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C²BRNE DIARY

Dedicated to Global First Responders

December 2021

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CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C2BRNE DIARY

EDITOR'S CORNER

Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

December, the last month of the year and the 24th month in the pandemic. Despite our global efforts and unimaginable science, the virus continues to prevail with a little help of governors that amid their panic forget to use their logic. Crisis communication management is at its worse and everybody is improvising instead of following certain standard operational procedures and common logic.

I delayed my vaccination hoping that those who are responsible for my health will overcome their hesitations and obsessions and do what would be best for the public health of their citizens – including all available vaccines (e.g., the Sputnik V and Light or Sinovac) and new antibody drugs. I thought that Sputnik was the best for me given my present medical status. But nothing happens! EU and my country prefer Western-only products blocking Russian and Chinese vaccines with ridiculous excuses and delays (WHO, EMA – recently Novavax [USA] got approval but not Sputnik). On top of this outrageous behavior, the Greek government recently decided to fine 100 euros per month for each citizen over 60 years old if not applied for vaccination by January 16, 2022. That is 1,200 euros per year that is a significant amount of money. They have already cut approximately 50% of my pension (after +35 years in service) in the last decade and now this extra penalty is too much to handle. So I was vaccinated (Pfizer) kind of "by force" without being given the chance to select my drug based on what is best for me and in accordance with my scientific evaluation and recent EMA reports on experimental vaccines' profiles.

The new Omicron[1] variant created a new round of panic for both "experts" and people although we still do not know enough to make conclusions. The fact is that we still do not know enough about this virus and its behavior once inside a host. But this does not stop us from scheduling for new versions of existing vaccines and new restrictive measures in societies, traveling, social behavior, and all. At the same time we have put aside face masks with the unbelievable perception that we do not need masks if we are vaccinated (e.g., packed football stadiums, entertainment industry, high profile official visits [like the recent visit of Pope Francis to Greece]; social distancing and personal hygiene that are of equal importance to vaccines. On top of these, Bill Gates repeatedly spoke about a near-future pandemic and asks the rhetorical question if we are prepared for such possibility – as if he does not know the answer!

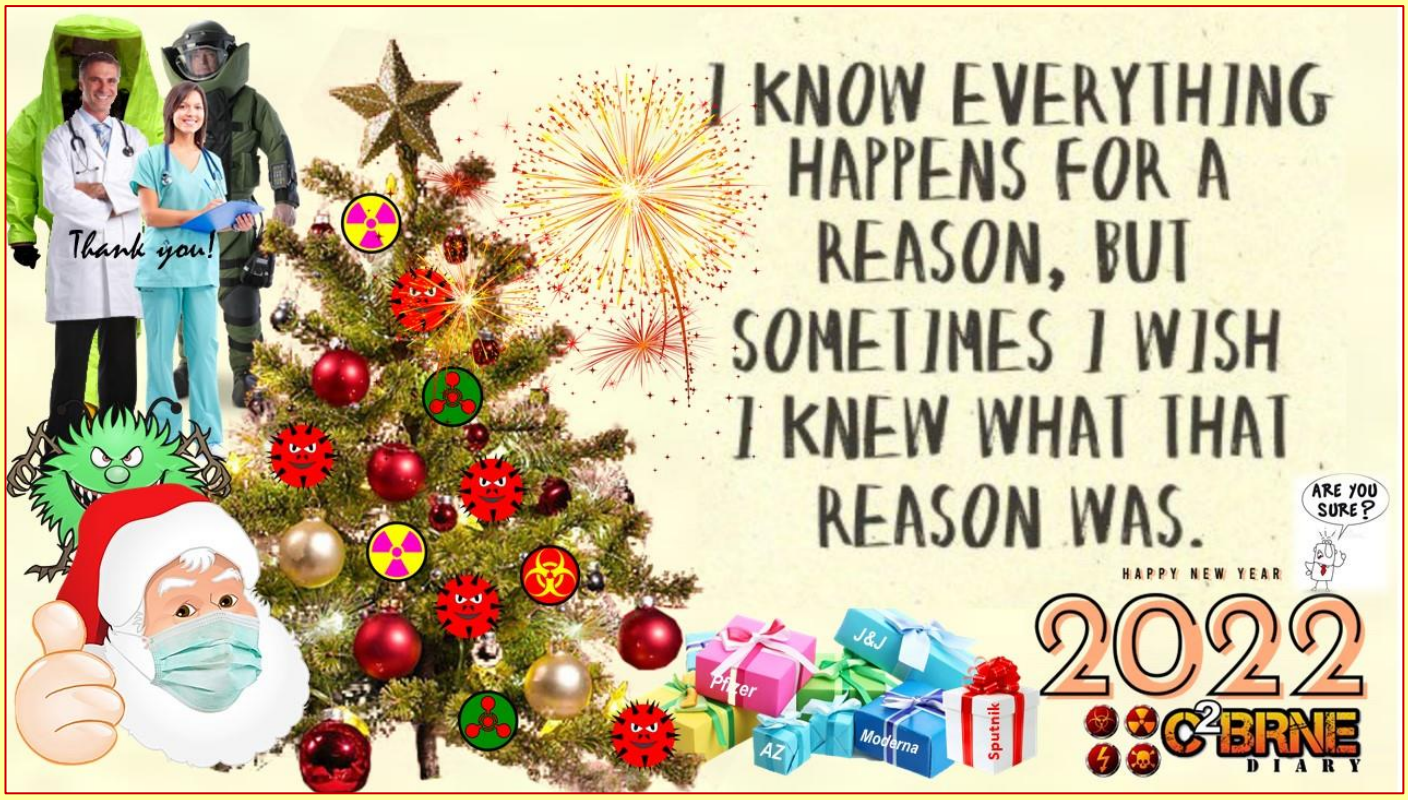
There is a lot of debate about the creation of a Middle East WMD Free Zone. It is very interesting to observe certain people, nations, and organizations setting utopic goals or deliberately forgetting that you cannot fulfill these goals of countries involved are not sincere and willing to accept these zones for the benefit of their people and the planet. Take Turkey for example: how can a Free Zone become a reality when this country has openly stated that is very much interested in nuclear weapons and everybody understands that the under-construction Akkuyu nuclear power plant is a smoke curtain towards this ambition? A similar attitude applies to chemical weapons where from time to time we learn about certain nations involved in the technical support of others using these forbidden weapons. Perhaps it would be better to establish Hypocricy Free Zones instead of WMDFZs – also applicable for EU countries that support Turkish offensive (e.g. German company Hensoltd [South African branch] providing cruclal equipment for their armed Bayraktar TB 2 drone).

[1] The WHO skipped two Greek letters in naming the variant, avoiding Nu, too easily confused with "new," and Xi, a common Chinese surname and the name of China's leader.

Since 2022 is just a few days away, predictions for the New Year are easy to make. Pandemic will continue until we have a good knowledge of the enemy (according to General Sun Zu) and redefine the protection mechanisms we have and make people understand the reasoning behind them. The Omicron problem will be solved as well – is it more dangerous than Delta or experts are more dangerous than viruses? Another sure thing is that troubles are expected in the SE Mediterranean basin due to the Turkish offensive against almost everybody in the area. Greece with be the epicenter of a short conflict and it will be given the opportunity to realize that in difficult times you are alone despite treaties, friends, and allies and prove that dogs who bark do not bite!

I take the opportunity to sincerely from heart wish to all CBRN First Responders and their families a Very Happy New Year 2022 full of Health, Happiness, and Prosperity. Fill your batteries; another difficult year is ahead!

The Editor-in-Chief



Holiday Terror Threats: How Extremists Encourage Violence During the Season

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/terrorism-study/holiday-terror-threats-how-extremists-encourage-violence-during-the-season/

Part of a general Christmas threat propaganda poster circulated by ISIS supporters.

Nov 23 – Though police have not ascribed a terror motive to Sunday's deadly incident in which an SUV drove into crowds at a Wisconsin Christmas parade, the scene invariably brought to mind the vulnerabilities exploited in the 2016 attacks on the Bastille Day crowds in Nice and the Breitscheidplatz Christmas market in Berlin: Soft targets without secure perimeters. Packed crowds that increased the casualty count from the use of a vehicle as a weapon. Crowds that were distracted by joyful holiday activities and not necessarily on alert for danger.

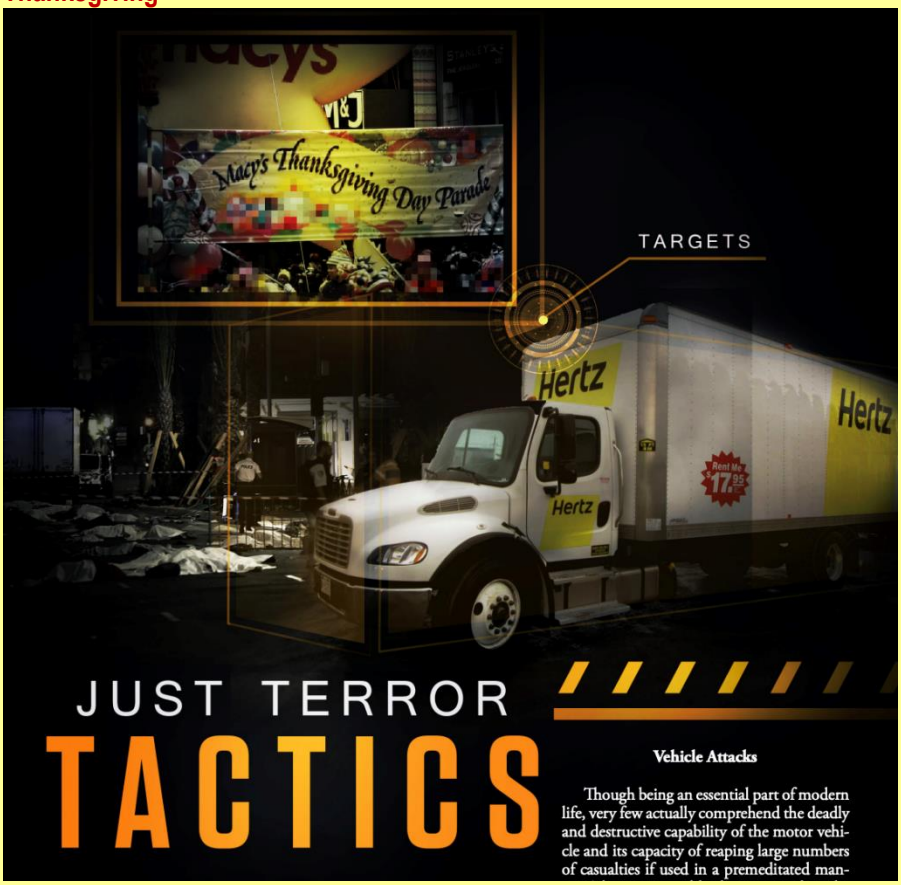
Extremist movements and lone actors have favored targets connected to holidays for these logistical reasons – ease of attack, ability to effectively use simple weapons, crowds that may be oblivious to the threat – or for symbolic reasons if the intended target, date, or victims align with an ideological motive. These can combine; for example, if a person with antisemitic beliefs opportunistically decides to attack a Jewish community location after noticing light security on an important date for either the faith of the victims or the faith of the attacker.

Holiday attacks present a conundrum for security services that are trying to keep venues and celebrations protected while keeping a sense of openness and welcoming during observations of community traditions.

The National Terrorism Advisory System bulletin released earlier this month warned of a continuing "diverse and challenging threat environment" as several religious holidays and

associated mass gatherings approach "that in the past have served as potential targets for acts of violence." Domestic violent extremists and individuals inspired by foreign terrorist organizations have targeted crowded commercial facilities, houses of worship, and public gatherings, and continued reopenings coupled with potential "ongoing societal and economic disruptions due to the pandemic, as well as mass gatherings associated with several dates of religious significance over the next few months, could provide increased targets of opportunity for violence, though there are currently no credible or imminent threats tied to any dates or locations."
Online propaganda and messaging are playing a critical role in the ongoing threat environment, NTAS continued, as both foreign and domestic threat actors "continue to introduce, amplify, and disseminate narratives online that promote violence, and have called for violence against elected officials, political representatives, government facilities, law enforcement, religious communities or commercial facilities, and perceived ideological opponents."
Terror propaganda and tutorials are easily accessible online for lone actors and groups of any ideology to access and use as inspiration or instruction. Past attacks and threats can provide some guidance on what has been attractive to violent extremists, how these threats may be adapted to realities on the ground today, and how both security officials and holiday revelers can prepare for a worst-case scenario in conjunction with focusing on the joy of the season.

Thanksgiving



A page from ISIS' Rumiyah magazine using imagery from the Macy's Thanksgiving Day Parade while tutoring on vehicle attacks

In a 2016 issue of ISIS' now-defunct *Rumiyah* magazine, the terror group used a tutorial-style format to encourage followers to emulate Mohamed Lahouaiej-Bouhlel's cargo truck attack on the Bastille Day revelers in France. ISIS directed would-be terrorists to steer clear of passenger cars and "off-roaders, SUVs, and four-wheel drive vehicles" as they can "lack the necessary attributes required for causing a blood bath" and "smaller vehicles lack the weight and wheel span required for crushing many victims." The magazine displayed a picture of a U-Haul, calling it "an affordable weapon"; in 2017, an attacker used a pickup rented from Home Depot to ram cyclists and runners along the Hudson River in Manhattan, killing eight. ISIS also showed a photo of the Macy's Thanksgiving Day Parade, describing the annual holiday tradition as "an excellent target."
"Any outdoor attraction that draws large crowds," the terror group noted, makes for an attractive target, especially "low security" gatherings deemed "fair game and more devastating to Crusader nations." While the Macy's parade is not low-security, primers on vehicle attacks and emphasis on targeting large crowds and soft targets have been a recurring theme in terror propaganda. "The target should be on a road that offers the ability to accelerate to a high speed, which allows for inflicting maximum damage on those in the vehicle's path," ISIS said in the *Rumiyah* article.
Violent extremists' focus over the Thanksgiving weekend would not be limited to parades but crowded stores on Black Friday – the alleged manifesto of accused El Paso Walmart shooter Patrick Crusius, still circulated among domestic extremists, advised others to "pick low hanging fruit" and "attack low security targets." Increased air travel would also pique the interest of extremists who could attempt attacks not just on flights but on travel infrastructure and related crowded areas. A magazine published by al-Qaeda supports to mark 20 years since the 9/11 attacks argued

that the tactic of using planes as weapons is "an open door even to lone wolves" and that "aircraft operations are not limited to the orientation of the aircraft as a weapon," such as planting explosives in cargo.

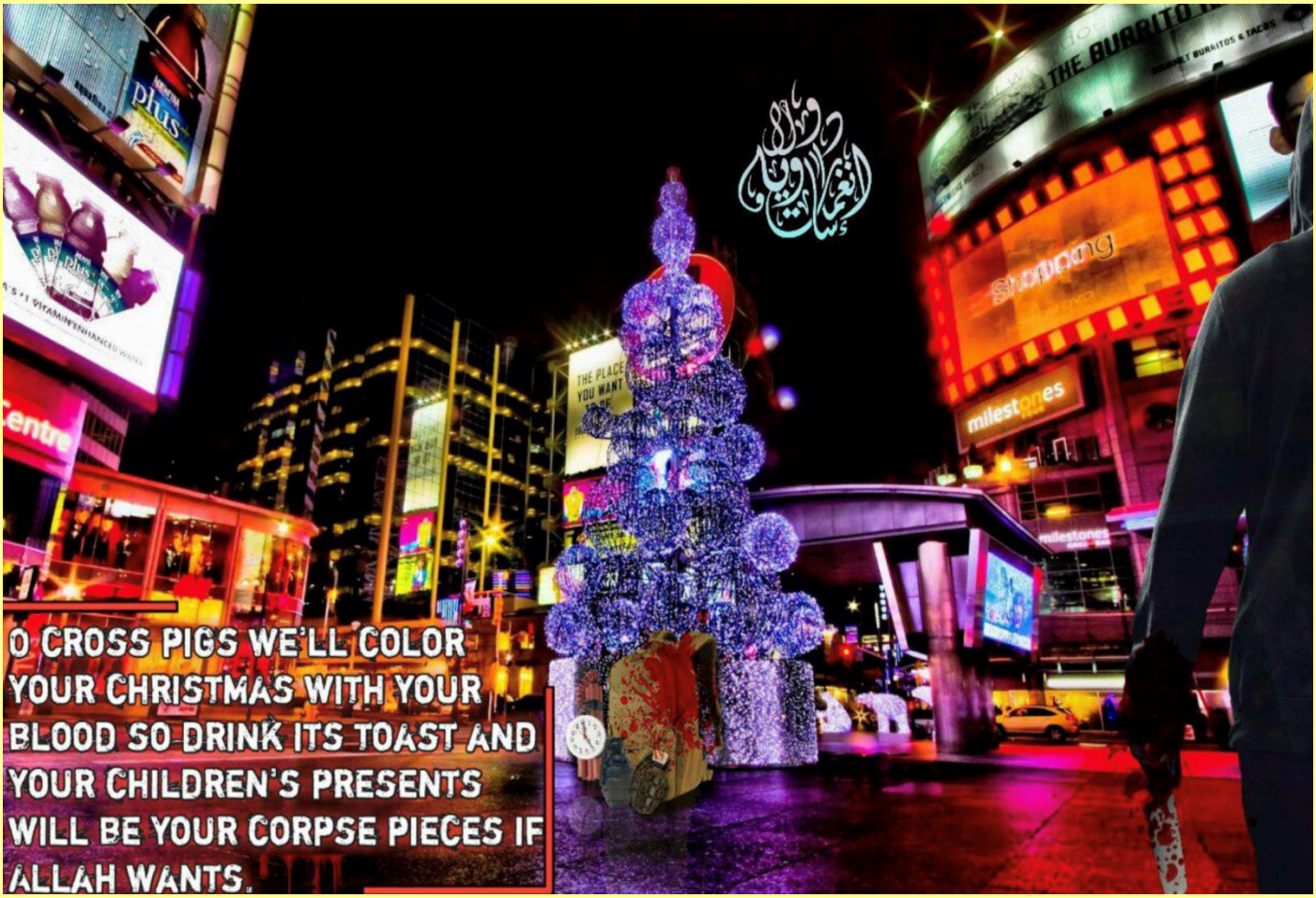
Antisemetic memes distributed by far-right extremists

Hanukkah

In 2019, on the seventh night of Hanukkah, a masked assailant entered a party at the home of a Hasidic rabbi in Monsey, N.Y., and stabbed five people, killing one. He was blocked from then attempting to enter the synagogue next door. Grafton Thomas, who has a history of antisemitic writings and browser searches, was found mentally incompetent to stand trial and was committed.

Important days in the Jewish faith are a potential target for extremism rooted in antisemitism – including white supremacists, neo-Nazis, conspiracy theory extremists, and Islamist extremists – but the threat is especially concerning in today's environment of rising antisemitic attacks not necessarily linked to holy days. At an August Senate Homeland Security and Governmental Affairs Committee hearing on the domestic extremist threat, Brian Levin, director of the Center for the Study of Hate and Extremism at California State University, San Bernardino, warned that antisemitic hate crimes were up 135 percent in New York City and 53 percent in Los Angeles and "heading for records." Jonathan Greenblatt, CEO and national director of the Anti-Defamation League, said that a "drastic and disturbing rise in anti-Semitic activity across America" has been fueled by social media and "the problem we see is that violence motivated by hate, antisemitism, and other forms of bigotry increasingly has been normalized."

Robert Bowers, who stands accused of picking Shabbat services in 2018 to launch the deadliest attack on the American Jewish community, is hailed as a hero in the antisemitic cesspool of meme culture, with domestic extremists urging others to emulate his actions and Nike "Just Do It" branding superimposed on his mugshot. And the pre-attack open letter attributed to 2019 Poway synagogue shooter John Earnest, who chose the last day of Passover for his attack and wrote that there is "no other option" than to kill Jews while asserting that his motive was based in Christianity, also has shown that manifestos have legs among domestic extremists. While this antisemitism unfortunately flourishes year-round and has been getting worse, particular attention to security is warranted on holidays because of the demonstrated penchant extremists have for openly admitting they draw inspiration from each other's crimes.



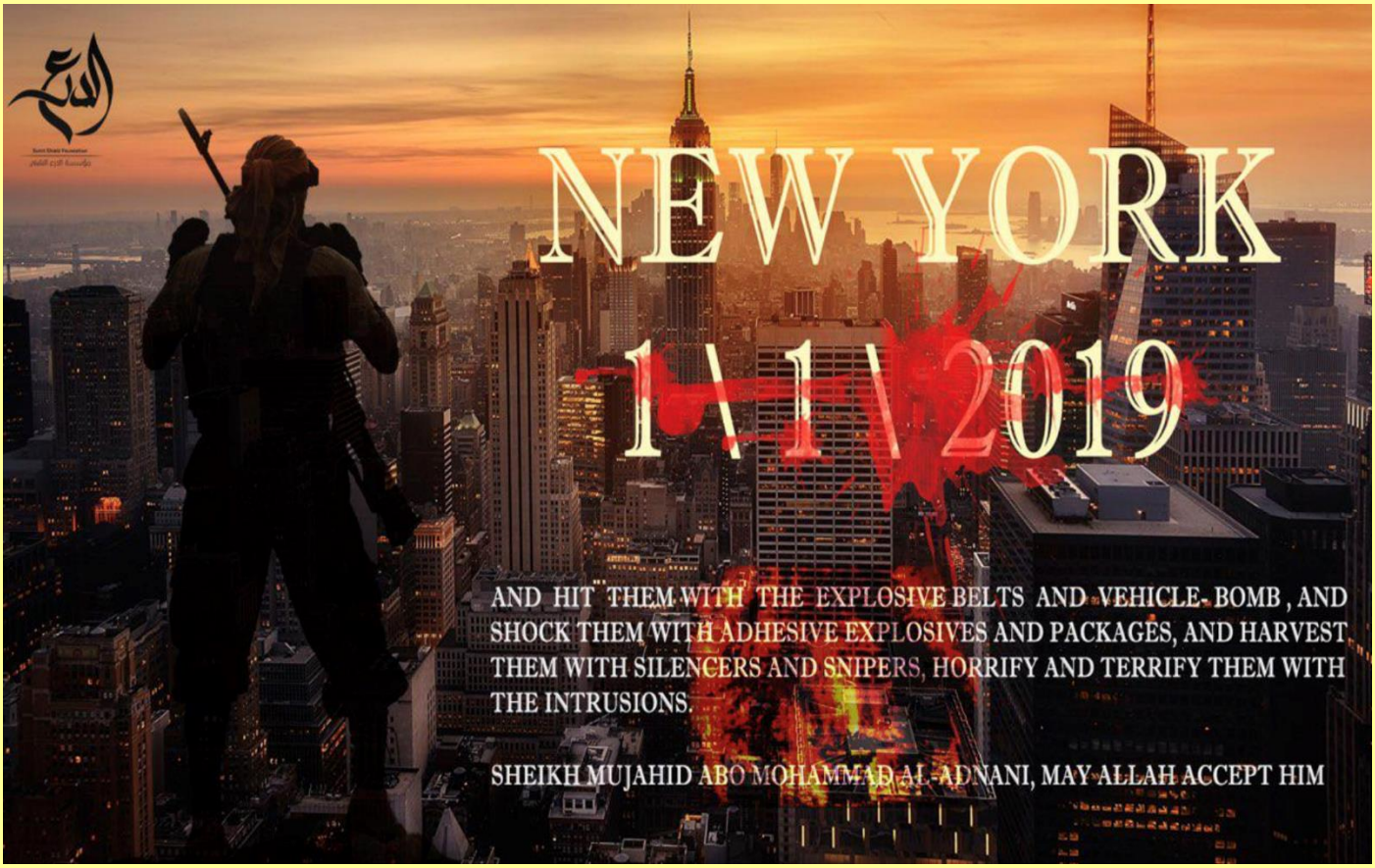
A 2018 threat from ISIS supporters depicting Toronto's Yonge-Dundas Square

Christmas

In the run-up to and during the holidays, ISIS supporters have historically churned out calls to action that have promoted Christmas market attacks in Germany (2016) and France (2018) as well as the 2015 attack on a county employees' holiday party in San Bernardino, Calif. Propaganda has run the gamut from depicting jihadists next to Christmas trees, to bombs in Santa's bag of gifts, to Santa running from an ISIS truck while lugging a flaming Christmas tree. "Beat him violently," said one image in French depicting a dead Santa in Strasbourg, scene of the 2018 attack. "Be sure to inflict the greatest losses on the enemy." Another suggested planting explosives in public Christmas tree displays, while yet another propaganda poster depicted blood-spattered angel lights on Regent Street in London.

These calls that circulate among ISIS channels have not always fallen on deaf ears: Everitt Aaron Jameson, a Modesto, Calif., tow-truck driver and former Marine, pleaded guilty in 2018 to planning a Christmas-season attack on San Francisco's Pier 39; he had "liked" on Facebook an ISIS propaganda image depicting Santa with a box of dynamite in New York's Times Square. And while the internet isn't as saturated with calls for Christmas attacks as in ISIS' heyday – when the terror group expressly issued many threats to the Vatican – these calls are inevitably released by ISIS supporters trying to urge others to take advantage of the symbolism of the Christian holiday. An English-language message to the "lone wolves and hungry lions" that circulated online among ISIS supporters as "new year is at the door" last December called on would-be attackers to use the holiday season and specifically target American and French civilians with a variety of tactics including arson and poisoning.

Christmas attacks have also served as a reminder that lone attackers, regardless of group loyalty or even ideology, have a well of open-source terror tutorials and advice from which to draw. The Dec. 11, 2017, bomber in the New York City subway tunnel, ISIS supporter Akayed Ullah, used an al-Qaeda pipe bomb recipe featured in the summer 2015 issue of *Inspire* magazine that incorporated a Christmas light, but the device didn't work as intended.



A threat posted by ISIS supporters at the end of 2018

New Year's Eve

Just before the turn of the millennium, Ahmed Ressam, detained at a port of entry while trying to cross into the United States from Canada, revealed a plot to bomb Los Angeles International Airport as 1999 turned into 2000. Officials would say that terror cells had been disrupted in multiple countries as the would-be LAX bomber claimed other millennium attacks had been planned worldwide.

Areas traditionally known to be crowded with revelers on any New Year's Eve quickly become high-security locations as authorities wisely put extra preparation and manpower into hardening these party spots, such as Times Square. And the timing doesn't need to be as monumental as the millennium: multiple New Year's Eve plots linked to ISIS in the last days of 2015 spurred stiff security around that year's celebrations in Europe. The threat could also be connected to additional motivating factors; for example, personalities billed to appear at New Year's celebrations or specific scheduled locations for festivities could also inspire domestic extremists driven by politics, religion, or conspiracy theories to attack.

But the symbolism of New Year's to extremists, often expressed in propaganda, can make a multitude of targets – including more accessible ones with less of a police presence – attractive to a would-be attacker as the clock nears midnight. This symbolism can be considered similar to anyone who would make a New Year's resolution to start the fresh year on a high note – except to extremists that fresh slate means making their cause or ideology infamous and potentially doing it with a bang, drawing new recruits to pump up the movement's strength, and essentially claiming the new year as their own.

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. Bridget is a terrorism analyst and security consultant with a specialty in online open-source extremist propaganda, incitement, recruitment, and training.*

Security and Governance in the Taliban's Emirate

By Antonio Giustozzi and Rasha Al Aqeedi

Source: https://newlinesinstitute.org/afghanistan/security-and-governance-in-the-talibans-emirate/

Nov 24 – Since taking power in Afghanistan on Aug. 15, the Taliban have encountered a new set of problems. As an insurgent group, they aimed to undermine security in the country, but as they transition to full state control, they now need to maintain law and order. Forming a conventional army appears to be one of the group's security objectives, but they will face obstacles in sustaining an organized fighting force and formulating a model that fits the Afghan context, including few financial resources, low technical skills, significant security threats, and intra-Taliban friction.

The Taliban are not making this transition out of military necessity; they have confidence in their own ability to control the Pashtun belt (although this might be misplaced given the intensifying Islamic State activities in the east). Instead, the Taliban are concerned about their image. For the international community, seeing Afghanistan under the control of a former insurgent force, without uniforms and clearly identifiable chains of command, only makes it harder to seriously consider cooperation with the new regime.

The Taliban had their own security governance system before their takeover of the country, centered around local Taliban units (essentially village militias), an intelligence system, and a shadow government, inclusive of provincial and district governors and courts. The system was geared toward controlling the population, especially in areas of strong Taliban presence, and toward hampering the old regime's efforts to spy on their movement. Population control was effective: The Taliban tracked individual movements in and out of their areas of operations, and their hit teams killed close to 1,000 "collaborators" each year.

The Taliban's courts administered justice based on the group's interpretation of Islamic law, while "political" cases rarely ended up in front of a judge. Sentences were largely based on oral evidence and investigations that would not meet the standards of any modern nation state. Considering that the Islamic Republic was even worse in delivering justice due to very high levels of corruption, however, the rural public was overall relatively appreciative of Taliban justice. The new minister of justice announced that the services of the judges trained under the previous regime would not be needed, which indicates how the Taliban are seeking to export their judicial system to the cities as well.

A New Set of Problems

The Taliban, which cast themselves as the party of Islamic law, are comfortable chasing criminals, but there is more to maintaining order. For example, the group has been confronted with the task of dealing with street demonstrations. The police of the Islamic Republic of Afghanistan were ineffective at maintaining public safety, despite having riot control units trained by European advisers. Typically, the police would shoot when faced with rioters, and most riots ended with loss of life. By those standards, the Taliban have been better at maintaining order in Kabul, although they have not faced a real riot yet.

Now that the Taliban have taken over the Ministry of Interior, they are saying they plan to re-establish a police force and have in fact already appointed chiefs of police in the provinces, although it is neither clear how they are going to pay for it, nor what it will look like. For the protection of the leadership and of key assets, the Haqqanis have formed the Badri 313 unit, which according to Taliban sources has 5,000 men countrywide and uses equipment and uniforms taken from the old Afghan commando forces.

For now, the justice system seems hardly operational; there have been several public hangings of criminals, with little trace of serious trials. However, the Taliban have largely delivered on their promise of amnesty to previous government officials; out of hundreds of thousands of potential targets, there have only been some tens of violations per month, suggesting that revenge and aggressive behavior by rogue Taliban have largely been kept in check.

A Regular Army

The Taliban have also announced that they intend to form a regular army, with a structure mimicking that of the old National Army of the now defunct Islamic Republic, from an army corps down to the smallest units. They say that they want to attract former members of the National Army into it, likely mainly in specialist, administrative, and technical positions. They are also trying to reactivate the Afghan Air Force, having managed to recruit a few pilots from the old AAF, though the Taliban currently are only able to fly a handful of helicopters inherited from the AAF and there is no evidence that they are able to maintain them.

In November, Taliban sources started circulating the claim that the new army would be small, possibly as few as 40,000 men. It is not clear whether they intend to have other structures under the umbrella of the Ministry of Defense, such as a border guard or a territorial army. Also in November, local sources reported that the Taliban were introducing conscription in some provinces, such as Kandahar and Kabul. Recruits were offered the option of buying their way

out of military service, but given the plans to cut the size of the army down, the conscripts might well be destined for some kind of territorial force.
In the past, the Taliban had debated internally which model of armed force to adopt, with some, notably leading military commander Ibrahim Sadr, advocating for a force styled after Iran's Islamic Revolutionary Guard Corps that specializes in asymmetric and hybrid warfare. There is no interest in the Revolutionary Guards' specialization in covert operations abroad; their focus is on a force that could resist any invaders. Arguably, a conversion of the Taliban's armed forces into such a military would be easier to achieve than turning the Taliban into a conventional army. The Taliban's elite units are already to a considerable degree styled after the Revolutionary Guards. Their hybrid tactics would arguably be more likely to help defend the Emirate against any external enemies than the poorly resourced and trained regular army that the Taliban are likely to be able to scrape together.
If a force styled after the Revolutionary Guards was established, it would not imply a preference for close relations with Iran – some of the Taliban's best hybrid warfare units belong to the Haqqani network, which has no sympathy for Iran. In any case, the Taliban's leadership appears to have gone for a more conventional model, even if a parallel Revolutionary Guards-style force might still be retained. The decision might have to do with Taliban leadership's anxiety over not just achieving international legitimization but also *looking* like a state.
The parallel with Iran's Islamic Revolutionary Guard Corps is particularly interesting when viewed through the prism of U.S. policymakers. The U.S. has faced obstacles in classifying the IRGC for decades because though it is not a rogue militia, it is also not Iran's formal army and has been a consistent nuisance to U.S. interests in the Persian Gulf, Iraq, Lebanon, and elsewhere. An explicit styling of the Emirate's armed forces after the Iranian model would likely unnerve the U.S.
Another important aspect of the Taliban's decision to go with the conventional model has to do with the priority now being assigned to maintaining internal order over fighting external enemies. Although resourcing the new conventional army is a concern (given that what was inherited from the Afghan National Army will be hard to maintain), the Taliban might have reasonable expectations of receiving equipment from the neighbors, especially China.
Since the group reactivated Bagram Air Base in October, rumors have been circulating that Chinese transport planes have been landing there. Local sources confirm several large transport planes landed in Bagram by night, although they could not confirm the nationality. A senior source within the Taliban, however, indicated that some 40 advisers from China (including some military ones) deployed to Afghanistan on Oct. 3, although there has been no confirmation from other sources. If confirmed, it would not be surprising if deliveries of military equipment were to follow. These deliveries would likely focus on strengthening Afghanistan's internal security and border management, and their impact on U.S. regional interests would be negligible.
The Taliban need to establish a functioning logistical system for their armed forces; at present, the rank and file are still relying on an increasingly hungry local population to feed them. In that regard, Taliban leadership has recently ordered fighters to move into barracks and vacate the houses where they had been quartered. The worse the economic situation becomes in the country, the harder it will be for the Taliban to feed its forces, though ultimately, they will be given priority over the general population.

Counterinsurgency and Counterterrorism

The Taliban have already fought the first internal conflict of the revived Emirate: a short campaign to bring Panjshir under their control. Their operational plan involved concentrating sufficient forces to saturate the valley and combining a conventional advance along the main road with the infiltration of small units through the mountains. The most powerful equipment deployed was rocket launchers and a few old tanks.
At the same time, the Taliban have also been engaged against the Islamic State in Khorasan (IS-K), whose main bases are all in remoter locations than Panjshir. In Kunar, the Taliban have been relying on the support of Pakistani militias such as Lashkar-e Taiba to fight IS-K, forcing them to abandon a couple of districts in recent weeks. However, taking the larger bases will require a major commitment of manpower by the Taliban, who already are stretched too thin.
The IS-K headquarters in the district of Jurm, Badakhshan, would represent an obvious target for the Taliban, even if the area is full of Central Asian fighters and the Taliban are likely to try to relocate them before going on the offensive. In any case, it is now too close to the cold season to start a campaign there. IS-K's other main bases are in Chapadara, Nuristan. There are at least several hundred IS-K members in each base, and the difficult geography would require the Taliban to concentrate a large force in the region.
Taliban sources in Kabul say the group struggles most with terrorist and insurgent cells in urban environments, and as a result, IS-K has been able to intensify operations in Kabul and Jalalabad. Unable to effectively track down the culprits, the Taliban appear to have unleashed death squads against alleged members and sympathizers of IS-K, many of

whom have turned up dead in recent days. Others have been detained, and in some provinces, such as Kunar, there has even been a crackdown on Salafi mosques and madrasas.
These indiscriminate repressive measures are causing a backlash. A delegation of Salafi leaders told Taliban leadership in September that if such measures were to continue, the Salafis would resist, to the benefit of IS-K. Worried about the consequences, the Taliban's leaders have dismissed the strongly anti-Salafi governor of Kunar, Osman Turabi, and replaced him with a more moderate figure, Mawlavi Qasim. That was not easy, however; Turabi refused to leave office, and his sizeable following mobilized street demonstrations. The episode shows the growing pains of the Taliban's chain of command as it tries to adapt from a decentralized, flexible insurgency to a state authority.
A thorough campaign to wipe out IS-K is a card that the Taliban hold if they want to motivate Western powers, especially the U.S., to seriously re-engage with the Emirate. Unlike the Taliban, the Islamic State does not seek international appeal or to look like a state. Its chaotic, brutally violent methods could make the Taliban appealing to the U.S. as a "lesser evil."

Do-It-Yourself Policing

The Taliban suffer from manpower shortages, with just some 70,000 men in their mobile units as of September. Some of the reservists who had been mobilized during the May-August offensive have been released from duty, compounding the problem. Manpower is concentrated in the cities, especially Kabul and Panjshir, and along the border with Tajikistan. In the average district, the Taliban are only able to deploy 20-30 men, who guard the district center facilities and carry out occasional patrols, riding motorbikes on the roads. They are rarely seen at all in the villages, where the Taliban have appointed one to two representatives for each village who are tasked with reporting on the village to the Taliban. Should the small district garrisons turn out to be unable to deal with a problem, the Taliban's command dispatches a larger force from the provincial capital.
In some parts of the country, the Taliban seem satisfied with this level of garrisoning. Among these is Nangarhar province, despite IS-K activity there. Elsewhere, however, the Taliban do not display the same self-confidence. In the northeast, for example (Takhar and Badakhshan), the Taliban have asked village elders and mullahs to set up new local Taliban militias, which for now do not seem to be receiving any training. These militias, akin to other militias that the Taliban have had for many years in areas where they were influential, have only a few tens of members to police local areas.
Village elders in Nangarhar report that IS-K has resumed recruitment in the districts, after the bulk of the Taliban's armed forces were moved to the cities and to Panjshir, leaving the villages unguarded. Travelers along the country's highways report that the Taliban's checkpoints are often abandoned or staffed only by local boys. IS-K appears to have been able to spread its cells to areas where it had never been active before, such as Charikar (Parwan), where it has been able to carry out several attacks recently.

Trappings of the State

The ability of the Taliban to set up a security governance system better rooted in the rule of law will to some extent depend on the financial resources they will be able to gather. The transition could turn out to be long and difficult, and an all-out war against IS-K, which appears inevitable, might divert many of the resources needed. Before their takeover, the Taliban could maintain the military force (85,000 men at its peak) with a few hundred million dollars per year because they did not have to maintain vehicles, aircraft, and bases.
Now, however, even a force of comparable size will cost significantly more. The captured Afghan National Army vehicles the Taliban currently uses are running out of fuel reserves. Buildings and vehicles will have to be maintained without the financial assistance the United States provided the previous government. Moreover, 20-30 men per district likely will not be enough for serious policing needs.
The Taliban are looking for ways to reduce the cost of their security establishment and seeking external sources of funding. At the same time, they remain protective of their independence and are unlikely to seek an external security guarantor.
The adoption of the trappings of a regular armed force also likely will contribute to push costs higher as it grows into a command hierarchy supported by a ministerial bureaucracy. Even a downsized bureaucracy will still cost more than the Taliban's old system, which was quite lean. The Taliban never had a separate police force and were relying on their local militias, under the supervision of their judges, for that purpose. The appointment of Sirajuddin Haqqani as minister of the interior suggests that the ministry is meant to carry real weight; Sirajuddin is not a man who would be satisfied running a ministry for show only. It appears that the governors will be placed back under the control of the ministry after the disbandment of the Independent Directorate of Local Governance. Sirajuddin will also make sure that the Ministry of Interior will have its own armed force and is already arguing that Badri 313 should be under its control.

The U.S. will most likely avoid cooperating openly with any official army formed by the Taliban. With other countries like Russia and China likely willing to accept such a force, the Taliban might enlist some security cooperation there, and some sources suggest this has already started, albeit on a small scale. A Russian military source has indicated that some Russian specialists have arrived to help the Taliban operate their small fleet of Russian-made Mi-17 helicopters. The same source indicates that the Taliban and Russia already are cooperating over intelligence about IS-K.

The U.S. must figure out how it intends to address the growing IS-K threat. Without a partner on the ground in Afghanistan, the U.S. has little to no leverage in combating IS-K, unlike its standing in Iraq or Syria. The U.S. could resort to pre-emptive drones or airstrikes, but given the absence of over-the-horizon capabilities and a recent strike that killed an Afghan family, such an approach will face pushback from both Congress and the public. Mediation through trusted partners who maintain contact with the Taliban, such as Qatar, could be feasible.

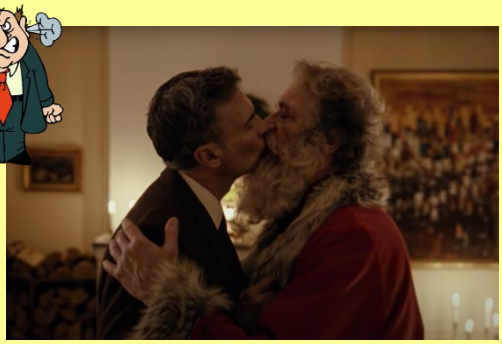
Perhaps the easier route for the U.S. to take is to cooperate with the Taliban secretly, as it appears to be doing with Hayat Tahrir as Sham in Syria. The Taliban would complain publicly about U.S. airstrikes on Afghan territory but would likely be pleased if those strikes targeted IS-K and perhaps would even secretly supply intelligence to facilitate them. From the U.S. point of view, helping the Taliban destroy IS-K would likely have little significance in terms of counterterrorism but would reduce the leverage of Taliban factions such as the Haqqani network and of foreign jihadist groups such as al Qaeda, strengthening the hand of Taliban leaders who want to marginalize them.

Dr. Antonio Giustozzi *is Senior Research Fellow in the Terrorism & Conflict program at the Royal United Services Institute (RUSI) in London. Dr. Giustozzi is the author of six books on the Afghan Taliban including "The Taliban at War" (Hurst, 2019). Guistozzi received his PhD at the London School of Economics, and is a frequent columnist on issues pertaining to Afghanistan.*

Rasha Al Aqeedi *is a Senior Analyst and the Head of the Nonstate Actors program in the Human Security Unit at the Newlines Institute. Prior to joining the Newlines Institute, Al Aqeedi was the editor in charge of "Irfaa Sawtak," a U.S.-based platform that offers insights into post-conflict communities in Iraq and Syria. She has also served as a Fellow with the Foreign Policy Research Institute and George Washington University's Program on Extremism*

When Harry Met Santa: Norwegian Postal Service gay-themed Christmas ad.

Source: https://www.euroweeklynews.com/2021/11/24/when-harry-met-santa-norwegian-postal-service-gay-themed-christmas-ad/



THE 2021 CHRISTMAS advert for the postal service in Norway features Santa in a gay-themed story titled: "When Harry Met Santa" – marking 50 years since homosexuality was de-criminalized in the country. "As always, the main goal of the campaign is to show that Norway Post never stops renewing itself. In addition to showing the flexibility of our services, we want to put it in a socially relevant setting, with themes that are important for the society around us and for us at Norway Post. "There will certainly be some negative reactions from some environments, but we are prepared to deal with that. The right to love whoever you want is a fundamental human right, and is not considered a political issue in free democratic societies in 2021. "Norway Post has connected people for 375 years, and will continue to do so regardless of orientation or gender identity."

EDITOR'S COMMENT: Why is it so important for certain groups of people to advertise how they are practicing sex in their bedrooms? Do they think that the rest of the world cares about it? What is wrong with them?

Migrants' desperate bid to cross the Channel

Source: https://www.nytimes.com/series/europe-morning-briefing

Nov 26 – The English Channel, where at least 27 people died this week while attempting to cross in a flimsy inflatable boat, is the final, treacherous leg of the journey for migrants hoping to reach Britain. Despite the extreme danger, migrants living in makeshift camps on France's northern coastline dream of making the crossing.

In recent months, the number of people setting off into the Channel has soared because the authorities have cracked down on other routes to England, especially by truck through the tunnel under the Channel.
French and British leaders vowed this week to crack down on migrant crossings of the channel, blaming organized smuggling rings and each other. In the past five years, both countries have sought to discourage asylum seekers by making their situation as difficult as possible, a policy that experts say creates unnecessary danger.
Analysis: The National Assembly said last month that the French government's migrant policy had been a failure and that it had led to violations of migrants' rights, with the vast majority of public spending going to security measures rather than to health and other assistance.
First person: Sassd Amian, who fled war in South Sudan four years ago, said he was pinning his hopes on the trucks bound for the Channel Tunnel despite the dangers. "Death," he said, "is nothing new in this life."

EDITOR'S COMMENT: Sassd Amian can visit the Embassy or Consulate of the UK in South Sudan and ask permission to migrate to this country. The same applies to similar cases of Pakistanis, Afghanis, Bangladeshis, Somalis, and others that trying to bypass national borders and enter Greece, Italy, or Spain illegally and without proper invitation. This way you will not endanger children and pregnant women that you use as shields or means of social pressure and sympathy.

Is Iran the 'Common Enemy' of Israel and Colombia?

By Joseph M. Humire
The Gatestone Institute | November 22, 2021
Source: https://www.meforum.org/62798/iran-and-hezbollah-in-colombia

***Joseph M. Humire** is a fellow at the Middle East Forum, the executive director of the Center for a Secure Free Society (SFS), and a distinguished senior fellow at the Gatestone Institute.*

First Planetary Defense Test

Source: https://www.homelandsecuritynewswire.com/dr20211128-first-planetary-defense-test

Nov 28 – An asteroid slammed into Earth 63 billion years ago, igniting vast fires which threw smoke and soot into the atmosphere, plunging the planet into a prolonged winter, killing many plants on which herbivores depended. The extinction of the dinosaurs was only one consequence of that event. NASA wants to make sure there is no repetition of such a calamity: The agency is planning the first-ever planetary defense test, which deliberately collides a spacecraft into an asteroid called Dimorphos. The aim is to try and deflect the asteroid away from its Earth-bound trajectory.

How Climate Change Will Impact National Security

By Christina Pazzanese
Source: https://www.homelandsecuritynewswire.com/dr20211128-how-climate-change-will-impact-national-security

Nov 28 – Rising temperatures and intensifying weather due to climate change, along with the unlikelihood of meeting the 2030 emissions goals of the Paris Agreement, will exacerbate geopolitical tensions, social instability, and the need for humanitarian aid, according to a joint report by the U.S intelligence community last month. The National Intelligence Estimate lays out the likely security implications over the next two decades of the mounting climate crisis. **Calder Walton is assistant director for research at the Belfer Center's Intelligence Project,** which organized Harvard Kennedy School's first conference on climate change and national security last spring. He spoke with the Harvard Gazette's Christina Pazzanese about the report and the important role the intelligence community should play in addressing the crisis.

Christina Pazzanese: We hear about the threats posed by climate change from an environmental standpoint, but rarely about the risks and threats it poses to national security. How does the U.S. intelligence community view climate change, and is this a new domain?

Calder Walton: The purpose of the U.S. intelligence community, established after the Second World War in the wake of Pearl Harbor, was to provide policymakers with decision advantage and forewarning of threats to national security. If the primary purpose is to give decision advantages about national security threats, obviously, by definition, the U.S. intelligence community has to have a role giving key decision-makers their assessments about the greatest existential threat in human civilization: climate change. What is going to be the impact of changing climate on national security, economic society, civil society? And this isn't just national security; this is international, globalized security. If we look at it like that, clearly, the U.S. intelligence community has to have a role. And they're very, very late to the game.

Pazzanese: How are other intelligence services responding to climate change? Is any country leading the way?

Walton: I don't think anyone is a shining star in terms of taking this seriously. I have yet to find an example of a country that has an intelligence bureaucracy set up to really deal with this and to provide assessments about the national security implications of climate change to policy leaders in a sufficient way.

The overwhelming focus of intelligence communities across the globe is still on post-Cold War structures — stealing other people's secrets. And we are now in an age of globalized challenges, the primary one being climate change, but also the bio revolution and biosecurity, cyber, and disinformation. Climate change and pandemics are linked; climate change will, scientists tell us, create more new disease outbreaks. And then, add in synthesized biology; we have cyber, artificial intelligence, and machine learning. These are globalized challenges that will affect societies across the world.

We are really at an inflection point in terms of the way that we understand intelligence and national security. U.S. national security and intelligence were built up to deal with blocs of states, first the fascist states and then Soviet communism. Nine-eleven was the first wake-up call about non-state actors, but the U.S. intelligence community still used the same framework of established bureaucracies built up in postwar years to deal with non-state actors. And now, with a pandemic and climate change, we're seeing truly globalized challenges. It seems to me that we need to rethink how we understand intelligence to deal with it, geared to sharing global intelligence to deal with global challenges we face.

Pazzanese: What are the most important takeaways from this report?

Walton: Let's start with the basics: that climate change does pose a threat to U.S. national security. The National Intelligence Estimate is a joint assessment produced by the entire U.S. intelligence community, 18 agencies. That's significant. There are no naysayers; there's no doubt. So that's a breakthrough. In this extraordinarily polarized and politicized environment, that is a big milestone itself.

There is a series of direct and indirect security threats that the report lays out. First and foremost, it says that it is likely that the temperature will rise by 1.5 degrees by 2030, which is the Paris Agreement target. So, we are unlikely to stop that from happening. And then, the report reveals the direct and indirect consequences of climate change: raising temperature and the inability of, as they see it, our decarbonization efforts to prevent that temperature rise in the U.S. Direct consequences relate to territorial integrity. The U.S. military's been talking about rising sea levels on bases since the 1970s, if not earlier. Rising sea level, which is affecting how we're undertaking military operations. And then, the secondary knock-on effects of population displacement, of civil disorder as key essentials become scarce, damage to crops, and economic realignment. Also, refugee crises or population displacement, and radicalization of people angry with their own government or willing to take action against countries that they regard as the big polluters. Scarce resources leading to political violence, terrorism — that's the kind of secondary threat progression that the U.S. intelligence community will be looking at.

Pazzanese: China accounts for 30 percent of the world's carbon emissions, followed by the U.S. Are the risks from climate change multiplying the existing concerns U.S. intelligence has about China, and does it change their approach?

Walton: It is. What we're witnessing is the combination of these global challenges to

international security — biosecurity, natural and synthesized biology and pandemics, climate change, disinformation — being fused with great power, geopolitical conflicts. There's this idea that we can either deal with the international security threats of climate change or China. But in reality, they are not mutually exclusive; they're all interwoven. Climate change is now fused with geopolitics. How is the U.S. intelligence community thinking about China and these issues? This is an area firmly within the traditional wheelhouse of what the U.S. intelligence community can do. The absolutely important information will be verification and attribution: whether China is adhering to its public statements about its carbon reduction. Is it being truthful or is it not being truthful? That's where intelligence collection — human intelligence, signals intelligence, imagery intelligence from satellite, overhead reconnaissance, and open-source intelligence — is going to be absolutely key. Senior policymakers in Washington will say, "I need to know whether China is adhering to what they profess to be doing in terms of decarbonization." So that will be a requirement set to the U.S. Intelligence Committee, to steal those secrets. That is not that different from what we've done in the past, and will be increasingly important.

There is a significant role the U.S. intelligence community could play and really, in my view, must play going forward. It's disseminating its assessments, particularly from overhead satellite mapping, what the U.S. intelligence community is observing both on the territorial integrity of countries and population displacement. During the Ebola crisis, the U.S. National Geospatial Intelligence agency, through its satellite platforms, collected and then publicly disseminated via its website information about the spread of Ebola in West Africa. That is exactly the direction that we need to go in with climate change.

Pazzanese: What comes after this report? Is there a next step?

***Walton*:** The next step is for the U.S. intelligence community to say, "This is what we can deliver. We know what we need; we know what policymakers need to know; we know what the public needs to know; and this is how we can contribute to assessments and messaging and help shape public policy." The worst thing they could do would be to set up a new bureaucracy within a particular agency and say, "We're now doing climate change." It's time for some bold thinking. This is a profound existential crisis for the way we live our lives, and it's time for profound thinking about intelligence to inform decision-making. Instead of the traditional focus of intelligence agencies to retain information because it is classified, it seems to me that when it comes to climate change the emphasis should be about publicly disseminating that intelligence. In other words, a reversal of tradition.

It's incumbent for assessments to be as widely read as possible so that we understand this, so that members of the public can hold policymakers' feet to the coals about making changes. There's no good if we find out in 50 years' time, they were being briefed on this. The stakes are too high for that.

***Christina Pazzanese** is Harvard staff writer. This interview is published courtesy of the Harvard Gazette, Harvard University's official newspaper.*

National Security Consequences of Climate Change

Source: https://www.homelandsecuritynewswire.com/dr20211128-national-security-consequences-of-climate-change

Nov 28 – Using novel data sets and computing systems, researchers at the Department of Energy's Oak Ridge National Laboratoryare simulating how climate change affects the safety and security of the country. This research can help policy and decision makers at federal, state and local levels quickly identify risk factors and develop real-world mitigation strategies.

For more than two decades, ORNL scientists have modeled environmental factors, such as temperature and precipitation, and population distribution. Currently, researchers are studying how climate change affects population density, critical infrastructure and security to better understand how extreme climate events can threaten physical safety and set off a domino effect of economic ramifications and other national security challenges.

In some cases, rising temperatures that reduce agricultural opportunities can lead to mass migrations away from struggling communities. In other cases, violent hurricanes and winter storms can disrupt electric grid operations, interrupting access to electricity and other utilities long after the initial climate threat has passed.

"We're interested in contextualizing the tangible consequences that phenomena like sea level rise and temperature and precipitation changes have on humans," said Carter Christopher, who leads ORNL's Human Dynamics Section in the National Security Sciences Directorate. "Human security is a function of the security and resilience of a community, whether that's a rural county, a small town or a major city, domestically or internationally."

Researchers in the National Security Sciences Directorate and across the laboratory are studying the relationship between climate change and national security from multiple perspectives — yielding important results that decision makers can use to strategize how best to protect people before they end up in dangerous situations.

Assessing Risk and Resilience

Bandana Kar, who leads ORNL's Built Environment Characterization, or BEC, Group, focuses on examining and forecasting the risk and resilience of the nation's critical infrastructure systems and cities. Using geographic information science concepts and technologies including satellite remote sensing, geospatial modeling and data sets, and computational science, Kar's team assesses and identifies the risk factors present in communities and cities, as well as access to resources such as energy in those areas, which is crucial for resiliency and disaster recovery.

Because the nation's critical infrastructure systems are interconnected, seemingly unrelated concerns, such as increased shipping costs and limited supplies of gasoline or other fuel sources, could affect supply chains and the communities that rely on them.

Having access to geospatial datasets and situational awareness information before disaster strikes enables emergency managers to plan evacuations or other mitigation measures as necessary. The BEC group generates critical infrastructure datasets and develops models and algorithms tailored to specific communities and scenarios to help forecast climate impacts and prevent economic losses, as well as injuries and fatalities.

"We're looking at resilience from physical, sociocultural and technological dimensions," Kar said. "Evaluating the physical conditions of infrastructure in the context of climatic conditions and sociocultural factors allows us to study how these factors change and affect people under different scenarios at a certain location."

Currently, Kar is studying how hydro-meteorological events affect individuals and energy infrastructure over time. Along with her collaborators, she identifies potential weak points along the energy supply chain, where unexpected interruptions during extreme climate events could lead to power outages.

Kar is also part of the Global Flood Modeling and Alerting project, which is funded by the NASA Disasters program. Using algorithms that combine hydrological models and remote sensing data sets, the project team forecasts flood severity and identifies regions across the globe that have a high probability of experiencing flooding based on previous climate events and typical precipitation levels.

This study generates flood severity alerts that are disseminated internationally to residents and policy makers through DisasterAWARE, a platform created by University of Hawaii researchers that has 2 million users and provides daily forecasts for more than 15 types of climate events.

As part of the Situation-Temporal Awareness Tool for Integrated Oil and Natural Gas Systems and Restoration of Power Outage from Wide-area Severe Weather Disruptions projects funded by DOE's Office of Cybersecurity, Energy Security, and Emergency Response, or CESER, Kar contributes to the development of models and simulations that help estimate the time needed to restore power following an extreme climate event, as well as the duration of liquid fuel availability at gas stations on evacuation routes and throughout the supply chain. These projects contribute to CESER's Environment for Analysis of Geo-Located Energy Information program.

Modeling Population at Unprecedented Scale

Scientists in ORNL's Human Geography Group apply geographic data science and computational methods to better understand the distribution and dynamics of populations around the world. Historical and current population trends based on demographic distributions and behavior related to human mobility during daytime and nighttime hours provide a baseline for communities at risk of facing environmental hazards.

"The Human Geography Group is uniquely positioned to address global human security through our scalable population modeling and research to expose current and future inequities and vulnerabilities across the human landscape," said Group Leader Marie Urban. "Our goal is to continue leading population dynamics research, not only in support of DOE's national security mission, but also in support of the humanitarian community, policy makers and stakeholders in development of a more sustainable future."

ORNL's LandScan population modeling program, which is funded by the National Geospatial-Intelligence Agency, builds on U.S. Census data to provide a more granular picture of populations in residential areas, office buildings, schools and other common commuter destinations. LandScan researchers develop algorithms to evaluate population movements based on daily schedules, as well as long-term migration patterns.

These algorithms model human activity, accounting for different sociocultural, economic and demographic factors around the world that influence where people are located throughout the course of a day. The various patterns throughout the landscape, particularly changes that occur between daytime and nighttime, are captured in LandScan to provide a better understanding of population distributions. Analyzing these routines helps researchers study how unwarned populations at home, at

work, in the classroom and elsewhere in a given city would fare against sudden security threats caused by the rapid onset of a climate disaster.
"LandScan was designed to help governments and scientists plan ahead and study the potential impacts of natural disasters — such as hurricanes, tsunamis, earthquakes and landslides — and technological disasters, such as oil spills," said LandScan Program Director Amy Rose. "For example, some of our federal users integrate LandScan data sets with hurricane tracks and forecasts, as well as other critical infrastructure data, to provide policy makers with estimates of how the hurricane will affect the residential population and economy of a community."
The LandScan team also examines how rising sea levels and other phenomena are likely to alter city growth and coastal topology in the long term.

Building Toward Energy and Environmental Justice
Using the UrbanPop framework, researcher Joe Tuccillo develops high-resolution recreations of the social makeup of Census block groups containing 600–3,000 people. This data can help proponents of energy and climate justice identify neighborhoods and communities that may lack access to clean energy sources or be disproportionately harmed by natural disasters and other environmental and national security consequences of climate change over time.
UrbanPop, which has received funding through ORNL's Laboratory Directed Research and Development program and DOE's National Virtual Biotechnology Laboratory, uses sample survey responses provided by the U.S. Census Bureau's American Community Survey to estimate the composition of these groups. This data enables researchers to study the general demographic characteristics and behavioral trends of people in different geographic areas — information that can be used to assess a group's risk and preparedness for climate-related threats — while preserving the privacy of individual respondents.
"The goal is to create aggregate representations of what communities are like in terms of individual demographics and behavior, which provide insights into collective activity patterns," Tuccillo said.
Research scientist Christa Brelsford focuses on human-environment interactions from another angle. She models how the location and arrangement of buildings in the year 2050 will affect environmental factors such as temperature, humidity and wind speed worldwide. She is particularly interested in learning how these changes might influence daily life, especially for communities located in economically and physically disadvantaged areas that may be more susceptible to flooding, air pollution and other environmental hazards.
"It's important for us to consider that the worst implications of all these adverse climate effects are most likely to be felt by the people who are already the most vulnerable," Brelsford said. In addition to developing new integrated modeling frameworks, Brelsford is examining existing population projections to determine the environmental footprint of major cities more than 30 years from now.
The expected influx of millions of new residents into cities around the world will have numerous consequences, including significant changes to each location's "microclimate." These small-scale but potentially devastating phenomena could include heatwaves and urban heat islands, which occur when cities endure higher temperatures than the surrounding areas because of the prevalence of manufactured structures that absorb more heat than natural surfaces. Brelsford's research is supported by the Integrated Multisector Multiscale Modeling project, which is funded by the MultiSector Dynamics program area in DOE's Biological and Environmental Research office. Through these research efforts, Christopher, Kar, Urban, Rose, Tuccillo, Brelsford and many others across ORNL aim to provide leaders at every level with the data and information they need to mitigate environmental threats and make informed national security decisions, both domestically and abroad.

EU advice on inclusive language withdrawn after rightwing outcry

Source: https://www.theguardian.com/world/2021/nov/30/eu-advice-on-inclusive-language-withdrawn-after-rightwing-outcry

Nov 30 – An internal European Commission document advising officials to use inclusive language such as "holiday season" rather than Christmas and avoid terms such as "man-made" has been withdrawn after an outcry from rightwing politicians.
The EU executive's volte-face over the guidelines, launched by the commissioner for equality, Helena Dalli, at the end of October, was prompted by an article in the Italian tabloid il Giornale, which claimed it amounted to an attempt to "cancel Christmas".

A series of politicians on the right, including the former president of the European parliament Antonio Tajani, a member of Silvio Berlusconi's Forza Italia, subsequently jumped on the issue to voice their opposition to the "absurd" advice.

"Inclusion does not mean denying the Christian roots of [the EU]", Tajani tweeted.

In response, Dalli, who had tweeted a picture of herself with the guidelines on 26 October, along with comments speaking of her pride in launching the document, issued an apologetic statement.

She said: "My initiative to draft guidelines as an internal document for communication by commission staff in their duties was intended to achieve an important aim: to illustrate the diversity of European culture and showcase the inclusive nature of the European commission towards all walks of life and beliefs of European citizens.

"However, the version of the guidelines published does not adequately serve this purpose. It is not a mature document and does not meet all commission quality standards. The guidelines clearly need more work. I therefore withdraw the guidelines and will work further on this document."

The European commission, along with other EU institutions, has long been criticised for the lack of diversity among its staff. There are no non-white commissioners. As part of an update of the language to be used by its staff, the commission had asked officials to be more sensitive in their communications.

Officials working with the 27-strong commission college, led by Ursula von der Leyen, were advised to avoid assuming that everyone is Christian, white and married. Rather than refer to Christmas, officials should say "the holiday season", the document suggested.

Officials were advised to avoid gender-specific pronouns and gendered words and phrases such as "chairman", "ladies and gentleman" or "man-made".

It was suggested that officials ask people what their pronouns are and to be careful using terms such as "gay" and "lesbians" as a noun. "Transgender, bi or intersex are not nouns." … "Say trans people, gay person, etc or refer to the person explicitly," it was suggested.

Following Dalli's U-turn, Tajani tweeted that the rethink was a victory for common sense. He was joined in celebrating the move by the former Italian prime minister Matteo Renzi, who tweeted: "It was an absurd and wrong document. A community is not afraid of its roots. And cultural identity is a value, not a threat."

Sophie in 't Veld, a liberal Dutch MEP, said she was concerned by the commission's sudden retreat on the issue. She said: "Commissioner Dalli deserves praise for having the courage to address the issue, be it in a somewhat clumsy way.

"The concerted misinformation and attacks on her by the far right and the subsequent response to these by the commission are concerning. We need to recognise that Europe and its institutions represent everyone. The institutions should be strictly neutral: let's not forget the majority of Europeans are not religious."

EDITOR'S COMMENT:

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Somalia: Anti-Piracy Resolution

Source: https://www.securitycouncilreport.org/whatsinblue/2021/12/somalia-anti-piracy-resolution-3.php

Today (3 December), the Security Council is scheduled to adopt a resolution authorising member states and regional organisations cooperating with Somali authorities to combat piracy and armed robbery at sea off the coast of Somalia for three months. The measures were last renewed in resolution 2554 of 4 December 2020.

The US, the penholder on the Somalia anti-piracy resolution, convened the first round of negotiations on 29 November and continued to engage in bilateral consultations with Council members in the following days. As no consensus transpired during the bilateral discussions,

the US convened a second round of negotiations on 2 December (the originally planned adoption date) and rescheduled the vote for today. A revised draft passed a short silence this morning. It appears that the penholder and other Council members engaged with Somalia prior to and throughout the negotiation process. Resolutions on combatting piracy off the coast of Somalia have traditionally enjoyed the full support of the Council. The first resolution on piracy in Somalia (resolution 1816 of 2 June 2008) and all subsequent resolutions on this issue have been adopted unanimously. Somalia also supported the anti-piracy measures.

This year Somalia appears to have advocated for the discontinuation of the anti-piracy measures, however. A few weeks before the mandate expiry date, Somalia apparently approached the penholder and other Council members, requesting that they consider not renewing the measures. In this regard, they apparently maintained that there had been a reduction in piracy-related events off their coast, that security responsibilities needed to be increasingly transferred to the federal government and that it was important to combat piracy by addressing its underlying socioeconomic causes. During last year's adoption, Somalia issued a statement emphasising that "there has been a massive reduction in the number of piracy-related incidents in the past three years thanks to the Federal Government of Somalia's efforts, in collaboration with the international community. For the first time in more than a decade, there is no single piracy-related incident off the coast of Somalia".

In the past two years, the Secretary-General's annual reports on piracy and armed robbery at sea off the coast of Somalia have indicated that no piracy events had been recorded. Issued on 3 November, this year's report states that "the continued absence of successful piracy attacks off the coast of Somalia demonstrates the effectiveness of the measures applied by the Federal Government of Somalia, the shipping industry and the international community, including the Security Council and military and naval forces". It nonetheless also notes that "the continued presence of pirate action groups and networks remains of concern and highlight that piracy has yet to be fully eradicated". In the Secretary-General's view, further efforts are needed to continue to address the root causes of piracy.

The negotiations on the draft appear to have reflected the penholder's attempt to bridge Council members' views and those of Somalia, especially given the need for Somalia's consent to the measures and the importance of its cooperation regarding their implementation. Since the adoption of resolution 1816, the Council has repeatedly affirmed that the Somali government has to provide written consent prior to the adoption or renewal of anti-piracy measures. Regarding cooperation with the Somali government when implementing the measures, resolution 2554 "stresses the need for a comprehensive response to prevent and suppress piracy and tackle its underlying causes by the international community in collaboration with Somali authorities and other relevant actors".

It seems that the US initially proposed a twelve-month renewal, which appears to have been supported by other Council members. As Somalia objected to this timeframe, the negotiations centred mostly around the length of the measures' renewal. Following talks between Somalia, on the one hand, and the penholder and other Council members on the other, Somalia seems to have moved from its initial position of advocating discontinuation of the measures to suggesting a renewal of two months. The pen appears to have suggested six months as a compromise solution, which some Council members apparently found agreeable. Others, especially EU members of the Council, reportedly supported another twelve-month renewal. Following further negotiations, also in consultation with Somalia, the penholder placed a draft under silence featuring a three-month renewal. It appears that all members were willing to accept this. Several multilateral and bilateral efforts are currently underway to implement the anti-piracy measures. Operation Atalanta, the EU anti-piracy naval operation off the coast of Somalia, which acts under the Security Council's authorisation, is mandated by EU Council Decision 2020/2188 of 1 January to "deter, prevent and repress acts of piracy and armed robbery off the Somali coast". In addition to the EU Mission, the Combined Maritime Forces—a multinational naval coalition comprising 34 Member States, including Council members France, Norway, UK, and the US—are also conducting anti-piracy operations. Individual member states have also deployed vessels to ensure safe maritime traffic in the region.

Migrants from Terror-Plagued Regions Are Crossing the Southern Border

By Todd Bensman

Source: https://www.meforum.org/62839/migrants-from-terror-regions-crossing-us-border

Dec 03 – The press office of U.S. Customs and Border Protection offered no judgments in a recent press release pregnant with unspoken meaning — just the facts, ma'am. But I certainly can. The nation's main border policing agency put out a November 30 press release pointing out that in just one randomly selected time frame in just one of the Texas border's overwhelmed sectors (Del Rio), during the third week of November, Border Patrol agents caught migrants from regions of the world bristling with Islamic terrorist organizations.

Two men from Syria were caught on November 23. One man was from Lebanon. Another hailed from Tajikistan. Still another arrived after a long journey from Uzbekistan. Six showed up from Eritrea, which sits in a dangerous northeast African neighborhood sharing borders with Sudan, Ethiopia, and Djibouti.

"We encounter individuals from all over the world attempting to illegally enter our country," Del Rio Sector Chief Patrol Agent Jason D. Owens was quoted as saying. "Our agents are focused and work hard to ensure that we detect, arrest, and identify anyone that enters our country in order to maintain safety of our communities."

Migrants from Syria, Lebanon, Tajikistan, Uzbekistan, and other terror-prone areas of the world get to the U.S. border by trekking through an 80-mile bottleneck stretch of jungle between Colombia and Panama known as the Darien Gap

The agency noted that in just October, Del Rio Sector agents encountered 28,111 unauthorized migrants from more than 50 countries. In the just-ended fiscal year of 2021, the Del Rio Sector encountered migrants from 106 countries. ...

Filling in the Unmentioned Darien Gap and Terror Infiltration Threat

The new CBP press release in this taboo subject area conspicuously self-censors the national security meaning behind the surging international origins of illegal border-crossers these days. For instance, it makes no mention of *how* migrants from places like Uzbekistan, Syria, and Tajikistan can even reach the southern border.

As my book, *America's Covert Border War*, details at length, they generally do it by flying to South America and then getting themselves smuggled through an 80-mile bottleneck stretch of jungle between Colombia and Panama known as the Darien Gap.

Although CBP did not explain in its November 30 press release how the migrants in question reached the southern border, the Center for Immigration Studies will next week. An expert panel on Tuesday, December 7, will focus on the heavily trammeled Darien Gap smuggling route through Colombia and into Panama. The panel will feature an Embera tribal leader who lives on Panama's side of the Darien Gap with a front-row seat.

Understanding the importance of the Gap is key to any American immigration policy that would seek to plug it.

Neither did the new CBP press release mention *why* an American policy might seek to plug the Darien Gap.

The answer must be said out loud, even though it seems so obvious: ... Tajiks, Uzbeks, Syrians, Pakistanis, Somalis, Bangladeshis, Mauritanians, and many others from terrorism-

plagues nations are coming through it all the time, reaching California, Arizona, and Texas. No one knows who most really are. America's ability to learn whether they are friend or foe is no sure bet.
A worthwhile debate would center on whether U.S. policy should finally address the Darien Gap as a chokepoint where this kind of migration could be most easily stopped.
Another worthy debate should center on whether the United States should finally insist that illegal border crossing strangers of totally unknown backgrounds from places like Syria and Tajikistan should seek their asylum in any of the dozen or so other countries through which they pass — on both sides of the Darien Gap — long before they get to Del Rio, Texas.

***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.*

UAE's Major General Al Raisi elected as president of Interpol

Source: https://gulfnews.com/uae/government/uaes-major-general-al-raisi-elected-as-president-of-interpol-1.83947386

Nov 25 – Major General Ahmed Nasser Al Raisi has been elected as the president of Interpol today. The global policing agency held its annual meeting in Istanbul, Turkey, to discuss crime trends and to conduct its much-anticipated election for the post of the president of the agency.

Major General Al Raisi currently serves as Inspector General at the UAE Ministry of Interior. **He was elected after he garnered 104 votes while his fellow candidate Czech police Col Sarka Havrankova got 47 votes at the General Assembly meeting.**
'Mr Ahmed Nasser Al Raisi of the United Arab Emirates has been elected to the post of President (4-yr term),' the Interpol tweeted.
About 470 police chiefs, ministers and other representatives from more than 160 countries are attending the three-day General Assembly of Interpol, which is scheduled to vote later today to elect new executive committee members.
Al Raisi had said hours before the election that he would help build a more diverse, modern and collaborative Interpol. "The time has finally come for the vote for the Interpol presidency here at the General Assembly. This moment will culminate more than four decades of service, and if elected I will help to build a more diverse, modern and collaborative Interpol," Al Raisi had tweeted earlier.

Congratulations pour in
Lt General Sheikh Saif bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Interior, praised Al Raisi, saying the world's confidence in the UAE is a result of the wise leadership of President His Highness Sheikh Khalifa bin Zayed Al Nahyan, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, and His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces.
"Thanks to our leadership on the world's trust in the UAE," Lt Gen Sheikh Saif bin Zayed tweeted.
Dr Anwar Gargash offered his congratulations to Al Raisi, saying his election bears testament to the UAE's achievements and efficiency in law enforcement and appreciation for the great personal record of Al Raisi.
Lt Gen Abdullah Khalifa Al Merri, Commander-In-Chief of Dubai Police, also congratulated Al Raisi for being elected as the president of the Interpol. He wished him a successful and prosperous term.

President's short bio

Al-Raisi joined the Abu Dhabi police force in 1980 as a member of the "burglar alarm branch". He rose through the ranks to become General Director of Central Operations in 2005. He received a BSc in computer science from Otterbein University in 1986, an diploma in police management from the University of Cambridge in 2004, an MBA from Coventry University in 2010 and a doctorate from London Metropolitan University in 2013.
He co-authored *Social & security impact of the internet*, which was published by the Emirates Center For Strategic Studies and Research in 2009.
Al-Raisi is the chairman of the American University in the Emirates' board of trustees. He also chairs the board of directors of the Baniyas Club.

INTERPOL

Biden's Counterterrorism Ignores Jihadi Threats

By A.J. Caschetta
Source: https://www.meforum.org/62842/biden-counterterrorism-ignores-jihadi-threats

Dec 03 – Like his former boss Barack Obama, Joe Biden began his presidency by using the executive branch to treat his critics as "domestic terrorists." When it comes to counterterrorism, the Biden administration is proving to be the third Obama term.

