions we've seen so far.

Already, most investment in clean energy technology has come to a halt, and it's only been a few months. Global electric vehicle sales are projected to decline by nearly 50 percent this year, and new rooftop solar and storage installations have also plummeted.



Where EU air pollution kills the most people

EU28 countries with the most premature deaths attributable to particulate matter (2015)



@StatistaCharts Source: European Environment Agency

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"Overall clean energy jobs dropped by almost 600,000 by the end of April, as investments in energy efficiency and renewable generation have plummeted," [says](#) Marten Ovaere, who researches energy economics at Yale University.

"If that were to continue it could significantly set back the push toward a clean energy future."

Using previous economic shocks as examples for their 'thought experiments', the authors roughly bind the best and worst

outcomes for the future under this current pandemic.

While the study is focused specifically on the US, the team says their findings can apply to much of the developed world. And even though these are hardly foolproof predictions, they might help prepare us for what's to come.

Unfortunately, even in the best-case scenario, where we put an end to this pandemic relatively quickly, there appear to be few long-term benefits. We'd simply go back to living the way we used to, making up for the lost time in no time at all.

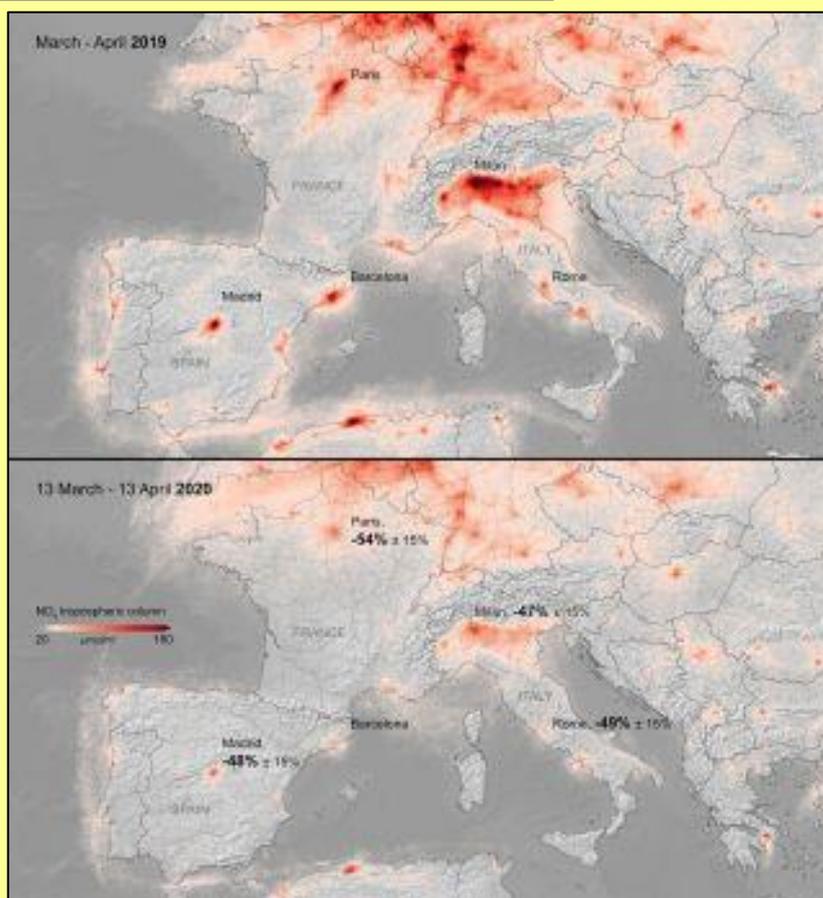
"Thus, [COVID-19](#) would be a relatively short-lived shock to the world economy," the authors [conclude](#).

"Most demand for products and services will be deferred rather than destroyed, so when the entire economy is safely reopened, there will be a massive rebound in economic activity, likely even surpassing the activity prior to the outbreak."

The second scenario, they say, is more likely, although it is much worse for the world. If it takes much longer for the pandemic to subside, the impacts on energy innovation could be significant.

In this scenario, COVID-19 is much more widespread, deadly and persistent, causing a much longer global recession.

In this case, even when we go back to normal, some people might be too afraid to use public transport, and those who continue working from home will simply use more energy there.



Plus, as investments for low-carbon technologies dry up, both in the private and public sector, the transition to new energy technologies will become far less compelling for cash-strapped industries.

"For example, there has been a huge amount of investment going into electric vehicles," [says](#) environmental economist Kenneth Gillingham from Yale University.

"But if companies are just trying to survive, it's much less likely that they can make large investments towards new technologies for the next generation because they don't even know if they're going to make it to the next generation."

To explore how this would impact long-term emissions, the team performed an illustrative modelling exercise.

In the next 15 years, the authors predict this worst-case scenario will result in a further 2,500 million metric tons of carbon dioxide emissions, which is nearly 3 trillion pounds of coal burned. That would cause 40 more deaths per month, or 7,500 deaths from 2020 to 2035.

"However," the authors [note](#), "the energy policy response to COVID-19 is the wild card that can change everything."

Even if the world is destined for a worst-case scenario, they say, our emission increases are not set in stone.

COVID-19 Improves Air Quality in Just Three Months

Weekly average concentration of NO₂ in the air in selected cities (Feb-Apr 2020)*



Central locations

* 95 percent of NO₂ in the air is caused by fossil fuel combustion

Source: World Air Quality Index (WAQI)



statista

Governments that can afford stimulus packages have an opportunity right now to invest in clean energy and public transport, while refusing to compromise on our climate goals.

"Depending on how policymakers respond," [says](#) Gillingham, "the consequences for human health from this deferred investment could far exceed the short-term environmental benefits that we have seen so far."

►► The study was published in [Joule](#).

Candida auris – Hospitals, keep an open eye on this mold!

Effect of Colchicine vs Standard Care on Cardiac and Inflammatory Biomarkers and Clinical Outcomes in Patients Hospitalized with Coronavirus Disease 2019

The GRECCO-19 Randomized Clinical Trial

By Spyridon G. Devereos, Georgios Giannopoulos, Dimitrios A. Vrachatis, et al.

Source: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2767593>

In this randomized clinical trial, participants who received colchicine had statistically significantly improved time to clinical deterioration (plus significantly less intubations). There were no significant differences in high-sensitivity cardiac troponin or C-reactive protein levels. These findings should be interpreted with caution.

New Cochrane review assesses how accurate antibody tests are for detecting COVID-19

Source: <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013652/epdf/full>

June 25 – Today Cochrane, a global independent organization that reviews evidence from research to inform health decision-making, publishes a review of studies looking at the accuracy of COVID-19 antibody tests.

The review shows that antibody tests could have a useful role in detecting if someone has had COVID-19, but that timing is important. The tests were better at detecting COVID-19 in



people two or more weeks after their symptoms started, but we do not know how well they work more than five weeks after symptoms started. We do not know if this is true for people who have milder disease or no symptoms, because the studies in the review were mainly done in people who were in hospital. In time, we will learn whether having previously had COVID-19 provides individuals with immunity to future infection.

Antibody tests are an important public health tool to identify individuals with previous COVID-19 disease. This enables assessment of the spread of infection and the need for public health interventions. The review summarizes research evidence available up until the end of April 2020 to see whether antibody tests:

- are accurate enough to diagnose disease in people with or without symptoms of COVID-19, and
- can be used to find out if someone has already had COVID-19.

The immune system of people who have COVID-19 responds by developing proteins in the blood called antibodies that attack the virus. Detecting antibodies in people's blood may indicate whether they currently have COVID-19 or have had it previously. Whilst detecting current infection is usually done using swab tests within the first 5 days of illness, they may miss infection and are not available to all.

Cochrane researchers from universities across the world led by experts from the University of Birmingham searched through the 11,000 publications on COVID-19 available at the end of April to find studies that reported results of antibody tests in groups of people known to have (or have had) COVID-19 and others known not to have had COVID-19 based. They found a total of 54 relevant studies reporting test results for nearly 16,000 samples. The majority of studies were from China and were carried out in people who had been admitted to hospital and likely to have had severe disease.

The studies looked at three types of antibody, IgA, IgG and IgM. Most tests measured both IgG and IgM, but some measured a single antibody or combinations of the three antibodies. Data were only available for 27 tests, a small fraction of the over 200 tests on the market. Data were available on both laboratory-based tests, which require blood samples taken from the veins, and point-of-care tests, which can use finger-prick blood samples. There were not enough data to compare the accuracy of different tests. The authors will continue to update this review over the next few months to provide a more complete summary of the research evidence as it accumulates.

The researchers found that the sensitivity (the proportion of the people who have had COVID-19 that the test can detect) of antibody testing is very closely related to when the test is performed. Tests of the IgG and IgM antibodies at 8 to 14 days after onset of symptoms correctly identified only 70% of people who had COVID-19. However, when the researchers looked at data reported at between 15 and 35 days after symptoms first began, antibody tests accurately detected over 90% of people with COVID-19. There are insufficient studies to estimate the sensitivity of antibody tests beyond 35 days after the beginning of symptoms. The tests only wrongly diagnosed COVID-19 in 1% to 2% of people without COVID-19.

To illustrate what these accuracy figures mean, in a sample of 1000 people where 200 people (20%) really have COVID-19, typical of workers in a hospital setting where COVID-19 patients have been treated:

- ❖ 193 people would receive a positive test result but 10 (5%) of those people would not have COVID-19 (known as a false positive result);
- ❖ 807 people would receive a negative test result but 17 (2%) of those people would have COVID-19 (known as false negative result).

In a population where COVID-19 was more common there would be more false negatives and fewer false positives.

Studies showed that antibody tests may have a role in diagnosing COVID-19 in patients who have had COVID-19 symptoms for two or more weeks but who have not had a swab (PCR) test or tested negative despite COVID-19-like symptoms.

Professor Jon Deeks, Professor of Biostatistics and head of the Test Evaluation Research Group at the University of Birmingham, explains: "We've analyzed all available data from around the globe - discovering clear patterns telling us that timing is vital in using these tests. Use them at the wrong time and they don't work. While these first COVID-19 antibody tests show potential, particularly when used two or three weeks after the onset of symptoms, the data are nearly all from hospitalized patients, so we don't really know how accurately they identify COVID-19 in people with mild or no symptoms, or tested more than five weeks after symptoms started. The researchers also had several concerns about the quality of the studies they found. Studies were small and did not report their results fully. Many papers included multiple samples from the same patients. More than half of the studies were made available before they had been through peer review (publications known as 'preprints'). In one important UK study the biomarker manufacturers did not approve the identification of the tests that had been evaluated.

Dr Jac Dinnes, who worked on the review with the University of Birmingham team commented, "The design, execution and reporting of studies of the accuracy of COVID-19 tests requires considerable improvement. Studies must report data broken down by time since onset of symptoms. Action is needed to ensure that all results of test evaluations are



available in the public domain to prevent selective reporting. This is a fast-moving field and we plan to update this review regularly as more studies are published."

As America struggles to reopen schools and offices, how to clean coronavirus from the air

By **Chris Mooney, Perry Stein and Aaron Steckelberg**

Source: <https://www.washingtonpost.com/climate-environment/2020/06/26/coronavirus-indoor-air-schools-offices/>

June 26 – As chief operating officer of the District of Columbia's largest charter school network, Dane Anderson is racing to clean the air in time for late August, when some students are expected to come back to a starkly different environment.

"We want the interior of our buildings to be essentially on lockdown related to virus," Anderson says of [KIPP DC](#), a publicly funded and privately operated network of seven campuses with 1,200 employees and 7,000 students.

A majority of those students live in neighborhoods that have high concentrations of black, low-income residents — swaths of the city with the greatest number of coronavirus deaths as well as the highest asthma rates, [according to](#) the nonprofit DC Asthma Coalition. Nationally, African Americans have [suffered disproportionately](#) from the virus.

As Americans contemplate returning to schools, offices and other indoor spaces they fled under threat of the deadly virus this spring, building managers like Anderson are figuring out how to reopen safely and prevent infection. They are focused on spaces where the virus can spread, from workspaces to bathrooms to elevators and heating, ventilation and cooling systems — and balancing the cost and practicality of changes.

"Building owners and operators are looking at what they can do to make their buildings safer. It's not just a real risk, it's a psychological risk," said William Bahnfleth, an expert on indoor air at Pennsylvania State University and chair of the epidemic task force at ASHRAE, a global expert body on the management of building systems. "People aren't going to be inclined to go back into buildings if they're concerned about how safe they are."

When it comes to schools and office buildings, wearing face masks and cleaning surfaces are not enough, experts say. They are recommending a menu of additional measures, many of which call for different ways of circulating and filtering the air.

But these steps are often expensive, rarely mandatory, and generally require help from professional engineers. And they can run counter to modern building design, which aims to seal the so-called building envelope to reduce heating and cooling costs. In the time of [coronavirus](#), the new goal is to bring in more fresh air.

"Across the nation, I'm really concerned about K through 12 schools and universities not being prepared for the fall, when students and staff and teachers come back," says Richard Corsi, dean of the Maseeh College of Engineering and Computer Science at Portland State University, and an air quality expert.

Corsi says the steps being taken by schools like KIPP DC will lower risks, but he worries not everyone will be able to do the same. "It sounds like this school has the resources to do it right, and a lot of school districts don't have the resources," he said.

Elimination of all risk isn't possible, but keeping schools closed has its own costs, argues Joseph Allen, who runs the Healthy Buildings program at Harvard's T.H. Chan School of Public Health and co-wrote a [report](#) released Wednesday about reopening schools during the pandemic.

"There will be cases in schools," Allen said. "That's unavoidable at this point because of the choice our national government has taken in terms of this absolutely failed response to controlling cases. ... We're stuck in this situation. But we still have to march forward. And I know that if we follow the science, we can significantly reduce risk in schools."

Viruses in the air

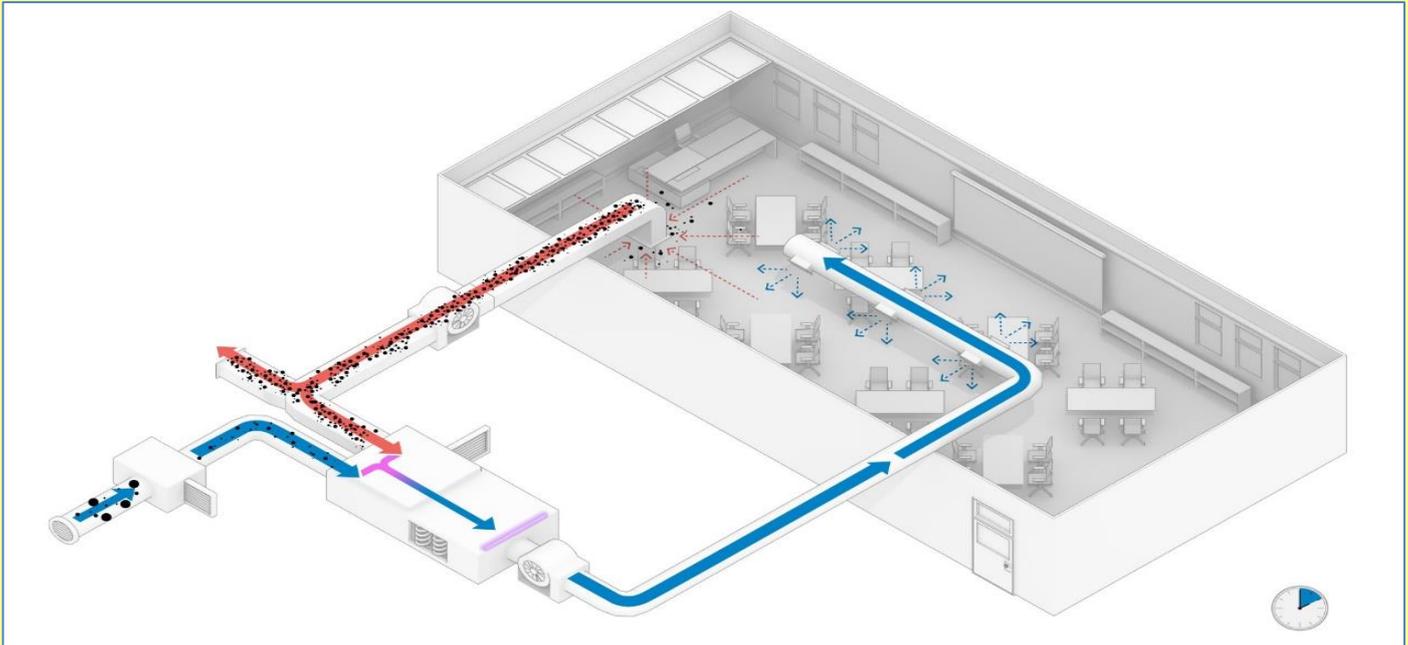
The KIPP DC schools have an advantage when it comes to the coronavirus and building upgrades — they have modern infrastructure to begin with. Since the charter network opened its first D.C. school in 2001, it has poured hundreds of millions of dollars into new buildings and modernized older buildings it rents from the city. KIPP DC has heavy philanthropic support and financial resources that other charters and traditional public-school systems lack. D.C. Public Schools, which educates just more than 50 percent of the city's 100,000 public school students, said it is still considering what it needs to do before reopening buildings, a spokesman said.

As early as February, the KIPP DC schools were considering what to do should the virus hit hard in the United States. In April, Anderson and board chairman Terry Golden, who has a real estate background and previously headed Host Marriott, discussed making sure the



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buildings were able to control air quality to prevent infection. Now KIPP DC is investing in a range of changes to increase safety, particularly when it comes to how air travels through these buildings.



Ventilation systems for buildings can vary but most rely on the same basic principles. Here is what an ideal system optimized to filter the coronavirus could look like.

Classroom

Stale indoor air is pulled from the room as fresh air from outside is pumped in.

MERV-13

filter bank

Filter

UV-C light

With outside ventilation increased to maximum, prefilters catch large particles from outside air while MERV-13 filters further clean the air and capture virus particles.

UV-C lights may also be installed in air-handling units or ducts to kill airborne viruses. Clean air is vented back into the room while the stale air is vented outside.

The goal would be to have the air filtered and pass UV-C lights every 10 minutes.

At the KIPP DC Webb campus in the Trinidad neighborhood, for instance, roughly \$50,000 has been committed so far to reprogram systems to bring in more fresh air and to install UV-C lights inside large building air handlers to kill viruses, among other measures. KIPP DC has so far committed \$350,000 for engineering upgrades in its seven campuses in the city, just one of many planned changes.

Experts say the greatest danger of coronavirus transmission is when one is in close proximity — usually within six feet — to someone who's already sick and coughing. While much remains unknown about transmission, [mounting evidence](#) suggests the virus can also travel in aerosolized droplets that are lighter and smaller than the large droplets produced in coughs, allowing them to float and linger in air.

This can happen when a person who is infected, but not necessarily showing symptoms, is talking or even just breathing. That's one key reason that public health experts say wearing a mask is one of the most effective ways to reduce the disease's spread.

"Aerosols can accumulate, remain infectious in indoor air for hours, and be easily inhaled deep into the lungs," a [recent study](#) in Science magazine noted.

ASHRAE, which writes standards for indoor air systems, has [already determined](#) that the risk of airborne coronavirus transmission indoors is serious enough that building systems should be modified to try to stop it.

Building engineers say the most important practice is to make sure that air turns over frequently, mixing in lots of fresh air, and that it passes through filters that remove viruses.



HZS C²BRNE DIARY – July 2020

"It's the combination of ventilation and filtration that results in the indoor air quality," Bahnfleth said. "So if you've got a good level of filtration and a good level of ventilation, that could be sufficient in a lot of environments."

Some experts also recommend electronic devices, such as UV-C lights, that kill viruses and other microorganisms that may get past the filters.

"Every 10 minutes ... we'd like the air to touch a filter, or get diluted, or start to hit an electronic," said Raj Setty, an engineer who is president and principal at Setty and Associates and is advising KIPP DC on the reopening. "Something to kill things in the air."

MERVs and HEPAs

Setty recommends that KIPP DC do everything from using sanitizing mats for students to walk across at entryways, to installing special closets for personal protective equipment in classrooms, to making water fountains touchless.

He is not a big fan of indoor barriers or partitions. Air vents tend to push air down from the ceiling and "pick up viruses and spread them around the room," moving around barriers, Setty said.

The goal should be to make sure the air is clean, rather than trying to prevent its circulation, he said.

To that end, the systems in the KIPP DC schools will be reprogrammed to admit more outside air. When it comes to filtering, meanwhile, KIPP's new and renovated schools have an advantage over many outdated buildings.

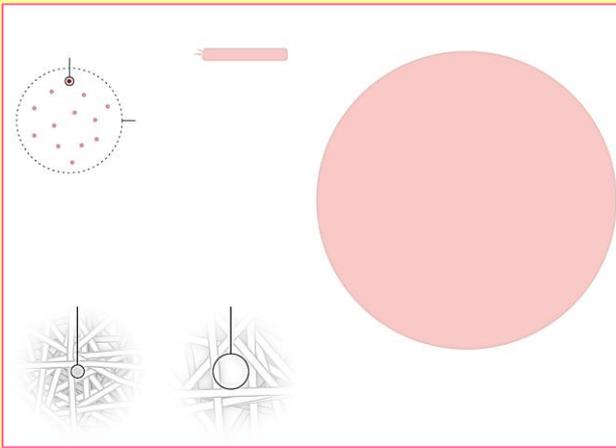
For instance, the large air handling units at KIPP DC schools already use an air filtration system, rated at a level known as MERV-

13, that matches what is being recommended for the novel coronavirus.

So much of the battle will simply involve properly maintaining these filters. That level of filtration should capture about 80 percent of the air particles that can convey the coronavirus, said Corsi, the air-quality expert at Portland State.

The coronavirus is about 500 times smaller than the width of a human hair, which measures around 50 microns or more, Corsi said. That's exceedingly tiny, but the virus would be traveling in somewhat larger aerosol particles, making them easier to be caught by filters. And when air passes through filters repeatedly, it is more likely virus will be captured, Setty said.

"If the MERV-13 filters are properly seated, and everything is done right, then a MERV-13 filter will remove a lot of the small, the tiny particles, down to about 1 micron, that can convey the virus," added Corsi.



Human red blood cell

Coronavirus

E. coli bacteria

0.1 micrometer

average diameter

2 micrometers long

7.5 micrometer diameter

Though individual coronavirus particles are very small, evidence suggests they may travel in larger groups of aerosolized droplets, which can be trapped by filters

HEPA filter

HEPA filter

MERV-13 filter

As small as

0.3 micrometers

As small as

1 micrometer

An even more exacting air filtration system is called HEPA, or high-efficiency particulate air. But experts say HEPA is not easily adapted to large buildings because its filters are very thick and require large amounts of energy to clean the air, and because most large buildings weren't designed for this type of equipment. Stand-alone HEPA units can be installed in individual rooms.



“What we’re trying to do is recommend things that can be implemented in the short term,” said Bahnfleth, of Penn State. “If every building had to have its HVAC system overhauled, that just wouldn’t be feasible.”

Across the spectrum

Theoretically, ultraviolet light might sound like the ideal fix.

“With ultraviolet, for a long enough contact time, you’ll deactivate or destroy pretty much any virus,” Corsi said.

But there’s a drawback — direct exposure to UV rays, and especially the shorter wavelength UV-C rays traditionally used for disinfection — [can be dangerous to people](#). Therefore, the devices have to be put in empty locations, such as the dark interiors of air systems. The New York Metropolitan Transit Authority has been experimenting with using UV light at night on empty trains, said David Brenner, a physicist and radiation expert at Columbia University.

But it’s unclear how long it takes ultraviolet light to kill coronavirus particles as they are flying through a building’s air system, Corsi said.

That’s being taken into account, Setty said.

“With each pass, we will get disinfection occurring and that is also why we are running the units two hours before and after occupancy,” said Setty, who is recommending that KIPP place UV-C light inside central building air handlers. “We also have the ability to specify more intensity of the UV-C, which we will do if the air is moving too fast.”

The ultimate solution may lie in research conducted by Brenner, [which shows](#) that there is a less-used wavelength of UV radiation, which he calls “far UV-C” light, that will kill viruses but will not penetrate the outer layer of human skin. That would theoretically allow the light to disinfect populated spaces.

“If you have a nice clean room at 5 in the morning, people will come into it and start coughing and sneezing,” Brenner said. “So the idea is to be able to use that to decontaminate continuously over the course of the day.” However, this idea remains under study for now, although Brenner says he feels the safety data at this point is encouraging.

No policy

Demand for solutions that clean indoor air and protect against the coronavirus is largely being driven by the market, not government regulation.

“There’s nothing legislated. There’s nothing mandated. That’s going to take years,” Setty said.

The result, in the near term, is likely to be a patchwork where some commercial buildings, schools, colleges and other facilities make investments while others don’t.

Brenner and others think changes brought on by the coronavirus will at some point become standard.

“These approaches are nice because they’re not only going to be helpful for covid-19, but for next year’s flu season, and come the next pandemic, they’re going to be helpful there, too,” he said. “Developing a vaccine is going to be very specific to the covid-19 pandemic. So, you can think of them as more long-term solutions.”

How the Coronavirus Short-Circuits the Immune System

By Gina Kolata

Source: <https://www.nytimes.com/2020/06/26/health/coronavirus-immune-system.html>

June 26 – At the beginning of the pandemic, the coronavirus looked to be another respiratory illness. But the virus has turned out to affect not just the lungs, but the kidneys, the heart and the circulatory system — even, somehow, our senses of smell and taste.

Now researchers have discovered yet another unpleasant surprise. In many patients hospitalized with the coronavirus, the immune system is threatened by a depletion of certain essential cells, suggesting eerie parallels with H.I.V.

The findings suggest that a popular treatment to tamp down the immune system in severely ill patients may help a few, but could harm many others. The research offers clues about why very few children get sick when they are infected, and hints that a cocktail of drugs may be needed to bring the coronavirus under control, as is the case with H.I.V.

Growing research points to “very complex immunological signatures of the virus,” said Dr. John Wherry, an immunologist at the University of Pennsylvania whose lab is taking a detailed look at the immune systems of Covid-19 patients.

In May, Dr. Wherry and his colleagues posted online a paper showing a range of immune system defects in severely ill patients, including [a loss of virus-fighting T cells in parts of the body](#).



In a separate study, the investigators [identified three patterns of immune defects](#), and concluded that T cells and B cells, which help orchestrate the immune response, were inactive in roughly 30 percent of the 71 Covid-19 patients they examined. None of the papers have yet been published or peer reviewed.

Researchers in China have [reported a similar depletion of T cells in critically ill patients](#), Dr. Wherry noted. But the [emerging data](#) could be difficult to interpret, he said — “like a Rorschach test.”

Research with severely ill Covid-19 patients is fraught with difficulties, noted Dr. Carl June, an immunologist at the University of Pennsylvania who was not involved with the work.

“It is hard to separate the effects of simply being critically ill and in an I.C.U., which can cause havoc on your immune system,” he said. “What is missing is a control population infected with another severe virus, like influenza.”

One of the more detailed studies, [published as a preprint](#) and under review at Nature Medicine, was conducted by Dr. Adrian Hayday, an immunologist at King’s College London.

He and his colleagues compared 63 Covid-19 patients at St. Thomas’s Hospital in London to 55 healthy people, some of whom had recovered from coronavirus infections.

Dr. Hayday and his colleagues began with the assumption that the patients would generate a profound immune response to the coronavirus. That is why most people recover from infections with few, if any, symptoms.

But those who get very sick from the virus could have immune systems that become impaired because they overreact, as happens in sepsis patients. Alternately, the scientists hypothesized, these patients could have immune systems that struggle mightily, but fail to respond adequately to the virus.

One of the most striking aberrations in Covid-19 patients, the investigators found, was a marked increase in levels of a molecule called IP10, which sends T cells to areas of the body where they are needed.

Ordinarily, IP10 levels are only briefly elevated while T cells are dispatched. But in Covid-19 patients — as was the case in patients with SARS and MERS, also caused by coronaviruses — IP10 levels go up and stay up.

That may create chaotic signaling in the body: “It’s like Usain Bolt hearing the starting gun and starting to run,” Dr. Hayday said, referring to the Olympic sprinter. “Then someone keeps firing the starting gun over and over. What would he do? He’d stop, confused and disoriented.”

The result is that the body may be signaling T cells almost at random, confusing the immune response. Some T cells are prepared to destroy the viruses but seem undermined, behaving aberrantly. Many T cells apparently die, and so the body’s reserves are depleted — particularly in those over age 40, in whom the thymus gland, the organ that generates new T cells, has become less efficient.

The research also suggests that a popular idea for treatment may not help most people.

Some patients are severely affected by coronavirus infections because their immune systems respond too vigorously to the virus. The result, a so-called cytokine storm, also has been seen in cancer patients treated with drugs that supercharge T cells to attack tumors.

These overreactions can be quelled with medications that block a molecule called IL-6, another organizer of immune cells. But these drugs have not been markedly effective in most Covid-19 patients, and for good reason, Dr. Hayday said.

“There clearly are some patients where IL-6 is elevated, and so suppressing it may help,” he explained. But “the core goal should be to restore and resurrect the immune system, not suppress it.”

The new research may help answer another pressing question: Why is it so rare for a child to get sick from the coronavirus?

Children have highly active thymus glands, the source of new T cells. That may allow them to stay ahead of the virus, making new T cells faster than the virus can destroy them. In older adults, the thymus does not function as well.

The emerging picture indicates that the model for H.I.V. treatment, a cocktail of antiviral drugs, may be a good bet both for those with mild illnesses and those who are severely ill.

Some experts have wondered if antiviral treatment makes sense for severely ill Covid-19 patients, if their main affliction is an immune system overreaction.

But if the virus directly causes the immune system to malfunction, Dr. Hayday said, then an antiviral makes sense — and perhaps even more than one, since it’s important to stop the infection before it depletes T cells and harms other parts of the immune system.

“I have not lost one ounce of my optimism,” Dr. Hayday said. Even without a vaccine, he foresees Covid-19 becoming a manageable disease, controlled by drugs that act directly against the virus.

“A vaccine would be great,” he said. “But with the logistics of its global rollout being so challenging, it’s comforting to think we may not depend on one.”



How Remdesivir, New Hope for Covid-19 Patients, Was Resurrected

By Gina Kolata

Source: <https://www.nytimes.com/2020/05/01/health/coronavirus-remdesivir.html>

May 01 - Remdesivir, an antiviral drug designed to treat both hepatitis and a common respiratory virus, seemed fated to join thousands of other failed medications after proving useless against those diseases. The drug was consigned to the pharmaceutical scrap heap, all but forgotten by the scientists who once championed it.

But on Friday, the [Food and Drug Administration](#) issued an emergency approval for remdesivir as a [treatment](#) for patients severely ill with [Covid-19](#), the disease caused by the coronavirus.

The story of remdesivir's rescue and transformation testifies to the powerful role played by federal funding, which allowed scientists laboring in obscurity to pursue basic research without obvious financial benefits. This research depends almost entirely on government grants.

Dr. Mark Denison of Vanderbilt University is one of a handful of researchers who discovered remdesivir's potential. He began studying coronaviruses a quarter-century ago, a time when few scientists cared about them — the ones infecting humans caused colds, he recalled, and scientists just wanted to know how they worked.

"We were interested from the biologic perspective," Dr. Denison recalled. "No one was interested from a therapeutic perspective." Neither he nor the scores of other scientists interested in coronaviruses foresaw that a new one would unleash a plague that has killed nearly a quarter-million people worldwide. The F.D.A. rushed to approve remdesivir under emergency use provisions, after a federal trial demonstrated modest improvements in severely ill patients.

The trial, sponsored by the National Institute of Allergy and Infectious Diseases, included more than 1,000 hospitalized patients and found that those receiving remdesivir recovered faster than those who got a placebo: in 11 days, versus 15 days.

But the drug did not significantly reduce fatality rates, and some critics noted that the trial's primary endpoint — its measure of success — had been greatly simplified to emphasize time to recovery.

A half-dozen experts contacted by The Times on Thursday said the change was necessary. Officials at N.I.A.I.D. said biostatisticians urging the revision had not seen the data and were not aiming for a particular result.

Dr. Anthony S. Fauci, director of the institute, said the results were "a very important proof of concept" but not a "knockout." President Trump hailed the drug on Friday as "an important treatment" and "really promising."

Remdesivir is approved only for severely ill patients and only temporarily; formal approval must come later. Still, some doctors laboring in intensive care units embraced the drug as an important new weapon against a virus that is killing patients worldwide.

"It's a great first step," said Dr. Robert Finberg, chairman of the department of medicine at the University of Massachusetts Medical School.

Little about the early history of remdesivir, manufactured by Gilead Sciences, suggested the hopes now placed upon it.

Coronaviruses hold much more RNA than scientists once theorized a virus could. Many viruses that cause epidemics rely on this type of genetic material, and almost all mutate constantly. That is why flu viruses change from year to year.

Yet [coronaviruses did not change much — their mutation rate is about one-twentieth the rate](#) of other RNA viruses.

In 2007, Dr. Denison discovered that coronaviruses have a powerful "proofreading" system. If an error occurs in copying RNA as the coronavirus replicates, it corrects the error. In lab experiments, coronaviruses that mutated were weaker, outcompeted by those without mutations.

Dr. Denison and other experts wondered if it might be possible to trick the virus with a drug that dodged the proofreading system and blocked the virus's growing RNA chain, making it prematurely terminate.

Talking about this problem with another scientist at a meeting, Dr. Denison learned that Gilead Sciences had dozens of drugs that might do the trick. "All of these compounds had been shelved for one reason or another," Dr. Denison said.

Most worked in lab tests to shut down coronaviruses, he found — some better than others. One of the best was GS-5734, now known as remdesivir. "I like to call it the Terminator," Dr. Denison said.

Dr. Denison discovered remdesivir was just what they were seeking: a drug that [slipped past the viruses' powerful system to protect RNA](#), their genetic material. Remdesivir made growing chains of the viral RNA terminate prematurely, killing the virus.

Remdesivir killed every known coronavirus in Dr. Denison's tests. Then researchers at the University of North Carolina found that the drug also killed the viruses in infected animals.

That included not just coronaviruses that cause the common cold, but also SARS and MERS — even a coronavirus that infects only mice.



But the drug failed a number of real-life tests, not just against hepatitis but also against Ebola in Africa. The drug languished, unapproved for any use — until a new coronavirus emerged.

As SARS-CoV-2, the virus that causes Covid-19, began to grow into a pandemic, many scientists realized that remdesivir might be the best solution at hand. It had already undergone animal testing and safety testing in humans.

So doctors began giving it to patients in studies without controls and even outside of studies altogether. Anecdotes fueled demand. Gilead sponsored some of these studies and gave the drug to doctors who treated hundreds of patients under compassionate use, a legal exemption permitting use of an unapproved drug to treat patients.

But none of this could demonstrate that a drug was helpful to patients. It took the federal trial, in which many patients were given a placebo, to show that remdesivir seems to have a modest effect.

Even a modest effect from the drug in hospitalized patients was a surprise, said Dr. Arnold Monto, an epidemiologist at the University of Michigan. He had expected that patients like those in the federal trial would not respond.

They were severely ill, and such patients often suffer not from their viral infections but from overreactions of the immune system. (That is why Tamiflu does not work well in severely ill flu patients, he added.)

“Thank God, we have something that works,” Dr. Monto said.

Not everyone is convinced that remdesivir will live up to its promise. A study in China, published this week in *Lancet*, found the drug offered no benefit to severely ill patients. And many experts want to see the data from the National Institute of Allergy and Infectious Diseases trial; so far, there have been only announcements about the results from administration officials.

Despite these questions, Gilead has been ramping up production and currently has 1.5 million vials on hand, enough for about 150,000 patients. Those will be provided to patients at no cost, said Daniel O’Day, the company’s chief executive.

He would not discuss what Gilead might charge in the long run, following a formal approval, but remdesivir is unlikely to be cheap, despite its origins in federally funded research.

“Gilead discovered this medicine and developed this medicine,” Mr. O’Day said. “We have been involved all the way.”

Some experts fear that taxpayers won’t get their due.

“Their pricing should reflect that the government not only invested substantial funds, but at risky stages,” said Dr. Aaron Kesselheim, a professor of medicine at Harvard University who studies drug pricing.

If Gilead reaps all the rewards, he added, “that doesn’t seem fair.”

