8\20

HZS CBRNE DIARY

Dedicated to Global First Responders

August 2020

coronavirus is airborne

Part A

نحن كلنا لبنانيون!

A HOTZONE SOLUTIONS GROUP PUBLICATION

HZS C²BRNE DIARY– 2020©

August 2020

Website: www.cbrne-terrorism-newsletter.com

Editor-in-Chief

BrigGEN (ret.) Ioannis Galatas MD, MSc, MC (Army)
PhD cand
Consultant in Allergy & Clinical Immunology
Medical/Hospital CBRNE Planner & Instructor
Senior Asymmetric Threats Analyst
Manager, CBRN Knowledge Center @ International CBRNE Institute (BE)
Senior CBRN Consultant @ HotZone Solutions Group (NL)
Athens, **Greece**

Contact e-mail: igalatas@yahoo.com

A publication of

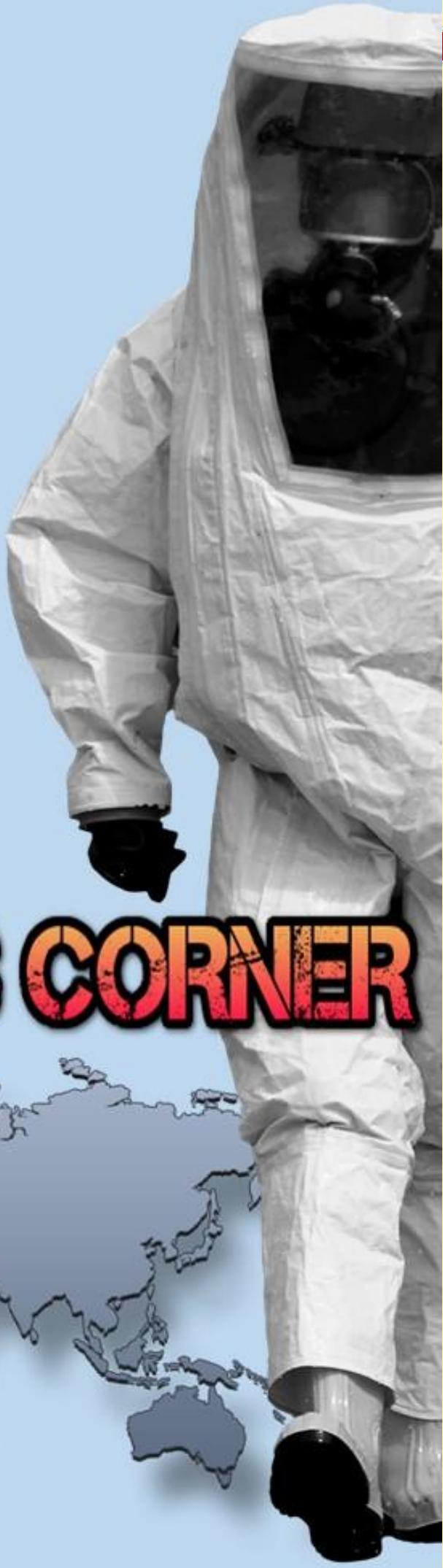
HotZone Solutions Group
Prinsessegracht 6, 2514 AN, The Hague,
The Netherlands
T: +31 70 262 97 04,
F: +31 (0) 87 784 68 26
E-mail: info@hotzonesolutions.org

HOTZONE SOLUTIONS GROUP

ICI International CBRNE INSTITUTE

C2BRNE DIARY

SINCE 2005



EDITOR'S CORNER

Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

History will record the first 8 months of 2020 as the period when two letters of the CBRNE acronym were recorded alone and in parallel: "B" and "E".The Covid 19 officially started in January and in August was enriched with the Beirut's Port explosion and carnage. The overall situation we are currently living in is becoming a solid proof that "the unexpected always happens" – a quote I always teach in all CBRNE courses and something I am trying to enforce in my personal life – not always successfully. In that respect, a dirty bomb or a nuclear power plant accident or "accident" it would be no surprise at all.

Covid-19 is still here and it seems that is the only one who is happy with summer vacation time, sun, and high temperatures. People all over the world consider having a good time and party more important than their own and collective lives. If you do not believe that have a look in the photo below (Bournemouth, SW UK). Not even one of those on this beach has an AC unit and a bath tub or a

shower at home! It is summer. In summer, we go to the beach and have fun. End of story! Ah! We also have a good time telling jokes and funny stories. The latest joke is only a single word: mask! The hypothesis that all people would like to be doctors or prime ministers was proven wrong and it seems that all the nice words about the healthcare heroes were just enthusiastic comments during the first offensive time of the pandemic. Suntan and cold beer (or hot if you are British) are more important than what medical people are declaring. The economy is of course another important issue since you can not have an omelet without breaking eggs. Of course many forget that in order to make money one has to be alive but this is not important in modern times. Countries with tourism as their "heavy industry" (e.g. Greece) are suffering the consequences and those involved in this industry sector are terrified because they have to find work to do in order to

survive during the 7-8 months they were enjoying the profits of "intensive" summer work. Do not get me wrong and think that I do not like or respect or that I envy tourism sector that significantly contributes in the national GPD. It is that I was never been able to understand the term "heavy industry" for a sector activated only 4-5 months per year. I thought that the shipping industry or car industry or chemical/oil/gas industries should be addressed as "heavy" that is all. Perhaps the ongoing pandemic crisis could become the opportunity to change course and be more productive and more "heavy"! Of course, there is the possibility that God and scientists will provide/find a solution soon that will enable people to go back to their "normal" lives. Yes! Those before the "new normal" and the "would you like to play the doctor" situation. When Covid-19 will go to court for crimes against global society its defense would surely be "I did what I did but what did you all do to protect and change?"

All these months we got used to fight an invisible enemy with an amazing "brain" able to counter all our defenses and treatment spectrum. In August, the offensive was much more visible and audible. It looked like nuclear but it was not though it was on a small

scale similarly catastrophic almost killing an entire capital, Beirut, Lebanon. What caused this enormous disaster is not known in detail. Stored ammonium nitrate is the first to blame but if this is proven right it would be the first time ever that fertilizer was activated and exploded by human stupidity and this is a parameter that we must get used to taking into account during disasters of any kind. It would be wise for all of us – "experts" included – to wait at least the official investigation report despite the fact that such reports take time and time has different expressions in various parts of the world. In the meantime, although this is a Lebanese problem, it would be wise to think if there is a similar "sleeping bomb" in our country and in our ports and cities – because there are![1] And we

[1] **Chennai, India:** Ten containers with 181 tonnes of ammonium nitrate were moved by Customs officials from the Manali Sattva Container Freight Station to a Hyderabad-based buyer. The transfer was done with 12-point instructions by the Chennai police and Petroleum and Explosives Safety

know that! And we do nothing about it! And we keep on thinking that "it will not happen to us!" Well, it happened in Lebanon; in Cyprus; in France and a few other places!
Healthcare providers were hit hard in four Beirut hospitals and a number of colleagues died in the line of duty. Just another reason to reherse our emergency response plans and adjust them into worst case scenarios – this should be applicable for both the pandemic, radiological, and the mega-explosion incidents.

As if a pandemic and a catastrophic urban explosion were not enough we faced an escalation of the oil/gas drilling crisis in the South/SE Mediterranean mainly because of the Turkish perception of negotiation: "what is mine is mine; what is yours is mine as well!" A military "accident" was/is that close to happen in the the sea or in the Greek skies – like the one that recently took place between Greek firgate *Limnos* and Turkish frigate *Kemal Reis* (photo left). The overall situation is very didactic for countries all over the world to realize three things: (1) In difficult times you are alone; (2) There are no allies; just opportunistic friends caring only about their own ambitions, profits and overall dominance; and (3) Peacekeeping requires strong armed forces especially in countries laying in geostrategic crosspoints or where West meets East. I might add a fourth remark – something like the hilarious "*we belong to the West*" – but this journal is not the right forum to do that.

Stay alert First Responders! Be safe in order to be able to offer your services to others! Keep in mind that Covid 19 is not the only one being airborne – stupidity is as well! Allways keep in mind that you ALL are the last defense and the only hope of the victims!

The Editor-in-Chief

The White Mountains, Crete

IS prisoner issue a ticking timebomb for the West

Source: https://www.bbc.co.uk/news/world-middle-east-53428928

July 24 – It is feared that released foreign fighters could resort to attacks on home soil.

The latent danger posed by thousands of defeated and captured fighters who joined the Islamic State (IS) group is festering and growing in the squalid, overcrowded prison camps of north-east Syria, where riots and attempted breakouts are becoming commonplace.

IS has vowed to liberate them, along with their wives and dependants, while a people-smuggling network is reportedly being put together using bribery to secure covert releases.

The ruling this month by Britain's Court of Appeal that the British-born former schoolgirl Shamima Begum, stripped of her UK nationality, had a right to return to the UK to face justice has also thrown a spotlight on the issue. As has the recent death in Kurdish custody of a British IS fighter.

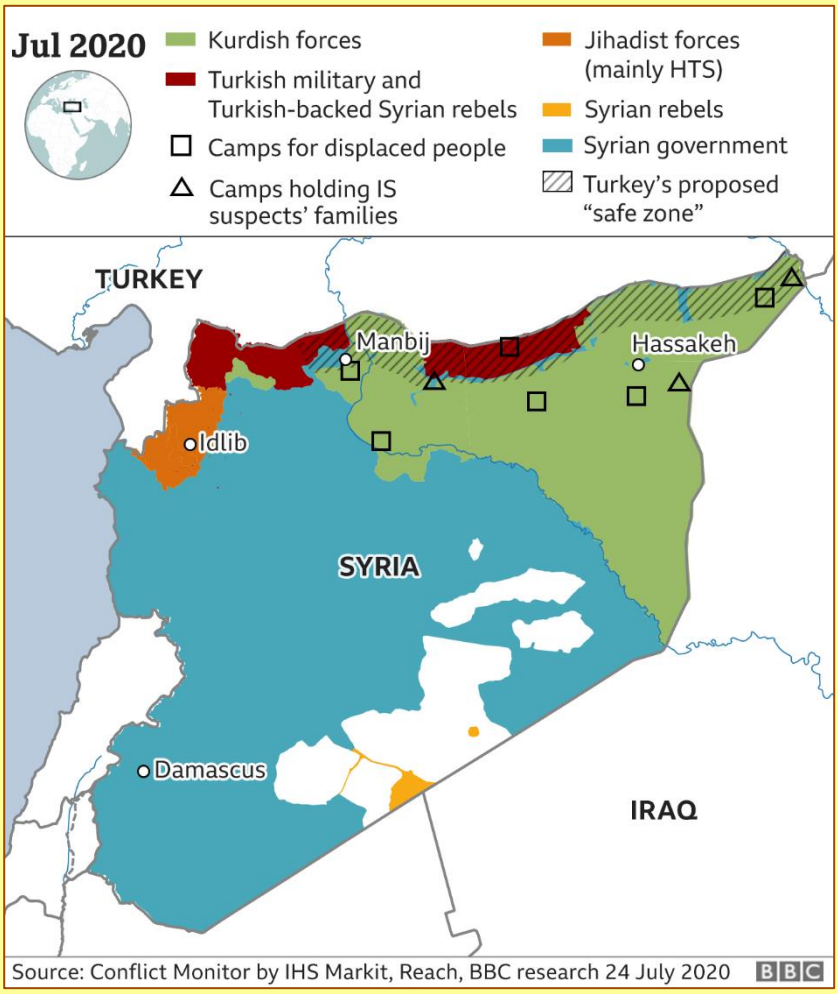
When IS lost the last of its self-declared caliphate at Baghuz in Syria in March 2019 thousands of its surviving members were rounded up and interned indefinitely in camps run by the Syrian Kurds who had fought them.

This, say critics, is unfinished business that risks developing into a renewed security problem for the world.

Research published by Kings College London Defence Studies this month warned that escaping IS fighters were regrouping in other parts of the world and that there was now a risk IS could regroup.

If we are committed to defeating IS," says the chairman of Britain's Parliamentary Defence Committee Tobias Elwood MP, "that doesn't mean just packing up after the air campaign is over.

There are tens of thousands of extremists, hardliners' families and other supporters of IS that remain in Iraq and Syria. And we have to make a decision as to whether we are committed to make sure that we defeat Daesh [IS] completely or the ideology will live on as they're able to regroup.



Fighters' offspring

Around 40,000 jihadists are believed to have flocked to Syria to join IS between 2014-19. Estimates of those so-called Foreign Terrorist Fighters who have survived – some in prison, some at large – range between 10,000-20,000.

A few have been processed through the court system in neighbouring Iraq but most are languishing in camps that the IS fugitive leadership has vowed to liberate, including women, whom they call "the chaste women" and "the brides of the caliphate".

Media captionChildren held in Islamic State group camps "are a time bomb"

The UN estimated earlier this year that there were around 8,000 children of Foreign Terrorist Fighters held in Kurdish-run prison camps. Of these, over 700 children are believed to be from Europe, from countries – including the UK – that have so far been reluctant to take them back.

Female enforcers

Anne Speckhard runs the International Centre for the Study of Violent Extremism. She has interviewed over 200 jihadists and their families over the last three years.

She has also visited camps in north-east Syria like Al-Hol, where she says the conditions are appalling and there is an escape attempt almost every week.
Many of the women there have renounced IS but are living in constant fear of retribution.
There are IS enforcers in the camps, she says. And these are women that kill other women. They set their tents on fire. They throw rocks and teach their children to throw rocks.
So, does that mean that all the dependants of IS fighters incarcerated in these camps are die-hard jihadists? No. Many have quietly turned their backs on extremist ideology but live in fear of the fanatical female enforcers.

The IS prisoners no-one wants

Under the so-called caliphate those enforcers belonged to the Hisbah, the female morality police, who meted out harsh punishments. Today, despite being behind barbed wire in the camps, they have effectively reconstituted themselves as the same thing.
Part of our research project is asking the women to tell their stories and to speak out, says Ms Speckhard. But they're terrified because they're afraid they'll be punished.
So, the kids are growing up with fear, trauma from having been in IS and trauma from being in this camp.
One country that has made a point of taking back its nationals who are dependants of IS fighters is Russia, from where a large number of jihadists went to join the group from its troubled north Caucasus region.
[Russian President] Vladimir Putin supported the idea of repatriating women and children," says Ekaterina Sokirianskaya, Director of the Conflict Analysis and Prevention Centre in St Petersburg.
He made a clear statement that children were not responsible for what their parents did and that Russia could not leave them behind in the war zone.

Considerations

Broadly speaking, from a legal perspective the issue of the abandoned jihadists of IS breaks down into three strands: legal, humanitarian and security.
From the legal aspect it is indefensible to leave thousands of people – especially children – stranded in limbo in these camps with no trial in sight.
Many jihadists, both fighters and their dependants, say they are prepared to come home and face justice and even do their time in prison.
The problem is that Western governments fear bringing them home – a deeply unpopular measure domestically – in case there is insufficient evidence to convict them and they are then obliged to release them into the population.
They also worry what effect it would have on already overcrowded prisons should there be an influx of hardened, radical jihadists who have spent years fighting for their cause in Syria and Iraq.
On the humanitarian side, there is mounting criticism from aid agencies and others about the poor conditions in the overcrowded prison camps.
Here there is little public sympathy anywhere in the world for followers of a death cult that inflicted unspeakable torture and cruelty on so many, enslaving and raping girls as young as nine.
But the West lost much of its moral authority in the Middle East after 2001 when the US carried out "extraordinary renditions" and flew hundreds of suspects to a remote naval base in Cuba, Guantanamo Bay, to be imprisoned there without trial.
For European countries, which themselves condemned Guantanamo Bay, to now ignore the problem of its abandoned citizens simply because it is too difficult lays them open to a charge of hypocrisy.
Finally, there is the security aspect. Ultimately this comes down to a choice for governments as to which is more dangerous: bringing their nationals home to face justice or leaving them out there.
So far, more than 400 Britons have returned from the Syrian battle space to the UK and they have presented very few security challenges.
But those were mostly people who went out in the early years of the Syrian uprising.
Today, MI5 (the UK's domestic intelligence agency) and the police worry that some of those still in the camps are far more radicalised, having been exposed to extreme violence over a period of years.
And Ms Sokirianskaya, from Russia, adds her own words of warning.
We're not even talking about this from just a humanitarian point of view. [Dealing with the problem] is an absolute must to prevent even more ultra-radical jihadist movements in the future because we're talking about them growing up in extremely radicalised conditions in the camps.

The Home Office in London says it would like to see those suspected of crimes prosecuted in Iraq and Syria.

What next?
But is it possible to separate out their dependants and bring them home while leaving the male fighters to face justice? Anne Speckhard believes it is.
A lot of women, she says, if they're successfully prosecuted would probably get a stay of sentence. But if they do go to prison, at least their children can visit them. They're not stuck in Syria, in danger.
So, the best thing is to bring children and mothers back together. But if that's unpalatable, can't be done, then at least bring the children to safety.
Either way, it is clear that the present situation cannot continue indefinitely.
The Syrian Kurds, who fought IS and who now guard the camps, have their own problems to worry about.
President Trump's partial withdrawal of US Special Forces from Syria has left them exposed to attack by encroaching Turkish forces.
The Kurds' position on all these IS prisoners from Europe is simple: They came from your countries. We cannot guard them for much longer. You need to take them back.

EDITOR'S COMMENT: Why Europe is complicating a problem with an easy and safe solution?

Jurassic World 3: The dinosaurs could they integrate the army as a weapon of destruction?

Source: https://thesaxon.org/jurassic-world-3-the-dinosaurs-could-they-integrate-the-army-as-a-weapon-of-destruction/20244/

July 26 – Then we wonder what will the future of dinosaurs in the late *Jurassic World 3,* the film could take a new turn in the making of these prehistoric creatures of the weapons of mass destruction for the benefit of the Government. If the latter should play a leading role vis-à-vis the survival of the dinosaurs, one could imagine a different scenario, in which forces decision-makers make every effort to use these genetically modified animals as weapons used on the battlefield. Although this idea may seem at first surprising and surreal, the franchise, *Jurassic World* has proven many times that she could exceed the limits of the understanding, the latter even going so far as to denounce the drifts of the science and cloning.
Not to mention horror movie, these remarks might in fact indicate the perverse intentions of the Government vis-à-vis the scientific research, using some of the drifts to its own army. Without that the feature falls in the shadow and in the effects too poussifs of the show – at the risk of making the plot ridiculous -, this story could make sense of the film and offer a direct sequel to the questions raised by *Fallen Kingdom*.
The presence of these weapons robotic version prehistoric could also, ultimately, to confirm the words of the producer of *Jurassic World 3*, Frank Marshall, who compared himself in a recent interview, the movie from Colin Trevorrow with the birth of a new era. Should we therefore expect the worst from humanity ?

Narcissists Don't Learn from Their Mistakes Because They Don't Think They Make Any

Source: https://journals.sagepub.com/doi/10.1177/0149206320929421

July 26 – **When most people find that their actions have resulted in an undesirable outcome, they tend to rethink their decisions and ask, "What should I have done differently to avoid this outcome?" When narcissists face the same situation, however, their refrain is, "No one could have seen this coming!"**
In refusing to acknowledge that they have made a mistake, narcissists fail to learn from those mistakes, a recent study from Oregon State University – Cascades found.
The mental process of analyzing past actions to see what one should have done differently is called "should counterfactual thinking." Counterfactual thinking is the mental process of imagining a different outcome or scenario from what actually occurred.
All of us engage in some level of self-protective thinking, said study author Satoris Howes, a researcher at OSU-Cascades with the OSU College of Business. We tend to attribute

success to our own efforts, but blame our failures on outside forces — while often blaming other people's failure on their own deficiencies.

"But narcissists do this way more because they think they're better than others," Howes said. "They don't take advice from other people; they don't trust others' opinions. … You can flat-out ask, 'What should you have done differently?' And it might be, 'Nothing, it turned out; it was good.'"

Narcissism is typically defined as a belief in one's superiority and entitlement, with narcissists believing they are better and more deserving than others.

The study, published recently in the *Journal of Management*, consisted of four variations on the same experiment with four different participant groups, including students, employees and managers with significant experience in hiring. One of the four was conducted in Chile with Spanish-speaking participants.

Participants first took a test that ranked their narcissism by having them choose among pairs of statements ("I think I am a special person" versus "I am no better or worse than most people"). In the first of the four variations, they then read the qualifications of hypothetical job candidates and had to choose whom to hire. After choosing, they were given details about how this hypothetical employee fared in the job, and were assessed regarding the extent they engaged in "should counterfactual thinking" about whether they made the right decision.

The four variations employed different methods to analyze how counterfactual thinking was affected by hindsight bias, which is the tendency to exaggerate in hindsight what one actually knew in foresight. The researchers cite the example of President Donald Trump saying in 2004 that he "predicted the Iraq war better than anybody."

The authors note that prior research has shown that hindsight bias is often reversed as a form of self-protection when a prediction proves to be inaccurate — e.g., Trump saying in 2017 that "No one knew health care could be so complicated" after failing to put forth a successful alternative to the Affordable Care Act.

Either way, the narcissists didn't feel they needed to do something differently or engage in self-critical thinking that might have positive effects on future decisions. Image is in the public domain.

In the OSU study, researchers found that when narcissists predicted an outcome correctly, they felt it was more foreseeable than non-narcissists did ("I knew it all along"); and when they predicted incorrectly, they felt the outcome was less foreseeable than non-narcissists did ("Nobody could have guessed").

Either way, the narcissists didn't feel they needed to do something differently or engage in self-critical thinking that might have positive effects on future decisions.

"They're falling prey to the hindsight bias, and they're not learning from it when they make mistakes. And when they get things right, they're still not learning," Howes said.

Narcissists often rise in the ranks within organizations because they exude total confidence, take credit for the successes of others and deflect blame from themselves when something goes wrong, Howes said.

However, she said, over time this can be damaging to the organization, both because of low morale of employees who work for the narcissist and because of the narcissist's continuing poor decisions.

To avoid the trap of hindsight bias, Howes said individuals should set aside time for reflection and review after a decision, even if the outcome is positive. Whether the decision was favorable or unfavorable, they should ask themselves what they should have done differently. And because narcissists don't engage in this process, Howes said it would be wise to have advisory panels provide checks and balances when narcissists have decision-making authority.

Co-authors on the study were Edgar E. Kausel at the Pontificia Universidad Catolica de Chile, Alexander T. Jackson at Middle Tennessee State University and Jochen Reb at Singapore Management University.

EDITOR'S COMMENT: I knew it! I knew it that there was something wrong with the "it will never happen to me" people in high places!

ISIS exploiting coronavirus security gaps to relaunch insurgency, UN report warns

By Paul Cruickshank (CNN Terrorism Analyst)
Source: https://edition.cnn.com/2020/07/23/politics/isis-coronavirus-un-terrorism-report/index.html

July 23 – There has been a significant rise in ISIS attacks in Iraq and Syria, with the group exploiting security gaps in Iraq caused by the coronavirus pandemic to relaunch and invigorate its rural insurgency in the country, according to a report submitted to the UN Security Council that was made public on Thursday.
The wide-ranging report, put together by the UN monitoring team that tracks the global jihadi terror threat, states that the group is consolidating in Iraq and Syria and "showing confidence in its ability to increasingly operate in a brazen manner in its former core area."
It states that the number of ISIS attacks in Iraq and Syria "increased significantly in early 2020 as compared with the same period in 2019."
Referring to the situation in Iraq, the UN monitoring team stated that ISIS has "exploited security gaps caused by the pandemic and by political turbulence in Iraq to relaunch a sustained rural insurgency, as well as sporadic operations in Baghdad and other large cities."
In recent weeks in particular, Iraq has seen a huge surge in Covid-19 cases, with the number of cumulative cases surpassing 100,000 on Thursday compared with fewer than 7,000 confirmed on June 1.
Syria has far fewer confirmed cases, but leaders of the US-backed Syrian Democratic Forces say ISIS has exploited the fact that the pandemic has limited the SDF's mobility in the region. Gen. Mazloum Abdi, the top commander of the SDF, told CTC Sentinel, the monthly publication of the Combating Terrorism Center at West Point, in June that a major Covid-19

outbreak would limit his forces' ability to counter the Islamic State "because we will be busy managing the situation in detention facilities" where the group currently houses thousands of former ISIS members.
The newly released UN report, which is based on information from member states, estimates that there are currently more than 10,000 ISIS fighters in Iraq and Syria.
One reason for ISIS's resilience in those countries is money. According to the new UN report, member states assess ISIS still has approximately $100 million in reserves. It states the group's assets are "believed to take the form of cash, buried or stored in caches across the conflict zone or kept with financial facilitators in neighbouring countries. Some of the funds have been invested in legitimate businesses in Iraq, the Syrian Arab Republic and neighbouring countries."

Report challenges Trump's narrative
The new United Nations findings challenge the narrative of President Donald Trump, who earlier this year claimed to have destroyed "100% of ISIS and its territorial caliphate."
The UN monitors also presented a more pessimistic assessment than that recently presented by the Trump administration. In June, Ambassador James Jeffrey, the special envoy to the global coalition to defeat ISIS, stated that although ISIS remained "a resilient and significant threat" in Iraq and Syria, there had been a small reduction in the overall number of ISIS attacks and a lessening in their complexity, "so we think the situation is not getting worse, it's getting better."
The UN report does not paint a uniformly negative picture of the evolving ISIS threat in Iraq and Syria. It noted that several significant ISIS leaders had been removed since Abu Bakr al-Baghdadi was killed last October and that "as some financial facilitators are captured or killed in counter-terrorism operations, knowledge of the whereabouts of hidden funds may also be lost."
The new UN report also notes that ISIS's new leader Amir Muhammad Sa'id Abdal-Rahman al-Mawla "has not visibly asserted himself in communications, which may prove to be a limiting factor in his influence and appeal, and perhaps that of the group."
In June the US government doubled the reward for information about al-Mawla to $10 million.
When it came to the big picture the new UN report noted that although ISIS "maintains the ambition to control territory and populations ... for the moment, [it] represents an entrenched rural insurgency without the reach to threaten urban areas on a sustained basis."

Covid-19 and the global terror threat
The UN report finds that outside of Syria, Iraq and other conflict zones, the short-term terror threat has fallen as a result of the Covid-19 pandemic, noting that "restrictions on international travel significantly constrain terrorist mobility, networking and finance-related activity" and that targets have become more elusive because of the discouragement of public gatherings
However, it warns that ISIS has "had a captive audience during the lockdown and, if it has successfully used this for planning and recruitment purposes, it is possible that the easing of restrictions in non-conflict zones will see a spike in attacks once targets become available again. Another motivation is fear of irrelevance: COVID-19 largely eclipsed terrorism from the news."
The report warns that should the pandemic lead to a severe global recession that could create conditions where terrorist and extremist narratives gain increased currency.
The report also noted that there have been no indications that ISIS "is systematically attempting to weaponize the virus."

Concern over al Qaeda
The report warns that the security situation in West Africa and the Sahel is a particular cause for concern, stating that ISIS and al Qaeda franchises there "continued to enjoy operational success in early 2020," which led to heightened concerns about stability in the region.
It also states that al Qaeda remains active in Afghanistan nearly 19 years after 9/11 and notes that its leadership continues to maintain a close relationship with the Haqqani network, a powerful subgroup within the Afghan Taliban.
A Pentagon report published earlier this month reached a similar conclusion.
The persisting close relations between al Qaeda and the Taliban are widely seen as one of the main stumbling blocks to future progress in the peace process in Afghanistan in the wake of the agreement signed between the US and the Taliban earlier this year. Though there has been speculation that al Qaeda leader Ayman al-Zawahiri may, like Osama bin Laden, have hidden in Pakistan, the UN report states that according to member states, al-Zawahiri is currently based in Afghanistan. The report finds that should al-Zawahiri's "poor health ... force a leadership succession, it will be challenging for Al-Qaida in the context of a peace process" in Afghanistan.
The report also found that al Qaeda has "ingrained itself in local communities and conflicts" around the world, with its recent "favored" affiliate in Syria, Hurras al-Din, "committed to

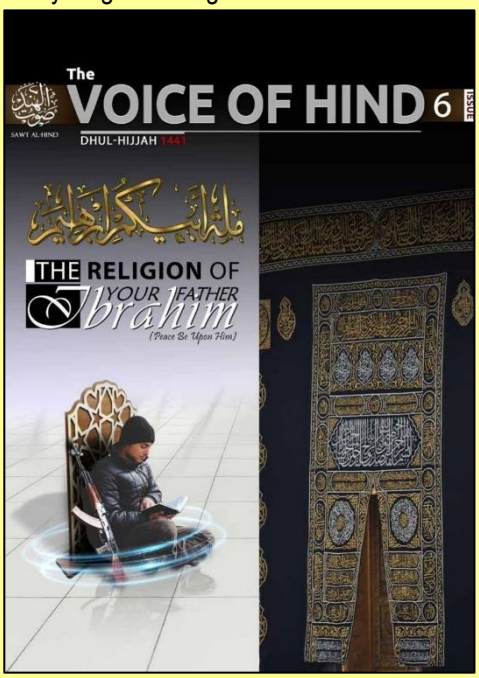
preparing for external attacks despite its current focus on targeting Syrian forces" and its Yemeni affiliate, al Qaeda in the Arabian Peninsula, still "determined to mount external operations."
According to the US government, AQAP had "significant ties" to Saudi air force officer Mohammed Alshamrani, who carried out a terrorist attack that killed three at Naval Air Station Pensacola in Florida in December 2019.
The report states that "during his time at Pensacola and up to the day of the attack, Alshamrani was in direct contact with Abdullah al-Maliki, an AQAP media and Internet recruitment operative who was killed in Yemen on May 13. The Pensacola attack is believed to have been planned prior to Alshamrani's arrival in the United States." In a May news conference, Attorney General William Barr and FBI Director Christopher Wray revealed that al-Maliki had been targeted in a counterterrorism operation but did not spell out whether he had been killed.

Territorial Losses Only a 'Temporary Transition' and 'Tactical,' Says ISIS Magazine

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/territorial-losses-only-a-temporary-transition-and-tactical-says-isis-magazine/

July 28 – A new English-language magazine from ISIS supporters insists that territorial losses were a tactical decision by the Islamic State, and called for loyalists to be broken out of prisons around the world including in the United States.
The first issue of "**The Voice of Hind**" was released in late February to coincide with President Trump's visit to India. The second issue of "Voice of Hind," released in March, encouraged attacks using simple weapons and tactics specifically targeting military and police officers who "have been deployed in their streets and alleys, thus making them an easy target" during the chaos of the coronavirus pandemic.



That issue also listed some ways to "annihilate the disbelievers," including vehicle attacks, knife and ax attacks, arson, and poisoning food and drink.
Between its fourth and fifth editions, the creators released a "lockdown special" edition of the magazine encouraging steps to "annihilate the disbelievers" including stabbing people with scissors and expending "less effort" by spreading deadly coronavirus. The issue tried to goad followers into spreading the virus, calling it "a weapon far greater than stones" and adding, "What better chance can you get to kill the disbelievers in multitudes than COVID 19?"
In the new sixth edition of the magazine, the authors mention "beloved sister" Aafia Siddiqui, aka "Lady al-Qaeda," while discussing ISIS prison break operations, as well as the ISIS wives still being held by the Syrian Democratic Forces. "There are still thousands of sisters imprisoned by the apostate SDF in al Houl Camp and they are living in extreme difficult conditions," the article states, noting "many others who are still in the prisons of America, Europe and the rest of the world."
The magazine threatens one European country — "we still consider Spain ours and its revenge is inevitable" — and vows to "never forsake our brothers who are in the prisons of America, Russia, Iran, India, Pakistan, Afghanistan, China, Saudi Arabia, Libya, Tunisia, Algeria, Africa and others."
Another article in the issue talks about jihadists "lying in wait for the enemy every day" to "make sure that no day will goes [sp] by without shedding the filthy blood of the enemies of Allah," calling "like one battle" Islamic State operations "from Iraq to Syria, Yemen to Sinai, East Asia to West Africa, Khurasan to Hind."
"Today, the enemy has penetrated into the cities and is roaming the streets and setting up bases almost everywhere. However, it does not mean that the enemy has achieved its goals and defeated the Munahedeen. Since our battle is actually within the populations in the cities and the tactics of defense and attack vary according to the situation," the article continues. "And the results of such a fierce battle do not come in a matter of weeks or months, but rather a decisive victory for either side in such type of war takes a long time. If the Islamic State had to tactically retreat from some areas where Allah's Shariah was enforced, it did not do so unless it made sure that every inch the Kuffar took from the Islamic State proved as an inferno for the infidels."
The magazine adds that territory reclaimed from ISIS is only "a temporary transition and it is only a matter of time that Islamic State takes them back, this time more strongly though."

Bridget Johnson is the Managing Editor for Homeland Security Today. A veteran journalist whose news articles and analyses have run in dozens of news outlets across the globe, Bridget first came to Washington to be online editor and a foreign policy writer at The Hill. Previously she was an editorial board member at the Rocky Mountain News and syndicated nation/world news columnist at the Los Angeles Daily News.

Is Terrorist Rehabilitation a Farce? A New Study Suggests Sometimes Yes

By Kalyna White

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/is-terrorist-rehabilitation-a-farce-a-new-study-suggests-sometimes-yes/

July 28 – A recent report released by The International Centre for the Study of Radicalization (ICSR) at King's College in London found **terrorists in captivity may be "faking" their rehabilitation to commit further terrorist acts**.

"Prisons and Terrorism: Extremist Offender Management in 10 European Countries" looked at the imprisonment and rehabilitation of terrorists with nations using different rehabilitation programs, and found that despite low recidivism rates overall there was no way to guarantee that a terrorist had truly been rehabilitated, ultimately putting others at risk.

The study was based on a 2010 study also released by ICSR; however, it focuses on a narrower set of countries in Europe. The study provides an overview and analysis of trends within the extremist offender population; attacks and operational planning within prison systems; measures aimed at preventing radicalization and recruitment; prison regimes for extremist offenders; and reintegration and release policies.

Each country has different conditions based on their law that need to be met in order for a prisoner to be released. In every country, after a prisoner's sentence comes to an end, they will be released. However, in some countries, such as Sweden, a prisoner has to exhibit "serious misbehavior" in order to have their release postponed. Many countries release prisoners on parole.

The rehabilitation programs vary from country to country. However, most countries have shifted toward focusing on disengagement (a change in behavior) rather than de-radicalization (a change in ideas). The majority of the rehabilitations follow the same basic principles: they begin with an assessment, are individually tailored, and involve a variety of interventions, such as cognitive behavioral therapy, mentoring, and structured dialogue tool. Many European countries chose to have the rehabilitation program be voluntary for the inmate. Only France and Britain's programs are compulsory, the argument being that the programs can do no harm. France and Britain are again the outliers in terms of including ideological conversion in their programs, offering a deep analysis into prisoners' beliefs and asking them to re-evaluate them.

In some countries, once a prisoner is granted parole, the former terrorists have to meet with an ideological mentor. The Netherlands has created a comprehensive post-release program specifically for those charged with terrorism. "The Dutch Probation Service's Terrorism, Extremism and Radicalisation team works closely with the prison service, identifying inmates that are due for release, developing a relationship with offenders while they are still incarcerated and facilitating their transition back into society by helping with social, psychological, and ideological needs," said the report.

These programs have varied success in stopping offenses once the prisoners have been rehabilitated. However, across Europe the rates of another offense range from 2 percent to 7 percent. This is a very low number, compared to some countries where the rate exceeds 50 percent. However, these numbers do not account for anyone who avoids conviction, anyone who dies while committing a terrorist attack, or those who have gone abroad. These numbers also only track those who were put in prison for the crime of terrorism, not those who may have been radicalized in prison or have been radicalizing others.

The study shared case studies of some prisoners who manipulated the system, showing remorse and getting out of their long sentences by exhibiting good behavior. One such prisoner was **Usman Khan** (photo, right). Khan was originally arrested for his involvement in a terrorist plot. His sentence was at first indefinite; however, he was soon granted a lighter sentence due to his model behavior. He remained in prison for only eight years before being released on parole, serving the rest of his 16-year sentence on parole. Khan joined the Desistance and Disengagement Programme, a British government program that provides "mentoring, psychological support, theological and ideological advice." Khan was actively in touch with his parole officer, and wore an ankle tag with his location. His behavior was so good that he was allowed to attend a conference by himself called "Learning Together" for rehabilitated prisoners. At the conference, he entered the bathroom and came out with a vest on, which had fake explosives, and two knives taped to his hands. He killed two people attending the conference, and was eventually forced out of the building. In the case of Usman Khan, these rehabilitation efforts failed as he played along with what was expected of him.

In Europe, while the rates of recidivism are generally low, there is very little way to guarantee that the rehabilitation has worked completely, as some prisoners are able to manipulate the system and ultimately are able to hurt others.

***Kalyna White** is an Assistant Editor at HSToday for Climate Change Security and is the STEM Ambassador to the Board of Directors for Women in Homeland Security. She is the founder of LABUkraine, a non-profit organization that builds computer labs for orphans in Ukraine. Since 2011 she has worked with Women in Homeland Security to encourage middle and high school student to pursue STEM careers by organizing and supporting field trips to STEM missions throughout the homeland security enterprise. She is also President of the University of California, San Diego Pi Beta Phi chapter.*

How Often Are Police Shot in the Line of Duty?

By Jennifer Mascia and Chip Brownlee

Source: http://www.homelandsecuritynewswire.com/dr20200728-how-often-are-police-shot-in-the-line-of-duty

July 28 – Though still near historic lows, violent crime has been rising in the U.S. since 2016. So far this year, murders are up 22 percent across three dozen cities. The increase in violence has created a particularly tense moment: Black and Brown communities say they're under attack by the police, and form the backbone of protests against police brutality, while the police say their job is exceptionally dangerous, especially amid calls to defund law enforcement.

There's no disputing that police work remains risky, as a recent case in McAllen, Texas, shows: On July 11, two officers were fatally shot during a domestic assault call. But the "war on cops" that some news reports and police advocates describe isn't backed up by evidence.

A new study from criminologists Justin Nix from the University of Nebraska Omaha and Michael Sierra-Arévalo from the University of Texas at Austin adds more data to the debate, while rejecting the notion that the profession has become increasingly unsafe.

Here are the facts about officer-targeted violence.

How Often Are Police Shot in the Line of Duty?

In a study published in *Criminology & Public Policy* on July 20, Nix and Sierra-Arévalo analyzed fatal and non-fatal shootings of police officers between 2014 and 2019. The analysis relies on data from the Gun Violence Archive, a nonprofit that tracks shootings through media and police reports. During the study period, 1,467 local and state law enforcement officers were shot in 1,185 incidents, 249 of which were fatal. That works out to, on average, 245 officers shot per year, 42 of them fatally. The study excludes federal officers, corrections officers, and shootings of officers by colleagues.

Nix and Sierra-Arévalo observed a spike in firearm assaults against officers in 2016, but did not find a sustained increase over the six-year period of their survey.

According to other research, policing has actually become a much safer profession over the last five decades. A study published last year in *Criminology & Public Policy* found that line-of-duty deaths fell 75 percent between 1970 and 2016, according to an analysis of FBI data.

That said, policing is still a dangerous profession, Nix and Sierra-Arévalo say. "I think we would all agree that being shot at, being wounded by a bullet, amounts to a certain level of dangerousness in a profession," Nix said. Both authors condemned listicles that rank a variety of other professions as being more dangerous than policing, like fishing, logging, and trucking. "You're not really sending pizza drivers or truck drivers to very potentially volatile situations in which there's always at least one firearm and that's the firearm on the officer's hip," Sierra-Arévalo said.

Is Policing More Dangerous in Certain States?

Significantly. The scholars noted a wide divergence between firearm assaults against police at the state level. Mississippi, the state with the highest average rate of firearm assault on police over the six-year period, recorded 2.29 firearm assaults per 1,000 officers, while Connecticut, the state with the lowest number of assaults, recorded .06 firearm assaults per 1,000 officers. (The national mean is .47 firearm assaults per 1,000 officers.) Other states with high rates include New Mexico, Arkansas, Oklahoma, and Colorado. States in the Southeast and Southwest had elevated rates compared to the national average.

While the authors say the reasons for regional differences merit future study, their working hypothesis is that the most violent areas for police may correlate to the number of guns in circulation, permissive concealed-carry laws, and open carry laws.

Previous research has found a link between gun ownership and shootings of police officers. A 2015 study in the *American Journal of Public Health* found that states with more civilian guns had more homicides of cops: For every 10 percent increase in the firearm ownership rate, there were 10 additional police killed while on duty.

How Do Officer Shootings Affect the Mindset of Police?

In an interview, the study's authors pointed to a few factors that play a role in how officers think about the risk of being shot: the militarization of police training, a police culture that amplifies tales of downed officers, and the proliferation of guns among civilians.

"What my ethnographic work shows is that police are systematically socialized to understand their work as predominantly dangerous, and to understand that the public is the key driver of that danger," said Sierra-Arévalo. "So police are trained that there actually is no such thing as a routine traffic stop, there is no such thing as a routine call for service. Instead, they are trained to view the world as full of infinite threats, and to approach a situation as if it might devolve into a fight of their lives at any moment."

This "warrior" culture has existed in law enforcement circles for decades but has intensified in recent years, as The Trace's Alain Stephens reported in June.

The proliferation of guns also exacerbates a sense of danger. "I don't think there's really any serious argument to be made that the supply of firearms doesn't influence the level of violent police encounters," Sierra-Arévalo added.

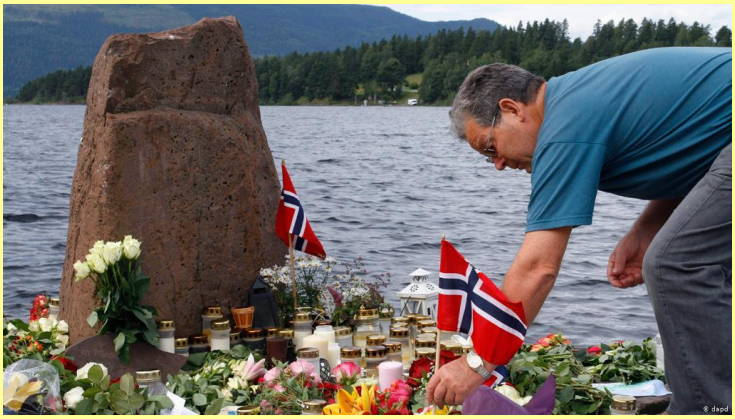
***Jennifer Mascia** is an engagement writer at The Trace.*
***Chip Brownlee** is accountability fellow at The Trace.*

Lessons from the Norway terror attack

By Mike Wood

Source: https://www.policeone.com/mass-casualty/articles/lessons-from-the-norway-terror-attack-yqryvkU9N0q8qdYT/

July 22 – On July 22, 2011, a political terrorist parked a vehicle-borne improvised explosive device (VBIED) near a collection of federal government buildings in the center of Oslo, Norway. About 10 minutes after he departed the area, the car bomb exploded, killing eight people and wounding upwards of 209 more.



After he left the government center, the killer got into another vehicle and drove about 20 miles northwest of Oslo, to a location where he boarded a ferry to the island of Utoya. Upon reaching Utoya, the terrorist began to shoot the adult staff and youth participants of the Norwegian Labor Party's summer camp, which was being held on the island. The killer began his rampage on the island at approximately 17:22, and continued to kill innocents until he was confronted by the members of a national police tactical team ("Delta"), just over an hour later. The suspect surrendered to police and was taken into custody, after killing 69 people and wounding at least 110 more.

This complex attack would have been horrific in any country, but it was particularly frightening for the residents of this normally quiet nation. It was the deadliest attack in Norway since World War II, and it was estimated that 1 in 4 Norwegians knew someone who had been directly affected by the violence.

Attendees at the National Tactical Officers Association (NTOA) 2018 annual tactical conference were fortunate to get an extensive debrief of the police response to this attack from two Norwegian police officers who responded to the Oslo and Utoya sites. They shared their experiences and identified many of the lessons learned from this terrible attack, which included the following:

The importance of vehicle exclusion

The terrorist was able to drive his van right up to the government buildings and park it next to the main entrance of one of the towers. There were no gates, barriers, or other security checkpoints to keep unauthorized vehicle traffic away from the building, so the terrorist was able to place his bomb right next to his target, where it could do the most damage. Considering the threat posed by VBIEDs and vehicle-ramming attacks, it's critically important to keep vehicles away from likely target buildings and large concentrations of people, using physical barriers, checkpoints, intelligent routing of access roads and other security measures.

Use of camouflage

The terrorist dressed in a fake police uniform to carry out the attacks, which gave him many advantages. A police helmet with a face shield helped to conceal his identity as he walked away from the car bomb. His uniform and false identification also made it easy to trick the ferry pilot that took him to the island and allowed him to get close to his target once he reached the shore. The camp staff was initially tricked by the uniform, and by the time they got suspicious, he was already in range to carry out his assault with the weapons he had openly wielded as part of his costume.

Later, when real police officers arrived on the island to stop the killing and rescue the innocents, many of the victims refused to come out of hiding or ran away from the officers, because they believed them to be additional attackers. This complicated the rescue effort and made it even more difficult to provide medical care to the wounded.

Fake uniforms and identification can make it easier for attackers to access sensitive areas and bring weapons into those areas. They can also cause confusion or delay for responding officers, which could give an attacker a tactical advantage when confronted. This kind of camouflage could also make it easier for attackers to escape. For all these reasons and more, police officers and agencies must safeguard uniforms, equipment, and credentials, and thoroughly investigate the theft of any of these items (from vehicles, dry cleaning businesses, government offices, etc.).

This concern extends to uniforms, equipment and credentials from other professions as well. Items from fire departments, EMS, utility companies, private security, hotels, public venues and other sources can be effectively used to provide access to sensitive areas, and police should investigate their theft or disappearance.

Tactical Emergency Casualty Care (TECC)

One of the officers who addressed the NTOA crowd was off duty in the downtown area when the car bomb exploded and spent the majority of his effort attending to casualties with a small first aid kit from his personal vehicle, and improvised bandages and tourniquets. The other officer – a member of the Delta team, who helped to arrest the suspect on Utoya island – also spent most of his effort assisting victims and treating their wounds with his personal first aid kit and improvised means. Both of these officers strongly encouraged LEOs to seek additional TECC training, and have access to enhanced medical kits – with enough supplies to treat a large number of wounded – for mass casualty incidents (MCIs) like this one.

Most police officers receive little training in casualty care, but in the aftermath of an MCI, the police may become the primary providers of medical care in warm and hot zones, because fire and EMS crews may be prohibited from entering. Officers will probably spend more time treating and evacuating the wounded than searching for the killer, so better medical training is a must.

Additionally, officers need access to suitable quantities of medical equipment. The officers in the Norway attack did an excellent job of improvising tourniquets, chest seals and bandages with other items, but these makeshift devices will never be as effective as dedicated medical equipment. Our experience in events like the Boston Marathon bombing and the Route 91 Harvest Festival shooting has demonstrated that improvised tourniquets are usually ineffective, for example, so police should have access to MCI kits that will allow them to attend to a large number of casualties.

Command, Control and Communications

The Norwegian police experienced highs and lows in their coordination during this event.

Early on, an important tip from a citizen was mishandled at the command post, and it took several hours for incident leaders to learn that the suspect from the Oslo bombing had driven away in a car, wearing a police uniform. The description of the suspect and car might have allowed the police to intercept the suspect on his way to the Utoya island ferry if it had been properly handled, but this critical information was lost in the chaos for a while.

Communication problems (including incompatible radio networks) between the national tactical team and the local police officers caused frustrating delays in deploying the Delta members to the island. There were also some police leadership failures at the local level, which held district police officers back from engaging the suspect early on, and also prevented the tactical team from getting timely boat transportation to the island.
Yet, there were some highlights in the police response as well. The members of the Delta team mobilized and deployed on their own initiative well in advance of any formal call out, which put them on scene sooner. They also took the initiative to conduct secondary searches at the site of the bombing in the absence of formal direction from overwhelmed police leadership, which enhanced scene security.
Additionally, patrol officers took the initiative to halt southbound traffic on a major highway, to allow the Delta team to bypass traffic congestion, by driving northbound on the wrong side of the road. This clever improvisation saved critical minutes as the police raced to stop the attack.
It's common for command and control to be the weak link in the chain during a tactical incident. The officers in the field usually do a good job of solving problems, but communication, leadership, coordination and planning issues usually handicap the response. In this sense, the Norway attack reminds us that one of the most valuable things we can do to prepare for MCIs is to train agency leaders in critical incident management skills and conduct regular and robust training exercises to ensure they are ready to take command in an emergency and make good decisions under stress.

Post-event mental health
While some group debriefs were held, there were no mandatory debriefs for individual officers after this attack. Mental health resources were available for those who wanted help, but there was no requirement for officers to see a mental health professional. Unfortunately, many officers who needed help dealing with the stress and trauma of the event didn't ask for it and suffered silently.
This event also had second-order effects on mental health, with the family members of police officers, and police officers who were not directly involved, experiencing trauma as well.
After critical incidents like this attack, agencies should consider mandatory debriefings and counseling for involved officers to eliminate the stigma and social pressure associated with voluntary referrals to mental health professionals. The mental health net should also be cast wide enough to capture non-sworn support personnel, dispatchers, family members and uninvolved officers too since all of these groups will likely be affected in some way by the trauma and stress associated with a critical incident.
Our people are our most valuable resource, and we need to do a better job of taking care of them after events like this. Peer-to-peer counseling, mandatory individual referrals, group debriefs and mental health services are all part of helping our people heal, and police leaders must be ready to commit extra energy to these activities for a long time after a critical incident.

***Mike Wood** is the son of a 30-year California Highway Patrolman and the author of "Newhall Shooting: A Tactical Analysis," the highly-acclaimed study of the 1970 California Highway Patrol gunfight in Newhall, California. Mike is an Honor Graduate of the United States Air Force Academy, a graduate of the US Army Airborne School, and a retired US Air Force Lieutenant Colonel with over 26 years of service. He's a National Rifle Association (NRA) Law Enforcement Division-certified firearms instructor, serves as a member of the Police1 Editorial Advisory Board, and has written the "Tactical Analysis" column at Police1.com since 2014. Mike is the senior editor at RevolverGuy.com, and has been a featured guest on the Excellence In Training Academy and American Warrior Society podcasts, as well as several radio and television programs. He's grateful for the opportunity to serve and learn from the men and women of law enforcement.*

Mysterious Chinese Seed Packets Are Showing Up All Over The US, Here's Why

Source: https://www.sciencealert.com/mysterious-chinese-seed-packets-are-showing-up-all-over-the-us

July 29 – Dozens of US states have reported mysterious seeds showing up in packages from China and are warning citizens not to plant them because they could be an invasive species.
The US Department of Agriculture said Tuesday that it was investigating the unsolicited packages of seeds reported by at least 27 states and urged anyone who receives them to contact local agricultural officials.

"Please hold onto the seeds and packaging, including the mailing label, until someone from your State department of agriculture or APHIS contacts you with further instructions," the USDA's Animal and Plant Health Inspection Service said in a press release. "Do not plant seeds from unknown origins."

The agency also said the packages were likely a "brushing scam," in which consumers are sent packages and a company then forges positive reviews of the products.

But they could also quickly become an ecological disaster.

"An invasive plant species might not sound threatening, but these small invaders could destroy Texas agriculture," Sid Miller, Texas' agriculture commissioner, said in a press release.

And scientists agree – that's why the USDA has such strict rules on importing plants and other organic materials.

"The reason that people are concerned is – especially if the seed is the seed of a similar crop that is grown for income and food, or food for animals – that there may be plant pathogens or insects that are harbored in the seed," Carolee Bull, a professor with Penn State's Plant Pathology and Environmental Microbiology program, told *The New York Times*. **UPDATE:** Seeds appear in Poland as well (Aug 05)

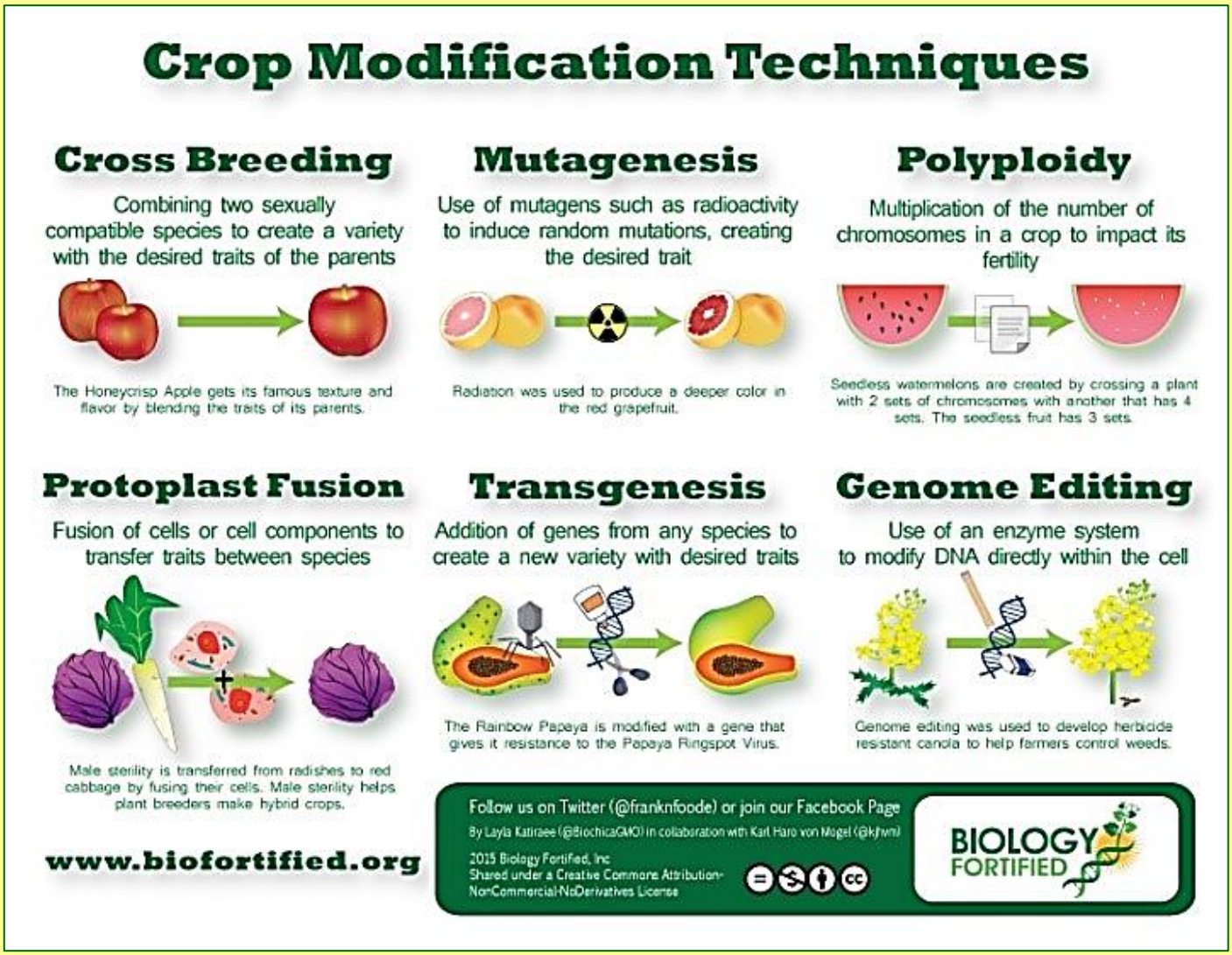
EDITOR'S COMMENT: As seen in the pictures published, there are different kind of seeds. So, plant them under controlled conditions and see what they are – The *Svalbard Global Seed Vault* might have a database for easy identification. The first conspiracy theory speaks about "*plants that eat Americans*!"

An Eco-Terrorist Who Destroyed A Sunflower Field Is Called an Environmental Hero. There's Just One Problem...

Source:https://www.science20.com/content/an_ecoterrorist_who_destroyed_a_sunflower_field_is_called_an_environmental_hero_theres_just_one_problem

July 28 – Marie Gangneux is co-president the organic food company Alterna'Bio so it's no surprise she hates science. It's not even a surprise she commits eco-terrorism.

What is a surprise is that she knows so little science that when she committed eco-terrorism against a "GM" sunflower field she didn't realize they were actually created using Mutagenesis. Which is not a GMO, it has been used for 2,000 different plants, many of them labeled organic. Eat organic lettuce? You're probably eating a genetically modified food, but since organic food activists need to think



science began in 1998 to exempt their own products, they leave out awkward facts like that their organic strains were created using chemical and radiation baths to force mutations. If they ignore all genetic engineering, they can argue that no science was involved in the creation of their goods.

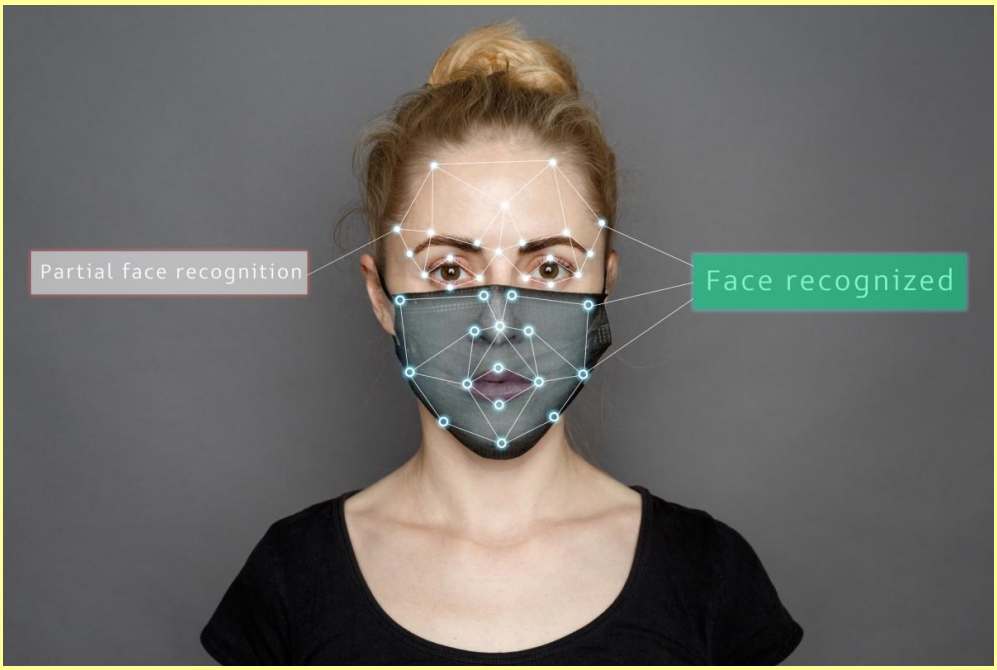
These people are just goofy. If you think you see Jesus in your food, you are their target customer.

Gangneux is being lauded as a champion of the organic movement because she is willing to commit violence. Again, no surprise. But what is a surprise is that they read us and have started to notice that *mutagenesis is science*; just different science than GMO or RNAi or

CRISPR-Cas9. We have criticized organic industry trade groups for 13 years due to their hypocrisy in putting Non-GMO Project and USDA Organic labels on foods they know were created using a precursor to GMOs; the less precise mutagenesis that transgenes made safer and better.
GMOs literally made impossible the Frankenfoods that mutagenesis or, worse, all-natural high-energy cosmic rays in the environment, could allow. And with the battle in Europe against GMOs won or lost, depending on who you ask, they need to find new fields to destroy or else eNGOs and organic food lobbying groups are out of business.
To rationalize terrorism, these groups need to call mutagenesis "new GMOs", as they did with the VrTH sunflowers they ransacked for a publicity stunt. Even though they are using a process common since the 1950s, again with 2,000 plants that can all be considered organic.
Terrorists are never the most literate lot. You don't strap suicide bombs onto your best and brightest. Russian influence in Europe encourages these modern day "useful idiots", because agriculture is one of their largest exports. And with a wave of a pen declaring almost all of their food is "organic" - no outside verification allowed - Russia wants to block its competition in Europe so they can prosper from the label they gave themselves. They love people like Gangneux, Russia Today and Sputnik are probably retweeting articles about her right now. But it's still a criminal act, if Europe would stand against violence the way they stand against science.

US government study finds face masks block facial recognition technology

Source: https://newatlas.com/computers/face-masks-block-facial-recognition-technology-nist-study/

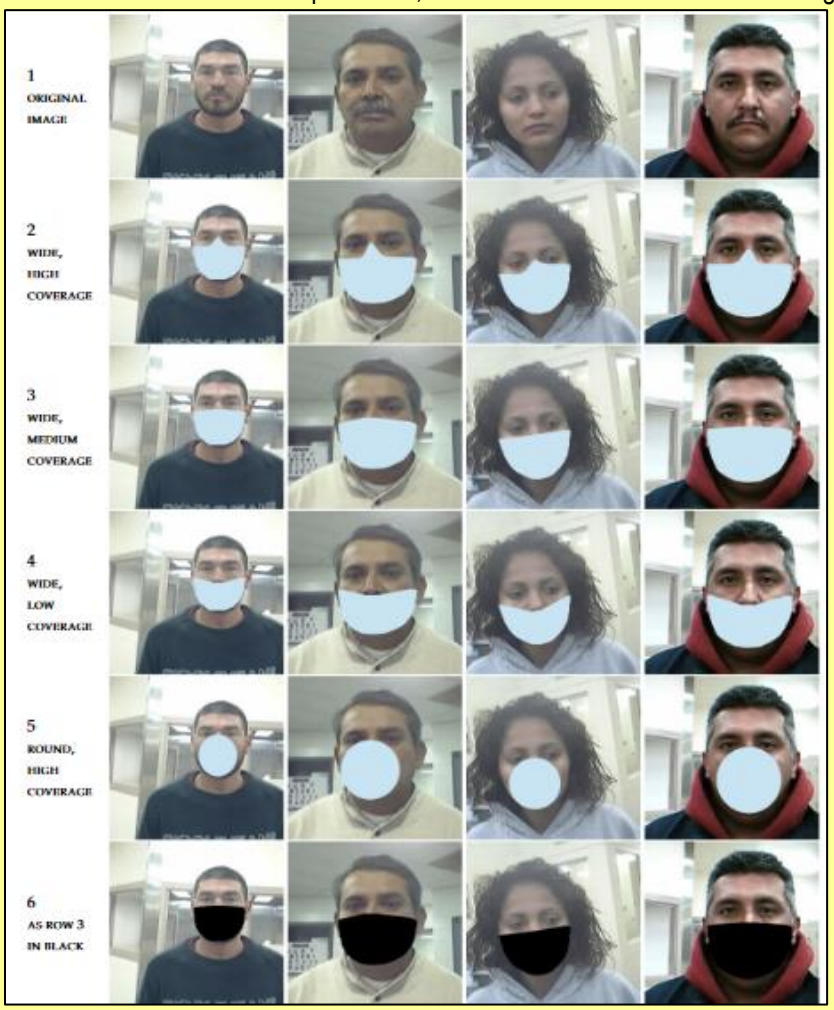


In a new study, the best algorithm tested still failed 5 percent of the time when trying to identify faces covered in masks

July 29 – A new study from the National Institute of Standards and Technology (NIST) has tested how accurate commercial facial recognition algorithms are at identifying people wearing protective face masks. The study reveals some commercially used systems fail at authenticating masked faces up to 50 percent of the time.
Over the last few years the growing use of nascent facial recognition technology by law enforcement agencies has led to significant public debate over the efficacy of the technology and the lack of oversight into its uses. Several cities in the United States have outright banned the use of facial recognition technology, while the American Civil Liberties Union (ACLU) is pushing for a greater transparency into where and how it is deployed.
With the COVID-19 pandemic reality meaning most people around the world are now wearing face masks in public, new questions have been raised over the effect this will have on facial recognition technology. A recent report in The Intercept revealed a leaked Homeland Security memo from late May expressing concern over the effect of face mask wearing on facial recognition accuracy.
“We assess face recognition systems used to support security operations in public spaces will be less effective while widespread public use of facemasks, including partial and full face covering, is practiced by the public to limit the spread of Covid-19,” the leaked intelligence document stated, raising concerns "violent adversaries" could subversively be using protective face masks as a way to evade law enforcement detection.
Now a new and publicly released study is offering the first in a series of investigations into the efficacy of current facial recognition systems on people wearing face masks. The NIST program is called the Face Recognition Vendor Test (FRVT) and this initial study

investigated 89 commercially available facial recognition systems in one-to-one match tests using digitally masked faces.

"With the arrival of the pandemic, we need to understand how face recognition technology deals with masked faces," says Mei Ngan, a computer scientist working at NIST. "We have begun by focusing on how an algorithm developed before the pandemic might be affected by subjects wearing face masks. Later this summer, we plan to test the accuracy of algorithms that were intentionally developed with masked faces in mind."



The one-to-one matching tests conducted in the study involved directly matching a target face image with other images of the same person on a database. It is one of the easier tests for a facial recognition system, and generally less error-prone than larger systems that scan faces in big crowds.

The study found even the most accurate facial recognition algorithm failed at significantly high rates when confronted with a masked face. The best system tested in the study still resulted in a 5-percent failure rate tracing masked faces, compared to its regular 0.3-percent failure rate. The study also noted that "otherwise competent" algorithms failed to trace masked faces between 20 and 50 percent of the time.

More specifically, the study found the higher a face covering is on the bridge of a person's nose, the less accurate a system is in identifying the person. Mask color was also relevant, with black masks negatively affecting accuracy more than surgical blue masks.

Interestingly, the study also found face masks significantly increased rates of false negative results but not false positive results. So, this means the facial recognition algorithms were not incorrectly identifying masked faces as different people, but instead the systems were simply unable to make an effective determination in the first place.

Ngan says future NIST studies will investigate other variables and newer facial recognition systems designed to work around masked faces.

"With respect to accuracy with face masks, we expect the technology to continue to improve," says Ngan. "But the data we've taken so far underscores one of the ideas common to previous FRVT tests: Individual algorithms perform differently. Users should get to know the algorithm they are using thoroughly and test its performance in their own work environment."

But activists against facial recognition technology shouldn't get too excited, tech companies are already racing to adapt their algorithms to our new masked world. Back in March one of China's key facial recognition start-ups announced it had already upgraded its systems to work with masked faces. Other US-based companies are reportedly doing the same, rapidly testing and tuning their algorithms to better detect faces based on characteristics that are left uncovered.

▶▶ The complete NIST facial recognition report is available here.

More realistic bite sleeve improves training of US Army working dogs

Source: https://newatlas.com/military/bite-sleeve-us-army-dog-realistic-training/

July 30 – The US Army has developed a more realistic bite sleeve for training military working dogs. Worn by the trainer during biting exercises, the protective silicone and Kevlar sleeve looks and feels more like a human arm when bitten, but still shields the wearer from harm.

Military working dogs are an integral and extremely valuable part of modern armies. With their intelligence, keen senses, agility, protective nature, and intense loyalty to their handlers, they fulfill a wide variety of duties, including security, patrol, explosives and drug detection, tracking, search and rescue, guard, sentry and tactical missions.

Like their human counterparts, these canines require the highest levels of very expensive training. In particular, they need to know how and where to bite when they need to help restrain a potentially hostile person. The dogs need to learn not to attack particularly vulnerable areas, like the face, neck, or groin, and even when going for the arm, they need to know how and where to bite.

As anyone who has given a terrier a lamb bone will know, even a relatively small dog can bite with a surprisingly destructive force. They can also bite very softly and check themselves in a guilty instant when a game of tug-of-war brings the jaws down on a hand rather than a squeaky. The trick is to teach the dog the finer points of control.

An important tool for this is training sleeve. However, the ones currently in use are made of materials like jute and are too bulky and feel too little like human skin and flesh to simulate a real-life arm. This can confuse the trainee dog and cause it to hesitate. Because they require additional appendages that add extra bulk, even silicone bite products can be equally confusing.

Developed by a team led by Dr. Stephen Lee, a senior scientist at the US Army Research Office, the new bite sleeve has an outer layer of non-toxic, prosthetic-grade silicone with an interior mesh that gives it a texture and resilience much more like the skin on the human forearm. In addition, it has inner layers made of leather, dissipating foam and several layers of Kevlar fabric. These make the sleeve thinner, so it allows for a full-mouth bite, while two adjustable straps provide for bespoke fitting.

The new sleeve is now being used by the US Army Special Operations Command. Meanwhile, Campbell University is working on an even more realistic concept design that bleeds artificial blood when bitten.

"Military working dogs are a very important team member and their training is equally important," says Lee. "These invaluable dogs have provided incomparable support helping soldiers accomplish their mission and saving soldier's lives. This new bite sleeve training tool has greatly helped in the development of effective combat canines."

New ISIS video calls for arson attacks on Western countries

Source: https://abc7chicago.com/isis-coronavirus-covid-arson-attack/6339412/

July 29 – **The video is entitled Incite the Believers and urges ISIS followers to start a campaign of arson attacks in the name of the terrorist organization.**

A new video released by ISIS terrorists urges followers to begin a campaign of arson attacks. The four-minute-long video is the first new marching orders in a long time from ISIS propaganda wing, pushing followers to fight fire with fire, literally.

The animated tightly-produced video is entitled Incite the Believers and many of the scenes are engulfed in flames and, as with previous terrorist message videos, it encourages violent criminal acts against Western civilization. This time, ISIS is encouraging followers to start fires for maximum damage and carnage.

In Arabic, **the narrator encourages followers to use cigarette lighters, matches and gasoline to start fires** in places where they won't be detected in retribution for U.S. combat operations in Iraq and Afghanistan the past nearly two decades.

The focus on arson is similar to an Al Qaeda directive to its followers a decade ago, first reported by the I-Team, in which followers were told to use pick-up trucks and plow them into crowded sidewalks. The edition of a terrorist magazine then known as Inspire featured the skyline of Chicago with an article about turning regular vehicles into mowing machines.

A few years later Al Qaeda urged individual jihadists to use kitchen knives, pressure cookers and other household products for their own one-person attacks on America. Perhaps in 2020, with fewer public places filled with people because of the ongoing COVID-19 pandemic, terror leaders are gravitating to arson because fires could find victims long after the terrorist has gone home and bring out first responders at the same time.

In a vivid reminder that the U.S. is still involved in a war on terror, overseas American forces attacked an ISIS compound in Somalia Tuesday. According to U.S. military officials, seven ISIS terrorists were killed in the air strike they say was in cooperation with the Somali government. Just last month the U.S. increased its bounty on the new leader of ISIS to 10-million dollars.

Hagia Sophia 1: Taliban banners unfurled inside shrine shouting "Allahu Akbar"

Source: https://www.reddit.com/r/europe/comments/i2xovb/hagia_sophia_taliban_banners_unfurled_inside/

Aug 03 – A video posted on social media shows men, some of them dressed in traditional Afghan costumes, unfurling a Taliban flag inside a large Orthodox shrine and shouting "Allahu Akbar" while raising their index fingers, a gesture that has been identified with Islamic extremism

Afghans unfurl Taliban banners inside Hagia Sophia a few days after it was converted to an Islamic shrine.

A video posted on social media shows men, some of them dressed in traditional Afghan costumes, unfurling a Taliban flag inside a large Orthodox church and shouting slogans. Among them is the cry of "Allahu Akbar" while they have raised their index finger, a gesture that has been identified with Islamic extremism.

https://www.youtube.com/watch?v=Swi95xE02Zs

The video was posted on Twitter by Noor Dahri, a London-based counter-terrorism and Islamic terrorism narrative expert.

In his post, Dahri wrote that "the flag of the Afghan Taliban was raised in Hagia Sophia in Turkey by Taliban activists. The conversion of Hagia Sophia was an encouraging message to the Muslim Brotherhood and to the Islamist extremists and terrorists of the world. "ISIS activists will soon raise their flag as well."

Security Science Journal

Source: http://www.securityscience.edu.rs/index.php/journal-security-science

August 2020 – "SECURITY SCIENCE JOURNAL" is an open access, peer-reviewed international interdisciplinary and multidisciplinary journal published by the Institute for National and International Security (Serbia), The Europa Institute, Bar-Ilan University, Israel, The Research Institute for European and American Studies - RIEAS (Greece) and ITS – Institute for Transnational Studies (Germany).
We publish high quality, refereed papers three times per year. Papers reporting original research or extended versions of the already published conference/journal papers are all welcome. Papers for publication are selected through peer reviewing to ensure originality, relevance, and readability. "SECURITY SCIENCE JOURNAL" features high-quality original papers in English (preferably), as well as in other leading world languages, such as French or German. Papers and book reviews addressing a diverse range of topics in the field of multidisciplinary approach in security science will be welcomed by the Editorial board.
"SECURITY SCIENCE JOURNAL" hopes that Researchers, Research scholars, Academicians etc. would make use of this journal publication for the development of interdisciplinary and multidisciplinary security topics.

Covid 19 pandemia: Did jihadi terror movements redefined their modus operandum or is it an implementation of a calculated rationale designated to regain territories and assets

By Dr. Barak Bouks (Ph.D.)

Security Science Journal | №1 | 2020; pp.47-58

Source: http://www.securityscience.edu.rs/index.php/journal-security-science/article/view/12/4

Religious terror movements have long since been associated with violent Jihad and suicide bombings. As such, associated Jihadist perpetrators operate according to specific Muslim Fatwas (Clerical permissions), in order to carry out suicide attacks against their chosen targets. These perpetrators proclaim their willingness to die for a definitive cause, regardless of any danger, as they expect an affluent after life in heaven. As COVID 19 erupted, the world came to a standstill and closure. The new situation affected terror movements globally. While previously Jihadists used to be regarded as fearless towards any death threat, COVID 19 is changing such former thoughts. Radical clerics issued new warnings for these Jihadists, to be aware of infected areas, temporarily making Europe practically a non-target for terror operations. This new significant modus operandum is an important topic for research. For the first time suicide bombers and Jihadists implement self-preservation techniques, while death itself is being considered as a threat rather than an achievement. This study finds that these perpetrators implement rational, calculated tactics, as religion is considered to be a part of this tactic, yet, they are not monolithic. They operate differently from one country to another, while having to review constantly the effectiveness of their operation vis-à-vis the support of the local population.

ISIS Video Urges Arson as 'Five-Star' Terror Tactic, Shows California Burning

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/isis-video-urges-arson-as-five-star-terror-tactic-shows-california-burning/

Aug 04 – A new video from the Islamic State's media wing tells followers that arson is the highest-rated of the low-skill terror tactics and encourages fire attacks with the devastation and death toll of the 2018 Camp Fire in California highlighted as an example.
The 4-minute video "Incite the Believers" issued by Al-Hayat Media Center, released in both English and Arabic, shows items such as a power drill and a handgun while noting that

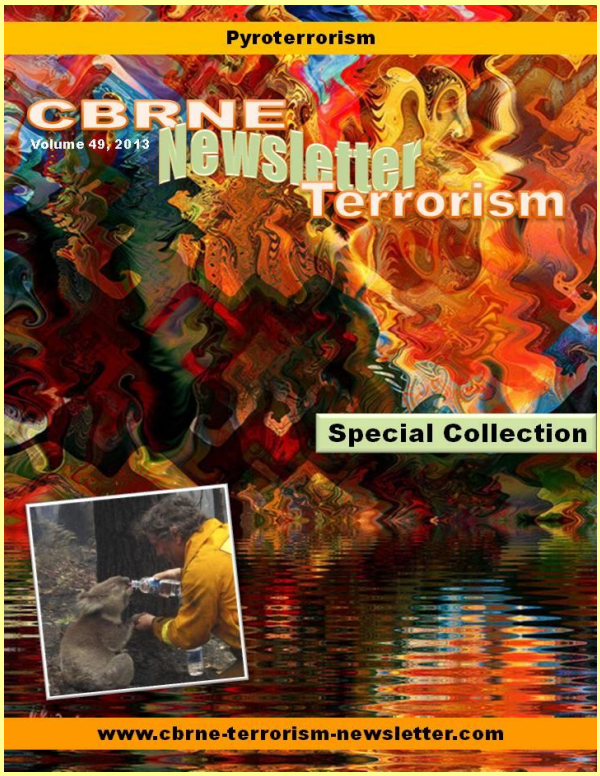
would-be jihadists may "look around yourself and you do not find a weapon that you can use to subdue the enemy of Allah."
It shows ISIS publications including *Dabiq* magazine and the weekly *al-Naba* newsletter — only the latter is still published — that have included calls for lone jihadists to act or offered tactic tutorials. The video also shows scenes of past attacks including the Orlando mass shooting, stating that followers are "eager to fulfill" calls to jihad "but you cannot find a way to achieve that."
"We are sure that if you knew how and found a weapon you would not delay in fulfilling your duty to support the Muslims and do jihad," the video continues, urging followers to "look around yourself again, keeping an eye for a solution and not searching for a problem" as they sort through "all the means to kill and destroy."
"Consider which you can use easily and without drawing attention to yourself and making the result be death, destruction and heavy losses to the enemies," the narrator states. "Yes, my brother, it is that weapon which is within reach of every hand and even children are proficient using it, and people have used it since ancient times to harm their enemies — yes, it is fire."
A graphic list of explosives, pistol, machine gun, hand grenade, sniper rifle, and RPG as "unavailable," followed by another graphic listing as "available" knife, electrocution, "hunting gun," "rope for strangulation," "firestarter," "car for ramming," and "toxic substance." The graphic includes star ratings for each tactic, giving the firestarter five stars, the car four stars, three stars for the hunting gun, and just two stars for the rest.
"To become more convinced of this option try looking for the losses caused by fires in the lands of the crusaders every year — fires in forests and fields, cities and villages completely destroyed, people displaced, armies of firefighters and civil defense personnel working continuous days to no avail," the narrator continues, noting that death tolls in major blazes sometimes "exceed the number of those lost in major strikes by the mujahideen in which they used guns and explosives."
Examples of death tolls are displayed for wildfires in Australia, Greece and California — specifically, the death toll of the 2018 Camp Fire that destroyed most of the town of Paradise. That blaze was sparked by a faulty power transmission line.
Tactically, the video advises would-be jihadists to "monitor well for a place where you can set a fire without drawing attention" and "consider that the fire will be so great that efforts made to extinguish it will cost your enemies greatly and perhaps they will not be able to put it out" before it spreads out of control

The video shows animation of a hand marking a spot on a map between San Francisco and Sacramento. The graphic then lights on fire, burning through the California map.

The video also urges arson jihadists to "safely dispose" of evidence after fleeing the scene of their attacks.
A target map at the end of the video suggests forest fires in the western United States, factory blazes in Canada, burning buildings in Europe, and agricultural fires in South America.
ISIS has long promoted arson as a cheap and easy terror tactic, and has put those threats into action in Iraq and Syria – taking advantage of warming temperatures in spring to set natural fuel alight with the intent of sowing fear, economic pain and potentially casualties. ISIS previously claimed in May 2019 that the terror group was behind a series of wildfires: In the ISIS newsletter *al-Naba* article, "Roll Up Your Sleeves and Begin the Harvest — May Allah Bless What You Reap," ISIS reminded "soldiers of the caliphate" that they "have before you millions of acres… their plantations, fields and homes, as well as their economic foundation" to burn.
A 49-minute video released this May by the terror group, "Strike Their Necks," features ISIS-shot footage of guerrilla-style attacks on remote roads, terror training and executions – along with structure arson and nighttime footage of a small group of terrorists setting brush fires. Some Iraqi farmers reported that these were complex attacks: If they tried to go out and extinguish the flames in their fields, they could be attacked by terrorists lying in wait.
For terror groups and movements that are perpetually looking for low-cost, efficient, low-skill means of attack, arson presents an opportunity to inflict casualties and economic losses while keeping a community on edge about where the surreptitious fire-setting might happen next.

Arson lends itself to long-distance inspiration of lone actors who need only find simple encouragement online, incendiary materials and a vulnerable target. Arson is ideal for terrorists looking to hit soft targets such as a forest, where no one is guarding the perimeter. Arson is a prime tactic for the terrorist who doesn't want to arouse suspicion by purchasing a firearm or who doesn't have the know-how to build a complex explosive device (though as a white supremacist in Britain who tried to torch a synagogue found out, sometimes the arsonist sets himself on fire); they can even get a helping hand from nature if the land is parched during wildfire season or high winds pick up, and non-arson blazes pop up in terror propaganda in order to urge would-be terrorists to inflict similar damage. Arson achieves what al-Qaeda has repeatedly stressed is a core objective of its jihad: hitting the West in the pocketbook, with losses caused by wildfires in California alone estimated at $400 billion in 2018.

And if those weren't enough reasons to heighten defenses against arson terrorism, the symbolism of large swaths of land, landmarks or critical infrastructure going up in flames feeds the narrative of accelerationist terrorist philosophies across the spectrum, groups and movements seeking societal collapse with their new world order arising from the ashes. ISIS, for example, has a two-part film narrated by an English-speaking westerner called "Flames of War." The neo-Nazi Feuerkrieg Division means "fire war" in German, and a teenage member arrested last fall in the UK was accused of plotting an arson spree targeting synagogues as he vowed to journal his activities "from now all the way to the inevitable race war."



With an eye on the danger of scorching summers, ISIS and al-Qaeda have linked their calls for wildland arson to devastating fires in recent history, stressing to supporters that they can wreak similar havoc by intentionally sparking blazes as their method of jihad.

Propaganda also recently has included a push for jihadists to target gas tankers and stations: "Targeting oil and gas transport trucks with accidental accident that causes the truck to overturn," directed one poster last year from ISIS-supporting Quraysh Media, which also showed a calendar at the bottom of the page switching from 2019 to 2020. "Targeting gas stations by throwing a cigarette to look like an accident. Do a search for the presence of oil pipelines, and then burn them."