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

***A.J. Caschetta** is a Ginsberg-Milstein fellow at the Middle East Forum and a principal lecturer at the Rochester Institute of Technology.*

Biden's Two-Faced Agenda on Turkey

By Burak Bekdil
Source: https://www.meforum.org/62843/biden-two-faced-agenda-on-turkey

Dec 03 – U.S. President Joe Biden's increasingly hypocritical policy on NATO's increasingly difficult ally, Turkey, is badly zig-zagging between the U.S. leader's self-declared advocacy for universal democratic values and criticism of Turkey's democratic deficit in public on the one hand and his appeasement of Turkish President Recep Tayyip Erdoğan behind closed doors on the other.

In a December 2019 interview, then-presidential candidate Biden said that Erdoğan should be ousted from power through a democratic process and that support for the opposition was crucial. Turkey's human rights record has gone downhill from there. The Council of Europe has said that if Turkish courts keep ignoring rulings from the European Court of Human Rights, it would start infringement proceedings against Turkey at the end of November.
All the same, on October 31, Biden and Erdoğan had a 70-minute meeting in a "very positive atmosphere" on the sidelines of the G20 summit in Rome. They reportedly agreed to form a joint mechanism to improve ties. "During the meeting," an Erdoğan aide told this author, "Biden's lecture on human rights did not exceed two minutes." It seems that a U.S. delegation will soon arrive in Ankara to work on that joint mechanism.
Since the summer, everything on the Washington-Ankara axis seems to have gone wrong. During a Senate Committee on Foreign Relations hearing in July, Republican and Democrat Senators criticized Turkish government policies and demanded more action from the Biden administration. Democratic Senator Bob Menendez of New Jersey and other Senators

expressed concern over the Turkish government's efforts to ban the pro-Kurdish Peoples' Democratic Party (HDP). "That's like if President Biden banned the Republican party from participating," Menendez said.

The Turkish Democracy Project (TDP) in September called on three U.S. companies and one German one to cut ties with Baykar Makina, whose TB2 armed drones have become a weapon of choice for repressive regimes worldwide. According to Ambassador Mark D. Wallace, CEO of TDP:

In refusing to cut ties with Turkey in the face of direct evidence of the crimes the Erdoğan regime is committing using their products, these companies are demonstrating that they do not take seriously the moral or legal implications of their actions. Lawmakers must take this into account in determining how these companies ought to be dealt with.

Before that, a coalition of 27 U.S. Congress members had signed a letter saying that technology transfers such as the ones these companies show that Turkey continues to clearly violate the terms of the CAATSA (Countering America's Adversaries Through Sanctions Act) sanctions.

In October, U.S. lawmakers proposed legislation that would require the State Department to investigate whether a Turkish ultra-nationalist group with links to the Turkish government, the Gray Wolves, should be designated a Foreign Terrorist Organization. The Grey Wolves are closely affiliated with the Nationalist Movement Party, Erdoğan's staunchest political ally.

A 2017 photo posted to social media shows Gray Wolves members in Istanbul with automatic weapons in front of the Nationalist Movement Party (MHP) flag.

In late October, Erdoğan ordered 10 ambassadors in Ankara, including those from the U.S., Germany, and France, to be declared *personae non-gratae*. The order followed a statement from the envoys calling for the urgent release of activist Osman Kavala, who has been in prison for more than four years while supposedly under investigation for participating in protests and a coup attempt, although he has never been convicted.

Erdoğan stepped back only after the U.S. Embassy in Ankara stated, "In response to questions regarding the Statement of October 18, the United States notes that it maintains compliance with Article 41 of the Vienna Convention on Diplomatic relations." Article 41 stipulates that the internal affairs of other states should not be interfered with.

When bilateral ties seemed to be moving from one low point to another, Erdoğan shocked the world by saying that the U.S. administration proposed to sell Turkey a batch of 40 F-16 Block 70 fighter jets -- a claim that quickly turned into a puzzle. On October 23, the day after Erdoğan's claim, State Department Spokesperson Ned Price stated that the U.S. had not made any financing offers on Turkey's request to purchase F-16 warplanes. On November 15, however, a senior U.S. diplomat told this author that all of the State Department, the Pentagon, and White House were "in agreement to encourage the F-16 sale to Turkey, but could not guarantee Congress's approval."

Two days after that, on November 17, Turkey's Ministry of Defense said in a statement that a high-level meeting between military delegations, held in Washington, was "positive and constructive." Apparently, the F-16 talks will continue, with Biden ignoring Congress.

Both Democratic and Republican U.S. lawmakers urged Biden's administration not to sell F-16 fighter jets to Turkey and said they were confident Congress would block any such exports. In an October 25 letter to Biden and Secretary of State Antony Blinken, 11 members of the House of Representatives cited "a profound sense of concern" about recent reports that Turkey might purchase 40 new Lockheed Martin F-16s and 80 F-16 modernization kits.

Turkey's Ambassador to the U.S., Murat Mercan, an extremely skillful diplomat, said in an October 27 speech: "Turkey's increased contributions to the transatlantic community's efforts opens a window of opportunity for a newly defined alliance relationship between Turkey and the United States that can still operate under extreme duress, no matter what the diverging opinions are."

There is something wrong with this Biden riddle. Is Biden the champion of human rights and universal democratic values that he claims he is? Or is he an unpleasant cheat with a disappointing fake democratic agenda?

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

EDITOR'S COMMENT: It is not fair to accuse the US of a two-faced agenda when certain EU countries are doing exactly the same mostly for profits and secondly for politics (or vice versa).

A one-man army

Gurkha used 400 bullets, 17 grenades, a mine and even a tripod to defeat 30 Taliban on his own

Courageous: Acting Sgt Dipprasad Pun came under fire from the enemy for 15minutes

Picture: PA

By **Fred Attewill**

A GURKHA who fired 400 bullets and 17 grenades while single-handedly fighting off 30 Taliban militants is to receive the second highest military honour for bravery.

Acting Sgt Dipprasad Pun, 31, was on sentry duty alone at night when he discovered two insurgents preparing to plant a bomb outside.

As enemy fighters launched wave after wave of attacks, the 1.7m (5ft 7in) Gurkha opened fire with a machine gun, a rifle and a grenade launcher.

When he exhausted all ammunition he tried to batter one militant with a sandbag before bludgeoning him with a machine gun tripod, as he roared in Nepali: 'I will kill you.'

The soldier, from the Royal Gurkha Rifles, was alerted to the enemy when he heard what he thought was a cow or a donkey near his sentry post.

But, when he climbed on to the roof, he found two insurgents digging a trench to lay an improvised explosive device at the checkpoint's front gate.

He then found himself pinned down under attack from rocket-propelled grenades and AK47s for more than 15 minutes, as he frantically radioed for back-up.

At first, he was afraid but he said yesterday: 'As soon as I opened fire, that was gone – before they kill me I have to kill some.'

When the fight was over, his company commander arrived, casually slapped him on the back and asked if he was OK.

The third-generation Gurkha, from Kent, will receive the Conspicuous Gallantry Cross, one of 136 awards to be announced today.

MI6 Chief Reviews the Big Four Threats and Heralds Unprecedented Public-Private Partnerships

Source: https://www.hstoday.us/subject-matter-areas/intelligence/mi6-chief-reviews-the-big-four-threats-and-heralds-unprecedented-public-private-partnerships/

Dec 04 – Richard Moore, Chief of the U.K. Secret Intelligence Service (MI6), has made his first public speech since taking up his role in October 2020. He talked about the seismic changes he sees in the world, specifically in the espionage environment. He discussed China, Russia and Iran, three of the "Big Four" priorities for the intelligence world. He also explained what the U.K. is doing to address the fourth priority – the amorphous, shape-shifting character of international terrorism.

MI6 has traditionally relied primarily on its own capabilities to develop world-class technologies. But, as the MI6 Chief told the International Institute for Strategic Studies, mastering human intelligence in the digital age is a national security imperative, and it cannot be done alone. Moore spoke of partnering with the private sector to find new technologies to allow continued mastery of human intelligence in the digital age.

China

Moore said that China's power, and its willingness to assert it, is growing.

"The Chinese Intelligence Services are highly capable and continue to conduct large-scale espionage operations against the U.K. and our allies. This includes targeting those working in government, industries, or on research of particular interest to the Chinese state. They also monitor and attempt to exercise undue influence over the Chinese diaspora.

"Chinese intelligence officers seek to exploit the open nature of our society, including through the use of social media platforms to facilitate their operations. We are concerned by the Chinese government's attempt to distort public discourse and political decision making across the globe."

Moore added that Beijing's growing military strength and the desire to resolve the Taiwan issue also pose a serious challenge to global stability and peace.

"Beijing believes its own propaganda about Western frailties and underestimates Washington's resolve. The risk of Chinese miscalculation through over-confidence is real.

"The Chinese Communist Party brook no dissent. Beijing have eroded Hong Kong's 'one country, two systems' framework, and removed individual rights and freedoms, in the name of national security. Its surveillance state has targeted the Uighur population in Xinjiang, carrying out widespread human rights abuses, including the arbitrary detention of an estimated 1 million Muslims.

"Worryingly, these technologies of control and surveillance are increasingly being exported to other governments by China: expanding the web of authoritarian control around the planet.

"Adapting to a world affected by the rise of China is the single greatest priority for MI6. We are deepening our understanding of China across the U.K. Intelligence community, and widening the options available to the government in managing the systemic challenges that it poses.

"This is not just about being able to understand China and Chinese decision making. We need to be able to operate undetected as a secret intelligence agency everywhere within the worldwide surveillance web.

"And we want other countries to be clear-eyed about the debt traps, data exposure and vulnerability to political coercion that arise from dependency on relationships where there is no recourse to an independent judiciary or free press.

"We will seek an overlapping set of partnerships with different countries and regions on these issues – making common cause on common concerns."

Russia

Turning to Russia, Moore spoke of the threat from state-sanctioned attacks, interference in democratic processes, cyber intrusion and the use of political proxies to undermine stability.

"More often than not these Russian state activities are designed to be covert, or at least deniable. However, we are also seeing more brazen activity – often linked to the personal enrichment of elites around President Putin – the denial of which is increasingly implausible."

The MI6 Chief said if Russia ceased its destabilising activity, more focus could be given to common threats, and Russian legitimate interests could be addressed through dialogue. "That dialogue might reassure Russia that, as the Prime Minister noted in his recent Mansion House speech, we have no desire to be adversarial towards Russia, to undermine or encircle it."

Iran

MI6 also remains actively focused on Iran. Moore said Hezbollah has grown to become a state within a state, contributing directly to state weakness and political turmoil in Lebanon. And Iran has repeated the model in Iraq, where Moore said it has exploited a fragile transition to democracy to seed the country with armed gangs who are undermining the state from within, murdering those who seek to uphold the law.

He also warned of Iran's cyber capabilities.

"Iran has also built up a substantial cyber capability which it has used against its regional rivals as well as countries in Europe and North America, and maintains an assassination programme which it uses against regime opponents. There are many parallels with the challenge that Russia poses, and it is no coincidence that the two countries have made common cause in Syria."

International Terrorism

The fourth and final of the 'Big Four' challenges is the threat from international terrorism.

"We retain an intense focus on developing new agent relationships and technological capabilities needed to degrade existing terrorist groups, prevent their spread, and identify unknown threats. To do this, MI6 continues to recruit agents in the most dangerous organisations in the world. We benefit from outstanding cooperation with our colleagues in MI5 and GCHQ and from our international partners.

"In the last twenty years, the U.K. intelligence community as a whole has disrupted dozens of overseas attack plans before they could reach the U.K. – saving potentially thousands of lives.

However, Al Qaeda, Daesh and their affiliates and imitators retain an undiminished appetite for violence and the inflicting of mass casualties, and the world still presents fertile ground for radicalization. Terrorist networks have spread in the Middle East, the Sahel, Sub Saharan Africa, the Horn of Africa and beyond.

"Counterterrorism work is more difficult in a more fragmented world, with rising internal conflicts, some states regressing in economic development as a result of conflict, and the diffusion of technologies making it easier for terrorists to conceal their planning. The home-grown threat of terrorism – with the attendant difficulty of disrupting lone wolf attacks – means that, sadly, some attacks are always likely to get through.

"Furthermore, there is no doubt about the morale boost the Taliban victory in Afghanistan has given to the extremist movement globally, as well as its potential emboldening effect on countries such as Russia, China and Iran.

"MI6 deals with the world as it is, not as we would like it to be. Nowhere is that sentiment more relevant than in Afghanistan. I am immensely proud of the contribution MI6 officers made to the Afghan mission, and to preventing Al Qaeda from carrying out another attack on the scale of 9/11. But I won't soft soap it, the threat we face will likely grow now we have left Afghanistan. Al Qaeda and Daesh will seek to increase their foothold, and to rebuild their ability to strike Western targets.

"Our priority, as the Prime Minister has said, is to stop the re-emergence of large scale international terrorist operations from a Taliban controlled Afghanistan, and to protect the U.K. homeland and our citizens from any threat that might emanate from there.

"As an intelligence community we will now do this 'outside in': working from the outside to identify and disrupt any threats from a resurgent Al Qaeda. This is an extremely difficult task, and will rely extensively on regional partnerships as well as coordination with our allies.

"At the same time, we are engaging with the Taliban and testing their willingness to cooperate. It is also the job of my Service to provide the independent secret intelligence from our sources to illuminate this murky scene. With our allies, we will be ready to disrupt Al Qaeda if the Taliban renege on their promises not to allow Al Qaeda to rebuild external operations capability and to tackle the threat from Daesh.

Public-Private Partnerships in the Digital World

Moore said there is no longer such a thing as an analog intelligence operation in the digital world.

"Our intelligence targets have online lives. Our officers need to operate invisibly to our adversaries. And we need to be able to run our agent and technical operations in an environment in which "Made in China" surveillance technology is found around the world.

"All of this requires insights from data, the tools to manipulate data and, most important, the talent to turn complex data into human insight. The combination of technological prowess

and insights from human intelligence gives the U.K. a powerful edge. The Integrated Review elevated science and technology as a component of the highest importance to our national security and we need to work to shape international norms in collaboration with allies and partners.
"Our adversaries are pouring money and ambition into mastering artificial intelligence, quantum computing and synthetic biology, because they know that mastering these technologies will give them leverage.
"An intelligence service needs to be at the vanguard of what is technologically possible."
Moore said MI6 is now pursuing partnerships with the tech community to help develop world-class technologies to solve the biggest mission problems.
"We cannot match the scale and resources of the global tech industry, so we shouldn't try. Instead we should seek their help. Through the National Security Strategic Investment Fund we are opening up our mission problems to those with talent in organizations that wouldn't normally work with national security. Unlike Q in the Bond movies, we cannot do it all in-house.
"I cannot stress enough what a sea-change this is in MI6's culture, ethos and way of working, since we have traditionally relied primarily on our own capabilities to develop the world class technologies we need to stay secret and deliver against our mission."
MI6 is in safe hands for its modernization. Moore understands not only the threats facing the U.K. and its allies, but also how these must be confronted in the digital age. He is not afraid to break the mold and is the first member of the British intelligence services to use social media publicly.

▶▶ Read the full speech at the Secret Intelligence Service

EDITOR'S COMMENT: In psychiatry, obsession is a disease. And if the patient is a nation then the condition is more serious than imagined. What if Russia thinks exactly the same way – the five threats are the US, UK, EU, NATO, and China; and China accuses the US, Russia, UK, AUKUS, EU, and so on! Is it possible to speak about peace, stability, and prosperity on this planet?

Christianity on trial in Finland as Bible is deemed 'hate speech'

Source: https://americanfaith.com/christianity-on-trial-in-finland-as-bible-is-deemed-hate-speech/

Dec 03 – Religious liberties are in danger in Finland, and Christianity has a giant target on its back.
In a court case with monumental implications, a pastor and a member of the Finnish Parliament are on trial for their faith. **Juhana Pohjola**, 49, (upper right photo) faces criminal charges for teaching the Christian word that has been established for thousands of years.
Pohjola has ministered to small delegations of only dozens and has worked a lifetime building a tight-knit network of churches across Finland. Many of the humble churches started as a handful of people gathering for Bible study, singing hymns, prayer, and communion.
Many of the humble churches started as a handful of people gathering for Bible study, singing hymns, prayer, and communion.

But Pohjola's life work faces a harrowing test of persecution when he and Finnish **MP Päivi Räsänen** (bottom right photo) go to trial on January 24th.
What's the accusation against Pohjola and Räsänen? Hate speech!
The Federalist wrote: Rasanen's alleged crimes in a country that claims to guarantee freedom of speech and religion include tweeting a picture of a Bible verse. Potential penalties if they are convicted include fines and up to two years in prison.

Finnish Authorities: The Bible Is Hate Speech

Rasanen and Pohjola are being charged with "hate speech" for respectively writing and publishing a 24-page 2004 booklet that explains basic Christian theology about sex and marriage, which reserves sex exclusively for within marriage, which can only consist of one man and one woman, for life. The Finnish prosecutor claims centuries-old Christian teachings about sex "incite hatred" and violate legal preferences for government-privileged

identity groups. For a country that supposedly believes in free speech and religion, this prosecution is nothing more than a witch hunt.

The American Conservative noted: Päivi Räsänen is a member of the Finnish Parliament from the Christian Democratic Party and a practicing Lutheran. She is also facing hate speech investigations for having questioned publicly her own church leaders' decision to affirm LGBT pride. Now, the Finnish police have expanded the investigation to consider charges against her over a 2004 pamphlet she wrote defending the Lutheran Church's traditional teaching about marriage (which entails denying that same-sex marriage is a real marriage). It's worth noting that Räsänen wrote that pamphlet seven years before LGBT was added to the national hate-speech law as a protected class. She was investigated once before for the pamphlet, and cleared — but now she's going to undergo another interrogation.

Two-legs animals vs. real animals

A homeless Afghani places a plastic bottle tight over the dog's nose and blows heroin smoke through the open top, leaving the dog subdued and suffering from similar symptoms a human would after ingesting the drug.

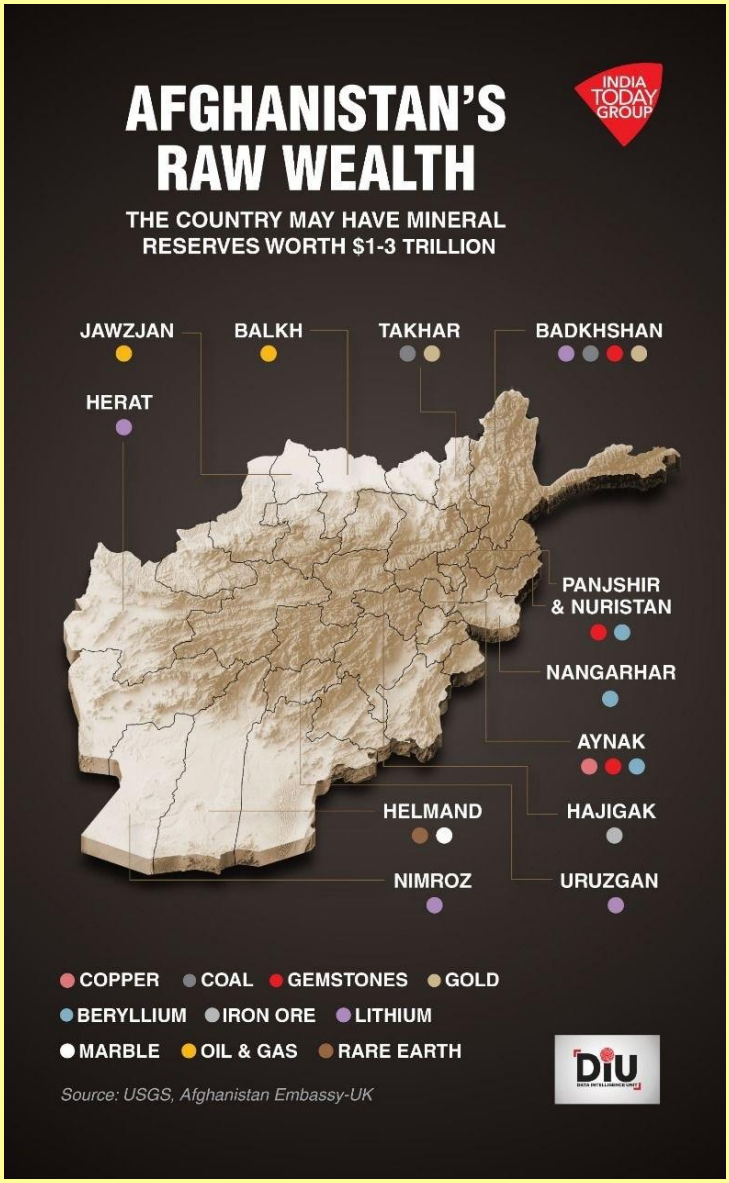
Why he is doing that? To become addicted and return each night and provide both body heat and comfort to the addicts.

Lithium in Afghanistan: Gold or Dust?

By Nicolas Frank Böhmer

Source: https://moderndiplomacy.eu/2021/12/07/lithium-in-afghanistan-gold-or-dust/

Dec 07 – With Lithium being much in focus due to the increasing demand for the electrification of many areas on the planet, expectations and dreams around the delicate metal grow by the day. Many electronics devices, most devices with rechargeable batteries, modern electric vehicles in particular, but also in storage and balancing battery systems for the electric grid – they require Lithium. All this is stirring the dreams of those governments, regions and countries having Lithium as one of their raw materials at hand. Like Afghanistan.



Besides some precious stones – which illegally are mined by many groups since decades – Afghanistan has several other raw materials, and a huge supply of Lithium among them. The war-worn country officially is led by the Taliban but with many regions under control by other groups and even terrorists. Situated in Nangarhar province, one of these opposing groups, the ISIS-K, seeks control over Ghazni province, with the goal to occupy the south of the capital Kabul and, therefore, having access to some of the raw materials as well as the smuggling routes towards Pakistan. One focus lies on Lithium in the Ghazni province. In parallel, the government seeks to find cooperating partners for mining Lithium as well – in the Ghazni province, for instance. Conflicts, therefore, can be expected. However, there are other areas where the Afghan people could mine Lithium, in the provinces of Helmand, Daykundi and Uruzgan, for instance.

Foreign countries and companies are interested in Lithium

This puts light onto a number of opportunities but even more on the obstacles. First and foremost, all known facts of the areas where Lithium can be found, and the calculated amount are based on Russian explorations from the mid 80ies and even earlier British information. Thus, the database is at least 40 years old. These figures neither have been thoroughly updated, nor verified, and not properly aggregated, too. Furthermore, there is a good chance to find more regions with Lithium as well as other sought-after minerals and metals. Besides exploration, the infrastructure, dependability, safety, continuous supply, social and environmental sound mining are further obstacles which need to be overcome. And this are a huge tasks. As of today, there are five Chinese companies – like Ganfeng Lithium corporation – looking into the Lithium business in Afghanistan. Many of the country's Lithium deposits are in remote locations with limited infrastructure. Decades of war and economic hardship have deteriorated the situation. China has been willing to undertake risky projects to support strategic investments in other countries like Nigeria and learned it is not worth the hassle. As a result, the Chinese are interested, but also reluctant to go for the Lithium in Afghanistan.

What is needed to attract foreign countries and companies to go into the Lithium mining business in Afghanistan? To obtain the raw materials lots of rocks/minerals need to be transported to the processing plants, ideally located nearby.

Thus, safe well-built roads for heavy-duty trucks or heavy-duty train tracks coming from the mines to the processing plants and from there to the borders for export are needed. Access to these remote areas, thus the infrastructure, plays a significant role.

To run these activities, many people are needed to do all the jobs and these people need accommodation as well as healthy food, medical help, transport, communications, entertainment, education, and more. Mining and particularly mining of Lithium needs lots of water. Water supply as well as environmental sound mining including saving water have become major issues. Many markets and the car & truck businesses in particular require a number of (independently controlled) actions to ensure social and environmental sound mining as well as the use of water: the car industry learned from the Cobalt disaster to closely monitor the situation at each mining facility.

Time and dependability

It takes about seven years to build, install and put a large and well monitored mining facility for Lithium into operation. In a situation of uncertain exploration data, two years for exploring the area, sources and mines must be added. These huge investments in geology, technology, labor, and time makes sense only if such a facility can safely run for as long as possible, preferably over decades. Thus, dependability is key. To make all parties profiting from such a mine, continuous supply, transport and sale of the metals and materials must be ensured. All this can only be achieved in a safe and stable environment. Frankly, Afghanistan neither will be able to provide the required infrastructure, nor the dependability, safety and continuous supply to achieve an economically successful operation. Not even mentioned the social and environmental sound mining which needs to be ensured, controlled, and confirmed.

Mining on a small scale as done today in Afghanistan is a way to sell raw materials like Lithium into secondary channels. These channels do not pay market prices and they do not ask questions. This might be an opportunity for ISIS-K and others, but it certainly isn't an option for the Afghan government in the long term since it is not economically sound. In order to properly and continuously make money with Lithium and other raw materials, the preconditions have to be established, adapted and improved, first.

Lithium is not at short supply

With crude oil, we were informed to see peak [supply of] oil very soon. Such stories came up first about 100 years ago, but the fossil fuel companies found more oil in countless new areas worldwide. Today, we talk about peak [oil] demand and this is more likely to happen before peak oil. Same applies to Lithium. Several analysts said we already are facing a shortage of Lithium. This, as well, is not true. Lithium is at high supply and rising demand. Several new Lithium sources – many easily accessible – have been found during the past few years. There are large new ones in Iowa, a huge source underneath the river Rhine in Europe, many more have been found in several countries, including China, but most of them in South America. Furthermore, there is lots of Lithium in sea water, too. Why do we suddenly find so many Lithium sources, now? Simply said, if you search for something very specifically you probably will find some – like California's Salton Sea area which is abundant with Lithium and is enough to build tens of million electric vehicles. Furthermore, this Lithium source is easily accessible.

There is a high and rising demand for Lithium, but no, there is no need to go far into remote areas of instable countries like Afghanistan to obtain the metal. Prices for Lithium came to an all-time high in late 2018 but then gradually dropped and now are relatively stable. New battery designs require less Lithium while the battery sizes become bigger. Furthermore, recycling will become the most important source of Lithium within the next ten years. As a result, Afghanistan is no treasure trove, companies can more easily acquire Lithium (and other critical minerals) from alternative sources. Most countries and companies are well aware of the risks and headaches that come with doing business in and with Afghanistan. As a result, China is not going to rush into Afghanistan, nor does any other country.

In response to the question above Lithium is not the new gold for Afghanistan since the preconditions are so questionable: The Taliban and ISIS-K dreams of a money flow by Lithium will not happen. And this applies to other raw materials, too. For instance, many rare earth elements can be found in Afghanistan. But with their name comes a misunderstanding: rare earth elements are not rare by the means of abundancy, they are "rare" since they "rarely exist in their purified form". Thus, rare earth elements require extensive processing – which as well requires infrastructure locally.

For Afghanistan it becomes vital to sort the infrastructure issues out which not only means roads and train tracks, but also hospitals, educational facilities, stores, entertainment, and social life – since with the investments in mining and processing by foreign countries and companies' specialists are coming and will work in Afghanistan: they want a normal life. The government's plans for such investments are highly important for being able to profit from all the raw materials. Otherwise, it all remains dust.

Which would be very sad since the country and particularly the areas where raw materials can be found are of an exceptional beauty with inhabitants of unparalleled hospitality.

Nicolas Frank Böhmer *is Co-Founder and Co-President of the Counter Narco-Terrorism Alliance Germany; consulting, research, communications specialist and*

entrepreneur; develops strategies and subsequent concepts for economy, communications and politics; information gathering; analyst, translator, writer and content developer; international experience in industry, technology, media tech, research and education institutes, governmental entities, politics, the UN and more.

The Michigan School Shooting Was Terrifying. But Was It Terrorism?

Source: https://www.vice.com/en/article/epxzpw/michigan-school-shooter-terrorism-charge

Dec 09 – One expert (Adam Lankford, a professor in criminology at the University of Alabama), told VICE that laying charges in a case like this shows a "fundamental misunderstanding of terrorism."

EDITOR'S COMMENT: Read the entire article at the source's URL and make your own conclusions. To me any similar action that evokes terror in people is terrorism. And it is humankind's failure that after so many years of terrorism incidents worldwide, we cannot agree on a universal definition of terrorism.

EU top court: Same-sex parents with children are 'family'

The court said it does not mean that all EU countries must recognize same-sex couples in national law, but that the children's right to free movement should not be hindered. **Read on »**

EDITOR'S COMMENT:

The box was intentionally left blank

EU Parliament debates the word 'Christmas'

Debates over Christian identity and the use of words like Christmas preoccupied the European Parliament plenary for over an hour. The debate was tabled by Manfed Weber, the leader of the centre-right EPP group. **Read on** ».

EDITOR'S COMMENT:

The box was intentionally left blank

Iranian State-Run Paper Threatens to Destroy Israel: "Just One Wrong Move!"

Source: https://jewishjournal.com/israel/343363/iranian-state-run-paper-threatens-to-destroy-israel-just-one-wrong-move/

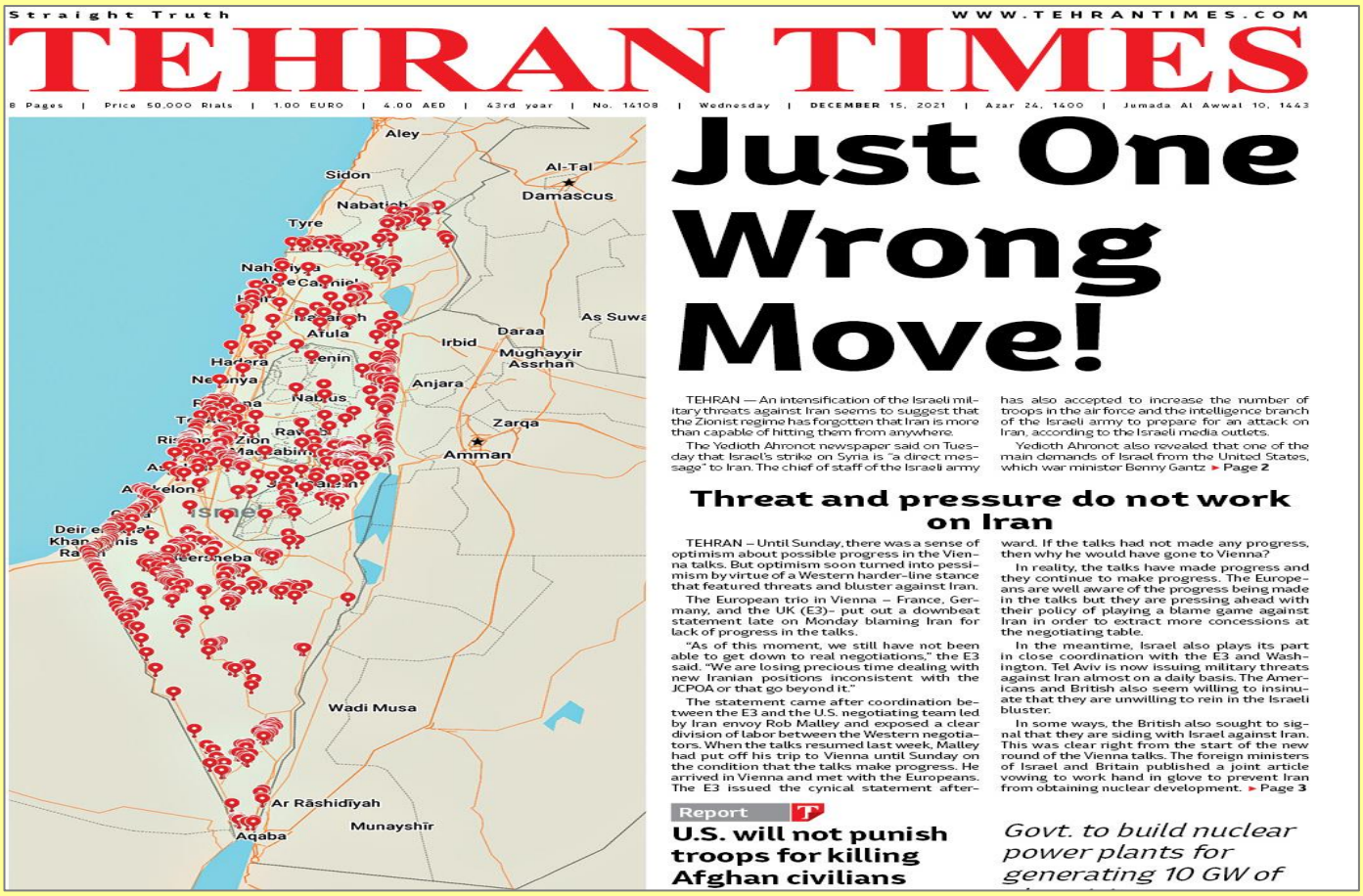
Dec 15 – The Tehran Times, an Iranian state-run newspaper, issued a threat against Israel with the headline "Just One Wrong Move!" and a map of targets for Iranian missile attacks.

The Wednesday edition of the Times stated that an "intensification of Israeli military threats against Iran suggest that the Zionist regime has forgotten that Iran is more than capable of hitting them from anywhere." The map published in the Times showed several targets in Israel as well as in Lebanon and the West Bank.

Associate Dean and Director of Global Social Action Agenda at the Simon Wiesenthal Center Rabbi Abraham Cooper said in a statement, "Iran has just explicitly threatened Israel through its *Tehran Times* mouthpiece. The Simon Wiesenthal Center urges all countries involved in Vienna talks with Iran – led by the United States, UK, Germany, France – to publicly denounce Iran for the regime's threats and support for terrorism across the region."

"If there is no pressure for regime change by the world's most powerful democracies, they must at least link any further softening of sanctions to behavioral change by the Mullahcracy," he added. "Iran is already threatening its neighbors with nuclear blackmail and one way or other will have nukes soon. That will create a sure path to catastrophic war. Why are our leaders silent when Israel and the Gulf States are continually threatened with annihilation by the Iranian regime?"

StandWithUs tweeted that the paper showed that "The Iranian regime has made their aim very clear: They want the State of #Israel destroyed." They added: "The Iranian regime is a threat to world stability. When will the world wake up?"



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Just One Wrong Move!

TEHRAN — An intensification of the Israeli military threats against Iran seems to suggest that the Zionist regime has forgotten that Iran is more than capable of hitting them from anywhere.

The Yedioth Ahronot newspaper said on Tuesday that Israel's strike on Syria is "a direct message" to Iran. The chief of staff of the Israeli army has also accepted to increase the number of troops in the air force and the intelligence branch of the Israeli army to prepare for an attack on Iran, according to the Israeli media outlets.

Yedioth Ahronot also revealed that one of the main demands of Israel from the United States, which war minister Benny Gantz ► Page 2

Threat and pressure do not work on Iran

TEHRAN – Until Sunday, there was a sense of optimism about possible progress in the Vienna talks. But optimism soon turned into pessimism by virtue of a Western harder-line stance that featured threats and bluster against Iran.

The European trio in Vienna – France, Germany, and the UK (E3)– put out a downbeat statement late on Monday blaming Iran for lack of progress in the talks.

"As of this moment, we still have not been able to get down to real negotiations," the E3 said. "We are losing precious time dealing with new Iranian positions inconsistent with the JCPOA or that go beyond it."

The statement came after coordination between the E3 and the U.S. negotiating team led by Iran envoy Rob Malley and exposed a clear division of labor between the Western negotiators. When the talks resumed last week, Malley had put off his trip to Vienna until Sunday on the condition that the talks make progress. He arrived in Vienna and met with the Europeans. The E3 issued the cynical statement afterward. If the talks had not made any progress, then why he would have gone to Vienna?

In reality, the talks have made progress and they continue to make progress. The Europeans are well aware of the progress being made in the talks but they are pressing ahead with their policy of playing a blame game against Iran in order to extract more concessions at the negotiating table.

In the meantime, Israel also plays its part in close coordination with the E3 and Washington. Tel Aviv is now issuing military threats against Iran almost on a daily basis. The Americans and British also seem willing to insinuate that they are unwilling to rein in the Israeli bluster.

In some ways, the British also sought to signal that they are siding with Israel against Iran. This was clear right from the start of the new round of the Vienna talks. The foreign ministers of Israel and Britain published a joint article vowing to work hand in glove to prevent Iran from obtaining nuclear development. ► Page 3

Report

U.S. will not punish troops for killing Afghan civilians

Govt. to build nuclear power plants for generating 10 GW of

Iranian Americans for Liberty Executive Director Bryan E. Leib tweeted, "This is who President Joe Biden is negotiating with. Makes me sick. Should make every American sick." He added in a later tweet: "I view this front-page headline, coupled with everything else from the Islamic Republic as a declaration of war against Israel. I wouldn't be surprised if Israel is in the process of launching strategic strikes against [Iranian] nuclear targets as I type this."

Can you sink a modern aircraft carrier?

Read also the related questions (right column).

Mum Earns Degree in Counter-Terrorism After Losing Son in Manchester Arena Bombing

Source: https://theprestonhub.co.uk/2021/12/17/mum-earns-degree-in-counter-terrorism-after-losing-son-in-manchester-arena-bombing/

Dec 17 – Figen Murray, whose son Martyn Hett was one of 22 people killed in the 2017 Manchester Arena bombing, has graduated with a distinction from the University of Central Lancashire (UCLan).

The 60-year-old said: "When my son was killed in a terrorist attack, I remember clearly thinking 'you kill my baby, you watch what I am going to do!' At the time I had no idea what shape or form that would take but I simply took the murder of my son very personally, and it became an issue between me and terrorism.

"Martyn would not want me to be angry and bitter but I quickly realised I knew absolutely nothing about terrorism. I didn't understand why people would be so angry to resort to blowing themselves up and take others with them. I wondered what made them so cross with humanity so, I had the need to find the answers to so many questions around terrorism."

"Martyn would not want me to be angry and bitter but I quickly realised I knew absolutely nothing about terrorism. I didn't understand why people would be so angry to resort to blowing themselves up and take others with them"— Figen Murray, whose son Martyn Hett was killed in the Manchester Arena bombing

Figen, from Stockport, worked full-time as a psychotherapist in private practice until the day of the attack. She came to UCLan's Preston Campus to give a talk to students and after a conversation with Jim Bonworth and Ian Palmer, she soon realised she wanted to enrol on to the two-year course.

She said: "I found the first year very interesting as we were given so much information about the historic background and a whole host of other topics relating to terrorism, such as sectarian violence, radicalisation, the Balkan conflict and the extreme right-wing movement.

"Sometimes it was difficult to sit through, say if there were photos of an attack or a major crime scene. I had to look away and try to ground myself in those moments, but I was determined not to leave the classroom. I always thought 'Bring it on! I can do this!' There were thankfully only a few of those tricky moments."

"I am obviously very thrilled to have graduated but I cannot believe I managed to complete it due to my circumstances"— Figen Murray, who has graduated from the MSc Counter terrorism degree course

Figen, who has four other grown up children and five grandsons, combined her course work with attending the Old Bailey trial of Hashem Abedi and the ongoing Manchester Arena Inquiry.

She said: "I used to attend University on a Tuesday then take the London train directly from Preston to meet my husband Stuart at Euston Station as he travelled from home to coincide with my arrival. We attended court three days a week. During that time there were obviously essays to write and that was challenging. I wrote them on the train to and from London, in hotel lobbies, and during long breaks at court sitting near the coats in the corner of the family room."

Figen, who publicly forgave bomber Salman Abedi less than a month after the attack to "break the cycle of hate that existed", is now aiming to reach more young people with talks about the dangers of online radicalisation and is campaigning the government for the introduction of Martyn's Law, which will mandate security at public venues instead of having it as a recommendation.

She donned her academic cap and gown today,16 December, as she took to the stage of UCLan's Sir Tom Finney Sports Centre.

She added: "I am obviously very thrilled to have graduated but I cannot believe I managed to complete it due to my circumstances. To have passed with a distinction is something I cannot even comprehend as I have been in a constant state of emotional stress throughout the two years I was on the course. I guess it was due to sheer grit and determination."

Mediterranean – In search of a port 300 immigrants – Among them pregnant women and children

Source: https://www.cyprusmedianet.com/news/8131/mediterranean-in-search-of-a-port-300-immigrants-among-them-pregnant-women-and-children/

Dec 20 – Two ships of German non-governmental organizations conducting search and rescue operations in the Mediterranean and have boarded almost 300 people, have difficulty finding a port to allow them to disembark, and were still waiting yesterday, after several days off.

To Sicily

The ships of the aid organizations Sea-Eye and Mission Lifeline have been sailing near Lampedusa in recent days.
However, as the weather worsened, they moved to Sicily, hoping to find calmer waters, according to Sea-Eye.
The non-governmental organization, based in Regensburg, clarified that 223 migrants are on Sea-Eye 4, among them seven pregnant women and eight children.
Several are injured, including a 5-year-old boy who was stranded on a small boat for three days before being rescued. He has difficulty walking because he has acute pains, the NGO stressed.
According to the Dresden-based Mission Lifeline, its own boat, the Rise Above, is carrying 66 people it rescued.

Tens of thousands of arrivals

As of Sunday, the Italian coast had counted more than 63,700 arrivals of refugees and migrants in the country.
According to UN figures, almost 23,000 people have lost their lives since 2014 trying to cross the Mediterranean and reach Europe.
Aid agencies conducting search and rescue operations have recently been increasingly critical of the Maltese authorities: although many migrants are located in the EU's search and rescue zone, Valletta is not responding to calls for help, they said.

EDITOR'S COMMENT: (1) Who authorized the German NGOs to sail around the Mediterranean Sea collecting illegal immigrants? (2) Since they are of German origin why they do not deliver them to Germany? (3) Pregnant women represent an excellent publicity shield to apply pressure for salvation and embarkation to foreign ports. Same for children and the elderly. (4) They say that desperation is the main cause. But is it ethical for pregnant women to endanger their unborn babies by traveling to dangerous waters? Why does nobody accuse these women of irresponsible behavior putting human lives in danger? (5) I have never heard or read that all these illegal aliens are coming to Europe to work (because the main goal is the benefits given to them; sometimes bigger than the pensions of hard-working retired citizens. (6) Why blame Malta for trying to protect its identity, culture, and safety? Because Malta, Italy, Spain, and Greece are the EU entry gates and those critically speaking are very far away (central or north EU).

PERSPECTIVES ON TERRORISM
a journal of the Terrorism Research Initiative

Volume XV, Issue 6 | December 2021
Source: https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2021/issue-6/vol-15-issue-6-rev2.pdf

The current issue features 5 ***Articles***. The opening article by Jonathan Collins seeks to apply David C. Rapoport's wave theory of terrorism to the upsurge of far-right terrorism. The second article by Kristy Campion, Jamie Ferrill, and Kristy Milligan investigates extremist exploitation of the COVID-19 issue in the context of Australian security. In the next article, Wesley S. McCann reports findings of his analysis of a database on CBRN terrorism interdictions during the period 1990–2016. Then Ronan Lee analyses the strategic communications of a new Muslim militant group in Myanmar, the Arakan Rohingya Salvation Army (ARSA). And finally, Fernando Reinares and Carola García-Calvo provide new insights on the Islamic State's Ripoll cell, responsible for the Barcelona and Cambrils attacks of 2017. These articles are followed by a ***Rejoinder*** from Lorne Dawson, who takes issue with Bart Schuurman's interpretation of his recent article in our journal regarding the role of religion in terrorism.
The ***Resources*** section features eight brief book reviews by Joshua Sinai, the Book Reviews Editor of our journal. This is followed by a longer review of a publication edited by Nina Käsehage on the (ab-)uses of the COVID-19 pandemic by religious fundamentalists. Information Resources Editor Judith Tinnes scopes the literature on hostage-takings and extrajudicial executions in her extensive bibliography, while Berto Jongman presents his survey of recent online resources on terrorism and related subjects.
In ***Announcements***, Olivia Kearney presents her regular Conference Calendar which, due to COVID-19, is still dominated by online meetings. Then three new Associate Editors who have joined the Editorial Team are introduced by the principal editors. We are also pleased to announce that Dr. Laura Dugan, the Ralph D. Mershon Professor of Human Security and Professor of Sociology at The Ohio State University, has agreed to join our Editorial Board. Finally, we

also announce a "Call for Proposals" for a special issue of the journal on anti-government extremism, to be edited by Tore Bjørgo and Kurt Braddock and published in December 2022.
The articles and other texts of the current issue of *Perspectives on Terrorism* have been selected and edited by Alex Schmid and James Forest, the journal's principal editors. Editorial Assistant Jodi Moore handled proofreading, while the technical online launch of the December 2021 issue of our journal has been in the hands of Associate Editor for IT Christine Boelema Robertus.

Greece 'prevented' over 140,000 migrant entries in 7 months

By EUobserver
Source: https://euobserver.com/tickers/153882

Dec 21 – Greek government figures cited 143,472 "preventions of illegal entries" of migrants at the Evros land border with Turkey from April to November 2021, said the Refugee Support Aegean in a tweet on Monday. Some 98,798 such incidents were registered during the same period in 2020. Greece has been accused of numerous illegal pushbacks of migrants, which it continues to deny.

EDITOR'S COMMENT: Perhaps it is time to change policies and copy & paste Turkish practices like facilitating illegal immigrants to pass to other neighboring countries by land or sea. We are sick and tired to be constantly accused of imaginary illegal pushbacks. It is time for Europe to experience what the so-called "EU gates" are suffering for decades (plus Poland recently). Even hypocrisy has limits! And so is EUobserver anti-Hellenic rhetoric …

Recognised refugees going hungry in Greece, say NGOs

By EUobserver
Source: https://euobserver.com/migration/153893

NGOs' Propaganda – Food is repeatedly thrown away by illegal immigrants in refugees camps

Dec 22 – Thousands of recognized refugees and others in Greece are said to be going hungry. The issue has been brewing for months by a Greek government that appears to be using hunger as an asylum deterrence for others.

Security Science Journal

Vol.2 No. 2 (2021)
Source: http://www.securityscience.edu.rs/index.php/journal-security-science/issue/view/4

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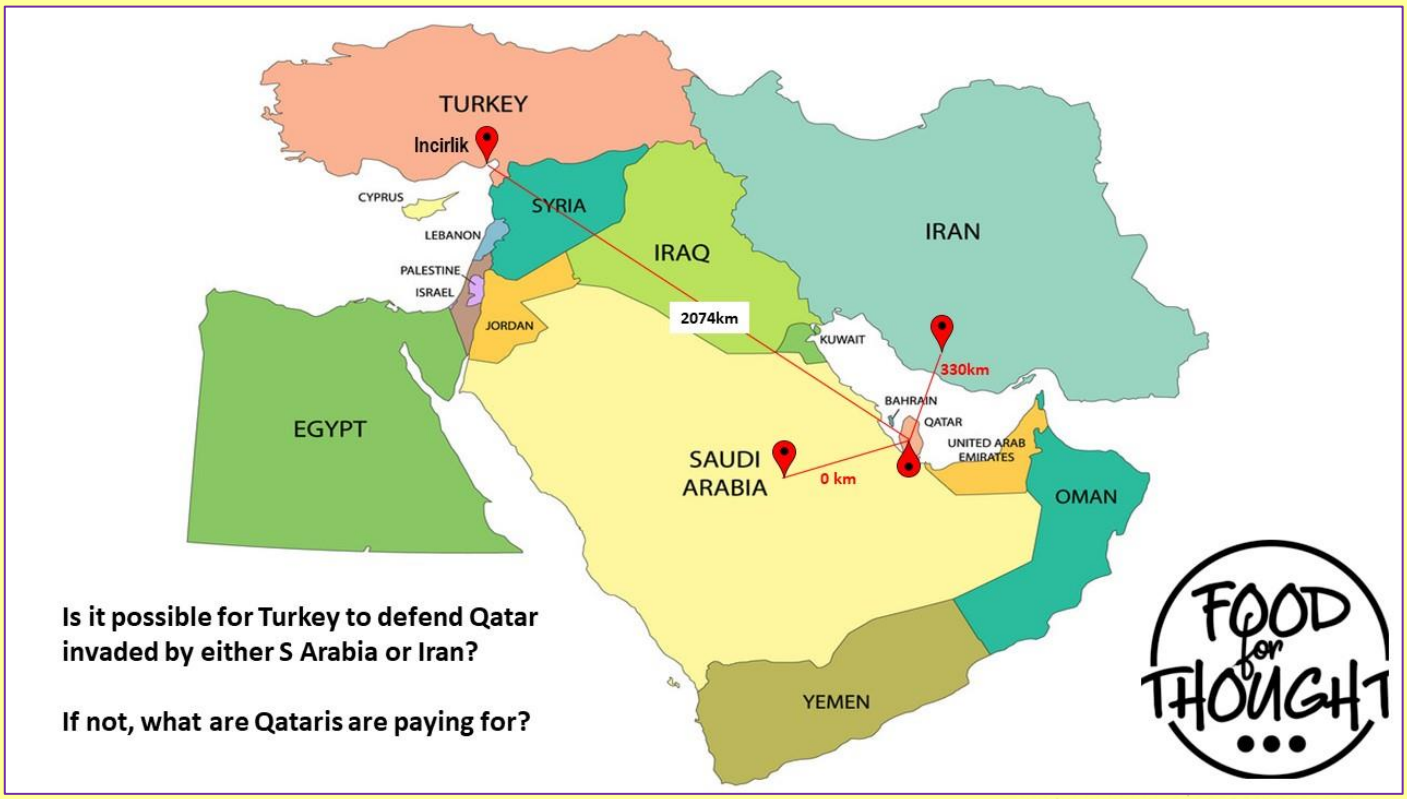
Rhetoric question

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CHEM NEWS

PA calls for probe into laboratories in Israeli settlements

Source: https://www.middleeastmonitor.com/20211124-pa-calls-for-probe-into-laboratories-in-israeli-settlements/

Nov 24 – The Palestinian Ministry of Foreign Affairs and Expatriates has called on the UN to send an international investigation team to Israeli settlements in the occupied territories to inspect their laboratories, *Wafa* reported on Tuesday.
Assistant Foreign Minister for UN and Specialised Agencies, Omar Awadallah, told participants at the conference of the State Parties to the Convention on the Prohibition of Biological Weapons held in Geneva that Israel is the only party that refuses to establish a zone free of weapons of mass destruction in the Middle East.
He pointed out that Israel controls the crossings and borders in the occupied Palestinian territories, so the PA is unable to monitor and verify what kind of weapons Israel is developing in the laboratories in its illegal settlements. Such a situation, he said, could pose a grave threat to the lives of the Palestinian people.
Awadallah reminded participants that Israel has nuclear weapons and refuses to allow inspectors from the International Atomic Energy Agency to visit and monitor its nuclear facilities. He also accused Israel of using chemical weapons against the Palestinian people and alleged that illegal Israeli settlers have used chemicals to burn Palestinian families.
Infamously, Jewish settlers burnt the Dawabshe family to death in the West Bank village of Duma in July 2015. Moreover, settlers murdered 16-year-old Mohammed Abu Khdeir by burning him alive in Jerusalem in July 2014.
According to Israeli rights group Peace Now, there are 666,000 Israeli Jewish settlers living in 145 illegal settlements and 140 outposts in the occupied West Bank and occupied Jerusalem.

EDITOR'S COMMENT: It is very easy and convenient to accuse another nation about using chemical weapons or producing biological agents. Can we have some solid evidence please?

CBRNE Defence: Technology trends

Source: https://www.army-technology.com/comment/cbrne-defence-technology-trends/

Nov 23 – In the wake of the Covid-19 experience, demand for counter chemical, biological, radiological, nuclear, and explosives (CBRNE) research investments and procurements are expected to grow.
Breakthrough technologies such as artificial intelligence (AI), internet of things (IoT), advanced materials, nanotechnology and remote sensing will be leveraged in novel CBRNE solutions to speed up reaction time against the threats and mitigate their adverse effects.
Listed below are the key technology trends impacting the CBRNE defence theme, as identified by GlobalData.

Nanotechnology
Although nanotechnology is relatively new, there have been some breakthroughs in developing and refining new techniques to detect and mitigate the use of biological or chemical weapons. For example, the decontamination of chemicals requires large amounts of water and can produce harmful waste to both humans and the environment. In contrast, nanotechnology can be used in the **decontamination** process even at room temperature, eliminating the need for thermal destruction and removing potentially harmful vapours.
Detecting the dispersal pattern of a chemical attack as it occurs, or developing better sensors for decontamination efforts, may offer more opportunities to use nanotechnology to reduce the effects of CBRN use.
Nanotechnology still presents some long-term risks, such as being used to aid the spread and distribution process or to hide deadly pathogens. 'Proto-nano-weapons' such as dense inert metal explosives (DIMEs) are designed to make explosives less indiscriminate and more dangerous, shrinking shrapnel to such an extent that medical professionals find it extremely difficult to treat the wounded.

Remote sensing
As the detection and identification of CBRNE threats is an expensive, meticulous, dangerous and painful endeavour for CBRNE protection forces, countries seek novel solutions including remote sensing to develop and improve their CBRNE detection and identification capabilities. Various laser absorption spectroscopy **(LAS)-based remote detection techniques** have been developed and fielded recently, including differential absorption LiDAR, tunable laser absorption spectroscopy, laser photoacoustic spectroscopy, dual-comb spectroscopy, laser heterodyne radiometry and active coherent laser absorption spectroscopy for chemical detection.

Unmanned vehicles equipped with remote sensors have great potential to monitor environment, detect and identify these threats rapidly and manage the consequences of CBRN attacks. For instance, in 2017, the European Defence Agency (EDA) and the European Space Agency (ESA) initiated an Autonomous Drone Services (AUDROS) project to detect and identify CBRNE threats using satellite and unmanned aerial vehicle (UAV) together. Similarly, the Australian Defence Science and Technology (DST) Group working with industries including Strategic Elements, Stealth Technologies and Planck Aero systems seek autonomous CBRN sensing and search by deploying Unmanned Ground Vehicle (UGV) and UAV.

Virtual reality (VR) and augmented reality (AR) for CBRNE training

The potential for VR and AR **training** applications has long been recognised by the aerospace and defence industry. VR enable trainees to undertake virtual simulated practice to gain real-world experience cost-effectively and safely without putting them in harm's way. A virtually constructed simulation of a dangerous scenario allows the soldiers to familiarise themselves with combat scenarios and adapt newer skills and techniques necessary for combat. While VR creates an artificial environment where the user can live; AR is used to enhance live exercises in a real environment by overlaying computer-generated images onto the user's real-world view.
Defence forces are benefitting from VR and AR technologies in CBRNE training solutions for their troops. For instance, Polish Armed Forces are developing a virtual training centre for Polish chemical forces. In addition, the US Department of Defence released a Small Business Innovation Research (SBIR) tender in April 2021, to develop software to support testing and evaluation of radiation detectors and their use in challenging life-like nuclear response scenarios without the use of radiological sources using VR and AR.

AI

AI technology can be used in the detection of CBRNE threats and protection from them, as well as in **training** and simulation. Facial recognition and behaviour recognition systems helps detect abnormal behaviours at important passengers' checkpoints such as airports, train stations and ports. In the Covid-19 context, AI is assisting in combating the virus by helping in the early detection and diagnosis of the infection to contact tracing, development of drugs and vaccines, and training of healthcare workers.
For example, the Mount Sinai Health System has partnered with Sana Labs to train nurses treating Covid-19 patients using AI-enabled assessments. According to a GlobalData survey, 43% of respondents stated that AI had played a significant role in helping the company survive the pandemic, with a further 34% saying it had played a minor role. Conversational platforms have become more important than ever following dramatic increases in demand for support services. The pandemic has also accelerated AI research in federated learning, which allows for collaboration on models without forcing users to disclose sensitive information. In June 2021, the US Department of Homeland Security (DHS) Small Business Innovation Research (SBIR) Program awarded $2m funding to two small businesses to develop machine learning technologies for detection of CBRNE threats. DHS aims to reduce time, redundancy, cost, and improve accuracy in detecting threats, such as explosives, chemical agents, and narcotics.

IoT

IoT describes the use of connected sensors and actuators to control and monitor the environment, the things that move within it, and the people that act within it. Use cases of IoT in defence include military intelligence, command and control systems, soldier modernisation systems, and predictive maintenance for military vehicles. This technology enables a myriad of sensors deployed in all the domains to acquire full situational awareness and control over diverse conflict zones or battle areas.
Some companies offer a designed network of threat detectors to establish secure and smart facilities and monitor areas. For instance, Bruker Detection provides CBRNet solution to detect CNBRNE agents using open source such as mobile telephony, terrestrial and satellite radios, and Bluetooth and WiFi connections. The system links CBRNE sensors, key decision makers, and advisors.

Wearable tech

As warfare becomes increasingly networked, new wearable devices are becoming indispensable for infantry officers and soldiers to heighten their situational awareness and **combat** effectiveness. These systems can be linked with radio systems and battle management systems through the use of head-mounted C2 displays; smart sights; smart wrist view and Commanders Combat information displays. These devices are smaller and lighter, and made of material technology when used as part of clothing. This reduces the weight and allows for the addition of a variety of components, such as connectors.

This is an edited extract from the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Defense – Thematic Research report produced by GlobalData Thematic Research.

OPCW pressures Syria, Russia to admit using chemical weapons

Source: https://www.dailysabah.com/world/syrian-crisis/opcw-pressures-syria-russia-to-admit-using-chemical-weapons

People stand in front of damaged buildings, in the town of Douma, the site of a suspected chemical weapons attack, near Damascus, Syria, April 16, 2018. (AP File Photo)

Nov 29 – Russia and the Assad regime came under pressure to acknowledge using chemical weapons, as the global chemical weapons watchdog convened in The Hague on Monday.

Damascus has still failed to declare its chemical weapons and admit inspectors, Organisation for the Prohibition of Chemical Weapons (OPCW) chief Fernando Arias said.

The nerve agent poisoning of jailed Kremlin critic Alexei Navalny in Russia meanwhile continues to pose a "serious threat" to world efforts to eradicate chemical armaments, Arias added.

Syria denies the use of chemical weapons and insists it has handed over its weapons stockpiles under a 2013 agreement with the United States and Russia, prompted by a suspected sarin gas attack that killed 1,400 in the Damascus suburb of Ghouta.

But Syria was stripped of its OPCW voting rights in April after a probe blamed it for further poison gas attacks, and it will remain suspended until it has fully declared its chemical weapons and weapons-making facilities.

"To date, Syria has not completed any of these measures," Arias told the meeting, adding that its declarations "still cannot be considered accurate and complete."

Damascus was also continuing to deny a visa to an OPCW weapons inspector, leading the organization to refuse to deploy a team there, said Arias.

He said he was arranging a meeting with Syria's foreign minister to discuss the breaches.

Russia meanwhile has been accused of failing to answer questions about the 2020 Novichok poisoning of Navalny, which Western powers have blamed on the Kremlin.

"The use of chemical weapons on the territory of the Russian Federation also poses a serious threat to the convention," Arias said.

Moscow had asked OPCW inspectors to come to Russia to investigate but Arias said the visit had not taken place due to conditions set by the Russian authorities that were stricter than those imposed by other countries.

London and Washington meanwhile pushed Moscow and Damascus on chemical weapons.

"We call again on Russia and the Assad regime to comply with their obligations," Bonnie Jenkins, the U.S. Under Secretary of State for Arms Control and International Security, said in a statement to the meeting.

British junior defense minister Annabel Goldie said Russia must not only answer questions on Navalny but also the Novichok poisoning of former KGB agent Sergei Skripal in Salisbury in 2018.
"There is no plausible explanation for these poisonings other than Russian involvement and responsibility," Goldie said.
Moscow has always denied involvement in both incidents.

EDITOR'S COMMENT: The photo from Douma accompanying the article links to a Turkish website with no further info. And if it is a chemical weapon crime scene why people are standing there without any protection? By the way, when OPCW will deal with the Kurdish accusation against Turkey for using chemical weapons?

Day of Remembrance for All Victims of Chemical Warfare 2021: History and significance

Source: https://www.firstpost.com/india/day-of-remembrance-for-all-victims-of-chemical-warfare-2021-history-and-significance-10175001.html

Nov 30 – According to a 2013 report by United Nations, several countries in the world have given up or destroyed their stockpiles of Nuclear Weapons but several are yet to do so. Image credit: Shutterstock
The Day of Remembrance for all Victims of Chemical Warfare by the United Nations is observed on **30 November**. The day is marked to pay tribute to the victims of chemical warfare. The day also highlights the pledge taken by the Organisation for the Prohibition of Chemical Weapons (OPCW) to eliminate the threat of chemical weapons. Chemical weapons were produced and used on a large scale during World War I, resulting in people dying in thousands. The usage of these lethal weapons was completely curbed in World War II.

History

The Chemical Weapons Convention was adopted in 1993. However, the convention came into force on 29 April, 1997. As per the official website of the United Nations, "the Chemical Weapons Convention is determined to completely exclude the possibility of the use of these lethal weapons for the sake of mankind and to maintain world peace."
At the 20th session of the convention, the Conference of the States Parties to the Chemical Weapons declared that November 30 will be observed as a Memorial Day for the victims of chemical warfare. Finally, the first 'Day of Remembrance for all Victims of Chemical Warfare' was observed in 2005.
As per the *Forbes*, The Chemical Weapons Convention, which is signed by 189 countries, prohibits the use, production and storing and transfer of chemical weapons on a large scale. It allows the production of chemical weapons (in a very limited quantity) for research purposes only.

Fernando Arias re-appointed as OPCW Director-General

Source: https://www.opcw.org/media-centre/news/2021/11/fernando-arias-re-appointed-opcw-director-general

Nov 30 – H.E. Mr Fernando Arias was re-appointed today as the Director-General of the Organisation for the Prohibition of Chemical Weapons (OPCW). The decision was made at the 26th Session of the Conference of States Parties to the Chemical Weapons Convention for Director-General Arias to lead the Organisation for a second term of office.

Director-General Arias expressed his gratitude to States Parties and noted: "the task you have entrusted me with for the coming years is a contract with the international community, which I accept to its full extent despite the difficulties we face."
Director-General Arias' second term will begin on 25 July 2022 and end on 24 July 2026.

Background

H.E. Mr Fernando Arias has served as OPCW Director-General since 25 July 2018. Prior to his appointment as OPCW Director-General, he served as the Ambassador of Spain to the Netherlands, as well as Permanent Representative of Spain to the OPCW.
Ambassador Arias has been a career diplomat since 1979 and has extensive multilateral experience with issues regarding weapons of mass destruction as well as bilateral experience in Africa, Asia, Eastern Europe, Western Europe, North America, and South America. In the past decade, he has represented Spain at international organisations including the OPCW. He also served as Vice-President of the OPCW Executive Council. At the United Nations in New York, he was Spain's Ambassador and Permanent Representative. While at the UN, he also served as Vice-President of the 68th Session of the General Assembly and Vice President of the ECOSOC.

Previously, Ambassador Arias represented Spain as Deputy Chief of Mission in the People's Republic of China. He was also Ambassador to Bulgaria, Ambassador to the Former Yugoslav Republic of Macedonia (now North Macedonia), Director (Director General) of the Protocol Department of the Presidency of the Government, Ambassador to the Islamic Republic of Mauritania, and Ambassador to the Republic of Mali. In addition to various posts held at the Ministry of Foreign Affairs of Spain, he was Deputy Chief of Mission at the Embassies of Spain in the Republic of Argentina, the United Mexican States, and the Republic of Romania. He began his diplomatic career as Secretary and Cultural Counsellor at the Embassy of Spain to the Netherlands.
The Conference of the States Parties meets annually to assess the implementation of the Chemical Weapons Convention (CWC) and to make key decisions regarding the future work of the Organisation. The Conference of the States Parties oversees the continued implementation of the Chemical Weapons Convention, the promotion of the treaty's objectives and reviews international compliance with the treaty.
As the implementing body for the Chemical Weapons Convention, the OPCW, with its 193 Member States, oversees the global endeavor to permanently eliminate chemical weapons. Since the Convention's entry into force in 1997, it is the most successful disarmament treaty eliminating an entire class of weapons of mass destruction.
Over 98% of all declared chemical weapon stockpiles have been destroyed under OPCW verification. For its extensive efforts in eliminating chemical weapons, the OPCW received the 2013 Nobel Peace Prize.

EDITOR'S COMMENT: Congrats on the second term in OPCW! A bit surprised that there was not another candidacy. In addition, the CWC overseen by OPCW is a highly specialized convention that requires special training and hands-on experience that a career diplomat lacks. In the near future, I would like to see a Director-General coming from CBRN First Responders.

Decision on aerosolised use of Central Nervous System-acting chemicals adopted by OPCW Conference of States Parties

Source: https://www.opcw.org/media-centre/news/2021/12/decision-aerosolised-use-central-nervous-system-acting-chemicals-adopted

Dec 01 – The Twenty-Sixth Session of the Conference of the States Parties to the Chemical Weapons Convention (CWC) today adopted a Decision titled "Understanding Regarding the Aerosolised Use of Central Nervous System-Acting Chemicals for Law Enforcement Purposes."
The Decision was co-sponsored by 50 OPCW Member States: Albania, Australia, Austria, Bulgaria, Canada, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, El Salvador, Estonia, Finland, Georgia, Germany, Greece, Haiti, Honduras, Iceland, Ireland,

Japan, Latvia, Liberia, Liechtenstein, Lithuania, Luxembourg, Malta, Marshall Islands, Montenegro, Netherlands, New Zealand, Niue, North Macedonia, Norway, Philippines, Poland, Portugal, Republic of Korea, Romania, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Arab Emirates, United States of America, and Vanuatu.

The Decision provides more clarity on the Conference's understanding under the CWC on the aerosolised use of Central Nervous System (CNS)-acting chemicals for law enforcement purposes, drawing on the extensive work of the OPCW's Scientific Advisory Board (SAB). The SAB recognised that chemicals that selectively modify CNS functions, such as the opioid fentanyl and its analogues, which are considered to be safe when used under controlled medical conditions, can have a very low safety margin when delivered as an aerosol. The SAB has noted that CNS-acting chemicals differ from Riot Control Agents (RCAs) as they act primarily on the central nervous system and their effects are not usually confined to sensory irritation of a temporary nature. The SAB, therefore, recognised that CNS-acting chemicals do not meet the definition of an RCA, as set out in paragraph 7 of Article II of the Convention.

The Decision requests that the Director-General task the SAB with continuing to review relevant developments in science and technology related to CNS-acting chemicals and provide updates to the Conference, as appropriate and include in its report the topic on developments in science and technology for future Special Sessions of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (Review Conferences).

The Decision only addresses the aerosolised use of CNS-acting chemicals in conjunction with law enforcement purposes and does not address the use of CNS-acting chemicals for other purposes not prohibited under the Convention.

A Quick Glance on CBRNe Incidents Investigations & Technologies Used

By Capt. Adolph Eid

Source: https://www.linkedin.com/pulse/quick-glance-cbrne-incidents-investigations-used-adolph-adolph-eid-/

Nov 30 – In the old days, investigations were based on questioning, suspicions, witnesses, and often unreliable evidence. However, nowadays where hardware technology, and different types of forensics are deeply involved, things have changed due to different types of forensics.

Forensic science, in its broadest definition, is the application of science to law. As our society has grown more complex, it has become more dependent on rules of law to regulate the activities of its members. Forensic science applies the knowledge and technology of science to the definition and enforcement of such law. In other words, forensic science is like an

umbrella that encompasses experts with different backgrounds using their skills to help law enforcement to put into custody people involved in crimes. For example, biological forensics based on finger and palm prints, body fluids such as blood, urine, semen, saliva etc. can easily connect a suspect to a crime scene since the signature of each individual's DNA is unique and therefore the perpetrator cannot deny his crime, unless investigators can prove that someone tampered with evidence or contaminated the scene. Since the mid-twentieth century, a revolution in computer technology has made possible a quantum leap forward in human knowledge. The resulting explosion of scientific advances has had a dramatic impact on the field of forensic science by introducing a wide array of sophisticated techniques for analyzing evidence related to a crime. Procedures such as chromatography, spectrophotometry, and electrophoresis allow the modern forensic scientist to determine with astounding accuracy the identity of a substance and to connect even tiny fragments of evidence to a particular person and place. Moreover, in the twenty first century, digital evidence has been introduced to crime investigation, since humans have become attached to their technological devices such as computers, smart phones, tablets etc. which sometimes contain all info and evidence needed to link a suspect person to a crime scene, and consequently sentence him. Other kinds of evidence are called impression evidence like foot prints, tires, tools and bite marks that have been also encompassed within the investigation and they are very liable to confirm the presence of the perpetrator in precise geological areas and locations. However, in some crimes one type of forensics could be enough to identify the hit man or the organization, in others, investigators need a wide variety of forensic, evidence, tools, and detectors, and even sometimes forensic psychology to connect a lone wolf or an organization to the crime and then prosecute them. According to Arrigo, B. (2003), forensic psychology is a growing and popular field of inquiry. Its allure, in part fueled by sensationalized and glamorized media images, features psychologists tracking down serial killers, treating sexual psychopaths, and studying the criminal mind.

For example, in a CBRNe emergency, investigators need a wide range of tools, and different types of Weapons of Mass Destruction (WMD) detectors to detect and identify the agent(s) that has been used in the attack. Forensic science is used in such attacks, because it could lead to the manufacturer of the Warfare Agent (WA) whether it was chemical, biological, radiological or nuclear, and then link the people or even the regime who stands behind the attack to the scene. It is essential, all crime scenes must be secured upon the arrival of law enforcement in order to preserve forensics and prevent intervention and tampering, by following protocols in a systematic and scrupulous manner with focus and attention on factors such as tight perimeter/access control, strict adherence to chain of custody, and documentation and preservation of the scene. Crime scene management, scene investigation and forensic evidence collection, preservation and analysis have become essential components in CBRNe crisis and consequence management. The CBRNe operational environment is unique, dynamic and complex, and may present with multiple hazards for both responding personnel and the affected community.

CBRNe Investigations Importance

Since a CBRNe attack is an unconventional attack with unconventional weapons, investigations are extremely important in order to preserve the contamination in one place (at the incident scene) because it is essential for First Responders (FRs) to stop cross contamination. Preventing cross contamination means mitigating the number of injuries, number of victims, and the number of contaminated areas. More contaminated areas mean more victims, more economical loss, more panic and more resources. Moreover, investigation identify the perpetrator of the attack, whether he was a lone wolf actor, a terrorist organization, or a "rogue state," and consequently allows law enforcement to take legal action or measures against them.

For this reason, special detectors must be used, and the three colored zones/perimeters (Red, Yellow, and Green) must be established by FRs.

The cases of Alexander Litvinenko (a former KGB/FSB defected agent that was assassinated in the UK with the radioactive Polonium-210), Tokyo subways attack (that was conducted by "Aum Shinrikyo" a Japanese religious cult, where the Chemical Warfare Agent (CWA) Sarin (GB) gas which is a nerve agent was released), and recently the Skripal's assassination attempt in Salisbury, UK, (where also a CWA (nerve agent) called Novithchok was used against Sergei Skripal and his daughter Julia), showed the effects of cross contamination on the population's psychological state, economy, and the great efforts exerted by competent authorities to track and decontaminate wide areas, and finally identifying the perpetrator(s). In addition to the tracking and decontamination struggle, enormous amounts of money were spent (millions of US dollars) on the decontamination process, medical treatment, follow up and victims' counseling. Collecting evidence from the safety perimeter/red zone conducted by FRs who are allowed and trained to operate inside this area (contaminated area), begins by using their handheld detection devices such as radiation detectors (alpha (α), beta (β), gamma (ɣ) and neutron), CWA and Toxic Industrial Materials (TICS) detectors, and Biological Warfare Agents (BWA) detectors, in order to locate the contamination and the hot spots, and then identify the agent(s) involved. In this stage investigations begin.

Immediately following CBRNe events, investigators should look for, and collect, shrapnel and residues from an Improvised Explosive Device (IED), body fluids, microbiological

cultures and environmental samples in bioterrorism events, air sampling and monitoring data from a venue attacked by a suspected chemical agent, collection of environmental media, e.g., vegetation, soil, and dust from radiochemical analysis/isotope characterization in a Radiological Dispersal Device (RDD), Improvised Nuclear Device (IND) detonation, or even a nuclear reactor accident/incident. More conventional forensic methods and techniques, such as latent fingerprints and DNA analysis, if not destroyed by fire or other physical forces in a terrorist event, would prove to be invaluable in the criminal investigation, subsequent prosecutorial efforts, and possible retaliatory action against foreign aggressors. Evidence can consist of both conventional and unconventional evidentiary materials. These may include blood and explosive residue, fingerprints on a flask of an unknown, suspect liquid, Petri dishes, incubators, microbial growth media, fermentation equipment, precursor chemicals or materials, suspect powders, dissemination devices, chemical synthesis lab ware, shipping papers, computers and related data storage devices, technical references, Personal Protective Equipment (PPE) or myriad of combinations.