Gina Kolata is a reporter at The Times, focusing on science and medicine. Her training is in science: She studied molecular biology on the graduate level at M.I.T. for a year and a half and has a master’s degree in applied mathematics from the University of Maryland. She is the author of six books, the most recent of which is [“Mercies in Disguise: A Story of Hope, a Family’s Genetic Destiny, and The Science That Saved Them.”](#)

Oxford Coronavirus Vaccine Will Be Rolled out in October under “Best Scenario”

Source: <http://www.homelandsecuritynewswire.com/dr20200626-oxford-coronavirus-vaccine-will-be-rolled-out-in-october-under-best-scenario>

June 26 – The Oxford [vaccine against coronavirus](#) will not be ready to be rolled out until October, researchers have said. Sarah Knapton writes in [The Telegraph](#) that there were hopes the vaccine [could be in use by September](#) if human trials continue to be successful, and drugs company AstraZeneca is ready to quickly [produce 30 million vaccines](#). But Professor Adrian Hill, the director of the Jenner Institute at the University of Oxford, told a webinar of the Spanish Society of Rheumatology that the “best scenario” would see results from clinical trials in August and September and deliveries from October.

Islamic State Calls for Followers to Spread Coronavirus, Exploit Pandemic and Protests

Source: <http://www.homelandsecuritynewswire.com/dr20200626-islamic-state-calls-for-followers-to-spread-coronavirus-exploit-pandemic-and-protests>

June 26 – An Islamic State group online publication in India has called for its supporters to spread the coronavirus, saying [“every brother and sister, even children, can contribute to](#)



Allah's cause by becoming the carriers of this disease and striking the colonies of the disbelievers." The group claims that devout Muslims will not be sickened, because "no disease can harm even a hair of a believer." It is the latest in an effort by the Islamic State group and its followers to take advantage of the pandemic and general civic instability in the West. Brian Glyn Williams writes in [The Conversation](#) that Islamic State followers are excited at the prospect of a massive Western death toll from the coronavirus, which they defined as "[God's smallest soldier](#)." They also see the virus at work in U.S. military pullbacks related to the coronavirus – such as the March announcement from the Pentagon that it would stop [sending troops to Iraq](#) for at least [two months](#). In addition, the U.S. pulled some troops out of Iraq, withdrew many more from [six frontline operating bases](#) and ordered the troops remaining in the country to stay on their bases – moves that [ended most joint missions](#) with local Iraqi and Kurdish troops.

Crisis Response When the Status Quo Is a Crisis

Source: <http://www.homelandsecuritynewswire.com/dr20200626-crisis-response-when-the-status-quo-is-a-crisis>

June 26 – If the 2016 earthquake in Italy repeated today, how would the country respond while being on lockdown? If a hurricane like Irma, Maria, or Dorian hit the Caribbean now, what regional and international partners could even respond to help? If a storm like Sandy hit the United States right now, how overwhelmed would New York and New Jersey be? Tellis Bethel and Ian Ralby write in [War on the Rocks](#) that as the world experiences a global pandemic in the form of the novel coronavirus, the focus of most governments



has understandably been on the health implications of this virus, and on the economic fallout of the lockdowns and other mitigation measures taken to stop its spread.

But there are two major issues whose careful consideration becomes more

necessary by the day: security matters and natural disasters. Criminals are [likely to capitalize on new opportunities](#) created by the dramatic change in the status quo. The same is true of terrorist organizations, with regard to both financing and attacks. Yet how much are security forces able to operate or react at the moment? And even beyond these security concerns, natural disasters may be a bigger threat to exceeding current capacity. Hurricanes, cyclones, and tornadoes will hit, earthquakes will strike, and volcanoes will erupt, pandemic or no pandemic. Now immersed in an indefinite global health crisis, every leader has to answer this question: If the status quo is a pervasive disaster, how can we cope with incidental or episodic emergencies? Few states, if any, are ready for the challenge.

Bethel and Ralby write that now that a global pandemic is a current reality rather than a historical oddity, new approaches to, and procedures for, law enforcement and disaster response are needed. Preparation, proactive rethinking, and consciously letting go of normal assumptions will help reduce the possibility of failure by states, even with limited resources.

By stretching beyond the limits of what seems possible, and working to confront the overwhelming challenge of addressing a pandemic, a natural disaster, and a security incident at the same time, states may actually develop policies and procedures that make them more efficient overall — and certainly better able to handle a single emergency. In other words, working to maximize efficiency and effectiveness to handle compound emergencies may improve the state's "normal" functioning as well. Furthermore, as every country on earth is experiencing significant strategic shock from this pandemic, there is great scope for global cooperation in exchanging lessons, good practices, and cautionary tales. Ultimately, the extent to which states marshal creativity and overlooked resources to address compound emergencies is the extent to which they save, or lose, human lives.

43% of U.S. Coronavirus Deaths Are Linked to Nursing Homes

Source: <http://www.homelandsecuritynewswire.com/dr20200627-43-of-u-s-coronavirus-deaths-are-linked-to-nursing-homes>

June 27 – At least 54,000 residents and workers have died from the coronavirus at nursing homes and other long-term care facilities for older adults in the United States, according to a [New York Times](#) database. As of June 26, the virus has infected more than 282,000 people at some 12,000 facilities. While 11 percent of the country's cases have occurred in long-term care facilities, deaths related to Covid-19 in these facilities account for more than 43 percent of the country's pandemic fatalities.



Sweden's Coronavirus Failure Started Long Before the Pandemic

Source: <http://www.homelandsecuritynewswire.com/dr20200627-sweden-s-coronavirus-failure-started-long-before-the-pandemic>

June 27 – Many countries have criticized the Swedish government's lax lockdown, but the deadly mistakes of defunding elder care and decentralizing public health oversight were made before anyone had heard of COVID-19. Carl-Johan Karlsson writes in [Foreign Policy](#) that Sweden has become a global outlier in ignoring calls for coronavirus lockdowns, with the government's public health agency issuing recommendations rather than mandating certain behaviors, what's considered a "light-touch strategy." Critics of the Swedish approach point to the fact that Sweden has a higher death rate relative to its Scandinavian strict-lockdown neighbors (Denmark, Norway, and Finland). But Karlsson notes that a closer look reveals a more complex reality: the overwhelming majority of Swedish COVID-19-related deaths occurred in senior citizens care centers, so some criticisms of the Swedish COVID-19 response may still be premature, and others should rather be directed at mistakes made long before the current health crisis—namely the decline of central government oversight and, especially, a decadelong neglect of Sweden's elderly population.

The Radical Right and the Obsession with Bioterrorism

By Dr. Ely Karmon

[Download the full article](#)

June 25 – This paper presents a comprehensive and detailed picture of the obsessive interest of radical right-wing groups and individuals in biological warfare and bioterrorism since the 1970s and its evolution until the new era of the global coronavirus pandemic. It underpins the ideological and strategic reasons and motivations for such interest and cites most of the important cases of bioterrorism by these elements. An interesting part of the analysis relates to the "schizophrenic" relations of some of these ideologues and groups with their jihadist counterparts. Based on this historic overview it presents a first evaluation of the future radical right bioterrorism threat.

Biological weapons (BW) could be considered the second threat among CBRN (chemical, biological, radiological and nuclear) weapons in order of priorities, after the threat of chemical terrorism. Biological weapon is a weapon whose components are produced from pathogenic microorganisms or toxic substances of biological origins.

BW agents can be hundred to thousands of times more potent than chemical agents and provide a much cheaper route to CBRN capability, considering an equal quantity of chemical agents. As international controls are strengthened on nuclear and chemical weapons materials, biological weapons become more attractive. In addition, biotechnology expertise is spreading rapidly.

Theoretically BW could produce a higher number of casualties, but do not take effect immediately. This delay makes for a less immediately spectacular effect. Because of the incubation period, it might be somewhat easier to contain and neutralize the effects of a terrorist strike involving biological weapons than one involving chemical agents or toxins.

A Nobel Winner Explains Why the Way You Breathe Is So Important During the Pandemic

By Louis Ignarro

Source: <https://www.sciencealert.com/there-s-a-proper-way-to-breathe-to-keep-your-lungs-healthy-and-it-could-help-against-the-coronavirus>

June 27 – Inhale through your nose and exhale through your mouth. It's not just something you do in yoga class – breathing this way actually provides a powerful medical benefit that can help the body fight viral infections.

The reason is that your nasal cavities produce the molecule [nitric oxide](#), which chemists abbreviate NO, that increases blood flow through the lungs and boosts oxygen levels in the blood.

Breathing in through the nose delivers NO directly into the lungs, where it [helps fight coronavirus infection](#) by [blocking the replication of the coronavirus in the lungs](#).

But many people who exercise or engage in yoga also receive the benefits of [inhaling through the nose](#) instead of the mouth. The higher oxygen saturation of the blood can make one feel more refreshed and provides greater endurance.

[I am one of three pharmacologists who won the Nobel Prize in 1998](#) for discovering how nitric oxide is produced in the body and how it works.



The role of nitric oxide in the body

Nitric oxide is a widespread signaling molecule that triggers many different physiological effects. It is also used clinically as a gas to selectively dilate the pulmonary arteries in newborns with pulmonary hypertension. Unlike most signaling molecules, NO is a gas in its natural state.

NO is produced continuously by the 1 trillion cells that form the inner lining, or [endothelium](#), of the 100,000 miles of arteries and veins in our bodies, especially the lungs.

[Endothelium-derived NO](#) acts to relax the smooth muscle of the arteries to prevent high blood pressure and to promote blood flow to all organs. Another vital role of NO is to [prevent blood clots in normal arteries](#).

In addition to relaxing vascular smooth muscle, NO also [relaxes smooth muscle in the airways](#) – trachea and bronchioles – making it easier to breathe. Another type of NO-mediated smooth muscle relaxation occurs in the erectile tissue (corpus cavernosum), which results in penile erection. In fact, [NO is the principal mediator of penile erection and sexual arousal](#).

This discovery led to the development and marketing of [sildenafil](#), trade name Viagra, which works by enhancing the action of NO.

Other types of cells in the body, including circulating white blood cells and tissue macrophages, produce nitric oxide for [antimicrobial purposes](#).

The NO in these cells reacts with other molecules, also produced by the same cells, to form antimicrobial agents to destroy invading microorganisms including bacteria, parasites and [viruses](#). As you can see, NO is quite an amazing molecule.

Nitric oxide gas as an inhaled therapy

Since NO is a gas, it can be administered with the aid of specialized devices as a therapy to patients by inhalation. Inhaled NO is used to treat infants born with [persistent pulmonary hypertension](#), a condition in which constricted pulmonary arteries limit blood flow and oxygen harvesting.

Inhaled NO dilates the constricted pulmonary arteries and increases blood flow in the lungs. As a result, the red blood cell hemoglobin can extract more lifesaving oxygen and move it into the general circulation.

Inhaled NO has literally turned blue babies pink and allowed them to be cured and to go home with mom and dad. Before the advent of inhaled NO, most of these babies died.

Inhaled NO is [currently in clinical trials](#) for the treatment of patients with [COVID-19](#). Researchers are hoping that three principal actions of NO may help fight covid: dilating the pulmonary arteries and increasing blood flow through the lungs, dilating the airways and increasing oxygen delivery to the lungs and blood, and directly killing and inhibiting the growth and spread of the [coronavirus](#) in the lungs.

How nitric oxide kills viruses

In an in vitro study done in 2004 during the last SARS outbreak, experimental compounds that release NO increased the survival rate of nucleus-containing mammalian cells infected with SARS-CoV.

This suggested [that NO had a direct antiviral effect](#). In this study, NO significantly inhibited the replication cycle of SARS-CoV by blocking production of viral proteins and its genetic material, RNA.

In a small clinical study in 2004, inhaled NO [was effective](#) against SARS-CoV in severely ill patients with [pneumonia](#).

The SARS CoV, which caused the 2003/2004 outbreak, shares most of its genome with SARS CoV-2, the virus responsible for [COVID-19](#). This suggests that inhaled NO therapy may be effective for treating patients with COVID-19.

Indeed, [several clinical trials of inhaled NO](#) in patients with moderate to severe COVID-19, who require ventilators, are currently ongoing in several institutions. The hope is that inhaled NO will prove to be an effective therapy and lessen the need for ventilators and beds in the ICU.

The [sinuses in the nasal cavity](#), but not the mouth, continuously produce NO. The NO produced in the nasal cavity is chemically identical to the NO that is used clinically by inhalation.

So by inhaling through the nose, you are delivering NO directly into your lungs, where it increases both airflow and blood flow and keeps microorganisms and virus particles in check.

While anxiously awaiting the results of the [clinical trials](#) with inhaled NO, and the development of an effective [vaccine against COVID-19](#), we should be on guard and practice breathing properly to maximize the inhalation of nitric oxide into our lungs. Remember to inhale through your nose; exhale through your mouth.

Louis J. Ignarro, Distinguished Professor Emeritus of Molecular & Medical Pharmacology, School of Medicine, University of California, Los Angeles.



Epidemiologic Clues to Bioterrorism

Source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497515/pdf/12690063.pdf>

Epidemiologic clues that may signal a biologic or chemical terrorist attack:

1. Single case of disease caused by an uncommon agent (e.g., glanders, smallpox, viral hemorrhagic fever, inhalational or cutaneous anthrax) without adequate epidemiologic explanation
2. Unusual, atypical, genetically engineered, or antiquated strain of an agent (or antibiotic- resistance pattern)
3. Higher morbidity and mortality in association with a common disease or syndrome or failure of such patients to respond to usual therapy
4. Unusual disease presentation (e.g., inhalational anthrax or pneumonic plague)
5. Disease with an unusual geographic or seasonal distribution (e.g., tularemia in a non-endemic area, influenza in the summer)
6. Stable endemic disease with an unexplained increase in incidence (e.g., tularemia, plague)
7. Atypical disease transmission through aerosols, food, or water, in a mode suggesting deliberate sabotage (i.e., no other possible physical explanation)
8. No illness in persons who are not exposed to common ventilation systems (have separate closed ventilation systems) when illness is seen in persons in close proximity who have a common ventilation system
9. Several unusual or unexplained diseases coexisting in the same patient without any other explanation
10. Unusual illness that affects a large, disparate population (e.g., respiratory disease in a large population may suggest exposure to an inhalational pathogen or chemical agent)
11. Illness that is unusual (or atypical) for a given population or age group (e.g., outbreak of measles-like rash in adults)
12. Unusual pattern of death or illness among animals, (which may be unexplained or attributed to an agent of bioterrorism) that precedes or accompanies illness or death in humans
13. Unusual pattern of death or illness among humans, (which may be unexplained or attributed to an agent of bioterrorism) that precedes or accompanies illness or death in animals
14. Ill persons who seek treatment at about the same time (point source with compressed epidemic curve)
15. Similar genetic type among agents isolated from temporally or spatially distinct sources
16. Simultaneous clusters of similar illness in noncontiguous areas, domestic or foreign
17. Large numbers of cases of unexplained diseases or deaths

Study Found Traces of Coronavirus in Europe in March 2019

By Claire Crossan

Source: <https://www.sciencealert.com/was-coronavirus-really-in-europe-in-early-last-year>

June 29 – The novel [coronavirus](#) – [SARS-CoV-2](#) – may have been in Europe for longer than previously thought. Recent studies have suggested that it was circulating in [Italy](#) as early as December 2019. More surprisingly, researchers at the University of Barcelona found traces of the [virus](#) when testing untreated wastewater samples dated 12 March 2019.

The study was recently published on a preprint server, [medRxiv](#). The paper is currently being subject to critical review by outside experts in preparation for publication in a scientific journal. Until this process of peer review has been completed, though, the evidence needs to be treated with caution.

So, how was the experiment conducted and what exactly did the scientists find?

One of the early findings about SARS-CoV-2 is that it is [found in the faeces](#) of infected people. As the virus makes its way through the gut – where it can cause [gastrointestinal symptoms](#) – it loses its outer protein layer, but bits of genetic material called RNA survive the journey intact and are "shed" in faeces.

At this point, it is no longer infectious – as far as current evidence tells us.

But the fact that these bits of coronavirus RNA can be found in untreated wastewater (known as "influent") is useful for tracking outbreaks. Indeed, they can predict where an outbreak is likely to occur a week to ten days before they show up in official figures – the reason being that people shed coronavirus before symptoms become evident.

These "pre-symptomatic" people then have to get sick enough to be tested, get the results, and be admitted to a hospital as an official "case", hence the week or so lag.



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As a result, [many countries](#), including Spain, are now monitoring wastewater for traces of coronavirus. In this particular study, wastewater epidemiologists were examining frozen samples of influent between January 2018 and December 2019 to see when the virus made its debut in the city.

They found evidence of the virus on January 15, 2020, 41 days before the first official case was declared on February 25, 2020. All the samples before this date were negative, except for a sample from March 12, 2019, which gave a positive result in their PCR test for coronavirus. PCR is the [standard way of testing](#) to see if someone currently has the disease.

PCR involves getting samples of saliva, mucus, frozen wastewater or whatever else the virus is thought to be lurking in, clearing all the unnecessary stuff out of the sample, then converting the RNA – which is a single strand of genetic material – into DNA (the famous double-stranded helix).

The DNA is then "amplified" in successive cycles until key bits of genetic material that are known to only exist in a particular virus are plentiful enough to be detected with a fluorescent probe.

Not highly specific

In coronavirus testing, scientists typically screen for more than one gene. In this case, the researchers tested for three. They had a positive result for the March 2019 sample in one of the three genes tested – the RdRp gene. They screened for two regions of this gene and both were only detected around the 39th cycle of amplification. (PCR tests become less "specific" with increasing rounds of amplification. Scientists generally use 40 to 45 rounds of amplification.)

There are several explanations for this positive result. One is that SARS-CoV-2 is present in the sewage at a very low level. Another is that the test reaction was accidentally contaminated with SARS-CoV-2 in the laboratory. This sometimes happens in labs as positive samples are regularly being handled, and it can be difficult to prevent very small traces of positive sample contaminating others.

Another explanation is that there is other RNA or DNA in the sample that resembles the test target site enough for it to give a positive result at the 39th cycle of amplification.

Further tests need to be carried out to conclude that the sample contains SARS-CoV-2, and a finding of that magnitude would need to be replicated separately by independent laboratories.

Reasons to be circumspect

A curious thing about this finding is that it disagrees with epidemiological data about the virus. The authors don't cite reports of a spike in the number of respiratory disease cases in the local population following the date of the sampling.

Also, we know SARS-CoV-2 to be highly transmissible, at least in its current form. If this result is a true positive it suggests the virus was present in the population at a high enough incidence to be detected in an 800ml sample of sewage, but then not present at a high enough incidence to be detected for nine months, when no control measures were in place.

So, until further studies are carried out, it is best not to draw definitive conclusions.

Claire Crossan is Research Fellow, Virology, Glasgow Caledonian University.

Vaxart Oral COVID-19 Vaccine Joins Trump's "Warp Speed," Ramps Up Manufacturing Capacity

Source: <https://www.genengnews.com/news/vaxart-oral-covid-19-vaccine-joins-trumps-warp-speed-ramps-up-manufacturing-capacity/>

June 29 – Vaxart's oral COVID-19 vaccine candidate has joined the handful of experimental vaccines being studied as part of President Donald Trump's commitment to delivering 300 million vaccine doses protecting against SARS-CoV-2 by January 2021—while the company gears up to manufacture as many as one billion doses a year.

The South San Francisco, CA, vaccine developer said Friday that its room temperature stable tablet vaccine had been selected for a non-human primate (NHP) challenge study organized and funded by Operation Warp Speed.

The study is designed to demonstrate the efficacy of Vaxart's COVID-19 vaccine candidate, which is based on the company's Vector-Adjuvant-Antigen Standardized Technology (VAASTM) Platform.

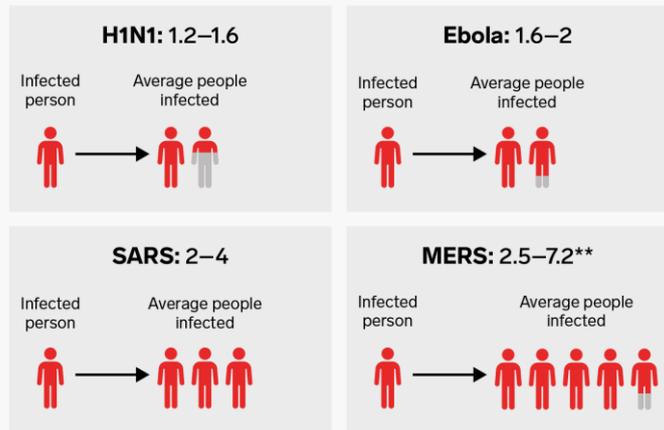
According to the company's most recent investor presentation, Vaxart plans an IND submission for its COVID-19 vaccine "soon," with a Phase I open-label, dose-ranging study set to enroll its first patient later this summer.

VAAS uses enteric-coated tablets designed to release in the small bowel the contents of the vaccine, which combines an adenovirus 5 (Ad5) vector, vaccine antigen, and a TLR3 adjuvant. VAAS vaccines are designed to activate the immune system of the gut,



generating broad systemic and local responses—and are designed for a wide range of recombinant antigens.

The average number of people that one person with a virus infects, based on the R0 scale



*As of February 28, 2020 **R0 calculated solely during the 2015 outbreak in South Korea

Sources: ScienceMag; WHO; Journal of the ISIRV

BUSINESS INSIDER

Hysteria over Germany's Surging R-Number Shows Why It's an Absurd Way to Measure COVID

Source: <http://www.homelandsecuritynewswire.com/dr20200626-hysteria-over-germanys-surging-r-number-shows-why-its-an-absurd-way-to-measure-covid>

June 26 – Germany's "R" number: 1.06 on Friday, rising to 1.79 on Saturday and 2.88 on Sunday. Should the Germans be worried? Ross Clark writes in [The Telegraph](#) that the Germans should not, because the apparent acceleration in Germany's R number shows the foolishness of focusing so much on a single figure. The rise in the number is entirely due to an outbreak in an abattoir in the town of Gutersloh in the region of North Rhine Westphalia, where 650 workers were found to have the virus. That is a closed environment kept at a chilled temperature which seems to have been an ideal place to promote the spread of the virus. It tells us nothing about COVID-19 in the rest of Germany (where, in fact, the numbers are in decline). "When the history of COVID-19 comes to be written, one issue which will need addressing is how mass fear was spread by the constant feeding of statistics by government and their agencies – figures which many people struggled to put into perspective. Here's just a little more perspective. Germany so far has recorded

8,882 deaths from COVID 19. That is less than 1 percent of the approximately one million people who die in Germany every year," Clark writes.



BE ALERT

Prevalent Eurasian avian-like H1N1 swine influenza virus with 2009 pandemic viral genes facilitating human infection

By Honglei Sun, Yihong Xiao, Jiyu Liu, et al.

Source: <https://www.pnas.org/content/early/2020/06/23/1921186117>

June 29 – Pigs are considered as important hosts or "mixing vessels" for the generation of pandemic influenza viruses. Systematic surveillance of influenza viruses in pigs is essential for early warning and preparedness for the next potential pandemic. Here, we report on an influenza virus surveillance of pigs from 2011 to 2018 in China, and identify a recently emerged genotype 4 (G4) reassortant Eurasian avian-like (EA) H1N1 virus, which bears 2009 pandemic (pdm/09) and triple-reassortant (TR)-derived internal genes and has been predominant in swine populations since 2016. Similar to pdm/09 virus, G4 viruses bind to human-type receptors, produce much higher progeny virus in human airway epithelial cells, and show efficient infectivity and aerosol transmission in ferrets. Moreover, low

G4 HAS THE POTENTIAL OF BECOMING A PANDEMIC

Researchers in China have discovered a new type of swine flu that is capable of triggering a pandemic, according to a study published Monday in the US science journal PNAS.

Named G4, it is genetically descended from the H1N1 strain that caused a pandemic in 2009

2009 H1N1 INFECTION STATS

Global cases: About **24%** of global population

Global deaths: over **284 000**

Researchers took **30 000** nasal swabs from pigs in Slaughterhouses in **10 Chinese** provinces and in a veterinary hospital, allowing them to isolate **179 swine flu viruses**.

According to blood tests which showed up antibodies created by exposure to the virus, **10.4%** of swine workers had already been infected.

The virus has therefore already passed from animals to humans but there is no evidence yet that it can be passed from human to human – the scientists' main worry.



antigenic cross-reactivity of human influenza vaccine strains with G4 reassortant EA H1N1 virus indicates that preexisting population immunity does not provide protection against G4 viruses. Further serological surveillance among occupational exposure population showed that 10.4% (35/338) of swine workers were positive for G4 EA H1N1 virus, especially for participants 18 y to 35 y old, who had 20.5% (9/44) seropositive rates, indicating that the predominant G4 EA H1N1 virus has acquired increased human infectivity. Such infectivity greatly enhances the opportunity for virus adaptation in humans and raises concerns for the possible generation of pandemic viruses.

Lab-Grown 'Mini-Brains' Suggest COVID-19 Virus Can Infect Human Brain Cells

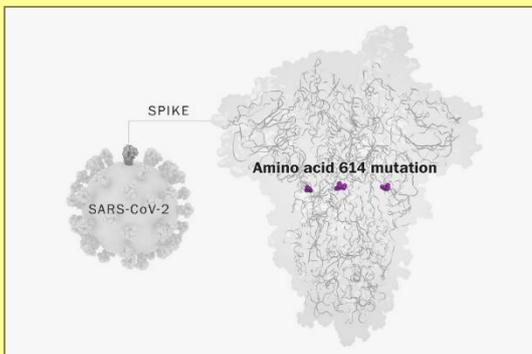
Source: <http://www.homelandsecuritynewswire.com/dr20200630-labgrown-minibrains-suggest-covid19-virus-can-infect-human-brain-cells>

June 30 – A multidisciplinary team from two Johns Hopkins University institutions, including neurotoxicologists and virologists from the Bloomberg School of Public Health and infectious disease specialists from the School of Medicine, has found that organoids (tiny tissue cultures that simulate whole organs) made from human cells (known as “mini-brains”) can be infected by the SARS-CoV-2 virus that causes COVID-19. The results were [published online today](#), June 26, in the journal *ALTEX: Alternatives to Animal Experimentation*. [Johns Hopkins](#) notes that Early reports from Wuhan, China, have suggested that **36% of COVID-19 patients show neurological symptoms**, but until now it was not clear whether the virus infects human brain cells. The Johns Hopkins researchers have now demonstrated that certain **human neurons express a receptor, ACE2**, that the SARS-CoV-2 virus uses for entering the lungs — and possibly the brain.



This Coronavirus Mutation Has Taken over the World. Scientists Are Trying to Understand Why

Source: <http://www.homelandsecuritynewswire.com/dr20200630-this-coronavirus-mutation-has-taken-over-the-world-scientists-are-trying-to-understand-why>



June 30 – When the first [coronavirus](#) cases in Chicago appeared in January, they bore the same genetic signatures as a germ that emerged in China weeks before. Sarah Kaplan and Joel Achenbach write in the [Washington Post](#) that as Egon Ozer, an infectious-disease specialist at the Northwestern University Feinberg School of Medicine, examined the genetic structure of virus samples from local patients, he noticed something different. At a glance, the mutation seemed trivial. About 1,300 amino acids serve as building blocks for a protein on the surface of the virus. In the mutant virus, the genetic instructions for just one of those amino acids — number 614 — switched in the new variant from a “D” (shorthand for aspartic acid) to a “G” (short for glycine). But the location was significant, because the switch occurred in the part of the genome that codes

for the all-important “spike protein” — the protruding structure that gives the coronavirus its crownlike profile and allows it to enter human cells the way a burglar picks a lock.

Coronavirus and Cancer Hijack the Same Parts in Human Cells to Spread – and Our Team Identified Existing Cancer Drugs that Could Fight COVID-19

Source: <http://www.homelandsecuritynewswire.com/dr20200630-coronavirus-and-cancer-hijack-the-same-parts-in-human-cells-to-spread-and-our-team-identified-existing-cancer-drugs-t>

June 30 – Most antivirals in use today [target parts of an invading virus itself](#). Unfortunately, SARS-CoV-2 – the virus that causes COVID-19 – has proven hard to kill. But viruses rely on cellular mechanisms in human cells to help them spread, so it should be possible to change



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FDA-cleared molecular diagnostic instrument for chlamydia and gonorrhea in both men and women that for the first time delivers same-visit diagnoses.

“Our proprietary platform will now leverage Sherlock’s CRISPR-based assay combined with binx’s electrochemical detection for rapid viral detection of SARS-CoV-2 without the need for additional instrumentation. This union of technologies is designed to enable physicians, clinicians, and other healthcare workers on the front lines of the global COVID-19 pandemic to make on-the-spot care decisions and to control and prevent further infections,” noted Luber.

Rahul Dhanda, co-founder, president, and CEO of Sherlock Biosciences also stressed the importance of being able to make on-the-spot care decisions. “The response to provide high-volume testing, including Sherlock’s own, has increased access to crucial results during the pandemic. While we have solutions for individuals who can reach hospitals, we still need to make testing accessible in other areas, like pharmacies, to empower individuals to proactively make decisions to improve their health, as well as prevent potential spread to those in their communities,” Dhanda told *GEN*.

Sherlock agrees with binx health’s strategy of “everywhere care” that depends on highly accurate in-clinic and easy-to-use at-home solutions. Sherlock hopes to serve as part of the solution to addressing the COVID-19 pandemic by making diagnostics available everywhere they are needed.

The current SHERLOCK CRISPR SARS-CoV-2 kit uses the [SHERLOCK](#) (Specific High-sensitivity Enzymatic Reporter unLOCKing) method to program a CRISPR molecule to detect the presence of a specific SARS-CoV-2 genetic signature in specimens collected from patients suspected of COVID-19 by their healthcare provider. The SHERLOCK CRISPR SARS-CoV-2 kit is intended for use in CLIA laboratories to assay nasal swabs, nasopharyngeal swabs, oropharyngeal swabs, or bronchoalveolar lavage (BAL) specimens. When the signature is found, the CRISPR enzyme is activated and releases a detectable signal, yielding results in about an hour. The kit is the first CRISPR-based diagnostic test to receive EUA from the FDA for qualitative detection of nucleic acid from SARS-CoV-2.

[Back in May](#), *GEN* spoke with Dhanda when Sherlock was establishing relationships with suppliers, manufacturers, and partners. Dhanda had expressed their hopes “for the best outcome for public health” and it seems that hope is coming into fruition with this partnership.

Sherlock is also moving forward in developing its INSPECTR at-home testing platform to create an instrument-free, handheld test—similar to that of an at-home pregnancy test—for the rapid detection of the SARS-CoV-2 virus.

The companies plan to launch the test in the second half of 2020.

A Deadly Rabbit Virus Nicknamed 'Bunny Ebola' Is Spreading Rapidly in Southwestern US

Source: <https://www.sciencealert.com/a-deadly-rabbit-virus-nicknamed-bunny-ebola-is-spreading-rapidly-in-southwestern-us>

July 01 – As the US struggles to bring its [coronavirus](#) outbreak under control, another [virus](#) is wreaking havoc among the country's rabbit population.

Across seven states in the southwest, thousands of wild and domestic rabbits are dying from a rare outbreak of a highly contagious disease known as rabbit hemorrhagic disease virus (RHDV2).

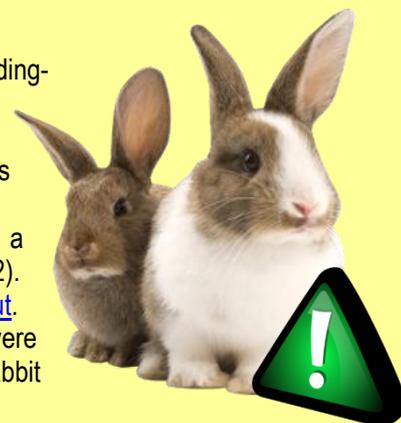
"We refer to it as 'bunny ebola'," Amanda Jones, a veterinarian from Killeen, Texas, [told The Cut](#).

While the rabbit virus is "not related in any way, shape, or form" to Ebola – a virus that causes severe bleeding, organ failure, and death in humans and primates – Jones said RHDV2 ravages rabbit bodies in a similar manner.

The virus causes lesions in rabbits' organs and tissues, which leads to internal bleeding and death. Often the only outward sign that the animals are infected comes after their death: After suddenly dropping dead, their noses leak bloody discharge. Since April, the US Department of Agriculture (USDA) [has confirmed](#) RHDV2 cases in [Arizona](#), [California](#), [Colorado](#), [Nevada](#), [New Mexico](#), [Utah](#), and [Texas](#). Parts of [western Mexico](#) have also been hit with the virus.

A virus that's 'moved like mad'

This outbreak is the fourth time RHDV2 has been reported in the US. (Variants of the virus have spread across almost every continent since [scientists reported](#) the first case in China 35 years ago.)



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But it's the first time the virus has spread beyond domesticated animals to hit rabbits, pikas, and hares native to North America. Cottontails, snowshoe hares, and jackrabbits have all gotten sick.

"The fact that this is in multiple counties and rabbitries, that's why this is so concerning," Eric Stewart, executive director of the American Rabbit Breeders Association, [told VIN News](#).

"And then to hear it's burning through the wild rabbit populations, that, of course, furthers our concerns that much more."

In 2018, the virus popped up [among pet rabbits in Ohio](#), then a separate outbreak happened [in Washington state](#). In late February, [more than a dozen rabbits died](#) at the Centre for Avian and Exotic Medicine in Manhattan, succumbing to the virus in minutes amid violent seizures.

This southwestern outbreak, which appeared in Arizona and New Mexico a month later, is unrelated to those three.

"We still have no idea where it originated," Ralph Zimmerman, New Mexico state veterinarian, [told the Cut](#). "It's snowballed and moved like mad."

Nearly 500 animals in New Mexico were infected between March and June.

"We had one guy with 200 rabbits, and he lost them all between a Friday afternoon and Sunday evening," Zimmerman added. "It just went through and killed everything."

New Mexican officials instituted a depopulation policy, [The Cut reported](#). If one rabbit in a home caught the disease, the state requires the remaining rabbits in the nest be euthanised. That led another 600 animals to be killed in the attempt to stop the virus' spread.

By April, researchers had reported cases in rabbit populations in Colorado, Texas, and Nevada as well. Dozens more then popped in California and Utah.

"I'm going to be really honest with you. I think there are more cases than have been reported," Jones [told The Cut](#).

A highly contagious, hard-to-kill virus

'Bunny ebola' kills with startling efficiency.

Once an animal is infected, the virus incubates in as few as three days. Some bunnies start to lose their appetites and energy, though others show no outward symptoms before dropping dead.

Ultimately, the rabbits' organs – livers and spleens – fail and their blood stops clotting properly. In the current outbreak, officials have reported a death rate [of about 90 percent](#).

The bunnies that do survive become severe hazards to others, since they continue shedding virus for nearly two months.

RHDV2 spreads easily through blood, urine, and faeces.

While the virus can't infect humans or other types of animals, it can stick to hair, shoes, and clothing to move between bunny hosts. If a rabbit touches a surface contaminated by viral particles, it could get sick. Insects that roam between rabbits can spread particles, too.

The virus is also hard to kill: It can live for [more than three months](#) at room temperature. It survives temperatures of 122 degrees F (50 C) for at least an hour and can't be killed by freezing, [according to the House Rabbit Society](#).

What's more, the virus has no cure, and obtaining a vaccine in the US is a time-consuming process.

Getting a vaccine in the US takes weeks

Since the virus originated overseas, there's no licensed vaccine available in the US yet.

Instead, vets like Zimmerman and Jones have to request permission from the USDA to import vaccines from Spain and France. That approval process takes at least a month.

Jones [told The Cut](#) she put in her order mid-April and received it June 9; one of Zimmerman's orders took five weeks to arrive.

The USDA is working to domestically produce a RHDV2 vaccine, but the process will likely take a year or more, [according to the House Rabbit Society](#).

"This isn't just going to go away," Jones said. "This is a new problem that's here to stay."

Coronavirus: Bahrain uses robots emitting UV light to fight virus

Source: <https://www.thenational.ae/world/gcc/coronavirus-bahrain-uses-robots-emitting-uv-light-to-fight-virus-1.1042407>

July 01 – A robot that emits ultraviolet light and can be used to disinfect public spaces and offices is being used in Bahrain, authorities said on Wednesday.

The machine is designed to beam out short-wavelength UV light to kill coronavirus particles by disrupting their DNA.

It is known as "ultraviolet germicidal irradiation".



So far, the robots, designed by Fab Lab Bahrain in collaboration with the Ministry of Youth and Sports Innovation Centre, have been tested in industrial environments only.



Most viruses, including Covid-19, are covered with a thin membrane easily broken apart by UV rays.

Bahrain's Covid-fighting robot uses UV light to prevent the spread of Covid-19.

In May, Bahrain also began using a pair of multilingual, multitasking robots to help front-line health workers deal with the crisis.

The assistant robots **can speak 12 languages**, check body temperatures, administer medicine, serve meals and sterilize treatment rooms with ultraviolet light.

They can also identify patients using facial recognition and can respond to voice commands from staff.

Dr Waleed Al Manea, from Bahrain's health ministry, called the technology a "medical revolution".

"We have started using the robots in the isolation and treatment facilities as part of the experimental phase to use AI in the health sector," Mr Al Manea said.