In January 2017, ISIS' now-defunct *Rumiyah* magazine told would-be jihadists that when planning and executing wildfire terrorism they should look for dry brush "as fire cannot endure in damp or wet environments." The article added that "incendiary attacks have played a significant role in modern and guerrilla warfare, as well as in 'lone wolf' terrorism."

The magazine suggested targets for arson jihad to "include houses and apartment buildings, forest areas adjacent to residential areas, factories that produce cars, furniture, clothing, flammable substances, etc., gas stations, hospitals, bars, dance clubs, night clubs, banks, car showrooms, schools, universities, as well as churches, Rafidi [Shiite] temples, and so forth. The options are vast, leaving no excuse for delay."

Jihadists were advised to time arson attacks "preferably in the later part of night to the early hours of morning when people are generally asleep," and were instructed how to block off exits in an effort to increase casualties.

During California wildfires in 2018, supporters of al-Qaeda — which has a lengthy history of promoting wildfire arson — circulated news photos from the blazes with the Quran verse, "They will question you about the mountains. Say: 'My Lord will scatter them as ashes.'"

A tutorial in a 2012 issue of al-Qaeda in the Arabian Peninsula's *Inspire* magazine highlighted the damage caused by various wildfires and instructed jihadists on picking optimum weather conditions for arson and where to set a blaze to inflict maximum devastation.
"In America, there are more houses built in the country sides than in the cities. It is difficult to choose a better place other than in the valleys of Montana where the population increases rapidly. In the year 2000, a fire that is considered to be the biggest in the American history flared up in one of those valleys. It spread in a space equal to that of London. The fire burnt down 70 houses as well as a hundred car. On July of the same year and in the same place, a thunderstorm lighted 78 massive blazes in just one day, most of them were deadly firestorms," the "Open Source Jihad" article said.
"We mention such examples only to show the magnitude of the destructive impact that fires or firebombs make, to then ask the question: **Is it possible for us to cause a similar destructive impact using a similar weapon? The answer is: Yes, it is possible. Even in a shorter time and with much bigger destructive impact," the *Inspire* tutorial continued, offering a step-by-step guide on building an "ember bomb" with a timer to**

Bridget Johnson *is the Managing Editor for Homeland Security Today.*

Study: Majority of Returning Jihadis Commit Terror Attacks

Source: https://clarionproject.org/study-majority-of-returning-jihadists-commit-terror-attacks/

July 29 – A new study on returning jihadis found that an estimated 60 percent of these Islamist extremists went on to commit further terror offenses.
The study followed 166 French jihadis who went to fight in Afghanistan, Iraq and Bosnia-Herzegovina between 1986 and 2006 and were subsequently imprisoned in France or abroad. The study, which was conducted by the Center for the Analysis of Terrorism (CAT), did not follow those who joined Islamic State, as those individuals are still imprisoned, for the most part.
The findings out of France lies in stark contrast to previous international studies regarding the behavior of returning jihadists. Those studies identified the terrorism re-engagement rate of returning jihadis at 11 percent, according to Jean-Charles Brisard, president of CAT.
The highest rate of recidivism was found among French jihadis who went to fight in Iraq in the early 2000s. One hundred percent of the 16 jihadis who fought in Iraq went on to commit

acts of terror upon their return. The lowest rate of 39 percent recidivism was found among those who fought in Bosnia-Herzegovina. Meanwhile, of the jihadis who do not engage in terror attacks upon return, many still retain their radical beliefs and pass them on to the youth in their communities, according to the study.

The study is of upmost concern to French authorities as 2,540 Islamist extremists are set to be released from French prisons between now and 2022. Three hundred of those prisoners are in jail for terrorism, including many who returned to France after joining Islamic State and other jihadi groups in Syria and Iraq.

Moreover, as is often the case, other extremists in prison may have been convicted on criminal charges relating to terrorism if prosecutors thought a terror charge would not result in a conviction. Others are known to have been radicalized in prison. At least 498 prisoners slated for release have been identified by the French Court of Auditors as being "susceptible to radicalization."

Just a few years ago, French counterterrorism forces were at a "breaking point" in part due to the growing number of attacks but also because of the capacity in which they were able to serve. Reports showed police and counterterrorism forces were "bored by their job" of standing guard outside vulnerable targets instead of training to proactively prepare against future attacks.

Speaking with *Newsweek* in 2015, France's Senator Nathalie Goulet who commissioned France's senate inquiry into jihadi networks, shared an assessment that is no less true five years later:

"At the end of the day we will have a policeman behind everybody in the street. Right now we are just reacting and not preventing. It's like trying to get the Titanic out of the water with a spoon."

While the CAT study is based on French recidivism rates, the problem is a global one with this French report serving as a case study — and a warning — for the United States.

Given the rise of crime in the U.S. due to 2020 riots and the cutbacks in police due to defunding decisions, there is even greater strain on the law enforcement community to work in terror prevention.

Cultivating a culture honoring the rule of law along with encouraging preventative programs remains our best option for countering the broader challenge of dealing with returning or future jihadis.

Lebanon as Paradise Lost

By Jeffrey Feltman

Source: https://www.brookings.edu/blog/order-from-chaos/2020/08/05/lebanon-as-paradise-lost/

Aug 05 – **A self-reverential joke once common in Lebanon posited that God bestowed Lebanon with beautiful mountains, stunning beaches, freshwater resources, fertile soil and fruited plains, and creative, attractive people: paradise. But then God realized that heaven is reserved for the afterlife — so he created Lebanon's neighbors. Indeed, the history of Lebanon, approaching its centennial on September 1, is a story of vexed relations with its neighbors.**

The comforting myth of Lebanon as a would-be paradise was shattered well before this week's astonishingly destructive back-to-back port explosions. Videos and testimonials from Beirut are simultaneously shocking and heartbreaking. Preliminary information about the blasts suggests that the Lebanese are most likely culpable, not the Syrians and not the Israelis. This appears to be yet another example of irresponsible or even criminal neglect on the part of Lebanese officials. As if the Lebanese people needed more evidence of the abysmally low performance of their successive governments.

And yet, it does not take a creative conspiracy theorist to devise a logical explanation that involves Lebanon's frequent antagonists: Hezbollah and Israel. Without question, Hezbollah plays a dominant but murky role at the Port of Beirut (as well as the international airport). Israel has concentrated on interrupting Hezbollah arms smuggling across the Syrian-Lebanese border. If Israel has been sufficiently successful in disrupting Hezbollah's illicit arms flows — the arms flows that Hezbollah claims protect Lebanon, when they actually put Lebanon at grave risk of war — then perhaps Hezbollah relies increasingly on importing and storing

arms via the Beirut port. The port, if it contains Hezbollah arms depots, then becomes an irresistible target for Israeli sabotage, setting off the conflagration that killed scores and injured thousands.

Hezbollah's interest in the port has primarily been linked to its economic network, perhaps including drugs, more than its arms smuggling. Hezbollah's economic tentacles are widespread and extend to Africa and Latin America: used car smuggling, independent telecom and internet networks, and so forth. By having effective control of, or dominance in, Lebanon's ports, Hezbollah masks its activities and avoids paying customs and taxes — mafia-like behavior of less concern to Israel than precision-guided missiles. Israel blockaded but did not destroy Lebanon's ports in 2020. Perhaps Israeli Prime Minister Netanyahu seeks a "wag-the-dog" diversion from political protests in Jerusalem, but it seems more likely that Israel does not seek to initiate war with Hezbollah — especially over Hezbollah's economic networks, which the port represents. Quick Israeli denials of involvement cannot be verified but seem credible.

Other theories posit that Hezbollah initiated the port explosions as a deadly diversion from the upcoming August 7 verdict announcement of the Special Tribunal for Lebanon (STL), which indicted four Hezbollah operatives in the February 14, 2005 murder of former Prime Minister Rafik Hariri and 21 others. While Hezbollah's disdain for the safety of Lebanese citizens is well documented, it would be quite a leap to go from providing murderers-for-hire (as has been alleged before the STL) to willfully destroying a large section of Lebanon's capital, at tremendous human cost. Unlike the deaths during the 2006 war with Israel that Hezbollah unilaterally provoked, these deaths can't as easily be pinned on Israel.

The more mundane theory is that a fire in a port warehouse or workshop (perhaps holding fireworks) caused the initial blast, and then flames and heat from that blast ignited stores of ammonium nitrate used for fertilizer (and for explosives) that were stored at the port. The alleged ammonium nitrate explosion accounted for the larger blast that damaged and destroyed buildings — structures that had survived Lebanon's civil war and the 2006 war with Israel — and broke windows all across the capital, sending thousands to hospitals with glass shard wounds. Prime Minister Hassan Diab has said that around 2,700 tons of ammonium nitrate, confiscated from a ship years earlier, were at the port. This compares to the two tons of ammonium nitrate that destroyed the Alfred E. Murray Federal Building in Oklahoma City in 1995.

The warehouse fire ignition theory is not as sexy as those involving Hezbollah and Israel, but it is plausible — and it is consistent with the overall sense that Lebanon suffers from deep, pervasive, self-inflicted rot. If this theory proves correct, then successive Lebanese governments — whether they were pro-West, or (as now) pro-Damascus, or a muddled amalgam of the two — are culpable for, at a minimum, neglect. Criminal neglect. Someone took the decision to place ammonium nitrate next to Lebanon's grain storage silos, and others were surely aware, or should have been, of the dangers. Now, during a financial crisis, Lebanon's grain reserves, purchased with dwindling foreign currency reserves, are reportedly all contaminated by the explosions, with the grain storage silos damaged and unusable.

When the dead are buried and the injuries addressed, the port explosions will surely further deepen Lebanese cynicism and despair about their government and political system.

When the dead are buried and the injuries addressed, the port explosions will surely further deepen Lebanese cynicism and despair about their government and political system. A responsible government would launch an investigation and demand accountability. People would overcome political divisions and forge solidarity to uncover the truth. A legitimate inquiry would necessarily shine light into how Hezbollah has privileged itself in the port and how others involved have long evaded public scrutiny, with deadly consequences.

But this tragedy, this crime, happened in Lebanon, Paradise Lost. Given the powerful interests in keeping the port operations in shadows and avoiding public accountability, it seems improbable that this Lebanese government — which relies on Hezbollah and its allies for its parliamentary support — or any Lebanese government would be courageous enough to take on an honest reckoning of why scores of families are now mourning. Nor is it likely that this Hezbollah-reliant government would turn to outsiders to conduct a comprehensive investigation, as happened in 2005 when the Lebanese accepted a series of U.N. probes into the Hariri assassination — probes that eventually morphed into the Special Tribunal for Lebanon. (At the time, the fear was that Lebanese investigators and judicial officials would be intimidated and even liquidated, should they uncover the truth. Those risks remain.) Instead, expect dismal, predictable finger-pointing by Lebanese political figures as they seize on this tragedy to score political points. With so much evidence of governmental paralysis, weakness, and even venality, it is hard to imagine that even a good-faith probe by Lebanese authorities would be deemed credible by the beleaguered citizenry.

The enormous truck bomb that killed Rafik Hariri in 2005 devastated a smaller part of Beirut than this week's port explosions. Yet it caused a political earthquake that changed Lebanon's history, with the forced departure only a couple of months later of Syrian troops and intelligence operatives who had occupied Lebanon for years. (Unfortunately, the pro-Damascus tilt of the current government demonstrates that the Lebanese forgot to lock the door once the Syrians left.)

One hopes that the shock of the August 4 port explosions will provoke a new political earthquake in Lebanon, one that gives the Lebanese authorities no way out but to conduct a credible investigation or — as in 2005 — forces them to turn over the forensic task to credible outsiders. A political earthquake that at last forces Lebanese leaders and warlords to clean up the governance and financial mess they have created. But will the Lebanese react in mass, as they did in 2005? Even before a large section of their capital was leveled with horrific human casualties, the Lebanese already suffered from a culmination of their country's financial collapse, de facto currency devaluation, coronavirus, soaring poverty rates, food insecurity, and more. One can hardly blame the Lebanese if, instead of mobilizing for accountability and political change, they hasten to find an exit from their once beautiful but seemingly doomed country.

John C. Whitehead *is Visiting Fellow in International Diplomacy - Foreign Policy*

Hellenic Special Unit for Disaster Management (EMAK)

One of the first to arrive on scene in support of Beirut's port explosion missing people in the ruins!

Greek rescue workers search amid the rubble three days after explosions that hit Beirut port. EPA

Hagia Sophia 2: Islamist waving Hamas flag inside the Orthodox church

Dans Sainte-Sophie reconvertie en mosquée, un homme brandit un drapeau à la gloire d'Allah et de son prophète Mahomet. *Alfred Yaghobzadeh pour le Figaro Magazine*

The Beirut tragedy must push Europe even further to tackle Hezbollah head on

By Damien McElroy

Source: https://www.thenational.ae/opinion/comment/the-beirut-tragedy-must-push-europe-even-further-to-tackle-hezbollah-head-on-1.1060707#6

Aug 09 – The continent needs to have a rethink on how to protect its interests amid the collapse of the militia-controlled Lebanese state

Like an oil tanker, European security policies take a long time to turn from the established and settled course. When it comes to the European Union's stance on Hezbollah, the change is suddenly under way. The steering wheel has spun in a new direction, with the security threat to EU member states having spurred a rethink.

The fundamental shift on Hezbollah spotlights a terror group engaged in activities posing threats to life and more.

While always acknowledging the group's ties to terror, the European capitals had once sought to make a distinction with a wider political movement. Over time the dividing line dissolved as the tentacles of its network spread.

Hezbollah has grown organised criminal activities with an extensive presence in country after country. Money laundering and the smuggling of illicit goods are fundamental to its coffers. The group also exerts control across a series of religious and community centres for the diaspora in European cities.

For decades, lawmakers had been able to exercise what the German think tank analyst Eckart Woertz called a "Solomonic solution" on Hezbollah, referring to a Biblical story in which King Solomon is required to rule between two women both claiming to be the mother of a child. Solomon does not make the ultimate choice but offers the unpalatable option of dividing the child in two. Thus Hezbollah was treated by Europe as having two parts

European countries were willing to proscribe the "military" wing of Hezbollah but not its other operations. However, the specific formulation is no longer holding. What's worse from its standpoint, the wider landscape in which the group – which was set by Iranian agents to promote its revolutionary ideology in the 1980s – operates has changed utterly.

The explosion that wrecked the heart of Beirut last week is certain to resonate against Hezbollah in Europe's halls of power. In part, it is a culminating event that brings together a whole set of charges against the organisation and lays these at its feet. Indeed, the blast in Beirut calls into question decades of European policies towards its near neighbours.

In the aftermath of the migration surge in 2015 from ISIS-held Iraq and Syria, the continent had already lost confidence in the stability of the neighbourhood. The distance imposed by the Mediterranean Sea was for a long time an effective cordon sanitaire. No longer. The sea basin is an active source of dangers from its eastern to its western tip.

The former colonial powers, such as France vis-a-vis Lebanon, struggle to keep pace with each twist in the spiral downwards. Other countries, such as Germany, seek but fail to keep Greece and Turkey away from the edge of conflict.

The collapse of the Lebanese state, in which Hezbollah holds the whip hand as a political force, is certain to accelerate Europe's rethinking of how it protects its interests.

When Europe had the luxury of detachment from day-to-day politics, it was able to devise its own policy on Hezbollah. A political and diplomatic argument was made that banning it would destabilise the Lebanese political settlement. Whatever credibility that idea possessed was long gone, even before last week's events at the port controlled by the group.

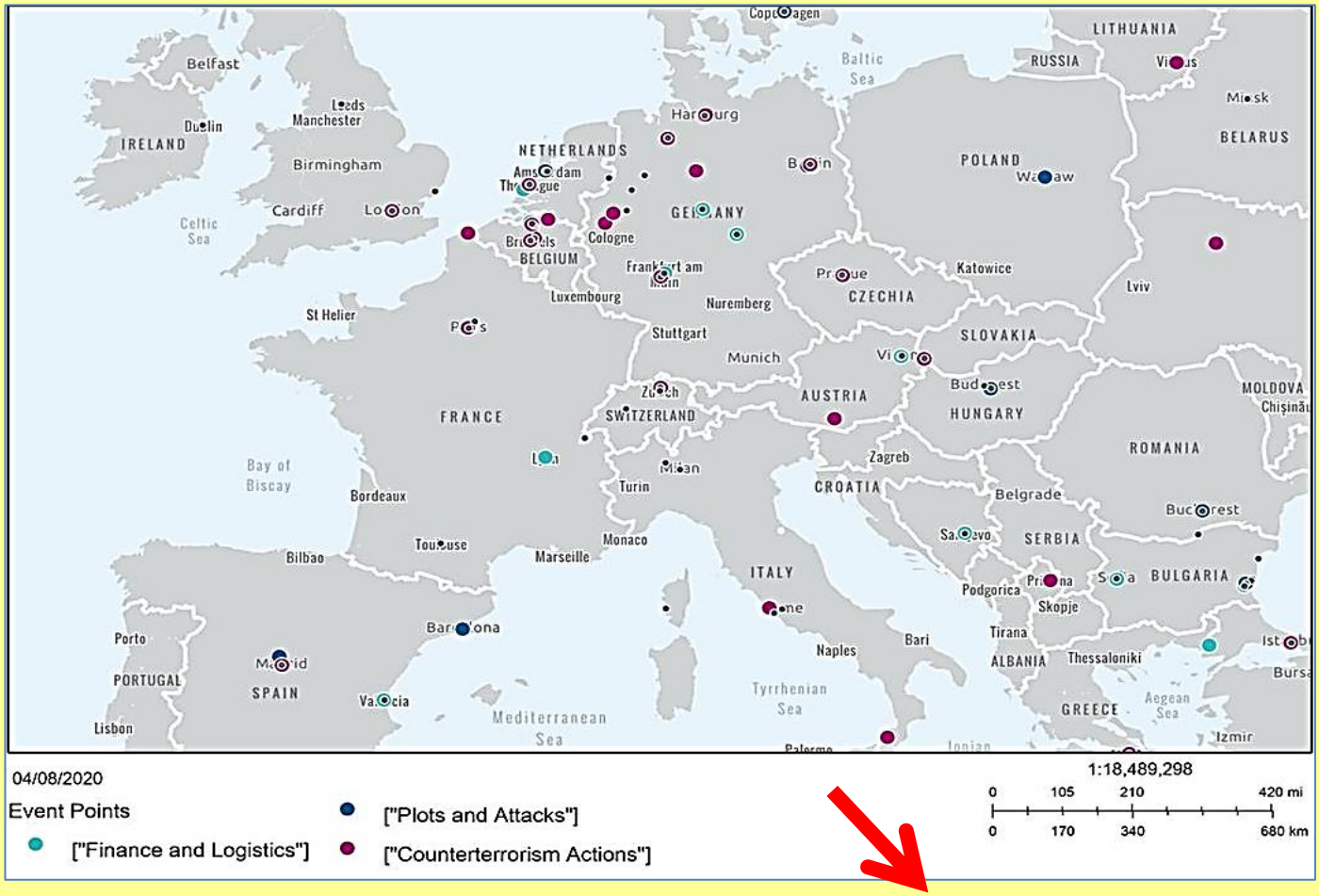
Britain moved to ban it in its entirety at the start of this year, putting a cap on the sea change in the climate facing the group. The Dutch had already done so. Austria's main political parties united behind a joint resolution demanding "effective action against Hezbollah" and "terrorist and criminal activities".

Austria also began prosecution of a kingpin who had lived near its southern borders for decades for money laundering and terror financing activities.

Germany brought in its own ban a few months ago, and within hours, hundreds of police officers were searing the mosques and associations affiliated with the Iran-backed movement. The treasure trove of documents seized has triggered investigations that prosecutors expect to see in the courts in the coming months.

In just the city of Hamburg the local intelligence believes there are 30 institutions under Hezbollah's control. The associations send millions of euros to the organisation and its leadership every year. Nationwide, the German intelligence believes there are at least 1,050 Hezbollah operatives scattered around the country.

The Washington Institute, a US-based think tank, last week warned that Hezbollah was stockpiling an arsenal of arms depots around Europe. It released an exhaustive interactive map of the group's involvement in organised crime, drug running, smuggling, money laundering and much more over almost four decades.



One of the components of the map is a US Department of State report titled "Select Europe-based Operational Activity" by Hezbollah. It detailed in May 2015 an event with haunting overtones following the tragedy in Beirut. The Cypriot authorities arrested Hussein Bassam Abdallah, a Lebanese-Canadian Hezbollah operative, who had stored 420 boxes of ammonium nitrate, the very material that ignited in the Beirut explosion. He was sentenced to three years in prison. Three years earlier another operative was accused of renting storage space for the same material but he fled Cyprus.

Keeping a lid on Hezbollah while seeking to promote European influence in the near abroad was already an impossible task. Last week showed how irresponsible it was not to tackle this group head on.

***Damien McElroy** is the London bureau chief of The National.*

The Prospect of China-Iran Axis

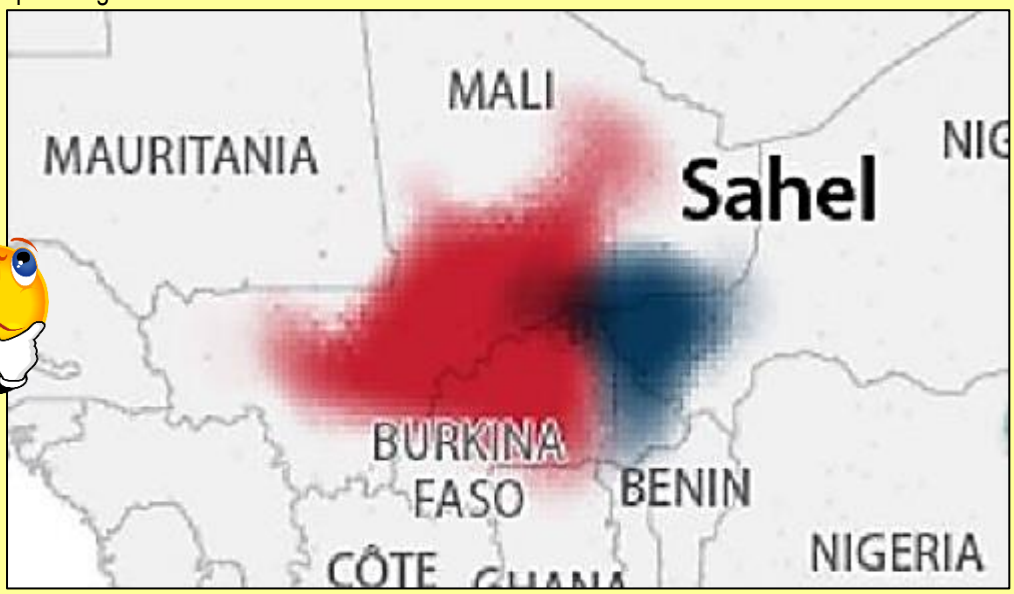
Source: http://www.homelandsecuritynewswire.com/dr20200810-the-prospect-of-chinairan-axis

Aug 10 – What will ties between China and Iran look like in the future? Amos Yadlin and Ari Heistein write that a recently leaked draft of a partnership agreement between Beijing and Tehran may provide some insight. The document outlines a framework for increased Chinese investment in Iran, strategic cooperation, and Iran's integration in China's Belt and Road Initiative. The potential agreement has rattled some in Washington, stoking concerns that America's assertive foreign policy has solidified a dangerous alliance between key, anti-American powers in East Asia and the Middle East.

Can the Takuba Force Turn Around the Sahel Conflict?

Source: http://www.homelandsecuritynewswire.com/dr20200810-can-the-takuba-force-turn-around-the-sahel-conflict

Aug 10 – Two years after a pan-European military initiative was first proposed to help tackle the Sahel's Islamist insurgency, the Takuba task force is finally becoming reality, as its first troops arrive amid the coronavirus pandemic, political turmoil and spreading unrest.



A group of roughly 100 Estonian and French special forces are the first on the ground to comprise **Takuba, the Tuareg name for a sabre**. Some 60 Czech troops are to join them in October, and another 150 Swedish ones by early next year.

Map depicts operating areas of AQIM, JNIM, and affiliates (**red**) and ISIS-Greater Sahara and affiliates. **READ ALSO +**

Estonia, Belgium and more recently Italy count among others to announce troops for the mission intended to help Mali and Niger forces fight extremist groups in the region.

But for now, and likely in the future, the main foreign troop contributor in the region is **France**, analysts say, who's own 5,100-troop Barkhane counterinsurgency operation enters its seventh year.

And despite recent military victories, they say, chances of eradicating the conflict are remote, unless the Europeans and Africans offer more holistic, long-term solutions.

The Top 10 Ways COVID-19 Could Impact Terrorism

By Gary Ackerman and Hayley Peterson

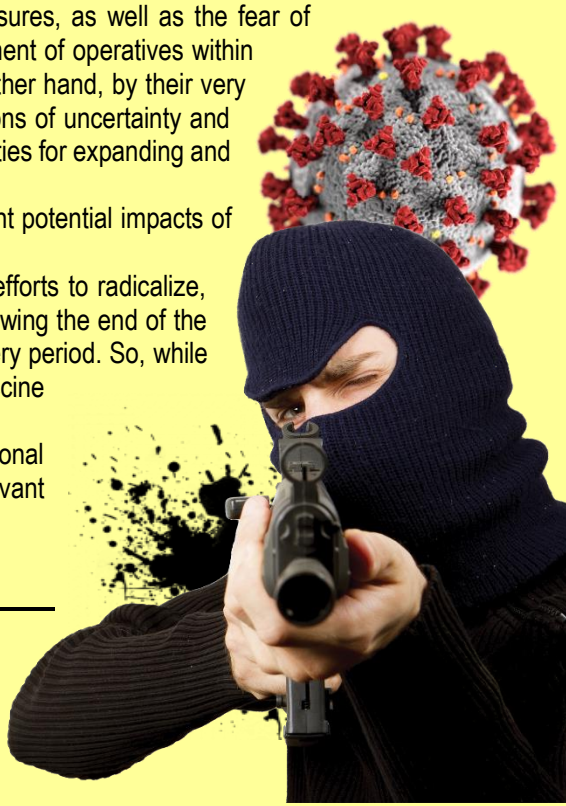
Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/the-top-10-ways-covid-19-could-impact-terrorism/

Aug 10 – The COVID-19 pandemic presents both challenges and opportunities for terrorists. On the one hand, terrorists are not immune to the coronavirus. Shutdowns, lockdowns and other social distancing measures, as well as the fear of infection, will tend to inhibit numerous aspects of terrorist operations, from the movement of operatives within and across borders, to the acquisition of vehicles, weapons and equipment. On the other hand, by their very nature as asymmetric adversaries, terrorists tend to adapt quickly and exploit conditions of uncertainty and instability to further their goals. The pandemic presents terrorists with several opportunities for expanding and adapting their activities.

In a new observational report, we have come up with a "Top 10" of the most significant potential impacts of COVID-19 on terrorism, in no particular order of relevance or likelihood.

Before we share our list, it is important to note that we believe that current terrorist efforts to radicalize, recruit and engage in pro-social activities are more likely to bear fruit in the years following the end of the pandemic, during what many project will be a lengthy economic stagnation and recovery period. So, while many of the short-term impacts of COVID-19 on terrorism will diminish once a viable vaccine is distributed widely, other effects are likely to be structural.

We also acknowledge that: a) we are still in the midst of the pandemic and additional consequences might yet emerge; and b) we are in uncharted territory with little to no relevant historical guidance to draw upon, forcing us to draw heavily on inference.



Here's our Top 10:

1. Terrorists Engaging in Pro-Social Activities

Even if only temporarily or cynically, there are several examples of larger terrorist organizations exploiting the pandemic to gain positive publicity and demonstrate the inadequacies of local governments. This includes offers to provide essential healthcare services, calls to social distance, promising safe passage to healthcare workers, disinfecting public spaces and organizing food distribution. These groups clearly see the propaganda value of such efforts as an opportunity to broaden their support in the long term.

2. Increased Susceptibility to Radicalization

The extended disruption can cause uncertainties, stresses and psychological setbacks. Psychological research indicates that this can make a greater number of people more susceptible to radicalizing narratives and extremist propaganda that seek to scapegoat various "others" and promise simple solutions – just as more people are spending more time online. Several terrorist organizations, including ISIS, have exploited the pandemic to directly boost their recruitment efforts, while many others, from al-Qaeda to multiple groups on the far right, have used the anxieties caused by the pandemic in order to feed into and, they hope, broaden the appeal of their narratives. This has led to a marked increase in activity on online extremist platforms, for example, encrypted channels on *Telegram* associated with white supremacists.

3. A Rise in Anti-Government Attitudes

Dissatisfaction with government responses to the pandemic have already fueled pre-existing levels of frustration and anti-government attitudes. Extremists whose ideology is particularly hostile to the state have pounced on this sentiment to further exacerbate levels of popular frustration, by using a maelstrom of disinformation campaigns and conspiracy theories. This frustration is heightened by the expansion of the state into everyday life via lockdowns and other restrictive measures, as we see with recent protests, and will likely only intensify as the socio-economic repercussions of the pandemic linger on for years.

4. Inspiration for Apocalyptic-Millenarian Extremists

While some extremist groups with an apocalyptic or millenarian flavor to their ideologies may believe that they must passively prepare for the end with a non-actionable role, others seek to actively initiate their particular version of Armageddon in order to secure salvation. The pandemic, evocative of the prophesied end times or deity displeasure with humanity, might act as a catalyst to violent action for a wide range of groups, from stereotypical cults to larger jihadists groups like ISIS.

5. Terrorists Working from Home

Ongoing global disruption to normal social operations and stay-at-home orders also affect extremists, who have quickly adapted to reach the currently augmented population of Internet users. Beyond fevered dissemination of propaganda material, committed radicals might begin to use their time at home to engage in operational preparations. Possible preparations of this kind range from taking advantage of today's data-saturated environment to collect ISR (intelligence, surveillance and reconnaissance) to improving their technical skills. Being limited to mostly online resources has also led to a marked escalation in cybercrime during the pandemic, with significant increases in ransomware attacks.

6. Establishing Bioterrorism as a Viable Tactic

The proven inability of even highly developed countries to stop the spread of the virus has exposed the many weaknesses present in global public health systems. These will not go unnoticed by terrorist groups when they consider new ways to achieve their goals. Since a key strategy of terrorists is to inflict psychological damage on populations as a means of violent coercion, the pandemic's societal and economic consequences provide a perfect script for the theatre of terrorism. Despite previous unsuccessful efforts, the possibility of replicating the death and disruption of the pandemic may make bioterrorism a newly attractive option. Conversely, for terrorists with well-defined, vulnerable constituencies, the indiscriminate spread of the disease would likely give them pause, at least when it comes to utilizing contagious pathogens.

7. Weaponizing COVID-19

While most past attempts at bioterrorism have involved noncontagious agents, there have already been reports of extremists considering using the SARS-CoV-2 virus as a weapon. Weaponizing the current pandemic could follow three possible scenarios: a) low-level

dissemination of the virus with little to no premeditation, such as the many observed cases in the U.S. and elsewhere of intentional spitting, coughing, or licking behavior in public, sometimes leading to domestic terrorism charges; b) a medium-level threat scenario using the virus as part of a planned attack on specific ideological targets (such as white nationalist and jihadist groups calling for the intentional spread of COVID-19 to specific populations); or c) a large-scale effort where perpetrators intentionally spread the virus in an indiscriminate manner in order to prolong or reignite the pandemic. The last of these threats becomes much more of a problem in the period from after the first wave of COVID-19 passes until a reliable vaccine is developed.

8. Conventional Attacks During the Pandemic

Aside from areas of high instability, where the pandemic might provide attack opportunities because it draws away security forces, many terrorists in more developed parts of the world will likely conclude that during a pandemic is not the optimal time to launch a major attack. Whether this is due to the noticeably decreased number of people frequenting soft targets such as transportation hubs or the difficulty in displacing news headlines about the pandemic, many terrorists might stick to planning until society returns to normal. The one glaring exception is healthcare facilities where COVID-19 patients are treated, since these provide both concentration of targets and would ensure widespread publicity.

9. Less-Secure Facilities

Aside from those such as government buildings, which tend to be well-guarded especially given the recent protests, coronavirus-related disruptions can negatively affect security at many facilities – whether from limited operations, personnel being quarantined or falling ill, a psychologically distracted workforce, or even, simply, reduced foot traffic by passersby. Consequences this could have on terrorist threats include increased likelihood of attacks on symbolic targets by those terrorists who specifically seek fewer or no casualties, lower risks for terrorists to acquire materials from either less-secure facilities or everyday stores where anxious workers are preoccupied by the pandemic, or even an opportunity to free followers in detention, as seen in recent ISIS endeavors.

10. CT Distractions

Like anyone, counterterrorism personnel might fall ill from the virus or experience its attendant psychological distresses. At the very least, the ongoing situation will reduce capabilities and introduce friction into the counterterrorism process (e.g., with analysts teleworking or suffering personal stresses), thus making it more likely that a crucial warning indicator or piece of intelligence could fall through the cracks. More detrimentally, we are already seeing potential ramifications internationally, as large terrorist networks seek to capitalize on the distractions caused by COVID-19. Multiple terrorist groups have explicitly called upon their followers to carry out attacks on vulnerable opponents whose forces are preoccupied with pandemic prevention and relief. Also, with the ongoing spread of the virus across the globe causing countries to focus inwards, national and international coordination on counterterrorism might only be weaken over time. The extent to which these strains on counterterrorism activities will persist or intensify will depend on the duration and extent of the progress of the disease, and the long-term economic damage brought about by the pandemic – but counterterrorism resources could be curtailed for years to come.

Gary Ackerman *is the Director, Center for Advanced Red Teaming, at the University at Albany, SUNY, and Associate Professor and Associate Dean, College of Emergency Preparedness, Homeland Security, Cybersecurity. Ackerman has designed and conducted Red Teaming for over a decade on behalf of a variety of government agencies and other organizations, including the Domestic Nuclear Detection Office within the Department of Homeland Security (DHS), the Transportation Security Administration (TSA), the Defense Advanced Research Projects Agency (DARPA) and national laboratories. He has published a compendium of his Red Team scenarios related to nuclear and radiological threats, titled Gaming Armageddon, which has been widely used within the United States government. Dr. Ackerman came to Red Teaming through his quest to understand terrorist tactical and strategic decision-making in the context of unconventional weapons and emerging technologies. Before founding CART and joining the faculty of the University at Albany, he was the Founding Director of the Unconventional Weapons and Technology Division at the National Consortium for the Study of Terrorism and Responses to Terrorism (START), where he also previously acted as the Research Director and Special Projects Director.*

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.

Turkey Still a Major Hub for ISIS Militants, IG Report Says

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/turkey-still-a-major-hub-for-isis-militants-ig-report-says/

Aug 07 – Turkey continues to be a regional transit hub for the Islamic State group, even though the NATO ally has recently stepped up efforts to counter attempts to smuggle ISIS fighters and weaponry into war-torn Syria, a new Inspector General's report says.
In a report released Tuesday by the **Lead Inspector General for the military's mission in Syria and Iraq, U.S. European Command** called Turkey a "major facilitation hub" for ISIS and said security at the country's southern borders with Syria and Iraq continues to be a problem.
Turkey has been criticized for years by Western allies for failing to stop the flow of foreign fighters into Syria, something critics have said contributed to the initial rise of ISIS in the region. But in recent months, Ankara has dealt more aggressively with ISIS within its borders and inside Syria, EUCOM said in the report.

▶▶ Read more at Stars and Stripes

Hagia Sophia and Cathedral of Córdoba: The Jihad Factor

By Raymond Ibrahim
Source: https://www.meforum.org/61370/hagia-sophia-and-cathedral-of-cordoba

***Raymond Ibrahim** is a Judith Friedman Rosen Fellow at the Middle East Forum.*

Lithuania Designates Hizbullah as a Terrorist Organization

Aug 13 – Lithuania on Thursday designated Hizbullah as a terrorist organization and issued a 10-year ban on all individuals related to the Iran-backed group from entering the Baltic nation's territory. "After receiving valuable information from our foreign partners, we can assume that Hizbullah is functioning on the principles of terrorist organization," Foreign Minister Linas Linkevicius said.

Abandoned by State after Explosion, Lebanese Help Each Other

Source: http://www.naharnet.com/stories/en/274140-abandoned-by-state-after-explosion-lebanese-help-each-other

Aug 13 – In the southern Lebanese town of Haris, a newlywed couple is living in one of Safy Faqeeh's apartments for free. He's never met them before, and they aren't on a honeymoon. Their apartment in Beirut was wrecked when last week's massive explosion wreaked destruction across the capital. Faqeeh is one of hundreds of Lebanese who have opened their homes to survivors of the Aug. 4 blast.

▶▶ **Read the rest of this touching article at source's URL.**

EDITOR'S COMMENT: Being recently in Beirut (July 2019) two things amazed me: (1) the magnitude and variety of volunteer services – to a level that Western societes cannot even imagine! Civil Protection; Lebanese Red Cross just to name a few; and (2) the fact that people must pay the "electricity mafia" in every neighborhood in order to have daily electricity.

A must-see video!

Source: https://www.pronews.gr/kosmos/905504_kina-nosokoma-kanei-dialeimma-kai-o-idrotas-trehei-potami-vinteo

The unexpected always happens and it is not always bad!

Aug 13 – The UAE and Israel have reached a historic deal that will lead to a full normalization of diplomatic relations between the two nations. The agreement, brokered by US President Donald Trump, means Israel has suspended plans to annex parts of the occupied West Bank.

Do you know the history behind this photo?

(click on photo)

During EU teleconference, Greece and Germany disagree on Turkey stance

Source: https://www.ekathimerini.com/255905/article/ekathimerini/news/during-eu-teleconference-greece-and-germany-disagree-on-turkey-stance

Aug 14 – During EU teleconference of the European Union Foreign Affairs Council (FAC) on Friday, Greece and Germany disagreed on the content of the statement officials had planned to issue after the talks, according to diplomatic sources.

The Greek side insisted on a harder line against Ankara that would have demanded an immediate end to Turkey's exploratory activities in the Eastern Mediterranean this week and that would have welcomed last week's deal between Greece and Egypt demarcating the two countries' exclusive economic zones.

However German officials disagreed, particularly over a proposed reference to the Greek-Egyptian deal. Berlin was irked with the timing of the Greek-Egyptian maritime accord, a day before the scheduled announcement of exploratory talks between Athens and Ankara that had been mediated by Germany.
As a result, Greece too refused to approve a proposed EU statement on the Belarus election results, meaning there was no joint statement at the end of the teleconference.
Instead European Union foreign policy chief Josep Borrell, expressed on Twitter "full solidarity" with Greece and Cyprus and called on Turkey "for immediate de-escalation and reengaging in dialogue."
According to sources, there was a discussion on a possible statement from Borrell's office about examining the possibility of a moratorium on research activities in "disputed waters."
In comments after the teleconference and following talks in Vienna with US Secretary of State Mike Pompeo, Greek Foreign Minister Nikos Dendias said he was satisfied with the condemnation of Turkey's behavior and the support shown by Greece's and Cyprus' partners. He said a list of sanctions is being drawn up by the FAC and will be the focus of informal discussions in Berlin on August 27 and 28.
During the teleconference, Dendias sought to present a precise picture of the "operational situation" in the region "so that friends and partners can see what Greece faces." He said Athens remained open to dialogue with Turkey "but not in a climate of pressure of blackmail" and exclusively "on the one real point of dispute between us," referring to the delineation of the continental shelf.

EDITOR'S COMMENT: The European Union (EU) is a political and economic union of 27 member states that are located primarily in Europe. The EU has developed an internal single market through a standardised system of laws that apply in all member states in those matters, and only those matters, where members have agreed to act as one. EU policies aim to ensure the free movement of people, goods, services and capital within the internal market; enact legislation in justice and home affairs; and maintain common policies on trade, agriculture, fisheries and regional development. The predecessors of the European Union were not devised as a military alliance because NATO was largely seen as appropriate and sufficient for defence purposes. 21 EU members are members of NATO while the remaining member states follow policies of neutrality. Following the Kosovo War in 1999, the European Council agreed that "the Union must have the capacity for autonomous action, backed by credible military forces, the means to decide to use them, and the readiness to do so, in order to respond to international crises without prejudice to actions by NATO". To that end, a number of efforts were made to increase the EU's military capability, notably the Helsinki Headline Goal process. After much discussion, the most concrete result was the EU Battlegroups initiative, each of which is planned to be able to deploy quickly about 1500 personnel. In the current energy/politics crisis between Greece, Cyprus, and Turkey I was hoping to see the expected EU solidarity – imagine Greek Nave supported by a Spanish-Italian-France armada clearly stating "go away! You are trespassing EU waters!" because this is what a "union" is for! And without expectations to reimburse "support" by purchasing warplanes or frigates from another member state. And on top of that I was expecting a strong presence of a US fleet passing the same message. We provide everything to them; they just want our last euro and to stay away from "bad" Russia! What a disappointment from a reality that we have not learned to seriously consider. If you have "friends" like them (Germany, Italy, Hungary, Bulgaria, Spain, Malta), who needs enemies!" Especially if among them are those who bloodied the world twice. But deep inside there is still an ancient sleeping Spartan gene asking "*not how many but where*?" ("*ού πόσοι, αλλά πού;"* a quote by Spartans commenting on the enemy; bravely repeated by Capt. Nikolaos Katountas, Commander of the 31st Company of the 33rd Commando Battalion during the Turkish invasion in Cyprus [July 1974]) and this is something that traditional enemies should always keep in mind!

North Koreans are ordered to hand over 'decadent and bourgeois' pet dogs for 'restaurant meat' as the country is rocked by food shortages

Source: https://www.dailymail.co.uk/news/article-8634831/North-Koreans-ordered-hand-pet-dogs-killed-meat-country-hit-food-shortages.html

Aug 12

- Dictator Kim Jong-un announced in July that owning a pet is now against the law
- Authorities are identifying homes with dogs in Pyongyang and rounding them up
- Some of the dogs are sent to state-run zoos or sold to dog meat restaurants


With Kim Jong-un in Jelly
ADULT
개 살인자!

In COVID's Shadow, Global Terrorism Goes Quiet. But We Have Seen This Before, and Should Be Wary

By Greg Barton

Source: http://www.homelandsecuritynewswire.com/dr20200818-in-covid-s-shadow-global-terrorism-goes-quiet-but-we-have-seen-this-before-and-should-be-wary

Aug 18 – Have we flattened the curve of global terrorism? In our COVID-19-obsessed news cycle, stories about terrorism and terrorist attacks have largely disappeared. We now, though, understand a little more about how pandemics work.

And ironically, long before the current pandemic, the language of epidemiology proved helpful in understanding by analogy the way in which terrorism works as a phenomenon that depends on social contact and exchange, and expands rapidly in an opportunistic fashion when defenses are lowered.

Terrorism Goes Quiet - but We've Seen This Before

In this pandemic year, it appears one piece of good news is that the curve of international terrorist attacks has indeed been flattened. Having lost its physical caliphate, Islamic State also appears to have lost its capacity, if not its willingness, to launch attacks around the world well beyond conflict zones.

We have seen this happen before. The September 11 attacks in 2001 were followed by a wave of attacks around the world. Bali in October 2002, Riyadh, Casablanca, Jakarta and Istanbul in 2003, Madrid in March 2004, followed by Khobar in May, then London in July 2005 and Bali in October, not to mention numerous other attacks in the Middle East and West Asia.

Since 2005, with the exception of the Charlie Hebdo shootings in Paris in January 2015, al-Qaeda has been prevented from launching any major attacks in Western capitals.

The September 11 attacks precipitated enormous investment in police counterterrorism capacity around the world, particularly in intelligence. The result has been that al-Qaeda has struggled to put together large-scale coordinated attacks in Western capitals without being detected and stopped.

Then in 2013, Islamic State emerged. This brought a new wave of attacks from 2014 in cities around the world, outside of conflict zones in Syria, Iraq, Afghanistan, Somalia and Nigeria.

This wave of IS international terror attacks now appears to have reached an end. The hopeful rhetoric of the collapse of the IS caliphate leading to an end of the global campaign of terror attacks appears to have been borne out. Although, as the sophisticated and coordinated suicide bombings in Colombo in Easter 2019 reminded us, further attacks by previously unknown cells cannot ever be ruled out.

While it's tempting to conclude that the ending of the current wave of international terrorist attacks by IS is due largely to the ending of the physical caliphate in Syria and Iraq, and a concomitant collapse of capacity, the reality is more complex. Just as the wave of al-Qaeda attacks in the first half of the 2000s was curtailed primarily by massive investments in counterterrorism, so too it appears to be the case with IS international terror plots in the second half of this decade.

The 2019 attacks in Sri Lanka illustrate dramatically what happens when there is a failure of intelligence, whether due to capacity or, as appears to be the case in Sri Lanka, a lack of political will. The rise of IS in 2013-14 should not have caught us by surprise, but it did, and in 2014 and 2015 we were scrambling to get up to speed with the intelligence challenge.

Epidemiology of Terror

The parallels with the epidemiology of viruses are striking. Reasoning by analogy is imperfect, but it can be a powerful way of prompting reflection. The importance of this cannot be underestimated as intelligence failures in counterterrorism, like poor political responses to pandemics, are in large part failures of imagination.

We don't see what we don't want to see, and we set ourselves up to become victims of our own wishful thinking. So, with two waves of international terrorist attacks over the past two decades largely brought under control, what can we say about the underlying threat of global terrorism?

There are four key lessons we need to learn.

First, we are ultimately seeking to counter the viral spread of ideas and narratives embodied in social networks and spread person-to-person through relationships, whether in person or online. Effective policing and intelligence built on strong community relations can dramatically limit the likelihood of terrorist networks successfully executing large-scale attacks. Effective intelligence can also go a long way to diminishing the frequency and

intensity of lone-actor attacks. But this sort of intelligence is even more dependent on strong community relations, built on trust that emboldens people to speak out.

Second, terrorist movements, being opportunistic and parasitic, achieve potency in inverse relation to the level of good governance. In other words, as good governance breaks down, terrorist movements find opportunity to embed themselves. In failing states, the capacity of the state to protect its citizens, and the trust between citizen and authorities, provides ample opportunities for terrorist groups to exploit grievances and needs. This is the reason around 75% of all deaths due to terrorist activity in recent years have occurred in just five nations: Syria, Iran, Afghanistan, Pakistan, and Nigeria (followed by Somalia, Libya, and Yemen).

The **third** lesson is directly linked to state failure, and is that military methods dramatically overpromise and under-deliver when it comes to countering terrorism. In fact, more than that, the use of military force tends to generate more problems than it solves. Nothing illustrates this more clearly than what has been so wrongly framed as the Global War on Terror.

Beginning in October 2001 in the immediate wake of the September 11 attacks, the war on terror began with a barrage of attacks on al-Qaeda positions in Afghanistan. It was spurred by understandable anger, but it led to two decades of tremendously expensive military campaigns they have completely failed to deliver the hoped-for end in terrorism to justify the massive toll of violence and loss of life.

The military campaign in Afghanistan began, and has continued for almost 19 years, without any strategic endpoints being defined and indeed with no real strategy vision at all. After almost two decades of continuous conflict, any American administration would understandably want to end the military campaign and withdraw.

Obama talked of doing this but was unable to do so. Trump campaigned on it as one of the few consistent features of his foreign policy thinking. Hence the current negotiations to dramatically reduce American troop numbers, and in the process trigger a reduction in allied coalition troops while releasing thousands of detained militants in response to poorly defined and completely un-guaranteed promises of a reduction in violence by the Taliban.

This is America's way of ending decades of stalemate in which it is has proven impossible to defeat the Taliban, which even now controls almost one half of Afghanistan. But even as the peace negotiations have been going on the violence has continued unabated. The only reason for withdrawing and allowing the Taliban to formally take a part in governing Afghanistan is fatigue.

Not Just Afghanistan

If the Taliban and al-Qaeda in Afghanistan were the main story, the situation would already be far more dire then we would care to accept. But the problem is not limited to Afghanistan and West Asia. The invasion of Iraq in 2003 by the "coalition of the willing" was justified largely on the grounds it was necessary to stop al-Qaeda from establishing a presence in Iraq. It achieved, of course, the exact opposite.

Al-Qaeda had little, if any, presence in Iraq prior to the invasion. But the ensuring collapse of not just the regime of Saddam Hussein but the dismantling of the Baath party and the Iraqi military, led largely by a Sunni minority in a Shia majority country, created perfect storm conditions for multiple Sunni insurgencies.

These in turn came to be dominated by the group that styled itself first as Al Qaeda in Iraq, then as the Islamic State in Iraq, and then as the Islamic state in Iraq and Syria. This powerful insurgency was almost completely destroyed in the late 2000s when Sunni tribes were paid and equipped to fight the al-Qaeda insurgency.

The toxic sectarian politics of Iraq, followed by the withdrawal of US troops at the end of 2011, coinciding with the outbreak of civil war in Syria, saw the almost extinguished insurgency quickly rebuild. We only really began to pay attention when IS led a blitzkrieg across northern Iraq, seized Mosul, and declared a caliphate in June 2014.

Defeating this quasi-state took years of extraordinarily costly military engagement. But even as IS was deprived of the last of its safe havens on the ground, analysts were warning it continued to have tens of thousands of insurgent militants in Syria and northern Iraq and was successfully returning to its earlier mode of insurgency.

As the Iraqi security forces have been forced to pull back in the face of a steadily building COVID-19 pandemic, there are signs the IS insurgent forces have continued to seize the spaces left open to them. Even without the pandemic, the insurgency was always going to steadily build strength, but the events of 2020 have provided it with fresh opportunities.

The **fourth** and final lesson we need to come to terms with is that we are dealing with a viral movement of ideas embodied in social networks. We are not dealing with a singular unchanging enemy but rather an amorphous, agile, threat able to constantly evolve and adapt itself to circumstances.

Al-Qaeda and IS share a common set of ideas built around Salafi-jihadi violent extremism. But this is not the only violent extremism we have to worry about.

In America today, as has been the case for more than a decade, the prime terrorist threat comes from far-right violent extremism rather than from Salafi-jihadi extremism. The same

is not true in Australia, although ASIO and our police forces have been warning us far-right extremism represents an emerging secondary threat.
But the potent violence of an Australian far-right terrorist in the attack in Christchurch in March 2019 serves to remind us this form of violent extremism, feeding on toxic identity politics and hate, represents a growing threat in our southern hemisphere.

Fighting the Terrorist Pandemic
In this year in which we have been, understandably, so preoccupied with the coronavirus pandemic, another pandemic has been continuing unabated. It is true we have successfully dealt with two waves of global terrorist attacks over the past two decades, but we have not dealt successfully the underlying source of infections.
In fact, we have contributed, through military campaigns, to weakening the body politic of host countries in which groups like al-Qaeda, IS and other violent extremist groups have a parasitic presence.
We now need to face the inconvenient truth that toxic identity politics and the tribal dynamics of hate have infected Western democracies. Limiting the scope for terrorist attacks is difficult. Eliminating the viral spread of hateful extremism is much harder, but ultimately even more important.

***Greg Barton** is Chair in Global Islamic Politics, Alfred Deakin Institute for Citizenship and Globalization, Deakin University.*

ISIS Declares Humanitarian Aid Workers Are Legitimate Targets

By Bridget Johnson
Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/isis-declares-humanitarian-aid-workers-are-legitimate-targets/

Aug 18 – **ISIS issued a warning to humanitarian organizations in the latest issue of its weekly *al-Naba* newsletter, calling their workers legitimate targets who either represent enemy entities or are trying to proselytize.**
The terror group made the threat as it maintains provinces and cells in areas that are often in need of humanitarian assistance, including central, north and west Africa, Somalia, Yemen, Afghanistan, and Syria.
The warning came just a few weeks after the Islamic State West Africa Province released a video showing five blindfolded men kneeling on the ground as masked, camouflaged terrorists stood behind them. The captives were all shot.
The victims were reportedly from aid groups Action Against Hunger and the International Rescue Committee, along with one from Nigeria's State Emergency Management Agency. They were kidnapped while traveling between Maiduguri and Monguno in Borno State; the ISWAP claim of responsibility accused the men of "Christianizing" while conducting their duties.
The International Rescue Committee issued a statement July 22 "strongly" condemning "the senseless execution of our colleague, Luka Filibus, and his fellow humanitarian captives."
"We are deeply saddened and heartbroken by this news. Luka and his family were forced to flee their home, and he was still compelled to alleviate the suffering of children. He dedicated his life to protecting children and to help lessen their trauma in the face of crisis. His colleagues in Nigeria remember him always with a smile on his face. We grieve with Luka's family and will do everything we can to support them through this challenging time," IRC said.
The group added, "The killing of aid workers is a violation of international law. Aid workers must never be a target."
In its *al-Naba* article, ISIS argued that aid organizations helping any entities seen as being in conflict with their brand of Islam were by extension at war with ISIS as well as "a partner in the fighting." Aid groups "nullify the fighting of the apostates, simply because of their work," the terror group continued.
ISIS also claimed that "it is no longer a secret that working in these organizations" was among the "most important covers" for spies.
"In addition to that, many of these organizations have a Western origin" and while providing relief services for countries in need are also working to "entrance" populations to Christianity "and bring them closer to that," the article said. "Also, some of them direct their activities to push other blasphemous beliefs, such as secularism, democracy, socialism and others."

"Many of them push Muslims to disbelief," ISIS charged, specifically decrying groups tied to the United Nations or to "blasphemous governments" and aid programs intended "to improve the image of tyrants and truly criminal states."
Legitimate targets include "all the people who work in those organizations," the terror group concluded.
ISIS called on followers to "study the situation of organizations that claim to provide services" and warn Muslims "not to work in organizations that aim to spread blasphemy and atheism" or ascribe to principles of democracy. "They have to fight organizations fighting the religion of Islam" and prevent them from working in Muslim countries, the terror group said.
Past ISIS murders of humanitarian aid workers have included the 2014 beheading of American aid worker Peter Kassig in Syria and the 2013 abduction of Kayla Mueller after she left a Doctors Without Borders hospital in Syria.
U.S. Africa Command recently warned that ISIS and al-Qaeda were making inroads in Nigeria and looking to expand, sparking a debate within the Nigerian government on how to weigh the U.S. warning and confront the threat.
"We have engaged with Nigeria and continue to engage with them in intel sharing and in understanding what these violent extremists are doing. And that has been absolutely critical to their engagements up in the Borno state and into an emerging area of northwest Nigeria that we're seeing al-Qaeda starting to make some inroads in," AFRICOM commander Maj. Gen. Dagvin Anderson told a media briefing two weeks ago.
"So, this intelligence sharing is absolutely vital and we stay fully engaged with the government of Nigeria to provide them with an understanding of what these terrorists are doing, what Boko Haram is doing, what ISIS-West Africa is doing, and how ISIS and al-Qaeda are looking to expand further south into the littoral areas," he said.

***Bridget Johnson** is the Managing Editor for Homeland Security Today.*

Nubia Watch, A Futuristic Flexible Display Smartwatch

Source: https://www.kickstarter.com/projects/1624500366/nubia-watch-a-futuristic-flexible-display-smartwatch

Curved, expansive, flexible. Meet Nubia Watch, a foldable smartwatch that comes from the future.

EDITOR'S COMMENT: I can think of a number of interesting applications relevant to CBRN first responders!

Narcoterrorism: Venezuela, Hezbollah and a cocaine invasion

By Peter Speetjens
Source: https://www.middleeasteye.net/big-story/narcoterrorism-venezuela-hezbollah-cocaine-maduro

Aug 13 – Washington says Nicolas Maduro and his Middle East allies are conspiring to hook Americans on drugs and carry out terror attacks on US soil. What's the truth?

***Peter Speetjens** is a Dutch journalist who lived in Lebanon for 20 years, regularly travels to India and has a special interest in how 19th century writers helped shape our conceptions of the world today.*

Europe Suffers from a New Global Terror Tactic

By Todd Bensman

Source: https://www.meforum.org/61410/in-europe-migrant-terrorist-strikes-continue

Aug 19 – An Iraqi asylum seeker thought to have radicalized while living in a Berlin refugee center "purposefully hunted" motorcyclists in a Opel Astra sedan this week, crushing two riders Tuesday and severely injuring three passengers in another car while bulldozing one of the motorbikes into it, according to press reports coming out of Germany. No one immediately died, thankfully, though one of the cyclists was in critical condition fighting for his life this week.

Sarmad A, a 30-year-old Iraqi migrant, posted this image of himself and the car he later used in a Berlin terror attack. (Facebook)

The 30-year-old Iraqi identified as "Sarmad A." gave German anti-terrorism investigators plenty of reason to initially conclude he harbored an "Islamist motive" for the attack, despite past psychological treatment. Initial reporting had it that Sarmad allegedly shouted "Allahu Akbar" during his attack, laid a prayer rug on the street and began praying afterward, and maintained a Facebook page where he supported ISIS and seemed to foretell that he planned to become a martyr in a way that involved a car.

The Berlin vehicle-ramming (a tactic frequently recommended by ISIS and Al Qaeda) extends a run of jihadist attacks and plots by migrants resettled in a dozen European countries among some three million refugees from the Islamic world since the Arab Spring uprisings in 2011 and the early Syrian civil war years.

This week's Berlin attack also adds to Center for Immigration Studies research on the phenomenon published in November 2019, which quantified the attacks through 2018 as evidence of a new global terror tactic: terrorist border infiltration and abuse of asylum systems. The CIS study found that between 2015 and 2018 alone, at least 104 border-infiltrating Islamic extremists from Muslim-majority countries like Iraq attacked, plotted, or successfully hid from European asylum adjudicators their past terrorist group memberships and atrocities.

Europe's tragic experience with refugee resettlement from Muslim-majority nations holds lessons for American homeland security strategists and policy-makers, especially the extent to which security vetting is incorporated as a central component in any national strategy to manage border-crossing migrants arriving as strangers without identification at the U.S.-Mexico border.

Since the 2018 end of the CIS study period, scores more migrant-terrorists who came in over Europe's borders as supposed refugees have attacked or were arrested while plotting mass-casualty and smaller-scale attacks.

... Even though the height of Europe's migrant crisis pretty much ended in 2017, those who came in before then and after keep attacking. Far too many to discuss here.

But the French newspaper *Le Parisien*, in covering the latest German attack, noted that German authorities have foiled a dozen attempted vehicle-ramming attacks since an infamous December 2016 one by an asylum seeker who drove a truck over 12 people at a Christmas market, including two in November 2019. And there was a thwarted "biological bomb" attack in June 2018 by a Tunisian linked to ISIS[2]. Since 2013, the number of Islamists considered dangerous in Germany increased five-fold to stand at 680 at the moment. The number of Salafists is estimated at 11,000, twice as many as in 2013, Le Parisien reports.

[2] A Tunisian man and his German wife went on trial on Friday on charges of planning a foiled biological bomb attack in Germany after buying ricin and testing the lethal toxin on a hamster. Sief Allah H., 30, and his wife Yasmin, 43, were arrested a year ago by an anti-terrorist squad that found 84 milligrams of the toxin in their Cologne apartment. The arrests likely prevented what would have been Germany's first biological attack, said Holger Muench, head of the BKA Federal Criminal Police Office, at the time. Federal prosecutors said the couple had "for a long time identified with the aims and values of the foreign terrorist organization ISIS". They decided in 2017 to detonate an explosive in a large crowd, "to kill and wound the largest possible number of people," said prosecutors ahead of the trial in Duesseldorf. The pair had allegedly researched various forms

"German Chancellor Angela Merkel has often been accused, especially by the far right, of having contributed to these attacks by generously opening her country's borders to hundreds of thousands of refugees and migrants in 2015," the paper concluded.
Attributing the security concern about strangers from terrorist-rich countries solely to the so-called "far right" suggests that no one else on the political spectrum shares it, even in the wake of actual bloodshed, real funerals, expensive security arrangements in European cities, and terrorism trials that send migrant-terrorists to authentic prisons.
If it is true that only the "far right" still thinks about such matters, then it is also true that this is what led to Europe's tragedy in the first place. And probably will, eventually, to something like it in the United States.

***Todd Bensman** is a fellow at the Middle East Forum and a senior national security fellow for the Center for Immigration Studies. He previously led counterterrorism-related intelligence efforts for the Texas Intelligence and Counterterrorism Division.*

Istanbul: Turkey is converting another former Byzantine church into a mosque

Source: https://www.euronews.com/2020/08/21/istanbul-turkey-is-converting-another-former-byzantine-church-into-a-mosque

Aug 22 – The Turkish government formally converted a former Byzantine church into a mosque on Friday, a move that came a month after it drew praise from the faithful and international opposition for similarly turning Istanbul's landmark Hagia Sophia into a Muslim house of prayer.

A decision by President Recep Tayyip Erdogan, published in the country's Official Gazette, said Istanbul's Church of St. Saviour in Chora, known as Kariye in Turkish, was handed to Turkey's religious authority, which would open up the structure for Muslim prayers.

Europe

Like the Hagia Sophia, which was a church for centuries and then a mosque for centuries more, had operated as a museum for decades before Erdogan ordered it restored as a mosque. It was not immediately known
The church, situated near the ancient city walls, is famed for its elaborate mosaics and frescoes. It dates to the 4th century, although the edifice took on its current form in the 11th-12th centuries.
The structure served as a mosque during the Ottoman era before being transformed into a museum in 1945. A court decision last year cancelled the building's status as a museum, paving the way for Friday's decision.

---

of explosives before deciding on the deadly poison. They ordered 3,300 castor beans over the internet and successfully made a small amount of ricin, a poison 6,000 times more potent than cyanide that can kill if swallowed, inhaled or injected, according to prosecutors.
Investigators also found 250 metal balls, two bottles of nail polish remover as well as wires soldered on lightbulbs. Only the raid and arrests prevented "the production of a larger quantity of ricin and the building of an explosive," said prosecutors. The couple were caught after a tip-off from the US Central Intelligence Agency. News weekly Der Spiegel has reported that the couple were believed to have already been radicalized when they met online in 2014.

And as with the Hagia Sophia, the decision to transform the Chora back into a mosque is seen as geared to consolidate the conservative and religious support base of Erdogan's ruling party at a time when his popularity is sagging amid an economic downturn.

Greece's Foreign Ministry strongly condemned the move, saying that Turkish authorities "are once again brutally insulting the character" of another UN-listed world heritage site.

"This is a provocation against all believers," the Greek ministry said in a statement. "We urge Turkey to return to the 21st century, and the mutual respect, dialogue and understanding between civilisations."

Elpidophoros, the Greek Orthodox archbishop of America, wrote on Twitter: "After the tragic transgression with Hagia Sophia, now the Monastery of Chora, this exquisite offering of Byzantine culture to the world!"

"The pleas and exhortations of the international community are ignored," he wrote.

Several Istanbul residents rushed to the building on Friday, some hoping to hold prayers there, Turkey's state-run Anadolu Agency reported.

"Like the Hagia Sophia, this is an important mosque for Muslims," the agency quoted Istanbul resident Cuma Er as saying. "We came here to pray after we learned about the decision. But we have been told that it has not yet been opened for prayers. We are waiting for the opening."

Last month, Erdogan joined hundreds of worshipers for the first Muslim prayers in Hagia Sophia in 86 years, brushing aside the international criticism and calls for the monument to be kept as a museum in recognition of Istanbul's multi-faith heritage.

As many as 350,000 took part in the prayers outside the structure.

ICI International CBRNE INSTITUTE

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C²BRNE DIARY

CHEM NEWS

Did you know?

Oleander

The oleander, or *Nerium oleander*, is considered by many to be the most poisonous plant in the world. All parts of the beautiful oleander contain poison -- several types of poison. Two of the most potent are oleandrin and neriine, known for their powerful effect on the heart. An oleander's poison is so strong, in fact, that it can poison a person who simply eats the honey made by bees that have digested oleander nectar.

The oleander is an attractive plant, and despite its deadly reputation is often planted for decorative purposes. Although native to the Far East and the Mediterranean areas, oleander has been introduced in the United States, where it grows easily. It's tolerant of poor-quality soil and dry weather. The plant grows as a dense shrub, and is typically 6 to 18 feet (1.8 to 5.4 meters) tall at maturity. It has thick, dark green leaves, and the flowers, which grow in clusters, can be yellow, red, pink or white.

Editor's toxic garden

Even in barren areas, the oleander produces lovely flowers and fragrance. Animals instinctively avoid the plant, and it grows rapidly, so it's often used for highway barriers and other areas that require screening from noise and pollution. Its rapid growth also makes it a popular choice around new construction zones, as it prevents erosion.

Unlike some toxic plants, the oleander is poisonous to most animals as well as humans. A single ingested oleander leaf can kill a child. Ingestion of oleander results in diarrhea, vomiting, intense stomach pain, drowsiness, dizziness, an irregular heartbeat, and often, death. If the victim s urvives the initial 24 hours after ingestion, his or her odds of surviving increase dramatically. For successful treatment, the patient is induced to vomit, his or her stomach may be pumped, or he or she may be fed activated charcoal to absorb as much of the poison as possible.

Toxic Principle

Oleandrin and neriine are two very potent cardiac glycosides (cardenolides) found in all parts of the plant. Red flowered varieties of oleander appear to be more toxic. Oleander remains toxic when dry. A single leaf can be lethal to a child eating it, although mortality is generally very low in humans. The lethal dose of the green oleander leaves for cattle and horses has been found to be 0.005% of the animal's body weight. The minimum lethal dose of oleander for cattle was found to be 50mg/kg body weight.

Horses given 40mg/kg body weight of green oleander leaves via nasogastric tube consistently developed severe gastrointestinal and cardiac toxicosis. Cardiac glycosides that act by inhibiting the cellular membrane sodium-potassium (Na+-K+ ATPase enzyme system) pump with resulting depletion of intracellular potassium and an increase in serum potassium. This results in progressive decrease in electrical conductivity through the heart causing irregular heart activity, and eventual complete block of cardiac activity, and death.

Marlborough firm launches revised chemical terrorism protections

Source: https://www.wbjournal.com/article/marlborough-firm-launches-revised-chemical-terrorism-protections

July 23 – Block Engineering of Marlborough has launched a revised line of its LaserWarn products used to identify chemical threats and protect people from terrorism or accidental chemical release.

The new products can detect and report on multiple chemicals simultaneously in real time and makes use of new artificial intelligence software lowering the limit of detection and reducing the chance of false alarms, according to a release from the company. The products include a rugged version for hazardous environments, as well as a lighter version for portable configurations.

"We currently have LaserWarn units installed globally at airports and other transportation hubs providing 24/7 monitoring for toxic industrial chemicals/materials and chemical warfare agents," Al Weggeman, president of Block Engineering, said in a release.

According to the company, the new rugged version of the detection system could be used to provide early warning against fugitive emissions and accidental chemical releases and was found to detect toxic gases a minute quicker than conventional technologies.

Medical Aspects of Chemical Weapons Victims of Iran

By Ali Karami

CBRNe World August 2012

Source: https://www.academia.edu/12119117/Medical_Aspects_of_Chemical_Weapons_Victims_of_Iran

Dr. Ali Karami, Ass Prof. of Molecular Biology and Biotechnology at the Baqyiatallah University of Medical Sciences (AK), talks to Dr. Sharhriar Khateri, co-founder of the Society for Iranian Chemical Weapons Victims Support:

AK: What is the current situation of CW injured patients in Iran?

SK: More than 70,000 CW victims are registered by the government and receive medical care. Many thousands are not registered and need medical care, and many had low-dose exposureand may develop long-term health effects in the future. Several of them have died in recent years because of respiratory failure, lung infection and other diseases. The government has provided full medical insurance and medical support for all registered CW victims. Sadly, there is almost no contribution by international medical communities and international organisations to help the Iranian medical community treat this huge number of patients. One reason might be that this humanitarian issue has been over-shadowed by political issues.

▶▶ **Read the full paper at source's URL.**

EDITOR'S COMMENT: I had the opportunity to visit the CW Hospital inside the Baqyiatallah University Hospital in Tehran during an OPCW course back in 2003 (while preparing for the 2004 Olympic Games in Athens). A unique opportunity to see, talk to and examine real CWA victims from the Iran-Iraq war era and discuss issues with Iranian medical experts that have the best knowledge of the effects and the long run course of CW on human body.

Amazing investment!

Five thousand, six hundrend and sixty-six (5,666) CBRN First Responders in Europe contribute their one month salary (1.500 €) and bought a collectible (10 cars only) **Bugatti Centodieci** as an investment for the future following the example

of Cristiano Ronaldo (you know the one who kicks a ball) who got one in order to celebrate Juventus' Serie A title win. Bugatti Centodieci is based on Bugatti Chiron and it uses the same 8.0 litre quad-turbocharged W16 engine that has been reworked to generate 1600 Bhp. Centodieci now does 0-100 kmph in just 2.4 seconds; 0-200 kmph in 6.1 seconds and it takes only 13.1 seconds to hit 300 kmph mark from zero. Bugatti has limited the top speed of Centodieci to 380 kmph which is lower than 420 kmph top of Chiron (damn!)

Detecting and preventing the use of chemical weapons

Source: http://www.homelandsecuritynewswire.com/dr20170608-detecting-and-preventing-the-use-of-chemical-weapons

June 08 – Like detectives looking for clues, researchers at the Department of Energy's Pacific Northwest National Laboratory have been working for nearly a decade on ways to identify the "fingerprints" of potential chemical threats. The ability to identify a particular agent and attribute its source is key to responding to and even preventing these threats.

Steven Ashby, director of Pacific Northwest National Laboratory, writes that at PNNL, a multidisciplinary team is conducting research and development in chemical detection and forensics with support from the Department of Homeland Security's Science and Technology Directorate and other U.S. government sponsors. Their work involves developing approaches to detect trace amounts of telltale compounds — the fingerprints, in samples taken from the area where an alleged attack took place or where an attack was thwarted.

These researchers are advancing the science behind the ability to identify the source of a particular chemical threat. Through the novel use of analytical techniques, researchers are able to help authorities connect a particular threat agent to where it may have been manufactured and, in some cases, to the specific lot of precursor materials. This information could be used by authorities to attribute a chemical attack to an individual, organization or state entity. This could help prevent follow-on attacks and, perhaps, even prevent them in the first place.

Additionally, analyses like this help address the challenges associated with commercial, dual-use chemicals that are produced for legitimate purposes but could also be used to produce chemical weapons. **For example**, **cyanide** is used in everyday products like

pesticides and plastics, as well as for mining. But cyanide also can be used to poison food and medicines, such as the cyanide-laced Tylenol capsules that led to several deaths in the Chicago area in the 1980s.

The steps to make cyanide are pretty much the same from manufacturer to manufacturer. However, researchers have found that various factors, including the manufacturing process and materials, and even the locale, may introduce manufacturer-specific impurities that can be detected in the final product. These "chemical attribution signatures" are the fingerprints authorities need to help put two and two together.

Ashby notes that PNNL research has shown that cyanide's signatures are probably unique enough to reveal where it was manufactured, by geographical location as well as specific plant, thereby helping authorities to determine who might have had access. Similarly, the chemical signatures of commercial calcium ammonium nitrate — a common chemical in fertilizer that also can be used in homemade explosives — can be indicative of its place of manufacture. Yet another effort is focused on tracing impurities in the raw materials used to make mustard agents to differentiate one sample from another.

PNNL researchers participated in the recent American Chemical Society National Meeting, at which they organized a symposium on chemical forensics, the fourth in a series. This symposium brought together experts from around the world, including representatives from the Organization for Prohibition of Chemical Weapons (OPCW) — an independent, international disarmament organization with 192 members that are working together to rid the world of the threat of chemical weapons. Today, 90 percent of the world's declared stockpile already has been destroyed.

"While the OPCW is focused on eliminating threats, PNNL is helping lead international efforts in chemical forensics that will make it possible to connect weaponized chemicals to their source," Ashby writes. PNNL researchers formed the Chemical Forensics International Technical Working Group, an ad hoc group that includes scientists, treaty experts, law enforcement and industry leaders dedicated to advancing the science of chemical forensics. The group's inaugural meeting took place in early April.

"Through technical expertise and leadership like this, PNNL scientists are making it easier for authorities to find those behind chemical attacks, as well as those who might be planning to use chemical weapons. In this way, we are helping to make the world a bit safer," Ashby concludes.

Sony's wearable air conditioner is pretty cool

By Sam Byford

Source: https://www.theverge.com/2020/7/22/21333837/sony-reon-pocket-hands-on-wearable-air-conditioner-japan

July 22 – I've lived in Japan for nearly twelve years, and I'm still not used to the awful summers. Between the high temperatures and suffocating humidity, stepping outside in July and August feels like being slowly cooked in a sous vide pot. As a seemingly interminable rainy season comes to an end, I'm not going to need much encouragement to stay home.

I don't think my opinion on Japanese summers is particularly unusual, which is probably why Sony decided to go ahead with the Reon Pocket through its First Flight internal-startup-incubator-slash-crowdfunding-platform. First Flight has previously led to products like the FES E Ink watch, the Huis smart home universal remote, and the Wena Wrist modular smartwatch. Now we have the Reon Pocket, which can only be described as a wearable air conditioner, and I've been testing it out.

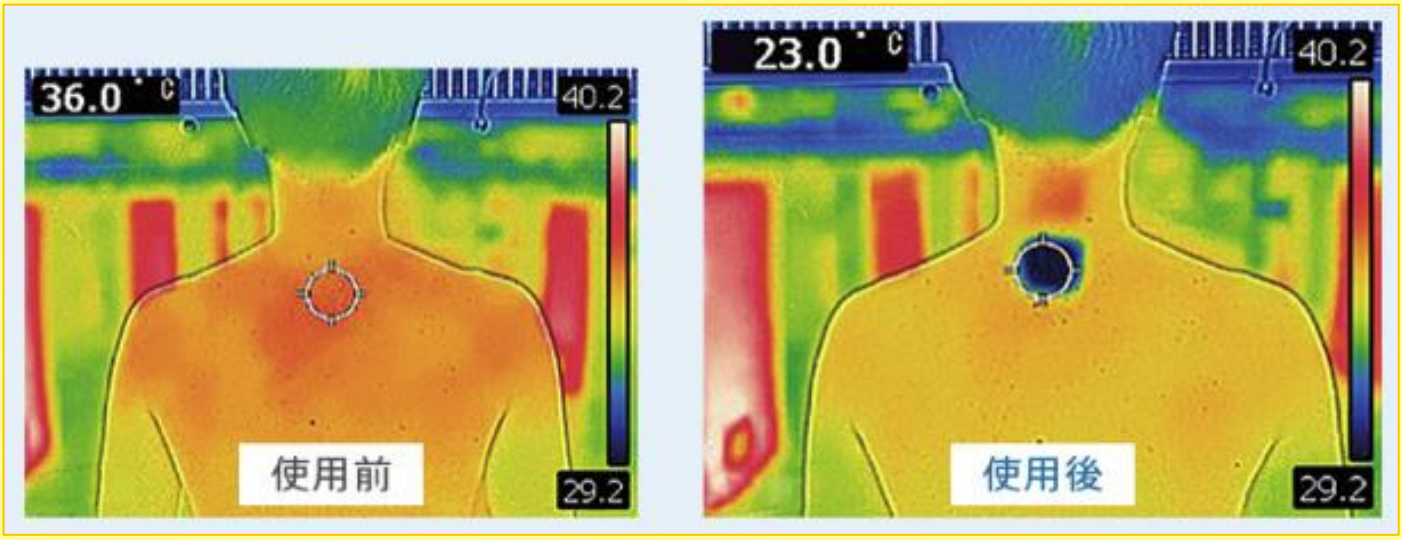
A Reon Pocket undershirt, complete with inner pocket on the back.

The Reon Pocket is a fairly slim palm-sized white plastic device that charges over USB-C and connects to your iOS or Android phone with Bluetooth. It definitely looks like a Sony gadget. There's a silicone pad on the back that you can press against your skin, and the Reon Pocket uses the Peltier effect to cool or warm itself up by absorbing and releasing heat. You can use it handheld, but the most widely promoted use cases involves buying Sony's special V-neck undershirts with a pocket on the inner back to keep the device resting between your shoulder blades.

The app is pretty simple and gives you direct control over the Reon Pocket's temperature settings. There are three levels of cooling or warming, plus an additional boost mode that's limited to two minutes and a control for the speed of the "fan." You can also set automatic modes that kick in whenever you turn the device on with its own power button rather than using the app. It lasts around 2-3 hours on a charge, depending on the intensity of your settings.

The device only weighs about 80 grams, so beyond the cooling and warming effects it doesn't really feel noticeable when you're wearing it in the undershirt, and it doesn't stick out beneath another layer of clothing. It is, however, a little awkward to insert it once the undershirt is on — you need to get a good fit in the pocket, which is hard to do with your hands behind your back. Maybe it gets easier with practice.

So, how does it work? Sony's marketing suggests that it can reduce your body surface temperature by 13°C, for example from 36°C (96°F) to 23°C (73.4°F). I can believe that that's the case at the point of contact, but the effect is clearly much less pronounced across the whole body, as Sony's own pictures show.



I wore the Reon Pocket while walking to a supermarket about a mile away for lunch today. The temperature was only 30°C (86°F), so, we're not quite into the swing of a Tokyo summer just yet, but the humidity was pushing 80 perce nt — this is still the kind of walk that would normally turn me into a puddle of sweat soon enough. I did find, generally, that the Reon Pocket improved matters somewhat, even on its lowest cooling setting. I was definitely still sweating by the time I got home, but the cooling sensation does make a difference while you're actually out there in the heat.

Basically, the Reon Pocket does what you'd expect any small, cold object to do when held against your skin. You're still going to feel like you're in a hot, sweaty environment, but you'll take what you can get. For me personally, I'm not sure the hassle of dealing with a weekly rotation of device-exclusive Sony undershirts would be worth it. But I'm in a position where I've been working from home for nearly a decade and my 2020 summer wardrobe consists almost exclusively of Toronto Raptors t-shirts. If I worked a job that involved a daily commute and business clothing, as is the case for tens of millions of people across Japan, I think the Reon Pocket could make more sense. As it is, I'd probably just use it as a pocket gadget that can act as a localized cooler or warmer in a pinch.

The Reon Pocket is out now exclusively in Japan. It costs 13,000 yen ($122) for the device itself, and the undershirts (available in white or beige) are 1,800 yen ($17) each. The app does work in English, if you're looking to import.

EDITOR'S COMMENT: Two groups of First Responders came into my mind immediately after reading this article: (1) CBRN FRs; and (2) ICU Covid FR's. This will make life much more confortable for them!

The Beirut Blast and Israel's Chemical Materials Concentration – the Failure Prevails

By Arie Egozi

Source: https://i-hls.com/archives/103283

Aug 06 – The explosion in Beirut has raised again the discussion about the concentration of huge amounts of chemical materials at the Haifa Bay region. My evaluation – the subject will disappear from the headlines within days and will not be dealt with.

Why? Because in Israel, such problems are not handled the right way. Too many players, too many rules. A lot of interests and a very sad result.

Ammonium Nitrate, 2750 tons of which had caused the disaster, is an oxidizing agent used for agricultural fertilizing, the manufacturing of civilian explosives (when mixed with diesel) and for various industrial uses, such as Nitrous Oxide gas production. In the past, most of the experts claimed that Ammonium Nitrate can not explode as long as it is not mixed with a flammable substance. However, a decade ago this assumption has changed following the explosion of Ammonium Nitrate in a US factory, and the investigation led to changes and stringency of the standards regarding its storage.

According to a publication in Calcalist, in Israel Ammonium Nitrate is widely used for agriculture and industrial production. According to the Ministry of Environmental Protection, the material is used in Israel in two major configurations: low-density Ammonium Nitrate used in quarries and for controlled explosions, and higher density Ammonium Nitrate for the manufacture of fertilizers. The material is reportedly used by a civilian explosive production factory near Zichron Ya'akov, at the Haifa Bay fertilizers factory, and at the fertilizer factories in Kiryat Gat and Beit She'an.

Chemistry prof. Ehud Keinan had said in the past: "I hope that at any stage of the production or storage, large amounts of the material are not stored at the factory. Any amount higher than 200 tons in a single installation might cause devastating consequences in case of an explosion. I believe that they regard this material with much more respect than in Beirut." Aharon Goren, an expert on fireworks accidents whose report on the subject had been published by the Ministry of Environmental Protection explains that both types of Ammonium Nitrate are dangerous and sensitive to explosion. Fireworks are also stored in various sites, and in Israel, there is not enough awareness of the danger emanating from their storage in closed installations.

The consultant Danny Kronenberg claims that "the main lesson to be learnt from the Beirut Port blast is that explosive materials, including fireworks and Ammonium Nitrate, must be stored under the right security conditions and not in warehouses at the heart of a dense city." He said that whenever a cargo of explosive material arrives in any port, it should be transferred as soon as possible to the right storage, in bunkers or in an installation far enough away so that no harm is caused to people of the environment in case of an explosion. It is very important that the storage conditions would be defined by law and enforced."

But in Israel (as in Lebanon), as Calcalist exposed, there are no legal regulations regarding the storage of explosive materials. This material category includes both fireworks and Ammonium Nitrate soaked with petrol – although since the definitions were set it became clear that the Ammonium does not have to be necessarily soaked with petrol, as the incident in the US factory had proved. In Israel, the explosive materials law was legislated in 1954, and the explosive materials regulations – in 1994, but they do not refer to fireworks. In fact, until now, no regulations were published in Israel regarding the secure storage and use of fireworks, in spite of the consequences to security and defense. So, the problem is known, the danger is clear. But in Israel, the mission is never completed. After the evacuation of the Ammonium container form Haifa Bay there were left in the site containers with dozens of types of hazardous chemical materials. But due to the confusion regarding whose responsibility is this, the issue has been left untreated, falling through the cracks. And the disaster is already behind the corner, not only in case of a missile attack from Lebanon but also as a result of a failure in one of the factories. There are too many invented titles for ministers in the Israeli government, but not one of them can actually solve the problem. Of course, since the Beirut blast, whoever had any relation to the subject got interviewed and expressed their opinion, but this was it. The Israeli government is not functioning, so don't expect any solution.