Contamination Detection in CBRNe emergencies

In CBRNe emergencies, contamination means that WMD agents or even Weapons of Mass Disruption such as an RDD/Dirty-Bomb have been used, and have contaminated a geographical area like buildings, streets, critical infrastructures, underground stations, cities etc. Therefore, special detectors and identification devices (usually the same device could perform both actions) must be used whether they were handheld, fixed, mobile, or mounted on helicopters or unmanned aerial vehicles. For example, the RIID identiFINDER which is a handheld gamma and neutron detector, spectrometer, and isotopes identification device, that contains Sodium Iodide (NaL) for gamma radiation detection and a Helium-3 (3He) tube for neutron detection would be a great tool for investigation in a hot zone (of course if the event is Radiological/Nuclear), moreover a Personal Radiation Detector (PRD) that contains either cesium iodide or plastic scintillators (for gamma detection) must be worn always on the waist of FRs to detect radiation and protect them from its harmful effects. Once the contamination is confirmed and the isotope identified, more tools and detectors are required if the isotope used in the event is an Alpha (α) or Betta (β) emitter. For example, in Litvinenko's case Po-210 was used which is an α-emitter. Consequently, α-detectors were used to follow the traces of contamination caused by α-particles.

If the event involves a CWA (e.g., Tokyo subway attack GB), or TICs, other technologies such as Mass Spectrometry and Spectroscopy (Raman or Laser) should be used. For example, the AP4C spectrometer is a handheld chemical detector which is able to detect and identify four (4) different types of CWA (e.g., nerve, blister, blood and choking) including TICs would also be a great tool to be used by investigators for detection and identification purposes, since Mass spectrometry is an analytical-instrumental method, often used in association with other spectral data mainly for the purposes of determining the structures of organic compounds (by ionizing the molecules and then weighing them). On the other hand, Spectroscopy is basically any experimental subject and is concerned with absorption, emission or scattering of electromagnetic radiation by atoms or molecules. Spectroscopy studies ions, therefore all molecules should be converted into ions (+ or -) in order to be detected and identified.

However, if the FRs suspect a biological attack, Lateral Flow Immunoassay (LFI) is highly recommended for the detection and identification of viruses, bacteria, or toxins. LFI represents a well-established and very appropriate technology when applied to a wide variety of point-of-care (POC) or field use applications. This is the reason why FRs in CBRNe emergencies should bring with them to incidents scenes different types of CBRNe detectors and of course different levels of Personal Protective Equipment (PPE) to conduct their investigations and stay safe without spreading contamination around.

Cross Contamination in Litvinenko's Case

Since the assassination of A. Litvinenko was carried out with Po-210 which is an α-emitter (when alpha particles enter human bodies they go into the gut and the stomach, they will very quickly cause vomiting, then they will enter the blood stream and the fluid around the cells in the body, the cells themselves and will irradiate them, especially the cells that have high division rate such as the skin, the gut wall, and the bone marrow. This produces acute radiation syndrome, and lead to the depletion of bone marrow the loss of the immune system, depletion of lymphocytes in the blood, low white blood cell count, and the loss of hair…and most probably death.), α-detectors were used by investigators, and led them to the perpetrators since cross contamination covered all places that Litvinenko himself, his assassins and even other innocent people passed by. According to the police scientists, Po-210 is rare, and — importantly — the radioactive signature it leaves behind is very distinctive. When it comes into contact with people and objects, the isotope spreads a trail of contamination with specific radioactive α-particles — such a trail if followed successfully could lead Peter Clarke's investigators directly to the person or persons who killed Litvinenko.

A hard and thorough scan of surfaces was conducted by experts since α-particles are very difficult to detect, and they travel a few centimeters in the air. Consequently, a very slow screening of surfaces and areas visited by people who met Litvinenko that day, took months

and led the investigators even to Germany where one of the perpetrators possessed a house and a car (even the airplane that perpetrators took on their way back from the UK to Germany was contaminated with α-particles).
There was radiation at the Itsu sushi bar on Piccadilly, where Litvinenko had met an acquaintance; there was radiation in the Pine Bar of the Millennium Hotel, where he met his alleged assassins ; there was radiation in the offices of Boris Berezovsky, where he had gone to photocopy documents; there was radiation in the car of a person, who had taken him home; and there was radiation in Litvinenko's own house. There was also radiation at several locations Litvinenko had not visited, although the police were keeping these secrets for the moment as potential material evidence in a future prosecution.

Conclusion
When Investigations are on the right path, especially in CBRNe events, where investigators equipped with the proper detectors, identification devices, needed laboratories for CBRNe forensics, and good scene management, there are no doubts that perpetrators would be identified and sometimes arrested and sentenced. Therefore, all States are requested to have a well-trained, equipped, and modernized CBRNe team(s), capable to investigate, face, and deal with any incident that involves CBRN/HAZMAT agents. Moreover, the international cooperation which includes information sharing (intelligence), Joint-exercises, training, donations, exchange of expertise etc. is strongly recommended since a CBRNe incident could be transboundary (e.g. Chernobyl, Fukushima Daishi, Litvinenko, and Skripal cases where contamination was found not only in several places but even in different countries and continents) and may jeopardize innocent people's lives.
Due to the international collaboration and cooperation between the Republic of Lebanon with its Allies such as the EU, US and others, the Lebanese intelligence services provided the Italian authorities in 2017 with a very sensitive information that prevented a CBRNe attack on the Italian soil.
Since "it is only a matter of time before terrorists get hold of a WMD" (experts forecasts), intelligence services all over the world must not hesitate to share any sensitive information among each other in order to deter any attempt to use CBRNe agents against innocents before it occurs. Moreover, states must establish strong security regimes to protect their industrial facilities that may contain HAZMAT and that could be used in "Dirty Bombs", and by adopting regulations and legislation to deter adversaries from committing such a crime.

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A Toxic Legacy – Chemical Weapons and Birth Defects in Syria

Source: https://syriaaccountability.org/updates/2021/12/02/a-toxic-legacy-chemical-weapons-and-birth-defects-in-syria/

Dec 02 – Since 2012, chemical weapon attacks by the Assad government have killed and injured thousands of Syrians. Such attacks are not only deadly but also psychologically terrorizing for victims. However, emerging evidence suggests that these weapons may have a further, long-term impact that has been under-examined and rarely documented. In early 2021, a doctor in southern Turkey contacted SJAC (Syria Justice and Accountability Centre) to share his concerns about the high number of children born with birth defects that his medical center has treated since 2015. The doctor suspected that a recent increase in certain conditions may be linked to exposure to chemical weapons. Further research is urgently needed to investigate this phenomenon, and families supporting children with congenital defects need support to access specialized healthcare and educational resources. In an attempt to shed light on the situation, SJAC interviewed seven parents whose children were born with developmental and musculoskeletal abnormalities after alleged exposure to a chemical attack. Interviewees

came from several locations inside Syria, including, Aleppo, Khan Shaykhun, Raqqa, and Douma. **The children of the interviewees experienced a variety of abnormalities, including Tetralogy of Fallot (a heart defect), cerebral palsy (a disorder that affects movement, muscle tone, and posture), and paraplegia (paralysis of the lower parts of the body).** The congenital defects documented by SJAC require precise diagnosis, physical therapy, surgery, and/or mobility aids, all of which are nearly impossible to access for many Syrians. One mother interviewed by SJAC experienced a chemical attack in Raqqa and suspects that her now immunocompromised child suffered from prenatal exposure. Unfortunately, she does not have the money to travel to a doctor, much less pay for vital treatment. Another mother hoped to travel to Turkey to receive treatment for her child with Tetralogy of Fallot, a rare heart condition. She told SJAC, "Right now we are waiting for permission to enter Turkey. The doctor told me that my son is in very critical condition and that he needs to have an operation, preferably before he turns one year old, or his life might be in danger."

Unfortunately, conducting research in conflict settings where chemical weapons are used is difficult, compromising the ability to confirm a link between these congenital defects and the use of chemical weapons in Syria. However, this is not the first time that survivors have alleged a link between chemical weapons and birth defects. **The 1988 massacre at Halabja was one of the few circumstances when sarin and mustard gas have been used in a civilian setting. This was followed by an increase in birth defects. Another study from the Iran-Iraq War studied two control groups and their children.** The study indicated that the group who had been previously injured by chemical weapons were more likely to have children born with congenital defects. However, follow-up research to assess a causal link was impossible in Saddam-era Iraq, with one 2012 study stating, "no publications on birth defects among exposed population in Kurdistan region are available." Later studies on the first Gulf War found an increase in birth defects, but could not determine if depleted uranium munitions, chemical weapons, or other factors were at play. A study into the Sarin attacks in Tokyo, reported no congenital defects, although the quality of the Sarin used in the attack was not classifieded as weapons grade. Use of agent orange in Vietnam and Korea resulted in devastating birth defects, however, this chemical is classed as a dioxin (a chemical compound found in herbicides) and is unrelated to the types of chemicals used in Syria. In the case of **Syria**, there is a specific need to understand the effects of exposure to chlorine and sarin gas, the use of which has been independently confirmed at several locations. In 2015, two Syrian physicians published an article in the Lancet that documented an increased rate of miscarriages, stillbirths, and birth defects among women from Eastern Ghouta, although more research would be needed to establish causation. There is evidence that chlorine gas exposure in a household or industrial setting can lead to severe hypoxia for the mother and fetus which may lead to complications in heart and limb development. However, the CDC states that "We do not know whether exposure to chlorine gas during pregnancy can result in damage to unborn babies because there are no studies of pregnant women or pregnant animals exposed to chlorine gas." Sarin gas has even fewer documented links to birth defects because of the rarity of its use. Sarin is a neurotoxin organophosphate, which is commonly used as a pesticide, but can cause neurological side effects in humans. Women in **South Africa** who had regular exposure to organophosphates were 6.5 times more likely to bear children with birth defects, including nervous system, cardiovascular, and musculoskeletal defects. Another study linked organophosphates with Tetralogy of Fallot. However, more research is needed to establish whether sarin has similar congenital effects.

The full legacy of Syria's chemical attacks might never be known, but hundreds if not thousands of Syrians may be living with lifelong disabilities caused by chemical weapon exposure. The reason that chemical weapons are prohibited under international law is precisely because of their indiscriminate and inherently cruel impact on innocent civilians, including children. SJAC's documentation on potential birth defects caused by the use of such weapons in Syria only serves to emphasize the callousness of the Syrian government, the need for the international community to prevent the future use of such weapons and to support victims of these attacks. Countries with the necessary resources to support and treat children with disabilities should consider granting medical visas to families whose children need specialized care. Better understanding of this topic could help inform treatments and lay the groundwork for reparations for children born with defects after chemical exposure, possibly to include subsidized healthcare and special education services. Organizations that document chemical warfare, including the OPCW, should consider studying the long-term impact that chemical weapons have on the next generation of Syrians and the UN and international medical organizations should work to assure access for medical researchers into affected areas of the country.

NATO CBRN High Visibility Protection Projects

By Steven Pike

Source: https://www.argonelectronics.com/blog/nato-cbrn-high-visibility-protection-projects

Covid-19 is a low virulence virus with a mortality rate of approximately 3%—nowhere near that of Ebola or anthrax, which are around 50% and 80%, respectively. However, the

consequences of this novel virus that usually causes a predominantly mild illness have demonstrated that the world is ill-equipped to deal with an unpredictable event. The effects of a chemical, biological, radiological, or nuclear attack could have far worse human consequences than Covid-19.
Covid-19 has also manifested the importance of protecting militaries, which need to be capable of functioning during a pandemic or if a weapon of mass destruction is used. Preserving combat effectiveness is paramount for military forces, particularly for the U.S.A., whose post-World War II military playbook has relied on large shows of force to deter conflict escalation. Covid-19 temporarily diminished this ability, and there were a number of challenges from rival militaries seeking to find chinks in U.S. armour.
Combat readiness becomes even more vital in the event of a CBRN incident, which involves military personnel being provided with sufficient personal protective equipment (PPE) and collective protection systems.
The pandemic highlighted weaknesses in addressing an unexpected event and combat readiness.
António Guterres, the Secretary-General of the United Nations, in Remarks to the Security Council on the COVID-19 Pandemic made on April 9, 2020, shortly after Covid-19 had been declared a pandemic, made the following remarks:
"The threat of terrorism remains alive. Terrorist groups may see a window of opportunity to strike while the attention of most governments is turned towards the pandemic...The weaknesses and lack of preparedness exposed by this pandemic provide a window onto how a bioterrorist attack might unfold – and may increase its risks. Non-state groups could gain access to virulent strains that could pose similar devastation to societies around the globe."
NATO approached the CBRN issue during the NATO Defence Ministers' Meeting on 21 October 2021.

Three NATO CBRN defence projects
At the Defence Ministers' Meeting, eleven NATO allies signed letters of intent, which relate to three multinational High Visibility Projects. These are a response to important capability challenges for the Alliance and involve the following:

1. Providing CBRN protection equipment
2. Developing and procuring CBRN detection and identification systems
3. Establishing a network of CBRN defence facilities

The 11 Nato allies that signed letters of intent were: Albania, Belgium, Greece, Hungary, Italy, Latvia, the Netherlands, Spain, the United Kingdom, and the United States.

Providing CBRN protection equipment
The first project strives to establish a framework for the provision of individual protective equipment and collective protection systems. Allied countries will be able to cost-effectively equip their forces with state of the art, standardised protection equipment. They will also be able to upgrade and manage the life-cycle of activities relating to individual protective equipment and collective protection systems.

- Individual protective equipment provides protection against CBRN agents and comprises protective clothing, protective masks, decontamination and first-aid kits, chemical detectors, and dosimeters.
- Collective protection systems provide safe environments that are protected against CBRN agents (buildings, tents, containers, ground vehicles, ships, and aircraft). When in a safe environment, personnel are able to carry out their tasks and rest without wearing individual protective equipment.

The project involves systematically assessing individual capability with a view to identifying promising cooperation opportunities. The 2020 cycle of this work strand focused on CBRN defence and identified concrete cooperation opportunities addressing CBRN protection, detection, and identification, as well as CBRN defence facilities.
Ten Allies will participate in this initiative: Albania, Belgium, Greece, Hungary, Italy, Latvia, the Netherlands, Spain, the United Kingdom, and the United States.

Developing and procuring CBRN detection and identification systems
The second project involves the development and procurement of advanced CBRN detection and identification systems. This will increase Allies' ability to quickly and effectively detect CBRN agents.
Individual capability areas are being systematically assessed to identify promising cooperation opportunities. The 2020 cycle of this work strand focused on CBRN defence and identified concrete cooperation opportunities addressing CBRN protection, detection, and identification, as well as CBRN defence facilities.

- Chemical, biological, and radiological detection and identification each require different technologies.

- Detectors are designed to indicate the presence of CBRN substances; identification equipment recognises the specific CBRN substances detected.

Nine Allies Allies will participate in this initiative: Albania, Belgium, Greece, Italy, Latvia, the Netherlands, Poland, the United Kingdom, and the United States.

Establishing a network of CBRN defence facilities

The third project is called Network of CBRN Defence Facilities. Participants will establish a framework to help share and use national CBRN defence facilities, including training sites and biological laboratories. The goal is to complement NATO members' capabilities and improve preparedness for future CBRN events.

The project will provide participants with a framework to connect different CBRN defence facilities—including live agent training sites and biological laboratories—within a single architecture. The objective is to make Allied capacities more widely available, thus increasing NATO defence forces' level of preparedness.

- Live agent training is an effective way to train CBRN specialist personnel. The use of live agents gives students a realistic experience when operating in a CBRN environment.

Nine Allies Allies will participate in this initiative: Belgium, Greece, Italy, Latvia, the Netherlands, Poland, Spain, the United Kingdom, and the United States.

The benefits of CBRN simulation training

The common thread running through all three of NATO's protection projects is preparedness. Adequately preparing for an event increases the likelihood of a positive outcome.

Specifically, the third project states the benefits of live agent training. Whilst this type of training is excellent, it is not always feasible. There are a plethora of environmental, economic, and safety issues that must be considered before a training exercise using real CBRN material is conducted. There is, however, an alternative—simulation training.

Argon Electronics has over 30 years of experience as a global provider of CBRN detector simulators that are used by many agencies worldwide, including the London Fire Brigade, the Fire Department of New York, U.K. Police National CBRN Centre, and the U.K. Defence CBRN Centre. We have developed strong relationships with many of the leading detector manufacturers, which allows us to create realistic simulators that are almost identical to the real devices.

Through the use of simulation devices, CBRN instructors can devise flexible and repeatable scenarios that pose no safety risk to people, equipment, infrastructure or the environment as no chemical or radiological agent is required.

Simulation devices are cost-effective and can be used to create highly realistic exercise scenarios both indoors and outdoors. They provide emergency responders with the confidence to effectively use the actual devices that detect chemical or radiological sources in any CBRN event. They allow instructors to create realistic scenarios and train future investigators who will accurately be able to detect CBRN threats and safeguard NATO security.

Simulation training could be a key element of each one of NATO's CBRN High Visibility Projects.

Pakistan re-elected to chemical weapons watchdog OPCW's executive council

Source: https://www.newindianexpress.com/world/2021/dec/04/pakistan-re-elected-to-chemical-weapons-watchdog-opcws-executive-council-2391835.html

Dec 04 – Pakistan has been re-elected to the Executive Council of the Organisation for the Prohibition of Chemical Weapons (OPCW) for the term 2022-2024, the country's Foreign Office said on Saturday, December 4, 2021.

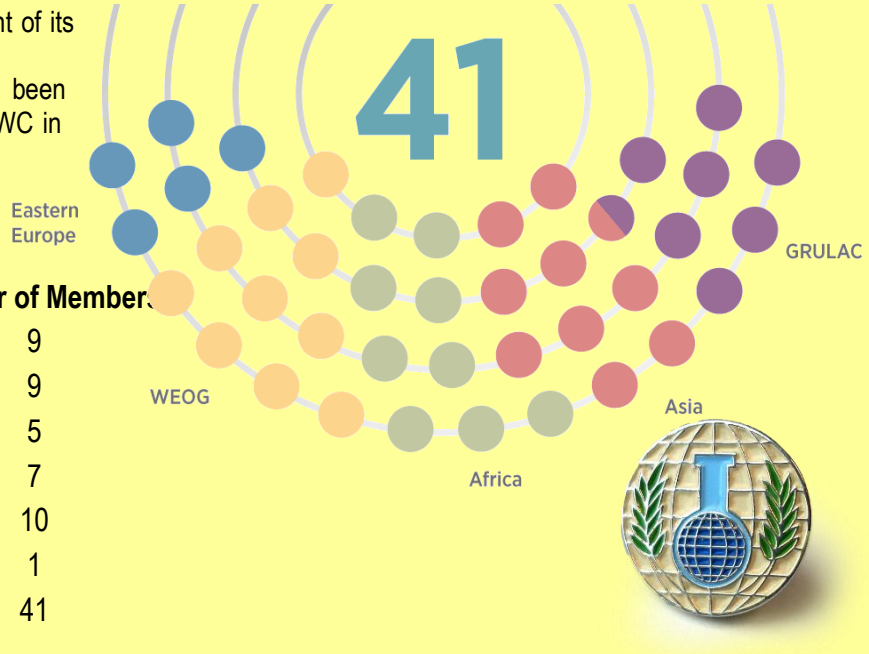
The elections were held during the recently concluded 26th Session of the Conference of States Parties held in The Hague from November 29 to December 2, it said.

"The re-election of Pakistan to the 41-member Executive Council of the OPCW is a testament to Pakistan's positive role at the OPCW," the FO said.

The Convention on the Prohibition of the Development, Production and stockpiling of Chemical Weapons and their Destruction (CWC) - with 193 States Parties - is the most successful disarmament treaty, eliminating an entire class of weapons of mass destruction.

The Executive Council is the principal policy-making organ of the Hague-based OPCW, which is responsible for supervising the effective implementation of and compliance with the Convention.

It also supports the scientific and economic development of its Member States in the peaceful uses of chemistry.
Pakistan is an active member of the OPCW and has been serving on the Executive Council since it ratified the CWC in 1997.



Regional Group	Number of Members
Africa	9
Asia	9
Eastern Europe	5
Latin America and the Caribbean (Grulac)	7
Western Europe and Others Group (Weog)	10
Rotating State Party from Asia or Grulac	1
Total	41

Fast Five Quiz: Toxic Plants

Source:https://reference.medscape.com/viewarticle/963366?uac=82598DG&faf=1&sso=true&impID=3842680&src=wnl_fastquiz_211204_mscpref

Plant exposures are some of the most frequent poisonings that are reported to poison control centers. Ingestion may be intentional or accidental. Although the consequences are rarely severe or life-threatening, plant poisoning can result in seizures, acidosis, liver necrosis, heart block, tachycardia, hypotension, and hypertension.
Do you know which plants can cause significant reactions, as well as key clinical information and best practices for management? Refresh and test your knowledge of plant poisoning with this short quiz.
▶ **Take this (difficult) short quiz.**

Countering WMD Threats in Iraq

Source: https://cbrnecentral.com/countering-wmd-threats-in-iraq/26668/

Nov 08 – The Department of State's Office of Cooperative Threat Reduction ISN/CTR administers WMD threat reduction activities for Iraq in partnership with government, security, academic, public and veterinary health, and industrial communities.
ISN/CTR's Iraq program secures chemical, biological (CB), radiological and explosive materials, dual-use equipment, technologies, expertise, and infrastructure to prevent their misuse by terrorists and other nefarious actors in Iraq in WMD attacks against the United States, U.S. allies, and U.S. interests abroad.
ISN/CTR's efforts in Iraq align with and help implement U.S. national security strategies, including the U.S. National Security Strategy, the U.S. National Biodefense Strategy, and the Interim National Security Strategic Guidance, among others.
ISN/CTR's Iraqi stakeholders include:

- Government ministries and agencies, both of the central Iraqi government in Baghdad (GOI) and the Kurdistan Regional Government (KRG) that have a role in chemical, biological and radiological oversight
- Government of Iraq and Kurdistan Regional Government law enforcement entities and security forces

- University and research faculties and departments handling potentially weaponizable chemical and biological materials and equipment
- Facilities that manufacture, store, or distribute high consequence pathogens (HCPs), and/or weaponizable chemicals and their precursors
- Chemical and biological academic, professional, and private industry associations
- Chemical academic and industry associations that play a role in the promotion of global chemical management best practices
- Agrochemical/pesticide and pharmaceutical sectors
- International organizations with complementary WMD prevention missions

In fiscal year 2022 (FY22), ISN/CTR seeks to fund activities that support one or more these goals in Iraq:

- Strengthen the ability of the Government of Iraq and Kurdistan Regional Government to prevent, detect and respond to the misuse, exploitation, theft, diversion, or loss of WMD-applicable material, expertise, and equipment
- Create a holistic, "one-Iraq" counter-WMD threat capacity through GOI and KRG multisectoral engagements with ministries, academia, private industry, and security forces
- Improve coordination and interaction among Government of Iraq and Kurdistan Regional Government ministries and law enforcement, technical, medical, and first responder/first receiver communities on the detection and investigation of WMD attack plots
- Improve communication between biological and chemical laboratory networks
- Strengthen partnership and information sharing between public health, security authorities and other relevant sectors to facilitate coordinated WMD-attack response and attribution

Train Iraqi partners responsible for WMD attack prevention, detection, and response to:

- Interdict dual-use chemical and biological equipment and materials
- Address threats from rudimentary and easily accessible crude weapons (e.g., toxic gasses, radiological materials) to sophisticated chemical agents used on the battlefield (e.g., sulfur mustard)
- Enhance the ability of institutions to track the types of WMD-applicable material (chemical, biological, and radiological as appropriate) in their institution
- Enhance the security posture at vulnerable universities, laboratories, and other facilities housing dual use chemical, biological, or radiological materials or equipment including through the development or improvement of biosecurity and chemical security training programs, Standard Operating Procedures (SOPs), and human reliability/insider threat programs
- Ensure safe handling, storage, transportation, and neutralization/destruction of dual-use CB materials and waste
- Improve capability of first responders and hospital emergency units to identify morbidities related to a potential WMD attack and contain further WMD spread
- Develop and/or implement national and facility-level policies and programs to strengthen oversight of CB materials and related assets
- Institutionalize CB security by engaging appropriate academic societies to require training in CB security as both a graduating and continuing education requirement
- Strengthen radiological security practices within hospitals and the oil industry.

Support security of biological and chemical materials and related assets throughout the supply chain:

- Conduct trainings on identifying and addressing insider threats at CB facilities and other institutions storing, transferring, or otherwise handling CB and explosive materials, such as personnel reliability programs and incorporating insider threat awareness into security forces training programs
- Institutionalize "know-your-customer" programs at CB suppliers throughout Iraq, and encourage the incorporation of such stringent commercial review practices into local, regional, and national regulations and guidelines
- Implement trainings to identify and mitigate physical and procedural security gaps, to include facility-appropriate vulnerability assessment methodologies, at CB facilities and other institutions storing, transferring, or otherwise handling CB and explosive materials
- Install physical security upgrades at relevant facilities and institutions across Iraq to prevent unauthorized access to CB materials and related assets that could be weaponized, including neutralization protocols for high-risk materials

Prevent WMD attacks by promoting awareness of CB and explosive threats and adoption of threat mitigation best practices:

- Promote the adoption of chemical security norms, management standards, and responsible use policies, such as Responsible Care® and employee vetting.
- Enhance identification and mitigation of endemic, emerging, and re-emerging dangerous infectious disease threats caused by HCPs and pathogens with pandemic potential.
- Encourage adoption of biosecurity norms, including improvements across ministries of relevant institutions' biosecurity practices
- Improve understanding of, and compliance with, relevant nonproliferation treaty commitments and UN Security Council obligations, including the Chemical Weapons Convention, Biological Weapons Convention, and UNSCR 1540
- Increase broad awareness of Iraqi biological and chemical security policies, programs, and best practice information as well as coordination among relevant ministries and security agencies

Develop innovative strategies and explore novel tools to adapt to the constantly evolving WMD threat:

- Develop cost-effective, high-impact remote engagement strategies
- Develop innovative tools and proposals to address new and complex challenges (such as mapping in-country laboratories and industrial plants that hold dangerous chemical precursors or HCPs)
- Prevent chemical and potential biological casualties through enhancing incident command systems to improve chemical/biological security posture and counter terrorist groups.

Grant Award Information

Total available funding for this effort is anticipated to be $3,500,000. ISN/CTR estimates to make up to 30 awards in the form of Interagency and Cooperative Agreements, each with a 12 month performance period starting 1 October 2022. The funding is projected as part of the FY22/23 Nonproliferation, Anti-Terrorism, Demining and Related Activities Funds under the Foreign Assistance Act.

The following organizations are eligible to apply (both domestic and international):

- Not-for-profit organizations
- Public and private educational institutions
- For-profit organizations
- Federally funded research and development centers
- Public International Organizations

Pathways to a WMD-free zone in the Middle East

By Leonardo Bandarra and Sharon Dolev

Source: https://thebulletin.org/2021/12/pathways-to-a-wmd-free-zone-in-the-middle-east/

Dec 02 – This week, the Conference on the Establishment of a Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction (WMD) is holding its second meeting at UN headquarters. Despite the absence of Israel and the United States at the conference and at an earlier session in 2019, this year's meeting could lead to significant progress toward a WMD-free zone given recent changes in the Middle East security situation.

Those changes include the Abraham Accords formalizing relations between Israel and four other countries in the proposed zone, the new government coalition in Israel, the changing US policy toward the Iran nuclear deal, the rapprochement between Tehran and Riyadh, and progress on Libyan peace talks. These events have improved the prospects for dialogue among key actors in the region. Enormous challenges still remain, and at the moment it is difficult to envision any near-term agreement in which Israel would be willing to part with its nuclear weapons. Nevertheless, we see several possible pathways for moving the region toward a treaty establishing a WMD-free zone in the medium and long term. As of now, such a treaty is the best shot at a lasting solution to proliferation concerns in the Middle East.

A history of dialogue

Achieving a stable environment in the Middle East has been an international political priority for years. Talks on the elimination of WMD from the Middle East date back to 1974, when Iran and Egypt sponsored a resolution calling for a nuclear-weapon-free zone in the region. In 1990, Egypt expanded the scope of the resolution to cover all WMD and their delivery systems. Between 1991 and 1995, Israel and its Arab neighbors held multilateral negotiations known

as the Arms Control and Regional Security working group. In 1995, countries in the region included progress toward a WMD-free zone (WMDFZ) as a conditional part of a package extending the Nuclear Non-Proliferation Treaty indefinitely.
After the treaty forum failed to advance toward a WMDFZ, the UN General Assembly established the conference that met two years ago and is meeting again this week.
The complete elimination of all WMDs from the Middle East would ensure further dialogue in the region and build trust among countries. Such elimination should be based on enforceable and legal grounds and should include a regional organization that ensures compliance with the peaceful uses of dual-use technologies and serves as a forum where countries can convene periodically. This endeavor should address all three categories of WMD and build on and expand existing verification systems, using and reinforcing expertise from international organizations such as the International Atomic Energy Agency and the Organization for the Prohibition of Chemical Weapons.

Adhering to international regimes

Eliminating all WMD through a regional and institutional structure would be a revolutionary endeavor. There are currently nine Nuclear-Weapon-Free Zones established under international law, five of which are in populated areas, but none of these zones cover non-nuclear types of WMD, let alone create mechanisms to avoid their proliferation. However, there are a number of multilateral nonproliferation treaties that have laid the foundation for a future regional treaty architecture in the Middle East.
Those overarching treaties include the Chemical Weapons Convention, the Biological Weapons Convention, the Nuclear Non-Proliferation Treaty, the Comprehensive Nuclear Test Ban Treaty, and the Treaty on the Prohibition of Nuclear Weapons, as well as requirements from other legally binding instruments, such as UN Security Council Resolution 1540 regarding the nonproliferation of WMD. Almost all Middle Eastern countries are already parties to most of those treaties—or have at least signed them. However, some countries bind their accession to regional rivals doing the same or to a broader definition of peace in the region. Basically, nobody wants to be the first to give up any perceived advantage. A fast and effective negotiation, and subsequent establishment of a WMD-free zone, offers a way out of this conundrum.

Imagining the zone

Creating a WMDFZ in the Middle East is one of the rare items of consensus among countries in the region. How to achieve it is, nonetheless, unclear. Some experts argue for a series of topic-specific treaties—starting, for example, with a prohibition on chemical or nuclear weapons, or a limited sub-regional WMDFZ covering only the Persian Gulf. Although that approach has some advantages, it risks dividing energies and singling out specific countries in the process. A nuclear-free-only zone would, for example, be promptly rejected by Israel. A chemical-only prohibition would likely be rejected by countries, such as Egypt, that bind their accession to the Chemical Weapons Convention to Israel's renunciation of nuclear weapons. A WMDFZ covering Gulf States only would leave aside relevant players like Egypt, Israel, Syria, and Libya.
A more promising solution would be to stick to a wide-ranging regional treaty that would cover all three WMD categories and create an institution to ensure compliance with the treaty's obligations. This umbrella would cover, as agreed in the UN Conference, all 22 members of the Arab League plus Iran and Israel.
Countries could follow three pathways in negotiating an effective WMDFZ treaty. Each of these models would include a governance system capable of coordinating verification activities in multiple facilities, avoiding duplication of activities with other international organizations, and implementing compliance mechanisms to prevent cheating. Furthermore, all three pillars—nuclear, chemical, and biological—would be addressed with a review and verification system that aligns with international mechanisms to verify and inspect nuclear, chemical, and biological materials (although the latter mechanism hasn't yet been agreed on). The models differ mostly in one central aspect, namely the role of the new regional organization that would be created by the treaty.
The **first model** is based on an (almost) exclusive reliance on international inspections and safeguard regimes already established by the International Atomic Energy Agency and the Organization for the Prohibition of Chemical Weapons. A regional Middle Eastern organization would serve as a coordinator between these international agencies and a registry. This is how nuclear-weapon-free zones like those in Central Asia, Mongolia, and the South Pacific currently work. The lower institutionalization of this model makes it budget-saving and relatively easy to implement. Its main disadvantage is that it does not address the imbalance between existing verification systems for different categories of WMDs. Also, this approach would be a missed opportunity to create a forum that all Middle Eastern countries can join on a standing basis and thereby create future trust-building measures.
The **second model** would add to existing international regimes by creating a regional commission to regulate WMD-related dual-use technology. This commission could also request special inspections by international organizations and appoint members to

verification missions—or even create its own verification mechanism if necessary. Examples of this approach include the nuclear-weapon-free zones in Africa, Southeast Asia, and Latin America. In the first two cases, the regional commission is closely associated with existing international organizations—the African Union and the Association of Southeast Asian Nations—whereas the third zone created its own Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean. The main advantage of a regional commission is that it binds countries together in a volatile region where there are typically few other opportunities to convene. The full application of this model could, however, be harmed by the lack of an international mechanism to inspect biological materials, despite ongoing changes in the Biological Weapons Convention peer-review process.

The **third model** goes a step further by establishing a regional verification, safeguards, and compliance system. In the nuclear realm, a nuclear-weapon-free zone with a full regional safeguards system is nonexistent, notwithstanding the bilateral safeguards agency between Brazil and Argentina. The main disadvantages of this model are the cost of establishing a new system and the need to build bureaucratic capacity. It has the advantage of creating new institutional mechanisms that increase countries' accountability and mutual trust. It would make the Middle East a leader in the creation of regional solutions to chemical and, most innovatively, biological threats.

An all-encompassing WMDFZ treaty for the Middle East, grounded on a regional organization capable of monitoring the peaceful uses of dual-use technologies, is a worthwhile project that would contribute to achieving stability in the region and beyond. It would turn the Middle East from a region of global concern, where chemical weapons have been widely employed and where a potential nuclear-arms race could be unleashed at any moment, into a region with a legally binding and humanitarian-based regional security system, capable of dissolving former rivalries.

This week's meeting presents a rare opportunity for progress, which can be achieved through multiple pathways. This is all possible if we keep looking for the solutions instead of obsessing over the obstacles.

The authors are part of a group of experts and practitioners that is developing models for a WMDFZ Draft Treaty under the auspices of the Middle East Treaty Organization.

Leonardo Bandarra *is an associate at the German Institute for Global and Area Studies (GIGA) and a project associate research fellow at the Middle East Treaty Organization (METO). He holds a PhD in social sciences from the University of Göttingen, Germany; an MA and a BA in international relations from the University of Brasília; and a Diplôme d'Université in international nuclear law from the University of Montpellier, France.*

Sharon Dolev *is a peace and human rights activist with a focus on eradicating nuclear and other weapons of mass destruction from the Middle East through innovative policy, education, advocacy, and activism. She is the founder and director of the Israeli Disarmament Movement (IDM), a co-founder and executive director of the Middle East Treaty Organization (METO), and an Israeli campaigner for the 2017 Nobel Peace Prize-winning International Campaign to Abolish Nuclear Weapons (ICAN).*

EDITOR'S COMMENT: I was expecting to read, among others, the word "Turkey" in this article. Instead, I read only about "Israel". Perhaps objectivity should be given equall attention to WMDFZ ambitions.

Putin accuses Poland of using pesticides against refugees on Belarus border

Source: https://www.athina984.gr/en/2021/12/05/o-poytin-katiggeile-tin-polonia-oti-chrisimopoiei-fytofarmaka-enantion-ton-prosfygon-sta-synora-me-ti-leykorosia/

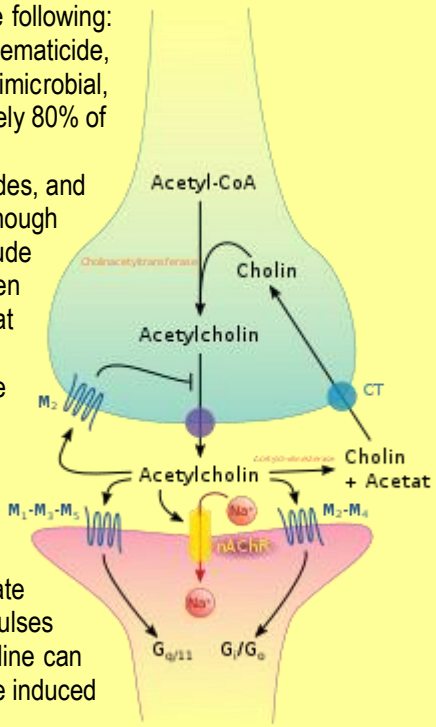
Dec 12 – Russian President Vladimir Putin has called for the depoliticisation of the refugee situation on the Polish-Belarusian border and against the use of pesticides and other chemicals in the water, in which he claimed that Polish authorities were spraying people in a teleconference. Francesco Roca Red Cross.

"It is not allowed to splash people not only with water, but also to mix pesticides and herbicides in this water in order to cause burns and other serious damage to these migrants, including women and young children. This is no longer in any way in line with the principles of humanitarian treatment of migrants. How many people have already died at the border and are buried there. Burials take place almost daily. "It's just a disaster, you also have to turn your attention to it." refugee problem.

The Russian president stressed that there are no flows of migrants to Europe through Russian territory and called on the Red Cross to continue to adhere to its firm principles, the depoliticization of the situation, as the problem is widespread.

"There are about 5.000 migrants in Belarus. 54.000 passed through Italy this year. "Do we not now see a crisis on the French-British border and mutual accusations between these countries?" "The situation on the Polish-Belarusian border will gradually ease and return to normal, although of course there are still people whose fate has not been determined."
The Russian president expressed his special concern for young children, as "it is impossible to look calmly when you see that in almost winter conditions they are forced to spend the night in the countryside" and described the action of the International Committee of the Red Cross and cooperation with his organizations in Belarus and Russia to end the suffering of the people.
President Putin pledged his full support to the International Committee of the Red Cross and Red Crescent during a lengthy and very warm conversation with Francesco Roca and reiterated his support for the Belarussian government, saying "it does everything in its power. persuading people to return voluntarily to their places of permanent residence, to their homeland and, first of all, to Iraq, but we need to, in the most careful and appropriate way, monitor what is happening at the border and what the authorities of the neighboring state are doing, in our case Poland ".
Putin praised the Red Cross action as "extremely important for all humanity, especially now, in the time of the pandemic", as well as the fundamental principles of the international voluntary movement, humanity and neutrality, which knows no borders, while Rota exposed areas of the international organization's activity both in the crisis on the Poland-Belarus border through its Minsk branch and worldwide. He also referred to the need for "fair access to vaccination" especially in the most vulnerable countries and populations of the world, with the first refugees and migrants, including the provision of free Russian vaccines Sputnik, which he discussed with the Russian government in the relevant program, the implementation of which was supported by the Kremlin leader.

Pesticides are substances that are meant to control pests. The term pesticide includes all of the following: herbicide, insecticides (which may include insect growth regulators, termiticides, etc.) nematicide, molluscicide, piscicide, avicide, rodenticide, bactericide, insect repellent, animal repellent, antimicrobial, fungicide, and lampricide. The most common of these are herbicides which account for approximately 80% of all pesticide use.
Pesticides can be classified by target organism (e.g., herbicides, insecticides, fungicides, rodenticides, and pediculicides), chemical structure (e.g., organic, inorganic, synthetic, or biological (biopesticide), although the distinction can sometimes blur), and physical state (e.g. gaseous (fumigant)).Biopesticides include microbial pesticides and biochemical pesticides. Plant-derived pesticides, or "botanicals", have been developing quickly. These include the pyrethroids, rotenoids, nicotinoids, and a fourth group that includes strychnine and scilliroside.
Many pesticides can be grouped into chemical families. Prominent insecticide families include organochlorines, organophosphates, and carbamates.
Organochlorine hydrocarbons (e.g., DDT) could be separated into dichlorodiphenyl ethanes, cyclodiene compounds, and other related compounds. They operate by disrupting the sodium/potassium balance of the nerve fiber, forcing the nerve to transmit continuously. Their toxicities vary greatly, but they have been phased out because of their persistence and potential to bioaccumulate. Organophosphate and carbamates largely replaced organochlorines. Both operate through inhibiting the enzyme acetylcholinesterase, allowing acetylcholine to transfer nerve impulses indefinitely and causing a variety of symptoms such as weakness or paralysis. Excess acetylcholine can lead to symptoms like muscle cramps or tremors, confusion, dizziness and nausea (similar to those induced by nerve agents).

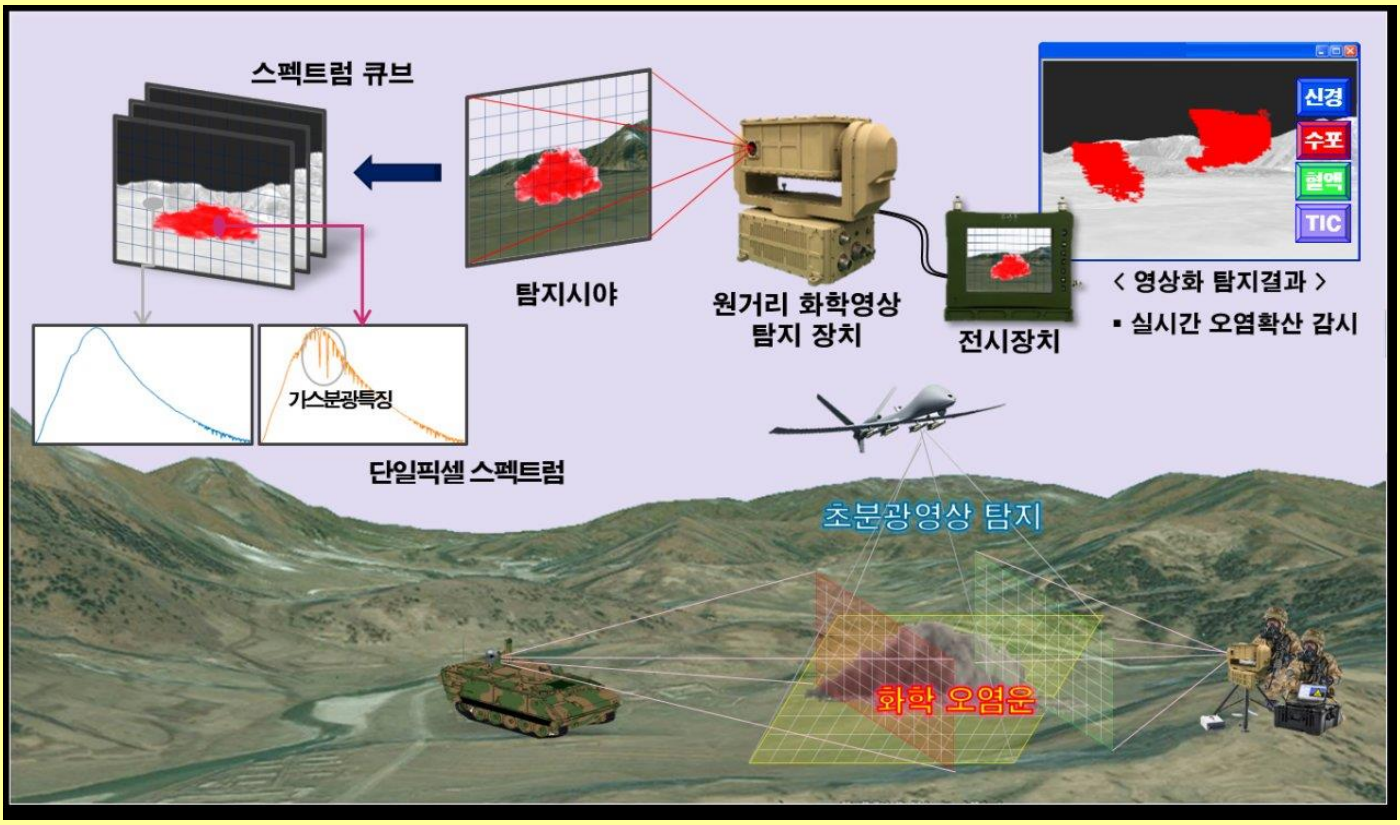


S. Korea develops real-time, standoff chemical warfare agent detector

Source: http://www.koreaherald.com/view.php?ud=20211208000645

Dec 08 – South Korea has developed its first homegrown technology for early detection of chemical weapons attacks at long distances, the state-run weapons development agency announced Wednesday.
The Agency for Defense Development said it had independently secured a “Hyperspectral Imaging Stand-off Chemical Agent Detection System,” which provides early warnings by monitoring and identifying the transmission of Chemical Warfare Agents or CWAs in contaminant plumes.

The new remote sensing technology monitors the spread of contamination in real time in case of chemical attacks, by analyzing 2D images and spectral information of infrared radiation. The technology now enables South Korea to visualize the spreading path of chemical agents.



According to the ADD, Seoul is expected to "secure the ability to quickly and effectively respond to chemical weapons threats," and minimize the damage of chemical attacks based on the new technology.

The portable and lightweight chemical warfare agent detector can be installed on a variety of platforms, including manned and unmanned reconnaissance systems.

The ADD said it would work toward applying the secured technology to the development of "weapons systems" for detecting chemical agents with a hyperspectral imaging infrared sensor.

The technology used in the detectors will be "actively" transferred to related private companies, the agency added.

The agency also said it would seek to focus on enhancing military strength and private-public joint readiness capabilities against terrorism. And as part of efforts, the agency will develop core technology for remotely detecting biological warfare agents.

The ADD explained that the chemical agent detector was the outcome of a research and development project initiated in 2012 as part of the core technology project spearheaded by South Korea's Defense Acquisition Program Administration.

The agency said the chemical agent early detection equipment was developed for various purposes, including chemical accidents where hazardous substances leak.

But the development of such technology is noteworthy considering North Korea's enhanced chemical and biological weapons capabilities.

The Pentagon particularly said North Korea was the "third-largest possessor of chemical agents in the world" in its report on North Korean Tactics released in July last year.

In the report, the US Army estimated that Pyongyang possesses 2,500–5,000 metric tons of chemical weapons and develops 20 different types of chemical weapons programs, including the highly toxic sarin and VX chemical agents. The US Army also braced for the possibility of Pyongyang using chemical artillery shells.

In general, South Korea's ADD has stepped up its efforts to take countermeasures to terrorism, including attacks with chemical, biological, and radiological or CBR weapons.

Seoul has also developed technology for predicting the transmission path of CBR agents in real time and quickly taking measures in case of attacks. The agency announced the technical development in late October as the outcome of the three-year project starting in 2018.

The technology aims to help the country to have a more accurate understanding of the situation in the event of CBR attacks, by providing high-resolution images of contamination and transmission path of CBR agents across the country including populated downtown areas.

The ADD said Seoul would be able to enhance disaster response capabilities and minimize damage to the public, government agencies, and the military in the event of CBR warfare.

Ensuring Coast Guard Can 'Strike' Fast During HAZMAT Incidents

Source: https://www.dhs.gov/science-and-technology/news/2021/12/09/feature-article-ensuring-coast-guard-can-strike-fast-during-hazmat-incidents

Dec 09 – Getting quickly to the scene of a hazardous material (HAZMAT) incident is critical—whether it's an oil spill or release of chemical, biological, or radiological materials.

During a HAZMAT response, the U.S. Coast Guard's National Strike Force (NSF), comprised of five specialized units of first responders, are ready to rapidly deploy to the scene properly

equipped to protect the public and environment. These units are unique, highly-trained teams deployable to anywhere in the country and around the world.

In 2021, the Coast Guard National Strike Force Coordination Center, the parent unit to the five strike teams, asked the Science and Technology Directorate's (S&T) Chemical Security Analysis Center (CSAC) to evaluate the unit's existing chemical-detection technologies. CSAC reviewed and analyzed the NSF's equipment and technologies ensuring a wide range detection of hazardous chemicals and toxins.

"The Coast Guard has a vital mission to facilitate preparedness for and response to hazardous substance incidents to protect public health and the environment," said Helen Mearns, deputy director of CSAC. "CSAC is honored to partner with the National Strike Force to help fulfill its mission and thus strengthen the overall security of the United States."

The NSF is the only Coast Guard resource that can quickly deploy, assess, and mitigate large-scale HAZMAT incidents. The team possesses a unique skillset and specialized equipment to detect and identify suspected hazardous substances like toxic industrial chemicals or chemical warfare agents. For example, during a chemical incident such as a chlorine leak, an NSF strike team can deploy upon request of a Federal On Scene Coordinator to initially establish a safe perimeter using plume trajectory models and conduct perimeter air monitoring to ensure the safety of the public. Once a perimeter is established, strike team personnel in HAZMAT suits can enter the area to secure the source of the release. For incidents with unknown chemicals, the NSF is specially trained and equipped with a wide array of capabilities to detect and identify hazards.

To deal efficiently with accidental or intentional releases of hazardous materials, the NSF periodically evaluates their specialized equipment and confirms it is working as intended.

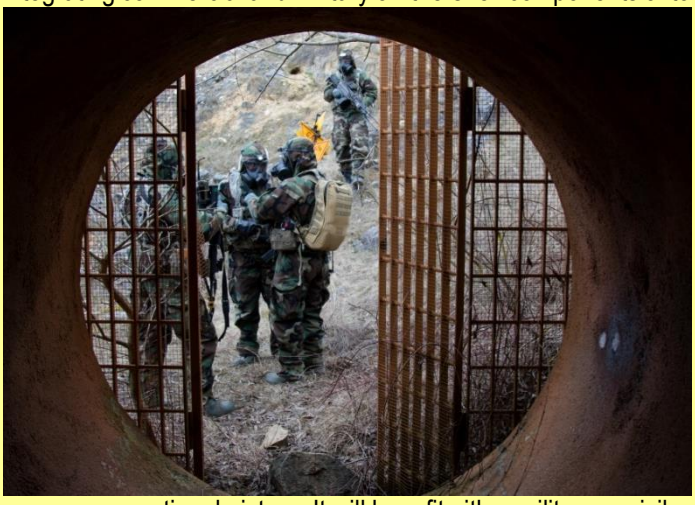
"We provided the Coast Guard with a comprehensive gap assessment of their current chemical-detection capabilities," said Jessica Cox, CSAC program manager and lead

chemist. "The relationship that the Coast Guard National Strike Force and CSAC have developed will help improve support for the National Strike Force's critical ongoing evaluation needs and upcoming training exercises."
As part of its initial request, the NSF asked CSAC to evaluate a number of chemical and biological detection technologies or kits. CSAC assessed them against 136 select chemicals and eight biological threats (like toxins and microorganisms) and categorized them into different groups.
To start the evaluation process, Dr. Carol Brevett, a CSAC principal scientist, conducted a detailed analysis of hazardous chemicals that are part of the S&T Chemical Threat Characterization (CTC) program. She then created a list of specific threat chemicals, pertinent to NSF's mission, based on prevalence, risk assessment, and requested chemicals of interest (e.g., chlorine, ammonia and pesticides).
"The CTC Toxic Chemicals of Concern List consists of 184 chemicals that encompass chemical warfare agents, pharmaceutical-based agents, and toxic industrial chemicals, which span a range of solid, liquid and gaseous materials. The substances used for this analysis were a subset of the CTC toxic chemicals of concern list that are pertinent to the Coast Guard NSF mission space," said Brevett.
In the next step, CSAC chemist Dr. Jerry Cabalo cross-referenced this list of threat chemicals and the concentration levels at which they become dangerous to human life and health against the reported performance of each of the NSF's detection technologies. He then produced an analysis of the technical challenges of the unit's equipment and technologies.
"For example, one technology used by the National Strike Force required users to know beforehand if a threat chemical might be present and whether tubes with an indicator for that specific chemical are available," said Cabalo. "Knowing beforehand is a limitation that can be overcome if, for example, first responders know that a chemical plant using methyl isocyanate is leaking. Then they can select the appropriate tube. But if the toxic substance is unknown, selection of the right tubes would be a gamble."
The CSAC analysis revealed both the capabilities and the limitations of various technologies used by the NSF.
"We reported the results in a quick stoplight matrix chart to rapidly evaluate which threats they could detect below levels of immediate danger to life and/or health, and which threats they couldn't," said Cabalo.
"This information allows the National Strike Force to focus resources on filling in the gaps and enhancing detection in the areas they are lacking to improve their response capabilities," added Cox.
Even after this analysis and evaluation was completed, S&T CSAC continues to provide support to meet the future needs of the NSF, including the improvement and optimization of emerging technologies and detection equipment.

CBRN Surveillance as a Service (CBRN SaaS)

Source: https://cbrnecentral.com/eda-spotlight-cbrn-surveillance-as-a-service-cbrn-saas/25666/

CBRN Surveillance as a Service (CBRN SaaS) aims for an especially important goal: to come up with concepts for combining and integrating commercial and military off-the-shelf components onto unmanned aerial and ground vehicles in order to detect and identify Chemical, Biological, Radiological and Nuclear (CBRN) threats and create a recognized CBRN picture.



Launched in 2018, CBRN SaaS brings together Austria, as the lead country, with four European Defence Agency (EDA) Member States: Croatia, France, Hungary and Slovenia.

Members of the Slovenian CBRN Decontamination Unit work with U.S. CBRN forces to search a cave during a simulated CBRN contamination during Allied Spirit VI at Joint Multinational Readiness Center, Hohenfels Training Area, Germany. Photo: Sgt. William Frye

With prototyping pegged for 2023, the project will demonstrate the viability of a rapidly deployable, 24/7 CBRN surveillance plug-in module to augment a common operational picture. It will benefit either military or civil security users, and thus can be used across a wide range of missions.
A crucial technical challenge will be to ensure that future capabilities emerging from the project are interoperable with national legacy CBRN surveillance systems.

CBRN SaaS's main deliverables will be a technological demonstrator that provides a proof of concept; a roadmap identifying what future modules could be developed; a concept of operations; and a service availability concept to reach the full operational capability.

Virtual Reality CBRN Training for Polish Chemical Forces

Source: https://cbrnecentral.com/virtual-reality-cbrn-training-for-polish-chemical-forces/25656/

Scientists at the Akademia Sztuki Wojennej (ASzWoj) Center for Simulation and Computer War Games are exploring the full potential of virtual reality (VR) and augmented reality (AR) training for military forces, including for Polish chemical forces training.

One example under development is a virtual chemical, biological, radiological and nuclear (CBRN) training island research and development project by Paweł Maciejewski, PhD. and Małgorzata Gawlik-Kobylińska, PhD.

Their effort aims to provide a VR preparatory training experience, preceding the practical training in the Chemical Training Center in Drawsko-Pomorskie.

"The learning process is taking place in the synchronous and asynchronous mode and is supervised by an instructor who assesses whether the trainees have reached the level required for training in the situation of real contamination," says Gawlik-Kobylińska. "This shows how the VR and AR tools give a possibility to create safe and controlled learning environment, and painless learning on your own mistakes."

AVON CH15 wins design award

Source: https://www.avon-protection.com/articles/news-ch15-compact-cbrn-escape-hood-wins-best-international-industrial-product-design-award/5353

Dec 03 – Avon Protection were delighted to pick up an award at The Plastics Industry Awards event on 2nd December for the Best International Industrial Product Design 2021 for the CH15 Compact CBRN Escape Hood.

Now in its 20th year, the Plastics Industry Awards is the forum for recognising and rewarding excellence in an increasingly competitive market. Launched in 2001, and held annually in London, this event is dedicated to rewarding innovation and exceptional performance.

"The Plastics Industry Awards are renown for acknowledging the best companies and the best people in the market, so to be selected as overall winner in the Best International Industrial Product Design category for the CH15 is a tremendous achievement and demonstrates the revolutionary and compact design features of the product," commented Tom Williams, Global Product Manager.

The CH15 escape hood is an ultra-thin, single size respiratory escape device that provides a minimum of 15 minutes of respiratory, vision and facial protection against Chemical, Biological, Radiological and Nuclear (CBRN) threats.
The last decade has clearly demonstrated how the CBRN threat profile has changed significantly. Today most threats are unplanned and the CH15 is a development driven after an emerging requirement from specialist users to have available instant protection from all CBRN materials when in a live threat scenario. Developed in conjunction with the US government Combating Terrorism Technical Support Office (CTTSO), the CH15 escape hood provides rapid deployment respiratory protection for military, first responders and protective detail.
One of the key design objectives was to reduce the number of components compared to the previous generation product, in particular the plastic componentry, which led to an overall reduction in mass by 22%. This was achieved through multiple design innovations surrounding the filter design as well as the hood and nose-cup design.
Nick Hunter, Senior Design Engineer, said: "With the CH15 we set out to create the lowest profile, lightest weight, one size fits all 15-minute CBRN escape respirator available. The development journey has proven to be very challenging; we were battling over every millimetre to reduce the product thickness whilst meeting the strict product performance requirements. Achieving our goal has required innovative design approaches, creative engineering and pushing the boundaries of materials science and manufacturing methods. Ultimately, we have delivered a key benefit to our end users that the CH15 can always be on hand for the unexpected."

What is "health" protective clothing?

Source: https://ouvry.com/en/what-is-health-protective-clothing/

In a recent article, Bruno Garrigue raises the question of the sizing of protective clothing for health care personnel, whether they are in hospitals, outside hospitals, on external missions, on humanitarian missions, etc.
If there are PPE (Personal Protective Equipment) well adapted to the risks incurred, for example for firemen, the military, industrialists, the agricultural sector, it turns out that, for

the moment, there is no clothing adapted to the specific risks incurred by health care workers who have to perform medical procedures sometimes in difficult climatic conditions or in a chemically or biologically contaminated environment.
Bruno Garrigue asks the following question: in a contaminated environment, either voluntarily during an act of biological aggression, or involuntarily in the case of a pandemic for example, what could be an adapted PPE allowing to protect the caregiver while leaving him free to perform medical care? If the knowledge of the biological agent, and in particular its mode of transmission (droplets, aerosols, biological liquids…) allows to adapt the protection as well as possible, it sometimes happens that its ignorance can be the source of an overprotection or worse, of an under-protection of the personnel.
In this blog, we have already addressed the problem of PPE used in EBOLA outbreak areas: see the corresponding article.

In the event of a fatal risk, the PPE must be category III
Currently, caregivers can wear 2 types of suits initially adapted to CBRN risks
● waterproof or impermeable type 3 (resistant to liquid in the form of a high-pressure jet).
Completely waterproof, they are "a priori" reassuring but they have many disadvantages. Particularly uncomfortable, especially in hot countries, when worn for a long time they can cause hyperthermia and require a high turnover of personnel. On the other hand, the entry of contaminated air by pumping effect at the interfaces is a definite disadvantage. Single use, they are inexpensive but produce a lot of waste;
● type 4 filtering, which can handle liquids in the form of sprays, allow perspiration to evaporate and thus improve thermoregulation. Without pumping effect, they capture the contaminant coming from outside thanks to a filtering media fixed under the external water-repellent envelope. Reusable, it produces much less waste.

What do the studies conducted on this "caregiver" theme tell us?
No serious study is able to clearly define the protective clothing to be worn by a caregiver during an outbreak. The materials available are often too protective and hinder the professional in his care activity, or too unprotective, exposing him to biological risks.
A large-scale bibliographical study has been carried out by Verbeel et al. but it gives contrasting results that are difficult to interpret. Although the authors agree that protective clothing is essential for healthcare workers, they note that the problem is much more complex than it appears. For example, a long suit will provide better protection than a simple apron, but putting it on and taking it off are crucial steps that can lead to contamination. Training must be developed and users must follow instructions correctly. Regarding respiratory protection, how to choose between paper masks and breathing apparatus, for which the interface with the suit will have to be adapted. This seems to be a major problem at the moment. On the other hand, studies show that PPE made of breathable textiles is preferred by users for its comfort.

What is happening in practice now?
The author gives us some current practices: in the Democratic Republic of Congo in 2019, in the context of an active Ebola outbreak, the members of a team taking care of war wounded were equipped with type 2 waterproof suits with integrated ventilatory apparatus, while those working in the Ebola treatment center and who did not perform surgical procedures, wore waterproof suits of which certain parts were reused (boots, apron, gloves, etc.), supplemented by disposable masks.
All these tight-fitting outfits, which are difficult to wear, also require the acquisition of specific skills, and therefore the implementation of a training program. In addition, their storage is important and waste management difficult.
Concerning the hospital gowns used against COVID-19, they are mainly light, disposable gowns (when they are not garbage bags cut up in case of supply shortage!) completed by a disposable ffp2 mask.

A specific outfit?
Bruno Garrigue also notes that the choice of the elements of an outfit adapted to a given situation wastes a lot of everyone's time.
All this leads the author to ask the question of a specific standard "caregivers" outfit, allowing to accomplish medical gestures in a biologically hostile environment. He gives the main characteristics of such an outfit, including

- ✓ simplicity of use (quick learning),
- ✓ comfort (therefore filtering),
- ✓ versatility (i.e., adaptable to various respiratory interfaces).

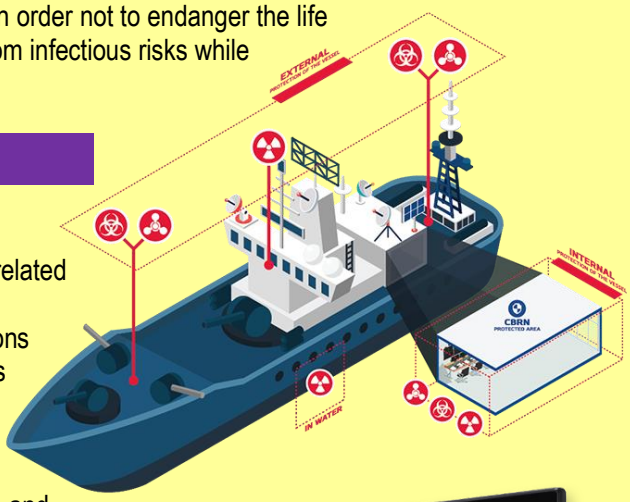
It should be reusable to limit storage and waste and declassified to facilitate export for NGOs.

Conclusion

It is true that the question deserves to be asked: caregivers have a difficult job, especially when they are on mission in hot countries in times of outbreak and must perform sometimes delicate medical procedures in order not to endanger the life of their patient. An adapted standard outfit would be welcome to protect them from infectious risks while being comfortable and generating as little storage and waste as possible.

Naval & Maritime CBRN Monitoring

Source: https://environics.fi/cbrn-solutions/naval-maritime-cbrn-monitoring/



CBRN threats can occur and be encountered in offshore, littoral and harbour related activities, in peace and wartime missions respectively.

Environics designs and supplies Naval & Maritime CBRN Monitoring Solutions globally, to a wide range of vessel types, ranging from the navy vessels such as Patrol Vessels, to Frigates, or even Amphibious Assault Ships. Our Naval & Maritime CBRN Monitoring Systems' components are compatible with Classification Society requirements.

Environics focus on providing early warning and protection from CBRN threats and their hazardous effects. Environics' Naval & Maritime CBRN Monitoring Systems deliver both situational awareness from detectors – independently and as a whole – as well as guidance by software. This enables the crew to perform further analyses and to counter threat events in a correct and timely manner.

Why Choose Naval & Maritime CBRN Monitoring Systems

- *Meets Classification Society requirements*
- *Robust product design for use in demanding environmental conditions*
- *Fast and reliable response*
- *System conceived with proven CBRN expertise*
- *Low life-cycle-cost*
- *Turnkey solution integration*
- *Full life-time support*

Usage Scenarios

Environics Naval & Maritime CBRN Monitoring systems are fully customizable and enable for preventing and minizing the consequences of a CBRN attack, allowing the continuation of the mission, by warning and protecting personnel from CBRN threats and their hazardous effects.

Chemical, Biological, Radiological and Nuclear Exercise ARZ 2021 (Beirut, Lebanon)

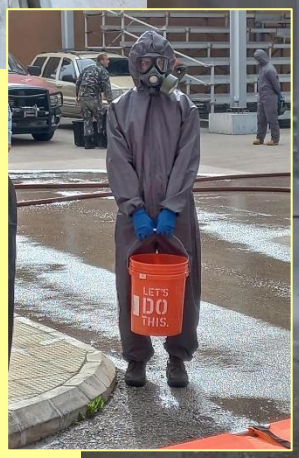
Source: http://www.unicri.it/News/Chemical-Biological-Radiological-Nuclear-Exercise-ARZ2021

Under the patronage of the President of the Council of Ministers of Lebanon, a 4-day inter-agency Chemical, Biological, Radiological and Nuclear field exercise "ARZ 2021" is taking place on 6-9 December 2021 in Beirut, Lebanon.

ARZ 2021, which focuses on countering CBRN terrorism, has been carried out under the leadership of the CBRN National Coordinator and the European Union Centres of Excellence (EU CBRN CoE) National Focal Point of Lebanon. The event is organized by the United Nations Interregional Crime and Justice Research Institute (UNICRI) in collaboration with the International Science and Technology Center (ISTC), Fondazione SAFE and the on-site assistance expert of the EU CBRN CoE.

The exercise is funded by the Directorate General FPI (Foreign Policy Instrument) of the European Commission within the framework of the EU CBRN CoE Initiative and aims to test

capacities of relevant stakeholders and promote interagency coordination and cooperation to prevent, detect and counter CBRN terrorism at the national level.
The participants include representatives from different sectors, institutions and agencies, including the Beirut Fire Fighters, the Civil Defence, the Internal Security Forces, the Lebanese Atomic Energy Commission, the, Lebanese Armed Forces and the Red Cross. Each participant plays a specific role in the simulation of real incidents, showing the different phases of a terrorism emergency which involve chemical, radiological and nuclear materials. The two scenarios of the exercise simulate the following situations:



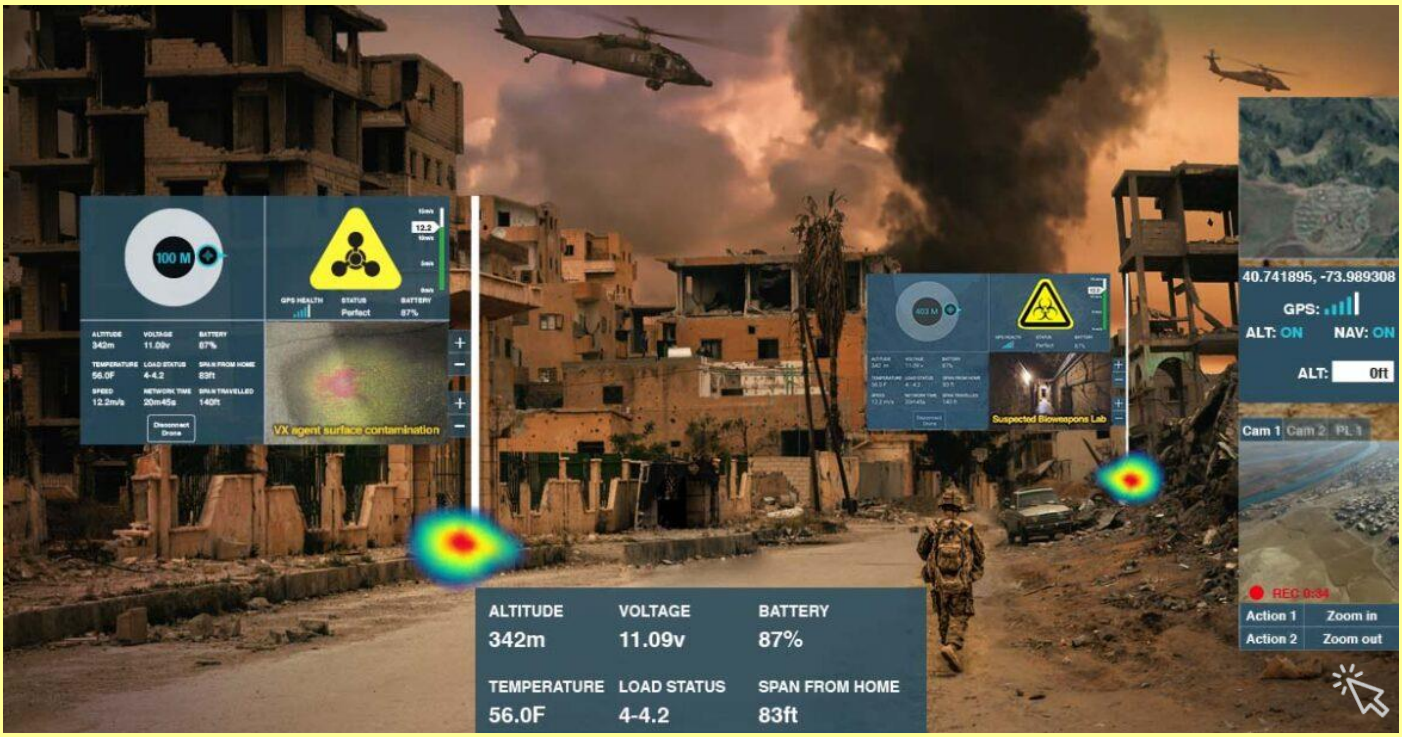
- Scenario 1: Illicit hazardous material storage and terrorist laboratory to produce chemical and biological warfare agents, dirty bombs and explosive devices.
- Scenario 2: Attack on a VIP convoy using chemical materials and explosive devices.

The overall development and implementation of the field exercise will be evaluated by representatives from the Organisation for the Prohibition of Chemical Weapons (OPCW), INTERPOL, NATO School, the French Police and the Italian Armed Forces.
Representatives from international partner organizations and countries are attending as observers, namely from the European Union, the European Commission Joint Research Centre (JRC), the CBRN CoE network, Canada, the United States, the League of Arab States and the United Nations Department of Safety and Security (UNDSS).

Visualizing Chemical Threats – New Capability

Source: https://i-hls.com/archives/112080

Dec 11 – Tools that see and sense harmful Chemical, Biological, Radiological and Nuclear (CBRN) substances are important for alerting military troops before anyone is hurt. The US military was looking for improved real-time CBRN situational awareness that will enable tactical assualt kit (TAK) users to see and avoid chemical and biological hazards.
In response, innovative battlefield threat mapping and visualization tools will be developed for the US Defense Threat Reduction Agency's Joint Science and Technology Office (DTRA JSTO). The technology will allow the capability to digitally map hazardous material threats from sensor data and to 'see' their exact location via mixed reality on mobile phones, tablets, and heads-up displays. Teledyne Flir will work with partners to develop software that allows CBRN hazards to be precisely located, measured and mapped for viewing within the Tactical Assault Kit suite of tools.
The threat map will be visualized in a 'see-through' augmented reality display by those running TAK on their electronics, as well as by futuristic HUD devices like the Integrated Visualization Augmentation System.



The project also will allow future individuals equipped with IVAS to visualize chemical-biological threats and receive real-time decision support when performing reconnaissance and decontamination missions.
The program further lays the Artificial Intelligence and AR groundwork for the U.S. Army's autonomous decontamination efforts.
The contract will fund the development of a mission-flexible prototype consisting of networked chem-bio sensors and AR visualization tools that DTRA will evaluate over the course of several events, according to optics.org.

Common household cleaning products could be modified to stop terrorists

Source: https://www.inentertainment.co.uk/common-household-cleaning-products-could-be-modified-to-stop-terrorists/

Dec 12 – Common Terrorists could modify household cleaners to make them explosive.
The Home Office is looking into ways to decrease the danger of chemical such as bleach or disinfectant being used for home-made bombs – as in the Manchester Arena attack which killed 22 people.

Philip Ingram, an explosives expert and former colonel in British military intelligence, said: 'It's frightening the number of substances that could easily be turned into something that goes bang.'
The Home Office is investigating how to reduce the risk of chemicals such as bleach and disinfectant being used in home-made bombs
He said the compound used in the Manchester Arena bombing – triacetone triperoxide – 'can be made from chemicals that, on their own, have nothing to do with explosives', adding: 'But if you put them together in the right order you can turn everyday household chemicals into highly explosive substances.'
Anti-terrorism laws require that shops and companies report any suspicious transactions.
The Home Office said: 'We have been working with industry to develop safer alternative substances to tackle evolving threats. We have robust measures which control access to explosive precursors and poisons, and strict licensing for the most dangerous substances.'
To stop terrorists from using common household cleaning products as explosives, they could be altered

Mr Ingram said: 'For most people, if they try to get hold of these chemicals it will immediately flag them to organisations who will send a lot of coppers with lots of weapons kicking their door at 5am.
'Unfortunately, the recipes for these explosives are still relatively easy to get.
'Every time security services or counter-terrorism police come across a new home-made explosive, they look at all the components –how they have been sourced, how they have been manufactured – and can they bring in different procedures to disrupt the ability of terrorists to turn these everyday items into explosives.'

How a Nerve Agent Killed Thousands of Sheep and Transformed Weapons Law in the US

Source: https://interestingengineering.com/nerve-agent-that-killed-thousands-of-sheep-and-transformed-weapons-law

Dec 11 – In 1942, the U.S. Army created the Dugway Proving Ground (DPG) in Utah's west desert, located 85 miles (137 k) southwest of Salt Lake City. It sat adjacent to the Utah Test and Training Range, a weapons development and testing facility, and together, the two sites form the largest overland special use airspace in the U.S.
Dugway's purpose was to test biological and chemical weapons, antidotes to those weapons, toxic agents, systems for spraying chemicals, and protective clothing. Dugway also tested flamethrowers and fire-bombing techniques.
In 1958, the U.S. Army moved its Chemical, Biological, and Radiological Weapons School to Dugway Proving Grounds. During the late 1950s and early 1960s, tests of weaponized mosquito-spread diseases were conducted at the site.
During the 1960s, it has been reported that almost half a million pounds (230,000 kg) of nerve agents were dispersed in open-air tests at Dugway, along with 328 open-air tests of biological weapons, and 74 tests of dirty bombs.