The robots are meant to limit the interaction of health workers with Covid-19 patients.

"It is certainly a new medical revolution and we want to see how this benefits patients and staff," he said.

"This new technology will help doctors and nurses as they can evaluate the effectiveness of the robots and help incorporate them in their daily work."

Bahrain plans to roll out the robots to hospitals across the country after the initial testing period.

The country has recorded 26,758 coronavirus cases and 96 deaths.

4 Unusual Things We've Learned About The Coronavirus Since The Start of The Pandemic

By Sanjaya Senenayake

Source: <https://www.sciencealert.com/4-unusual-things-we-ve-learned-about-the-coronavirus-since-the-start-of-the-pandemic>

July 03 – It is now almost six months since the world became aware of [COVID-19](#), and almost four months since the World Health Organisation [declared a pandemic](#).

As the number of people infected with the [SARS-CoV-2 coronavirus](#) grows, so does our knowledge of how it spreads, how it affects the body, and the range of symptoms it causes.

Here are some of the unusual things we've learned about the coronavirus along the way.

1. It affects how your blood clots

Many inflammatory diseases, including infections, are associated with an increased risk of developing blood clots. However, COVID-19 is more strongly associated with blood clots than many other infections.

If blood clots are large enough, they can block the flow of blood through a blood vessel. This in turn leads to the part of the body the blood vessel supplies being starved of oxygen.

If this happens in a coronary artery, which supplies blood to your heart, it can cause a heart attack. In the lungs, it can cause a [pulmonary embolism](#). In the brain, it can cause a stroke, which we have seen [even in young people](#) with COVID-19 but no other risk factors.



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Critically ill COVID-19 patients in intensive care units (ICU) are particularly at risk of blood clots.

[One study](#) found 49 percent of patients were affected, mainly with clots to the lungs. [Other studies](#) found 20-30 percent of critically ill COVID-19 patients had blood clots.

These rates are [much higher](#) than we'd expect to see in patients admitted to ICU for other reasons.

Worryingly, clots occur in COVID-19 patients [despite](#) using standard preventative measures such as blood-thinning drugs.

2. You can lose your sense of smell

We now know COVID-19, [like other viral infections](#), can lead to anosmia, or losing your sense of smell.

In one study, it affected about [about 5 percent](#) of patients in hospital with COVID-19. But [some people](#) with only very mild disease say they they've suddenly lost their smell, [before regaining it](#).

Anosmia has now been [added to the list](#) of possible COVID-19 symptoms.

Anyone who's had a regular cold knows nasal congestion can affect your sense of smell. But COVID-19 is different. People can lose their smell [without](#) a runny or blocked nose.

Perhaps the [virus](#) latches onto [receptors](#) in the lining of the nose before entering the cells. We know these [ACE2 receptors](#) are how the virus enters other parts of the body, including the lungs.

Some people with COVID-19 who lose their sense of smell also report a [reduction](#) or [loss](#) of their sense of taste.

3. It can trigger serious inflammatory disease in kids

Another unusual feature is [how little](#) COVID-19 appears to have affected children, compared with many other respiratory infections. However, doctors in Europe and the UK, who have seen larger numbers of COVID-19 in children, have noticed an unusual but serious inflammatory condition in children with the virus. This is known as "multisystem inflammatory syndrome in children", or [MIS-C](#).

In studies from the [UK](#), [Italy](#) and [France](#), most of the children with this serious condition likely had COVID-19 in the past.

[Symptoms vary](#). But the main ones include [fever](#), rash and gut symptoms (vomiting, abdominal pain and diarrhoea). Some children develop heart complications.

These symptoms generally resemble other conditions such as [Kawasaki disease](#) and [toxic shock syndrome](#).

Researchers think it's not the virus itself that is responsible for MIS-C. Instead, they think it's the body's immune response to the virus, perhaps [long after being infected](#).

4. It can travel from humans to animals and back again

At the start of the [pandemic](#), we believed [SARS-CoV-2](#) originated from animals before spreading into humans. However, we were unsure if the virus could travel back into animals, perhaps infecting our pets.

We now know humans can transmit COVID-19 to domestic or captive animals, such as [dogs](#), [cats](#) and even [tigers](#).

In the Netherlands, there have been outbreaks in animals at several mink farms. [Researchers believe](#) an infected worker introduced the virus to the farms. The mink developed viral [pneumonia](#), which spread among the animals.

Sick mink then reportedly [infected two people](#) – the first documented case of animal-to-human transmission after the virus originated in China.

Sanjaya Senanayake, Associate Professor of Medicine, Infectious Diseases Physician, Australian National University.

More covid-19 patients are surviving ventilators in the ICU

Source: https://www.washingtonpost.com/health/more-covid-19-patients-are-surviving-ventilators-in-the-icu/2020/07/03/2e3c3534-bbca-11ea-8cf5-9c1b8d7f84c6_story.html

July 03 – An increasing number of U.S. covid-19 patients are surviving after they are placed on mechanical ventilators, a last-resort measure that was perceived as a signal of impending death during the terrifying early days of the pandemic.

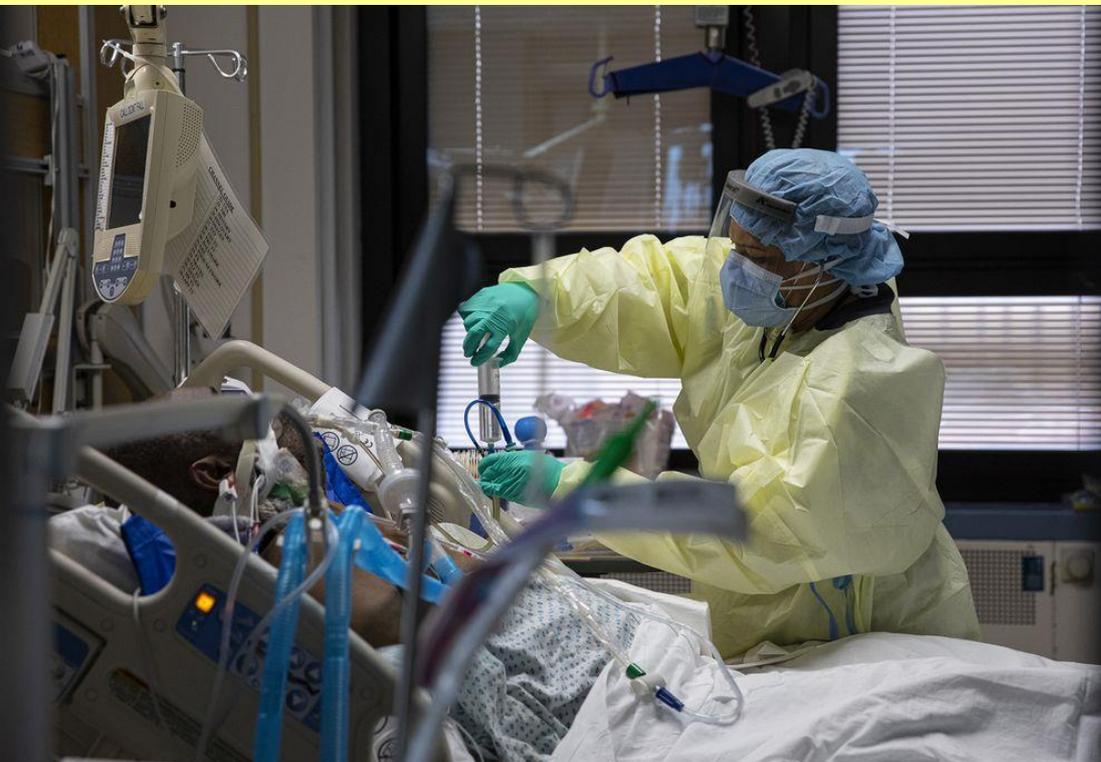
[Early reports out of Wuhan, China](#), and Italy cemented the impression that the vast majority of patients who required the breathing devices ultimately succumbed to the disease caused by the novel [coronavirus](#).



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But as the pandemic has continued, U.S. hospitals are reporting much lower mortality rates, results on par with death rates for patients with similar severe lung problems caused by other diseases.

Experts say that's because clinicians have become more skilled and are deploying new tactics as they learn more about the course of covid-19; some are using ventilators more selectively; many hospitals are less overwhelmed than when the virus first inundated Wuhan, parts of Italy and New York City; and early data on ventilation and death did not present a true picture.



"Being on a ventilator right now in our hands is no different than it would be any day of the year," said Greg Martin, a professor of medicine at Emory University School of Medicine and president-elect of the Society of Critical Care Medicine.

In a [May 26 study in the journal Critical Care Medicine](#), Martin and a group of colleagues found that 35.7 percent of covid-19 patients who required ventilators died — a significant percentage but much lower than early reports that put the figure in the upper 80 percent range.

Use of drugs such as remdesivir, which shortens the recovery time for some of the sickest patients, and the steroid dexamethasone have helped as well.

"We've learned a lot about Covid

since the beginning of the year," said Russell G. Buhr, a pulmonary and critical care physician at Ronald Reagan UCLA Medical Center. "That means we have a significantly better understanding of how to diagnose, recognize and manage this."

Buhr's hospital is still putting together data, but he said the mortality rate for ventilated patients is in the 30 percent to 50 percent range. That is about the same as the rate for people who develop [acute respiratory distress syndrome](#), the dangerous buildup of fluid in the tiny air sacs of the lungs caused by diseases such as pneumonia, or injuries such as those suffered in car accidents.

Before the pandemic, about 200,000 people developed acute respiratory distress each year and about 60 percent survived.

Roughly 20 percent of symptomatic covid-19 patients require hospitalization and about 5 percent end up in the ICU. Most of those in intensive care require ventilators. The devices essentially breathe for the patient, who is sedated with a long plastic tube placed down the throat and into the windpipe.

Severely ill covid-19 patients tend to linger on ventilators longer than other intubated patients, some for weeks. The tube inflames tissue, which can interfere with breathing, so later in the course of convalescence it may be removed and replaced by a smaller tube inserted through an incision in the windpipe.

While there is widespread agreement that ventilators have saved many lives during the pandemic, clinicians debate whether doctors turned to ventilators too often and too soon, especially at the beginning of the pandemic.

"This is a brand-new disease we'd never seen before," said Leora Horwitz, an associate professor of population health and medicine at NYU Langone Health. "We're generally learning to recognize who needs to be intubated and who doesn't. We're avoiding intubation where we can. We're learning proning," the technique of placing patients on their stomachs to help them breathe. "We're learning about blood clots."

At the NYU hospital, 60 percent of patients placed on ventilators between March 1 and May 5 died, according to a [paper Horwitz and others published in the BMJ medical journal](#).

"It's never going to be 10 to 20 percent. Let's not kid ourselves," Horwitz said. "The people who are sick enough to be put on ventilators, they're really sick."

Managing a patient on a ventilator is a time-consuming, delicate task that requires caregivers to monitor and adjust the amount of oxygen a patient is receiving, the pressure in his or her



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lungs and the time between breaths, among other factors. Buhr said he can spend 30 to 45 minutes perfecting the ventilator settings for a single patient.

When hospitals in China, Italy and New York City were swamped with patients early in the pandemic, that simply wasn't possible. Some patients were intubated in the emergency room instead of the ICU, where nurses can pay closer attention. Some New York hospitals were using older or backup equipment designed for anesthesia. Others relied on staff who were less familiar with the devices or who came from other places.

Italy has fewer ICU beds per capita than the United States and a large elderly population.

Martin, of Emory, said there is no doubt all those factors boosted mortality rates, especially because hospitals saw older and more vulnerable patients when the pandemic first hit their countries. In addition to age, underlying conditions such as heart disease and diabetes sharply increase the odds of dying of covid-19.

"The number of cases in New York exceeded the capacity for normal, conventional care," Martin said.

The Centers for Disease Control and Prevention said it has no data on the number of covid-19 patients who have required ventilators, or the proportion who survive. But health-care personnel have been listing outcomes on national and international registries, including one maintained by the [International Severe Acute Respiratory and Emerging Infection Consortium \(ISARIC\)](#).

When a team of researchers led by Annemarie Docherty, academic critical care consultant at the University of Edinburgh, looked at more than 20,000 United Kingdom patients on the ISARIC registry, they found 1,658 who required ventilators. Of those, 17 percent were discharged alive, 37 percent died and 46 percent were still in the hospital as of May 3.

In contrast, early studies that showed higher mortality rates may have presented a skewed view of the data. An [early report in the Lancet Respiratory Medicine](#) out of Wuhan put the fatality rate at 86 percent, but it included only 22 ventilated patients.

And when Northwell Health, one of the two largest medical systems in New York, first reported the results of [a review of its patients](#) in April, it put the death rate for those who needed ventilators at 88 percent. The study received widespread coverage in the U.S. media.

But several days later, when researchers corrected their work to account for the large number of patients on ventilators who were still in hospitals, they reduced the mortality rate to 25 percent.

A Visual Guide to the SARS-CoV-2 Coronavirus

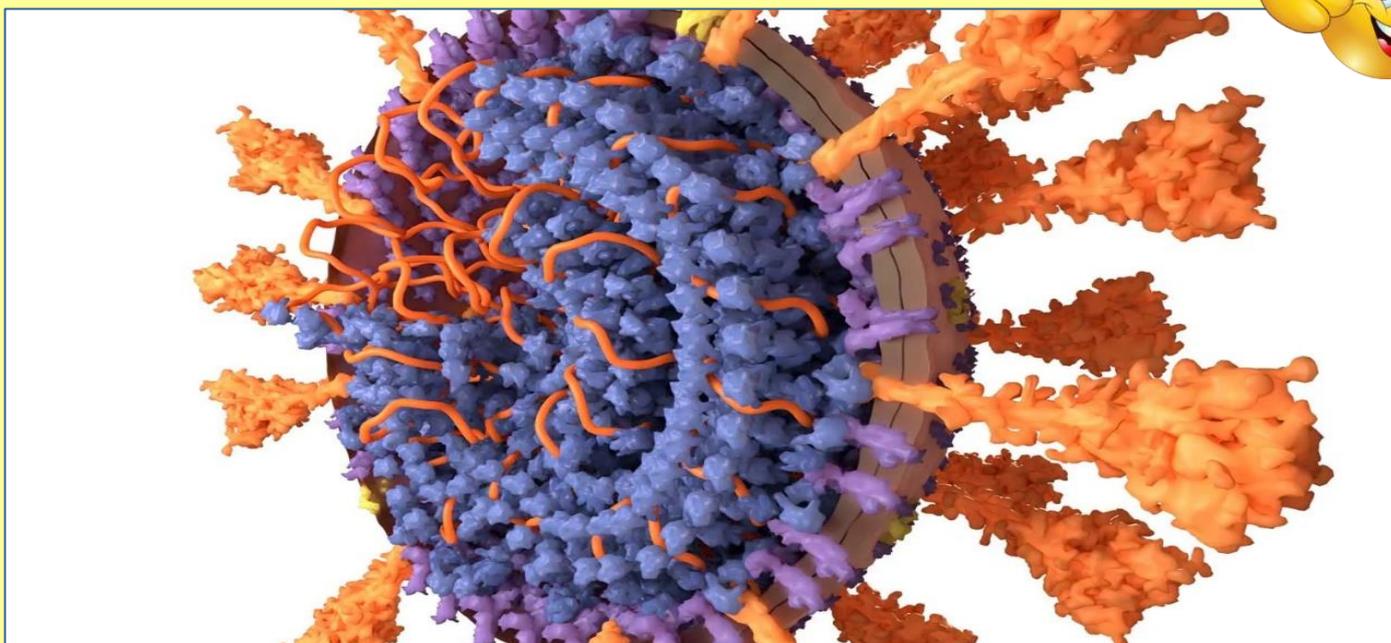
What scientists know about the inner workings of the pathogen that has infected the world

By Mark Fischetti, Veronica Falconieri Hays, Britt Glaunsinger, Jen Christiansen

Scientific American July 2020 Issue

Source: <https://www.scientificamerican.com/article/a-visual-guide-to-the-sars-cov-2-coronavirus/>

Interactive: https://www.scientificamerican.com/interactive/inside-the-coronavirus/?utm_source=pocket-newtab



Lessons unlearned: Four years before the CDC fumbled coronavirus testing, the agency made some of the same mistakes with Zika

Source: https://www.washingtonpost.com/investigations/lessons-unlearned-four-years-before-the-cdc-fumbled-coronavirus-testing-the-agency-made-some-of-the-same-mistakes-with-zika/2020/07/03/c32ca530-a8af-11ea-94d2-d7bc43b26bf9_story.html

July 04 – Four years before the federal Centers for Disease Control and Prevention fumbled the nation’s chance to begin effective early testing for the novel [coronavirus](#), the agency similarly mishandled its efforts to detect another dreaded pathogen.

Amid a feared outbreak of the newly emerged Zika virus, senior CDC officials in 2016 sidelined an effective test for it — and instead directed public health laboratories nationwide to use a more complicated test that failed about one-third of the time.

The agency’s response to Zika now stands as an unheeded prequel for how the CDC stumbled this year as it confronted the coronavirus pandemic, which has claimed more than 125,000 lives nationwide.

Both Zika and the coronavirus originated overseas and became American health emergencies that have challenged the CDC’s ability to carry out its fundamental mission to rapidly identify and contain newly arrived pathogens.

In both emergencies, the CDC pressured the public health labs to shelve the effective tests and to use less reliable test kits manufactured by the agency that sought to detect multiple pathogens. The agency stood behind the troubled test kits despite internal data indicating they were flawed. Ultimately, the CDC notified the public lab officials that they could switch to more effective tests.

With Zika, the CDC took nearly a year to change course. With the coronavirus, the agency took more than a month, delaying a nationwide rollout of effective testing as the malady it causes, covid-19, erupted into the nation’s most deadly infectious disease in a century. Clinicians and public health officials believe the delay caused additional deaths, although the total number is uncertain.

The component of the CDC’s coronavirus test kits that was designed to detect strains other than SARS-CoV-2 became contaminated during manufacturing at the agency in January, causing false-positive results at 24 of 26 labs that first tried out the kits, [The Washington Post revealed in April](#). The CDC waited until Feb. 28 before dropping the problematic “pan-coronavirus” segment from the kit — while the public labs were precluded from using other options, such as an effective test made available in mid-January by the World Health Organization.

The parallels in how the CDC responded to the two health crises emerge from a Washington Post examination of federal investigative and regulatory records, congressional testimony, CDC emails and documents, and interviews with scientists and other technical experts.

“It’s painful to watch the same challenges again and again,” said Timothy M. Persons, who has reviewed the efforts to counter Zika and the coronavirus as chief scientist of the U.S. Government Accountability Office. “As I think we saw with Zika, we need to apply lessons learned to definitely try and respond better.”

An [audit that Persons led](#) three years ago for the government faulted CDC leaders for not being more rigorous in evaluating the troubled test for Zika.

Reliable early testing “is a critical piece of the overall preparedness and response system,” Persons said in an interview.



President Trump and his appointees have generally praised the administration’s response to the coronavirus. But [a review released on June 19](#) by the Department of Health and Human Services said that CDC officials — despite seeing worrisome “anomalies” — skipped standard quality control checks before distributing the test kits for detecting the nation’s earliest cases of the virus. The review also confirmed that the kits were “likely” contaminated during the CDC’s manufacturing.

Robert S. Lanciotti, a virologist who headed the CDC’s diagnostic efforts with Zika until May 2016 — when the agency stripped him of his leadership role after he warned against distributing the deficient test kits — said the decision-making with the coronavirus mirrored what he witnessed.

“This is exactly the same mistake I saw during Zika,”

Lanciotti said in interviews with The Post.

Lanciotti said that by shelving effective tests in favor of less reliable approaches, CDC officials “slowed things down and screwed things up.”



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As [reported in The Post in 2016](#), Lanciotti had raised concerns then that the CDC's preferred Zika test missed infections and that the agency withheld information about its deficiencies from local lab officials.

CDC officials did not respond to questions for this article.

On Saturday, an HHS spokeswoman, Caitlin Oakley, said the government at no point blocked the public health labs "from using any other" available test for the coronavirus. Representatives of the labs, however, have complained that then-existing regulations tethered them to the CDC's troubled test.

Former CDC Director Tom Frieden, who led the agency's efforts against Zika in 2016, praised its overall performance with that virus and defended the decisions made with the Zika test.

"Any test can get improved with time," Frieden said. "And any action can be looked back on. . . . In the course of refining the test, you expect it to get better with time."

'We weren't taken by surprise'

Researchers discovered the virus that came to be called Zika in 1947 in the blood of a rhesus monkey in Uganda's Zika Forest. Initially, the virus posed little threat to humans: Over the next three decades, fewer than 20 Zika infections would be diagnosed from Africa to Southeast Asia, and the reported symptoms were nonexistent or mild — occasional fever, headache and malaise. No deaths or other severe outcomes emerged.

In June 2007, the CDC first dealt with Zika when the agency's diagnostic lab in Fort Collins, Colo., received blood samples from physicians in Yap state, a cluster of tiny Pacific islands about 500 miles east of the Philippines in the Federated States of Micronesia. The island doctors suspected that an epidemic of rashes, eye redness and joint pain had been touched off by disease-carrying mosquitoes.

At the time, Lanciotti was chief of the lab, which specialized in diseases spread by mosquitoes and ticks.

Using a well-established molecular testing technique called polymerase chain reaction, or PCR, Lanciotti and his colleagues discovered that the epidemic in Yap was caused by the Zika virus. Lanciotti also developed a separate enzyme-based test, which showed whether a person's blood carried Zika antibodies, another sign of infection.

His lab continued to use those tests on Zika samples as small outbreaks emerged in the coming years elsewhere in the Pacific, still thousands of miles from the U.S. mainland.

The CDC's concern rose by late 2015, after Zika infections were detected widely along the northern coast of Brazil. This marked Zika's first confirmed appearance in the Western Hemisphere — and the stakes were made more urgent by mysterious clusters of microcephaly, a birth defect that left newborns with tiny heads.

In December 2015, Lanciotti began distributing instructions for how to conduct the molecular test, which his team was already using, to public health labs in 21 states and the District of Columbia, along with several counties, records show.

A top priority, Lanciotti recalled during recent interviews, was to prevent Zika's spread in the United States by likely hosts — including infected airline passengers returning from the 2016 Summer Olympics in Rio de Janeiro. If an infected person were bitten by a mosquito, Zika might spread to whomever the insect next found. Zika, he knew, could also be transmitted sexually.

"When this hit in 2015, we weren't taken by surprise," Lanciotti recalled. "We had testing in place. . . . We knew there would be travelers returning, potentially infected with Zika."

Lanciotti's approach was informed by his CDC experience with West Nile disease, another mosquito-spread virus: Using molecular and antibody testing, he and his colleagues had been the first to confirm that an outbreak in 1999 of human encephalitis in New York City was caused by West Nile.

Lanciotti said the CDC did not manufacture the Zika test kits, but told others how to build them.

The Zika molecular testing protocol that Lanciotti distributed instructed the local labs where to purchase chemical mixtures necessary for the tests and specified the temperatures and durations at which blood samples, along with the mixtures, should be heated, cooled and reheated during testing.

Lanciotti also sent a "proficiency panel," which each lab could use to verify whether it was generating reliable results with the test, called "Singleplex." The panels included small tubes of inactivated Zika virus and a non-viral substance to verify accuracy.

Within two weeks of receiving Lanciotti's testing instructions, public labs in Florida, Texas, California, New York and Maryland were analyzing samples, interviews and CDC records show.

"The approach that my lab took was, we want to develop a very rapid way for state public health partners detecting these viruses," Lanciotti said. "We want to know right away if a traveler has Zika."



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Rapid detection would enable health authorities to isolate an infected person and, if a cluster of cases emerged, the affected neighborhoods could be promptly sprayed with insecticide. If a pregnant woman were diagnosed with Zika, she would be informed immediately.

A more elaborate approach to testing

By early 2016, CDC scientists based in Puerto Rico and at agency headquarters in Atlanta saw the emerging Zika crisis as an opportunity to deploy a new — and more elaborate — approach to detecting the virus.

Instead of using the molecular test to look only for Zika, they would also target five additional pathogens: chikungunya virus and four strains of dengue fever. The new test, referred to by scientists as an “assay,” was called “Trioplex,” and was intended to provide convenience for labs that wanted to look simultaneously for Zika and the other pathogens.

The portion of the Trioplex test targeting the four strains of dengue fever was known as the “pan-dengue” component. Four years later, the CDC would complicate its SARS-CoV-2 test with the “pan-coronavirus” component, designed to search for additional coronavirus strains.

All of the viral strains targeted in the new test were transmitted by mosquitoes, but only Zika posed an imminent threat to the continental United States. Even if Trioplex detected a case of dengue or chikungunya, no effective medical treatments existed for their often-mild symptoms, and neither dengue nor chikungunya was associated with birth defects.

Unlike Lanciotti’s test, the CDC would manufacture and distribute the Trioplex test kits, each with 41 pages of instructions, versus two for Lanciotti’s concise protocol.

The expanded diagnostic approach, however, introduced a challenge: Targeting multiple pathogens typically reduces a test’s sensitivity, according to scientific experts.

“You always are careful about sacrificing sensitivity,” said Richard Meyer, a microbiologist who designed and conducted molecular tests before retiring as chief of the CDC’s rapid response lab for bioterrorism.

Lanciotti said he worried about the change because he knew from his work during the Yap outbreak that, with Zika, only a relatively small amount of the virus could be detected in a person’s blood. Due to Zika’s low viral load, detecting it required a test with great sensitivity.

“A small reduction in analytical sensitivity leads to a big problem, because most of the Zika cases had low levels of” virus in the blood, Lanciotti said.

But Lanciotti did not oppose developing Trioplex — as long as it was not distributed until its sensitivity was upgraded, CDC records show.

Lanciotti said he remained confident in the Zika test already in use, Singleplex.

His work with Zika and other viruses drew accolades from the CDC. On Feb. 16, 2016, the CDC gave Lanciotti a “Director’s Recognition Award,” noting his “timely development of diagnostic tests that provided the first . . . evidence of a linkage between microcephaly and Zika virus.”

By early that month, the testing had confirmed 50 cases of Zika infection among returned U.S. travelers, according to CDC documentation provided to the White House. President Barack Obama cited the cases [in a letter on Feb. 22, 2016](#), when he asked Congress for a \$1.9 billion emergency appropriation to counter Zika. Nearly half, \$828 million, was intended for the CDC’s efforts.

At about the same time, the CDC began manufacturing the new Trioplex test kits in Atlanta.

In a briefing with reporters on March 10, 2016, CDC Director Frieden said the “new PCR test [Trioplex] will be particularly helpful” in combating Zika. The emergency funding, he said, “is crucially important and urgently needed.”

“The sooner we’re able to get a robust program up and running, the more we can reduce the risk to pregnant women,” Frieden said. On March 17, 2016, the Food and Drug Administration, which regulates some disease tests, granted the CDC an emergency use authorization for Trioplex, signifying it “may be effective.” The CDC then directed public health labs to use the test for Zika, records show.

Six days later, Frieden told a House appropriations subcommittee that the agency had already “produced more than half a million” Zika test kits. At least 13 states, he said, were at “high risk” of Zika being spread by the *Aedes aegypti* mosquito. In Puerto Rico, alone, “we could see thousands of affected pregnancies,” he said.

Missed infections

Health officials had another concern: that Zika could be transmitted through blood transfusions involving an infected donor.



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Because of that, in early 2016, the nonprofit Blood Systems Research Institute began to assess the reliability of the Trioplex test. The work was performed under a long-standing contract with the National Institutes of Health.

The blood organization, based in San Francisco, quickly found trouble with Trioplex.

On April 13, 2016, Michael P. Busch, the institute's director, sent an email to a senior CDC official: Testing over the previous two months had generated "disturbing" results. The data, Busch said, showed that Trioplex had missed 18 of 48, or 37.5 percent, of Zika infections it should have detected.

Trioplex appeared to be "less sensitive than . . . Lanciotti's assays," Busch wrote in the email to Lyle R. Petersen, a division director at the CDC, along with three other officials at both the CDC and the FDA.

Busch's email asked the officials "to support rapid publication" of the test data that his institute had analyzed.

One of the FDA officials, Jay Epstein, its director of blood research, responded to Busch on April 15: "I support publication," and "Re lower sensitivity . . . it seems to me that users need to shift to better assays."

"There was a lot of controversy over the accuracy of that [Trioplex] test and performance," Busch recently told The Post, adding that it reminded him of "the current situation with" the coronavirus.

A senior CDC official who was involved with the Zika response from the outset said the agency did not take "enough time to evaluate" Trioplex before distributing it.

"We made a bad decision with this Trioplex," said the official, who spoke on the condition of anonymity because they were not authorized to comment publicly. "We already knew how to diagnose for Zika virus. We already had the tests, which were developed in Rob Lanciotti's lab."

Lanciotti, meanwhile, was conducting his own studies in early 2016 on the reliability of Trioplex.

In mid-April, Lanciotti sent emails to a handful of senior CDC colleagues, reporting that analyses performed on patient samples in his lab found that "Trio misses 30-39% of the Zika positives."

One of the email recipients, Ronald M. Rosenberg, CDC's associate director of vector-borne diseases, suggested informing the state labs.

"The simplest solution might be to convey this information to the states and let them decide" which test to use, Rosenberg wrote in an email on April 18 to Lanciotti and four other CDC scientists. "But whatever they decide . . . it might be unwise to abandon the singleplex."

As concerns mounted over the accuracy of Trioplex, its lead designer, Jorge L. Munoz, chief of the CDC's dengue virus lab in Puerto Rico, told colleagues he saw no deficit in sensitivity, records show.

Also, on April 18, Frieden touted Trioplex to more than 1,500 health officials invited to a "Zika Action Plan Summit" at the agency's headquarters. Frieden said CDC scientists had "done a phenomenal job" developing Trioplex and the antibody tests. He again called for the emergency funding from Congress.

Two days later, Lanciotti voiced his growing concerns over Trioplex with Petersen, who had been detailed from Fort Collins to Atlanta to manage the CDC's response to Zika. Lanciotti said the state labs "that have validated and are using the singleplex should be encouraged to make no changes until they hear from us about the revised trioplex." Lanciotti also sent the email to 11 other senior CDC scientists.

Petersen did not respond to Lanciotti, according to documents gathered by a subsequent CDC review.

The next afternoon, on April 21, Lanciotti went a step further and emailed officials at 29 state labs that were using or had qualified to use Singleplex: "We want to inform you that in the Fort Collins laboratory we are continuing to use the Zika singleplex due to its greater relative sensitivity (that we have just established/become aware of through comparative analyses in several laboratories)."

Another senior CDC official, virologist Ann Powers, admonished Lanciotti for his email.

"While I certainly appreciate that you are wanting to make sure states are doing top quality testing, this email has created more trouble and confusion than it clarified," Powers wrote on April 25.

Two days later, CDC officials in Atlanta notified more than 100 public health labs that Trioplex was "recommended for use in the current Zika response."

The email made no mention of the Singleplex test or the data reflecting Trioplex's inferior sensitivity.

Some CDC officials had hoped that even if Trioplex failed to detect a Zika infection in pregnant women, those false negatives would be caught through later antibody tests.

But because of Zika's low viral load, that was not a reliable alternative: Antibodies in patients' blood typically are not seen during the first few days of infection and are never present in samples of urine or amniotic fluid. Of 13 patients with Zika that Trioplex had failed to detect, four were also missed by the antibody test, according to analyses done by Lanciotti's lab.



If those samples had not been subjected to the Singleplex test, “4 confirmed cases would have gone undetected,” Lanciotti wrote in an April 28 email to CDC officials Petersen, Powers and Rosenberg. The scientists were usually based in Fort Collins, and Lanciotti reported to both Powers and her superiors, Rosenberg and Petersen.

In a reply to the group titled, “triplex sensitivity,” Rosenberg wrote: “Shouldn’t CDC officially communicate this limitation to users?” On May 2, Triplex’s sensitivity was discussed during a conference call involving Lanciotti, Powers, Munoz and Julie M. Villanueva, a senior CDC scientist put in charge of the new Zika Emergency Operations Center. Villanueva this year co-developed the CDC’s test for the novel coronavirus, according to a [scientific journal article she co-authored](#).

Two days later, according to the CDC’s subsequent review, “potential enhancements to the Triplex” were also discussed with Frieden during a “daily update call” that included Munoz. Frieden said he did not remember the call.

Munoz, Petersen, Rosenberg, Powers and Villanueva did not answer written questions from The Post.

“What bothered me the most was, we were telling our state public health lab partners to use a test that we weren’t fully convinced was ready for prime time,” Lanciotti recalled. “There was no question in my mind that we were going to be missing cases.”

Lab chief turned whistleblower

On May 17, 2016, Rosenberg informed Lanciotti that the agency was stripping him of his duties as lab chief, but Rosenberg relayed no reason for the demotion, according to Lanciotti.

Within days, Lanciotti filed a [whistleblower complaint](#) with the U.S. Office of Special Counsel. In his complaint, Lanciotti alleged that the CDC had endangered public health by withholding the data about Triplex’s sensitivity. He [spoke recently about the issue](#) with the Project on Government Oversight.

On July 1, 2016, the special counsel’s office, which protects federal employees who reveal potential wrongdoing, determined there was a “substantial likelihood” that Lanciotti’s allegations were credible.

Special Counsel Carolyn N. Lerner contacted the CDC to recommend Lanciotti’s reinstatement as lab chief, according to people familiar with the matter. The CDC promptly restored Lanciotti’s title — but continued to exclude him from the agency’s response to Zika.

Lerner also referred Lanciotti’s allegations to Health and Human Services Secretary Sylvia M. Burwell for further investigation.

That type of referral typically would have been assigned to the HHS Inspector General, experts said. Instead, Burwell sent the matter to Frieden, who assigned it to the CDC’s associate director for laboratory science and safety, Stephan Monroe. His review, released on Sept. 2, concluded that Triplex had posed no danger and that agency officials acted prudently.

Monroe’s review cited the favorable conclusion about sensitivity reached by Triplex’s designer, Munoz, and described the available data for comparing the two tests as “inconclusive and contradictory.” His review also said, “It was reasonable to not share this information with external public health laboratories, as it did not provide any meaningful information for laboratories to act upon.”

Lerner, the special counsel whose initial investigation won Lanciotti’s reinstatement, closed her office’s file on the case in a letter to the White House on Sept. 27, concluding that Monroe’s findings “appear reasonable.”

A later Government Accountability Office report in May 2017 would find that Monroe’s review did not conduct “a comprehensive comparison of Triplex and Singleplex.”

Monroe did not respond to written questions from The Post. Frieden, to whom Monroe had reported directly, said he viewed the report as an independent review. It established to his satisfaction, Frieden said, that the CDC acted correctly with Triplex, including the decision to withhold the test data from the public health labs and other users.

“I think it’s very important in public health to share more rather than less,” Frieden said in an interview. “But that doesn’t necessarily mean that you share the results of evaluations that have not been done in a systematic way, that may not be accurate.”

At least seven state and local public labs defied the CDC’s original directive and continued to use Singleplex, according to scientists familiar with the matter and CDC records. Among them were the central labs for the states of New York, Maryland, Florida, Massachusetts and New Jersey.

Burwell, now the president of American University, declined through a spokeswoman to be interviewed.

The CDC eventually tried to improve Triplex’s sensitivity.

On Sept. 21, 2016, the FDA approved a CDC-requested change to Triplex, telling lab officials nationwide that they could try to boost its sensitivity by first extracting higher volumes of genetic material from samples of blood or urine. The samples would then be analyzed in the PCR machines.

But few of the labs had the specialized instruments necessary for the larger extractions, according to scientists familiar with the matter, including Busch, who had warned in April about Triplex’s sensitivity.

The CDC’s modification of Triplex, Busch said, “didn’t really fix the problem.”



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Within days of the change to Trioplex, the CDC's request for emergency funding to counter Zika was granted: On Sept. 28, 2016, Congress passed a spending measure that included \$1.1 billion of the \$1.9 billion that Frieden had for months sought on the Obama administration's behalf. A total of \$394 million wound up going to the CDC.

Meanwhile, in a dynamic that would be repeated this year with the coronavirus, many state lab officials privately fumed over the CDC's handling of Trioplex, afraid to speak out because their operations depended on funding from the agency.

But in an extraordinary plea on Oct. 14, 2016, the presidents of three organizations representing government and commercial scientists urged the CDC to release data that would illuminate Trioplex's "performance characteristics." The presidents, PhD scientists Susan E. Sharp, Charles E. Hill and Alexandra Valsamakis, represented the American Society for Microbiology, the Association for Molecular Pathology and the Pan American Society for Clinical Virology, respectively.

[Their letter](#) noted that "comparative studies of the Trioplex and Singleplex . . . suggest that Trioplex is significantly less sensitive than the Singleplex assay."