Arie Egozi is iHLS Editor-in-Chief.

Poison: Chasing the Antidote

Source: http://www.homelandsecuritynewswire.com/dr20200808-poison-chasing-the-antidote

Aug 08 – Pick your poison. It can be deadly for good reasons such as protecting crops from harmful insects or fighting parasite infection as medicine — or for evil as a weapon for bioterrorism. Or, in extremely diluted amounts, it can be used to enhance beauty.

While targeted chemical attacks on civilians tend to make headlines, the most common poisoning reports in the United States are from accidental exposure to household chemicals such as insect sprays, cleaning solutions or improperly washed fruit or vegetables. In any case, the remedy is a fast-acting, poison-chasing drug compound, and Oak Ridge National Laboratory is on the forefront developing a new generation of life-saving antidotes.

Simply put, "a poison is something that acutely degrades your health, or your health state," said Andrey Kovalevsky, a crystallographer and biochemist at ORNL. He is an expert in atomic-level understanding of enzyme function, drug binding and drug resistance. Using neutrons and X-rays, he studies how enzymes work in the body and, depending on the specifics, how to inhibit or reactivate them using small organic molecules.

"Depending on the poison and amount, the effect can be very quick — within seconds — or it can be slow," he added. The body triggers its own defenses to counteract a poisonous substance; however, it's usually not enough. Any level of exposure could be deadly, especially if the type of poison is not immediately known to a first responder or medical team attending to an affected patient. An antidote must act fast — before the poison does irreversible damage — to be effective and save lives.

Mirror the Poison

Kovalevsky is part of a team, led by Zoran Radić of the University of California, San Diego's Skaggs School of Pharmacy and Pharmaceutical Sciences, developing a new family of antidotes for poisons called organophosphates, which include nerve agents. Radić's research uniquely targets the root cause of organophosphate poisoning, going beyond just treating the symptoms as with existing remedies.

Their focus is on the complex biochemical mechanisms that control and maintain the body's nervous system. They start with acetylcholine, or ACh, which is a compound found at the junction of muscles and nerves and also in the brain. ACh functions as a neurotransmitter that maintains normal communication between nerves and muscles. But ACh doesn't act alone.

The enzyme called acetylcholinesterase, or AChE, is also where muscles and nerves meet. Its job is to provide specific control of the levels of ACh compound by degrading it, which ensures the nerves are functioning properly.

When a person is exposed to a nerve agent, or to copious amounts of an insect spray, for instance, the poison passes quickly from the lungs or skin into the blood stream and races to the nervous system. As it reaches the muscle-nerve junctions, the poison overwhelms and inhibits the work of the AChE enzyme.

As the AChE enzyme is under attack and unable to degrade ACh, the levels of the ACh compound rise, disrupting the balance between muscles and nerves. This wreaks havoc on the body.

"Instead of being too little of something, there's too much of this neurotransmitter. So, the nerves' receptors are overexcited, and people can go into shock, have tremors and seizures and start sweating because their glands are working too much," Kovalevsky explained. In the end, the affected person will likely die because they stopped breathing.

Radić said the antidote must mirror the poison's activity without acting as an inhibitor, too.

"These poisons, typically comprised of uncharged or neutral molecules, traverse biological membranes very quickly into the blood and are then distributed from blood to tissue, including the central nervous system. And all of this happens in minutes after exposure," he said.

"The poison gets to its target quickly, so to treat that target and recover the activity of the enzyme, we have to have an antidote that does the same."

If done right, the antidote will relieve the AChE enzyme of the poison's attack, essentially excising the poison's molecule attached to the enzyme, and allowing it to begin leveling out the ACh neurotransmitters and ultimately calm down the entire nervous system. The trick is to ensure the antidote is designed not to overstay or get too attached to the enzyme — and become part of the problem.

To the Rescue

In a study funded by the CounterACT Program, National Institutes of Health Office of the Director and the National Institute of Neurological Disorders and Stroke and **published**

in the Journal of Biological Chemistry, Radić's team designed and tested fast-acting drugs called reactivators on three different nerve agents and one pesticide with positive initial results.
The team started with an existing drug compound (code name RS194B), which was developed by Radić and UC San Diego professor Palmer Taylor about 15 years earlier, because it had already shown promise traveling through the blood-brain barrier when tested on primates exposed to organophosphate poisoning.
However, the newly designed reactivators performed better in vitro, or outside a living organism, than RS194B, and the research team figured out why.
At the atomic level, RS194B could not reach the site of the poison's activity within the AChE molecule as efficiently as the new reactivators.
For this study, the team used X-ray crystallographic analysis to look at the RS194B complex with the AChE enzyme alone and then introduced an analog of a chemical nerve agent called VX — one of the deadliest chemicals ever made. While RS194B didn't bind as expected, the experiment did foster ideas on how to redesign "a sort of elite compound," Kovalevsky said.
"We need to improve the reactivator's ability to cross the blood-brain barrier, bind loosely to the enzyme, chemically snatch the poison and then leave quickly," Kovalevsky said. "We don't want it to stay upon reactivation, as we do for many standard drugs that normally inhibit an enzyme function."
"That's our goal. That's why designing reactivators is a completely different endeavor and many rules of conventional drug design do not apply," he added.
After some tweaks to the drug design, the team came up with a new paradigm that can completely change how researchers think about a reactivator design. They ran computer simulations and later synthesized several most promising compounds of the altered design options, which provided details on their properties and clues on how each compound might work.
They analyzed the impact of each drug design variation, plus the original RS194B, with nerve agents Sarin, Cyclosarin, VX and a pesticide Paraoxon. Also, the team included 2PAM (also called Pralidoxime) — the only antidote for organophosphate poisoning that is approved by the U.S. Federal Drug Administration for use in adults and children — which served as a control for the experiments.
"We wanted our reactivator designs to be as good as, or better than, 2PAM in these studies," said Kovalevsky. However, 2PAM is not able to cross the blood-brain barrier. It can travel to other poison-effected areas of the body to act on the peripheral nervous system, but it doesn't reactivate in the central nervous system.
Based on the study's initial results, several of the team's drug design variations worked better than RS194B and 2PAM, which Kovalevsky said is a very encouraging result for their novel reactivator design ideas.
"One of distinctions of our antidote is that they can engage different organophosphate poisons more effectively, because their reactivation structures can change with their protonation," Radić said. "Unlike X-rays, diffraction of neutrons is an experimental technique that can tell us about the position of protons in both the antidote and in the poisoned enzyme."

Big, tiny crystals

To get a better picture of the novel reactivator design, the team used neutron crystallography at ORNL's High Flux Isotope Reactor, a Department of Energy Office of Science user facility. Kovalevsky operates the instrument named IMAGINE, which uses neutron diffraction techniques to look at the structure of a single crystal at atomic scale.
The molecular structure of the protein is complex, which requires growing large single crystals — a strength of ORNL's — for neutron diffraction. Neutrons are highly sensitive to light elements such as hydrogen, and they are particularly well suited to find individual hydrogen atoms in protein crystals that X-rays cannot detect. The data collected from IMAGINE, along with information from a neutron experiment performed at Institut Laue–Langevin in France, confirmed it's possible to pinpoint the location and distribution of each hydrogen atom in the protein.
The team will continue growing larger crystals for analysis, which should produce higher resolution datasets and inform adjustments to the promising, novel drug designs. Their continued research could ultimately confirm a new class of fast-acting, life-saving antidotes for organophosphate poisoning.

Aum Shinrikyo Threat is not over!

Source: https://www.scmp.com/week-asia/people/article/3093734/japans-subway-sarin-attack-doomsday-cult-aum-shinrikyo-still

July 06 – Some 25 years after the Aum Shinrikyo cult released sarin nerve gas on subway trains in Tokyo, the head of the Japanese agency charged with monitoring its activities has warned that loyal followers of founder Shoko Asahara remain a threat.

Ayuko Watanabe, director of the Public Security Intelligence Agency unit devoted to tracking the cult's members and periodically searching its facilities, said on Friday that three splinter groups have emerged from the original cult are actively recruiting new members, most of whom are young and unaware of Aum's history. These groups are simultaneously building up millions of dollars worth of cash reserves, she said.

"It has been a quarter of a century since the terrorist attacks on Tokyo, but Aum Shinrikyo is not history yet," Watanabe warned in a press conference on Friday. "It still exists and it remains a persistent problem."

Shoko Asahara, the half-blind yoga teacher who founded the cult in 1984, was hanged in July 2018 – five years after he had been found guilty of ordering 1995's subway sarin attack, which killed 14 people and injured 5,800 other commuters, and 13 other crimes. Those additional counts included an earlier sarin attack that killed eight people and the abduction and murder of a lawyer who had been representing parents attempting to get their children out of the cult. As well as killing the lawyer, Asahara's disciples murdered his wife and their 1-year-old son. A further 12 of his most senior acolytes were also hanged on the same day.

Aum Shinrikyo was forcibly disbanded by the Japanese authorities, but Asahara's followers formed a new religious group, called Aleph, that continued his teachings. Two splinter groups have since been set up: the "Circle of Rainbow Light" in 2007 and a religion that the country's intelligence agency refers to as the Group led by Yamada, in January 2015.

The groups are united, however, by their continuing adherence to Asahara's teachings, Watanabe said.

"Aleph shows no signs of changing its beliefs or nature," she said. "The group instructs its followers to write in their wills that their families are prevented from collecting their bodies after their death. It hides its name and uses social media and events to recruit new followers."

According to the agency, Aum Shinrikyo had more than 11,400 followers in Japan with branches in the United States, Russia, Germany and Sri Lanka. Membership fell to around 1,000 immediately after the Tokyo sarin attack but has been gradually increasing since then. At present, its spin-off groups are thought to have around 1,650 followers living at 31 facilities across Japan.

Meanwhile, assets held by groups associated with the cult have increased exponentially, from the 4 million yen (US$37,370) in savings that Aleph was estimated to have build up in 2000 to the nearly 12.9 billion yen (US$120.5 million) in cash assets that the various groups are thought to control today.

The groups make money by having followers purchase religious study books and paraphernalia, as well as paying to undergo ceremonies to increase their spiritual powers. These ceremonies typically require lengthy fasting, electric shock treatments and purchasing water that was "blessed" by Asahara before his arrest, Watanabe said.

While Aum and the other groups have been declared terrorist organisations in the US and are prohibited from operating, Watanabe said the Japanese government had taken a decision to permit the splinter groups to continue as it was the most effective way of monitoring their activities. That approach has been successful, she said, as there have been no further threats to the well-being of the general public.

She admitted, however, that the groups have been caught breaking the law, including by falsifying applications for welfare payments. The biggest concern for the authorities, said Watanabe, is that young people who know little about the cult are being talked into joining – with officials of the agency obtaining footage of known cult members approaching people in libraries and in the street and striking up conversations.

"We know that they invite people to go to yoga workshops or 'spiritual' meetings and then they start explaining about Asahara's teachings without mentioning his name or Aum Shinrikyo," she said. "And then they say that the sarin attacks were a conspiracy within the government and the media. And when they have built up a solid connection, they reveal who they really are and welcome these people into the group."

Watanabe estimates that as many as 100 people are joining the groups every year.

"After 25 years, most people think that Aum is part of history," she said. "It's not. People have forgotten and that's what makes me most afraid."

UK – Stolen Chemicals

Source: https://www.lancs.live/news/lancashire-news/major-investigation-launched-after-lethal-18525625

July 01 – Major investigation launched after lethal chemicals stolen from van. The stolen van contained Talunex - an Aluminium Phosphide-based chemical. The vehicle was found by officers from Greater Manchester Police in Blackley but the chemicals were missing. The chemical has been described as 'very toxic' if swallowed, and emits a toxic gas if placed in contact with water and acids.

Experiment enhances C-130's competitive edge against CBRN threat.

Source: https://www.edwards.af.mil/News/Article/2293300/experiment-enhances-c-130s-competitive-edge-against-cbrn-threat/

July 30 – Chemical, biological, radiological, and nuclear analysts from the 711th Human Performance Wing at Wright-Patterson Air Force Base, Ohio recently visited the 19th Airlift Wing to conduct the first vapor purge test on a cargo plane as part of a series of experiments they will conduct on aircraft across the Department of Defense.

A piece of equipment reads the number of chemical particles that are in the air inside a C-130J Super Hercules at Little Rock Air Force Base, Ark. (July 24, 2020).

French Expert: Dangerous Chemicals Remain in Beirut Port

Source: http://www.naharnet.com/stories/en/274076-french-expert-dangerous-chemicals-remain-in-beirut-port

Aug 11 – Chemical experts and firefighters are working to secure at least **20 potentially dangerous chemical containers** at the explosion-shattered port of Beirut, after finding one that was leaking, according to a member of a French cleanup team.
Some of the containers were punctured when last week's deadly blast ripped through the port and the Lebanese capital, said Lt. Anthony, a French chemical expert at the site who was not authorized to be identified by his full name according to government policy.
French and Italian chemical experts working amid the remains of the port have so far identified more than 20 containers carrying dangerous chemicals, Anthony said.

"We noted the presence of containers with the chemical danger symbol. And then noted that one of the containers was leaking," he told The Associated Press in a TV interview on Monday.

The experts are working with Lebanese firefighters to secure all of the containers and analyze their contents, he said. "We need to clean everything and put all in security."

He didn't identify what chemicals were involved or provide further details. Lebanese officials have not commented on the potential chemical risks at the port.

"There are also other flammable liquids in other containers, there are also batteries, or other kind of products which could increase the risk of potential explosion," Anthony said, describing huge containers tossed around the port by the powerful force of the blast.

It is unclear whether there could be additional potentially dangerous containers in other zones of the port. The French and Italian experts were assigned to a specific zone to examine and secure that section, Anthony said.

The explosion last Tuesday in the port killed at least 160 people and injured about 6,000 others. It is believed to have been caused by a fire that ignited a 2,750-ton stockpile of highly volatile ammonium nitrate. The material had been stored at the port since 2013 with few safeguards despite numerous warnings of the danger.

The chemical experts are among scores of French emergency workers who arrived to help search for bodies, aid the sick and clean up after the blast. Nearly 50 French police are also in Beirut helping investigate what happened.

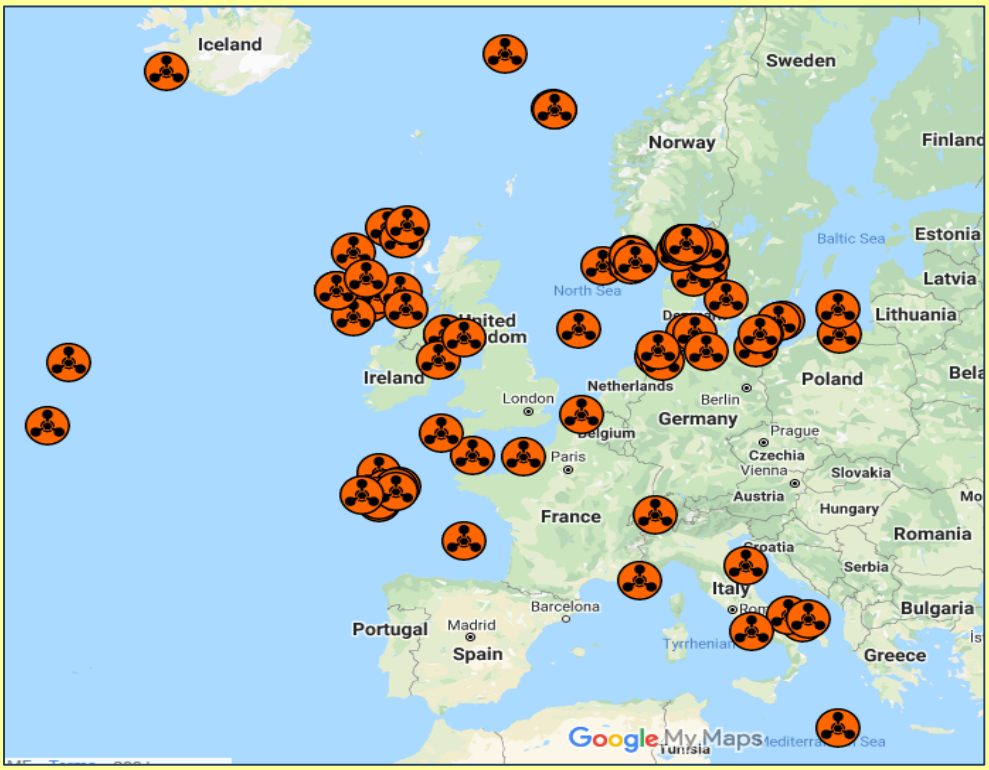
Chemical Weapon Munitions Dumped at Sea: An Interactive Map

By Ian Wilkinson

Source: http://www.nonproliferation.org/chemical-weapon-munitions-dumped-at-sea/

September 2017 – In the decades following World War I, and even more so during and after World War II, at least four major powers disposed of massive quantities of captured, damaged, and obsolete chemical warfare (CW) material by dumping them into the oceans.

The jettisoned material consisted either of munitions containing chemicals (such as artillery shells, mortar rounds, or aerial bombs) or chemicals stored in large metal containers or encased in concrete. Shells and bombs were sometimes jettisoned unfettered, but more often were loaded as cargo onto ships that were sunk by opening their seacocks, by naval artillery fire, or torpedoes. (1)



Because those sunken ships tended to settle on the seabed largely intact, the CW material they contained remained within a small area. Unfettered material, on the other hand, may be widely dispersed by currents, tides, and other forces. (2) In those times, the disposal crews did not give much consideration to the safety and environmental implications of sea-dumping CW materials.

Too much protection might be bad for your health!

Security officer at Chennai International Airport, Chennai, India – can he really breath?

Russian Opposition Leader in Coma after Being Poisoned

Source: http://www.homelandsecuritynewswire.com/dr20200820-russian-opposition-leader-in-coma-after-being-poisoned

Aug 20 – Outspoken Kremlin critic Aleksei Navalny is unconscious and on a ventilator in a hospital intensive-care unit in Siberia after falling ill with what his spokeswoman suspects is a case of poisoning.

The 44-year-old anti-corruption campaigner "is still on a ventilator. He is in a coma in grave condition. There are no test results as yet," Kira Yarmysh tweeted on 20 August.

She said earlier that Navalny felt ill while on a flight back to Moscow from the Siberian city of Tomsk, forcing the aircraft to make an unscheduled landing in Omsk, also in Siberia, where he was taken by ambulance to a hospital.

Yarmysh said she believed the politician was poisoned after drinking a cup of tea he had bought at the Tomsk airport.

"We assume that Aleksei was poisoned with something mixed into the tea. It was the only thing that he drank in the morning. Doctors say the toxin was absorbed faster through the hot liquid," Yarmysh said.

Anatoly Kalinichenko, a doctor at the Omsk Emergency Hospital No.1 where Navalny is staying, told reporters that Navalny was in serious, yet stable condition, and that medics were working to "save his life."

However, he said there was "no certainty that the cause of his condition is poisoning," adding, "This is one of the possible reasons" and that several diagnoses were being considered as tests are carried out.

But Yarmysh complained that doctors "are obviously stalling and aren't saying what they know," adding the hospital was full of police officers.

"The hospital already has more police than doctors. Investigative Committee just arrived," she said.

Pavel Lebedev, a passenger on the flight where Navalny fell ill, said that at the start of the flight Navalny "went to the toilet and didn't return."
"He was really sick and is still screaming in pain. They didn't say what exactly happened to him. We landed in Omsk. Ambulance arrived," he added in a post on social media.
Navalny, a staunch critic of President Vladimir Putin, has exposed rampant corruption in Russia.
He has been jailed several times in recent years, barred from running for president, and had a bid to run for Moscow mayor blocked.
Navalny has suffered physical attacks in the past.
He endured chemical burns to one of his eyes in 2017 after he was assaulted with antiseptic dye.
In July 2019, Navalny was given a 30-day jail term after calling for unauthorized protests. During that jail sentence, he was taken ill to a hospital with severe swelling of the face and a rash, and later alleged he was poisoned.
"Obviously, they did the same to him now," said Yarmysh, the press secretary for the Anti-Corruption Foundation Navalny founded in 2011.
The head of the foundation's legal department, Vyacheslav Gimadi, wrote on Twitter, "There is no doubt that Navalny was poisoned for his political position and activity."
Navalny's lawyers are requesting a probe into attempted assassination, he added.
EU foreign-policy chief Josep Borrell said he was "worried to hear about Alexei Navalny's suspected poisoning."
"If confirmed, those responsible must be held to account," he tweeted, adding that he wished the Kremlin foe a "swift and full recovery."

EDITOR'S COMMENT: Mass media are reluctant to use the word "terrorism" but easily write "poisoning" when the victim is a Russian citizen. Let's wait to identify the poison's nature!

Oleandrin dangers: Toxicology Organization's joint statement concerning proposals for the use as a potential treatment for COVID-19

Source: http://outbreaknewstoday.com/oleandrin-dangers-toxicology-organizations-joint-statement-concerning-proposals-for-the-use-as-a-potential-treatment-for-covid-19-59147/

Aug 22 – The American College of Medical Toxicology (ACMT), the American Academy of Clinical Toxicology (AACT), and the American Association of Poison Control Centers has issued the following joint statement in response to recent discussions proposing use of oleandrin as a potential treatment for COVID-19:

As physicians, pharmacists, and experts in pharmacology and poisoning, we are extremely concerned, based on the available scientific data and our clinical experience, about the proposed use of oleandrin for treatment of COVID-19.
Oleandrin is a cardioactive steroid extracted from the oleander plant (Nerium oleander). Each year, exposures to oleander and related compounds result in thousands of poisonings worldwide. These drugs are cardiac poisons capable of causing bradycardia (slow heart rate), dysrhythmias (irregular heartbeats), and death.
Although closely-related compounds such as digoxin are used to treat heart failure and atrial fibrillation, these medications are rigorously tested, FDA-approved, pharmaceutically produced, and their place in therapy has been established over decades of use. Even when used appropriately, blood levels must be closely monitored to prevent toxicity. Treatment of toxicity from cardioactive steroids is expensive and, unfortunately, not always successful.
We are aware of a preprint publication suggesting that oleandrin may inhibit replication of SARS-CoV-2 in vitro. This is true of many other chemicals, as well. This does not mean oleandrin is safe or effective for the treatment or prevention of coronavirus in humans. It is often the case that drugs that appear effective in "test tube" or animal models are found to be ineffective or harmful in humans. Before any treatment can be seriously considered for any disease, it needs to be rigorously studied for both safety and efficacy. If

oleandrin is to be seriously considered as a potential coronavirus treatment, we expect to see peer-reviewed research for that use.
As physicians, scientists, and citizens, we share the desire for effective treatments for this devastating pandemic. However, a potentially dangerous treatment with no evidence of benefit is worse than no treatment at all. Preparations made from oleander are available for purchase, but we caution consumers strongly against use of capsules, tablets, or teas, or any product made from this plant. People with suspected oleandrin toxicity should be managed in consultation with a clinical toxicologist. Patients and clinicians can reach their regional poison center at 1-800-222-1222, 24 hours/7 days a week/365 day a year.
In the strongest terms possible, we recommend against the use of oleandrin outside of rigorous, medically supervised clinical research with regulatory oversight, and we implore consumers to not rush to use an untested remedy with potentially life-threatening toxicity.


ICI
International
CBRNE
INSTITUTE
CBRNE-Terrorism Newsletter
W
O
M
D
HOTZONE
SOLUTIONS
GROUP
C2BRNE
DIARY
BIO NEWS

By Dave Eggers
Source: https://www.nytimes.com/2020/07/10/opinion/culture/coronavirus-testing-eggers.html

Q: I think I have it.
A: Have what?
Q: *It*. I've got extreme fatigue, migraines, chills, aches, nausea and a fever of 102.
A: Are we talking about coronavirus?
Q: We are. I'm worried. I'm 50. People my age are dying.
A: That does sound concerning. Let's get you tested.
Q: OK, I'm ready.
A: You mean now?
Q: Of course.
A: Oh, you can't do one *now*.
Q: Why not?
A: How's late next week look for you?
Q: Late next week? I'm sick *today*.

Credit...Peter Arkle

A: We have three appointments in mid July. Wait. Those were just taken. How's your end-of-month?
Q: We're four months into the pandemic. It still takes that long to get a test?
A: It depends. Looks like Tulsa has a drive-through thingie tomorrow. Are you anywhere near Tulsa, Okla.?
Q: No.
A: Keystone, S.D.?
Q: No.
A: Well, then it could take longer. Where are you?
Q: San Francisco.
A: Oh, then it'll be a *lot* longer. Let me make sure … Let's see … Typing in 'San Francisco' … Is that two S's or two C's? No, I got it. Whoa, looks like a lot of people want tests where you are.
Q: And you don't have enough?
A: Oh, we have plenty of *tests*. We just don't have *appointments*. You need an appointment to get a test, and the appointments — these we don't have.
Q: Until the end of July.
A: Well, see, while we've been talking, those have been taken. How's early August?
Q: But I won't be sick by then, will I?
A: Let's hope not! If you're sick that long, you'd know you had the virus for sure.
Q: So, if we wait two weeks before testing me, I might not be sick, and then the test won't work. Shouldn't I know *now* if I have the virus *now*?
A: Oh, definitely. That would be a big help for you and your family, I'm betting. Otherwise you might be living in four-dimensional terror and endlessly self-quarantining for no reason. Are you quarantining?
Q: I am.
A: Does your head feel like an 80-pound melon being stabbed by machetes that are serrated and also on fire?
Q: It does.
A: Is your family afraid to be near you? See you?
Q: They are.
A: Good. Now all you need is a test.
Q: But there are no tests.
A: I just told you, there are plenty of *tests*. So many beautiful tests! Just no appointments.
Q: But you have some in early August?

A: Early August? You know what? To be suresies, let's say mid-August. And ideally you're still sick. Otherwise there won't be any point.
Q: So, in mid-August, I come in and get a test?
A: Absolutely!
Q: And get a result?
A: Eventually!
Q: It sounded like you just said "eventually."
A: Did I say that? That does sound like something I'd say.
Q: How long does it take to get the results?
A: Not long at all! This information is of the utmost urgency. So we're thinking five days. Or seven. Maybe 10? No more than 12. Two weeks, tops.
Q: And then you'll call me?
A: Of course, we will. Unless we don't. Check the website. Or the app! The app is pretty sweet. Please don't call us.
Q: And from the app, I get the results?
A: Sure. When they become available.
Q: So, I should check the app often?
A: I should say so! But that's just if you're concerned about your health, your possible death, the fate of your family, and the global struggle against this plague.
Q: I'll check every 10 minutes. For 12 days?
A: Didn't we say two weeks?
Q: So almost a month until I get an appointment, then 14 days to get a result. And in the meantime I self-quarantine?
A: Right. And then, sometime in September, you'll know for sure whether you had Covid-19 in early July. Unless it's a false negative.
Q: Wait. False negative?
A: That's when you have it but the test doesn't show it. So maybe just assume you have it. And had it. And will always have it.
Q: But if I did have it, I'd have antibodies, right?
A: Absolutely. Maybe. Do you have them?
Q: I don't know yet.
A: You should get a test.
Q: Can I get one?
A: Of course! But you need an appointment.
Q: Can't I get it at the same time as the Covid-19 test? Wait, why are you laughing?
A: I'm just … It's nothing. I mean. It's just that … You know this isn't Denmark, right?
Q: I do know that.
A: OK, because, I mean, I just wanted to make sure. The virus does funny things to people's brains.
Q: So, I need a different appointment?
A: Of course, you need a different appointment. How's your October? The thing with the antibodies is that they don't show up right away. That's if they show up at all. So it's good to wait.
Q: I'm happy to wait if it means I have antibodies and can't get the virus again.
A: Oh, for sure you can get the virus again! We think. Maybe.
Q: I just wanted some assurance that I'm immune.
A: Assurance? Oh, you won't have that! Of all the tests, the antibody tests are the least reliable.
Q: They are?
A: Oh, man, some are just plain bad. At the beginning, the government let anyone make them and sell them without F.D.A. review. Most of them are terrible. I think Fisher-Price made one.
Q: Can we do one of the *good* tests?
A: We can try! I can make a note to that effect. Let me just type that in … "Would prefer to get one of … good tests. …" Got it. When would you like to do it?
Q: You'd mentioned October.
A: October's booked. Can we say November?
Q: And the results?
A: The good thing with the antibody test is you get the results immediately.
Q: Excellent.

A: But they mean nothing.
Q: Oh.
A: It could be that you're never immune.
Q: Right.
A: And remember that the Covid-19 test you're taking could mean nothing, too, because it only works if you're in the thick of the illness. So, if you wait till your symptoms are gone before you take the Covid test, you won't know if you had the virus until you take the antibody test, which also tells us nothing.
Q: So, I'll never know what's causing my fatigue, migraines, chills, aches, nausea and a fever of 102.
A: You hear anything about this new thing coming out of Mongolia? Bubonic something? I'm thinking we keep our eyes on that.

Dave Eggers *is a novelist and satirist and the author of several books, including "The Captain and the Glory."*

Aiming for 10-second result, breathalyzer detector for COVID begins early tests

Source: https://www.timesofisrael.com/israeli-startups-breathalyzer-detector-for-covid-19-begins-early-tests/

July 09 – An Israeli startup this week began tests with the goal of identifying the genetic fingerprint of the coronavirus and then determining if it can be detected by a simple and quick breath test, similar to breathalyzers used on suspected drunk drivers.
The firm, Scentech Medical, started the early stages of a trial for its so-called breath technology — a mix of software and hardware — together with the Meir Medical Center in Kfar Saba.
"It's a breath test that's really going to change the world of diagnostics in general, and the world of COVID-19 in particular," Scentech's Dr. Rom Eliaz told Channel 13 news.
Dr. Abalil Fadi of Meir Medical Center emphasized the ease with which the test will be able to be carried out: "It is non-invasive. And not painful."
The current test for coronavirus requires a nasal swab to collect mucus and saliva, which is then tested to confirm infection, if present.

If swabs are not collected properly, for example by insufficiently trained staff, this can significantly affect the number of false negatives.
Scentech Medical says that if successful, its test could yield results within 10 seconds and hopes that it could be available within weeks.
"As soon as we can check a patient in 10 seconds and verify if they are sick, all the borders can be opened," Eliaz said. "It means the world can return to normal. And with that, the opening of everything else — stadiums, concert halls, restaurants. The whole world can open."
The breath technology will help identify patients even before symptoms are present, thus helping to halt the spread of the virus, the company hopes.
In a second stage, the study will be enlarged to a wider sample — 100-200 ill and healthy soldiers in the Israeli army — to validate the results attained in Meir, and to test whether the technology is indeed able to identify patients who are ill with an accuracy rate of at least 85 percent, Dr. Udi Cantor, a general and urological surgeon who is the medical director of the startup team, said in April.
The Tel Aviv-based company was already developing the technology to try to identify cancer and infectious diseases via breath analysis — searching for their biomarkers in the thousands of different gases present in each exhalation, explained Cantor.
The firm was undertaking proof of concept studies in Israel and the US when the coronavirus pandemic broke out, he said. That was when the company decided to see if the same method could be used to sniff out the virus, whose "breath signature" or "biomarker" is still unknown, he said.
Although Cantor preferred to keep vague details of how the technology works, he explained that it is based on a mix of hardware and software that enables the real-time identification of volatile chemical compounds in breath.
The process uses gas chromatography, a lab technique to separate and analyze compounds in gases; mass spectrometry, a technique used to determine the elemental signatures of particles and molecules; and a ReCIVA breath collecting device.

These techniques can analyze the some-8,000 volatile organic compounds present within each breath, which play an active part in eliminating body waste, in a similar way to urine, sweat or stool, Cantor said.
"Anything that is broken down by our bodies — part of it is expressed in the breath," he said.
Many of these gases have a known signature, he said, but there are still many of them that are unknown. The idea is to use an analytical elimination process to separate the known from the unknown compounds and then narrow the process down to find the elusive coronavirus biomarker.
As the coronavirus outbreak has spiked in Israel, testing has increased, reaching a record 28,136 tests carried out on Wednesday.
The Health Ministry is reportedly planning to tighten the criteria for carrying out coronavirus testing in a bid to ease pressure on an overwhelmed system.
Most carriers of COVID-19 have only mild symptoms or none at all, and some experts say that as asymptomatic people can infect others, massive testing is a critical element in getting a grip on the true spread of the virus — especially when lockdown measures are rolled back.

Read also on the same topic:

- S Africa: https://www.the-scientist.com/news-opinion/in-south-africa-covid-19-breath-test-trial-set-for-june-67631
- Israel: https://www.ctvnews.ca/health/coronavirus/israeli-firm-developing-30-second-coronavirus-breath-test-1.5037534

Smallpox Found in Viking Teeth Proves Disease Plagued Humans for 1400 Years

Source: https://www.genengnews.com/news/smallpox-found-in-vikings-teeth-proves-disease-plagued-humans-for-1400-years/

A 1200-year-old smallpox-infected Viking skeleton found in Öland, Sweden. [The Swedish National Heritage Board]

July 24 – An international team of scientists has discovered extinct strains of smallpox in the teeth of Viking skeletons from sites across northern Europe, and reco nstructed near-complete genomes of the causative variola virus (VARV) from multiple samples. Their findings, published in *Science*, are reported just days after an independent team of scientists published details of a study through which they identified smallpox virus strains that were circulating during the American Civil War.
The investigators reporting on the latest Viking discoveries say the smallpox virus samples found in the teeth predate the earliest confirmed smallpox cases by about 1000 years and prove for the first time that the killer disease plagued humanity for at least 1400 years. "We discovered new strains of smallpox in the teeth of Viking skeletons and found their genetic structure is different to the modern smallpox virus eradicated in the 20th century," said study leader Eske Willerslev, PhD, at St John's College, University of Cambridge, who is director of the Lundbeck Foundation GeoGenetics Centre, University of Copenhagen. "The 1400-year-old genetic information extracted from these skeletons is hugely significant because it teaches us about the evolutionary history of the variola virus that caused smallpox. We already knew Vikings were moving around Europe and beyond, and we now know they had smallpox. People traveling around the world quickly spread COVID-19 and it is likely Vikings spread smallpox. Just back then, they traveled by ship rather than by plane.
Willerslev and colleagues reported on their discoveries in a paper titled, "Diverse variola virus (smallpox) strains were widespread in northern Europe in the Viking Age."
Smallpox killed around a third of people it infected, leaving another third permanently scarred or blind. The disease is estimated to have caused 300–500 million deaths in the 20th century alone, until it was officially declared eradicated by the World Health Organization in 1980. The World Health Organization launched an eradication program in 1967 that included contact tracing and mass communication campaigns—all public health techniques that countries have been using to control today's coronavirus pandemic. In fact, smallpox was eliminated throughout most of Europe and the United States by the beginning of the 20th century, but it remained endemic throughout Africa, Asia, and South America. It was the global rollout of a vaccine that ultimately stopped smallpox in its tracks.

Smallpox is the first human disease to be wiped out, although the virus is stored in certain laboratories in the United States and Russia. Nevertheless, there are still concerns that smallpox-like disease might emerge again, the authors noted, "… via accidental or deliberate reintroduction of variola virus, adaptation of monkeypox virus to humans, or zoonosis, or genetic engineering of another orthopoxvirus." Knowing more about the evolutionary history of variola virus would, therefore, be of particular interest to scientists, they pointed out.

Massacred 10th century Vikings found in a mass grave at St John's College, Oxford, were part of the study. [Thames Valley Archaeological Services]

Historians believe smallpox may have existed since 10,000 BC but until now there was no scientific proof that the virus was present before the 17th century. "The timeline of the emergence of smallpox in humans is unclear," the team wrote. "Hypotheses regarding the earliest history of VARV have been derived exclusively from often ambiguous historical accounts and from the visual examination of mummies dating from as early as 3570 ya." And while it is not known how the virus first infected humans, it is, like COVID-19, believed to have come from animals.
The researchers found smallpox in skeletons from 11 Viking-era burial sites in Denmark, Norway, Russia, and the U.K. They also found it in multiple human remains from Öland, an island off the east coast of Sweden with a long history of trade. The team was able to reconstruct near-complete variola virus genomes for four of the samples. The sequences revealed now extinct relatives to the modern variola viruses that were in circulation before smallpox eradication. "We date the most recent common ancestor of variola virus to ~1700 years ago," the authors noted. "Distinct patterns of gene inactivation in the four near-complete sequences show that different evolutionary paths of genotypic host adaptation resulted in variola viruses that circulated widely among humans … Our finding of the virus in northern Europe at these times disproves various suggestions of first introductions involving later dates."
Senior study author Martin Sikora, PhD, from the Centre for GeoGenetics, University of Copenhagen, explained, "The timeline of the emergence of smallpox has always been unclear but by sequencing the earliest-known strain of the killer virus, we have proved for the first time that smallpox existed during the Viking Age. While we don't know for sure if these strains of smallpox were fatal and caused the death of the Vikings we sampled, they certainly died with smallpox in their bloodstream for us to be able to detect it up to 1400 years later. It is also highly probable there were epidemics earlier than our findings that scientists have yet to discover DNA evidence of."

Massacred 10th century Vikings found in a mass grave at St John's College, Oxford, were part of the study. [Thames Valley Archaeological Services]

The team claims that their discoveries of Viking Age variola virus sequences push back the definitive date of the earliest variola infection in humans by about 1000 years. Terry Jones, PhD, one of the senior authors leading the study, is a computational biologist based at the Institute of Virology at Charité—Universitätsmedizin Berlin and the Centre for Pathogen Evolution at the University of Cambridge. He commented, "There are many mysteries around poxviruses. To find smallpox so genetically different in Vikings is truly remarkable. No one expected that these smallpox strains existed. It has long been believed that smallpox was in Western and Southern Europe regularly by 600 AD, around the beginning of our samples."
It's previously been thought that returning crusaders or other later events may have brought smallpox to Europe, but the new discoveries overturn such theories, he continued. "We have

proved that smallpox was also widespread in Northern Europe … While written accounts of disease are often ambiguous, our findings push the date of the confirmed existence of smallpox back by a thousand years.
" Virologist and co-first author Lasse Vinner, PhD, at the Lundbeck Foundation GeoGenetics Centre, suggested that an understanding of the genetic structure of the ancient smallpox virus will potentially help scientists understand viral evolution and so add to the bank of knowledge that helps in the fight against emerging viral diseases. "The early version of smallpox was genetically closer in the pox family tree to animal poxviruses such as camelpox and taterapox, from gerbils," Vinner said. "It does not exactly resemble modern smallpox which shows that the virus evolved. We don't know how the disease manifested itself in the Viking Age—it may have been different from those of the virulent modern strain which killed and disfigured hundreds of millions."
Computational biologist and co-first author Barbara Mühlemann, PhD, took part in the research during her PhD at the Centre for Pathogen Evolution at the University of Cambridge. Now also based at the Institute of Virology at Charité, she commented, "The ancient strains of smallpox have a very different pattern of active and inactive genes compared to the modern virus. There are multiple ways viruses may diverge and mutate into milder or more dangerous strains. This is a significant insight into the steps the variola virus took in the course of its evolution.
"Knowledge from the past can protect us in the present, Jones maintained. "When an animal or plant goes extinct, it isn't coming back. But mutations can re-occur or revert and viruses can mutate or spill over from the animal reservoir so there will always be another zoonosis." As Willerslev concluded, "Smallpox was eradicated but another strain could spill over from the animal reservoir tomorrow. What we know in 2020 about viruses and pathogens that affect humans today, is just a small snapshot of what has plagued humans historically."
The reported research is part of a long-term project to sequencing 5000 ancient human genomes and their associated pathogens, through a collaboration between the Lundbeck Foundation, the Wellcome Trust, the Nordic Foundation, and Illumina.

Quartet of COVID-19 Vaccine Candidates Head toward the Homestretch

By Alex Philippidis
Source: https://www.genengnews.com/gen-edge/quartet-of-covid-19-vaccine-candidates-head-toward-the-homestretch/

July 22 – Viewed as a horse race, none of the four COVID-19 vaccine candidates whose developers released early clinical data this month fully broke away from the pack galloping toward regulatory approval.
However, a trio of distinguished experts interviewed by *GEN*, and two investment firms that track biopharma stocks, agreed that three of the four candidates showed sufficient promise in Phase I or Phase I/II studies to warrant interest from researchers, industry observers, and others in upcoming trials for:

- AZD1222 by AstraZeneca, the University of Oxford, and its spinout Vaccitech
- BNT162b1, the most advanced of four vaccine constructs by Pfizer and BioNTech
- mRNA-1273 by Moderna
- Ad5-nCoV by CanSino Biologics

All four are among the 18 "Front Runners" of the more than 270 COVID-19 therapeutics included in *GEN*'s updated "COVID-19 Drug & Vaccine Candidate Tracker."
"You can't bet on this race," William A. Haseltine, PhD, the HIV research pioneer and chairman of ACCESS Health International, told *GEN*. "The vaccine that I'd bet on is the one that's the safest, and I can't tell you which that is at this time."
Echoing that sentiment is Peter J. Hotez, MD, PhD, dean for the National School of Tropical Medicine at Baylor College of Medicine: "There's no winner at this point and we'll have many more vaccines coming through."
Before that can happen, Hotez said, "we're going to need to go through the hard work of a large Phase III clinical trial or multiple Phase III trials with 10,000 to 30,000 patients, to show that these vaccines actually work and they're safe. And that's what's going to take time."
All four vaccine candidates have such large-scale trials planned, with Moderna saying it anticipates launching its approximately 30,000-patient Phase III trial this month, and Pfizer and BioNTech planning to launch their own Phase IIb/III study very soon. AstraZeneca has already begun Phase II/III trials in the U.K., Brazil, and South Africa, with plans to start in the United States.

AZD1222: Seeing double

AZD1222 is a vaccine based on an adenovirus vector and the SARS-CoV-2 spike protein. After vaccination, the spike protein is produced, which primes the immune system to attack the coronavirus.

On Monday, researchers published preliminary Phase I/II data showing AZD1222 (formerly ChAdOx1 nCoV-19) to have an acceptable safety profile, and favorable immunogenicity against the virus: "The preliminary results of this first-in-human clinical trial supported clinical development progression into ongoing Phase II and III trials," the researchers concluded in their study, published in *The Lancet*.

The Phase I/II trial enrolled 1,077 healthy adult participants aged 18–55 years, and assessed a single dose of AZD1222 against a comparator meningococcal conjugate vaccine, MenACWY.

But while 543 patients were randomized to AZD1222 and 534 to MenACWY, only ten patients were enrolled to receive two doses of AZD1222, a prime and a boost. All ten showed neutralizing antibody activity after receiving the booster dose.

AstraZeneca hinted that it will pursue two doses of AZD1222: "We saw the strongest immune response in participants who received two doses of the vaccine, indicating that this might be a good strategy for vaccination," Andrew Pollard, MBBS, PhD, chief investigator and co-author of the Oxford Vaccine Trial, said in a statement released by AstraZeneca.

All the leading vaccine candidates showed better results after two doses compared with one—yet a single-dose vaccine would be optimal, Haseltine noted.

"This should be a vaccine that could be used around the world, for everybody, in rich and poor countries, as a constant. And for that, you need a vaccine in which a single dose will do you," Haseltine said. "The reason for that, as any vaccinologist will tell you, is that in difficult to reach areas, it's hard to get people once, it's even harder to get them twice. Some of the vaccines are two weeks apart, some of them are 28 days apart, so it's difficult. That's not optimal."

However, with the notable exception of the seasonal flu vaccine, many vaccines against infectious diseases work with initial "prime" and subsequent "boost" injections.

Among those receiving the single dose of AstraZeneca/Oxford's vaccine, neutralizing antibody responses against SARS-CoV-2 were detected in 32 of 35 participants when measured via microneutralization assay (MNA80) and in all 35 participants when measured via the 50% plaque reduction neutralization assay ($PRNT_{50}$).

"It makes you wonder; they've just done a two-dose study in ten people and now they're talking about the capacity to make hundreds of millions of dollars. How about a little humility here?" said Paul A. Offit, MD, director of the Vaccine Education Center and an attending physician in the division of infectious diseases at Children's Hospital of Philadelphia. "How about going through a Phase II trial, where you at least look at hundreds of people who got your two doses to make sure that it's safe and to make sure that it's consistently immunogenic?

"I don't feel extremely confident that a paper basically that looks at ten people that were going to be getting the dose number that they're planning on doing is in any sense a proof. So, go slowly and be a little more humble about all this," urged Offit, who is also the Maurice R. Hilleman chair of vaccinology at the University of Pennsylvania.

Madhu S. Kumar, PhD, senior research analyst with Baird, noted in an investor report that the AZD1222 trial revealed a challenge common to all leading COVID-19 vaccine candidates, namely containing adverse events. Of particular interest is that adverse events have proven less of a problem for adenovirus-based candidates than for mRNA vaccines.

AstraZeneca and the University of Oxford addressed adverse events at two of their trial's five sites (Oxford and Southampton) with a protocol amendment allowing paracetamol (the active ingredient in Tylenol®), to be administered before vaccination.

Researchers reported 56 severe adverse events in participants who received both the AZD1222 and paracetamol, compared with 487 among participants dosed with the vaccine alone—of which 328 (67%) were mild to moderate pain after vaccination.

mRNA-1273: "Warning sign" seen

Moderna's mRNA-1273 is a lipid nanoparticle (LNP)-encapsulated mRNA vaccine encoding for a prefusion stabilized form of the spike protein. The vaccine candidate showed positive interim data in a Phase I study (NCT04283461) whose results were published in *The New England Journal of Medicine* (*NEJM*) on July 14, about two months after they were announced by the company—an example of how much more aggressively than ever developers have used press releases and publicity to shape public perception of their COVID-19 vaccines before publication of data, according to Hotez.

The study evaluated a two-dose vaccination schedule of mRNA-1273 given 28 days apart across three dose levels (25, 100, 250 µg) in 45 healthy adult participants ages 18–55 years, with results reported through day 57.

mRNA-1273 induced binding antibodies to the spike protein in all participants after the first vaccination, with all participants seroconverting by Day 15. Dose dependent increases in binding titers were seen across the three dose levels, and between prime and boost vaccinations within the dose cohorts.

As a result, Moderna said it will give the 100 µg dose to participants randomized to treatment in its upcoming Phase III trial. At the 100 µg dose, they reported, the geometric mean titers

seen among patients were 2.1-fold higher than those seen in convalescent sera obtained from 38 individuals with confirmed COVID-19 diagnoses (and 4.1-fold above those seen in reference convalescent sera).
At the highest (250 µg) dose level, three of 14 participants (21%) reported one or more severe adverse events. A fourth severe event was a fever of 39.6°C (103.3°F) reported in a patent in the 100 µg group. Lesser solicited systemic adverse events were more common after the second vaccination.
"The Moderna vaccine knocked a couple of young healthy people on their ass, and it was only 2.5 times the actual dose they plan to use. That's not good. That is a warning sign," Haseltine said. "If I were the CEO of that company, I wouldn't have proceeded until I knew a lot more about the safety profile in target populations: Older people, and people with some comorbidities, say mildly obese and relatively healthy diabetic."
Researchers from Moderna, the National Institute of Allergy and Infectious Diseases (NIAID)—which led the trial—and their clinical research partners reported in the *NEJM* that the adverse events were not trial-limiting (the systemic adverse events after the first vaccination were all graded mild or moderate). They emphasized that mRNA-1273 induced rapid and strong immune responses against SARS-CoV-2: "These safety and immunogenicity findings support advancement of the mRNA-1273 vaccine to later-stage clinical trials."

BNT162: Dose-response links vary

BioNTech and Pfizer are evaluating four vaccine constructs of BNT162 in an mRNA-based clinical program the companies have dubbed "Project Lightspeed." The most advanced of the four is BNT162b1, a lipid nanoparticle-formulated, nucleoside-modified mRNA (modRNA) vaccine candidate that encodes a trimerized SARS-CoV-2 spike glycoprotein receptor-binding domain (RBD) antigen.
BNT162b1 and a second modRNA construct, BNT162b2, have both received the FDA's Fast Track designation.
"What makes RNA technology attractive is that it's easy to make. The minute that you knew the sequence of this virus in January, then you knew the genetic sequence of the spike protein, so it was plug and play," Offit said. "All you had to do is take that generic sequence and then plug it into an mRNA strategy or plug it into a DNA strategy, or plug it into a replication defective adenovirus strategy or plug it into a vector vaccine strategy, the way we make the dengue or Ebola vaccine."
Ease of making and scale-up are the reasons Offit predicts "those are going to be the leading candidates, and they know that will be the first vaccines that are used. It doesn't make them the best vaccines, but I think we'll find that out over time. It certainly makes the fastest to make vaccine."
Pfizer and BioNTech just published initial data from an ongoing German Phase I/II, open-label, non-randomized, non-placebo-controlled, dose-escalation trial of BNT162b1 (EU Clinical Trials Registry EudraCT number 2020-001038-36). The preliminary data—from a non-peer-reviewed preprint posted on *medRxiv*—showed BNT162b1 to have elicited high, dose level-dependent SARS-CoV-2-neutralizing titers and RBD-binding immunoglobulin G (IgG) concentrations after the second dose.
The German study recruited 60 participants in four dose groups (1, 10, 30, and 50 µg). For each dose group, a dozen participants received a first dose on Day 1 and a boost dose on Day 22. In addition, 12 participants in the 60 µg group only received a single injection.
At Day 43, SARS-CoV-2 neutralizing geometric mean titers ranged from 0.7-fold (1 µg) to 3.2-fold (50 µg) compared to sera from patients recovered from SARS-CoV-2 infection. The sera of participants vaccinated with BNT162b1 showed broadly neutralizing activity in assays across a panel of 16 SARS-CoV-2 RBD variants represented in publicly available sequences and against the D614G strain. The German trial results also showed for the first time high levels of $CD4^+$ and $CD8^+$ T cell responses, indicating a strong potential for cell mediated anti-viral activity, according to BioNTech and Pfizer.
However, a team of SVB Leerink analysts led by Geoffrey C. Porges, MBBS, director of therapeutics research, observed that the German study did not show clear dose dependency of the T-cell response strength using dose levels ranging from 1 µg to 50 µg. (Even 1 µg of the mRNA can induce T-cell responses that are similar to 50 µg.)
"The authors suggested this could indicate stimulation and robust expansion of T cells might be accomplished at the lowest mRNA-encoded immunogen level. We find this phenomenon quite intriguing and not exactly convinced [sic] by the explanations provided by the authors," the SVB Leerink analysts wrote.
Pfizer and BioNTech also disclosed encouraging immunogenicity and a favorable safety profile in preliminary Phase I/II data posted July 1 in a preprint study reporting on their U.S. Phase I/II trial (NCT04368728). The U.S. trial enrolled 45 healthy adults ages 18–55—of which 24 participants received two injections, 21 days apart, of 10 µg or 30 µg; 12 participants received a single injection of 100 µg on day 1; and nine participants received two placebo control doses.

Ad5-CoV: Disappointing data

The most disappointing data of the four lead vaccine candidates comes from CanSino Biologics for Ad5-nCoV, a recombinant vaccine incorporating a non-replicating adenovirus type 5 vector for prevention of COVID-19.

Researchers from CanSino and partners published results Monday in *The Lancet* from a Phase II study (NCT04341389), conducted with China's Beijing Institute of Biotechnology, Academy of Military Medical Sciences. The results showed Ad5-nCoV to be safe, with its effectiveness varying depending on the measure.

Both doses of the vaccine resulted in significant neutralizing antibody responses to live SARS-CoV-2, the investigators reported. RBD-specific ELISA antibody responses induced by the vaccine were detected from day 14 onward, with geometric mean titers (GMTs) of 94.5 and 85.1 in the 1×10^{11} and 5×10^{10} viral particles per mL dose groups, respectively. Seroconversion of binding antibodies were seen in 96% and 97% of participants.

However, the vaccine induced seroconversion of neutralizing antibodies in just 59% and 47% of participants in the 1×10^{11} and 5×10^{10} dose groups, respectively, and positive specific T-cell responses measured by IFNγ-ELISpot were found in 90% and 88% of participants.

"The antibody and T-cell responses were both very low," Brad Loncar, CEO of Loncar Investments and an investor in CanSino, told Bloomberg News. "I thought the data was unimpressive."

CanSino's adverse event rates were 9% (24/253) and 1% (1/129) at the 1E11 and 5E10 doses, respectively. Those rates are higher than those published by Moderna, though Moderna's cohorts had lower numbers of patients. Baird's Kumar noted: "All in all, we believe the existing clinical data from these Ad COVID vaccine trials provide a much higher safety bar for new COVID-19 vaccine entrants than that required by the mRNA-1273 data set so far."

The need to address adverse events, and assess the vaccines in much larger populations explains why Hotez doesn't expect one or more vaccines to emerge until at least the third quarter of 2021—which would still be a record for vaccine development, which usually takes a decade or more to achieve

"We'll have the first vaccines come out, but they'll eventually get replaced by potentially better vaccines over time," Hotez said. "And that's not unusual. We saw this happen with rotavirus, we saw this happen with homofluous influenza type B, with HPV. It's actually the rule rather than the exception that the first vaccines are often not the best vaccines and they get replaced.

"That's why I look upon this business of a race for a vaccine with some amusement," Hotez said. "Be careful what you wish for, because history says that if you're the winner, it has a built-in obsolescence and will be replaced."

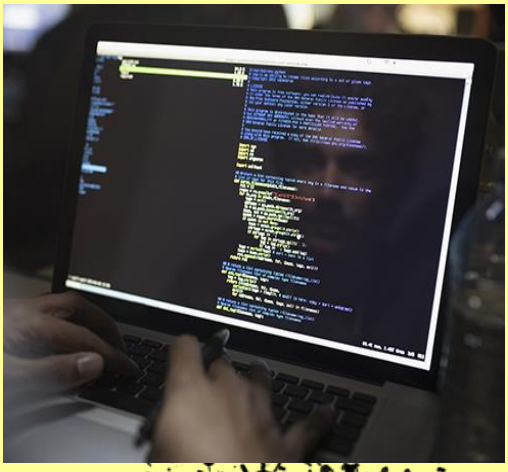
Haseltine said the scramble by biopharmas to develop a COVID-19 vaccine brought to mind the words of the Biblical book of Ecclesiastes:

"I returned, and saw under the sun that the race is not to the swift, not the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favor to men of skill; but time and chance happeneth to them all."

***Alex Philippidis** specializes in biopharma business news and industry issues as Senior News Editor for GEN / Genetic Engineering & Biotechnology News, sister publication Clinical OMICs, and the parent company for both publications, Mary Ann Liebert, Inc.*

Why AI fell short in slowing the spread of COVID-19

Source: https://www.healthcareitnews.com/news/why-ai-failed-help-slow-spread-covid-19



July 23 – This spring, much of the healthcare industry hoped that artificial intelligence could be a key tool in stemming the spread of the COVID-19 pandemic across the world.

But the results weren't just underwhelming. In some cases, they were "anti-constructive," said Dr. Isaac Kohane, chair of the Department of Biomedical Informatics at Harvard Medical School, during a FutureMed presentation on Thursday.

"We in healthcare were shooting for the moon, but we hadn't gotten out of our own backyard," said Kohane.

In the United States there were several attempts to use aggregate data from electronic health records. Kohane used Epic as an example, pointing to its system to predict severity of disease based on admissions.
"It didn't perform very well at all," said Kohane.
According to Kohane, a lack of high-quality data contributed to the shortfall.
"Most of the data that was being shared for the first three months was literally just case counts and death counts," he said. "To the extent that there was sharing of clinical courses, it was from single institutions," rather than interstate efforts.
"We did not have a real collective intelligence," he said.
But hope isn't completely lost for AI's role in addressing the pandemic. Kohane noted that companies are using it to develop vaccines – specifically, using large databases of protein interactions and docking simulations to figure out the best protein domain to block.
In December or sooner, he said, we'll see "the results of Phase 2 trials from purely machine-learned trials."
U.S. Food and Drug Administration Principal Deputy Commissioner Amy Abernethy said during the presentation that AI might be used to help sort through the available drugs and to help get data sets cleaned up "to better understand how drugs are performing."
Meanwhile, Eran Segal, a professor in the computer science department at the Weizmann Institute of Science, pointed to the use of AI in conjunction with surveys to help predict, based on reported symptoms, which individuals should be tested.
Ultimately, said Dr. Karen DeSalvo, chief health officer at Google Health and former National Coordinator for Health IT, those building AI tools to confront the pandemic must not replicate existing biases in medicine, a possibility that is a continued concern among many developers.
"There's a really important challenge to look at fairness: to make sure that whatever we are building is not going to exacerbate inequities in health outcomes," said DeSalvo.

Assessing the US government response to the coronavirus

By Daniel M. Gerstein
Bulletin of the Atomic Scientists, 2020; 76:4, 166-174
Source: https://www.tandfonline.com/doi/pdf/10.1080/00963402.2020.1778356

When the coronavirus pandemic struck the United States, the country demonstrated significant shortfalls in preparedness and response. Diagnostic testing came late and was inadequate. Desperate for ventilators and personal protective equipment, states were thrust into a chaotic competition over the limited supplies. The network of federal, state, and local officials who had trained together on how to respond to a pandemic was torn as the Trump administration created the Coronavirus Task Force. And to top it off, the federal government had failed for decades to develop an efficient and well-resourced biodefense system to monitor and respond to biological threats like a pandemic virus.

Daniel M. Gerstein *formerly served as the acting undersecretary and deputy undersecretary in the Science and Technology Directorate of the Department of Homeland Security from 2011-2014. Gerstein's latest book is The Story of Technology: How We Got Here and What the Future Holds, and was published by Prometheus Books.*

EDITOR'S COMMENT: It is amazing that despite the fact that we all read doctrines, guidelines and preparedness issues written by Americans, this nation was never adequately prepared to deal with any major disaster. Perhaps it is time to change our diet and avoid ready-made fast food preferring our own anthropocentric recepies.

5 persistent myths about coronavirus and why they are untrue

By Maria Cohut, Ph.D.
Source: https://www.medicalnewstoday.com/articles/5-persistent-myths-about-coronavirus-and-why-they-are-untrue

June 05 – Even before the World Health Organization (WHO) declared the new coronavirus outbreak a "pandemic," their director general, Dr. Tedros Adhanom Ghebreyesus, warned of the danger associated with spreading false information about the virus.
At a conference on February 15, 2020, he declared that "we're not just fighting an epidemic; we're fighting an infodemic."
"Fake news spreads faster and more easily than this virus and is just as dangerous," he emphasized.

However, it can be difficult to tell what is credible and what is not given the sheer quantity of information that people are sharing both on and offline.
Previously on *Medical News Today*, we compiled a list of 28 myths surrounding the new coronavirus (SARS-CoV-2). In this Special Feature, we will take an in-depth look at five more persistent myths and explain why people should not take them at face value.

Myth 1: Vitamin D prevents infection

Some articles claim that if a person takes vitamin D supplements, they will be less likely to contract SARS-CoV-2.
In part, people have based these claims on a controversial paper that appears in the journal *Aging Clinical and Experimental Research*.
The paper's authors claim to have found a correlation between low mean levels of vitamin D in the populations of certain countries and higher rates of COVID-19 cases and related deaths in those same countries.
Based on this correlation, the authors hypothesize that supplementing the diet with vitamin D may help protect against COVID-19.
However, there is no evidence to suggest that this would actually be the case.
In a rapid review of the evidence published on May 1, 2020, researchers from the Centre for Evidence-Based Medicine at the University of Oxford in the United Kingdom unequivocally conclude: "We found no clinical evidence on vitamin D in [the prevention or treatment of] COVID-19."
They also write that "[t]here was no evidence related to vitamin D deficiency predisposing to COVID-19, nor were there studies of supplementation for preventing or treating COVID-19."
Other researchers who have conducted reviews of the existing data surrounding a potential relationship between vitamin D and COVID-19 agree.
One report by specialists from various institutions in the U.K., Ireland, Belgium, and the United States — which appeared in *BMJ Nutrition, Prevention & Health* in May 2020 — also points to a lack of supporting evidence in favor of taking vitamin D supplements to prevent infection with SARS-CoV-2.
The report's authors warn that:
"[C]alls [for high dose vitamin D supplementation as a preventive strategy against COVID-19] are without support from pertinent studies in humans at this time, but rather based on speculations about *presumed* mechanisms."
They also note that although sufficient vitamin D can contribute to overall good health on a day-to-day basis, taking supplements without first seeking medical advice can be harmful.
For example, taking too much vitamin D in the form of a dietary supplement could actually jeopardize health, especially among people with certain underlying chronic conditions.

Myth 2: Zinc stops the virus in its tracks

Another widespread rumor is that taking zinc supplements could help prevent infection with SARS-CoV-2 or treat COVID-19.
It is true that zinc is an essential mineral that helps support the functioning of the human immune system.
Starting from this notion, a team of researchers from Russia, Germany, and Greece hypothesized that zinc might be able to act as a preventive and adjuvant therapeutic for COVID-19. Their results appear in the *International Journal of Molecular Medicine*.
The researchers refer to in vitro experiments that apparently showed that zinc ions were able to inhibit the action of a certain enzyme that facilitates the viral activity of SARS-CoV-2.
However, they also point out the lack of actual clinical evidence that zinc might have an effect against SARS-CoV-2 in humans.
Other papers that cite the potential of zinc as an adjuvant in COVID-19 therapy — including one that appears in *Medical Hypotheses* — are more speculative and not based on any clinical data.
In a "Practice patterns and guidelines" paper from April 2020 — which appears in *BMJ Nutrition, Prevention & Health* — nutritionist Emma Derbyshire, Ph.D., and biochemist Joanne Delange, Ph.D., reviewed existing data about zinc (alongside other nutrients) in relation to viral respiratory infections.
They found that, according to available research in humans, zinc supplementation may help prevent pneumonia in young children, and that zinc insufficiency may impair immune responses in older adults.
However, they note that there is not enough evidence about the role of zinc supplementation in preventing viral infections in general.
"Rigorous trials […] are yet to determine the efficacy of zinc supplementation," they write.

Myth 3: Vitamin C can fight SARS-CoV-2

Vitamin C is another essential nutrient that has received a lot of attention. Many people believe that it can prevent or even cure the flu or common cold.

Although it is true that sufficient vitamin C can help support immune function, current evidence regarding its effectiveness in treating or preventing colds and influenza is limited and often contradictory.

Despite this, there have been claims that this vitamin might help fight infections with the new coronavirus.

It is possible that people are basing these claims on an existing ongoing clinical trial in China, which is looking at the effects of high dose intravenous (IV) vitamin C on hospitalized patients receiving care for severe COVID-19.

The researchers expect to complete the trial by the end of September 2020. No results are available in the interim.

Commenting on the trial, experts from the Linus Pauling Institute — which focuses on health and nutrition — at Oregon State University in Corvallis explain that although high dose IV vitamin C might help alleviate COVID-19 symptoms in severely ill patients, regular vitamin C supplements are very unlikely to help people fight off infections with SARS-CoV-2.

The experts warn that "IV vitamin C is not the same as taking vitamin C supplements," as they would never raise blood levels of this vitamin as highly as an IV infusion would.

They also warn people who may be tempted to up their dosage of vitamin C of the fact they could end up taking too much and experiencing adverse side effects.

Myth 4: The keto diet can cure COVID-19

Keto diets, which are high in fats and low in carbohydrates, have also received some attention in the context of treating or preventing COVID-19.

This may be because there is some evidence to suggest that keto diets could help boost the immune system. However, much of that evidence is based on animal studies rather than human trials.

Also, an upcoming clinical trial from Johns Hopkins University in Baltimore, MD, proposes to look at whether or not a ketogenic intervention might help intubated COVID-19 patients by reducing inflammation.

The intervention would necessitate the administration of a specially devised ketogenic formula through enteral feeding. It would be a last-resort procedure for those in a critical condition.

There is currently no evidence to suggest that following a keto diet could help a healthy person prevent or treat infection with SARS-CoV-2.

However, there is evidence to suggest that keto diets can expose people to certain health risks — such as by raising cholesterol levels. Keto diets may also have side effects, such as flu-like symptoms, headaches, nausea, and changes in blood pressure.

Myth 5: Herbal remedies can help

There are also claims suggesting that various herbal medicines might be able to fight off the new coronavirus.

This may partly be based on a statement issued by a Chinese official in April 2020, suggesting that certain herbal drugs could help treat COVID-19, as a communication in *The Lancet* on May 15, 2020, reports.

Author Yichang Yang — from the Department of Traditional Chinese Medicine at the Second Affiliated Hospital of Zhejiang University School of Medicine in Hangzhou, China — warns that people should take encouragements to use herbal remedies in the treatment of COVID-19 with a pinch of salt.

Yang warns that herbal remedies — including the drugs that the Chinese official names — can have unexpected risks and may not be as effective as some people claim. Also, evidence from human trials is very limited.

For similar reasons, he also notes that the mechanisms through which herbal drugs work on the body are often unclear, which may mean that they are not always safe.

A mystery "herbal cure" for COVID-19 on sale in Madagascar — a herbal tea made from artemisia plants — has also spurred worry among specialists, who say that the "remedy" may do more harm than good.

Matshidiso Moeti, director of WHO Africa, has also commented on this:

"We [the WHO] would caution and advise countries against adopting a product that has not been taken through tests to see its efficacy."

Although people may be tempted to try anything and everything in the face of such a threat to health as SARS-CoV-2, the most important preventive step is to follow official national and international guidelines for public health, as well as individual health advice from doctors and other healthcare professionals.

Racial inequalities in Covid-19 – the impact on-black communities

Source: https://www.medicalnewstoday.com/articles/racial-inequalities-in-covid-19-the-impact-on-black-communities

COVID-19 Update: Antibodies Decrease, UV Light Fights Virus

Source: https://www.medscape.com/viewarticle/934501

July 23 – Here are the coronavirus stories Medscape's editors around the globe think you need to know about today:

Antibodies Drop Rapidly

Antibody levels in patients with mild COVID-19, the level of disease most people have, appear to drop by half within 36 days, new research suggests.

The results, published online in a letter to the editor of *The New England Journal of Medicine*, "put firm numbers on the dropping of antibodies after early infection," study author Otto Yang, MD, professor of medicine at the University of California, Los Angeles, told *Medscape Medical News.*

The rapidity in the antibody drop at 5 weeks "is striking compared to other infections," he said.

Although interpreting the data comes with a few caveats, the study indicates that there is "no reason for anybody to be getting an antibody test medically right now," Yang said.

Using UV Light to Fight Disease Spread

A century-old approach to fending off infectious diseases involves the use of ultraviolet light — known as germicidal UV — delivered in the right dose to wipe out viruses, bacteria, and other microorganisms. "Although it's not perfect, it probably offers the best solution for direct air disinfection" in the current pandemic, David Sliney, a faculty member at Johns Hopkins University and longtime researcher on germicidal UV, told *Kaiser Health News*.

Research shows close to 90% of airborne particles from a previous coronavirus (SARS-CoV-1) can be inactivated in about 16 seconds when exposed to a certain strength of UV. Other viruses, such as the adenovirus, require a higher dose of UV.

UV can go only so far toward preventing infection, however. People can still get sick from the larger, heavier droplets ejected via coughs and sneezes, for instance.

COVID-19 Spread Outpacing Testing Capacity

The coronavirus may be spreading faster in the United States than labs can test for it.

That, in turn, leads to a slower turnaround time for results, which can hinder contact tracing efforts. States frustrated by private laboratories' increasingly long turnarounds for COVID-19 test results are scrambling to find ways to salvage their testing programs, *Kaiser Health News* reports.

One company, LabCorp, is processing about 165,000 COVID-19 tests per day, compared with 20,000 per day in late March, and averaging between 3 to 5 days to return results to someone not in the hospital.

"We're continuing to increase capacity every single week," Adam Schechter, the CEO of LabCorp, said on CNBC's *Closing Bell*. "The problem is that the number of tests being asked to be performed each week is growing faster than the capacity that we can build."

How Much Can We Reduce COVID–19 Spread by Staying Home? A Lot, New Research Shows

Source: https://www.sciencealert.com/how-much-can-we-reduce-covid-19-spread-by-staying-at-home-a-lot-new-research-shows

July 27 – **There is one number affecting the lives of so many people around the world right now: the reproduction number, also called simply R.**

In the case of infectious diseases such as coronavirus, R determines how many people will be infected by each person who already has the virus. To successfully defeat a pathogen like SARS-CoV–2, you need R to be less than 1 – meaning each person passes the infection on to less than one other person, which ultimately leads to fewer and fewer people being infected. In contrast, an R value greater than 1 represents a growing spread.

But how can we really know what measures are working to curb the spread of COVID–19 and put downward pressure on this all-important R number?
A new study led by paediatrician David Rubin from the Children's Hospital of Philadelphia gives us one of the clearest and most comprehensive perspectives on this yet in the US context, pooling data from 211 counties across the country, in total covering over half (54 percent) of the US population.

"Unequivocally, the strongest factor in our models that was associated with reduced transmission has been social distancing," Rubin told UPI.

"We need to accept some consistent national standards around masking, reducing the size of crowds and limiting access to locations, like indoor bars, where the risk of outbreaks has been highest."
The researchers wanted to understand what factors at county level seemed to impact R the most, which varies based on time and place. In the study, looking at data from February 25 to April 23, the team specifically examined the potential impact of three variables on R: social distancing, population density, and temperature.
As we all know, social distancing is supposed to curb the spread of coronavirus by limiting how much contact infected people have with non-infected people. Similarly, population density is expected to be an important factor in virus spread, with greater density (and thus less ability to socially distance) equating with greater transmission.
As for weather, its impact on coronavirus spread isn't as clear, as rising temperature and humidity levels are thought to have an impact on virus transmission, but the evidence is somewhat mixed.
In the new study, social distancing was measured by county-level mobile location data, estimating levels of travel to non-essential businesses during shutdown measures, compared against pre-pandemic trends.
To the extent that that's an accurate proxy, it looks like social distancing measures are indeed linked with the greatest reductions to R overall.
On average, the researchers found that a 50 percent decrease in visits to non-essential businesses correlated to a 46 percent drop in R, while a 75 percent decrease in visits to non-essential businesses correlated to a 60 percent drop in R.
Greater population density, as expected, also correlated with slight increases in R, and weather also seemed to have an impact, although again the effects were a bit unclear: the coldest and hottest wet-bulb temperatures both seemed to be linked to higher R values, but spring-like conditions in the middle correlated with the lowest R number.
On the whole, though, the researchers say the effects of social distancing look to have the greatest effect on reducing coronavirus transmission – bearing in mind, this is all observational data, so we can't confirm any actual effects here, but rather draw informed guesses on what might be working.
To that extent, the researchers say it's crucially important we listen to data like this, and use it going forward.
"Our data reveal that if the United States had collectively waited longer, opened more slowly, and then kept our gathering sizes small, we might have reduced case counts like Europe or Canada and experienced a relatively normal summer, free of extreme disease burden from COVID–19," Rubin explains in a press release.
"As the pandemic resurgence continues, we must commit to social distancing and universal masking nationwide in order to gain control of this epidemic and avoid a potentially catastrophic fall and winter season."

►► **The findings are reported in** *JAMA Network Open*.

A 'Journey Mindset' Can Help Us Get Through This Pandemic. Here's What That Means

Source: https://www.sciencealert.com/a-journey-mindset-can-help-us-get-through-this-pandemic-here-s-what-that-means

July 27 – Living in the present can be a present in itself, but during a global pandemic, when the world is in crisis, reflecting only on the 'now' might not be your best tactic.
If we want to get through this tragedy stronger than ever, behavioural psychologist Szu-chi Huang and Jennifer Aaker from Stanford University argue we need to switch our mindsets.
Success is not a box to be ticked on your bucket list and forgotten thereafter, they say. Rather, life should be seen as a journey, which requires us to reflect on the steps that brought us achievement or failure in the past and apply those lessons in the future.

It might sound obvious or cliched, but evidence suggests applying a "journey metaphor" to life can have a real impact on your happiness.
"Having a journey mindset can help," Huang explains. "As we think about navigating COVID-19 and how it has impacted our lives, a focus solely on the destination can result in a lot of frustration, because if a problem is not solved right away and we fail at reaching our destination, all seems lost."
And it's really easy to think that way in 2020 when everything seems to be going south and the only thing, we're holding out for is a vaccine. But despite everything happening in the world, we might be able to cope with it better if we change our mindset slightly and stop looking for a solution.
In the past, psychologists have found that seeking happiness is not actually the surest path to feeling happy. It's kind of like the mirror of Erised in Harry Potter, you can't receive happiness if you're focused on the end goal too much.
Holocaust survivor Viktor Frankl hit on this point explicitly in his book *Man's Search for Meaning*.
"To the European it is a characteristic of the American culture that, again and again, one is commanded and ordered to 'be happy.' But happiness cannot be pursued; it must ensue. One must have a reason to 'be happy.'"
The important difference between pursuing 'meaning' and 'happiness' in life is something that Huang and Aaker have been studying for years.
In a review paper published in October last year, they summed up the results of six experiments they'd conducted on the journey mindset, which involved more than 1,600 participants and were focused on dieting and fitness regimes.
One of the experiments was based on a 14-day walking program in which steps were tracked to achieve an ultimate goal. After that goal had been reached, the subjects were given the opportunity to continue tracking their steps.
The authors found those who thought about the program as a journey walked close to 55 percent more during the three additional days than those who simply had a destination (meeting the goal) in mind.
"The journey mindset is about the continuation from our past meaningful successes and failures to the present moment and into the future," says Aaker.
"Success does not exist in isolation - it has a past and it needs to be sustained into the future."
So how do we achieve a journey mindset? During this pandemic, many of us are connecting more with old friends and family, picking up new hobbies, and finding unique ways to get work done at home. It's not all bad; there's still hope among the tragedy.
Meditating on the good and bad, or writing down your thoughts, goals and feelings in a journal on an daily, weekly or even annual basis can help you achieve a journey mindset, Huang and Aaker said in their 2019 paper.
Even if there's nothing good to reflect on in that moment, you can always go back to previous successes and this might help you find a path for new ones. Success, after all, is not all about goals; it's also about growing, learning and changing.
"All of these are skills and lessons that we can carry on even after COVID-19," says Huang.
"Once people learn how to best cope with these challenges, the journey mindset can reinforce such growth and thus sustain people's mental health in the future—especially when future triggers or stressors occur."
They're not the only researchers to show the importance of thinking beyond finding immediate happiness.
In one 2003 study, when participants listened to classical music, those who tried to force happiness while listening, as opposed to just passive listening, ended up unhappier after the song ended.
Instead of trying to generate happiness from nothing, psychologists say we should focus more on finding meaning in life, whether that be through family, friends, nature, religion or working for the greater good.
While focusing on those aspects of life might not lead directly to happiness, it does seem to give us the best shot at it, while also providing a safety net of purpose, coherence and worth just in case we can't attain it.

►► **Huang and Aaker's latest review was published in the** *Journal of Personality and Social Psychology*.

Disease Experts Create Color-Coded Chart to Help You Decide When to Leave the House

Source: https://www.sciencealert.com/disease-experts-create-color-coded-chart-to-help-you-decide-when-to-leave-the-house

July 27 – When businesses began reopening from the coronavirus shutdown across the US, Arizona-based epidemiologist Saskia Popescu started fielding a whole series of new questions from colleagues, friends, and worriers on the internet.
Everyone, it seemed, had questions.

Can I eat at a restaurant?
Can I play tennis?
Can I golf?

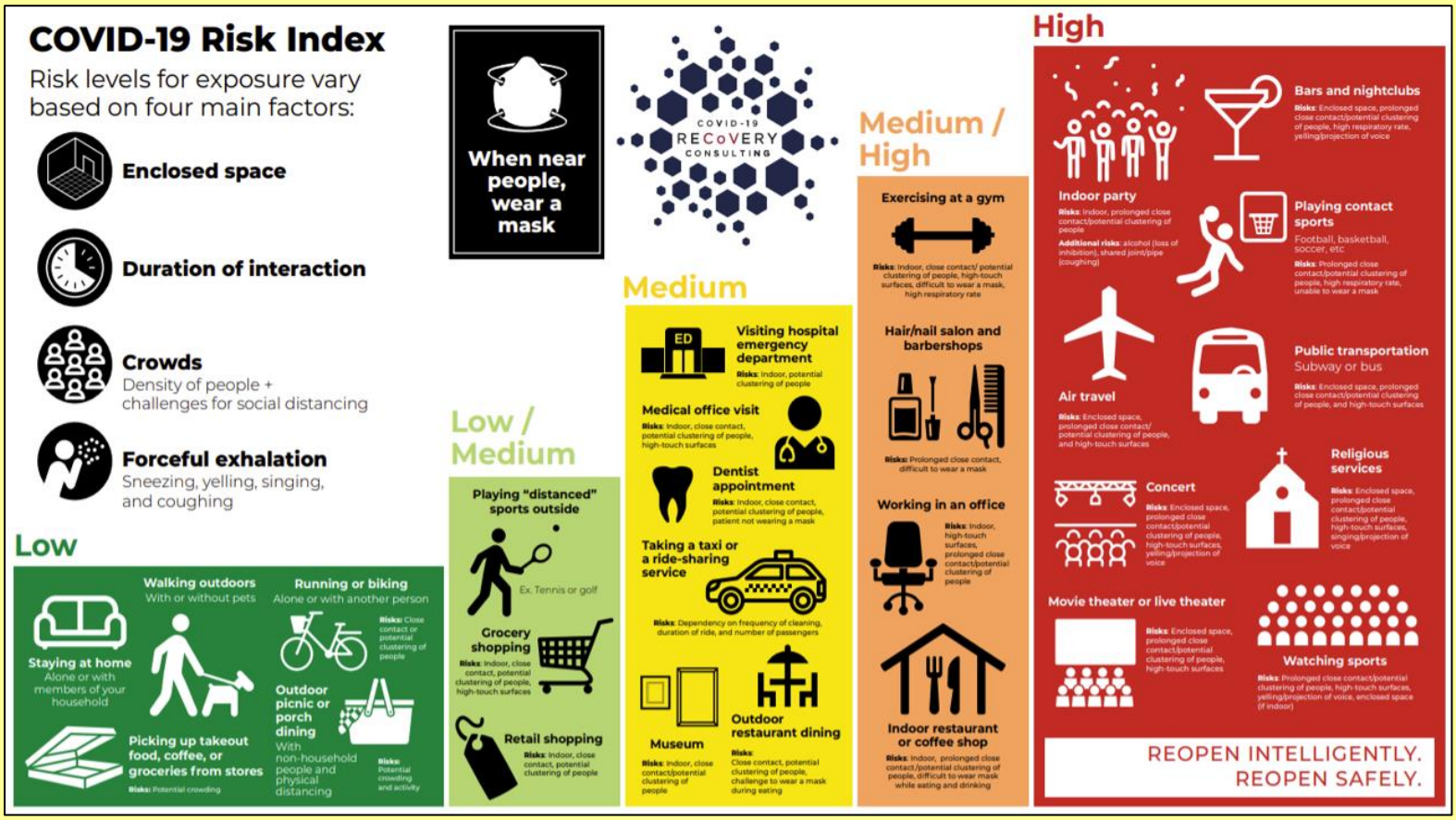
"We were finding just that people really struggled to understand risk dynamics," Popescu, from the University of Arizona and George Mason University, told Insider.

"There was this kind of false dichotomy of either you stay in, or you go out and it's really, really dangerous."

So Popescu got together with two of her colleagues to decide, collectively, which activities they thought were safest, and which might be most hazardous during the pandemic.

"You can still live your life and not feel so trapped by what's going on right now," Popescu said.

Here's the chart that she, along with Dr James Phillips (George Washington University) and Dr Ezekiel Emanuel (University of Pennsylvania), created.



It ranks activities from dark green (safest) to red (very risky).

"Nothing is zero risk right now," she said. "It's about trying to reduce the risk as much as possible."

Popescu, Phillips, and Emanuel also have a consulting business, where they weigh these kinds of risks for companies and advise them on the safest ways to reopen during the pandemic. But they created this chart knowing not everyone may be as cautious as them.

"I can't assume everybody is doing the right thing and taking the necessary steps in their business, or in that environment," she said. "I'd rather you be cognisant of that."

For example, taking public transportation is listed as a high risk red-coloured activity on this chart, because it's in an enclosed space where you may have prolonged, close contact with others, and there are high-touch surfaces involved (doors, chairs, etc.)

It could be the case that busses and trains in a certain city, or within a certain company, have put in place the proper precautions. Adequate social distancing, masking requirements, and sanitizing measures could bring a bus trip down into a less risky category of activity.

The important thing is to "know what to look for when you're trying to make those decisions," Popescu said.