Meet "VX"
One of the nerve agents that was tested at Dugway was "VX", which is short for "venomous agent X." VX is an extremely toxic nerve agent that was first formulated during the 1950s by a chemist working for Imperial Chemical Industries and tested at England's super-secret Porton Down site, the location of the Ministry of Defence's Defence Science and Technology Laboratory.
Exposure to only 10 milligrams of VX via absorption through the skin, or 25 to 30 mg if inhaled, is enough to kill a human, making VX more potent than its cousin Sarin. Once exposed, VX disrupts the body's signaling mechanism by blocking an enzyme that allows glands and muscles to relax, causing muscles to clench uncontrollably and, eventually, prevent a victim from being able to breathe.
VX is categorized as a weapon of mass destruction by the United Nations, and it is banned from use under the Chemical Weapons Convention of 1993, but that hasn't stopped its use. On February 13, 2017, Kim Jong-nam, the half-brother of North Korea's leader Kim Jon-un, was attacked with VX at the Kuala Lumpur International Airport, in Malaysia.
A cloth soaked with VX was placed over Kim Jong-nam's face and he was sprayed in the face by two women, one Vietnamese and the other Indonesian. Despite being rushed to the hospital and aggressively treated, Kim died. When detained, the two women explained that they thought it had been a TV prank, and one served no jail time while the other served just one month before being released.

The Dugway sheep incident
On March 13, 1968, an A-4 Skyhawk attack aircraft with two TMU-28B spray tanks flew over the Dugway Proving Ground testing the aerial dispersion of VX. Each tank held 160 gallons of the nerve agent and, unfortunately, just after the "bombing run", one of the tank's aerosol nozzles malfunctioned, accidentally releasing a small amount of the agent at a much higher altitude, allowing a small stream of VX to be blown far from the testing grounds.
The nerve agent drifted into the neighboring Skull Valley, a farming community located just north of the Dugway Proving Ground. There, thousands of sheep were contentedly grazing on grass, until they weren't.
On the morning of March 14, 1968, the Tooele County Sheriff, Fay Gillette, received a call from a rancher telling him to come quick. What Gillette saw next was carnage, "Sheep laying all over. All of them down — patches of white as far as you could see."
On March 17, 1968, Keith Smart, chief of the Ecology and Epidemiology Department at Dugway was awakened at 12:30 a.m. by a call telling him over 6,000 sheep were lying dead in Skull Valley. Dugway immediately denied that it had been testing any chemical weapons, however, that assertion was contradicted on March 21, 1968, when Utah Senator Frank Moss made public a Pentagon report that described the spraying of 320 gallons of VX on March 13.

Those sheep not killed outright were, according to the journal *Science*, "generally act[ing] dazed, [with] their heads tilted down and off to the side, walk[ing] in a stilted, uncoordinated manner," before they too eventually died. The sheep's symptoms conformed exactly to those caused by poisoning by VX nerve gas. The National Communicable Disease Center in Atlanta tested water and grass from the Skull Valley area, as well as blood and livers of the dead sheep. Their tests "prove[ed] beyond doubt ..." that the deaths were caused by the Army's nerve agent. Quietly, the Army paid $376,685 to the rancher, Alvin Hatch, whose sheep accounted for 90% of those killed. They also sent bulldozers to Hatch's ranch to aid in the mass burial of the sheep. In February 1969, the TV network NBC broadcast a documentary about the Dugway sheep incident, and a congressman from New York named Richard McCarthy happened to see it. McCarthy was shocked, believing that chemical weapons had long ago been banned by an international agreement.

One big loophole

During World War I, all the major combatants used chemical weapons, to horrifying effect. More than 1 million soldiers were gassed, and more than 90,000 died. Following "The Great War," in 1925, 38 countries signed The Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare, which is known as the Geneva Protocol due to the location of its signing. As of April 2021, 146 states have ratified, acceded to, or succeeded to the Protocol. The treaty prohibited the use of chemical and biological weapons in international armed conflicts. It was signed on June 17, 1925, and entered into effect on February 8, 1928. It prohibits the use of "asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices" and "bacteriological methods of warfare". But, there was a loophole: although the United States signed the Geneva Protocol in 1925, it did not ratify the agreement until April 10, 1975, when the U.S. Congress finally approved the Protocol and it was proclaimed by President Gerald Ford. On top of this, the Protocol has nothing to say about production, storage, or transfer of chemical and biological weapons. Later treaties that covered these aspects — the Biological Weapons Convention and the Chemical Weapons Convention were not signed until 1972 and 1993. That left the U.S. free to ramp up its chemical weapons production and testing, especially between the years 1961 and 1969. So many chemical weapons were created that disposing of them became a problem, which was solved, in part, by dumping hundreds of thousands of tons of the chemicals into the ocean. Even worse, there was little official record keeping as to how much and where the weapons were dumped. For chemical weapons that were stored on land, it was discovered that many of their containers were leaking, including 21,000 leaky chemical bomb clusters at the Rocky Mountain Arsenal in Denver. In May 1969, Senator McCarthy, alerted by the news of the Dugway sheep kill, began congressional hearings on the U.S. chemical weapons program. Those hearings revealed that the program responsible for the disposal of the U.S.'s chemical weapons was named CHASE. This stood for "Cut Holes [in the containers] And Sink 'Em." In July 1969, just two months after Senator McCarthy's hearings, 24 people on the U.S.

military base on Okinawa became ill after exposure to a nerve gas agent which escaped its container through a small leak. The press attention eventually forced the Pentagon to admit that besides Okinawa and Dugway, open-air testing of the nerve agents Tabun, Sarin, Soman, VX, and mustard gas had been conducted at Edgewood Arsenal, Maryland, and Fort McClellan, Alabama.

Nerve agents still in use

As we've previously written, on March 4, 2018, a former Russian military officer and double agent named Sergei Skripal and his daughter Yulia were found collapsed on a bench outside a restaurant in Salisbury, England. When police officer Nick Bailey went to the Skripal's house to investigate, he too fell ill. Eventually, it was determined that the Skripals and Bailey were suffering the effects of the Novichok nerve agent, and it was alledged that two agents of Russia's G.R.U. Intelligence Service had slipped into the UK to conduct the attack, then slipped out again. They had carried the Novichok in a perfume bottle from a well-known brand, and following the attack, they discarded the bottle in a dumpster in the neighboring town of Amesbury. When Amesbury resident Charlie Rowley went dumpster diving, looking for something nice to give to his girlfriend Dawn Sturgess, he was delighted to come up with the perfume, which he gave to Sturgess, who sprayed it on herself. Rowley survived, but Sturgess wasn't so lucky, leaving behind a young daughter. It is also generally accepted that in February 2018, weaponized chlorine gas was used on two Syrian towns, Saraqueb in Idlib and Douma in eastern Ghouta. Previous chemical attacks by the Syrian government on its people have also been alleged. The Dugway sheep incident was portrayed in the 1972 movie, *Rage,* starring and directed by George C. Scott. Author Stephen King used the incident as the inspiration for his 1978 novel, *The Stand*.

Hellenic Joint NBC Battalion

Source: https://www.defencenet.gr/amyna/geetha/913445_iae-eidan-tis-dynatotites-toy-eidikoy-lohoy-pyrinikis-biologikis-himikis-amynas

Dec 12 – The capabilities of the Special Battalion of Nuclear - Biological - Chemical Defense (EDLO / PBX) were demonstrated in a delegation of 3 UAE Officers in Chaidari, Attica, from Monday 06 to Tuesday 07 December 2021 and in the context of the implementation of the

bilateral program. between Greece and the United Arab Emirates (UAE), under the auspices of the Directorate of Operations of National Defense General Staff (GEETHA/A1).

Is the U.S. Military Prepared for Chemical Warfare?

Source: https://nationalinterest.org/blog/reboot/us-military-prepared-chemical-warfare-197898

Dec 13 – The U.S. Army is worried its troops are not prepared for a biological or chemical attack. At the same time, chemical warfare is growing more common while it's becoming easier for terrorists to cook up home-brewed bio-weapons in their basements.

"Not a lot" of soldiers are good at "at donning their mask in nine seconds," Lt. Gen. Perry Wiggins, commander of U.S. Army North, told reporters Oct. 15 according to *Air Force* magazine. "We need to get back to the 'B' in CBRN."

Wiggins deployed the acronym for chemical, biological, radiological and nuclear weapons. His larger point? Troops were going under-trained for a poisonous battlefield after years of counter-insurgency warfare in Iraq and Afghanistan.

But in Iraq, chemical weapons — at least — were becoming more common. Insurgents attacked U.S. troops around two dozen times with chlorine weapons during the course of the war, according to the *New York Times*. Hundreds of American service members were exposed to blister and nerve agents discovered in leftover Iraqi army stockpiles.

This would end up paling in comparison to Syria's chemical war. On the morning of Aug. 21, 2013, the Syrian army fired bulbous, custom-made rockets loaded with sarin gas into rebel-controlled suburbs in eastern Damascus. Hundreds of people suffocated to death — most of them unarmed civilians.

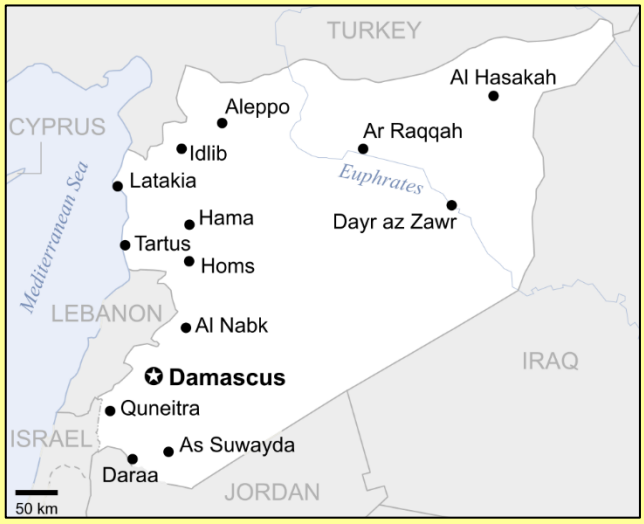
There's some evidence Islamic State has deployed chemical weapons in both Syria and against Kurdish forces in Iraq. These weapons are most likely chlorine and mustard gases, or another concoction that shares characteristics with them. It's not clear whether Islamic State cooked up the chemicals itself or captured them from the Syrian army. It could be some combination.

What's particularly unsettling is the repeated, scattered but credible reports of it from Kurdish forces on the receiving end. In short — we've entered a scary new age of low-level but *persistent* chemical warfare.
But Wiggins, the Army North commander, emphasized biological weapons as the greater threat. Perhaps a weaponized panflu, custom-built Henipavirus or modified MERS. Chemicals are easy to turn into a weapon, but tinkering with lethal organisms can sicken or, worst-case scenario, *kill* potentially millions of people.
"The threshold for participation in biotechnology is decreasing all the time: you don't need to be a college educated microbiologist to do this any more," Aaron Firoved, a senior biodefense adviser at the Department of Homeland Security, recently told the trade magazine *CBRNe World*.
Indeed, the U.S. Army's problem isn't just that soldiers don't put their masks on fast enough during exercises. Chemical and biological weapons are by nature difficult to detect. They are briefly visible, if at all, disparate and *insidious*. What they have in common is the ability to inflict mass casualties before the victims are even aware of what's happening.
In the 2009 manual *Combating Weapons of Mass Destruction* from the Army's Training and Doctrine Command, the branch noted 17 "deficiencies" in its ability to counter such attacks. These ranged from lacking the ability to detect chemical and biological weapons, determining who is responsible and knowing where to shoot back.
That's all on top of problems that come with soldiers having to fight in a bulky, kitted-out protective suit. Another problem — the Army "contracted a lot" of counter-CBRN work during the wars in Iraq and Afghanistan, Wiggins told *Air Force* magazine.

Israeli airstrikes in Syria targeted chemical weapons facilities, officials say

By Joby Warrick and Souad Mekhennet
Source: https://www.washingtonpost.com/national-security/israel-syria-chemical-weapons/2021/12/13/8ed0b02c-59ea-11ec-a808-3197a22b19fa_story.html

Dec 14 – Just after midnight on June 8, Israeli warplanes streaked across the country's northern frontier for a highly unusual airstrike deep inside Syrian territory. The jets fired missiles at three military targets near the cities of Damascus and Homs, killing seven soldiers, including a colonel described in local news accounts as a "hero martyr" and an engineer who worked at a top-secret Syrian military lab.



The Israel Defense Forces, following standard practice, declined to comment on the incursion into Syrian airspace. But intelligence analysts in Western capitals quickly observed a distinction in the operation: While previous Israeli attacks in Syria nearly always targeted Iranian proxy forces and arms shipments, the June 8 strike was aimed at Syrian military facilities — all with links to the country's former chemical weapons program.
An explanation emerged in the weeks that followed. According to current and former intelligence and security officials briefed on the matter, the June 8 strike was part of a campaign to stop what Israeli officials believe was a nascent attempt by Syria to restart its production of deadly nerve agents.
Israeli officials ordered the raid, and a similar one a year earlier, based on intelligence suggesting that Syria's government was acquiring chemical precursors and other supplies needed to rebuild the chemical-weapons capability that it had ostensibly given up eight years ago, according to four current and former U.S. and Western intelligence officials with access to sensitive intelligence at the time of the strikes. They spoke on the condition of anonymity to discuss classified material and their understanding of Israeli deliberations.
The attacks reflected grave concerns that arose within Israeli intelligence agencies beginning two years ago, after a successful attempt by Syria's military to import a key chemical that can be used to make deadly sarin nerve agent, the officials said. The worries grew as intelligence operatives spotted activity at multiple sites that pointed to a rebuilding effort, the officials said.
Asked for comment, Israeli officials would neither confirm the attacks nor elaborate on the reasons behind them. Syria strongly condemned the Israeli attacks at the time, and

government officials have repeatedly denied using, or making, chemical weapons since 2013.
Bassam Sabbagh, Syria's ambassador to the United Nations, said in address to the U.N. Security Council in October that Syria "categorically condemned and rejected any use of chemical weapons under any circumstance, by whomever, whenever and wherever."
The prospect of a reconstituted chemical weapons program in Syria is regarded as a direct threat to the security of Israel, and perhaps other neighboring countries. While Syrian leader Bashar al-Assad famously used chemical weapons against his own citizens dozens of times since the start of the country's civil war, Syria's once-vast chemical arsenal was originally intended for use in a future war with Israel.
"It is a strategic weapon for the regime," said a Western intelligence official, summarizing the consensus among spy agencies that closely monitor Syria's weapons procurement efforts.

Rebuilding a chemical weapons capability
The first of the two Israeli airstrikes occurred on March 5, 2020, and targeted a villa and compound in a suburb southeast of the city of Homs, about 100 miles north of Damascus, the officials said. Syria's third-largest city, Homs was a previous hub for Syria's chemical-weapons production.
The strike on the villa was directly tied to Syria's successful procurement the previous year of a large quantity of tricalcium phosphate, according to two Western intelligence officials. The chemical, commonly known as TCP, has numerous nonmilitary uses, including as a food additive. But it can be readily converted into phosphorous trichloride, a heavily regulated compound that is restricted from import into Syria because of its known use as a precursor for sarin and other nerve agents.
The ultimate recipient of the TCP, the officials said, was a Syrian military unit known as Branch 450, a division of Syria's top military laboratory, the Scientific Studies and Research Center. The SSRC oversaw production of Syria's chemical weapons from the 1980s until at least 2014, when the program was officially dismantled under an agreement brokered by the United States and Russia.
Intelligence intercepts in the months following the March 2020 strike led to the discovery of additional sites, and what Israelis believed to be an ongoing effort to rebuild Syria's chemical weapons capability, the two Western officials said.
"There were more signs of them going back into production," one of the officials said.
The June 8 strike targeted a military storage bunker near Nasiriyah, a desert village north of Damascus, and two additional sites near Homs. Of those two, one was described as an auxiliary facility for the SSRC's military laboratory in Masyaf, about 40 miles northwest of Homs.
Syrian news reports listed seven military casualties from that strike, including a Syrian colonel — posthumously promoted to brigadier general — identified as the "hero martyr" Ayham Ismail. The dead officer was said to be a military engineer assigned to the Masyaf complex. Whether the attacks were fully successful in disrupting Syria's plans is unclear. Israeli officials intended the strikes to be preemptive, knocking out the country's production capabilities before actual weapons could be made, the two Western intelligence officials said. Any effort to bomb an existing stockpile of nerve agents risks unleashing plumes of lethal gases that can spread to nearby towns and villages. Senior officials in both the Trump and Biden administrations became aware of the attacks and the underlying intelligence shortly after the strikes, current and former officials said. U.S. intelligence officials long suspected that Syria was retaining, if not rebuilding, key aspects of its chemical-weapons capability. State Department officials in 2019 publicly accused Syria of secretly continuing its program, citing in particular a chlorine-gas attack against opposition fighters that year.
The Biden White House is nearing completion of a comprehensive Syria policy review, one that is expected to call for punishing Assad for both past and ongoing violations of Syria's treaty obligations under the Chemical Weapons Convention.
"The administration has stated that it will hold Assad accountable for his actions," said Ambassador James Jeffrey, a veteran U.S. diplomat who oversaw diplomacy with Syria during the final two years of the Trump administration. "This should certainly include the evidence presented by [then-Secretary of State Mike] Pompeo and others . . . that Assad is trying to reconstitute his chemical weapons." Human rights groups and independent investigators have previously accused the Assad regime of maintaining at least a latent ability to attack civilians with poison gases.
"Syria still has a chemical weapons stockpile, retains the capacity to produce chemical weapons today, and has the ability to carry out chemical weapons attacks on civilians," said Steve Kostas, a lawyer for the Open Society Justice Initiative, a nonprofit that seeks prosecution for perpetrators of chemical warfare. Kostas cited as evidence Syria's "undeclared production capacity" and repeated efforts to obstruct fact-finding missions by the Organization for the Prohibition of Chemical Weapons, the international watchdog based in The Hague that investigates chemical attacks. At the time of the outbreak of Syria's civil war in 2011, Damascus controlled one of the world's largest and most advanced stockpiles of chemical weapons, including hundreds of tons of binary sarin and VX, two of the deadliest chemical warfare agents ever made. The

Syrian government repurposed its chemical arsenal for use in attacks against anti-Assad rebels, and it shocked the world in August 2013 with a massive sarin attack that killed an estimated 1,400 civilians — mostly women and children — in the Damascus suburbs. Faced with a threatened military strike by President Barack Obama, Assad agreed to renounce chemical weapons and to allow international inspectors to oversee the destruction of his entire weapons stockpile, along with all production centers and manufacturing equipment.

In an unprecedented international operation, some 1,300 tons of chemical agents were hauled out of Syria to be destroyed in incinerators aboard a specially modified U.S. ship in the Mediterranean Sea. Yet Assad continued to use chemical weapons — chiefly the common industrial chemical chlorine, a crude substitute for deadlier nerve agents — in more than 200 attacks against rebel strongholds. The attacks persisted despite warnings by the Obama administration and despite two airstrikes on Syrian military installations ordered by President Donald Trump. Assad also preserved a small portion of his sarin stockpile and used some of it on at least two occasions after 2017, U.S. intelligence officials later concluded. Since 2018, there have been numerous reports about alleged Syrian efforts to manufacture new chemical weapons, but without proof.

Weapons experts note that allegations about secret biological and chemical programs often turn out to be inaccurate, as U.S. intelligence agencies discovered after the U.S. invasion of Iraq in 2003. Syria's efforts to obtain the dual-use chemical TCP is not, on its own, a smoking gun, observed Greg Koblentz, an associate professor and biodefense expert at George Mason University's Schar School of Policy and Government. "Syria's procurement of this chemical, even through black-market channels, is not indicative of a nefarious purpose," Koblentz said. In the case of Syria, however, the allegation appears more credible because of the Assad regime's well-established record of cheating on its treaty obligations, he said. "Syria has been hiding key components of its chemical weapons program ever since it signed the Chemical Weapons Convention in 2013," Koblentz said.

In the beginning, Assad may have decided to preserve his best weapons as a kind of insurance policy against the collapse of the regime. But now that Syria has regained control over most of its territory, he said, "it makes sense that the Assad regime would want to rebuild its chemical-weapons program to serve once again as a strategic deterrent against its longtime adversary, Israel."

***Joby Warrick** joined The Washington Post's National staff in 1996. He has served with the Post's investigative and national security teams and writes about the Middle East, terrorism and weapons proliferation. He is the author of three books, including "Black Flags: The Rise of ISIS," which was awarded a 2016 Pulitzer Prize for nonfiction.*
***Souad Mekhennet** is a correspondent on the national security desk. She is the author of "I Was Told to Come Alone: My Journey Behind the Lines of Jihad," and she has reported on terrorism for the New York Times, the International Herald Tribune and NPR.*

Did Israeli bombing destroy evidence of chemical weapons in Syria?

Source: https://al-bab.com/blog/2021/12/did-israeli-bombing-destroy-evidence-chemical-weapons-syria

Dec 14 – A report in the Washington Post yesterday appears to confirm Syrian claims that Israel bombed chemical weapons facilities in the country last June – thus destroying evidence sought by OPCW investigators.

Satellite image showing location of the Nasiriyah chemical weapons site

Although the paper's story is based on unnamed intelligence sources, information from elsewhere suggests it's probably true. Syrian government media reported Israeli bombing at the time (though without mentioning a chemical weapons connection) and satellite imagery shows one of the sites, known as Nasiriyah1, was damaged sometime between June 6 and 9. The bombing is said to have occurred shortly before midnight on June 8.

A month later, Syria sent a one-page note to the OPCW – the global chemical weapons watchdog – saying the Nasiriyah site had been "flagrantly attacked by the Israeli enemy using missiles". It also said the attack had destroyed two gas cylinders at the centre of OPCW investigations into an alleged chlorine attack on Douma in 2018.

Syria joined the Chemical Weapons Convention in 2013 under international pressure following a nerve agent attack on Ghouta which killed hundreds of people. Joining the Convention meant it then had to declare all chemical weapons in its possession, together with the production facilities, and destroy them under OPCW supervision. The regime's initial declaration was incomplete and eight years later, despite some additions, OPCW inspectors have still not certified it as complete. Further investigations have shown that Syria retained some of its stockpile and/or secretly resumed production. The Nasiriyah site was of particular interest to the OPCW because it housed one of several chemical weapons production facilities which had been sealed after Syria declared them. Although the regime claims the Nasiryah site had never begun production the OPCW has since discovered evidence casting doubt on that claim. According to the regime, the two cylinders from Douma were among "losses" sustained in the Nasiriyah attack. The OPCW had been seeking to transport them to its headquarters in the Hague for forensic examination but the Syrian authorities were refusing to allow them out of the country. As a result of that stand-off the cylinders had been placed in sealed containers and stored at a location 60km from Nasiriyah. The Syrians were told not to tamper with them or move them without written consent from the OPCW.
So far, Syria has refused to explain how the cylinders came to be in Nasiryah – and we only have the regime's word that they were actually there. Blaming Israel for their destruction does seem a rather convenient way of eliminating them from the OPCW's ongoing investigation. Surprisingly, the Washington Post's account does not mention the difficulties Israel's alleged bombing has caused for the OPCW. Israel is known to carry out attacks in Syria from time to time, though it doesn't discuss them publicly. They mostly target Iranian-linked elements operating in the country. The Washington Post says Israel decided to attack chemical facilities because of "grave concerns" that a reconstituted chemical weapons programme in Syria would pose a direct threat its security.
The Israeli concerns are said to have begun two years ago when Syria imported large quantities of tricalcium phosphate (TCP) – a chemical which has plenty of civilian uses but can be easily converted into phosphorus trichloride, a precursor for the nerve agent sarin. As a result of that discovery, according to the Washington Post, Israel bombed a site near Homs in March 2020.
It's unclear why the TCP was seen as a threat to Israel specifically. Syria has had chemical weapons since the 1970s and although it originally began developing them as a relatively cheap way of countering Israel's nuclear weapons progamme, it has so far only used them against its own citizens. Whether Israel's reported fears were well-founded or not, unilateral action of this kind undermines collective efforts to police the Chemical Weapons Convention through the OPCW – the international body created for that task. Israel, however, is not a full member of the Convention. It signed in 1993 but has never ratified. Three other countries – Egypt, South Sudan and North Korea have neither signed nor ratified.

'Syria won't hesitate to use chemical weapons against Israel,' says former IDF general

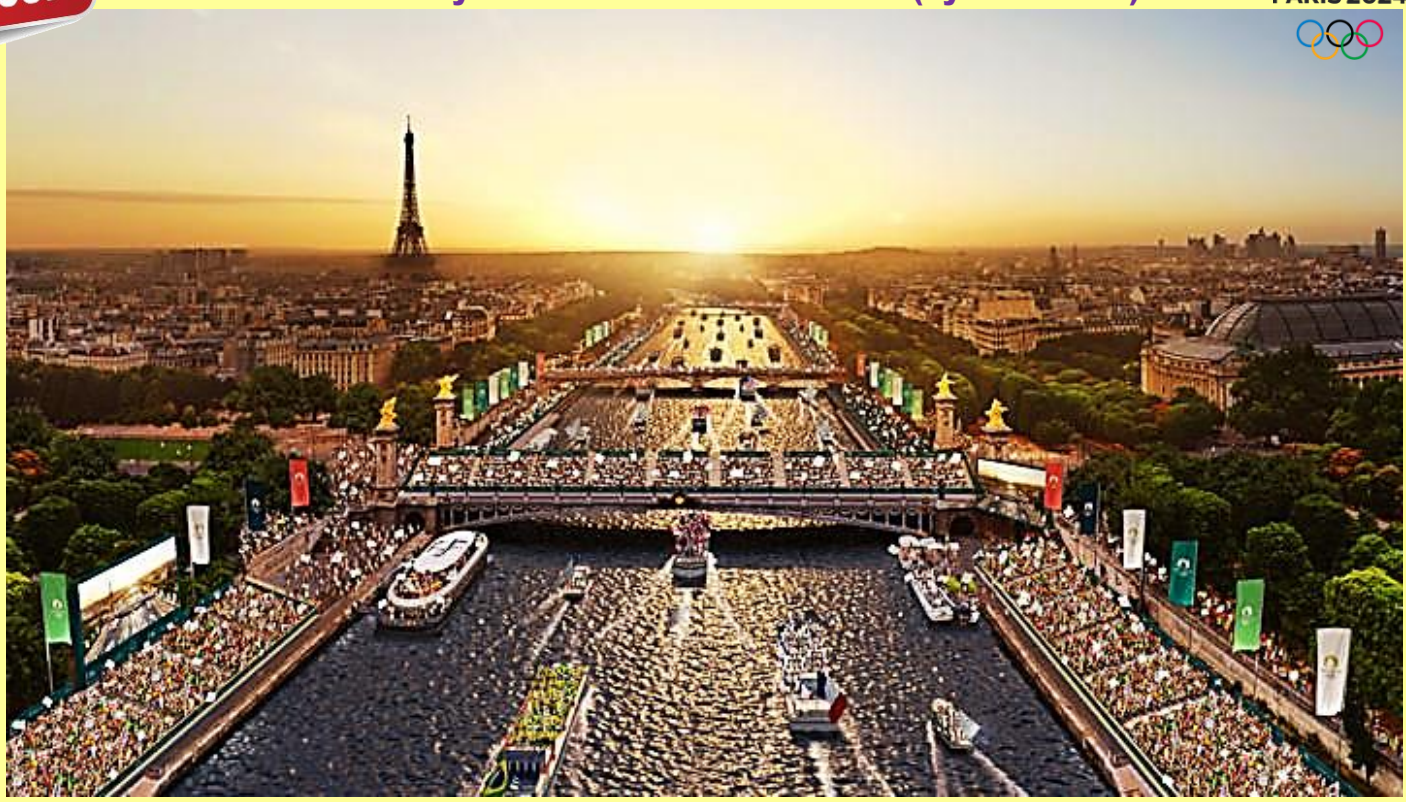
Source: https://worldisraelnews.com/syria-wont-hesitate-to-use-chemical-weapons-against-israel-says-former-idf-general/

Dec 14 – On the heels of reports that the IDF had bombed Syrian stockpiles of chemical weapons in June, a former high-ranking Israeli military official told Hebrew language media that Syria "would not hesitate to use chemical weapons against Israel" in a warfare scenario.
Former Brigadier General Zvika Fogel, who previously oversaw the Golan Heights region bordering Syria, told Radio 104.5 North FM that Syrian president Bashar al-Assad would use the weapons against Israel if he needed to do so in order to remain in power.
Arabist Professor Eyal Zisser of Tel Aviv University told Radio 103 FM that the threat of a Syrian chemical weapons attack "did not come out of nowhere," and that they'd likely had the weapons at their disposal for decades.
"It's not a doomsday weapon, [but] it's a guarantee for Assad's survival," Zisser said. "Our assumption should be that Assad [for certain], possibly Hezbollah, and definitely Iran have these capabilities."
Zisser continued by speculating that "the enemy knows what the Holocaust was" and may use gas against Israelis in order to "go all the way" and finish the job of annihilating the world's Jews.
However, some critics noted that Israeli fears of a chemical weapons attack stretch back decades and have never come to fruition.
During the 1991 Gulf war, the Israeli government widely distributed gas masks to citizens and warned that a chemical weapons attack by Iraq was imminent.
While the Iraqi government fired numerous ground-to-ground missiles at Israel, several of which struck residential buildings and killed three Israeli civilians in the central city of Ramat Gan, there was never any use of chemical weapons. However, hysteria over the possibility of a chemical weapon attack led to the deaths of several Israelis, including a baby, as people panicked and incorrectly put on their gas masks, cutting off their own oxygen supplies. Others died after unnecessarily injecting themselves with the anti-nerve gas drug atropine and suffering adverse reactions.

A brilliant idea but is it CBRN-safe?

Read more at January 2022 *C²BRNE DIARY* issue (by the Editor)

PARIS 2024



Dec 13 – Organizers outlined their plans for an unprecedented opening ceremony set against the backdrop of the host city. Instead of the traditional stadium setting, Paris 2024's opening will follow the River Seine, with organizers expecting 600,000 to attend. It will be the first Olympic Games to open on water.

Oppo looks to put a stylish head-up display on your face

Source [+video]: https://newatlas.com/wearables/oppo-air-glass/

Dec 14 – Back in 2012, Google announced that it was working on a project that placed all sorts of useful information right in front of a user's eye. Despite a number of iterations, Project Glass failed to connect with the public at large, and has since made inroads into the business world instead.

Now the folks at Chinese smartphone maker Oppo think that the time is right for a head-up display you wear on your head, launching the Oppo Air Glass smart monocle at its annual Inno Day convention.

Oppo's device features a tech-packed arm with a monocle display to the front, and is mounted to a simple frame and worn like a pair of ordinary spectacles – with the device's transparent display over one eye and nothing over the other.

The arm is home to Qualcomm's Snapdragon Wear 4100 mobile platform, a built-in battery, an integrated speaker and dual microphones, and comes with Bluetooth and Wi-Fi connectivity to work with a smartphone or smartwatch running a companion mobile app.

There's a sleek touch bar on the outer surface for control, but the Air Glass also supports gestures such as nodding the head to display notifications and Oppo says that it's currently testing hand gesture control via the Oppo Watch 2.

In addition to such things as checking the weather or consulting a daily schedule, the setup is reported capable of translating speech from one language into text in another (with English and Mandarin Chinese currently supported but Korean and Japanese on the way), it can help cyclists or pedestrians get around town when used with a navigation app (the company is currently working with Chinese search giant Baidu to improve this experience), and folks who give presentations or business briefings will no doubt appreciate the teleprompter app.

Oppo delivers images in front of the wearer's eye using a micro-LED array and a projection unit designed from the ground up. Its Spark micro projector is reckoned to be about the size of a coffee bean and incorporates a five-lens projection system that's reported to deliver "bright and sharp content whether worn indoors or outdoors" to a diffractive optical waveguide display sandwiched between two layers of sapphire glass.

The monocle hosting the display rocks a curved shape based on the wing of a cicada (instead of the kind of hard-edged rectangle chosen by the likes of Google) and supports either 16-level or 256-level "grayscale" (the image is displayed in bright green) at up to 1,400 nits of brightness.

The whole thing tips the scales at just 30 g (1 oz) and comes with a basic frame in black or silver for mounting so that the display sits in front of the right eye.

Oppo plans to launch the Air Glass during Q1 2022 in mainland China, and there's

no word at this time on whether it will be made available elsewhere. Are consumers now ready for "assisted reality" delivered through a goofy-looking monocle display? Perhaps the brief video below will help you decide.

EDITOR'S COMMENT: Perhaps this product might be useful to be worn inside a gas mask or be incorporated in a gas mask to provide useful data to the First Responder.

As part of the National Library of Medicine's (NLM) reorganization, the Chemical Hazards Emergency Medical Management (CHEMM) website has now been fully transferred to our sister HHS agency, the Assistant Secretary for Preparedness and Response (ASPR) - our partner for many years to develop both CHEMM and the Radiation Emergency Medical Management (REMM) resource. We thank ASPR for their partnership over the years and look forward to seeing these great resources continue under their expertise.

●▶ **The new CHEMM website URL is** - https://chemm.hhs.gov/index.html

Don't allow food-bioterrorism to replace AK-47, don tasks FG

Source: https://punchng.com/dont-allow-food-bioterrorism-to-replace-ak-47-don-tasks-fg/

Dec 16 – The Federal Government has been urged not to allow food-bioterrorism to replace AK-47 in the country.

A Professor of Biochemical Toxicology at the Michael Okpara University of Agriculture Umudike, Polycarp Okafor, handed down this task while delivering the 52nd inaugural lecture of the university, entitled, 'Metabolism of Cassava Cyanide and Jim Jones [cult] Cyanide in Humans'.

Okafor noted that "Cyanide, either in Cassava or elsewhere remains a potential toxin capable of causing mass destruction of lives and therefore be handled with utmost care but not fear."

He said the tuber can be processed into *garri* [cassava flakes] in a way that the residual Cyanide content will be very low and will have a low glycemic index, thus could be consumed by a diabetic patient.

He advised that "the Nigerian Government should give adequate attention to the security challenges of the country and take drastic measures to end the kidnapping and abduction of our school children and students and every act of terrorism.

"Today, it is AK-47, tomorrow, it may be more dangerous 'Food Bioterrorism".

He also advised NAFDAC and SON to "pay close attention to the quality of foods and drinks marketed in Nigeria to avoid be danger of massacre and other dangers associated with food and drink toxicity.

Preparing for Event X: what CBRN responders can learn from Covid-19

By Steven Pike

Source: https://www.argonelectronics.com/blog/preparing-for-event-x-what-cbrn-responders-can-learn-from-covid-19

Dec 17 – In a recent BBC Richard Dimbleby lecture, Professor Dame Sarah Gilbert detailed how scientists reacted quickly to the Covid-19 pandemic. However, the Oxford professor said they should have moved forward at even greater speed. The overarching question throughout her talk was, "How do you fight a pandemic when you are in a pandemic?" While this question might have been moot in 2019, moving into 2022, there is a clear answer.

Professor Gilbert's lecture spoke about Covid-19, not a Chemical, Biological, Radiological and Nuclear (CBRN) event in the first responder / military sense, but "B" nonetheless with clear parallels between the two. Both can cause an unrivalled amount of destruction to health and the economy, and both need previous investment, preparation, and training to ensure the best possible response.

We were not prepared for Disease X, but listening to Professor Gilbert's story about how she developed a vaccine for Disease X should give those involved in CBRN an insight into how we could better prepare for Event X.

Responding to the threat

At the time of writing, Covid-19 has taken 5,340,614 lives, emptied schools, savaged economies, kept us from our loved ones, and closed down entire societies. The virus has killed more people than any infectious disease for over a century.

However, despite the destruction it has left in its wake, the human response has been nothing short of extraordinary. Within less than a year, Professor Gilbert's team designed, made, manufactured, and distributed a very safe vaccine that is highly effective and available worldwide.

The scientists moved at a speed that would have been impossible pre-2020, facilitated by their level of preparedness before we had even heard of zoonotic disease. Researchers, rather than governments, had been planning for infectious diseases in general—and Disease X specifically. Despite Disease X being a hypothetical, it was seen as inevitable.

Professor Gilbert's team had surveillance systems in place to track the virus, gathered a vast amount of knowledge from similar previous viruses, and used prior vaccine preparation to create the Covid-19 vaccination. Ironically, pre-Covid we were told the public was tired of listening to experts; however, this sentiment evaporated quicker than the virus was spreading. It was clear for all to see that the experts were the ones who would lead us out of the pandemic.

In the future, new strands will appear, but experts are confident they can beat Covid-19. However, this is dependent on how prepared they are.

Memory: essential in preparing for the next threat

When a virus affects us, our immune system detects intruders and destroys them. Our bodies remember this process so that they can better respond next time.

Our immune systems are very good at doing this, but viruses are quick, which is why they can make us ill. Viruses can hit us before our immune system has had the chance to mobilise its forces—which is why vaccines are so important.

Vaccines provide the immune system with a memory of a virus without the body suffering from the disease. Instead, they present a body with a harmless mimic of a virus. And most modern vaccines show the body only the part of the virus it needs to recognise to produce an immune response.

Using technology to safeguard the future

AstraZeneca, Pfizer, and Moderna all produced vaccines using platform technology, developed due to the inadequate response to ebola. The world first knew about ebola in 1976, but 20 years later, there was still no vaccine. However, everything changed in 2014 with the ebola outbreak in West Africa, when 8% of Liberia's doctors and nurses were killed by the disease. This shook the world into action, and the WHO began to draw up a list of dangerous diseases against which we should develop vaccinations. The institution was aware of some diseases and unaware of others—the so-called Disease X.

But how do you prepare for a disease about which you know nothing? The answer lies in preparing platform technologies suitable for rapid response. Platform technologies are used as the infrastructure upon which other applications, technologies, or processes can be developed for an end-user. The key to a platform technology architecture is abstraction, which is the quality of dealing with generic forms rather than specific events, details, or applications.

In terms of vaccinations, platform technologies have been developed that could make it possible for multiple vaccines to be more rapidly produced from a single system. Thus, Professor Gilbert used the work she had been carrying out on MERS, which belongs to the coronavirus family, as a springboard from which to start working on Covid-19.

Luckily she secured funding for this research. Unfortunately, many researchers spend their professional lives chasing elusive grants that can take years of work to secure, only to be denied at the final hurdle. This means experts are, for years, trapped in a silent mouse spinner instead of working on scientific discovery.

Rapid, multi-institutional response is everything

When Professor Gilbert received the news that the virus was a coronavirus, she knew the template her team had already created for MERS could be used to develop a vaccine.

When Chinese scientists posted the genetic sequence for the novel coronavirus online, the years of preparation—albeit for a different virus—allowed her and her team to work quickly. Using the code, it took only 48 hours to work out the exact genetic sequence to make the vaccine.

Months of work followed until the Clinical BioManufacturing Facility at Oxford made the vaccine and had it ready for clinical trials. Professor Gilbert described that this moment felt as if "we had created a great sourdough in the kitchen and then you have to supply every supermarket in the world."

However, her team drew upon existing infrastructure and colleagues in Brazil and South Africa to carry out clinical trials. And this time, they were lucky. Lucky because she was successful when previously they were likely to have failed—not for the robustness of her science but for the lack of funding.

Previous vaccine efforts have moved slowly or halted because they have not been considered a high enough priority. The system of applying for funding is laggard, and vaccines are almost always delayed for this reason rather than for being unsafe. It happened at a time "when we were scrambling to find PPE and clapping for carers—and this kind of limping along would not do," said Professor Gilbert.

She was able to move quickly because the system allowed her to. Helped by former venture capitalist Kate Bingham, funding cycles were compressed, which allowed her to focus on the research rather than the fundraising. Vaccine development was also helped by The Medicines and Healthcare products Regulatory Agency reviewing the evidence on a rolling basis instead of scientists presenting every piece of evidence at the end of a trial, which is the general practice.

Cooperation and preparedness are the keys to success

The success of the vaccine is not just about its efficacy. It also depends on how many doses can be manufactured, how easy it is to supply, and how many people are willing to receive it. Manufacturing and producing vaccines were not a problem for Professor Gilbert at Oxford; however, the logistics of distributing them across the globe was. When AstraZeneca, a pharmaceutical manufacturing giant, approached her, this problem became smaller. This type of inter-company, inter-institutional, international cooperation was one of the vaccine's keys to success. Cooperation on every level is paramount. However, better preparation and more secure funding would have led to an even faster response. Professor Gilbert admits to not being fully prepared. And as they had never gone through this process before, her team was using never-tried-before techniques, which are always somewhat trial and error.

But the experts learned during the pandemic, and they made the systems more efficient. Time, funding, and practice meant that when the more contagious Delta variant was discovered globally in 2021, they had a much better system in place to analyse how to best address it. Just like the body's immune system, Professor Gilbert's team learnt from past experiences and adapted to overcome challenges. Every time a new variant is detected, work starts to change the vaccinations in response.

Professor Gilbert concluded, "There will be a disease Y. This will not be the last time a disease threatens our lives or our livelihoods. The next one could be worse—more contagious or more lethal." The only way to beat Covid-19 is through experience facilitated by investment, preparation, and training.

What lessons can we learn from Covid-19 for a CBRN event?

Luckily for us, scientists around the globe like Professor Gilbert were prepared for Disease X. But we were also perturbed that our governments did not seem equally prepared for a pandemic. Surprisingly, according to the 2021 Global Health Security Index, "Despite important steps taken by countries to respond to the Covid-19 pandemic, all countries...remain dangerously unprepared to meet future epidemic and pandemic threats." Governments did not believe a pandemic of this magnitude would happen—until it did. For many, this exposes the lack of serious preparation for a possible CBRN event. Accidents and terrorist attacks can cause serious global disruption and are a risk for human health and the economy. To prevent catastrophe tomorrow, we must prepare today.

In the words of Professor Gilbert, "What we discovered is what we can do when we understand our goal and really put our minds to achieving it. By working together, we can have a better response to Disease Y."

Preparing for a CBRN event with simulation training

Preparing for a CBRN event is a complex process. There are many ways of ensuring an efficient response; however, similarly to Covid-19, successfully addressing CBRN threats involves four core elements:

1. Foresight - recognising that one day there will be an Event X
2. Investment in the right technologies
3. Preparation by studying the best ways to address Event X
4. Training using simulation devices so first responders are fully prepared for Event X

CBRN simulation training is a widely used method of preparing investigators in the field to correctly identify chemical and radioactive materials. It involves investment, preparation, and training.

Argon Electronics has over 30 years of experience as a global provider of CBRN detector simulators. The company has developed strong relationships with many of the leading detector manufacturers, which allows it to create realistic simulators that are almost identical to the real devices.

Steven Pike *is Founder and Managing Director of Argon Electronics, a world leader in the development and manufacture of Chemical, Biological, Radiological and Nuclear (CBRN) and hazardous material (HazMat) detector simulators.*

CBRN Terrorism Interdictions (1990–2016) and Areas for Future Inquiry

By Wesley S. McCann

PERSPECTIVES ON TERRORISM Volume 15, Issue 6, December 2021

Source: https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2021/issue-6/vol-15-issue-6-rev2.pdf

The pursuit and use of chemical, biological, radiological, and nuclear (CBRN) weapons have been examined by scholars for more than two decades. What has not been examined are the cases in which non-state actors were prevented from obtaining or using these weapons and agents and the corresponding reasons for successful interdiction. This article uses the

Table 10: Modes of Interdiction by Agent/Weapons (n=217)

Agent	Unknown	Chance	Routine	Probable Cause	Surveillance	Undercover	Sting	Total	Collaborations
Hydrogen Cyanide	3	2	0	6	5	1	0	17	2
Ricin	0	2	1	6	5	1	1	16	3
Unknown Chemical	1	2	2	5	3	0	1	14	4
Unknown Poisons	2	2	0	5	3	0	0	12	2
Unknown Radiological	1	2	2	3	4	0	0	12	5
Sarin	0	1	0	4	4	0	1	10	6
Unknown Biological	1	1	1	4	0	3	0	10	3
Unknown Cyanide Salt	2	2	1	2	1	2	0	10	2
Potassium Cyanide	1	3	2	2	1	0	0	9	1
Sodium Cyanide	1	3	0	4	1	0	0	9	0
Bacillus Anthracis	1	2	0	4	1	0	0	8	1
C. Botulinum Toxin	0	1	0	2	4	0	0	7	1
Uranium-235	1	3	0	0	2	0	0	6	2
Unknown Nuclear	4	0	0	1	0	0	0	5	1
Arsenic	1	1	1	1	0	0	0	4	0
Chlorine	1	0	1	0	2	0	0	4	0
Mustard Gas	1	1	1	0	1	0	0	4	1
Hydrochloric Acid	0	0	0	3	0	0	0	3	1
Nitric Acid	0	0	0	2	1	0	0	3	1
Sulfuric Acid	0	1	0	1	1	0	0	3	0
Uranium-238	0	0	3	0	0	0	0	3	2

Across the different agents pursued by the actors in the study, hydrogen cyanide, ricin, sarin, potassium cyanide, sodium cyanide, *Bacillus anthracis*, *Clostridium botulinum*, uranium-235, along with various gases, acids, and unknown substances being the most common agents pursued that were interdicted

Profiles of Incidents Involving CBRN and Non-State Actors (POICN) database to carry out an exploratory analysis of CBRN interdictions around the world from 1990–2016. Using basic descriptives and cross-tabulations, this study finds that successful interdictions often resulted from probable cause searches, surveillance operations, but also from other, unknown reasons. However, there is a tremendous amount of variation when it comes to modes of interdiction and actor motivation. The same goes for jurisdiction, whether international collaboration aided the interdiction, and weapon acquisition and delivery. This text is intended to serve as a foundation for the study of CBRN terrorism interdiction as it seeks to undercover why some law enforcement efforts fail while others succeed.

Wesley S. McCann *is an assistant professor of criminology, law, and society at George Mason University. His research interests center on combating extremism, terrorists' pursuit of CBRN weapons and interdiction efforts, immigration and border security, and criminal law. He has taught at half a dozen different universities and is also affiliated with several research institutes and centers that promote more effective scholarship on combating extremism and anti-immigrant sentiments, as well as fostering national security efforts, particularly concerning CBRN weapons and terrorism.*

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Δεκατρείς μύθοι & αλήθειες για τις χημικές στολές τύπου 1Α

20 Δεκεμβρίου 2021 Ειδική αρθρογραφία, Ρέτσιος Ιωάννης 0

EDITOR'S COMMENT: This article is in Greek but it is one of the best articles I have ever read regarding the secrets of Level-A personal protection equipment written by a very experienced CBRN/industrial First Responder/Inspector (John Retsios). Well done!

New PPE Innovations Are Cool—Literally

By Guy Burdick (EHS Daily Advisor)
Source: https://ehsdailyadvisor.blr.com/2019/09/new-ppe-innovations-are-cool-literally/

Personal protective equipment (PPE) is vital to workplace safety, but it can also be uncomfortably hot—and warm weather doesn't help. New research and products are looking to keep workers cool while wearing PPE without compromising on protection.
It's been a hot summer—one for the record books. July 2019 edged out July 2016 to become the hottest month on record, according to the European Union's Climate Change Service. June 2019 was the hottest June ever, the Climate Change Service reported.
If you have employees who must wear long pants and long-sleeved shirts or arc-flash and fire-resistant (AFR) clothing to protect them from other workplace hazards, the potential for heat stress is even greater.
Certain government and industry consensus standards require workers to wear AFR clothing. These garments aren't optional no matter how tempted your employees may be to go without.
AFR clothing is impermeable and doesn't allow effective heat exchange. Some outdoor workers must wear long pants and long-sleeved shirts to protect them from biting insects. Aren't these workers sweltering in those clothes?
You may have seen high-tech "personal air-conditioning" devices recently covered in online news or on television. Sony has a smartphone-operated personal air-conditioning system it plans to release in time for the 2020 Tokyo Summer Olympic Games. A group of entrepreneurs from the Massachusetts Institute of Technology is selling a $300 cooling bracelet that is also smartphone-enabled. Could something like those help?
Consumer personal air-conditioning devices like the Sony Reon Pocket and Embr Labs' Embr Wave bracelet aren't intended for the personal protective equipment (PPE) market.
However, safety equipment suppliers offer a variety of cooling garments that can be used with impermeable protective clothing.
For example, Cincinnati, Ohio-based Vortec makes a personal air-conditioning vest for the PPE market. Vortec's personal cooling vest consists of a:

- Cooling tube with belt that pumps cold compressed air to provide air flow to the worker; *and*
- Plasticized PVC vest through which the cold air flows to cool the worker's torso.

Vortec claims its personal air-conditioning vest is capable of keeping the wearer 45°F to 60°F cooler than the ambient air temperature, minimizing worker heat stress and reducing the frequency and duration of cooling breaks.

NIOSH Research

The National Institute for Occupational Safety and Health (NIOSH) studied the use of cooling PPE in its 2016 recommendation for a standard for heat and hot environments. They found cooling PPE can help mitigate the heat caused by wearing protective clothing or equipment but that there are limitations for each type of cooling garment.
Protective clothing like AFR clothing can add to the heat stress of summer work, and workers may be tempted to go without it. AFR clothing protects workers from sparks but makes body-temperature regulation difficult.
All clothing, but especially clothing developed to provide protection against hazardous chemical, physical, and biologic agents, will affect the rate and amount of heat exchange between the skin and the ambient air. Clothing insulates the wearer from the external environment and also traps body heat.
Wearing impermeable, protective clothing greatly limits heat exchange. The impermeability prevents the evaporative heat transfer normally accomplished through sweating. Wearing and working in protective clothing, which sometimes can be heavy, also requires additional metabolic energy, creating even more body heat.

PPE That Cools

NIOSH evaluated four auxiliary cooling methods for its heat and hot environments criteria document:

- Water-cooled garments,
- Air-cooled garments,
- Cooling vests, *and*
- Wetted overgarments.

Water-cooled garments have coolant tubing sewn into the garment and an external operating device. The operating device may include a battery, circulating pump, control pad, fluid container, and heat exchanger. However, the weight and volume of the operating device

may limit a wearer's movement and impose an extra weight burden. A water-cooled garment includes:

- Water-cooled cap paired with a water-cooled vest,
- Long water-cooled undergarment, *and*
- Short water-cooled undergarment.

Because water-cooled systems require the wearer to be tethered to a system to circulate cool water through the garment, they also limit the range of operation.

Air-cooled garments distribute cooling air next to the skin. Garments like the Vortec personal air-conditioning vest use a vortex tube as a source of cooled compressed air and require a constant source of compressed air supplied through an air hose. A vortex tube cooling system can be quite noisy but can be used in a variety of hot environments.

Cooling vests may contain as many as 72 cooling packs made of ice or frozen phase-change materials. Cooling packs are secured to the vest by tape inserted into vest pockets or integrated with the vest. The last type requires freezing the entire vest before each use.

Ice packs and packs containing frozen phase-change materials quickly unfreeze, limiting their usefulness.

A cooling vest may only be effective for 2 or 3 hours. This requires replacing cooling packs every 2 to 4 hours. The cooling pack replacement requires a work stoppage to swap out cooling packs. Cooling pack garments are noise-free, require no external apparatus, are less expensive than any other garment type, and allow for greater mobility than any of the other methods.

A wetted overgarment consists of a wetted cotton terry cloth coverall or a two-piece cotton cover, extending from just above the boots and from the wrists to a V-neck. The wetted overgarment provides a simple cooling method, effective in cooling a worker in impermeable clothing. However, because the method relies on evaporative cooling, it works best in low-humidity, high-temperature environments.

Cooling garments can also be too heavy for some work assignments or tasks.

PPE: Last Resort

You should also remember that PPE of any type, including cooling garments, is a last resort. PPE typically is the least-effective control measure. The traditional hierarchy of controls is elimination of hazards, then substitution, engineering controls, administrative controls, and then PPE.

The most widely recommended and used controls for heat stress and illness are administrative controls.

NIOSH's recommendation for a federal heat and hot environments standard is a good guide to control methods for heat stress. NIOSH suggests reducing the length of time and temperature workers are exposed to in heat stress conditions by taking the following steps:

- Schedule hot tasks for cooler parts of the day, such as early morning, late afternoon, or the night shift; or schedule hot tasks on alternate rather than successive days;
- If you can, schedule occasional, routine maintenance and repair work in hot areas for cooler seasons of the year;
- Alter rest and work schedules to permit more rest time; *or*
- Add extra personnel to reduce exertion levels and exposure time for each member of the crew.

Increasing crew sizes can mitigate the exertion required from each worker. The level of exertion contributes to heat stress. Clothing, exertion, humidity, and temperature, as well as duration of exposure all are factors in heat stress.

Work schedules and crew size can help reduce but do not eliminate heat stress. You will need to provide breaks, shade, and water to prevent heat-related illnesses.

However, you can enhance your employees' ability to work in hot conditions through a heat-acclimatization program. Keep in mind that the ability of people to adapt to heat varies widely.

A properly designed and applied heat-acclimatization program will increase your employees' ability to work in hot conditions and decrease the risk for heat-related illnesses, as well as help prevent unsafe acts caused by diminished judgment or mental capacity due to heat.

The armed forces and other government researchers have found heat acclimatization can usually be accomplished over 7 to 14 days of increased exposure to hot conditions.

For workers who have had previous exposure to hot conditions on the job, the acclimatization regimen should start at no more than 50 percent of the usual duration of work in the hot environment on day 1, 60 percent on day 2, 80 percent on day 3, and then 100 percent on day 4.

For new workers, the schedule should begin with no more than 20 percent of the usual duration of work in the hot environment on day 1, and increase by no more than 20 percent each day.

Being physically fit does not replace the need for heat acclimatization but can enhance heat tolerance. The time required for non-physically fit individuals to develop acclimatization is about 50 percent greater than for the physically fit.
An adequate water supply and intake are essential for heat tolerance and for the prevention of heat-related illnesses. The water lost in the sweat and urine must be replaced at least hourly during the workday.

Education and Training
Workers and supervisors should be trained in the prevention and first aid of heat-related illness, as well as how to recognize symptoms of heat stress and heat-related illness—including heat cramps, heat exhaustion, heat rash, and heatstroke—in themselves and others.
A buddy system should be implemented in which each worker and supervisor on a hot job is responsible for one or more other workers. Each should be assigned the responsibility for observing, at periodic intervals, one or more fellow workers to determine whether they have any early symptoms of a heat-related illness.
Any worker who exhibits signs and symptoms of an impending heat-related illness should be sent to the first-aid station for a more complete evaluation and possible first-aid treatment.
Heatstroke, the most serious of heat-related illnesses, can be fatal if treatment is delayed. Signs and symptoms of heatstroke can include confusion or altered mental status, slurred speech, seizures, or loss of consciousness.

Chemical Weapons and Absurdity: The Disinformation Campaign Against the White Helmets

Source: https://www.bellingcat.com/news/mena/2018/12/18/chemical-weapons-and-absurdity-the-disinformation-campaign-against-the-white-helmets/

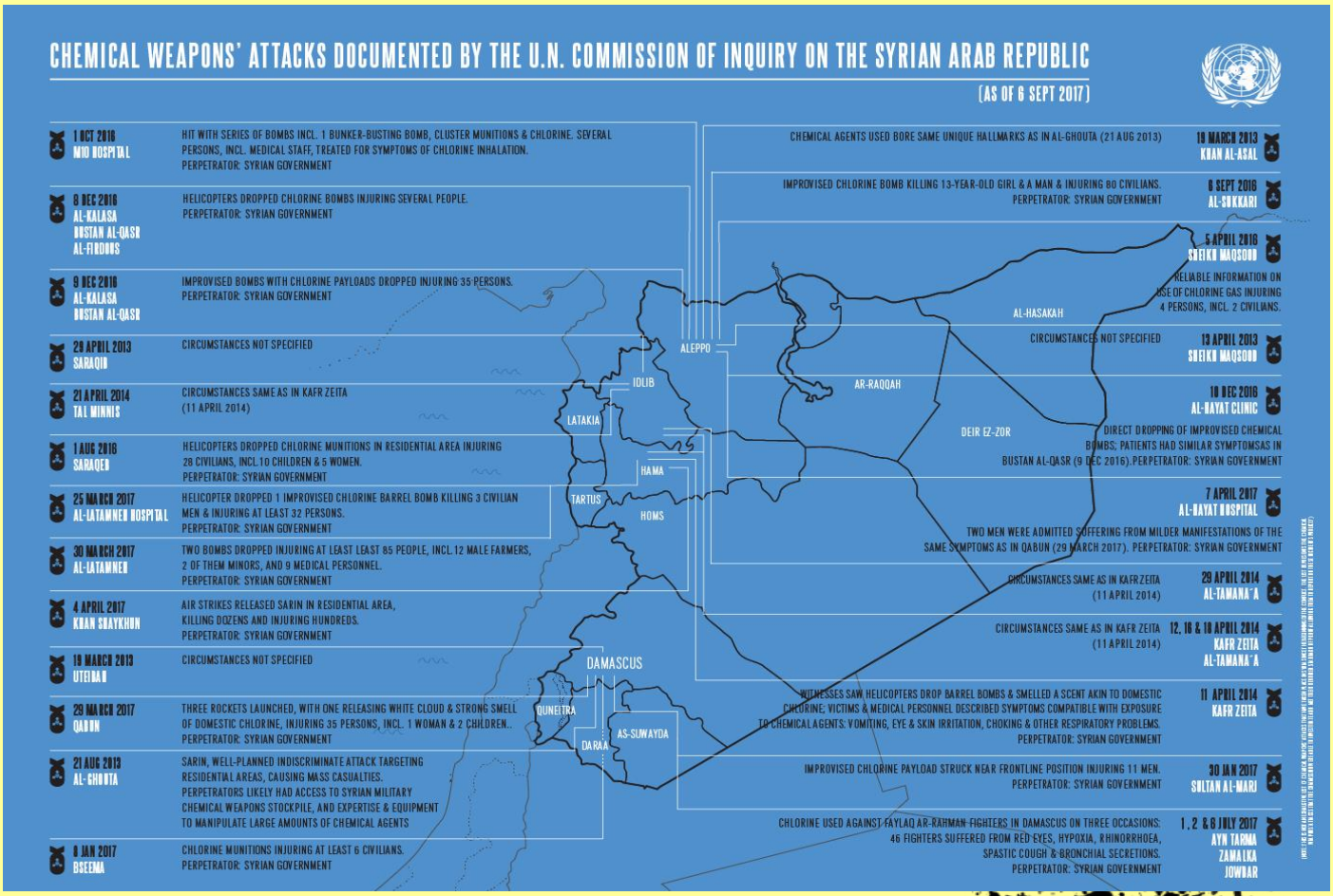


Image 1: Chemical Attacks in Syria, along with perpetrators, according to the UN Commission of Inquiry on the Syrian Arab Republic

Dec 18 – The Syrian Civil Defence (SCD), also known as the White Helmets, is a search-and-rescue organisation based in opposition-held areas. They have recorded some of the worst atrocities carried out in Syria and provided vital evidence of gross human rights abuses by the Syrian government and the Russian military. This has made them the target of a significant disinformation campaign attempting to smear them as "terrorists," with some pro-government supporters claiming they are "legitimate targets."
During mid-2018 this disinformation campaign appears to have focused on attempting to associate the SCD with chemical attacks in Idlib. From August to November of this year, the Russian and Syrian governments and state-controlled media continually repeated narratives involving the SCD and movement, or use of, chemical weapons around rebel-held areas of north-western Syria, primarily Idlib. This article will examine the accusations made against the SCD in Idlib and assess the evidence provided. The information we collected can be found here.
It should be noted that no reputable body has ever found that SCD was involved in any chemical incidents in Syria in any capacity other than as first responders to attacks. However, the Syrian government has been identified as the perpetrator in 23 Chlorine and Sarin attacks and has likely been involved in many more. Both Russia and Syria have a dubious reputation for factual reporting on the issue of chemical weapons due to their accusations of vast international conspiracies, use of doctored satellite images and tendency to present videos and images from computer games as evidence.

Accusations

Bellingcat has identified 22 separate accusations relating to the use or transportation of chemical weapons in Idlib and the surrounding area in 2018. Where the same accusation has been repeated in multiple articles, we have only included the earliest example. We chose to stop the chart on the 23rd of November due to the alleged chemical attack in Aleppo, which resulted in a large number of speculatory accusations not based on a specific source.
After two isolated accusations in February and June, there appears to have been a surge of accusations during and after the negotiations for the Sochi agreement, which established a truce and buffer zone in Idlib from the 17th September. The rate of these accusations dropped dramatically over the month of November leading up to the Aleppo chemical attack.

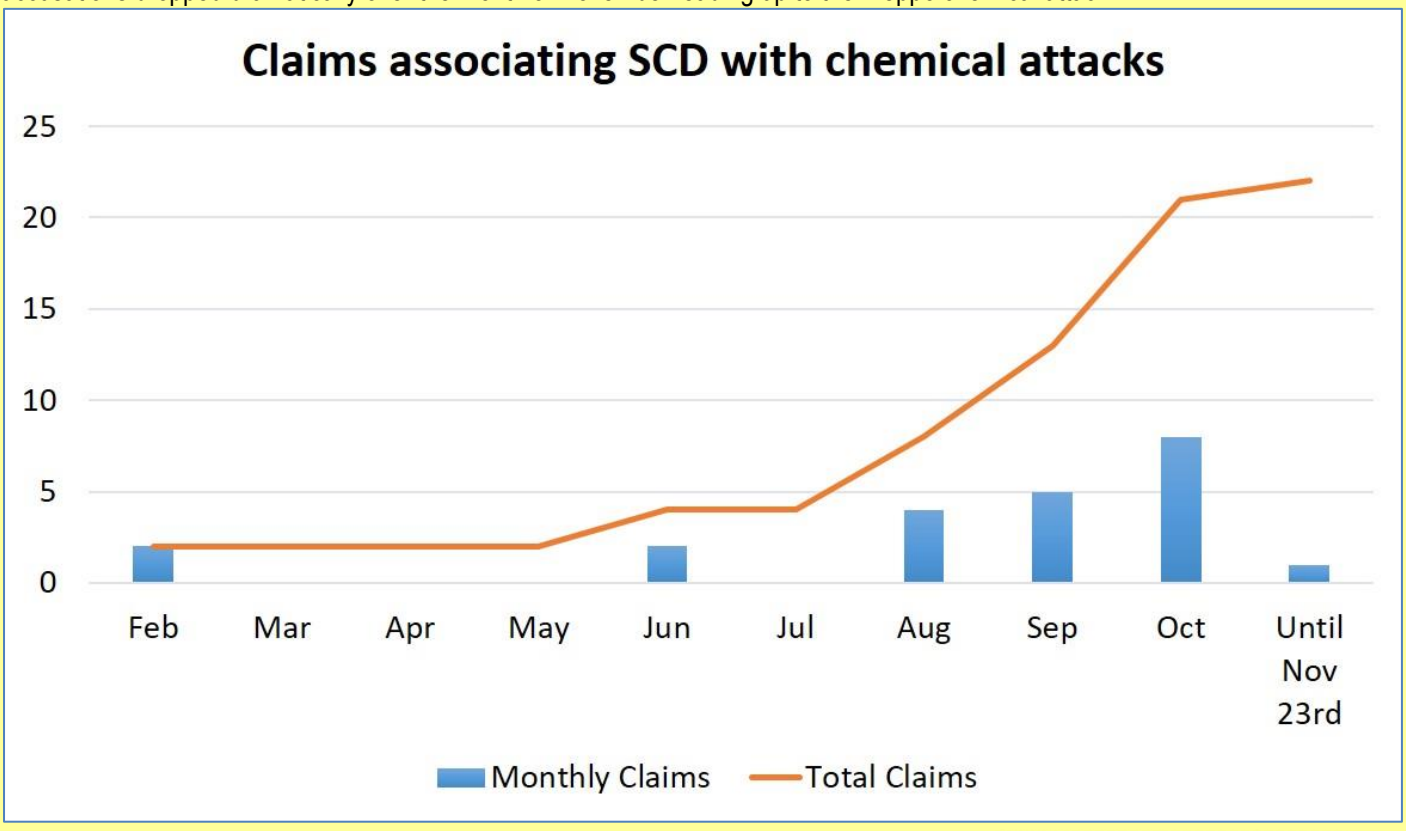


Image 2: Claims associating SCD with chemical weapons in Idib during 2018

Accusations associating the SCD with chemical weapons cover a wide geographic area, including Idlib, Hama, and Aleppo. The largest cluster of accusations relates to the north

Hama towns of al Lataminah and Kafr Zita, areas which have been repeatedly targeted by chemical weapons deployed by the Syrian government.

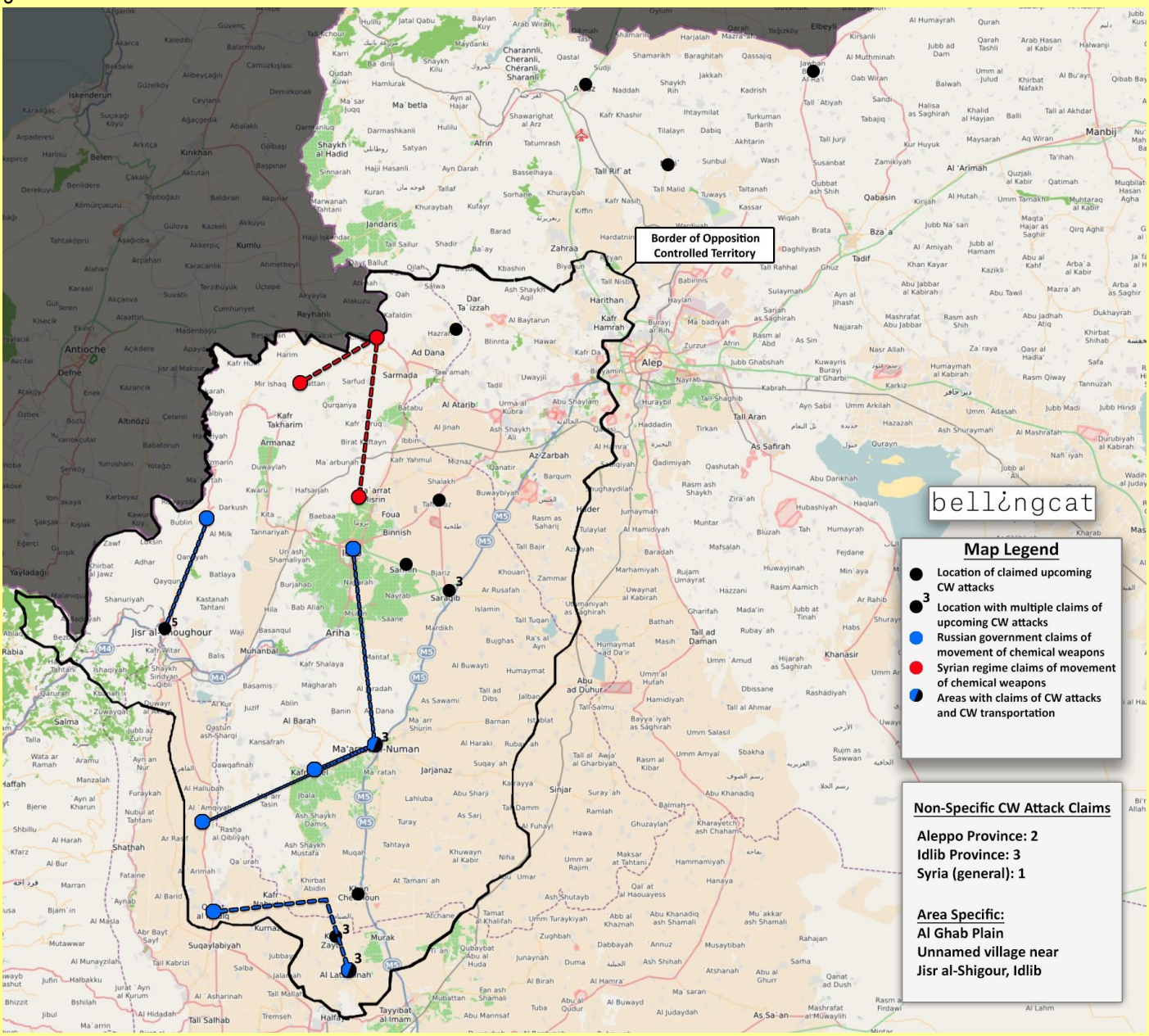


Image 3: Map showing locations allegedly connected to the use or movement of chemical weapons by the SCD

Despite continual claims that chemical attacks were imminent or had already taken place, no chemical attacks were accurately predicted. Considering the Syrian government's continual use of chemical weapons throughout the conflict, as well as the obfuscation of this issue by the Syrian and Russian governments, this is unsurprising. It is similar to the manner in which the Russian government attempted to obscure its role in the chemical attack in Salisbury, or provided false evidence to the Dutch Safety Board investigating MH17.

A significant proportion, eight out of 22, of these accusations came from the Russian Centre for Reconciliation of Opposing Sides in Syria (RCROSS). As the name suggests, this is a body set up by the Russian MoD, theoretically in order to track violence in Syria and attempt the reconciliation of opposing sides. This investigation indicates that it plays an important role in disseminating what is likely disinformation against civilian first responders, calling into question its stated purpose.

11 of the remaining accusations originate from Russian government controlled sources, such as Sputnik, the Russian Ministry of Defence, or representatives of the Russian government.
Of the 22 claims, all except four explicitly state that future chemical attacks will be some form of "false flag" designed to provoke the West into attacking the Syrian government, targeting civilians in rebel held areas. None of the other four state that the SCD would use chemical weapons to attack civilians in government-held territory. Despite attempting to imply that the SCD was associated with the apparent chemical attack in Aleppo on 24th November, that implication does not match the narrative that is built by the accusations we examined. It should also be noted that we believe the open source evidence from the Aleppo attack is inconclusive, while the British and American governments claim it was carried out by the Syrian government using some form of tear gas.
The accusations occasionally veer into the bizarre. On September 11 and 12 of this year, RCROSS stated that SCD had worked with HTS to create a fake chemical attack. RCROSS claimed this was filmed by "Middle Eastern TV channels" and the "regional branch of the American news channel." This footage was supposedly to be submitted to the UN and OPCW. Leaving aside the absurdity of the accusation itself, the RCROSS never produced a single piece of evidence to support this claim, and no such footage has been released.

"False Flag Groups" Alleged To Be Involved

If one were to take the word of the Russian or Syrian governments, there is a vast network of different groups, many of whom are currently fighting against each other, working together to carry out these attacks which didn't actually happen. Bellingcat has already explored the absurdity of what a "false flag" chemical attack at Khan Sheikhoun would mean. The Russian and Syrian claims would add several layers of complexity to this scenario, as they have variously accused the following groups of being involved:

1. The Syrian Civil Defence
2. British Intelligence
3. British Special Forces
4. A British Security Company named Olive Group
5. British foreign experts
6. United States Intelligence
7. United States Special Forces
8. The French Government
9. "Middle Eastern TV channels"
10. "The regional branch of the American news channel"
11. Hayat Tahrir al-Sham and its previous iterations
12. "Foreign specialists"
13. "Foreign friends"
14. Turkish foreign experts
15. Chechen foreign experts
16. Ahrar al-Sham
17. The Islamic Party of Turkmenistan
18. Jaish al Izza
19. Unnamed "militants"

For those familiar with the Syrian conflict, the idea that these groups are working together is incredibly unlikely. The idea that a huge campaign to create "false flag" attacks would go unchallenged by other groups, local civilians, civil society or foreign press pushes the boundary of absurdity.

Evidence Provided

Due to the low level of evidence provided with the accusations, it is difficult to debunk each one individually, as there is no real material to disprove. Of the 22 allegations that we identified, the sum of all verifiable evidence provided was a single 9-second video clip and a single image. Both were presented in support of the claim that IS had attacked HTS, taking two chlorine cylinders and killing two employees of SCD. The video depicted plant machinery operating next to a series of caves that can be geolocated to the center of al Lataminah, while the image showed a truck with a possibly cylindrical container on the back. No exact location data was provided, while the picture and video appear to have been cropped or zoomed in, making geolocation difficult.
The video from al Lataminah does show a location associated with the SCD, and it does seem the figure in the video is wearing a white hat or helmet. However, nothing within the

image or video supports the claim that there was an IS attack in this area during this time, or that any movement of chemical weapons took place. In both the video and image there appear to be possibly cylindrical objects, but without better quality imagery it is impossible to say with any certainty if they are cylindrical, let alone what they are.