"The lack of access to all data regarding test performance of these assays prevents laboratory professionals from making informed decisions about which test to adopt or recommend. Access to these data would provide transparency and allow for optimal patient care."

On Jan. 12, 2017, 10 months after the rollout of Trioplex, the CDC informed users of the test that they could discard the non-Zika components of Trioplex. This essentially reduced Trioplex to the original Singleplex test.

In the end, Zika did not inflict widespread harm within the United States.

Reported Zika infections — mostly among returned travelers — totaled 5,168 in 2016 before declining to 452 in 2017, 74 in 2018 and just 22 last year, according to CDC records and interviews.

Lanciotti retired in December 2018, after 29 years with the CDC.

A guide to R — the pandemic's misunderstood metric

What the reproduction number can and can't tell us about managing COVID-19.

Source: <https://www.nature.com/articles/d41586-020-02009-w>

Special report: The simulations driving the world's response to COVID-19

How epidemiologists rushed to model the coronavirus pandemic.

Source: <https://www.nature.com/articles/d41586-020-01003-6>

Chinese Research Papers Raise Doubts, Fueling Global Questions About Scientific Integrity

Apparently fraudulent data in dozens of peer-reviewed articles spark fresh worries about 'paper mills' used by researchers under pressure to publish

Source: <https://www.wsj.com/articles/chinese-research-papers-raise-doubts-fueling-global-questions-about-scientific-integrity-11593939600>

China Dominates PPE Manufacturing

Source: <https://www.nytimes.com/2020/07/05/business/china-medical-supplies.html>

July 05 – Alarmed at China's stranglehold over [supplies of masks](#), gowns, [test kits](#) and other front-line weapons for battling the coronavirus, **countries around the world have set up their own factories to cope with this pandemic and outbreaks of the future.**

When the outbreak subsides, those factories may struggle to survive. China has laid the groundwork to dominate the market for protective and medical supplies for years to come.

Factory owners get cheap land, courtesy of the Chinese government. Loans and subsidies are plentiful. Chinese hospitals are often told to buy locally, giving China's suppliers a vast and captive market.

Once vaccines emerge, demand will plummet. Factories will close. But Chinese companies are likely to have the lowest costs by far and be best positioned for the next global outbreak.



“The Chinese have been successful weaving global personal protection equipment dominance with supply-chain command and control,” said Omar Allam, a former Canadian trade official trying to establish production of in-demand N95 medical respirators in his country.

China’s grip on the market is a testament to its drive to dominate important cogs in the global industrial machine.

For years, China’s leaders have worried that the country depended too much on foreign sources for everything from medical supplies to microchips to airliners. It has used subsidies, economic targets and other government inducements to emerge as a powerhouse in those important industries.

When Chinese leaders grew concerned about pollution and dependence on foreign oil, for example, they helped local makers of solar panels, wind turbines and high-speed rail equipment clobber the competition. They have taken similar steps to dominate industries of the future, like the next generation of wireless data transmission, known as 5G.

The state’s heavy involvement in its economy has led to waste and graft that could slow China’s growth. But the policies have often proved effective in building industries that can withstand losses and tough foreign competition. Medical supplies may be similar.

“There will be massive consolidation after the epidemic,” said Howard Yu, a professor of management and innovation at the Institute for Management Development, a business school in Switzerland. “It will be exactly the same dynamics as in green energy, 5G and high-speed rail.”

Before the pandemic, China already exported more respirators, surgical masks, medical goggles and protective garments than the rest of the world combined, the Peterson Institute for International Economics estimated.

Beijing’s coronavirus response has only added to that dominance. It increased mask production nearly 12-fold in February alone. It can now make 150 tons per day of the specialized fabric used for masks, said Bob McIlvaine, who runs a namesake research and consulting firm in Northfield, Ill. That is five times what China could make before the outbreak, and 15 times the output of U.S. companies even after they ramped up production this spring.

American companies have been reluctant to make big investments in fabric manufacturing because they worry that mask demand



will be temporary. But Texas required [on Thursday](#)

that most residents wear masks in public places, part of a broader embrace of face masks in recent days.

“It is a huge mistake to assume that the market will disappear,” Mr. McIlvaine said.

Ma Zhaoxu, vice minister of foreign affairs, said that from March through May, China exported 70.6 billion masks. The entire world produced about 20 billion all of last year, with China accounting for half.

[Sample masks on the Chinese equipment before it was installed in Anaheim. Credit...Bryan Denton for The New York Times](#)

Other countries now want self-reliance. Earlier in the pandemic, China sometimes decided which countries received crucial supplies and demanded [profuse and public thanks](#) in exchange.

President Emmanuel Macron of France pledged in March to produce homegrown masks and respirators by the end of this year. Peter Navarro, President Trump’s industrial policy adviser, has [begun a push](#) for the federal government to buy American-made pharmaceuticals and medical supplies.

China, however, has a head start.

In 2005, after the outbreak of SARS, which killed 350 people in China, the Ministry of Science and Technology announced that it had developed respirators that [better fit Chinese faces](#). In 2010, the government’s five-year economic plan ordered a “focus on developing basic equipment and medical materials that have high demand, wide application and are mainly imported.”

China also foresaw the importance of nucleic acid test kits, which can detect coronavirus infections. In 2017, the Ministry of Science and Technology identified the kits as a “targeted development” industry.



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The ministry's decision was part of the country's [\\$300 billion "Made in China 2025" industrial policy](#) to replace imports in many key industries, including medical devices. The ministry called for raising China's share of the local market by 30 to 40 percentage points in each category of medical supplies.

Chinese makers of medical gear enjoyed generous government subsidies. Shenzhen Mindray, a maker of ventilators and other intensive care equipment, received up to \$16.6 million a year over the past three years, according to company documents. Winner Medical, a mask manufacturer, received \$3 million to \$4 million a year. Guangzhou Improve, a producer of masks and test kits, received \$2.5 million to \$5 million a year.

Shenzhen Mindray and Winner Medical declined to comment, while Guangzhou Improve did not respond to numerous requests. Hospitals began to buy locally. Three years ago, the central government required purchasers to buy from domestic producers that could meet requirements. Local governments followed. Sichuan Province, for example, cut in half the number of categories for which medical equipment and supplies could be imported. Only the top hospitals could import anything, the provincial government said, while lower-ranked hospitals had to buy everything in China.



At least three other large, populous provinces — Liaoning, Hubei and Shandong — made similar announcements.

[Fine-tuning the settings on the QYK Brands mask assembly line.](#)
Credit...Bryan Denton for The New York Times

Such efforts helped put China firmly at the front of the industry, as Rakesh Tammabattula discovered. An entrepreneur in the Los Angeles suburbs, he shifted his business making nutrition supplements and moisturizer to the production of medical masks and hand sanitizer in response to the epidemic. To do that, he needed a machine that could compress and cut

fabric to make masks.

He discovered that the machines were made only in China. He had to charter a jet to fly the huge device — 36 feet long, six feet high and five feet wide — from southern China to Los Angeles.

"It's not that we can't make this," said Mr. Tammabattula, the chief executive of QYK Brands. "It's just that we haven't focused on it." The Chinese government played a major role in this year's medical-equipment build-out.

Sinopec, a state-owned Chinese oil company, said it had worked closely with the Chinese Communist Party as it set out to build a factory to make the particle-trapping fabric needed for surgical masks and respirators.

At one site, 600 engineers and workers labored in shifts day and night for 35 consecutive days to build a factory that would normally take a year to construct. A "party member assault team" worked 20 hours straight on Feb. 26 to prepare a warehouse for the project, according to the company.

Officials also accelerated efforts to make land available for new factories. The city of Hangzhou in Zhejiang Province transferred 1.6 acres to the Jiande Chaomei Daily Chemical Company on Feb. 15 for an emergency expansion of respirator production. Lanxi, a county in Zhejiang, transferred land to the Baihao New Materials Company by the end of February for respirator production. Officials in Guangdong Province and the city of Jinan in Shandong Province approved more lenient land policies for medical supply businesses as well.

Government support for the medical supply industry is continuing. Guangzhou Aoyuan Biotech Company decided this year to expand from its usual business of making disinfectant into the manufacture of N95 masks. A top local official immediately visited the company, arranged land for it in an industrial park and approved all of the necessary forms.



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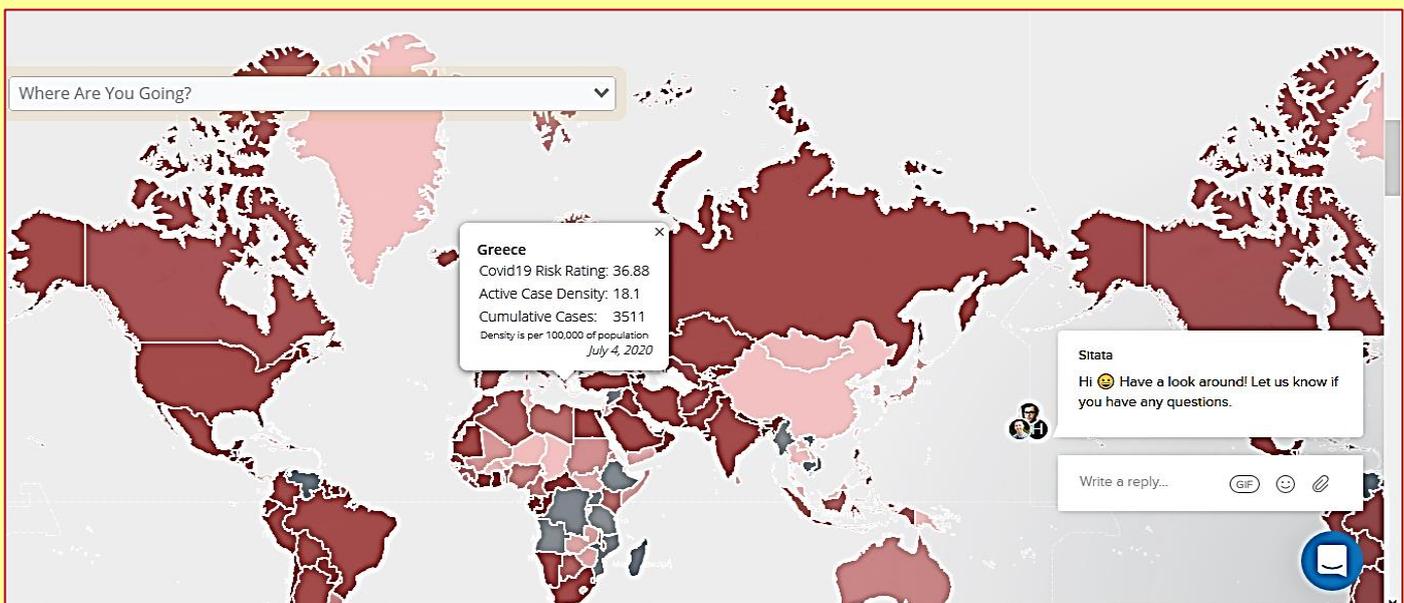
A few economic policy experts in China contend that their country may be going too far. According to Tianyancha, a Chinese data service, more than 67,000 companies have registered in China this year to make or trade masks. Many start-ups with poor quality control have already run into trouble. The Chinese government has imposed increasingly stringent customs inspections on exports. “Many mask-manufacturing enterprises — especially the small and medium enterprises that came into the picture much later and do not possess strong foundations — would have to face closure when they have a surplus of masks and profits begin to plunge,” wrote Cai Enze, a retired deputy mayor and economic planner in central China, in an essay in April. “That marks the start of a crisis.” Still, the broader industry in China appears to be better prepared for the future.

In Los Angeles, Mr. Tammabattula has found that even producing hand sanitizer is hard. He has been unable to find any company in the United States that still makes plastic bottles with pump handles. He imports them, on expensive chartered aircraft, from China. Mr. Tammabattula has applied for a federal loan for small businesses trying to produce medical supplies, but the paperwork has proved extensive, daunting and slow, he said. “If we were to compare to the Chinese government,” Mr. Tammabattula said, “there’s just no support for domestic manufacturing.”

Keith Bradsher is the Pulitzer Prize-winning Shanghai bureau chief for The New York Times, having reopened the Shanghai bureau in 2016. He has previously served as the Hong Kong bureau chief and the Detroit bureau chief for The Times. Before those postings, he was a Washington correspondent for The Times covering the Federal Reserve and international trade, and a New York-based business reporter covering transportation and telecommunications for The Times.

Where are you traveling to?

Source (interactive): <https://www.covidchecker.com/en/>



WHO reviewing scientists' concerns over airborne spread of COVID-19

Source: <https://www.smh.com.au/world/europe/who-reviewing-scientists-concerns-over-airborne-spread-of-covid-19-20200707-p559me.html>

July 07 – The World Health Organization (WHO) is reviewing a report that suggested its advice on the novel coronavirus needs updating, after some scientists told the *New York Times* there was evidence the virus could be spread by tiny particles in the air. The WHO says the COVID-19 disease spreads primarily through small droplets, which are expelled from the nose and mouth when an infected person breathes them out in coughs, sneezes, speech or laughter and quickly sink to the ground.





In an open letter to the Geneva-based agency, [239 scientists in 32 countries outlined the evidence](#) they say shows that smaller exhaled particles can infect people who inhale them, the newspaper said on Saturday.

Because those smaller particles can linger in the air longer, the scientists - who plan to publish their findings in a scientific journal this week - are urging WHO to update its guidance, the *Times* said.

"We are aware of the article and are reviewing its contents with our technical experts," WHO spokesman Tarik Jasarevic said in an email reply to a request for comment.

The extent to which the coronavirus can be spread by the so-called airborne or aerosol route - as opposed to by larger droplets in coughs and sneezes - remains disputed.

Any change in the WHO's assessment of risk of transmission could affect its current advice on keeping one-metre physical distancing. Governments, which also rely on the agency for guidance policy, may also have to adjust public health measures aimed at curbing the spread of the virus.

"Especially in the last couple of months, we have been stating several times that we consider airborne transmission as possible but certainly not supported by solid or even clear evidence," Benedetta Allegranzi, the WHO's technical lead for infection prevention and control, was quoted as saying in the *New York Times*.

WHO guidance to health workers, dated June 29, says that SARS-CoV-2, the virus that causes COVID-19, is primarily transmitted between people through respiratory droplets and on surfaces.

But airborne transmission via smaller particles is possible in some circumstances, such as when performing intubation and aerosol generating procedures, it says.

Medical workers performing such procedures should wear heavy duty N95 respiratory masks and other protective equipment in an adequately ventilated room, the WHO says.

EDITOR'S COMMENT: Air borne? Really? It would never cross my mind! I thought that droplets cannot fly and you have to lick them in order to be infected. Thank you, World Humor Organization, for spreading the knowledge in order to keep me/us safe and healthy – or something! On the other hand, why tiny particles (Covid-19 is 0.06 *microns* to 0.14 *microns*) need other tiny particles to fly/spread around?

From CDC:

Droplet spread refers to spray with relatively large, short-range aerosols produced by sneezing, coughing, or even talking. Droplet spread is classified as direct because transmission is by direct spray over a few feet, before the droplets fall to the ground. Pertussis and meningococcal infection are examples of diseases transmitted from an infectious patient to a susceptible host by droplet spread.

Airborne transmission occurs when infectious agents are carried by dust or droplet nuclei suspended in air. Airborne dust includes material that has settled on surfaces and become resuspended by air currents as well as infectious particles blown from the soil by the wind. Droplet nuclei are dried residue of less than 5 microns in size. In contrast to droplets that fall to the ground within a few feet, droplet nuclei may remain suspended in the air for long periods of time and may be blown over great distances. Measles, for example, has occurred in children who came into a physician's office after a child with measles had left, because the measles virus remained suspended in the air.

Cat drug shows promise against coronavirus in lab tests, Chinese researchers say

Source: <https://www.scmp.com/news/china/society/article/3088458/cat-drug-shows-promise-against-coronavirus-lab-tests-chinese>



June 10 – A drug used to treat an infectious disease in cats effectively stopped the replication of the pandemic coronavirus in laboratory tests, according to Chinese researchers.

The findings come just weeks after the American developer of the feline medicine announced that it had applied to the US Food and Drug Administration for emergency approval to start clinical trials of the drug on humans.

In a non-peer-review paper posted on the preprint server bioRxiv on Sunday, researchers led by Professor Zhang Shuyang at the Chinese Academy of Medical Sciences said that computer modelling and laboratory experiments suggested that the **medication called GC376** was "a relatively effective and safe drug candidate".



The drug binds to an important enzyme of Sars-CoV-2, the coronavirus that causes the disease Covid-19, according to the study. The enzyme, called Mpro, breaks down big proteins into amino acids and the virus uses these amino acids as building blocks. Without Mpro, the virus cannot make copies of itself.

The Chinese scientists found that the drug could easily enter cells infected by the novel coronavirus and inhibit viral production. It required only a dose of very low concentration to achieve maximum effect, “showing an excellent safety profile”, the researchers said.

GC376 was developed by Anivive Lifesciences, a biotech company based in Long Beach, California, and has been used to treat kittens suffering the feline infectious peritonitis, a fetal disease that is caused by a coronavirus that does not infect humans.

Anivive filed a pre-investigational new drug request with the FDA for GC376 based on its own research over the past few months, the company said late last month.

Anivive said it would receive guidance from the FDA to set up clinical study protocols. It was unclear when the drugs would be tested on Covid-19 patients.

“We look forward to our discussions with the FDA and advancing toward a clinical trial,” company founder Dylan Balsz was quoted as saying.

There were numerous reports of cats being infected in the global pandemic

. At the Bronx Zoo in New York, five tigers and three lions developed symptoms including a cough and tested positive for the new coronavirus.

A study in April led by Professor Chen Hualan, at the Harbin Veterinary Research Institute, found that Sars-CoV-2 was particularly bad for cats

. The virus replicated poorly in dogs, pigs, chickens and ducks, but thrived in the airway and intestines of cats.

The Chinese scientists warned in a paper published in Science magazine that cats could become a hidden reservoir or intermediate host that passed the virus to humans.

Guo Xiaofeng, professor of veterinary with the South China Agricultural University in Guangzhou, said some diseases infected both humans and animals, and their medical treatments could be similar. The rabies virus, for instance, could jump from dogs to humans through a bite, and the rabies vaccines for dogs and humans were technically identical.

“The difference, if any, may be quality,” Guo said. “If a drug works on cats, there is a reasonable hope it will work on humans as well. But there is no guarantee.

“Humans are likely more sophisticated than cats.”

What about COVID-19 waste? More than 7 tons of waste has been mishandled

Source: <https://www.animalpolitico.com/2020/06/residuos-covid-19-toneladas-desechos/>



Environmental authorities have raised two complaints against companies for the mishandling and abandonment of COVID-19 waste. According to the official standard, companies contracted by hospitals or by the government must comply with various provisions.

The largest, almost six thousand cubic meters of waste, in a [collection center in Cuautinchán, Puebla, on May 18](#). The rest of the waste, 3.5 tons, was [abandoned in the areas of Las Cebadillas and El Cabro of the municipality of Nicolás Romero, in the State of Mexico](#).

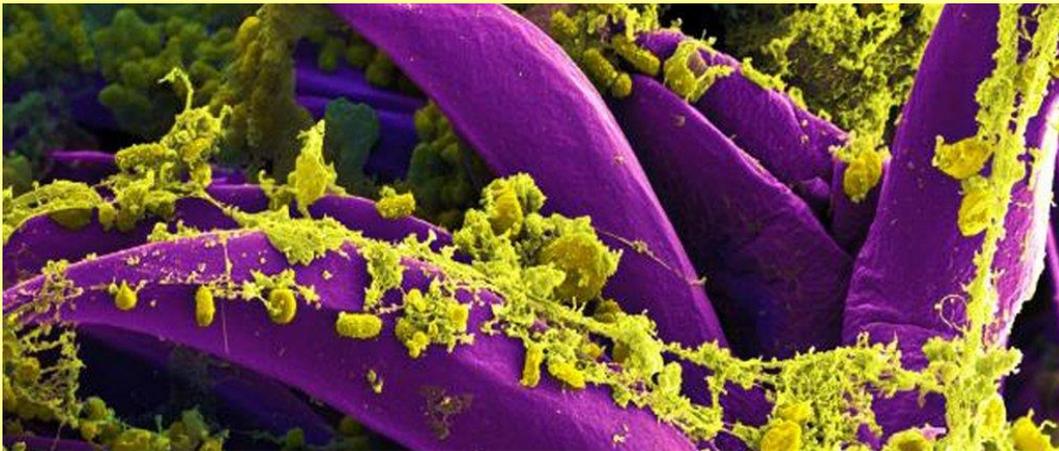
Warnings Issued as China Confirms a Case of Bubonic Plague in Inner Mongolia

Source: <https://www.sciencealert.com/chinese-authorities-issue-warnings-after-mongolian-farmer-contracts-the-bubonic-plague>

July 07 – Authorities in an autonomous region in northern China have issued a health warning after a local farmer contracted the bubonic plague.

A herdsman was reportedly in a stable condition after having been confirmed to have caught the disease on Sunday, [according to the New York Times](#).





Yersinia pestis bacteria that causes bubonic plague (yellow), on the spines of a flea. (NIAID)

Health officials in Bayan Mur, a city in Inner Mongolia, on Sunday issued a third-level alert, [according to Reuters](#), which is the second-lowest of four tiers.

The alert forbids the hunting or eating of wild animals that could carry the plague and it

will be in place until the end of the year. Locals have also been told to report finding any ill and dead animals, as well as people showing signs of a [fever](#) or sudden deaths.

"At present, there is a risk of a human plague [epidemic](#) spreading in this city. The public should improve its self-protection awareness and ability, and report abnormal health conditions promptly," the local health authority said, according to the [China Daily newspaper](#). The bubonic plague is a highly transmissible disease caused by a bacterial infection and was the cause of the Black Death, which swept through much of Asia, Europe and Africa in the fourteenth century and claimed [as many as 50 million lives](#).

It is now easily treatable with antibiotics, meaning cases are rare and an epidemic is highly unlikely, and the infected patient is in a stable condition, [according to the Global Times](#).

But there are still [occasional outbreaks](#) of the disease – Madagagascar recorded more than 300 cases in 2017, [according to a BBC report](#).

A Mongolian couple [also died last year](#) after contracting the bubonic plague when they ate raw marmot meat.

Trump administration moves to formally withdraw US from WHO

Source: <https://thehill.com/homenews/administration/506214-trump-administration-formally-withdraws-us-from-who>

July 07 – The White House has officially moved to withdraw the United States from the World Health Organization (WHO), a senior administration official confirmed Tuesday, breaking ties with a global public health body in the middle of the coronavirus pandemic. The U.S. has submitted its withdrawal notification to the United Nations secretary-general, the official said. Withdrawal requires a year's notice, so it will not go into effect until **July 6, 2021**, raising the possibility the decision could be reversed.

How Well Trained Is the Class of COVID-19?

By Elizabeth Svoboda

Source: <https://www.medscape.com/viewarticle/933183>

June 30 – During a family medicine rotation at Oregon Health and Sciences University (OHSU), third-year medical students are preparing for a patient visit. Only, instead of entering a clinic room, students sit down at a computer. The patient they're virtually examining — a 42-year-old male cattle rancher with knee problems — is an actor.

He asks for an MRI. A student explains that kneecap pain calls for rehab rather than a scan. The patient pushes back. "It would ease my mind," he says. "I really need to make sure I can keep the ranch running." The student must now try to digitally maintain rapport while explaining why imaging isn't necessary.

When COVID-19 hit, telehealth training and remote learning became major parts of medical education, seemingly overnight. Since the start of the pandemic, students have contended with canceled classes, missed rotations, and revised training timelines, even as the demand for new doctors grows ever more pressing.

Institutions have been forced to rethink how to best establish solid, long-term foundations to ensure that young doctors are adequately trained. "They may find themselves the only doctors to be practicing in a small town," said Stephen G. Post, PhD, bioethicist and



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professor at New York's Renaissance School of Medicine at Stony Brook University. "They have to be ready." With limited hands-on access to patients, students must learn in ways most never have before. Medical schools are now test-driving a mix of new and reimagined teaching strategies that aim to produce doctors who will enter medicine just as prepared as their more seasoned peers.

Hands-Off Education

Soon after starting her pediatrics rotation in March, recent Stanford University School of Medicine graduate Paloma Marin-Nevarez, MD, heard that children were being admitted to her hospital for evaluation to rule out COVID-19. Marin-Nevarez was assigned to help care for them but never physically met any — an approach called **"virtual rounding."**

In virtual rounding, a provider typically goes in, examines a patient, and uses a portable device such as an iPad to send video or take notes about the encounter. Students or others in another room then give input on the patient's care. "It was bizarre doing rounds on patients I had not met yet, discussing their treatment plans in one of the team rooms," Marin-Nevarez said. "There was something very eerie about passing that particular unit that said, 'Do Not Enter,' and never being able to go inside."

Within weeks, the Association of American Medical Colleges (AAMC) [advised medical schools](#) to suspend any activities — including clinical rotations — that involved direct student contact with patients, even those who weren't COVID-19-positive.

Many schools hope to have students back and participating in some degree of patient care at non-COVID-19 hospital wards as early as July 1, says Michael Gisondi, MD, vice chair of education at Stanford's Department of Emergency Medicine. Returning students must now adapt to a restricted training environment, often while scrambling to make up training time. "This is uncharted territory for medical schools," Gisondi said. "Elective cases are down, surgical cases are down. That's potentially going to decrease exposure to training opportunities."

When students come back, lectures are still likely to remain on hold at most schools, replaced by Zoom conferences and virtual presentations. That's not completely new: A trend away from large, traditional classes predated the pandemic. In a [2017–2018 AAMC survey](#), 1 in 4 second-year medical students said they almost never went to in-person lectures. COVID-19 has accelerated this shift. For faculty who have long emphasized hands-on, in-person learning, the shift presents "a whole pedagogical issue — you don't necessarily know how to adjust your practices to an online format," Gisondi said. Instructors have to be even more flexible in order to engage students. "Every week I ask the students, 'What's working? What's not working?'" Gisondi said about his online classes. "We have to solicit feedback."

Changes to lectures are the easy part, says Elisabeth Fassas, a second-year student at the University of Maryland School of Medicine. Before the pandemic, she was taking a clinical medicine course that involved time in the hospital, something that helped link the academic with the practical. "You really get to see the stuff you're learning being relevant: 'Here's a patient who has a cardiology problem,'" she said. "[Capturing] that piece of connection to what you're working toward is going to be tricky, I think." Some students who graduated this past spring worry about that clinical time they lost. Many remain acutely conscious of specific knowledge gaps. "I did not get a ton of experience examining crying children or holding babies," said Marin-Nevarez, who starts an emergency medicine residency this year. **"I am going to have to be transparent with my future instructors and let them know I missed out because of the pandemic."**

Such knowledge gaps mean new doctors will have to make up ground, says Jeremiah Tao, MD, who trains ophthalmology residents at the University of California, Irvine, School of Medicine. But Tao doesn't see these setbacks as a major long-term problem. His residents are already starting to make up the patient hours they missed in the spring and are refining the skills that got short shrift earlier on. For eligibility, "most boards require a certain number



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of days of experience," he said. "But most of the message from our board is [that] they're understanding, and they're going to leave it to the program directors to declare someone competent."

Robert Johnson, MD, dean of Rutgers New Jersey Medical School, in Newark, says short-term setbacks in training likely won't translate into longer-term skill deficits. "What most schools have done is overprepare students. We're sure they have acquired all the skills they need to practice."

Closing the Gaps

To fill existing knowledge gaps and prevent future deficits, institutions hope to strike a balance between keeping trainees safe and providing necessary on-site learning. In line with ongoing [AAMC recommendations](#), which suggest schools curtail student involvement in direct patient care in areas with significant COVID-19 spread, virtual rounding will likely continue.

Many schools may use a hybrid approach, in which students take turns entering patient rooms to perform checkups or observations while other students and instructors watch a video broadcast. "It's not that different from when I go into the room and supervise a trainee," Gisondi said.

Some schools are going even further, transforming education in ways that reflect the demands of a COVID-19-era medical marketplace. Institutions such as [Weill Cornell Medicine](#) and OHSU have invested in telemedicine training for years, but COVID-19 has given telehealth education an additional boost. These types of visits have [surged dramatically](#), underscoring the importance of preparing new doctors to practice in a virtual setting — something that wasn't common previously. In a [2019 survey](#), only about a quarter of sampled medical schools offered a telemedicine curriculum.

Simulated telehealth consults such as OHSU's knee-pain scenario serve several purposes, says Ryan Palmer, EdD, associate dean of education at Northeast Ohio Medical University, in Rootstown. They virtually teach skills that students need — such as clearly explaining to patients why a care plan is called for — while allowing the trainees to practice forging an emotional connection with patients they are treating remotely.

"It's less about how you use a specific system," said Palmer, who developed [OHSU's TeleOSCE](#), a telehealth training system that has interested other schools. He sees this as an opportunity, inasmuch as telemedicine is likely to remain an important part of practice for the foreseeable future.

To that end, the AAMC recently hosted an [online seminar](#) to help faculty with telehealth instruction. But training such as this can only go so far, says Rutgers' Johnson. "There are techniques you do have to learn at the patient's side."

Johnson says that a traditional part of medical school at Rutgers has been having students spend time in general practitioners' offices early on to see what the experience is like. "That's going to be a problem — I expect many primary care practices will go out of business. Those types of shadowing experiences will probably go away. They may be replaced by experiences at larger clinics."

Some learning in clinics may soon resume. Although fears about COVID-19 still loom large, Tao's ophthalmology residents have started taking on something closer to a normal workload, thanks to patients returning for regular office visits. As people return to medical facilities in larger numbers, hospitals around the country have started [separating patients with COVID-19](#) from others. Gisondi suggests that this means medical students may be able to circulate in non-COVID-19 wards, provided the institution has enough personal protective equipment. "The inpatient wards are really safe — there's a low risk of transmission. That's where core rotations occur."

The Road Ahead

In settings where patients' viral status remains uncertain, such as emergency wards and off-site clinics without rapid testing, in-person learning may be slower to resume. That's where longer-term changes may come into play. Some schools are preparing digital learning platforms that have the potential to transform medical education.

For example, Haru Okuda, MD, an emergency medicine doctor and director of the Center for Advanced Medical Learning and Simulation at the University of South Florida, in Tampa, is testing a new virtual-reality platform called [Immertec](#). Okuda says that, unlike older teaching tools, the system is not a stale, static virtual environment that will become obsolete. Instead, it uses a live camera to visually teleport students into the space of a real clinic or operating room.

"Let's say you have students learning gross anatomy, how to dissect the chest. You'd have a cadaver on the table, demonstrating anatomy. The student has a headset — you can see like you're in the room." The wrap-around visual device allows students to watch surgical maneuvers close up or view additional input from devices such as laparoscopes.

Okuda acknowledges that educators don't yet know whether this works as well as older, hands-on methods. As yet, no virtual reality system has touch-based sensors sophisticated enough to simulate even skills such as tying a basic surgical knot, Gisondi says. And



immersive platforms are expensive, which means a gap may occur between schools that can afford them and those that can't. The long-term consequences of COVID-19 go beyond costs that institutions may have to bear. Some students are concerned that



the pandemic is affecting their mental well-being in ways that may make training a tougher slog. A few students graduated early to serve on the COVID-19 front lines. Others, rather than planning trips to celebrate the gap between medical school and residency, watched from home as young doctors they knew worked under [abusive and unsafe conditions](#).

"Many of us felt powerless, given what we saw happening around us," said recent University of

Michigan Medical School graduate Marina Haque, MD. She thinks those feelings, along with the rigors of practicing medicine during a pandemic, may leave her and her colleagues more prone to burnout.

The pandemic has also had a galvanizing effect on students — some excited new doctors are eager to line up for duty on COVID-19 wards. But supervisors say they must weigh young doctors' desire to serve against the possible risks. "You don't want people who have a big future ahead of them rushing into these situations and getting severely ill," said Stony Brook's Post. "There is a balance."

All these changes, temporary or lasting, have led many to question whether doctors who complete their training under the cloud of the pandemic will be more — or less — prepared than those who came before them. But it's not really a question of better or worse, says Rutgers' Johnson, who stresses that medical education has always required flexibility.

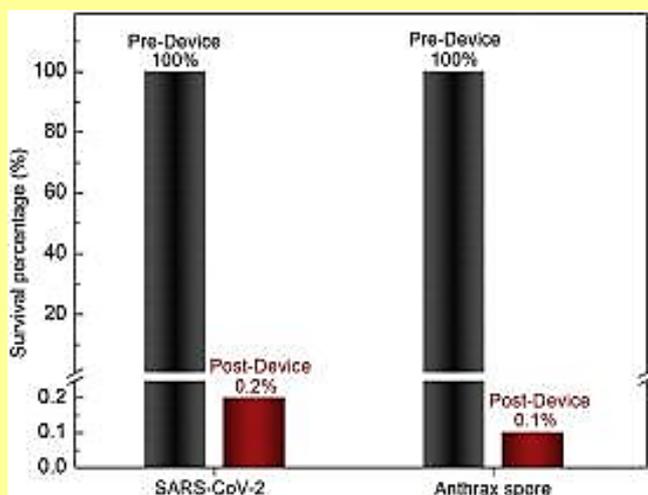
"You come into medicine with a plan in mind, but things happen," he said. He reflected on the [HIV](#) pandemic of the late 1980s and early 1990s that influenced his medical career. He hopes young doctors come through the COVID-19 crucible more seasoned, resilient, and confident in crisis situations.

"This is a pivotal event in their lives, and it will shape many careers."

Elizabeth Svoboda is a science writer in San Jose, California. Her work has appeared in the Washington Post, Discover, and elsewhere. She is also the author of [What Makes a Hero?: The Surprising Science of Selflessness](#).

Researchers create air filter that can kill the coronavirus

Source: https://www.eurekalert.org/pub_releases/2020-07/uoh-rca070720.php



July 07 – Researchers from the University of Houston, in collaboration with others, have designed a "catch and kill" air filter that can trap the virus responsible for COVID-19, killing it instantly.

Zhifeng Ren, director of the Texas Center for Superconductivity at UH, collaborated with Monzer Hourani, CEO of Medistar, a Houston-based medical real estate development firm, and other researchers to design the filter, which is described in a [paper](#) published in *Materials Today Physics*.

The researchers reported that virus tests at the Galveston National Laboratory found 99.8% of the novel SARS-CoV-2, the virus that causes COVID-19, was killed in a single

pass through a filter made from commercially available nickel foam heated to 200 degrees Centigrade, or



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about 392 degrees Fahrenheit. It also killed 99.9% of the anthrax spores in testing at the national lab, which is run by the University of Texas Medical Branch.

"This filter could be useful in airports and in airplanes, in office buildings, schools and cruise ships to stop the spread of COVID-19," said Ren, MD Anderson Chair Professor of Physics at UH and co-corresponding author for the paper. "Its ability to help control the spread of the virus could be very useful for society." Medistar executives are also proposing a desk-top model, capable of purifying the air in an office worker's immediate surroundings, he said.

Ren said the Texas Center for Superconductivity at the University of Houston (TcSUH) was approached by Medistar on March 31, as the pandemic was spreading throughout the United States, for help in developing the concept of a virus-trapping air filter.

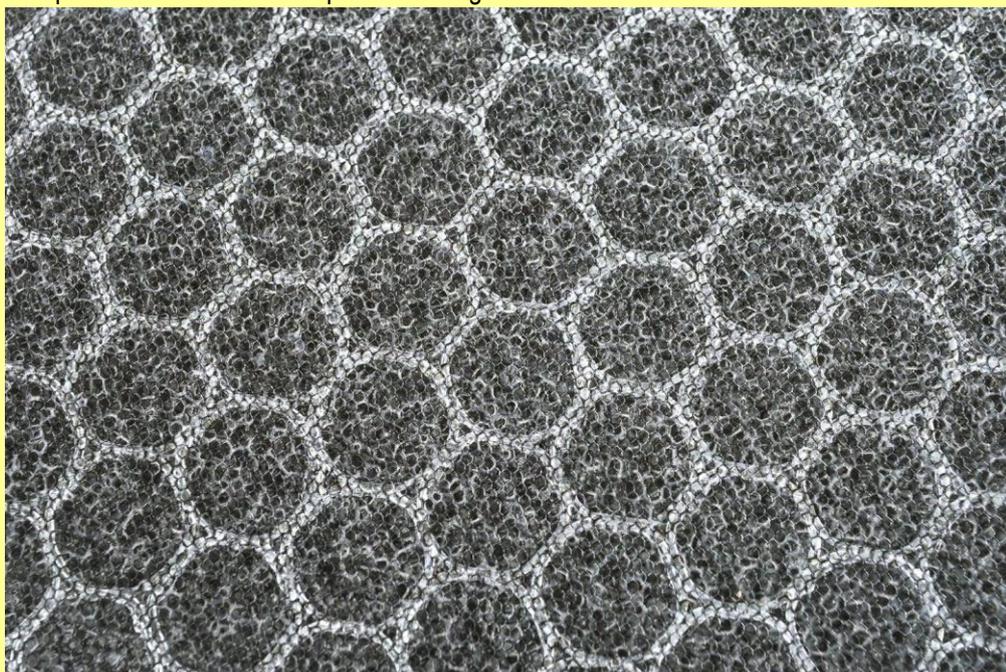
Luo Yu of the UH Department of Physics and TcSUH along with Dr. Garrett K. Peel of Medistar and Dr. Faisal Cheema at the UH College of Medicine are co-first authors on the paper.