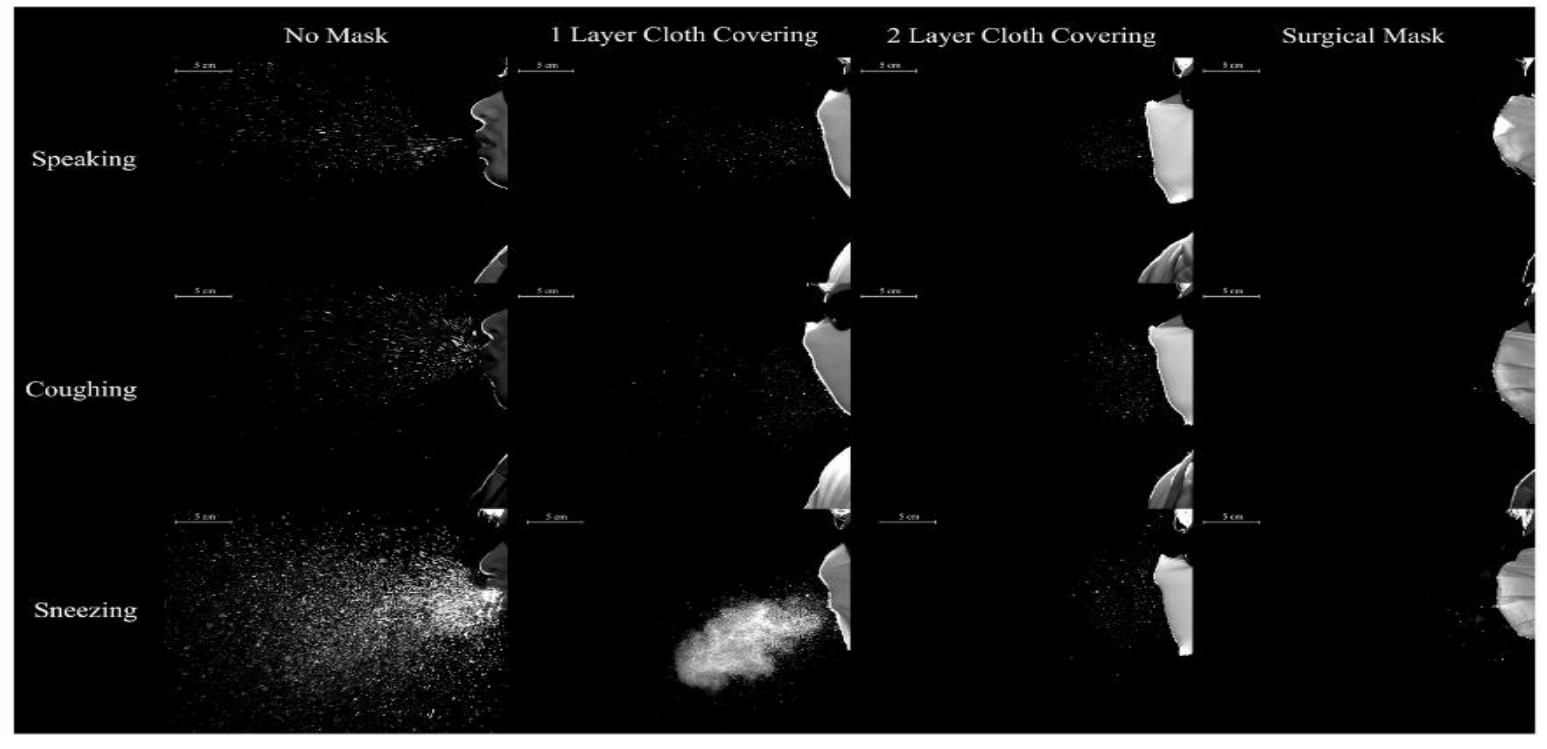
Good air circulation, minimising time indoors and with crowds, and better hygiene are all key.
"We all collectively agree that going to a concert is a really bad idea," she said.
The risk propositions of some other activities aren't always as clear-cut and will depend on how you approach them.
"Golf, for example, it's going to be low-risk if you're doing it by yourself, or you're a part of a group and you're all socially distanced and you're taking your own golf cart and wearing masks when you're around each other," Popescu said.
"But if you're all together in one golf cart, drinking and not really wearing your mask, that's going to be high risk."

Scientists Test Which Masks Work Best by Filming People Coughing and Sneezing in Them

Source (+video): https://www.sciencealert.com/scientists-test-which-face-mask-works-better-by-filming-coughs-and-sneezes

July 26 – If you're not sure whether wearing a face mask is worth it, or you need to wear a mask but are unsure which type, our new research should help you decide.
We took videos of what happens when you talk, cough and sneeze in different scenarios — while not wearing a mask, wearing two different types of cloth masks, or wearing a surgical mask.
The results, published in the journal *Thorax*, are clear.
A surgical mask was the most effective at blocking droplets and aerosols from talking, coughing and sneezing. But if you can't get hold of one, a cloth mask is the next best thing, and the more layers the better.

Here's what we did and what we found
You can be infected with the coronavirus, but not show symptoms. So you cannot identify an infected person just by looking at them. And you may be infected (and infectious) but not know it.



So, we wanted to compare how effective different types of masks were at preventing outward transmission of droplets while talking, coughing and sneezing. These are the types of masks the public might use to reduce community transmission.
We compared using no mask with two different types of cloth masks made from DIY templates provided online (one mask had a single layer of cloth; the other had two layers), and a three-layered surgical mask.

To visualise the droplets and aerosols you may not otherwise see, we used an LED lighting system with a high-speed camera.
We confirmed that even speaking generates substantial droplets. Coughing and sneezing (in that order) generate even more.
A three-ply surgical mask was significantly better than a one-layered cloth mask at reducing droplet emissions caused by speaking, coughing and sneezing, followed by a double-layer cloth face covering.
A single-layer cloth face covering also reduced the droplet spread caused by speaking, coughing and sneezing but was not as good as a two-layered cloth mask or surgical mask.
We do not know how this translates to infection risk, which will depend on how many asymptomatic or mildly symptomatic infected people are around. However, it shows a single layer is not as good a barrier as a double layer.

What does this mean?
With mandated mask use in Greater Melbourne and the Mitchell Shire, we may face shortages of surgical masks. So it is important to understand the design principles of cloth masks.
We did not test more than two layers, but generally, more layers are better. For example, a 12-layered cloth mask is about as protective as a surgical mask, and reduces infection risk by 67 percent.
We acknowledge it's difficult to sew together 12 layers of fabric. But there are steps you can take to make cloth masks more effective.
You can:

- increase the number of layers (at least three layers)
- use a water-resistant fabric for the outer layer
- choose fabric with a high thread count (so a tighter weave, for instance from a good quality sheet is generally better than a fabric with a looser weave that you can clearly see light through)
- hybrid fabrics such as cotton–silk, cotton–chiffon, or cotton–flannel may be good choices because they provide better filtration and are more comfortable to wear
- make sure your mask fits and seals well around your face
- wash your mask daily after using it.

The evidence is mounting
In practice, we don't yet know which has a greater effect — wearing masks to prevent infected people spreading to others or protecting well people from inhaling infected aerosols. Probably both are equally important.
In Missouri, two infected hairdressers kept working while infectious, but wore a mix of cloth and surgical masks, as did their 139 clients. No client was infected.
However, one hairdresser infected her household family members, as she did not wear a mask at home, and neither did her family.
This is reassuring evidence that infection risk is reduced when everyone wears masks.

How to make your own cloth mask
During widespread community transmission, a mask or homemade face covering can make a difference — both by protecting well people and blocking infected aerosols and droplets from an infectious person.
So, as many Victorians start living with mandated face masks, research from our group and others suggests throwing a scarf over your face is not as protective as a well designed cloth mask with several layers.
The Victorian government provides instructions on how to make a good cloth mask. There are many videos showing how, including a no-sew method. There are also community groups making cloth masks and providing helpful information.

Estimation of Viral Aerosol Emissions From Simulated Individuals With Asymptomatic to Moderate Coronavirus Disease 2019

By Michael Riediker and Dai-Hua Tsai
JAMA Netw Open. July 2020;3(7):e2013807.
Source: https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768712

Question
What is the estimated viral load released from an individual with coronavirus disease 2019 (COVID-19) by breathing and coughing, and what is the resulting concentration in a room?

Findings
In this mathematical modeling study, breathing and coughing by a simulated individual with COVID-19 were estimated to release large numbers of viruses in a poorly ventilated room with a coughing person. However, the estimated infectious risk posed by a person with typical viral load who breathes normally was low, and only few people with very high viral load posed an infection risk in a poorly ventilated closed environment.
Meaning
These results may partially explain the observed rates of transmission and suggest that there is a need for strict respiratory protection when people are in the same room with an individual with COVID-19.

Abstract

Importance
Individuals with asymptomatic or mild coronavirus disease 2019 (COVID-19) have been reported to frequently transmit the disease even without direct contact. The severe acute respiratory syndrome coronavirus 2 has been found at very high concentrations in swab and sputum samples from such individuals.
Objective
To estimate the virus levels released from individuals with asymptomatic to moderate COVID-19 into different aerosol sizes by normal breathing and coughing, and to determine what exposure could result from this in a room shared with such individuals.
Design, Setting, and Participants
This mathematical modeling study combined the size-distribution of exhaled breath microdroplets for coughing and normal breathing with viral swab and sputum concentrations as approximation for lung lining liquid to obtain an estimate of emitted virus levels. Viral data were obtained from studies published as of May 20, 2020. The resulting emission data fed a single-compartment model of airborne concentrations in a room of 50 m^3, the size of a small office or medical examination room.
Main Outcomes and Measures
Modeling was used to estimate the viral load emitted by individuals breathing normally or coughing, and the concentrations expected in the simulated room at different ventilation rates.
Results
The mean estimated viral load in microdroplets emitted by simulated individuals while breathing regularly was 0.0000049 copies/cm^3, with a range of 0.0000000049 to 0.637 copies/cm^3. The corresponding estimates for simulated coughing individuals were a mean of 0.277 copies/cm^3 per cough, with a range of 0.000277 to 36 030 copies/cm^3 per cough. The estimated concentrations in a room with an individual who was coughing frequently were very high, with a maximum of 7.44 million copies/m^3 from an individual who was a high emitter. However, regular breathing from an individual who was a high emitter was modeled to result in lower room concentrations of up to 1248 copies/m^3.
Conclusions and Relevance
In this modeling study, breathing and coughing were estimated to release large numbers of viruses, ranging from thousands to millions of virus copies per cubic meter in a room with an individual with COVID-19 with a high viral load, depending on ventilation and microdroplet formation process. The estimated infectious risk posed by a person with typical viral load who breathes normally was low. **The results suggest that only few people with very high viral load pose an infection risk in poorly ventilated closed environments**. **These findings suggest that strict respiratory protection may be needed when there is a chance to be in the same small room with an individual, whether symptomatic or not, especially for a prolonged period.**

Africa to Become Testing Ground for "Trust Stamp" Vaccine Record and Biometric Digital Payment System

By Raul Diego

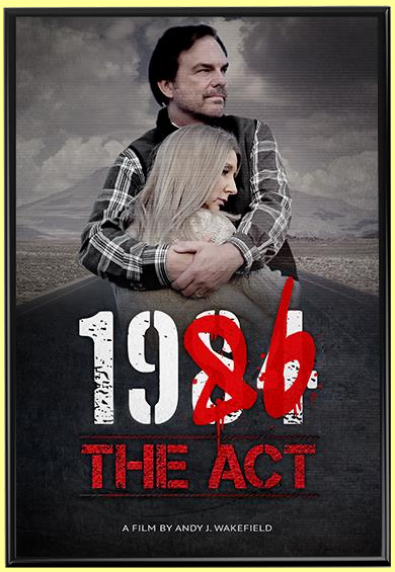
July 19 – The program, which was first launched in late 2018, will see Trust Stamp's digital identity platform integrated into the GAVI-Mastercard "Wellness Pass," a digital vaccination record and identity system that is also linked to Mastercard's click-to-play system that powered by its AI and machine learning technology called NuData. Mastercard, in addition to professing its commitment to promoting "centralized record keeping of childhood immunization" also describes itself as a leader toward a "World Beyond Cash," and its partnership with GAVI marks a novel approach towards linking a biometric digital identity system, vaccination records, and a payment system into a single cohesive platform. The

effort, since its launch nearly two years ago, has been funded via $3.8 million in GAVI donor funds in addition to a matched donation of the same amount by the Bill and Melinda Gates Foundation.

"COVID Vaccines" and "Genetically Modified Humans"

By Dr. Carrie Madej and Mark Taliano

July 19 – In this video, Dr. Carrie Madaj questions what "it is to be human". Why? Because the so-called "COVID" vaccines deploy recombinant DNA/RNA technology that "rewrites" the genetic code much as Monsanto, for example, rewrites the genetic code of numerous seeds (including tomatoes, corn, etc) not to mention the application of genetic bio-technology to animals.



Andrew Wakefield Releases "1986: The Act" Film All About Big Pharma's Immunity from Vaccine Liability

By Ethan Huff

July 22 – The much-anticipated **1986: The Act** film by Andrew Wakefield has finally been released, revealing the truth about the infamous 1986 National Childhood Vaccine Injury Act (NCVIA) and its detrimental impact on the lives of innocent children. Now available for online streaming as of July 8, the film is described as a "forensic examination" of the NCVIA, which for nearly 35 years has unjustly shielded the vaccine industry from all liability associated with vaccine-induced injuries and deaths.

Kennedy Jr. Warns Parents About Danger of Using Largely Untested COVID Vaccines on Kids

By Martin Berger

July 27 – Environmental lawyer Robert F. Kennedy Jr. warned Americans on Thursday to be cautious about any new coronavirus vaccine, pointing out that key parts of testing are being skipped. "The Moderna vaccine, which is the lead candidate, skipped the animal testing altogether," Kennedy said during an online debate on mandatory vaccinations with renowned Harvard law professor Alan Dershowitz. The debate was aired by Valuetainment and moderated by Patrick Bet-David

I see skies of blue and
clouds of white.
The bright blessed day,
the dark sacred night.
And I think to myself
what a wonderful world.


Covid-19 is airborne
Wear a surgical mask
Wash your hands
Keep distances
Be logic!
Avoid crowded places
You are not immortal if you are young

Trained sniffer dogs detect coronavirus with 94-percent success rate

Source: https://bmcinfectdis.biomedcentral.com/track/pdf/10.1186/s12879-020-05281-3

Members of the research team, Dr. Friederike Twele, Dr. Sebastian Meller, [dog] Otto and Professor Holger Volk (Dr. Sebastian Meller)

July 27 – Earlier this year, we looked at a research project in the UK where scientists were exploring how dogs could be trained to sniff out signs of the novel coronavirus. Similar ventures are now being carried out around the world, including one at Germany's University of Hanover where a team found that with little training, sniffer dogs were capable of identifying positive samples with a high degree of accuracy. The incredible sensitivity of dogs' noses has seen scientists look to use them for all kinds of purposes, including detecting cancer, malaria, and explosive devices. By exposing the animals to samples in a room and teaching them to distinguish between those that are infected and those that aren't, the hope is that dogs can become a powerful screening tool in public spaces to help slow the spread of COVID-19.

The University of Hanover scientists were investigating these possibilities with eight specialized sniffer dogs. The team spent one week training the animals to distinguish between samples infected with SARS-CoV-2, the coronavirus strain that causes the disease COVID-19, and uninfected controls.

Some 1,012 saliva and tracheobronchial samples were collected, with the dogs then tasked with identifying those that were infected with SARS-CoV-2. The samples were randomly distributed so neither the researchers nor the dog handlers knew which were positive.

One of the labradors involved in the study, Frida (Kerstin Thellmann)

The dogs correctly identified 157 positive samples and 792 negative samples, while incorrectly identifying 33 negatives and incorrectly rejecting 30 positives. **All up, the team notes this makes for an average sensitivity (detection of positives) of 83 percent, an average specificity (detection of negatives) of 96 percent and overall average detection rate of 94 percent.**

"The results of the study are incredibly exciting," says study author Professor Holger Volk. "We have created a solid foundation for future studies to investigate what the dogs smell and whether they can also be used to differentiate between different times of illness or clinical phenotypes. "

▶▶ **The research was published in the journal** *BMC Infectious Diseases*.

EDITOR'S COMMENT: *"Since dogsare susceptible to SARS-CoV-2 all samples fromCOVID-19 patients were inactivated using beta propio-lactone (BPL) in order to protect the dogs and their han-dlers from infection during training".* This is good since in other similar articles this concern was not mentioned.

21 Existing Drugs Identified Appear to Block SARS-CoV-2 Replication in The Lab

Source: https://www.sciencealert.com/scientists-identify-21-existing-drugs-that-could-help-treat-covid-19

July 28 – In an industry where getting one drug developed from lab to clinic can cost hundreds of millions of dollars and decades of time, it helps when scientists can be thrifty and make use of substances that already exist.

A global team of researchers has now done just that, by searching through one of the world's largest collections of already developed drugs to discover 21 potential treatments for COVID-19.

We will need considerably more research to determine if any of these drugs can be used to help COVID-19 patients, but it's an excellent first step, bypassing some of the barriers for producing completely new drugs.
"The development of a vaccine is likely to require at least 12-18 months, and the typical timeline for approval of a novel antiviral therapeutic can exceed 10 years," the team writes in their new paper.
"Thus, repurposing of known drugs could significantly accelerate the deployment of novel therapies for COVID-19."
The researchers took the ReFRAME Drug Repurposing Library - 11,987 compounds which have either received FDA approval or made it to clinical-trials – and began testing them against SARS-CoV-2 in a line of cells called Vero, cultured from the kidney of an African green monkey (*Chlorocebus* sp.).
"We realised early in the COVID-19 pandemic that ReFRAME would be an invaluable resource for screening for drugs to repurpose against the novel coronavirus," says medical chemist and study co-author Arnab Chatterjee from Calibr, the drug discovery division of Scripps Research that created ReFRAME.

Of these, thirteen were found to harbor effective concentrations likely commensurate with achievable therapeutic doses in patients, including the PIKfyve kinase inhibitor apilimod[2–4], and the cysteine protease inhibitors MDL-28170, Z LVG CHN2, VBY-825, and ONO 5334. Notably, MDL-28170, ONO 5334, and apilimod were found to antagonize viral replication in human iPSC-derived pneumocyte-like cells, and the PIKfyve inhibitor also demonstrated antiviral efficacy in a primary human lung explant model.

As was expected, the vast majority of the tests didn't result in much, but the team did find 100 compounds that inhibited viral replication of SARS-CoV-2 in Vero cells.
The team then demonstrated that 21 of those 100 compounds had a dose-response relationship – meaning the dose required to be effective wasn't also likely to cause harm to humans. One of these was remdesivir, so that leaves 20 yet to be tested for COVID-19 treatment.
Of those 21 drugs, 13 were found to be effective at concentrations that could be safely used in COVID-19 patients and had previously entered clinical trials.
"This study significantly expands the possible therapeutic options for COVID-19 patients, especially since many of the molecules already have clinical safety data in humans," said virologist Sumit Chanda from Sanford Burnham Prebys Medical Discovery Institute in California.
"This report provides the scientific community with a larger arsenal of potential weapons that may help bring the ongoing global pandemic to heel."
The 21 drugs are currently being tested further using small animal models or mini lungs that can mimic human tissue. However, the team has already found three that worked in human stem cell-derived lung tissue, and one showed antiviral effects in a lab-based lung culture system.
This is all exciting stuff, but as we've seen in many examples so far, caution is needed before rushing into the administration of new drugs, even during a pandemic - not all promising compounds will actually work against COVID-19, even if those drugs have been approved for other ailments in the past. The more treatments we have however, the better.
"While some of these drugs are currently in clinical trials for COVID-19, we believe it's important to pursue additional drug candidates so we have multiple therapeutic options," says Chanda.

▶▶ **The research has been published in** *Nature*.

From anti-vaxxers to Zoom shirts: your guide to the new language of Covid-19

Source: https://www.thenational.ae/uae/health/from-anti-vaxxers-to-zoom-shirts-your-guide-to-the-new-language-of-covid-19-1.1055902

July 28 – Coronavirus has changed not just the way we live, but the way we speak.
Once obscure medical terms are now part of everyday language, while new words and phrases have emerged.
For those who don't know the difference between quarantine and quaranteam, our guide to Covid-19 is here to help:
Air bridge / air corridor: An arrangement between two countries to allow direct flights between them that bypass quarantine restrictions imposed on citizens of other nations.
Anti-vaxxer: People who will refuse to be vaccinated against Covid-19, even before a drug is available. Reasons vary from fears of side effects, to a belief that vaccinations are an instrument of government control, possibly by injecting some form of identity chip. A philosophy most prominent in the US, but which also includes the Taliban.

Cluster: A group of people with the disease, usually infected by a single carrier. Clusters could be a single household or entire cities. Weddings, busy open-plan offices and factories are particular hot spots. Isolating clusters to limit the range of Covid-19 are crucial to prevent it spreading.

Contact tracing: Once someone is confirmed with Covid-19 it is important to locate everyone they have been in close contact with and get them to self-isolate. Also known as **track and trace**, it is widely believed to be the reason why many countries in east Asia, who already had advance contract tracing systems from the earlier Sars outbreak, have escaped with such low disease rates.

Contactless: As in "contactless payments only please." The waving of a debit card over the reduces the risk of touching anything when paying. In some countries, the use of cash has dropped by more than half during the pandemic.

Covid-19: Stands for COrona VIrus Disease and the year it emerged, 2019. The virus itself is called Sars-CoV-2 and the disease it causes is called Covid-19.

Covidiot: Anybody who ignores sensible health precautions in a reckless manner, but also widely applied to tone-deaf celebrities who fail to read the room. Think Ellen DeGeneres comparing self isolation in her LA mansion to "prison" or Madonna calling the disease "a great equaliser", from a candle-lit bath filled with rose petals.

Dexamethasone: A cheap and readily available anti-inflammatory that its shown to reduce deaths by a third of the most seriously ill patients on ventilators. A rare success among around 150 existing drugs being evaluated for Covid-19.

Expert: Once someone with extensive and incisive knowledge of a subject, under Covid-19 this now applies to retired politicians who think they could have done better, disgruntled scientists not invited to sit on important committees, that man in the supermarket queue who heard something from someone, and your brother-in-law.

Flattening the curve: A strategy that involves closing offices, shops and schools and encouraging, sometimes enforcing, people to stay at home. The objective is to keep infections below a point at which health services are not overwhelmed at any one time, or flattening the curve of a graph representing this rate. Also described by the UK's Boris Johnson as "flattening the sombrero" because of the graph's resemblance to the hat.

Fomite: Scientific term for any object or material that can transmit infection. Studies have indicate Covid-19 can survive on a variety of surfaces from just a couple of hours to nine days.

Furlough: A term once applied to soldiers given extended leave from the front line, now applied to workers sent home by companies affected by the coronavirus shutdown, but not yet made redundant. They may sometimes receive a reduced wage, in some cases paid by the government. The word comes from the Dutch "verlof" meaning leave of absence.

Herd immunity: Controversial theory that suggests if around 60 per cent of people contract the Covid-19 virus, the entire population (or herd) will become effectively immune. Mentioned as a possible strategy by one UK scientist but abandoned for full lockdown after further projections of a death toll in the hundreds of thousands.

Hydroxychloroquine (HCQ): Anti-malarial drug that showed some promise in animal trials but has so far failed to reproduce this in humans. Donald Trump was an early enthusiast. The WHO said it does not reduce death rates.

K number: The K number, or value, is an attempt to calculate varying rates of infection - where some people or situations pass on the disease to a large number of others and others hardly any or not at all. Many scientists think identifying these complex patterns is the key to controlling Covid-19.

'New normal': Over-used expression applied to any aspect of everyday life changed under Covid-19 restrictions. Examples include queuing at two metre intervals outside a supermarket, having a haircut in a mask and never going on holiday again. Much loved by politicians and media pundits, ensuring it is the most irritating phrase of 2020.

Novel coronavirus: The correct full name for the type of disease. Novel (meaning new) refers to what the WHO defines as "new pathogen of a previously known type", while coronavirus means a virus who shape has the characteristics of a crown, or corona in Latin.

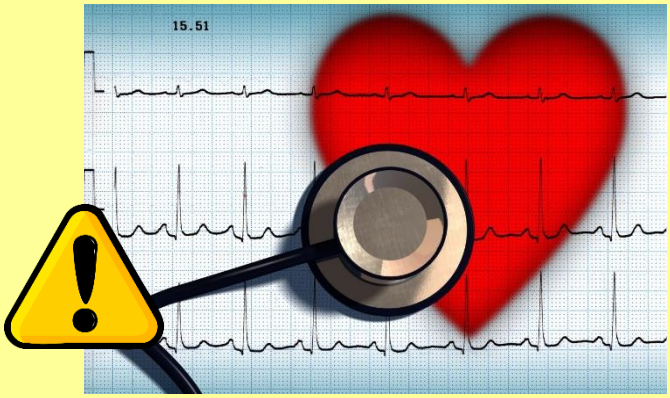
Pandemic: Covid-19 became identified as a pandemic when it was judged to have spread across multiple countries or continents, as opposed to an **epidemic** which is restricted to a particular country. Both spread rapidly over a short period of time.

Patient Zero: The first infected person identified at the start of an outbreak. Since many people seem to get Covid-19 with few or no symptoms, the disease may actually have entered a community week, if not months earlier, before Patient Zero.
PPE: Personal Protective Equipment. Medical grade masks, gowns, gloves etc which protect health workers from infection. Such basics have been crucial to coping with the pandemic.
Quarantine: Applies to a process of remaining isolated either singly or in a household for a period of time, with the objective of either avoiding the disease or not passing it on. Not to be confused with…
Quaranteam: A group of friends or like-minded people that hang out together in an exclusive bubble or "pod". If everyone sticks to isolating the rest of the time, they can meet without fear of catching the virus - in theory.
Remdesivir: Anti-viral drug originally developed to fight ebola, whose effectiveness against Covid-19 is disputed.
R number: Stands for reproductive, or the number of people infected by a single person with coronavirus. An R number above 1 means the disease is spreading, while a number below 1 shows it is in decline and should eventually disappear. (see also **K number)**
Shielding: Protecting those most vulnerable to serious illness from contracting Covid-19, by ensuring they remain completely isolated from any face to face contact with another person.
Social distancing: The distance between people necessary to prevent transmission of the disease. Widely set at two metres, but reduced to 1.5 or or even 1 metre as the number of cases falls.
Sourdough starter: A naturally fermenting wild yeast used to make sourdough bread, one the more popular hobbies taken up during Covid lockdown, with successes (rare) bragged about on social media. Alternatives include learning Japanese or mastering the ukulele.
Superspreader: Some people do not appear to be infectious, while others give it to dozens. These are superspreaders, for reasons that are not fully understood but may be linked to their behaviour. After attending a church service in Korea, one woman is believed to have infected nearly 40 fellow worshippers and caused the lockdown of a city of 2.5 million.
WFH: Commonly used abbreviation for working from home, with many companies closing their offices and encouraging home working. Popular at first, but maybe less so after six months sharing the laptop with the kids. Side effects include wearing pyjamas until noon, and spending too much time watching funny cat videos on YouTube.
Zoom: A widely used video conferencing tool, once obscure, whose use for home working has rocketed, along with its share price. Offers all the irritations of office meetings but none of the perks (gossip, lunch breaks, getting away from the family).
Zoom shirt: The realisation that only the upper half of your body is visible on Zoom. A neatly pressed Zoom work shirt or blouse is kept on the back of a chair and slipped on over more casual attire for video conferences. Care must be taken when standing up during a call.

Study detects heart damage in majority of recovered COVID-19 patients

Source: https://newatlas.com/health-wellbeing/heart-damage-recovered-covid19-patients-coronavirus/

July 28 – A pair of newly published studies in the journal *JAMA Cardiology* highlight the potential for long-term heart complications in recovered COVID-19 patients. The research suggests the virus can directly damage cardiovascular muscles with ongoing inflammation detectable months after recovery, even in patients originally suffering a mild form of the disease.



While much attention has been focused on the volume of deaths caused by COVID-19, now that we are six months into this global pandemic researchers are beginning to see signs of chronic health problems in recovered patients. Only now are clinicians starting to get a glimpse at the potential persistent health consequences of this new virus, and two new studies offer insights into the cardiovascular impact of COVID-19.

Back in March it was quickly apparent that patients with underlying cardiovascular disease were more likely to suffer a fatal outcome from COVID-19. However, it was unclear whether the virus was directly damaging myocardial cells, or whether there was longer-term cardiovascular damage following recovery.

The first new study investigated 100 recovered COVID-19 patients (median age of 49 years old), an average of 71 days after initial diagnosis. Using cardiac magnetic resonance imaging (CMR) the study detected cardiovascular abnormalities in 78 percent of the recovered

patients. Signs of myocardial inflammation were detected in 60 percent of the subjects. These abnormal results were compared to a healthy age-matched control group, and independent of any cardiovascular disease diagnosed before the patients presented with COVID-19.

Most notably, only 33 percent of the cohort studied required hospitalization during the course of their COVID-19 infection. This suggests a degree of cardiovascular damage seems to result from the disease regardless of the severity of the acute illness or the presence of any pre-existing conditions.

"Our findings demonstrate that participants with a relative paucity of preexisting cardiovascular condition and with mostly home-based recovery had frequent cardiac inflammatory involvement, which was similar to the hospitalized subgroup with regards to severity and extent," the researchers write in the study.

The study notes that it is possible these abnormal CMR findings were present prior to COVID-19 infection, however, it is also likely that the viral infection amplified any pre-existing cardiovascular damage. It is also unclear whether these post-COVID-19 cardiovascular effects are permanent or have long-term health consequences.

The second new study looked closely at heart tissue gathered during autopsies of 39 COVID-19 patients. The average age of the patients was 85, and the most commonly listed cause of death was pneumonia.

Traces of SARS-CoV-2, the virus that causes COVID-19, were found in heart tissue of more than 60 percent of the subjects. Sixteen of the subjects were found to have clinically significant levels of viral load in their heart tissue at the time of death.

Again, there is no evidence at this stage that the viral presence in heart tissue means the disease has any long-term negative cardiovascular effects. But, the two studies combined do suggest this new virus certainly has an effect on the heart.

John Swartzberg, an infectious disease expert from UC Berkeley, says it is becoming increasingly clear COVID-19 is more than just a respiratory disease, and its long-term complications are yet to be seen.

"There is evidence now that the virus can directly attack heart muscle cells, and there's also evidence that the cytokine storm that the virus triggers in the body not only damages the lungs, but can damage the heart," says Swartzberg, who did not work on either of these new studies. "We don't know what the long-term effects of that may be, but it could be that we will have a population of people who survive COVID-19 only to go on and have chronic cardiac problems."

In a commentary accompanying the publication of the new studies, deputy editor of *JAMA Cardiology* Clyde Yancy and section editor Gregg Fonarow call for urgent ongoing research to better understand the cardiovascular complications associated with COVID-19, as preparations may be necessary for what could be another dimension to this pandemic crisis.

"We wish not to generate additional anxiety but rather to incite other investigators to carefully examine existing and prospectively collect new data in other populations to confirm or refute these findings," write Yancy and Fonarow. "… if this high rate of risk is confirmed, the pathologic basis for progressive left ventricular dysfunction is validated, and especially if longitudinal assessment reveals new-onset heart failure in the recovery phase of COVID-19, then the crisis of COVID-19 will not abate but will instead shift to a new de novo incidence of heart failure and other chronic cardiovascular complications."

►► The CMR study and the autopsy study were published in the journal *JAMA Cardiology*.

Advancing Biosecurity in the Age of COVID

By Stevie Kiesel

Source: http://www.homelandsecuritynewswire.com/dr20200729-advancing-biosecurity-in-the-age-of-covid

July 29 – The response to COVID-19 has exposed a world that is largely unprepared to deal with emerging and novel biothreats, whether the outbreak is natural or intentional. The Global Health Security Network brought together two biosecurity experts to discuss how current projects to improve global health security can adapt during the pandemic and what changes the world needs to make to improve biosafety and biosecurity. Dr. Rebecca Katz moderated while also providing insight from her position as the Director of the Center for Global Health Science and Security at Georgetown University Medical Center, while Dr. Beth Cameron provided her perspective as the Nuclear Threat Initiative's (NTI) Vice President for Global Biological Policy and Programs. If you missed the livestream on 15 July, you can watch it on YouTube here.

As the novel coronavirus emerged and began spreading across the globe, Dr. Cameron was working on a project to strengthen biosecurity and biosafety across five regional centers in Africa, leveraging a strong relationship with the Africa Centers for Disease Control and Prevention that helped produce significant improvements in national public health capacity throughout the region. When COVID-19 was declared a pandemic and travel was severely restricted,

this team was preparing a series of workshops on laboratory biosafety and biosecurity. However, they took this opportunity to revamp the trainings to include information about biosafety in laboratories working with the novel coronavirus and to make them available asynchronously online. Such flexibility is a hallmark of a strong and agile institution, and creating new ways of collaborating and learning reduces barriers to access.

Another example of thinking outside the box to provide timely, useful, easily accessible information to policymakers and the public is COVID Local, a project Drs. Cameron and Katz both work on to produce a decision framework to support leaders trying to safely open their community. This project has so far resulted in both US and international guides full of checklists, metrics, and key objectives to ensure a safe reopening informed by the best available science.

Drs. Cameron and Katz had numerous suggestions for how to improve biosafety and biosecurity efforts, some inspired by lessons learned from COVID-19 and others for which they have advocated for years. Particularly relevant today is the need to support institutions such as the World Health Organization (WHO) and the Biological Weapons Convention (BWC). While these institutions should never be above reproach, they should not be abandoned with no plan for addressing the purpose they served. Depoliticizing these institutions, conducting lessons learned reviews, and implementing evidence-based changes will serve the US and the international community much better.

That being said, current institutions leave an important gap that should be addressed. The BWC focuses on deliberate misuse of biological agents, while the WHO is responsible for natural outbreaks. However, no entity in the international system tracks emerging biosecurity risks. Such an entity could add a great deal of value by developing norms and standards for biosecurity research and soliciting buy-in from the private sector, academia, and non-governmental organizations so that these standards represent a wide range of perspectives and are more likely to be adhered to.

A final suggestion was informed by the initial confusion (since dispelled) that the novel coronavirus represented an act of biological warfare. Dr. Cameron suggested that a mechanism must be created to investigate the circumstances of potentially suspicious outbreaks (or as Dr. Cameron calls them, "high consequence events of unknown biological origins"). This mechanism must be depoliticized and led by a coalition of countries so that it does not appear punitive or politically motivated. This concept is similar to the idea of a challenge inspection, found in the Chemical Weapons Convention (CWC). If a CWC member country suspects another member country of non-compliance with the CWC, they can request a challenge inspection, which is undertaken in a short amount of time after the request is submitted. The request must contain evidence for suspicions of non-compliance. Dr. Cameron believes that the concept of a challenge inspection is useful for investigating suspicious outbreaks, but the requirement for evidence of nefarious activity should not apply. Investigations of suspicious outbreaks should not be accusatory but should attempt to fully understand the epidemiological origins of an outbreak so that the appropriate action can be taken. The details of such a mechanism, as well as which entity would have responsibility for the mechanism, need further development.

This hour-long discussion only scratched the surface of the topic of biosecurity and biosafety. And while the webinar attendees were from many countries of the world, more global cooperation is essential to improving biosafety and biosecurity in any meaningful way. To that end, the NTI and the Global Health Security Network are sponsoring the Fourth Annual Next Generation for Biosecurity Competition. Teams of researchers are encouraged to work with colleagues across the globe to answer the following question: "What are technical and/or political actions global health security community stakeholders should take either nationally or internationally to reduce biosecurity-related risks associated with COVID-19 and future outbreaks/pandemics?" While this webinar certainly had a number of great ideas to answer this question, COVID-19 has exposed a great deal about the current status of biosecurity risks, and there is much to be said on the topic.

***Stevie Kiesel** is Biodefense Ph.D. student, GMU.*

Combating a Pandemic Is 500 Times More Expensive Than Preventing One

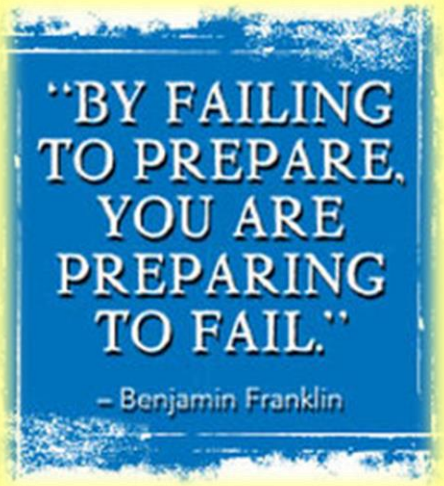
Source: http://www.homelandsecuritynewswire.com/dr20200729-combating-a-pandemic-is-500-times-more-expensive-than-preventing-one

July29 – According to new research, the failure to protect tropical rain forests has cost trillions of dollars stemming from the coronavirus pandemic, which has wreaked economic havoc and caused historic levels of unemployment in the United States and around the world.

For decades, scientists and environmental activists have been trying to draw the world's attention to the many harms caused by the rapid destruction of tropical forests. One of these harms is the emergence of new diseases that are transmitted between wild animals and humans, either through direct contact or through contact with livestock that is then eaten by

humans. The SARS-CoV-2 virus—which has so far infected more than 15 million people worldwide—appears to have been transmitted from bats to humans in China.

"Much of this traces back to our indifference about what has been occurring at the edges of tropical forests," says Les Kaufman, a Boston University professor of biology.



He recently brought together 18 experts from Princeton University, Duke University, Conservation International, and other institutions, to better understand the economic costs of reducing transmission of viruses like the novel coronavirus. Looking at existing research, they made a startling realization.

BU notes that they discovered that significantly reducing transmission of new diseases from tropical forests would cost, globally, between $22.2 and $30.7 billion each year. In stark contrast, they found that the COVID-19 pandemic will likely end up costing between $8.1 and $15.8 trillion globally—roughly 500 times as costly as what it would take to invest in proposed preventive measures. To estimate the total financial cost of COVID-19, researchers included both the lost gross domestic product and the economic and workforce cost of hundreds of thousands of deaths worldwide. They published their findings in a policy brief in *Science*.

The researchers say disease transmission from wild animals to humans occurs frequently near the edges of tropical forests, where human incursions increase the likelihood of contact with animals. These incursions take the form of logging, cattle ranching, and other livestock businesses, and the exotic animal trade, among others. Tropical forests are often cut down in a patchwork or checkerboard pattern, increasing the amount of land that lies at the edges of the forest and thus increasing the risk for disease transmission between species that would normally live in different ecosystems.

To reduce disease transmission, Kaufman and his collaborators propose expanding wildlife trade monitoring programs, investing in efforts to end the wild meat trade in China, investing in policies to reduce deforestation by 40 percent, and fighting the transmission of disease from wild animals to livestock.

In China alone, wildlife farming (a government-monitored effort to sustainably hunt wild animals without overhunting them) is an approximately $20 billion industry, employing 15 million people, say Kaufman and his peers. In many China communities, the purchase of wildlife and bushmeat—meat from wildlife species—is a status symbol.

The researchers also propose to increase funding for creating an open source library of the unique genetic signatures of known viruses, which could help quickly pinpoint the source of emerging diseases and catch them more quickly, before they can spread.

Every year, two new viruses are estimated to transfer from animals to humans, the researchers say. Historically, these have included HIV, MERS, SARS-CoV-1, H1N1, and most recently, the SARS-CoV-2 virus that causes COVID-19. Kaufman and his colleagues hope that their report will spur governments around the world, including the US government, to help fund these preventive measures.

There are some signs of hope, they say, including the February announcement by the Standing Committee of the National People's Congress that wildlife consumption for food or related trade would be banned in China.

"The pandemic gives an incentive to do something addressing concerns that are immediate and threatening to individuals, and that's what moves people," says Kaufman. "There are many people who might object to the United States fronting money, but it's in our own best interest. Nothing seems more prudent than to give ourselves time to deal with this pandemic before the next one comes."

Lung fibrosis: an undervalued finding in COVID-19 pathological series

By Federica Grillo, Emanuela Barisione, Lorenzo Ball, Luca Mastracci and Roberto Fiocca

Source: https://www.thelancet.com/action/showPdf

July 28 – With the COVID-19 pandemic having reached tremendous proportions, post-mortem series are under the limelight to explain many of the peculiar clinical findings. Pathological descriptions of disease are fundamental for under-standing pathogenetic features and might inform new treatments. Indeed, the widely discussed identification of thrombosis in patients with COVID-19 has garnered much interest, and has resulted in new treatment strategies, with anticoagulants now part of patient management.In their Article, Luca Carsana and colleagues1 describe the lung findings of 38 patients who died with COVID-19 and show that early-phase or intermediate-phase diffuse alveolar damage is the main pathological finding, as well as fibrin thrombi in small arterial vessels.

HOTZONE SOLUTIONS GROUP

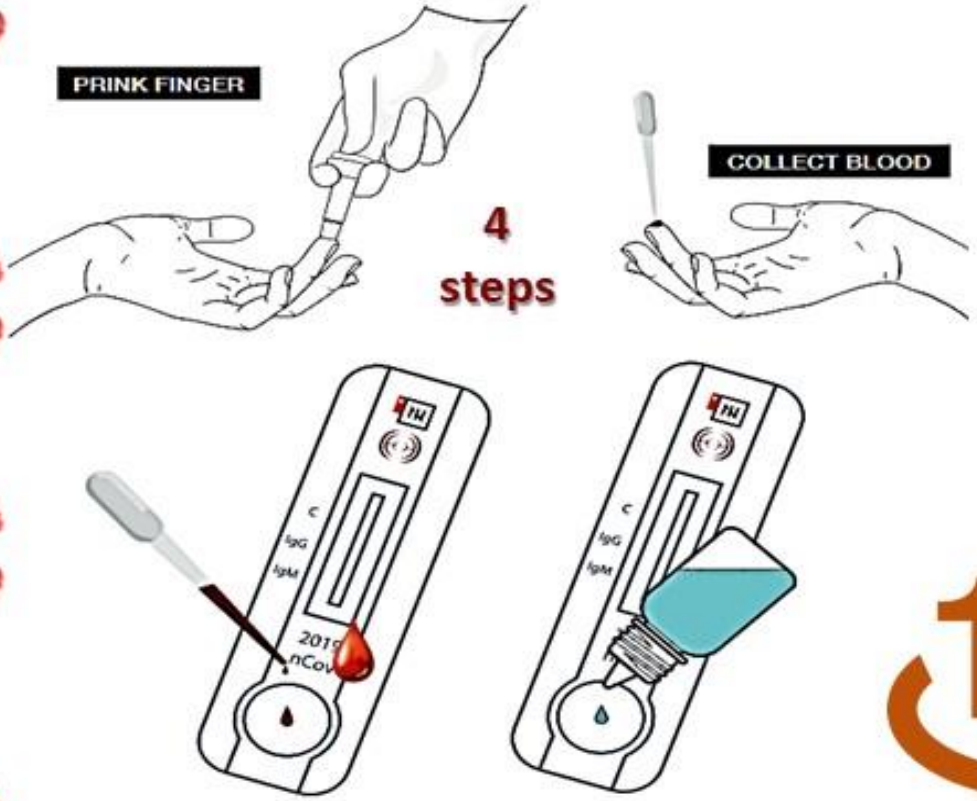
ZEKMED

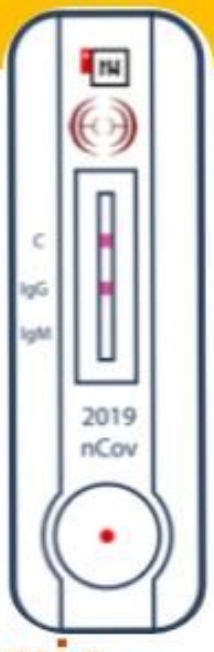
NEW IgM/IgG COVID-19 TEST KIT

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).





10 min

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

www.hotzonesolutions.org

Raxibacumab: a panacea for anthrax disease?

By Michael H Norris and Jason K Blackburn
The Lancet, Vol 20(8), pp.886-887, August 01, 2020
Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30164-X/fulltext

Apr 22 – When anthrax exposure is suspected, recommended post-exposure prophylaxis is 60 days of antibiotics (ciprofloxacin or doxycycline) combined with anthrax vaccination. Anthrax Vaccine Adsorbed (AVA) is approved for human use in the USA, and Anthrax Vaccine Precipitated (AVP) is approved in the UK. The major antigen in these vaccines is the *Bacillus anthracis* protective antigen; this molecule is secreted by *B anthracis* and creates a pore in the host membrane that binds then separately translocates lethal factor and oedema factor into the cell. Even with prompt antibiotic treatment, the toxins released can still overwhelm the host, leading to toxaemia and death; thus, development and testing of anti-toxin treatments is needed.

▶▶ **Read also:** https://pubmed.ncbi.nlm.nih.gov/19587338/
https://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(20)30069-4.pdf

Can Cholesterol Drugs and Antihistamines Fight COVID-19?

By John Whyte, MD, MPH; Yaakov (Koby) Nahmias, PhD
July 29, 2020
Source: https://www.medscape.com/viewarticle/934803

- **Studying primary human lung cells that were infected in the lab with SARS-CoV-2 showed how the cells began to accumulate large amounts of lipid droplets.**
- **After infection, the lung proteins downregulate the ability of lung cells to burn carbohydrates and fatty acids. Lung cells are not designed to hold fat, which could explain some of the severe damage to the lungs of patients with COVID-19.**
- **The virus is dependent on glucose uptake, cholesterol production, and fatty acid oxidation.**
- **More research is needed on the cholesterol drug fenofibrate before clinical trials can begin.**
- **The antihistamine cloperastine, which is mostly sold in Japan, blocks glucose uptake in lung cells and has shown a small effect in fighting COVID-19.**

Military Doctors Are Adapting Tools Designed for Combat Zones to Fight COVID-19

Source: https://www.military.com/daily-news/2020/07/29/military-doctors-are-adapting-tools-designed-combat-zones-fight-covid-19.html

July 29 - A tracking system developed to monitor and treat wounded troops in Iraq and Afghanistan has proven invaluable in the U.S. military's fight against the COVID-19 pandemic, defense health officials said Monday.
The Defense Department's joint trauma system, created in 2004 to collect information on casualties, treatments and outcomes to determine what worked -- or didn't -- in saving lives in combat, is being used during the pandemic to gather real-time data on COVID-19 patients, according to Dr. Paul Cordts, chief medical officer at the Defense Health Agency.
The information is leading to more widespread use of effective treatments, Cordts said.
As of Monday, the DoD has had 36,659 total cases of COVID-19, including 960 hospitalizations and 56 deaths, since the first military patient was diagnosed with the illness Feb. 24 in the Republic of Korea.
With the need for better care, military physicians have been uploading patient information, approaches and outcomes, just as they do with operations and training injuries.
"We leveraged the lessons learned from OIF/OEF in creating the Joint Pain or Trauma Registry, the Joint Trauma System, to inform our COVID-19 registry. Part of the power of that registry is real-time data and information," Cordts said during a call with reporters Monday.
In 2004, the Defense Department directed the individual services to establish a trauma registry. The collected data and reporting on treatments led to life-saving changes to protocols, including increased use of tourniquets, changes to administering blood transfusions, the use of freeze-dried plasma and response during the "Golden Hour" -- the first 60 minutes following a traumatic injury.

A dozen years later, those overseeing the Joint Trauma System were given the authority to establish trauma care guidelines and make recommendations to the services, combatant commanders and the Defense Health Agency on best practices.

Navy Lt. Caroline Mosher, a nurse anesthesia student at USU's Graduate School of Nursing, conducts "proof-of-concept" testing using the "COVID-19 Airway Management Isolation Chamber," or CAMIC, May 28, 2020. (Photo courtesy of LtCol Robert Long)

The ability to share data nearly instantaneously on every DoD patient with COVID-19 has helped with treatment of the currently incurable illness. Using feedback from physicians across the system who are treating patients, DoD providers have been using remdesivir, the experimental drug first developed to combat Ebola, as well as convalescent plasma and dexamethasone, an anti-inflammatory that has shown promise in treating patients on ventilators, to treat hospitalized victims, Cordts said.

"We can evaluate our therapies in real time and adjust our clinical practice guidelines if need be toward those therapies that appear to be most effective. I think that was a great learning piece for us, leveraging the lessons we learned during OIF/OEF," he said.

"With traditional implementation of innovation, we would most likely have a randomized controlled trial, some rigorous multi-year study that proves the efficacy of a given treatment," added Air Force Col. Todd Rasmussen, associate dean of research at the Uniformed University of the Health Sciences (USUHS). "In certain clinical situations, that's just not feasible. We don't have the time. ... It's a sort of alternative, rapid-cycle innovation near real time."

In addition to using the DoD Trauma Registry in a new, creative way, DoD medical personnel have developed resources for physicians and medical devices for patients to improve well-being and decrease transmission of the contagious illness.

According to Dr. Simon Pincus, director of the Connected Health Branch at the DHA, the DoD created an online "provider resilience suite" that contains apps for meditation and mindfulness, as well as tips to identify burnout and provide self care.

"When you're a provider in combat, you are also not going home from the trauma -- you are potentially at risk as a victim. This is kind of similar to what providers are doing on the front lines [of COVID-19]. ... They are at risk for the same outcome, so one of the innovations we developed was this suite for self care," Pincus said.

More helpful in protecting providers and other patients from airborne droplets of the SARS-CoV-2 virus emitted when COVID-19 patients exhale, talk, cough or sneeze is the **"COVID-19 airway management isolation chamber," or CAMIC,** a $15 box made of PVC pipe and plastic sheeting that can be placed on a patient's head before he or she needs to be intubated or requires other close medical interventions involving the neck or head.

The box allows physicians and other medical personnel to conduct procedures on a patient while they receive fresh air and suction. The CAMIC, developed by a team of military medical personnel led by Army Maj. Steven Hong, assistant professor of surgery at USUHS received an emergency use authorization from the Food and Drug Administration in June.

At its peak, the CAMIC was used about 25 times a day since it received emergency approval, according to Hong. There are currently 60 devices across the military health system: 15 at the Walter Reed National Military Medical Center, Bethesda, Maryland; five at Fort Belvoir Army Community Hospital in Virginia; 30 at William Beaumont Army Medical Center, El Paso, Texas; and 10 at Madigan Army Medical Center in Washington.

Hong said the prospect of shortages of personal protective equipment drove him to build a device to protect his fellow health care workers.

"If anything was a surprise during this process of creation and innovation was the level of leadership and institutional support here at Walter Reed and the Defense Health Agency for what really was a grassroots effort," he said.

Cordts added that the DoD's $5.5 billion electronic health records system has been useful in places where it currently is being used. According to Cordts, patients have been able to upload answers to questionnaires to determine whether they need to come into a medical facility or can be treated at home.

"We can keep low-risk people at home and identify patients that are appropriate for testing or identify those that need further care," he said.

EDITOR'S COMMENT: Initially looked like a good idea but in the July 2020 issue of the *C²BRNE Diary* (Part A; p.104) there was an article stating that similar equipment are not as safe as it was thought!

Did you know?

Air cleaning strategies involve applying air filtration or purification within a building, rooms, or at a personal level, such as a properly worn mask. But among all three, there must be high efficiency filters and sufficient airflow. At the building level, high efficiency particulate (HEPA) filters in the recirculated or mixed air duct can reduce the cross contamination between rooms and increase the total clean air delivery rate (outdoor plus filtered air) for diluting the virus concentration in the ventilated space. Standalone room air cleaners with HEPA filters can also be used as a supplementary measure to further reduce the concentration of virus in the occupied space. Research has shown a range of clean air delivery rate (CADR) from 170 to 800m³/h (or 100 to 470 CFM) with a median cost of $361 based on a comprehensive survey of off-the-shelf air cleaners available from the most popular online shopping sites. The results were consistent with an earlier laboratory study in which 6 portable air cleaners were tested for both particulate and volatile organic compounds removal performance. An air cleaner with a CADR of 722m³/h (425 CFM) can double the clean air supply for 25 people in a classroom or open plan office. This can be considered as a cost-effective supplementary measure for rooms where total ventilation airflow rate is insufficient. However, for spaces with displacement ventilation (DV), a room air cleaner should only be used with caution so that the desirable airflow pattern of DV is not disturbed.

The (Low) Cost of Preventing the next pandemic

Source: http://www.homelandsecuritynewswire.com/dr20200730-the-low-cost-of-preventing-the-next-pandemic

July 30 – **Thus far, COVID has cost at least $2.6 trillion and may cost ten times this amount. It is the largest global pandemic in 100 years.** Six months after emerging, it has killed over 600,000 people and is having a major impact on the global economy.

"How much would it cost to prevent this happening again? And what are the principal actions that need to be put in place to achieve this?" asked Andrew Dobson, a professor of ecology and evolutionary biology at Princeton. He and colleague Stuart Pimm of Duke University assembled a team to seek answers.

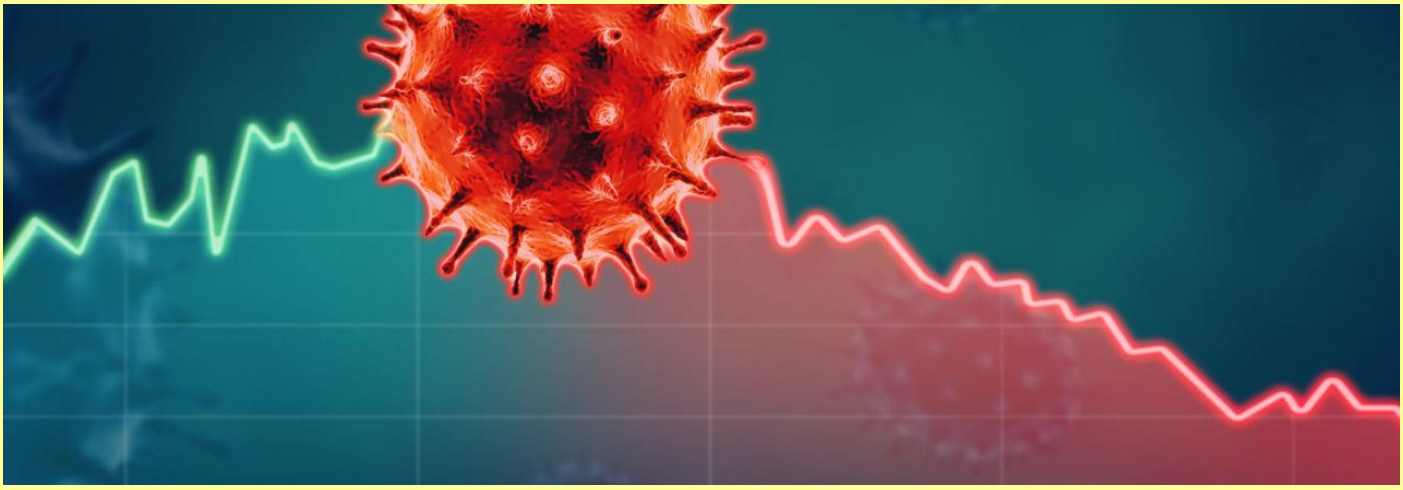
Their team has now written a Policy Forum article — a research-based opinion piece — for the journal *Science*. In it, the multidisciplinary group of epidemiologists, wildlife disease biologists, conservation practitioners, ecologists and economists argue that an annual investment of $30 billion would pay for itself quickly.

"There have been at least four other viral pathogens that have emerged in the human population so far this century. Investment in prevention may well be the best insurance policy for human health and the global economy in the future," Pimm said.

Two major factors loom large as drivers of emerging pathogens: destruction of tropical forests and the wildlife trade. Each has contributed two of the four emerging diseases that have appeared in the last 50 years: COVID, Ebola, SARS, HIV.

Both deforestation and the wildlife trade also cause widespread damage to the environment on multiple fronts, so there are diverse benefits associated with reducing them, note the researchers. Increased monitoring and policing of these activities would allow future emerging viruses to be detected at a much earlier stage, when control could prevent further spread.

All the credible genetic evidence points to COVID-19 emerging from a bat species traded as food in China. The wildlife trade is a major component of the global economy, with principal economic products including food, medicine, pets, clothing and furniture. Some of these are traded as luxury goods, which can create an intimate association that enhances the risk of pathogen transmission to the merchant or the buyer. Wildlife markets are invariably poorly regulated and unsanitary.



The organization tasked with monitoring international wildlife trade — the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) — has a net global budget of "a mere $6 million," said Dobson. "Many of the 183 signatories are several years in arrears in their payments."

The monitoring of this trade needs to be expanded; the authors argue. In particular, scientists need vital information about the viral pathogens circulating in potential food and pet species. They suggest using regional and national wildlife trade monitoring groups, integrated with international organizations for monitoring animal health.

Monitoring and regulating this trade will not only ensure stronger protection for the many species threatened by the trade, it will also create a widely accessible library of genetic samples that can be used to identify novel pathogens when they emerge, say the authors. It will also generate a genetic library of viruses with two key roles: more speedily identifying the source and location of future emerging pathogens, and developing the tests needed to monitor future outbreaks. Ultimately, this library will contain the information needed to speed the development of future vaccines.

Although there have been calls to close the "wet markets" where wild and domestic animals are sold, to prevent future outbreaks of emerging pathogens, the authors acknowledge that many people are dependent on wild-sourced foods and medicines, and suggest that better health oversight of domestic markets is required.

They suggest that the risk of new viruses emerging can be mitigated if more people are trained in monitoring, early detection and control of pathogens in wildlife trade, and working with local communities to minimize risks of exposure and onward transmission.

"In China, for example, there are too few wildlife veterinarians, and the majority work in zoos and animal clinics," said co-author Binbin Li, an assistant professor of environmental science at Duke Kunshan University in Jiangsu, China.

"Veterinarians are on the front line of defense against emerging pathogens, and globally we desperately need more people trained with these skills," noted Dobson.

The expansion and development of better ways to monitor and regulate the wildlife trade could be done for around $500 million a year, which the authors call "a trivial cost" when compared with the current costs of COVID, especially considering the add-on benefits such as curbing wildlife consumption and sustaining biodiversity.

Slowing tropical deforestation would also slow viral emergence, plus it would reduce carbon inputs into the atmosphere from forest fires and protect forest biodiversity. On the other hand, it reduces revenues from timber, grazing and agriculture.

Is it worth foregoing these tangibles, but economically focused, benefits? The authors undertake this part of their cost-benefit analysis from two complementary economic perspectives: first ignoring and then including the benefits of carbon stored as a hedge against climate change. They make no attempt to put a value on the loss of biodiversity.

The Policy Forum article sharply focuses on the bottom-line costs needed to prevent the next COVID.
"Pathogen emergence is essentially as regular an event as national elections: once every four to five years," said co-author Peter Daszak, an epidemiologist with Ecohealth Alliance in New York, pointing to numerous studies. "New pathogens have appeared at roughly the same rate as new presidents, congressmen, senators and prime ministers!"
"We may see the costs of COVID soar to beyond $8 to $15 trillion with many millions of people unemployed and living under lockdown," said co-author Amy Ando, a professor of agricultural and consumer economics at the University of Illinois-Urbana Champaign.
The annual cost of preventing future outbreaks is roughly comparable to 1 to 2% of annual military spending by the world's 10 wealthiest countries. "If we view the continuing battle with emerging pathogens such as COVID-19 as a war we all have to win, then the investment in prevention seems like exceptional value," Dobson said.

Children Under 5 May Be Carrying Higher Levels of Coronavirus, New Study Suggests

Source: https://www.sciencealert.com/study-suggests-young-children-are-carrying-higher-levels-of-coronavirus

July 31 – Children under the age of five have between 10 to 100 times greater levels of genetic material of the coronavirus in their noses compared to older children and adults, a study in *JAMA Pediatrics* said Thursday.

Moderna Vaccine Protects Against COVID-19 in Monkey Study

Source: https://www.medscape.com/viewarticle/934926

July 30 – Moderna Inc on Tuesday said its experimental COVID-19 vaccine induced a robust immune response and protected against infection in a study on monkeys.
The vaccine, **MRNA-1273**, given to non-human primates protected against infection in the lungs and nose, and prevented pulmonary disease in all animals, the company said in a news release. Results of the study in rhesus macaque monkeys were published in the New England Journal of Medicine.
In the study involving **24 monkeys**, Moderna tested doses of **10 micrograms or 100 micrograms** of the vaccine against no treatment.
Both doses proved effective at protecting against viral replication in the lungs and lung inflammation, with the larger dose also protecting against viral replication in the nose of the animals.

Assessment of SARS-CoV-2 Screening Strategies to Permit the Safe Reopening of College Campuses in the United States

By A. David Paltiel, PhD, Amy Zheng, BA and Rochelle P. Walensky, MD, MPH
July 31: JAMA Netw Open. 2020;3(7): e2016818. doi:10.1001/jamanetworkopen.2020.16818
Source: file:///C:/Users/I1CD3~1.GAL/AppData/Local/Temp/paltiel_2020_oi_200614.pdf

Question
What screening and isolation programs for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) will keep students at US residential colleges safe and permit the reopening of campuses?
Findings
This analytic modeling study of a hypothetical cohort of 4990 college-age students without SARS-CoV-2 infection and 10 students with undetected asymptomatic cases of SARS-CoV-2 infection suggested that frequent screening (every 2 days) of all students with a low-sensitivity, high-specificity test might be required to control outbreaks with manageable isolation dormitory utilization at a justifiable cost.
Meaning
In this modeling study, symptom-based screening alone was not sufficient to contain an outbreak, and the safe reopening of campuses in fall 2020 may require screening every 2 days, uncompromising vigilance, and continuous attention to good prevention practices.

Abstract

Importance
The coronavirus disease 2019 (COVID-19) pandemic poses an existential threat to many US residential colleges; either they open their doors to students in September or they risk serious financial consequences.
Objective
To define severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) screening performance standards that would permit the safe return of students to US residential college campuses for the fall 2020 semester.
Design, Setting, and Participants
This analytic modeling study included a hypothetical cohort of 4990 students without SARS-CoV-2 infection and 10 with undetected, asymptomatic SARS-CoV-2 infection at the start of the semester. The decision and cost-effectiveness analyses were linked to a compartmental epidemic model to evaluate symptom-based screening and tests of varying frequency (ie, every 1, 2, 3, and 7 days), sensitivity (ie, 70%-99%), specificity (ie, 98%-99.7%), and cost (ie, $10/test-$50/test). Reproductive numbers (R_t) were 1.5, 2.5, and 3.5, defining 3 epidemic scenarios, with additional infections imported via exogenous shocks. The model assumed a symptomatic case fatality risk of 0.05% and a 30% probability that infection would eventually lead to observable COVID-19–defining symptoms in the cohort. Model projections were for an 80-day, abbreviated fall 2020 semester. This study adhered to US government guidance for parameterization data.
Main Outcomes and Measures
Cumulative tests, infections, and costs; daily isolation dormitory census; incremental cost-effectiveness; and budget impact.
Results
At the start of the semester, the hypothetical cohort of 5000 students included 4990 (99.8%) with no SARS-CoV-2 infection and 10 (0.2%) with SARS-CoV-2 infection. Assuming a R_t of 2.5 and daily screening with 70% sensitivity, a test with 98% specificity yielded 162 cumulative student infections and a mean isolation dormitory daily census of 116, with 21 students (18%) with true-positive results. Screening every 2 days resulted in 243 cumulative infections and a mean daily isolation census of 76, with 28 students (37%) with true-positive results. Screening every 7 days resulted in 1840 cumulative infections and a mean daily isolation census of 121 students, with 108 students (90%) with true-positive results. Across all scenarios, test frequency was more strongly associated with cumulative infection than test sensitivity. This model did not identify symptom-based screening alone as sufficient to contain an outbreak under any of the scenarios we considered. Cost-effectiveness analysis selected screening with a test with 70% sensitivity every 2, 1, or 7 days as the preferred strategy for a R_t of 2.5, 3.5, or 1.5, respectively, implying screening costs of $470, $910, or $120, respectively, per student per semester.

Conclusions and Relevance
In this analytic modeling study, screening every 2 days using a rapid, inexpensive, and even poorly sensitive (>70%) test, coupled with strict behavioral interventions to keep R_t less than 2.5, is estimated to maintain a controllable number of COVID-19 infections and permit the safe return of students to campus.

EDITOR'S COMMENT: Exactly what I keep on saying about the tourism sector and travel industry: using rapid tests instead of the obesession with RT-PCR which is both expensive and takes time. When authorities will realize that they are complementary technologies that together they can provide a better picture regarding the Covid-19 status of a given individual? Unless they know but they choose to ignore it by choosing the "*gold standard*" (compared to what?)

The Coronavirus Is Airborne. Keep Saying It.

By Michael A. Fisher
Source: https://slate.com/technology/2020/07/coronavirus-airborne-what-that-means.html

July 31 – In the U.S., COVID-19 is spreading like wildfire. At the same time, the research community is learning more and more about how the coronavirus gets from one person to another. There are many nuances, and we don't know everything about it yet. But we're in an emergency, and we do have actionable facts. To help break through the noise, the public should be warned, plainly, and often: The coronavirus is airborne.
Researchers and medical practitioners have spent months pressing the public health establishment to evolve on messaging about the ways that COVID-19 spreads. At first, many experts thought that the virus spread mainly via large droplets, like those that fly out of your

mouth and fall to the ground within a few feet, particularly when you cough. Then it became clear that people without coughs or other symptoms could—and, in many, many cases, do—spread the virus too. In an April 1 letter to the White House, the National Academy of Sciences raised concerns about the risk of the spread of the coronavirus through small droplets, which can accumulate around us as we talk and even as we breathe normally. Two days later, the Centers for Disease Control and Prevention recommended people could wear "face coverings" over their mouths and noses if they wanted. In early July, 239 scientists called on the World Health Organization to finally recognize the risk of airborne transmission of COVID-19. WHO now acknowledges that coronavirus-carrying droplets may remain suspended in the air in crowded indoor spaces, but its messaging tends to convey the risk of airborne spread of COVID-19 as an afterthought. For example, a WHO Q&A page gives the impression that if we're all staying about 3 feet away from one another, the distance they recommend, and taking care to wash our hands, everything will be OK.

Photo illustration by Slate. Photo by Photo illustration by Slate. Photo by Andrey Zhuravlev/iStock/Getty Images Plus.

It won't be. The updated message that needs to reach people is: In addition to visible routes of transmission like getting coughed on or touching a surface and then your face, COVID-19 can spread through the air we breathe, particularly indoors. Or more succinctly: The coronavirus is airborne. Repeat it. Tell your friends and family. We should be hearing it on the radio and podcasts, seeing it in PSAs on TV and YouTube. It should be written on little signs that we must pass as we carefully make our way into grocery stores. While we don't need to worry about infectious clouds of coronavirus roaming an open beach—the outside is pretty safe, if you can stay distanced—we do need to be really worried about encountering the virus anywhere there are people in poorly ventilated spaces, because the coronavirus is, indeed, airborne. The message needs to break through the noise of a world that produces about 350,000 tweets every minute, in which a person's knowledge of the pandemic differs depending on their preferred news source, and where a full third of Americans are not consistently wearing face coverings into stores and other businesses.

A big part of the challenges around messaging might be that the word *airborne* implies different things to specialists in different disciplines. In aerosol science, *airborne* can describe particles that drift on air currents. In medicine, *airborne* evokes a set of specific disease control measures appropriate for patients with tuberculosis or chickenpox, such as isolating patients in special rooms with negative air pressure. As a scientist, I can relate to the specialized nature of this term, but as part of the general public who wishes to avoid COVID-19, it doesn't much matter to me if one virus that can be infectious in the air for about 30 minutes (which is the estimate for SARS-CoV-2), and another virus that can be infectious in the air for two hours (the case for the measles virus), are both described as airborne. That's a matter of degree. What matters to me is that if I'm in the same room as a person infected with COVID-19 and they are consistently singing, yelling, talking, or even simply breathing, there are SARS-CoV-2 viral particles carried by small droplets drifting through the air that could potentially infect me. That seems to be true even if I'm over 6 feet away if I'm stuck in a room for a while that is not ventilated—say, a dive bar. I am more likely to be concerned about all this if I have it ringing in my head that the coronavirus is airborne.

The coronavirus is airborne"—that statement is jarring. It conveys that something harmful can be present, even when it cannot be seen with the naked eye or felt on the skin. Many people have already heard the expression "it's airborne" in the context of *Outbreak*, the 1995 Dustin Hoffman thriller (and the fifth-most-popular movie on Netflix in March!). It's already associated with a life-threatening disease. A concise warning lends itself to repetition, a key tactic in getting an idea across. Most importantly, "the coronavirus is airborne" provides direct support for precautionary measures for preventing the spread of COVID-19, such as keeping at least 6 feet of distance from people who are not in your household, wearing a face covering over your nose and mouth when in public, spending the bare minimum amount of time in indoor spaces that aren't your home, and improving the ventilation in buildings. (Surface transmission might be less common, but, yes, it's still important to wash your hands with soap and water.) If you're going to be inside for a long time with people from a variety of households—say, at a school—care should be taken to ensure that the chance someone with an infection is there is very low.

There is no time to waste. COVID-19 has already killed over 674,000 people, including more than 152,000 Americans. Failures of government, the private sector, international bodies, and on down the line have been out of many individuals' control. But experts responding to COVID-19 can control how they communicate with the public. While the scientific and technical nuances of COVID-19 are absolutely critical, the pandemic is a crisis, and now is

definitely not the time for perfect to be the enemy of a good, lifesaving blanket statement. Communication with the public should prioritize engagement and clarity so it becomes more likely that people adopt effective protective measures that mitigate the spread of COVID-19. Say it with me: The coronavirus is airborne. The coronavirus is airborne. The coronavirus is airborne.

***Michael A. Fisher** is a senior fellow with the Federation of American Scientists, working to help connect policymakers with science and drawing on his experiences as a protein engineer, informal STEM educator, and congressional campaign staffer.*

Some Coronavirus Patients Report They're Losing Excessive Amounts of Hair

Source: https://www.sciencealert.com/some-coronavirus-patients-are-losing-excessive-amounts-of-hair

July 31 – More than two months after she tested positive for the coronavirus, Peggy Goroly noticed she was losing clumps of hair in the shower.

The hair loss started around the second week of June, three-plus months after her symptoms appeared.

Goroly, a 56-year-old Long Island resident, doesn't feel recovered. She's been sick since March 5, with symptoms including fatigue, brain fog, heart palpitations, and shortness of breath. She struggles to climb stairs or walk around the grocery store without getting winded.

The loss of her hair on top of that, she told Business Insider, is "quite traumatic".

But she knows she's not the only one. Goroly belongs to a Facebook support group for COVID-19 patients. Members often crowdsource advice about their long-lasting symptoms.

"I went on there one day and someone had posted, 'Is anybody losing hair?' And people were actually showing clumps of hair in their hand," Goroly said. "So I know I'm not crazy now."

Her 23-year-old daughter, who tested positive for the coronavirus in April, has started losing hair as well.

The Centres for Disease Control and Prevention doesn't list hair loss as a symptom of COVID-19, but some doctors have noticed the condition among their patients.

"It tends to be in people who have pretty severe cases that we've seen it," Dr Nate Favini, the medical lead at Forward, a primary-care practice that's collecting data on coronavirus patients around the country, told Business Insider.

Favini said coronavirus patients may suffer from **telogen effluvium**, a condition that leads hair to stop growing and eventually fall out roughly three months after a traumatic event. Whereas the average healthy person loses about 100 strands of hair per day, people with telogen effluvium may lose about three times that.

"When the body is in a really stressful situation, it basically diverts energy from growing hair to more essential things," Favini said. The stress can be either physical or mental, he added – a high fever or depression would both qualify.

The condition usually lasts for about six months, with patients losing up to half the hair on their scalp.

"For other causes of telogen effluvium, we typically tell people: 'three to six months, you'll see improvement,'" Favini said. But he noted that the typical guidance may not apply to coronavirus patients.

"With coronavirus, there's always the caveat that we don't understand this that well yet," he said.

Research suggests that women in their 40s and 50s are more likely than other groups to develop chronic telogen effluvium, but again, experts aren't sure whether that trend will hold in coronavirus cases.

"There are people who seem to be really quite ill with coronavirus for long periods of time. If that's the case, then it becomes harder to predict when you'd have hair regrowth," Favini said.

Goroly said her hair loss seems to have slowed down recently. She's adjusting to the change with a new hair cut.

"Patience is the most important thing," Favini said. "Patience and giving your body the right care so that it can recover and heal."

Do not
blame him!
He has no brain!

Blame them!
They have brains!?

Is North Korea Developing 'Bio Doomsday' Weapon? Experts Say Coronavirus Imports Make It Conducive

Source: https://www.ibtimes.sg/north-korea-developing-bio-doomsday-weapon-experts-say-coronavirus-imports-make-it-conducive-49327

July 31 – North Korean supreme leader Kim Jong Un could be using the Coronavirus crisis as a cover to develop a doomsday biological weapon, by claiming that raw materials they are sourcing will be used to develop a Coronavirus vaccine in North Korea, suspect U.S. weapons experts.
Andrew Weber, who was Assistant Secretary of Defense for nuclear, chemical, and biological defense programs during the Barack Obama presidency, said the North Korean dictator could use the "legitimate vaccine aspiration as a way" to boost biotechnology capability of the country, reported by Politico,

North Korea's Plan
Despite recent EU sanctions against several North Korean officials and agencies over Pyongyang's continued efforts to develop nuclear missiles and other weapons of mass destruction, the country shows no sign of giving up the nuclear arsenal.
Now, Weber fears that North Korea's plans on making a bioweapon may come true. He said 16 countries, including Russia, China, and Iran, are suspected of having bio-weapons. While all these countries are conducting research to find a COVID-19 vaccine, North Korea is the most bothering nation in terms of creating a bio-weapon instead, said Weber.
He explained that the most secretive country in the world has a history of ignoring the international weapons agreement. As per Weber, North Korea could buy equipment from Western or Chinese sources that "would be necessary for their vaccine effort, and then next year they could turn around and use it to produce biological weapons."
In 2019, while explaining his concerns over North Korea's motives, Weber told New York Times that Kim Jong Un is most likely to use the biological weapons than tanks and added that the "program is advanced, underestimated and highly lethal."
Apart from Weber, Bruce Bennett, a defense researcher at an American non-profit global policy think tank RAND Corporation, said the Coronavirus pandemic has given an opportunity for the North Korean regime.
He said anything related to the COVID-19 is going to be reviewed as humanitarian and "humanitarian things are not prohibited by sanctions...You have to get the item by item approval, but there have been lots of humanitarian shipments. Lots of stuff could be flowing in that."
In terms of the Coronavirus infections in the country, the regime declared a state of emergency after a person suspected of having crossed from South Korea tested COVID-19 positive but the state-run Rodong Sinmun newspaper of North Korea claimed that nobody has been infected with the Coronavirus so far in the country.

Bio-arms Operation Since the 1960s
It was in 1993 that the Russian intelligence agency reported that North Korea was performing military-biological research. It was also claimed that the country was studying pathogens for cholera, bubonic plague, malignant anthrax, and smallpox.
Former national security adviser John Bolton also said in 2002 that the U.S. government believes North Korea has "one of the most robust offensive bioweapons programs on Earth"
Recently Politico reported that North Korean defectors and U.S. intelligence revealed that Kim Jong Un's country has had a bio-arms operation since the 1960s.

Here's Why Hydroxychloroquine Doesn't Block the Coronavirus in Human Lung Cells

By Katherine Seley-Radtke
Source: https://www.sciencealert.com/here-s-why-hydroxychloroquine-doesn-t-block-the-coronavirus-in-human-lung-cells

Aug 01 – A paper came out in *Nature* on July 22 that further underscores earlier studies that show that neither the malaria drug hydroxychloroquine nor chloroquine prevents SARS-CoV-2 – the virus that causes COVID-19 – from replicating in lung cells.
Most Americans probably remember that hydroxychloroquine became the focus of numerous clinical trials following the president's statement that it could be a "game

changer." At the time, he appeared to base this statement on anecdotal stories, as well as a few early and very limited studies that hydroxychloroquine seemed to help patients with COVID-19 recover.
Many in the antiviral field, including myself, questioned the validity of both, and in fact, one of the papers was later disparaged by the scientific society and the editor of the journal that published it.
Since then, HQC has had a bumpy ride. It was initially approved by the FDA for emergency use. The FDA then quickly reversed its decision when numerous reports of deaths caused by heart arrhythmias emerged. That news brought many clinical trials to a halt.
Regardless, some scientists continued to study it in hopes of finding a cure for this deadly virus.

How the work was done
The new study was carried out by scientists in Germany who tested HQC on a collection of different cell types to figure out why this drug doesn't prevent the virus from infecting humans.
Their findings clearly show that that HQC can block the coronavirus from infecting kidney cells from the African green monkey. But it does not inhibit the virus in human lung cells – the primary site of infection for the SARS-CoV-2 virus.
In order for the virus to enter a cell, it can do so by two mechanisms - one, when the SARS-CoV-2 spike protein attaches to the ACE2 receptor and inserts its genetic material into the cell. In the second mechanism, the virus is absorbed into some special compartments in cells called endosomes.
Depending on the cell type, some, like kidney cells, need an enzyme called cathepsin L for the virus to successfully infect them. In lung cells, however, an enzyme called TMPRSS2 (on the cell surface) is necessary. Cathepsin L requires an acidic environment to function and allow the virus to infect the cell, while TMPRSS2 does not.
In the green monkey kidney cells, both hydroxychloroquine and chloroquine decrease the acidity, which then disables the cathepsin L enzyme, blocking the virus from infecting the monkey cells. In human lung cells, which have very low levels of cathepsin L enzyme, the virus uses the enzyme TMPRSS2 to enter the cell.
But because that enzyme is not controlled by acidity, neither HCQ and CQ can block the SARS-CoV-2 from infecting the lungs or stop the virus from replicating.

Why it matters
This matters for several reasons. One, much time and money has been spent studying a drug that many scientists said from the very beginning was not going to be effective in killing the virus.
The second reason is that the studies that have reported antiviral activity for hydroxychloroquine were not in epithelial lung cells. Thus, their results are not relevant to properly studying SARS-CoV-2 infections in humans.

What's next?
As scientists proceed with investigating new drugs as well as trying to repurpose old ones, like hydroxychloroquine, it is critical that researchers take the time to think about their study design.
In short, those of us involved in antiviral drug development should all take a lesson from this study. It is important not only to focus our efforts on pursuing drugs that will directly shut down viral replication, but also to study the virus in the primary site of infection.

***Katherine Seley-Radtke**, Professor of Chemistry and Biochemistry and President-Elect of the International Society for Antiviral Research, University of Maryland, Baltimore County.*

Does Coronavirus Linger? What We Know About How Viruses Hide in The Brain and Testes

By William Petri
Source: https://www.sciencealert.com/here-s-what-we-know-so-far-about-chronic-or-persistent-covid-19

Aug 02 – As millions of people are recovering from COVID-19, an unanswered question is the extent to which the virus can "hide out" in seemingly recovered individuals.
If it does, could this explain some of the lingering symptoms of COVID-19 or pose a risk for transmission of infection to others even after recovery?
I am a physician-scientist of infectious diseases at the University of Virginia, where I care for patients with infections and conduct research on COVID-19.

Here I will briefly review what is known today about chronic or persistent COVID-19.

What is a chronic or persistent viral infection?
A chronic or persistent infection continues for months or even years, during which time virus is being continually produced, albeit in many cases at low levels. Frequently these infections occur in a so-called immune privileged site.

What is an immune privileged site?
There are a few places in the body that are less accessible to the immune system and where it is difficult to eradicate all viral infections. These include the central nervous system, the testes and the eye.
It is thought that the evolutionary advantage to having an immune privileged region is that it protects a site like the brain, for example, from being damaged by the inflammation that results when the immune system battles an infection.
An immune privileged site not only is difficult for the immune system to enter, it also limits proteins that increase inflammation. The reason is that while inflammation helps kill a pathogen, it can also damage an organ such as the eye, brain or testes.
The result is an uneasy truce where inflammation is limited but infection continues to fester.

A latent infection versus a persistent viral infection
But there is another way that a virus can hide in the body and reemerge later.
A latent viral infection occurs when the virus is present within an infected cell but dormant and not multiplying. In a latent virus, the entire viral genome is present, and infectious virus can be produced if latency ends and the infections becomes active.
The latent virus may integrate into the human genome – as does HIV, for example – or exist in the nucleus as a self-replicating piece of DNA called an episome.
A latent virus can reactivate and produce infectious viruses, and this can occur months to decades after the initial infection. Perhaps the best example of this is chickenpox, which although seemingly eradicated by the immune system can reactivate and cause herpes zoster decades later.
Fortunately, chickenpox and zoster are now prevented by vaccination. To be infected with a virus capable of producing a latent infection is to be infected for the rest of your life.

How does a virus become a latent infection?
Herpes viruses are by far the most common viral infections that establish latency.
This is a large family of viruses whose genetic material, or genome, is encoded by DNA (and not RNA such as the new coronavirus).
Herpes viruses include not only herpes simplex viruses 1 and 2 – which cause oral and genital herpes – but also chickenpox.
Other herpes viruses, such as Epstein Barr virus, the cause of mononucleosis, and cytomegalovirus, which is a particular problem in immunodeficient individuals, can also emerge after latency.
Retroviruses are another common family of viruses that establish latency but by a different mechanism than the herpes viruses. Retroviruses such as HIV, which causes AIDS, can insert a copy of their genome into the human DNA that is part of the human genome.
There the virus can exist in a latent state indefinitely in the infected human since the virus genome is copied every time DNA is replicated and a cell divides.
Viruses that establish latency in humans are difficult or impossible for the immune system to eradicate. That is because during latency there can be little or no viral protein production in the infected cell, making the infection invisible to the immune system.
Fortunately, coronaviruses do not establish a latent infection.

Could you catch SARS-CoV-2 from a male sexual partner who has recovered from COVID-19?
In one small study, the new coronavirus has been detected in semen in a quarter of patients during active infection and in a bit less than 10% of patients who apparently recovered.
In this study, viral RNA was what was detected, and it is not yet known if this RNA was from still infectious or dead virus in the semen; and if alive whether the virus can be sexually transmitted. So many important questions remain unanswered.
Ebola is a very different virus from SARS-C0V-2 yet serves as an example of viral persistence in immune privileged sites. In some individuals, Ebola virus survives in immune privileged sites for months after resolution of the acute illness.
Survivors of Ebola have been documented with persistent infections in the testes, eyes, placenta and central nervous system.