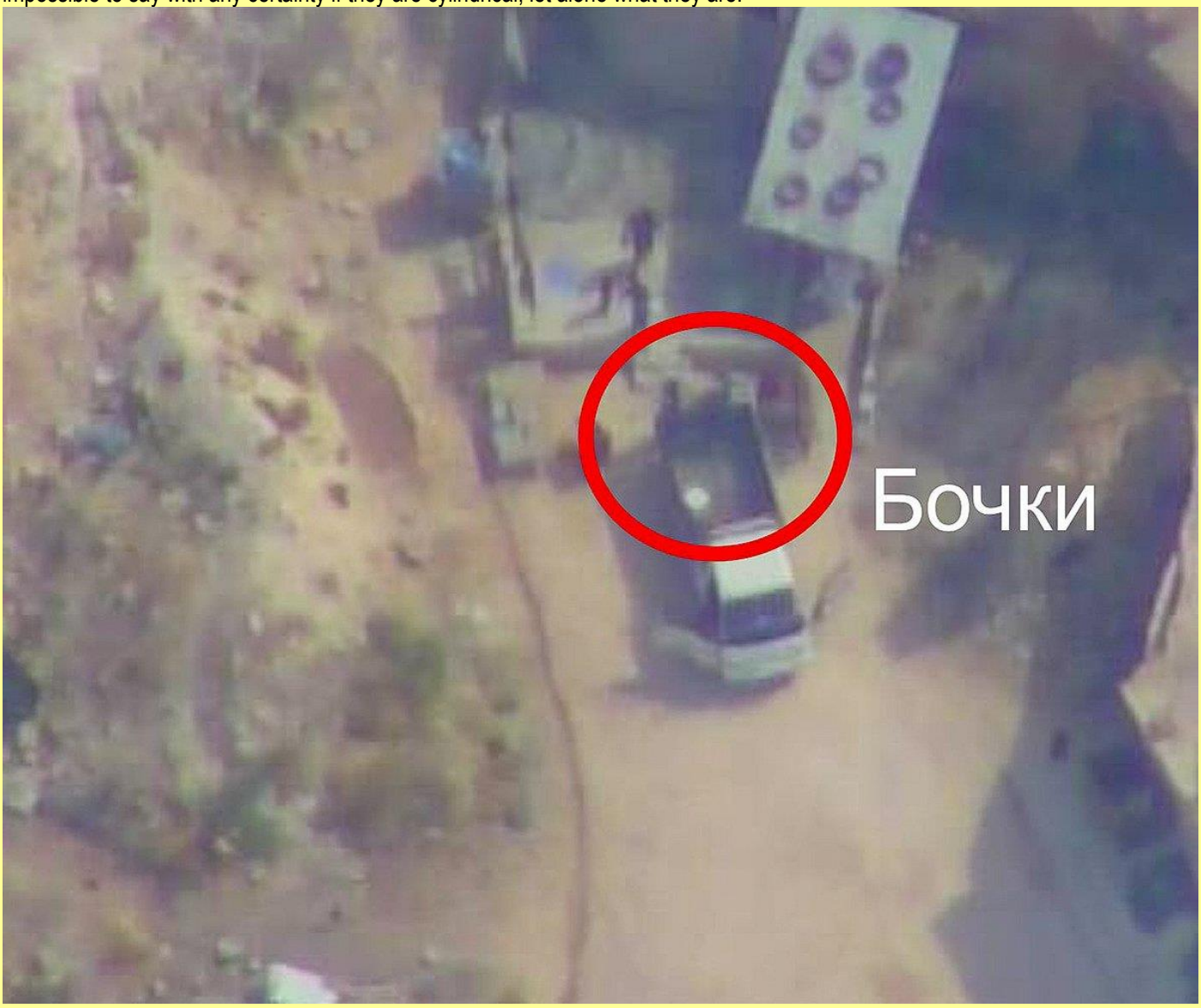


Image 4: Truck labelled with "Бочки" (barrels) – Video released by Russian MoD showing SCD location in al Lataminah

Despite this dearth of verifiable evidence, sources such as the Russian MoD and its monitoring organisation, RCROSS, have continually stated accusations as if they were facts. The language they use leaves no room for doubt or uncertainty. Indeed, for a cluster of claims in mid-September that appear to be linked, RCROSS stated they had "irrefutable information." about an imminent attack. This information has not been published. Previous Russian MoD claims of having "irrefutable" evidence turned out to be footage from a computer game.

Time and again the Russian government has provided evidence that has either been faked, doctored or plagiarized from bloggers. To have any credibility when making these accusations the Russian MoD must be transparent and release its "irrefutable" evidence. Until then, based on previous experience, its claims cannot be taken seriously.

Conclusion

The Syrian Civil Defence is an organisation working under extraordinary circumstances, willingly risking their own lives to save others. As with any organisation operating in such a

complex conflict, they sometimes make decisions which others would disagree with. However, one only has to watch a fraction of the hundreds of videos of them pulling victims from under the rubble of bombed buildings to understand that they are genuine first responders who have helped to save many thousands of lives across opposition-held Syria.

The disinformation campaign waged against the SCD has been brutal and unrelenting. It has attempted to cast doubt on their ability to provide evidence, painted them as "terrorists" and ultimately tried to transform them into "legitimate targets." It is clear that Russia and Syria believe that associating the SCD with chemical weapons is a key part of this narrative. Despite claiming to have "irrefutable information" neither the Russian nor Syrian governments appear to have produced any verifiable evidence that actually supports their accusations.

The extraordinarily low level of evidence supporting these accusations, the absurdity of some of the claims, and the continual failure to predict a chemical attack exposes these accusations for what they are: a continuation of a deliberate and planned disinformation campaign against a humanitarian organisation operating in the most difficult of circumstances.

EDITOR'S COMMENT: It is not the first time that the propaganda game deals with White Helmets and the services they offer as a civil defense organization. They have been accused many times that they are staging chemical weapons attacks and based on photos such as those below they prove either that they have no idea about chemical weapons mode of action or that they do not have the means to make it right forgetting that CWA experts can evaluate many things even from a distance – two photos below are examples of amateur chemical attacks:

(Left) This Sunday, April 8, 2018 image released by the Syrian Civil Defense White Helmets, shows a rescue worker carrying a child following an alleged chemical weapons attack in the rebel-held town of Douma, near Damascus, Syria. (Syrian Civil Defense White Helmets via AP) | (Right) White Helmets rescuers treat victims of the Assad regime's sarin attack on Khan Sheikhoun in northwest Syria, April 4, 2017

If a single mask or a simple face mask is sufficient to protect first responders from secondary contamination from chemical warfare agents (unless it is chlorine), it is absolutely stupid to suffer wearing personal protective equipment (Level-C/B/A) and make our lives difficult. One might argue that they risk their lives to save children exposed but it is vital for responders to be alive to provide their services to others.

Alan Scott, the doctor credited with developing Botox for medicine, dies at 89

Source: https://www.npr.org/2021/12/18/1065533946/alan-scott-the-doctor-credited-with-developing-botox-for-medicine-dies-at-89

Dec 22 – **Alan Brown Scott**, the ophthalmologist credited with developing the drug Botox for medical use, died at the age of 89 on Thursday, his family confirmed to NPR.

Scott, a Berkeley, Calif., native, was suffering from an acute illness for 10 days and was in the intensive care unit, his daughter Ann Scott said.

"He definitely loved his work and he was also a really great father," Ann Scott said, saying her father often involved his kids in his research and work.

Botox, which is derived from what is known as one of the deadliest toxins, was not originally discovered for medical use. It was actually first being developed by Ed Schantz, who was working in the military's biological weapons program. Schantz was the one to first send the toxin to Scott, who wanted to use it for medical purposes. Scott was looking for a way to help his patients with eye disorders so they wouldn't have to go through extensive surgeries and thought the chemical could help. Specifically, he was aiming to treat people with strabismus, or cross-eyes, and blepharospasm, which is an uncontrollable closure of eyes. Today, it's also used as a treatment to help with migraines, hair loss, and drooling.

What Botox is now more commonly known for — smoothing down wrinkles for cosmetic purposes — was not on his agenda.

"I think that's a charming, slightly frivolous use," Scott told *SF Gate* in 2002 on how Botox is used by celebrities. "But it's not along the lines of what I was into, applications for serious disorders."

In 1991, Scott sold the drug to the company Allergan; it was called Oculinum, but the next year the name of the drug was officially changed to Botox. In 2020, 4.4 million cosmetic Botox procedures were performed in the U.S.

In the same interview with *SF Gate*, Scott reflected on his discovery and how widespread the drug now is.

"Life's a mystery. It's dazzling, all the things that happen," he said.

His daughter Ann said outside of his medical work he enjoyed "anything intellectually stimulating."

"He was a really calm, more of a quiet reserved person," Scott said of her father, "Growing up he studied the classics, really liked word play."

Scott says her father was committed to teaching his students, many of whom were international students.

"That was what he really loved," she said.

US brings botulinum toxin to Ukraine — Donetsk Republic

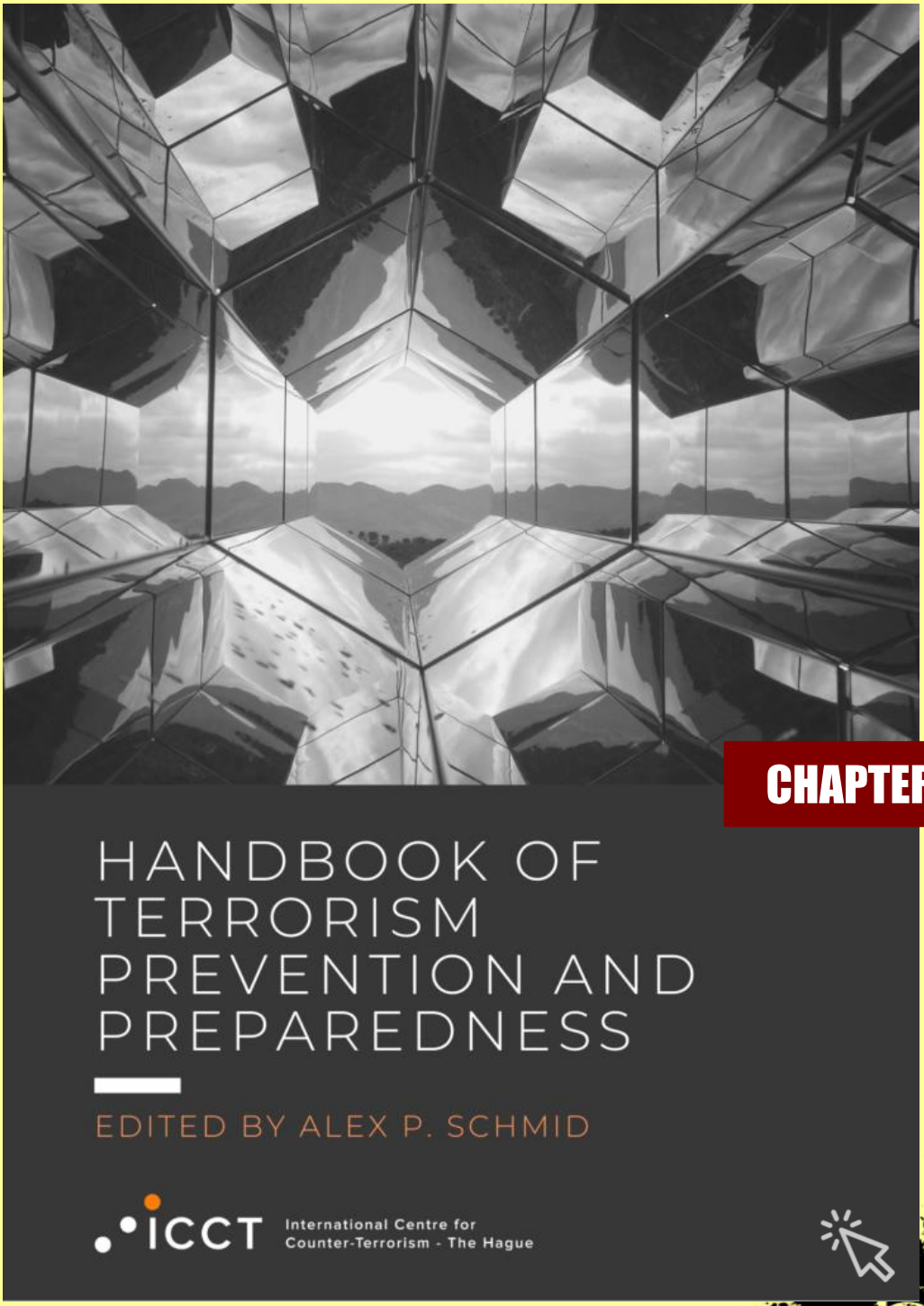
Source: https://tass.com/world/1379319

Dec 22 – The People's Militia of the Donetsk People's Republic has evidence that a batch of **botulinum toxin** (a highly toxic substance causing paralysis) and its antidote has been delivered to Ukraine from the United States, the deputy chief of the People's Militia Directorate, Eduard Basurin, said on the Rossiya-1 television channel in an interview on Wednesday.

"It is common knowledge that the United States has brought different types of weapons to Ukraine," he said adding that a batch of an antidote for botulinum toxin was delivered in October. Basurin recalled that botulinum toxin was a chemical warfare agent.

"The chemical substance proper was supplied in November," he added. "A **300-kilogram container** of this warfare agent, used as a

spray, was brought to Mariupol. The poisonous substance was then moved to the Kharkov region."
Basurin confirmed the presence of US military instructors on the engagement line.
"Their task is to make fire emplacements. They obey only certain people. They do not have a common command on the Ukrainian side," he said.
On December 21, Russian Defense Minister Sergey Shoigu said that the presence of more than 120 members of private US military companies had been identified in the villages of Avdeyevka and Priazovskoye. He stressed that containers with unknown chemical compounds had been delivered to the village of Avdeyevka and Krasny Liman for staging provocations. Ukrainian Foreign Ministry spokesman Oleg Nikolayenko has denied the presence of private military instructors from the US or toxic chemicals in the Kiev-controlled part of Donbass.



CHAPTER 17: CBRN

2021/2022 CBRNe-related conferences

Qatar Health 2022

08-12 February 2022
https://www.hamad.qa/EN/All-Events/Qatar-Health-2022/Pages/default.aspx

Qatar Health 2022 is a collaborative effort between Hamad Medical Corporation and the Ministry of Public Health in preparation for the FIFA World Cup 2022. It will be virtually hosted in Qatar from 8 to 12 February 2022. The conference will build on the previous success of QH2020 and QH2021 by continuing to provide state-of-the-art learning from experts in the fields of disaster medicine, infectious disease, and trauma surgery for healthcare professionals and students from different backgrounds and countries. It will maintain a focus on providing quality care during mass gatherings with the inclusion of recent developments and best practices in pandemic mitigation. It shall also provide opportunities in professional development for a wide variety of healthcare providers from a diverse set of disciplines and practices. Qatar Health 2022 will offer a 3-day program, with multiple full and half-day tracks, preceded by a 2-day of pre-conference workshops and symposia. The main tracks will be as follows:

- Multidisciplinary collaboration in preparation for the 2022 World Cup
- Best practice and lessons learned from sports mass gatherings
- Healthcare preparations for the 2022 World Cup

Conference Objectives

1. To provide the participant with updates on the latest developments, recent evidence, and best practice in the multidisciplinary approaches to the preparations for WC2022.
2. To provide the participant with updates on the latest developments, recent evidence, and best practice in the fields of disaster medicine, infectious disease, and trauma surgery in the context of mass gatherings.
3. To recognize, celebrate and showcase the lesson learned from the successful conduct of large-scale sporting events in the pandemic setting, in Qatar and globally.
4. To provide the participant with professional education activities to enhance their knowledge of the latest initiatives and programs from the MoPH, PHCC, SCDL and other stakeholders in FIFA2022.

11TH SYMPOSIUM ON CBRNE THREATS

https://nbc2022.org/

The NBC 2022 symposium on CBRNE threats has been rescheduled to take place at the **Sibelius Hall** in **Lahti**, Finland on **June 5 – 8, 2022**.

CBRNe Summit Asia 2022

INTELLIGENCE-SEC

Bangkok, Thailand | 04-05 April 2022
https://intelligence-sec.com/events/cbrne-summit-asia-2022/

We are pleased to announce our next edition of our CBRNe Summit Asia conference & exhibition which will take place in Bangkok, Thailand on the 4th – 5th April 2022. The world has been hit hard over the last two years by the COVID pandemic and many Asian nations have been well prepared to deal with this new pandemic we have all been living in.
Infectious diseases have been a common occurrence in South-East Asia with many outbreaks that have been fought against by national public health agencies. Our CBRNe Summit Asia 2022 show will look at how different Asian nations have coped with the recent pandemic and will analyse their current pandemic preparedness and CBRNe capabilities.
As well as looking at pandemic preparedness our event will also look at how Asian nations train emergency services, law enforcement and the military to prepare for a CBRNe incident

and a natural disaster. By attending our international show, it will allow you to hear insightful presentations from leading government and military officials discussing many issues such as medical countermeasures, CBRNe response and techniques, cooperation in dealing with CBRNe incidents, pandemic preparedness, lessons learnt and much more.
To be part of our international CBRNe Summit Asia conference & exhibition either as a speaker, sponsor, exhibitor or delegate please contact us either by telephone +44 (0)1582 346 706 or email events@intelligence-sec.com

NCT CBRNe Pavilion @ Eurosatory 2022

13-17 June 2022 | Paris, France
https://nct-events.com/event/nct-cbrne-pavilion-eurosatory-2022

For its first edition, the NCT CBRNe Pavilion will gather the global CBRNe community under one flag at the leading defense and security exhibition worldwide: Eurosatory 2022.
During five days, you will have the opportunity to meet with leading companies in the field and discover their latest innovations. Daily **workshops and conference sessions** will tackle the trendiest topics in the field, creating a unique platform to exchange on best practices and lessons learned. Operators will also have the chance to join in the **NCT PRO Experience** for mock CBRNe scenario trainings led by expert instructors, while **Live Demonstrations** will showcase European CBRNe capabilities.
Join the CBRNe experts, industry leaders and operators to discover the world of Chemical, Biological, Radiological, Nuclear and Explosive defense. Don't miss the NCT CBRNe Pavilion @ Eurosatory 2022!

Explosives & Blasting Techniques Conference

30 Jan – 02 Feb 2022 | Paris Las Vegas Hotel & Casino, Nevada USA
https://isee.org/conferences/2022-conference

Join nearly 1,600 blasters, manufacturers, government officials and industry leaders at the world's largest conference on explosives engineering, sponsored by the International Society of Explosives Engineers.

CBRNe Summit EMEA 2022

10-12 May 2022 | Kharkiv, Ukraine
https://intelligence-sec.com/events/cbrne-summit-emea-2022/

We are pleased to bring our CBRNe Summit series to Kharkiv, Ukraine for our first CBRNe Summit EMEA conference and exhibition. The event will provide you a great opportunity to hear from leading military, civil and scientific officials from across Ukraine, Middle East, South Eastern Europe and the Caucasus regions.
With the recent global COVID pandemic other key CBRNe incidents have taken place in the region which will all be discussed during the conference. CBRNe Summit EMEA will discuss national CBRNe capabilities, pandemic response, recovery and lessons learnt, chem-bio threats in the region, threat intelligence, international cooperation, first responder challenges and lessons learnt, medical countermeasures to biological outbreaks and asymmetrical threats.
Many governments in light of the global pandemic are now creating CBRNe jobs and placing more emphasis on improving their CBRNe capabilities to be better prepared for future CBRNe incidents and global pandemics. CBRNe Summit EMEA will provide you the perfect opportunity to network with leading officials who work tirelessly in the CBRNe domain.

To be part of our CBRNe Summit EMEA conference and exhibition please contact us via email at events@intelligence-sec.com or by phone +44 (0)1582 346 706 and we will be happy to provide you further information on how you can participate either as a speaker, sponsor/exhibitor or as delegates.

CBRNe Summit USA 2022

4-6 Oct 2022 | Denver, Colorado USA
https://intelligence-sec.com/events/cbrne-summit-usa-2021-2-2/

Our 2nd annual CBRNe Summit USA will be coming to Denver, CO on the 4th – 6th October 2022. This event brings together leading officials from the military, civil and scientific agencies to provide you will a full perspective on all CBRNe threats and challenges.
Over the 2-day conference and exhibition you will hear different perspectives on CBRNe preparedness, resilience and response. With the world entering a new chapter with the global COVID pandemic behind us many governments are now seeing the importance to improve CBRNe capabilities to deal with a future pandemic.
CBRNe Summit USA will also focus on Colorado State CBRNe response capabilities and analyse the challenges they face across the State; Chem-Bio countermeasures and emergency response procedures and agency collaboration; First responder techniques and training to allow inter-agency response to CBRNe incidents; International CBRNe threats and response techniques and Military CBRNe capabilities and development.
To take part in our inaugural CBRNe Summit USA conference and exhibition as either a speaker, sponsor, exhibitor or delegate please contact us at events@intelligence-sec.com or call us at +44 7792 47 32 46.

Global Health Security Conference

28 Jun – 01 Jul 2022 | Singapore
https://www.ghsconf.com/event/ce6e8302-3682-4893-9a1f-26827766de77/summary

CBRNe Protection Symposium

20-22 September 2022 | Malmo, Sweden
https://cbw.se/

As an engaged professional within the CBRNe-protection field this symposium is for you! Contribute to the symposium through fruitful meetings, elaborated conversations and sharing of recent research. Visit the exhibition of CBRNe protection equipment, where industry and institutes display their latest products and research in an encouraging environment. The exhibition offers a good opportunity for the symposium participants to make themselves acquainted with commercially available state-of-the-art equipment related to CBRNe-protection.

Radiological Emergency Planning

18-22 Jul 2022 | Harvard Longwood Campus; Boston, MA
https://www.hsph.harvard.edu/ecpe/programs/radiological-emergency-planning/

This program moves beyond the basics of emergency planning to provide skills and strategies for communicating about radiological emergencies, medically managing casualties of incidents involving radioactive material, and supporting other organizations during these crises.

This course is designed for anyone involved in emergency planning, response, or recovery in the public, private, or nonprofit sectors. Health physicists, public safety professionals, and first receivers and responders will also find this program beneficial. Foreign and domestic participants from organizations with the following functions are likely to attend:

- Nuclear or energy-industry regulatory bodies
- Homeland security and emergency management agencies
- Defense or military organizations
- Departments of health
- Power generation, especially nuclear power generation
- State and local emergency agencies
- State radiation control agencies

NCT Events 2022

https://nct-events.com/

NCT is back! After the stop imposed on us by the pandemic, we have a large calendar of events coming up in 2022. We will start in Abu Dhabi, February 7th and 8th. We will then reach almost every continent: NCT is scheduled for Brazil, Germany, Thailand, Croatia, the United States, and South Korea. **Visit our website** for the latest news regarding dates and locations!

NCT MIDDLE EAST 2022

NCT Middle East taking place in Abu Dhabi will welcome the highest decision makers from the national CBRNe, C-IED, EOD Community, again providing a networking and knowledge exchange platform for local & federal first responders, as well as industry leaders in the fields of CBRNe, C-IED and EOD. Over the duration of three days, **NCT Middle East** will feature a **Conference**, **Exhibition** and multiple **Networking Opportunities**.
Collaboration between the public and the private sectors as well as the use of the newest technologies are key factors capable of countering CBRNe threats. In the MENA-region as well as in many other countries, it is of significant importance to adopt a multi-level and interdisciplinary approach in order to face the complexity of the challenges CBRNe threats can pose.

NCT EVENT SOUTH AMERICA 2022

The South America event will welcome the highest decision makers from the national CBRNe, C-IED, EOD Community, again providing a networking and knowledge exchange platform for local & federal first responders, as well as industry leaders in the fields of CBRNe, C-IED and EOD. Over the duration of three days, NCT USA at Aberdeen Proving Ground will feature a **Conference**, **Exhibition** and the 6th edition of the **NCT PRO Trainings**. Based on the success of the previous editions, the NCT PRO Trainings will foster interoperability of responders and introduce them to the latest CBRNe, C-IED and EOD technologies.
Collaboration between the public and the private sectors as well as the use of the newest technologies are key factors capable of countering CBRNe threats. In the USA, as well as in many other countries, it is of significant importance to adopt a multi-level and interdisciplinary approach in order to face.

NCT Europe 2022

NCT Europe 2022 taking place in Germany will welcome the highest decision makers from the national CBRNe, C-IED, EOD Community, again providing a networking and knowledge exchange platform for local & federal first responders, as well as industry leaders in the fields of CBRNe, C-IED and EOD. Over the duration of three days, **NCT Europe** will feature a **Conference**, **Exhibition, Pro-Trainings,** and multiple **Networking Opportunities**.

Collaboration between the public and the private sectors as well as the use of the newest technologies are key factors capable of countering CBRNe threats. In the USA, as well as in many other countries, it is of significant importance to adopt a multi-level and interdisciplinary approach in order to face the complexity of the challenges CBRNe threats can pose.

NCT USA 2022
6-8 September 2022
Aberdeen Proving Ground
Edgewood, MD, USA

NCT APAC 2022
25-27 October 2022
Seoul, South Korea


ICI
International
CBRNE
INSTITUTE
CBRNE-Terrorism Newsletter
W
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HOTZONE
SOLUTIONS
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C2BRNE
DIARY
BIO NEWS

Experimental chewing gum that 'traps' Covid particles could help protect people

Source: https://www.mirror.co.uk/news/us-news/experimental-chewing-gum-traps-covid-25527964

Nov 23 – A new experimental chewing gum could help people protect themselves against Covid-19, scientists believe.
The gum, which is being analysed through a study in the US, contains a protein that "traps" coronavirus particles and could limit the amount of virus in saliva.
Researchers believe it could curb transmission when infected people are talking, breathing or coughing.

The chewing gum contains copies of the ACE2 protein found on cell surfaces, which the virus uses as a gateway to break into cells and infect them.
In test-tube experiments using saliva and swab samples from infected individuals, virus particles attached themselves to the ACE2 "receptors" in the chewing gum, scientists explained.
As a result, the **viral load in the samples fell by more than 95%,** the research team from the University of Pennsylvania reported in Molecular Therapy.
The research team said the gum tastes like conventional chewing gum and can be stored for years at normal temperatures.
Scientists added that chewing it does not damage the ACE2 protein molecules.
Researchers said that using gum to reduce viral loads in saliva could add to the benefit of vaccines and would be particularly useful in countries where vaccines are not yet available or affordable.
While the gum is not available for use, it may be a promising step for the future.
It comes as Government and NHS guidance in the UK advised people to take a rapid Covid-19 test before mixing with others in "crowded indoor spaces".
Previously the public was advised to use lateral flow tests twice-weekly, but now Brits have been told to take tests when they go to crowded places or when they visit a person who is at higher risk of getting seriously ill from Covid-19.
The advice comes ahead of the busy festive period where people will be spending more time seeing loved ones, shopping or going to Christmas parties.
People who develop symptoms of Covid-19 - including a new and persistent cough, a fever or a loss or change of taste or smell - are still encouraged to self-isolate and get a PCR test.
The advice on the Government website says that around one in three people who have Covid-19 do not have any symptoms, which means they could be spreading the virus without knowing.

US issues biological weapons' danger warning at UN meeting

Source: https://www.yenisafak.com/en/world/us-issues-biological-weapons-danger-warning-at-un-meeting-3584718

Nov 23 – The US told the UN Office for Disarmament Affairs on Monday that a global biological weapons threat is real, serious and growing as some states have sophisticated, well-established programs, while non-state actors are acquiring capabilities.
US Under Secretary for Arms Control Bonnie Denise Jenkins said at the opening of the four-day meeting in Geneva that the Biological Weapons Convention is one of the critical international security agreements that guard the threat of weapons of mass destruction.
"For the past two decades, efforts to strengthen the Convention have been treading water," said Jenkins.
"Useful discussions" at the disarmament office had led to minor steps at the national level, while states had been unable to agree on more significant action.
She said the widespread availability of sophisticated scientific and technological tools and methods is gradually eroding barriers to the development of biological weapons.
"While COVID-19 was not the result of a biological weapon, the pandemic is a wake-up call for all of us," she said.
Jenkins said while there are unprecedented efforts to strengthen international health security, the world needs to address the latest challenge.
"To do so, we must strengthen the Biological Weapons Convention," she said.
"We must take action to ensure that the Convention can effectively address the challenges we face now and in the future."

Moderna's COVID-19 Vaccine: More Antibodies Means More Protection

Source: https://www.genengnews.com/news/modernas-covid-19-vaccine-more-antibodies-means-more-protection/

Nov 24 – COVID-19 vaccine boosters are likely to be a hot topic of conversation around many Thanksgiving gatherings this week. The idea of a booster is, in part, to increase the number of circulating antibodies being made against SARS-CoV-2. But, it has remained unknown how correlated the level of antibodies is to the level of protection against infection. Now, by measuring antibodies against the SARS-CoV-2 spike protein in participants in a Phase III trial of the Moderna COVID-19 vaccine, researchers found that the higher the antibody level, the greater the vaccine protection against COVID-19.

The results help define "correlates of protection"—or molecular biomarkers to measure how much immunity is needed to fight infection—and may guide approval decisions for mRNA COVID-19 vaccines and other COVID-19 vaccines. Immune marker correlates of protection can be used to reliably predict the level of vaccine efficacy against infection such as SARS-CoV-2. As such, they are highly sought in vaccine research; identification and validation of a correlate of protection would expedite the clinical evaluation and regulatory approval process for existing vaccines for new populations, for vaccine regimen modifications, and for new vaccines. Neutralizing antibodies (nAbs) or binding antibodies (bAbs) have been established as a correlate of protection for vaccines against many viral diseases. The hypothesis that antibodies, whether elicited by infection or by spike protein-based vaccines, are a correlate of protection against COVID-19 is supported by diverse lines of evidence.

Here, following previous assessments by other groups in non-human primates in which each of several antibody markers correlated with protection against SARS-CoV-2 replication after challenge in vaccinated rhesus macaques, Peter Gilbert, PhD, professor in the biostatistics, bioinformatics, and epidemiology program and the vaccine and infectious disease division at the Fred Hutch, and colleagues, assessed whether the same SARS-CoV-2 antibody markers were correlates of vaccine protection in a Phase III trial of the mRNA-1273 COVID-19 vaccine.

By measuring binding and neutralizing antibodies against the viral spike protein, they found that the higher the antibody level, the greater the protection afforded by the mRNA vaccine.

The team assessed anti-spike, anti-receptor binding domain IgG, and neutralizing antibodies in vaccine recipients as correlates of risk for COVID-19 and as correlates of protection. The immune markers were measured at the second vaccination and four weeks later.

Based on any of the antibody markers, estimated COVID-19 risk was about 10 times lower for vaccine recipients with antibodies in the top 10% of values compared to those with negative/undetectable values.

All markers, the authors wrote, were inversely associated with COVID-19 risk and directly associated with vaccine efficacy. Vaccine recipients with post-vaccination 50% neutralization titers 10, 100, and 1000 had estimated vaccine efficacy of 78%, 91%, and 96%, respectively.

These results, the authors noted, help define immune marker correlates of protection with applications including to support provisional or traditional approval decisions for mRNA COVID-19 vaccines and potentially for other COVID-19 vaccines.

▶▶ **This work is published in *Science*, in the paper,** "Immune correlates analysis of the mRNA-1273 COVID-19 vaccine efficacy clinical trial."

COVID-19 Drug Candidate Veils Viral Anchor on Human Target Cell with DNA

A new precision approach against coronavirus infection blocks the ACE2 receptor 'gateway' into human cells. The new strategy hinders the infection of human cells by the coronavirus SARS-CoV-2 variants and is the basis of a new drug for which a patent has already been filed. Italian scientists use a PCR-based procedure called SELEX to identify two single strand DNA molecules that specifically interact with the key residue on the human receptor protein on which the viral spike protein docks. **+ MORE**

Ultrashort laser pulses shred superbugs without harming human cells

Source: https://newatlas.com/medical/ultrashort-laser-pulses-superbugs/

Nov 23 – Antibiotics were one of the most important inventions of the 20th century, but their effectiveness is plummeting as bacteria develop resistance to them. Now, researchers at Washington University in St. Louis have shown that **ultrashort pulses of laser light can kill bacteria and viruses, without harming human cells**.

The rise of multidrug-resistant "superbugs" is a looming health crisis that, according to some studies, could claim up to 10 million lives per year by 2050. Our last line of defense is already beginning to fail, and some strains of bacteria are now resistant to every antibiotic in use.

New antibiotics are always in development, but that's just kicking the problem down the road. To break the loop, scientists are investigating other methods for killing bacteria that they can't evolve resistance to – physical attacks like jagged materials, synthetic polymers, molecular drills, liquid-metal shredders, poisoned arrow molecules, and black phosphorus coatings.

And now we might be able to add lasers to that list. The Washington researchers had previously been exploring how ultrashort pulses of laser light could kill off viruses and regular bacteria, but for the new study they investigated how well they might destroy antibiotic-resistant bacteria, as well as hard-to-kill bacterial spores.

The team turned its focus on two specific superbug species: multidrug-resistant *Staphylococcus aureus* (MRSA) and ESBL-producing *E. coli*, each representing one of the two main categories of bacteria, gram positive and gram negative. They also targeted *Bacillus cereus* spores, which are food-borne pathogens that can survive being boiled or cooked.

And sure enough, **the laser pulses wiped out more than 99.9 percent of each microbe.** The team says the technique works because the lasers excite protein structures inside viruses and bacteria, causing some of their molecular bonds to break. As the broken ends connect almost at random, protein function shuts down inside the microbe, killing them.

Importantly, the laser pulses don't harm human cells – the team says they would need to be several orders of magnitude more powerful before they posed a threat to us. That could make them a safer disinfectant alternative to harsh chemicals, radiation or heat.

"The ultrashort-pulse laser technology uniquely inactivates pathogens while preserving human proteins and cells," says Shaw-Wei Tsen, first author of the study. "Imagine if, prior to closing a surgical wound, we could scan a laser beam across the site and further reduce the chances of infection. I can see this technology being used soon to disinfect biological products in vitro, and even to treat bloodstream infections in the future by putting patients on dialysis and passing the blood through a laser treatment device."

▶▶ **The research was published in the** *Journal of Biophotonics*.

Covid 'super variant' with 32 mutations found with cases in South Africa, Botswana and Hong Kong

Source: https://inews.co.uk/news/politics/covid-super-variant-mutations-cases-found-south-africa-botswana-hong-kong-1316864

Nov 25 – A new covid variant with an "extremely high" number of mutations and which could escape vaccines has been identified in three different countries, although case numbers are very small.

The B.1.1.529 strain, an offshoot of an old variant called B.1.1, has 32 spike mutations and has been found in South Africa, Botswana and one case in Hong Kong, where the person had recently travelled to South Africa.

So far only 10 cases of the variant have been spotted through genomic sequencing, but scientists say there could be more not yet identified. The profile of mutations is concerning due to its potential to dodge antibodies that can fight the virus.

New covid variants are identified by virologists all the time and often do not spread beyond a handful of cases. Even if they have the capacity to evade vaccines, if they are less transmissible than a dominant variant in a country they can quickly die out.

While the cluster is small, the case in Hong Kong exported from South Africa will fuel concerns that more infections will have spread through international travel.

Officials and scientists at the UK Health Security Agency (UKHSA) are monitoring and investigating the variant.

The Hong Kong case was a 36-year-old man who travelled to South Africa on 23 October and returned on 11 November. He tested negative on arrival back in Hong Kong but went on to test positive while at a quarantine hotel.

The Hong Kong authorities have carried out compulsory testing at the apartment block where he lives.

In South Africa, the number of confirmed cases of covid has increased from 312 on Monday to more than 860 on Tuesday, although scientists believe it is too soon to tell whether there is a link with the new "super variant".

The new variant was identified on Tuesday by Tom Peacock, a virologist at Imperial College London, who posted the details on a sequence-sharing forum and on Twitter.

The variant's 32 spike mutations is described as "extremely high". The Delta variant, now dominant across the world, has 16.

Spike mutations are essentially the virus' "bag of tricks" that allow it to adapt and do different things such as become more transmissible, escape vaccines or become more deadly. It is not known whether B.1.1.529 is more transmissible or could beat Delta's dominance.

Dr Peacock wrote: "Export to Asia implies this might be more widespread than sequences alone would imply. Also the extremely long branch length and incredibly high amount of spike mutations suggest this could be of real concern (predicted escape from most known monoclonal antibodies)."

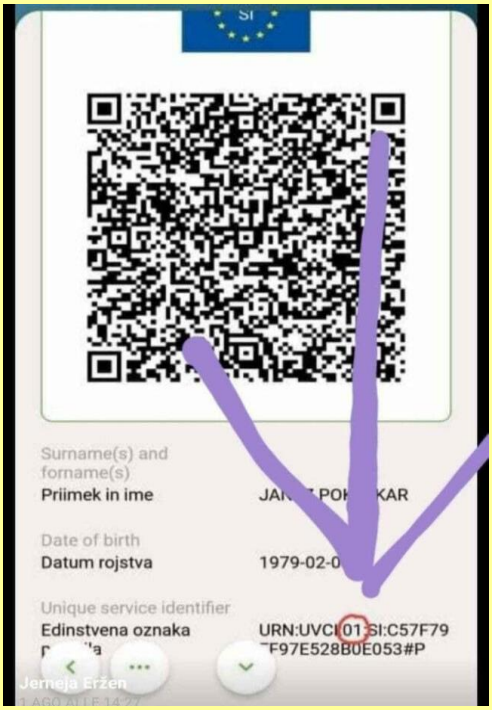
Dr Peacock described the spike mutation profile as "really awful" and "horrific".

He added: "Worth emphasising this is at super low numbers right now in a region of Africa that is fairly well sampled, however it very much should be monitored due to that horrific spike profile (would take a guess that this would be worse antigenically than nearly anything else about)."

Variants that mutate to become more antigenic are more able to evade the antibodies that are built up through immunity from either vaccines or previous infection.
It is understood that all governments where the variant has been identified, in South Africa, Botswana and Hong Kong, are aware of the cases.
Dr Meera Chand, Covid-19 Incident Director at UKHSA, said: "The UK Health Security Agency, in partnership with scientific bodies across the globe, is constantly monitoring the status of SARS-CoV-2 variants as they emerge and develop worldwide.
"As it is in the nature of viruses to mutate often and at random, it is not unusual for small numbers of cases to arise featuring new sets of mutations. Any variants showing evidence of spread are rapidly assessed."

Crisis in Slovenia: Whistleblower nurse says politicians receive saline instead of mRNA jab

Source: https://dailytelegraph.co.nz/covid-19/crisis-in-slovenia-whistleblower-nurse-says-politicians-receive-saline-instead-of-mrna-jab/



Nov 24 – A crisis has hit the eastern European country of Slovenia, with a whistleblower nurse telling the public that politicians and other high-ranking citizens receive saline instead of the mRNA experimental medication. In a video on Facebook, which has been deleted by YouTube, the woman claiming to be the head nurse of the University Medical Center in Ljubljana, which takes care of receiving and managing the jab bottles for politicians, resigned and gave a press conference on the scandal. During the conference she showed codes on the bottles where each contains 1, 2 or 3 digits, and then explained the meaning of those numbers.
Note: *Daily Telegraph* understands from our sources in Slovenia the original video has now been removed from Facebook.
Number 1 is the placebo, saline. Number 2 is the mRNA. The number 3 is an mRNA stick that contains the *onco* gene, linked to the adenovirus that contributes to the development of cancer. She said those receiving the number 3 bottle will develop soft tissue cancer within two years of receiving the jab. She says she personally witnessed the jab of all the politicians and tycoons and everyone who received the number 1 bottle, claiming they received the saline solution, a placebo. This explains why the same person administers the jab to politicians when they take pictures for the media.

On 3.7 million people shows Sputnik V is the best vaccine to protect against mortality from COVID with 98% efficacy and 85.7% efficacy against infection

Source: https://sputnikvaccine.com/newsroom/pressreleases/a-unique-comparative-study-of-five-vaccines-in-eu-member-hungary-on-3-7-million-people-shows-sputnik/

Nov 25 – A unique independent nationwide observational study in EU member state Hungary estimating and directly comparing the efficacy of five vaccines against COVID has demonstrated that the Russian Sputnik V vaccine has the highest (98%) efficacy in preventing COVID-related mortality and 85.7% efficacy against coronavirus infection leading alongside the vaccine by Moderna.
The study based on the real-world data from 3.7 million vaccinated individuals in Hungary is available at: https://www.sciencedirect.com/science/article/pii/S1198743X2100639X

Hungary was the first country in EU to authorize Sputnik V. The article analyses data from the National Public Health Center (NPHC).

Clinical Microbiology and Infection

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ELSEVIER

Original Article

Nationwide effectiveness of five SARS-CoV-2 vaccines in Hungary - The HUN-VE study

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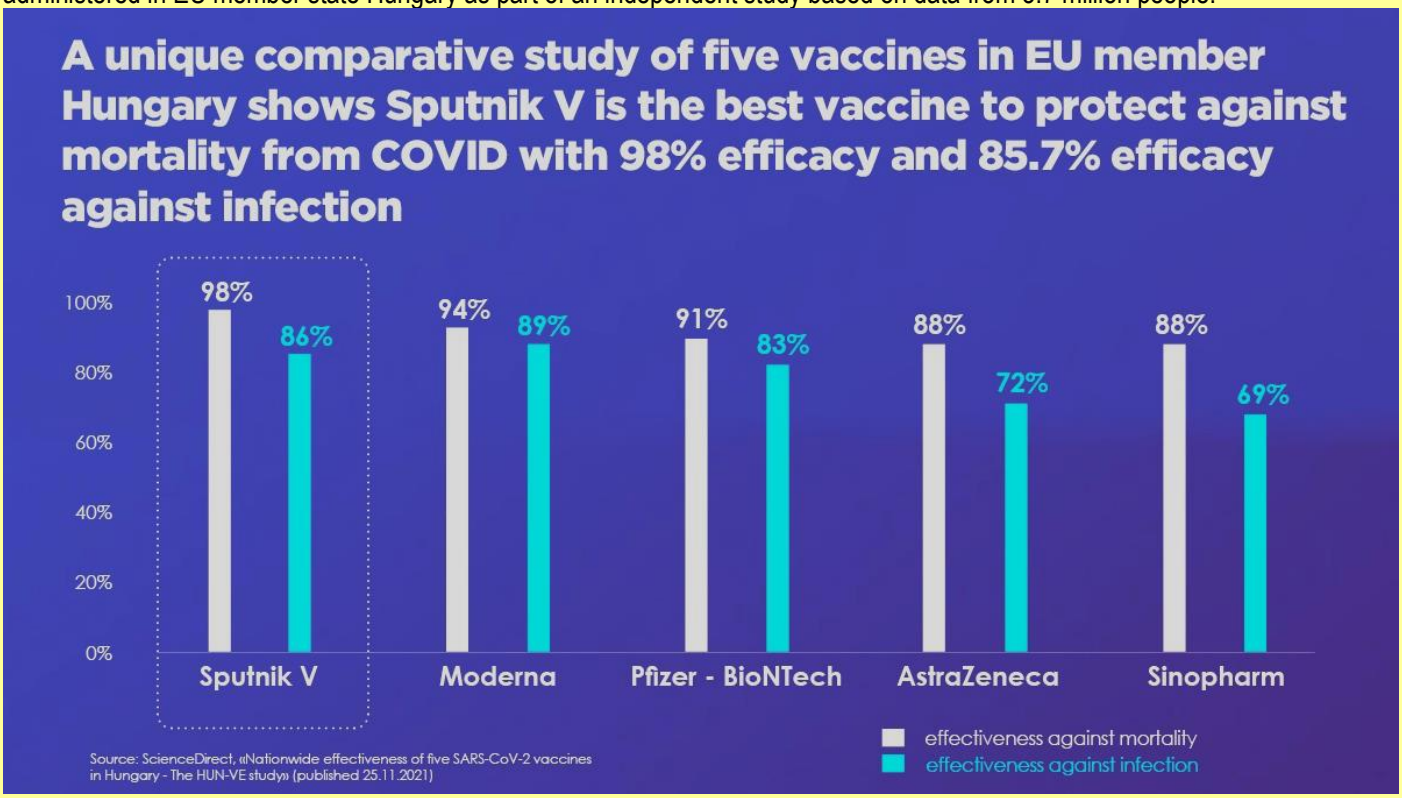
Between 22 January 2021 and 10 June 2021, residents of Hungary received two doses of Sputnik V, Moderna, Pfizer-BioNTech, Sinopharm or AstraZeneca vaccines as part of the national vaccination program. The Russian vaccine proved the best in protection against COVID related mortality and leads alongside the vaccine by Moderna in efficacy rate against COVID infection based on analysis of data from 820,000 individuals vaccinated with Sputnik V (see the chart below). The study has also demonstrated Sputnik V is 100% effective against COVID related deaths in individuals aged 16–44 years.

Kirill Dmitriev, CEO of the Russian Direct Investment Fund, said: "With 98% efficacy in preventing COVID-related mortality and 85.7% efficacy against coronavirus infection Sputnik V has demonstrated the best results among five vaccines (Sputnik V, Moderna, Pfizer-BioNTech, Sinopharm and AstraZeneca) administered in EU member state Hungary as part of an independent study based on data from 3.7 million people."



Russian Direct Investment Fund (RDIF) is Russia's sovereign wealth fund established in 2011 to make equity co-investments, primarily in Russia, alongside reputable international financial and strategic investors. RDIF acts as a catalyst for direct investment in the Russian economy. RDIF's management company is based in Moscow. Currently, RDIF has experience of the successful joint implementation of more than 80 projects with foreign partners totaling RUB 2.1tn and covering 95% of the regions of the Russian Federation. RDIF portfolio companies employ more than 1 mn people and generate revenues which equate to more than 6% of Russia's GDP. RDIF has established joint strategic partnerships with leading international co-investors from more than 18 countries that total more than $40 bn. Further information can be found at rdif.ru

EDITOR'S COMMENT: Perhaps this paper will force both WHO and EMA to stop fooling around and approve the Sputnik V vaccine. In particular, EMA will prove that the EU cares for public health instead of how to sell more Western vaccines for profit. European citizens demand to have access to an effective and safe vaccine that will greatly help fight the 21st-century plague!

mRNA COVID-19 Vaccine Improved through mRNA Backbone Optimization

With only 48% efficacy, **CureVac's** first mRNA COVID-19 vaccine, CVnCoV, delivered disappointing results. Now, a second-generation mRNA vaccine, with optimization of non-coding regions, has demonstrated improved protection against COVID-19 in preclinical testing with 18 cynomolgus macaques. The new findings suggest that CV2CoV induced substantially higher binding and neutralizing antibodies, memory B cell responses, and T cell responses as compared with CVnCoV. Clinical trials of CV2CoV are planned. **+ MORE**

"Game Changer:" After Vaccines, Pfizer Stakes Claim in COVID-19 Drugs, Too

Pfizer said its COVID-19 **pill PAXLOVID**™ (PF-07321332) reduced the risk of hospitalization or death by 89% from any cause compared to placebo in non-hospitalized high-risk adults with COVID-19 who were treated within three days of the onset of symptoms. That result, announced via press release Friday, met the primary endpoint of Pfizer's Phase II/III EPIC-HR (Evaluation of Protease Inhibition for COVID-19 in High-Risk Patients) trial (NCT04960202). **+ MORE**

Top 11 Best Selling COVID-19 Vaccines and Drugs of H1 2021

The Pfizer/BioNTech and Moderna vaccines accounted for 70% of the total combined $36.907 billion in sales generated during January-June 2021 by the top-selling 11 COVID-19 vaccines and drugs for which sales figures have been disclosed (or in the case of one company, suggested in an investor presentation)-and compiled by GEN in this A-List. This list does not include numerous additional COVID-19 vaccines and drugs that are well into clinical development but have yet to win any approvals or emergency authorizations from regulators. More than 300 vaccines and drugs are in development for COVID-19, according to GEN's **COVID-19 DRUG & VACCINE CANDIDATE TRACKER**. **+ MORE**

Predictions of Smallpox Return Are Nothing New

Source: https://www.theepochtimes.com/predictions-of-smallpox-return-are-nothing-new_4121115.html

Nov 26 – COVID-19 is still the virus of the moment, but the emergence of a much older and more deadly virus is said to lurk just over the horizon.

This premonition comes from Microsoft founder turned vaccine-focused philanthropist Bill Gates. In a recent interview with Policy Exchange, Gates warned governments to prepare for bioterrorist attacks using smallpox. He urged the United States, the UK, and other nations to immediately begin investing billions in research and development to counter the impending threat.

"You say, OK, what if a bioterrorist brought smallpox to 10 airports? You know, how would the world respond to that? There are naturally caused epidemics and bioterrorism-caused epidemics that could even be way worse than what we experienced today," Gates said.

Gates's preparedness plan envisions governments pouring money into a new World Health Organization (WHO) Pandemic Task Force to address this deadly scenario predicted to besiege humanity in the near future. Just days after Gates's announcement, vials labeled "smallpox" were found in a Merck laboratory in suburban Philadelphia.

The world is still struggling to recover from the economic devastation and death toll brought by COVID-19. So why smallpox and why now?

Smallpox is a contagious disease caused by the variola virus, with a reputation of being one of the most devastating diseases known to mankind. Symptoms include fever, severe fatigue, pain, and sometimes blindness. But the most characteristic sign is the red spots that sprout all over the body. The spots turn into fluid-filled blisters, which later develop into deep, pitted scars or pox marks. The disease has an infection record stretching back at least 3,000 years. And while most survived smallpox, it also claimed numerous lives.

In terms of modern health threats, however, smallpox is practically a forgotten relic. Although the disease is said to have killed 300 million in the 20th century alone, by the end of the century, it virtually disappeared.

Older generations may still sport a small scar on their shoulder—the unique signature of the smallpox vaccine—but immunization programs for this disease faded in the 1970s. By 1979, member states of the World Health Assembly declared the disease eradicated, and health experts concluded that the serious complications that the vaccine is known to cause outweighed the benefits in the absence of an actual outbreak.

According to the WHO, smallpox is the only disease ever to be declared eradicated, citing the accomplishment "among the most notable and profound public health successes in history."
But ever since the disease made its exit, experts have feared that it would one day return, not as a force of nature, but as a weapon. Although the variola virus has appeared to have vanished in the wild, samples are kept in two labs, one at the State Research Center of Virology and Biotechnology in Koltsovo, Russia, and another at the Centers for Disease Control and Prevention (CDC) in Atlanta. The samples are kept for study, but the concern is they might fall into the wrong hands.

Dark Winter

Twenty years before Gates made his prediction, the Center for Strategic and International Studies and the Johns Hopkins Center for Civilian Biodefense Studies hosted an exercise known as Operation Dark Winter. The exercise was aimed at examining how officials might address the challenges posed by a weaponized smallpox attack on America.

The worrisome conclusions drawn from the Dark Winter exercise prompted a renewed interest in a smallpox vaccination program, at least briefly. Given that it had been decades since this vaccine had been administered to the public, it presumably left millions of Americans vulnerable to an attack. And experts argued that reviving the vaccine could effectively protect the population.
A report from the Johns Hopkins Center for Health Security outlines the findings from the Dark Winter exercise. It explores the issues related to any biological attack—the threat of national security interests, the massive civilian casualties, the breakdown of essential institutions, civil disorder, loss of confidence in government, and reduced U.S. strategic flexibility abroad—but it also covered the concerns specific to a smallpox outbreak.
"Smallpox, because of its high case-fatality rates and transmissibility, represents one of the most serious biological warfare threats to the civilian population," the report states. "Aerosol release of smallpox virus disseminated among a relatively small population could result in a significant epidemic. Evidence suggests the infectious dose is very small."
We typically think of biological warfare as a relatively recent development, but smallpox was imagined as a weapon in the past. For example, during the French and Indian War (1754–1763), British general Lord Jeffrey Amherst wrote letters in which he proposed wiping out Native American enemies by offering them smallpox-infected blankets.
Historians dispute whether the plan was ever implemented, and if it was, question if it even worked. What is clear is that many Native Americans were killed by smallpox when Europeans arrived in the New World. With no immunity to Old World diseases, several tribes were decimated with exposure.

The Search for Risk-Free Immunity

For centuries, people observed that those who survived smallpox were rewarded with a special ability: immunity. This meant that if you got sick from it once and recovered, the disease couldn't touch you again. In the past, various methods were employed to take advantage of this ability, while minimizing the threat. Throughout Asia and Africa, people discovered a procedure that involved smearing some smallpox pus or powdered scabs into a fresh scrape on the skin. Ideally, the process would produce mild symptoms and smallpox immunity, but it could also be fatal and cause outbreaks.
In England, a notable variation on this procedure led to the invention of the first vaccine. According to legend, an orphan boy heard a milkmaid proclaim that her complexion would never be blemished by smallpox marks because of her exposure to the bovine variety of the disease, known as cowpox. That orphan grew up to become a country surgeon named Edward Jenner who was eager to test the milkmaid's claim. In 1796, Jenner exposed a young boy to a cowpox lesion in hopes of stimulating smallpox immunity and his experiment proved a success. Jenner named his new invention a vaccine after the Latin word for cow: vacca.
This invention is often credited with the eradication of smallpox, but some suggest that improvements in hygiene and nutrition may have played an even greater role in ending the

scourge. Whatever the case, even the most ardent fans of the smallpox vaccine admit the treatment comes with significant risk. One big reason the world didn't embrace a renewed vaccination program following the Dark Winter exercise was all the complications associated with the treatment, including serious infections of the brain and heart.
These problems are detailed in a 2003 article in the journal, Clinical Medicine and Research, titled "Smallpox Vaccine: The Good, The Bad, and The Ugly."
"Current evidence suggests net harm would result if smallpox vaccine were made available to the general public on a voluntary basis. Such a policy would pose a risk to both the vaccinees and their close contacts (who presumably have not consented to vaccinia exposure) with little or no benefit under many attack scenarios. If this complex public health decision is delegated to individual citizens, some individuals will be unable to weigh the risks and benefits for true informed consent," the article states.

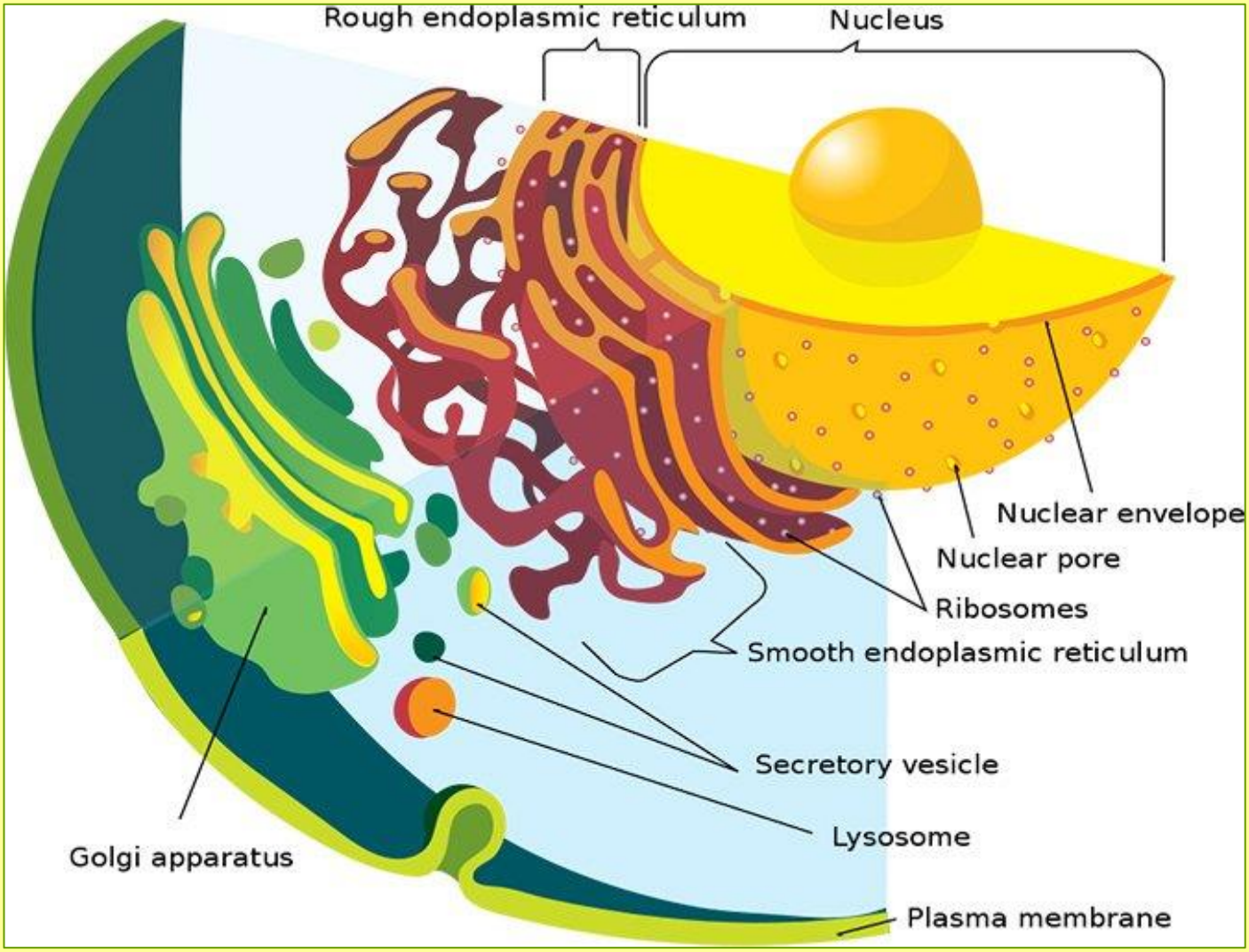
Treatments Old and New
So what if a smallpox attack really does break out in the next few years? Another weak spot in our protection from an attack is that there hasn't been a recognized treatment for it.
Drugmakers, however, are already gearing up to fill the gap just in case.
In 2018, the U.S. Food and Drug Administration (FDA) approved the first drug to treat smallpox, named **tecovirimat**. In June 2021, the FDA approved another drug to treat the disease named **brincidofovir**. Both drugs were approved under the FDA's animal rule. Because of the ethical issues associated with infecting human subjects with smallpox to test the drugs, only animal trials were used to assess safety and effectiveness.
Another smallpox remedy not approved by the FDA comes from Native American medicine of the 1800s.
The Micmac tribe of Nova Scotia in particular treated smallpox infections with a carnivorous pitcher plant known as Sarracenia pupurea. Herbert Miles, the assistant surgeon to the Royal Artillery, reported that during an outbreak, an old Indian woman treated the tribe with Sarracenia and "was so successful as to cure every case."
In 1892, American botanist Charles Millspaugh described Sarracenia as "the greatest remedy known for the dreadful scourge."
The remedy went largely forgotten for the next century. But in 2012, researchers at Arizona State University took a fresh look at the old remedy and conducted in vitro experiments with a Sarracenia extract. They found that it inhibited the replication of the variola virus.
The study, published in the journal PLOS ONE, concluded that Sarracenia was "the first effective inhibitor of poxvirus replication at the level of early viral transcription."

Shock AI Discovery Suggests We've Not Even Discovered Half of What's Inside Our Cells

Source: https://www.sciencealert.com/shocking-ai-discovery-suggests-we-barely-know-what-s-inside-our-own-cells

Nov 26 – Inside every cell of the human body is a constellation of proteins, millions of them. They're all jostling about, being speedily assembled, folded, packaged, shipped, cut and recycled in a hive of activity that works at a feverish pace to keep us alive and ticking. But without a full inventory of the protein universe inside our cells, scientists are hard-pressed to appreciate on a molecular level what goes wrong with our bodies that leads to disease.
Now, researchers have developed a new technique that uses artificial intelligence to assimilate data from microscopy images of single cells and biochemical analyses, to create a 'unified map' of subcellular components – half of which, it turns out, we've never seen before.
"Scientists have long realized there's more that we don't know than we know, but now we finally have a way to look deeper," says computer scientist and network biologist Trey Ideker of the University of California (UC) San Diego.
Microscopes, powerful as they are, allow scientists to peer inside single cells, down to the level of organelles such as mitochondria, the power packs of cells, and ribosomes, the protein factories. We can even add fluorescent dyes to easily tag and track proteins.
Biochemistry techniques can go deeper still, honing in on single proteins by using, for example, targeted antibodies that bind the protein, pull it out of the cell, and see what else is attached to it.

Integrating those two approaches is a challenge for cell biologists.
"How do you bridge that gap from nanometer to micron-scale? That has long been a big hurdle in the biological sciences," explains Ideker.
"Turns out you can do it with artificial intelligence – looking at data from multiple sources and asking the system to assemble it into a model of a cell."
The result: Ideker and colleagues have flipped textbook maps of globular cells which give us a birds-eye view of candy-colored organelles into an intricate web of protein-protein interactions, organized by the teensy distances between them.



Classic view of a Eukaryote cross section. (Mariana Ruiz/LadyofHats/Wikimedia)

Fusing image data from a library called the Human Protein Atlas and existing maps of protein interactions, the machine learning algorithm was tasked with computing the distances between protein pairs.
The goal was to identify communities of proteins, called assemblies, that co-exist in cells at different scales, from the very small (less than 50 nm) to the very 'large' (more than 1 µm).
One shy of 70 protein communities were classified by the algorithm, which was trained using a reference library of proteins with known or estimated diameters, and validated with further experiments.
Around half of the protein components identified are seemingly unknown to science, never documented in the published literature, the researchers suggest.

In the mix was one group of proteins forming an unfamiliar structure, which the researchers worked out is likely responsible for splicing and dicing newly made transcripts of the genetic code that are used to make proteins.
Other proteins mapped included transmembrane transport systems that pump supplies into and out of cells, families of proteins that help organize bulky chromosomes, and protein complexes whose job it is to make, well, more proteins.
A hefty effort, it's not the first time that scientists have tried to map the inner workings of human cells, though.
Other efforts to create reference maps of protein interactions have yielded similarly mind-boggling numbers and attempted to measure protein levels across tissues of the human body.
Researchers have also developed techniques for visualizing and tracking the interaction and movement of proteins in cells.
This pilot study goes a step further by applying machine learning to cellular microscopy images which locate proteins relative to large cellular landmarks such as the nucleus, and data from protein interaction studies that identify a protein's nearest nano-scale neighbors.
"The combination of these technologies is unique and powerful because it's the first time measurements at vastly different scales have been brought together," says bioinformatician Yue Qin, also of UC San Diego.
In doing so, the Multi-Scale Integrated Cell technique or MuSIC "increases the resolution of imaging while giving protein interactions a spatial dimension, paving the way to incorporate diverse types of data in proteome-wide cell maps," Qin, Ideker and colleagues write.
To be clear, this research is very preliminary: the team focused on validating their method and only looked at the available data from 661 proteins in one cell type, a kidney cell line which scientists have been culturing in the lab for going on five decades.
The researchers plan to apply their newfangled technique to other cell types, says Ideker.
But in the meantime, we'll have to humbly accept we're mere interlopers inside our own cells, capable of understanding a small fraction of the total proteome.
"Eventually we might be able to better understand the molecular basis of many diseases by comparing what's different between healthy and diseased cells," says Ideker.

▶▶ **The study was published in** *Nature*.

Molecule Derived From Poisonous Plant Blocks All SARS-CoV-2 Variants in Cell Cultures

Source: https://www.sciencealert.com/molecule-found-in-poisonous-plant-blocks-all-sars-cov-2-variants-in-cell-cultures

Nov 27 – The plant-based antiviral agent thapsigargin (TG), derived from a group of poisonous plants known as **'deadly carrots'**, (*Thapsia villosa*) appears to be effective against all variants of SARS-CoV-2 in the lab – and that includes the quick-spreading Delta variant.
A previous study published in February demonstrated that TG can be effective against a host of viruses. Now, this latest work by the same research team confirms that the antiviral also isn't being outflanked as SARS-CoV-2 evolves. With the emergence of new variants an ongoing possibility, it's intriguing to observe the continuous efficacy of TG.

In tests on cell cultures in the lab, doses of TG delivered either before infection or during active infection were shown to block and inhibit SARS-CoV-2 variants, triggering a broad and powerful protective response.

"A single pre-infection priming dose of TG effectively blocked all single-variant infections and every combination (AB, AD, BD variants) of co-infection at greater than 95 percent relative to controls," write the researchers in their published paper.

As a host-centric antiviral, **TG seems to break some of the mechanisms that viruses like SARS-CoV-2 hijack in host cells to replicate themselves and spread throughout the body.**

"All available data (generated by us and others) as exemplified in influenza virus, respiratory syncytial virus, and coronaviruses, including SARS-CoV-2, indicate that TG does not prevent viral entry but rather triggers intracellular pathways to inhibit virus replication," the team writes.

The cell culture study also confirmed the higher replication rate and cell-to-cell transmission rate of the Delta variant: it was found to spread at four times the rate of the Alpha variant of coronavirus and at nine times the rate of the Beta variant.

What's more, Delta can accelerate the multiplication of other variants when co-infections occur. If someone succumbs to two variants of SARS-CoV-2 at the same time, then Delta acts as an extra boost for whatever other variant it's partnering up with.

"Our new study has given us better insights into the dominance of the Delta variant," says Kin-Chow Chang, a professor of Veterinary Molecular Medicine at the University of Nottingham in the UK.

"Even though we have shown that this variant is clearly the most infectious and promotes production of other variants in co-infections, we are pleased to have shown that TG is just as effective against all of them."

While vaccinations massively reduce the risk of getting infected with SARS-CoV-2, they don't reduce the risk entirely – and of course, there are substantial numbers of people who can't or won't agree to get a jab to protect themselves against the virus.

With that in mind, finding new treatments to manage COVID-19 will remain a high priority for controlling the ongoing global pandemic.

It's not certain that TG would be as effective against future variants, but the signs are good.

After demonstrating its efficacy in the lab, the next step is actually developing treatments from TG, which would of course take time – as you might expect from an agent developed from a poisonous plant, it's going to take a significant amount of further research to turn it into something safe for humans.

Testing it against cell cultures and getting promising results is by no means even a guarantee that this antiviral would eventually pass a clinical trial, but it's a hugely exciting first step for sure. "Together, these results point to the antiviral potential of TG as a post-exposure prophylactic and an active therapeutic agent," says Kin-Chow Chang.

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

COVID Vax Rates in Africa Are Low But Region Avoids Worst, Leaving Scientists Baffled

Source: https://www.newsweek.com/covid-vax-rates-africa-are-low-region-avoids-worst-leaving-scientists-baffled-1651375

Nov 19 – When the COVID-19 pandemic emerged last year, many experts predicted the virus would surge across Africa, but so far the continent has not experienced any major outbreaks, confusing scientists.

Though fewer than 6 percent of Africans are vaccinated and residents of many countries do not wear masks regularly, the World Health Organization has described Africa as "one of the least affected regions in the world."

Wafaa El-Sadr, chair of global health at Columbia University, told the Associated Press something "mysterious" is going on across the continent.

"Africa doesn't have the vaccines and the resources to fight COVID-19 that they have in Europe and the U.S., but somehow they seem to be doing better," she said.

Researchers think the lower number of cases could be due to the population being younger—the average age being 20—or their lower rates of urbanization and longer time spent outdoors. Others think it could have something to do with prior infections with other diseases or the fact that people across the continent are more used to dealing with outbreaks even without vaccines.

In the AP report, researchers in Uganda said Friday that they found COVID-19 patients who had previously been exposed to malaria were less likely to show severe symptoms or die.
Jane Achan, a senior research advisor at the Malaria Consortium and a co-author of the study, told the AP they went into the project thinking previous malaria exposure would make COVID-19 infections worse.

"We were actually quite surprised to see the opposite—that malaria may have a protective effect," Achan said.

#	Country, Other	Total Cases	New Cases	Total Deaths
	World	261,442,954	+84,238	5,215,001
1	USA	49,077,695		799,312
2	India	34,572,523		468,554
3	Brazil	22,076,863		614,236

28 November 2021

Devi Sridhar, chair of global public health at the University of Edinburgh, said African leaders haven't gotten the credit they deserve for acting quickly, citing Mali's decision to close its borders before COVID-19 even arrived.
"I think there's a different cultural approach in Africa, where these countries have approached COVID with a sense of humility because they've experienced things like Ebola, polio and malaria," Sridhar said.
In past months, the coronavirus has pummeled South Africa and is estimated to have killed more than 89,000 people there, by far the most deaths on the continent. But for now, African authorities, while acknowledging that there could be gaps, are not reporting huge numbers of unexpected fatalities that might be COVID-related. WHO data show that deaths in Africa make up just 3 percent of the global total. In comparison, deaths in the Americas and Europe account for 46 percent and 29 percent, respectively.

#	Country, Other	Total Cases	New Cases	Total Deaths
	Europe	72,775,036	+62,731	1,406,193
1	UK	10,110,408		144,724
2	Russia	9,570,373	+33,548	272,755
3	France	7,588,400		118,871
4	Germany	5,744,517		101,340
5	Spain	5,131,012		87,955

#	Country, Other	Total Cases	Total Deaths
	Africa	8,713,419	223,291
1	South Africa	2,958,548	89,791
2	Morocco	949,648	14,774
3	Tunisia	717,163	25,363
4	Libya	371,571	5,438
5	Ethiopia	371,177	6,736

In Nigeria, Africa's most populous country, the government has recorded nearly 3,000 deaths so far among its 200 million population. The U.S. records that many deaths every two or three days.
The low numbers have Nigerians like Opemipo Are, a 23-year-old in Abuja, feeling relieved. "They said there will be dead bodies on the streets and all that, but nothing like that happened," she said.
On Friday, Nigerian authorities began a campaign to significantly expand the West African nation's coronavirus immunization. Officials are aiming to inoculate half the population before February, a target they think will help them achieve herd immunity.
Oyewale Tomori, a Nigerian virologist who sits on several WHO advisory groups, suggested Africa might not even need as many vaccines as the West. It's an idea that, while controversial, he said is being seriously discussed among African scientists—and is reminiscent of the proposal British officials made last March to let COVID-19 freely infect the population to build up immunity.
That doesn't mean, however, that vaccines aren't needed in Africa.
"We need to be vaccinating all out to prepare for the next wave," said Salim Abdool Karim, an epidemiologist at South Africa's University of KwaZulu-Natal, who previously advised the

South African government on COVID-19. "Looking at what's happening in Europe, the likelihood of more cases spilling over here is very high."
In Zimbabwe, doctors were grateful for the respite from COVID-19—but feared it was only temporary.
"People should remain very vigilant," warned Dr. Johannes Marisa, president of the Medical and Dental Private Practitioners of Zimbabwe Association. He fears that another coronavirus wave would hit Zimbabwe next month. "Complacency is what is going to destroy us because we may be caught unaware."

Is stupidity trendy?

The new eating-out fashion in London!

EDITOR'S COMMENT: These private pods might look romantic and nice and all. BUT there is no information regarding (1) how many times the air change inside the pod and (2) the method that the pod is disinfected when new customers enter the pod. Most probably, there is no air control device inside and disinfection is a simple wipe-out of the table. Not to mention that customers most probably do not wear masks (because they are vaccinated …) and this means that viral loads are concentrated in a limited confined space. In addition, in some pod models there is a zipper at the entrance; so, no fresh air inside!

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Bio-terrorism Strategy in the Wuhan Coronavirus Pandemic: A Perspective from Conspiratorial and Apocalyptic Hypotheses

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The frequency with which Wuhan Covid-19 virus appears randomly all over the world has raised suspicion that it could be a bio-warfare and hegemonic tool of Beijing, the emergent imperial power to sustain its over bearing ambition and influence in the global system in recent times. The controversies surrounding the outbreak of the virus have left no doubt that the virus is concocted in a laboratory in Wuhan, China. This study, therefore, attempts to ascertain whether the outbreak of Covid-19 or Coronavirus pandemic is a natural epidemic or a bioterrorism as it is alleged to be put to use

for sinister motives by the Communist Party in China. The study also relates same to the conspiratorial and apocalyptic hypotheses surrounding its outbreak since late December 2019. The study examines the concept of bioterrorism and biological weapons, and most importantly "Covid-19" and the challenges it poses to the entire world, W.H.O and the intelligence community as a tool of state actor terrorism. To review relevant literatures in the study area, the study adopted historical design which is qualitative and explorative in nature. Historical research method is applied via secondary sources of data, including textbooks, official documents, research articles and opinion papers, and internet materials. The study finds it necessary to suggest appropriate measures to forestall further spread of the strain as a means for biological warfare by the Communist Party of China as alleged by conspiracy theorists

India faces threat of targeted bioterrorism

By Dr P.S. Venkatesh Rao

Source: https://www.sundayguardianlive.com/news/india-faces-threat-targeted-bioterrorism

Nov 27 – Deadly Ebola and Marburg viruses were collected from bats in Nagaland by Chinese and US defence researchers in 2017. Any disgruntled or greedy or brainwashed employee in a bio-warfare program of any nation can easily pass on deadly viruses to terrorists in an easy to carry vaccine or insulin cool-pouch.