The researchers knew the virus can remain in the air for about three hours, meaning a filter that could remove it quickly was a viable plan. With businesses reopening, controlling the spread in air-conditioned spaces was urgent.

And Medistar knew the virus can't survive temperatures above 70 degrees Centigrade, about 158 degrees Fahrenheit, so the researchers decided to use a heated filter. By making the filter temperature far hotter - about 200 C - they were able to kill the virus almost instantly.

Ren suggested using nickel foam, saying it met several key requirements: It is porous, allowing the flow of air, and electrically conductive, which allowed it to be heated. It is also flexible.

But nickel foam has low resistivity, making it difficult to raise the temperature high enough to quickly kill the virus. The researchers solved that problem by folding the foam, connecting multiple compartments with electrical wires to increase the resistance high enough to raise the temperature as high as 250 degrees C.



By making the filter electrically heated, rather than heating it from an external source, the researchers said they minimized the amount of heat that escaped from the filter, allowing air conditioning to function with minimal strain.

A prototype was built by a local workshop and first tested at Ren's lab for the relationship between voltage/current and temperature; it then went to the Galveston lab to be tested for its ability to kill the virus. Ren said it satisfies the requirements for conventional heating, ventilation and air conditioning (HVAC) systems.

"This novel biodefense indoor air protection technology offers the first-in-line prevention against environmentally mediated transmission of airborne SARS-CoV-2 and will be on the forefront of technologies available to combat the current pandemic and any future airborne biothreats in indoor environments," Cheema said.

Hourani and Peel have called for a phased roll-out of the device, "beginning with high-priority venues, where essential workers are at elevated risk of exposure (particularly schools, hospitals and health care facilities, as well as public transit environs such as airplanes)."

That will both improve safety for frontline workers in essential industries and allow nonessential workers to return to public work spaces, they said.

Reference: *"Catching and killing of airborne SARS-CoV-2 to control spread of COVID-19 by a heated air disinfection system"* by Luo Yu, Garrett K. Peel, Faisal H. Cheema, William S. Lawrence, Natalya Bukreyeva, Christopher W. Jinks, Jennifer E. Peel, Johnny W. Peterson, Slobodan Paessler, Monzer Hourani and Zhifeng Ren, 7 July 2020, Materials Today Physics.



The Pandemic Is Pushing Scientists to Rethink How They Read Research Papers

By Richard Harris

Source: <https://www.npr.org/sections/health-shots/2020/07/07/884957449/the-pandemic-is-pushing-scientists-to-rethink-how-they-read-research-papers>

July 07 – The coronavirus pandemic has posed a special challenge for scientists: Figuring out how to make sense of a flood of scientific papers from labs and scientists unfamiliar to them.

More than 6,000 coronavirus-related preprints from researchers around the world have been posted since the pandemic began, without the usual peer review as a quality check. Some are poor quality, while others, including papers from China from early in the course of the epidemic, contain vital information.

The beauty of science is the facts are supposed to speak for themselves.

"In the ideal world we would simply read the paper, look at the data and not be influenced by where it came from or who it came from," says [Theo Bloom, the executive editor of the medical journal BMJ](#) (formerly the British Medical Journal). But Bloom knows we don't live in an ideal world. We are deluged with information, so people necessarily turn to shortcuts to help them sort through it all. One shortcut is to look for a familiar name, or at least a trusted institution, in the list of authors.

"As human beings, I think we default to thinking: 'How do I know this, where does it come from, who's telling me and do I believe them,'" she says.

But leaning on that has a downside. "The shortcuts we use tend to propagate what in this country we would call an old boys network," Bloom says. That favors biases over fresh ideas. And it's often not a useful tool for evaluating papers about the coronavirus. Since the pandemic hit Asian and European countries first, important papers have been originating abroad from scientists often outside U.S. research networks.

Some of the most important research about the nature of the virus and the epidemic have come from Chinese scientists not widely known to a global audience. These papers helped identify the virus, explore how rapidly it spreads and how the disease progresses within an individual. Bloom says important insights about the unfolding pandemic came as well from researchers in Spain and Italy who were not widely known internationally.

Part of Bloom's job at BMJ involves managing a major repository of unpublished medical papers at [Medrxiv](#) (pronounced med-archive). Some of the papers in Medrxiv end up getting published later in peer-reviewed journals, but many don't.

Few of the submitters are familiar to Bloom, despite her many years as a top journal editor. And the sheer quantity of new information, especially from unknown labs and unknown scientists around the world, is a huge challenge.

Medrxiv, like its sister repository, [Biorxiv](#), does only basic screening of submissions. Are they actually scientific investigations, or simply commentary? Have human experiments been performed ethically? And would a preliminary finding create public panic? (When editors fear that might be the case, they refer the study to a journal for proper peer review before posting an explosive claim). Bloom's job is not to judge the quality of the research. That task is left to scientists (and journalists) who read the papers.

"It takes a large investment of attention and effort to really dig deeply into a manuscript to scrutinize the methods, the claims and the relationship between the methods and the claims," says [Jonathan Kimmelman](#), a professor of biomedical ethics at McGill University. He first asks himself a basic question: Can I trust what I'm reading here?

"Knowing where a researcher is, or who a researcher is, can be part of establishing that trust," Kimmelman says. "But I do think it harbors some dangers."

Sometimes the freshest ideas come from young and relatively unknown scientists. And sometimes scientists with big reputations produce flops.

In the case of coronavirus research, a lot of important results come out of labs he's never heard of, produced by people he doesn't know. So Kimmelman tries to look for signals of quality in the papers themselves.

He recalls one paper out of China in late March that touted the benefits of hydroxychloroquine, a malaria drug that has been promoted as a possible treatment for COVID-19.

"This [finding] was pretty quickly taken up by *The New York Times*, and a number of different experts had fairly positive statements to say about the clinical trial," Kimmelman recalls.

Rather than diving directly into the data and analysis, Kimmelman first looked at how the researchers had approached their work. Studies involving human beings are supposed to be registered in government databases such as [clinicaltrials.gov](#). There, scientists declare in advance the specific hypothesis they are testing and describe how their experiment is designed.



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In the case of the hydroxychloroquine study, Kimmelman discovered that the reported results had veered significantly from their previously stated experimental plan. "Those struck me as a lot of major red flags," he says. "It probably took me something between 15 minutes and 30 minutes to come to the conclusion that this paper wasn't worth the time of day."

Sure enough, the promise of hydroxychloroquine as a COVID-19 treatment eventually crumbled, as several larger studies failed to show any benefit.

Some scientists in the U.S. approach research from China with trepidation. There have been [some widely publicized scandals](#) around scientific misconduct at Chinese universities. While misconduct is hardly unique to China, scientists with only a vague sense of who is culpable may prejudice Chinese science in general. This would be a mistake, argues [Heping Zhang](#), a professor of biostatistics at Yale University.

"There are people who cheat whenever humans are involved," Zhang says. "It is unfair and unnecessary to be prejudiced against diligent and honest scientists regardless of how many others don't hold up the high standard," he writes in an email. "I have direct experience where an important and solid study may be rejected because the authors are Chinese."

Scientists should approach each piece of research with an open mind, he says, and judge the science on its merits.

Bloom at the BMJ agrees, saying there is a danger in relying too heavily on surrogates, such as big names or big-name journals, when evaluating a new finding.

"There are retractions and falsifications from great journals, great institutions, from Nobel laureates and so on," Bloom says. "So, it behooves us all to try and move away from who we recognize as good."

One way researchers are working to overcome bias is by coming together to form international research teams.

Motivated by a desire to address "a common threat to humanity," Zhang [has worked collaboratively](#) with multiple colleagues in China to analyze trends of the coronavirus within the United States. He speculates that the Yale connection adds credibility to that research. [Lauren Ancel Meyers](#), a biologist at the University of Texas in Austin, says she has also had the benefit of working with a postdoctoral researcher in her lab, Zhanwei Du, who hails from Hong Kong.

"Working very closely with someone from China has been incredibly invaluable to just getting basic understanding of the situation, but also to building bridges to researchers and to data that are coming out of China," Meyers says.

Her lab, which specializes in modeling diseases, not only consumes coronavirus research, but produces it as well. [One of their early papers](#) used Chinese cellphone data to predict how the coronavirus would spread out of Wuhan, where the epidemic started, and into other regions of China. Her papers share authors around the world.

She notes that some of the important early information flowing from unfamiliar scientists in China got immediate recognition because their papers were co-authored by prominent researchers in Hong Kong and Britain.

"I imagine that some of the reaching out and some of the bridges that were built were not just to get credibility, but really to bring the brightest minds to help think through the data and what was going on," Meyers says.

*Award-winning journalist **Richard Harris** has reported on a wide range of topics in science, medicine and the environment since he joined NPR in 1986. In early 2014, his focus shifted from an emphasis on climate change and the environment to biomedical research. Harris has traveled to all seven continents for NPR. His reports have originated from Timbuktu, the South Pole, the Galapagos Islands, Beijing during the SARS epidemic, the center of Greenland, the Amazon rain forest, the foot of Mt. Kilimanjaro (for a story about tuberculosis), and Japan to cover the nuclear aftermath of the 2011 tsunami. In 2010, Harris' reporting revealed that the blown-out BP oil well in the Gulf of Mexico was spewing out far more oil than asserted in the official estimates. That revelation led the federal government to make a more realistic assessment of the extent of the spill.*

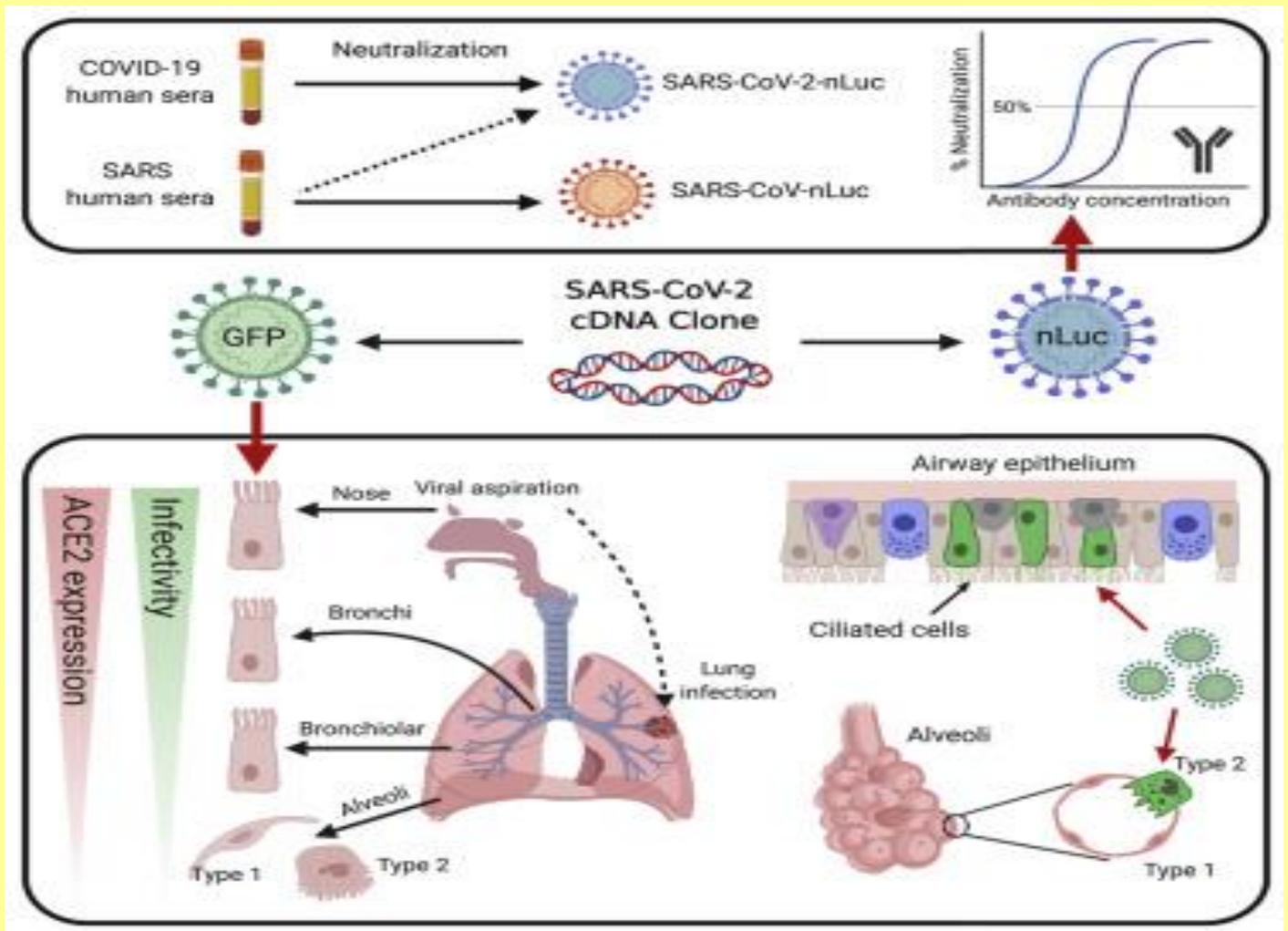
Researchers map how coronavirus infection travels through cells of nasal cavity and respiratory tract

By Yixuan J. Hou, Kenichi Okuda, Caitlin E. Edwards, et al.

Source: <https://www.cell.com/action/showPdf?pii=S0092-8674%2820%2930675-9>

The mode of acquisition and causes for the variable clinical spectrum of coronavirus disease 2019 (COVID-19) remain unknown. We utilized a reverse genetics system to generate a GFP reporter virus to explore severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pathogenesis and a luciferase reporter virus to demonstrate sera collected from SARS and COVID-19 patients exhibited limited cross-CoV neutralization. High-sensitivity RNA *in*





situ mapping revealed the highest angiotensin-converting enzyme 2 (ACE2) expression in the nose with decreasing expression throughout the lower respiratory tract, paralleled by a striking gradient of SARS-CoV-2 infection in proximal (high) versus distal (low) pulmonary epithelial cultures. COVID-19 autopsied lung studies identified focal disease and, congruent with culture data, SARS-CoV-2-infected ciliated and type 2 pneumocyte cells in airway and alveolar regions, respectively. These findings highlight the nasal susceptibility to SARS-CoV-2 with likely subsequent aspiration-mediated virus seeding to the lung in SARS-CoV-2 pathogenesis. These reagents provide a foundation for investigations into virus-host interactions in protective immunity, host susceptibility, and virus pathogenesis.

The emerging spectrum of COVID-19 neurology: clinical, radiological and laboratory findings

By Ross W Paterson, Rachel L Brown, Laura Benjamin, et al.

Brain, awaa240

Source: <https://watermark.silverchair.com/awaa240.pdf>

July 08 – Preliminary clinical data indicate that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is associated with neurological and neuropsychiatric illness. Responding to this, a weekly virtual coronavirus disease 19 (COVID-19) neurology multi-disciplinary meeting was established at the National Hospital, Queen Square, in early March 2020 in order to discuss and begin to understand neurological presentations in patients with suspected COVID-19-related neurological disorders. Detailed clinical and paraclinical data were collected from



cases where the diagnosis of COVID-19 was confirmed through RNA PCR, or where the diagnosis was probable/possible according to World Health Organization criteria. Of 43 patients, 29 were SARS-CoV-2 PCR positive and definite, eight probable and six possible. Five major categories emerged: (i) encephalopathies ($n = 10$) with delirium/psychosis and no distinct MRI or CSF abnormalities, and with 9/10 making a full or partial recovery with supportive care only; (ii) inflammatory CNS syndromes ($n = 12$) including encephalitis ($n = 2$, para- or post-infectious), acute disseminated encephalomyelitis ($n = 9$), with hemorrhage in five, necrosis in one, and myelitis in two, and isolated myelitis ($n = 1$). Of these, 10 were treated with corticosteroids, and three of these patients also received intravenous immunoglobulin; one made a full recovery, 10 of 12 made a partial recovery, and one patient died; (iii) ischemic strokes ($n = 8$) associated with a pro-thrombotic state (four with pulmonary thromboembolism), one of whom died; (iv) peripheral neurological disorders ($n = 8$), seven with Guillain-Barré syndrome, one with brachial plexopathy, six of eight making a partial and ongoing recovery; and (v) five patients with miscellaneous central disorders who did not fit these categories. SARS-CoV-2 infection is associated with a wide spectrum of neurological syndromes affecting the whole neuraxis, including the cerebral vasculature and, in some cases, responding to immunotherapies. The high incidence of acute disseminated encephalomyelitis, particularly with hemorrhagic change, is striking. This complication was not related to the severity of the respiratory COVID-19 disease. Early recognition, investigation and management of COVID-19-related neurological disease is challenging. Further clinical, neuroradiological, biomarker and neuropathological studies are essential to determine the underlying pathobiological mechanisms, which will guide treatment. Longitudinal follow-up studies will be necessary to ascertain the long-term neurological and neuropsychological consequences of this pandemic.

Russia approves R-Pharm's Coronavir for Covid-19 treatment

Source: <https://www.pharmaceutical-technology.com/news/russia-nod-coronavir-covid-19/>

July 09 – Russian pharmaceutical company R-Pharm has secured regulatory approval for the use of its antiviral drug Coronavir, to treat patients suffering from Covid-19.

The approval comes after a clinical trial in mild to moderate Covid-19 patients showed that the drug is highly effective in blocking replication of SARS-CoV-2, the novel coronavirus that causes the disease.

R-Pharm was quoted by Reuters as saying: “Coronavir is one of the first drugs in Russia and in the world that does not tackle the complications caused by SARS-CoV-2, but battles the virus itself.”

Study data revealed improvement in 55% of outpatients on day seven of treatment with the drug, compared to 20% of those on standard etiotropic therapy, which targets disease cause instead of symptoms.

In addition, a significant difference was observed at 14 days, added the company. The virus was found to be eliminated in 77.5% of Covid-19 patients by day five of treatment with Coronavir.

In a statement, R-Pharm medical director Mikhail Samsonov said: “Global clinical practice and the clinical study we conducted have confirmed that Coronavir puts a much more rapid stop to the infection as a result of its effective obstruction of the virus's replication.”

According to Russia's Central Research Institute of Epidemiology clinical trials head Tatyana Ryzhentsova, the drug entered clinical testing in May and has been used to treat more than 110 outpatients so far.



EU economy and coronavirus

Source: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651359/IPOL_BRI\(2020\)651359_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651359/IPOL_BRI(2020)651359_EN.pdf)

Coronavirus: UAE mask manufacturer to go global to limit spread of pandemic

Source: <https://www.thenational.ae/uae/health/coronavirus-uae-mask-manufacturer-to-go-global-to-limit-spread-of-pandemic-1.1047418>



July 11 – A manufacturing unit in Al Ain has been meeting local demand from healthcare workers for N95 protection masks

A mother and daughter wear gloves and face masks as they walk in Dubai. The government



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Protective masks manufactured in the UAE could soon be exported to help other nations slow the spread of Covid-19. The country's first N95 mask manufacturing facility in Al Ain has secured sufficient orders within the country until the end of the year.

The unit has an annual capacity of more than 30 million masks and has supplied healthcare and emergency response teams across the Emirates.

"We are aware that access to PPE (personal protection equipment) is one of the biggest challenges facing countries and international organisations in their efforts to limit the spread of the Covid-19," said Ismail Ali Abdulla, chief executive of Strata Manufacturing, part of Abu Dhabi based Mubadala Investment Company.

He said a partnership with Honeywell helped set up the first production line for N95 masks in the Gulf region.

The unit can produce 90,000 units per day and this has reduced the need for the protective kits to be imported from overseas.

"Our focus is on meeting local demand initially and supporting the UAE government's efforts," he told Wam news agency.

The company is assessing international demand with a goal of producing an additional quantity to support the global fight against Covid-19.

Producing N95 masks locally cuts costs on shipping, warehouse storage, transport and tariffs incurred during import.

The initiative was part of Mubadala's *WeAreDedicated* campaign to encourage companies to step up and address the challenges posed by the coronavirus.

The masks have been certified as per international and local standards.

"By utilising our manufacturing expertise, we are in a position join this fight and address a growing domestic demand for PPE," he said.

"We are confident that by working together, we will collectively emerge as a stronger and more resilient community."

EDITOR'S COMMENT: Let us all follow the example of UAE – autonomy is kind of antidote in a pandemic.

Intubation Boxes May Do More Harm Than Good in COVID-19 Risk

Source: <https://drive.google.com/file/d/123CS7Cmv8Hp6vZYenceuJ2pti-UsonTX/view>

July 10 – Clear aerosol boxes designed to keep COVID-19 patients' airborne droplets from infecting healthcare workers during intubation may actually increase providers' exposure to the virus, a small study suggests.

Joanna P. Simpson, MbChB, an intensivist in the Department of [Anaesthesia](#) and Perioperative Medicine at Eastern Health in Melbourne, Victoria, Australia, and colleagues, tested five models of barriers used for protection while intubating simulated "patients" with COVID-19 and compared the interventions with a control of having no protection. They [published](#) their findings online Thursday in *Anaesthesia*.



Coauthor Peter Chan, MBBS, also an intensivist at Eastern Health, told *Medscape Medical News* the virus essentially concentrates inside the box and because the box has holes on the sides to allow providers' arms in, the gaps "act as nozzles, so when a patient coughs, it creates a sudden wave of air that pushes all these particles out the path of least resistance" and into the face of the intubator.

Their institution stopped using any such aerosol-containment devices during intubation until safety can be proven.

Many Forms for Boxes

The boxes take different forms and are made by various designers and manufacturers around the world, including in the United States, but they generally cover the head and upper body of patients and allow providers to reach through holes to intubate.

The US Food and Drug Administration (FDA) on May 1 issued an [emergency use authorization](#) (EUA) for "protective barrier enclosures...to prevent [healthcare provider] exposure to pathogenic biological airborne particulates by providing an extra layer of barrier protection in addition to personal protective equipment [PPE]".



Others refer to them as "intubation boxes." A search of GoFundMe campaigns showed [hundreds of campaigns](#) for intubation boxes.

Simpson and colleagues used an in-situ simulation model to evaluate laryngoscopist exposure to airborne particles sized 0.3 to 5.0 µm using five aerosol containment devices (aerosol box, sealed box with suction, sealed box without suction, vertical drapes, and horizontal drapes) compared with no aerosol containment device.

Nebulized saline was used in an aerosol-generating model for 300 seconds, at which point the devices were removed to gauge particle spread for another 60 seconds.

Compared with no device use, the sealed intubation box with suction resulted in a decreased exposure for particle sizes of 0.3, 0.5, 1.0, and 2.5 µm — but not 5.0 µm — over all time periods ($P = 0.003$ for all time periods, which ranged from 30 - 360 seconds).

Conversely, the aerosol box, compared with no device use, showed an increase in 1.0, 2.5, and 5.0 µm airborne particle exposure at 300 seconds ($P = 0.002, 0.008, \text{ and } 0.002$, respectively). Compared with no device use, neither horizontal nor vertical drapes showed any difference in any particle size exposure at any time.

The researchers used seven volunteers who took turns acting as the patient or the intubator. As each of the seven volunteers did all six trials (the five interventions plus no intervention), the study generated 42 sets of results.

More Evidence Passive Boxes Are Ineffective

Plastic surgeon Dave Turer, MD, MS, who is also an electrical and biomedical engineer, and some emergency physician colleagues had doubts about these boxes early on and [wrote](#) about the need for thorough testing.

He told *Medscape Medical News*, "I find it kind of infuriating that if you search for 'intubation box' there are all these companies making claims that are totally unsubstantiated."

A desperate need to stop the virus is leading to unacceptable practices, he said.

His team at the University of Pittsburgh Medical Center in Pennsylvania [tested commercially available boxes](#) using white vapor to simulate patients' exhaled breath and found the vapor billowed into the surrounding environment.

He said Simpson and colleagues had similar findings: The boxes didn't contain the patients' breaths and may even increase the stream heading toward intubators.

Turer said his team has designed a [different kind of box](#), without armholes for the intubators, and with active airflow and filtering and have submitted their design and research to the FDA for an EUA.

The FDA's current EUA is for boxes "that are no different from a face shield or a splash shield," Turer said, adding that "they specifically state that they are not designed or intended to contain aerosol."

He said while this study is a good start, his team's findings will help demonstrate why the common passive boxes should not be used.

One of the [most prevalent designs](#), he pointed out, was one by Taiwanese anesthesiologist Hsien Yung Lai that was widely circulated in March.

David W. Kaczka, MD, PhD, associate professor of anesthesia, biomedical engineering, and radiology at University of Iowa in Iowa City, is one of the researchers who modified that design and made prototypes. He told *Medscape Medical News* he thinks the study conclusion by Simpson et al is "not as dismal as the authors are making it out to be."

He pointed to the relative success of the sealed box with suction. His team's adapted model added a suction port to generate a negative pressure field around the patient.

The biggest critique he had of the study, Kaczka said, was a lack of a true control group.

"They tested all their conditions with nebulized saline," he pointed out. "I think a more appropriately designed study would have also looked at a group where no saline was being nebulized and see what the particle counts were afterwards. It's not clear how the device would distinguish between a particle coming from a saline nebulizer vs coming from a simulated patient vs coming from the laryngoscopist."

He also noted that what comes out of a patient is not going to be saline and will have different density and viscosity.

That said, the study by Simpson and colleagues highlights the need to take a hard look at these boxes with more research, he said, adding, "I think there's some hope there."

He noted that a letter to the editor by Boston researchers, [published](#) online April 3 in the *New England Journal of Medicine*, describes how they used fluorescent dye forced from a balloon to simulate a patient's cough to see whether an aerosol box protected intubators.

That letter concludes, "We suggest that our ad hoc barrier enclosure provided a modicum of additional protection and could be considered to be an adjunct to standard PPE."



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The *Anaesthesia* findings come as a second global wave becomes more likely as does awareness of the potential of airborne droplets to spread the virus.

Scientists from 32 countries [warned](#) the World Health Organization that the spread of COVID-19 through airborne droplets may have been severely underestimated.

On Wednesday, the World Health Organization formally acknowledged evidence regarding potential spread of the virus through these droplets and on Thursday issued an [updated brief](#).



EDITOR'S COMMENT: Initially, I thought this was a great idea but it seems that I was wrong. Perhaps, an alternative in order to reduce the emitting infectious load would be the Extraoral Dental Suction System used by dentists exposed to drilling products (see photo above).

Smart mask

Source: <https://www.donutrobotics.com/c-mask>

"C-FACE" is the world's first "smart mask that works with smartphones" developed by applying robot technology. We have redefined the "mask" that has been protecting human health for a long time with the latest technology.

It delivers your voice to the smartphone of the other party and realizes "to convert voice into letters", "translate in 8 languages", and "create minutes". Of course, our robot "cinnamon" can also give instructions from a distance. I hope that it will be useful in a society where people live apart from each other.



Currently, only sounds and characters are used, but in the future, it will be expanded to image systems (AR, VR, etc.). It is a new communication device in the rapidly progressing online and digital world. **Expected in the market in September – price: 40 USD.**



NEW IgM/IgG COVID-19 TEST KIT

Now available via Hotzone Solutions Group

The Covid-19 rapid antibody test is a lateral flow chromatographic immunoassay for the qualitative detection of IgG and IgM antibodies to COVID-19 in human whole blood, serum or plasma specimen with only 10 minutes assay time.

High accuracy (sensitivity: IgG 99.9%; IgM 85% ■ specificity: IgG 98%; IgM 96% (compared to PCR performed with BAL/ nasopharyngeal/oral samples).



Suitable for

- ✓ Hospitals, Nursery homes
- ✓ Military, Schools/universities
- ✓ Business sector employees
- ✓ Distant rural areas

- CE-IVD Certified
- ISO 13485:2016
- UK Medicines & Healthcare Products Regulatory Agency
- Made in Switzerland

COVID-19 Autopsy Study Finds Blood Clots in 'Almost Every Organ', Pathologist Says

Source: <https://www.sciencealert.com/covid-19-patient-autopsies-show-blood-clots-in-almost-every-organ-pathologist-says>

July 13 – Autopsy studies of [coronavirus](#) patients show that blood clots from the disease are present not only in the lungs but also in "almost every organ", a New York University pathologist told [CNN](#) on Thursday.

Amy Rapkiewicz, NYU Langone Medical Centre's chair of the department of pathology, described the new findings, which her team [published in The Lancet journal EClinicalMedicine](#) last month, as "dramatic".

When the [virus](#) was first discovered, doctors thought COVID-19 was a respiratory disease like [pneumonia](#), but they have since learned that the virus can cause blood clots. These can lead to more serious issues like strokes, kidney failure, heart inflammation, and immune-system complications, Business Insider's Holly Secon reported.

Doctors previously reported that excessive blood clots could occur in large blood vessels, as well as the [lungs, heart, brain, and skin](#). But the new study suggests that blood clots can also affect smaller blood vessels.

"And this was dramatic because though we might have expected it in the lungs, we found it in almost every organ that we looked at in our autopsy study," she told CNN's Erin Burnett.

The autopsy study also showed the noteworthy appearance of large bone-marrow cells called megakaryocytes. Rapkiewicz said these cells "usually don't circulate outside the bones and lungs".

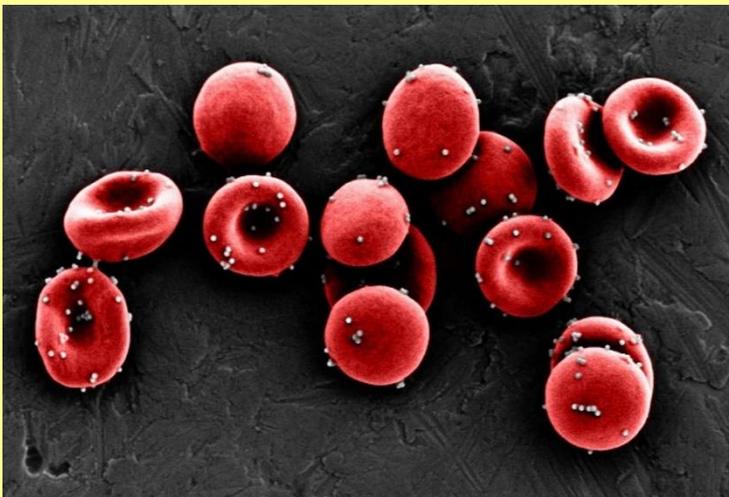
"We found them in the heart and the kidneys and the liver and other organs," she told CNN. "Notably in the heart, megakaryocytes produce something called platelets that are intimately involved in blood clotting."

According to CNN, researchers plan to determine the connection between the large bone-marrow cells and small blood vessel clotting in the coronavirus.

►► This article was originally published by [Business Insider](#).

New Harvard vaccine technique coats red blood cells in nanoparticles

Source: <https://newatlas.com/medical/harvard-vaccine-platform-red-blood-cells-nanoparticles/>



Red blood cells coated with nanoparticles could be a new vaccine platform, inducing the spleen to produce a strong immune response (Wyss Institute at Harvard University)

July 13 – Researchers at Harvard have developed a new platform for producing vaccines – and the secret ingredient is blood. The technique involves loading red blood cells with antigens that they can then use to generate a specific immune response, and tests in mice have shown it is effective in slowing the growth of cancer.

Red blood cells are best known for their important work in shuttling oxygen from the lungs around the body, but it turns out that's not the only cargo they can carry. In recent years, scientists have found ways to attach [chemical payloads](#) to them, like [drugs](#) or antibodies, which can then be delivered to specific organs or tissues.

For the new study, researchers at Harvard's Wyss Institute built on this base, with the spleen as the target. Since this vital organ is one of the few places in the body where red and white blood cells interact directly, it should help launch a stronger immune response to a given pathogen.

Red blood cells have a secondary function of carrying neutralized pathogens to the spleen, where they're passed onto antigen-presenting cells (APCs). From there, white blood cells learn to recognize these antigens, which are the molecules of a pathogen that the body uses to launch a counter-attack. This improves the immune response against those pathogens.



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The new system, named Erythrocyte-Driven Immune Targeting (EDIT), exploits this. The problem is that normally, the payload is sheared off as red blood cells squeeze through narrow capillaries in the lungs, so much of it never reaches the spleen. But the team developed a way to stick antigen nanoparticles to red blood cells firmly enough to reach their destination.

In this case, the nanoparticles were made of polystyrene, and coated with an antigenic protein called ovalbumin. The red blood cells also had to express a lipid molecule called phosphatidyl serine (PS) in just the right amounts – too much and the spleen would register the cells as damaged and destroy them.

“We hoped that a lower amount of PS would instead temporarily signal ‘check me out’ to the spleen’s APCs, which would then take up the red blood cells’ antigen-coated nanoparticles without the cells themselves getting destroyed,” says Anvay Ukidve, co-first author of the study.

The team ran tests on mice. First, they incubated their antigen-loaded nanoparticles with mouse red blood cells, and found that a ratio of about 300 nanoparticles to one red blood cell was enough to ensure that at least 80 percent stayed stuck to their surface.

Next, they injected the concoction into mice, and tracked where the nanoparticles ended up. After 20 minutes, almost all of the nanoparticles had been cleared from the animals’ blood, with more accumulating in the spleen than the lungs.

This abundance in the spleen remained for 24 hours after injection, and importantly the team found that the amount of EDIT red blood cells in the body didn’t change. That shows that they weren’t being destroyed by the spleen.

In the next tests, the researchers checked whether this technique actually induced a stronger immune response. The team gave two groups of mice a treatment once a week for three weeks, and then analyzed their spleen to check how many T cells were displaying the ovalbumin antigen.

Mice that had received the EDIT treatment had eight times more ovalbumin T cells than mice that had just received the nanoparticles not attached to red blood cells. This number was also 2.2 times higher than in mice that had received no treatment. More antibodies against ovalbumin were also found in the blood of the EDIT mice than the others.

Finally, the researchers investigated how effective the technique might be against disease. The team again gave groups of mice the EDIT treatment over three weeks, then injected the animals with lymphoma cells that expressed ovalbumin.

Sure enough, tumors grew three times slower in mice that had received EDIT than in the control or free nanoparticle groups. The EDIT mice also had lower numbers of viable cancer cells in their bodies.

The team says that the new technique could be used as a new delivery system for vaccines targeting a range of infections and illnesses. But the real advantage is that it works without adjuvants – agents added to vaccines to boost the immune response – which could help speed up vaccine development.

Part of the reason why vaccine development today takes so long is that foreign adjuvants delivered along with an antigen have to go through a full clinical safety trial for each new vaccine,” says Zongmin Zhao, co-first author of the study. “Red blood cells have been safely transfused into patients for centuries, and their ability to enhance immune responses could make them a safe alternative to foreign adjuvants, increasing the efficacy of vaccines and speed of vaccine creation.”

Of course, for now the research remains only in mice, but the team plans to continue the work to gain a better understanding of how the system works, and test it against other antigens.

►► The research was published in the journal [PNAS](#).

Coronavirus: Why Everyone Was Wrong

Source: <http://www.homelandsecuritynewswire.com/dr20200713-coronavirus-why-everyone-was-wrong>

July 13 – “This is not an accusation, but a ruthless taking stock [of the current situation],” Beda M. Stadler writes in [Medium](#). Stadler, the former director of the Institute for Immunology at the University of Bern and an emeritus professor of biology, stresses that his article is about Switzerland, and that the situation in different countries may differ. He continues: “I could slap myself, because I looked at Sars-CoV2- way too long with panic. I am also somewhat annoyed with many of my immunology colleagues who so far have left the discussion about Covid-19 to virologist and epidemiologist. I feel it is time to criticize some of the main and completely wrong public statements about this virus. “Firstly, it was wrong to claim that this virus was novel. Secondly, it was even more wrong to claim that the population would not already have some immunity against this virus. Thirdly, it was the crowning of stupidity to claim that someone could have COVID-19 without any symptoms at all or even to pass the disease along without showing any symptoms whatsoever.”