The WHO recommends for male Ebola survivors that semen be tested for virus every three months. They also suggest that couples abstain from sex for 12 months after recovery or until their semen tests negative for Ebola twice.
As noted above, we need to learn more about persistent new coronavirus infections before similar recommendations can be considered.

Could persistent symptoms after COVID-19 be due to viral persistence?
Recovery from COVID-19 is delayed or incomplete in many individuals, with symptoms including cough, shortness of breath and fatigue. It seems unlikely that these constitutional symptoms are due to viral persistence as the symptoms are not coming from immune privileged sites.

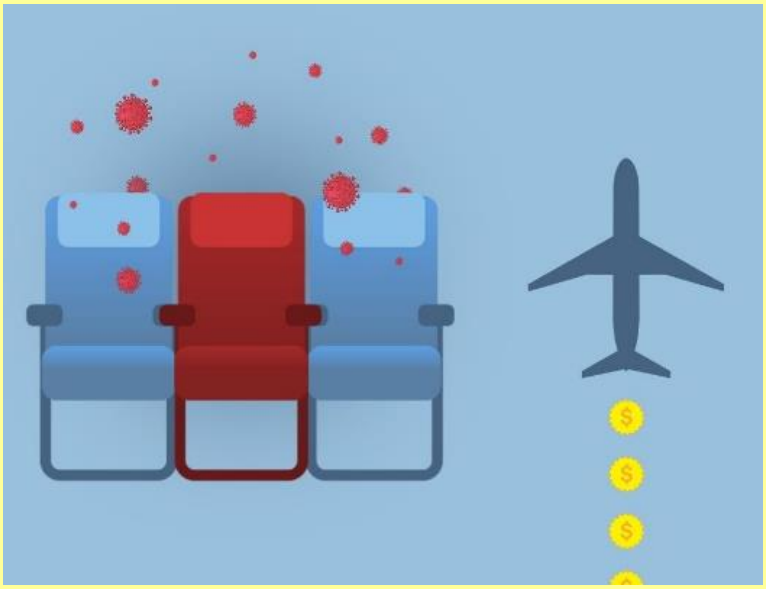
Where else could the new coronavirus persist after recovery from COVID-19?
Other sites where coronavirus has been detected include the placenta, intestines, blood and of course the respiratory tract. In women who catch COVID-19 while pregnant, the placenta develops defects in the mother's blood vessels supplying the placenta.
However, the significance of this on fetal health is yet to be determined.
The new coronavirus can also infect the fetus via the placenta. Finally, the new coronavirus is also present in the blood and the nasal cavity and palate for up to a month or more after infection.
The mounting evidence suggests that SARS-CoV-2 can infect immune privileged sites and, from there, result in chronic persistent – but not latent – infections.
It is too early to know the extent to which these persistent infections affect the health of an individual like the pregnant mother, for example, nor the extent to which they contribute to the spread of COVID-19.
Like many things in the pandemic, what is unknown today is known tomorrow, so stay tuned and be cautious so as not to catch the infection or, worse yet, spread it to someone else.

***William Petri** is Professor of Medicine @ University of Virginia.*

Covid-19 Risk Among Airline Passengers: Should the Middle Seat Stay Empty?

By Arnold Barnett
Source: https://www.medrxiv.org/content/10.1101/2020.07.02.20143826v3.full.pdf

We use recent data and research results to approximate the probability that an air traveler in coach will contract Covid-19 on a US domestic flight two hours long, both when all coach seats are full and when all but middle seats are full. The point estimates we reach based on data from late June 2020 are **1 in 4,300 for full flights and 1 in 7,700 when middle seats are kept empty**. These estimates are subject to both quantifiable and nonquantifiable sources of uncertainty, and sustain known margins of error of a factor about 2.5. However, because uncertainties in key parameters affect both risk estimates the same way, they leave the relative risk ratio for fill all seats compared to middle seat open close to 1.8 (i.e., close to 1/4,300)/(1/7,700). We estimate the mortality risks caused by Covid-19 infections contracted on airplanes, taking into account that infected passengers can in turn infect others. **The point estimates, which use 2019 data about the percentage of seats actually occupied on US flights, range from one death per 400,000 passengers to one death per 600,000.** These death-risk levels are considerably higher than those associated with plane crashes but comparable to those arising from two hours of everyday activities during the pandemic.



A Statistician Explains How 1 Figure Shows the US Isn't Doing Enough Testing Yet

By Ronald D. Fricker

Source: https://www.sciencealert.com/the-us-isn-t-doing-enough-testing-yet-says-statistics-expert

Aug 03 – The US has performed more coronavirus tests than any other country in the world. Yet, at the same time, the US is notably underperforming in terms of suppressing COVID-19. Confirmed cases – as well as deaths – are surging in many parts of the country.

Some people have argued that the increase in cases is solely due to increased testing.

I am a statistician who studies how mathematics and statistics can be used to track diseases. The claim that the increase in cases is only caused by increases in testing is just not true. But how do public health officials know this?

Testing, confirmed cases and total cases

COVID-19 testing has two purposes. The first is to confirm a diagnosis so that medical treatment can be appropriately rendered. The second is to do surveillance for tracking and disease suppression – including finding those who may be asymptomatic or only have mild symptoms – so that individuals and public health officials can take actions to slow the spread of the virus.

At a White House briefing on July 13, the president said, "When you test, you create cases."

The problem with this statement is that anyone who is infected with the coronavirus is, by definition, a case. Since taking a COVID-19 test does not cause a person to get coronavirus, just like taking a pregnancy test does not cause one to become pregnant, the president's claim is false. Testing does not create cases.

However, because many COVID-19 cases are asymptomatic, many people are infected and don't know it. What COVID-19 testing does do is identify unknown cases. And thus, it does increase the number of cases that are known, or otherwise called the confirmed case count.

Finding unknown cases is good, not bad, because identifying those who are COVID-19-positive allows individuals and public health officials to take actions that slow the spread of the disease. When public health officials find cases, they can begin contract tracing. When a person finds out they are infected, they will know to quarantine.

Since the beginning of the pandemic, the US has performed more total tests and more tests per capita than any other country, though as of late July the UK, Russia and Qatar were performing more tests per capita per day.

But counting the total number of tests or the tests per capita is not the right way to judge success of a testing program.

As it says on the Johns Hopkins testing comparison page, a country's "testing program should be scaled to the size of their epidemic, not the size of the population." Sure, the US might have a big testing program, but it has a massive epidemic.

The US needs an equally massive testing program if health officials want to have an accurate picture of what's really going on.

Test positivity rate

So how do public health officials know if they are doing enough testing?

Better than simply counting total number of tests, the test positivity rate is a useful measure of whether enough tests are being done. The test positivity rate is simply the fraction of tests that come back positive.

It is calculated by dividing the number of positive tests by the total number of tests. Generally, a lower test positivity rate is good.

A good way to think about test positivity is to think about fishing with a net. If you catch a fish almost every time you send the net down – high test positivity - that tells you there are probably a lot of fish around that you haven't caught – there are a lot of undetected cases. On the other hand, if you use a huge net – more testing – and only catch a fish every once in a while, – low test positivity – you can be pretty sure that you've caught most of the fish in the area.

According to the World Health Organization, before a region can relax restrictions or begin reopening, the test positivity rate from a comprehensive testing program should be at or below 5 percent for at least 14 days.

There are two ways to lower a test positivity rate: either by decreasing the number of positive tests or by increasing the total number of tests. A comprehensive testing program does both.

By conducting a large number of tests, most cases in the community are detected. Then, individual and government actions can be taken that contain the virus. This results in a declining number of positive tests.

Returning to the fishing metaphor, the goal of a comprehensive testing program is to use a huge net to overfish in the coronavirus lake until there are very few COVID-19 cases left. Using the test positivity rate as a measure of success helps ensure that a testing program is appropriately scaled to the size of an epidemic.

As of July 27, the U.S. as a whole had a test positivity rate of 10 percent. States where testing programs are robust and the virus is fairly well controlled have test positivity rates well below 5 percent, like Massachusetts at 2.68 percent and New York at 1.09 percent. In places like Mississippi and Arizona that are experiencing large outbreaks, test positivity rates are above 20 percent.

The right amount of testing

The increases in confirmed cases aren't occurring just because there is more testing. The high-test positivity rates in some locations show that the virus is in fact spreading and growing so testing needs to grow with it.

I believe that if the US wants to beat back this virus, one of the first things that needs to happen is to increase testing. We need to deploy larger nets to catch more fish. Yes, we'll find more cases, but that's the point.

Ronald D. Fricker, *Jr. is Professor of Statistics and Associate Dean for Faculty Affairs and Administration, Virginia Tech.*

How the Pandemic Defeated America

A virus has brought the world's most powerful country to its knees.

By Ed Yong

The Atlantic | September 2020 issue

Source: https://www.theatlantic.com/magazine/archive/2020/09/coronavirus-american-failure/614191/

How did it come to this? A virus a thousand times smaller than a dust mote has humbled and humiliated the planet's most powerful nation. America has failed to protect its people, leaving them with illness and financial ruin. It has lost its status as a global leader. It has careened between inaction and ineptitude. The breadth and magnitude of its errors are difficult, in the moment, to truly fathom.

In the first half of 2020, SARS-CoV-2—the new coronavirus behind the disease COVID-19—infected 10 million people around the world and killed about half a million. But few countries have been as severely hit as the United States, which has just 4 percent of the world's population but a quarter of its confirmed COVID-19 cases and deaths. These numbers are estimates. The actual toll, though undoubtedly higher, is unknown, because the richest country in the world still lacks sufficient testing to accurately count its sick citizens.

Despite ample warning, the U.S. squandered every possible opportunity to control the coronavirus. And despite its considerable advantages—immense resources, biomedical might, scientific expertise—it floundered. While countries as different as South Korea, Thailand, Iceland, Slovakia, and Australia acted decisively to bend the curve of infections downward, the U.S. achieved merely a plateau in the spring, which changed to an appalling upward slope in the summer. "The U.S. fundamentally failed in ways that were worse than I ever could have imagined," Julia Marcus, an infectious-disease epidemiologist at Harvard Medical School, told me.

Since the pandemic began, I have spoken with more than 100 experts in a variety of fields. I've learned that almost everything that went wrong with America's response to the pandemic was predictable and preventable. A sluggish response by a government denuded of expertise allowed the coronavirus to gain a foothold. Chronic underfunding of public health neutered the nation's ability to prevent the pathogen's spread. A bloated, inefficient health-care system left hospitals ill-prepared for the ensuing wave of sickness. Racist policies that have endured since the days of colonization and slavery left Indigenous and Black Americans especially vulnerable to COVID-19. The decades-long process of shredding the nation's social safety net forced millions of essential workers in low-paying jobs to risk their life for their livelihood. The same social-media platforms that sowed

partisanship and misinformation during the 2014 Ebola outbreak in Africa and the 2016 U.S. election became vectors for conspiracy theories during the 2020 pandemic.

The U.S. has little excuse for its inattention. In recent decades, epidemics of SARS, MERS, Ebola, H1N1 flu, Zika, and monkeypox showed the havoc that new and reemergent pathogens could wreak. Health experts, business leaders, and even middle schoolers ran simulated exercises to game out the spread of new diseases. In 2018, I wrote an article for *The Atlantic* arguing that the U.S. was not ready for a pandemic, and sounded warnings about the fragility of the nation's health-care system and the slow process of creating a vaccine. But the COVID-19 debacle has also touched—and implicated—nearly every other facet of American society: its shortsighted leadership, its disregard for expertise, its racial inequities, its social-media culture, and its fealty to a dangerous strain of individualism.

SARS-CoV-2 is something of an anti-Goldilocks virus: just bad enough in every way. Its symptoms can be severe enough to kill millions but are often mild enough to allow infections to move undetected through a population. It spreads quickly enough to overload hospitals, but slowly enough that statistics don't spike until too late. These traits made the virus harder to control, but they also softened the pandemic's punch. SARS-CoV-2 is neither as lethal as some other coronaviruses, such as SARS and MERS, nor as contagious as measles. Deadlier pathogens almost certainly exist. Wild animals harbor an estimated 40,000 unknown viruses, a quarter of which could potentially jump into humans. How will the U.S. fare when "we can't even deal with a starter pandemic?," Zeynep Tufekci, a sociologist at the University of North Carolina and an *Atlantic* contributing writer, asked me.

Despite its epochal effects, COVID-19 is merely a harbinger of worse plagues to come. The U.S. cannot prepare for these inevitable crises if it returns to normal, as many of its people ache to do. Normal led to this. Normal was a world ever more prone to a pandemic but ever less ready for one. To avert another catastrophe, the U.S. needs to grapple with all the ways normal failed us. It needs a full accounting of every recent misstep and foundational sin, every unattended weakness and unheeded warning, every festering wound and reopened scar.

A pandemic can be prevented in two ways: Stop an infection from ever arising, or stop an infection from becoming thousands more. The first way is likely impossible. There are simply too many viruses and too many animals that harbor them. Bats alone could host thousands of unknown coronaviruses; in some Chinese caves, one out of every 20 bats, is infected. Many people live near these caves, shelter in them, or collect guano from them for fertilizer. Thousands of bats also fly over these people's villages and roost in their homes, creating opportunities for the bats' viral stowaways to spill over into human hosts. Based on antibody testing in rural parts of China, Peter Daszak of EcoHealth Alliance, a nonprofit that studies emerging diseases, estimates that such viruses infect a substantial number of people every year. "Most infected people don't know about it, and most of the viruses aren't transmissible," Daszak says. But it takes just one transmissible virus to start a pandemic.

Sometime in late 2019, the wrong virus left a bat and ended up, perhaps via an intermediate host, in a human—and another, and another. Eventually it found its way to the Huanan seafood market, and jumped into dozens of new hosts in an explosive super-spreading event. The COVID-19 pandemic had begun.

"There is no way to get spillover of everything to zero," Colin Carlson, an ecologist at Georgetown University, told me. Many conservationists jump on epidemics as opportunities to ban the wildlife trade or the eating of "bush meat," an exoticized term for "game," but few diseases have emerged through either route. Carlson said the biggest factors behind spillovers are land-use change and climate change, both of which are hard to control. Our species has relentlessly expanded into previously wild spaces. Through intensive agriculture, habitat destruction, and rising temperatures, we have uprooted the planet's animals, forcing them into new and narrower ranges that are on our own doorsteps. Humanity has squeezed the world's wildlife in a crushing grip—and viruses have come bursting out.

Curtailing those viruses after they spill over is more feasible, but requires knowledge, transparency, and decisiveness that were lacking in 2020. Much about coronaviruses is still unknown. There are no surveillance networks for detecting them as there are for influenza. There are no approved treatments or vaccines. Coronaviruses were formerly a niche family, of mainly veterinary importance. Four decades ago, just 60 or so scientists attended the first international meeting on coronaviruses. Their ranks swelled after SARS swept the world in 2003, but quickly dwindled as a spike in funding vanished. The same thing happened after MERS emerged in 2012. This year, the world's coronavirus experts—and there still aren't many—had to postpone their triennial conference in the Netherlands because SARS-CoV-2 made flying too risky.

In the age of cheap air travel, an outbreak that begins on one continent can easily reach the others. SARS already demonstrated that in 2003, and more than twice as many people now travel by plane every year. To avert a pandemic, affected nations must alert their neighbors quickly. In 2003, China covered up the early spread of SARS, allowing the new disease to gain a foothold, and in 2020, history repeated itself. The Chinese government downplayed the possibility that SARS-CoV-2 was spreading among humans, and only confirmed as much on January 20, after millions had

traveled around the country for the lunar new year. Doctors who tried to raise the alarm were censured and threatened. One, Li Wenliang, later died of COVID-19. The World Health Organization initially parroted China's line and did not declare a public-health emergency of international concern until January 30. By then, an estimated 10,000 people in 20 countries had been infected, and the virus was spreading fast.

The United States has correctly castigated China for its duplicity and the WHO for its laxity—but the U.S. has also failed the international community. Under President Donald Trump, the U.S. has withdrawn from several international partnerships and antagonized its allies. It has a seat on the WHO's executive board, but left that position empty for more than two years, only filling it this May, when the pandemic was in full swing. Since 2017, Trump has pulled more than 30 staffers out of the Centers for Disease Control and Prevention's office in China, who could have warned about the spreading coronavirus. Last July, he defunded an American epidemiologist embedded within China's CDC. America First was America oblivious.

Even after warnings reached the U.S., they fell on the wrong ears. Since before his election, Trump has cavalierly dismissed expertise and evidence. He filled his administration with inexperienced newcomers, while depicting career civil servants as part of a "deep state." In 2018, he dismantled an office that had been assembled specifically to prepare for nascent pandemics. American intelligence agencies warned about the coronavirus threat in January, but Trump habitually disregards intelligence briefings. The secretary of health and human services, Alex Azar, offered similar counsel, and was twice ignored.

Being prepared means being ready to spring into action, "so that when something like this happens, you're moving quickly," Ronald Klain, who coordinated the U.S. response to the West African Ebola outbreak in 2014, told me. "By early February, we should have triggered a series of actions, precisely zero of which were taken." Trump could have spent those crucial early weeks mass-producing tests to detect the virus, asking companies to manufacture protective equipment and ventilators, and otherwise steeling the nation for the worst. Instead, he focused on the border. On January 31, Trump announced that the U.S. would bar entry to foreigners who had recently been in China, and urged Americans to avoid going there.

Travel bans make intuitive sense, because travel obviously enables the spread of a virus. But in practice, travel bans are woefully inefficient at restricting either travel or viruses. They prompt people to seek indirect routes via third-party countries, or to deliberately hide their symptoms. They are often porous: Trump's included numerous exceptions, and allowed tens of thousands of people to enter from China. Ironically, they *create* travel: When Trump later announced a ban on flights from continental Europe, a surge of travelers packed America's airports in a rush to beat the incoming restrictions. Travel bans may sometimes work for remote island nations, but in general they can only delay the spread of an epidemic—not stop it. And they can create a harmful false confidence, so countries "rely on bans to the exclusion of the things they actually need to do—testing, tracing, building up the health system," says Thomas Bollyky, a global-health expert at the Council on Foreign Relations. "That sounds an awful lot like what happened in the U.S."

This was predictable. A president who is fixated on an ineffectual border wall, and has portrayed asylum seekers as vectors of disease, was always going to reach for travel bans as a first resort. And Americans who bought into his rhetoric of xenophobia and isolationism were going to be especially susceptible to thinking that simple entry controls were a panacea.

And so, the U.S. wasted its best chance of restraining COVID-19. Although the disease first arrived in the U.S. in mid-January, genetic evidence shows that the specific viruses that triggered the first big outbreaks, in Washington State, didn't land until mid-February. The country could have used that time to prepare. Instead, Trump, who had spent his entire presidency learning that he could say whatever he wanted without consequence, assured Americans that "the coronavirus is very much under control," and "like a miracle, it will disappear." With impunity, Trump lied. With impunity, the virus spread.

On February 26, Trump asserted that cases were "going to be down to close to zero." Over the next two months, at least 1 million Americans were infected.

As the coronavirus established itself in the U.S., it found a nation through which it could spread easily, without being detected. For years, Pardis Sabeti, a virologist at the Broad Institute of Harvard and MIT, has been trying to create a surveillance network that would allow hospitals in every major U.S. city to quickly track new viruses through genetic sequencing. Had that network existed, once Chinese scientists published SARS-CoV-2's genome on January 11, every American hospital would have been able to develop its own diagnostic test in preparation for the virus's arrival. "I spent a lot of time trying to convince many funders to fund it," Sabeti told me. "I never got anywhere."

The CDC developed and distributed its own diagnostic tests in late January. These proved useless because of a faulty chemical component. Tests were in such short supply, and the criteria for getting them were so laughably stringent, that by the end of February, tens of thousands of Americans had likely been infected but only hundreds had been tested. The official data were so clearly wrong that *The Atlantic* developed its own volunteer-led initiative—the COVID Tracking Project—to count cases.

Diagnostic tests are easy to make, so the U.S. failing to create one seemed inconceivable. Worse, it had no Plan B. Private labs were strangled by FDA bureaucracy. Meanwhile, Sabeti's lab developed a diagnostic test in mid-January and sent it to colleagues in Nigeria, Sierra Leone, and Senegal. "We had working diagnostics in those countries well before we did in any U.S. states," she told me.

It's hard to overstate how thoroughly the testing debacle incapacitated the U.S. People with debilitating symptoms couldn't find out what was wrong with them. Health officials couldn't cut off chains of transmission by identifying people who were sick and asking them to isolate themselves.

Water running along a pavement will readily seep into every crack; so, too, did the unchecked coronavirus seep into every fault line in the modern world. Consider our buildings. In response to the global energy crisis of the 1970s, architects made structures more energy-efficient by sealing them off from outdoor air, reducing ventilation rates. Pollutants and pathogens built up indoors, "ushering in the era of 'sick buildings,'" says Joseph Allen, who studies environmental health at Harvard's T. H. Chan School of Public Health. Energy efficiency is a pillar of modern climate policy, but there are ways to achieve it without sacrificing well-being. "We lost our way over the years and stopped designing buildings for people," Allen says.

The indoor spaces in which Americans spend 87 percent of their time became staging grounds for super-spreading events. One study showed that the odds of catching the virus from an infected person are roughly 19 times higher indoors than in open air. Shielded from the elements and among crowds clustered in prolonged proximity, the coronavirus ran rampant in the conference rooms of a Boston hotel, the cabins of the Diamond Princess cruise ship, and a church hall in Washington State where a choir practiced for just a few hours.

The hardest-hit buildings were those that had been jammed with people for decades: prisons. Between harsher punishments doled out in the War on Drugs and a tough-on-crime mindset that prizes retribution over rehabilitation, America's incarcerated population has swelled sevenfold since the 1970s, to about 2.3 million. The U.S. imprisons five to 18 times more people per capita than other Western democracies. Many American prisons are packed beyond capacity, making social distancing impossible. Soap is often scarce. Inevitably, the coronavirus ran amok. By June, two American prisons each accounted for more cases than all of New Zealand. One, Marion Correctional Institution, in Ohio, had more than 2,000 cases among inmates despite having a capacity of 1,500.

Other densely packed facilities were also besieged. America's nursing homes and long-term-care facilities house less than 1 percent of its people, but as of mid-June, they accounted for 40 percent of its coronavirus deaths. More than 50,000 residents and staff have died. At least 250,000 more have been infected. These grim figures are a reflection not just of the greater harms that COVID-19 inflicts upon elderly physiology, but also of the care the elderly receive. Before the pandemic, three in four nursing homes were understaffed, and four in five had recently been cited for failures in infection control. The Trump administration's policies have exacerbated the problem by reducing the influx of immigrants, who make up a quarter of long-term caregivers.

Even though a Seattle nursing home was one of the first COVID-19 hot spots in the U.S., similar facilities weren't provided with tests and protective equipment. Rather than girding these facilities against the pandemic, the Department of Health and Human Services paused nursing-home inspections in March, passing the buck to the states. Some nursing homes avoided the virus because their owners immediately stopped visitations, or paid caregivers to live on-site. But in others, staff stopped working, scared about infecting their charges or becoming infected themselves. In some cases, residents had to be evacuated because no one showed up to care for them.

America's neglect of nursing homes and prisons, its sick buildings, and its botched deployment of tests are all indicative of its problematic attitude toward health: "Get hospitals ready and wait for sick people to show," as Sheila Davis, the CEO of the nonprofit Partners in Health, puts it. "Especially in the beginning, we catered our entire [COVID-19] response to the 20 percent of people who required hospitalization, rather than preventing transmission in the community." The latter is the job of the public-health system, which prevents sickness in populations instead of merely treating it in individuals. That system pairs uneasily with a national temperament that views health as a matter of personal responsibility rather than a collective good.

At the end of the 20th century, public-health improvements meant that Americans were living an average of 30 years longer than they were at the start of it. Maternal mortality had fallen by 99 percent; infant mortality by 90 percent. Fortified foods all but eliminated rickets and goiters. Vaccines eradicated smallpox and polio, and brought measles, diphtheria, and rubella to heel. These measures, coupled with antibiotics and better sanitation, curbed infectious diseases to such a degree that some scientists predicted they would soon pass into history. But instead, these achievements brought complacency. "As public health did its job, it became a target" of budget cuts, says Lori Freeman, the CEO of the National Association of County and City Health Officials.

Today, the U.S. spends just 2.5 percent of its gigantic health-care budget on public health. Underfunded health departments were already struggling to deal with opioid addiction, climbing obesity rates, contaminated water, and easily preventable diseases. Last year saw

the most measles cases since 1992. In 2018, the U.S. had 115,000 cases of syphilis and 580,000 cases of gonorrhea—numbers not seen in almost three decades. It has 1.7 million cases of chlamydia, the highest number ever recorded.

Since the last recession, in 2009, chronically strapped local health departments have lost 55,000 jobs—a quarter of their workforce. When COVID-19 arrived, the economic downturn forced overstretched departments to furlough more employees. When states needed battalions of public-health workers to find infected people and trace their contacts, they had to hire and train people from scratch. In May, Maryland Governor Larry Hogan asserted that his state would soon have enough people to trace 10,000 contacts every day. Last year, as Ebola tore through the Democratic Republic of Congo—a country with a quarter of Maryland's wealth and an active war zone—local health workers and the WHO traced twice as many people.

Ripping unimpeded through American communities, the coronavirus created thousands of sickly hosts that it then rode into America's hospitals. It should have found facilities armed with state-of-the-art medical technologies, detailed pandemic plans, and ample supplies of protective equipment and life-saving medicines. Instead, it found a brittle system in danger of collapse.

Compared with the average wealthy nation, America spends nearly twice as much of its national wealth on health care, about a quarter of which is wasted on inefficient care, unnecessary treatments, and administrative chicanery. The U.S. gets little bang for its exorbitant buck. It has the lowest life-expectancy rate of comparable countries, the highest rates of chronic disease, and the fewest doctors per person. This profit-driven system has scant incentive to invest in spare beds, stockpiled supplies, peacetime drills, and layered contingency plans—the essence of pandemic preparedness. America's hospitals have been pruned and stretched by market forces to run close to full capacity, with little ability to adapt in a crisis.

When hospitals do create pandemic plans, they tend to fight the last war. After 2014, several centers created specialized treatment units designed for Ebola—a highly lethal but not very contagious disease. These units were all but useless against a highly transmissible airborne virus like SARS-CoV-2. Nor were hospitals ready for an outbreak to drag on for months. Emergency plans assumed that staff could endure a few days of exhausting conditions, that supplies would hold, and that hard-hit centers could be supported by unaffected neighbors. "We're designed for discrete disasters" like mass shootings, traffic pileups, and hurricanes, says Esther Choo, an emergency physician at Oregon Health and Science University. The COVID-19 pandemic is not a discrete disaster. It is a 50-state catastrophe that will likely continue at least until a vaccine is ready.

Wherever the coronavirus arrived, hospitals reeled. Several states asked medical students to graduate early, reenlisted retired doctors, and deployed dermatologists to emergency departments. Doctors and nurses endured grueling shifts, their faces chapped and bloody when they finally doffed their protective equipment. Soon, that equipment—masks, respirators, gowns, gloves—started running out.

American hospitals operate on a just-in-time economy. They acquire the goods they need in the moment through labyrinthine supply chains that wrap around the world in tangled lines, from countries with cheap labor to richer nations like the U.S. The lines are invisible until they snap. About half of the world's face masks, for example, are made in China, some of them in Hubei province. When that region became the pandemic epicenter, the mask supply shriveled just as global demand spiked. The Trump administration turned to a larder of medical supplies called the Strategic National Stockpile, only to find that the 100 million respirators and masks that had been dispersed during the 2009 flu pandemic were never replaced. Just 13 million respirators were left.

In April, four in five frontline nurses said they didn't have enough protective equipment. Some solicited donations from the public, or navigated a morass of back-alley deals and internet scams. Others fashioned their own surgical masks from bandannas and gowns from garbage bags. The supply of nasopharyngeal swabs that are used in every diagnostic test also ran low, because one of the largest manufacturers is based in Lombardy, Italy—initially the COVID-19 capital of Europe. About 40 percent of critical-care drugs, including antibiotics and painkillers, became scarce because they depend on manufacturing lines that begin in China and India. Once a vaccine is ready, there might not be enough vials to put it in, because of the long-running global shortage of medical-grade glass—literally, a bottle-neck bottleneck.

The federal government could have mitigated those problems by buying supplies at economies of scale and distributing them according to need. Instead, in March, Trump told America's governors to "try getting it yourselves." As usual, health care was a matter of capitalism and connections. In New York, rich hospitals bought their way out of their protective-equipment shortfall, while neighbors in poorer, more diverse parts of the city rationed their supplies.

While the president prevaricated, Americans acted. Businesses sent their employees home. People practiced social distancing, even before Trump finally declared a national emergency on March 13, and before governors and mayors subsequently issued formal stay-at-home orders, or closed schools, shops, and restaurants. A study showed that the U.S. could have averted 36,000 COVID-19 deaths if leaders had enacted social-distancing measures just a week earlier. But better late than never: By collectively reducing the spread of the virus, America flattened the curve. Ventilators didn't run out, as they had in parts of Italy. Hospitals had time to add extra beds.

Social distancing worked. But the indiscriminate lockdown was necessary only because America's leaders wasted months of prep time. Deploying this blunt policy instrument came at enormous cost. Unemployment rose to 14.7 percent, the highest level since record-keeping began, in 1948. More than 26 million people lost their jobs, a catastrophe in a country that—uniquely and absurdly—ties health care to employment. Some COVID-19 survivors have been hit with seven-figure medical bills. In the middle of the greatest health and economic crises in generations, millions of Americans have found themselves disconnected from medical care and impoverished. They join the millions who have always lived that way.

The coronavirus found, exploited, and widened every inequity that the U.S. had to offer. Elderly people, already pushed to the fringes of society, were treated as acceptable losses. Women were more likely to lose jobs than men, and also shouldered extra burdens of child care and domestic work, while facing rising rates of domestic violence. In half of the states, people with dementia and intellectual disabilities faced policies that threatened to deny them access to lifesaving ventilators. Thousands of people endured months of COVID-19 symptoms that resembled those of chronic postviral illnesses, only to be told that their devastating symptoms were in their head. Latinos were three times as likely to be infected as white people. Asian Americans faced racist abuse. Far from being a "great equalizer," the pandemic fell unevenly upon the U.S., taking advantage of injustices that had been brewing throughout the nation's history.

Of the 3.1 million Americans who cannot afford health insurance, more than half are people of color, and 30 percent are Black. This is no accident. In the decades after the Civil War, the white leaders of former slave states deliberately withheld health care from Black Americans, apportioning medicine more according to the logic of Jim Crow than Hippocrates. They built hospitals away from Black communities, segregated Black patients into separate wings, and blocked Black students from medical school. In the 20th century, they helped construct America's system of private, employer-based insurance, which has kept many Black people from receiving adequate medical treatment. They fought every attempt to improve Black people's access to health care, from the creation of Medicare and Medicaid in the '60s to the passage of the Affordable Care Act in 2010.

A number of former slave states also have among the lowest investments in public health, the lowest quality of medical care, the highest proportions of Black citizens, and the greatest racial divides in health outcomes. As the COVID-19 pandemic wore on, they were among the quickest to lift social-distancing restrictions and reexpose their citizens to the coronavirus. The harms of these moves were unduly foisted upon the poor and the Black.

As of early July, one in every 1,450 Black Americans had died from COVID-19—a rate more than twice that of white Americans. That figure is both tragic and wholly expected given the mountain of medical disadvantages that Black people face. Compared with white people, they die three years younger. Three times as many Black mothers die during pregnancy. Black people have higher rates of chronic illnesses that predispose them to fatal cases of COVID-19. When they go to hospitals, they're less likely to be treated. The care they do receive tends to be poorer. Aware of these biases, Black people are hesitant to seek aid for COVID-19 symptoms and then show up at hospitals in sicker states. "One of my patients said, 'I don't want to go to the hospital, because they're not going to treat me well,'" says Uché Blackstock, an emergency physician and the founder of Advancing Health Equity, a nonprofit that fights bias and racism in health care. "Another whispered to me, 'I'm so relieved you're Black. I just want to make sure I'm listened to.'"

Black people were both more worried about the pandemic and more likely to be infected by it. The dismantling of America's social safety net left Black people with less income and higher unemployment. They make up a disproportionate share of the low-paid "essential workers" who were expected to staff grocery stores and warehouses, clean buildings, and deliver mail while the pandemic raged around them. Earning hourly wages without paid sick leave, they couldn't afford to miss shifts even when symptomatic. They faced risky commutes on crowded public transportation while more privileged people teleworked from the safety of isolation. "There's nothing about Blackness that makes you more prone to COVID," says Nicolette Louissaint, the executive director of Healthcare Ready, a nonprofit that works to strengthen medical supply chains. Instead, existing inequities stack the odds in favor of the virus.

Native Americans were similarly vulnerable. A third of the people in the Navajo Nation can't easily wash their hands, because they've been embroiled in long-running negotiations over the rights to the water on their own lands. Those with water must contend with runoff from uranium mines. Most live in cramped multigenerational homes, far from the few hospitals that service a 17-million-acre reservation. As of mid-May, the Navajo Nation had higher rates of COVID-19 infections than any U.S. state.

Americans often misperceive historical inequities as personal failures. Stephen Huffman, a Republican state senator and doctor in Ohio, suggested that Black Americans might be more prone to COVID-19 because they don't wash their hands enough, a remark for which he later apologized. Republican Senator Bill Cassidy of Louisiana, also a physician, noted that Black people have higher rates of chronic disease, as if this were an answer in itself, and not a pattern that demanded further explanation.

Clear distribution of accurate information is among the most important defenses against an epidemic's spread. And yet the largely unregulated, social-media-based communications infrastructure of the 21st century almost ensures that misinformation will proliferate fast. "In

every outbreak throughout the existence of social media, from Zika to Ebola, conspiratorial communities immediately spread their content about how it's all caused by some government or pharmaceutical company or Bill Gates," says Renée DiResta of the Stanford Internet Observatory, who studies the flow of online information. When COVID-19 arrived, "there was no doubt in my mind that it was coming."

Sure enough, existing conspiracy theories—George Soros! 5G! Bioweapons!—were repurposed for the pandemic. An infodemic of falsehoods spread alongside the actual virus. Rumors coursed through online platforms that are designed to keep users engaged, even if that means feeding them content that is polarizing or untrue. In a national crisis, when people need to act in concert, this is calamitous. "The social internet as a system is broken," DiResta told me, and its faults are readily abused.

Beginning on April 16, DiResta's team noticed growing online chatter about Judy Mikovits, a discredited researcher turned anti-vaccination champion. Posts and videos cast Mikovits as a whistleblower who claimed that the new coronavirus was made in a lab and described Anthony Fauci of the White House's coronavirus task force as her nemesis. Ironically, this conspiracy theory was nested inside a larger conspiracy—part of an orchestrated PR campaign by an anti-vaxxer and QAnon fan with the explicit goal to "take down Anthony Fauci." It culminated in a slickly produced video called *Plandemic*, which was released on May 4. More than 8 million people watched it in a week.

Doctors and journalists tried to debunk *Plandemic*'s many misleading claims, but these efforts spread less successfully than the video itself. Like pandemics, infodemics quickly become uncontrollable unless caught early. But while health organizations recognize the need to surveil for emerging diseases, they are woefully unprepared to do the same for emerging conspiracies. In 2016, when DiResta spoke with a CDC team about the threat of misinformation, "their response was: 'That's interesting, but that's just stuff that happens on the internet.'"

Rather than countering misinformation during the pandemic's early stages, trusted sources often made things worse. Many health experts and government officials downplayed the threat of the virus in January and February, assuring the public that it posed a low risk to the U.S. and drawing comparisons to the ostensibly greater threat of the flu. The WHO, the CDC, and the U.S. surgeon general urged people not to wear masks, hoping to preserve the limited stocks for health-care workers. These messages were offered without nuance or acknowledgement of uncertainty, so when they were reversed—the virus is worse than the flu; wear masks—the changes seemed like befuddling flip-flops.

The media added to the confusion. Drawn to novelty, journalists gave oxygen to fringe anti-lockdown protests while most Americans quietly stayed home. They wrote up every incremental scientific claim, even those that hadn't been verified or peer-reviewed.

There were many such claims to choose from. By tying career advancement to the publishing of papers, academia already creates incentives for scientists to do attention-grabbing but irreproducible work. The pandemic strengthened those incentives by prompting a rush of panicked research and promising ambitious scientists' global attention.

In March, a small and severely flawed French study suggested that the antimalarial drug hydroxychloroquine could treat COVID-19. Published in a minor journal, it likely would have been ignored a decade ago. But in 2020, it wended its way to Donald Trump via a chain of credulity that included Fox News, Elon Musk, and Dr. Oz. Trump spent months touting the drug as a miracle cure despite mounting evidence to the contrary, causing shortages for people who actually needed it to treat lupus and rheumatoid arthritis. The hydroxychloroquine story was muddied even further by two studies published in top medical journals—*The Lancet* and the *New England Journal of Medicine*—that claimed the drug was not effective and was potentially harmful. The papers relied on suspect data from a small analytics company called Surgisphere. Both were retracted in June.

Science famously self-corrects. But during the pandemic, the same urgent pace that has produced valuable knowledge at record speed has also sent sloppy claims around the world before anyone could even raise a skeptical eyebrow. The ensuing confusion, and the many genuine unknowns about the virus, has created a vortex of fear and uncertainty, which grifters have sought to exploit. Snake-oil merchants have peddled ineffectual silver bullets (including actual silver). Armchair experts with scant or absent qualifications have found regular slots on the nightly news. And at the center of that confusion is Donald Trump.

During a pandemic, leaders must rally the public, tell the truth, and speak clearly and consistently. Instead, Trump repeatedly contradicted public-health experts, his scientific advisers, and himself. He said that "nobody ever thought a thing like [the pandemic] could happen" and also that he "felt it was a pandemic long before it was called a pandemic." Both statements cannot be true at the same time, and in fact neither is true.

A month before his inauguration, I wrote that "the question isn't whether [Trump will] face a deadly outbreak during his presidency, but when." Based on his actions as a media personality during the 2014 Ebola outbreak and as a candidate in the 2016 election, I suggested that he would fail at diplomacy, close borders, tweet rashly, spread conspiracy theories, ignore experts, and exhibit reckless self-confidence. And so he did.

No one should be shocked that a liar who has made almost 20,000 false or misleading claims during his presidency would lie about whether the U.S. had the pandemic under control; that a racist who gave birth to birtherism would do little to stop a virus that was disproportionately killing Black people; that a xenophobe who presided over the creation of new immigrant-detention centers would order meatpacking plants with a substantial immigrant workforce to remain open; that a cruel man devoid of empathy would fail to calm fearful citizens; that a narcissist who cannot stand to be upstaged would refuse to tap the deep well of experts at his disposal; that a scion of nepotism would hand control of a shadow coronavirus task force to his unqualified son-in-law; that an armchair polymath would claim to have a "natural ability" at medicine and display it by wondering out loud about the curative potential of injecting disinfectant; that an egotist incapable of admitting failure would try to distract from his greatest one by blaming China, defunding the WHO, and promoting miracle drugs; or that a president who has been shielded by his party from any shred of accountability would say, when asked about the lack of testing, "I don't take any responsibility at all."

Trump is a comorbidity of the COVID-19 pandemic. He isn't solely responsible for America's fiasco, but he is central to it. A pandemic demands the coordinated efforts of dozens of agencies. "In the best circumstances, it's hard to make the bureaucracy move quickly," Ron Klain said. "It moves if the president stands on a table and says, 'Move quickly.' But it *really* doesn't move if he's sitting at his desk saying it's not a big deal."

In the early days of Trump's presidency, many believed that America's institutions would check his excesses. They have, in part, but Trump has also corrupted them. The CDC is but his latest victim. On February 25, the agency's respiratory-disease chief, Nancy Messonnier, shocked people by raising the possibility of school closures and saying that "disruption to everyday life might be severe." Trump was reportedly enraged. In response, he seems to have benched the entire agency. The CDC led the way in every recent domestic disease outbreak and has been the inspiration and template for public-health agencies around the world. But during the three months when some 2 million Americans contracted COVID-19 and the death toll topped 100,000, the agency didn't hold a single press conference. Its detailed guidelines on reopening the country were shelved for a month while the White House released its own uselessly vague plan.

Again, everyday Americans did more than the White House. By voluntarily agreeing to months of social distancing, they bought the country time, at substantial cost to their financial and mental well-being. Their sacrifice came with an implicit social contract—that the government would use the valuable time to mobilize an extraordinary, energetic effort to suppress the virus, as did the likes of Germany and Singapore. But the government did not, to the bafflement of health experts. "There are instances in history where humanity has really moved mountains to defeat infectious diseases," says Caitlin Rivers, an epidemiologist at the Johns Hopkins Center for Health Security. "It's appalling that we in the U.S. have not summoned that energy around COVID-19."

Instead, the U.S. sleepwalked into the worst possible scenario: People suffered all the debilitating effects of a lockdown with few of the benefits. Most states felt compelled to reopen without accruing enough tests or contact tracers. In April and May, the nation was stuck on a terrible plateau, averaging 20,000 to 30,000 new cases every day. In June, the plateau again became an upward slope, soaring to record-breaking heights.

Trump never rallied the country. Despite declaring himself a "wartime president," he merely presided over a culture war, turning public health into yet another politicized cage match. Abetted by supporters in the conservative media, he framed measures that protect against the virus, from masks to social distancing, as liberal and anti-American. Armed anti-lockdown protesters demonstrated at government buildings while Trump egged them on, urging them to "LIBERATE" Minnesota, Michigan, and Virginia. Several public-health officials left their jobs over harassment and threats.

It is no coincidence that other powerful nations that elected populist leaders—Brazil, Russia, India, and the United Kingdom—also fumbled their response to COVID-19. "When you have people elected based on undermining trust in the government, what happens when trust is what you need the most?" says Sarah Dalglish of the Johns Hopkins Bloomberg School of Public Health, who studies the political determinants of health.

"Trump is president," she says. "How could it go well?"

The countries that fared better against COVID-19 didn't follow a universal playbook. Many used masks widely; New Zealand didn't. Many tested extensively; Japan didn't. Many had science-minded leaders who acted early; Hong Kong didn't—instead, a grassroots movement compensated for a lax government. Many were small islands; not large and continental Germany. Each nation succeeded because it did enough things right.

Meanwhile, the United States underperformed across the board, and its errors compounded. The dearth of tests allowed unconfirmed cases to create still more cases, which flooded the hospitals, which ran out of masks, which are necessary to limit the virus's spread. Twitter amplified Trump's misleading messages, which raised fear and anxiety among people, which led them to spend more time scouring for information on Twitter. Even seasoned health experts underestimated these compounded risks. Yes, having Trump at the helm during a pandemic was worrying, but it

was tempting to think that national wealth and technological superiority would save America. "We are a rich country, and we think we can stop any infectious disease because of that," says Michael Osterholm, the director of the Center for Infectious Disease Research and Policy at the University of Minnesota. "But dollar bills alone are no match against a virus."

Public-health experts talk wearily about the panic-neglect cycle, in which outbreaks trigger waves of attention and funding that quickly dissipate once the diseases recede. This time around, the U.S. is *already* flirting with neglect, before the panic phase is over. The virus was never beaten in the spring, but many people, including Trump, pretended that it was. Every state reopened to varying degrees, and many subsequently saw record numbers of cases. After Arizona's cases started climbing sharply at the end of May, Cara Christ, the director of the state's health-services department, said, "We are not going to be able to stop the spread. And so we can't stop living as well." The virus may beg to differ.

At times, Americans have seemed to collectively surrender to COVID-19. The White House's coronavirus task force wound down. Trump resumed holding rallies, and called for *less* testing, so that official numbers would be rosier. The country behaved like a horror-movie character who believes the danger is over, even though the monster is still at large. The long wait for a vaccine will likely culminate in a predictable way: Many Americans will refuse to get it, and among those who want it, the most vulnerable will be last in line.

Still, there is some reason for hope. Many of the people I interviewed tentatively suggested that the upheaval wrought by COVID-19 might be so large as to permanently change the nation's disposition. Experience, after all, sharpens the mind. East Asian states that had lived through the SARS and MERS epidemics reacted quickly when threatened by SARS-CoV-2, spurred by a cultural memory of what a fast-moving coronavirus can do. But the U.S. had barely been touched by the major epidemics of past decades (with the exception of the H1N1 flu). In 2019, more Americans were concerned about terrorists and cyberattacks than about outbreaks of exotic diseases. Perhaps they will emerge from this pandemic with immunity both cellular and cultural.

There are also a few signs that Americans are learning important lessons. A June survey showed that 60 to 75 percent of Americans were still practicing social distancing. A partisan gap exists, but it has narrowed. "In public-opinion polling in the U.S., high-60s agreement on anything is an amazing accomplishment," says Beth Redbird, a sociologist at Northwestern University, who led the survey. Polls in May also showed that most Democrats and Republicans supported mask wearing, and felt it should be mandatory in at least some indoor spaces. It is almost unheard-of for a public-health measure to go from zero to majority acceptance in less than half a year. But pandemics are rare situations when "people are desperate for guidelines and rules," says Zoë McLaren, a health-policy professor at the University of Maryland at Baltimore County. The closest analogy is pregnancy, she says, which is "a time when women's lives are changing, and they can absorb a ton of information. A pandemic is similar: People are actually paying attention, and learning."

Redbird's survey suggests that Americans indeed sought out new sources of information—and that consumers of news from conservative outlets, in particular, expanded their media diet. People of all political bents became more dissatisfied with the Trump administration. As the economy nose-dived, the health-care system ailed, and the government fumbled, belief in American exceptionalism declined. "Times of big social disruption call into question things we thought were normal and standard," Redbird told me. "If our institutions fail us here, in what ways are they failing elsewhere?" And whom are they failing the most?

Americans were in the mood for systemic change. Then, on May 25, George Floyd, who had survived COVID-19's assault on his airway, asphyxiated under the crushing pressure of a police officer's knee. The excruciating video of his killing circulated through communities that were still reeling from the deaths of Breonna Taylor and Ahmaud Arbery, and disproportionate casualties from COVID-19. America's simmering outrage came to a boil and spilled into its streets.

Defiant and largely cloaked in masks, protesters turned out in more than 2,000 cities and towns. Support for Black Lives Matter soared: For the first time since its founding in 2013, the movement had majority approval across racial groups. These protests were not about the pandemic, but individual protesters had been primed by months of shocking governmental missteps. Even people who might once have ignored evidence of police brutality recognized yet another broken institution. They could no longer look away.

It is hard to stare directly at the biggest problems of our age. Pandemics, climate change, the sixth extinction of wildlife, food and water shortages—their scope is planetary, and their stakes are overwhelming. We have no choice, though, but to grapple with them. It is now abundantly clear what happens when global disasters collide with historical negligence.

COVID-19 is an assault on America's body, and a referendum on the ideas that animate its culture. Recovery is possible, but it demands radical introspection. America would be wise to help reverse the ruination of the natural world, a process that continues to shunt animal diseases into human bodies. It should strive to prevent sickness instead of profiting from it. It should build a health-care system that prizes resilience over brittle efficiency, and an information system that favors light over heat. It should rebuild its international alliances, its social safety net, and its trust in empiricism. It should address the

health inequities that flow from its history. Not least, it should elect leaders with sound judgment, high character, and respect for science, logic, and reason.

The pandemic has been both tragedy and teacher. Its very etymology offers a clue about what is at stake in the greatest challenges of the future, and what is needed to address them. *Pandemic. Pan* and *demos*[3]. All people.

Ed Yong *is a staff writer at The Atlantic, where he covers science.*

UAE vaccinates 722,000 Pakistani children against polio in one week

Source: https://www.thenational.ae/uae/health/uae-vaccinates-722-000-pakistani-children-against-polio-in-one-week-1.1058515

A Pakistani health worker administers polio vaccine drops to a child during a polio vaccination campaign in Islamabad in December, 2018. AFP

Aug 03 – More than 720,000 children in Pakistan received polio vaccinations during a week-long initiative spearheaded by the UAE in July.

The extensive Emirates Polio campaign is believed to have been the first of its kind carried out since the Covid-19 outbreak.

The humanitarian mission was part of a global effort to eradicate polio being led by Sheikh Mohamed bin Zayed, Crown Prince of Abu Dhabi.

[3] From **Ancient Greek** *πάνδημος* (pándēmos, "of or belonging to all the people, public") + English *-ic* (suffix forming adjectives from nouns with the sense 'of or pertaining to'). πάνδημος is derived from *παν-* (pan-, prefix meaning 'all, every') (ultimately from Proto-Indo-European *peh_2- ("to protect, shepherd")) + *δῆμος* (dêmos, "the common people; free citizens, sovereign people") (ultimately from Proto-Indo-European *deh_2- ("to divide, share")). Compare Late Latin *pandēmus* ("affecting all the people, general, public").

Abdullah Khalifa Al-Ghafli, director of the UAE Pakistan Assistance Programme, said the wide-ranging operation highlighted the commitment of the UAE leadership to eliminate the debilitating disease.
Mr Al-Ghafli said 722,500 children were successfully vaccinated between July 20 and 26.
"This campaign is the first of its kind in the world to vaccinate children against polio since the spread of Covid-19, after a break of nearly four months in vaccination efforts," he said.
The programme targeted areas in Pakistan where there had been spikes in polio cases and directed support to those most vulnerable to infection.
The campaign was carried out in line with Covid-19 safety measures, with more than 3,400 vaccination team members and security personnel undergoing training on potential risks.
They were also equipped with protective equipment, including uniforms, masks, gloves, and sterilisation materials.
This effort was complimented by an awareness campaign across all forms of media to encourage parents to be proactive in vaccinating their children.

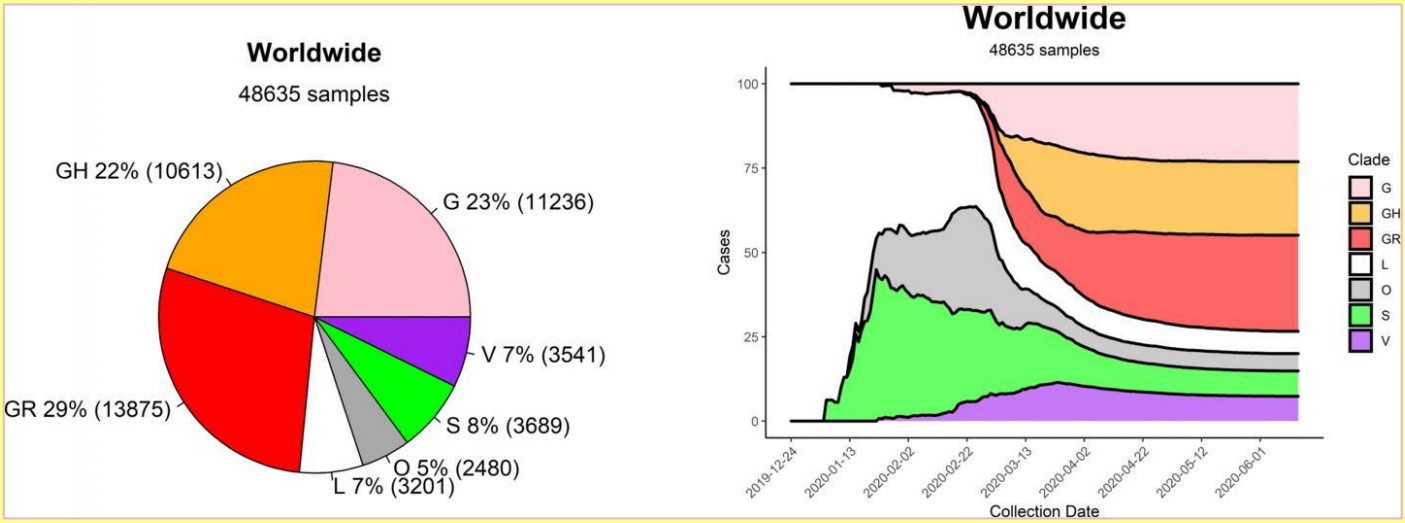
The Emirates Polio Campaign will launch a 10-day vaccination programme on August 17, with the aim of reaching more than 15 million children living in 85 regions of Pakistan.

Since its launch in 2014, the UAE's vaccination project has immunised more than 86 million Pakistani children.
Sheikh Mohamed bin Zayed has committed US$327.8 million (Dh1.2 billion) to supporting efforts to elimate polo worldwide, with a particular focus on high-risk areas in Pakistan and Afghanistan.

EDITOR'S COMMENT: Bravo UAE! But correct me if I am wrong: Is Pakistan a nuclear power and has the money to develop nuclear weapons but not the funds to counter this preventable disease? The program was fortunate to be completed without any casualties since many times in the past, sanitary crews performing vaccinations have been attacked or even killed.

The six strains of SARS-CoV-2

Source: https://www.eurekalert.org/pub_releases/2020-08/udb-tss080320.php



The most extensive study ever carried out on SARS-CoV-2 sequencing revealed six strains of the virus (Credit: Frontiers in Microbiology)

Aug 03 – The virus causing the COVID-19 pandemic, SARS-CoV-2, presents at least six strains. Despite its mutations, the virus shows little variability, and this is good news for the researchers working on a viable vaccine.
These are the results of the most extensive study ever carried out on SARS-CoV-2 sequencing. Researchers at the University of Bologna drew from the analysis of 48,635 coronavirus genomes, which were isolated by researchers in labs all over the world. This study was published in the journal *Frontiers in Microbiology*. It was then possible for researchers to map the spread and the mutations of the virus during its journey to all continents.

The first results are encouraging. The coronavirus presents little variability, approximately seven mutations per sample. Common influenza has a variability rate that is more than double.
"The SARS-CoV-2 coronavirus is presumably already optimized to affect human beings, and this explains its low evolutionary change", explains Federico Giorgi, a researcher at Unibo and coordinator of the study. "This means that the treatments we are developing, including a vaccine, might be effective against all the virus strains".
Currently, there are six strains of coronavirus. The original one is the L strain, that appeared in Wuhan in December 2019. Its first mutation - the S strain - appeared at the beginning of 2020, while, since mid-January 2020, we have had strains V and G. To date strain G is the most widespread: it mutated into strains GR and GH at the end of February 2020.
"Strain G and its related strains GR and GH are by far the most widespread, representing 74% of all gene sequences we analysed", says Giorgi. "They present four mutations, two of which are able to change the sequence of the RNA polymerase and Spike proteins of the virus. This characteristic probably facilitates the spread of the virus".
If we look at the coronavirus map, we can see that **strains G and GR are the most frequent across Europe and Italy.** According to the available data, GH strain seems close to non-existence in Italy, while it occurs more frequently in France and Germany. This seems to confirm the effectiveness of last months' containment methods.
In North America, the most widespread strain is GH, while in South America we find the GR strain more frequently. In Asia, where the Wuhan L strain initially appeared, the spread of strains G, GH and GR is increasing. These strains landed in Asia only at the beginning of March, more than a month after their spread in Europe.
Globally, strains G, GH and GR are constantly increasing. Strain S can be found in some restricted areas in the US and Spain. The L and V strains are gradually disappearing.
Besides these six main coronavirus strains, researchers identified some infrequent mutations, that, at the moment, are not worrying but should nevertheless be monitored.
"Rare genomic mutations are less than 1% of all sequenced genomes", confirms Giorgi. "However, it is fundamental that we study and analyse them so that we can identify their function and monitor their spread. All countries should contribute to the cause by giving access to data about the virus genome sequences".
➲ This study was published in the journal *Frontiers in Microbiology* with the title "Geographic and Genomic Distribution of SARS-CoV-2 Mutations". The authors are Daniele Mercatelli and Federico M. Giorgi, both from the Department of Pharmacy and Biotechnology of the University of Bologna.

COVID-19-Related Skin Changes: The Hidden Racism in Documentation

By Graeme M. Lipper, MD
Source: https://www.medscape.com/viewarticle/934605

July 27 – Belatedly, the disproportionate impact of COVID-19 on patients of color is getting attention. By now, we've read the headlines. Black people in the United States make up about 13% of the population but account for almost three times (34%) as many deaths. This story repeats — in other countries and in other minority communities.
Early detection is critical both to initiate supportive care and to isolate affected individuals and limit spread. Skin manifestations of COVID-19, especially those that occur early in the disease (eg, vesicular eruptions) or have prognostic significance (livedo, retiform purpura, necrosis), are critical to this goal of early recognition.
In this context, a recent systematic literature review looked at all articles describing skin manifestations associated with COVID-19. The investigators identified 46 articles published between March and May 2020 which included a total of 130 clinical images.
Their findings are striking:

- 92% of the published images of COVID-associated skin manifestations were in Fitzpatrick skin types I-III.
- Only 6% of COVID skin lesions included in the articles were in patients with skin type IV.
- None showed COVID skin lesions in skin types V or VI.
- Only six of the articles reported race and ethnicity demographics. In those, 91% of the patients were White and 9% were Hispanic.

Discussion
These results reveal a critical lack of representative clinical images of COVID-associated skin manifestations in patients of color. This deficiency is made all the more egregious given

the fact that patients of color, including those who are Black, Latinx, and Native American, have been especially hard hit by the COVID-19 pandemic and suffer disproportionate disease-related morbidity and mortality.
As the study authors point out, skin manifestations in people of color often differ significantly from findings in white skin (for example, look at the figure depicting the rash typical of Kawasaki disease in a dark-skinned child compared with a light-skinned child). It is not a stretch to suggest that skin manifestations associated with COVID-19 may look very different in darker skin.

Kawasaki disease in a dark- and a light-skinned child.

These investigators have identified a damning lack of images of COVID-19–associated skin manifestations in patients with darker skin. This isn't a new phenomenon. Almost half of dermatologists feel that they've had insufficient exposure to skin disease in darker skin types. Skin of color remains underrepresented in medical journals.
Like other forms of passive, institutional racism, this deficiency will only be improved if dermatologists and dermatology publications actively seek out COVID-associated skin manifestations in patients of color and prioritize sharing these images. A medical student in the United Kingdom has gotten the ball rolling, compiling a handbook of clinical signs in black and brown skin as part of a student-staff partnership at St George's Hospital and the University of London. Mind the Gap is looking for a publisher.

***Graeme M. Lipper, MD**, is a clinical assistant professor at the University of Vermont Medical College in Burlington, Vermont, and a partner at Advanced DermCare in Danbury, Connecticut.*

Preparing to Clean Up Following an Anthrax Attack

Source: http://www.homelandsecuritynewswire.com/dr20200804-preparing-to-clean-up-following-an-anthrax-attack

Aug 04 – The microorganism that causes anthrax, the bacterium *Bacillus anthracis,* has infected people and animals since ancient times. Even though anthrax is rare, it is a severe infectious disease with a death rate ranging from 25 percent to 80 percent if medical treatment is not sought early. According to the Centers for Disease Control and Prevention, anthrax is one of the most likely agents to be used in a biological attack, because the anthrax bacteria exist in the natural environment, can be easily disguised in powders, sprays, food or water, and have been previously used as a biological warfare agent.
Anthrax spores are difficult to kill, as they can remain viable in the environment for decades. When the spores are inhaled by humans or animals, the bacteria awaken and reproduce to a disastrous effect.

If terrorists use anthrax as a bioagent on a ship or in a harbor, the U.S. Coast Guard must decontaminate the impacted area as quickly as possible to reduce the threat to personnel and civilians, while remaining ready to do its mission. The project Analysis for Coastal Operational Resiliency (AnCOR) aims to find the best, safest methods to decontaminate Coast Guard bases, stations, and vessels. S&T notes that the project is a partnership of the Department of Homeland Security (DHS) Science and Technology Directorate (S&T), the U.S. Environmental Protection Agency (EPA) and the Coast Guard. AnCOR, which started in 2018, focuses on addressing the wide-area release of a biological agent such as anthrax and uses non-pathogenic anthrax-like spores or anthrax surrogates in its studies and field demonstrations.
"The U.S. Coast Guard is charged with protecting the nation's coastlines and waterways, including aiding the boating public," said Don Bansleben, S&T Program Manager for AnCOR. "It is important that the Coast Guard continues mission essential functions, even in a contaminated environment."

S&T, EPA and Coast Guard conduct first decontamination field test

The first major AnCOR field test took place at the Davie campus of the University of Florida in early 2020 and involved decontaminating a Coast Guard boat contaminated with non-pathogenic, anthrax-like spores. Three types of surrogates were used: *B. anthracis* Sterne strain (a harmless anthrax strain used for vaccination), *B. atrophaeus var. globigii* and *B. thuringiensis subsp. kurstaki*. Before this field test, EPA developed and tested different decontamination methods in a laboratory to see how effective they are on various types of surfaces found on Coast Guard boats - marine grade aluminum, glass, seat material, marine grade carpet, anti-skid material, and bumper material. To test the methods, EPA scientists prepared one-inch-diameter samples from those materials and contaminated them with spores from the three non-pathogenic surrogate species.
"EPA is supporting DHS S&T and the Coast Guard because of our extensive experience and knowledge in this area," said Shannon Serre, a Chemical Engineer at EPA. "We've been working on decontamination of anthrax spores since 2002."
Over the course of three weeks, three different decontamination methods were tested on a retired 25-foot Coast Guard response boat. EPA researchers and Coast Guard teams taped squares on 11 different surfaces on the boat—marine grade aluminum, cabin windows, seating, flooring, electronics, deck, motors, etc.—where they placed spores from the two non-vaccine strains of bacteria.
During each decontamination test, participants in protective gear followed the following steps:

- Sampled the contaminated areas and then decontaminated the whole boat using three approaches.
- Took post-decontamination samples to check for spores that survived.
- Checked if the boat electronics were still operational after the decontamination step (new electronics were installed between each test).
- Reset the boat and sent the samples for analysis.

During each decontamination round, participants sprayed the outside of the boat with pH modified bleach. Then, they tented the boat by wrapping it in plastic for the fumigation or fogging step. Each of the three decontamination rounds had different methods:

- **First round:** Participants fumigated the boat with methyl bromide gas for 48 hours and then removed the gas and captured it using barrels filled with activated carbon (methyl bromide is an ozone-depleting chemical and is not safe to be released in the atmosphere).
- **Second round:** Participants used household humidifiers to distribute hydrogen peroxide inside the wrapped boat and let it dwell for four days.
- **Third round:** Participants conducted fogging with peracetic acid (a disinfectant), which was left to work for 18 hours.

Results from this study will be published in a report later this year and will provide data on the efficacy of the decontamination approaches as well as cost considerations. The preliminary findings showed samples taken after the methyl bromide and peracetic acid decontamination rounds contained no viable spores; and after the hydrogen peroxide decontamination, some samples contained viable spores.

History of Anthrax Threats Underscores Need for AnCOR

"We are responsible for protecting U.S. Coastal areas," said Dana Tulis, Director, Emergency Management at the Coast Guard. "AnCOR is important for the Coast Guard to cleanup contamination but also to ensure the Coast Guard's assets and property are safe, so that we can keep the people we rescue safe."
The Coast Guard has been concerned about biological attacks since 2001, when letters with anthrax spores were sent to two U.S. senators and two news agencies. This led to 22 people getting sick and five deaths. EPA disinfected the building where one of the letters was delivered.

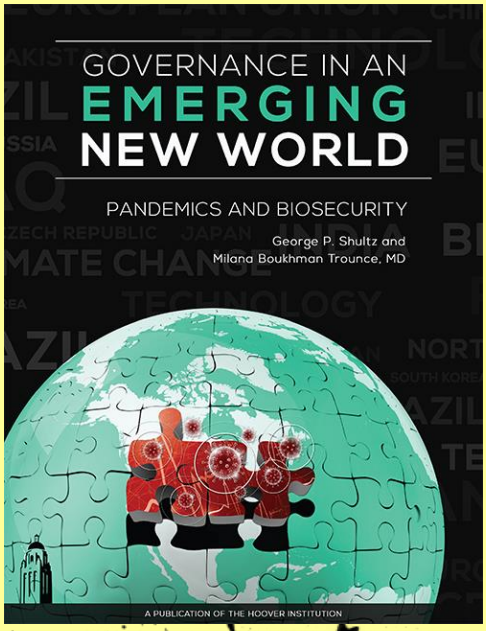
"We pick anthrax because those spores are the most difficult to decontaminate, very persistent and toxic," said Tulis. "If we can successfully decontaminate *B. anthracis*, we can decontaminate less toxic biological agents."
The Coast Guard wants to be prepared if someone releases anthrax spores near water, as many of the country's major metropolitan areas (e.g. New York, San Francisco, Los Angeles, Chicago, Boston, Miami, New Orleans) are along, or near, bodies of water.
This isn't the first time that S&T and EPA worked together on an anthrax decontamination project. Several years ago, the two agencies embarked on a similar effort—the Underground Transport Restoration project—for the New York City subway system, which included a field exercise involving the decontamination of the subway after a simulated anthrax attack. AnCOR is a continuation of joint S&T-EPA projects focused on recovery from attacks with chemical or biological agents.

Future AnCOR Milestones and Other Upcoming Joint EPA and S&T Projects
S&T, EPA, and the Coast Guard are planning to conduct a wide-area decontamination field test in October 2021 at a venue with similar properties as a Coast Guard station (storage buildings, boats, vehicles, and paved and non-paved surfaces). The purpose of this test will be to test and evaluate under realistic conditions decontamination options on various types of outdoor surfaces (porous and non-porous surfaces, including vegetation).
"We will be looking at how to sample for an event like that, what methods are suitable for decontaminating objects in outdoor areas, including grassy fields," said Bansleben. "We hope that what we learn from these AnCOR tests will ultimately be applicable not only for an anthrax event but for decontamination after other types of biological events, including the easier-to-disinfect COVID-19 virus."
AnCOR is scheduled to end in 2023 with a guidance document, prepared by EPA on decontamination and recovery from a biological event.
"We want to minimize exposure and maximize the response to a biological event quickly; and by doing all this work upfront with S&T and EPA, we will know exactly what decontamination methods work," said Tulis. "Because a biological event is life-or-death, having the knowledge and experience upfront is critical."

COVID-19 and Future Pandemics

By Milana Boukhman Trounce and George P. Shultz
Source: https://www.hoover.org/sites/default/files/research/docs/covid-19_governance.pdf

July 30 – On April 8, 2019, we gathered around the circular table in the Annenberg Conference Room at the Hoover Institution for another discussion from our research project on Governance in an Emerging New World. This session was led by Dr. Lucy Shapiro, a professor of biology at the Stanford University School of Medicine.



One featured speaker was Dr. Milana Boukhman Trounce. One of Hoover's great assets is our ability to draw on the wealth of expertise surrounding us across the Stanford campus, and our interaction with Dr. Trounce exemplifies that. A Stanford professor and emergency medicine physician, policy scholars here were introduced to Dr. Trounce through an even earlier cross-disciplinary Hoover policy panel on the threat of pandemics, organized by Hoover National Security Affairs Fellow Conny Arvis, representing the US Department of State. For our 2019 Governance Project discussion, Dr. Trounce presented a paper on potential pandemics. She described in detail in her paper how "the threat of infectious disease is making a comeback. Unfortunately, at this point, we are ill equipped to deal with a number of scenarios, particularly those involving large-scale infectious disease outbreaks—pandemics." She explained how human activities, including increased contact between humans and wild animals and global transportation networks, have increased the threat of new infectious diseases. She explained why drugs for the treatment of a new disease such as this and vaccines to prevent its spread would not be available in time to prevent a public health crisis. The principal countermeasures would be the same public health measures that have been used for centuries—isolation and quarantine. We learned that the word "quarantine" is derived from an Italian term for the forty days that all ships were required to be isolated before passengers and crew could go ashore during the fourteenth-century Black Death plague epidemic. We learned about "social-distancing" measures, such as closing schools, public gatherings, businesses, and transport,

and the possibility that internet commerce might facilitate implementation of isolation and quarantine. We learned that rapid diagnostic testing, if available, might help a lot. Later in the day, we heard from Stephen Quake, a professor of bioengineering at Stanford, about the potential of modern gene-sequencing technology to rapidly recognize the causes of infectious disease outbreaks.

Overall, the panelists argued that "the public sector is not sufficiently preparing for this." While local public health departments have protocols, do drills, and receive guidance from the federal Centers for Disease Control and Prevention (CDC), "there are too many cooks in the kitchen." A large-scale disease outbreak is not just a medical event but also one of public safety and security: "It's chaos every time, and it is always reactive." Looking at how warehousing and logistics technologies are developing, panelists considered how the US private sector might end up delivering many needed services in such an outbreak, and the market incentives and coordination that governments could consider to help enable that.

In response, Dr. Shapiro observed, "If you don't push the boundaries of understanding this world that we are living in . . . without new kinds of understandings of how living beings, living organisms, can survive changes in their environment—we are being, if not short-sighted, then we are being criminal."

One year later, project participants found themselves discussing pandemics one again, but not in a circle around Hoover's Annenberg Conference Room on Stanford campus. Instead, we were all in our own squares, meeting virtually over online videoconferencing, each discussant in his or her spare bedroom—three months after a novel coronavirus became capable of infecting and spreading among humans in Wuhan. The potential threat was known, but we were not prepared for it when it became real.

An early retrospective of the US governance and civil society response to the COVID-19 pandemic of 2020 changes little from these warnings. It has simply made them clearer. We understand that political realities make proactivity—fully preparing for every small-chance, large-impact risk ahead of time—infeasible. No one celebrates the mitigation of the outcome that never occurred. One could say that the American way of dealing with the problem of prioritization is instead to react, swiftly and effectively, to the reality that has been made present to everyone. The whole-of-society approach to the 9/11 attacks exemplifies this sort of mobilization. But the COVID-19 pandemic calls that approach into question for the sorts of risks we see coming over the hinge of history and into the rest of the century: though small circles of experts knew exactly how the problems of a pandemic were likely to unfold, their technical foresight described a scenario so foreign to many of our institutions that once it actually happened, attempts to respond to an unrolling crisis fell flat. It took too long for them to internalize the novel nature of the crisis they faced. This was true across many organs of government. And it highlights the need to not just better prepare for pandemics but better prepare to react to anything, and to be flexible, so as to effectively function while under duress.

The virus shows that we are part of an interconnected world. And a pandemic is a clear example of a problem whose solution would benefit greatly from international cooperation and US leadership. The global response to COVID-19 could have been more effective with better international cooperation—and better US leadership. This is a recurring theme. International cooperation is part of the solution to the transformational challenges before us, including advancing technology, changing demographics, large-scale migration, global warming, and nuclear proliferation, not to mention the potential for infectious diseases far more lethal than COVID-19. Knowledge can lead to assessment of risk and appropriate preparations, and the following (unfortunately needed) sequel to Dr. Trounce's earlier analysis points to steps that we can still take today for a better American recovery from this pandemic—and resilience against other health crises that are sure to come. Informed US leadership here is crucial at this time in our history.

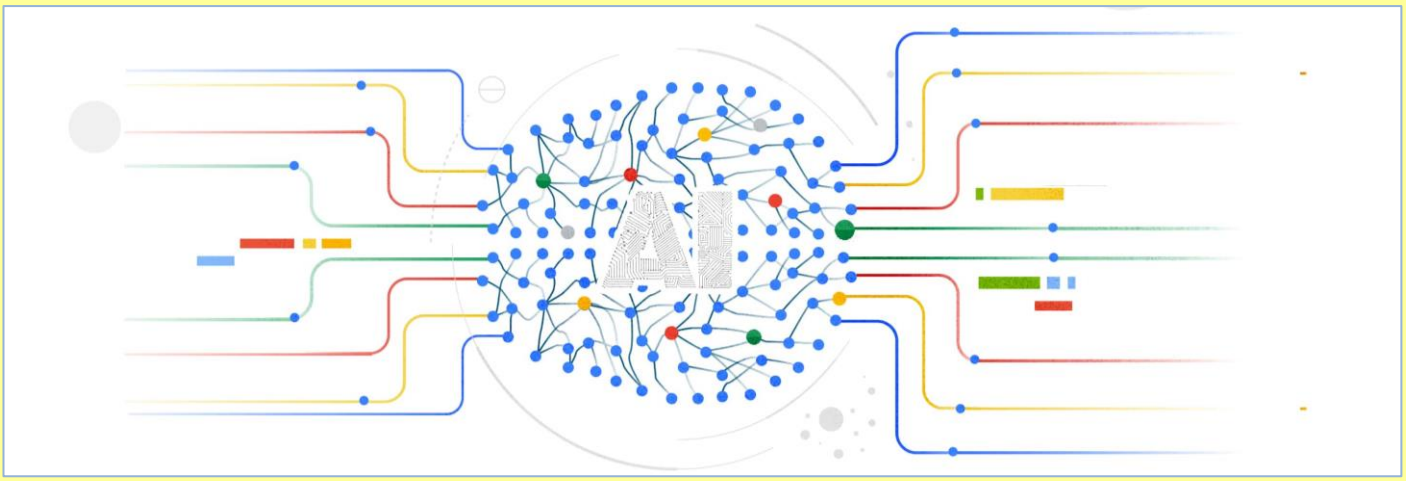
Dr. Milana Boukhman Trounce *is a clinical professor at the Stanford University School of Medicine and an emergency medicine physician. She serves as biosecurity chair for the American College of Emergency Physicians.*
George P. Shultz *is the Thomas W. and Susan B. Ford Distinguished Fellow at the Hoover Institution, where he leads the project on Governance in an Emerging New World. From 1982 to 1989 he served as the 60th US secretary of state.*

Google Cloud AI and Harvard Global Health Institute Collaborate on new COVID-19 forecasting model

Source: https://gweb-cloudblog-publish.appspot.com/products/ai-machine-learning/google-cloud-is-releasing-the-covid-19-public-forecasts/amp/

Aug 03 – The COVID-19 pandemic has had a tremendous impact on the world, from changing the way we live to driving extraordinary acts of human compassion. Nowhere have both the disruption and perseverance been more evident than among the front-line workers who continue to respond tirelessly.

In partnership with the Harvard Global Health Institute, Google Cloud is releasing the COVID-19 Public Forecasts to serve as an additional resource for first responders in healthcare, the public sector, and other impacted organizations preparing for what lies



ahead. These forecasts are available for free and provide a projection of COVID-19 cases, deaths, and other metrics over the next 14 days for US counties and states.

The COVID-19 Public Forecasts are trained on public data such as those from Johns Hopkins University, Descartes Lab, and the United States Census Bureau and will continue to be updated with guidance from the Harvard Global Health Institute.

"The COVID-19 Public Forecasts model produces forecasts at the critical jurisdiction of public health action—the county. Coupled with the work of the Harvard Global Health Institute's county-level COVID-19 Suppression Metrics, the COVID-19 Public Forecast Model will allow for targeted testing and public health interventions on a county-by-county basis. By providing accurate, timely predictions of cases, infections, hospitalizations, and deaths to both policy makers and the general public, it will enhance our ability to understand and respond to the rapidly evolving COVID-19 pandemic," said Dr. Thomas Tsai, surgeon and health policy researcher in the Department of Surgery at Brigham and Women's Hospital and in the Department of Health Policy and Management at Harvard T.H. Chan School of Public Health.

Alongside other data sources, the COVID-19 Public Forecasts can be a helpful resource for those at the front lines of responding to this pandemic who are seeking to better understand and prepare for the progression of COVID-19 in their region. For example, healthcare providers can incorporate the forecasted number of COVID-19 cases as one datapoint in resource planning for PPE, staffing, and scheduling. Similarly, state and county health departments can use the forecast of infections over the next two weeks to help inform their testing strategy and help identify areas at risk of new outbreaks.

"As healthcare providers, the ability to ever more accurately predict the evolution of this pandemic is vital to our ability to prepare for, and manage, the COVID-19 crisis," said Dr. Edmund Jackson, Chief Data Officer at HCA Healthcare. "Having Google bring their unique compute and AI prowess to better answering this question is enormously helpful. We are excited to be part of this work."

To generate the COVID-19 Public Forecasts, Google Cloud researchers developed a novel time series machine learning approach that combines AI with a robust epidemiological foundation. By design, this new model is trained on public data and leverages an architecture that allows researchers to dive into the different relationships that the model has learned to better interpret why it makes certain forecasts. We hope that these measures not only help the public understand how the model works, but can also enable further innovation in infectious disease modeling.

The COVID-19 Public Forecasts are free to query in BigQuery or to download as CSVs (state forecast CSV and county forecast CSV). Additionally, they are available through our Data Studio dashboard and as part of the National Response Portal. We are also publishing a full explanation of the novel methodology and the datasets used in our White Paper and User Guide. As with any forecasts, the COVID-19 Public Forecasts have limitations that should be carefully considered before being used to inform decisions. In order to download or use the forecasts, users must agree to the Google Terms of Service.

Google is committed to a core set of AI principles. In developing the COVID-19 Public Forecasts, we paid close attention to the disproportionate impact the disease has had and how that would impact our adherence to these principles, particularly principle #2: "Avoid creating or reinforcing unfair bias." CDC research has shown that communities of color in the United States have been the hardest hit by COVID-19 with disproportionately high rates of cases and deaths. Our team has conducted a comprehensive fairness analysis to investigate how that disproportionate

impact affects the accuracy of our forecasts and how they should be interpreted. We encourage all users who intend to make decisions in part based on the COVID-19 Public Forecasts to closely review the Fairness Analysis. Additionally, we call for an open dialog among public health officials and the AI community in how to address these inequities and measure how their impact may appear in various AI models.
We are excited to focus Google Cloud's commitment to innovation in AI to help those on the front lines of the COVID-19 response. Learn more about the COVID-19 Public Forecasts from our User Guide and White Paper, or get started with the data now in BigQuery, Data Studio dashboard, the National Response Portal, or via the CSV data (state, county).

Common Colds May Have 'Primed' Some People's Immune Systems For COVID-19

Source: https://www.sciencealert.com/common-colds-may-have-primed-some-people-s-immune-systems-for-covid-19

Aug 07 – **A cold you got years ago may prove helpful if your body has to fight the new coronavirus.**
According to a study published Tuesday, some people who've never been exposed to the new coronavirus may nonetheless have T cells that react to it. Scientists think that's because those cells previously learned how to identify and fight coronaviruses that cause common colds.
A type of white blood cell, T cells are a crucial part of the body's defence against a virus: They identify and destroy infected cells while also informing B cells about how to craft new antibodies. When you're infected, your immune system generates both antibodies and these white blood cells.
Antibody levels can drop in the months following an infection, but memory T cells stick around for years and can help mount another attack should the same virus ever return.
Recent research suggests that T cells that remember how to fight other coronaviruses may give people an immunological head start against the new coronavirus.
"This could help explain why some people show milder symptoms of disease while others get severely sick," Alessandro Sette, a coauthor of the new study, said in a press release. He cautioned, though, that it's too soon to tell whether that preexisting immunological memory affects COVID-19 patients' outcomes.

Some T cells recognise the new coronavirus without having seen it before
Sette's team analysed blood samples collected between 2015 and 2018 from 25 people who, of course, had never had COVID-19. They found that those unexposed individuals had memory T cells that could recognise both the new coronavirus and the four types of common cold coronaviruses.
Those findings built on research Sette published in May, in which he described 10 people who had never been exposed to the new coronavirus yet had helper T cells capable of identifying and responding to it.
He also did a larger analysis looking at data from cohorts in the US, Netherlands, Germany, Singapore, and the UK, and concluded that white blood cells from 20 percent to 50 percent of unexposed people significantly react to the new coronavirus.
"Preexisting immune reactivity exists to some degree in the general population," Sette wrote in the analysis.
Two other recent studies offer even more evidence for this conclusion.
The first, published last month, found that among 68 healthy Germans who'd never had COVID-19, more than one-third had T cells that reacted to the virus. The second, published in the journal *Nature*, found that more than half of a group of 37 healthy people who had never gotten COVID-19 had memory T cells that could recognise the new coronavirus.
The *Nature* study also examined 23 people who'd survived SARS – which is a coronavirus, too – and found that they still had SARS-specific memory T cells 17 years after getting sick. Those same T cells could recognise the new coronavirus as well.

People with cross-reactive T cells might mount a faster immune response
The likeliest explanation for these observations is a phenomenon called cross-reactivity: when T cells developed in response to one virus react to a similar, but previously unknown, pathogen.
That can give the immune system a leg up.
"You're starting with a little bit of an advantage – a head start in the arms race between the virus that wants to reproduce and the immune system wanting to eliminate it," Sette previously told Business Insider.

In the absence of cross-reactive T cells, your body has to mount its defence from scratch – which could impact how expediently your immune system can respond to the invading virus. Varying levels of cross-reactivity might therefore "translate to different degrees of protection," Sette said.
"Having a strong T cell response, or a better T cell response may give you the opportunity to mount a much quicker and stronger response," he added.

Most of the coronavirus tests the U.S. does are worthless. But there's a solution that could actually work — and stop the spread.