The threat of state sponsored bioterrorism to India is a clear and present danger. Awareness of this is most important as forewarned is forearmed. A study in Nagaland at Mimi village on the Indo-Myanmar border in 2017 on viruses in local fruit bats by researchers from Uniformed Services (Military) University of the Health Sciences, Bethesda, Maryland, USA; Wuhan Institute of Virology (WIV) and Duke-National University of Singapore with Indian researchers was published on 31 October 2019 in the journal "PLOS Neglected Tropical Diseases" and was sponsored by the Department of Defense, Defense Threat Reduction Agency, USA. They reported the presence in these bats of the filovirus family of viruses that include the deadly Ebola and Marburg viruses that for long have been the focus of bioweapon research. They also found reactive antibodies to these viruses in both human bat hunters and the local bats. The involvement of foreign entities with consent only from their own institutions but without prior permission of the Government of India raised major concern and an enquiry was ordered by the government only after the pandemic started. A five-member committee set up by the Indian Council of Medical Research had submitted a report to the Health Ministry. The US Centre for Disease Control (CDC) in Atlanta stated that it had not commissioned this study. It had probably not been kept in the loop by the US Department of Defense. The viruses and data collected by the WIV Chinese researchers can easily be misused to prepare bioweapons against India. Answers to the five-Ws—Who, Why, What, When, Where—and How are the essentials of any investigation by journalists, military intelligence, detectives or researchers and hence are answered here.

WHO THE THREAT IS FROM

The threat is mainly from our traditional adversaries, the Chinese and Pakistani establishments who are together pursuing bioweapons. They have opened a third front within India by enrolling corrupt Indians, political malcontents and religious bigots as agents to achieve their agenda. Every effort is being made to rope in our neighbours and also influence world powers, multilateral global agencies and the Indian diaspora to attack India and its government. The sustained effort is to hijack Indian democracy to bring regime change or at least create chaos to paralyse the government and thus weaken our economy, health and defences. Another risk is any disgruntled or greedy or brainwashed employee in the bio-warfare program of any nation can easily pass on deadly viruses to terrorists in an easy to carry vaccine or insulin cool pouch.

WHY BIOTERRORISM IS A CLEAR AND PRESENT DANGER TO INDIA

Bioterrorism has the advantage of deniability, portability, deployment, self-replication and is the only option left for China and Pakistan against India because of the following reasons. Chemical and nuclear warfare are becoming increasingly irrelevant because of traceability of the source, international pressure and counter-attack deterrence. Conventional wars have become wars of attrition by proxies. It is now limited in time frame, geography and advantage gained because of arms supplies and support to both sides of any war by global powers divided into two adversary camps. Pakistan establishment's war of bleeding India by a thousand cuts using proxy terrorists is going nowhere; instead, it is Pakistan's economy that is bleeding by a thousand leaks. Chinese war by salami slicing of Indian land has ground to a halt in the heights of the Himalayas as its pampered army is short of breath and willpower to fight. Its Belt and Road Initiative (BRI) and debt trap attempts to encircle India and overcome its Malacca dilemma are causing a ballooning diplomatic and debt crisis. The only option left is to weaken India by bioterrorism preceded by cyber-attacks, disinformation and propaganda and encouraging internal strife both

communal and Naxalite, hence National Security Advisor Ajit Doval's recent statement that "civil society is the new frontier of war". The intent to use bioweapons is further confirmed by the army of Chinese ally North Korea marching in Hazmat suits (See image).

WHAT THE RISK IS

The risk is very high as bioweapons are ready for deployment as already evident from the inadvertent leak at the Wuhan laboratories. The proxies have also been augmented and activated both on our western front and also on our far eastern flank, thanks to the instability in Afghanistan, Pakistan and Myanmar. The inimical activists within India are high on fervor and enthusiasm after what they perceive as success in their street protests and attacks against the government for economic problems and pandemic management.

WHEN THE LIKELY THREAT IS

The first wave of Covid-19 in India was delayed by a ban on flights from China and the national lockdown, and started towards the end of June 2020, otherwise it would have started in March. The second wave started in mid-February of 2021; hence the threat of bioterror is likely to be in February-March during or after the budget session of Parliament for three reasons. 1. This timing will help pass off the attack as a natural third wave of the pandemic. 2. It may include another attack on our temple of democracy. 3. Our adversaries hope that a weakened India by May will enable them to march in by the time the snow melts on our Himalayan borders.

WHERE THE LIKELY THREAT IS

The bio warfare may not necessarily be with our Army at the borders, as our enemies want these areas to be safe for them to occupy and dismember India. It is more likely the deadly pathogens will be spread in our commercial hubs, strategic installations, command and control centres, health facilities and heavily populated areas after a cyber-attack to paralyse all infrastructure and communication.

HOW THE VIRUS WILL BE SPREAD

In a previous article titled "Corona variants are bio-weapons in a war by deception" dated June 20, 2021 in The Sunday Guardian, I had detailed how the corona virus can be preserved in powder form for up to 14 days at room temperature and at least 2 months at +4 degrees C with ordinary refrigeration. I had also mentioned how the Covid-19 outbreak in Jubilant Pharma factory in Nanjangud, Karnataka, India in March 2020 was likely to have been a field test in targeted bio warfare. There were five variants of the Covid-19 virus in Jan 2020 as per the family tree published by the researchers of the Wuhan Institute of Virology (WIV) in the journal Nature. By now deadlier viruses and variants, and vaccines and medicines for them would have been prepared with

the benefit of the pandemic experience. It is no wonder that all efforts to investigate the WIV are being stonewalled. The virus can be spread by suicide bio-bombers or by agricultural spraying drones.

BIODEFENCE AND MEDICAL COUNTERMEASURES:
Biodefence includes medical research and preparations to defend against bioterrorist attacks. High-Efficiency Particulate Air (HEPA) filters need to be installed in AC ducts, to filter out biological agents at large quarantine emergency shelters and in strategically important facilities including health, communication, transport and logistics facilities. Medical measures include personal protection equipment like Hazmat suits, early identification of the bioweapon used and quick development and deployment of testing kits, hospital and ICU equipment and facilities, vaccinations and medicines. We should develop vaccines and medication for Ebola and other virus infections not yet seen in India. Information and relief distribution measures and networks of health care and frontline workers developed during this pandemic will be useful. All crowds at any place or reason should be restricted or banned. Enhanced funding for research and development of new detection and disease surveillance methods; new vaccines and antimicrobial therapies; design and construction of large disaster relief cum quarantine shelters; and health facilities capable of managing a surge in demand, should be a national priority as this will also improve our preparedness for natural disasters and epidemics.

Dr P.S. Venkatesh Rao, *MBBS (Vellore), MS (Vellore), DNB, FRCS (Glasgow), FACS, FICS, FMAS, FAES is Consultant Endocrine, Breast and Laparoscopic Surgeon.*

What We Know So Far About Omicron, The Latest COVID 'Variant of Concern'

Source: https://www.sciencealert.com/what-we-know-so-far-about-omicron-the-latest-covid-variant-of-concern

Nov 27 – A coronavirus variant first detected in South Africa has now spread to several other countries, including Israel and Belgium, prompting a spate of travel restrictions across Europe, Asia, and North America.
The new variant, called Omicron, carries a concerning number of mutations that could make it more transmissible or more likely to cause severe disease than the Delta variant, public-health experts say.
The World Health Organization labeled Omicron a "variant of concern" on Friday – a designation given to variants like Delta that require scrutiny from public-health officials.
Preliminary evidence suggests that Omicron may increase the risk of reinfection relative to other variants of concern, WHO said.
But scientists have barely begun to examine Omicron's threat: Fewer than 100 of the variant's genome sequences have been reported globally, compared with Delta's more than 2.8 million sequences.
"We don't know very much about this variant yet," Maria van Kerkhove, WHO's technical lead on COVID-19, said at a Thursday briefing. "What we do know is that this variant has a large number of mutations, and the concern is that when you have so many mutations, it can have an impact on how the virus behaves."
She added: "It will take a few weeks for us to understand what impact this variant has."
Many scientists are hoping for answers much sooner than that, Katelyn Jetelina, an epidemiologist at UTHealth School of Public Health, told Insider.
The variant could be lying undetected in some parts of the globe, she said.
"I would not be surprised if it's already landed in the US," Jetelina said. "We've already seen that this has been transmitting in communities like Turkey, Egypt, Belgium, Israel."

Omicron contains several new, unfamiliar mutations

South African researchers identified the first Omicron case on November 9, then reported the variant to WHO on Wednesday.
Scientists are hopeful that they spotted the variant early, since the majority of known cases are still concentrated in southern Africa.
"South Africa has one of the best genomic surveillance systems in the world, so we know that they're really constantly evaluating this virus," Jetelina said. "For them to have 'only' detected 100 cases thus far in South Africa really gives us hope that this is the beginning stages of spread."
Still, a number of markers suggest that Omicron is highly transmissible relative to other coronavirus variants.
For one, South Africa's coronavirus cases have risen sharply over the past few weeks: Average daily cases have risen thirteenfold since the variant was first discovered on

November 9, from about 275 to 3,700 cases per day, according to Johns Hopkins University data.
Omicron also contains several worrisome mutations found in other variants of concern – including Delta and Alpha – that could help it spread, render vaccines less effective, or lead to more severe disease.
The new variant carries some unfamiliar mutations, as well.
"There are a number of mutations that we don't have any information about," Jetelina said. "They've never seen them on previous variants of concern. So, I think, one of the first questions is: What are these? Do we need to worry about them or not?"
So far, scientists have identified 32 mutations on the variant's spike protein – the protruding crownlike bumps on the surface of the virus that help it invade our cells.
Other variants of concern have had fewer spike mutations.
"The spike protein is basically the key into our cells to infect us, so once that protein changes for better or for worse, then we need to really pay attention to it," Jetelina said. "That is probably what is creating this increase in cases that we're seeing in South Africa right now."

Public-health experts say there's no need for panic yet

A higher number of mutations doesn't necessarily make a variant deadlier or more transmissible – nor does it suggest on its own that Omicron will pose a greater challenge to vaccines than other variants of concern.
"We don't know yet if this new variant is outcompeting Delta," Jetelina said. "We also still don't know if it will evade our vaccines yet, either."

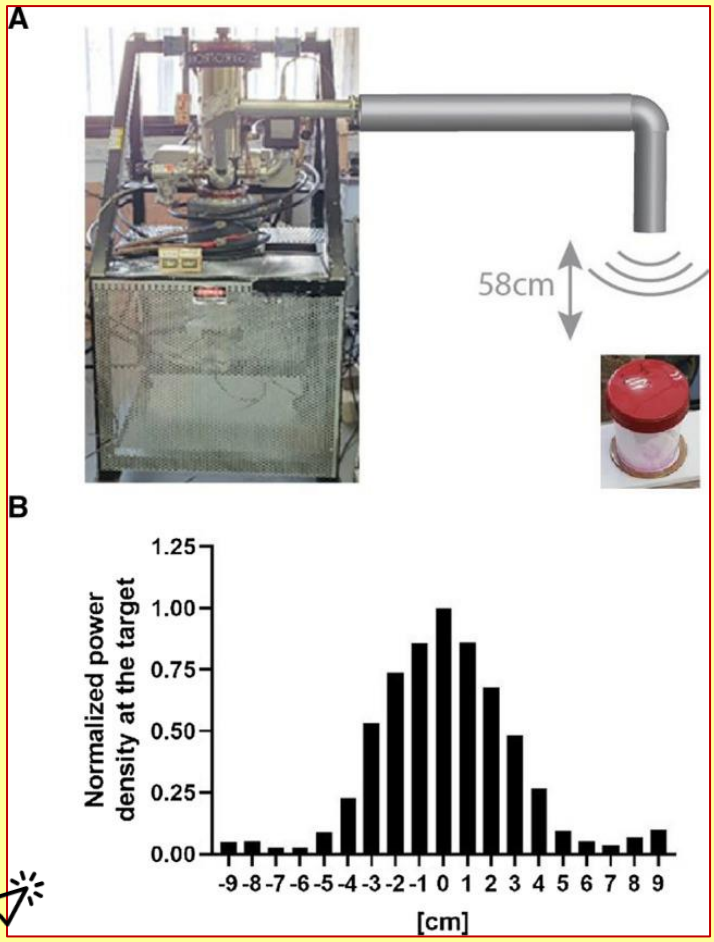
Scientists are still waiting on lab studies to determine how well coronavirus antibodies – either from natural infection or vaccines – hold up against Omicron.
They're also watching carefully to see how quickly the variant spreads across the globe, particularly in countries with higher vaccination rates. (South Africa has fully vaccinated just 24 percent of its population, compared with 59 percent in the US.)
"We really just need to hold tight to see how this plays out and what our next move is," Jetelina said.
Moderna, BioNTech-Pfizer, and Johnson & Johnson all said on Friday that they were testing how well their vaccines protected against Omicron.
People who have been fully vaccinated and wear masks in public indoor settings shouldn't feel compelled to change their behavior right now, Jetelina added.
Mike Ryan, the executive director of WHO's health-emergencies program, shared a similar message on Thursday.
"Viruses evolve, and we pick up variations. It's not the end of the world. The sky is not falling in," he said. "There is this idea that we're just waiting for the next variant, and I don't want people to spend their lives worrying about that every day."

Special radiation can kill COVID-19 and polio virus, Israeli study shows

Source: https://www.jpost.com/health-and-wellness/coronavirus/special-radiation-can-kill-covid-19-and-polio-virus-israeli-study-shows-686981

Nov 25 – A special form of radiation known as millimeter waves can kill 99% of corona and polioviruses from surfaces within two seconds, new research from scientists at Ariel University has shown. The results can have important implications on how to disinfect environments and equipment in a fast and efficient way.

"Our laboratory focuses on electromagnetic radiation sources," said Prof. Moshe Einat from the Department of Electrical Engineering, and a co-author of the study recently published in the journal Environmental Chemistry Letters. "This type of radiation operates in the millimeter-wave regime, which means that they have a wavelength of about three millimeters. Just for comparison, the radiation from a cellphone has a wavelength of about 30 centimeters, and that from a microwave of about 12 centimeters."



The W-band gyrotron used for the irradiation of viruses. **A** Image of the W-band gyrotron used for virus irradiation and a sample cup with the virus sample in it in front of the radiation tube. **B** The W-band beam profile. The sample cup with a diameter of 4 cm was placed in the center of the beam

Millimeters waves have many applications. In the medical field, preliminary research has shown that they can be very effective in targeting tumors and killing cancerous cells. In addition, they can be used to transfer energy and electricity without using wires, as well as in the manufacturing process of unique materials such as synthetic diamonds.

"They make the process go much faster than the current ones," Einat said.

After the coronavirus pandemic broke out, Einat and his team had the idea to use the waves to kill the virus, and they started cooperating with Dr. Gabi Gerlitz, a molecular biologist.

"We saw that the radiation could increase the temperature of the vials and therefore kill the virus," said Garlitz, lead author of the study.

It does not appear that the technology can currently target the virus in the human body, "but it can be very useful for rooms, equipment and all forms of surfaces that need to be clear from any virus and coronavirus specifically," he noted.

According to Garlitz, the big advantage offered by millimeter waves is that they can disinfect a surface very fast.

"Other methods currently used for this purpose, like UV radiation, take minutes and sometimes even a full hour, and in addition, they might be toxic for humans, which makes the disinfection process very impractical," he said. **"With our technique, we have cleared almost 99.9% of the virus within two seconds."**

The radiation is also very gentle on the **surfaces**, neither heating them nor affecting them, and therefore can be used on delicate surfaces such as electronic equipment.

The scientists also tried the same technology with the poliovirus and obtained similar results.

"We wanted to prove that the method works with viruses in general," Garlitz said.

For the future, the researchers are focusing on applying the technique to **disinfect water**. "Water contamination is a worldwide problem," said Garlitz. "We think that this could offer a solution for it."

The Code Breaker by Walter Isaacson review – a science page-turner

By Laura Spinney

Source: https://www.theguardian.com/books/2021/mar/11/the-code-breaker-by-walter-isaacson-review-a-science-page-turner

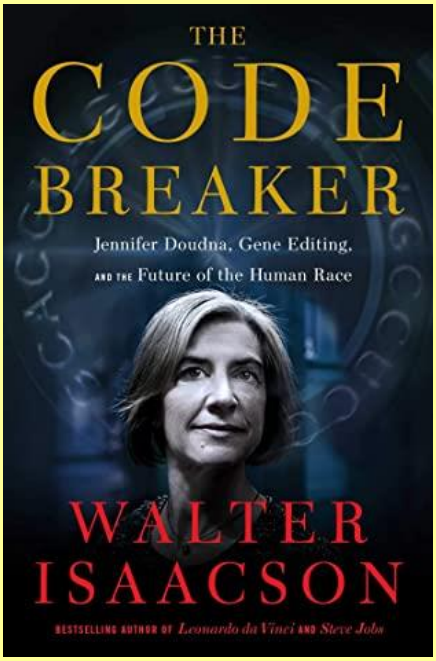
March 2021 – One of the most striking passages in Walter Isaacson's new book comes towards the end. It is 2019 and a scientific meeting is under way at the famous Cold Spring Harbour Laboratory in New York State, but James Watson, the co-discoverer of the structure of DNA, is banned from it because of the racist and scientifically unfounded views he has expressed on intelligence. Isaacson, who is to interview Watson, therefore has to make his

way to the house on the nearby campus that the scientist has been allowed to keep. When the conversation sails dangerously close to the race issue, someone shouts from the kitchen: "If you are going to let him say these things, then I am going to have to ask you to leave." The 91-year-old Watson shrugs and changes tack.

Jennifer Doudna with her Nobel gold medal (together with Emmanuelle Charpentier), December 2020. Photograph: Jeff Chiu/Associated Press/EPA

The voice from the kitchen belonged to Rufus, Watson's middle-aged son who suffers from schizophrenia. "My dad's statements might make him out to be a bigot and discriminatory," he once said. "They just represent his rather narrow interpretation of genetic destiny." In many ways, Isaacson observes, Rufus is wiser than his father.

Genet ic destiny is a central theme of *The Code Breaker*, Isaacson's portrait of the gene-editing pioneer Jennifer Doudna, who, with a small army of other scientists, handed humanity the first really effective tools to shape it. Rufus Watson's reflections encapsulate the ambivalence that many people feel about this. If we had the power to rid future generations of diseases such as schizophrenia, would we? The immoral choice would be not to, surely? What if we could enhance healthy human beings, by editing out imperfections? The nagging worry – which might one day seem laughably luddite, even cruel – is that we would lose something along with those diseases and imperfections, in terms of wisdom, compassion and, in some way that is harder to define, humanity.



Doudna contributed to the identification of **Crispr**, a system that evolved in bacteria over billions of years to fend off invading viruses. Crispr-Cas9, to give it its proper name, disarms viruses by slicing up their DNA. Bacteria invented it, but the insight that won Doudna – a biochemist at the University of California, Berkeley – the Nobel prize in chemistry last year, along with French microbiologist Emmanuelle Charpentier, was that it could be adapted to edit genes in other organisms, including humans. The paper that sealed the duo's fame was published in 2012, when Charpentier was working at Umeå University in Sweden. By the beginning of 2020, two dozen human trials were under way for medical applications of the technique – for conditions from cancers to atherosclerosis to a congenital form of blindness.

The Crispr story is made for the movies. It features a nail-biting race, more than its fair share of renegades, the highest prize in chemistry, a gigantic battle over patents, designer babies and acres of ethical quicksand. It presents a challenge to a biographer, however, who has to pick one character from a cast of many to carry that story. Isaacson chose Doudna, and you can understand why. Having helped to elucidate the basic science of Crispr, she remains implicated in its clinical applications and in the ethical debate it stimulated – unlike Charpentier, who has said that she doesn't want to be defined by Crispr and is now pursuing other science questions. Doudna is the thread that holds the story together.

Still, you can't help wondering how that story might have read if it had been told from the point of view of Francisco Mojica, the Spanish scientist who first spotted Crispr in bacteria inhabiting salt ponds in the 1990s. He intuited that it did something important, then doggedly pursued this line of research despite a lack of funding and the fact that everyone told him he was wasting his time. A different story again might have been told via the two French food scientists who realised in 2007 that Crispr could be harnessed to vaccinate bacteria against viruses, thus securing the future of the global yoghurt industry, or the Lithuanian biochemist Virginijus Šikšnys, who moved the story on again, but whose work was rejected by top journals.

Each one made an essential contribution, and it's difficult to say whose, if any, was the most important. A similar dilemma preoccupied Carl Djerassi and Roald Hoffmann in their 2001 play *Oxygen*, which asked who should receive a "Retro-Nobel" for the discovery of the eponymous gas. Should it go to the scientist who discovered oxygen but didn't publish his discovery, the one who published but failed to understand the discovery's significance, or the one who grasped its significance but only thanks to the insights of the other two?

Focusing on Doudna also paints the Crispr story as more American than it was. Doudna herself acknowledged its international dimension, in her own account, *A Crack in Creation*

(2017). "All told, we would be quite the international group," she wrote of the team that produced the seminal 2012 paper, "a French professor in Sweden, a Polish student in Austria, a German student, a Czech postdoc, and an American professor in Berkeley". The fact that her Czech postdoc and Charpentier's Polish student had grown up close to each other – either side of a border – and that both spoke Polish, reinforced the group's synergy and sped the writing of the paper.

It was precisely because so many people contributed, and because they disagree about the significance and primacy of their contributions, that they remain entangled in a row over ownership. The Crispr revolution owes a great deal to America and the premium it places on creativity and innovation, but as with so many scientific breakthroughs, there was an element of convergence – of people independently and more-or-less simultaneously arriving at the same insight. (Isaacson suggests radar and the atomic bomb were American inventions too, but radar was developed in many countries in the run-up to the second world war, while European refugees from that war helped build the bomb.)

It's not only the discovery process that is collective. As soon as a discovery is made public an even wider circle of people will apply it, and they may not have the same priorities. It's easy and right to condemn Chinese maverick He Jiankui for editing the genes of twins Lulu and Nana, supposedly to protect them from HIV infection, but in his impassioned reply to Doudna's criticism of his act there seems buried a grain of truth. "You don't understand China," he told her. "There's an incredible stigma about being HIV positive, and I wanted to give these people a chance at a normal life ..." Genetic destiny means different things to different people, as Rufus Watson understands.

Isaacson, who is best known for his lives of Steve Jobs and Leonardo da Vinci, remains a consummate portraitist. He captures the frontier spirit of Harvard geneticist George Church in an anecdote about how, when Church was a child, his physician stepfather let him administer hormone injections to his female patients (Church has been testing experimental Covid-19 vaccines on himself lately). Isaacson also has a privileged vantage point, knowing the Crispr backstory and the personalities that shaped it. In 2000, as editor of *Time*, he put the two men leading competing efforts to sequence the human genome – Francis Collins and Craig Venter – on the cover. He understands the tensions that drive discovery and how flawed brilliant people can be. This story was always guaranteed to be a page-turner in his hands. It's just that science has outgrown biography as a medium. His subject should have been Crispr, not Doudna.

***Laura Spinney** is a science journalist and the author of "Pale Rider: The Spanish Flu of 1918 and How it Changed the World".*

Promising COVID-19 pill is less effective than initially reported

Source: https://newatlas.com/health-wellbeing/merck-coronavirus-pill-molnupiravir-final-trial-efficacy-fda/

Nov 28 – Ahead of a U.S Food and Drug Administration advisory panel meeting, drugmaker **Merck** has revealed final analysis data from a Phase 3 trial testing its oral antiviral pill against COVID-19. The new data reveals the treatment is significantly less effective than early indications.

Two months ago, Merck announced promising early data for **molnupiravir**, its oral antiviral COVID-19 treatment. The interim Phase 3 trial analysis revealed the pill reduced a person's risk of hospitalization or death from COVID-19 by 50 percent when taken within five days of symptoms appearing.

However, the final trial analysis is now indicating the treatment is much less effective than first suggested. The new data, encompassing all the Phase 3 trial participants (1,433 subjects, instead of the earlier analysis that only looked at 775 subjects), found 9.7 percent of those in the placebo group experienced either hospitalization or death from COVID-19 compared to 6.8 percent in the group taking the new antiviral.

This means **molnupiravir reduces a person's risk of hospitalization or death from COVID-19 by 30 percent, and not 50 percent**, as was previously reported after the interim analysis. The new data also reports nine COVID-19 deaths were seen in the placebo group, compared to just one death in the molnupiravir group.

The new data comes ahead of this week's Antimicrobial Drugs Advisory Committee (ADAC) meeting. The ADAC is an independent panel that publicly convenes to issue antimicrobial drug approval recommendations, and while the FDA generally follows ADAC's advice, it is not compelled to do so.

Alongside evaluating the molnupiravir trial data, the FDA has issued two key questions for ADAC to discuss. One question asks if there should be any monitoring strategies put in place to track viral mutations that may be triggered through the use of molnupiravir.

Molnupiravir inhibits the replication of SARS-CoV-2 by increasing the frequency of viral RNA mutations. This essentially floods the viral genome with so many errors the virus can no longer effectively replicate. The FDA's question to ADAC is linked to some concerns that widespread use of molnupiravir could hasten the rise of dangerous SARS-CoV-2 variants.
The other key question the FDA is asking ADAC to consider is whether molnupiravir is safe for pregnant women. Hypothetically, mutagenic drugs such as molnupiravir could generate birth defects. Pregnant women were excluded from Merck's Phase 3 trial of molnupiravir, so the FDA is tasking ADAC with providing recommendations for what groups of people should be excluded from using the drug.
No serious adverse effects were detected in Merck's molnupiravir trial and it is likely the antiviral will be issued an Emergency Use Authorization by the FDA despite this reduced efficacy.
This will make it the first oral treatment designed specifically for COVID-19 to be approved for clinical use.

Hot on its heels is a COVID-19 antiviral pill from Pfizer, which recently reported extraordinary interim results of reducing hospitalization or death in high-risk patients by 89 percent compared to placebo.

Virus is still winning …

EudraVigilance - European database of suspected adverse drug reaction reports

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Last Update: Nov 20, 2021	Reported Cases	Fatalities	% fatalities to cases	All Multiple Symptoms	Serious injuries	% serious to ALL
Pfizer-BioNTech	574 427	14 526	2,53%	1 323 370	570 901	43,14%
Oxford/AstraZeneca	410 479	6 145	1,50%	1 075 335	557 549	51,85%
Moderna	158 401	8 518	5,38%	390 163	189 769	48,64%
Janssen	37 814	1 825	4,83%	101 732	36 973	36,34%
Total:	**1 181 121**	**31 014**	2,63%	**2 890 600**	**1 355 192**	46,88%

31,014 Deaths and 2,890,600 Injuries Following COVID Shots in European Database of Adverse Reactions as Young, Previously Healthy People Continue to Die.

The COVID vaccines were designed to fail

Source [video]: https://rumble.com/vpw1y9-the-covid-vaccines-were-designed-to-fail.html

Nov 27 – In this 10-minute video, Dr. Sucharit Bhakdi (Prof. Medical Microbiology @ University Johannes Gutenberg Mainz) discusses the fundamental reason for the current wave of "breakthrough infections:" the failure of the COVID vaccines had to be expected, **because fundamental principles of immunology were ignored in their design**.
The **first** mistake was to focus on antibodies rather than cellular immunity (cytotoxic T-lymphocytes) in assessing vaccine efficacy, even though cellular immunity is far more important to antiviral immunity than are antibodies.
The **second** mistake was to neglect the functional distinction between the two major categories of antibodies, which the body produces in order to protect itself from pathogenic microbes:
1. The first category (secretory IgA) is produced by immune cells (lymphocytes) that are located directly underneath the mucous membranes that line the respiratory and intestinal tract. The antibodies produced by these lymphocytes are ejected through and to the surface of the linings. These antibodies are thus on site to meet air-borne viruses and they may be able to prevent viral binding and infection of the cells.
2. The second category of antibodies (IgG and circulating IgA) occur in the bloodstream. These antibodies protect the internal organs of the body from infectious agents that try to spread via the bloodstream.

What to know about viruses?

Medically reviewed by Jill Seladi-Schulman, Ph.D.
Written by Peter Crosta — Updated on June 24, 2021
Source: https://www.medicalnewstoday.com/articles/158179

June 2021 – Viruses are microscopic particles that exist almost everywhere on Earth. They are present in animals, plants, and other living organisms, and they can sometimes cause diseases.
Viruses are biological entities that can only thrive and multiply in a host, which is a living organism such as a human, an animal, or a plant. Some viruses cause disease. For example, severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, causes the disease COVID-19.
A virus may also affect one organism in one way but a different one in another. This explains why a virus that causes illness in a cat may not affect a human.
Viruses vary in form and complexity. They consist of genetic material, DNA or RNA, with a coat of protein around it. Some have an additional coat called the envelope. This may be spiky and helps them latch onto and enter host cells. They can only replicate in a host.
In this article, we discuss in detail viruses, including how they act and how they can affect people.

What are viruses?

Electron microscope image of the first U.S. case of COVID-19. The spherical viral particles, colored blue, contain a cross-section of the viral genome, in the form of black dots.
Viruses are microscopic entities that have a core of genetic material, either DNA or RNA. The core is covered with a capsid, a protective coat made of protein.
Around the capsid, there may be a spiky covering known as the envelope. These spikes are proteins that enable viruses to bind to and enter host cells. There, if the conditions are right, they can multiply.
There is some disputeTrusted Source about whether viruses meet the criteria for living organisms. They can grow and reproduce, but they do not produce adenosine triphosphate, a compound that drives many processes in living cells.
They also do not contain ribosomes, so they cannot make proteins. This makes them unable to reproduce independently and totally dependent on their host.
After entering a host cell, a virus hijacks the cell by releasing its own genetic material and proteins into the host. It uses the host's cellular machinery to make many copies of itself.
Next, the virus continues to reproduce, but it produces more viral protein and genetic material instead of the usual products that the cell would produce.
Viruses have different shapes and sizes. Scientists categorize viruses according to various factors, including:

- their shape and size, which may be rod-shaped, almost spherical, or other shapes
- the type of their nucleic acid, which contains their genetic information
- whether or not they have a protective lipid envelope derived from the host cell

Examples of viruses with an envelope include the influenza virus and HIV.
Within these categories are different types of viruses. A coronavirus, for example, has a sphere-like shape and a helical capsid containing RNA. It also has an envelope with crown-like spikesTrusted Source on its surface.
Seven coronaviruses can affect humans, but each one can change or mutate, producing many variants.

What are friendly viruses?

Just as there are friendly bacteria in the intestines that are essential to gut health, humans may also carry friendly viruses that help protectTrusted Source against dangerous bacteria, including *Escherichia coli*.

Sources

Viruses do not leave fossil remains, so they are difficult to trace through time. Scientists use molecular techniques to compare the DNA and RNA of viruses and find out more about where they come from.
Three competing theoriesTrusted Source try to explain the origin of viruses. In reality, viruses may have evolved in any of these ways.

The regressive, or reduction, hypothesis suggests that viruses started as independent biological entities that became parasites. Over time, they shed genes that did not help them parasitize, and became entirely dependent on the cells they inhabit.
The progressive, or escape, hypothesis postulates that viruses evolved from sections of DNA or RNA that "escaped" from the genes of larger entities. In this way, they gained the ability to become independent and move between cells.
The virus-first hypothesis suggests that viruses evolved from complex molecules of nucleic acid and proteins either before or at the same time as the first cells on Earth appeared, billions of years ago.
When a viral disease emerges, it is not always clear where it comes from. For instance, experts believeTrusted Source SARS-CoV-2 originated in bats and then spilled over into humans.

Transmission

A virus exists only to reproduce. When it reproduces, particles spread to new cells and new hosts. The features of a virus affect its ability to spread.
Viruses can spread through:

- **Touch:** If, for example, a person has the SARS-CoV-2 virus on their hands, and they touch their nose, mouth, or eyes, the virus can enter the body, and they can develop COVID-19.
- **Respiratory droplets:** Some viruses can be present in respiratory droplets. A person produces these when they talk, cough, or sneeze. Influenza and SARS-CoV-2 are two examples of viruses that can spread in this way.
- **Direct contact:** Some viruses may spread through direct contact with a person that has the virus. For example, the human papillomavirus (HPV) can spread via direct contact with the skin. The Epstein-Barr virus, which causes mononucleosis (mono), can spread through saliva, such as while kissing.
- **Bodily fluids:** HIV, for instance, can pass from one person to another through the exchange of semen or blood.
- **Contaminated food or water:** Noroviruses are one type of virus that can enter the body when a person consumes contaminated food or water.
- **Insects:** Mosquitoes carry the virus that causes Zika from one person to another.
- **Around childbirth:** A mother with the cytomegalovirus, which is a herpes virus, can pass the virus on to an unborn child.

Some viruses can remain active on an object for some time. If a person with the virus on their hands touches an item, the next person can pick up that virus by touching the same object. The object is known as a fomite.

What happens if viruses change?

Viruses often change over time. As they reproduce, "copying errors" and genetic changes naturally occur. Some of these changes are very small and do not cause concern, but others can be more significant.
Significant changes could make a virus more transmissible, as has been the case with the B.1.1.7 variant of SARS-CoV-2.
They may also help the virus evade the immune system or existing treatments. For example, doctors use several drugs in combination to treat HIV so that it is harder for the virus to develop resistance to treatment.
Influenza viruses can also do so-called antigenic shift. This can happen if a host cell has become infected with two different types of influenza virus. The two influenza viruses can "reassort" to produce a novel influenza virus. For instance, pigs can often serve as a mixing vessel for avian and human influenza viruses.

Viral diseases

Viruses cause many human diseases. For example, the Epstein-Barr virus can lead to mono.
Other viral diseases include:

- COVID-19
- smallpox
- the common cold
- different types of flu
- measles
- mumps
- rubella
- chickenpox
- hepatitis
- herpes simplex virus (HSV)
- polio

- rabies
- Ebola
- hantavirus
- HIV
- SARS
- dengue fever
- Zika

Some viruses, such as HPV, can lead to cancer.
The full impact of a virus can take time to appear, and sometimes there may be a secondary effect.
For example, the herpes zoster virus can cause chickenpox. The person recovers, but the virus may stay in the body. Years later, it may cause shingles in the same individual.

COVID-19

SARS-CoV-2, the virus that causes the disease COVID-19, is a coronavirus. Coronaviruses are a large family of viruses and include viruses that cause the common cold.
Overall, experts consider SARS-CoV-2 a relatively stable virus. However, it has changed many times since scientists first identified it in China.
By September 2020, scientists had logged over 12,000Trusted Source mutations, and the development continues.
Some variants are more transmissible and more likely to cause severe illness than others. The main concern with new variants is the unpredictability of their impact.
There may also be uncertainty about how well current vaccines can combat a new variant.
The main symptoms of COVID-19 are dry cough, fatigue, and fever, but there are many possible symptoms.
Anyone who has symptoms should seek a test. It is also important to self-isolate until 10 daysTrusted Source after symptoms appear and when no fever has been present for 24 hours.
If a person has difficulty breathing, they should seek emergency medical attention.
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Tackling viruses

When the body's immune system detects a virus, it starts taking measures to protect the body.
As viruses enter the body's cells, the immune system cannot "see" the virus. However, special T cells, known as cytotoxic T cells, can recognize cells that contain viruses, and release substances that kill those cells.
Some viruses can escape detection by cytotoxic T cells, but other immune cells — natural killer cells — can cause the cell containing the virus to die.
In addition, body cells that contain a virus emit proteins called interferons, which warn other cells that a virus is present. This gives healthy cells a chance to defend themselves by changing the molecular makeup of their surface.
Antibodies can also help fight a virus before it enters a cell. They do this by neutralizing or damaging the virus or by changing its features so that it can no longer enter healthy cells.
People may have antibodies if they have already had a virus or if they have received a vaccine.

Treatment

Antibiotics treat bacterial infections, but they cannot treat a viral infection. People will need either a vaccination to prevent infection, or antiviral drugs to treat any symptoms. Sometimes, the only option is symptom relief.
In recent decades, scientists have developed antiviral drugs, largely in response to the AIDS pandemic. These drugs do not destroy the virus, but they slow or prevent its development.
With antiviral treatment for HIV, for example, the level of virus in the body can become so low that tests cannot detect it. At this point, it becomes untransmittable, which means that a person cannot pass the virus on to another person.

Antivirals are also available to treat infection with HSV, hepatitis B, hepatitis C, influenza, shingles, and chickenpox.
Tamiflu is an example of an antiviral drug. People can use it to manage influenza.

Vaccines

Vaccination can be an effective way of preventing viruses from causing disease.
Some vaccines have succeeded in eliminating diseases such as smallpox, which experts believe has been around for at least 3,000 yearsTrusted Source.
Here are some ways a virus vaccination may work:

- It contains an inactivated form of the virus.
- It contains a live attenuated virus, as in immunization for polio.
- It is an mRNA vaccineTrusted Source, which teaches the body to make proteins that fight a specific virus, such as SARS-CoV-2.
- It uses viral vector technologyTrusted Source to create a modified version of a virus such as Ebola or SARS-CoV-2. The vaccine does not contain the real virus but teaches the body to fight the actual virus.

Currently, vaccinations exist for polio, measles, mumps, rubella, COVID-19, and various forms of the flu, among other conditions.
Vaccination can dramatically reduce the likelihood of becoming seriously ill due to a virus, as well as the risk of passing a virus on to others.
For example, according to the Centers for Disease Control and Prevention (CDC), two doses of the measles vaccine offer 97%Trusted Source protection from measles, a highly contagious and potentially fatal condition.
Moreover, widespread use of the vaccine has reduced the incidence of measles in the United States by 99%Trusted Source since it first appeared. If there is an outbreak, it usually affects people who have not had the vaccine.
However, if fewer than 92–95% percent of people receive the vaccine, a community can lose its herd immunity. As a result, the risk of disease increases dramatically, and an outbreak can occur.
Research shows that COVID-19 vaccines are safe and effectiveTrusted Source at preventing serious illness in those exposed to the SARS-CoV-2 virus. Health experts encourage people to have this vaccine to protect themselves and others.

Summary

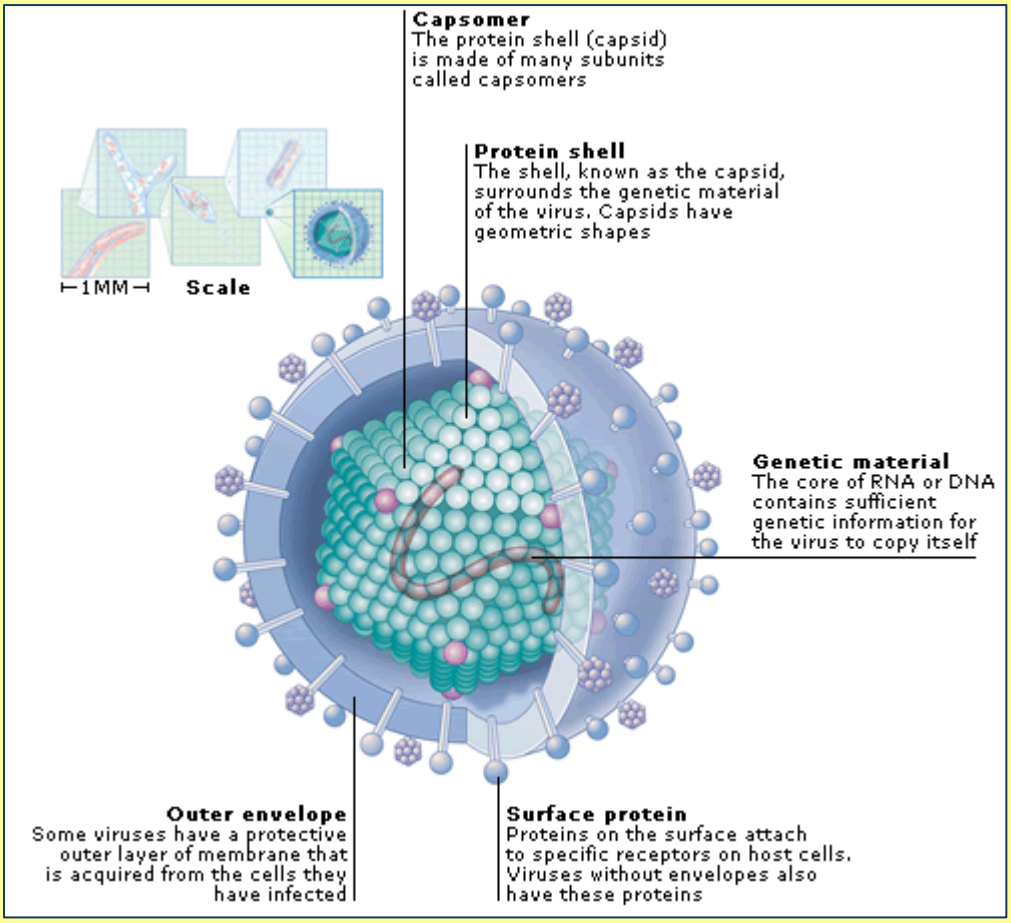
Viruses are biological entities that are present in all living beings. Some are harmless, while others can cause a range of diseases, from the common cold to Ebola. Seeking protection from potentially hazardous viruses — for example, through vaccinations — can help prevent serious illness.

Why the world needs viruses to function

By Rachel Nuwer
Source: https://www.bbc.com/future/article/20200617-what-if-all-viruses-disappeared

June 18 – Viruses seem to exist solely to wreak havoc on society and bring suffering to humanity. They have cost untold lives over the millennia, often knocking out significant chunks of the global population – from the 1918 influenza epidemic which killed 50 to 100 million people to the estimated 200 million who died from smallpox in the 20th Century alone. The current Covid-19 pandemic is just one in a series of ongoing and never-ending deadly viral assaults.
If given the choice to magically wave a wand and cause all viruses to disappear, most people would probably jump at that opportunity, especially now. Yet this would be a deadly mistake – deadlier, in fact, than any virus could ever be.
"If all viruses suddenly disappeared, the world would be a wonderful place for about a day and a half, and then we'd all die – that's the bottom line," says Tony Goldberg, an epidemiologist at the University of Wisconsin-Madison. "All the essential things they do in the world far outweigh the bad things."
The vast majority of viruses are not pathogenic to humans, and many play integral roles in propping up ecosystems. Others maintain the health of individual organisms – everything from fungi and plants to insects and humans. "We live in a balance, in a perfect equilibrium", and viruses are a part of that, says Susana Lopez Charretón, a virologist at the National Autonomous University of Mexico. "I think we'd be done without viruses."
Most people are not aware of the role viruses play in supporting much of life on Earth, because we tend to focus only on the ones that cause humanity trouble. Nearly all virologists

solely study pathogens; only recently have a few intrepid researchers begun investigating the viruses that keep us and the planet alive, rather than kill us.



"It's a small school of scientists who are trying to provide a fair and balanced view of the world of viruses, and to show that there are such things as good viruses," Goldberg says.

What scientists know for sure is that without viruses, life and the planet as we know it would cease to exist. And even if we wanted to, it would probably be impossible to annihilate every virus on Earth. But by imagining what the world would be like without viruses, we can better understand not only how integral they are to our survival, but also how much we still have to learn about them.

Anatomy of a virus

For a start, researchers do not know how many viruses even exist. Thousands have been formally classified, but millions may be out there. "We've discovered only a small fraction because people haven't looked much," says Marilyn Roossinck, a virus ecologist at Penn State University. "It's just bias – the science has always been about the pathogens."

Nor do scientists know what percentage of total viruses are problematic toward humans. "If you looked numerically, it would be statistically close to zero," says Curtis Suttle, an environmental virologist at the University of British Columbia. "Almost all viruses out there are not pathogenic to things we care about."

Key to ecosystems

What we do know is that phages, or the viruses that infect bacteria, are extremely important. Their name comes from the Greek *phagein*, meaning "to devour" – and devour they do. "They are the major predators of the bacterial world," Goldberg says. "We would be in deep trouble without them."

Phages are the primary regulator of bacterial populations in the ocean, and likely in every other ecosystem on the planet as well. If viruses suddenly disappeared, some bacterial populations would likely explode; others might be outcompeted and stop growing completely.

This would be especially problematic in the ocean, where more than 90% of all living material, by weight, is microbial. Those microbes produce about half the oxygen on the planet – a process enabled by viruses.

These viruses kill about 20% of all oceanic microbes, and about 50% of all oceanic bacteria, each day. By culling microbes, viruses ensure that oxygen-producing plankton have enough nutrients to undertake high rates of photosynthesis, ultimately sustaining much of life on Earth. "If we don't have death, then we have no life, because life is completely dependent on recycling of materials," Suttle says. "Viruses are so important in terms of recycling."

Researchers studying insect pests also have found that viruses are critical for species population control. If a certain species becomes overpopulated, "a virus will come through

and wipe them out", Roossinck says. "It's a very natural part of ecosystems." This process, called "kill the winner", is common in many other species as well, including our own – as evidenced by pandemics.

In Yellowstone National Park, a certain kind of grass has an increased heat tolerance due to a virus (Credit: Getty Images)

"When populations become very abundant, viruses tend to replicate very rapidly and knock that population down, creating space for everything else to live," Suttle says. If viruses suddenly disappeared, competitive species likely would flourish to the detriment of others.

"We'd rapidly lose a lot of the biodiversity on the planet," Suttle says. "We'd have a few species just take over and drive out everything else."

Some organisms also depend on viruses for survival, or to give them an edge in a competitive world. Scientists suspect, for example, that viruses play important roles in helping cows and other ruminants turn cellulose from grass into sugars that can be metabolised and ultimately turned into body mass and milk.

Researchers likewise think that viruses are integral for maintaining healthy microbiomes in the bodies of humans and other animals. "These things are not well understood, but we're finding more and more examples of this close interaction of viruses being a critical part of ecosystems, whether it's our human ecosystem or the environment," Suttle says.

Roossinck and her colleagues have discovered concrete evidence supporting this. In one study, they examined a fungus that colonises a specific grass in Yellowstone National Park. They found that a virus that infects that fungus allows the grass to become tolerant to geothermal soil temperatures. "When all three are there – the virus, fungi and plant – then the plants can grow in really hot soils," Roossinck says. "The fungus alone doesn't do it."

In another case study, Roossinck found that a virus passed through jalapeno seeds allows infected plants to deter aphids. "Aphids are more attracted to plants that don't have the virus, so it's definitely beneficial," Roossinck says.

She and her colleagues have discovered that plants and fungi commonly pass viruses from generation to generation. While they have yet to pinpoint the function of most of those viruses, they assume the viruses must somehow be helping their hosts. "Otherwise, why would plants hang on to them?" Roossinck says. If all of those beneficial viruses disappeared, plants and other organisms that host them would likely become weaker or even die.

Protective to humans

Infection with certain benign viruses even can help to ward off some pathogens among humans.

GB virus C, a common blood-born human virus that is a non-pathogenic distant relative of West Nile virus and dengue fever, is linked to delayed progression to Aids in HIV-positive people. Scientists also found that GB virus C seems to make people infected with Ebola less likely to die.

Likewise, herpes makes mice less susceptible to certain bacterial infections, including the bubonic plague and listeria (a common type of food poisoning). Infecting people with herpesvirus, bubonic plague and listeria to replicate the mouse experiment would be unethical, but the study's authors suspect that their findings in rodents likely apply to humans.

While lifelong infection with herpesviruses "are commonly viewed as solely pathogenic," they write, their data suggest that herpes in fact enters into a "symbiotic relationship" with its host by conferring immune benefits. Without viruses, we and many other species might be more prone to succumbing to other diseases.

Viruses are also some of the most promising therapeutic agents for treating certain maladies.

Phage therapy, the subject of considerable research in the Soviet Union as far back as the 1920s, uses viruses to target bacterial infections. It's now a quickly growing field – not only because of increasing antibiotic resistance, but also because of the ability to fine-tune

treatments to knock out specific bacterial species rather than indiscriminately wipe our entire bacterial populations, as antibiotics do. *(Read more about what we do and don't know about our microbiome).*

"Quite a number of lives have been saved by using viruses when antibiotics have failed," Suttle says. Oncolytic viruses, or ones that selectively infect and destroy cancer cells, are also increasingly being explored as a less toxic and more efficient cancer treatment. Whether targeting harmful bacteria or cancer cells, therapeutic viruses act "like little microscopic guided missiles that go in and blow up the cells we don't want", Goldberg says. "We need viruses for a suite of research and technology development efforts that are going to lead us into the next generation of therapeutics."

Because they are constantly replicating and mutating, viruses also hold a massive repository of genetic innovation that other organisms can incorporate. Viruses replicate by inserting themselves into host cells and hijacking their replication tools. If this happens in a germline cell (eggs and sperm), the viral code can be passed on to the next generation and become permanently integrated. "All organisms that can be infected with viruses have an opportunity to suck up viral genes and use them to their advantage," Goldberg says. "The insertion of new DNA into genomes is a major mode of evolution." The disappearance of viruses, in other words, would impact the evolutionary potential for all life on the planet – including Homo sapiens.

Viral elements account for an estimated 8% of the human genome, and mammalian genomes in general are peppered with around 100,000 remnants of genes originating from viruses. Viral code often manifests as inert pieces of DNA, but sometimes it confers new and useful – even essential – functions. In 2018, for example, two research teams independently made a fascinating discovery. A gene of viral origin encodes for a protein that plays a key role in long-term memory formation by moving information between cells in the nervous system.

The most striking example, though, relates to the evolution of the mammalian placenta and the timing of gene expression in human pregnancy. Evidence indicates that we owe our ability to have live births to a bit of genetic code that was co-opted from ancient retroviruses that infected our ancestors more than 130 million years ago. As the authors of that 2018 discovery wrote in PLOS Biology: "It is tempting to speculate that human pregnancy would be very different – perhaps even nonexistent – were it not for eons of retroviral pandemics afflicting our evolutionary ancestors."

Experts believe that such signatures occur throughout all forms of multi-cellular life. "There are likely many functions that remain unknown," Suttle says.

Scientists have only just begun to discover the ways that viruses help to sustain life, because they have only just begun to look. Ultimately, though, the more we learn about all viruses, not just the pathogens, the better equipped we will be to harness certain viruses for good and to develop defenses against others that could lead to the next pandemic.

More than that, learning more about the wealth of viral diversity will help us unlock a deeper understanding of how our planet, ecosystems and very bodies work. As Suttle says, "We need to invest some effort in trying to figure out what's out there, just for our own good."

Mir-19 medication effective against all coronavirus strains, Russian official says

Source: https://tass.com/society/1362237

Nov 16 – The Mir-19 anti-coronavirus drug is capable of blocking the viral replication site so it is effective against all virus strains, Head of Russia's Federal Medical-Biological Agency (FMBA) Veronika Skvortsova told the Rossiya-24 TV channel on Tuesday.

"A medication has been developed that is capable of blocking the replication site of the SARS-Cov-2 virus. The replication site is crucial for the virus, not only for some particular strain but for the entire SARS-Cov-2 lineage, which is why it is a universal solution," she pointed out.

Skvortsova noted that phase one clinical trials had confirmed that the nasal form of the medication was well-tolerated. "The drug is safe for humans as it only impacts the virus and not the entire body. It is a highly specific aetiotropic antiviral drug," she stressed.

The Mir-19 medication, designed to prevent and treat coronavirus, is suitable for inhalation and nasal administration. It halts virus replication and prevents the most severe forms of the infection, as well as pneumonitis and the acute respiratory distress syndrome that the infection causes.

Sputnik V Maker: Vaccine Could Be Adapted to Fight Omicron

Source: https://www.usnews.com/news/business/articles/2021-11-29/sputnik-v-maker-vaccine-could-be-adapted-to-fight-omicron

Nov 29 — The developer of Russia's Sputnik V vaccine said Monday that it will immediately start working on adapting that COVID-19 vaccine to counter the omicron variant.

The Gamaleya Institute and the Russian Direct Investment Fund that bankrolled Sputnik V and its one-shot version Sputnik Light said in a statement that the existing vaccine should be efficient against the new variant.

"Nonetheless, the Gamaleya Institute, based on existing protocols of immediately developing vaccine versions for variants of concern, has already begun developing the new version of Sputnik vaccine adapted to omicron," the statement said.

"The Gamaleya Institute believes Sputnik V and Sputnik Light will neutralize omicron, as they have the highest efficacy against other mutations," RDIF head Kirill Dmitriev said in the statement.

If a modification is necessary, a new version of Sputnik V could be **ready for mass production in 45 days**, the statement said, claiming that several hundred million Sputnik omicron boosters can be provided to international markets by Feb 20, 2022, with over 3 billion doses available in 2022.

The new omicron variant was identified days ago by researchers in South Africa, prompting nations around the world to order travel bans for several nations in southern Africa. Still, much is not known about it, including whether omicron is more contagious, more likely to cause serious illness, or more able to evade the protection of vaccines.

How the Far-Right Is Radicalizing Anti-Vaxxers

Source: https://www.vice.com/en/article/88ggqa/how-the-far-right-is-radicalizing-anti-vaxxers

Nov 29 – Piers Corbyn, a notorious conspiracy theorist and the elder brother of former Labour Party leader Jeremy Corbyn, is one of Britain's most well-known and vocal anti-vaxxers. During the pandemic, he's been on a relentless anti-vaccine tour across the U.K., harassing health experts, holding protests, and promoting wild medical misinformation. Earlier this month, his campaign brought him to a neo-Nazi podcast.

Corbyn's host was Mark Collett, a self-avowed admirer of Adolf Hitler and one of Britain's most prominent Nazi sympathizers. A former youth chair of the far-right British National Party, he now leads his own white nationalist group. Over the course of an hour, Collett and Corbyn discussed a range of COVID-19 conspiracy theories, both opposing vaccinations and claiming the pandemic was part of some sort of secretive plot. Corbyn talked about stopping a "new world order," while Collett questioned who was behind the "COVID scamdemic."

"Obviously, you and I agree on a lot of things," Collett told Corbyn.

As anti-vaccine activists continue to spread medical misinformation online and hold rallies targeting schools, hospitals, and government officials, pairings like Corbyn and Collett have become common. White nationalists and QAnon influencers have become prolific sources for anti-vaccine propaganda, while far-right extremists march alongside anti-vaxxers at protests. In countries around the world, far-right and anti-vaccine movements are now deeply intertwined.

"We're seeing something that we've probably never seen before in terms of how these ideologies work to feed off each other."

"We're seeing something that we've probably never seen before in terms of how these ideologies work to feed off each other," said Aoife Gallagher, an analyst at the London-based Institute for Strategic Dialogue think tank who tracks extremism and disinformation. Far-right extremists and anti-vaxxers have increasingly found that they are natural bedfellows, sharing anti-government beliefs and indulging in a range of conspiracy theories. The boom in anti-vaccine movements since the emergence of COVID-19 has provided an opportunity for far-right groups to latch onto protests and rallies, creating a pipeline from vaccine hesitancy to outright conspiracies and extremism.

A demonstrator holds a sign during an anti-mandate protest against the Covid-19 vaccine as part of a 'Global Freedom Movement' in New York on November 20, 2021. (Photo by YUKI IWAMURA/AFP via Getty Images)

Meanwhile, social media platforms have made it easier than ever for the two movements to bleed into each other and amplify their message—one that frequently repackages old antisemitic bigotries and applies them to the pandemic.

The far-right embraces anti-vaccine protests

Since the start of the pandemic, anti-vaccine movements in numerous countries have gained new life and mobilized to take advantage of the increased public focus on vaccinations. Street protests and massive social media communities sprang up to oppose social distancing measures and spread medical misinformation. As researchers tracked these rallies and online anti-vax groups, they began to notice a variety of far-right activists mingling with coronavirus conspiracy theorists.

"What was totally new for us was the strong mixture between the conspiracy groups and the far-right groups," said Simone Rafael, a researcher at the German anti-racism group the Amadeu Antonio Foundation.

When COVID-19 vaccines became increasingly available over the past year and many governments moved to institute vaccination mandates for employment or travel, that link intensified, researchers say.

In New York, white nationalist Nick Fuentes and other members of the American far-right held anti-vaccine rallies earlier this month outside of a Staten Island hospital and clashed with counterprotesters in downtown Manhattan. Italian neo-fascists and anti-vaccine protesters joined in an October mass protest in Rome that degenerated into violence and an attempt to storm the prime minister's office. In Canada, Ireland, and Australia, anti-government sovereign citizen movements have become deeply intertwined with anti-vaxxers. And in Germany, the country's domestic intelligence agency put anti-vaccine protesters under surveillance this year as they mixed with far-right groups.

"We had big demonstrations in the streets in a lot of German cities, but also an evolving network of hate groups," Rafael said. "We could see the common thread throughout these groups was conspiracy ideologies and antisemitism."

Some of the organizers of anti-lockdown groups have rapidly radicalized over the course of the pandemic. Attila Hildmann, a celebrity vegan chef in Germany, went from initially helping organize rallies against social distancing measures to months later running a Telegram channel with over 120,000 subscribers at its peak, where he spreads anti-vaccine misinformation and antisemitic conspiracies. Hildmann has issued death threats toward politicians he believed were promoting Jewish interests and called on his supporters to target officials. Hildmann fled from Germany to Turkey earlier this year to avoid potential prosecution and told his followers he is now a "real proud Nazi."

"We've had individuals in the UK putting out leaflets which compared the NHS to Auschwitz."

The anti-vaccine movement has brought in extremist groups from across the far-right spectrum.

In the United States, members of the far-right Stop the Steal movement that promoted the conspiracy that Donald Trump won the 2020 presidential election have since shifted toward opposing vaccines and government mandates. Pro-Trump celebrities like former national security adviser Michael Flynn and Simone Gold, founder of the right-wing activist group America's Frontline Doctors, have both headlined anti-vaccine rallies this year. Other prominent anti-vaccine activists also double as QAnon influencers, lumping vaccinations in with their beliefs into broader conspiracies about global pedophile elites plotting to control the world. Meanwhile, far-right extremists like the Proud Boys have attended similar rallies in multiple states.

Canadian members of the sovereign citizen movement have attempted to carry out citizen's arrests of public officials over vaccine mandates, while far-right politicians have become leaders in the anti-vaccine movement. One of the most prominent figures in Canada's anti-vaccine movement is Mark Friesen, who also ran as a parliamentary candidate for the far-right People's Party of Canada and has appeared on a white nationalist livestream show. Before switching to anti-vaccine rallies, he was a lead organizer of Canada's anti-government Yellow Vests protests.

The symbiotic relationship between anti-vaxxers and the far-right has been a boon for anti-vaccine activists, politicizing the decision to get vaccinated and aligning the movement with powerful right-wing political groups. Anti-vaxxers now have fervent champions in Congress, including far-right Rep. Marjorie Taylor Greene of Georgia, who this month announced she was unvaccinated and would refuse the vaccine "because I'm an American."

"It's really grown in strength by becoming part of the whole far-right," said Peter Hotez, co-director of the Center for Vaccine Development at Texas Children's Hospital. "As a consequence of that, people who want to show their allegiance to that movement do so by refusing vaccinations."

Hotez, who authored a book that examines his own daughter's autism diagnosis and debunks medical conspiracy theories, is a longtime target of online hate and threats from anti-vaccine activists. More recently, he's noticed they've taken on a far-right tone.

"Now when the threats come, it's of a different character," Hotez said. "It's about an army of patriots coming to take me down."

The extremism pipeline

Late last year, Facebook banned the Stop Mandatory Vaccination group—not for spreading medical misinformation among its 200,000 members but for violating the platform's policies on QAnon. The group, which circulated unproven treatments and anti-vaccine rhetoric, had

become rife with QAnon conspiracies as its founder Larry Cook claimed that vaccines were part of a "global plan to enslave humanity."
Cook's group was one of many online communities across social media platforms where QAnon conspiracies and anti-vaccine activists overlapped. Following Trump's election defeat and the Jan. 6 insurrection, the QAnon movement increasingly became fixated on vaccinations. QAnon influencers created anti-vaccine viral videos promoting groundless claims that the pandemic was a hoax or that vaccines were an attempt to kill people en masse in order to control the global population.
The pipeline between anti-vaccine groups and other forms of extremism is especially dangerous, researchers say, because the anti-vax movement draws followers from a greater range of the population than far-right activists could normally reach. Many anti-vaccine supporters may not even fully understand that the conspiracies they share have deep ties to far-right and antisemitic narratives.
Anti-vaccine activists come to the movement in a number of ways—from wellness communities posting medical misinformation, from their belief in anti-government conspiracies, or from distrust of pharmaceutical companies. But much of the anti-vaccine movement's ideology tends to fit neatly into what some researchers call "super conspiracies," which include QAnon and New World Order movements.
"These are the kind of big, overarching narratives that provide explanation for smaller conspiracies," said David Lawrence, a researcher with anti-extremism group Hope Not Hate, adding that these so-called super conspiracies are often gateways to antisemitism and other extremist beliefs.
Social media platforms' lack of effective moderation and anti-vaccine policy failures helped amplify those conspiracies. Facebook researchers found in February that as many as 60 percent of comments on vaccine-related posts contained anti-vaccine sentiment, according to the company's leaked internal documents.

Deep roots in antisemitism

At an Arizona school board meeting last month, an anti-vaccine activist at the microphone rattled off a list of grievances that ranged from the "deep state" to critical race theory as she denounced vaccinations and pharmaceutical companies. Just before storming off, she made a final accusation.
"And if you want to bring race into this, it's the Jews," she said.
Behind many anti-vaccine narratives are thinly veiled old bigotries and well-worn conspiracies, researchers say, promoting antisemitic tropes of secretive elites and powerful Jewish families controlling the world. During the pandemic, many of these have come to the forefront, such as this month when Florida Gov. Ron DeSantis' press secretary, Christina Pushaw, suggested that the Rothschilds were involved in a conspiracy to profit from COVID-19.
With mainstream platforms such as Facebook and YouTube attempting to crack down on COVID-19 misinformation, many anti-vaccine groups and activists have migrated to less-moderated platforms such as Telegram and Parler where extremist and antisemitic rhetoric is common.
"Some of these alternative platforms have very entrenched far right communities that are very strongly antisemitic," Lawrence said. "So all these conspiracy theory types finding their way onto these platforms meant that they're in close proximity to these antisemitic elements."
One of the largest COVID-19 conspiracy channels on Telegram, with over 70,000 members, has featured thousands of antisemitic posts since it started six months ago. Another Telegram channel of a Florida pastor turned prominent QAnon influencer regularly posts a mix of explicit antisemitic and white supremacist propaganda, along with anti-vaccine conspiracies.
Couple wearing anti-semitic Holocaust imagery at an anti-vaccine protest in Rome on July 27th, 2021 (Photo by Samantha Zucchi/Insidefoto/Mondadori Portfolio via Getty Images)
"More human beings globally will die at the hands of the Zionist-created vaccines than Jews died during WWII," one post stated. The channel has over 300,000 subscribers and is filled with antisemitic comments framing vaccinations as part of a global Jewish plot.
While far-right extremists promote antisemitic conspiracies about secretive cabals or a new world order, another section of the anti-vaccine movement has taken to appropriating the Holocaust and claiming that unvaccinated people are today's equivalent of Jews under Naziism.
Georgia Rep. Marjorie Taylor Greene made headlines earlier this year after she compared policies requiring face masks to Nazis forcing Jews to wear yellow Stars of David during the Holocaust, but Greene's rhetoric is a common talking point in the anti-vaccine movement.
Anti-vaxxers in numerous countries have worn yellow stars and made comparisons between themselves and victims of the Holocaust. In Germany, anti-vaxxers shared images featuring the words "vaccination sets you free" in reference to the infamous "work sets you free" slogan

at the entrance to the Auschwitz Nazi death camp. French and British anti-vaccine protesters have similarly worn Stars of David during rallies and vowed health officials would face Nuremberg-style trials.
"We've had individuals in the UK putting out leaflets which compared the NHS to Auschwitz, which is kind of just this base scare-mongering. But ultimately it's trivializing and minimizing the Holocaust," Lawrence said.
A look through any anti-vaccine group on social media will almost inevitably lead to talk about nefarious elites who have elaborate plans to commit harm—a long-standing thread through both anti-vaxxer conspiracies and far-right beliefs that is now repackaged for the pandemic.
"That narrative is certainly linked to antisemitism," Gallagher said. "It gets a new coat of paint every decade or so."

Two-meter COVID-19 Rule Is "Arbitrary Measurement" of Safety

Source: https://www.homelandsecuritynewswire.com/dr20211128-twometer-covid19-rule-is-arbitrary-measurement-of-safety

Nov 28 – A team of engineers from the University of Cambridge used computer modelling to quantify how droplets spread when people cough. They found that in the absence of masks, a person with COVID-19 can infect another person at a two-meter distance, even when outdoors.

The team also found that individual coughs vary widely, and that the 'safe' distance could have been set at anywhere between one to three or more meters, depending on the risk tolerance of a given public health authority.

The results, published in the journal *Physics of Fluids*, suggest that social distancing is not an effective mitigation measure on its own, and underline the continued importance of vaccination, ventilation and masks as we head into the winter months in the northern hemisphere.
Despite the focus on hand-washing and surface cleaning in the early days of the pandemic, it's been clear for nearly two years that COVID-19 spreads through airborne transmission. Infected people can spread the virus through coughing, speaking or even breathing, when they expel larger droplets that eventually settle or smaller aerosols that may float in the air.
"I remember hearing lots about how COVID-19 was spreading via door handles in early 2020, and I thought to myself if that were the case, then the virus must leave an infected person and land on the surface or disperse in the air through fluid mechanical processes," said **Professor Epaminondas Mastorakos** from Cambridge's Department of Engineering, who led the research.
Mastorakos is an expert in fluid mechanics: the way that fluids, including exhaled breath, behave in different environments. Over the course of the pandemic, he and his colleagues have developed various models for how COVID-19 spreads.
"One part of the way that this disease spreads is virology: how much virus you have in your body, how many viral particles you expel when you speak or cough," said first author Dr. Shrey Trivedi, also from the Department of Engineering. "But another part of it is fluid mechanics: what happens to the droplets once they're expelled, which is where we come in. As fluid mechanics specialists, we're like the bridge from virology of the emitter to the virology of the receiver and we can help with risk assessment."
In the current study, the Cambridge researchers set out to 'measure' this bridge through a series of simulations. For example, if a person coughed and emitted a thousand droplets, how many would reach another person in the same room, and how large would these droplets be, as a function of time and space?
The simulations used refined computational models solving the equations for turbulent flow, together with detailed descriptions of droplet motion and evaporation.
The researchers found that there isn't a sharp cut-off once the droplets spread beyond two meters. When a person coughs and isn't wearing a mask, most of the larger droplets will fall on nearby surfaces. However, smaller droplets, suspended in the air, can quickly and easily spread well beyond two meters. How far and how quickly these aerosols spread will depend on the quality of ventilation in the room.

In addition to the variables surrounding mask-wearing and ventilation, there is also a high degree of variability in individual coughs. "Each time we cough, we may emit a different amount of liquid, so if a person is infected with COVID-19, they could be emitting lots of virus particles or very few, and because of the turbulence they spread differently for every cough," said Trivedi.
"Even if I expel the same number of droplets every time I cough, because the flow is turbulent, there are fluctuations," said Mastorakos. "If I'm coughing, fluctuations in velocity, temperature and humidity mean that the amount someone gets at the two-meter mark can be very different each time."
The researchers say that while the two-meter rule is an effective and easy-to-remember message for the public, it isn't a mark of safety, given the large number of variables associated with an airborne virus. Vaccination, ventilation and masks – while not 100% effective – are vital for containing the virus.
"We're all desperate to see the back of this pandemic, but we strongly recommend that people keep wearing masks in indoor spaces such as offices, classrooms and shops," said Mastorakos. "There's no good reason to expose yourself to this risk as long as the virus is with us."
The research team are continuing this research with similar simulations for spaces such as lecture rooms that can help assess the risk as people spend more time indoors.

Study details new links between long COVID and chronic fatigue syndrome

Source: https://newatlas.com/health-wellbeing/long-covid-chronic-fatigue-syndrome-shortness-breath-fatigue/

Nov 29 – New research from the Icahn School of Medicine at Mount Sinai has identified a link between long COVID and chronic fatigue syndrome, adding to a growing understanding of the overlap between the two illnesses.
It is estimated up to 50 percent of those diagnosed with COVID-19 will experience some kind of persistent, lingering symptoms beyond the few weeks of acute disease. **Informally known as long COVID, the condition has more recently been clinically dubbed PASC (Post-Acute Sequelae of SARS-CoV-2 infection).**
It is still unclear what causes long-term symptoms after COVID-19 but researchers have begun to notice distinct similarities between long COVID and chronic fatigue syndrome, which is also known as **myalgic encephalomyelitis** (ME/CFS). A review article published in August, led by researchers from the Johns Hopkins School of Medicine, indicted the two illnesses share similar biological abnormalities.
This new research enrolled 41 patients experiencing persistent COVID-19 symptoms between three and 15 months after their acute infection. In particular, all patients were experiencing continued shortness of breath (known as dyspnea) despite showing normal results on pulmonary function tests, chest X-rays, and CT scans.
The cohort completed a cardiopulmonary exercise test (CPET) designed to help doctors investigate the causes underlying shortness of breath. Strikingly, 88 percent of the long COVID patients displayed abnormal breathing patterns during the CPET.
"Recovery from acute COVID infection can be associated with residual organ damage," explains Donna Mancini, lead author on the new study. "Many of these patients reported shortness of breath, and the cardiopulmonary exercise test is often used to determine its underlying cause. The CPET results demonstrate several abnormalities including reduced exercise capacity, excessive ventilatory response and abnormal breathing patterns which would impact their normal daily life activities."
Almost all the cohort exhibited low CO2 values at rest indicating chronic hyperventilation. Mancini says this suggests the dyspnea seen in long COVID could possibly be treated by offering patients breathing exercises.
"These findings suggest that in a subgroup of long haulers, hyperventilation and/or dysfunctional breathing may underlie their symptoms," says Mancini. "This is important as these abnormalities may be addressed with breathing exercises or 'retraining.'"
This kind of dyspnea has previously been detected in ME/CFS patients, affirming the growing link between the two chronic illnesses.
The researchers conducted diagnostic interviews with the entire long COVID cohort to assess each individual for ME/CFS. Nearly half of the cohort (46 percent) met the diagnostic criteria for ME/CFS.
The new findings make reference to prior studies highlighting ME/CFS-like symptoms in survivors of the 2003 SARS epidemic. **A key 2009 study found 27 percent of SARS survivors met the diagnostic criteria for ME/CFS four years after the acute infection.**
Much more work will be needed to tease out the correlations between long COVID and ME/CFS, but in the short term the new research indicates cardiopulmonary exercise testing could be a useful way to assess long COVID patients.

▶▶ **The new study was published in the journal** *JACC:Heart Failure*.

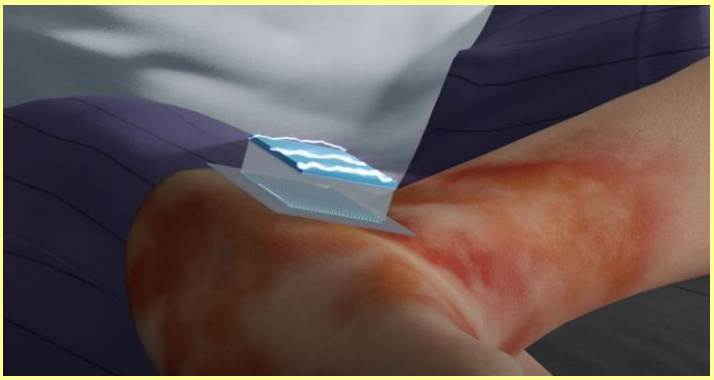
New nanochip reprograms cells in the body to perform different functions

Source [+video]: https://newatlas.com/medical/silicon-nanochip-reprogram-skin-cells-in-body-blood-vessels/

The Indiana University nanochip (Indiana University)

Nov 29 – A team of researchers led by Chandan Sen at the Indiana University School of Medicine, is moving a new nanochip device, which **can reprogram skin cells in the body to become new blood vessels and nerve cells**, out of the prototype phase.

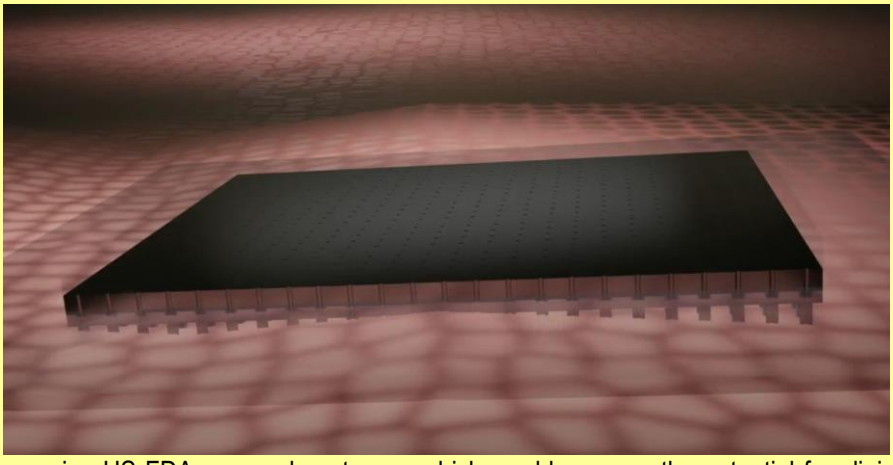
One of the more remarkable medical developments in the past two decades has been the ability to take specialized adult cells and revert them into the kind of non-specialized stem cells found in embryonic tissue. These **stem cells** have great therapeutic potential because they can then be induced to grow into various cells, tissues, and (eventually) organs that will be completely compatible with the patient, eliminating the problem of tissue rejection or finding donors.