The Fatal Mistakes Which Led to Lockdown

Source: <http://www.homelandsecuritynewswire.com/dr20200713-the-fatal-mistakes-which-led-to-lockdown>

July 13 – On the basis of what were fateful decisions about economic lockdowns as a proper response to the coronavirus made? And why is there such resistance to efforts to go back, cautiously and intelligently, but in a determined fashion, back to semblance of normalcy? Dr. John Lee writes in [The Spectator](#) that those who insisted on lockdowns and who now question economic and social reopening explained that they are being “guided by science.” In fact, he writes, “they are doing something rather different: being guided by models, bad data and subjective opinion. Some of those claiming to be ‘following the science’ seem not to understand the meaning of the word.” The decision-making leading to lockdowns was of exceedingly low quality, as is the resistance to economic and social reopening. The reason for both? “An early maintained but exaggerated belief in the lethality of the virus reinforced by modelling that was almost data-free, then amplified by further modelling with no proven predictive value. All summed up by recommendations from a committee based on qualitative data that hasn’t even been peer-reviewed.” Lee concludes: “Mistakes were inevitable at the start of this. But we can’t learn without recognizing them.”



If There Is a Second Wave of COVID, the Swedish Approach Will Have Been Right All Along

Source: <http://www.homelandsecuritynewswire.com/dr20200713-if-there-is-a-second-wave-of-covid-the-swedish-approach-will-have-been-right-all-along>

July 13 – One country can look to the winter with less trepidation than most. Last week, a study suggested that 30 per cent of Swedes have built up immunity to the virus. It would help explain why COVID-19 has been fizzling out in Sweden. If a measure of herd immunity also helps them avoid the second wave, Sweden’s take-it-on-the-chin [approach will be vindicated](#). Christopher Snowdon writes in [The Telegraph](#) that not going into lockdown was described as “a mad experiment” by one expert, while another accused the Swedish government of “leading us to catastrophe.” But the catastrophe never arrived. The pattern of mortality in Sweden is indistinguishable from that of many countries that locked down. Its daily death toll rarely exceeded double figures and has been below 30 since mid-June. As in Britain, half the deaths were in care homes and two-thirds of those who died were aged 80 or over. And what of the costs? “Sweden will not be unscathed by the global recession. Its GDP is expected to decline by 5.3 per cent this year. But GDP is expected to fall by 8.7 per cent in the Eurozone, by 9.7 per cent in Britain and by more than 10 per cent in Italy, France and Spain,” Snowdon writes.

Is the COVID-19 Pandemic Cure Really Worse than the Disease? Here’s What Our Research Found

Source: <http://www.homelandsecuritynewswire.com/dr20200713-is-the-covid19-pandemic-cure-really-worse-than-the-disease-here-s-what-our-research-found>

July 13 – The coronavirus pandemic catapulted the country into one of the deepest recessions in U.S. history, leaving [millions of Americans without jobs or health insurance](#). There is a lot of evidence that [economic hardship is associated with poor health](#) and can increase the risk of [cardiovascular disease](#), [mental health problems](#), [cognitive dysfunction](#) and [early death](#). All of that raises a question: Is the U.S. better off with the public health interventions being used to keep the coronavirus from spreading or without them? In a [new working paper](#), Olga Yakusheva, Associate Professor in Nursing and Public Health at the University of Michigan, writes in [The Conversation](#) that she [and a research team](#) of health economists from U.S. universities set out to answer that question from a humanitarian perspective. They estimate that by the end of 2020, public health measures to mitigate COVID-19 – including business lockdowns, school closings, etc. — would save between 900,000 and 2.7 million lives in the



U.S. The economic downturn and loss of income from shelter-in-place measures and other restrictions on economic activity could contribute to between 50,400 and 323,000 deaths, based on an economic decline of 8%-14%.

The Role of Cognitive Dissonance in the Pandemic

Source: <http://www.homelandsecuritynewswire.com/dr20200713-the-role-of-cognitive-dissonance-in-the-pandemic>



July 13 – *Cognitive dissonance*, coined by Leon Festinger in the 1950s, describes the discomfort people feel when two cognitions, or a cognition and a behavior, contradict each other. *I smoke* is dissonant with the knowledge that *Smoking can kill me*. Social psychologists Elliot Aronson and Carol Tavis write in [The Atlantic](#) that to reduce that dissonance, the smoker must either quit—or justify smoking (“it keeps me thin, and being overweight is a health risk too, you know”). At its core, Festinger’s theory is about how people strive to make sense out of contradictory ideas and lead lives that are, at least in their own minds, consistent and meaningful. “Few people fully appreciate the mechanism’s enormous motivational power—and the lengths people go to in order to reduce its discomfort,” Aronson and Tavis write, adding:

For example, when people feel a strong connection to a political party, leader, ideology, or belief, they are more likely to let that allegiance do their thinking for them and distort or ignore the evidence that challenges those loyalties.

....

Because of the intense polarization in our country, a great many Americans now see the life-and-death decisions of the coronavirus as political choices rather than medical ones. In the absence of a unifying narrative and competent national leadership, Americans have to choose who to believe as they make decisions about how to live: the scientists and the public-health experts, whose advice will necessarily change as they learn more about the virus, treatment, and risks? Or President Donald Trump and his acolytes, who suggest that masks and social distancing are unnecessary or “optional”?

....

How to resolve this dissonance? People could avoid the crowds, parties, and bars and wear a mask. Or they could jump back into their former ways. But to preserve their belief that they are smart and competent and would never do anything foolish to risk their lives, they will need some self-justifications: Claim that masks impair their breathing, deny that the pandemic is serious, or protest that their “freedom” to do what they want is paramount.

Aronson and Tavis that today, as we confront the many unknowns of the coronavirus pandemic, all of us are facing desperately difficult decisions. “The challenge is to find a way to live with uncertainty, make the most informed decisions we can, and modify them when the scientific evidence dictates—as our leading researchers are already doing. Admitting we were wrong requires some self-reflection—which involves living with the dissonance for a while rather than jumping immediately to a self-justification,” they write. Aronson and Tavis say that staying with the dissonance for a while, rather than rushing to resolve it, is what they call the “Shimon Peres solution.” Peres, Israel’s former prime minister, was angered by his friend Ronald Reagan’s disastrous official visit to a cemetery in Bitburg, Germany, where members of the Waffen SS were buried. When asked how he felt about Reagan’s decision to go there, “Peres could have reduced dissonance in one of the two most common ways: thrown out the friendship or minimized the seriousness of the friend’s action. He did neither. ‘When a friend makes a mistake,’ he said, ‘the friend remains a friend, and the mistake remains a mistake.’ Peres’s message conveys the importance of staying with the dissonance, avoiding easy knee-jerk responses.”

Scientists Hail “Stunning” Results that Show Areas of New York May Have Reached 68 Percent Immunity

Source: <http://www.homelandsecuritynewswire.com/dr20200713-scientists-hail-stunning-results-that-show-areas-of-new-york-may-have-reached-68-percent-immunity>



July 13 – Areas of New York have recorded a nearly 70 percent rate of immunity to COVID-19, in what scientists have described as “stunning” findings that suggest they could be protected from any second wave. Josie Ensor writes in [The Telegraph](#) that some 68 percent of people who took antibody tests at a clinic in the Corona neighborhood of Queens received positive results, while at another clinic in 3, 56 percent tested positive. The results, shared by healthcare



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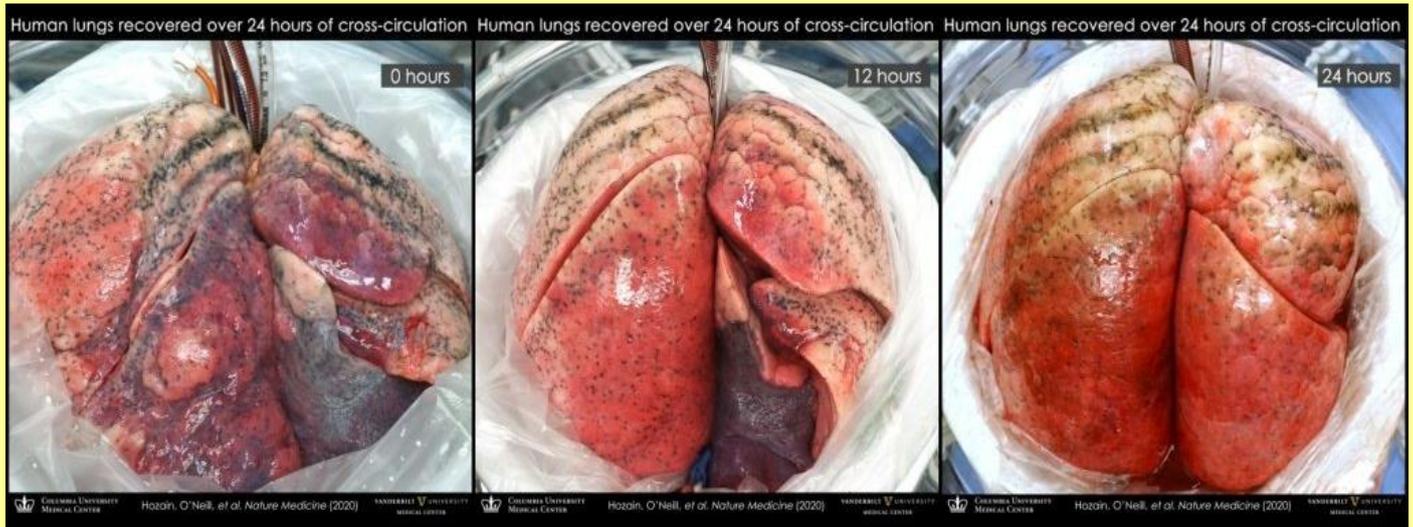
company CityMD [with the New York Times](#), appear to show a higher antibody rate than anywhere in the world, based on publicly released data.

Damaged Human Lungs Can Be Repaired by Attaching Them to Pigs, Experiment Shows



Source: <https://www.sciencealert.com/a-damaged-human-lung-has-been-repaired-by-attaching-it-to-a-pig>

July 13 – The sad reality of terminal lung illnesses is that there are simply far more patients than there are donor lungs available.



This isn't just because of the low number of donors, which would be problem enough, but many donor lungs are significantly damaged, rendering them unusable.

By using a new experimental technique, though, such a damaged lung has now been restored to function - by sharing its circulatory system with that of a living pig. This leverages the body's self-repair mechanisms to exceed the capabilities of current donor lung restoration techniques.

►► The research has been published in [Nature Medicine](#).

Anti-cholesterol drug fenofibrate can 'downgrade' COVID-19 to common cold: Hebrew University professor

Source: <https://www.newindianexpress.com/lifestyle/health/2020/jul/15/anti-cholesterol-drug-fenofibrate-can-downgrade-covid-19-to-common-cold-hebrew-university-profess-2170013.html>

July 15 – A widely used anti-cholesterol drug, **fenofibrate**, can "downgrade" the danger-level of coronavirus to that of a common cold, a Hebrew University (HU) academic has claimed after testing it on infected human tissue.

Professor Yaakov Nahmias, director of HU's Grass Center for Bioengineering, in a joint research with Benjamin tenOever at New York's Mount Sinai Medical Center, found that the novel coronavirus is so vicious because it causes lipids to be deposited in the lungs and that fenofibrate can undo the damage.

"If our findings are borne out by clinical studies, this course of treatment could potentially downgrade COVID-19's severity into nothing worse than a common cold," Nahmias was quoted as saying in a press release issued by the HU.

The two researchers focused on the ways in which SARS-CoV-2 changes patients' lungs in order to reproduce itself.

They discovered that the virus prevents the routine burning of carbohydrates.

As a result, large amounts of fat accumulate inside lung cells, a condition the virus needs in order to reproduce.



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"This new understanding of SARS CoV-2 may help explain why patients with high blood sugar and cholesterol levels are often at a particularly high risk to develop COVID-19," they noted.

"Viruses are parasites that lack the ability to replicate on their own, so they take control of our cells to help accomplish that task. By understanding how SARS-CoV-2 controls our metabolism, we can wrestle back control from the virus and deprive it from the very resources it needs to survive," Nahmias explained.

Having drawn this conclusion, the two researchers began to screen FDA-approved medications that interfere with the virus' ability to reproduce.

In their lab studies, the cholesterol-lowering drug fenofibrate, sold under the brand name Tricor, showed extremely promising results. By allowing lung cells to burn more fat, fenofibrate breaks the virus' grip on these cells and prevents SARS CoV-2's ability to reproduce.

In fact, within only five days of treatment, the virus almost completely disappeared, the researchers claim.

"With second-wave infections spiking in countries across the globe, these findings could not come at a better time," Nahmias was quoted as saying, adding that "global cooperation may provide the cure".

"The collaboration between the Nahmias and tenOever labs demonstrates the power of adopting a multi-disciplinary approach to study SARS-CoV-2 and that our findings could truly make a significant difference in reducing the global burden of COVID-19," tenOever added.

While there are many international efforts currently underway to develop a coronavirus vaccine, studies suggest that vaccines may only protect patients for a few months, the university's press release said.

Therefore, blocking the virus' ability to function, rather than neutralizing its ability to strike in the first place, may be the key to turning the tables on COVID-19, it added.

The findings of the research will appear in this week's Cell Press' Sneak Peak.

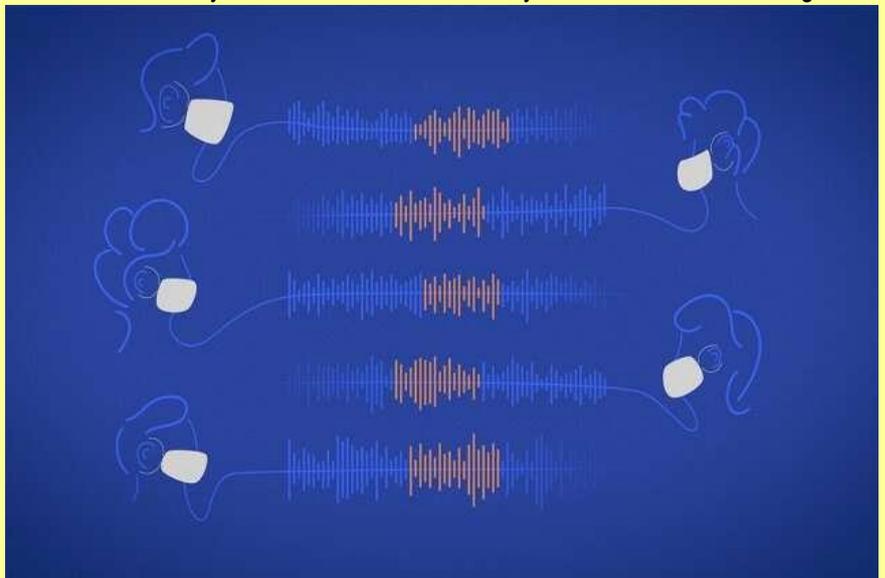
Signs of COVID-19 may be hidden in speech signals

Source: <https://medicalxpress.com/news/2020-07-covid-hidden-speech.html>

July 09 – It's often easy to tell when colleagues are struggling with a cold—they sound sick. Maybe their voices are lower or have a nasally tone. Infections change the quality of our voices in various ways. But MIT Lincoln Laboratory researchers are detecting these changes in COVID-19 patients even when these changes are too subtle for people to hear or even notice in themselves.

By processing speech recordings of people infected with COVID-19 but not yet showing symptoms, these researchers found evidence of vocal biomarkers, or measurable indicators, of the disease. These biomarkers stem from disruptions the infection causes in the movement of muscles across the respiratory, laryngeal, and articulatory systems. A technology letter describing this research was recently published in [IEEE Open Journal of Engineering in Medicine and Biology](#).

While this research is still in its early stages, the initial findings lay a framework for studying these vocal changes in greater detail. This work may also hold promise for using mobile apps to screen people for the disease, particularly those who are asymptomatic.



Talking heads

"I had this 'aha' moment while I was watching the news," says Thomas Quatieri, a senior staff member in the laboratory's Human Health and Performance Systems Group. Quatieri has been leading the group's research in vocal biomarkers for the past decade; their focus



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has been on discovering vocal biomarkers of neurological disorders such as amyotrophic lateral sclerosis (ALS) and Parkinson's disease. These diseases, and many others, change the brain's ability to turn thoughts into words, and those changes can be detected by processing speech signals.

He and his team wondered whether vocal biomarkers might also exist for COVID-19. The symptoms led them to think so. When symptoms manifest, a person typically has difficulty breathing. Inflammation in the respiratory system affects the intensity with which air is exhaled when a person talks. This air interacts with hundreds of other potentially inflamed muscles on its journey to speech production. These interactions impact the loudness, pitch, steadiness, and resonance of the voice—measurable qualities that form the basis of their biomarkers.

While watching the news, Quatieri realized there were speech samples in front of him of people who had tested positive for COVID-19. He and his colleagues combed YouTube for clips of celebrities or TV hosts who had given interviews while they were COVID-19 positive but asymptomatic. They identified five subjects. Then, they downloaded interviews of those people from before they had COVID-19, matching audio conditions as best they could.

They then used algorithms to extract features from the vocal signals in each audio sample. "These vocal features serve as proxies for the underlying movements of the [speech production](#) systems," says Tanya Talkar, a Ph.D. candidate in the Speech and Hearing Bioscience and Technology program at Harvard University.

The signal's amplitude, or loudness, was extracted as a proxy for movement in the respiratory system. For studying movements in the larynx, they measured pitch and the steadiness of pitch, two indicators of how stable the vocal cords are. As a proxy for articulator movements—like those of the tongue, lips, jaw, and more—they extracted speech formants. Speech formants are frequency measurements that correspond to how the mouth shapes sound waves to create a sequence of phonemes (vowels and consonants) and to contribute to a certain vocal quality (nasally versus warm, for example).

They hypothesized that COVID-19 inflammation causes muscles across these systems to become overly coupled, resulting in a less complex movement. "Picture these speech subsystems as if they are the wrist and fingers of a skilled pianist; normally, the movements are independent and highly complex," Quatieri says. Now, picture if the wrist and finger movements were to become stuck together, moving as one. This coupling would force the pianist to play a much simpler tune.

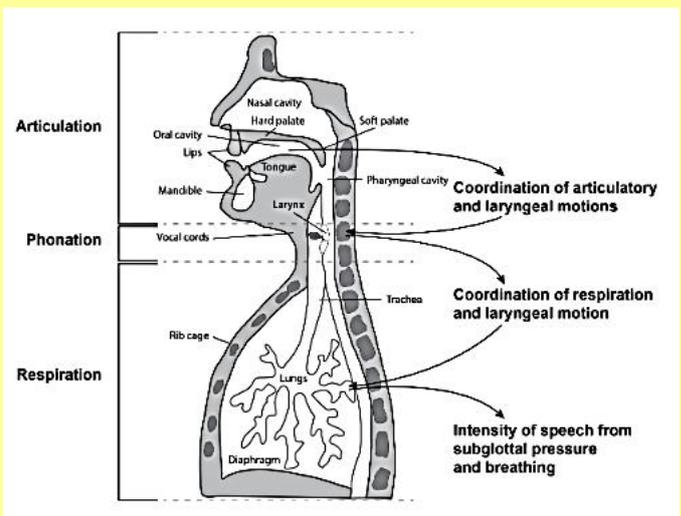
The researchers looked for evidence of coupling in their features, measuring how each feature changed in relation to another in 10 millisecond increments as the subject spoke. These values were then plotted on an eigenspectrum; the shape of this eigenspectrum plot indicates the complexity of the signals. "If the eigenspace of the values forms a sphere, the signals are complex. If there is less complexity, it might look more like a flat oval," Talkar says.

In the end, they found a decreased complexity of movement in the COVID-19 interviews as compared to the pre-COVID-19 interviews. "The coupling was less prominent between larynx and articulator motion, but we're seeing a reduction in complexity between respiratory and larynx motion," Talkar says.

Early detections

These preliminary results hint that biomarkers derived from vocal system coordination can indicate the presence of COVID-19. However, the researchers note that it's still early to draw conclusions, and more data are needed to validate their findings. They're working now with a publicly released dataset from Carnegie Mellon University that contains audio samples from individuals who have tested positive for COVID-19.

Beyond collecting more data to fuel this research, the team is looking at using [mobile apps](#) to implement it. A partnership is underway with Satra Ghosh at the MIT McGovern Institute for Brain Research to integrate vocal screening for COVID-19 into its VoiceUp app, which was initially developed to study the link between voice and depression. A follow-on effort could add this vocal screening into the How We Feel app. This app asks users questions about their daily health status and demographics, with the aim to use these data to pinpoint hotspots and predict the percentage



of people who have the disease in different regions of the country. Asking users to also submit a daily voice memo to screen for biomarkers of COVID-19 could potentially help scientists catch on to an outbreak.

"A sensing system integrated into a mobile app could pick up on infections early, before people feel sick or, especially, for these subsets of people who don't ever feel sick or show symptoms," says Jeffrey Palmer, who leads the research group. "This is also something the U.S. Army is interested in as part of a holistic COVID-19 monitoring system." Even after a diagnosis, this sensing ability could help doctors remotely monitor their patients' progress or monitor the effects of a vaccine or drug treatment.

As the team continues their research, they plan to do more to address potential confounders that could cause inaccuracies in their results, such as different recording environments, the emotional status of the subjects, or other illnesses causing vocal changes. They're also supporting similar research. The Mass General Brigham Center for COVID Innovation has connected them to international scientists who are following the team's framework to analyze coughs.

"There are a lot of other interesting areas to look at. Here, we looked at the physiological impacts on the vocal tract. We're also looking to expand our biomarkers to consider neurophysiological impacts linked to COVID-19, like the loss of taste and smell," Quatieri says. "Those symptoms can affect speaking, too."

Recommendations for Improving National Nurse Preparedness for Pandemic Response: Early Lessons From COVID-19

June 15, 2020

This report describes myriad factors that influence nursing workforce development and training for pandemic response as well as the safety and support needed during pandemics at the government, system, organization, and individual levels. Also identified are some of the relevant stakeholders who can influence decision making at these levels. The report identifies gaps and proposes short- and long-term recommendations for ways to improve the readiness, safety, and support of the national nursing workforce for COVID-19 and future pandemics.

[View Full Report](#)

GSK signs deal with Medicargo for COVID-19 vaccine

Source: https://www.pmlive.com/pharma_news/gsk_signs_deal_with_medicargo_for_covid-19_vaccine_1344532

July 08 – GlaxoSmithKline (GSK) continues to strengthen its position in COVID-19 research and development, with a new vaccine candidate collaboration forged with Canadian biopharma company Medicargo.

The new deal will see GSK and Medicargo develop and evaluate a [COVID-19](#) vaccine, combining Medicargo's recombinant coronavirus virus-like particles (CoVLP) and GSK's pandemic adjuvant system.

These CoVLPs mimic the structure of the SARS-CoV-2 virus that causes COVID-19, which allows them to be recognised by the immune system. The use of an adjuvant could be of particular use in a pandemic situation, as it can boost immune response and reduce the amount of antigen required per dose, allowing more vaccine doses to be manufactured and distributed.

Quebec City, Canada-headquartered Medicargo has already tested its CoVLP vaccine candidate in a pre-clinical study, with the results from this testing with Medicargo's candidate demonstrating a high level of neutralising antibodies following a single dose when administered with an adjuvant.

According to a statement from GSK, phase 1 clinical testing is set to begin in mid-July and will evaluate the safety and immunogenicity of three different dose levels of Medicargo's antigen with GSK's adjuvant, in parallel with an adjuvant from another company. The vaccine will be administered on a one- and two-dose vaccination schedule, given 21 days apart.

If the candidate proves successful and regulatory processes allow it, the companies aim to complete development and make the vaccine available in the first half of 2021. GSK and Medicargo will also evaluate expanding their collaboration to develop a post-pandemic COVID-19 vaccine candidate, based on the need for further development after the pandemic.

Using Medicargo's plant-based production platform to manufacture the COVID-19 vaccine antigen, the companies expect to be able to manufacture up to 100 million doses by the end of 2021, with a further one billion doses planned to be delivered annually by the end of 2023 following the completion of a large-scale facility currently under construction in Quebec City.

"This agreement paves the way for an innovative vaccine option combining a scalable plant-based antigen technology with an adjuvant which has pandemic dose sparing capability. If successful, it will be a meaningful contributor in the fight against COVID-19. We strongly



believe that multiple vaccines are needed, including post-pandemic vaccines,” said Thomas Breuer, chief medical officer of GSK Vaccines.

GSK has already offered its pandemic adjuvant system in previous deals focused on targeting COVID-19, including a collaboration with [Sanofi](#) for a recombinant protein-based vaccine. Another deal was also agreed in [February](#) with China-based Clover Pharmaceuticals that saw GSK’s adjuvant platform utilised for the development of the biotech’s coronavirus vaccine candidate, COVID-19 S-Trimer.

The Best and Worst Face Masks For COVID-19, Ranked by Their Level of Protection

Source: <https://www.sciencealert.com/some-masks-are-better-than-others-here-they-are-ranked-best-to-worst>

July 16 – The science is clear: Face masks can [prevent coronavirus transmission](#) and save lives.

A preliminary [analysis of 194 countries](#) found that places where masks weren’t recommended saw a 55 percent weekly increase in [coronavirus](#) deaths per capita after their first case was reported, compared with 7 percent in countries with cultures or guidelines supporting mask-wearing.

A [model from the University of Washington](#) predicted that the US could prevent at least 45,000 coronavirus deaths by November if 95 percent of the population were to wear face masks in public.

But not all masks confer equal levels of protection.

The ideal face mask blocks large respiratory droplets from coughs or sneezes – the primary method by which people pass the coronavirus to others – along with [smaller airborne particles](#), called aerosols, produced when people talk or exhale.

The [World Health Organisation](#) recommends medical masks for healthcare workers, elderly people, people with underlying health conditions, and people who have tested positive for the coronavirus or show symptoms.

Healthy people who don’t fall into these categories should wear a fabric mask, according to WHO. The Centres for Disease Control and Prevention also recommends cloth masks for the general public.

But even cloth masks vary, since certain types are more porous than others.

“It depends on the quality,” Dr. Ramzi Asfour, an infectious-disease physician in Marin County, California, told Business Insider.

“If you’re making a cloth mask from 600-thread-count Egyptian cotton sheets, that’s different than making it from a cheap T-shirt that’s not very finely woven.”

Over the past few months, scientists have been evaluating the most effective mask materials for trapping the coronavirus. Here are their results so far, from most to least protective.

Two medical-grade masks, N99 and N95, are the most effective at filtering viral particles.



There’s a reason agencies recommend reserving N99 and [N95](#) masks for healthcare workers first: Both seal tightly around the nose and mouth so that very few viral particles can seep in or out. They also contain tangled fibres to filter airborne pathogens.

A [study published in the Journal of Hospital Infection last month](#) evaluated more than 10 masks based on their ability to filter airborne coronavirus particles.

The researchers found that N99 masks reduced a person’s risk of infection by 94 to 99 percent after 20 minutes of exposure in a highly contaminated environment. [N95 masks](#) offered almost as much protection – the name refers to its minimum 95 percent efficiency at filtering aerosols.

Another recent study also [determined that N95 masks offered better protection](#) than surgical masks.



Disposable surgical masks are a close second.



Surgical masks are made of nonwoven fabric, so they're usually the safest option for healthcare workers who don't have access to an N99 or [N95 mask](#).

An April study found that surgical masks [reduced the transmission of multiple human coronaviruses](#) (though the research did not include this new one, officially called [SARS-CoV-2](#)) through both respiratory droplets and smaller aerosols.

In general, surgical masks are about three times as effective at blocking [virus](#)-containing aerosols than homemade face masks, [a 2013 study found](#). But healthcare workers should still have access to them first.

"The official guidelines are cloth masks because we don't want to take those masks away from medical workers who might need

them more," Asfour said.

"Hybrid" masks are the safest homemade option.

In [a recent paper](#) that hasn't yet been peer-reviewed, researchers in the UK determined that "hybrid" masks – combining two layers of 600-thread-count cotton with another material like silk, chiffon, or flannel – filtered more than 80 percent of small particles (less than 300 nanometres) and more than 90 percent of larger particles (bigger than 300 nanometres).

They found that the combination of cotton and chiffon offered the most protection, followed by cotton and flannel, cotton and silk, and four layers of natural silk.

The researchers suggested that these options may even be better at filtering small particles than an [N95 mask](#), though they weren't necessarily better at filtering larger particles.

The team also found that two layers of 600-thread-count cotton or two layers of chiffon might be better at filtering small particles than a surgical mask.

Three layers of cotton or silk are also highly protective.

WHO recommends that [fabric masks have three layers](#): an inner layer that absorbs, a middle layer that filters, and an outer layer made from a nonabsorbent material like polyester.

A [University of Illinois study](#) that's still awaiting peer review found three layers of either a silk shirt or a 100 percent cotton T-shirt may be just as protective as a medical-grade mask. Silk in particular has electrostatic properties that can help trap smaller viral particles.



Vacuum-cleaner bags are a DIY alternative to surgical masks.

(Dzura/iStock/Getty Images)

The [Journal of Hospital Infection study](#) found that vacuum-cleaner bags (or vacuum-cleaner filters inserted in a cloth mask) reduced infection risk by 83 percent after 30 seconds of exposure to the coronavirus and by 58 percent after 20 minutes of exposure in a highly contaminated environment.

The material was almost as good at filtering aerosols as surgical masks, the researchers found.

That could be enough protection to stop an outbreak.

A [May study](#) found that universal



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mask-wearing would bring an [epidemic](#) under control even if the masks were only 50 percent effective at trapping infectious particles.

Tea towels and antimicrobial pillowcases aren't ideal materials, but they're better than a single layer of cotton.

Tea towels and antimicrobial pillowcases were the next-best alternatives to vacuum-cleaner bags or filters, [the same study found](#).

Tea towels need to be tightly woven to confer protection, the researchers said.

Antimicrobial pillowcases (usually made of satin, silk, or bamboo) were preferable to a standard cotton pillowcase, they found.

Wrapping a scarf or cotton T-shirt around your nose and mouth isn't particularly effective at filtering the coronavirus, but it's still better than nothing.

The UK researchers found that a single layer of 80-thread-count cotton was among the [least effective materials](#) at blocking coronavirus particles both large and small.

Scarves and cotton T-shirts reduced infection risk by about 44 percent after 30 seconds of exposure to the coronavirus, the [Journal of Hospital Infection study](#) found. After 20 minutes of exposure in a highly contaminated environment, that risk reduction dropped to just 24 percent.

But that's better than zero.

Even [a loosely fitted cotton mask "substantially decreases" the spread of viral particles](#) when an infected person coughs or sneezes, researchers in India recently determined.

They found that infectious droplets travelled up to 16 feet when a person wasn't wearing a mask, compared with just 5 feet when particles leaked out the sides of a face mask.

Single-layer cotton masks are preferable to single-layer paper masks.

The UK researchers found that [people who wore cotton masks](#) had a 54 percent lower chance of infection than people who wore no masks at all. People who wore paper masks had a 39 percent lower chance of infection than the no-mask group.

Unlike a surgical mask, which is typically pleated and made of three layers of fabric, paper masks are thinner, so they confer less protection.



How you wear your mask matters too.

The protectiveness of a mask – including N95 and surgical masks – [declines considerably when there is a gap](#) between the mask and the skin.

"It's about the seal of the mask," Asfour said. "You have to make sure there's no air leak."

Even so, research has suggested that wearing masks improperly or sporadically could still reduce transmission.

In [an editorial published Tuesday](#) in the Journal of the American Medical Association, CDC Director Robert Redfield predicted that the universal adoption of face masks could [bring the US's outbreak under control](#) in as little as four weeks.

Your Blood Type May Affect COVID-19 Risk, But It's No Kind of Protection, Experts Say

Source: <https://www.sciencealert.com/early-research-suggests-type-o-blood-might-give-a-slight-advantage-against-covid-19>

July 16 – A handful of early studies have found that people with blood type O may have a slight advantage during this [pandemic](#). [Research](#) published over the weekend found that patients with type O were less likely to test positive for [COVID-19](#) than patients with type A, B, or AB blood.

An April study found a similar trend: The research (though yet to be peer-reviewed) [analysed 1,559 coronavirus patients](#) in New York City and found that a lower proportion had type O blood.

Other research has reported a link between patients' blood type and the severity of their infections, but these two studies did not. Overall, the jury is still out on whether your blood type affects your [coronavirus](#) risk in any significant way.



"No one should think they're protected," Nicholas Tatonetti, the lead author of the April study, [told the New York Times](#).

Blood type O is associated 'with a lower risk of testing positive'

The newest study on blood types examined nearly 1,300 coronavirus patients admitted to five hospitals in Massachusetts in March and April.

The results showed that blood type O "was associated with a lower risk of testing positive," the researchers said, while types B and AB came with a higher risk. Type A blood had no link to a patient's chance of a positive diagnosis.

The research aligns with previous findings.

In March, [a study](#) of 2,173 coronavirus patients at three hospitals in Wuhan and Shenzhen, China, also found that people with blood type O had a lower risk of infection.

[A study](#) published last month in the *New England Journal of Medicine* found an even more substantive link: Patients in Italy and Spain with blood type O had a 50 percent reduced risk of severe infection (cases requiring ventilation or supplemental oxygen) compared to patients with other blood types.

More specifically, the study authors found that a region of the participants' genomes that helps code for blood type was linked to a patient's chances of developing severe symptoms.

Research is split on whether any blood types are associated with higher risk

O is the most common blood type. About 48 percent of Americans have type O blood, [according to the Oklahoma Blood Institute](#).

In general, your blood type depends on the presence or absence of proteins called A and B antigens on the surface of red blood cells. People with O blood have neither antigen. This genetic trait is inherited from our parents.

The *New England Journal of Medicine* study found that people with A antigens were 50 percent more likely to develop severe COVID-19 symptoms like respiratory failure.

Research into whether people with type A blood face a higher risk of getting infected in the first place doesn't paint a clear picture, however.

The study in China found that patients with blood type A were at higher risk for infection compared to people other blood types. The April research also found that a higher proportion of infected patients studied had blood type A.

But the new study found that people with types B and AB had "higher odds of testing positive."

Most researchers agree that it's too early to tell whether there's a strong link between blood type and infection risk.

Dr. Eric Topol, director of the Scripps Research Translational Institute, [told the Associated Press last month](#) that the evidence is "tentative ... it isn't enough of a signal to be sure."

The link is so tenuous, in fact, that blood type shouldn't be one of the factors you use to assess your risk, experts say.

"I wouldn't even bring it up," Anahita Dua, a co-author of the new study, [told the New York Times](#).

Physical distancing, face masks, and eye protection for prevention of COVID-19

Source: <file:///C:/Users/I1CD3~1.GAL/AppData/Local/Temp/Lancet%20Protection%20by%20distancing,%20masks,%20eye%20protection%20June%202020.pdf>

The Secret Lab Conspiracy: A Converging Narrative

Source: <http://www.homelandsecuritynewswire.com/dr20200715-the-secret-lab-conspiracy-a-converging-narrative>

July 15 – **"The United States has deployed more than 200 military biological laboratories across the world. Among them, more than 30 have been exposed. The rest are hidden in unknown places. They may be right beside you", an alarming message warned YouTube users in a video shared on the 21st of May. The creators of the video claimed that "the biological laboratories of the United States give us the creeps" and sincerely invited the "netizens from all over the world to look for more than 200 mysterious biological laboratories of the United States".**

Just a few weeks later, on the 11th of June, the "netizens", as active participants of online communities are called, delivered. Another YouTube video presented "continuous revelations from the netizens", cataloguing a "growing list" of exposed laboratories in the United States, Europe, the Caucasus and Asia. "The US military has set up over 200 bio-security labs in 25 countries for research and development of biological weapons such as dangerous bacteria", the video said and appealed, on behalf



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of the global netizens, for international organizations to investigate the US biological laboratories.

At a glance, the videos would resemble an already familiar conspiracy theory sowing doubt about the origins of the coronavirus, were it not for several telling details. The videos were shared in five languages from the YouTube accounts of the [China Global Television Network](#) (CGTN). CGTN is the international division of the CCTV, or China Central Television – the [state-controlled TV network of the People's Republic of China](#). Earlier this year, the British media watchdog Ofcom formally [sanctioned CGTN](#) for biased coverage of the Hong Kong protests. Even more surprisingly, the “continuous revelations of netizens” almost verbatim coincided with “revelations” previously made by the pro-Kremlin media and the Russian officials.

The Revival of the “Secret Labs”

The disinformation trope of secret US military bio-labs on Russia's borders has been making rounds in the pro-Kremlin media for years, in particular targeting the Lugar lab in Georgia. The outbreak of the COVID-19 pandemic gave a new impetus to these efforts, with the pro-Kremlin media building and expanding on the already existing “secret lab” disinformation template. Multiple pro-Kremlin disinformation outlets claimed not only that the novel coronavirus was an [American biological weapon against China](#) manufactured in [NATO](#) and [Pentagon-funded](#) laboratories, but also that clandestine US laboratories were operating [around the world, surrounding Russia, China and Iran](#).