Source: https://news.yahoo.com/most-of-the-coronavirus-tests-the-us-does-are-worthless-but-theres-a-solution-that-could-actually-work-and-stop-the-spread-154815346.html?.tsrc=daily_mail&uh_test=2_04

Aug 06 – To stop its raging coronavirus outbreak, which is currently spreading at a rate of about 60,000 new cases per day, the United States can do one of two things.
Either it can lock everybody down completely — or it can test everybody constantly.
The lockdown approach works because if infected people can't get close to noninfected people, the chain of transmission is broken, even if we don't know who is actually infected.
The testing approach works because it lets us identify infected people and isolate them from noninfected people without forcing everybody else to stay home.
The problem with lockdowns, however, is that after enduring a big national one this spring — and suffering the economic fallout with little to show for it — Americans have zero appetite for even targeted, localized sequels.
That leaves testing.
Unfortunately, the latest data shows that testing is falling across much of the U.S. According to Johns Hopkins University, the average number of COVID-19 tests conducted per 1,000 people declined in the past week in 30 states — more than half the country. Nationally, the average number of daily tests dropped by 8.75 percent during the same period, from 822,470 on July 29 to 750,517 on Aug. 4.
And while a few of the states where testing has slipped have been affected by Hurricane Isaias, most haven't. Most are states — 22 in all — where a high percentage of COVID-19 tests are still coming back positive, which indicates they're not casting a wide enough net to track (and control) their outbreaks.
In short, although President Trump is correct that the U.S. has conducted more tests than any other country, it's not testing enough, given the scale of its outbreak. And the testing it is doing, for reasons we'll explain, isn't helping as much as it should.
The good news is that there might be a simple solution: new tests that prioritize speed over sensitivity.
Storms aside, the main reason U.S. testing is going down instead of up is that the type of testing we're doing — PCR (polymerase chain reaction) — seems to have reached its limit. PCR tests are the gold standard for diagnosing COVID-19, and rightly so: They correctly identify more than 98 percent of positive cases.
But they're also slow, and getting slower. As the virus spreads, more and more potentially exposed Americans are demanding tests, forcing overwhelmed U.S. labs to compete with other countries for the supplies required to process so many samples. Often, labs run out. As a result, crippling backlogs have been delaying test results for so long they've essentially become worthless.
According to a new national survey by researchers from Harvard University, Northeastern University, Northwestern University and Rutgers University, Americans tested for COVID-19 in July reported waiting an average of four days for their results. About 10 percent of people reported waiting 10 days or more.
Yet public health experts say results that take more than 24 to 48 hours to arrive defeat the purpose of testing. By the time people get a positive result, they may have already infected others. By the time they get a negative result, they may have been infected by others.
Americans seem to be getting the message. "Long wait times and long turnaround times means people are just giving up," Dr. Ashish Jha, director of the Harvard Global Health Institute, tweeted Tuesday.
The collapse of U.S. testing has, in short, exposed its fatal flaw. Costly and cumbersome PCR tests are fine when an outbreak is relatively modest; in that situation, you can afford to invest in a slower, labor-intensive test that won't miss any positive cases because you want to stop the virus from spreading before it's too late.
But when it's already too late — when more than 4.8 million infections have been reported and nearly 160,000 people have died — the PCR infrastructure can't keep up.

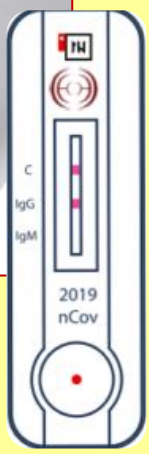
That's why experts such as Dr. Michael Mina, an assistant professor of epidemiology at both Harvard Medical School and the Harvard T.H. Chan School of Public Health, are suggesting we scrap it and start over.

"We need to change the whole script of what it means to test people," Mina recently explained.

Imagine a $1, at-home, paper-based test that's as easy to distribute and use as a pregnancy test. Imagine waking up in the morning, adding saliva or mucus to a tube of chemicals, waiting 15 minutes, dipping a paper strip in the tube and reading your results — instantly.

Now imagine every single person in America doing this every couple of days.

So-called **rapid antigen tests** aren't science fiction. In fact, they already exist. Two such tests, made by BD and Quidel, have received emergency authorization from the Food and Drug Administration, though both still require instruments to run. (The governors of six states announced this week a joint bid to purchase a total of 3.5 million of these antigen tests.) Another $1 antigen test has been put to use in Senegal. And U.S. companies such as E25Bio and Sherlock Biosciences have developed at-home tests as cheap and easy as the one described above.



These are not the same thing as the antibody tests you might have heard of, which detect virus-fighting substances in the blood of people who were infected previously (and may therefore have immunity). Rapid antigen tests are meant to detect ongoing, active infections.

So why isn't the U.S. government mass-producing antigen tests and distributing them freely to everyone? The major hurdle, so far, has been what news stories tend to describe as "accuracy." But "sensitivity" is a better way to think about it.

PCR tests make thousands of copies of the virus's RNA and thus can detect it at very low levels. Antigen tests rely on a molecule that binds to the coronavirus's protein spikes; at very low levels of infection, there may not be enough viral particles in a sputum sample to trigger a positive result.

The fear is that if we rely on antigen tests, we'll miss many cases. But there are two reasons this fear may be unfounded.

The first is that we're already missing tons of cases. According to CDC antibody data, our current PCR system is testing only enough people to detect about 10 percent of the total number of infections. "If everyone took an antigen test today — even identifying only 50 percent of the positives — we would still identify 50 percent of all current infections in the country," Jha has explained. That's "five times more than the 10 percent of cases we are likely currently identifying because we are testing so few people."

The second is that the amount of coronavirus in the body increases exponentially in the early days of infection. At first, during the incubation period, no test would be sensitive enough to detect it. About three to five days later, a PCR test would pick it up. After another eight to 24 hours, according to Mina, a rapid antigen test would show a positive result.

So, the question isn't *whether* an antigen test would detect an infection. It's *when*.

This is a crucial distinction. Say the PCR test delivers a positive on day four, and the antigen test delivers a positive on day five. As best as experts can tell, both day four and day five are before or near the beginning of the window when people can transmit the virus to others. But if the person who takes the PCR test doesn't find out whether he or she is positive until day eight, or even day 14, while the person who takes the antigen test finds out on day five, the antigen test is far more useful for stopping the spread of the virus, even though it's less sensitive.

What if your viral load was too low on day five for the antigen test to detect it? Your infection probably wouldn't be very transmissible yet. Then the next test you take, on day seven, would pick it up. And the person who took the PCR test still wouldn't have the results.

"The vast majority of PCR positive tests we currently collect in this country are actually finding people long after they have ceased to be infectious," Mina recently explained. "All we're

doing with all of this testing is clogging up the testing infrastructure, and essentially finding people for whom we can't even act because they are done transmitting."
Current FDA guidelines stipulate that any new coronavirus test vying for emergency clearance must perform nearly as well as a PCR test. But as fall approaches — and with it colder weather, increased indoor activity, a return to school and the potential for even larger waves of infection — the time may have come to rethink those regulations.
Rapid antigen tests have their challenges. Equitable distribution on a mass scale would probably require billions of dollars in government investment; cheap and easy at-home tests would work only if everyone takes them conscientiously.
But experts say they're starting to make more sense than the status quo.
"If you had asked me this a couple months ago, I would have said we just need to be doing the PCR tests," Susan Butler-Wu, a clinical microbiologist at the University of Southern California, told the New York Times Wednesday. "But we are so far gone in this country. It is a catastrophe. It's kitchen sink time."

Some Coronavirus Patients Are Getting Rashes, And It May Signal Underlying Issues

Source: https://www.sciencealert.com/some-coronavirus-patients-are-getting-rashes-and-that-s-not-something-to-take-lightly

Aug 08 – Patients with severe coronavirus may experience rashes and lesions indicative of underlying blood clots, a new report suggests.
In the paper, published in *JAMA Dermatology* Wednesday, researchers described four New York City patients who were intubated with severe coronavirus and had skin complications.
All experienced "acral fixed livedo racemosa", or discolored, sometimes broken skin on the extremities, and "retiform purpura", or uneven skin lesions caused when red blood cells leak into the skin, according to the researchers from from New York-Presbyterian/Weill Cornell Medical College.
The two complications are "hallmark manifestations" of skin blood clots, they wrote.

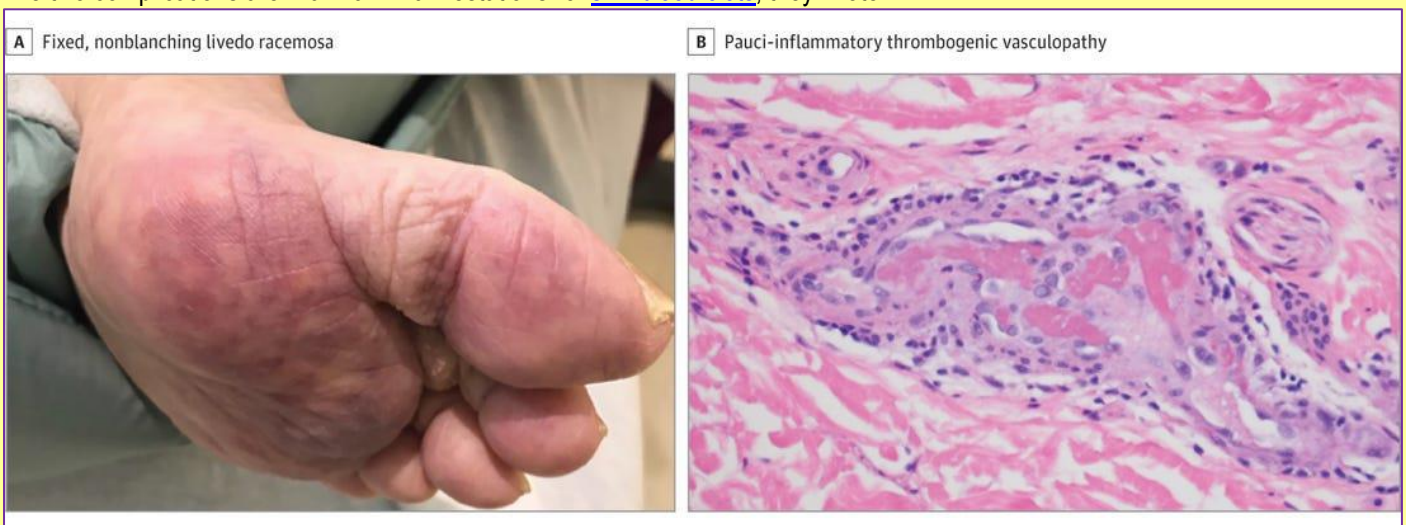


Image courtesy of JAMA Network®
© 2020 American Medical Association

Indeed, even though all patients received therapy to help prevent blood clots when they were admitted, all developed clots in their skin and were thought to have pulmonary embolisms, or an artery blockage in the lung.
It's unclear if or when the patients were discharged.
The researchers weren't able to identify exactly when the rashes first appeared and didn't use the type of imaging they'd like in order to spare staff exposure.
But the findings are a lesson to other healthcare professionals to take skin manifestations as a potential sign of abnormal underlying blood clots, which can lead to strokes, heart attacks, pulmonary embolisms, and other potentially fatal complications.

The list of coronavirus manifestations continues to grow

The paper is far from the first to note the coronavirus may cause complications in the skin, with patients reporting "COVID toes", or purple, swollen toes that look like they have been frostbitten, early on.

In a Facebook group for coronavirus patients and survivors, people have reported fluid-filled blisters, full-body rashes, hives, red and purple spots, patches of skin that burn, chicken-pox like bumps, and more.

In some of these cases, the skin changes may be due to blood clotting in the skin's small blood vessels.

The skin is just one of the organs that can populate with blood clots, a common denominator among some of the most poorly understood and dangerous coronavirus symptoms.

In fact, blood clots were found in "almost every organ" of coronavirus patients' autopsies, a NYU pathologist said.

Skin abnormalities are among the growing list of non-respiratory ways the coronavirus seems to manifest

Doctors are increasingly understanding that the coronavirus is far from "only" a respiratory condition.

While the Centres for Disease Control and Prevention's list of potential symptoms slowly grows, including issues like hair loss and clogged ears, a recent survey of more than 1,500 patients found hundreds reporting other complications ranging from dizziness to flashes of light in vision to weight gain to nerve sensations.

The wide-ranging ways the disease appears to manifest starkly sets it apart from any other virus Dr Anthony Fauci has seen in his 40 years, the infectious disease expert said in a webinar hosted by US News & World Report last week.

"I've never seen anything that has such a broad range of manifestations from a certain percentage of people," he said, noting that up to 40% have no symptoms, many have minor symptoms, some get hospitalized, and some die.

"You go from nothing to death," he said. "It's very, very unusual."

Simple New Experiment Reveals Which Face Masks Are Best at Blocking Droplets

Source: https://www.sciencealert.com/simple-low-cost-experiment-reveals-which-face-masks-are-best-at-blocking-droplets

The masks tested. (Fischer et al., Science Advances, 2020)

Aug 10 – We know that by wearing masks, we can help reduce the transmission of COVID-19, and we know that not every type of face mask is equally good at blocking viral droplets when we cough, sneeze, talk – or even simply breathe. But how can we really know for sure?

Aside from simply believing manufacturers' claims, if you wanted to somehow test different masks against one another to compare how much protection they offer in the real world, how would you go about it?

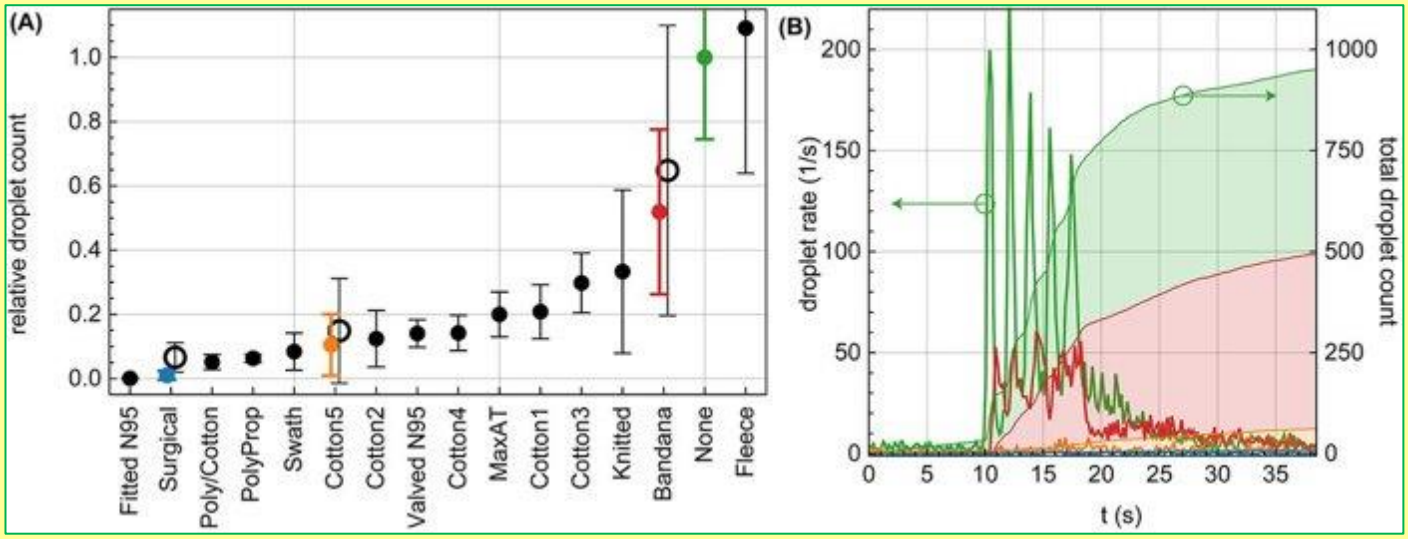
New research from scientists at Duke University shows you don't actually need all that much to devise a test. In a proof-of-concept study, they cobbled together a simple, low-cost laser device, and conducted an experiment comparing 14 different types of masks and face coverings.

"The fundamental question is, how well does a specific mask type prevent droplets from spreading," lead researcher and molecular imaging specialist Martin Fischer says in a press Q&A.

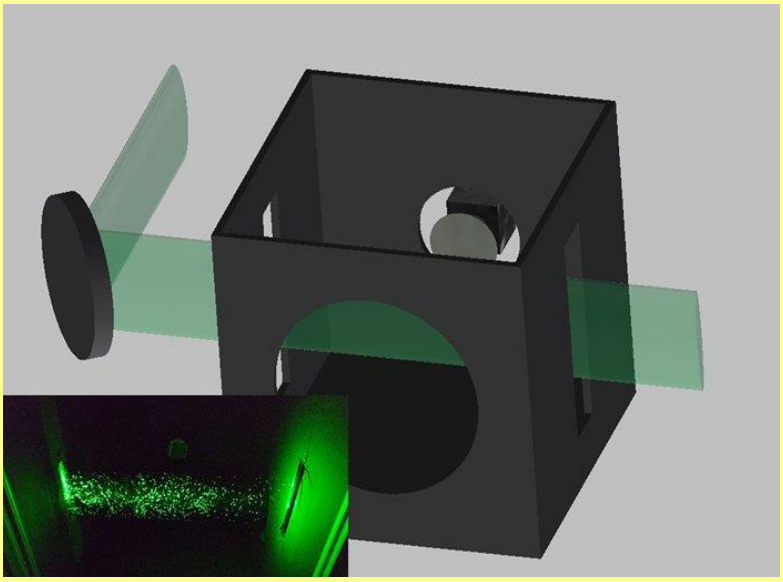
The question is particularly relevant in the coronavirus pandemic, given many people have taken to buying fabric masks online, or making their own masks at home.

While the general consensus from experts is that all of these kinds of loose-fitting masks should help reduce COVID-19 transmission – which is why face coverings are mandated in many places around the world right now – most of the mask testing to date has been done

on things like surgical masks and fitted N95 masks, and not on loose fabric masks or face coverings.
"Surgical masks are commonly worn by medical personnel and have received a fair amount of testing in clinical settings," Fischer says.
"But as far as we know, there was no quick, easy, and cost-effective way to demonstrate the effectiveness of such a wide variety of other mask types."
To fill that void, Fischer and his team devised an easy-to-make, inexpensive laser experiment, which can be used to test how different kinds of masks block tiny droplets that come out of people's mouths when they speak.
In the experimental setup, a lens turns an optical laser into a sheet of light. This light sheet, shone through a dark enclosure (made up of cardboard sheets and duct tape), reveals when droplets pass through it, with the results being filmed by a mobile phone camera.
In experiments, people would speak toward the sheet of light, saying the phrase "Stay healthy, people", while wearing 14 different kinds of face masks and coverings.
"We confirmed that when people speak, small droplets get expelled, so disease can be spread by talking, without coughing or sneezing," Fischer says.
"We could also see that some face coverings performed much better than others in blocking expelled particles."



Droplet count results for each mask. (Fischer et al., Science Advances, 2020)



The results showed that fitted N95 masks blocked the greatest number of droplets released by the person speaking, followed by surgical masks, then masks made with polypropylene.
However, all sorts of other masks, including cotton masks and even knitted ones, showed an ability to block droplets, as did a valved version of the N95 mask, which didn't score as well as the fitted N95 mask due to its exhaust valve.
"These valves are closed when breathing in, but can open when speaking, hence letting out unfiltered air," Fischer says.

A schematic of the experimental setup. (Fischer et al., Science Advances, 2020)

"In other words, they do a great job of protecting the wearer from the outside environment, but a bad job of protecting others

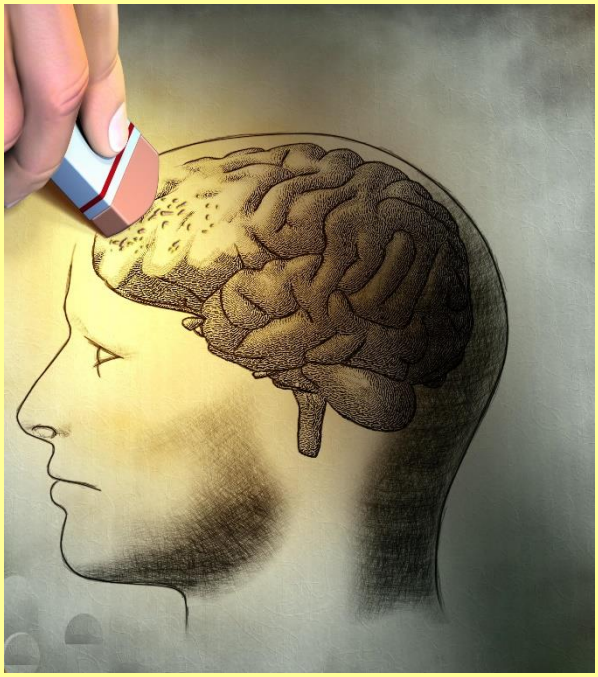
from the wearer, and it is the second role that is the important one to reduce COVID-19 spread."
Most surprising, however, were the results at the bottom of the table. In terms of blocking droplets, bandanas were among the less effective, but worst of all is wearing a neck fleece, which the researchers found is actually *worse* than not wearing any kind of facial covering.
That sounds counter-intuitive – and likely warrants further examination – but the researchers think the neck fleece actually makes droplets proliferate in the air.
"Common sense would dictate that wearing anything is better than wearing nothing – this was not the case here," Fischer says.
"We observed that the number of droplets increased when the speaker put on the neck fleece. We believe that the material of our fleece breaks down large droplets emitted during speaking into several smaller ones. This could make wearing such a mask counterproductive, since smaller droplets have an easier time being carried away by air currents and endangering nearby persons."
Of course, the researchers are eager to emphasise that the focus of the study is actually the low-cost testing method they developed, not their own test results of which masks are the most and least effective – as the same kind of testing could be conducted more robustly and more systematically than in the proof-of-concept study here.
That said, their own testing is certainly food for thought, highlighting again that not every mask is equal, and if you really want to protect other people and help to reduce the spread of coronavirus, you really need to think about what you're putting on your face.

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

COVID-19 Could Increase Risk of Memory Loss. Here's What We Know

By Natalie C. Tronson
Source: https://www.sciencealert.com/covid-19-might-increase-the-risk-of-memory-loss-and-cognitive-decline

Aug 10 – Of all the frightening ways that the SARS-CoV-2 virus affects the body, one of the more insidious is the effect of COVID-19 on the brain.



It is now clear that many patients suffering from COVID-19 exhibit neurological symptoms, from loss of smell, to delirium, to an increased risk of stroke.
There are also longer-lasting consequences for the brain, including myalgic encephalomyelitis /chronic fatigue syndrome and Guillain-Barre syndrome.
These effects may be caused by direct viral infection of brain tissue. But growing evidence suggests additional indirect actions triggered via the virus's infection of epithelial cells and the cardiovascular system, or through the immune system and inflammation, contribute to lasting neurological changes after COVID-19.
I am a neuroscientist specializing in how memories are formed, the role of immune cells in the brain and how memory is persistently disrupted after illness and immune activation.
As I survey the emerging scientific literature, my question is: Will there be a COVID-19-related wave of memory deficits, cognitive decline and dementia cases in the future?

The immune system and the brain
Many of the symptoms we attribute to an infection are really due to the protective responses of the immune system. A runny nose during a cold is not a direct effect of the virus, but a result of the immune system's response to the cold virus.
This is also true when it comes to feeling sick. The general malaise, tiredness, fever and social withdrawal are caused by activation of specialized immune cells in the brain, called neuroimmune cells, and signals in the brain.

These changes in brain and behavior, although annoying for our everyday lives, are highly adaptive and immensely beneficial. By resting, you allow the energy-demanding immune response to do its thing.
A fever makes the body less hospitable to viruses and increases the efficiency of the immune system. Social withdrawal may help decrease spread of the virus.
In addition to changing behavior and regulating physiological responses during illness, the specialized immune system in the brain also plays a number of other roles.
It has recently become clear that the neuroimmune cells that sit at the connections between brain cells (synapses), which provide energy and minute quantities of inflammatory signals, are essential for normal memory formation.
Unfortunately, this also provides a way in which illnesses like COVID-19 can cause both acute neurological symptoms and long-lasting issues in the brain.
During illness and inflammation, the specialized immune cells in the brain become activated, spewing vast quantities of inflammatory signals, and modifying how they communicate with neurons.
For one type of cell, microglia, this means changing shape, withdrawing the spindly arms and becoming blobby, mobile cells that envelop potential pathogens or cell debris in their path. But, in doing so, they also destroy and eat the neuronal connections that are so important for memory storage.
Another type of neuroimmune cell called an astrocyte, typically wraps around the connection between neurons during illness-evoked activation and dumps inflammatory signals on these junctions, effectively preventing the changes in connections between neurons that store memories.
Because COVID-19 involves a massive release of inflammatory signals, the impact of this disease on memory is particularly interesting to me. That is because there are both short-term effects on cognition (delirium), and the potential for long-lasting changes in memory, attention and cognition.
There is also an increased risk for cognitive decline and dementia, including Alzheimer's disease, during aging.

How does inflammation exert long-lasting effects on memory?
If activation of neuroimmune cells is limited to the duration of the illness, then how can inflammation cause long-lasting memory deficits or increase the risk of cognitive decline?
Both the brain and the immune system have specifically evolved to change as a consequence of experience, in order to neutralize danger and maximize survival. In the brain, changes in connections between neurons allow us to store memories and rapidly change behavior to escape threat, or seek food or social opportunities.
The immune system has evolved to fine-tune the inflammatory response and antibody production against previously encountered pathogens.
Yet long-lasting changes in the brain after illness are also closely linked to increased risk for age-related cognitive decline and Alzheimer's disease. The disruptive and destructive actions of neuroimmune cells and inflammatory signaling can permanently impair memory.
This can occur through permanent damage to the neuronal connections or neurons themselves and also via more subtle changes in how neurons function.
The potential connection between COVID-19 and persistent effects on memory are based on observations of other illnesses. For example, many patients who recover from heart attack or bypass surgery report lasting cognitive deficits that become exaggerated during aging.
Another major illness with a similar cognitive complications is sepsis – multi-organ dysfunction triggered by inflammation. In animal models of these diseases, we also see impairments of memory, and changes in neuroimmune and neuronal function that persist weeks and months after illness.
Even mild inflammation, including chronic stress, are now recognized as risk factors for dementias and cognitive decline during aging.
In my own laboratory, I and my colleagues have also observed that even without bacterial or viral infection, triggering inflammatory signaling over a short-term period results in long-lasting changes in neuronal function in memory-related brain regions and memory impairments.

Does COVID-19 increase risk for cognitive decline?
It will be many years before we know whether the COVID-19 infection causes an increased risk for cognitive decline or Alzheimer's disease. But this risk may be decreased or mitigated through prevention and treatment of COVID-19.

Prevention and treatment both rely on the ability to decrease the severity and duration of illness and inflammation. Intriguingly, very new research suggests that common vaccines, including the flu shot and pneumonia vaccines, may reduce risk for Alzheimer's. Additionally, several emerging treatments for COVID-19 are drugs that suppress excessive immune activation and inflammatory state. Potentially, these treatments will also reduce the impact of inflammation on the brain, and decrease the impact on long-term brain health.
COVID-19 will continue to impact health and well-being long after the pandemic is over. As such, it will be critical to continue to assess the effects of COVID-19 illness in vulnerability to later cognitive decline and dementias.
In doing so, researchers will likely gain critical new insight into the role of inflammation across the life-span in age-related cognitive decline. This will aid in the development of more effective strategies for prevention and treatment of these debilitating illnesses.

***Natalie C. Tronson** is Associate Professor of Psychology, University of Michigan.*

4 Israeli inventions that purify the air of Covid-19

Source: https://www.israel21c.org/four-israeli-inventions-that-can-help-clean-the-air-of-covid-19/

July 20 – Remember when pollution was our worst respiratory worry? Now, scientists say airborne virus particles may be the main cause of Covid-19 infections.
In the face of new evidence, the World Health Organization has changed its tune about the virus not being transmitted through air.
"WHO, together with the scientific community, has been actively discussing and evaluating whether SARS-CoV-2 may also spread through aerosols … particularly in indoor settings with poor ventilation," the agency announced July 9.
Simply improving ventilation isn't always possible or adequate. And although a new American study found that covering the nose and mouth can decrease risk of SARS CoV-2 infection by 65 percent, many people resist wearing facemasks.
The ultimate answer could be one or more of these Israeli high-tech solutions to cleanse indoor air from dangerous pathogens.

ProtectAir

The ProtectAir device continuously releases minute amounts of chlorine dioxide. Photo: courtesy

This device sterilizes indoor air by slowly releasing chlorine dioxide (ClO_2) in tiny amounts– far below the approved level of ClO_2indrinking water.
"Chlorine dioxide is powerful against viruses and other types of germs because only a very small amount deactivates the virus as soon as it gets on one of its outer spikes. It doesn't need to go into the core of the virus to kill it," explains ProtectAir cofounder Tsvi Dahan.
"The efficiency is therefore very high. And it's safe because it doesn't go into the body. It stops on the spike."
The small device can be mounted on a wall or placed on a surface and doesn't need electricity, Wi-Fi or batteries. "For a very big space you might put four or five units," Dahan says.
It comes with a sachet of granules to place inside. Refills are needed about every four weeks. An optional upgrade is a gel that's a little more powerful for a large area and lasts a longer time.
"Opening the package activates the granules or the gel. By nature, chlorine dioxide vaporizes and oxidizes quickly. But ProtectAir's formulation allows it to be released gradually and uniformly."
ProtectAir was tested for efficacy against SARS-CoV-2 at Israel's Amnilabs and has undergone safety testing in Israel and overseas.
"Two hours after you put it in the room, the air is sterilized and continues to be sterilized for three to four weeks. You don't need to do anything to activate it if a person sneezes or coughs."
The system was invented by Tsvi's brother, Meir Dahan, who was a specialist in machine and water purification for 15 years at Soreq Nuclear Research Center.
"This is where he got to know ClO_2. Most companies use it in liquid form to purify water, but he knew it could purify air also. When news about the coronavirus began in December, Meir

thought about how to use it differently. He worked with one of the producers to make it release into the air consistently, 24/7, for a period of a month or so."

Sales are beginning in Israel. "We are speaking with government ministries to get ProtectAir units in public transportation, schools, and government offices," says Dahan. "We are also speaking with an Israeli company about marketing it globally."

AuraAir

Aura Air's filtration and disinfection device. Photo: courtesy

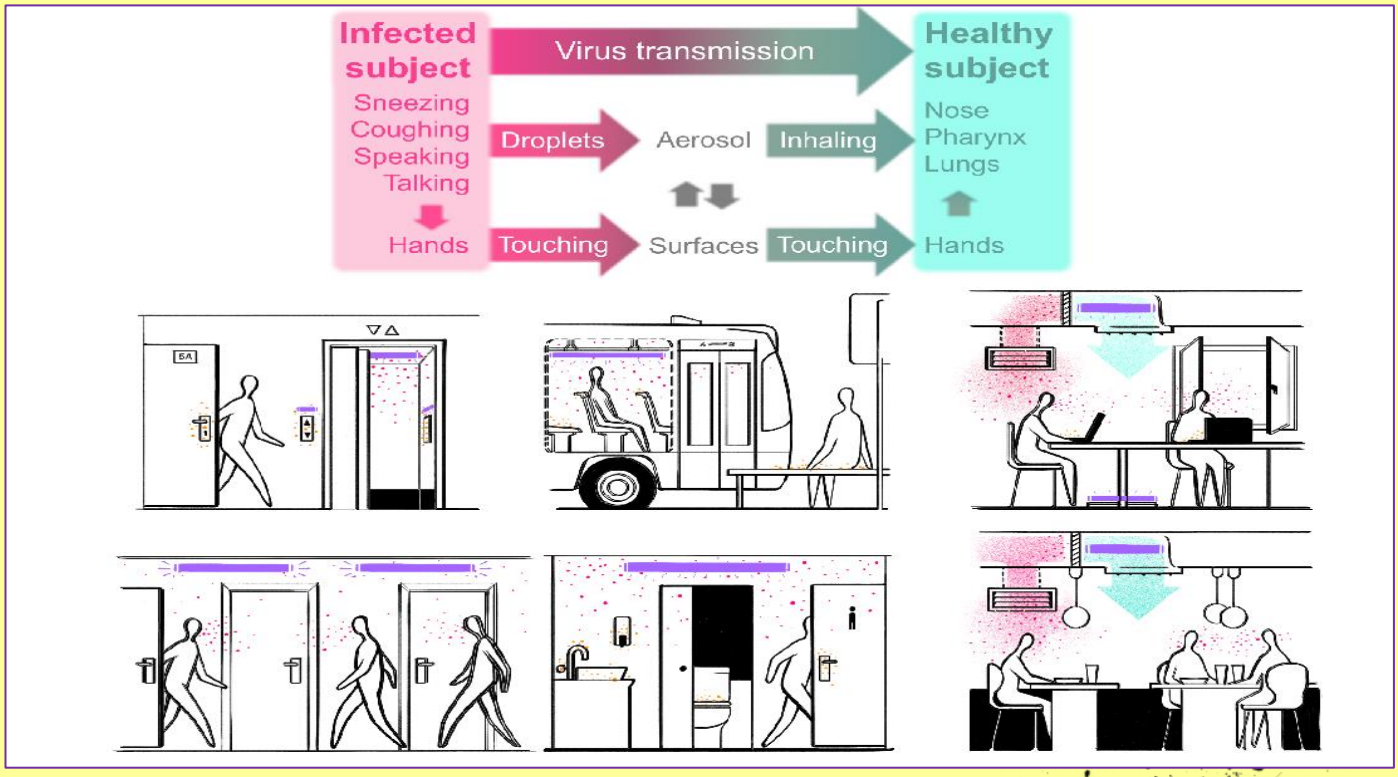
Israeli startup Aura Air has completed two phases of a pilot at Sheba Medical Center to check the efficacy of its air filtration and disinfection system.

Aura Air's device senses contaminants and filters out tiny particles of bacteria, viruses, pollen, mold, fungi and other particulates.

The system uses a carbon- and copper-infused "Ray" filter, a HEPA (high efficiency particulate air) filter, a pre-filter and ultraviolet UVC LEDs. It also generates positive and negative ions to freshen indoor air. In previous lab experiments, the system demonstrated an average of 99 percent effectiveness against influenza viruses. "We started the collaborative work with Sheba in an effort to reduce contaminants in the hospital, and then the coronavirus arrived," said Roy Friedberg, vice president of Aura Air. "Now we are focusing on purifying and disinfecting the air from severe viruses, including the coronavirus." Aura Air was tested in a hotel, a conference room in a commercial building and a residential apartment in the United States that showed significant improvements in air quality. The company is conducting other tests in collaboration with Israeli strategic partner Beth-El Industries, which makes advanced air filtration systems for the civilian and military sectors worldwide.

Aura Air has received a $1.5 million grant from the Israel Innovation Authority and expects EU funding, said Friedberg. "The goal is to target solutions for closed-space infections in general, and the coronavirus in particular."

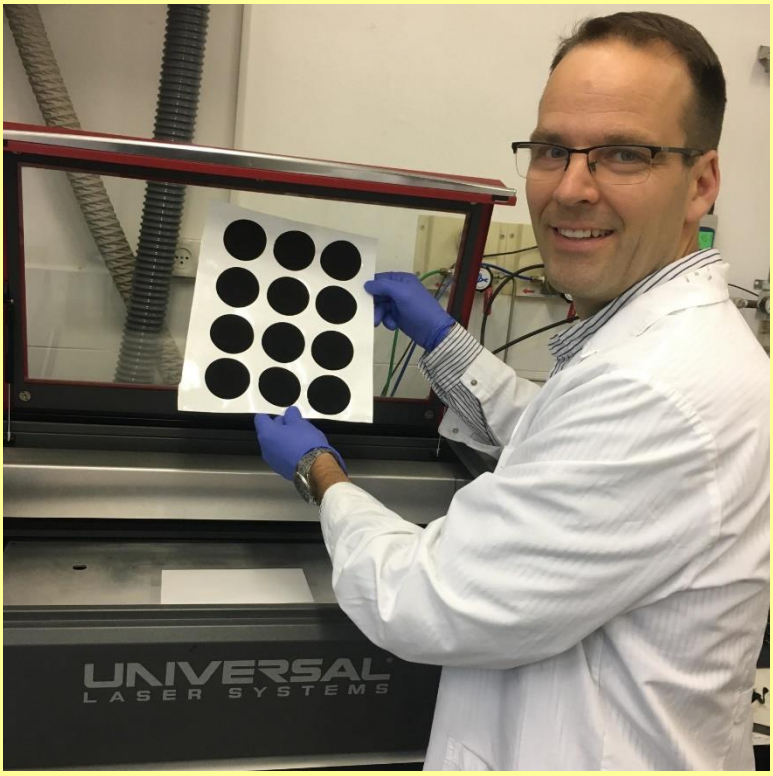
Ultraviolet-C light



Pathways of viral infection in everyday life. Placement of UV-C light sources at ventilation systems and rooms not in use, without direct optical paths to humans, help reduce virus propagation. Image sketches by Nacho Gaubert

Ultraviolet C (UVC) light, a known disinfectant, could be a "particularly efficient, easily deployable, and economically affordable" way to inactivate the coronavirus in indoor air, says a team of international scientists including Prof. Ido Kaminer of the Technion-Israel Institute of Technology.
The scientists suggest a global capital investment in UVC sources — such as fluorescent lamps, microcavity plasmas and LEDs on the inside of the ventilation systems of buildings and in shared indoor spaces – would quickly deactivate airborne and surface-deposited SARS-CoV-2 viruses.
"The Covid-19 outbreak, caused by the SARS-CoV-2 virus, is posing an extraordinary challenge that requires swift worldwide action for the massive deployment of affordable and ready-to-apply measures to drastically reduce its transmission probabilities in indoor spaces," their report said.
"Doing so will allow for the eventual return to conventional activities such as working at the office, going to school, or even attending entertainment events."

Sterilizing air filters



Ben-Gurion University researcher Dr. Christopher Arnusch is developing a new type of air filter that sterilizes and decontaminates. A new type of air-filter that self-sterilizes and decontaminates is being developed at Ben-Gurion University of the Negev Israel based on water filtration technologies.
The new nanotechnology is derived from laser-induced graphene (LIG) water filters that eliminate viruses and bacteria in water.
This new concept, re-engineered for air-filtration, could be used in heating, ventilation and air-conditioning (HVAC) systems or integrated into facemasks for a self-sterilizing effect. LIG is resistant to bacteria and actively kills microbes and viruses using a low-level electric current from a power source. The researchers explain it's a two-fold protective system. "The bacterial-resistant graphene surface protects against microorganisms so they can't multiply, while the microbes trapped in the filter are eliminated by the electric current," says inventor Chris Arnusch, senior lecturer and researcher at BGU's Zuckerberg Institute for Water Research, part of the Jacob Blaustein Institutes for Desert Research.
"Thus, an LIG air filter has the potential to be combined with state-of-the-art air filtration such as HEPA filters. The filters could add an active layer of protection, as well as prolong the lifetime of the expensive HEPA technology. As a result, hospitals, cars, buildings and public transport could all become safer spaces," said Arnusch. Supported by the BGU Coronavirus Task Force, Arnusch and immunology experts are testing the air filters against viruses.

Hadassah researchers pinpoint source of corona blood clots

Source: https://www.israel21c.org/hadassah-researchers-find-source-of-corona-blood-clots/

June 17 – Researchers around the world have been puzzled by a deadly Covid-19 complication: blood clots that can cause swollen legs, rashes and even sudden death.
More than 30 percent of Covid-19 patients suffer from blood clots, which create lethal blockages in the lungs, kidneys, heart and brain.
Dr. Abd Al-Roof Higazi, head of the Division of Laboratories and Department of Clinical Biochemistry at Hadassah University Medical Center in Jerusalem, has **found the mechanism that causes the clots.**

Higazi and colleagues published a paper last year in the American Society of Hematology journal *Blood* about the peptide **Alpha-defensin**. They discovered that this peptide speeds up the creation of blood clots and prevents their disintegration.
This background helped them understand what was happening to Covid-19 patients because existing anticoagulant drugs don't impact Alpha-defensin.
"We took blood samples from 80 patients in Hadassah's Outbreak Department and found a high concentration of Alpha-defensin," said Higazi. "The sicker the person, the higher the concentration of this peptide."
Higazi and lab manager Suhair Abdeen are working on a new way to dissolve the blood clots. They are testing **colchicine**, an oral medication used for gout and familial Mediterranean fever. It has succeeded in reducing Alpha-defensin levels and blood clots in mice.
They are waiting approval to begin human trials.
Higazi said if the drug can dissolve blood clots in Covid-19 patients, it could vastly reduce the numbers of patients needing respirators. "These patients have numerous blood clots in their lungs, preventing normal blood flow," he explained. "We can also give it to those with mild symptoms to prevent the development of blood clots."

30 Israeli medical innovations to fight coronavirus

Source: https://www.israel21c.org/30-israeli-medical-tech-solutions-to-help-fight-coronavirus/

March 2020 – The coronavirus crisis is first and foremost about people.
People stuck at home, people out of work. People sick with the virus, people caring for them. People canceling dream weddings and vacations, people deciding public-health policies.
Technology is also about people.
Here in Israel, a powerhouse of innovative technology, people are busy inventing and adapting technologies to ease the corona burden.
"Technology has a great role to play in solving and helping us get through this crisis, from diagnosis, mitigation, patient tracking, contamination prevention, and protecting medical staff, to education and exercise for the homebound," says OurCrowd CEO Jon Medved.
As you read below about Israeli medical technologies for the COVID-19 pandemic, remember that each one is about people – people striving to protect themselves, their loved ones and all humankind against this terrible pandemic.

ASSESSING AND DIAGNOSING COVID-19

The economic and logistic limitations of current assessment and testing methods have motivated many Israelis to find better solutions.
BATM is scaling up production of a rapid diagnostic kit that detects coronavirus infection from saliva samples within 50 minutes. The kit is compatible with equipment used to do the current PCR test for diagnosing COVID-19 in a matter of hours.
Diagnostics.ai is working toward complete automation of PCR testing for COVID-19 using artificial intelligence (AI). Now being tested at King's College Hospital NHS London and soon at CLIA labs in the United States, the pcr.ai method would enable doubling the number of samples tested per day without additional staffing needs.
The Defense Ministry's Directorate for Defense Research and Development is working with **Vocalis Health** to identify a unique vocal 'fingerprint' of virus carriers based on voice samples from confirmed coronavirus patients and a control group from the general population. The remote technology also could help monitor recovery of COVID-19 patients.
Researchers from **Technion-Israel Institute of Technology and Rambam Health Care Campus** say they can dramatically increase COVID-19 testing capacity by pooling multiple samples in a single test tube.
MyEleanor, a voice bot and virtual care manager from **MyndYou**, can call individuals or act as a hotline to assess risk, manage symptoms and provide guidance. On each call, AI-driven voice analytics can detect subtle changes in health and trigger proactive interventions.
An app from **K Health** uses AI to give free COVID-19 risk assessment and primary care advice based on US Centers for Disease Control guidelines. Symptomatic or high-risk users may be connected to a physician for a free 14-day chat-based consultation.
Geneyx is working with hospitals in Israel, China and Italy to determine whether certain genetic mutations may lessen or worsen individual COVID-19 infections. The company intends to create a database to help predict the severity of each patient's case.

VocalZoom autonomous sensors for Industry 4.0 applications may be repurposed for noninvasive skin scans to detect possible COVID-19 symptoms in hospitals and mass transit hubs.
RADLogics has adapted its AI-powered medical-image analysis solution to automatically and accurately detect and classify COVID-19 infection in chest CT images of patients believed to be infected. The solution has been deployed in China, Russia and Italy to measure the percentage of affected lung volume.
Air Doctor, an app connecting travelers with local doctors, now offers a constantly updated list of COVID-19 testing sites and regional rules in 42 countries across five continents.

MANAGING COVID-19 PATIENTS

TytoCare's unique modular device and telehealth platform is allowing healthcare organizations in the US, Europe and Israel to remotely examine and monitor potential and actual COVID-19 patients at home and in hospitals. Tyto Care exams of lungs, heart and temperature fully replicate an in-person checkup.
Several hospitals are using software and hardware from **Mittwoch** to enable remote exams and diagnosis of COVID-19 patients using technologies such as Tyto Care devices and digital stethoscopes.
Datos Health introduced a Coronavirus Telemedicine Program for hospitals and HMOs to provide online symptom-checking and video consultations to COVID-19 patients who don't need hospitalization.
The Wearable Vital Sign Monitor from **Biobeat** is providing continuous, noninvasive medical-grade monitoring of blood pressure, oxygen saturation, respiratory rate, heart rate, temperature and other vitals in COVID-19 patients at several Israeli hospitals and at home.
An under-mattress contact-free monitoring solution from **EarlySense** allows hospitals to monitor and analyze COVID-19 patients' breathing patterns for subtle changes and signs of respiratory distress.
The OLO blood analyzer from **Sight Diagnostics** performs rapid automated testing ofCOVID-19 patients' samples using a self-contained cartridge to collect two drops of blood from a venous or finger prick sample. The cartridge is inserted in the OLO unit, which provides full blood count results in minutes via computer vision and AI. (OLO has point-of-care regulatory approval in Europe and Israel but not yet in the United States.)
A TeleICU technology from Clew Medical — now being deployed in two Israeli hospitals and tested in two US facilities — uses AI-based predictive analytics to expand ICU capacity and resources while protecting frontline care workers. It includes AI-based algorithms to identify respiratory deterioration in advance, and machine learning models for proactively managing disease severity and workload.
Sweetch AI-powered mobile health platform, developed for diabetes patients, is enabling remote monitoring, management and intervention for COVID-19 patients with chronic diseases.
Hospitals are using the **RenalSense** Clarity RMS platform to monitor critical COVID-19 patients' urine flow remotely and continuously.
A robotic process automation (RPA) solution from **Kryon** allows for automated reporting of COVID-19 testing results to the Israeli Ministry of Health from Maccabi Healthcare Services, one of Israel's national HMOs. Manual uploading was causing huge backlogs and human errors. The streamlined process is available free of charge to healthcare providers anywhere.

TREATMENTS, VACCINES

"We have no reliable clinical data about any drug useful in reducing severity and mortality" in COVID-19 patients, says Dr. Eyal Leshem, director of geographic medicine at Sheba Medical Center. "Perhaps in several weeks or months we will know what drugs may be useful."
In Israel, about a dozen existing drugs are being tested for their effectiveness alone or combined. Israel-based **Teva Pharmaceutical Industries** is donating millions of its hydroxychloroquine sulfate tablets to US hospitals for testing as a potential treatment for COVID-19.
As for vaccine candidates, "Studies are in various stages and we'll have to wait patiently for safety and efficacy trials to be completed within one to one and a half years," says Leshem.
Antibody therapy, immunotherapy and immunization options are being investigated in many Israeli companies, universities and research institutions.
Kamada is developing a polyclonal immunoglobulin treatment for severely ill COVID-19 patients, using purified blood and plasma samples from recovered patients. Kamada previously developed serums for treating rabies and Zika.
The Israel Institute of Biological Research is working toward a coronavirus vaccine as well as an antibody-based treatment for COVID-19 using plasma from recovered patients.

The treatment is expected to take less time to develop than the vaccine, says Chief Innovation Coordinator Eran Zehavy, who is actively pursuing collaborations with startups.
A poultry coronavirus vaccine under development at **MIGAL Galilee Research Institute** is being reformulated as an oral vaccine against human COVID-19 that could be adapted to future forms of the virus.
CEO David Zigdon says animal trials of MIGAL's human formulation may begin this week. "We are raising money and looking for a GMP (Good Manufacturing Practices) facility to produce our vaccine," he says.
TransAlgae has opened an investment round to support development of an oral algae-based coronavirus vaccine in pill form.
The patented PLX cell product from **Pluristem Therapeutics** is being evaluated at the BIH Center for Regenerative Therapy and the Berlin Center for Advanced Therapies as a potential treatment for respiratory and inflammatory complications associated with COVID-19.
Pepticom is seeking partners to validate and develop peptide drug candidates to inhibit proteins in the novel coronavirus.
Intubation and mechanical ventilation of critically ill COVID-19 patients is invasive, expensive and can damage the lungs.
Inspira is developing a disposable alternative for direct blood oxygenation via a catheter placed into a central vein. Another solution comes from Dr. Ishay Benuri, a pediatric gastroenterologist and medical device inventor. His unique laryngoscope, enabling easier, more accurate and faster intubation of critical COVID-19 patients, is patented in Israel and soon to be patented in Europe and the United States.
Enlivex has developed a medication that could help treat severe symptoms of COVID-19 including catastrophic organ failure.
XRHealth provides specialized therapeutic apps delivered through virtual reality (VR) headsets for quarantined coronavirus patients. Options include stress and anxiety treatments, cognitive and physical exercises, support groups and two-way interactions with healthcare providers. XRHealth recently set up virtual reality telehealth clinics in the United States.

Israeli VCs are also working toward solutions
On March 24, Jerusalem Venture Partners launched the first of a series of teleconferences bringing together experts from Israel and other countries to address immediate and long-term strategies for the COVID-19 crisis.
Cukierman & Co Investment House will hold a COVID-19 Innovation Conference in early April, matching investors with Israeli and global medtech and biotech companies.

This Chicago hospital was prepared for the pandemic years before it ever hit

Source: https://kimatv.com/news/spotlight-on-america/this-chicago-hospital-was-prepared-for-the-pandemic-years-before-it-ever-hit

Aug 10 — Hospitals across the country have been challenged by the coronavirus, from finding enough protective gear to equip their staff to dealing with an influx of patients battling the disease. But one hospital in Chicago was ready for a pandemic year in advance. Spotlight on America was given special access to a place few can see in the midst of a global pandemic: the emergency room of a major hospital. We went inside the ER at Rush University Medical Center in Chicago, a city that's battled 63,000 COVID-19 cases.

Inside Rush's emergency room, every person showing signs of the virus is flagged with a red sign bearing three letters: PUI. Patient under investigation.

Dr. Dino Rumoro, Chairperson of the Department of Emergency Medicine, explained, "We needed a visual. We needed something bright and obnoxious. So that people would stop and make sure they had the right equipment on."

Simple protocols like those signs are just the beginning of what this hospital has done to handle coronavirus. The surge has passed here, but in other cities, hospitals are still grappling with the disease. Still, when the coronavirus pandemic hit hardest, the 14-story facility was ready. It was designed and then specifically outfitted for a pandemic, almost a decade before it ever hit. Dr. Rumoro said, "I wouldn't say people thought it was crazy. For the most part people thought it wouldn't be needed."
But Dr. Rumoro and the team behind the design of a new tower that opened in 2012, had a vision. In the wake of 9/11, they set out to design a facility that could respond to a number

of potential scenarios, from a surge in patients to a bioterrorism attack from something like anthrax and even an infectious disease outbreak like COVID-19.
"Because a lot of facilities are limited in what they can do, there was only so much they could do," Dr. Rumoro said of other hospitals preparing for the virus. "They could prepare their staff, they could get their PPE. But they weren't setting up massive treatment centers like we were."
The treatment center at Rush has a special COVID-triage and screening area that keeps potential coronavirus carriers isolated during testing. During surge mode, that work happened in a converted ambulance bay designed to also function as a mass decontamination unit. Beneath the bay, special underground tanks sit ready to catch contaminated water. At the height of the pandemic, Dr. Rumoro tells Spotlight on America, their COVID-triage area saw almost 100 patients a day.

This ambulance bay at Rush University Medical Center served as a COVID-triage area during the height of the pandemic (Photo: Rush University Medical Center)

Infected patients went, and still start out in POD-C, the COVID unit, which has glass doors in every treatment room to maintain isolation. Another key feature of this area is the negative airflow system that keeps infected air from spilling out to other areas. Dr. Rumoro told us, "I don't know of other hospitals that have done that. That is unique. If you're in an environment like this where the air turns are so rapid, you're going to have less exposure."
Keeping other patients from being exposed was something else the hospital planned for in advance, arming its lobby with specialized equipment to handle emergencies. The equipment needed to treat patients, from oxygen to IV pumps, can be hooked up through panels hidden in the columns that line the area. During the height of the pandemic, spokesman Tobin Klinger said this area was briefly used as a special medical unit to handle routine injuries and illnesses while remaining completely cut off from coronavirus patients.

The lobby at Rush University Medical Center was outfitted with technology so non-COVID patients could be treated without risking exposure (Photo: Rush University Medical Center)

It's a reminder that this facility looked at every space as potentially valuable in a mass-casualty crisis. "It's definitely satisfying to see that it worked well and that it wasn't just some crazy dream that would never get used," Dr. Rumoro said.

Let's Not Forget the Important Lessons the Coronavirus Taught Us about Supply Chains

By Sarah Golden

Source: http://www.homelandsecuritynewswire.com/dr20200810-let-s-not-forget-the-important-lessons-the-coronavirus-taught-us-about-supply-chains

Aug 10 – It turns out our economic systems are more fragile than we thought.
As locations across the world implemented "shelter-in-place" orders in an effort to flatten the coronavirus contagion curve last spring, we got a real-time lesson in how intertwined our transportation and distribution systems are. It was staggering to see how efforts to curb the human toll of a pandemic rippled across every sector and created incalculable emotional and social impacts.

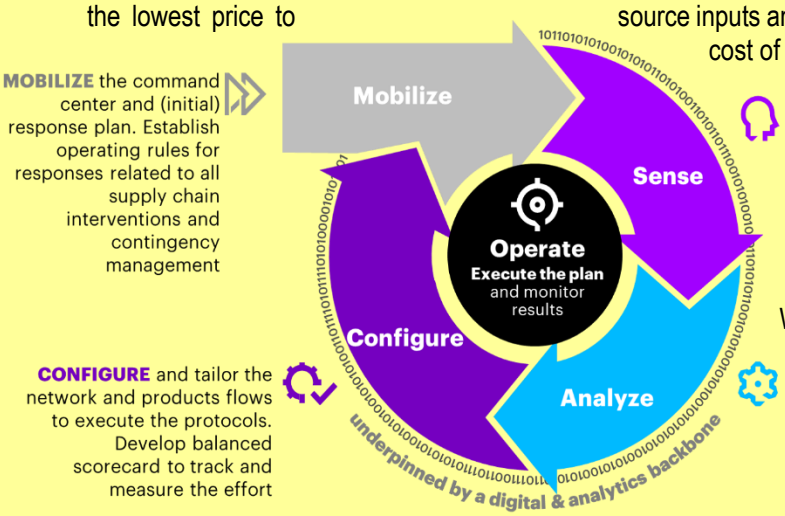
As we work to future-proof our economy, this pandemic may give rise to the power and value of local sourcing.

The Lesson of Supply Chains

While I knew vaguely how globally interconnected our economy was, I didn't really think about it until parts started to break down. It took everything falling apart for me to understand how it fits together.

By early March nearly 75 percent of U.S. companies had seen supply chain disruptions, and an analysis of supply chains showed that the world's largest 1,000 companies or their suppliers had more than 12,000 facilities in quarantined areas of China, Italy and South Korea.

In a world where the only consumer-facing metric is the price of a good, it makes sense how this would happen. Companies look for the lowest price to source inputs and prioritize low costs over diversification. Efforts to drive down the cost of goods put all of our supply eggs in one quarantined basket.



If you live in California and experienced planned power shutoffs last fall, this may sound familiar. Our aging grid and prolonged power outages had a multi-billion-dollar economic impact on the region, much of which would have been avoidable if utilities and regulators had properly analyzed the risk of wildfires.

While the specifics are different, the lesson is similar: When we rely on centralized supply and fragile distribution systems, we're vulnerable to disruptions that may result in economic impacts not properly accounted for in the cost of supplies.

Local = Resilient

It's hard to put a value on resilience until you need it.

Companies reliant on single sourcing for upstream supplies are likely regretting having not better analyzed the potential for disruption. It reflects a failure of risk management principles, according to the Harvard Business Review, showing businesses failed to monitor supply chains and understand potential disruptions.

Likewise, companies and municipalities are working to understand the cost of microgrids and back-up power supplies as California looks down the barrel of the next fire season. People smarter than me have asserted that when we look at the cost of resilience holistically, we can't afford not to act. Yet deferred action is attractive. The upfront costs are right, and it requires no political or regulatory will.

The unprecedented response to coronavirus, however, may provide the best argument for local resilience we've had. For the first time, I felt connected to communities everywhere by the same common threat and solution. Perhaps there's never been a better (or bleaker) argument for local resilience than the coronavirus

Decarbonization Benefits

Supply chain disruptions also highlight the global sourcing for components that comprise consumer goods. As a friend once whimsically put it: If a string were to connect all items and materials in your house to their places of origin, the world would be covered in string.

At a time when we are increasingly considering the embedded carbon within our products, the corona-disruption brought to light the massive amount of transportation-related emissions that are invisible. It may be economically cheap to transport items across the globe, but it's costly in greenhouse gas emissions.

"When Covid-19 comes around, disrupting that flow of goods around the world, we are faced with a reckoning that the 'cheap' goods may not be so cheap after all," said Noah Goldstein, director of energy, sustainability and infrastructure at Guidehouse, in an email. "If there are no parts to put together, not being able to sell a product makes it infinitely expensive."

In other words, the same strategies that keep a company's operations financially resilient could make it more climate-friendly.

"Coronavirus is forcing us to look into supply chains, and it will be a good time to use that reflection as an opportunity," Goldstein said. "An opportunity to look at local supply chains. An opportunity to evaluate the resilience in the supply chain. An opportunity to look at the embedded carbon in the supply chain."

***Sarah Golden** is Senior Energy Analyst and writer at Green Biz.*

COVID-19 Patients Exhibit Early Antibody Signatures Potentially Predictive of Death or Recovery

Source: https://www.genengnews.com/news/covid-19-patients-exhibit-early-antibody-signatures-potentially-predictive-of-death-or-recovery/

Aug 10 – Researchers at the Ragon Institute of MGH, MIT and Harvard, and the University of Washington (UW) School of Medicine, have identified five immune response markers that, collectively, were able to distinguish between those COVID-19 patients who convalesced from the infection, and those who didn't survive the disease. The researchers used a systems serology technique to generate a detailed profile of SARS-Co-2-specific humoral—antibody generating—responses in hospitalized patients, which they validated in a second patient cohort. The findings indicated that individuals who survived COVID-19 infection and those who died exhibited antibody responses that were primarily directed against different SARS-CoV-2 proteins.

"Any given feature tells only a small part of the story," said co-lead scientist Galit Alter, PhD, group leader at the Ragon Institute and professor of medicine at Harvard Medical School. "By looking at the overall profile of the immune response, we can begin to truly understand how the immune system responds to COVID-19 and then use that knowledge to prevent the worst outcomes of this disease."

The results could help in the development of COVID-19 vaccine candidates, suggested co-lead researcher Helen Chu, MD, associate professor of medicine, division of allergy and infectious diseases, and UW Medicine physician. "Finding these early antibody signatures may have implications for assessing COVID-19 vaccine candidates to ensure they produce an immune response similar to that of individuals who survive natural infection."

The investigators reported on their study in *Immunity*, in a paper titled, "Distinct early serological signatures track with SARS-CoV-2 survival."

It's still not clear why some individuals infected with SARS-CoV-2 recover from infection and others die, the authors noted. "While the rapid spread of SARS-CoV-2, even during the asymptomatic phase of this infection, is alarming, more harrowing is our inability to predict disease trajectories among symptomatic individuals." And without any therapeutics or vaccines as countermeasures, there is "an urgent need" to start mapping how immunity to the virus starts to develop. This knowledge will not only help to guide patient care, but could help to direct the development of future immune-based strategies against the disorder.

For their study, the researchers profiled how the immune responses of hospitalized SARS-CoV-2 infected patients evolved, to see if they could define antibody features that were predictive of disease outcome. A team headed by Chu collected samples from a cohort of 22 hospitalized SARS-CoV-2 patients, 12 of whom recovered, and 10 of whom died.

Alter's team then applied her systems serology technique—which is an approach that relies on more than 60 assays to create a detailed profile of the immune response—to compare the immune responses of those individuals who had survived, with the responses of individuals who died from COVID-19.

SARS-CoV-2 has two main proteins that trigger humoral immune system responses. They are the spike (S) protein and the nucleocapsid (N) protein. The N protein is produced at significantly higher levels in the virus than the S protein is, but previous studies have shown that an immune response to the N protein does not provide protection against coronaviruses related to SARS-CoV-2.

Using her systems serology technique, which creates a detailed profile of the humoral immune response, Alter's lab compared the immune responses from the recovered individuals to those of deceased patients. They found that those who had recovered exhibited a humoral immune response that responded mostly to S protein, while deceased individuals had a shift in immunodominance such that they had a stronger immune response to the N protein. "The shift in immunodominance was only apparent after comparing robust, detailed profiles of the immune response from different groups of patients," Alter said.

This immunodominance shift could be detected by measuring five immune response markers: IgM and IgA1 responses to S protein and antibody-dependent complement deposit, IgM, and IgA2 response to N protein. Using these five markers, researchers were able to build a model that could correctly classify clinical samples as belonging to deceased or convalesced individuals.

"Despite inter-individual heterogeneity, distinct antibody signatures resolved individuals with different outcomes," the investigators wrote. "While no differences in SARS-CoV-2-specific IgG levels were observed, spike–specific humoral responses were enriched among convalescent individuals, whereas functional antibody responses to the nucleocapsid were elevated in deceased individuals. These data point to early diverging humoral immune responses that may mark more effective immunity and suggest that functional antibodies directed against S protein might be beneficial for SARS-CoV-2 disease trajectory."

In order to verify this model, another 40 clinical COVID-19 samples—20 from convalesced individuals and 20 from deceased patients—from a different hospital were evaluated. The results showed the same S protein to N protein shift in immunodominance in samples from the deceased individuals, compared with those from convalesced patients.

Importantly, in the samples analyzed, this immunodominance shift was more predictive of recovery or death than were demographic factors, such as age or sex. "Thus, a minimal set of SARS-CoV-2 humoral profiles, rather than demographic information, appear to significantly resolve individuals who later went on to die from those who recover," the team noted. "… these findings suggest that a consistent overall shift in S:N immunity early in SARS-CoV-2 infection may have a protective role and aid in recovery from severe disease."

How these predictive immune markers may be influenced by risk factors of COVID-19, time course of infection, or severity of disease isn't yet known. However, the study provides a potential approach to identifying at-risk patients, based on individual immune responses, and may help in the design and development of anti-COVID-19 vaccines, the scientists suggested. "Whereas this study only attempted to understand the humoral disparities between convalescent and deceased individuals in a cohort of severely infected individuals, further studies may attempt to define humoral profiles able to further classify individuals across the clinical trajectory spectrum ranging from asymptomatic to severe disease."

And while the team noted several limitations to their studies, they concluded, "These results demonstrate that early antigen-specific and qualitative features of SARS-CoV-2-specific antibodies, point to differences in disease trajectory, highlighting the potential importance of functional antigen-specific humoral immunity to guide patient care and vaccine development.

The Impact of COVID-19 on Terrorism

Source: http://www.homelandsecuritynewswire.com/dr20200811-the-impact-of-covid19-on-terrorism

Aug 11 – While government leaders are focused on fighting COVID-19, the threat of terrorism has not gone away. In fact, homeland security experts have warned that violent extremists may seek to take advantage of the fear and disruption around the pandemic to further their agenda and recruit new members.

Gary Ackerman, an associate professor in the College of Emergency Preparedness, Homeland Security and Cybersecurity (CEHC), who specializes in terrorist ideology, recently teamed up with CEHC graduate student Hayley Peterson to explore both the challenges and opportunities that the COVID-19 crisis presents for terrorist organizations.

Their observational report was published in last month's edition of *Perspectives on Terrorism*.

"During times of crisis, we often see terrorists exploit the situation and use it for propaganda," said Ackerman. "This is particularly true amongst anti-government groups on both the far-right and far-left. They take advantage of widespread anxiety and distrust in leadership to promote radicalization and violence."

"Lots of people do not realize that many extreme groups reside, or least operate, in our societies," added Peterson, who earned a dual undergraduate degree in Emergency Preparedness, Homeland Security and Cybersecurity (EHC) and Human Biology in May. "Recent lockdowns, social distancing and other disruptions to daily life due to COVID-19 have presented an interesting case study to analyze how terrorists respond to a global crisis."

Albany says that the 15-page report introduces and discusses a "top 10" list of COVID-19's most significant current and potential impacts on terrorist activity. The list ranges 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.

Although there could (and likely will) be short- and medium-term impacts, Ackerman and Peterson argue the pandemic's long-term economic damage is more likely to create the heightened psychological stress and anger against the government that could lead to radicalization at dangerous levels.

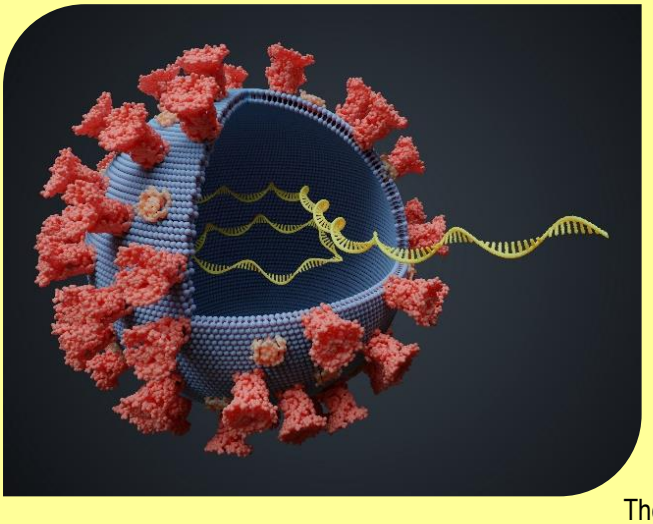
"The greatest danger from terrorists utilizing COVID-19 itself as a weapon will arise after the first wave is over, but before a vaccine is available," said Ackerman. "More importantly, it is during the years following the end of the pandemic, which many project will be a lengthy economic stagnation and recovery period, that the gains made through current terrorist efforts to radicalize, recruit and engage in pro-social activities are likely to bear fruit."

Ackerman's research focuses on understanding how terrorists and other adversaries make tactical, operational and strategic decisions. Last October, he co-led the launch of CEHC's Center for Advanced Red Teaming (CART). Peterson joined CART as an undergraduate intern and is continuing her research now at the graduate-level.

How Do We Know Whether a Virus Is Bioengineered?

Source: http://www.homelandsecuritynewswire.com/dr20200811-how-do-we-know-whether-a-virus-is-bioengineered

Aug 11 – Since the onset of the pandemic, theories – or, rather, conspiracy theories – and no-evidence assertions argued that the coronavirus was intentionally engineered by Chinese scientists as a potential bioweapon, despite the consensus of scientists that the virus's genetics indicate that it is most likely a zoonotic pathogen.



In fact, on 30 April, the US Office of the Director of National Intelligence (ODNI) announced that the virus was neither human-made not genetically modified. *Pandora Report* notes that the intelligence community came to this conclusion based, in part, on a **Finding Engineering-Linked Indicators (FELIX) analysis**, which found that the virus had not been engineered using foreign genetic sequences.

The specific story of the coronavirus aside, the detection of bioengineering is a "fraught task" because there are many methods to identify engineering in a virus, and there are many methods to engineer a virus. Tools such as FELIX are being deployed to "test the veracity of online stories claiming that SARS-CoV-2 was engineered in a laboratory" (see Sarah Scoles, "How Do We Know If a Virus Is Bioengineered?, *Medium*, 5 August 2020).

Though the result of the FELIX analysis provides evidence against the possibility that SARS-CoV-2 was the result of engineering, Dr. Filippa Lentzos clarifies that this finding only rules out certain types of bioengineering. While other methods for testing and detecting intentional adjustments to a virus exist, they share a critical limitation: reliance on the records of known organisms and known "signatures of engineering." These tools aim to increase biosecurity, but they have the potential for dual-use purposes – offense and defense.

Further, Dr. Gregory Koblentz, Director of GMU's Biodefense Graduate Program, says that these detection tools send a message to the world that such research is "driven by this perception that the diffusion of increasingly sophisticated biotechnology is creating new potential threats that we are not prepared to detect." Put simply, the United States is signaling that it considers biothreats as clear and present dangers.

Topic Collection: Bioterrorism and High Consequence Biological Threats

Healthcare Emergency Preparedness Information Gateway

Source: https://asprtracie.hhs.gov/technical-resources/41/bioterrorism-and-high-consequence-biological-threats/27

The CoronaVirusFacts/DatosCoronaVirus Alliance Database

Source: https://www.poynter.org/ifcn-covid-19-misinformation/

Here is the database that gathers all of the falsehoods that have been detected by the CoronaVirusFacts/DatosCoronaVirus alliance. This database unites fact-checkers in more than **70 countries** and includes articles published in **at least 40 languages**.

Ask the experts: Is it safe to travel?

Source: https://www.israel21c.org/ask-the-experts-is-it-safe-to-travel/

Aug 12 – We all miss traveling. Over the last years as the skies opened up, and flights became cheaper, people have been traveling the world more than ever. Mini breaks, ski holidays, long-haul travel to exotic destinations – Covid-19 has put a stop to everything.
In March, Israel – like so many other countries around the world – announced a strict travel ban. Only Israeli citizens, and students from abroad, can enter the country, and they have to quarantine for two weeks.
While some airlines have resumed flights since then, including Air Canada, Delta, Lufthansa, Wizz Air and Ryanair, flights are few and far between and they certainly aren't bringing in tourists.
Plans to reopen Israeli skies on August 16 to a greater number of flights also look doomed to failure.
After an excellent early start bringing corona numbers down to just 20 or so a day, the country opened up too fast. New cases are now hovering around 1,500 to 2,000 a day and Israel has one of the highest morbidity rates in the world per capita, making other countries reluctant to let Israeli tourists in.
Despite the difficulties, however, there are opportunities to travel and more will emerge. Should we be taking them?
We invited you to send in your questions and asked two experts, Mark Feldman, CEO and founder of Ziontours Jerusalem and Dr. Eyal Leshem, director of the Center for Travel Medicine and Tropical Diseases at Sheba Medical Center, for their thoughts. Find out their answers below.

Travel by air

1. **How safe is it to be on a 14-hour trans-Atlantic flight?**

Mark Feldman: It's extremely safe on the three airlines flying nonstop from Tel Aviv to North America. United flies to Newark, Delta to JFK and Air Canada to Toronto. All three are adamant that their cleaning procedures far exceed what has been recommended. The cleaning and disinfection procedure is followed diligently and where possible they block middle seats.

2. **What will the airline do to provide a Covid-19 safe trip, and what additional safety measures can we take as passengers?**

Mark Feldman: Facemasks are now mandatory at all the airports and throughout the flight. Food is given in a box upon take-off and another meal is handed out prior to landing. Trolley service has been banned.

3. **Is it safe for people over the age of 70, or who are in the vulnerable risk demographic, to fly at this time? Should we wait for a vaccine in 12-18 months?**

Mark Feldman: Again, the act of flying in and of itself is not the risk. It's where the person is going. It also depends on the reason. I would hesitate about an elderly person flying over to Florida for the summer. But if he or she were going to upstate New York where the numbers are under 1% then I have no concerns.

Eyal Leshem: Travel at an older age and with severe Covid-19 risk factors is risky and the necessity of travel should be weighed against the potential risk. All travelers must have comprehensive travel health and evacuation insurance in case they fall ill because expenses of Covid-19 treatment may be very high.

4. **Airlines advertise that their planes have filters and air is exchanged every few minutes, but to do that it needs to move around the aircraft. Does the airplane ventilation system spread the virus?**

Mark Feldman: The filters have been installed throughout the plane so the risk is only if you're sitting next to someone without a mask. Otherwise your risk from the ventilation system is almost at nil.

5. Should we wear outer protective clothing when traveling by air?

Mark Feldman: No, a facemask and gloves is more than sufficient. The concern should be not your seat or tray but the restrooms. You need to be very vigilant of not touching any services without immediately washing your hands.

Eyal Leshem: No – facemasks are enough.

6. **How dangerous is it to travel by air compared to traveling by bus or train?**

Mark Feldman: Congestion on buses and trains is still at a far higher number than planes.

Eyal Leshem: Overall, air travel is not considered substantially riskier than bus or train travel but does confer higher risk than car travel, walking outdoors or cycling. The highest risk during air travel comes from spending time standing in line or seated near (within 6 feet of) potentially ill persons, and touching infected surfaces. Simple actions may help reduce this risk: facemasks, avoid touching your face, handwashing, and eating in an open space or alone in a room.

7. **Doesn't it defeat the purpose of wearing a mask on the airplane if everyone will take them off at the same time to eat the meals on the 15-hour flight?**

Mark Feldman: First, not everyone is served at the same time; on night flights many people don't even eat the meal when it's provided. I would be more cognizant of my nearest neighbor, though, during meal time.

Eyal Leshem: It does increase risk, but duration is important as the dose response influences overall risk.

8. **Would it be safer to fly in first class rather than coach, and to spend the extra money to do so?**

Mark Feldman: Yes, and aside from business class, there is a middle class called premium which consists of only three rows and the middle seat is blocked. If the passenger can afford the extra money it's a safer way to fly.

Eyal Leshem: Flying business or first class will reduce line time and close contact, but carries a substantial cost. If you can afford it, first class is expected to be safer.

9. **Experts say corona is going to be with us for another year or so – is there any time of the year that you think it might be the safest to travel during this time?**

Mark Feldman: Until there is a vaccine or you can be tested upon arrival, flying is going to be a risk; less for the actual flight or the arriving or departing airport but for the place you are going to.

Eyal Leshem: Timing is difficult to pick but obviously flu season (December through March) carries higher risk and once a vaccine is available risks may be lower.

10. **Do you think that once we have a vaccine, we will only be allowed to travel to other countries if we have proof that we have had the vaccine?**

Mark Feldman: Yes, and probably well before that.

Eyal Leshem: It's difficult to predict at this time. There are precedents for vaccine requirements like yellow fever for Africa and South America, and smallpox in the past.

11. **If you are flying through a country to get to another one, can you travel without going into quarantine in the country in the middle?**

Mark Feldman: Yes, transit passengers via Europe, for example, are allowed to switch planes in Europe even though they are not allowed to visit the country unless they have an EU passport.

Eyal Leshem: This needs to be checked with your individual itinerary.

12. **When do you think it will be safe to fly again?**

Mark Feldman: When airports and countries have a near identical protocol. Today, both Greece and Vienna test every single person entering and within two hours the result is given. If positive, they are put in quarantine at the country's expense.

Eyal Leshem: In a few years.

13. **Will all passengers be screened for Covid-19 before they get on the plane? How?**

Mark Feldman: Today, no… hopefully soon.

14. **If I have to fly, what seat on the plane is best? If you have a long-haul flight, is it better to take two shorter flights than one long one?**

Mark Feldman: In economy, an aisle seat in the middle section is the safest as the seat next to you should be blocked. Now it's true the person across the aisle isn't 6 feet across, but it's still the safest seat in economy class.

Eyal Leshem: Difficult to say, but the least human contact is preferable.

Arriving at your destination

15. **Are there any countries an Israeli citizen can travel to without going into quarantine at this time?**

Mark Feldman: Several, but the main one is the United States. Israelis can travel to any of the US states without quarantine, except Hawaii and Alaska, which require all travelers to quarantine.

Eyal Leshem: Yes – but you need to check with country visa/entry requirements.

16. **Will pneumonia vaccinations help prevent corona?**

Mark Feldman: No

Eyal Leshem: No

17. **My girlfriend lives in Israel. Am I able to stay with her when I am in quarantine?**

Mark Feldman: As long as she has a separate room and bathroom for her and if food is delivered to the room. You cannot spend any time in shared spaces.

Eyal Leshem: Yes, as long as you comply with Ministry of Health regulations for quarantine.

18. **Can quarantine in Israel be circumvented with a negative test and a doctor's cover letter?**

Mark Feldman: No.

Eyal Leshem: No.

19. **What happens if we fly abroad and then get sick with corona? Are we able to fly home?**

Mark Feldman: No!

Eyal Leshem: Not before you recover and exit isolation.

20. **How safe is it to stay at a hotel, and how dangerous is the air in a hotel room?**

Mark Feldman: You need to check each hotel's cleaning and disinfectant protocol as there is no general rule.

21. **Is there anything that I can do as a guest to make my hotel room safer?**

Mark Feldman: Clean all the areas that you touch yourself; do not rely upon the cleaning staff unless you're certain of their protocols.

Eyal Leshem: Open windows.

22. **What are the best hotel chains to stay at during the Covid crisis?**

Mark Feldman: I think the smaller, family-run chains are more diligent; we've had complaints of several hotel chains inside Israel.

'Apollo 11 Moment': Two Monoclonal Antibody Trials for COVID Launched

Source: https://www.medscape.com/viewarticle/935170

Aug 04 – Officials from the National Institutes of Health (NIH) and Eli Lilly and Company today announced the launch of two clinical trials that will examine the investigational monoclonal antibody LY-CoV555 for the treatment of COVID-19. One trial will include outpatients, and the other will include hospitalized patients.

"This is a significant day, but it's also an example of how the best clinical science can only happen with public participation," NIH Director Francis Collins, MD, PhD, said during a press briefing. "We will be earnestly seeking individuals who've been found to be infected with SARS-CoV-2 virus and who are interested in taking part in seeking answers to a critical question: can monoclonal antibodies reduce severity of COVID-19? Can that approach even save lives?"

The news marks the latest development in efforts from the NIH's Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) program, a public-private partnership that was launched in April 2020 to speed development of the most promising treatments and vaccine candidates. The effort includes seven government partners, 20 industry partners, and three nonprofit partners.

The LY-CoV555 antibody was discovered in a blood sample from a recovered COVID-19 patient in the state of Washington by Vancouver, British Columbia–based AbCellera Biologics in collaboration with the Vaccine Research Center of the National Institute of Allergy and Infectious Diseases (NIAID). Following this, Lilly Research Laboratories partnered with AbCellera to develop and manufacture LY-CoV555.

In ACTIV-2, a phase 2 trial, investigators plan to study the safety and efficacy of LY-CoV555 in 200 people with mild to moderate symptoms of COVID-19 who have not been hospitalized. Half will receive the monoclonal antibody, and the other half will receive placebo. To be eligible, study participants must have tested positive for COVID-19 within 7 days and have experienced symptoms within 10 days.

Colorized scanning electron micrograph of a cell heavily infected with SARS-COV-2 virus particles, isolated from a patient sample.

During the briefing, NIAID Director Anthony Fauci, MD, said that the primary objective of ACTIV-2 is "to determine whether the investigational treatment reduces the duration of symptoms through 28 days and increases the proportion of the volunteers who have undetectable virus in the nasopharynx at various periods of time ranging from 3 days to 28 days. If transitioned to phase 3, [this trial will] determine if in fact the intervention reduces the risk of hospitalization and/or death."
The other trial being launched, ACTIV-3, is a phase 3 study that will examine the safety and efficacy of LY-CoV555 in 300 hospitalized patients. Half will receive the monoclonal antibody, and the other half will receive placebo.
If the treatment appears to be effective, "this will go on to a second phase of 700 individuals, for a total of 1000 [patients]," Fauci said. "The entry criteria for this trial are symptoms [of COVID-19] for 12 days or less, requiring hospitalization but without end-stage organ failure. The primary objective is a sustained recovery for 14 days at home after hospital discharge."

"Apollo 11 Moment"
Fauci characterized ACTIV-2 and ACTIV-3 as important from the overall standpoint of helping clinicians manage patients with COVID-19. "We have good therapies for late disease: dexamethasone for people on ventilators or requiring oxygen, and remdesivir for hospitalized patients with documented lung disease," he said. "This is important, because we're talking about people who don't require hospitalization in ACTIV-2, and those who are in the hospital but don't require the kinds of interventions that we see in late-stage disease, in ACTIV-3."
Near the close of the briefing, Dan Skovronsky, MD, PhD, Eli Lilly and Company's chief scientific officer, characterized the launch of these two trials as an "Apollo 11 moment" in the fight against COVID-19.
"Today we have liftoff," he said. "We can't be sure we'll reach our destination on this mission, but our biopharmaceutical industry and our public health partners won't give up until we do."
Safety data and other findings will be shared across the ACTIV-2 and ACTIV-3 studies through an independent data and safety monitoring board. Collins noted that each trial can be adapted to evaluate additional therapies.

A Vaccine Against a Widespread Common Cold Type Just Passed Promising Clinical Trials

Source: https://www.sciencealert.com/a-vaccine-against-one-of-the-most-common-strains-of-cold-could-be-just-years-away

Aug 12 – A vaccine designed to prevent one of the most widespread common cold types has just delivered promising results in the latest set of clinical trials, and the developers now think it could actually reach the market in just a few years.
The cold, known as respiratory syncytial virus (RSV), is so common, more than 90 percent of kids contract it by the age of two. In fact, this dangerous and sometimes

deadly infection is the leading cause of serious lower respiratory diseases in children worldwide, and we still don't have a working vaccine to prevent it.
While Bavarian Nordic, the German company that owns this particular vaccine - known as MVA-BN-RSV - hopes it will become available in 2024, the medicine still has to pass a third clinical trial before the US Food and Drug Administration (FDA) would approve it for general use.
The first two clinical trials of a vaccine are usually limited to examining its safety and optimal dosage. The results of these phases might also give some indication of effectiveness, but the size and breadth of such trials are usually not enough to determine immunity.
So far, it appears as though a single dose of this new vaccine safely induces a broad immune response to RSV in most of the 420 adults over the age of 55 that were enrolled in the study.
In this randomised, placebo-controlled trial, the immune response from T cells, which hunt and destroy infections, and antibodies, which recognise foreign invaders, persisted for at least six months.
When followed up with a booster shot at 12 months, there was an even better immune response.
Those who received either one or both doses showed higher antibody levels at 56 weeks compared to the placebo group, "thus demonstrating persistence of MVA-BN-RSV induced immune responses for up to one year."
However, after a single, high dose of the vaccine, the T cell response had pretty much maxed out.
"Peak T cell responses following the booster vaccination were lower than peak responses following the initial vaccination, suggesting that activation of T cells may be regulated by pre-existing levels of antigen-specific T cells," the researchers write in a study summarising the results.
"This is consistent with the observation that a second vaccination did not induce further T cell responses."
In other words, if a bunch of T cells are already around, then a booster shot isn't going to induce a further response.
It's an interesting explanation, but more research will be needed to confirm those results and figure out the mechanism of action; given the challenges RSV keeps presenting for vaccine development, it's clear we're not quite there yet.
Not only is RSV good at hiding from the immune system, its presence does not induce long-lasting immunity, like chicken pox or measles might, which means we can keep on getting sick with the same thing over and over again, even as adults.
While usually mild cold and flu symptoms occur, older people and those with weakened immune systems are particularly vulnerable to RSV.
A vaccine could potentially stop 33 million serious respiratory infections a year, saving the lives of nearly 60,000 children annually. That would be a huge deal, and while there's reason to be hopeful, it's important not to get ahead of ourselves. There are many almost-vaccines out there, on the brink of hitting the market in the next five years.
The third clinical trial is set to start in 2021 and will include more than 12,000 adults. Hopefully that will be enough to answer some of these remaining questions.
Given "the broad immune response" already elicited by the vaccine, experts at Bavarian Nordic think there is more than enough promise here to merit a phase 3 efficacy trial. Watch this space.