The chip can be applied directly to the damaged area (Indiana University)

Unfortunately, doing this requires complicated laboratory procedures, and, along with many alternatives, can raise certain **risks, including giving rise to cancerous cells**. Instead, a simpler system is needed that does not require the elaborate steps that stem cell perversion requires.

The IU team's approach is to forgo the laboratory and turn the human body into its own cell programmer using a technology called tissue nano-transfection. This uses a silicon nanochip that has been printed to include channels ending in an array of micro-needles. On top of the chip is a rectangular cargo container, which holds specific genes.
Propelled by a focused electric charge, these genes are introduced to the desired depth in the living tissue and alter the cells, converting the location into a little bioreactor that reprograms the cells to become different kinds of cells or multicellular structures, such as blood vessels or nerves, without the need for elaborate laboratory techniques or hazardous virus transfer systems. Once produced, these cells and tissues can help to repair damage both locally or in other parts of the body, including in the brain.
"This small silicon chip enables nanotechnology that can change the function of living body parts," says Sen, director of the Indiana Center for Regenerative Medicine and Engineering. "For example, if someone's blood vessels were damaged because of a traffic accident and they need blood supply, we can't rely on the pre-existing blood vessel anymore because that is crushed, but we can convert the skin tissue into blood vessels and rescue the limb at risk."



The nanochip uses an array of channels ending in micro-needles (Indiana University)

The technology has been under development for over five years, and the IU team is now focusing on going beyond prototyping to making the nanochip a practical concern that can be used in clinical settings. This includes securing US FDA approval next year, which would open up the potential for clinical research in people. Potential applications in civilian and military medicine include repairing brain damage resulting from a stroke or reversing nerve damage caused by diabetes.
"This is about the engineering and manufacturing of the chip," says Sen. "The chip's nanofabrication process typically takes five to six days and, with the help of this report, can be achieved by anyone skilled in the art."

▶▶ **The research was published in *Nature Protocols*.**

EDITOR'S COMMENT: Looks magnificent and genius but what about possible malicious dual use of this switching mechanism? What if it is used to make certain cells produce certain hazardous substances that might affect/alter body functions or even kill?

COVID-19 Conspiricism and the Four Ds of Stochastic Terrorism

By Dr. Gerard Gill
Source: https://gnet-research.org/2021/11/25/covid-19-conspiricism-and-the-four-ds-of-stochastic-terrorism/

Nov 25 – In the past weeks, Australian counter-terrorism officials have arrested and charged a man who encouraged anti-lockdown protesters to bring firearms to the State Parliament in order to shoot Premier Dan Andrews "…in the head with a .50 cal explosive tip! Just to make sure hes [sic] gone for life!". The man also instructed protesters on how to manufacture Molotov cocktails. In other incidents, the daughter of a politician was hospitalised after being attacked on the streets, and death threats have been levelled at a pro-vaccination celebrity and a school student, among others.
Elise Thomas, a researcher with the Institute for Strategic Dialogue, has recently pointed out that while there is ample of evidence of some far-right involvement in the COVID-19 conspiricist movement, it is largely unnecessary to make this connection before viewing the movement as a potential source of violent extremism. As the rhetoric and action of the movement escalates, it is prudent to consider the nature of 'conspiracy extremism' in its own right.
With its diverse range of actors, all with their own motivations and ideologies, an instructive way to look at COVID-19 conspiricism is as an environment of stochastic terrorism. According to the influential article that popularised this term, "Stochastic terrorism is the use of mass communications to stir up random lone wolves to carry out violent or terrorist acts

that are *statistically predictable but individually unpredictable."* The stochastic terrorist may deliberately incite violence or simply be indifferent to its possibility. In either case, the danger posed is very real, if somewhat intangible (until it is too late).
Psychologist Valerie Tarico provides a succinct formula for stochastic terrorism. It refers to more traditional platforms such as airwaves and pulpits, so I have paraphrased it to apply to social media-enabled movements. I refer to this version as the 'four Ds':

1. **Demonisation** – a figure with a platform targets a person or group to be blamed for real or imagined ills.
2. **Dehumanisation** – with repetition of the demonisation, the target loses their personhood in the eyes of the audience, becoming a monster or symbol of evil and depravity.
3. **Desensitisation** – violent language and imagery is used in discussion of the target, and while no direct calls to use violence are issued, violent speech becomes an accepted part of the discourse.
4. **Denial** – when violence occurs, the stochastic terrorist denies any responsibility, pointing to their lack of direct involvement or instruction.

To demonstrate this formula with the COVID-19 conspiricist movement, I examined content from a sample of 100 COVID-19 conspiricist Twitter accounts, two Facebook groups with around 1,000 to 1,500 members, and three Telegram groups with memberships ranging from just over 100 to 65,000.

Demonisation and Dehumanisation
As the first steps in the formula, demonisation and dehumanisation of a range of figures, mostly political, was near constant. Three major themes emerged in this step. The first of these was the association of the figures with political groupings that are easily framed as evil or at least clearly 'other' – namely Communists, Nazis and war criminals. Examples include:
'These spiteful virtue-signallers are a hop, skip and a jump from Pol Pot."
"protocols of zion in operation.. #Bolsheviks gunna Bolshevik"
Relatedly, political figures and counter-protesters were likened to the most reviled of criminals or the mentally ill:
'The anti-freedom pedo's going to protest haha"
"What's this psychopath Gunner doing to first Australians?"
Finally, a number of figures or groups were portrayed as literally not human. Examples of this included NSW Chief Health Officer Kerry Chant being referred to as a demon, a meme depicting the Premier of Queensland as a snake, and vaccinated people being depicted as orcs from the Lord of the Rings.

Desensitisation
The repeated use of violent rhetoric, and as such its normalisation, is the point at which a spotlight has been shone on the Australian COVID-19 conspiricist movement, following escalations that underlined the real threats posed. A prominent anti-lockdown protest organiser posted a picture of a home-made gallows online, intimating that it was meant for the Victorian Premier. A great deal of media coverage followed the appearance of a similar device at a protest. Execution by hanging is a recurrent theme of discourse within the movement, an example of such a post is:
"Psychological, biological, treason, crimes against humanity, we have it all. When this goes to REAL courts, we will see quite a number of the elite swing!"
Researchers have speculated about the choice of hanging as the execution method in such posts. One possibility is its association with the Nuremberg Trials, after which twelve defendants were hanged. The Nuremberg Trials and Nuremberg Code are commonly discussed within the sample. Seemingly giving credence to this interpretation, another post links to a Wikipedia page on the trial and execution of Nicolae and Elena Ceaușescu (who were shot, not hanged) with the commentary:
"When is this going to happen to the politicians and others forcing this genocide on countries [sic]"
Other violent rhetoric is less sophisticated:
"It [Kerry Chant] needs a bullet."

Denial
Strictly speaking, the denial step as included in the formula refers to after a terrorist attack or other violent event. As of the moment, nobody has been killed in relation to Australian anti-lockdown protests or the Australian COVID-19 conspiricist movement. However, as authorities and commentators alike have reacted with dismay to recent escalations, denials that the movement is extreme or violent have likewise surfaced. These have included characterisations of reporting on the movement as 'smears' or 'information warfare', as well as content citing the presence of non-white people at protests as proof that the movement is not politically far-right, and statements of non-violence from movement leaders.

As political organisation, including violent extremism, tends increasingly towards decentralisation, official movement statements and plots are no longer sufficient as predictors of extremist violence. After the heyday of Islamic State, this much should be an obvious truism. And a popular awareness of the way stochastic terrorism works is only going to get more important.

Is Omicron More Contagious Than Delta? A Virus Expert Explains What We Know So Far

By Suresh V. Kuchipudi
Source: https://www.sciencealert.com/is-omicron-more-contagious-than-delta-here-s-what-we-know-and-what-we-don-tl

Dec 01 – A new variant named Omicron (B.1.1.529) was reported by researchers in South Africa on Nov. 24, 2021, and designated a "variant of concern" by the World Health Organization two days later. Omicron is very unusual in that it is by far the most heavily mutated variant yet of SARS-CoV-2, the virus that causes COVID-19.
The Omicron variant has 50 mutations overall, with 32 mutations on the spike protein alone. The spike protein – which forms protruding knobs on the outside of the SARS-CoV-2 virus – helps the virus adhere to cells so that it can gain entry. It is also the protein that all three vaccines currently available in the US use to induce protective antibodies.
For comparison, the Delta variant has nine mutations. The larger number of mutations in the Omicron variant may mean that it could be more transmissible and/or better at evading immune protection – a prospect that is very concerning.
I am a virologist who studies emerging and zoonotic viruses to better understand how new epidemic or pandemic viruses emerge. My research group has been studying various aspects of the COVID-19 virus, including its spillover into animals.

Why do new SARS-CoV-2 variants continue to emerge?
While the unusually high number of mutations in the Omicron variant is surprising, the emergence of yet another SARS-CoV-2 variant is not unexpected.
Through natural selection, random mutations accumulate in any virus. This process is sped up in RNA viruses, including SARS-CoV-2. If and when a set of mutations provides a survival advantage to a variant over its predecessors, the variant will out-compete all other existing virus variants.
Does the Omicron variant's greater number of mutations mean it is more dangerous and transmissible than Delta? We simply don't know yet. The conditions that led to the emergence of the variant are not yet clear, but what is clear is that the shear number and configuration of mutations in Omicron is unusual.
One possible explanation for how viral variants with multiple mutations emerge is through prolonged infection in a patient whose immune system is suppressed – a situation that can lead to rapid viral evolution.
Researchers have hypothesized that some of the earlier SARS-CoV-2 variants, such as the Alpha variant, may have stemmed from a persistently infected patient. However, the unusual constellation and numerous mutations in the Omicron variant make it very different from all other SARS-CoV-2 strains, which raises questions about how it came about.
Another possible source of variants could be through animal hosts. The virus that causes COVID-19 can infect several animal species, including mink, tigers, lions, cats, and dogs.
In a study that is not yet peer-reviewed, an international team that I lead recently reported widespread infection by SARS-CoV-2 in free-living and captive white-tailed deer in the US. Therefore, we also cannot rule out the possibility that the Omicron variant emerged in an animal host through rapid evolution.

How the Delta variant became dominant worldwide
Delta is between 40 and 60 percent more transmissible than the Alpha variant and nearly twice as transmissible as the original SARS-CoV-2 virus first identified in China. The Delta variant's heightened transmissibility is the primary reason why researchers believe it was able to out-compete other variants to become the dominant strain.
A key factor in viral fitness is its replication rate – or how quickly a virus can make more copies of itself. The Delta variant replicates faster than previous SARS-CoV-2 variants, and a not-yet-peer-reviewed study estimated that it produces 1,000 times more virus particles than its predecessors.
In addition, people infected with the Delta variant are making and shedding more virus, which is another potential mechanism for its increased ability to spread.

Research suggests that a possible explanation for the Delta variant's heightened ability to replicate is that mutations in the spike protein led to more efficient binding of the spike protein to its host, via the ACE-2 receptor.
The Delta variant has also acquired mutations that would allow it to evade neutralizing antibodies that serve a critical role in the body's defense against an invading virus. This could explain why, as multiple reports have shown, the COVID-19 vaccines have been somewhat less effective against the Delta variant.
This combination of high transmissibility and immune evasion could help explain how the Delta variant became so successful.
Studies also show that people infected with the Delta variant have a higher risk of being hospitalized compared to those infected with the original SARS-CoV-2 and early variants.
One particular mutation on the spike protein of the Delta variant – the P681R mutation – is thought to be a key contributor to its improved ability to enter cells and to cause more severe disease.

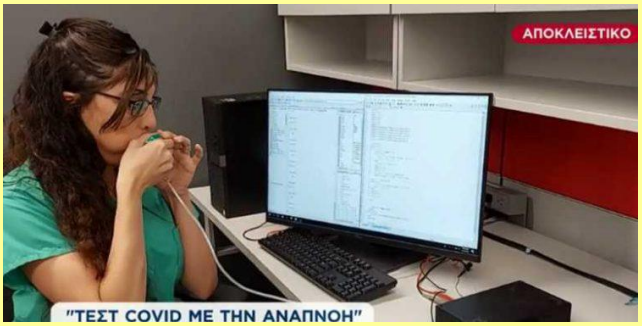
Will Omicron replace Delta?
It is too early to say if the Omicron variant is fitter than Delta or if it will become dominant. Omicron shares some mutations with the Delta variant but also possesses others that are quite different.
But one of the reasons why we in the research community are particularly concerned is that the Omicron variant has 10 mutations in the receptor-binding domain – the part of the spike protein that interacts with the ACE-2 receptor and mediates entry into cells – compared with just two for the Delta variant.
Suppose the combination of all the mutations in Omicron makes it either more transmissible or better at immune evasion than Delta. In that case, we could see the spread of this variant globally. However, it is also possible that the unusually high number of mutations could be detrimental to the virus and make it unstable.
It is highly likely that the Omicron variant is not the endgame and that more SARS-CoV-2 variants will emerge. As SARS-CoV-2 continues to spread among humans, natural selection and adaptation will result in more variants that could plausibly be more transmissible than Delta.
We know from influenza viruses that the process of viral adaptation never ends.
Lower vaccination rates among many countries means that there are still a lot of susceptible hosts out there for the virus, and that it will continue to circulate and mutate as long as it can spread.
→ The emergence of the Omicron variant is yet another reminder of the urgency to vaccinate to stop the further spread and evolution of SARS-CoV-2.

Suresh V. Kuchipudi *is a Professor of Emerging Infectious Diseases @ Penn State.*

EDITOR'S COMMENT: The last sentence of this article puzzled me. Suppose we are all vaccinated (+booster); does this means that the pandemic will be over because vaccines will stop the evolution of SARS-CoV-2? Because for the time being, the new variants (i.e., Omicron) manage to bypass major immunologic defenses quite easily. We need a vaccine that kills the virus. If there is no virus around then the pandemic will be over.

Coronavirus: Breathing test awaits approval – Result in 15 seconds

Source: https://www.fourals.com/2021/12/01/coronavirus-breathing-test-awaits-approval-result-in-15-seconds/



Dec 01 – **Pelagia-Irene Gouma**, a researcher and professor in the Department of Materials Science and Engineering and the Department of Mechanical and Aerospace Engineering at Ohio State University, who developed the coronavirus breath test, spoke to AL against the pandemic.
"This is a portable device with special sensors, in which we exhale once in the mouth and within 15 seconds we have the result", as he explains. **The success rate in the first tests was 88%.**
"We have applied to the US Food and Drug Administration (FDA) and are awaiting a response soon so that we can market the devices to the public health system."

Pelagia-Irini Gouma also referred to the phone call she received from the White House: "They took us from the White House and asked if I could turn it in to detect the flu and we were very happy but there was also a lot of uncertainty because then we did not know a lot about the pandemic ".

Scientists have discovered an antibody to develop a universal vaccine against COVID-19

Source: https://mailbd.net/uncategorized/7327/scientists-have-discovered-an-antibody-to-develop-a-universal-vaccine-against-covid-19/

Dec 02 – Scientists from Of China discovered the **monoclonal antibody 35B5**, which is able to effectively neutralize various strains of COVID-19, according to scientists, it can serve as the basis for creating a universal vaccine, according to an article published on the bioRxiv resource.

According to scientists, through experiments using a cryoelectron microscope, it was possible to find out that the 35B5 antibody affects that unique part of the virus that does not change during the mutation process. This feature, according to scientists, allows the 35B5 antibody to be used to create a universal vaccine against various strains of SARS-CoV-2. Scientists speculate that the 35B5 antibody is also able to neutralize the recently discovered omicron strain B.1.1.529.

Monoclonal antibody 35B5 was obtained by scientists from the blood of a person who had previously recovered from COVID-19 in a severe form.

Earlier, the Chinese pharmaceutical company Sinovac announced that it is working on the study of a new strain of COVID-19 "omicron" and is ready to start creating a vaccine "if necessary." The company noted that Sinovac pays increased attention to the omicron strain and is currently actively collecting information about the strain and its samples in order to "determine the need for a vaccine against this strain as soon as possible."

Earlier, the World Health Organization, following an emergency meeting, decided to classify a new variant of the coronavirus found in South Africaas disturbing. New strain – B.1.1.529 – WHO named "omicron" by the Greek letter.

▶▶ **Read the full paper.**

2021

ACADEMIA | Letters

Once More A Queer Virus

Piotr Sobolczyk, Institute of Literary Research, Polish Academy of Sciences

The epidemiological relevance of the COVID-19-vaccinated population is increasing

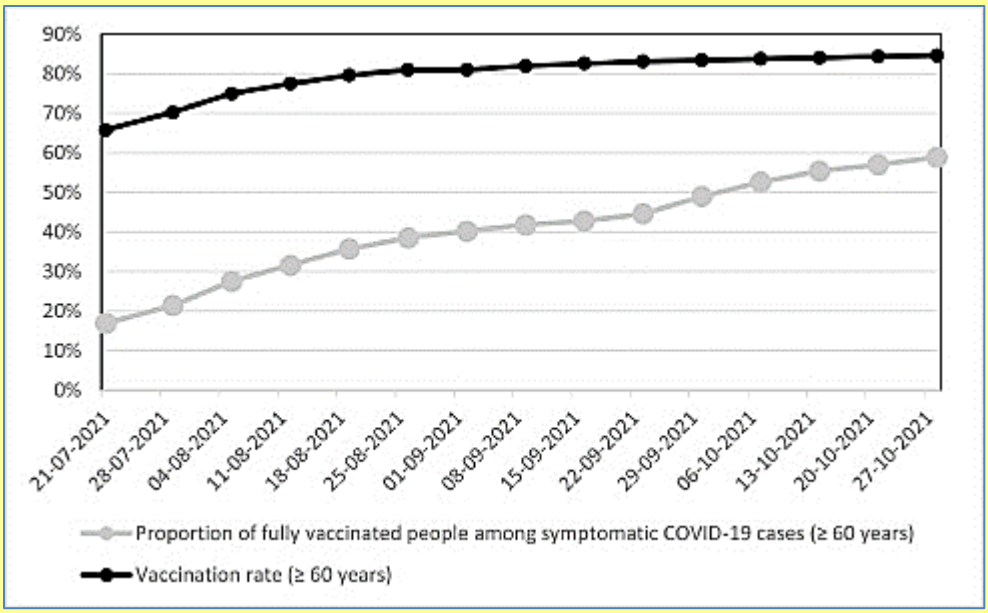
By Günter Kampf

Source: https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762(21)00258-1/fulltext

read.

Nov 19 – High COVID-19 vaccination rates were expected to reduce transmission of SARS-CoV-2 in populations by reducing the number of possible sources for transmission and thereby to reduce the burden of COVID-19 disease. Recent data, however, indicate that the epidemiological relevance of COVID-19 vaccinated individuals is increasing. In the UK it was described that secondary attack rates among household contacts exposed to fully vaccinated index cases was similar to household contacts exposed to unvaccinated index cases (25% for vaccinated vs 23% for unvaccinated). 12 of 31 infections in fully vaccinated household contacts (39%) arose from fully vaccinated epidemiologically linked index cases.

Peak viral load did not differ by vaccination status or variant type [[1]]. In Germany, the rate of symptomatic COVID-19 cases among the fully vaccinated ("breakthrough infections") is reported weekly since 21. July 2021 and was 16.9% at that time among patients of 60 years and older [[2]]. This proportion is increasing week by week and was 58.9% on 27. October



2021 (Figure 1) providing **clear evidence of the increasing relevance of the fully vaccinated as a possible source of transmission**.

Figure 1. Vaccination rates and proportions of fully vaccinated people among symptomatic COVID-19 cases (≥ 60 years) in Germany between 21. July and 27. October 2021 based on the weekly reports from the Robert Koch-Institute.

A similar situation was described for the UK. Between week 39 and 42, a total of 100.160 COVID-19 cases were reported among citizens of 60 years or older. 89.821 occurred among the fully vaccinated (89.7%), 3.395 among the unvaccinated (3.4%) [[3]]. One week before, the COVID-19 case rate per 100.000 was higher among the subgroup of the vaccinated compared to the subgroup of the unvaccinated in all age groups of 30 years or more. In Israel a nosocomial outbreak was reported involving 16 healthcare workers, 23 exposed patients and two family members. The source was a fully vaccinated COVID-19 patient. The vaccination rate was 96.2% among all exposed individuals (151 healthcare workers and 97 patients). Fourteen fully vaccinated patients became severely ill or died, the two unvaccinated patients developed mild disease [[4]]. The US Centres for Disease Control and Prevention (CDC) identifies four of the top five counties with the highest percentage of fully vaccinated population (99.9–84.3%) as "high" transmission counties [[5]]. **Many decisionmakers assume that the vaccinated can be excluded as a source of transmission.** It appears to be grossly negligent to ignore the vaccinated population as a possible and relevant source of transmission when deciding about public health control measures.

EDITOR'S COMMENT: I only hope that all those so called high profile expert to read this article and stop taking public health measures without justification.

Pfizer vs Moderna: Harvard study compares the two mRNA COVID vaccines

Source: https://newatlas.com/health-wellbeing/pfizer-moderna-mrna-coronavirus-vaccines-compared/

Dec 01 – A new study published in the *New England Journal of Medicine* (NEJM) is the first to pit Moderna and Pfizer's mRNA COVID-19 vaccines against each other in an efficacy face-off. The novel research compared health records from nearly half a million US veterans and found both vaccines are incredibly effective but Moderna's candidate is marginally better at preventing COVID-19 infections, both mild and severe.

In late 2020, as Phase 3 trial data emerged, it became clear Moderna and Pfizer's mRNA COVID-19 vaccines were incredibly effective. Across clinical trial and real-world data, the vaccines consistently prevented symptomatic COVID-19 at rates higher than 90 percent.

In the absence of a direct head-to-head clinical trial it has been unclear which mRNA vaccine is generally more effective. So this new study set out to fill that gap in the science by retrospectively analyzing health records from the Department of Veterans Affairs, the largest integrated health care system in the US.

From a database of over three million veterans, the researchers generated two cohorts of 219,842 subjects. Each person was matched with a demographically similar partner based on characteristics such as age, race, and sex. The only difference between the individuals in each matching couple was the mRNA vaccine they were administered.

Overall, the results reveal both vaccines are powerfully effective at preventing SARS-CoV-2 infections, hospitalizations and death. But Moderna's mRNA was found to be ever-so-slightly better on all counts.

The initial 24-week study period, a snapshot of a time early in 2021 before the Delta variant emerged, revealed 4.52 positive cases of COVID-19 per 1,000 persons in the Moderna group. This compared to 5.75 cases per 1,000 persons in the Pfizer group. This means those Pfizer subjects were 27 percent more likely to report a documented COVID-19 infection.

A secondary analysis was conducted with a smaller cohort of subjects spanning a period later in the year when the Delta variant was predominant. Both vaccines were still incredibly effective in the face of the Delta variant, however, Pfizer again was marginally less effective, with its caseload rising to 6.54 more positive Delta cases per 1,000 persons compared to Moderna's per 1,000 caseload.

"Given the high effectiveness of both vaccines, either one is strongly recommended to any individual offered the choice between the two," notes first author on the study, Barbra Dickerman. "However, this large-scale study allowed us to detect subtle differences between these two highly effective vaccines. While the identified differences in estimated risk were small on the absolute scale, they may be meaningful for larger decision-making bodies, such as health care systems and higher-level organizations, when considering the large population scale at which these vaccines are deployed."

Exactly why Moderna's mRNA COVID-19 vaccine is slightly more effective than Pfizer's is a big unanswered question.

Fundamentally, both vaccines are incredibly similar, delivering mRNA encoding the same SARS-CoV-2 spike protein. The researchers point to a few small but key differences between the two vaccines that could account for the discord in effectiveness.

"A difference in effectiveness between the BNT162b2 [Pfizer] and mRNA-1273 [Moderna] vaccines might be the result of the different mRNA content of the vaccines (100 µg for mRNA-1273 vs. 30 µg for BNT162b2), the different interval between the priming and boosting doses (4 weeks for mRNA-1273 vs. 3 weeks for BNT162b2), or other factors, such as the lipid composition of the nanoparticles used for packaging the mRNA content," the researchers speculate in the study.

One factor this new study did not investigate is the difference in reported side effects between the two vaccines. While serious adverse effects from both mRNA vaccines are very rare, prior research has indicated **Moderna's vaccine can lead to higher rates of mild side effects following vaccination compared to Pfizer.**

In an editorial accompanying the new study, NEJM editors Eric Rubin and Dan Longo say the most important point in the research is that both vaccines are highly effective, and the real difference in efficacy between Moderna and Pfizer is tiny. Echoing Dickerman's advice, Rubin and Longo suggest either vaccine would be a good choice for most individuals.

"So the lesson we take away is not about differences – it's about similarities," write Rubin and Longo. "We are lucky to have such good options. Vaccination with any vaccine is far better than remaining unprotected. The message is that the best vaccine is the one that's available."

▶▶ **The new study was published in** *The New England Journal of Medicine*.

Is There Any Difference in Which Booster Shot You Choose? Experts Weigh In

Source: https://www.sciencealert.com/is-there-any-difference-in-which-booster-shot-you-choose-scientists-weigh-in

Dec 03 – Now that free booster shots are being offered to all adults in the US, many are wondering which is the best one to get.

Truth is, all of the three authorized COVID-19 vaccines do a good job, and you can decide to boost with whichever vaccine you want. All three have been deemed safe and effective.

But, there are some small differences in the vaccines that could be a factor in your decision making – particularly for older adults, who may choose to prefer the mRNA boosters, especially Moderna's, based on the available data.

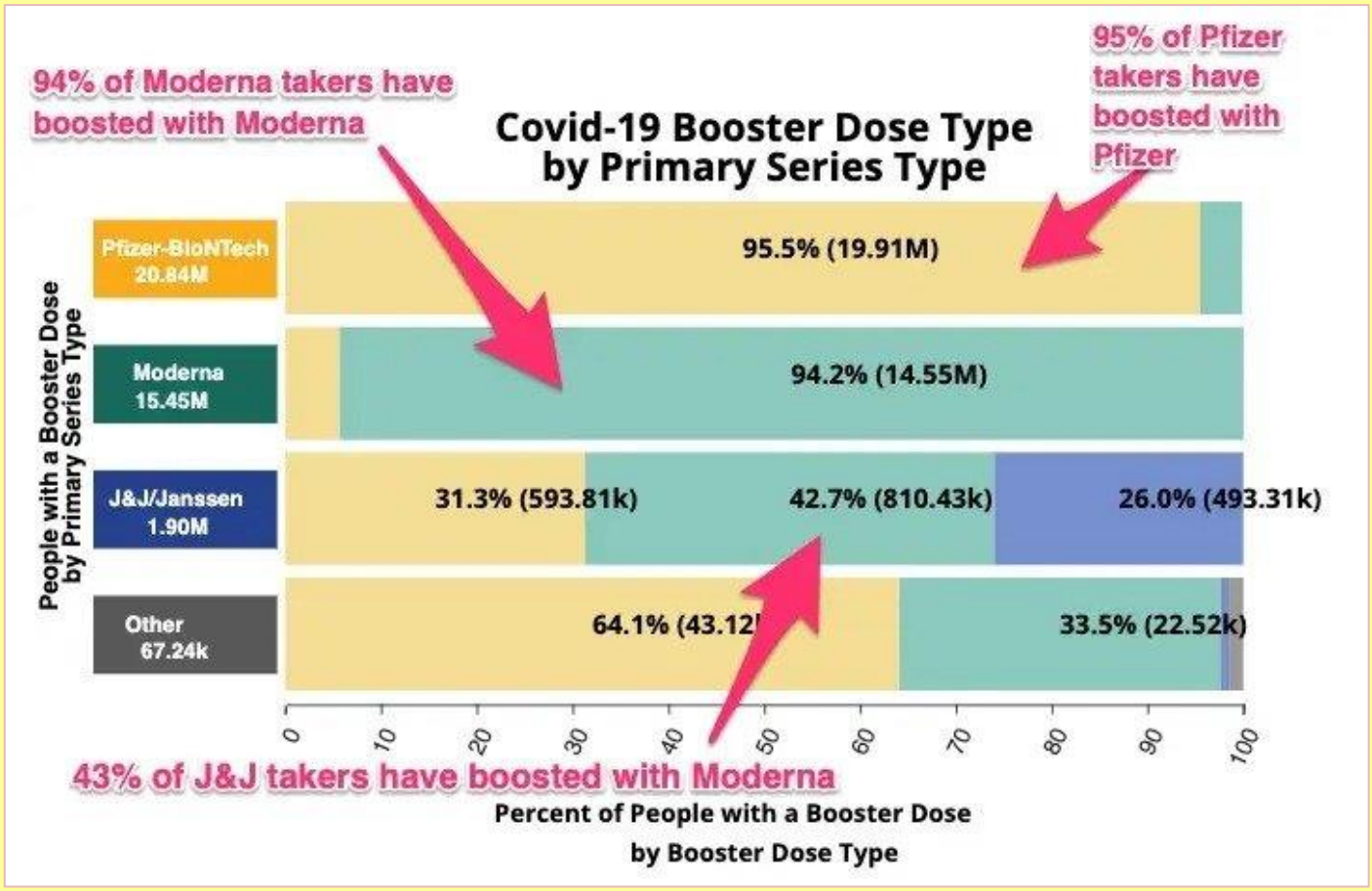
Generally speaking, Moderna's vaccine tends to prompt slightly stronger immunity, and it also seems to elicit slightly higher antibody levels than the other two vaccines. That doesn't mean it's a dramatically better vaccine in the long run, but the extra protection it provides in the immediate term does seem to eke out Pfizer, at least a little bit.

"To be honest, I'm not sure there's really a big difference between those two," Dr. William Moss, who directs the International Vaccine Access Center at Johns Hopkins University, said of Pfizer and Moderna, saying he doesn't see any strong argument for picking one mRNA vaccine over the other. "I would probably say, you know, whichever is more convenient to get."

Most US adults have stuck with their original brand – except for J&J users

All adults are advised to get a booster shot six months after their initial series – except for those who've gotten Johnson & Johnson's single shot vaccine, who have been advised to get a booster at any time past two months after their initial shot.

Federal data on booster shots suggest most people who got Moderna or Pfizer end up sticking with their initial brand when they boost.
Johnson & Johnson takers, however, seem to have a slight preference for Moderna boosts. There is evidence to suggest that J&J users might benefit from this "heterologous" boosting strategy – i.e. switching vaccine platforms – meaning they would add an mRNA vaccine (Pfizer or Moderna) on top of their adenovirus vaccine (J&J).



Data until December 1, 2021 for which booster was chosen. (CDC)

Moderna's shot is a bigger dose than Pfizer's

Moderna's booster is a half-dose of the original vaccine, with 50 micrograms of mRNA inside. (Half-dose boosters are common for many vaccines, and they work well.)
Pfizer's booster, in contrast, is exactly the same size as the first two shots administered from that manufacturer, with 30 micrograms of mRNA in it.
Like Moderna's vaccine, Pfizer's provides a strong jolt to antibody levels, meaning that people who get boosted with it reap the benefit of some increased protection against infection for at least a few months afterwards. (How long the extra protection lasts and exactly how good it is is something scientists are still figuring out.)

Moderna's vaccine may be slightly more powerful than the others

There is some emerging clinical data that suggests Moderna's vaccine performs slightly better at keeping older people out of the hospital.
One Veterans Affairs study published on December 1 showed that from January to May 2021 (before the emergence of the Delta variant) Moderna's vaccine was associated with a 21 percent lower risk of confirmed infection, and a 41 percent lower risk of hospitalization than Pfizer's.
And in a more recent federally-funded mix and match COVID-19 vaccine trial of more than 450 adults, Moderna's vaccine elicited the most robust antibody responses post-boost, while Pfizer's was marginally lower, and Johnson & Johnson took third place.

That's why some experts say it might be a better booster for elderly adults, who are generally more vulnerable to severe outcomes, and need more frequent and potent boosters of all kinds.

How the side effects differ

Moderna boosters may be the most powerful, but they're also the most intense.

Because Moderna's vaccine tends to be more reactogenic than Pfizer's, people who switch to Moderna for their booster may notice the severity of their side effects is a little higher than with their second shot. The most widespread complaint people have after either booster shot is some pain at the injection site. Headaches, fatigue, and muscle aches are also common.

For those who don't switch brands, getting a booster shot feels a lot like getting a second shot, whether it's Pfizer or Moderna.

The one issue people in Moderna's clinical trial tended to complain of more often after their booster shot was some armpit swelling or tenderness. Pfizer trial recipients also reported a bit more swelling (lymphadenopathy) after their boosts.

People who got Johnson & Johnson's shot, and stuck with the same brand for boosters, tend to report very similar, albeit slightly milder side effects for a second shot, compared to their first. But all of these adverse effects of booster shots are mild to moderate and temporary, usually not lasting for more than a day or two after vaccination.

Not very scientific, don't you think?

Many experts say it doesn't matter what booster you get, it's all the same

With time, over the next several months and years, it will become clearer what the very best COVID-19 vaccination strategy truly is. In the meantime, infectious disease experts stress, don't overthink it too much. Regardless of which booster shot people choose, they are better protected against the virus than people with just one (J&J) or two (Pfizer, Moderna) shots. "Right now, don't make it complicated," Dr. Anthony Fauci, the nation's top infectious diseases expert, recently told Insider. "The effect of boost is very, very favorable to preventing people from getting infected."

Bottom line: It's generally agreed (especially with the Omicron variant circulating) as reasonable for all adults to go ahead and get boosted with whichever shot they may choose to, ahead of the holiday gathering season.

SARS-CoV-2 Study Forecasts Emergence of Immune Escape Variants

A new study models future SARS-CoV-2 mutations and forecasts their ability to evade immune defenses developed by vaccines and antibody-based treatments. Since the study's completion, several of the predicted mutations have appeared in omicron, the most recently identified SARS-CoV-2 variant, offering insight into how omicron might be able to escape immune defense generated by mRNA vaccines and monoclonal antibody treatments for COVID-19. **+ MORE**

You Should Be Afraid of the Next 'Lab Leak'

By Jon Gertner *(NY Times)*

Source: https://www.nytimes.com/2021/11/23/magazine/covid-lab-leak.html

Nov 23 – The National Emerging Infectious Diseases Laboratories is a seven-story concrete fortress in Boston's South End, hemmed in by Interstate 93 on one side and Boston University's medical school on another. Unmarked by overt signs or logos, NEIDL — known as "needle" — is surrounded by a vast manicured lawn that would make for an excellent picnic spot, but for the high-spired steel fence and the constant surveillance by a police force stationed at nearby checkpoints. The safeguards ensure that passers-by will keep out. Yet almost everything else about the lab — its layout, its operations, its work protocols — is in service to an opposing imperative: keeping dangerous things, and especially very deadly things, in. The building has one of the larger collections of Biosafety Level 4 and Biosafety Level 3 labs in the world. These kinds of facilities are where research on the planet's most threatening pathogens takes place. Ebola, Lassa, Marburg viruses: All are designated for Level 4 work by the National Institutes of Health, meaning they are both transmissible and highly pathogenic, with few (or no) treatments for those who become infected with them. The pathogens studied in a Level 3 lab, like Mycobacterium tuberculosis or SARS-CoV-1, the predecessor to the novel coronavirus responsible for Covid-19, are slightly less lethal but still dangerous; the risks in this level of lab remain significant, but the safety level is a notch lower.

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

The U.K. Government's Preparedness for COVID-19: Risk-Management Lessons

Source: https://www.homelandsecuritynewswire.com/dr20211203-the-u-k-government-s-preparedness-for-covid19-riskmanagement-lessons

Dec 03 – A new report from the U.K. National Audit Office (NAO) examines the government's risk analysis, planning, and mitigation strategies prior to the arrival of the COVID-19 pandemic.

The report aims to highlight the government's overall risk management approach, and it deals only with the central government's role – it does not cover local-level risk planning, wider aspects of resilience planning, or top-level disaster response procedures. It also does not cover the government's response to COVID-19 or how prepared it was for subsequent waves of the pandemic.

The report notes that the pandemic has exposed a vulnerability to whole-system emergencies – that is, emergencies which are so broad that they require the engagement of the entire system. The government had plans for an influenza pandemic, it did not have detailed plans for many non-health consequences and some health consequences of a pandemic like COVID-19. There were lessons from previous simulation exercises that were not fully implemented and would have helped prepare for a pandemic like COVID-19. There was limited oversight and assurance of plans in place, and many pre-pandemic plans were not adequate. In addition, there is variation in capacity, capability and maturity of risk management across government departments.

Pandora Report summarizes the report to say:

> The pandemic has highlighted the need to strengthen the government's end-to-end risk management process to ensure that it addresses all significant risks, including interdependent and systemic risks. This will require collaboration on risk identification and management not only across government departments and local authorities, but also with the private sector and internationally. For whole-system risks the government needs to define its risk appetite to make informed decisions and prepare appropriately so that value for money can be protected. The pandemic has also highlighted the need to strengthen national resilience to prepare for any future events of this scale, and the challenges the government faces in balancing the need to prepare for future events while dealing with day-to-day issues and current events.

Here is the report's introductory section and Introduction:

Background to the Report

The scale and nature of the COVID-19 pandemic and the government's response are without precedent in recent history. Many people have died, and many lives, families and businesses have been adversely affected. By the end of July 2021, the estimated lifetime cost of measures announced as part of the government's response was £370 billion. Like many other governments across the world, the UK government was underprepared for a pandemic like COVID-19. It will need to learn lessons from its preparations for and handling of whole-system risks, which will include making judgements on what level of preparations is appropriate.

The Cabinet Office, through its Civil Contingencies Secretariat (CCS), is responsible for coordinating the government's planning for, and response to, major emergencies. Individual departments and other public sector organizations are responsible for identifying and managing risks in line with their desired risk appetite, including relevant national risks allocated to them by the Cabinet Office. For example, the Department of Health & Social Care is responsible for planning for the health and social care impacts of health-related risks. All departments are responsible for planning for emergencies that would have significant consequences in their areas of remit

Scope of the Report

This report sets out the facts on:

- the government's approach to risk management and emergency planning (Part One);
- the actions the government took to identify the risk of a pandemic like COVID-19 (Part Two);
- the actions the government took to prepare for a pandemic like COVID-19 (Part Three); and
- recent developments (Part Four).

The report sets out central government's risk analysis, planning, and mitigation strategies prior to the arrival of the COVID-19 pandemic, with the aim of drawing out wider learning for the government's overall risk management approach. It does not cover local-level risk planning, wider aspects of resilience planning or top-level disaster response procedures. It also does not cover the government's response to COVID-19 or how prepared it was for subsequent waves of the pandemic.

Report Conclusions

This pandemic has exposed a vulnerability to whole-system emergencies – that is, emergencies that are so broad that they engage the entire system. Although the government had plans for an influenza pandemic, it did not have detailed plans for many non-health consequences and some health consequences of a pandemic like COVID-19. There were lessons from previous simulation exercises that were not fully

implemented and would have helped prepare for a pandemic like COVID-19. There was limited oversight and assurance of plans in place, and many pre-pandemic plans were not adequate. In addition, there is variation in capacity, capability and maturity of risk management across government departments.

The pandemic has highlighted the need to strengthen the government's end-to-end risk management process to ensure that it addresses all significant risks, including interdependent and systemic risks. This will require collaboration on risk identification and management not only across government departments and local authorities, but also with the private sector and internationally. For whole-system risks the government needs to define its risk appetite to make informed decisions and prepare appropriately so that value for money can be protected. The pandemic has also highlighted the need to strengthen national resilience to prepare for any future events of this scale, and the challenges the government faces in balancing the need to prepare for future events while dealing with day-to-day issues and current events.

Introduction

1. The UK government and devolved administrations, along with the emergency services and other local responders, have clear responsibilities for identifying, assessing, preparing for and responding to emergencies, as well as supporting affected communities to recover. The government has risk management processes in place that aim to identify risks, to ensure that plans are drawn up to mitigate risks and prepare for shocks, and to prevent risks from being overlooked despite short-term pressures. Cabinet Office guidance states that preparedness is the preparation of plans that are flexible enough both to address known risks and to provide a starting point for handling unforeseen events.

2. The scale and nature of the COVID-19 pandemic and the government's response are without precedent in recent history. Many people have died, and many lives, families and businesses have been adversely affected. By the end of July 2021, the estimated lifetime cost of measures announced as part of the government's response was £370 billion. The pandemic has tested the government's plans to deal with unforeseen events and shocks, and demonstrated the risks that exist to which UK citizens are exposed. Like many other governments across the world, the UK government was underprepared for a pandemic like COVID-19. It will need to learn lessons from its preparations for and handling of whole-system risks, which will include making judgements on what level of preparations is appropriate.

3. Emergencies can take many forms, such as natural disasters, terrorist attacks, industrial accidents, critical supply chain disruptions or disease outbreaks. These emergencies can have widespread impacts, such as fatalities and serious disruption to people's lives and the national economy. Emergencies, or the risk of emergencies, can originate inside or outside the UK, exacerbate the likelihood or impact of other risks, and be felt locally, nationally or globally. In the UK, recent emergencies include the London and Manchester terrorist attacks, the 'Beast from the East' winter storm, serious flooding incidents and the COVID-19 pandemic.

4. The Cabinet Office, through its Civil Contingencies Secretariat (CCS), is responsible for coordinating the government's planning for, and response to, major emergencies. Individual departments and other public sector organizations are responsible for identifying and managing risks in line with their desired risk appetite, including relevant national risks allocated to them by the Cabinet Office. For example, the Department of Health & Social Care is responsible for planning for the health and social care impacts of health-related risks. All departments are responsible for planning for emergencies that would have significant consequences in their areas of remit.

You Should Be Afraid of the Next 'Lab Leak'

Source: https://pandorareport.org/

In Boston stands a seven-story fortress that houses the National Emerging Infectious Diseases Laboratories (NEIDL), and it contains a large collection of Biosafety Level 4 and Biosafety Level 3 labs. These high-containment labs conduct research on some of the deadliest pathogens, like Lassa and Marburg viruses. An accident that resulted in one of these lethal microbes escaping could spur another outbreak and even another pandemic. Six years ago, the National Institutes for Health commission Gryphon Scientific, a consulting firm, to conduct a risk assessment of certain types of research at US facilities. The assessment led to a thousand-page report, which found that "that experiments to improve the transmissibility of coronaviruses in a lab could significantly increase the chance of a

pandemic due to a laboratory accident." It also noted that "loss of containment" incidents for viruses are rare, and that a breach would "not necessarily mean an outbreak." Even an escaped pathogen with pandemic potential "would have a low chance of leading to a global crisis."
Dr. Filippa Lentzos and Dr. Gregory Koblentz conducted a study of Biosafety Level 4 labs around the world and calculated that there are 59 in operation, under construction, or in the planning stages. Lentzos stated that "these labs are there so we can work with these pathogens in safe, secure ways," but "these labs are spreading into other parts of the world, where you have different kinds of regimes, more authoritarian regimes, for instance, where the concept of openness is particularly challenging."

The Athena Agenda: Executing the Apollo Program for Biodefense

Source[2]: https://pandorareport.org/

The Bipartisan Common on Biodefense published a baseline report in 2015, *A National Blueprint for Biodefense: Leadership and Major Reform Needed to Optimize Efforts*, which warned that the United States was inadequately prepared for biological threats. Six years later, the US experience with COVID-19 continues to validate our original findings. The Commission's January 2021 report, *The Apollo Program for Biodefense: Winning the Race Against Biological Threats*, details an ambitious goal-directed program to develop and deploy the technologies needed to defend against all biological threats, empower public health, and prevent pandemics within just ten years. Since the release of this report, the pandemic continues to cause devastation throughout the United States and the world. Likewise, the risk of an accidental or deliberate release of even deadlier pathogens continues to rise. The past year has only emboldened the idea that we cannot let a pandemic like the one we are facing, or something worse, ever happen again.
The Commission will convene an in-person meeting, The Athena Agenda: Executing the Apollo Program for Biodefense, to provide a better understanding of ongoing federal efforts to implement The Apollo Program for Biodefense, the role of the private sector in implementing The Apollo Program for Biodefense, how the public and private sectors can fully implement The Apollo Program for Biodefense within ten years. Register here.

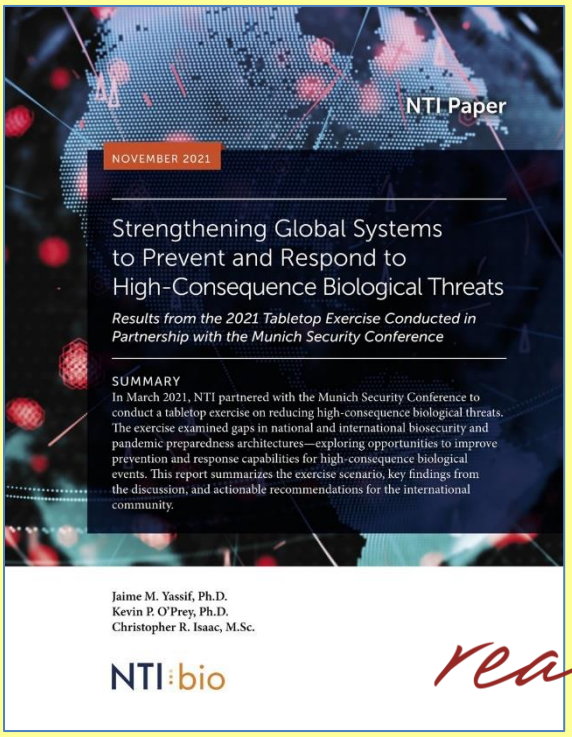
Preventing and Responding to High-Consequence Biological Threats

Source: https://www.homelandsecuritynewswire.com/dr20211203-preventing-and-responding-to-highconsequence-biological-threats

Dec 03 – A new NTI | bio report offers actionable recommendations for the international community to bolster prevention and response capabilities for high-consequence biological events.
The report, "Strengthening Global Systems to Prevent and Respond to High-Consequence Biological Threats,"written by NTI | bio Senior Fellow Dr. Jaime M. Yassif, Dr. Kevin P. O'Prey, and Christopher R. Isaac, summarizes key findings and recommendations from a March 2021 tabletop exercise on high-consequence biological threats, jointly hosted by NTI and the Munich Security Conference. This report, and the exercise that informed it, are the third in a series of collaborations between NTI and the Munich Security Conference—which have focused on reducing global catastrophic biological risks and building stronger systems for pandemic prevention and response.
"NTI recognizes the critical importance of strengthening the global biosecurity and pandemic preparedness architecture," said NTI Interim Vice President Dr. Margaret A. Hamburg in the report's foreword. Dr. Hamburg also stressed that, as part of these efforts, "Scientific and political leaders must take bold action to safeguard the global bioscience and biotechnology research and development enterprise to ensure that catastrophic accidents or deliberate misuse do not lead to the next global pandemic."

[2] Pandora Report is conducted by students and faculty of the George Mason University Schar School of Policy and Government Biodefense program. This site's goal is to provide a knowledge hub for biodefense related issues and to share their work with the world

The 2021 tabletop exercise included 19 senior leaders and experts from across Africa, the Americas, Asia, and Europe with decades of combined experience in public health, biotechnology industry, international security, and philanthropy. Exercise participants were asked to engage with a fictional scenario that portrayed a deadly, global pandemic involving an unusual strain of monkeypox virus that spread globally over 18 months. Ultimately, the scenario revealed that the initial outbreak had been caused by a terrorist attack using a pathogen engineered in a laboratory with inadequate biosafety and biosecurity provisions and weak oversight. By the end of the exercise, the fictional pandemic resulted in more than three billion cases and 270 million fatalities worldwide.



EDITOR'S COMMENT: If you read the scenario of the TTX you will realize that the current pandemic is nothing more than another flu … And if we managed this flu so badly imagine our response to a real "B" situation!

Discussions during the exercise generated several key findings. Most significantly, exercise participants agreed that, notwithstanding improvements following the global response to COVID-19, the international system of pandemic prevention, detection, analysis, warning, and response is woefully inadequate to address current and anticipated future challenges. Gaps in the international biosecurity and pandemic preparedness architecture are extensive and fundamental, undermining the ability of the international community to prevent and mount effective responses to future biological events.

"The world is unprepared to cope with severe global pandemics, and COVID-19 is a warning shot that has highlighted our shared vulnerability to these events," said report author NTI | bio Senior Fellow Dr. Jaime Yassif. "While decision-makers are rightly focused on saving lives and fostering economic recovery, now is also the time to strengthen our capabilities to prevent and respond to future high-consequence biological events, which could match the impact of COVID-19 or cause damage that is significantly more severe."

The report authors developed a set of concrete recommendations for the international community based on the key findings from the exercise discussion. The recommendations include:

1. Bolster international systems for pandemic risk assessment, warning, and investigating outbreak origins
2. Develop and institute national-level triggers for early, proactive pandemic response
3. Establish an international entity dedicated to reducing emerging biological risks associated with rapid technology advances
4. Develop a catalytic global health security fund to accelerate pandemic preparedness capacity building in countries around the world
5. Establish a robust international process to tackle the challenge of supply chain resilience

▶▶ **More details about the exercise findings and report recommendations can be found in the full report.**

To learn more about previous NTI | bio tabletop exercises, see the 2020 report, "Preventing Global Catastrophic Biological Risks," and the 2019 report, "A Spreading Plague."

Dr. Sherif R. Zaki, Acclaimed Disease Detective, Dies at 65

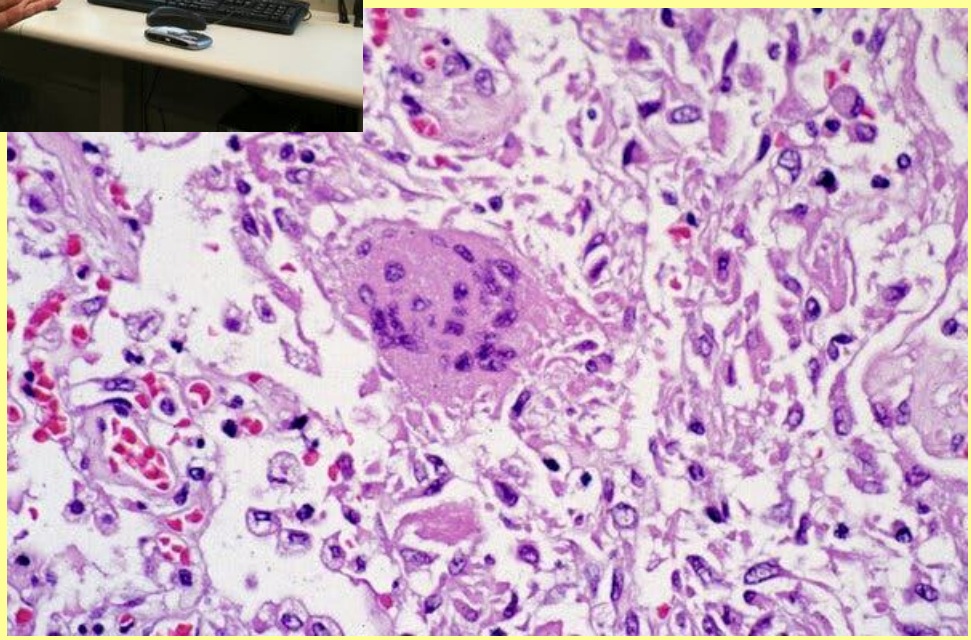
Source: https://www.nytimes.com/2021/12/04/science/sherif-r-zaki-dead.html

Dec 04 – Dr. Sherif R. Zaki, a pathologist who as America's chief infectious disease detective helped identify the Covid-19, Ebola, West Nile and Zika viruses and severe acute respiratory syndrome, as well as the bioterrorism attack that spread anthrax in 2001, died on Nov. 21 in Atlanta. He was 65.

His wife, Nadia Zaki, said he died in a hospital from complications of injuries sustained in a fall down a flight of stairs at his home.

Dr. Zaki joined the Centers for Disease Control and Prevention in 1988 and became chief of the agency's infectious diseases pathology branch in the early 1990s. He and his team made strides in distinguishing rare diseases and their mutations and determining what made some of them, like SARS and Ebola, so contagious and lethal. To do so they applied a process called immunohistochemistry, which allows researchers to identify foreign pathogens by staining cells and observing them through electron microscopes capable of magnifying bacteria and viruses 740,000 times.

"Dr. Zaki was critical in diagnosing unexplained illness and outbreaks that allowed C.D.C. and public health to respond more quickly and save lives," the agency's director, Dr. Rochelle Walensky, said in a statement.



An image of the lung tissue pathology of SARS. After studying the coronavirus that caused SARS, Dr. Zaki presciently told Smithsonian magazine in 2003, "I don't see any reason why it shouldn't come back."Credit...Dr. Sherif Zaki

Dr. Rima Khabbaz, the director of the agency's National Center for Emerging and Zoonotic Infectious Diseases, said in an email to the C.D.C. staff that Dr. Zaki had widely been considered to be "among the most influential infectious disease pathologists of his generation." He was also known as a generous mentor and colleague, and as a researcher with a phenomenal memory.

After studying the coronavirus that caused SARS, he presciently told Smithsonian magazine in 2003, "I don't see any reason why it shouldn't come back."

In 2001, after the Sept. 11 terrorist attacks in New York and Washington, Dr. Zaki determined that a number of people who had come into contact with letters containing a white powder had died from anthrax after their skin was exposed to the bacteria, or after inhaling it.

He and his team helped identify a deadly outbreak of hantavirus in the Navajo Nation in 1993 (that discovery spurred the expansion of the infectious diseases pathology branch); a previously unidentified bacterial illness called leptospirosis in Nicaragua; and the mosquito-borne Zika virus in the brain tissue of babies in Brazil, establishing that it could be transmitted during pregnancy.

Dr. Zaki headed the agency's Unexplained Deaths Project, a squad of detectives of last resort responsible for delving into the causes of the 700 or so baffling fatalities from disease that occur in the United States every year.

A colleague, Dr. Christopher D. Paddock, recalled Dr. Zaki's "remarkable patience, perseverance and curiosity," as well as his "stubborn determination to find the cause of disease, whether it involved one patient or 100 patients — he simply would not give up."

After four people who received organ transplants in Massachusetts and Rhode Island developed a viral infection and three of them died, Dr. Zaki and his colleagues pinpointed the cause as lymphocytic choriomeningitis, a rare rodent-borne virus. It turned out that the organ donor's daughter had a pet hamster.

In 2005, a few days after complaining to his pediatrician of a fever, a headache and an itchy scalp, a 10-year-old Mississippi boy became so agitated that he bit a relative. After the boy was hospitalized, tests were inconclusive, but he died two weeks later.

About a week after that, Dr. Zaki's team detected rabies virus in the boy's body. They learned from follow-up interviews that dead bats had been discovered in the boy's home, and that he had found a live bat in his bedroom.
Sherif Ramzy Zaki was born on Nov. 24, 1955, in Alexandria, Egypt. He spent his first six years in Chapel Hill, N.C., where his father, Ramzy Zaki, was attending graduate school. He later lived in the Caribbean, the Middle East and Europe, where his father worked for the United Nations' International Labor Organization. His mother, Dalal (Elba) Zaki, was a teacher.
In addition to his wife — Nadia Abougad when they married — he is survived by a daughter, Yasmin; a son, Samy; and two sisters, Dorreya and Safa.
Dr. Zaki graduated second in his class of 800 from the Alexandria Medical School in **Egypt** in 1978. But he was less interested in practicing medicine than in unraveling mysteries, which had been an obsession of his ever since he was captivated by the novels of the British author Enid Blyton as a child.
That obsession was at the heart of his work at the C.D.C. "We go into the basics of how a disease happens, the mechanism," he said in an interview with Stat, a medical website, in 2016. "Putting pieces together. Solving puzzles."
Dr. Zaki earned a master's in pathology from Alexandria University. But since autopsies were not permitted in Egypt for religious reasons, he did his residency in anatomic pathology at Emory University in Atlanta, where he also received a doctorate in experimental pathology.
He then went to work at the C.D.C. and became a naturalized American citizen.
Described by James LeDuc, a former colleague, as "kind of the secret weapon for a lot of what was done at C.D.C. on emerging diseases," Dr. Zaki was awarded the Department of Health and Human Services Secretary's Award for Distinguished Service, the department's highest honor, nine times.
"What distinguished him as a researcher was creativity, collaboration, solid scientific methodology and a broad knowledge base.," Dr. Inger K. Damon, of the C.D.C.'s National Center for Emerging and Zoonotic Infectious Diseases, said in an email.
Dr. Zaki had no illusions that his work would ever be finished.
"We think we know everything," he told The New York Times in 2007, "but we don't know the tip of the iceberg."
"There are so many viruses and bacteria we don't know anything about, that we don't have tests for," he added. "A hundred years from now, people will not believe the number of pathogens we didn't even know existed."

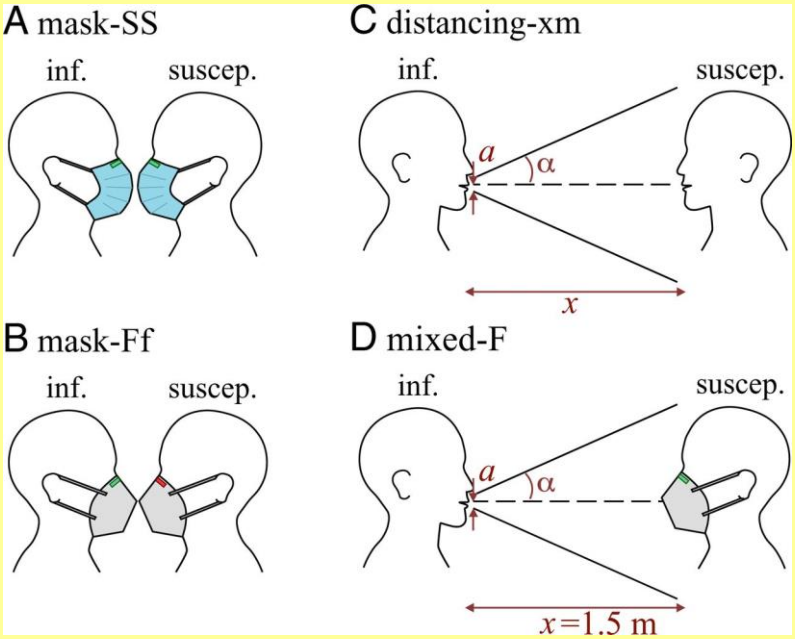
An upper bound on one-to-one exposure to infectious human respiratory particles

By Gholamhossein Bagheri, Birte Thiede, Bardia Hejazi, et al.
Proceeding of the National Academy of Sciences of the United States | December 7, 2021 118 (49) e2110117118
Source: https://www.pnas.org/content/118/49/e2110117118

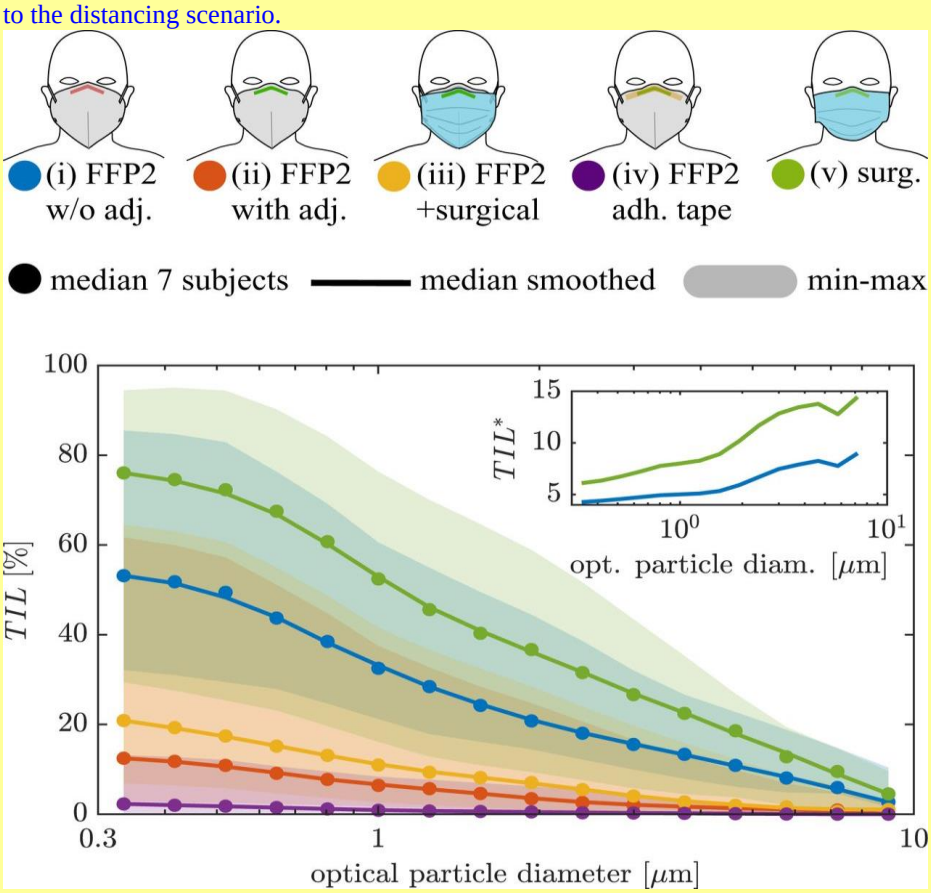
Significance
Wearing face masks and maintaining social distance are familiar to many people around the world during the ongoing SARS-CoV-2 pandemic. Evidence suggests that these are effective ways to reduce the risk of SARS-CoV-2 infection. However, it is not clear how exactly the risk of infection is affected by wearing a mask during close personal encounters or by social distancing without a mask. Our results show that face masks significantly reduce the risk of SARS-CoV-2 infection compared to social distancing. We find a very low risk of infection when everyone wears a face mask, even if it doesn't fit perfectly on the face.

Abstract
There is ample evidence that masking and social distancing are effective in reducing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission. However, due to the complexity of airborne disease transmission, it is difficult to quantify their effectiveness, especially in the case of one-to-one exposure. Here, we introduce the concept of an upper bound for one-to-one exposure to infectious human respiratory particles and apply it to SARS-CoV-2. To calculate exposure and infection risk, we use a comprehensive database on respiratory particle size distribution; exhalation flow physics; leakage from face masks of various types and fits measured on human subjects; consideration of ambient particle shrinkage due to evaporation; and rehydration, inhalability, and deposition in the susceptible airways. We find, for a typical SARS-CoV-2 viral load and infectious dose, that social distancing alone, even at 3.0 m between two speaking individuals, leads to an upper bound of 90% for risk of infection after a few minutes. If only the susceptible wears a face mask with infectious speaking at a distance of 1.5 m, the upper

bound drops very significantly; that is, with a surgical mask, the upper bound reaches 90% after 30 min, and, with an FFP2 mask, it remains at about 20% even after 1 h.



Schematics of scenarios investigated in this study. (*A* and *B*) The mask-is scenario: a masked infectious breathing/speaking to a breathing-only masked susceptible, where the susceptible is exposed to the nondiluted total outward leakage of the infectious exhale; i and s indicate the type of mask worn by the infectious and susceptible individuals, respectively, with adjusted (i.e., well-fitted to the face) FFP2 mask abbreviated by "F," FFP2 mask without adjustment (i.e., without fitting to the face) abbreviated by "f," and adjusted surgical mask abbreviated by "S" (only mask-Ff and mask-SS are sketched here). For this scenario, fd=1.0 . (*C*) The distancing-xm scenario: an unmasked breathing-only susceptible exposed to the exhalation cone of an unmasked breathing/speaking infectious while the distance between the two is x meters. For this case, f_d is calculated via the exhalation cone formula $fd=a/(x\,tan(\alpha))$, where a= 1.8 cm is the radius of the mouth and α= 10° is the exhalation cone half-angle. (*D*) The mixed-s scenario: the same as *C*, but susceptible is wearing a mask and the distance is kept fixed at 1.5 m; *s* indicates the type of mask worn by the susceptible. Cases considered for this scenario are "mixed-S" and "mixed-F," which correspond to susceptible wearing adjusted surgical and adjusted surgical FFP2 mask, respectively (only mixed-F is sketched here). For this scenario, f_d is calculated based on the exhalation cone formula similar to the distancing scenario.



Median of the total inward leakage over all subjects for different mask-wearing cases. Smoothed curves are the three-point moving average. Shaded areas show minimum and maximum as an indication of variability in total inward leakage for different subjects–the individually measured particle size–dependent *TIL* can be found in *SI Appendix*, section 2.I. The first–last bin total leakage values are (*i*) 53.2 to 2.7%, (*ii*) 12.5 to 0%, (*iii*) 20.9 to 1.0%, (*iv*) 2.3 to 0%, and (*v*) 76.0 to 4.5%. *Inset* shows the total inward leakage of the surgical mask and the FFP2 mask without adjustment normalized with the total inward leakage of the adjusted FFP2 mask $TIL*=TIL/TIL_{\mathrm{FFP2,adj}}$.

When both wear a surgical mask, while the infectious is speaking, the very conservative upper bound remains below 30% after 1 h, but, when both wear a well-fitting FFP2 mask, it is 0.4%. We conclude that wearing appropriate masks in the community provides excellent protection for others and oneself, and makes social distancing less important.

Gilead recalls vials of its Remdesivir covid drug in U.S. due to glass contamination

Source: https://news.yahoo.com/gilead-recalls-vials-remdesivir-covid-122120730.html

Biopharmaceutical company Gilead Sciences issued a recall of two lots of its drug **remdesivir** due to the "presence of glass particulates," it was announced.

Is the SARS-CoV-2 afraid of the Pope?

◀The Pope and the President of the Hellenic Republic during his recent visit to Greece – no face masks because they are vaccinated?

The Pope with refugees in Lemnos Island – again no masks! (vaccinated? distancing?)

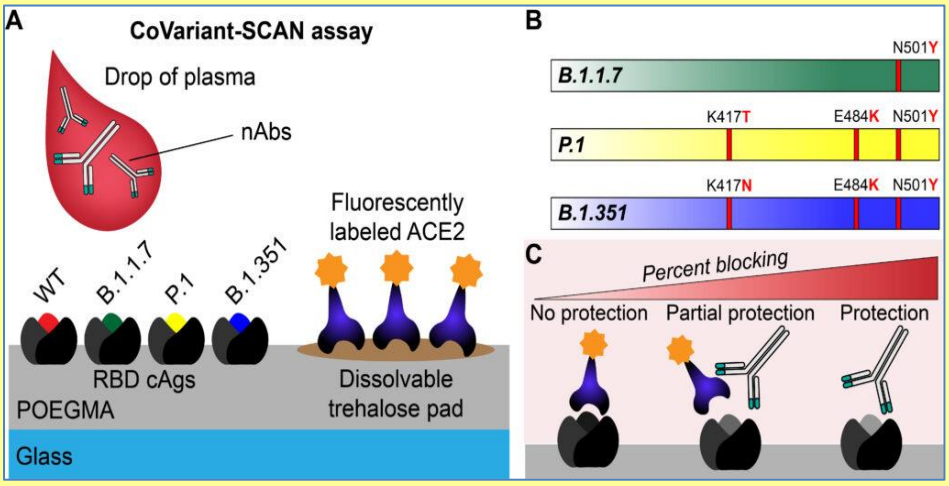
Greek Archbishop Ieronymos visited Pope Francis at the Apostolic Nunciature – are face masks obligatory or not?

COVID-19 Test Measures Immunity against Multiple SARS-CoV-2 Variants in an Hour

Source: https://www.genengnews.com/topics/translational-medicine/infectious-diseases/covid-19-test-measures-immunity-against-multiple-sars-cov-2-variants-in-an-hour/

Dec 06 – Scientists at Duke University have developed a quick and easy-to-deploy serological test that can detect neutralizing antibodies (nAbs) that block the interaction between the human receptor protein (angiotensin-converting enzyme 2, ACE2) and the spike protein of wild-type SARS-CoV-2 as well as three variants of concern (VOCs): B.1.1.7, B.1.351, and P.1. The scientists have also adapted the platform to detect nAbs against an additional variant (B.1.617.2, Delta variant). The researchers call the new test the COVID-19 Variant Spike-ACE2-Competitive Antibody Neutralization assay (CoVariant-SCAN).

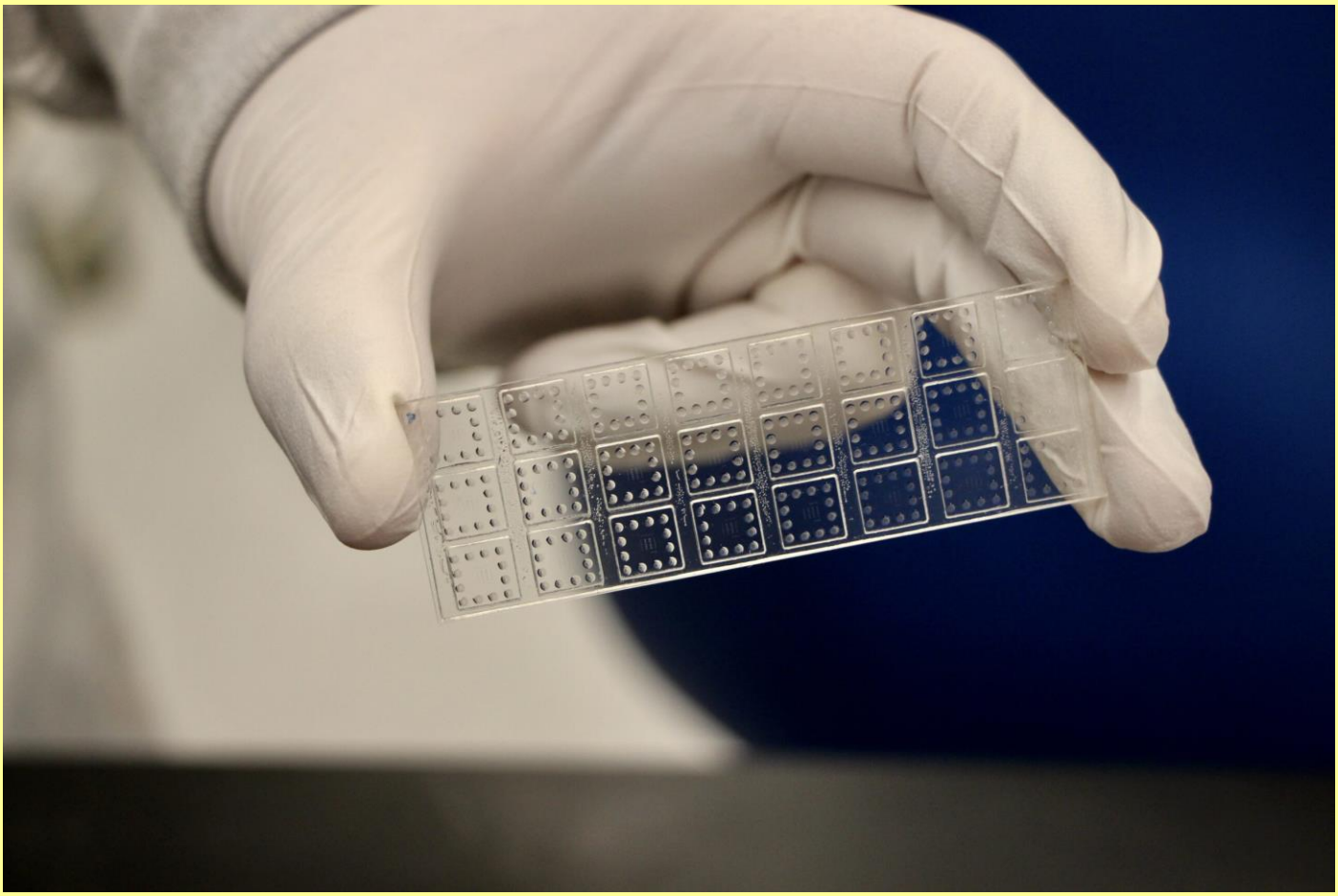
The test that could potentially inform clinicians on which synthetic monoclonal antibody to use in treatments for the best outcome, is reported in an article in the journal *Science Advances*, titled "Rapid test to assess the escape of SARS-CoV-2 variants of concern."



How well antibodies work against multiple variants of COVID-19 can be tested using the new test. It works by releasing fluorescently labeled ACE2 proteins – the cellular targets of the COVID-19 spike protein – together with antibodies. If the antibodies can neutralize variants of COVID-19 spike proteins printed on the slide, the spike proteins cannot attach to the ACE2 proteins, causing the fluorescent markers to wash away and the slide becomes dim. [Source: Jake Heggestad, Duke University]

Tests to detect anti–SARS-CoV-2 antibodies are important in assessing natural and vaccine-induced immunity in patients and for epidemiological surveillance. While several serological tests are currently available, with the emergence of more transmissible and virulent VOCs

there is an urgent need for a test that can measure nAbs against all VOCs simultaneously in a quick and simple test that does not need viruses, cell culture, or high-level biosafety containment facilities.