In a remarkable example of interaction in disinformation realm, Chinese state-controlled media and officials echoed the unfounded claims about the “US secret labs”, coined by pro-Kremlin sources. In late April, a spokesperson of the Chinese Ministry of Foreign Affairs [voiced](#) “concerns of the local people” over the function, purpose and safety of US biological labs in former Soviet Union countries, making a [direct reference](#) to the earlier claims made by the [Russian Ministry of Foreign Affairs](#). The accompanying calls to the US to [“address the concerns of the international community”](#) were covered widely in Chinese state-controlled media.

Subsequently, the Russian edition of RT published an [article](#) highlighting Chinese concerns over the “US biolabs” on Russia's borders, thus completing the disinformation cycle. In less than two weeks the US biolabs conspiracy travelled from the Kremlin to Beijing and back, gaining legitimacy and international prominence along the way. And in Chinese state media, the theory became part of [a wider range of accusations](#) about [allegedly suspicious behaviour by the US](#) around the virus.

The Overlap of Disinformation Narratives

The YouTube videos about “secret American bio-laboratories” were shared in English, Russian, French, Spanish and Arabic – all the broadcasting languages of the CGTN. They were viewed cumulatively only over forty thousand times, but they illustrate an overlap in pro-Kremlin and the Chinese Communist Party's (CCP's) disinformation narratives.

Notably, the alarming figure of an alleged 200 secret US biological labs comes straight out of the pro-Kremlin disinformation playbook. In January 2020, the [EU-sanctioned](#) secretary of the Russian Security Council, Nikolay Patrushev, [claimed](#) that the US ran more than 200 biological labs around the world and warned that their activities have “little to do with peaceful science”. Human experiments, according to the Russian official, were a particularly worrying fact.

The videos pack a number of disinformation messages that have been circulated by the pro-Kremlin media. They include claims about [secret labs](#) for “lethal bacteria” in Ukraine; development of [offensive biological weapons, including blood-sucking insects](#), in the Lugar lab; the treatment of people in [Kazakhstan](#) and other nations as “material” for biological research. Many of these claims have been previously debunked by [diplomats](#), [international media](#), and [independent fact-checkers](#) after appearing in pro-Kremlin sources, but that did not seem to deter the so-called “netizens” and Chinese state media from repeating them.

Disinfo Benefits

This is not the first instance when Chinese authorities have benefitted from pro-Kremlin disinformation campaigns. In late April, Russian state-controlled Rossiya 24 TV channel [lashed out](#) against the US, defending Chinese authorities against criticism for their handling of the COVID-19 outbreak. The EU-sanctioned TV host [Dmitry Kiselyov](#) compared criticism of the Chinese government to Russia being held responsible for the chemical attack in [Salisbury](#) and meddling in the [2016 U.S. presidential elections](#) – using two prominent pro-Kremlin disinformation tropes.

And it is also not the first time that Chinese officials and state media have been engaging with conspiracy theories: in March, one of the spokespeople of the Chinese MFA tweeted [conspiracy theories](#) which [alleged that it was the US military](#) that brought COVID-19 to China. That claim has [appeared](#) in the pro-Kremlin media as well.

In 2019, amidst the Hong Kong protests, an outlet linked to the Chinese Communist Party called the unrest a “[US colour revolution](#)”, an [old darling of the pro-Kremlin disinformation](#).

Given the so-far sporadic interaction between these actors in the realm of disinformation, it remains unclear whether and how such activities are coordinated. But according to



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the [Australian Strategic Policy Institute](#) (ASPI), “there is much to suggest that the CCP’s (China Communist Party’s) propaganda apparatus has been learning from the strategies and effects of Russian disinformation campaigns”.

Indeed, earlier in June, Twitter said it had removed [thousands of accounts linked to China](#) that were engaged in a manipulative and coordinated campaign to spread disinformation about the protests in Hong Kong and China’s response to coronavirus – behaviour not unlike that of the infamous [St.Petersburg Troll Factory](#). This was the second takedown of a Chinese-linked disinformation network in less than a year, [the previous one happening last August](#).

Coronavirus: Abu Dhabi health chief volunteers as first patient to test Covid-19 vaccine

Source: <https://www.thenational.ae/uae/health/coronavirus-abu-dhabi-health-chief-volunteers-as-first-patient-to-test-covid-19-vaccine-1.1050032>

July 16 – The UAE has begun the first globally recognized, last-phase clinical trial for a Covid-19 vaccine in Abu Dhabi. The chairman of the Department of Health Abu Dhabi, Sheikh Abdullah bin Mohammed Al Hamed, volunteered as the first patient to test the inactive vaccine, which contains a killed version of the germ that causes Covid-19.

دائرة الصحة
DEPARTMENT OF HEALTH

As world's first Phase III clinical trials of COVID-19 inactivated vaccine commence in Abu Dhabi

Volunteers can visit www.4humanity.ae to submit their details for the historic initiative

Eligibility:

- Individuals aged between 18 – 60
- Living in Abu Dhabi or Al Ain
- Participating volunteers can contact the special hotline on **02 819 1111**

Applicants will undergo a medical check-up to assess if they are considered suitable for the trials

@admediaoffice

Dr Jamal Al Kaabi, acting undersecretary of the department, which is overseeing the trials, volunteered to be second to test if the vaccine is capable of producing antibodies that fight the coronavirus and provide immunity.

The tests are the first Phase-3 clinical trial for Covid-19 to be listed by the World Health Organization, officials said on Thursday.

The trial will last between three and six months and will be open to volunteers aged between 18 and 60 living in Abu Dhabi and Al Ain. Officials said 15,000 volunteers would take part.

Volunteers can register their details at 4humanity.ae. They will undergo a medical test to ensure they are healthy enough to take part.

People of all backgrounds are encouraged to sign up but they must not suffer from any chronic illnesses.

Sheikh Abdullah bin Mohammed Al Hamed, chairman of Dhabi, participates in phase III of the clinical trial for the Abu Dhabi. Courtesy: Abu Dhabi Government Media

They will be closely monitored for up to year and asked to keep a "vaccine diary" to record any symptoms.

Pregnant women can not be part of the trial, which will be conducted at five healthcare centres and a mobile clinic across the emirate.

The clinical trial process is usually divided into three phases, of which the first mainly looks into the safety of the vaccine.

Phase 2 evaluates immunogenicity – the ability of a foreign substance to provoke an immune response in a human or animal's body – and explores the immunisation process in a limited number of people.

Phase 3 considers the safety and effectiveness of the vaccine in a larger population sample.



Department of Health Abu Covid-19 inactivated vaccine in Office



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If a vaccine is confirmed safe and effective throughout the entire clinical trial process, the test is considered successful and the vaccine is manufactured on a large scale.

At present, no Covid-19 vaccine has been approved for commercial use. The WHO says human trials have begun on 23 potential vaccines worldwide.

The UAE's trial is the first to reach Phase 3 with an inactivated vaccine, which have been used against diseases including influenza and measles for decades.

The UAE will test two vaccine strains and a placebo.

Dr Nawal Al Kaabi, principal investigator and chief medical officer of Sheikh Khalifa Medical City, where is taking part in the trials, said volunteers would be given two doses three weeks apart.

"Our participation in this trial enables us to make a major contribution in the global fight to combat the Covid-19 pandemic," Dr Al Kaabi said.

"It is a matter of national pride that we are able to help facilitate the trial process that could have a worldwide impact and help people around the world to benefit from research and, if successful, the manufacture of a vaccine to fight back against this disease."

Dr Walid Zaher, group research director, said he expected to recruit the required number of volunteers over the next few months.

"Today is a remarkable day," Dr Zaher said. "This is one of the first steps in fighting the pandemic."

"It is part of a series of initiatives that also introduce local capacity."

The UAE announced in late June that it would begin Phase 3 trials for a Covid-19 vaccine, working with a Chinese pharmaceutical company Sinopharm and Group 42, an artificial intelligence and cloud computing company in Abu Dhabi.

G42 is leading the clinical trial operations in the UAE, under the supervision of the Department of Health of Abu Dhabi.

Sinopharm's inactivated vaccine has already passed Phases 1 and 2 of clinical trials in China without showing any serious adverse reactions.

All volunteers involved in the trials generated antibodies after two doses in 28 days.

The company said the UAE was chosen as the location for the trial because of its varied demographics.

The trials are also being supervised by the Abu Dhabi Health Services Company, Seha.

The processes were steered by guidelines from the WHO and the US Food and Drug Administration.

COVID-19 Serological Tests: How Well Do They Actually Perform?

By Abdi Ghaffari, Robyn Meurant and Ali Ardakani (Canada)

Source: <https://www.preprints.org/manuscript/202006.0278/v1>

EDITOR'S COMMENT: A very good paper with excellent graphics for educational purposes

Blood test detects positive COVID-19 result in 20 minutes

Source: <https://www.sciencedaily.com/releases/2020/07/200717101037.htm>

July 17 – World-first research by Monash University in Australia has been able to detect positive COVID-19 cases using blood samples in about 20 minutes, and identify whether someone has contracted the virus.

In a discovery that could advance the worldwide effort to limit the community spread of COVID-19 through robust contact tracing, researchers were able to identify recent COVID-19 cases using 25 microlitres of plasma from blood samples.

The research team, led by BioPRIA and Monash University's Chemical Engineering Department, including researchers from the ARC Center of Excellence in Convergent BioNano Science and Technology (CBNS), developed a simple agglutination assay—an analysis to determine the presence and amount of a substance in blood—to detect the presence of antibodies raised in response to the SARS-CoV-2 infection.

Positive COVID-19 cases caused an agglutination or a clustering of red blood cells, which was easily identifiable to the naked eye. Researchers were able to retrieve positive or negative readings in about 20 minutes.

While the current swab / PCR tests are used to identify people who are currently positive with COVID-19, the agglutination assay can determine whether someone had been recently infected once the infection is resolved—and could potentially be used to detect antibodies raised in response to vaccination to aid clinical trials.



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Using a simple lab setup, this discovery could see medical practitioners across the world testing up to 200 blood samples an hour. At some hospitals with high-grade diagnostic machines, more than 700 blood samples could be tested hourly—about 16,800 each day.

Study findings could help high-risk countries with population screening, case identification, contact tracing, confirming vaccine efficacy during clinical trials, and vaccine distribution.

This world-first research was published today (Friday 17 July 2020) in the prestigious journal *ACS Sensors*.

A patent for the innovation has been filed and researchers are seeking commercial and government support to upscale production. Dr. Simon Corrie, Professor Gil Garnier and Professor Mark Banaszak Holl (BioPRIA and Chemical Engineering, Monash University), and Associate Professor Timothy Scott (BioPRIA, Chemical Engineering and Materials Science and Engineering, Monash University) led the study, with initial funding provided by the Chemical Engineering Department and the Monash Center to Impact Anti-microbial Resistance.

Dr. Corrie, Senior Lecturer in Chemical Engineering at Monash University and Chief Investigator in the CBNS, said the findings were exciting for governments and health care teams across the world in the race to stop the spread of COVID-19. He said this practice has the potential to become upscaled immediately for serological testing.

"Detection of antibodies in patient plasma or serum involves pipetting a mixture of reagent red blood cells (RRBCs) and antibody-containing serum/plasma onto a gel card containing separation media, incubating the card for 5-15 minutes, and using a centrifuge to separate agglutinated cells from free cells," Dr. Corrie said.

"This simple assay, based on commonly used blood typing infrastructure and already manufactured at scale, can be rolled out rapidly across Australia and beyond. This test can be used in any lab that has blood typing infrastructure, which is extremely common across the world."

Researchers collaborated with clinicians at Monash Health to collect blood samples from people recently infected with COVID-19, as well as samples from healthy individuals sourced before the pandemic emerged.

Tests on 10 clinical [blood samples](#) involved incubating patient plasma or serum with red [blood](#) cells previously coated with short peptides representing pieces of the SARS-CoV-2 virus.

If the patient sample contained antibodies against SARS-CoV-2, these antibodies would bind to peptides and result in aggregation of the [red blood cells](#). Researchers then used gel cards to separate aggregated cells from free cells, in order to see a line of aggregated cells indicating a positive response. In negative samples, no aggregates in the gel cards were observed.

"We found that by producing bioconjugates of anti-D-IgG and peptides from SARS-CoV-2 spike protein, and immobilizing these to RRBCs, selective agglutination in gel cards was observed in the plasma collected from patients recently infected with SARS-CoV-2 in comparison to healthy plasma and negative controls," Professor Gil Garnier, Director of BioPRIA, said.

"Importantly, negative control reactions involving either SARS-CoV-2-negative samples, or RRBCs and SARS-CoV-2-positive samples without bioconjugates, all revealed no agglutination behavior."

Professor Banaszak Holl, Head of Chemical Engineering at Monash University, commended the work of talented Ph.D. students in BioPRIA and Chemical Engineering who paused their projects to help deliver this game changing COVID-19 test.

"This simple, rapid, and easily scalable approach has immediate application in SARS-CoV-2 serological testing, and is a useful platform for assay development beyond the COVID-19 pandemic. We are indebted to the work of our Ph.D. students in bringing this to life," Professor Banaszak Holl said.

"Funding is required in order to perform full clinical evaluation across many samples and sites. With commercial support, we can begin to manufacture and roll out this assay to the communities that need it. This can take as little as six months depending on the support we receive.

Drug Treatment for COVID-19: A Quick Summary for PCPs

By Laurie Scudder

Source: <https://www.medscape.com/viewarticle/933966>

July 17 – Information about COVID has evolved so quickly that it can be difficult for clinicians to feel confident that they are staying current. These summaries include links to our [COVID-19 FAQ](#), which is constantly updated to make sure you have the latest information.

While [treatment for COVID-19 outside of the hospital setting](#) is currently limited to supportive therapy, over 1000 clinical trials are underway looking at a range of drug treatments. Here is a quick summary for primary care clinicians of the current state of evidence.



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Remdesivir

Much-anticipated results from the National Institute of Allergy and Infectious Diseases' clinical trial of remdesivir, published in May, [confirmed preliminary results](#) suggesting that the [drug shortens the disease course for hospitalized COVID-19 patients](#). That earlier report resulted in the [US Food and Drug Administration \(FDA\) issuing an emergency use authorization](#) for the drug. Drugmaker Gilead subsequently released results from the sponsored, randomized phase 3 SIMPLE trial, which found that a 5-day course of the drug [improved outcomes among patients hospitalized with COVID-19 who did not need ventilation](#). The National Institutes of Health said that the [most benefit was in patients on oxygen](#) who did not require ventilation.

Remdesivir should be the ["standard of care," according to Dr Anthony Fauci](#), though Dutch investigators have cautioned that it can be associated with [rare but severe liver complications](#).

Bottom line on remdesivir. Remdesivir is administered intravenously, limiting its use to hospitalized patients. However, [phase 1 trials of an inhaled nebulized version](#) were initiated in late June 2020 to determine whether remdesivir can be used on an outpatient basis and at earlier stages of disease. The FDA has [warned against use of remdesivir in combination with hydroxychloroquine \(HCQ\)](#). Stay current on [remdesivir](#).

Dexamethasone

A cheap and widely available steroid roared to international attention in June with the announcement by British researchers that the RECOVERY trial involving over 6000 patients had been halted early due to positive results. The investigators reported that [dexamethasone reduced death rates by about a third](#) among severely ill hospitalized COVID-19 patients. Initial [reaction in the United States was mixed](#).

While a number of clinicians indicated that the results confirmed their own experience, others were wary of embracing the study results prior to peer review. That may change, however, with the announcement by the Infectious Diseases Society of America (IDSA) that [the drug will now be incorporated into COVID-19 treatment guidelines](#). [Dexamethasone](#), or an equivalent steroid such as [methylprednisolone](#) or [prednisone](#), is recommended for hospitalized patients who require supplemental oxygen, [mechanical ventilation](#), or extracorporeal mechanical oxygenation.

Bottom line on dexamethasone. While corticosteroids are not generally recommended for treatment of COVID-19 or any [viral pneumonia](#), the UK RECOVERY trial changed that. [IDSA guidelines include low-dose dexamethasone \(6 mg orally or intravenously daily for 10 days\) in patients requiring respiratory support](#). At present, the [World Health Organization has cautioned clinicians to reserve use](#) for severely ill patients. Stay current on [dexamethasone](#).

Hydroxychloroquine

Initial data suggested that HCQ and [chloroquine](#), sometimes in combination with [azithromycin](#), had some degree of efficacy in treating COVID-19. But those studies were rapidly followed by newer data from observational trials, suggesting that the [drugs were not only without benefit but also could be dangerous in some patients](#). After 2 months of controversy, the FDA [revoked the emergency use authorization](#) it had previously granted for use of these agents in inpatient settings.

The matter seemed to be put to bed until early July when the Henry Ford Hospital released results of a [retrospective, observational trial of HCQ with azithromycin](#) that concluded that the combination, if given within the first 2 days of hospital admission, reduced COVID-19 mortality.

Trials of [HCQ as preventive therapy are ongoing](#), though a randomized trial published in early June found that the [drug was ineffective as prevention](#) and that side effects were common.

Bottom line on HCQ. While some continue to tout its benefit, particularly if given early in the course of infection, there [is little evidence at this time to support its use at any stage](#) of illness. Stay current on [HCQ](#).

Other Antimicrobials

In the race to find an effective therapy, clinicians around the world have launched trials of a wide range of agents, with almost universally disappointing results.

Azithromycin. While some initial trials of azithromycin in combination with HCQ were promising, later results have not held up and [major cardiology organizations now warn against the combination](#). There are [no recommendations for use of this antimicrobial](#).

Antiviral agents. The UK-based RECOVERY trial examined other drugs in addition to [dexamethasone](#), concluding that the [combination of lopinavir and ritonavir had no benefit](#) in hospitalized patients. A [Japanese trial of favipiravir](#), marketed as Avifavir, determined that



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patients given the drug early in the trial showed more improvement than those who received delayed doses, but the results did not reach statistical significance. [Trials of other antivirals](#) are ongoing.

A Grab Bag of Other Drugs

Convalescent plasma. While a very small Chinese [pilot study of convalescent plasma](#) reported in April that its use in severely ill COVID-19 patients raised antibody titers, reduced viral load, and led to symptom improvement, other studies have [not yet shown it to be effective](#). The [FDA has approved its use in patients with serious or immediately life-threatening infection](#).

Colchicine. An open-label, randomized trial currently underway in Greece has reported that hospital course was slightly shorter and the [time to clinical deterioration improved in patients treated with colchicine](#), although there were no significant differences between treated and untreated groups in cardiac and inflammatory biomarkers.

Nitric oxide. [Inhaled nitric oxide was studied as a supportive measure for patients with SARS-CoV-1 infection](#) in 2004. It was found to reverse [pulmonary hypertension](#), improve severe hypoxia, and shorten the length of ventilatory support. A [phase 2 study](#) is underway in patients with COVID-19, with the goal of preventing disease progression in those with severe [acute respiratory distress syndrome](#).

Zinc. Initial trials of HCQ often studied it in combination with azithromycin and [zinc](#). While some studies have suggested that zinc may be somewhat effective in treatment of upper [respiratory infections](#), some of which are caused by coronaviruses, the [National Academies of Sciences, Engineering, and Medicine cautions that there is no evidence](#) to suggest that the supplement has a role in the treatment or prevention of COVID-19.

Monoclonal antibodies. The use of [human antibodies](#) is being investigated by a number of teams around the world. Eli Lilly has reported [positive interim results of its trials of monoclonal antibodies](#), and anticipates FDA review and possible approval by September. [European trials](#) of another antibody could begin as early as this summer. And trials of a third agent are [planning to start in August in Singapore](#).

Laurie Scudder, DNP, NP, is a nurse practitioner and an editorial director at Medscape.

The CDC Released (July 17) More Information on Who Is Most at Risk From COVID-19

Source: <https://www.sciencealert.com/the-cdc-has-updated-its-list-of-underlying-conditions-that-could-put-people-at-risk-of-severe-covid-19>

North Korea: No COVID-19 cases? Two medical professionals tell their story

Source: <https://www.amnesty.org/en/latest/campaigns/2020/07/north-korea-no-covid-19-medical-professionals-tell-their-story/>

July 09 – North Korea is one of the few countries that has reported “no cases” of COVID-19 infection, and last week leader Kim Jong Un heralded the government’s “shining success” in dealing with the pandemic. The country closed its borders to all foreign visitors in late January, just as it did when faced with the Ebola outbreak in West Africa from 2014 to 2015.

Little is known about how the health care system is run in North Korea, but its apparent ability to escape COVID-19 makes it worth digging deeper into its public health system.

Amnesty International has spoken to two North Korean health care professionals now living and working in South Korea. *Kim is a practitioner of Korean medicine, while *Lee is a pharmacist. Both women believe North Korea has a certain “immunity” to epidemics, but there are also factors which make the country’s health care system particularly vulnerable.

North Korea’s relative “safety” from COVID-19

“As North Korea has been suffering under incessant epidemics, people have built ‘mental immunity’ against them, and are able to deal with them without major fear. This is the same for COVID-19,” Lee said.

“Not that they are immune biologically, but the continuous years of epidemics have made them insensitive.”



She cites outbreaks of scabies and measles in 1989, and the recurrence of cholera, typhoid, paratyphoid and typhus since 1994. After 2000, SARS, Ebola, avian influenza and MERS also threatened North Korea.

However, the fact that no cases of COVID-19 have been reported to the outside world could be connected to surveillance and drastic curbs on freedom of expression at the hands of the authorities.

“North Koreans are well aware that when making contact with family or friends living in South Korea, there is always a chance that they are being wiretapped. So phone calls and letters are usually made under the premise that someone might be listening to or reading their conversations. They will never say a word related to COVID-19, as this can cost their lives,” said Lee.

Ensuring adequate sanitation and affordable care for all

North Korea’s food crisis in the 1990s, known as the Arduous March, caused fundamental changes in its health system.

As Lee explains, “Before the Arduous March, the medical professionals were devoted to their work. Like what the slogans say, ‘A patient’s pain is my pain,’ ‘Treat patients like family.’ But with the economic crisis, the state stopped giving salaries or rations, and survival became the most urgent task. Medical professionals had to get realistic and all those good systems were put aside.”

The result of these changes was effectively a health system based on payments existing alongside the “free” health services. According to Lee, the state opened pharmacies outside hospitals and made people buy drugs with money.

Many people still do not enjoy the right to an adequate standard of living, which covers such areas as adequate food, water, sanitation, housing and health care. But an emerging middle class has started to change the way in which scarce health resources are allocated, and made it even more difficult for poorer communities to access adequate health care.

“Free medical care still exists, nominally, so hospitals don’t charge that much. But some people have recently become willing to pay money for better treatment,” says Kim. “In South Korea, as long as you pay, you get to choose the hospital and the method of treatment. But in the North, you don’t have that choice. ‘You live in district A, so you are to go to hospital B,’ is all there is. Nowadays, people wish to go to the hospital that they choose and see a doctor they want, even at extra cost.

“In the past, doctors only had to look after patients within their assigned area. Regardless of the number of patients, they received a constant salary from the hospital, so there was no need for exceptionalism. Now the patients are bringing money, and this is changing the motivations of health care professionals.”

North Koreans, like everyone, have the right to the highest attainable level of health care. While this does not mean all health care has to be free, the emergence of these unregulated payments does call to question whether health care remains affordable to all or not.

The international community and the right to health in North Korea

Lee and Kim believe that medical training in North Korea is of a high standard and medical professionals are committed to their patients, but one significant bottleneck has been the lack of materials to keep the system running, in part due to sanctions imposed by the international community.

“This humanitarian support comes and goes depending on inter-Korean politics. I personally hope there is steady support from the international community, for example on drugs used to treat tuberculosis, regardless of the political situation,” says Kim. “Much-needed ingredients are entirely procured through imports, but most of them are on the international community and America’s sanction lists.”

Lee agrees: “The facilities stop running because raw materials like petrol for electricity and of ingredients for drug production have been lacking. It’s just a matter of materials. If the supply of these materials were sufficient, I would expect North Korea to be capable of solving public health emergencies smoothly on its own.”

The international community therefore has lessons to learn in ensuring the right to health of individuals in North Korea, in terms of making access to health care more equitable to all people in society.

Economic sanctions must not be applied in a way that would compromise the rights of North Koreans, and arrangements must be put in place to make essential medicines and other health-related items available to people who need them. Restrictions on these goods should never be used as an instrument of political and economic pressure.

International cooperation in nutrition, water and sanitation is also needed to ensure that North Korea is prepared against future epidemics such as COVID-19. Such epidemics may result from diseases related to unclean food and water, and could more readily affect people who already suffer from poor nutrition.

The North Korean government, on the other hand, has the responsibility to ensure that items provided for humanitarian causes are used for their intended purposes free of charge, and not diverted for personal gain. The authorities must fully cooperate with any providers of



humanitarian aid, granting them rights of access to all sites where humanitarian operations are taking place, so it can be verified that help is indeed reaching people that are genuinely in need.

***To protect the identities of these individuals, we are only identifying them by their last names.**

Historic Smallpox Virus Strains Identified from Civil War Vaccination Kits

Source: <https://www.genengnews.com/news/historic-smallpox-strains-identified-from-civil-war-vaccination-kits/>



Researchers analyzed the genomes of virus fragments found on smallpox vaccination kits used during the Civil War. The kits are housed at the Mutter Museum of the College of Physicians of Philadelphia. [JD Howell, McMaster University]

July 20 – Scientists and historians working at McMaster University, the Mutter Museum, and the University of Sydney applied sophisticated sequencing techniques to reconstruct the genomes of viral strains that were recovered from the “vaccination kits” used during the time of the American Civil War. They say the work points to the importance of studying the diversity of wild virus strains, which could feasibly include

strains that may protect against a wide range of viruses, including flu or coronaviruses. Their work could also lead to a new field of medical history study through the non-destructive examination of materials previously associated with biological samples.

“Understanding the history, the evolution, and the ways in which these viruses can function as vaccines is hugely important in contemporary times,” said evolutionary geneticist Hendrik Poinar, PhD, who is director of the McMaster Ancient DNA Centre, where the work was carried out, and a principal investigator at the university’s Michael G. DeGroote Institute for Infectious Disease Research. “This work points to the importance of looking at the diversity of these vaccine strains found out in the wild. We don’t know how many could provide cross protection from a wide range of viruses, such as flus or coronaviruses.”

Poinar and colleagues report their findings in *Genome Biology*, in a paper titled, [“The origins and genomic diversity of American Civil War Era smallpox vaccine strains.”](#)

Smallpox is caused by variola virus (VARV), a human-specific member of the Orthopoxvirus (OPXV) genus of the Poxviridae. Smallpox was one of the most devastating viral diseases ever to strike humankind, killing about three out of every 10 people who were infected. Those who survived infection frequently left disabled, blind, or disfigured.

The World Health Organization recently celebrated the 40th anniversary of the eradication of smallpox, the most successful campaign ever attempted. In fact, smallpox is the only human infectious disease that humans have managed to eradicate, thanks to widespread coordinated vaccination programs, and the effectiveness of the vaccine itself. “The World Health Organization’s success in eradicating smallpox using vaccinia virus (VACV; 1980) was in part due to the broad protective immunity induced by infection with one OPXV against subsequent infection by another,” the authors wrote.

Yet despite the historical importance of the achievement, little is known about the origins and diversity of viruses used in smallpox vaccination, the team continued. “Prior to the twentieth century, the method, source, and origin of smallpox vaccinations remained unstandardized and opaque ... The lack of standardization in vaccination practices and propagation throughout most of its history means that historical vaccine strains may be any one of several OPXVs.”

The concept of widespread vaccination dates back to 1796, when English physician Edward Jenner observed that exposure to a milder illness (called cowpox)—thought to be transferred from cows with a similar pox-like illness on their udders to milkmaids—offered protection against future smallpox outbreaks. While “cowpox” is often referenced as the source of the first vaccination, little had been known about the specific origins and diversity of the virus strains used in early smallpox vaccination programs, and the method and source material used for early smallpox vaccinations remained unstandardized for over a century.



"On the basis of Edward Jenner's work, cowpox virus (CPXV) was assumed to have been involved in historical vaccination, although horsepox virus (HSPV) and 'equination' are also cited," the authors continued. "In 1939, it was recognized that the smallpox vaccine strains being used in the twentieth century were distinct from CPXV and these VACV strains had become the predominant smallpox vaccines. However, both the origin of VACV and its natural host or reservoir are also unknown."

For their study, researchers used sophisticated techniques developed at the McMaster Ancient DNA Centre to reconstruct and analyze the genomes of virus fragments recovered from vaccination kits used during the Civil War era. "To better characterize the origins of smallpox vaccination, we investigated the origin, diversity, and propagation of early smallpox vaccine strains by extracting and sequencing total DNA and analyzing both the virome and metagenome from these kits," the investigators explained.

The kits, part of a medical collection at the Mütter Museum of the College of Physicians of Philadelphia, contained lancets and small glass plates for mixing fluid for vaccines that had been collected from blisters of deliberately infected subjects, and tin boxes with sliding lids to contain scab material. "Kits found in collections relating to the American Civil War correspond to a time of known medical crisis and intervention to prevent smallpox outbreaks," the investigators noted. "We were kindly granted access to five historical kits from the Mütter Museum of the College of Physicians of Philadelphia that date to the mid-to-late nineteenth century (likely circa 1859–1873) and are associated with medical practices of the American Civil War era ... Vaccination 'kits' and their biological contents (scabs, lymph) provide evidence of early vaccination methods and materials and remain in medical collections/archives across the globe."

The techniques used by the scientists enabled them to successfully recover viral molecules from both organic sources, such as scab material, and also from the non-destructive sampling of inorganic materials, such as tin boxes and glass slides, which contained no evidence of organic residues.

The researchers were able to determine that in the 1860s and 1870s, medical practitioners in Philadelphia were using a vaccinia virus strain that was still being propagated in human subjects. The milder relative of the deadly smallpox pathogen was introduced into the body, usually by applying pus or scabs to a scratch or cut in the skin, where it helped recipients to develop immunity to smallpox.

So, within the historical context of American medical practices in the 1860s and 1870s, it seems that vaccination was a "uniquely human process," the team noted. "Vaccination material was still being produced within humans and transferred directly from donors to patients, a process that changed in the following decades in response to public health concerns over iatrogenic disease spread and the for-profit industrialization of vaccine production through animals."

An overriding concern about vaccine design is how close—from an evolutionary standpoint—the vaccine strain must be to the one causing disease for it to prevent illness. The vaccinia strains used for vaccination were in fact very distantly related to the virus that causes smallpox. The slow mutation rate of orthopox viruses (of which both vaccinia and variola are members) likely allows for this "distant" protection.

"Vaccination is a wonderful process with a rich medical history that we should celebrate," said Ana Duggan, PhD, a former postdoc in the department of anthropology at McMaster, now at the Public Health Agency of Canada, who was lead researcher on the study. "Medical museums are incredible repositories of our past and of our collective history. The new tools we develop in this work allow us to begin to investigate how medical sources, procedures, and techniques have changed through time."

The authors conclude that their work offers up a novel, non-destructive approach to recovering DNA which can preserve historical medical collection artifacts for further study. "The clear identification and reconstruction of near-complete genomes of VACV from these vaccination kits, which were in use during the American Civil War era, indicates that these strains were circulating within humans and via physician networks prior to the twentieth century."

And as researchers around the world are working to develop a vaccine against COVID-19, the success of the smallpox campaign, and the findings reported by Poinar and colleagues, point to the value of vaccination, the team reasoned. They suggested other vaccines are waiting to be discovered among the viral relatives of today's influenza and coronaviruses.

COVID-19 Not Transmitted by Mosquitoes

Though the World Health Organization has stated previously that "to date, there has been no information nor evidence to suggest that the new coronavirus could be transmitted by mosquitoes," direct experimental data has been lacking.

However, now, investigators at Kansas State University (KSU) have released new data that help solidify the hypothesis that mosquitoes do not transmit SARS-CoV-2. [+ MORE](#)



Turmeric Can Help Eliminate Some Viruses Suggest Wuhan Researchers

Source: <https://www.genengnews.com/virology/wuhan-research-team-reports-that-turmeric-can-help-eliminate-some-viruses/>

July 17 – Researchers say that curcumin, a natural compound found in the spice turmeric, could help eliminate certain viruses. The scientists, from the Wuhan University of Engineering in China, published a study, "[Antiviral and virucidal effects of curcumin on transmissible gastroenteritis virus in vitro](#)," in the *Journal of General Virology* which showed that curcumin can prevent transmissible gastroenteritis virus (TGEV), an alpha-group coronavirus that infects pigs, from infecting cells. At higher doses, the compound was also found to kill virus particles.



"Emerging coronaviruses represent serious threats to human and animal health worldwide, and no approved therapeutics are currently available. Here, we used Transmissible gastroenteritis virus (TGEV) as the alpha-coronavirus model, and investigated the antiviral properties of curcumin against TGEV. Our results demonstrated that curcumin strongly inhibited TGEV proliferation and viral protein expression in a dose-dependent manner. We also observed that curcumin exhibited direct virucidal abilities in a dose-, temperature- and time-dependent manner," write the investigators.

"Furthermore, time-of-addition assays showed that curcumin mainly acted in the early phase of TGEV replication. Notably, in an adsorption assay, curcumin at 40 μM resulted in a reduction in viral titers of 3.55 log TCID₅₀ ml⁻¹, indicating that curcumin possesses excellent inhibitory effects on the adsorption of TGEV. Collectively, we demonstrate for the first time that curcumin has virucidal activity and virtual

inhibition against TGEV, suggesting that curcumin might be a candidate drug for effective control of TGEV infection."

Infection with TGEV, which is characterized by diarrhea, severe dehydration and death, is highly infectious and invariably fatal in piglets younger than two weeks. There are currently no approved treatments for alpha-coronaviruses and although there is a vaccine for TGEV, it is not effective in preventing the spread of the virus.

To determine the potential antiviral properties of curcumin, the research team treated experimental cells with various concentrations of the compound, before attempting to infect them with TGEV. They found that higher concentrations of curcumin reduced the number of virus particles in the cell culture.

The research suggests that curcumin affects TGEV in a number of ways: by directly killing the virus before it is able to infect the cell, by integrating with the viral envelope to inactivate the virus, and by altering the metabolism of cells to prevent viral entry.

"Curcumin has a significant inhibitory effect on TGEV adsorption step and a certain direct inactivation effect, suggesting that curcumin has great potential in the prevention of TGEV infection," said Lilan Xie, PhD, lead author of the study and researcher at the Wuhan Institute of Bioengineering.

Curcumin has been shown to inhibit the replication of some types of virus, including dengue virus, hepatitis B, and Zika virus. The compound has also been found to have a number of significant biological effects, including antitumor, anti-inflammatory, and antibacterial activities.

Curcumin was chosen for this research due to having low side effects according to Xie, who added that "There are great difficulties in the prevention and control of viral diseases, especially when there are no effective vaccines. Traditional Chinese medicine and its active ingredients, are ideal screening libraries for antiviral drugs because of their advantages, such as convenient acquisition and low side effects."

The researchers now hope to continue their research in vivo, using an animal model to assess whether the inhibiting properties of curcumin would be seen in a more complex system.

"Further studies will be required, to evaluate the inhibitory effect in vivo and explore the potential mechanisms of curcumin against TGEV, which will lay a foundation for the comprehensive understanding of the antiviral mechanisms and application of curcumin" said Xie.



People Who Got Anosmia Due to COVID-19 Are Turning to 'Smell Therapy'

Source: <https://www.sciencealert.com/people-who-ve-lost-their-smell-due-to-covid-19-are-turning-to-smell-therapy>

July 20 – A growing number of people who lost their smell during the [COVID-19 pandemic](#) and haven't been able to get it back are now turning to "smell therapy."

Anosmia, or loss of smell, was first recognised by the Centres for Disease Control (CDC) as an official COVID-19 symptom in April alongside the loss of taste.

Both affected hospitalized [coronavirus](#) patients as well as those who had a mild form of infection or showed no other symptoms.

But while many recovering COVID-19 patients have since regained their ability to smell, others haven't been as lucky. Now, charities and other organisations that offer "smell therapy" report a dramatic uptick in interest.

"At the moment, we are probably three times the membership that we were before COVID-19 hit," Chrissi Kelly, the founder of [AbScent](#), a UK charity that helps people who suffer from smell loss, told Business Insider.

"I first noticed the interest in March when people suddenly started contacting me on social media, first from Iran, then Italy, and then Spain," Kelly said. "Now we have over 7,000 members in our [Facebook] groups."

While not a cure, smell training is a form of physiotherapy for the nose. It requires you to work with four essential oils – rose, lemon, clove, and eucalyptus – to stimulate and amplify the nerves in your nose that are responsible for smell.

For it to be effective, recovering patients are advised to sniff each bottle for up to 20 seconds, twice a day, for a minimum of four months, according to Kelly.