▶▶ **The study was published in** *The Journal of Infectious Diseases*.

Mouthwashes could reduce the risk of coronavirus transmission, study shows

Source: https://www.sciencedaily.com/releases/2020/08/200810103239.htm

Aug 10 – Sars-Cov-2 viruses can be inactivated using certain commercially available mouthwashes. This was demonstrated in cell culture experiments by virologists from Ruhr-Universität Bochum together with colleagues from Jena, Ulm, Duisburg-Essen, Nuremberg and Bremen. High viral loads can be detected in the oral cavity and throat of some Covid-19 patients. The use of mouthwashes that are effective against Sars-Cov-2 could thus help to reduce the viral load and possibly the risk of coronavirus transmission over the short term. This could be useful, for example, prior to dental treatments. However, mouth rinses are not suitable for treating Covid-19 infections or protecting yourself against catching the virus.
The results of the study are described by the team headed by Toni Meister, Professor Stephanie Pfänder and Professor Eike Steinmann from the Bochum-based Molecular and Medical Virology research group in the Journal of Infectious Diseases, published online on 29 July 2020. A review of laboratory results in clinical trials is pending.

Eight mouthwashes in a cell culture test

The researchers tested eight mouthwashes with different ingredients that are available in pharmacies or drugstores in Germany. They mixed each mouthwash with virus particles and an interfering substance, which was intended to recreate the effect of saliva in the mouth. The mixture was then shaken for 30 seconds to simulate the effect of gargling. They then used Vero E6 cells, which are particularly receptive to Sars-Cov-2, to determine the virus titer. In order to assess the efficacy of the mouthwashes, the researchers also treated the virus suspensions with cell culture medium instead of the mouthwash before adding them to the cell culture.

Product	Trade name	Active compound	Log reduction factor (mean of n=3)		
			Strain 1	Strain 2	Strain 3
a	Cavex Oral Pre Rinse	hydrogen peroxide	0.78	0.61	0.33
b	Chlorhexamed Forte	chlorhexidinebis (D-gluconate)	1.00	0.78	1.17
c	Dequonal	dequalinium chloride, benzalkonium chloride	≥3.11	≥2.78	≥2.61
d	Dynexidine Forte 0.2%	chlorhexidinebis (D-gluconate)	0.50	0.56	0.50
e	Iso-Betadine mouthwash 1.0%	polyvidone-iodine	≥3.11	≥2.78	≥2.61
f	Listerine cool mint	ethanol, essential oils	≥3.11	≥2.78	≥2.61
g	Octenident mouthwash	octenidine dihydrochlorid	1.11	0.78	0.61
h	ProntOral mouthwash	polyaminopropyl biguanide (polihexanide)	0.61	≥1.78	≥1.61

Three formulations (products c, e and f) containing different active compounds significantly reduced viral infectivity to undetectable levels.

All of the tested preparations reduced the initial virus titer. Three mouthwashes reduced it to such an extent that no virus could be detected after an exposure time of 30 seconds. Whether this effect is confirmed in clinical practice and how long it lasts must be investigated in further studies.

The authors point out that mouthwashes are not suitable for treating Covid-19. "Gargling with a mouthwash cannot inhibit the production of viruses in the cells," explains Toni Meister, "but could reduce the viral load in the short term where the greatest potential for infection comes from, namely in the oral cavity and throat -- and this could be useful in certain situations, such as at the dentist or during the medical care of Covid-19 patients."

Clinical studies in progress

The Bochum group is examining the possibilities of a clinical study on the efficacy of mouthwashes on Sars-Cov-2 viruses, during which the scientists want to test whether the effect can also be detected in patients and how long it lasts. Similar studies are already underway in San Francisco; the Bochum team is in contact with the American researchers.

EDITOR'S COMMENT: This is a very logic approach. I am expecting to read a similar nasal spray in order to cover the nose/sneeze – mouth/cough nexus of viral spray.

AI Approach Identifies Potential New Drugs to Treat COVID-19

Source: https://www.genengnews.com/news/ai-approach-identifies-potential-new-drugs-to-treat-covid-19/

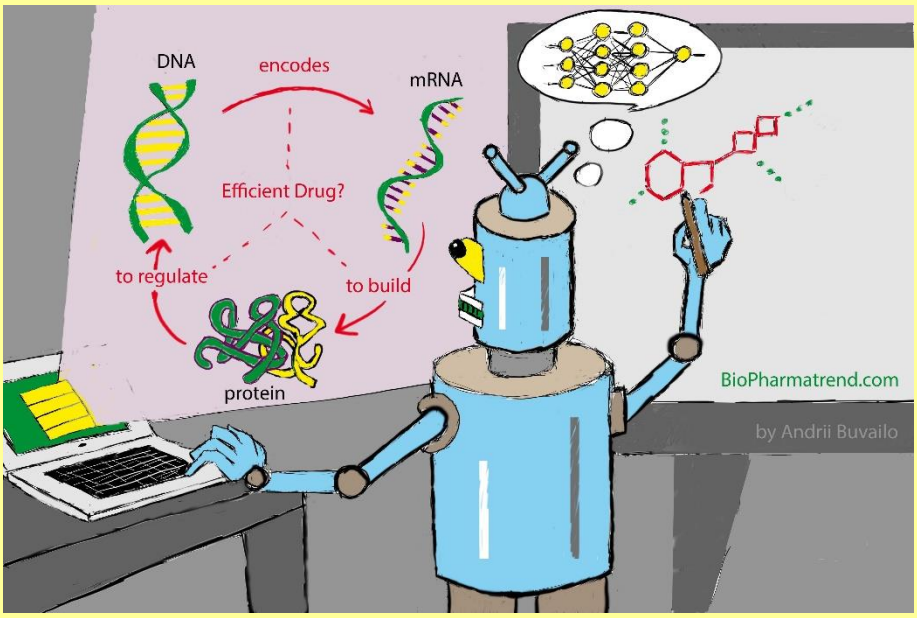
Aug 13 – There is an urgent need for the identification of effective therapeutics for COVID-19. Now, a team from the University of California (UC), Riverside, is joining the effort of many

other academic and industry researchers to identify new drug candidates. They have developed a machine learning drug discovery pipeline to identify hundreds of new potential drugs that could help treat COVID-19.

The drug discovery pipeline is a type of computational strategy linked to artificial intelligence—a computer algorithm that learns to predict activity through trial and error, improving over time.

Efforts to repurpose drugs, such as Remdesivir, have achieved some success. A vaccine for the SARS-CoV-2 virus could be months away, though it is not guaranteed.

"As a result, drug candidate pipelines, such as the one we developed, are extremely important to pursue as a first step toward systematic discovery of new drugs for treating COVID-19," Anandasankar Ray, PhD, professor at UC Riverside said. "Existing FDA-approved drugs that target one or more human proteins important for viral entry and replication are currently high priority for repurposing as new COVID-19 drugs. The demand is high for additional drugs or small molecules that can interfere with both entry and replication of SARS-CoV-2 in the body. We have developed a drug discovery pipeline that identified several candidates."



Joel Kowalewski, a graduate student in Ray's lab, used small numbers of previously known ligands for 65 human proteins that are known to interact with SARS-CoV-2 proteins, including the ACE2 receptor. Next, **they trained machine learning models to predict inhibitory activity and use them to screen FDA registered chemicals and approved drugs (~100,000) and ~14 million purchasable chemicals.**

"These models are trained to identify new small molecule inhibitors and activators—the ligands—simply from their 3-D structures," Kowalewski said.

Kowalewski and Ray were thus able to create a database of chemicals whose structures were predicted as interactors of the 65 protein targets. They also evaluated the chemicals for safety.

"The 65 protein targets are quite diverse and are implicated in many additional diseases as well, including cancers," Kowalewski said. "Apart from drug-repurposing efforts ongoing against these targets, we were also interested in identifying novel chemicals that are currently not well studied."

Ray and Kowalewski used their machine learning models to screen more than 10 million commercially available small molecules from a database comprised of 200 million chemicals, and identified the best-in-class hits for the 65 human proteins that interact with SARS-CoV-2 proteins.

Taking it a step further, they identified compounds among the hits that are already FDA approved, such as drugs and compounds used in food. They also used the machine learning models to compute toxicity, which helped them reject potentially toxic candidates. This helped them prioritize the chemicals that were predicted to interact with SARS-CoV-2 targets. Their method allowed them to not only identify the highest scoring candidates with significant activity against a single human protein target, but also find a few chemicals that were predicted to inhibit two or more human protein targets.

"Compounds I am most excited to pursue are those predicted to be volatile, setting up the unusual possibility of inhaled therapeutics," Ray said.

"Historically, disease treatments become increasingly more complex as we develop a better understanding of the disease and how individual genetic variability contributes to the progression and severity of symptoms," Kowalewski said. "Machine learning approaches like ours can play a role in anticipating the evolving treatment landscape by providing researchers with additional possibilities for further study. While the approach crucially depends on experimental data, virtual screening may help researchers ask new questions or find new insight."

Ray and Kowalewski argue that their computational strategy for the initial screening of vast numbers of chemicals has an advantage over traditional cell-culture-dependent assays that are expensive and can take years to test.

"Our database can serve as a resource for rapidly identifying and testing novel, safe treatment strategies for COVID-19 and other diseases where the same 65 target proteins are relevant," he said. "While the COVID-19 pandemic was what motivated us, we expect our predictions from more than 10 million chemicals will accelerate drug discovery in the fight against not only COVID-19 but also a number of other diseases."

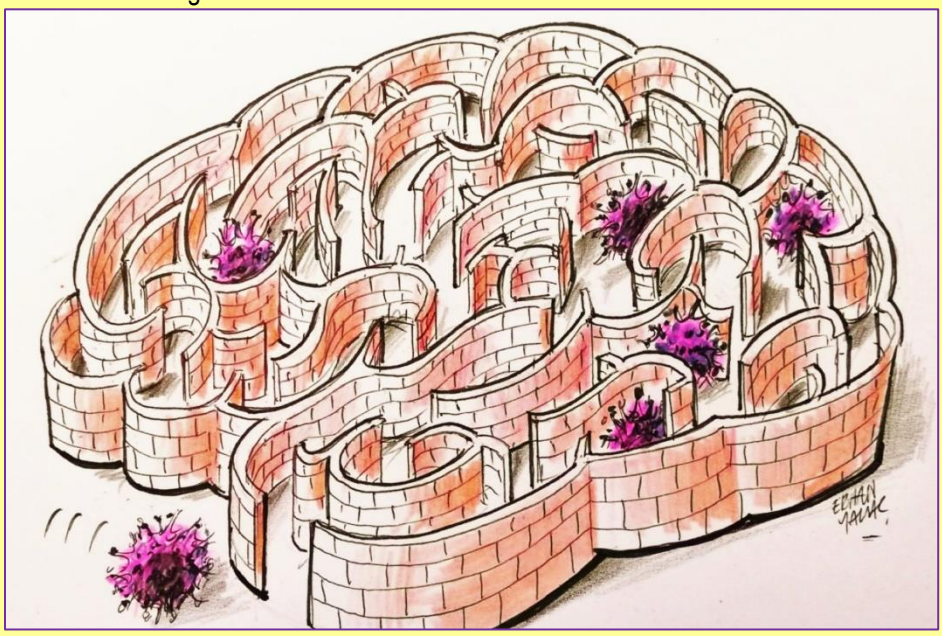
►► The work is published in the journal *Heliyon*, in the paper titled, "Predicting novel drugs for SARS-CoV-2 using machine learning from a >10 million chemical space."

Pandemic Conspiracies and Rumours Have Killed Over 800 People, Study Shows

Source: https://www.sciencealert.com/covid-19-rumours-have-killed-800-people-hospitalised-almost-6-000-scientists-warn

Aug 13 – Right now, a global infection is spreading from person to person, leading many to sickness and even death. We are not talking about the coronavirus. But it goes hand in hand with this other insidious plague.

The global spread in question is what researchers call an infodemic – an oversupply of information, carrying with it fake news, rumours, and conspiracy theories that put people in harm's way. Bad ideas and poor advice, shared amongst friends, family, and total strangers alike.



In theory, an infodemic could attach to anything. This time, it's COVID-19. And it's a hugely serious problem that amplifies and extends the already grave dangers of the coronavirus crisis.

In a new study, an international team of infectious disease researchers scoured social media and news websites to monitor how COVID-19 misinformation was circulating on online platforms.

In total, they identified over 2,300 reports of COVID-19-related rumours, stigma, and conspiracy theories, communicated in 25 languages from 87 different countries.

None of this misinformation is helpful – even if it's intended to be – and much of it is harmful. In some cases, it's lethal, leading to preventable death and injury on a truly tragic scale.

"For example, a popular myth that consumption of highly concentrated alcohol could disinfect the body and kill the virus was circulating in different parts of the world," the authors write in their study.

"Following this misinformation, approximately 800 people have died, whereas 5,876 have been hospitalised and 60 have developed complete blindness after drinking methanol as a cure of coronavirus."

That incident, centred in Iran, might be the worst example of infodemic-related death, injury, and misery. But it's far from the only one the team found.

A similar event claiming the lives of 30 people was reported in Turkey, the researchers say, while in Qatar, two men died from ingesting either surface disinfectant or alcohol-based hand sanitiser.

In India, a dozen people became ill after drinking alcohol made from toxic datura seeds, having watched a video on social media that claimed it would boost their immunity against COVID-19. Five of the imbibers were children.

Of course, not every dangerous fallacy about coronavirus leads to hospitalisations that make headlines. Yet so many twisted ideas are out there and being shared, the researchers found, which people suggest can kill, cure, or prevent coronavirus – things like drinking bleach, drinking cow urine and cow dung, ingesting silver solution, or spraying chlorine all over your body.

In the midst of this swirl of misinformation, even relatively benign mistruths can become dangerous in the wrong hands, the researchers say.

"A church in South Korea, where a spray bottle was used to spray salt water among the church attendees, resulted in more than 100 infections among the attendees because of spraying contaminated water," the team explains – describing an incident in which the nozzle of a spray bottle was repeatedly put inside the mouths of different members of the congregation, without being disinfected.
The infodemic doesn't just perpetuate claims about false cures, though. It also has a lot to say about the origins of coronavirus, how you can catch it, and racial aspersions about who's to blame.
Some from the long list of examples includes: coronavirus is a type of rabies; mobile phones can transmit coronavirus; coronavirus is an engineered bio-weapon; coronavirus was made to sell vaccines; coronavirus was manufactured by the Bill & Melinda Gates Foundation/Donald Trump/the CIA/China (etc.); coronavirus is a population control scheme. And so on, and so on.
The researchers acknowledge a number of limitations to their study, and point out that they didn't investigate or follow up on the misinformation they discovered online, nor determine the number of people who believed in any given rumour or conspiracy.
Nonetheless, they did find all this misinformation freely circulating on publicly accessible websites and social media. That's the heart of the issue: the coronavirus infodemic is out there for all to see – and it's a problem we need to actively counter, the researchers say.
"Misinformation fuelled by rumours, stigma, and conspiracy theories can have potentially serious implications on the individual and community if prioritised over evidence-based guidelines," the team writes.
"Health agencies must track misinformation associated with COVID-19 in real time, and engage local communities and government stakeholders to debunk misinformation."

▶▶ **The findings are reported in** *The American Journal of Tropical Medicine and Hygiene*.

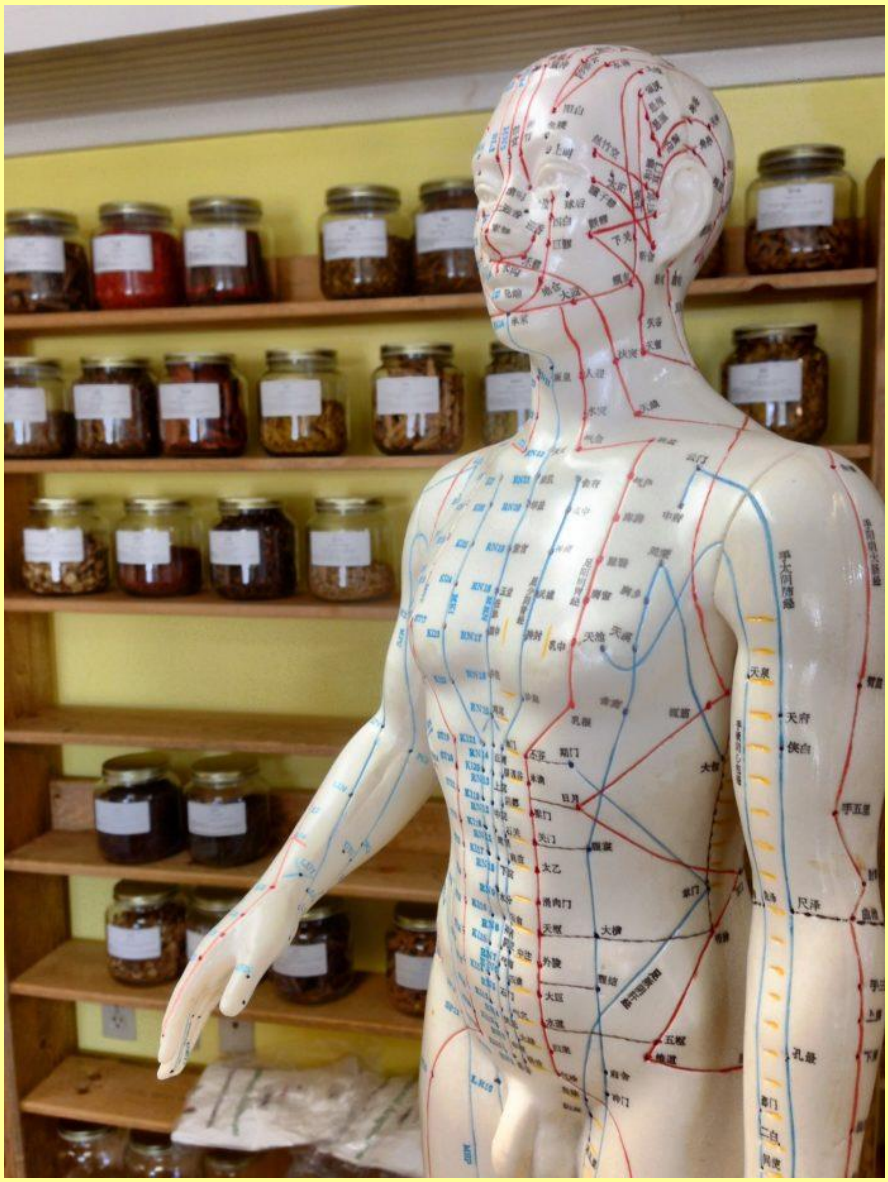
Acupuncture Tames Cytokine Storm, Improves Mouse Survival Via Specific Neural Pathways

Source: https://www.genengnews.com/news/acupuncture-tames-cytokine-storm-improves-mouse-survival-via-specific-neural-pathways/

Aug 13 – A team of researchers led by neuroscientists at Harvard Medical School has successfully used acupuncture to dampen a potentially fatal inflammatory response known as a cytokine storm, in mice with systemic inflammation. The team's studies showed how acupuncture activated different signaling pathways that triggered either a pro-inflammatory or an anti-inflammatory response in animals with bacterially induced systemic inflammation.
The results of the experiments also indicated that three factors determined how acupuncture affected response: site, intensity, and timing of treatment. Where in the body the stimulation occurred, how strong it was, and when the stimulation was administered yielded dramatically different effects on inflammatory markers and survival. "Most Western medicine has been focusing on blocking the neural pathways of pain to relieve the symptoms, but there are so many pain pathways and so many ways to open each of them," said research lead Qiufu Ma, PhD, professor of neurobiology in the Blavatnik Institute at Harvard Medical School and a researcher at Dana-Farber Cancer Institute.
The investigators believe that the experiments will help to define the neuroanatomical mechanisms underlying acupuncture, and offer a roadmap for harnessing the technique to help treat inflammatory diseases. "Our findings represent an important step in ongoing efforts not only to understand the neuroanatomy of acupuncture but to identify ways to incorporate it into the treatment arsenal of inflammatory diseases, including sepsis," added Ma, who, together with colleagues, reported on their work in *Neuron*, in a paper titled, "Somatotopic Organization and Intensity Dependence in Driving Distinct NPY-Expressing Sympathetic Pathways by Electroacupuncture."
Although rooted in traditional Chinese medicine, acupuncture has recently become more integrated into Western medicine, particularly for the treatment of chronic pain and gastrointestinal disorders. The approach involves mechanical stimulation of certain points on the body's surface—known as acupoints. Targeted stimulation is believed to trigger nerve signaling, which can remotely affect the function of internal organs corresponding to specific acupoints. However, the basic mechanisms underlying acupuncture's action and effect have not been fully elucidated.
With a starting point inspired in the core ideology of traditional Chinese medicine—which is to treat a disease by addressing the root cause—Ma and his team aimed to target inflammation, a common source of human diseases and pain. "During the past two decades, nerve stimulation has been emerging as a potential therapeutic regimen to treat systemic inflammation," the authors noted. As a neurobiologist who studies the fundamental mechanisms of pain, Ma had been curious about the biology of acupuncture for years. He was intrigued by prior research demonstrating that using

acupuncture in mice could alleviate systemic inflammation by stimulating the vagal-adrenal axis—a signaling pathway in which the vagus nerve carries signals to the adrenal glands—to trigger the glands to release dopamine. More recent previous research had also shown that vagus-nerve stimulation could dampen inflammatory responses and lessen symptoms of rheumatoid arthritis. However, while previous studies have shown how direct vagal-nerve stimulations in the neck region can help reduce inflammation, such experimental approaches to vagal-nerve stimulation typically required invasive procedures.

With this in mind, Ma and his team set out to investigate whether and how electric stimulation using acupuncture, which only involves inserting thin needles through the skin, can modulate inflammation. For their reported study, the researchers applied a technique called electroacupuncture, rather than the traditional manual approach that involves the insertion of ultra-thin needles just under the skin in various areas of the body. Instead of needles, electroacupuncture uses very thin electrodes inserted into the skin and into the connective tissue, offering better control of stimulation intensities.



Through their studies in mice, the team showed that acupuncture stimulation influenced how animals coped with cytokine storm, the rapid release of large amounts of inflammation-fuelling cytokines. The phenomenon has gained particular attention over recent months as a complication of severe COVID-19, but this aberrant immune reaction can occur in the setting of any infection, and has been long known to physicians as a hallmark of sepsis, an organ-damaging, often-fatal inflammatory response to infection. “For patients suffering sepsis, the high fatality rate is often caused by excessive release of pro-inflammatory cytokines, referred to as the cytokine storm,” they wrote. Sepsis is estimated to affect 1.7 million people in the United States and 30 million people worldwide each year.

The team began by giving mice 15-minute electroacupuncture at 3 mA, at a specific site on the abdomen. This acupoint, dubbed ST25, has been associated with nerves of the spleen, which is a major organ involved in immune responses. The team then simulated life-threatening inflammation by injecting mice with a compound called lipopolysaccharide (LPS). The researchers found that in animals treated using electroacupuncture before LPS administration, the serum levels of pro-inflammatory molecules were significantly lower than they were in control mice, and the electroacupuncture-treated animals’ survival rates also more than doubled. However, when the team gave mice the electroacupuncture after the LPS shot, the electroacupuncture-treated mice had much greater inflammation than those that were untreated, and did not survive.

By comparing the effect of electroacupuncture in mice with altered nervous systems, the team determined that high-intensity stimulation at the abdomen could excite norepinephrine-producing nerves that connect the spine and spleen. The norepinephrine then activated a particular type of receptors in the spleen that suppressed pro-inflammatory molecules. But when LPS was introduced first, another type of splenic receptors—pro-inflammatory in this case—became highly expressed, and the subsequent electroacupuncture therapy further enhanced inflammation. “We were really surprised to find that the same input has completely opposite outcomes in different disease stages,” Ma said. “But a lot of the time, a patient would only come to us if

they already have the disease. So we wanted to find out if there is a way to reduce inflammation as a treatment."
To investigate this the team then conducted electroacupuncture at a different acupoint, this time on the hind legs of mice. They found that stimulation at a low intensity of 0.5 mA for 15 minutes could significantly reduce levels of pro-inflammatory molecules either before or after LPS-injection. The animals' survival rate after electroacupuncture also increased by 1-fold or more. Further experiments in the genetically modified mice model suggested that low-level electroacupuncture applied at the hind legs reduced inflammation, not through the spleen, but through a different neural pathway involving the vagus nerves and the adrenal glands.
"Using endotoxin-induced systemic inflammation as a model, we found that electroacupuncture stimulation (ES) drives sympathetic pathways in somatotopy- and intensity-dependent manners," the researchers stated. "Low-intensity ES at hind limb regions drives the vagal-adrenal axis, producing anti-inflammatory effects that depend on NPY+ adrenal chromaffin cells. High-intensity ES at the abdomen activates NPY+ splenic noradrenergic neurons via the spinal-sympathetic axis; these neurons engage incoherent feed forward regulatory loops via activation of distinct adrenergic receptors (ARs), and their ES-evoked activation produces either anti- or pro-inflammatory effects due to disease-state-dependent changes in AR profiles."
"This observation underscores the idea that if practiced inappropriately, acupuncture could have detrimental results, which I don't think is something people necessarily appreciate," Ma said. "Our study illustrated that electroacupuncture has neuroanatomic basis, but its efficacy and safety on humans need to be validated in clinical trials," he added. "There are still many questions unanswered about this medical practice and thus a lot of room to do more research."
The researchers believe the study represents an important step in mapping the neuroanatomy of acupuncture. "The findings that acupuncture stimulation modulates systemic inflammation in somatotopy-, intensity-, and disease-state-dependent manners should help to improve acupuncture practice," they noted.
Much more work will be needed to confirm their findings through further research in animals and in humans, and to carefully define the optimal parameters for acupuncture stimulation. Nevertheless, the authors believe, these early findings point to the potential to one day using electroacupuncture as a versatile form of treatment, whether as an adjunctive therapy for sepsis in the intensive care unit, or for more targeted treatment of site-specific inflammation, such as in inflammatory diseases of the gastrointestinal tract. "The revelation of somatotopic organization and intensity dependency in driving distinct autonomic pathways could form a road map for optimizing stimulation parameters to improve both efficacy and safety in using acupuncture as a therapeutic modality," they wrote.
Another possible use of the approach, Ma said, would be to help modulate inflammation resulting from cancer immune therapy, which, while lifesaving, can sometimes trigger cytokine storm due to overstimulation of the immune system. Acupuncture is already used as part of integrative cancer treatment to help patients cope with side effects of chemotherapy and other cancer treatments. "
… the revelation of somatotopic organization and intensity dependence in driving distinct autonomic pathways could help to optimize stimulation parameters and improve both efficacy and safety in using acupuncture to treat systemic inflammation," the investigators concluded.

With data from NBA study, FDA extends Emergency Use Authorization to Yale's SalivaDirect COVID-19 test

Source: https://yaledailynews.com/blog/2020/08/15/fda-extends-emergency-use-authorization-to-yales-salivadirect/

Aug 15 - On Saturday morning, the U.S. Food and Drug Administration (FDA) granted an Emergency Use Authorization for SalivaDirect, a saliva-based test for COVID-19 developed by researchers at the Yale School of Public Health.
The EUA paves the way for other labs that hope to begin use of the test, noted for being inexpensive to produce and implement, with the general public.
In mid-May, the NBA approached the Yale team behind SalivaDirect, curious about a potential partnership that could help validate their new saliva-based assay. The collaboration generated a plan to verify the test, as players from 22 of the NBA's 30 teams embarked on their own experiment to recreate the season in a bubble.
Now, with the NBA-Yale study ongoing and basketball back in action, both experiments are proving successful. The test will now be rolled out this week, according to Anne Wyllie, the associate research scientist in epidemiology who helped spearhead this research at Yale.
A non-peer-reviewed preprint published earlier this month by lead researchers Wyllie and Nathan Grubaugh, an assistant professor of epidemiology, found the test to be "highly sensitive" with "high agreement" in testing outcomes when compared to widely used

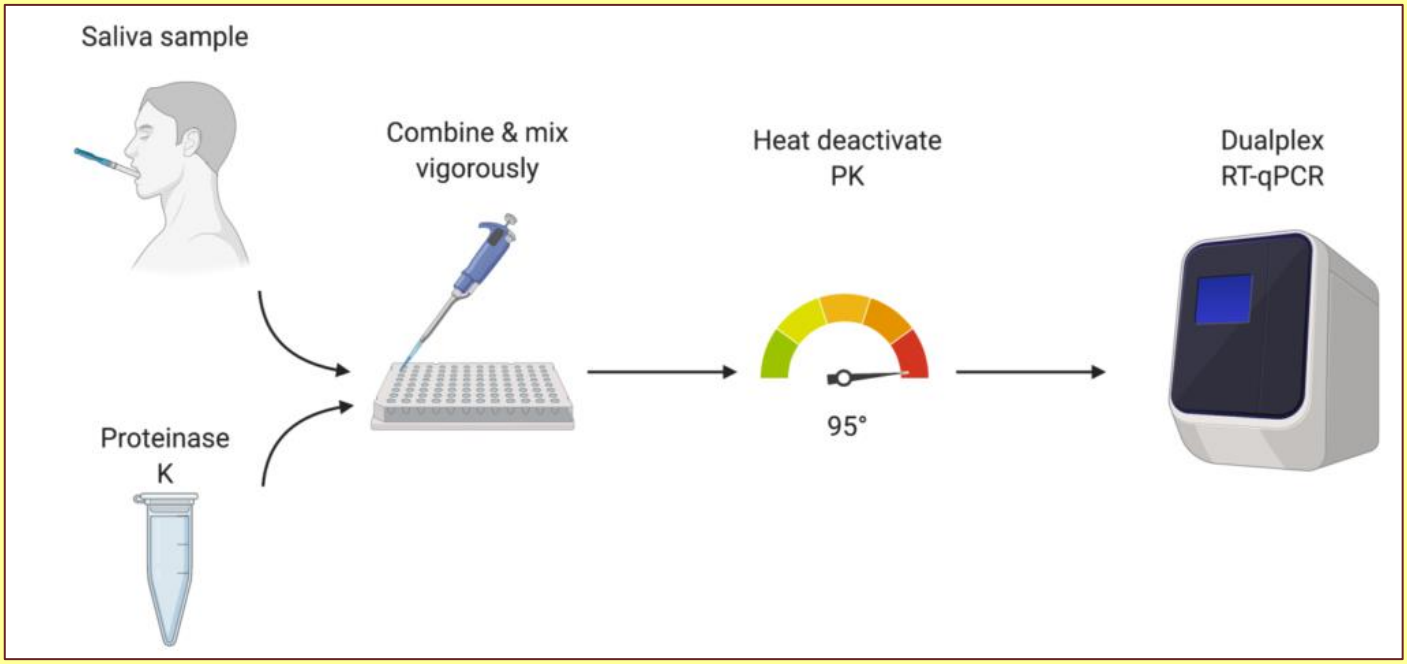
ThermoFisher Scientific nasopharyngeal (NP) swabs. The test is validated for use with reagents and instruments from multiple vendors, which researchers hope will minimize supply chain bottlenecks.

"Providing this type of flexibility for processing saliva samples to test for COVID-19 infection is groundbreaking in terms of efficiency and avoiding shortages of crucial test components like reagents," FDA Commissioner Stephen Hahn said in an official release.

Other saliva tests approved by the FDA, like one developed by Rutgers, are far more expensive than SalivaDirect. In May, Vault Health was offering the test, conducted in a patient's home with telehealth video supervision, for $150. According to the August SalivaDirect preprint, reagents for the test could **cost as little as $1.29 to $4.37 per sample**. Researchers estimate that Proteinase K, used for sample processing, would cost somewhere between 13 and 26 cents a sample. Primers and probes would cost a few cents. And a RT-qPCR kit would require between 75 cents and $2.11 per sample.

When labs offer tests to the public, each test should only cost $10 or less, Wyllie wrote in an email to the News. From the beginning, researchers have sought an inexpensive, flexible test that could be scaled and immune to bottlenecks.

"We've called it SalivaDirect because of the idea that we're almost testing saliva directly. We're doing a very simple intermediate treatment," Wyllie told the News in June. "That makes it a lot cheaper and makes it a lot higher throughput and faster turnaround."



The SalivaDirect sampling process, as shown on the team's website (Graphic: Courtesy of Anne Wyllie)

The NBA study allows researchers to validate the test in an asymptomatic cohort, Wyllie said. In addition to receiving daily testing to ensure that they have not contracted the virus, a group of players, coaches and staff heading for the NBA's Florida bubble volunteered to offer a saliva test sample that researchers could use to verify the efficacy of SalivaDirect.

Although she could not yet report on the study itself, Wyllie pointed out that the very success of the NBA bubble in Florida has created a unique challenge for researchers studying a new coronavirus test: there are no positive cases. Before teams entered the bubble at Disney World, 25 of 351 players tested positive for the virus between June 23 and July 2. But of the more than 340 players still receiving constant tests within the bubble, zero positive tests have been recorded over the past month, according to official NBA releases.

An NBA spokesperson did not respond to an immediate request for comment Saturday on whether the league now plans to begin using SalivaDirect in its normal testing regimen. The NBA and National Basketball Players Association contributed more than $500,000 to fund the validation study for SalivaDirect, ESPN reported Saturday. The researchers' preprint also lists the Huffman Family Donor Advised Fund, George Mason's Mercatus Center, the Yale Institute for Global Health and the Beatrice Kleinberg Neuwirth Fund as funders.

Grubaugh and Wyllie have both emphasized how saliva testing could change the game for detecting COVID-19. Not only has it been proven in their studies to be equally — if not more — effective as nasopharyngeal swab testing, but it is more comfortable for patients and significantly lowers the risk of infection for healthcare workers administering the tests.

The FDA also explained in its announcement that SalivaDirect is incredibly versatile, as it does not require a particular collection device. Any sterile container will work.

"This test is also unique because it does not require a separate nucleic acid extraction step," the FDA wrote. "This is significant because the extraction kits used for these step-in other tests have been prone to shortages in the past. Being able to perform a test without these kits enhances the capacity for increased testing, while reducing the strain on available resources."

While the saliva testing method is generally more straightforward than NP swab testing, one of the potential barriers to widespread use of SalivaDirect will be getting adequate saliva samples, according to Wyllie. She said that the sample is supposed to just be "the normal saliva that naturally pools in your mouth." Often people think it is more complicated than that, and they sniff or cough to produce saliva, which can sometimes reduce the test's accuracy.

Wyllie told the News when the NBA study started that the ultimate goal was not to commercialize SalivaDirect, and that the protocols were already available online to the public. The FDA's statement explains that Yale will now provide these testing protocols to other labs on an "open source" basis.

"Our goals and values hold true. There is still no kit and no commercialization," Wyllie told the News in an email. "The method is available but we have to designate labs who can use it to make sure they follow the requirements exactly — just some oversight. However, it also means that we have a free license for commercial labs — we want to have conversations about them for testing."

By following the instructions put out by Wyllie and Grubaugh's team, these labs will be able to get the necessary materials and easily do the test themselves, according to the FDA. This is made possible by the fact that SalivaDirect does not depend on specific equipment from Yale and can be scaled up at other laboratories.

Instructions on the Grubaugh Lab's coronavirus-centric website, CovidTrackerCT.com, simply invite labs to email salivadirect@gmail.com to begin the process alongside a link to a detailed protocol that covers collecting spit — thinking about "favorite foods" or an "upcoming meal" can stimulate saliva production — processing the sample and reporting a result.

"I think people will move to this quite quickly — we need more tests as screening measures as we continue to reopen," Wyllie wrote in an email to the News. "With more frequent testing we can get this virus under control. I think people are much more open to saliva than swabs!"

The Yale team submitted SalivaDirect as a laboratory developed test for FDA EUA on July 14, 2020, making SalivaDirect the fifth saliva sample test that the FDA has authorized.

Summer 2020 Stupidity Competition

The Silver Winner is:

If you are curious about the Gold Winner, organizers are still looking for an individual swimming or surfing or diving in full PPE!

Research Shows a Way to Sanitize N95 Masks at Home - You Just Need an Electric Cooker

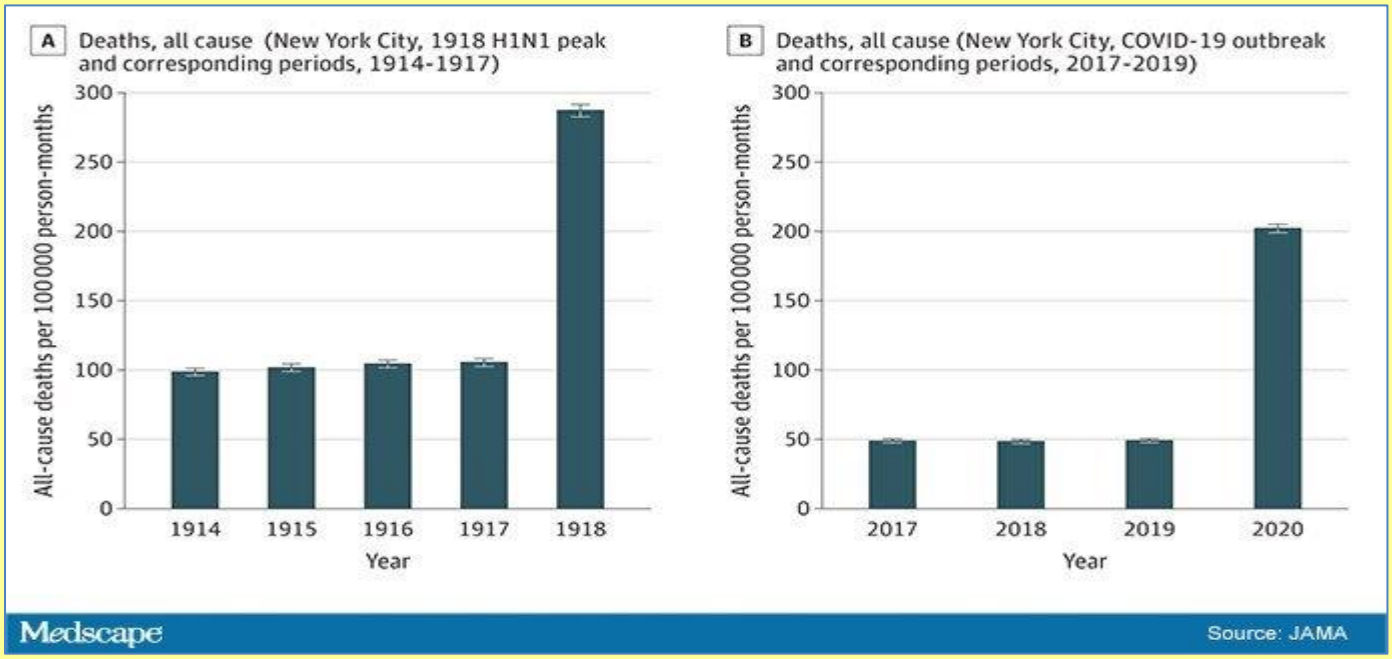
Source: https://www.eurekalert.org/pub_releases/2020-08/uoia-eca080620.php
Video: https://www.youtube.com/watch?time_continue=65&v=o7-k0EIR0To&feature=emb_logo

COVID-19 and 1918 Flu Mortality in NYC 'In the Same Ballpark'

Source: https://www.medscape.com/viewarticle/935696?src=wnl_edit_tpal&uac=82598DG&impID=2507039&faf=1

Aug 16 – A comparison of excess deaths in New York City during the beginning of the COVID-19 outbreak with excess deaths from the peak of the 1918 H1N1 influenza outbreak finds COVID-19 mortality rates jumped higher.
Jeremy Samuel Faust, MD, an emergency physician at Brigham and Women's Hospital in Boston, Massachusetts, and colleagues, found that during the peak of the H1N1 outbreak, excess deaths (the number of deaths beyond what would normally be expected for that period) were comparable to COVID-19 excess deaths in the first 2 months of the city's outbreak.
However, because death rates have dropped by half over the last century with medical advances, the relative increase in excess deaths during the COVID-19 outbreak was substantially greater than the rate during the H1N1 "Spanish flu" pandemic.

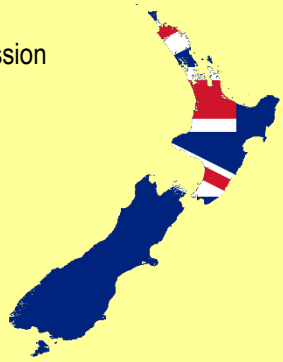
COVID-19 Mortality Jump from Baseline Was Higher
Faust told *Medscape Medical News* they looked at the data through two lenses.
In one comparison of all-cause mortality rates, COVID-19 is about 70% as deadly as the 1918 flu, which killed 50 million people worldwide, 675,000 in the United States.



In other words, he said, "70% as many of the people died in April of this year as died in November of 1918."
But in terms of how far the death rates jumped from pre-pandemic times, COVID-19 is worse.
The incident rate ratio for all-cause mortality during the 1918 H1N1 pandemic compared with the 3 years before jumped to almost 3 times as high (2.80).
But the incident rate ratio for all-cause mortality during the first 2 months of the pandemic in New York City compared with corresponding periods from 2017 through 2019 was more than 4 times as high (4.15).
"From the perspective of mortality, these pandemics [are] in the same ballpark," Faust said.
The study, which used public data from the Centers for Disease Control and Prevention, The New York City Department of Health and Mental Hygiene, and the US Census Bureau, was published online today in *JAMA Network Open.*

100 days without Covid-19: How New Zealand got rid of a virus that keeps spreading across the world

Source: https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12354489



Aug 09 – Today New Zealand marked 100 days without community transmission of Covid-19.
From the first known case imported into New Zealand on February 26 to the last case of community transmission detected on May 1, elimination took 65 days.
New Zealand relied on three types of measures to get rid of the virus:
1. Ongoing border controls to stop Covid-19 from entering the country
2. A lockdown and physical distancing to stop community transmission
3. Case-based controls using testing, contact tracing and quarantine.

▶▶ Read the rest of this article at source's URL.

Michael Baker *is Professor of Public Health,* University of Otago.
Amanda Kvalsvig *is Senior Research Fellow, Department of Public Health,* University of Otago.
Nick Wilson *is Professor of Public Health,* University of Otago.

UPDATE: *The virus is back to the point to delay national elections for one month!* ☹

American Academy of Pediatrics Provides Guidance on Cloth Face Coverings, Coronavirus Testing, and PPE

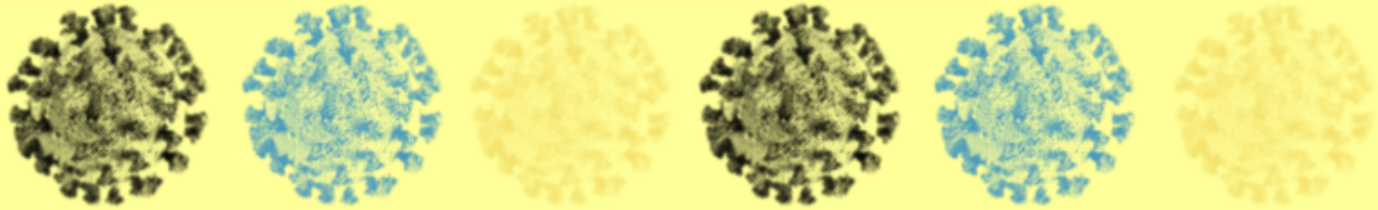
Source: https://services.aap.org/en/news-room/news-releases/aap/2020/american-academy-of-pediatrics-provides-guidance-on-cloth-face-coverings-coronavirus-testing-and-ppe/

Aug 13 – Today, the American Academy of Pediatrics (AAP), drawing from the latest evidence, issued three new interim guidance documents on the care of children during the COVID-19 pandemic. New recommendations address:

- Children's use of cloth face coverings
- Testing protocols for children
- Personal protective equipment (PPE) for pediatric medical providers

Seven months later, what we know about Covid-19 — and the pressing questions that remain

Source: https://www.statnews.com/2020/08/17/what-we-now-know-about-covid19-and-what-questions-remain-to-be-answered/



Aug 17 - The "before times" seem like a decade ago, don't they? Those carefree days when hugging friends and shaking hands wasn't verboten, when we didn't have to reach for a mask before leaving our homes, or forage for supplies of hand sanitizer. Oh, for the days when social distancing wasn't part of our vernacular.
In reality, though, it's only been about seven months since the world learned a new and dangerous coronavirus was in our midst. In the time since Chinese scientists confirmed the rapidly spreading disease in Wuhan was caused by a new coronavirus and posted its genetic

sequence on line, an extraordinary amount has been learned about the virus, SARS-CoV-2, the disease it causes, Covid-19, and how they affect us.
Here are some of the things we have learned, and some of the pressing questions we still need answered.

What we know

Covid and kids: It's complicated

Early in the pandemic, it looked like there was a silver lining to the disease cloud sweeping across the world. Children, it seemed, didn't develop the severe symptoms that were sending adults to hospitals struggling for breath, and they very rarely died. It even seemed that kids didn't contract the disease at the same rates as adults did.
But everything Covid is complex, and kids are no exception. While deaths among children and teens remain low, they are not invulnerable. And they probably contribute to transmission of SARS-CoV-2, though how much remains unclear.
We've learned younger children and teenagers shouldn't be lumped together when it comes to Covid. Teens seem to shed virus — emit it from their throats and nasal passages — at about the same rates as adults. Kids under 5 have high levels of virus in their respiratory tracts, but it's still not clear how much they spread it or why they don't develop symptoms as often as adults do.
A recently published report from a Georgia sleep-away camp shows how quickly the virus can spread among kids. The camp had to be closed within 10 days of starting its orientation for camp staffers, because within days of children arriving, kids and staff started getting sick. (The campers ranged in age from 6 to 19.) The camp did not require campers to wear face masks.
A recent report on Covid infections in children from the Centers for Disease Control and Prevention showed that while they remain low, U.S. hospitalization rates for Covid-19 in children have risen since the pandemic started. And one in three children hospitalized with the disease ends up in intensive care. The highest rate of hospitalizations in children was among those under 2 years of age.
Black and Latino children were hospitalized at higher rates than white children. And like adults, children with other health conditions — obesity, chronic lung diseases, or infants who were born premature — are at higher risk than otherwise healthy children.
Perhaps most alarmingly, it's become clear that a small proportion of children infected with Covid-19 go on to develop a condition where multiple organs come under attack from their own immune system. Called multisystem inflammatory syndrome in children or MIS-C, this condition seems to occur about two to four weeks after Covid-19 infection. Most children who develop this syndrome recover.

There are safer settings, and more dangerous settings

Research has coalesced on a few key points about what types of setting increase the risk that an infectious person will pass the virus to others.
Essentially, the closer you are to someone infectious and the longer you're in contact with them, the more likely you are to contract the virus, which helps explain why so much transmission occurs within households. Being indoors is worse, particularly in rooms without sufficient ventilation; the more air flow, the faster the virus gets diluted. Everyday face coverings reduce the amount of virus projected, but aren't total blockades.
Loud talking, heavy breathing, singing, and screaming expel more virus, which is why experts point to nightclubs and gyms as risky businesses to be open. (That's not to say it's impossible to catch the virus while having a quiet conversation with someone outside — it's just less likely.)
The reason having prolonged, proximate contact with someone is riskier is in part because there is a threshold level of virus you need to be exposed to to become infected. (More on this later.) Also, one hypothesis for why some people get so sick is that they are exposed to higher "doses" of virus.
Researchers are also finding that some relatively small proportion of infected people — maybe 10% to 20% — are driving some 80% of new cases, often through "superspreading" events in indoor settings like bars, meat processing plants, and homes. Whether such transmission occurs depends on a host of variables: how many people are in a given place, what the ventilation in the room is like, and, of course, whether someone with infectious Covid-19 is there. Some people might shed more virus than others, and people are more or less likely to spread the virus during different points in their infection. Evidence suggests that contagiousness spikes in the days before people who will go on to show symptoms start feeling sick.

People can test positive for a long time after they recover. It doesn't matter

There was a lot of angst a few months ago about some people who had seemingly recovered from Covid-19 infections continuing to test positive for the virus for weeks. Were they infectious? Should recommendations be changed for how long infected people should be isolated?

It turns out it is an issue of testing. Most testing is conducted using a platform called PCR — polymerase chain reaction — that looks for tiny fragments of the SARS-CoV-2 virus. But the test can't tell if those sections of genetic code are part of actual viruses that can infect someone else, or fragments of viruses that are absolutely no threat.
It's clear now that people who had mild or uncomplicated infections shed active virus for somewhere up to 10 days after their symptoms started. ("Severely ill or immunocompromised patients do shed infectious virus for longer," said Malik Peiris, a coronavirus expert at Hong Kong University.)
The weeks and weeks of positive tests — like those that prevented this woman in Quebec from cuddling her infant son for 55 days — don't tell us that these people are still a risk to others. "In fact, we know that they are not infectious for that long," said Maria Van Kerkhove, the World Health Organization's leading coronavirus expert.

After the storm, there are often lingering effects
Name a body part or system and Covid-19 has left its fingerprints there. We know this: Unusually sticky blood can clog vessels on the way to the heart and inside the brain and lungs of infected people, causing heart attacks, strokes, and deadly pulmonary embolisms. There are growing worries that these and other health effects will be long-lasting.
Heart: The hyperinflammation of an immune response triggered by the virus can weaken heart muscles so much that even young people who had mild infections may be at risk for future heart failure, cardiac MRIs in Germany indicate. More immediately, some people have chest pain or feel like their hearts are racing as they recover from the infection. And college athletes are no exception
Brain: People whose first Covid-19 symptom might have been losing their sense of smell and taste may find their anosmia persists. Headaches and dizziness are common. Mood disorders such as anxiety, depression, and PTSD follow in the wake of infection, and the mental confusion called "Covid fog" leaves people searching for words, struggling with simple math, or simply trying to think.
Peripheral nervous system: In Italy, three Covid-19 patients experienced myasthenia gravis, an autoimmune disorder, possibly due to demyelination. Demyelination, in which the protective coating of nerve cells is attacked by the immune system, can cause weakness, numbness, and tingling. In some cases it can spur psychosis and hallucinations. Some patients have Guillain-Barre syndrome, a rare autoimmune disease that interferes with nerve signals, leading to abnormal sensations, weakness, and sometimes paralysis.
SARS-CoV-2, the virus that causes Covid-19, affects more than just the lungs and airways. Here's how this virus enters cells and the symptoms that can arise from infecting different parts of the body.

'Long-haulers' don't feel like they've recovered
They have a name, a growing social media presence, and a problem. They are the "long-haulers," people who have survived their Covid-19 infections but feel a long way from normal. We know they're out there, but we don't know how many, why their symptoms persist, and what happens next.
In July, a survey conducted by the CDC found that 35% of people who tested positive for SARS-CoV-2 and had symptoms of Covid-19 — cough, fatigue, or shortness of breath — but were not hospitalized had not returned to their previous health two to three weeks later. Among those between 18 and 34 years old who had no previous chronic conditions, 20% felt prolonged signs of illness.
The National Heart, Lung, and Blood Institute has launched an observational study to track the long-term effects of Covid-19, aiming to follow 3,000 patients six months after being discharged from 50 hospitals.
Mount Sinai Health System in New York City opened a Center for Post-Covid Care in May to treat long-haulers. David Putrino, director of rehabilitation innovation there, has suggested dysautonomia — when heart rate, blood pressure, and body temperature are disjointed —could be to blame for prolonged and distressing symptoms. Why Covid-19 would cause this isn't known, nor is the best treatment.

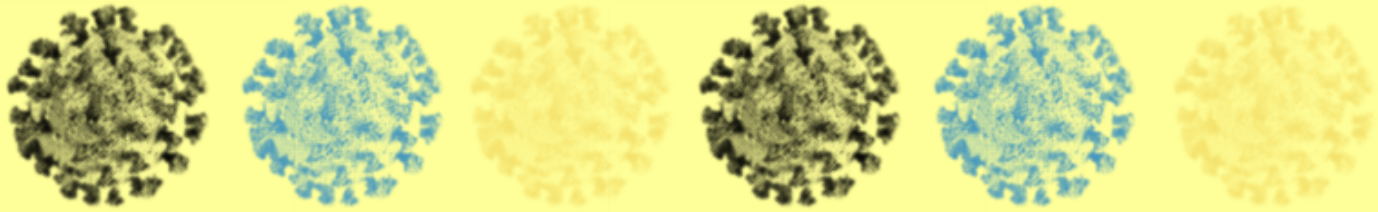
Vaccine development can be accelerated. A lot
The world still doesn't have a vaccine that has been shown to be protective against Covid-19, though China and Russia have issued emergency use licenses for partially tested vaccines.
But an extraordinary amount of progress toward Covid-19 vaccines has been made, in record time. Trials have been compressed and overlapped, with manufacturers running Phase 1/2 trials in some cases and Phase 2/3 trials in others.
Meanwhile, they've been building out production capacity to be able to produce hundreds of millions of doses and have started production, even before finding out whether their vaccine candidate actually works. This work is being done with substantial financial support of governments, the Bill and Melinda Gates Foundation, and CEPI, the Coalition for Epidemic Preparedness Innovations.

It's called "at risk" production — and the term is apt. If some of these vaccines don't work, that output will have to be junked. But if Phase 3 trials show they do work, deployment could begin as soon as the Food and Drug Administration, or a regulator in another country, approves any of these vaccines.
That means vaccination with fully approved vaccines could begin as soon as about a year after the discovery of the new virus. This constitutes a revolution in vaccine development.

People without symptoms can spread the virus
Discussing asymptomatic cases of Covid-19 automatically raises some headache-inducing semantic issues. Some people are truly asymptomatic throughout their infections, but the word is often also used to describe people who are presymptomatic — those who will show symptoms but haven't yet. Other people don't show classic Covid-19 symptoms — fever, cough, loss of smell — but just feel kinda crappy for a day. Where do they fit in?
Whatever group you're talking about, there are some key implications for the pandemic, and trying to rein it in. One: Some percentage of infected people — roughly 20%, according to one recent review, though other studies have produced higher estimates — do not show symptoms at all. And two: Whether or not someone is asymptomatic or presymptomatic, they can still spread the virus (though whether they spread it as efficiently as people with symptoms is still unknown). That is why public health campaigns have been stressing distancing, masks, and hand hygiene for everyone, not just people who feel sick. Once you do start showing symptoms and try to restrict contact with others, it is too late to prevent spread.

Mutations to the virus haven't been consequential
Coronaviruses in general do not mutate very quickly compared to other viral families. This is a good thing: The leading vaccine candidates, for example, are based on SARS-CoV-2's genetic sequence, so theoretically a major change in that lineup could hinder the effectiveness of any vaccine. So far, that doesn't seem to have happened.
Still, scientists have noticed smaller changes in the genome. The one that has gotten the most attention was one swap in the "letters" that make up the virus' RNA, which created the "G variant." The switch happened early in the pandemic, and the G variant has since become dominant around the world. Scientists haven't been able to figure out, however, whether the G variant is outcompeting its predecessor — perhaps it's more contagious? — or if that's just chance. And so far, they haven't landed on evidence that people who contract the G variant get more or less sick than those infected by the other variant. It could just be a mutation that's like changing your T-shirt from navy blue to royal blue — an aesthetic difference, but something pretty neutral.

Viruses on surfaces probably aren't the major transmission route
Throughout the spring, you could barely find hand sanitizer. Fears that viruses lurking on surfaces could infect us with Covid-19 turned most of us into zealous surface cleaners. Some people went so far as to quarantine their mail, not touching it for days as they waited for potential lingering viruses to die.
The general consensus now is that "fomites" — germs on surfaces — aren't the major transmission route for Covid-19. Van Kerkhove of WHO said there hasn't been a case recorded where it's clear someone was infected by fomites alone.
(In the real world, someone in close enough contact with an infected person to become infected will likely have encountered viruses on surfaces and virus-laced droplets and maybe even small, aerosol-sized particles containing the virus that have been expelled by coughing, singing, or speaking. Teasing out of that situation which route of transmission triggered infection may be impossible to do.)
But it's clear from lots of studies that surfaces around infected people can be contaminated with viruses and the viruses can linger. Cleaning surfaces and being prudent about hand hygiene is a risk-lowering step people can take, public health officials agree.



What we don't know
People seem to be protected from reinfection, but for how long?
The thinking is that a case of Covid-19, like other infections, will confer some immunity against reinfection for some amount of time. But researchers won't know exactly how long that protection lasts until people start getting Covid-19 again.

So far, despite some anecdotal reports, scientists have not confirmed any repeat Covid-19 cases.
All that supports the notion that Covid-19 acts like other viral infections, including illnesses caused by other coronaviruses. Researchers are finding that most infected people mount an immune response involving both antibodies and immune cells that clears the virus, and that persists for some amount of time. Reports of waning antibody levels incited some concern that perhaps protection to SARS-CoV-2 might not last very long, with big implications for the frequency of required vaccine boosts. But immunologists have pointed out that antibodies for other viruses wane as well; their levels surge upon re-exposure to the pathogen and they can still halt reinfection.
When a new pathogen causes illness, the immune system creates memories, so its cells can target and kill the invader if it ever comes back again. Here's how a person becomes develops immunity. *Hyacinth Empinado/STAT*
Researchers don't know for sure what level of antibodies are required to block the virus from gaining a toehold in cells, and what role pathogen-fighting T cells might have in fending off an infection. People who recover from Covid-19 also produce varying levels of antibodies — it's possible people who generate a weaker initial immune response might not be protected for as long from reinfection. "We don't know for how long that immune response lasts," the WHO's Van Kerkhove said last week. "We don't know how strong it is."

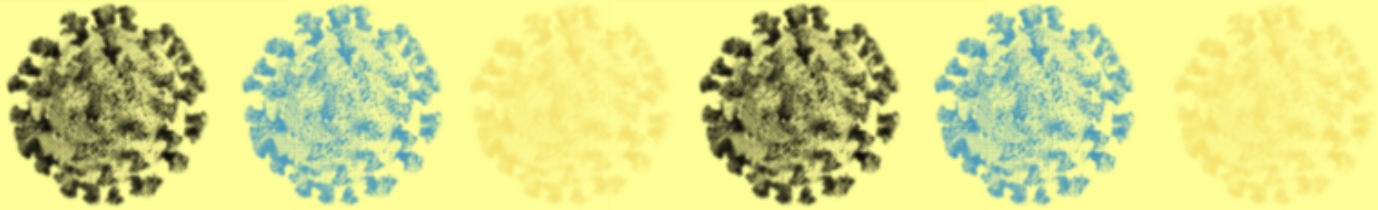
What happens if or when people start having subsequent infections?
Given that most respiratory viruses are not "one-and-done" infections — they don't induce life-long immunity in the way a virus like measles does — there is a reasonable chance that people could have more than one infection with Covid-19.
Experience with human coronaviruses — which mostly cause colds — supports that idea. A study in the Netherlands followed people for decades, measuring their antibodies to four human coronaviruses at regular intervals and looking for changes that would indicate a new infection. The scientists found that reinfection could occur within a year of the first infection. (The study is a preprint, meaning it hasn't yet been through the peer review process.)
Some scientists have theorized that on subsequent infections, immune systems might mount quicker responses to Covid-19, leading to milder infections. If that's true, the SARS-CoV-2 virus might transition into a less daunting threat over time. But it's still a big unknown. "We don't know," Van Kerkhove said. "I don't want to speculate."

How much virus does it take to get infected?
Whether you become infected or not when you encounter a pathogen isn't just a question of whether you're susceptible or immune. It depends on how much of the virus (or bacterium) you encounter.
And the amount capable of tipping the balance is what's known as the minimum infectious dose. Some pathogens have a low infectious dose. For example, it doesn't take a lot of E. coli 0157, a dangerous bacterium transmitted in food, to make someone sick. How big a dose of SARS-CoV-2 does it take to infect most people? It's one of the burning questions in SARS-CoV-2 research, said Angela Rasmussen, a coronavirus expert at Columbia University. "We don't know the amount that is required to cause an infection, but it seems that it's probably not a really, really small amount, like measles."

How many people have been infected?
There have been 21 million confirmed cases of Covid-19 around the world, and 5.3 million in the United States. Far more people than that have actually had the virus.
Problems with testing, and its limited availability, have contributed to that gap, as has the fact that some people have such mild or no symptoms that they don't know they're infected. But researchers don't know just how big of a gulf they're dealing with — how much spread they've missed.
"Serosurveys" — which rely on testing for the level of SARS-CoV-2 antibodies in a community — are starting to help fill in some knowledge. A recent CDC study of 10 cities and states estimated that in most places, the true number of infections was some 10 times higher than the number of confirmed cases.
Still, that leaves perhaps 20% of people, even in hard-hit communities, with potential immunity to Covid-19. That means that herd immunity — the point at which so many people are immune that the virus can't circulate — remains far off even in areas that have suffered severe outbreaks.

It's not clear why some people get really sick, and some don't
The sheer range of outcomes for people who get Covid-19 — from a truly asymptomatic case, to mild symptoms, to moderate disease leading to months-long complications, to death — has befuddled infectious disease researchers.

There are some clear factors for who faces higher risks of getting severely ill: older people, as well as people with conditions ranging from cancer to obesity to sickle cell disease.
But scientists have postulated that a host of other underlying factors could help dictate why most healthy 30-year-olds shake off the virus after a couple days and some get severely ill. Researchers are studying genetic differences in patients, while others are looking at blood type.
Recent studies have pointed to another potential player. Perhaps up to half the population has immune-system T cells that were initially generated in response to an infection by one of the common cold-causing coronaviruses but that can recognize SARS-CoV-2 as well. These "cross-reactive" T cells could help give the immune system the boost it needs to stave off serious symptoms, but researchers don't know for sure what role, if any, they actually play.



Here's How to Talk to Someone Who Won't Wear a Mask, And Actually Change Their Mind

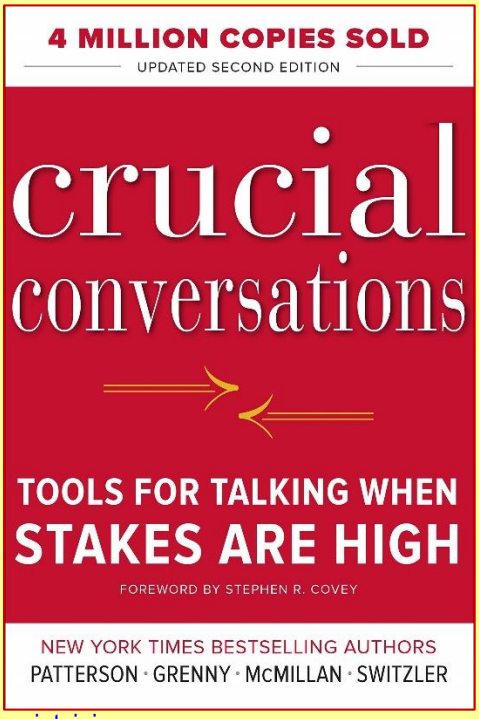
By Claire Hooker
Source: https://www.sciencealert.com/how-to-talk-to-someone-who-doesn-t-wear-a-mask-and-actually-change-their-mind

Aug 17 – It could be a brother or sister. It could be a neighbour. It could be a person you work with. We probably all know someone who doesn't wear a mask in public even though it's compulsory or recommended where you live.
The media is quick to highlight people who think it's their right not to wear a mask, such as #bunningskaren, or who become violent in expressing their objection.
But others can be persuaded, with the right approach.
So how do you know if it's worth trying to convince someone to wear a mask? And what's the best way to talk to them if you actually want to make a difference?

Yelling 'Mask up!' at them won't work

People vary in how they perceive and tolerate risk, and how physically and psychologically vulnerable they are. So we may need to negotiate accepted behaviours, just as we did with HIV. Many of these conversations might be difficult.
We also need to watch our own emotions don't cloud the message we want to convey. For instance, when we become angry, anxious, outraged or fearful, the person we are trying to communicate with might not hear the message we intended.
We might want to convey: "I want you to wear a mask when you catch the train to see our father."
But instead, the other person hears the message: "I think you are behaving badly and I'm angry with you."
Ironically, the pandemic makes this type of miscommunication more likely. When we are stressed or emotional, we are more likely to activate our body's "fight, flight, freeze" mechanisms. This affects how we communicate and how our communication is received.
If refusing to wear a mask is about maintaining a sense of control or is connected to a sense of identity — for example, if someone considers themselves "not someone who fusses" — then telling them to mask up could make them defensive.
Becoming defensive makes people not only less willing to listen, but less *able* to take in information, and or to appraise it accurately.
As a result, criticising someone's views — for example, that wearing a mask doesn't work — may lead them to "switch off" from what you're saying and stick more firmly to their beliefs.

So, what does work?
To communicate well, we need to prepare. The authors of the book *Crucial Conversations* recommend asking yourself what you want to achieve as an outcome *and* what you want for the relationship between you.



The goal is to keep the relationship respectful and the lines of communication open, so negotiations can continue as new pandemic circumstances arise.
You won't completely change someone's beliefs or actions.
A better aim is to negotiate a change in behaviour that minimises harm. This might be: "Do as you choose at other times of course, but could we agree that just for now, you wear a mask when you visit Dad?"

Respect, empathy[4], appeal to values

Identifying and respecting another person's values and finding values in common reduces defensiveness and provides grounds for negotiation.
For instance: "I can see how important it is to you to be sceptical, and I absolutely agree, especially since the evidence changes so often. But since the evidence definitely shows that even some young, healthy people can get seriously ill, could I ask you to wear a mask on our trip?"
Asking someone why they are not wearing a mask, instead of telling them to wear one, is another helpful tool. This is a chance for someone to be heard, which lowers any defensiveness.
There are many reasons why people don't wear masks. And hearing someone explain could provide an opportunity to problem-solve (especially if we ask how we can help, and refrain from giving advice).
Compassion or empathy allows us to support another's position while more strongly maintaining our own.
For example, acknowledgements such as "I can relate! All these controls over our lives make me crazy and a lot of them make no sense" or "I might be wrong, and I might be overreacting", can help with negotiating "please humour me and wear a mask, just on the train".
Empathy can also help preserve the relationship while insisting on a boundary, such as: "Our relationship is so important, I really want to see you, and I hate saying this, but I can't accept you visiting without a mask, at least until there are fewer cases."

How a non-judgemental approach can win people over

Evidence shows some groups of men — such as younger men, more politically conservative men, men with lower health literacy, and men who endorse more traditional notions of masculinity — are among the most likely to resist wearing a mask.
Non-judgemental communication is as effective with men as with everyone else.
When Harvard professor Julia Marcus wrote about male anti-maskers without shaming or judgement, many men contacted her, willing to listen to her views on masks.

In a nutshell

If we are non-judgemental, empathetic, and clear in what we want to achieve, we can rise above counterproductive reactions, such as jumping in to tell someone off or dismissing someone's concerns.
This allows us to be brave enough to tailor our communication to what the other person is able to hear, and to make it safe for the other person to speak. This is when our communication will actually work.

***Claire Hooker** is Senior Lecturer and Coordinator, Health and Medical Humanities, University of Sydney.*

[4] **Empathy** is the capacity to understand or feel what another person is experiencing from within their frame of reference, that is, the capacity to place oneself in another's position. The English word *empathy* is derived from the Ancient Greek word ἐμπάθεια (*empatheia*, meaning "physical affection or passion"). This, in turn, comes from ἐν (*en*, "in, at") and πάθος (*pathos*, "passion" or "suffering").

Young adults can't stop partying during the pandemic because they're wired that way

By Hillary Hoffower

Source: https://www.businessinsider.com/why-young-adults-cant-stop-partying-during-pandemic-experts-2020-8

Young adults celebrating graduation in Manhattan Beach, California, in early June. Jay L. Clendenin/Getty Images

Aug 10 – It all began with the spring breakers.

The week the coronavirus was declared a pandemic, students swarmed Texas and Florida beaches and hopped on flights to Cabo. Come summer, young adults flocked to bars in large groups as states slowly reopened. And TikTok and YouTube stars have recently been gathering for massive parties despite record COVID-19 cases in California.

Many young adults are safely social distancing and wearing masks, but others have been ignoring warnings. Officials have been reporting nationwide that many new infections are among young adults under age 35, Business Insider's Holly Secon reported at the end of June. Officials have urged young adults to follow guidelines and take the pandemic more seriously.

But for these millennials and Gen Zers, that's all easier said than done. Four psychologists weighed in on why young people won't stop partying, and their risky behavior has a lot to due with their developmental stage.

Science makes young adults think they're invincible

Eighteen may be considered the legal marker of adulthood in the US, but the brain doesn't stop developing until at least the mid-20s, Katie Lear, a North Carolina-based therapist who specializes in child and adolescent anxiety and trauma, told Business Insider.

Much of the brain's restructuring during this time occurs in the frontal cortex, which controls judgement, problem solving, impulse control, and emotional regulation. During this development, she said, young people rely more on their amygdala, the fight or flight part of the brain, for decision-making.

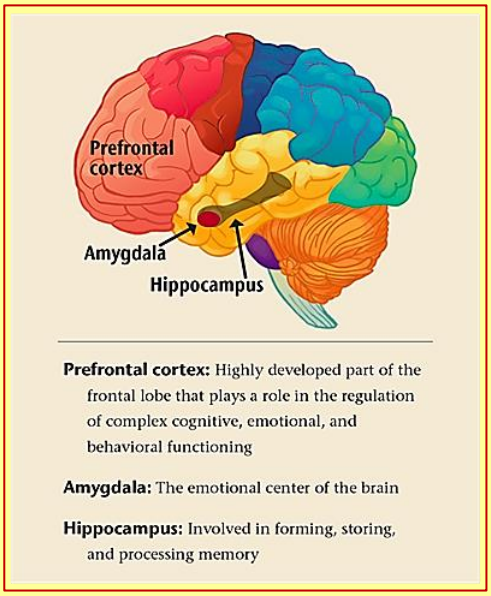
"This might help explain why young people may have a hard time thinking about the long-term repercussions of their decisions and their possible impact on other people, even if they've been informed of the risks," she said.

Spring breakers in Pompano Beach, Florida, in March. Because their brains are still developing, some young adults think they're invincible. Julio Cortez/AP Images

She added that it doesn't help that early coronavirus media coverage made it seem like young people were at zero risk of experiencing severe symptoms if infected, even though it's possible for the young to asymptomatically spread the virus or experience prolonged illness from it themselves.

Part of this development involves a phase where

young adults feel "invincible," Forrest Talley, a clinical psychologist who spent 20 years working at the University of California - Davis Medical Center, told Business Insider. Not only do young people tend to feel immune from the laws of physics and common sense, a Max Planck Institute study found, they have a strong tendency to selectively ignore information that would refute this view.
So when the youth hear they shouldn't gather in large groups, Talley explained, many will place little personal importance on the information. "Youth is not marked by risk aversion, but rather by risk taking," he said.



Socializing is critical to forming their identity
Socializing takes on special importance for young adults. They're in the midst of identity development, which often happens in the context of social relationships. Feeling part of a group is critical to their identity and self-esteem.
This is known as the identity versus role confusion phase in developmental psychologist Erik Erikson's psychosocial stage of development theory. Christie Kederian, a marriage and family therapist and educational psychologist who specializes in working with young adults, told Business Insider that this is when social approval begins to matter more and when adolescents and young adults experience egocentrism.

Young adults party on a rooftop in New York in August. Feeling part of a group is critical to forming one's identity. Noam Galai/Getty Images

She explained that telling them to wear a mask to protect others goes against their emotional development, which focuses inward on their own thoughts and feelings. Combined with the rise of social media apps like TikTok, this thinking can "reaffirm that belief that 'everyone is watching and caring about me,' which can increase the self-centered way of thinking and decrease the care and empathy for others," she said.
If socializing with peers helps form their identity, Talley added, then remaining homebound cuts off this source of affirmation, sometimes reinforcing a sense of being childlike in that they need follow rules about who they can associate with. Rebelling against "the establishment," where socializing restrictions are currently coming from, also enables young adults to develop a sense of independence, he said.

Socializing is also a coping mechanism
Leela Magavi, a child and adolescent psychiatrist, told Business Insider that socializing helps adolescents and young adults attain a sense of normalcy. She said many of her patients do party or socialize with their friends because it diverts their attention from pandemic-related frustration and emotional distress.
"Although many of them are well aware of the risks involved, they gather in large groups and engage in activities to distract themselves from feelings of helplessness and loneliness," she said. For some, she added, it's a case of FOMO and losing friends. Others, she said, don't have secure relationships with their parents and rely on friends for emotional support.

Kederian points out that while everyone is grieving during the pandemic, everyone has their own unique grieving process. Young adults are also in the intimacy vs. isolation phase, she said, where they desire deeper connections with others and their ultimate fear is isolation.
This means that their stage of grief may perpetually be the first stage of grief, she said: denial. Thus, hanging out with friends and partying are all acts of denial centered around a fear of loneliness.
"Ultimately, their fear of being alone trumps the fear of illness or death, which becomes a deeper fear psychologically in late adulthood," she said.

***Hillary Hoffower** is the first to report on millennial wealth for Business Insider, covering the lifestyles and financial behaviors of millennials. She often covers trends in how millennials are living and spending, particularly among the generation's wealthiest, and examines how the environment millennials grew up in shaped them and their money habits. She also dives into the luxury landscape by exploring the rise of discreet wealth and the evolution of status symbols among the rich. Hillary joined Business Insider in 2018 reporting on personal finance for the Your Money section. She got her start in the luxury world as an associate editor at Boat International Media writing about superyachts and the people who work on them.*

European youth Covid's perception
Source: https://www.euronews.com/2020/07/30/coronavirus-greater-numbers-of-young-europeans-are-contracting-covid-19-says-who

...

In several countries, including France and Germany, health experts have said that younger people are testing positive for the virus. Officials said that young people have been social distancing less often and have more contacts.
Indeed, many young Europeans contacted by Euronews have said that although some aspects of life are different, they are still seeing as many friends as they did before coronavirus.
"I think I see as many people as before, but maybe less often because of the decrease in the number of events. I prefer outdoor meetings to limit wearing a mask," said Simon, a 33-year-old living in Lyon, France.
But he said his friends have stopped the French custom of greeting by kissing each other on the cheek.
Sarah, a 32-year-old who works for a non-profit foundation in Paris, said that she sees just as many people as before, and has since at least June when bars and restaurants reopened in France.
She said most people she knows aren't concerned about the outbreak.
"I have no fear in terms of the virus because I'm in a young population, and not at risk. I don't really frequent people who are at risk," Sarah added.
"There comes a point where the desire to resume normal life is stronger than the fear of dying," she added, explaining that people also wanted to start living again due to the economic crisis.
"I think I'm seeing as many people as before little by little," said Vincent, a 34-year-old in Lyon. "I'm using preventive measures, wearing a mask when necessary, washing my hands and maintaining distancing when possible."
Simon and Vincent agreed that they're more worried about "transmitting" the virus to others rather than getting it themselves.
Sarah said that around people at risk, however, she pays close attention to distancing and using preventive measures. Otherwise, it's just during "the rare times" that a friend is worried about the virus.

EDITOR'S COMMENT: This is a critical issue for the containment of the Covid-19 pandemic. It is OK to accept the point that part of the problem is developmental (brain issue) until at least the mid-20s with the remark that we let these ages to vote in national elections or to drive cars – should we reconsider? Then it is socialization and identity issues central to emotional development and alike. In addition, it is the common perception that durability goes with the age – young are strong; older people are weak. But at the same time, older people do not prove that maturity goes with age. Finally, we focus on the fact that young people are not speaking to each other verbally; instead, they prefer to communicate via electronic alternatives (i.e. cell phones, emails, social media). If you put all these together, the main conclusion is that this is a problem without a viable effective solution. Or not? We usually forget the value of family paradigm and family "education" that starts from a very young age and might continue

through life always driven by example – the best way to teach people in all forms of the education process. It is hilarious and provocative to see a prime minister or the president of a nation to undress the public without wearing a mask and urge the population to always wear a mask! The importance of mimetism is highly ignored or it is implemented only when bad behaviors are imposed or practiced.
PS: Is the first photo of this article indicative of the maturity of young adults' graduates – even in the US (not to mention similar activities in Oxford, UK).

3D Printing to Support the Shortage in Personal Protective Equipment Caused by COVID-19 Pandemic

By Mostapha Tarfaoui, Mourad Nachtane, Ibrahim Goda, Yumna Qureshi and Hamza Benyahia
Materials **2020**, *13*(15), 3339; https://doi.org/10.3390/ma13153339
Download PDF

Abstract
Currently, the emergence of a novel human coronavirus disease, named COVID-19, has become a great global public health concern causing severe respiratory tract infections in humans. Yet, there is no specific vaccine or treatment for this COVID-19 where anti-disease measures rely on preventing or slowing the transmission of infection from one person to another. In particularly, there is a growing effort to prevent or reduce transmission to frontline healthcare professionals. However, it is becoming an increasingly international concern respecting the shortage in the supply chain of critical single-use personal protective equipment (PPE). To that scope, we aim in the present work to provide **a comprehensive overview of the latest 3D printing efforts against COVID-19, including professional additive manufacturing (AM) providers, makers and designers in the 3D printing community**. Through this review paper, the response to several questions and inquiries regarding the following issues are addressed: technical factors connected with AM processes; recommendations for testing and characterizing medical devices that additively manufactured; AM materials that can be used for medical devices; biological concerns of final 3D printed medical parts, comprising biocompatibility, cleaning and sterility; and limitations of AM technology.

Success Reported with HAE Tx in Severe COVID-19

Source: https://www.medpagetoday.com/infectiousdisease/covid19/88076

Aug 14 – Hospitalized COVID-19 patients who received **icatibant (Firazyr), the bradykinin inhibitor normally used for hereditary angioedema (HAE),** had less need for oxygen supplementation compared to controls, a small retrospective study from the Netherlands found.
Of the nine total patients receiving icatibant, four were no longer oxygen dependent within 10 to 35 hours, and eight of nine saw a reduction in oxygen supplementation of 3 L/min or greater within 24 hours, reported Frank L. van de Veerdonk, MD, PhD, of Radboud University Medical Center in Nijmegen, the Netherlands, and colleagues, writing in a research letter in *JAMA Network Open*.
Among controls, only three of 18 showed spontaneous reduction in oxygen supplementation of 3 L/min or greater within 24 hours. However, three patients treated with icatibant also had a resurgence in the need for oxygen supplementation, the authors noted. They also added icatibant has a short half life of about 2 hours, which may have contributed to this resurgence.

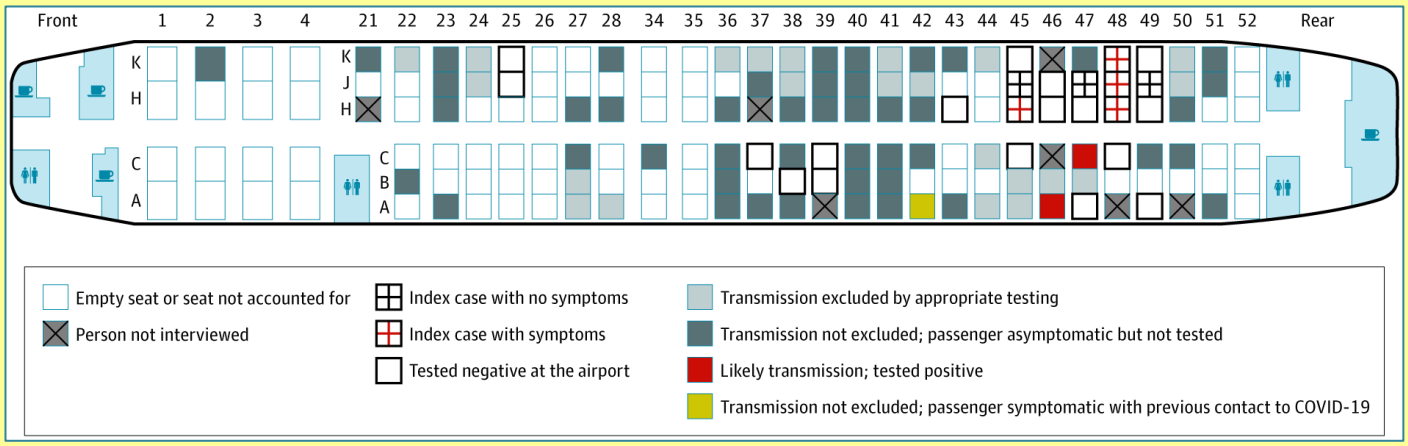
Icatibant is a synthetic peptide drug approved by the FDA in 2011 for HAEs. Clinical evidence indicates vascular leakage contributes to pulmonary edema in COVID-19 patients, van de Veerdonk and colleagues explained. And SARS-CoV-2 enters cells via angiotensin converting enzyme 2 (ACE2), which is involved in degrading bradykinin.