The AbScent founder stressed that the essential oils could be swapped for anything (i.e. shoe polish, coffee, or other spices), and that smell kits can easily be created at home.



"You just need to get people to really focus and concentrate on what they're smelling, for it to work," she said.

"My smell is still completely gone"

Freya Rosedale, 24, from London, told Business Insider that she keeps perfume by the side of her bed so when she wakes up every morning, she can check to see whether her smell has returned.

The 24-year-old lost her sense of taste and smell in March when she "very suddenly" noticed that she couldn't smell or taste the bacon she was frying in her kitchen one morning. She had not been displaying any other symptoms.

"When I took a bite, it was quite horrible...there was just nothing. It made me really aware of texture which never bothered me before," she said.

Four months on, Rosedale says she is able to taste her food again but still hasn't been able to smell anything.

"My smell is still completely gone. It comes back a couple of times but only for about 15 minutes and then it goes again," she said.

"It's not as upsetting as the taste because I love food and not being able to enjoy eating was a big issue for me. Now, it's more of a hindrance and just a bit annoying."

Almost 90 percent of COVID-19 patients with anosmia recovered within a month

[According to a study from Italy published earlier this month](#), 49 percent of patients had fully regained their sense of smell or taste and 40 percent reported improvements. Another 10 percent had persistent smell loss that lasted for months.

While the understanding of COVID-19 is still developing, researchers are starting to understand what causes anosmia in coronavirus patients in the first place.

In [an article in The Conversation](#), Dr. Jane Parker, an associate professor of flavour chemistry at the University of Reading, and Dr. Simon Gane, a rhinologist at the University of London explained that people who recover more quickly from anosmia most likely had inflammation at a local level, otherwise known as "cleft syndrome."

It means that the olfactory cleft – the part in your nose responsible for smell – is obstructed by swollen tissue and mucus, and therefore, blocks any aroma from reaching it. However, this can be fixed in weeks, and once a patient's swelling goes down, the pathway to their olfactory neurons opens up again.



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People who are having long-term smell problems most likely had an aggressive inflammation which can cause nerve or tissue damage, according to the article. However, like many nerves, this can be regenerated with smell training, and "the chances are good," according to Kelly.

"It [the training] is amazingly effective. You can do amazing things with your sense of smell, whether you are a healthy person or a recovering person," said Kelly.

[Clinical trials](#) have shown that patients who used the training did better in identifying and discriminating between smells than people who did not.

The emotional impact loss of smell can have on patients is huge: [A recent study in the UK](#) exposed high rates of depression and anxiety among the anosmic population.

That's why it's so important to stick with smell therapy.

"For a lot of people who lost their sense of smell, they stop being curious about smell," said Kelly. "You must remain curious about smell and continue to look for smell in your day to day life and that's so so important."

This Promising New COVID-19 Treatment Could Reduce Patient Deaths

Source: <https://www.sciencealert.com/promising-new-covid-19-treatment-slashed-death-risk-in-randomised-trial>

July 21 – An aerosol-based treatment could drastically reduce the number of new [coronavirus](#) patients dying from the disease or requiring intensive care, according to preliminary results released Monday by a British biotech firm.

In a [randomised trial](#) of 100 patients admitted to hospital with [COVID-19](#), those who received an **inhaled formula of the protein interferon beta** were at 79 percent lower risk of developing severe disease compared to those who received a placebo.

They were also more than twice as likely to make a full recovery compared with the control group.

The firm behind the treatment, known as SNG001, [said](#) the preliminary results suggested "a major breakthrough" in the [pandemic](#).

"We are all delighted with the trial results announced today, which showed that SNG001 greatly reduced the number of hospitalised COVID-19 patients who progressed from requiring oxygen to requiring ventilation," [said](#) Richard Marsden, CEO of Synairgen.

The results published Monday have not yet been peer-reviewed and the sample size is relatively small.

But if confirmed the treatment could revolutionise the way COVID-19 is dealt with in hospitals.

Game changer

Interferon beta is a naturally occurring protein, commonly used to treat multiple sclerosis.

It forms part of the body's natural fight against infection, and the novel coronavirus suppresses its production in an attempt to evade an immune response.

Delivering the protein directly into the lungs of patients is designed to trigger a robust immune response to the [virus](#), even in patients whose immune system is already weakened by infection.

"The results confirm our belief that interferon beta... has huge potential as an inhaled drug to be able to restore the lung's immune response," [said](#) Tom Wilkinson, professor of respiratory medicine at the University of Southampton.

He said the trial showed SNG001 was effective in "enhancing protection, accelerating recover and countering the impact of [SARS-CoV-2](#) virus."

Naveed Sattar, professor of metabolic medicine at the University of Glasgow said the new treatment "could be a game changer".

"With small (trial) numbers comes less certainty on the true level of benefit, or whether benefits vary between people with differing risk characteristics," said Sattar, who was not involved in the research.

"Such work would require a larger trial but, even so, these results are very exciting."

There are currently a number of treatments available for patients hospitalised with COVID-19.

Last month a Britain-based team of researchers lead by the University of Oxford announced they had successfully reduced the risk of death among seriously ill patients by administering the commonly available [steroid dexamethasone](#).

Several countries have also issued the emergency authorisation for treatment with [anti-viral remdesivir](#).



Algorithm predicts mortality of Covid-19 patients from blood biomarkers

Source: <https://www.chemistryworld.com/news/algorithm-predicts-mortality-of-covid-19-patients-from-blood-biomarkers/4012143.article>

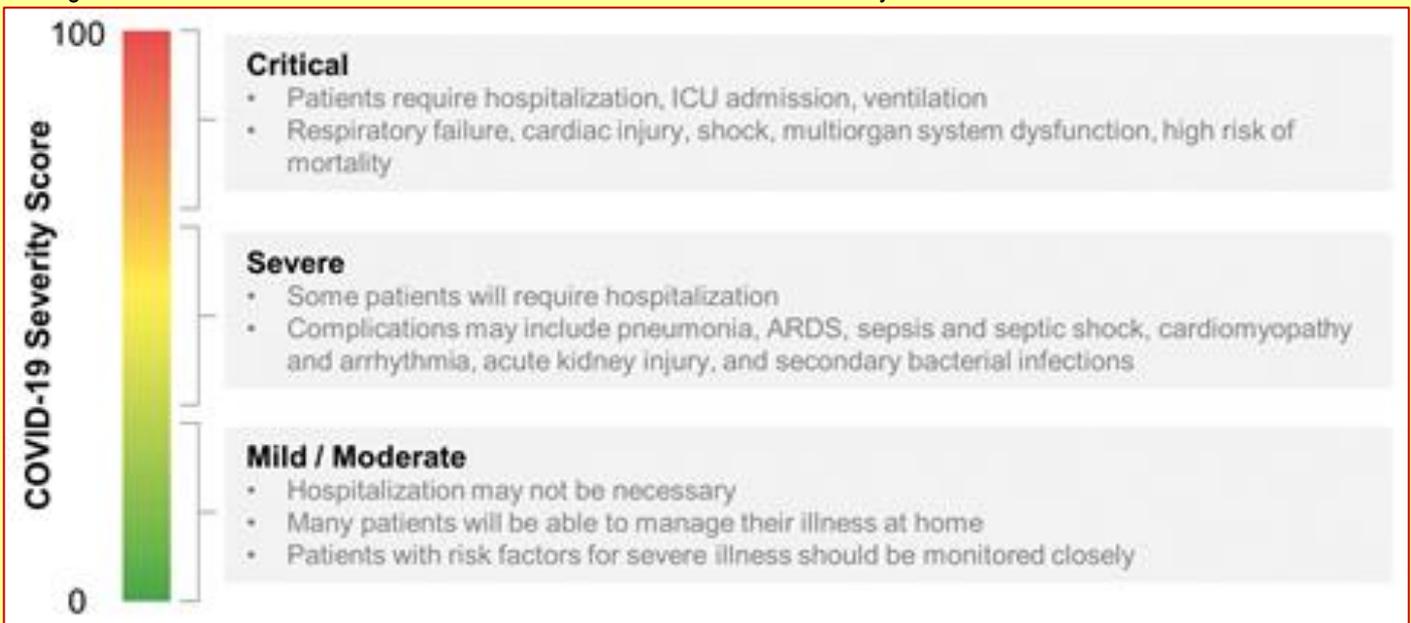
July 15 – A team of researchers in the US and China has devised a severity scoring system for Covid-19 by looking at the biomarkers present in blood. The system combines biomarker measurements with risk factors such as age and gender in a statistical learning algorithm to predict the likelihood of a Covid-19 patient dying from the disease. It is the first quantitative point-of-care diagnostic tool to predict the severity of the disease in individual patients.

The system can detect several biomarkers from a single blood sample without needing to be sent away to a laboratory. Each test runs in a single-use microfluidic cartridge placed within a biosensor platform, which generates immunofluorescent signals that correlate to antigen concentrations.

The **biomarkers were specifically chosen** because their presence was linked to poor outcomes in patients. Biomolecules such as D-dimer (a breakdown product of blood clots), C-reactive protein (a marker of inflammation or infection) and procalcitonin (increased levels of which indicate a bacterial co-infection and sepsis) were identified as relevant to complications associated with Covid-19, and were dramatically increased in patients that died versus those that recovered. The result is a score between 0–100 – a single number output is important, as a doctor can quickly identify whether a specific patient may be more or less likely to suffer life-threatening complications.

The use of severity score systems to make clinical decisions is well known – the team had previously worked on a severity score system for cardiovascular events, and they were able to use this body of research to help them when selecting biomarkers for Covid-19. [John McDevitt](#), who led the project at New York University, was stunned that ‘a good scorecard did not exist’ for Covid-19. The researchers recognised that doctors did not have a good way to prioritise resources, and wanted to change that.

The algorithm was trained using an artificial intelligence approach and known outcomes from hospitalised Covid-19 patients in Wuhan. The model continues to learn – in fact, the slowest step in its development is acquiring the data. McDevitt says that once they are able to access data, new understanding comes ‘within days.’ Currently they are working with communities in Brooklyn and seeing how much influence cultural and economic differences have on the severity of the disease.



Source: © John McDevitt/New York University: Initial rough scale for Covid-19 severity score based on the CDC’s interim clinical guidance for management of patients with confirmed Covid-19

[Brian Cunningham](#), an expert in biosensors and engineering at the University of Illinois at Urbana-Champaign, US, notes that the model can ‘never be fully predictive, even when it is used to evaluate a group of patients with similar characteristics.’ However, he believes that this tool could help identify high risk patients, allowing them to access further care ‘which could potentially save their life’.



The next steps are ambitious – the team are working on a free app for immediate release to help clinicians manage their patients, and they are adamant they don't want this technology to only be available to the world's richest medical centres.

[Utkan Demirci](#), who specialises in applying nanoscale technologies to problems in medicine at Stanford University, US, says technologies similar to this one 'will play a significant role [in future] as we combine these tools with existing health data and history at a personalised level merged with machine learning methods.'

▶▶ References: M P McRae *et al*, *Lab Chip*, 2020, 20, 2075 (DOI: [10.1039/d0lc00373e](https://doi.org/10.1039/d0lc00373e))

Sanitizing agents for virus inactivation and disinfection

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Abstract

Viral epidemics develop from the emergence of new variants of infectious viruses. The lack of effective antiviral treatments for the new viral infections coupled with rapid community spread of the infection often result in major human and financial loss. Viral transmissions can occur via close human-to-human contact or via contacting a contaminated surface. Thus, careful disinfection or sanitization is essential to curtail viral spread. A myriad of disinfectants/sanitizing agents/biocidal agents are available that can inactivate viruses, but their effectiveness is dependent upon many factors such as concentration of agent, reaction time, temperature, and organic load. In this work, we review common commercially available disinfectants agents available on the market and evaluate their effectiveness under various application conditions. In addition, this work also seeks to debunk common myths about viral inactivation and highlight new exciting advances in the development of potential sanitizing agents.

KEYWORDS

disinfectant, sanitizer, surface, virucidal, virus

All the COVID-19 Vaccines Currently in Clinical Testing

By Keith Speights

Source: <https://www.fool.com/investing/2020/07/19/here-are-all-the-covid-19-vaccines-currently-in-cl.aspx>

July 19 – When will a COVID-19 vaccine be available? How effective will it be? Those are two of the most pressing questions being asked by many with the number of COVID-19 cases rising in much of the U.S.

Unfortunately, the questions can't be answered yet with a high level of confidence. But there are 23 COVID-19 vaccine candidates currently in clinical testing, according to the World Health Organization (WHO). The progress of these candidates can at least provide a clue as to when a COVID-19 vaccine might be available. Here are those vaccine candidates and how likely they could be to win regulatory approval.

In phase 1 testing

The field of early stage COVID-19 vaccine candidates is crowded. Of the 23 COVID-19 vaccine candidates currently in clinical testing, 18 are in phase 1 studies:

Organization(s)	Vaccine Candidate	Status
AnGes / Takara Bio / Osaka University	DNA vaccine	In phase 1/2 study.



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Organization(s)	Vaccine Candidate	Status
BioNTech (NASDAQ:BNTX) / Pfizer (NYSE:PFE)	BNT162 (Four candidates)	In phase 1/2 study.
Bharat Biotech	Whole-virion inactivated vaccine	In phase 1/2 study.
Cadila Healthcare	ZyCoV-D	In phase 1/2 study.
Clover Pharmaceuticals / GlaxoSmithKline / Dynavax	SCB-2019	In phase 1/2 study.
CSL / Sequirus / University of Queensland	Molecular clamp stabilized spike protein with MF59 adjuvant	In phase 1/2 study.
CureVac	CVnCoV	In phase 1/2 study.
Genexine Consortium	GX-19	In phase 1/2 study.
Gamaleya Research Institute	Gam-COVID-Vac	In phase 1/2 study.
Imperial College London	RNA vaccine	In phase 1/2 study.
Inovio Pharmaceuticals	INO-4800	In phase 1/2 study.
Novavax (NASDAQ:NVAX)	NVX-CoV2373	In phase 1/2 study.
Institute of Medical Biology / Chinese Academy of Medical Sciences	Inactivated SARS-CoV-2 vaccine	In phase 1/2 study.
Medicago / GlaxoSmithKline / Dynavax	Plant-derived virus-like particle	In phase 1/2 study.
Sinopharm / Beijing Institute of Biological Products	Inactivated SARS-CoV-2 vaccine	In phase 1/2 study.
Sinopharm / Wuhan Institute of Biological Products	Inactivated SARS-CoV-2 vaccine	In phase 1/2 study. Now: In phase 3
Vaxine Pty Ltd / Medy-Tox	COVAX-19	In phase 1/2 study.
Walvax Biotechnology / People's Liberation Army Academy of Military Sciences	ARCoV	In phase 1/2 study.

Data sources: WHO, ClinicalTrials.gov, company press releases.

BioNTech and Pfizer [reported positive results](#) on July 1 for BNT162b1, one of four candidates in development. The FDA recently granted Fast Track designation to two of those candidates, which paves the way for an expedited review process.

Novavax has attracted a lot of attention for its COVID-19 vaccine candidate as well. Operation Warp Speed, the U.S. government's program to accelerate COVID-19 vaccine development, selected NVX-CoV2373 to receive [\\$1.6 billion in funding](#).

What are the chances of FDA approval for a vaccine candidate in phase 1 testing? Very low, at least based on historical data. Only 16% of experimental vaccines in early stage studies between 2006 and 2015 ultimately won FDA approval, based on an analysis conducted by biopharmaceutical industry trade organization BIO.

In phase 2 testing

Two Chinese drugmakers are currently evaluating COVID-19 vaccine candidates in phase 2 clinical studies:

Organization(s)	Vaccine Candidate	Status
Cansino Biologics / Beijing Institute of Biotechnology	Ad5-nCoV	In phase 2 study



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Organization(s)	Vaccine Candidate	Status
Anhui Zhifei Longcom Biopharmaceutical / Institute of Microbiology, Chinese Academy of Sciences	Adjuvanted recombinant protein	In phase 2 study

Data sources: WHO, ClinicalTrials.gov, Chinese Clinical Trial Registry, company press releases.

The Chinese military is already using Cansino's experimental Ad5-nCoV vaccine under a one-year special permission granted by China's Central Military Commission. The vaccine candidate isn't approved for use outside of military personnel at this time, though. Neither of these two COVID-19 vaccine candidates is being tested in the U.S. at this point. The odds an experimental vaccine in a phase 2 clinical trial will eventually win FDA approval is low, based on BIO's historical data -- less than 25%.

In phase 3 testing (or soon will be)

There are three leaders in the COVID-19 vaccine race based on the clinical progression of their respective candidates. Each of these companies' COVID-19 vaccine candidates is either in phase 3 clinical studies or soon will be.

Organization(s)	Vaccine Candidate	Status
AstraZeneca (NYSE:AZN) / University of Oxford	AZD1222	In phase 2/3 study
Moderna (NASDAQ:MRNA) asdf	mRNA-1273	Phase 3 study scheduled to begin on July 27, 2020
Sinovac Biotech	CoronaVac	Phase 3 study scheduled to begin in July 2020

Data sources: WHO, ClinicalTrials.gov, company press releases.

Moderna's COVID-19 vaccine program has received the most publicity in the U.S. The biotech [recently announced the publication of results](#) from a phase 1 study of mRNA-1273 in *The New England Journal of Medicine*. Those results showed that Moderna's COVID-19 vaccine candidate produced neutralizing antibodies (which can prevent viral infection) in all 45 participants in the study. It's not surprising that Moderna ranks as a big winner among [biotech stocks](#) in 2020. So far this year, Moderna's shares are up well over 300%.

Chinese drugmaker Sinovac reported in June that its COVID-19 vaccine candidate CoronaVac produced neutralizing antibodies in over 90% of patients in a phase 1/2 clinical study. Results from a phase 1 study of AZD1222, the COVID-19 vaccine candidate being developed by AstraZeneca and the University of Oxford, are expected to be published on July 20 in *The Lancet* medical journal.

It's still too soon to know whether any of these vaccine candidates will be successful in late-stage testing. However, 74% of experimental vaccines that made it to phase 3 clinical trials between 2006 and 2015 went on to win FDA approval, according to BIO.

THE OXFORD VACCINE

Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial

By Pedro M Folegatti, MSc, Katie J Ewer, PhD, Parvinder K Aley, et al.

Source: <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2931604-4>

Summary

Background

The pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) might be curtailed by vaccination. We assessed the safety, reactogenicity, and immunogenicity of a viral vectored coronavirus vaccine that expresses the spike protein of SARS-CoV-2.

Dr. Adrian Hill and his team at Oxford's Jenner Institute

Methods

We did a phase 1/2, single-blind, randomised controlled trial in five trial sites in the UK of a chimpanzee adenovirus-vectored vaccine (ChAdOx1 nCoV-19) expressing the SARS-CoV-



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2 spike protein compared with a meningococcal conjugate vaccine (MenACWY) as control. Healthy adults aged 18–55 years with no history of laboratory confirmed SARS-CoV-2 infection or of COVID-19-like symptoms were randomly assigned (1:1) to receive ChAdOx1 nCoV-19 at a dose of 5×10^{10} viral particles or MenACWY as a single intramuscular injection. A protocol amendment in two of the five sites allowed prophylactic paracetamol to be administered before vaccination. Ten participants assigned to a non-randomised, unblinded ChAdOx1 nCoV-19 prime-boost group received a two-dose schedule, with the booster vaccine administered 28 days after the first dose. Humoral responses at baseline and following vaccination were assessed using a standardised total IgG ELISA against trimeric SARS-CoV-2 spike protein, a multiplexed immunoassay, three live SARS-CoV-2 neutralisation assays (a 50% plaque reduction neutralisation assay [PRNT₅₀]; a microneutralisation assay [MNA₅₀, MNA₈₀, and MNA₉₀]; and Marburg VN), and a pseudovirus neutralisation assay. Cellular responses were assessed using an ex-vivo interferon- γ enzyme-linked immunospot assay. The co-primary outcomes are to assess efficacy, as measured by cases of symptomatic virologically confirmed COVID-19, and safety, as measured by the occurrence of serious adverse events. Analyses were done by group allocation in participants who received the vaccine. Safety was assessed over 28 days after vaccination. Here, we report the preliminary findings on safety, reactogenicity, and cellular and humoral immune responses. The study is ongoing, and was registered at ISRCTN, 15281137, and [ClinicalTrials.gov](https://www.clinicaltrials.gov/ct2/show/study/NCT04324606), [NCT04324606](https://www.clinicaltrials.gov/ct2/show/study/NCT04324606).

Findings

Between April 23 and May 21, 2020, 1077 participants were enrolled and assigned to receive either ChAdOx1 nCoV-19 (n=543) or MenACWY (n=534), ten of whom were enrolled in the non-randomised ChAdOx1 nCoV-19 prime-boost group. Local and systemic reactions were more common in the ChAdOx1 nCoV-19 group and many were reduced by use of prophylactic paracetamol, including pain, feeling feverish, chills, muscle ache, headache, and malaise (all $p < 0.05$). There were no serious adverse events related to ChAdOx1 nCoV-19. In the ChAdOx1 nCoV-19 group, spike-specific T-cell responses peaked on day 14 (median 856 spot-forming cells per million peripheral blood mononuclear cells, IQR 493–1802; n=43). Anti-spike IgG responses rose by day 28 (median 157 ELISA units [EU], 96–317; n=127), and were boosted following a second dose (639 EU, 360–792; n=10). Neutralising antibody responses against SARS-CoV-2 were detected in 32 (91%) of 35 participants after a single dose when measured in MNA₈₀ and in 35 (100%) participants when measured in PRNT₅₀. After a booster dose, all participants had neutralising activity (nine of nine in MNA₈₀ at day 42 and ten of ten in Marburg VN on day 56). Neutralising antibody responses correlated strongly with antibody levels measured by ELISA ($R^2=0.67$ by Marburg VN; $p < 0.001$).

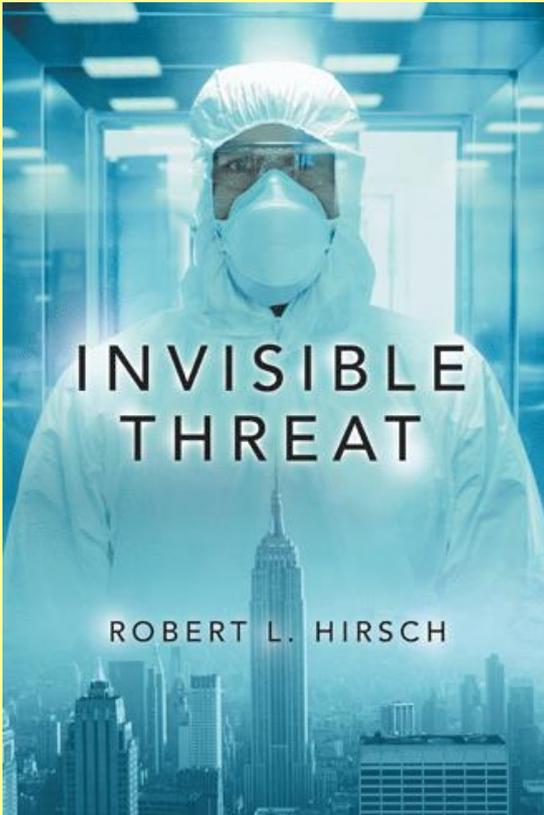
Interpretation

ChAdOx1 nCoV-19 showed an **acceptable safety profile**, and homologous boosting increased antibody responses. These results, together with the induction of **both humoral and cellular immune responses**, support large-scale evaluation of this candidate vaccine in an ongoing phase 3 programme.

In the meantime:



Read a book:



Invisible Threat

Author: Robert L. Hirsch

Source: <https://www.iuniverse.com/en/bookstore/bookdetails/810103-invisible-threat>

Dr. Alan Mazer graduated from Harvard Medical School at the age of twenty and started curing rare diseases by age twenty-five. He grew into one of America's most brilliant scientists, so no one could have foreseen his true intentions.

Now a radicalized Muslim, Mazer uses his genius to isolate viruses that attack the nervous system. One "vaccine" kills instead of protecting, stealing the lives of children. In particular, Mazer targets Israelis and Americans in an effort to bring down Western society.

Now, skilled Mossad agents, the Joint Terrorist Task Force, and an immunologist from a biotechnology company work together to fight against jihad. They rush to stop Mazer and his team of terrorists; even as unlimited funds roll in from across the globe supporting Mazer's cause. This team must find this man and stop him before the virus and others spread indiscriminately.

About the Author

Robert L. Hirsch graduated from Brandeis University and received his doctorate from Georgetown University. He continued in academics at John Hopkins University School of Medicine and University of Maryland School of Medicine before working in the pharmaceutical industry. He developed important products for prevention and treatment of immune disorders and viral infections. He now lives in Naples, Florida, with his wife, Amy.

Or make plans for your summer time or that of 2021 (perhaps in Greece; Paxoi, Western Greece [photo])!



This New Prototype N95 Mask Designed by Harvard And MIT Is Reusable and Hygienic

Source: <https://www.sciencealert.com/new-prototype-n95-mask-designed-by-harvard-and-mit-is-reusable-scientists-say>

July 23 – Not every mask is equal. As countries around the world grapple with varying levels of mask shortages, one of the [most effective types of face masks](#) for blocking airborne [coronavirus](#) particles has been reinvented – with a brilliant experimental tweak that could enable us to make more masks with less material, and maybe save more lives as a result.

The new prototype, designed by scientists at Harvard University and MIT, is a spin on the [N95 mask](#) used by frontline healthcare workers. N95 masks – a type of respirators that filters airborne particles – are tight-fitting, unlike loose-fitting surgical masks, and are made from polypropylene fibres that can filter out viral particles.

However, the majority of the mask is made from this polypropylene material, and since N95 masks are [supposed to be discarded](#) after each patient encounter or exposure to [virus](#)-laden aerosols, their innate disposability is a large part of the reason why N95 mask supply is seemingly under constant constraint in the upheaval of the [COVID-19 pandemic](#).



"One of the key things we recognised early on was that in order to help meet the demand, we needed to really restrict ourselves to methods that could scale," [says](#) gastroenterologist Giovanni Traverso from Harvard-affiliated Brigham and Women's Hospital, who also teaches mechanical engineering at MIT.

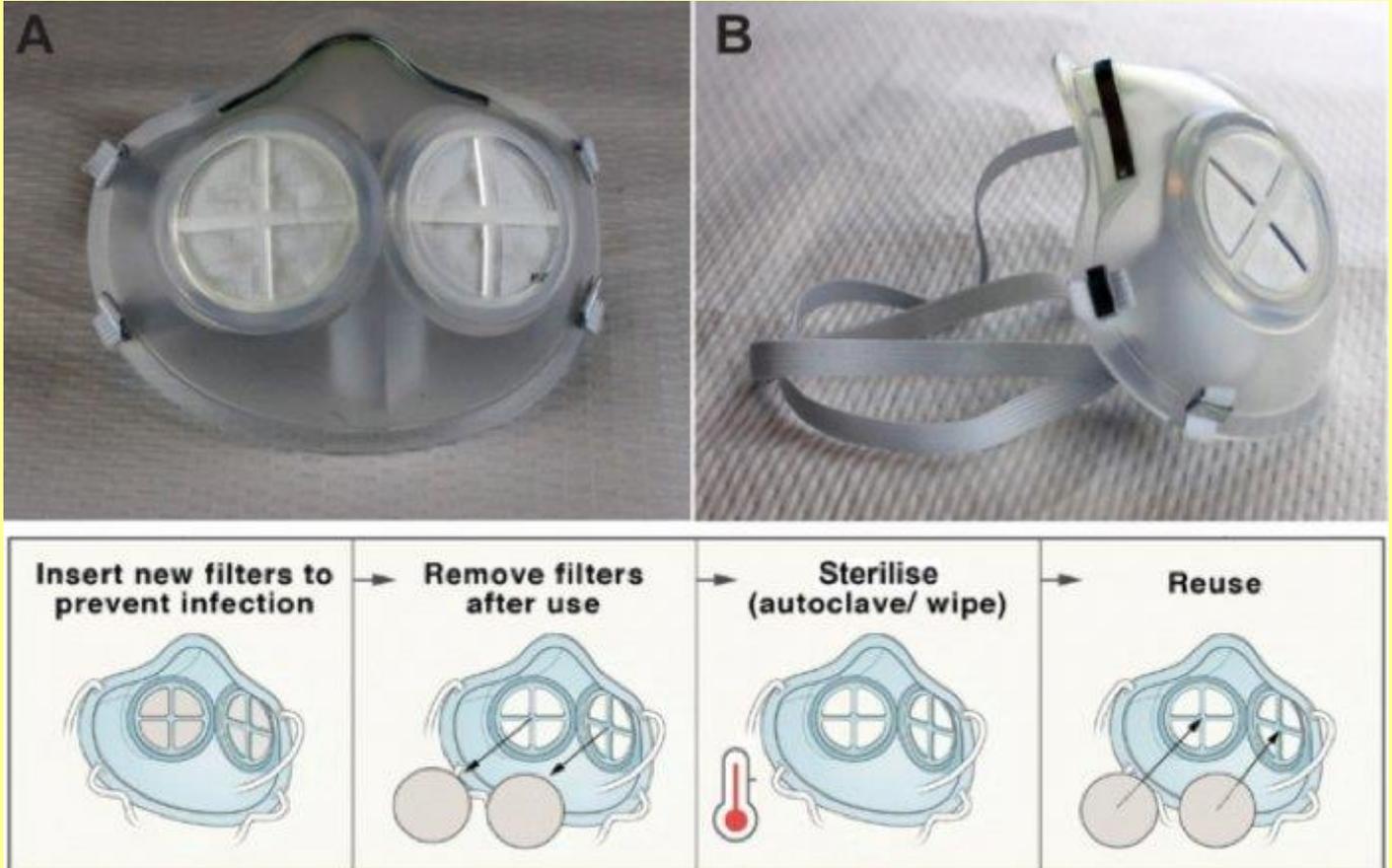
"We also wanted to maximise the reusability of the system, and we wanted systems that could be sterilised in many different ways." The answer, which is now undergoing its second round of development, is a [reusable mask made from silicone rubber](#), capable of being worn again after sterilisation, and still offering the protection of N95 – in theory – via the use of one or two filters that can be inserted at the front of the mask.

In other words, the most important functional part of the N95 respirator – the polypropylene material that filters out [at least 95 percent](#) of airborne particles – is still there, but this



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alternative way of wearing it means much less one-time-use material needs to be manufactured before being thrown away. At least, that's the supposed 'ideal' use case of N95 masks. In the grim reality of the pandemic and the surges in coronavirus patients it creates, healthcare workers around the world have been forced to innovate unproven ways of cleaning and reusing their own disposable personal protective equipment (PPE), or fashioning their own in-house replacements – simply because they don't know when the next batch of new masks will actually arrive.



For people trying to save lives on a daily basis, that's not good enough; it can put them, their patients, their families, and everybody else downstream at risk – a serious problem that could in part be mitigated by an experimental design like this.

"With this design, the filters can be popped in and then thrown away after use, and you're throwing away a lot less material than an N95 mask," [says](#) MIT materials scientist Adam Wentworth.

The mask system – called **Injection Moulded Autoclavable, Scalable, Conformable (iMASC)** – was designed with the help of computers, using 3D-modelling to simulate the behaviour and deformation of the silicon design when worn on different kinds of face shapes and sizes.

In the study, the developers [estimate the rough cost of the masks](#) could be as low as about US\$7 each, with filters perhaps 50 cents each; after a little more than a dozen uses, iMASC could thus become a more economical option than N95 masks costing a dollar each.

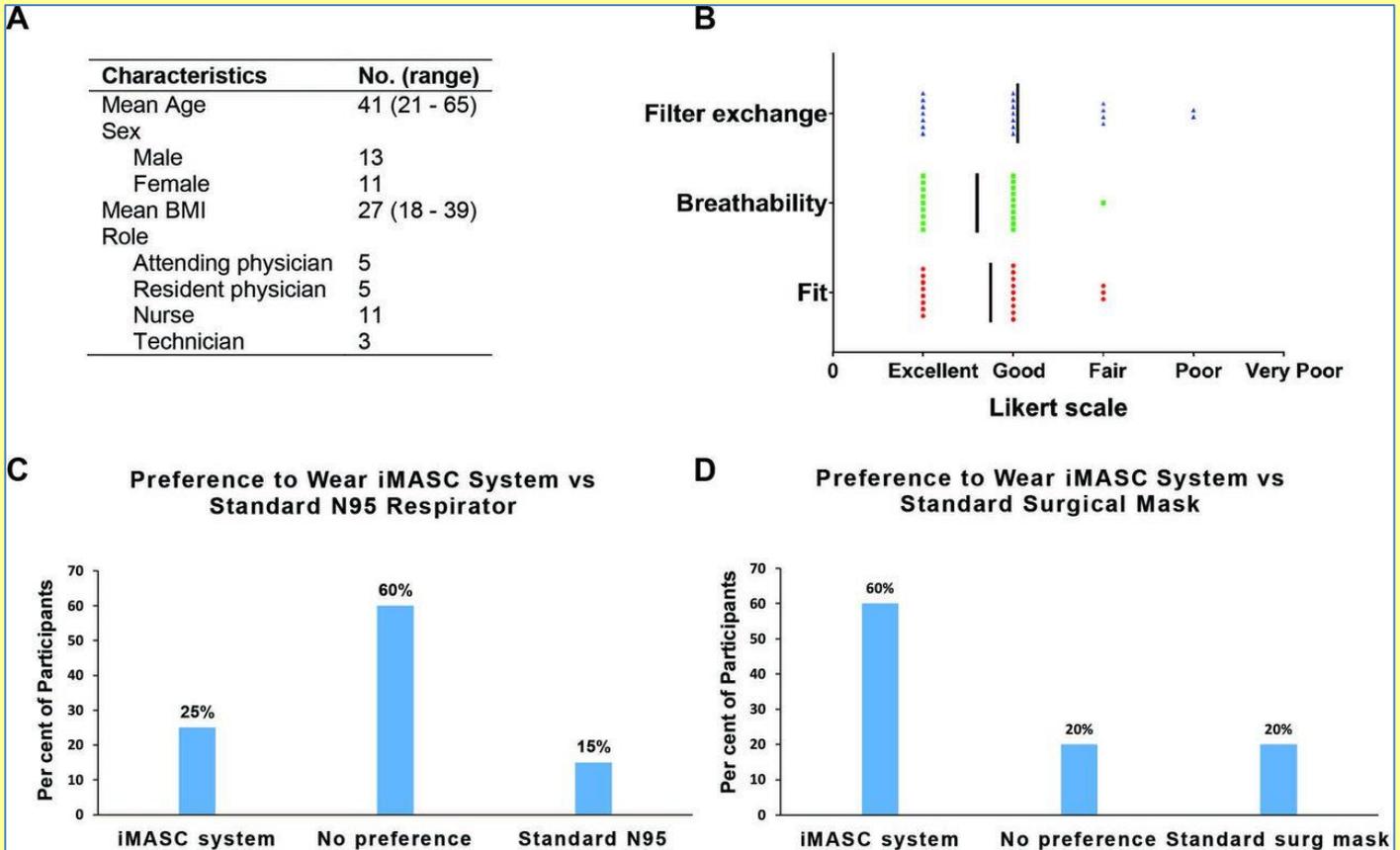
To test iMASC wearability in real life, the researchers had 20 hospital workers try to fit the mask per the standard fit test required by the Occupational Safety and Health Administration (OSHA) for N95 masks. All 20 participants passed the fit test – indicating they had established a proper seal – and the mask also scored well on ratings relating to fit, breathability, and ease of filter replacement. Various sterilisation techniques were also explored on the silicone material – including steaming, heating the masks in an oven, and soaking in bleach or isopropyl alcohol. Aside from minor differences in the feel of the silicone afterward, the masks showed no changes or signs of damage.

Based on initial feedback provided to the researchers, a second version of the mask has now undergone further testing, and if results can demonstrate that the replaceable filter



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system is effective at filtering viral particles too – something not tested in this initial proof-of-concept study – we could very well be looking at a new generation of PPE here. And not before time.



Fit testing of Injection Molded Autoclavable, Scalable, Conformable (iMASC) system in healthcare workers and their user experience. (A) Demographics of participants (n=24) enrolled in fit testing clinical trial. (B) User experience (n=20) with the mask based on a Likert scale. User preferences (n=20) comparing the iMASC system to the (C) standard surgical mask and (D) N95 respirators. BMI, body mass index.

"When the virus started popping up in the US, we talked about the need for PPE, and identified really early on that there was going to be a large deficit within the United States as well as the world," first author and radiation oncologist James Byrne from Harvard and MIT told [Fast Company](#).

"We really put our heads together to try to come up with something that was sustainable, and that's how we really came up with this reusable, scalable, conformable, flexible mask."

►► The findings are reported in [BMJ Open](#).

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