"Loss of ACE2 might lead to plasma leakage and further activation of the plasma kallikrein-kinin system with more bradykinin formation that could contribute to pulmonary angioedema via stimulation of bradykinin 2 receptors," the group wrote.
They therefore hypothesized that icatibant could make a difference, especially since pulmonary edema is a "prominent feature" of many patients with the virus.
Patients were given icatibant if they tested positive for SARS-CoV-2 via polymerase chain reaction assay, had oxygen saturation of less than 90% without supplemental oxygen, needed 3 L/min supplemental oxygen or more, and had a CT severity score of 7 or greater. For each of these patients, two controls were identified retrospectively based on sex, age, BMI, and day of illness, for a total of 18 controls.
Icatibant was given in three 30-mg injections at intervals of 6 hours.
Mean age for icatibant patients was 55; for controls it was 58. Most were men.
There were no severe adverse events, nor a "clear association" with D-dimer concentrations and fever, the authors noted.
The study's small size and lack of randomization or prospective assignment were important limitations, van de Veerdonk and colleagues acknowledged. Also, the report lacked data on COVID-19 severity other than patients' oxygen requirements. Nevertheless, the authors said, the findings warrant further investigation of treatments targeting the kallikrein-kinin system in similar patients.

Unfriendly Skies: COVID-19 Transmission on a Plane

Source: https://www.medpagetoday.com/infectiousdisease/covid19/88131

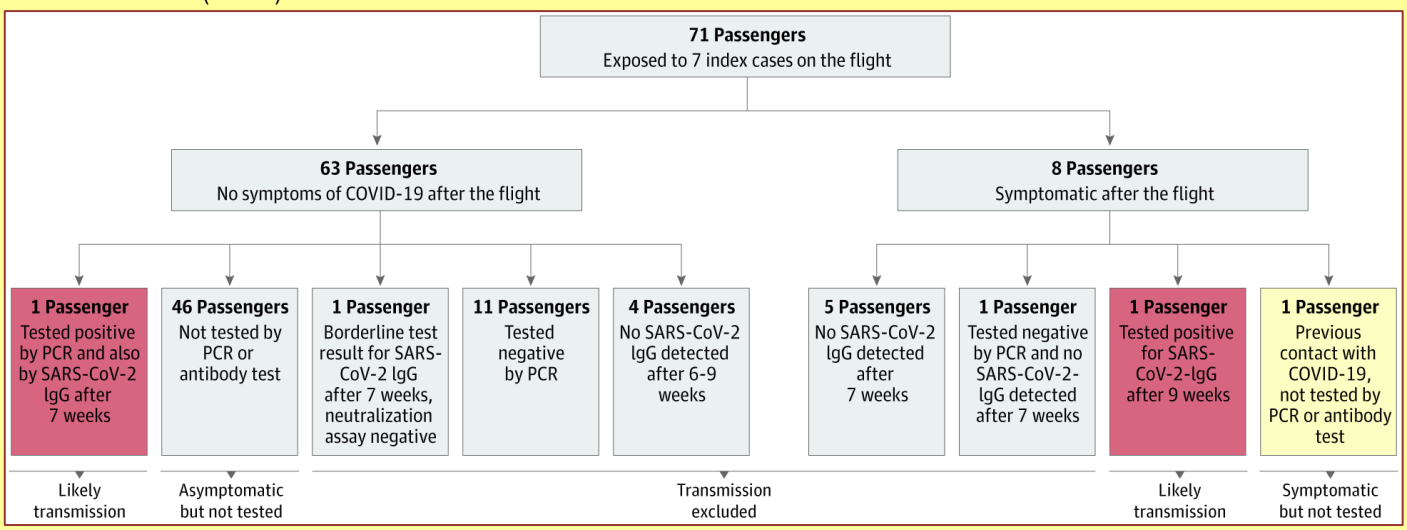
Aug 18 – A flight of 102 people from Tel Aviv to Frankfurt apparently included seven infected individuals ("index cases"). Two others believed not to be infected when they boarded were later diagnosed with the infection, reported Sandra Ciesek, MD, of Goethe University Frankfurt am Main, and colleagues.
Both sat within two rows of index cases, Ciesek's group wrote in a *JAMA Network Open* research letter. The authors noted, however, that they couldn't prove the two passengers contracted their infections on the plane.
One factor that may increase the chance of mid-air transmission: passengers were not wearing masks.
Little research exists about the extent of SARS-CoV-2 transmission on an airplane, though the U.S. recently lifted its global advisory against international travel.



Of the 24 members of the tourist group, 7 tested positive for SARS-CoV-2 RNA in a throat swab sample on arrival. Four of the 7 were symptomatic during the flight, 2 were presymptomatic, and 1 remained asymptomatic

Ciesek and colleagues reviewed the 4-hour, 40-minute flight from Tel Aviv to Frankfurt on March 9. Among the passengers was a tourist group. Beginning 7 days earlier, the group had contact with a hotel manager who was later diagnosed with COVID-19, but no member of the group was diagnosed with the virus prior to the flight.
That changed when the plane landed in Germany, however. Of the 24 members in the tourist group, seven tested positive for SARS-CoV-2 via a throat swab on arrival. Four passengers were symptomatic during the flight, two were pre-symptomatic, and one was asymptomatic.

They also were able to interview 71 of 78 other passengers 4 to 5 weeks later. Passengers within two rows of the index case and those who reported symptoms were offered an antibody test. Borderline or positive IgG tests were confirmed with a plaque reduction neutralization test (PRNT).



A total of 71 of the other 78 passengers (91%) who had been exposed to the group on the flight completed the interview. Serum samples were obtained from 13 of these individuals 6 to 9 weeks after the flight

Serum samples from 13 of these passengers were obtained about 6 to 9 weeks following the flight. Of these, one passenger tested positive for SARS-CoV-2 4 days after the flight, but could not recall any symptoms, and SARS-CoV-2 IgG was detected 7 weeks after the flight, with a positive PRNT result.

Seven other passengers said they were symptomatic within 14 days after the flight. One passenger reported "headache, muscle ache and hoarseness" beginning 5 days after the flight. Nine weeks later, researchers got a serum sample and SARS-CoV-2 IgG was detected, though the PRNT result was borderline.

However, the six other symptomatic and five other asymptomatic passengers who provided serum samples 9 weeks after the flight tested negative except for one, who had a borderline result on the IgG, but a negative result on PRNT.

SARS-CoV-2 transmission could not be excluded for one passenger who had previous contact with a COVID-19 patient, and the 46 asymptomatic passengers who were not tested.

Ciesek and colleagues cited prior research noting both SARS and influenza transmission may occur among passengers seated beyond the "two-row perimeter."

They noted the airflow in the cabin "from the ceiling to the floor and from the front to the rear" may be tied to a reduced rate of transmission, but with a caveat: "Our findings do not rule out airborne transmission of SARS-CoV-2 in an airplane cabin," they wrote.

#3 Cause of Death

Source: https://www.medscape.com/viewarticle/935927

Aug 18 – More than 170,000 people have died of COVID-19 in the United States since the pandemic began, according to data from Johns Hopkins University, making it the third-leading cause of death in the country, former Director of the Centers for Disease Control and Prevention Thomas Frieden, MD, told CNN.

"COVID is now the No. 3 cause of death in the US — ahead of accidents, injuries, lung disease, diabetes, Alzheimer's, and many, many other causes," Frieden said.

In 2017, the most recent year for which public data are available, nearly 170,000 Americans died of accidents and unintentional injuries, 160,000 died of chronic lower respiratory diseases, 146,000 died of stroke and cerebrovascular disease, 121,000 died of Alzheimer's disease, 83,000 died of diabetes, and 55,000 died of influenza and pneumonia. The top two causes of death were heart disease, with nearly 650,000 deaths, and cancer, which killed nearly 600,000.

Evidence Mounts for Thyroid Effects

Source: https://www.medscape.com/viewarticle/935927

Aug 18 – Rates of thyrotoxicosis are significantly higher among patients who are critically ill with COVID-19 than among patients who are critically ill but who do not not have COVID-19, suggesting an atypical form of thyroiditis related to the novel coronavirus infection, according to new research.
The study did not find that thyroid disorders increase the risk of developing COVID-19.
"This study joins at least six others that have reported a clinical presentation resembling subacute thyroiditis in critically ill patients with COVID-19," said one expert who was not involved in the research.

COVID-19 Outcomes in Female-Led Countries "Systematically and Significantly Better"

Source: http://www.homelandsecuritynewswire.com/dr20200819-covid19-outcomes-in-femaleled-countries-systematically-and-significantly-better

Aug 19 – **Female national leaders locked down earlier and suffered half as many COVID deaths on average as male leaders, according to analysis across 194 countries by the University of Liverpool.**
With New Zealand now the first country to record zero cases over consecutive days and Germany the first to resume competitive top level sports, their respective female leaders have received plenty of praise, but researchers found that even when outliers like New Zealand and Germany – and the United States for male leaders – were removed from the statistics, the case for the relative success of female leaders was only strengthened.
University of Liverpool Management School Developmental Economist, Professor Supriya Garikipati and her colleague at the University of Reading, Professor Uma Kambhampati, analyzed differing policy responses and subsequent total COVID cases and deaths across 194 countries for the first quarter of the pandemic, up to 19 May.
Garikipati said: "Our results clearly indicate that women leaders reacted more quickly and decisively in the face of potential fatalities.
"In almost all cases, they locked down earlier than male leaders in similar circumstances.
"While this may have longer-term economic implications, it has certainly helped these countries to save lives, as evidenced by the significantly lower number of deaths in these countries."
To reach this conclusion, the academics introduced a number of variables to help analyze the raw data and draw reliable country comparisons.
They considered GDP, total population, urban population density and the proportion of elderly residents; they also looked at annual health expenditure per capita, openness to international travel and general level of societal gender equality.
And with only 19 of the 194 countries being led by women, they created 'nearest neighbor' countries across the above demographics to balance out the small sample size, leading to comparisons such as Serbia (female led) and Israel (male led); New Zealand (female) and Ireland (male); Germany (female) and the UK (male) and Bangladesh (female) and Pakistan (male).
Garikipati said: "Nearest neighbor analysis clearly confirms that when women-led countries are compared to countries similar to them along a range of characteristics, they have performed better, experiencing fewer cases as well as fewer deaths."
On average, the researchers found that female led countries locked down "earlier" – at significantly fewer deaths – than male led countries.
While this may play into gender stereotypes around risk aversion, Garikipati counters that "while women leaders were risk averse with regard to lives, they were prepared to take significant risks with their economies by locking down early" suggesting "risk aversion may manifest differently in different domains, with women leaders being significantly more risk averse in the domain of human life, but more risk taking in the domain of the economy".
Interestingly, when researchers applied the 'openness to travel' control, they found that female-led countries did not experience significantly lower COVID cases but did report lower deaths, suggesting "better policies and compliance in these countries".
And to further check the robustness of their findings, Garikipati and her team dropped the countries most often referred to – Germany, New Zealand and the United States – from the data to check for undue influence, but found this only "strengthened the results".
They were also unable to include the female-led Taiwan (500 cases, seven deaths in the research period) as the World Bank no longer provides data for it separately from China.

Garkipati said: "Our findings show that COVID outcomes are systematically and significantly better in countries led by women and, to some extent, this may be explained by the proactive policy responses they adopted.
"Even accounting for institutional context and other controls, being female-led has provided countries with an advantage in the current crisis."

Coronavirus: UAE firm working on non-invasive test to detect Covid-19 within a minute

Source: https://www.thenational.ae/uae/health/coronavirus-uae-firm-working-on-non-invasive-test-to-detect-covid-19-within-a-minute-1.1065983

Aug 19 – A UAE company is working on creating a Covid-19 test that will detect the virus in up to 60 seconds.
G42 Healthcare, a subsidiary of Abu Dhabi-based technology company Group 42, signed an agreement with NanoScent, an Israeli company specialised in scent reading technologies, to develop and distribute Scent Check, a device capable of detecting suspected cases of Covid-19 from a sample of exhaled nasal air.

The Scent Check device detects a combination of volatile organic compounds, or VOCs, from exhaled nasal air that is derived from the patient's response to the SARS-CoV-2 infection.
The patient will blow nasal air into a a small bag fitted with a straw known as an "Air trap". The device then analyses the sample and provides the result in 30 to 60 seconds.
The non-invasiveness and speed of results give Scent Check the potential to transform the diagnostics industry globally, reported state news agency Wam. The test does not require complex infrastructure and is cost-effective.
During the agreement signing, held via video conference, Ashish Koshy, chief executive of G42 Healthcare said that, in absence of a vaccine, mass testing is the most effective way to break the transmission patterns of Covid-19.
"At G42 Healthcare we are at the forefront of the battle against Covid-19 and committed to developing impactful innovative programmes and solutions to improve and safeguard public health. Through this collaboration with NanoScent, we will be adding another powerful solution to our comprehensive diagnostics portfolio, which already includes PCR and LamPORE testing," he said.
G42 Healthcare is also involved in the Phase III clinical trials for an inactivated Covid-19 vaccine, developed by a Chinese pharmaceutical company, in the UAE.

EDITOR'S COMMENT: The interesting thing is not the detection device itself but the collaboration between Emirates and Israel following their recent diplomatic restoration.

Save the Gaiters!

Source: https://www.nytimes.com/2020/08/17/well/live/coronavirus-gaiters-masks.html

Aug 17 – A small study prompted fears that neck gaiters could spread more virus droplets than they stop. But new research shows that those face coverings can protect just as well as other cloth masks.

Loss of Smell in COVID-19 Has an Unusual Cause, Study Indicates

Source: https://www.sciencealert.com/covid-s-impact-on-our-sense-of-smell-is-nothing-like-that-of-a-common-cold

Aug 20 – Losing your senses of taste and smell is a common symptom of COVID-19 – patients have reported being unable to tell that they're wearing perfume or pick up on the nuance of a well-balanced dish.
Anyone who's caught a cold or suffered through the flu might think they can relate, since those ailments also tend to make rich scents and layered flavours less accessible and appealing. (Bring home some bland soup, please.)
But a small study published Tuesday describes key differences between the loss of taste and smell that results from each of those viruses, shedding light on how and why this symptom may arise in COVID cases.
More specifically, it underscores that the coronavirus, unlike other common respiratory infections, affects the brain and nervous system.
"There are altogether different things going on when it comes to smell and taste loss for COVID-19 patients, compared to those with a bad cold," Carl Philpott, the lead researcher and a professor at the University of East Anglia's Norwich Medical School, said in a press release.
"It means that smell and taste tests could be used to discriminate between COVID-19 patients and people with a regular cold or flu," he added.

The study offers more evidence that the coronavirus affects the nervous system

Anywhere from 34 to 98 percent of hospitalized patients with COVID-19 will experience a loss of smell, clinically known as anosmia. Some will experience it for more than 30 days – and some may never regain it.
For the new study, a group of European smell-disorder experts gave taste and smell tests to 10 COVID-19 patients, as well as 10 people with bad colds and 10 healthy participants. They then compared the results, matched for age and sex.
The researchers found that smell loss was "much more profound" among people infected by the coronavirus – they were less able to identify scents than victims of a cold. (The particular test, "Sniffin' Sticks," asks participants to sniff 12 different everyday smells and choose the correct scent for each out of four multiple-choice options.)
COVID-19 patients' sense of taste was also seriously muted; they couldn't identify sweet or bitter flavours using "taste strips" that react to various tongue areas.
That wasn't so much the case for people with a run-of-the-mill cold.
When you have a cold, smelling and tasting are mostly tough because your nose is stuffed and your airways are clogged. But with COVID-19, the symptoms seem to stem from the way the illness invades the brain and nervous system since the virus doesn't tend to cause a stuffy nose, the researchers suspect.
Other research has also shown that the coronavirus can have potentially severe neurological consequences beyond the olfactory system.
One study found short-term loss of smell may stem from "cleft syndrome," a condition in which swelling prevents aromas from reaching the olfactory neurons.
Another found that some coronavirus patients developed brain swelling and delirium, while others developed nervous-system disorders like Guillain-Barré syndrome that can cause paralysis. Strokes have also been observed as a consequence of COVID-19.
"We're seeing things in the way COVID-19 affects the brain that we haven't seen before with other viruses," Michael Zandi, one of the new study's co-authors, told *The Guardian*.

The new research may help clinicians differentiate between the coronavirus and colds

The new study found that by giving patients standard and relatively simple tests of taste and smell, it can be pretty straightforward to differentiate between those who have COVID-19 and those with other respiratory conditions.
"Although such tests could not replace formal diagnostic tools such as throat swabs, they could provide an alternative when conventional tests are not available or when rapid screening is needed – particularly at the level of primary care, in emergency departments, or at airports," Philpott said in the release.
Ultimately, more research – including studies done using brain scans – is needed, the authors added, to help understand how exactly the coronavirus affects the senses.
Additional investigations could also tease apart "whether genetic variation in people's bitter and sweet taste receptors might predispose them to COVID-19, or conversely, whether COVID-19 infection changes how these receptors function," Philpott said.

Study of More Than 55,000 COVID-19 Cases Reveals a Predictable Order of Symptoms

Source: https://www.sciencealert.com/study-of-more-than-55-000-covid-19-cases-reveals-a-predictable-order-of-symptoms

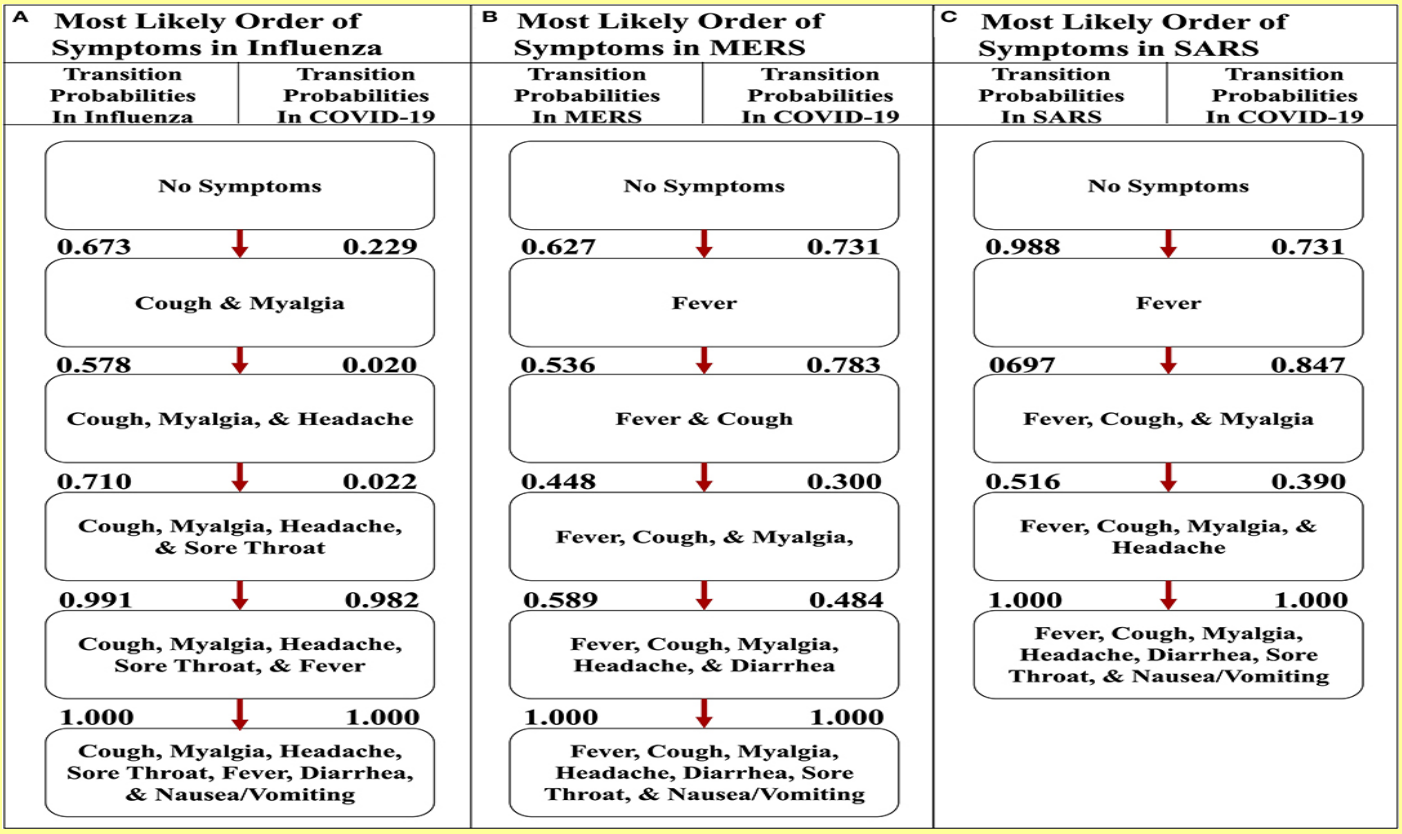
Aug 20 – A new study on the global pandemic has found those who contract COVID-19 may exhibit a predictable sequence of symptoms, and the order differs from what we experience with flu and other coronaviruses.

So far, evidence indicates the most likely order of initial COVID-19 symptoms tends to start with a fever and then progress to a cough and muscle pain, followed by nausea and/or vomiting, and lastly, diarrhea.

While the symptoms themselves are not particularly unique, the order in which they arrive is different to other respiratory viruses, and the authors think their model could help to distinguish new cases, thus helping us to limit the spread of the disease.

Using World Health Organisation (WHO) data from more than 55,000 confirmed cases in China, the authors compared COVID-19's order of symptoms to thousands of influenza cases collected by the University of Michigan, nearly 150 severe acute respiratory syndrome (SARS) cases in the Toronto area, and a handful of Middle East respiratory syndrome (MERS) cases reported in Korea.

An influenza infection was found to begin with a cough and *then* a fever. And while MERS and SARS might start similarly to COVID-19, the lower gastrointestinal tract is usually impacted first, leading to diarrhea *before* nausea and vomiting.



"The order of the symptoms matters," says Joseph Larsen who researches computational biology and bioinformatics at the University of Southern California.

"Knowing that each illness progresses differently means that doctors can identify sooner whether someone likely has COVID-19, or another illness, which can help them make better treatment decisions."

When the researchers simulated the symptoms of COVID-19 for 500,000 patients, they found "a most common order of discernible symptoms... that is also different from other prominent respiratory diseases."

Even when the authors included other symptoms like sore throat, headache and fatigue, the order of the four most likely initial symptoms remained the same.

Since fever appears to usually come first, taking someone's temperature could be a valid screening mechanism.

The United States Centres for Disease Control and Prevention (CDC) already advises that people take their temperature before leaving isolation to make sure it's safe, and this new research backs that up.
"We are not proposing initial symptoms as a diagnostic test, but instead as a possible sign to get tested," the authors write.
COVID-19 is more contagious than influenza and it tends to break out in clusters. If we can better inform the public on its order of symptoms, this might help us faster identify and quarantine cases before they spread further.
Bob Lahita, a rheumatologist not affiliated with the study, told CBS news that the new model of symptoms was "a good guide".
Even if the disease doesn't present exactly the same in everyone, paying close attention to initial symptoms of respiratory infections could allow us to tease apart typical cycles of sickness from the current global pandemic.

▶▶ **The study was published in** *Frontiers in Public Health*.

COVID-19 Drug & Vaccine Candidate Tracker

GEN Genetic Engineering & Biotechnology News

Total Drug & Vaccine Candidates: 237 (as of June 8)

Source: https://www.genengnews.com/covid-19-candidates/covid-19-drug-and-vaccine-tracker/

Mary Ann Liebert, Inc. publishers

The goal of this resource is to provide a comprehensive collection of news, milestones, and updates on drug and vaccine candidates currently being developed for the COVID-19 pandemic.
This resource is based on the reporting of *GEN* senior news editor Alex Philippidis, who began compiling information on drug and vaccine candidates in the early weeks of the pandemic. The numbers of verified candidates ballooned rapidly from 35 in February 2020, to 60 in March, to 160 in April.
Since then, biopharmas, regulators, and academic researchers have ramped up efforts to develop and evaluate COVID-19 drug and vaccine candidates designed to vanquish the virus. The number of legitimate COVID-19 candidates is approximately divided between vaccines and drugs, with 10 vaccines now in clinical trials.
To help navigate through the potential therapeutic options for COVID-19, *GEN* had divided this list of candidates into four broad categories based on their developmental and (where applicable) clinical progress:

- **FRONT RUNNER – the most validated or touted therapeutics in development, based on advanced stages of activity, favorable data or both.**
- **DEFINITELY MAYBE – candidates in earlier phases with the most promising partners, or more advanced candidates well under way in development that have generated uneven data.**
- **KEEPING AN EYE ON… – interesting technology, attracting notable partners, or both, but still early days.**
- **TOO SOON TO TELL – longshots or new entries pending additional details from their developers and/or clinical progress.**

GEN categorizes the most common treatment categories by color, including **antibodies**, **antivirals**, **RNA-based treatments**, **and vaccines**. Please click any category to see the full list of candidates and information on each therapy/vaccine.
On the therapeutic side, many institutions are studying familiar blockbuster drugs with success outside virology that could prove effective against COVID-19. Among clinical trials in progress are studies assessing Novartis' Gilenya® (fingolimod), one examining Celebrex® (celecoxib), and even a study evaluating sildenafil citrate, the phosphodiesterase-5 (PDE5) inhibitor better known as Viagra®.
Among the top vaccines are eight candidates that had advanced to clinical trials as of May 11, according to the World Health Organization. "We have many candidates and hope to have multiple winners. In other words, it's multiple shots on goal," said Anthony S. Fauci, MD, Director of the NIH's National Institute of Allergy and Infectious Disease in recent Senate testimony. However, the first successful candidate is about 12–18 months from reaching the market.
To accelerate development of vaccines and drugs, the NIH has launched Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV), a public-private effort through which U.S. regulators, the European Medicines Agency, and more than a dozen biopharma giants are prioritizing and accelerating clinical study of drug and vaccine candidates deemed to have short-term potential for success.
GEN will update the COVID-19 tracker as frequently as possible. Comments and suggestions are welcome: aphilippidis at genengnews dot com.

QF inspired innovative platform developing device for quicker detection of COVID-19-induced pneumonia

Source: https://www.qatarday.com/news/local/qf-inspired-innovative-platform-developing-device-for-quicker-detection-of-covid-19-induced-pneumonia/76913

Aug 19 – A Qatar Foundation inspired innovative platform for bringing people from around the world together to accelerate technological solutions to humanity's greatest challenges is being developed to create a device that could lead to COVID-19-induced pneumonia being detected faster.

SynSapien is an Artificial Intelligence-driven web application that enables innovators from different countries to collaborate, with the aim of co-creating new technologies tackling urgent and complex issues such as climate change – breaking down the barriers that physical distance can install. Ultimately, it aims to create a 'virtual' global community of one million innovators.

Its team is now working with researchers from around the world – with 14 countries already involved – to create an early detection device that clinically vulnerable people, such as elderly members of society who have to self-isolate amid COVID-19, can use to raise the alarm if it indicates they may be at risk of pneumonia, and be treated before the infection takes a firmer grip.

According to Basil Mahfouz, SynSapien's Co-Founder and an alumnus of Qatar Foundation (QF) partner university Georgetown University in Qatar, the platform aims "to bring together a global community of innovators, and give them the tools to create open source technology effectively."

"Innovation results from a diverse group of people being involved in a project," he said. "Larger, more diverse groups have a wider pool of knowledge to draw upon when solving a complex challenge.

"However, without the right systems, it can be chaotic. Our platform helps large groups to collaborate in a structured way so they can design and develop technologies more swiftly.

"We asked ourselves 'what does it take to get ideas and inventions off the ground?' There are several barriers to innovation: access to expertise and knowledge; Intellectual Property concerns; and being able to collaborate, brainstorm, and ideate at scale. If you have 500 people from different parts of the world wanting to solve a problem together, how do you organise that?

"We've created a platform that allows this to take place digitally. We want to unlock the ability of people to innovate together, which improves the quality of the solutions that emerge. People don't need to be in the same place to think and act creatively."

Through SynSapien, users input their interests and expertise, and the platform's algorithm matches them to ideas, projects, and other collaborators. Once they select a project, they

want to be part of, they enter an anonymised collaboration space which currently allows up to 300 people to share and propose ideas, contribute data, provide feedback, and make decisions.
The platform also addresses the issue of how Intellectual Property rights are distributed by measuring the contribution each person makes to a project – the time they spend on it, the ideas they put forward, and how their peers rate their contribution – and producing an "influence score".
Mahfouz' eyes were opened to the possibilities that a platform like SynSapien could create through his time studying at QF, and the interdisciplinary environment at Education City that brings together students from nine different universities, researchers, innovators, and a vast expanse of different ideas and perspectives. "Having the best of so many disciplines on one campus highlighted to me the value of interdisciplinary collaboration," he said.

SynSapien is developing a 'Github for scientists'
SynSapien is community of innovators from around the world who collaborate to develop technologies that solve climate change and other global challenges. One of the drivers of this particular community is the desire to show people across the Middle East who want to develop solutions to global problems that they can do so.
SynSapien is a decentralised research lab where scientists, researchers, and innovators worldwide collaborate to develop technology faster.
Unlike crowdsourcing websites, which run open competitions, SynSapien uses blockchain and AI to enable thousands of innovators worldwide to solve a challenge collaboratively. It is also working on a solution that is critical to catalyse climate innovation in order to cut global carbon emissions by half - inline with the Paris Agreement.
GitHub is a web-based version-control and collaboration platform for software developer which is delivered through a software-as-a-service (SaaS) business model. It was started in 2008 and was founded on Git, an open source code management system to make software builds faster.

Some 'Healthy' Kids Can Carry as Much COVID-19 Virus as Severely Sick Adults

Source: https://www.sciencealert.com/some-healthy-kids-with-covid-19-might-carry-enough-virus-to-hospitalise-an-adult

Aug 21 – Summer in the Northern Hemisphere is coming to an end, and if we're not super careful about reopening our schools and daycare centres, experts warn children could soon play a much bigger role in the pandemic.
Just because kids often don't show symptoms, doesn't mean they don't carry any traces of the virus, new research has shown.
While children might contract COVID-19 at lower rates to adults and show milder or no symptoms, once they do catch the virus, scientists say they may carry unusually high loads of it.
This means even without any obvious symptoms, kids with COVID-19 are potentially contagious, carrying a high number of viral particles from school to home and back again.
"During this COVID-19 pandemic, we have mainly screened symptomatic subjects, so we have reached the erroneous conclusion that the vast majority of people infected are adults," says pediatric gastroenterologist Alessio Fasano who works at MassGeneral Hospital for Children in Boston.
"However, our results show that kids are not protected against this virus. We should not discount children as potential spreaders for this virus."
The study, which was conducted at two hospitals in Boston during the peak of an outbreak, is said to be the most comprehensive analysis of pediatric COVID-19 patients to date.
Among 192 children and young people between the ages of 0 and 22, the authors found 49 kids who were carrying SARS-CoV-2 (the coronavirus that causes COVID-19) and 18 kids who had multisystem inflammatory syndrome[5] in children (MIS-C) - an ailment related to COVID-19.

[5] Multisystem inflammatory syndrome in children (MIS-C) is a condition where different body parts can become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, or gastrointestinal organs. We do not yet know what causes MIS-C. However, we know that many children with

Compared to adults hospitalised for COVID-19, these children had surprisingly higher levels of coronavirus in their airways, especially in the first two days of contracting it.
"I was not expecting the viral load to be so high," admits pediatric pulmonologist Lael Yonker from Massachusetts General Hospital. "You think of a hospital, and of all of the precautions taken to treat severely ill adults, but **the viral loads of these hospitalised patients are significantly lower than a 'healthy child' who is walking around with a high SARS-CoV-2 viral load**."
That's a disturbing result, because having a higher viral load could potentially mean more shedding of the virus and, therefore, a greater risk of contagion. While this study did not examine transmissibility of the virus directly, the findings do suggest children may be a hidden source of spread.

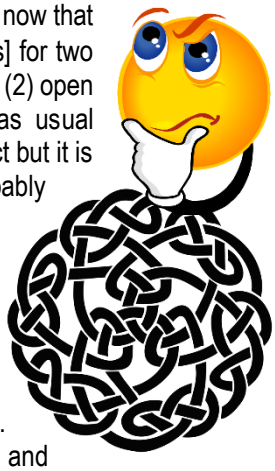
While other studies have found kids show fewer immune receptors for SARS-CoV-2 than adults, the new research suggests this has little impact on the actual presence of the virus.
Instead, it seems even when children show mild or no symptoms, they are, in fact, carrying high doses of the virus, enough to hospitalise an adult.
"Pediatric patients displayed no apparent difference in viral load compared with adults requiring intubation for severe SARS-CoV-2 infection when stratified by time. Viral load in children in the symptomatic/early infection phase was significantly higher than in hospitalised adults with severe disease with over 7 days of symptoms," the team writes in the study.
Some initial research on adults suggests higher viral loads are linked to more severe outcomes, but for some reason, this doesn't appear to be the case in children.
In the end, the authors say this could make infection-control strategies much harder to implement, especially since mild symptoms of COVID-19 appear so similar to other common illnesses.
"Identifying SARS-CoV-2 infection in children will become even more challenging during pollen allergy season and influenza season this fall," the authors write.

While fever is usually the first symptom of COVID-19, the study found only half the children with acute SARS-CoV-2 infections presented with a high body temperature.

This suggests temperature screening may not be an effective tool in reopening schools and daycare centres. Instead, the authors suggest focusing on strategies like social distancing, mask use, viral screening, and/or remote learning.
"Without infection control measures such as these," the authors conclude, "there is significant risk that the pandemic will persist, and children could carry the virus into the home, exposing adults who are at higher risk of developing severe disease."
In communities of lower income, where multiple generations often live under the same roof, this could very well be deadly.
In the study, nearly 20 percent of acute SARS-CoV-2 infections and those with MIS-C did not have a known household exposure to the virus.
It's not clear how this infection spreads through a house or a school, but recent research suggests it might have to do with the age of the child. Children under 10, for instance, do not seem to spread the virus as far as their older counterparts.
"This study provides much-needed facts for policymakers to make the best decisions possible for schools, daycare centers and other institutions that serve children," Fasano says.
"Kids are a possible source of spreading this virus, and this should be taken into account in the planning stages for reopening schools."
Fasano is worried about what will happen if schools reopen fully.

MIS-C had the virus that causes COVID-19, or had been around someone with COVID-19. MIS-C can be serious, even deadly, but most children who were diagnosed with this condition have gotten better with medical care.

▶▶ **The study was published in the** *Journal of Pediatrics*.



EDITOR'S COMMENT: Interesting study but without extrapolation to real life providing a proposal now that schools are about to open worldwide after summer. What are the options: (1) close schools [all levels] for two years provided that vaccinations will take place provided that vaccines will be safe and widely available; (2) open schools while adopting certain precautions and preventive measures; and (3) open all schools as usual suggesting more intensive hygiene measures while keeping the distances. Proposal #1 might be perfect but it is not viable for many obvious reasons. Proposals #2 and #3 have their cons and pros and most probably solution #2 will be chosen but small children have no essences of what is going on and why they have to wear this new "toy" in their face and why they cannot hold hands while older children especially those at high school are beginning to go through the immortality phase copying the behavior of university seniors and young adults. Teaching cannot change attitudes in a month or so and family suggestions are not always persuasive the moment that even their own parents are not fully understand the overall situation confusing the disease with personal rights and other perceptions or movements (anti-maskers; anti-vaccers). The situation is not a Gordian Knot to be solved with a sword as Alexander the Great did. In conclusion, I think that the best approach is going to school taking into consideration both family and healthcare professionals' advice and having in mind that "*God helps those who help themselves*!" (Ancient Greek quote: "*Συν Αθηνά* και *χείρα κίνει!*" = *"Together with goddess Athena, move your own hands")* – at least for now!

Just breathe: Israeli-made Nano COVID breath test spots every carrier in trial

Source: https://www.timesofisrael.com/just-breathe-israeli-made-nano-covid-breath-test-spots-every-carrier-in-trial/

A prototype of Prof. Hossam Haick's COVID-19 breath test (courtesy of Hossam Haick)

Aug 21 – An Israeli COVID-19 breath test has correctly identified all positive patients in a clinical trial in Wuhan, China, according to a newly peer-reviewed study.

The device uses nanotechnology to identify compounds from the lung that are present in the breath of coronavirus patients, Prof. Hossam Haick of the Technion-Israel Institute of Technology told The Times of Israel on Friday. He said that it is fully automatic, eliminating the need for anyone to come in to contact with the patient to handle their sample, which is good for efficiency and for hygiene. "You just blow into the device, which is the size of a smartphone, for 2 to 3 seconds, from a distance of 2 centimeters away," he said. "There are no accessories, it requires no lab processing, and it gives results within 30 seconds of blowing."

The current prototypes of the device are half-held, but Haick said that the final product will require no touch, meaning that the "danger of cross-contamination is very low."

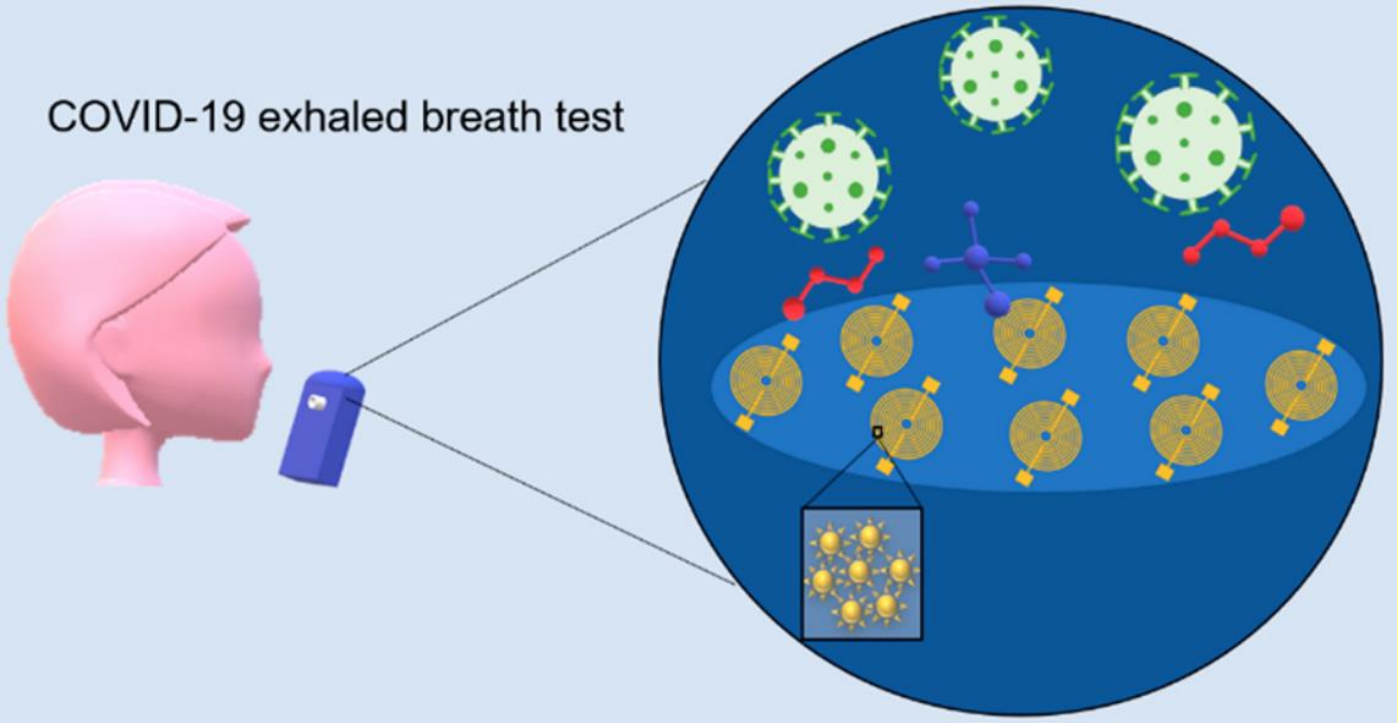
The technology is being developed for the market by the company Nanose Medical, where Haick serves as chief technology officer, and he predicted tests will cost around $2 to $3 per person.

The clinical trial examined 140 people, 49 of them confirmed coronavirus patients. It identified all carriers as coronavirus positive, but erred with the results of seven healthy people, reporting them to be positive.

Regular swab tests also throw up some false positives, but it's not known exactly how many, as people often assume their result is correct and they are asymptomatic. Doctors are less concerned about false positives, which can cause inconvenience by needlessly worrying and quarantining people, than false negatives that can lead people to assume wrongly they are virus-free and spread the coronavirus.

Haick said that in his design, he emphasized accurate assessment of people who are sick, but with respiratory conditions other than coronavirus. "Think about winter time, when people

will have lots of conditions, such as influenza and colds, that make them feel sick but aren't COVID-19, and it's very important we can differentiate between them correctly," he commented.



While there is a flurry of reports about new fast-testing technologies, Haick said that his has credentials to prove its seriousness. The trial was approved by authorities in China, and, unlike some other innovations, results have been peer-reviewed and published earlier this week in a scientific journal, ACS Nano. "This was peer-reviewed, which is important, as it indicates we are meeting the standards of the scientific community," said Haick.

A participant in the trial blows on a device to detect COVID-19 in Wuhan, China in March 2020 (Courtesy of Hossam Haick)

He has developed the test, together with Technion colleague Yoav Broza and researchers from Wuhan, based on a device he invented a few years ago for detecting cancer.

This cancer test isn't in use yet, as it is still undergoing assessment by regulators, but Haick expects the coronavirus version to be accredited quickly due to the urgency of COVID testing.

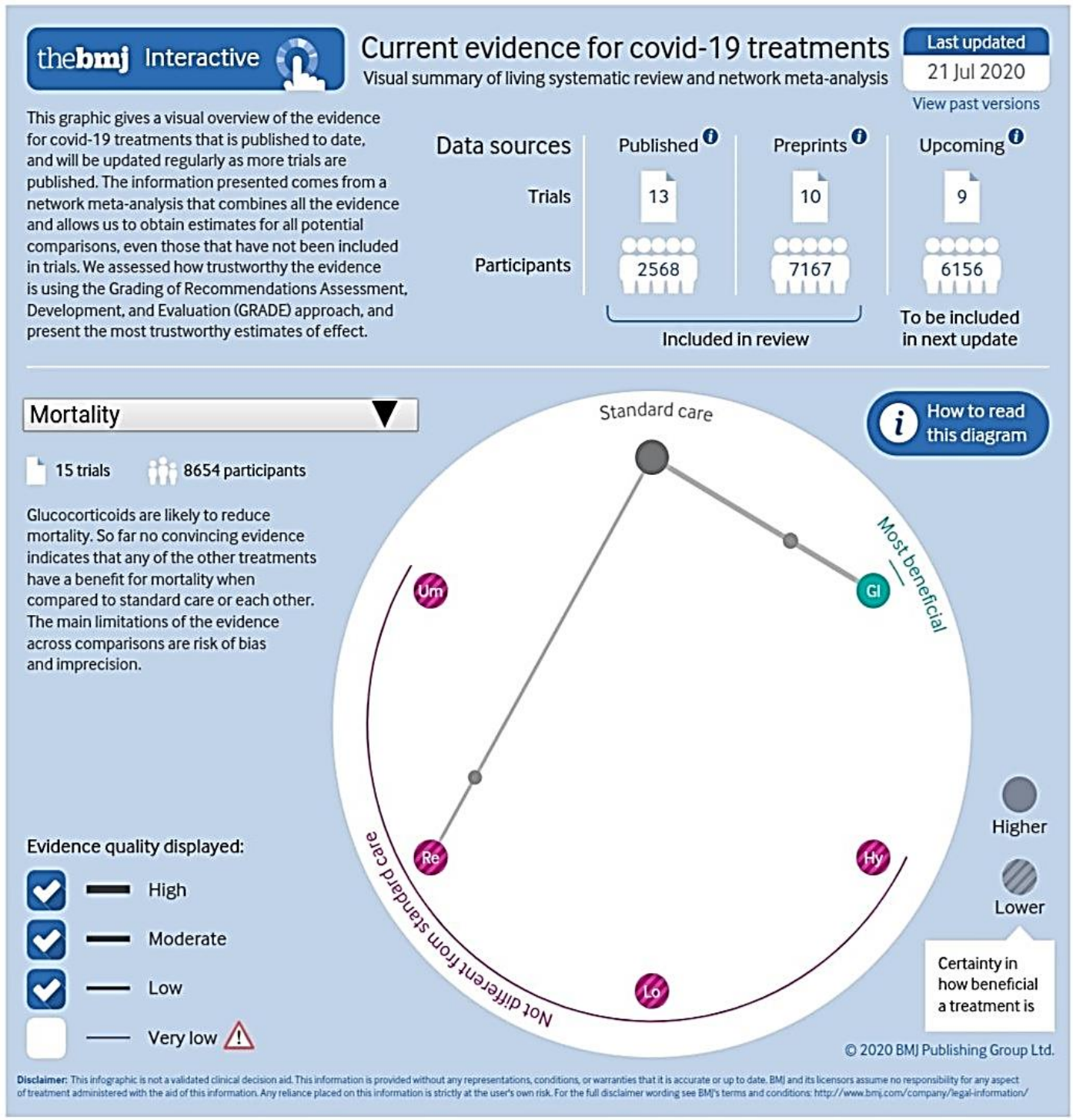
"If everything goes well with further clinical studies, I hope it will be available and regulated within six months," he said.

The test is one of several innovations being worked on in Israel, including a new ultra-fast gargle-and-spit test, to replace PCR testing, which includes an unpleasant swabbing process and requires lengthy lab analysis, as the main screening method used worldwide.

PCR tests are believed to be around 80% accurate. Accelerated PCR testing, the fastest current method, is not widely available and with a 15-minute turnaround at its best, comes at a financial cost and with a reduction in accuracy levels.

Drug treatments for covid-19: living systematic review and network meta-analysis

Source: https://www.bmj.com/content/370/bmj.m2980



Conclusion: **Glucocorticoids** probably reduce mortality and mechanical ventilation in patients with covid-19 compared with standard care. The effectiveness of most interventions is uncertain because most of the randomised controlled trials so far have been small and have important study limitations.

Century-old vaccine limits COVID spread, so bring it back!

Source: https://www.timesofisrael.com/century-old-vaccine-limits-covid-spread-so-bring-it-back-say-israeli-experts/

Aug 19 – A vaccine that has been in use for almost a century limits the spread and severity of coronavirus, Israeli biologists have claimed after studying data from almost two thirds of the world's population.

As they champion the bacillus Calmette-Guerin vaccine, they are going head-to-head with the World Health Organization. They argue that three decades after many countries — Israel included — phased out blanket BCG shots, they should consider restoring them to fight the pandemic.

"We found that countries with more coverage of BCG in the last 15 years have better outcomes for coronavirus — better death rates and fewer people being infected," Nadav Rappoport, a Ben-Gurion University of the Negev computational biologist, told The Times of Israel.

The BCG shot, primarily used to fight tuberculosis, was first given to humans 99 years ago, in July 1921. While the researchers say BCG is not a substitute for a vaccine against COVID-19, they do argue that data shows BCG coverage contributes to the "attenuation of the spread and severity of the COVID-19 pandemic."

Co-author Michal Linial of the Hebrew University said that while the WHO has strongly opposed deploying the vaccine against the virus, her team thinks countries that don't use the BCG should consider doing so immediately. "There's nothing to lose but a lot to gain," she said.

Rappoport, together with Linial and two other Hebrew University biologists, crunched data on BCG use alongside coronavirus incidence and morbidity in 55 countries, home to 62.9 percent of the world's population.

Their work adds to a growing body of international research examining whether BCG has benefits in fighting the coronavirus, including a new University of Michigan study that "suggests that mandated BCG vaccination can be effective in the fight against COVID-19."

The Israel researchers also tested to see whether there was a correlation between the coronavirus and another common vaccine, against measles and rubella, and found that there wasn't.

Linial told The Times of Israel that their results were starkest when looking at some neighboring countries that are divided by BCG policy.

The UK, which ended widespread BCG vaccination in 2005, ranks third in the world in terms of coronavirus deaths per million people, while Ireland, where it was given until 2015, ranks 17th. Spain ranks 6th, and ended blanket vaccination in 1981, while Portugal gave the BCG vaccine until 2017, and ranked 33rd. The United States has not given widespread BCG vaccinations, and ranks 10th.

"Portugal has a long border with Spain, which did really badly and has another wave now, but Portugal, with poor economics and health care, is doing much better," said Linial. "And take the UK and Ireland — the difference in coronavirus is huge."

The World Health Organization has rejected deployment of BCG to reduce the impact of the coronavirus, writing: "There is no evidence that the Bacille Calmette-Guérin vaccine (BCG) protects people against infection with COVID-19 virus."

The WHO went on to argue: "In the absence of evidence, WHO does not recommend BCG vaccination for the prevention of COVID-19."

And some doctors reject the view that there is nothing to lose by administering the vaccine. The Indian Council of Medical Research plans to give the vaccine to some elderly people. "This worries me a lot," tweeted Dr. Madhukar Pai, director of the McGill International TB Centre at McGill University in Montreal, Canada.

He argued: "Millions of infants get BCG every year. It is quite safe in this group. But the number of elderly people given BCG is close to zero. BCG is a live vaccine. It should not be given to elderly (who might have co-morbidities) without safety data."

The WHO is waiting for clinical trials that examine whether recently vaccinated people fare better against coronavirus. But Rapaport's team argued that trials based on individuals won't fully show the benefits of the vaccine, which are best discerned on countrywide levels.

Linial said: "I would start giving the BCG vaccination more widely now — it's very safe, with very long experience." She argued: "If it were an experimental vaccine, I would be extremely worried but with this vaccine there are more than 90 years of experience and billions of people have received it."

Linial acknowledged that her research is statistical and doesn't prove a cause-and-effect relationship between BCG and reduced impact of coronavirus, or explain the science of why the vaccine may help. Nevertheless, she said, the figures point to strong trends that are too important to be ignored.

The Israeli researchers found that BCG correlation was significant among those aged 24 and younger who had received the vaccination in the last 15 years. Among older adults who

got the BCG vaccine years ago, there was no discernible correlation between BCG rates and coronavirus infection.
Scientists have been discussing the potential of BCG since early in the pandemic. In the US, the National Institutes of Health (NIH) cautiously reported in June that their statistics "suggest that BCG could have a protective effect," stressing that clinical trials are needed to find out more.
Now, some trials are underway, including one in the US involving 1,800 people and another in Australia involving 10,000 healthcare workers. Participants are being given BCG and scientists are monitoring whether being newly vaccinated with it makes them less likely than others to catch the coronavirus, and better equipped to fight it if they are infected.
The NIH researchers cautioned that correlations between BCG and the coronavirus are "difficult to validate due to broad differences between countries such as socioeconomic status, demographic structure, rural versus urban settings, time of arrival of the pandemic, and the number of diagnostic tests and criteria for testing."
Rappoport said that his team tried to overcome such challenges by adjusting figures to account for demographic, economic, pandemic-restriction-related and health-related country-based variables, and also for different start dates of the health crisis in different countries.

In trial, Israeli gargle test gives COVID results in 1 second, at 95% accuracy

Source: https://www.timesofisrael.com/in-trial-israeli-gargle-test-gives-covid-results-in-1-second-at-95-accuracy/

Aug 17 – Israeli scientists are testing a new ultra-fast gargle-and-spit test for coronavirus on hundreds of patients, and report that so far it is proving **95-percent accurate**.
The developers have built a USB-powered machine the **size of an ashtray**, which takes just **one second** to conduct light analysis of mouthwash that a patient has gargled.
They are about halfway through a trial of 400 people at Israel's largest hospital, Sheba Medical Center, and say that if accuracy levels continue to impress, they expect it to become available internationally by the end of the year.

The innovation team, drawn from Sheba and the Newsight ima ging company, says that the technology has the potential to replace PCR testing, which includes an unpleasant swabbing process and requires lengthy lab analysis, as the main screening method used worldwide. PCR tests are believed to be around 80% accurate. Accelerated PCR testing, the fastest current method, is not widely available and with a 15-minute turnaround at its best, comes at a financial cost and with a reduction in accuracy levels.

The machine built by Sheba Medical Center and the Newsight imaging company to analyze mouthwash that patients have gargled with to test for coronavirus. (courtesy of Newsight)

"This system is very rapid, cheap, and is looking reliable," Prof. Eli Schwartz, head of the trial and of Sheba's Center for Geographic Medicine, told The Times of Israel. "It's suitable for mass screening, as well as airport screening, screening at nursing homes, and even screening at home."
He added: "The idea is to mostly replace PCR tests, especially in places where you need mass screening." Schwartz said that the system will give highly accurate positive-negative results, and PCR testing will only be needed if results are borderline, or if medical professionals need detailed information on the viral load, which his test will not provide.
Patients rinse with 10 milliliters of a special mouthwash, and then spit into a tube. The sample is placed in a machine that analyzes it, and reports whether it matches the profile of a sample infected with COVID-19.
The machine, called the SpectraLIT, does not require any chemicals, and no medical skills are required to operate it.

Eli Assoolin, CEO of Newsight, told The Times of Israel that the machine shines light through the sample and onto a special chip. "A light source goes thought it, and part of the light is absorbed, and the rest is captured by the sensors," he said.
The process is known as determining the sample's "spectral signature": matter reflects different light signatures, depending on its composition. Artificial intelligence tools have made it possible for the developers to determine what the signature for mouthwash from a coronavirus-positive person looks like, as opposed to mouthwash from anyone else.
In the weeks before the current trial, staff fed spectral signature data into the chip from numerous people whose positivity/negativity state was already known. Data gathered by the sensors for each person's spectral signature was entered into an algorithm, which used it to build a profile of infected and non-infected people.
If the new screening method becomes widespread and makes testing more accessible, as he hopes, Schwartz said it will prove "lifesaving" by alerting people to self-isolate before they would otherwise know.
Assoolin said it will also solve a major problem of PCR supply shortage. "There's a big shortage of PCR test kits, and we're getting rid of the need for these costly kits and chemicals needed for processing," he commented.
Assoolin said that patents have been filed for the technology, internationally. Virusight Diagnostics, a company jointly established by Sheba and Newsight, can quickly start mass production of the machines and materials for tests, he stated.
He added: "We hope that by the end of this year the system will be commercially available to everyone, and before then we hope it will be used in large pilots, including in airports."
The tube and specially-formulated mouthwash that are given to patients will cost 25 cents, a little less than a shekel. Developers say they are hoping that once the machines are in mass production, they will be available from $200, around NIS 700.

Small trial for COVID antibody drug, a world 1st!

Source: https://www.timesofisrael.com/worlds-1st-trial-for-covid-antibody-drug-off-to-flying-start-in-jerusalem/

Aug 13 – **The world's first clinical trial for a coronavirus drug made from antibodies got off to a promising start in Jerusalem, with all three patients involved released from the hospital days after receiving it.**
The patients were in moderate condition, with COVID-19-induced pneumonia, when given the drug, manufactured from antibodies found in the plasma of recovered coronavirus patients, earlier this week.

"The response was, in my eyes, it was almost a miracle — they received it and they are now home," said Zeev Rothstein, director of Hadassah Medical Center in Jerusalem, which worked with the biopharmaceutical firm Kamada to develop the drug, and is now running the clinical trial.
The trial started last Thursday, and involves treating 12 patients, in batches. The first batch consisted of three patients, the last of whom was discharged on Wednesday. Doctors say that the patients are well enough to rest at home, but have not yet tested negative for COVID-19.
Rothstein commented: "I don't know if it's beginners' luck, but we are very enthusiastic. For a physician to see such an improvement in a very short period of time is astonishing."
He said he is "trying to be cautious," as he has been disappointed by some treatments that have been touted for the coronavirus, but added: "If trials show the efficiency we expect, it won't only improve patients' situation but could change the attitude to coronavirus in Israel and in the world."
Rothstein expressed hope that other Israeli hospitals will join this phase of testing, both for the sake of patients who may benefit and to bolster the reliability of results.
Kamada was the first company in the world to manufacture a coronavirus drug from antibodies and has now become the first company to clinically test such a product, said its CEO, Amir London. He added that the drug, which is currently being tested on active patients, will also be examined for possible preventative qualities.
In May, The Times of Israel was first to report on plans for such a treatment based on Israeli blood samples.
London is not commenting yet on the clinical trial, as he is waiting on data from all 12 patients who are to receive the treatment in this first phase of testing.
Israeli patients have been given antibodies from recovered patients since early in the pandemic, but this drug, while based on antibodies, is "very different," said London.

He commented: "We use convalescent plasma as our raw material, but then it goes in to pharmaceutical development and processing to become a drug. When you give an infusion [of regular antibodies] you don't know exactly what you are giving."

With the new product, he said, the manufacturing process ensures the quantities of antibodies are pre-defined and standardized and patients are delivered an "anti-viral treatment that can reduce the viral load."

It is being tested on moderate patients, because they are believed to more consistently have high viral loads than serious patients, who are sometimes battling the after-effects of the virus rather than the virus itself.

"We are giving it to moderate patients, with pneumonia, but who aren't ventilated yet," London said. "We want to catch them while they're still highly vital, but before deterioration, and to treat that viral phase with an anti-viral treatment."

The product is hyperimmune globulin, sometimes referred to as a passive vaccine. It is called passive because unlike a regular vaccine, which prompts the body to create antibodies to fight viruses or bacteria, it contains pre-formed antibodies.

Hadassah, together with Magen David Adom, which runs Israel's blood service, started collecting plasma from recovered patients three months ago, for the development of the drug. Hadassah's statement said that it did so, "despite initial opposition from the then-director general of the Health Ministry," referring to Moshe Bar Siman-Tov, who resigned in May.

Jerusalem's **ultra-Orthodox community** was key to facilitating plasma collection needed for the drug. Upon realizing that large amounts of antibody-containing plasma were needed in a short time, Hadassah turned to Haredi leaders through the Yad Avraham nonprofit. Rothstein said: "We went directly to the Haredi community, where coronavirus was prevalent, and the idea of people helping one another brought a good response." Some 126 volunteers came forward.

Kamada, which has long manufactured an antibody treatment for rabies with approval of America's Food and Drug Administration, modified its product to treat the coronavirus.

Humidity, dust, temperature: New studies probe how they affect virus spread

Source: https://www.inverse.com/mind-body/coronavirus-spread-studies

Aug 19 – In early July, the World Health Organization acknowledged that the coronavirus might be airborne, or more specifically, spread by aerosols as opposed to just larger droplets. That move was the product of ongoing studies of droplet behavior and reports of people who gathered indoors and ended up sick.

That work has proven invaluable in our understanding of the coronavirus.

We know that the primary route of transmission appears to be through respiratory droplets (which can remain airborne). There are still lots of things to learn about the dynamics of those droplets themselves – how long they last, what conditions allow them to persist, and how long the virus itself may survive in the environment, even once the person breathing them out has left.

This week, two new studies tackled bits and pieces of this bigger story. A study released Tuesday in *Physics of Fluids* used a model to demonstrate that humidity and temperature both play key roles in how long droplets survive. A study released Tuesday in *Nature Communications* on guinea pigs suggests that tiny particles of aerosolized dust may help spread influenza, opening a line of inquiry for how SARS-CoV-2 can also spread.

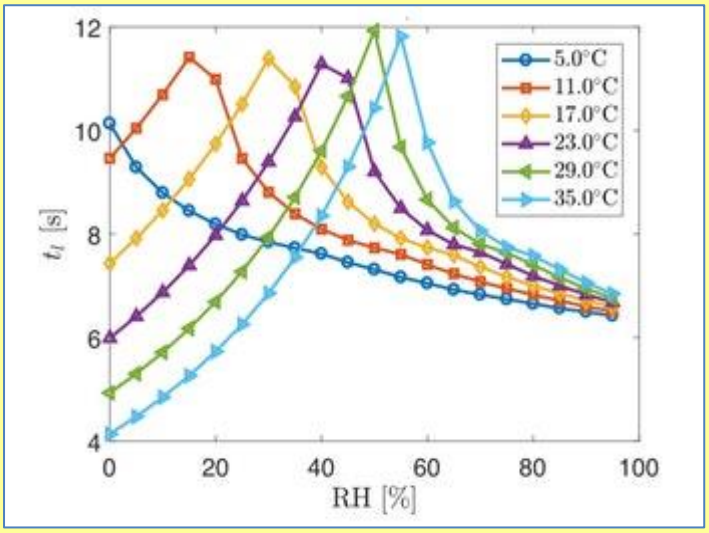
The best way to truly prove that an element is really spreading the coronavirus involves a combination of **aerobiology** (how droplets behave, whether the virus can survive in certain environments) and **epidemiology**, which provides real-world evidence that a virus has spread. That's how we arrived at the idea that loud talking might spread the coronavirus: Studies showed that talking could release thousands of small droplets that remain airborne. Case studies, like the rapid spread of Covid-19 through a choir in Washington, gave us proof that such spreads could happen.

When we look at newer studies on droplet or aerosol behavior, we're getting the first part of the picture, but missing the second. That said, these two studies point to two more ways they're digging deeper into how the coronavirus lingers and where it thrives.

Humidity and temperature – In the *Physics of Fluids* paper, a team at the University of Missouri created a mathematical model to predict the behavior of droplets in certain temperature and humidity conditions.

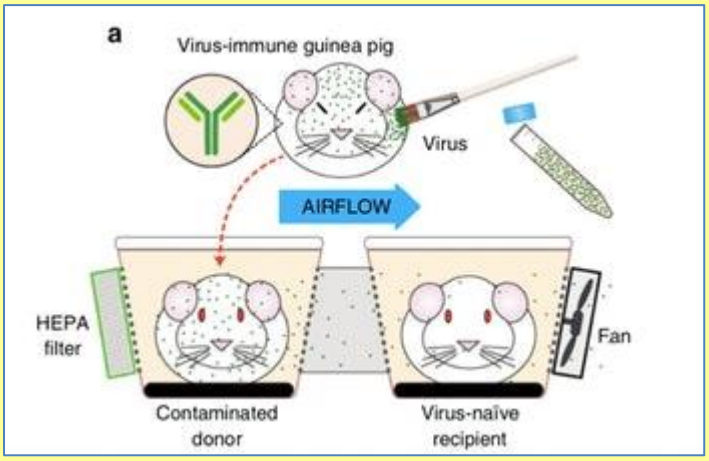
Held at a fixed temperature of about 72 degrees, the team found that intensely humid conditions (up to 95 percent) could extend the airborne lifetime of a 50-micron droplet by 23 times**, suggesting that droplets are "extremely sensitive" to humidity.**

That said, temperature also plays a key role. When it came to a 100-micron droplet (the larger end of droplet size), the authors found that in very humid air, colder temperatures actually shortened the droplet's airborne lifetime. In dry air, they found that the airborne lifetime of the droplet increased as temperatures dropped.
So far, the study suggests that the interaction between humidity and temperature may play a role in how coronavirus-laden droplets survive, though the study's lead author Bin Bin Wang, an assistant professor of civil and environmental engineering at the University of Missouri tells *Inverse* that it's too early to apply these findings the pandemic just yet.
"Please keep this in mind, we don't know how viruses are correlated to the droplets, and the dry-out of a droplet would affect the fate of the virus. We need to be quite careful in interpreting our findings," Wang cautions



The airborne life time of a 100 µm droplet at different temperatures and humidities, according to the model.

That said, the relationship between humidity and Covid-19 is becoming clearer, at least when it comes to outdoor conditions. A study on humidity and coronavirus cases in Australia published August 18 in *Transboundary and Emerging Diseases* reports that **decreases in humidity** were linked to a greater spread of the coronavirus.
For example, they found that a decrease in humidity of about one percent (drier air) was linked to about a 7.7 percent increase in the number of coronavirus cases reported. That effect was most pronounced when humidity was above 79 in the early stage of the pandemic as cases grew and above 75 percent in the later stage as cases dropped off.
Karen Kormuth, an assistant professor of biology at Bethany College, who was not involved with the study says that the humidity questions are particularly relevant for **indoor transmission** of the coronavirus, where risks are higher. She points out that looking at humidity at around 95 percent, which increased droplet lifetime the most in the *Physics of Fluids* study, is "really at the higher end of the spectrum."
When she has measured the humidity of her own lab it tends to be lower in the winter, clocking in around the teens or twenties, and as high as about 50 percent in the summer.
"What I think we need to be thinking about more is the humidity inside a controlled indoor environment," she says.
On that front, she says we still have a "limited understanding" of how real droplets that are exhaled from human respiratory tracts behave.



An illustration of the study procedure.*Nicole Bouvier et. al.*

Aerosolized dust – Studies focusing on droplet transmission hinge on the fact that the person spewing the droplets is still in the room. The study released in *Nature Communications* suggests that there's another avenue to explore: aerosolized fomites, or tiny dust particles. These may also contain samples of virus even without the presence of a breathing being.
Scientists at Univerity of California, Davis "painted" immune guinea pigs with the flu virus and put them into a dusty environment with a susceptible partner, taking care to reduce the risk of respiratory spread. Three of 12 susceptible guinea pigs ended up with influenza, which the team suggested came from the 1,000s of dust particles that the guinea pigs turned up while scampering about their cages.
In a follow-up experiment, they also found that a crumpled tissue, if rubbed for eight minutes, could produce 1,000s of small particles that contained flu virus.

At this point, the **fomite-based transmission** of coronavirus is not as much of a concern as **droplet-based transmission**. However, the study's lead author William Ristenpart, a professor at UC Davis, explains that aerosolized fomites are far different than traditional ones. Open questions remain as to whether Covid-19 can become aerosolized from other sources like tissues, contaminated clothing, or a dusty floor.

"We are not saying that people are barking up the wrong tree by focusing on respiratory droplets," says Ristenpart. "Our point is that there is a whole other tree that needs to be considered, for example, the possibility of aerosolized fomite transmission."

Ed Nardell is a professor in the environmental health department at Harvard's TH Chan School of public health. Nardell, who was not involved in the study, tells *Inverse* that this is "a very good aerobiology study."

At the same time, it "doesn't nail it as evidence that this is happening in real life," Nardell says.

The CDC still advises that the cleaning of "visibly dirty surfaces" is still a best practice measure for the prevention of Covid-19. However, so far, we've yet to come across examples of people getting sick through aerosolized dust particles.

"It hasn't been clearly established prior to our work that aerosolized fomites can transmit respiratory viruses, so it really hasn't been on the radar yet for Covid research," Ristenpart adds.

Nardell says this work is still useful to us, even though some scientists have argued that fomite-based transmission doesn't seem to be as risky as contact with droplets. "For months people were Cloroxing their grocery bags because they could have been a source of transmission and all of the sudden, we're told not to worry about that," he says.

"It isn't a distraction," he continues. "It deserves to be worked out."

Airflow in enclosed environments – What remains true is that it's worth avoiding poorly ventilated indoor spaces. If you must be inside, good ventilation can make a huge difference, and wearing a mask is essential if you're with people outside of your pod.

Take a recent case study published in *JAMA Network Open* on how Covid-19 spread on an international flight between Germany and Israel in early March: There were 102 passengers on the plane, and 24 of those passengers were part of the same tourist group, which had come into contact with a Covid-19 positive hotel manager a week before the flight.

Seven people in that group eventually came down with Covid-19 due to prior exposure — only two additional passengers in this case study appeared to have gotten the virus during the 4 hour and 40-minute flight. The authors admit that, while it's possible there were cases they may have missed, the airflow in the cabin from the ceiling to the rear likely limited transmission. Had passengers been wearing masks, the authors speculate that risk may have plummeted even further.

Kormuth says that there are still some simple precautions we can all take as the science on droplet behavior and what kinds of vehicles host coronavirus continue to develop.

"Just increasing ventilation, as much as possible, even if it's just as simple as having a personal air purifier, turning on a fan to kind of mix up the air, or opening a window – that's really what's critical to reducing the risk," she says.

Progress report on the coronavirus pandemic

Nature 584, 325 (2020)

Source: https://www.nature.com/articles/d41586-020-02414-1

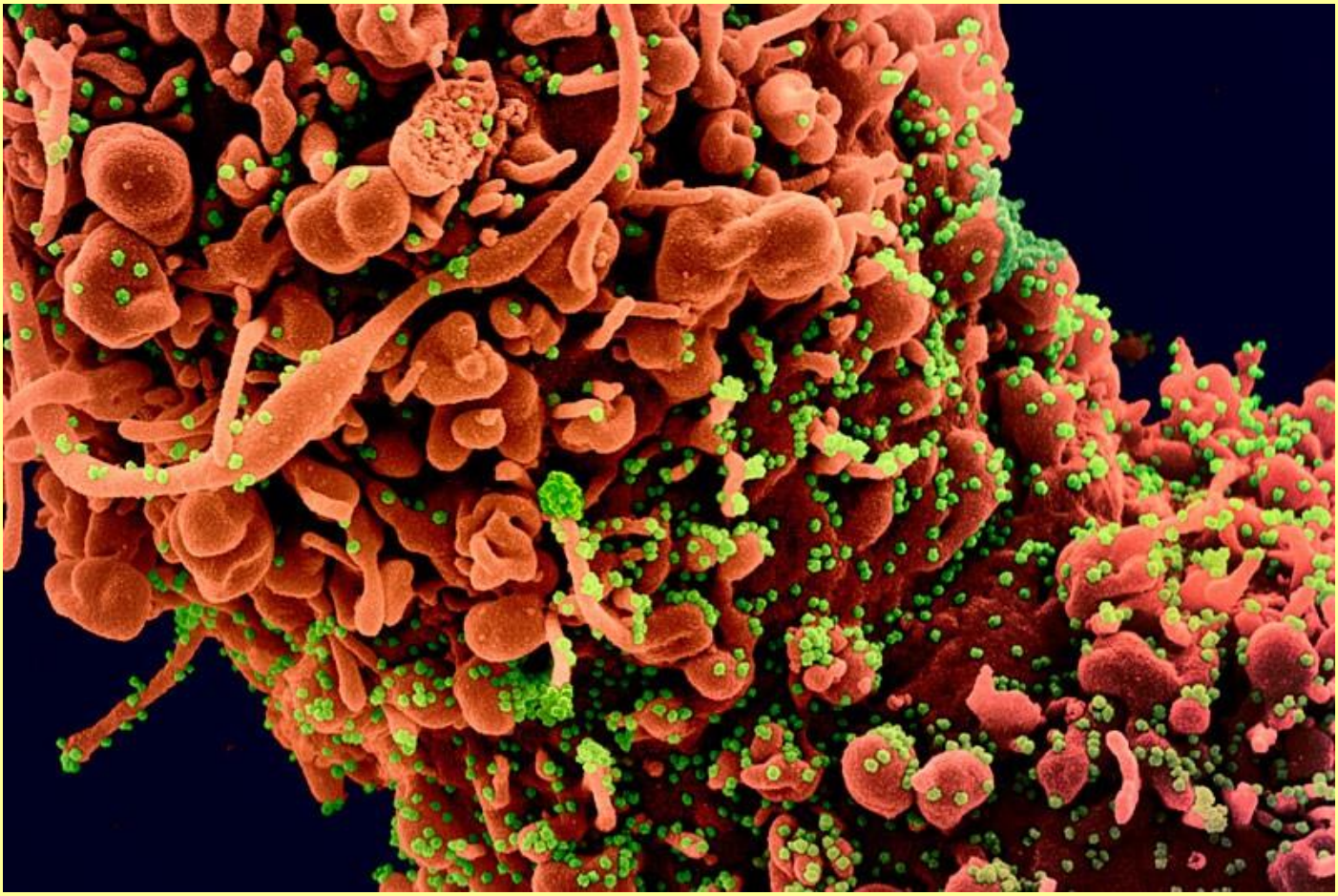
Aug 19 – In the space of eight months, the new coronavirus SARS-CoV-2 and the disease it causes, COVID-19, have dominated the work of thousands of researchers in an unprecedented global effort.

In a series of editorials, we look back at key scientific findings that have revealed important characteristics of the virus and COVID-19, including emerging approaches to treatment and prevention. We begin, this week, with how the virus was identified; the molecular details of its mechanism of infection; how it transmits between people; and the many ways in which it affects the human body.

Cracking the virus code

When an outbreak of a disease similar to severe acute respiratory syndrome (SARS) emerged in Wuhan, China, at the end of 2019, researchers suspected that a new coronavirus had spread to humans. Many of the first cases to be identified were linked to a single live-animal market in the city.

Researchers in China immediately began working to isolate and sequence the virus. When the original SARS virus, now known as SARS-CoV-1, emerged in humans in 2002, it took months to obtain a full sequence of the virus genome. This time, advances in sequencing technologies meant that scientists were able to unpick the virus's RNA code within weeks of the first cases appearing.



Scientists have scrambled to unpick the mechanism that the new coronavirus (green) uses to enter a human cell (orange). Credit: NIAID/National Institutes of Health/Science Photo Library

On 11 January, Yong-Zhen Zhang at Fudan University in Shanghai and his colleagues deposited the genome sequence of a virus isolated from a 41-year-old who had worked at the animal market into a public database. In doing so, they alerted the world to the existence of a new coronavirus that was related to SARS-CoV-1. Their findings were subsequently published in *Nature*[1].

Although Zhang's team had sequenced the virus from only a single patient, simultaneous work by other groups identified the same virus from other people with pneumonia. Together, these researchers firmly implicated this new coronavirus as the cause of the disease. One of the teams, led by Shi Zhengli at the Wuhan Institute of Virology, also determined that the closest known relative of the new virus was a bat coronavirus[2].

Some six months later, the coronavirus has ravaged the world. Scientists have now generated more than 80,000 viral sequences. This wealth of genetic information has allowed transmission chains to be traced — revealing, for example, cryptic community transmission in the United States — as well as showing that a variant that seems to be particularly infectious to cultured cells has now become dominant around the world[3,4]. What this altered infectivity means for transmission and disease is not yet clear.

Not just a respiratory virus

Initial reports of the disease, named COVID-19 on 11 February, described a severe respiratory illness similar to that caused by SARS-CoV-1. Chest scans showed patchy shadows — known as 'ground glass opacities' — in the lungs of many patients, according to early studies from hospitals in Wuhan[5]. Moreover, older people, men and those with other diseases were more likely to be admitted to intensive care, whereas children seemed to have milder disease[6].

But it quickly became apparent that SARS-CoV-2 is not just a respiratory virus. It also affects blood vessels, causing thrombosis[7] and strokes[8]. In rare cases, children can develop what is called a multisystem inflammatory syndrome, reminiscent of Kawasaki disease[9].

Autopsies have found the virus in organs other than the lungs, including the kidneys, liver, heart and brain, as well as in the blood[10]. We now know that symptoms of COVID-19 can include gastrointestinal, neurological, renal, cardiovascular and other complications[11]. Symptoms experienced by different people might be dictated by a combination of which cells and tissues are infected; the direct damage the virus causes to these cells; interference with the normal function of host cells' ACE2 receptors, to which the virus binds; and individual variations in the immune response to the virus. For example, severely ill patients show hyperactivation of their immune response, which damages the lungs.

Unravelling these contributions will hopefully lead to effective treatments. The steroid drug dexamethasone, which calms the overactive immune response, has already been shown to reduce mortality from severe COVID-19[12]. Progress has also been made in managing severe disease. However, what causes the sudden onset of acute respiratory distress in some people is still not known.

Modes of infection

A burning question early on was how the new virus infects human cells — the answer would help to explain the disease's pathology, as well as offering clues about how to block infection.

Coronaviruses are decorated with 'spike' proteins. These interact with specific proteins on the surface of the cells they are infecting. After binding to the cell receptor, the spike has to be cleaved by an enzyme called a protease in the host cell. This activates the spike, which fuses the virus and cell membranes.

Scientists soon showed that both SARS-CoV-1 and the new coronavirus use the same cell receptor, ACE2[2], and the same protease, TMPRSS2[13], to enter cells. But SARS-CoV-2 can also infect cell lines that don't express TMPRSS2, which could stymie drug development.

Researchers used Vero cells — which do not express TMPRSS2 — in an early study that suggested that the drug chloroquine might work as a treatment for COVID-19[14]. But chloroquine did not prove effective in clinical trials, and scientists discovered that it does not inhibit the virus in lung cells that express TMPRSS2[15].

Despite the overall structural similarity between the spike proteins of the two SARS coronaviruses, scientists found that the SARS-CoV-2 spike binds the ACE2 receptor at least ten times more tightly than SARS-CoV-1 does[16]. This might explain some of the differences between how the two viruses infect people and cause disease.

The SARS-CoV-2 spike also has a feature that SARS-CoV-1 lacks: a sequence of amino acids that allows it to be recognized and cleaved by an enzyme called furin[17]. How this sequence contributes to the virulence of SARS-CoV-2 is not yet known. But similar sequences are also found in the receptor-binding protein of some influenza viruses, and contribute to their virulence.

Something in the air

It soon became clear that SARS-CoV-2 could hop from one person to another. This could happen through direct contact or indirect transmission, such as through droplets expelled during a cough, or even a simple exhalation. What wasn't clear — and is still a matter of debate — is how big those droplets need to be, and how far they can travel.

It's an important question. Larger droplets will quickly fall to the ground, but smaller, lighter ones — known as aerosols — can stay suspended in the air. A virus that can hitch a ride on such tiny droplets can travel farther and could increase the risk of infection in poorly ventilated indoor spaces.

The potential of the new coronavirus to travel in this way was the focus of a study, published in April, on SARS-CoV-2 aerodynamics in two hospitals in Wuhan[18]. Researchers found that some areas of the hospitals, particularly some staff areas, had relatively high concentrations of viral RNA in aerosol-sized droplets.

The team did not determine whether those droplets were infectious, but a US-based team reported in April that both SARS-CoV-2 and SARS-CoV-1 were stable and infectious in artificially generated aerosols for three hours[19].

It has not yet been shown definitively that SARS-CoV-2 is spreading in this way, in part because it is hard to separately measure the different ways in which the virus transmits.

Invisible disease

As the virus began to spread around the world, there were suggestions that people without symptoms might be able to transmit it. In March, data from the cruise ship Diamond Princess revealed that 17.9% of those who tested positive for COVID-19 on the ship had no symptoms[20]. More than 3,700 people had been quarantined aboard the vessel in February after a former passenger was found to have COVID-19. In April, a study of 94 people showed that 'viral shedding' — the release of a virus into the environment — seemed to peak before or at the same time as the onset of symptoms[21]. The researchers also

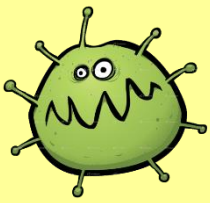
evaluated 77 pairs of people, one of whom had probably been infected by the other, and found that 44% of the infections were transmitted before the participants developed symptoms.
What proportion of virus carriers never show symptoms is still a matter of debate, but it is clear that people can transmit the virus even if they are not ill, which is probably contributing to its spread.
We have come a long way in understanding how the pandemic arose and how it spread around the world — by studying the virus's characteristics and transmission, and how it causes disease. In future instalments of this editorial series, we'll look at the research on how to control it, as well as progress on treatments and vaccines.

▶▶ References are available at source's URL.

Blood pressure medication improves COVID-19 survival rates

Current Atherosclerosis Reports; August 24, 2020.
Source (full paper): https://link.springer.com/article/10.1007/s11883-020-00880-6

Aug 24 — Medication for high blood pressure could improve Covid-19 survival rates and reduce the severity of infection - according to new research from the University of East Anglia.
Researchers studied 28,000 patients taking antihypertensives - a class of drugs that are used to treat hypertension (high blood pressure).
They found that the risk of severe Covid-19 illness and death was reduced for patients with high blood pressure who were taking Angiotensin-Converting Enzyme inhibitors (ACEi) or Angiotensin Receptor Blockers (ARB).
Lead researcher **Dr Vassilios Vassiliou**, from UEA's Norwich Medical School, said: "We know that patients with cardiovascular diseases are at particular risk of severe Covid-19 infection. But at the start of the pandemic, there was concern that specific medications for high blood pressure could be linked with worse outcomes for Covid-19 patients.
"We wanted to find out what the impact of these medications is for people with Covid-19.
"We therefore studied the outcomes for patients taking antihypertensives - looking particularly at what we call 'critical' outcomes such as being admitted to intensive care or being put on a ventilator, and death."
The research was led by UEA in collaboration with the Norfolk and Norwich University Hospital.
The team analysed data from 19 studies related to Covid-19 and ACEi and ARB medications. The meta-analysis involved more than 28,000 patients and is the largest and most detailed such study to date.
They compared data from Covid-19 patients who were taking ACEi or ARB medications with those who were not - focusing on whether they experienced 'critical' events (admission to intensive care and invasive or non-invasive ventilation) and death.
Dr Vassiliou said: "We found that a third of Covid-19 patients with high blood pressure and a quarter of patients overall were taking an ACEi/ARBs. This is likely due to the increasing risk of infection in patients with co-morbidities such as cardiovascular diseases, hypertension and diabetes.
"But the really important thing that we showed was that there is no evidence that these medications might increase the severity of Covid-19 or risk of death.
"On the contrary, we found that there was a significantly lower risk of death and critical outcomes, so they might in fact have a protective role - particularly in patients with hypertension.
"Covid-19 patients with high blood pressure who were taking ACEi/ARB medications were 0.67 times less likely to have a critical or fatal outcome than those not taking these medications.
"As the world braces itself for a potential second wave of the infection, it is particularly important that we understand the impact that these medications have in Covid-19 patients.
"Our research provides substantial evidence to recommend continued use of these medications if the patients were taking them already. "However, we are not able to address whether starting such tablets acutely in patients with Covid-19 might improve their prognosis, as the mechanism of action might be different," he added.



HOTZONE
SOLUTIONS
GROUP

A holistic approach in CBRNe operations

Consultation
Products
Training

www.hotzonesolutions.org