A new test can quickly test the ability of antibodies to neutralize spike proteins from different variants of COVID-19 simultaneously. The D4 assay shown here is the Teflon-like technology that makes the test possible. [Duke University]

Ashutosh Chilkoti, PhD, professor and chair of biomedical engineering at Duke University and senior author of the paper says, "While developing a point-of-care test for COVID-19 antibodies and biomarkers, we realized there could be some benefit to being able to detect the ability of antibodies to neutralize specific variants, so we built a test around that idea. It only took us a week or two to incorporate the Delta variant in our test, and it could easily be expanded to also include the Omicron variant. All we need is the spike protein of this variant, which many groups across the world—including our group at Duke—are feverishly working to produce."
Cameron Wolfe, associate professor of medicine at the Duke University School of Medicine and a co-author of the paper says, "We currently really have no rapid way of assessing variants, neither their presence in an individual, nor the ability of antibodies we possess to make a difference. It's one of the lingering fears that as we successfully vaccinate more and more people, a variant may emerge that more radically evades vaccine-induced antibody neutralization. And if that fear came true—if Omicron turned out to be a worst-case scenario—how would we know quickly enough?"
"There are several translational scenarios where we think this test could be useful," says Jacob Heggestad, PhD, lead author of the paper and a graduate student in Chilkoti's lab. "First, it could be deployed as an epidemiological tool to assess the efficacy of vaccines against circulating or emerging variants in specific regions. Second, it could be used at the bedside to test patients presenting with acute COVID-19 who are either known to have been or likely are infected by a VOC. Patients with low neutralizing activity could be treated immediately with the Regeneron cocktail or a similar mAb therapy to reduce the likelihood of severe infection. Third, this test could also be used to rapidly screen mAb therapeutics and assess their effectiveness against each variant."

Heggestad adds, "While larger studies are needed to confirm the clinical significance of our results, we believe that the translational significance lies in the fact that CoVariant-SCAN is very easy to use and can be conducted rapidly, ideally at the point-of-care."
The test uses a non-stick polymer brush coating that stops anything but the desired biomarkers from attaching to a wet test slide. The effectiveness of this non-stick shield allows the detection of low level targets. Printing different molecular traps on different areas of the slide enables researchers to detect multiple biomarkers at once. Fluorescent human ACE2 receptors and viral spike proteins are printed on a slide. During the test, ACE2 proteins detach from the slide and are caught by the spike proteins still attached to the slide, causing the slide to glow. But in the presence of nAbs, the spike proteins cannot grab on to the ACE2 proteins, making the slide glow less, indicating the effectiveness of the nAbs.
"The CoVariant-SCAN builds off our extensive body of previous work," says Heggestad. "First, the non-fouling surface coating (POEGMA) allows us to directly test complex biological samples without sample dilution. This coating leads to high signal-to-noise ratios by suppressing background noise which results in higher sensitivity. We use a simple and scalable fabrication method for functionalizing our surface—using inkjet printing—without the need for covalent chemistry. The assay itself is novel. We can measure neutralizing antibodies, or those that block the ACE2-Spike interaction, against several variants of concern simultaneously from a single sample. Moreover, we only need to measure the fluorescent output of a single fluorophore which greatly simplifies the readout step, relative to other assays."
The researchers test the technology using monoclonal antibodies either derived from patients or from Regeneron's commercial prophylactic treatment. They also test plasma from healthy vaccinated people and those currently infected with the virus. Heggestad says the results show, "Our test is working just as well as the methods currently being used." While the results are comparable, CoVariant-SCAN allows speed and ease. It does not require isolating live virus or culturing cells. While current tests can take up to 24 hours CoVariant-SCAN takes less than an hour.
"With the emergence of the Omicron variant, we are hoping to integrate the spike protein into CoVariant-SCAN so that we can begin to assess the impact that the many RBD [receptor binding domain] mutations have on the vaccine-induced humoral response," says Heggestad.
The team is working to make the test even easier to use through microfluidic technology. Heggestad says, "We hope to show that with **the microfluidic chip, the assay can be conducted from a finger prick of blood in less than 30 minutes**. These studies are ongoing.

How Can mRNA Vaccines Be Updated to Target Omicron? A Microbiologist Explains

By Deborah Fuller
Source: https://www.sciencealert.com/microbiologist-explains-how-mrna-vaccines-can-be-rapidly-updated-against-omicron

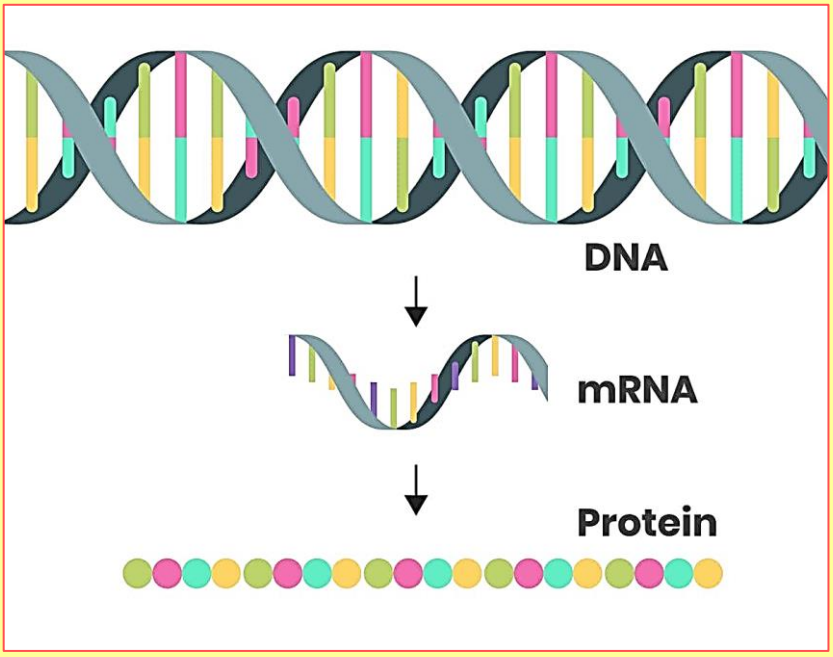
Dec 06 – If the Omicron variant of the coronavirus is different enough from the original variant, it's possible that existing vaccines won't be as effective as they have been. If so, it's likely that companies will need to update their vaccines to better fight Omicron.
Deborah Fuller is a microbiologist who has been studying mRNA and DNA vaccines for over two decades. Here she explains why vaccines might need to be updated and what that process would look like.

1. Why might vaccines need to be updated?

Basically, it's a question of whether a virus has changed enough so that antibodies created by the original vaccine are no longer able to recognize and fend off the new mutated variant.
Coronaviruses use spike proteins to attach to ACE-2 receptors on the surface of human cells and infect them. All mRNA COVID-19 vaccines work by giving instructions in the form of mRNA that direct cells to make a harmless version of the spike protein.
This spike protein then induces the human body to produce antibodies. If a person is then ever exposed to the coronavirus, these antibodies bind to the coronavirus's spike protein and thus interfere with its ability to infect that person's cells.
The Omicron variant contains a new pattern of mutations to its spike protein. These changes could disrupt the ability of some – but probably not all – of the antibodies induced by the current vaccines to bind to the spike protein. If that happens, the vaccines could be less effective at preventing people from getting infected by and transmitting the Omicron variant.

2. How would a new vaccine be different?

Existing mRNA vaccines, like those made by Moderna or Pfizer, code for a spike protein from the original strain of coronavirus. In a new or updated vaccine, the mRNA instructions would encode for the Omicron spike protein.
By swapping out the genetic code of original spike protein for the one from this new variant, a new vaccine would induce antibodies that more effectively bind the Omicron virus and prevent it from infecting cells.
People already vaccinated or previously exposed to COVID-19 would likely need only a single booster dose of a new vaccine to be protected not only from the new strain but also other strains that may be still in circulation.
If Omicron emerges as the dominant strain over Delta, then those who are unvaccinated would only need to receive 2-3 doses of the updated vaccine.
If Delta and Omicron are both in circulation, people would likely get a combination of the current and updated vaccines.



Changing the mRNA sequence will change the antibody protein to better match the new variants. (Alkov/iStock via Getty Images)

3. How do scientists update a vaccine?

To make an updated mRNA vaccine, you need two ingredients: the genetic sequence of the spike protein from a new variant of concern and a DNA template that would be used to build the mRNA.
In most organisms, DNA provides the instructions for making mRNA. Since researchers have already published the genetic code for the Omicron spike protein, all that's left to do is make a DNA template for the spike protein that would be used to produce the mRNA part of new vaccines.
To do this, researchers mix DNA templates with synthetic enzymes and four molecular building blocks that make mRNA – G, A, U and C for short. The enzymes then build an mRNA copy of the DNA template, a process called transcription.
Using this process, it takes only minutes to produce a batch of the mRNA for vaccines. Researchers then place the mRNA transcripts within fatty nanoparticles that protect the instructions until they are safely delivered into cells in your arm.

4. How long until a new vaccine might be ready?

It takes only three days to generate the DNA template needed to make a new mRNA vaccine. Then it would take about a week to produce sufficient doses of the mRNA vaccine for testing in the lab and another six weeks to perform the pre-clinical tests on human cells in test tubes to make sure a new vaccine works as it should.
So within 52 days, scientists could have an updated mRNA vaccine ready to plug into the manufacturing process and begin producing doses for a human clinical trial. That trial would likely require at least another few weeks for a total of around 100 days to update and test a new vaccine.
While that trial is going on, manufacturers could start switching their current process to making a new vaccine. Ideally, once the clinical trial is complete – and if the vaccine gets authorized or approved – a company could immediately start rolling out doses of a new vaccine.

5. Does an updated vaccine need full clinical trials?

It's currently not clear how much clinical data would be required to get FDA approval or authorization for an updated COVID-19 vaccine. However, all the ingredients would be the same in a new vaccine.
The only difference would be a few lines of genetic code that would ever so slightly change the shape of the spike protein. From a safety perspective, an updated vaccine is essentially identical to the already tested vaccines. Because of these similarities, clinical testing may not need to be as extensive as what was needed for the first-generation COVID-19 vaccines.

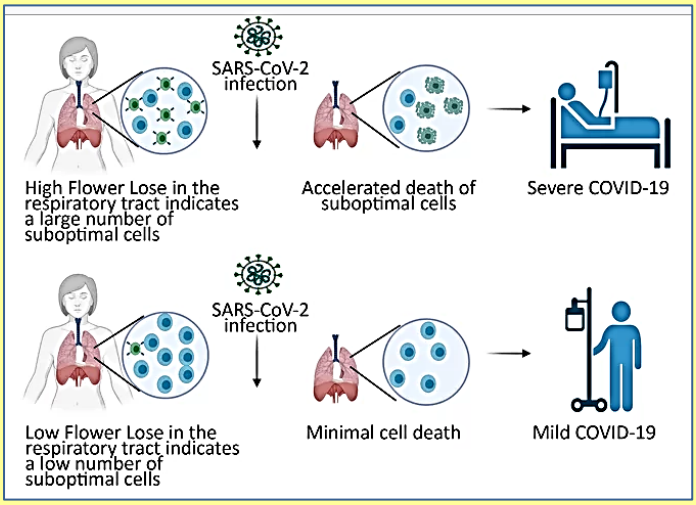
At a minimum, clinical trials for updated vaccines would likely require safety testing and confirmation that an updated vaccine induces antibody levels on par with the response of the original vaccine against the original, Beta and Delta strains. If these are the only requirements, then researchers would enroll only hundreds – not tens of thousands – of people to obtain the clinical data needed.
One important thing to note is that if vaccine manufacturers decide to update their vaccines for the Omicron variant, it wouldn't be their first time making this kind of change.
A previous variant, B.1.351, emerged in October 2020 and was sufficiently resistant to then-current vaccines to warrant updating them. Manufacturers quickly responded to the potential threat by developing an updated mRNA vaccine to match this variant and performed clinical trials to test the new vaccine.
Fortunately, this variant did not become the dominant variant. But if it had, vaccine manufacturers would have been ready to roll out an updated vaccine.
If it turns out that Omicron – or any future variant, for that matter – warrants a new vaccine, companies have already completed the dress rehearsals and are ready to meet the challenge.

***Deborah Fuller** is a Professor of Microbiology, School of Medicine @ University of Washington.*

Biomarker predicts severity of Covid-19 infection early on

Source: https://www.mpg.de/17722615/1021-pfor-biomarker-predicts-severity-of-covid-19-infection-early-on-149770-x

Oct 21 – Scientists of an international research team with participation of the Max Planck Institute for Heart and Lung Research in Bad Nauheim have identified a biomarker with the **gene isoform hFwe-Lose**, which indicates the "fitness degree" of lung epithelial cells. In the future, this can be used to predict whether a person can expect a severe course of the disease after a Covid-19 infection.



For example, hFwe-Lose is likely to predict a severe course of Covid-19 infection: if many lung cells are not in an "optimal" state prior to infection and therefore strongly express the hFwe-Lose gene, the probability of a severe course is high. Conversely, low expression of the gene indicates good "cell fitness." A severe course of infection is unlikely. (© MPI f. Heart and Lung Research)

Many months after the onset of the Covid-19 pandemic, it is still not clear why some patients become very severely ill, sometimes with a fatal course, after Sars-CoV-2 infection, while other patients have only mild symptoms. An international team of researchers led by Rajan Gogna of the University of Copenhagen, together with scientists from the Max Planck Institute for Heart and Lung Research in Bad Nauheim, Germany, have therefore been looking for ways to use biomarkers to predict the course of a Sars-CoV-2 infection.
The scientists found what they were looking for when they analyzed lung tissue samples from patients who had died from Covid-19. "We found that the gene isoform *hFwe-Lose* was highly expressed in severe Covid-19 progression. This gene is a so-called fitness gene. Cells that are not in an optimal state show high activity of a special expression form of this gene," said Michail Yekelchyk, a postdoc in Thomas Braun's department at the Max Planck Institute in Bad Nauheim and first author of the study. Such isoforms are described as splicing variants.

A disturbed renewal process can lead to severe Covid-19

"We believe that high expression of the *hFwe-Lose* splicing variant in individual cells that no longer function optimally normally leads to their replacement by healthy cells. Patients with damaged lungs have a large proportion of *hFwe-Lose*-expressing cells. If many cells express *hFwe-Lose* and thus no longer function optimally, this natural renewal process no longer works. In the course of an infection, it is precisely these cells that rapidly die. The result is severe lung damage, mainly caused by explosive inflammatory processes," Yekelchyk explains. If the natural renewal process is disturbed because many cells are no

longer "fit," a severe course of Covid-19 infection is likely. In this way, *hFwe-Lose* not only represents a marker for the general fitness of the lung, but also indicates an increased risk of a severe Covid-19 course.
To date, scientists have focused primarily on the immune system for evidence of a severe course of infection. The advantage of monitoring *hFwe-lose* expression is that this marker provides an indication much earlier, i.e. at the beginning of the infection, whether the patient will become severely ill or even die during the course of the infection.

Prediction with 90 percent accuracy
The scientists were able to prove this by analyzing nasal swabs from around 300 patients. They could predict with a probability of around **90 percent** that individual patients would later become seriously ill or die from the Covid-19 infection. The prediction of a less severe course was somewhat less precise. That is, in individual cases, a predicted severe course did not become evident. "Overall, a much better prognosis of an infection course is possible with *hFwe-Lose* than was previously the case with other biomarkers. One could even use the marker to make a prediction about the course of a Covid-19 disease before the person is even infected," Yekelchyk says.
The scientists hope the study will lead to more targeted treatment of Covid-19 patients. Non-vaccinated patients can be treated more specifically if a severe course is predicted by using the biomarker and thus possibly prevent a severe course. In this way, the proportion of fatal courses could be reduced. In addition, the research team hopes to be able to use *hFwe-Lose* to predict the course of other diseases, such as influenza, in the future.

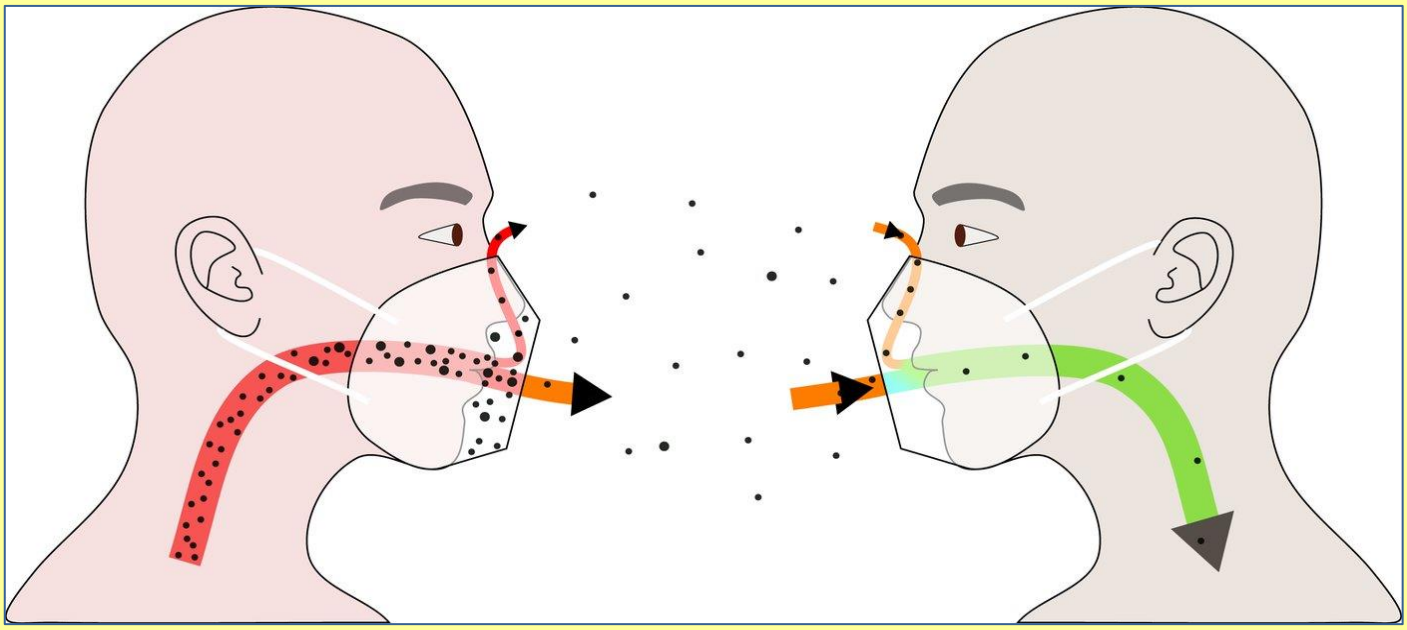
How well masks protect

Source [+video]: https://www.mpg.de/17916867/coronavirus-masks-risk-protection

Dec 02 – **Three metres are not enough to ensure protection**. Even at that distance, it takes less than five minutes for an unvaccinated person standing in the breath of a person with Covid-19 to become infected with almost 100 percent certainty. That's the bad news. The good news is that if both are wearing well-fitting medical or, even better, FFP2 masks, the risk drops dramatically. In a comprehensive study, a team from the Max Planck Institute for Dynamics and Self-Organisation in Göttingen has investigated to what extent masks protect under which wearing conditions. In the process, the researchers determined the maximum risk of infection for numerous situations and considered several factors that have not been included in similar studies to date.
The Göttingen team was surprised at how great the risk of infection with the coronavirus is. "We would not have thought that at a distance of several metres it would take so little time for the infectious dose to be absorbed from the breath of a virus carrier," says Eberhard Bodenschatz, Director at the Max Planck Institute for Dynamics and Self-Organisation. At this distance, the breathing air has already spread in a cone shape in the air; the infectious particles are correspondingly diluted. In addition, the particularly large and thus virus-rich particles fall to the ground after only a short distance through the air. "In our study we found that the risk of infection without wearing masks is enormously high after only a few minutes, even at a distance of three metres, if the infected persons have the high viral load of the delta variant of the Sars-CoV-2 virus," says Eberhard Bodenschatz. And such encounters are unavoidable in schools, restaurants, clubs or even outdoors.

Well-fitting FFP2 masks reduce the risk at least into the per thousand range.
As high as the risk of infection is without mouth-nose protection, medical or FFP2 masks protect effectively. The Göttingen study confirms that FFP2 or KN95 masks are particularly effective in filtering infectious particles from the air breathed - especially if they are as tightly sealed as possible at the face. If both the infected and the non-infected person wear well-fitting FFP2 masks, the maximum risk of infection after 20 minutes is hardly more than one per thousand, even at the shortest distance. If their masks fit poorly, the probability of infection increases to about four percent. If both wear well-fitting medical masks, the virus is likely to be transmitted within 20 minutes with a maximum probability of ten percent. The study also confirms the intuitive assumption that for effective protection against infection, in particular the infected person should wear a mask that filters as well as possible and fits tightly to the face.
The infection probabilities determined by the Max Planck team indicate the upper limit of the risk in each case. "In daily life, the actual probability of infection is certainly 10 to 100 times smaller," says Eberhard Bodenschatz. This is because the air that flows out of the mask at the edges is diluted, so you don't get all the unfiltered breathing air. But we assumed this because we can't measure for all situations how much breathing air from one mask wearer reaches another person, and because we wanted to calculate the risk as conservatively as possible," Bodenschatz explains. "Under these

conditions, if even the largest theoretical risk is small, then you're on the very safe side under real conditions." For the comparative value without the protection of a mask, however, the safety buffer turns out to be much smaller. "For such a situation, we can determine the viral dose inhaled by an unprotected person with fewer assumptions," says Gholamhossein Bagheri, who as a research group leader at the Max Planck Institute for Dynamics and Self-Organization who is the lead author of the current study.



Masks that do not fit tightly at the edges allow air to enter and exit, especially at the nostrils, but also at the cheeks. But even ill-fitting masks still significantly reduce the risk of infection. (© Birte Thiede/MPI für Dynamik und Selbstorganisation)

"Masks in schools are a very good idea"

In their calculations of the risk of infection, the Göttingen team considered a number of factors that had not previously been included in comparable studies. For example, the researchers investigated how a poor fit of the mask weakens the protection and how this can be prevented. "The materials of FFP2 or KN95 masks, but also of some medical masks, filter extremely effectively," says Gholamhossein Bagheri. "The risk of infection is then dominated by the air coming out and going in at the edges of the mask." This happens when the edge of the mask is not close to the face. In elaborate experiments, Bagheri, Bodenschatz and their team measured the size and amount of respiratory particles that flow past the edges of masks that fit differently. "A mask can be excellently adapted to the shape of the face if you bend its metal strap into a rounded W before putting it on," says Eberhard Bodenschatz. "Then the infectious aerosol particles no longer get past the mask, and glasses no longer fog up either."

How masks protect against Covid-19

Using a manikin, a team from the Max Planck Institute for Dynamics and Self-Organisation demonstrates how the respiratory cloud, and possibly coronaviruses with it, spread in different scenarios. Without a mask, many potentially infectious particles disperse in the room. Surgical masks already reduce the amount significantly, even if they fit poorly. Tight-fitting FFP2 or KN95 masks protect particularly well.

The team also considered that droplets that people spread when they breathe or speak dry while in the air and become lighter. This means that they remain in the air longer but also have an increased virus concentration as equal size droplets directly after release. When inhaled, the opposite happens: the particles take up water again, grow like a drop in the cloud and therefore deposit more easily in the respiratory tract.

Although the detailed analysis by the Max Planck researchers in Göttingen shows that tight-fitting FFP2 masks provide 75 times better protection compared to well-fitting surgical masks and that the way a mask is worn makes a huge difference; even medical masks significantly reduce the risk of infection compared to a situation without any mouth-nose protection at all. "That's why it's so important for people to wear a mask during the pandemic," says Gholamhossein Bagheri. And Eberhard Bodenschatz adds, "Our results show once again that mask-wearing in schools and also in general is a very good idea."

Vaccinated People Clear COVID Faster, Less Time with High Virus Levels

By Jack Feehan and Vasso Apostolopoulos

Source: https://globalbiodefense.com/2021/12/04/vaccinated-people-clear-covid-faster-less-time-with-high-virus-levels/

Dec 04 – A vaccinated person is less likely to get COVID in the first instance, is less contagious, and is contagious for a shorter time, resulting in significantly less spread of the virus through a highly vaccinated community.

Some recent studies have shown similar peak viral loads in vaccinated people compared to unvaccinated people who contract COVID. This has raised concerns for the efficacy of vaccines for preventing transmission.

How concerned should we be? Are vaccinated people just as contagious as unvaccinated? What does this mean for future plans for reopening?

These studies only show a similar *peak* viral load, which is the highest amount of virus in the system over the course of the study.

But vaccinated people clear the virus faster, with lower levels of virus overall, and have less time with very high levels of virus present.

Therefore, vaccinated people are, on average, likely to be less contagious.

Let us explain.

Similar peak viral loads

A study in medical journal The Lancet followed 602 primary close contacts of 471 people with COVID. It documented transmission and viral load in the group.

It found there were no differences in *peak* viral loads between vaccinated and unvaccinated individuals. It also showed only a small decrease in the number of infections in household members between vaccinated and unvaccinated people, suggesting a similar level of infectiousness.

Another unpublished pre-print, which is yet to be reviewed by other scientists, suggests a similar trend in viral load between vaccinated and unvaccinated people, as does a CDC report in the US from July which analysed outbreak data from Massachusetts.

The Massachusetts data came from a number of large public events over a two-week period in July in Barnstable County, Massachusetts. From 469 COVID cases, 346 (74%) occurred in fully vaccinated people. Viral load was similar in both vaccinated and non-vaccinated groups.

However, we shouldn't fear this analysis too much. The data reported is an imperfect representation of the population, and the measures they used – a single swab and PCR test – don't provide information about overall viral load over time.

What is viral load?

Viral load refers to the amount of virus present in someone's bodily fluids at a given point in time. Scientists can measure this by looking at your blood, or more commonly in COVID, swabs of your nose and throat.

Generally, higher viral loads are thought to correspond to a more contagious individual.

However, this isn't always clear in reality. For example, some people with COVID who don't have symptoms and have low viral loads transmit more, as they are less likely to follow social distancing, mask wearing, and stay at home.

The evidence on how viral load relates to severity of disease is mixed. Some studies find no relationship between the amount of virus in swabs and poorer outcomes, but others find an increased death rate with increasing viral load.

Vaccinated people clear the virus quicker

The results of the Lancet study suggest similarities in terms of viral load between vaccinated and unvaccinated people. But the study doesn't provide strong evidence that vaccines don't work to prevent transmission through the population.

While the *peak* load may be similar, vaccinated people are likely to have lower viral load overall, and therefore be less contagious.

Given vaccines speed the clearance of COVID from the body, vaccinated people have less opportunity to spread the virus overall. This appears to be the case even with the more infectious Delta variant.

While the Lancet study specifically collected an even number of vaccinated and unvaccinated infections in order to compare them, this isn't a true representation of the community in Australia. We know being fully vaccinated reduces the likelihood of catching COVID even if the vaccines aren't perfect (none are) and there are breakthrough infections.

While it's difficult to estimate the rate of breakthrough infections accurately, studies have estimated they occur in 0.2% to 4% of people. In reality, this means that for every 100 vaccinated people, somewhere between 0.2 and 4 of them would get COVID.

So, while in the rare instance where a breakthrough infection occurs, there may be a similar viral load, and possibly a similar infectiousness, there remain much fewer vaccinated people getting COVID.
Importantly, while the Lancet study also showed a similar rate of household transmission between the vaccinated and unvaccinated, there are a number of other studies in different contexts showing decreased transmission through vaccinated people.

So what does it mean for us?
If you're one of the unlucky few vaccinated people who get a breakthrough infection, it does mean you have to follow the health advice given to you.
Even though you may not feel sick, you still have the capacity to spread the virus to a vulnerable person around you. Though if the people in your home are also fully vaccinated, then the risk of transmission drops even further again.
However, a vaccinated person is less likely to get COVID in the first instance, is less contagious, and is contagious for a shorter time, resulting in significantly less spread of the virus through a highly vaccinated community.
This, combined with the well-known ability of vaccines to keep people out of hospital and ICU, makes them the most important part of the health response in the near future.
As the vaccine rollout continues, and there are fewer people without protection, the decreased rate of breakthrough infection will help ensure a future where COVID no longer dominates the news, society, and our minds.

Jack Feehan, *Research Officer – Immunology and Translational Research,* Victoria University. *PhD in gerontology, immunology and regenerative medicine. Research officer in the Immunology and Translational Research Group, within the Mechanimsms and Interventions in Health and Disease Program, Institute for Health and Sport, Victoria University. Currently researching alternative vaccine strategies, for both infectious disease, substance use disorders and autoimmune conditions.*
Vasso Apostolopoulos*, Professor of Immunology and Associate Provost, Research Partnerships,* Victoria University. *Over 25 years experience in research in the area of vaccines and drugs for cancer and chronic diseases with translational focus. In addition, extensive clinical research background, translating research to clinical trials. Multidisciplinary research expertise, in the areas of, immunology, crystallography, medicinal chemistry, biochemistry, crystallography, clinical research and drug development. Main focus is treating diseases with an immunological focus. Areas of research include: cancer, type-1 diabetes, type-2 diabetes, multiple sclerosis, mental health, drug addiction, infectious diseases including the recent SARS-CoV-2 virus which causes COVID-19. With COVID-19 we are trying to understand disease progression, how the immune system responds to disease and are developing ways to overcome disease.*

Let's Not Forget About the Other Respiratory Viruses

By Connor Bamford and Grace C Roberts
Source: https://globalbiodefense.com/2021/12/04/lets-not-forget-about-the-other-respiratory-viruses/

Dec 04 – With coronaviruses taking over our news feeds – and lives – you may be fooled into thinking it's the only virus affecting humans at the moment. But it's important to remember that there are many viruses, especially respiratory viruses, that regularly infect us. These viruses range from the mildly annoying, such as those that cause the common cold, to the potentially deadly, such as influenza.
Despite the challenges posed by the pandemic, scientists around the world are still working hard on these viruses, to find treatments and vaccines to improve our quality of life.

1. Rhinoviruses
Rhinoviruses (from the Greek "rhinos" for "of the nose") are usually associated with the common cold. They cause a nasal infection, resulting in congestion and a runny nose. But rhinoviruses have a more malevolent side. They have been linked to exacerbating lower respiratory tract diseases, such as asthma and COPD (an obstructive lung disease that causes long-term breathing problems and poor airflow).
Rhinoviruses can spread all year round, and there is no vaccine against them as they are an incredibly diverse group of viruses. There is also no licensed antiviral medication against

rhinoviruses, although scientists are working on this to help manage conditions such as asthma and COPD.
Interestingly, rhinoviruses have only been found in humans and are closely related to viruses that infect our guts.

2. Adenoviruses

Adenoviruses were first isolated from the adenoids – an area of the throat near the tonsils – hence the name. There are over 50 human adenoviruses, most of which cause respiratory disease. But some cause infections of the gastrointestinal tract, the eye (conjunctivitis), and the urinary tract (cystitis). In most healthy people these viruses only cause mild, short-lived disease, but they tend to spread quickly in densely populated areas.
There are no antiviral treatments for adenoviruses, although some are in clinical trials). But there are vaccines for two of the respiratory adenoviruses that cause regular outbreaks in crowded populations. These vaccines are regularly used by armed forces.
An exciting area of research is using adenoviruses as anti-cancer therapies, as some strains can selectively infect and destroy cancer cells while leaving healthy cells untouched.

3. Pneumoviruses

Humans are infected with two kinds of pneumoviruses: respiratory syncytial virus (RSV) and metapneumovirus (MPV). All members of the pneumoviruses ("pneumo" being Greek for lung) are respiratory viruses, but they have a range of hosts they can infect. As well as humans, certain pneumoviruses can infect cows (bovine respiratory syncytial virus), mice (murine pneumonia virus) and birds (avian metaphneumovirus).
Most people will have had many human respiratory syncytial virus (HRSV) infections in their lifetime, with over 80% of the population infected by the age of two years. For most healthy people, HRSV causes a nasty cold, but this will resolve itself without the need for any treatment. In those with respiratory conditions such as asthma, however, the consequences can be severe. In 2015 alone, it is estimated that RSV caused 3.2 million hospitalisations and over 59,000 deaths in the under-fives.
HRSV has been linked with the development of asthma, though this is a contentious area of science that is still much debated and researched.

4. Parainfluenza viruses

The parainfluenza viruses (PIVs) are a sub-group of viruses known as paramyxoviruses and are closely related to other pathogens such as mumps and measles. They also infect our respiratory tract and are major causes of a lower respiratory tract disease called croup. People with croup often have a barking cough, like a seal.

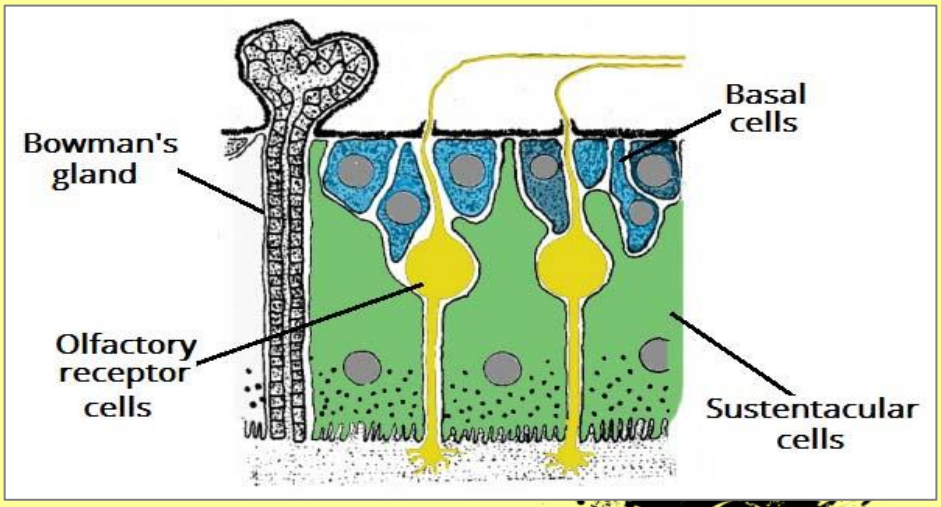
There are two distinct paramyxovirus groups of parainfluenza viruses, one called the respiroviruses (PIV1 and 3) and the other the rubulaviruses (PIV2 and 4). PIV1 and 3 have counterparts in other animal species, such as mice and cows, while PIV2 and 4 are relatively closely related to the mumps virus.
PIVs tend to spread in autumn and spring. There is no licensed vaccine or antivirals against PIVs, although researchers have made significant progress on this.

5. Influenza viruses
Influenza viruses are perhaps the most worrying of respiratory viruses, given their capacity for causing pandemics, such as the 1918 flu pandemic. They are highly diverse viruses with four major types (A, B, C and D). All but influenza D virus infect humans, and A and B can cause significant lower respiratory tract disease and even death. Influenza B and C remain associated with humans while influenza A virus is really a virus of aquatic birds, although influenza A viruses circulate in humans, pigs and even bats.
Occasionally, avian flu A viruses jump species into humans and may even spread well and can cause pandemics.
Influenza viruses continuously circulate in humans because they are able to mutate and evade our immune responses. We have vaccines against influenza viruses, but they have to be updated each year to keep up with the mutations.
Antivirals, such as Tamiflu, when used early enough, can be effective at reducing how long you are sick for. Researchers are continuing to develop broader, long-lasting flu vaccines and more potent antivirals.
All the above respiratory viruses routinely infect humans. Most lack a vaccine and effective treatments – and many disproportionately affect the most vulnerable in society. Now that there is a raised scientific and public awareness on respiratory infections, we must take this opportunity now to make major advances against respiratory infections through research and increased preventative measures such as hand hygiene and social distancing.

Connor Bamford, *Research Fellow, Virology,* Queen's University Belfast. *Connor is a virologist with over a decade of experience in studying how the immune system defends humans and other animals against disease-causing microbes like viruses, such as the hepatitis C virus, influenza virus and Zika virus. Connor recently moved to Queen's University Belfast as a 'Wellcome Trust Institutional Strategic Support Fund (ISSF) Early Career Research Fellow' to continue his research into the human immune system and antiviral proteins called 'interferons'. Connor obtained his PhD in 2014 in molecular virology studying the mumps virus before carrying out his postdoctoral research at the MRC-University of Glasgow Centre for Virus Research (CVR) in Scotland, UK.*
Grace C Roberts, *Research Fellow in Virology,* Queen's University Belfast. *Grace is a postdoctoral research fellow in the School of Molecular and Cellular Biology at the University of Leeds. Her current research focusses on Hepatitis C virus. Previously, Grace has worked as a postdoc at Queen's University, Belfast researching respiratory viruses. Grace obtained her PhD at the University of Leeds in 2019, with the study of Chikungunya virus and its interactions with host cell immune pathways. Grace's experience in virology includes work mosquito-borne viruses (e.g. Chikungunya virus), Hepatitis C virus and Adenoviruses.*

SARS-CoV-2 Does Not Infect Olfactory Neurons, Spatial Analysis Suggests

SARS-CoV-2 does not appear to infect the sensory neurons of the olfactory epithelium, or olfactory bulb neurons, in COVID-19 patients. Spatial analysis on tissues harvested from deceased COVID-19 patients revealed that **sustentacular cells** – also known as supporting cells – are the main target cell type for the virus in the olfactory epithelium. These findings indicate that SARS-CoV-2 does not appear to be a neurotropic virus. **+ MORE**



The First Study Assessing Pfizer's Effectiveness Against Omicron Just Came Out

Source: https://www.sciencealert.com/small-preliminary-study-suggests-a-40-fold-reduction-in-antibody-protection-for-omicron

Dec 08 – The Omicron variant substantially reduced antibody levels generated by the Pfizer-BioNTech COVID-19 vaccine, according to preliminary results from a South African study that's still awaiting peer review.

These are the first laboratory results to see how a COVID-19 vaccine holds up to Omicron. A team of researchers led by Africa Health Research Institute's Alex Sigal tested 14 blood samples from 12 people against a live sample of the Omicron variant. All 12 people were vaccinated, and six were previously infected.

Overall, the scientists found a roughly 40-fold reduction in the levels of neutralizing antibodies, the virus-fighting proteins that play a key role in our immune response, compared with the original version of the virus.

Omicron did not evade vaccine protection completely, Sigal wrote on Twitter, meaning there's still benefit to being vaccinated against this new variant. But the marked reduction in antibodies raises questions of how durable vaccine protection will be against Omicron – namely, whether booster shots will sufficiently ward off disease or if new vaccines may eventually be required. Sigal called it a "very large drop in neutralization of Omicron."

"A good booster probably would decrease your chance of infection, especially severe infection leading to more severe disease," Sigal said in an online presentation of his results on Tuesday, according to Bloomberg.

"People who haven't had a booster should get one, and people who have been previously infected should be vaccinated."

Shortly after Sigal announced his team's results, another group of researchers at Sweden's Karolinska Institutet disclosed their own findings that suggested a substantial but less dramatic decline in antibody levels. The Karolinska team found a seven-fold reduction across 17 blood samples.

They noted the impact of Omicron varied greatly between samples, and they used a version of Omicron that was artificially made in a lab instead of the live virus. A lead researcher for that group said the findings make Omicron "certainly worse than Delta, but, again, not as extreme as we expected."

Other variants have also shown the ability to partially evade the vaccine's protection to a lesser degree. Previous lab tests showed the Delta variant led to a 2- to 3-fold reduction in antibodies compared with the original virus, while the Beta variant caused a 7- to 8-fold reduction.

The results are not finalized and have not been published in a medical journal. Sigal cautioned on Twitter that the findings "are likely to be adjusted as we do more experiments."

Drugmakers are working on variant-specific boosters

Pfizer Chief Scientific Officer Mikael Dolsten previously told Insider he'd be worried to see a 10-fold reduction in antibody levels. A decrease of that magnitude, he said, would make him concerned that current vaccines wouldn't offer sufficient protection and an Omicron-specific shot would be needed.

"If we exceed a 10-fold drop in neutralization of Omicron, I think we are starting to enter the yellow to red zone, when your immunity is likely lowered and there's limited time after your boost until waning," Dolsten said in a November 29 interview.

Several vaccine developers, including Pfizer, Moderna, and Johnson & Johnson, are already working on Omicron-specific shots. Dolsten said an updated version could be ready to start mass-producing as soon as March 2022.

The South African study only analyzed blood samples from people who got two shots of Pfizer's vaccine, not people who'd received a booster shot. Five of the six blood samples that came from people who were both vaccinated and previously infected showed relatively high levels of neutralizing antibodies against Omicron.

"Previous infection, followed by vaccination or booster is likely to increase the neutralization level and likely confer protection from severe disease in Omicron infection," the researchers wrote.

Even reduced antibody levels may still protect against severe disease

It's still unclear if Omicron will impact vaccine protection against severe disease.

Virologists are cautiously optimistic that the vaccines could still help prevent critical illness, despite significant drops in antibody levels. Vaccines also activate other parts of the immune system, particularly B- and T-cells that often confer protection against variants.

Anecdotally, disease experts in South Africa have suggested that vaccines still seem to reduce the risk of serious illness among Omicron cases.

"We are seeing breakthrough infections of people who have been vaccinated, but the infections we're seeing are very mild to moderate," Richard Friedland, chief executive officer of Netcare, which operates South Africa's largest private healthcare network, told Bloomberg on Friday. He added that "for healthcare workers who have had boosters, it's mostly mild."
But Omicron has also shown signs of being highly transmissible compared with other coronavirus strains. The variant has spread to more than 40 countries since it was first detected roughly a month ago.

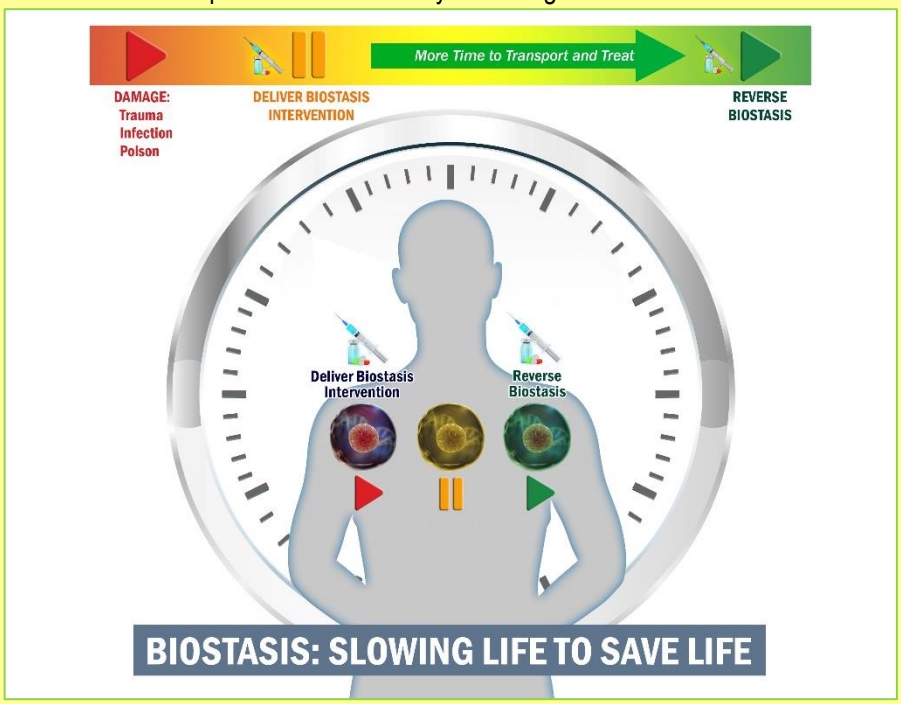
DARPA wants to 'slow life to save life' with program that extends the 'golden hour'

Source: https://www.armytimes.com/news/your-military/2018/03/26/darpa-wants-to-slow-life-to-save-life-with-program-that-extends-the-golden-hour/

Researchers at the Defense Advanced Research Projects Agency recently launched a five-year project dubbed "Biostasis." The program will work at "slowing life to save life" using biological processes to extend the golden hour that follows a critical or life-threatening injury. (Gertrud Zach/Army)

2018 – When troops are wounded, time is precious. That's why the fast-ticking minutes that follow such an event are called the "golden hour." Get the right care within the right time and you survive. Wrong care or an evac takes too long — you're dead.
While major efforts across the government push to advance medical technology in the field and speed up the vehicles that carry troops to top treatment, one new effort is trying something even more ambitious — slowing life to save life.
Researchers at the Defense Advanced Research Projects Agency recently launched a five-year project dubbed "**Biostasis**." The program will "leverage molecular biology to develop innovative ways of controlling the speed at which living systems operate."
By doing that they hope to extend the "golden hour" before it's too late.
"At the molecular level, life is a set of continuous biochemical reactions, and a defining characteristic of these reactions is that they need a catalyst to occur at all," said Tristan McClure-Begley, the Biostasis program manager.

Those catalysts, McClure-Begley said, are proteins and "large molecular machines" that transform chemical and kinetic energy into biological processes.
"Our goal with Biostasis is to control those molecular machines and get them to all slow their roll at about the same rate so that we can slow down the entire system gracefully and avoid adverse consequences when the intervention is reversed or wears off."
The program starts small, first by aiming at slowing certain processes within cells, then slowing whole cells and later tissue processes, then onto the entire organism, he said.
But the goal isn't simply to slow processes down but to do it without damaging the processes when they return to normal speed.
"Our treatments need to hit every cellular process at close to the same rate, and with the same potency and efficacy," McClure-Begley said. "We can't focus treatments to interrupt just a subset of known critical processes."
The wrong kind of slow down, in the wrong sequence or at different rates, could kill a cell.
To avoid those problems, DARPA wants to put their efforts on the protein level. And they're looking to nature for some clues.
Certain creatures such as tardigrades and wood frogs can go into a state known as "cryptobiosis," where it seems like all their metabolic processes have stopped but they're still alive, according to the DARPA release.



Tardigrades, which are microscopic invertebrates, can use this adaptation to survive freezing, extreme radiation and near-total dehydration. Wood frogs use the same method to survive freezing solid for multiple days.
"Nature is a source of inspiration," McClure-Begley said. "If we can figure out the best ways to bolster other biological systems and make them less likely to enter a runaway downward spiral after being damaged, then we will have made a significant addition to the biology toolbox."
The Biostasis program's goals are to build "proof-of-concept" technologies and testing them in simple living systems. The work will include federal health and regulatory agencies to then develop a pathway for future human medical use.

Biostasis Project Advances to Next Phase of Development

Source: https://wyss.harvard.edu/news/biostasis-project-advances-to-next-phase-of-development/

2020 — The Wyss Institute's Biostasis project, which began just eighteen months ago as part of the Defense Advanced Research Projects Agency (DARPA)'s Biostasis program, has successfully completed its project Phase 1 goals and moved into Phase 2 this month, on schedule despite the disruption of the global COVID-19 pandemic. This ambitious project aims to identify biostasis inducers – molecular compounds that can reversibly slow or even stop the processes of cellular metabolism at room temperature – which could be used to stabilize vaccines without the need for a cold chain of transportation, preserve cellular therapies and organs for transplantation, and buy time to treat people with life-threatening injuries.
"I am very proud of this team and what we have been able to accomplish in such a short period of time – to go from a 'moonshot' idea on paper to a multidisciplinary research effort that is moving into *in vivo* experiments so quickly is just breathtaking," said Isabel Chico-Calero, Ph.D., D.V.M., the Biostasis Project Manager at the Wyss Institute. "We made so much progress that we were even able to seamlessly begin some Phase 2 activities before Phase 1 was over."
The Biostasis project involves team members from multiple labs, platforms, and disciplines across the Wyss Institute community. In order to identify compounds that could potentially

induce biostasis, the group designed, built, and is using a development pipeline to find candidate substances, analyze them for traits that indicate biostasis-related activity, and evaluate them using computational methods. Simultaneously, candidate compounds are tested experimentally and those results are fed back into the pipeline, refining it over time to make its predictions more accurate.
"I'm completely blown away by the coherence and energy of the team – everyone is working together really well, addressing the challenge from different perspectives. We've already gotten some really interesting insights into the timing and regulation of biological processes, and it will be fascinating to see it transitioned into practical applications in Phase 2," said Michael Levin, Ph.D., an Associate Faculty Member of the Wyss Institute, and the Vannevar Bush Chair Professor and Director of the Allen Center for Discovery at Tufts University, whose lab is working on multiple experimental aspects of the Biostasis project.
The foundations of the Biostasis project have also been deployed in the worldwide fight against COVID-19. Three computational pipelines that were being pursued as part of the Biostasis project are now being used to predict and identify existing drugs that could have effects against the CoV-2 virus as part of a new DARPA program. The first promising compounds are being tested in Organ Chip and animal models by collaborators at the University of Maryland Medical School and the Icahn School of Medicine at Mount Sinai, and the team is in close contact with other government agencies regarding moving any effective compounds into clinical trials.

Candidate biostasis-inducing compounds are tested on tadpoles in the lab, and some have shown an ability to put the animals into a state of torpor. Credit: Wyss Institute at Harvard University

"This project underscores the importance of having a multidisciplinary team that's comfortable taking scientific risks in solving difficult problems like inducing biostasis. Our group has become a self-driving engine of innovation, even beyond the problem at hand, and I'm grateful to be part of the team," said Richard Novak, Ph.D., a Senior Staff Engineer on the Advanced Technology Team and co-lead of the Biostasis project. In Phase 2, which will last twelve months, the Biostasis team will continue to refine their pipeline based on experimental data. They are also testing compounds in human Organ Chips, and are integrating metabolic sensors into the chips to further evaluate how the compounds affect organ systems. Their lead compounds are being tested in collaboration with Lackland Air Force Base in San Antonio, Texas, where they are being evaluated for their ability to affect metabolic processes in whole vascularized tissues during organ transplantation in a large animal model. This work, if successful, could lay the groundwork for a new method of preserving human organs and limbs for transport to people who need them, and also brings the Biostasis project one step closer to fruition. "When we wrote the grant application and laid out a plan for developing biostasis therapeutics that could effectively induce a state of suspended animation, it truly read like a science fiction short story. But turning that fiction into reality is what the Wyss Institute is all about, and the progress we have made in such a short time is amazing. I am incredibly proud of the team who are working together so well to make this happen," said Donald Ingber, M.D., Ph.D., who is leading the Biostasis project with Novak. Ingber is the Wyss Institute's Founding Director, as well as the the *Judah Folkman Professor of Vascular Biology* at Harvard Medical School and Boston Children's Hospital, and Professor of Bioengineering at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS).

Inaccurate clickbait headline in Forbes article used to promote the false claim that COVID-19 vaccines change our DNA

COVID-19 Antibodies Get Stronger with Repeated Vax 'Boosts': Study

Source: https://www.medscape.com/viewarticle/964333

Dec 07 – New research helps bolster the argument for getting COVID-19 booster shots now, even though the formulations are not specifically targeted to the latest Omicron and Delta variants, researchers suggest in a paper published today.

Senior author Otto Yang, MD, professor in the division of infectious diseases and of microbiology, immunology, and molecular genetics at the David Geffen School of Medicine, University of California, Los Angeles, told *Medscape Medical News* that their findings, published in the peer-reviewed journal *mBio,* suggest encouraging news regarding the merits of boosters.

The researchers, led by F. Javier Ibarrondo, PhD, also from the David Geffen School of Medicine, compared immune reactions in 15 vaccinated people who had not been infected before with SARS-CoV-2 and 10 people who were infected before vaccination. Most had received the Pfizer or Moderna two-dose mRNA vaccines.

They evaluated how antibodies act against a panel of seven spike variant combinations of five mutations. They studied people shortly after they recovered from a mild case of COVID-19 after experiencing symptoms no later than April 2020. They then compared this group with people never infected who were evaluated shortly after vaccination.

Yang said they found that people who had had COVID and then got vaccinated developed not only more antibodies to the virus but a higher quality of antibodies, more equipped to take on variants.

The antibodies produced by either just getting COVID-19 or by getting vaccinated without having had COVID had difficulty protecting against certain variants, Yang said.

"But when we looked at the combination of the two — so people who had had COVID and who got vaccinated after they'd had COVID — they developed much more efficient antibodies that could deal with all the spike variants that we tested," he said.

Making B Cells Stronger

Yang explained that boosters were not available at the time of the study, but said it is a small leap to predict that they behave similarly.

"We only show this in the case of COVID plus vaccination," he said, "but COVID plus vaccination is not that different from vaccinations plus vaccination (booster)."

Yang says it follows a basic concept in antibody research: somatic hypermutation.

"Once the B cells make antibodies, the longer those B cells are exposed to the things they're making antibodies against the more they continue to modify those antibodies to be better," he said. "It fits what we expect but it's perhaps faster than we expected — this improvement of antibodies — so it's good news."

Even within the fairly limited scenarios the researchers tested, the B cells can continue to improve, he said.

"It suggests that if we get boosters, the additional exposure from the vaccine will not only increase the amount of antibodies after [they've] drifted down, but will also improve the quality of those antibodies," Yang said.

The authors say in the paper, "Whether this can also be accomplished in SARS-CoV-2-naive persons through vaccination alone, such as delivering supplemental doses beyond the original vaccination regimen of two doses, remains to be determined."

Yang said a common argument he hears against the boosters is that people are waiting because they think a booster targeted to a specific variant is around the corner.

"What this (study) suggests — is if you get the booster now you will still get some additional benefit against these variants even though the vaccine is not specifically tailored against the variants," Yang said.

He said that by the time their work was published, other studies, referenced in the paper, had come out showing similar findings.

▶▶ ***mBio.*** **Published online December 7, 2021.** Full text

How Has COVID-19 Changed the Violent Extremist Landscape?

By Michele Grossman

Source: https://www.homelandsecuritynewswire.com/dr20211208-how-has-covid19-changed-the-violent-extremist-landscape

Dec 08 – The COVID-19 pandemic has upended the normative social order of democratic societies in profound ways: lockdowns, public health mandates, a range of restrictions on movement and behavior, and the rapid development of new-generation vaccines. This disruption has occurred amid an environment of risk and uncertainty that threatens peoples'

sense of security, stability, and resilience. The rise of pandemic-led conspiracy thinking has therefore been predictable.
There is a well-established relationship between conspiracy narratives and the sense of threat, particularly concerning system identity threat, or the view that society is fundamentally changing. QAnon influencers, for example, quickly harnessed their conspiracy movement's anti-government, "Deep State" narrative of corrupt, shadowy elites to fit with how states around the world were responding to the pandemic's public health threats.
However, QAnon's dark prophesies of a New World Order that would upend civilization is not new, drawing together a pastiche of familiar, pre-existing militant narratives based on anti-Semitism, white nationalism, anti-vaccination, and anti-technology discourse.
Some of these older militant narratives have long been associated with violent action against minorities and violent resistance to the state. It is, therefore, unsurprising that the rise of pandemic-inspired conspiracist movements has been escalated and capitalized on by violent extremist movements across the board.
EUROPOL has warned that COVID-19 will continue to escalate violent extremist threats in various countries, increasing tolerance for violence in response to pandemic-induced stressors. This runs alongside evidence that ideologically diverse violent extremist networks are exploiting pandemic-related vulnerabilities through online propaganda and recruitment efforts.
As our AVERT Research Network submission to Australia's parliamentary inquiry on extremist movements and radicalism argues, the extension of government authority and curtailing of individual liberties during a public health emergency have been consistently reframed by extremists as instruments of social control, government corruption, and state illegitimacy, accelerating what Ehud Sprinzak (1991) terms the "transformational delegitimation" of democratic societies and institutions.

New Gateways to Violent Extremism
While QAnon influencers were predictably nimble in exploiting gateway online anti-child abuse and exploitation networks to grow their impact, pandemic-inspired intersection of lifestyle and wellness, violent extremism, and conspiracy networks has been more novel.
In Australia, the former chef and dietary wellness influencer Pete Evans posted the neo-Nazi "*sonnenrad*" or "black sun" swastika for his many online followers, a symbol appropriated by the Nazis to signal the rebirth of Aryanism. Other wellness influencers have also energetically sought to monetize the surge of interest in anti-authority conspiracies by promoting product-based resistance to public health measures.

The Weaponization of COVID-19
The promotion of conspiracies and disinformation can be understood as a form of attack. For those who seek to escalate violent conflict, accelerate civil unrest, and enhance social and political polarization, COVID-19 has been a swiftly weaponized gift, for example, by encouraging followers to deliberately spread COVID-19 as a means of hastening the collapse of civilization or the elimination of hated others. These efforts have been significantly aided by the shift to extensive online social interaction as well as information-gathering to make sense of the upheaval.
This is particularly the case for young people who are arguably bearing a disproportionate pandemic-related burden in terms of disrupted schooling, dwindling or precarious employment, isolation from face-to-face culturally diversified social settings, and mental health and housing challenges (Lowe, 2021). Under these circumstances, the vulnerability of young people – already a generation of digital natives – to the online social harms of violent extremist conspiratorial ideologies can intensify.

Addressing the Intersection of COVID-19 and Extremist Ideologies
A key question raised by the impact of the pandemic on drivers toward violent extremism is whether these impacts are likely to be acute or chronic.
Will the cessation or moderation of the pandemic, driven by increased global vaccination rates and the restoring of individual liberties and movement, see extremist conspiracy uptake subside? Or will the longer-term social, economic, and political impacts of the pandemic, which may well outlast the immediate public health crisis, provide fertile ground for continuing political and social polarization that extremists can channel toward violent action?
While we may not be able to answer this question yet, we should be prepared for both scenarios. A key response for policymakers is to recognize and address:

1. The role that conspiratorial thinking plays in processes of radicalization
2. The emergence of conspiracist movements as critical extremist actors (AVERT, 2021)
3. Whether strategies for inoculating or "pre-bunking" against conspiracist-extremist appeals might be effective (Banas and Miller, 2013; Braddock, 2019).

Our approach needs to become part of, but also go beyond, preventing violent extremism (PVE) strategy and programming. Policy settings need to redress:

- The post-truth environment in which conspiracist thinking flourishes
- The economic inequalities that fuel its potency
- The social divisions that nurture its narratives
- The technological affordances that drive its dissemination
- All of these are critical areas of investment in mitigating how violent extremist movements can weaponize COVID-19

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The world is unprepared for the next pandemic, study finds

Source: https://edition.cnn.com/2021/12/08/health/world-unprepared-pandemic-report/index.html

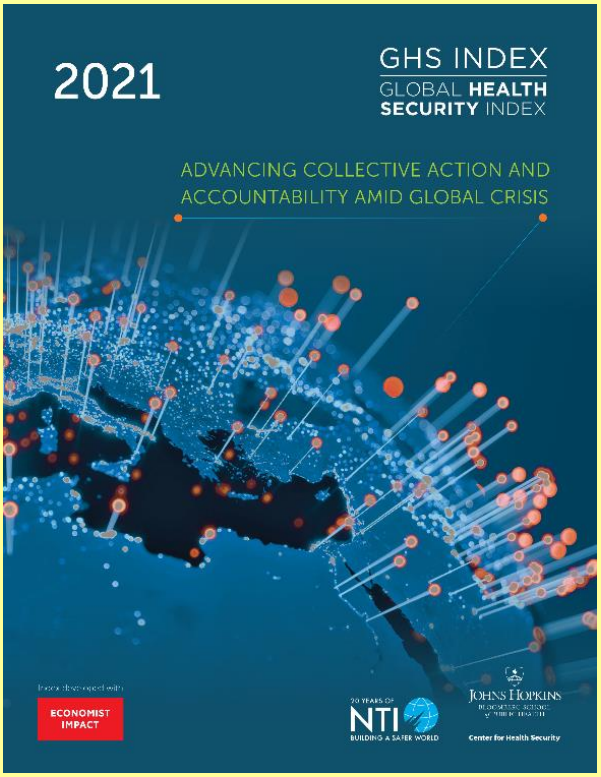
Dec 08 – The entire world remains unprepared for the next pandemic and most countries are underprepared even for small outbreaks of disease, researchers reported Wednesday.

Not a single country scored well on the Global Health Security index -- a measure of preparedness for various health emergencies and problems put together by the Nuclear Threat Initiative and the Johns Hopkins Center for Health Security at the Bloomberg School of Public Health.

"The 2021 GHS Index continues to show that all countries still lack some critical capacities, which hinders their ability to respond effectively to COVID-19 and reduces their preparedness for future epidemic and pandemic threats. The average country score in 2021

was 38.9 out of 100, which is essentially unchanged from 2019," the report reads. **The highest overall score was just under 76 -- achieved by the United States.**

The worst area of preparedness is in preventing the emergence of new pathogens such as the virus that has caused the current pandemic. "The global average for the prevention of the emergence or release of pathogens is 28.4 out of 100, making it the lowest-scoring category within the GHS Index," the report reads. It finds 113 countries "show little to no attention" to diseases transmitted from animals to humans.



"Leaders now have a choice," said Dr. Jennifer Nuzzo, senior scholar at the Johns Hopkins Center for Health Security. "They can make dedicated, sustainable investments in the new capacities created during the Covid-19 response to prepare their countries for the long term, or they can fall back into the decades-long cycle of panic-and-neglect that will leave the world at grave risk for inevitable future public health threats."

The report found that 155 out of the 195 countries in the survey have failed to invest in preparing for a pandemic or epidemic within the past three years, and 70% have failed to invest in clinics, hospitals and community health centers.

"Political and security risks have increased in nearly all countries, and those countries with the fewest resources have the highest risk and greatest preparedness gaps," the group said in a statement. It found the populations of 161 countries have low to moderate levels of public confidence in their governments.

The US was the No. 1 example of this, the report found. "With more reported cases and more deaths than any other country, the United States' poor response to the COVID-19 pandemic shocked the world," the report read. "How could a country with so much capacity at the start of the pandemic have gotten its response so wrong?" the report asked. It found several reasons. "The most significant: it had the lowest possible score on public confidence in the government—a factor that has been identified as key among countries with high numbers of COVID-19 cases and deaths.

Such lack of confidence can undermine public adherence to disease-control measures, such as wearing masks or complying with stay-at-home recommendations or vaccination protocols, which have been reported among the ongoing challenges to the U.S. COVID-19 response," it added.

"Over nearly two years, U.S. politicians have questioned the motives and messages of health officials and debated the seriousness of the virus and the effectiveness and safety of vaccines. The result: in many areas of the country, people have been unwilling to comply with public health recommendations that would slow the spread of the virus." Other US weaknesses included limited access to health care without cost barriers, and lower numbers of health care personnel and hospital beds per capita than many other high-income countries.

The findings show that even rich and seemingly prepared countries can still fail to contain a pandemic. "The public must trust advice from health officials and not face hurdles, such as lost income, if protective recommendations are to be followed," the report reads. "Public health and health system capacities must be coupled with policies and programs that enable all people to comply with public health recommendations.

Universal health coverage, paid sick leave, subsidized childcare, income assistance, and food and housing assistance are examples of policies that helped populations comply with protective public health measures of the COVID-19 pandemic," it recommends. "For example, Ghana and Ukraine both provide wraparound services, such as economic or medical support, to infected patients and their contacts to self-isolate or quarantine. New Zealand raised its minimum wage and began providing weekly benefits to support participation of public health measures in society."

FDA authorizes AstraZeneca's preventative COVID-19 antibody treatment

The FDA has authorized the first COVID-19 drug designed to prevent infection in immunocompromised populations. The monoclonal antibody treatment is delivered by intramuscular injection and offers robust protection from infection for up to six months. **Read more**

A New Type of Omicron Has Now Emerged in Multiple Countries

Source: https://www.sciencealert.com/a-new-omicron-variant-has-been-found-and-it-s-now-even-harder-to-identify

Dec 09 – A new version of the Omicron coronavirus variant was designated on Tuesday that experts say will be harder to track because of its genetics.

The new lineage, called BA.2, has been spotted seven times so far across South Africa, Australia, and Canada.

BA.2 is genetically quite different from the original Omicron lineage, now called BA.1, which has been spreading across the world, said Francois Balloux, the director of the University College London Genetics Institute, per *The Guardian*.

Crucially, it doesn't have the characteristic S-gene dropout mutation which allows Omicron BA.1 to be easily identified via PCR test results, the main way the variant has been tracked so far.

That means that "the two lineages may behave differently," he said, *The Guardian* reported.

While the change will make tracking harder, it is "nothing to be scared of yet" said Vinod Scaria, a clinician and computational biologist at the CSIR Institute of Genomics and Integrative Biology, in a tweet.

David Stuart, a professor of structural biology at Oxford University, agreed. "I don't think there's any reason to think that the new outlier is any more of a threat than the form of Omicron that's knocking around at the moment in the UK," he said, per the *Financial Times*. "But it is terribly early," he added.

PCR tests should still pick up this variant but might not be able to distinguish it from others

BA.2 carries "many of the defining mutations" of Omicron, according to Andrew Rambaut, an evolutionary biologist at the University of Edinburgh, UK, who reviewed the mutations in a blog post. But it also has dozens of mutations BA.1 doesn't have and dropped dozens that do appear on BA.1. Most notably, BA.2 is lacking the specific mutation that scientists were using as a quick way to track Omicron: the 69/70del mutation on the S gene, as Insider previously reported.

PCR tests check for different markers to see if someone is carrying the coronavirus, one of which targets the S gene.

When someone with the BA.1 lineage of Omicron gets a PCR test, one of the markers won't work: this is called an S-gene dropout.

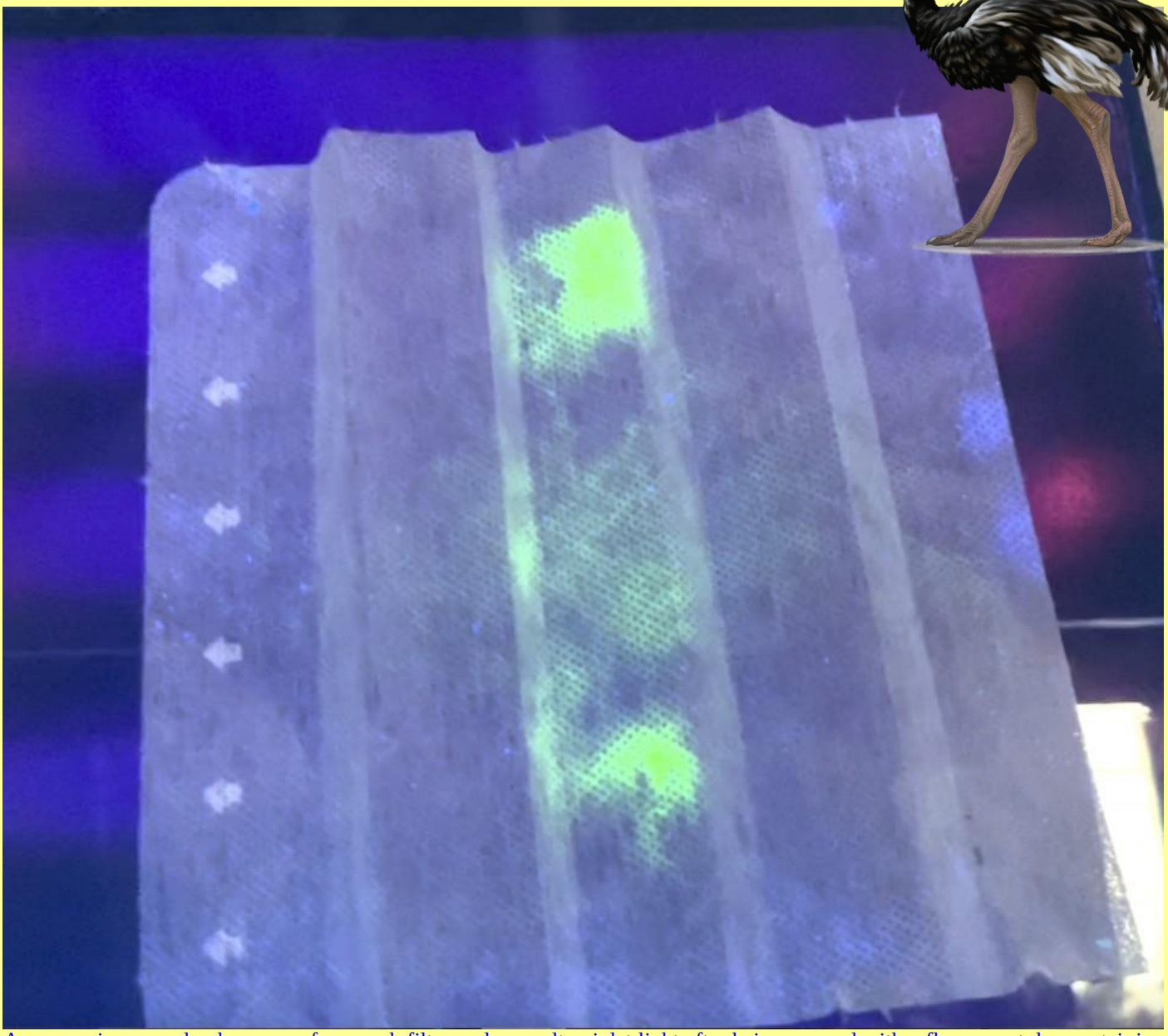
This was an easy way to separate Omicron from other variants currently circulating, most of which wouldn't cause this S-gene dropout. But this likely won't be the case for the BA.2 lineage. That means scientists will have to depend on more time-consuming and less widespread sequencing to identify it.

For Emma Hodcroft, an evolutionary geneticist at the University of Basel, that means that "there may be more Omicron than we think," per the *Financial Times*. She told that outlet that "from the numbers we have right now, I don't think there's a very large hidden burden from BA.2." In a tweet, Hodcroft emphasized that PCR tests should still work to detect whether someone has the coronavirus, even with this new lineage. "This means we can't use this 'shortcut' to find possible Omicron cases for BA.2 only. However, the PCR test itself still works!" she said.

Japanese scientists develop glowing masks to detect coronavirus

Source: https://english.kyodonews.net/news/2021/12/8a768ba9e395-scientists-develop-glowing-masks-to-detect-coronavirus.html

Dec 08 – A team of scientists at a university in western Japan has developed masks that glow when exposed to ultraviolet light if they contain traces of the coronavirus, using antibodies extracted from ostrich eggs.



A coronavirus sample glows on a face mask filter under an ultraviolet light after being sprayed with a fluorescent dye containing antibodies. (Photo courtesy of Kyoto Prefectural University)(Kyodo)

The team at Kyoto Prefectural University, headed by its president, Yasuhiro Tsukamoto, 52, hopes the masks will offer users an easy way to test whether they have contracted the virus.

With testing continuing to put them into practical use, the team aims to gain government approval to sell the masks possibly next year.

Ostriches are capable of producing several different kinds of antibody, or proteins that neutralize foreign entities in the body.

In February last year, the team injected an inactive and non-threatening form of the coronavirus into female ostriches, successfully extracting a large quantity of antibodies from the eggs that they laid.

The team then developed a special filter that is placed inside the face mask. The filter can be taken out and sprayed with a fluorescent dye containing the coronavirus antibodies from the ostrich eggs. If the virus is present, the filter will glow when shone under an ultraviolet light.

When the team conducted experiments over the course of up to 10 days with 32 people infected with the coronavirus, they found that all the masks they wore glowed under the UV light, which faded as time went by and their viral load decreased.

Tsukamoto's team next aims to expand the experiment to cover 150 participants. The university president discovered that he himself was positive for COVID-19 after wearing one of the experimental masks and finding it glowed when checked. He confirmed his status with a polymerase chain reaction test.
"We can mass-produce antibodies from ostriches at a low cost. In the future, I want to make this into an easy testing kit that anyone can use," Tsukamoto said.

Human and Economic Impacts of Covid-19

Source: https://www.homelandsecuritynewswire.com/dr20211209-human-and-economic-impacts-of-covid19

Dec 09 – Throughout its unsteady course, the COVID-19 pandemic has altered the behavior of businesses and households. Those behavioral changes, intensified by government actions like mandatory closures, have had a reverberating impact on the U.S. economy.
A new study led Adam Rose, research professor at University of Southern California's Price School of Public Policy, analyzes the economic impacts of specific behavioral responses such as closures, re-openings, workplace avoidance, and a reduction in entertainment activities, as well as federal government stimulus packages. He presented the study, "The Impact of COVID-19 on the U.S. Economy: The Role of Avoidance Behavior and Resilience," during the Society for Risk Analysis Virtual Annual Meeting, Dec. 5-9 in Washington, DC.
The analysis tracked the broader economic ramifications of individual responses of producers and consumers through domestic supply-chain interactions and international trade linkages between the U.S. and other regions. This method allowed the researchers to trace the ripple effects of direct behavioral responses to the pandemic, including resilience (telework and deferred spending) and avoidance behavior (relating to public transportation, mass gatherings, and in-person shopping).
"Businesses and households changed their behavior greatly in response to the pandemic and some of those will linger throughout the recovery," says Rose.

Here are some of the most significant findings:

- The largest economic losses were associated with mandatory closure and slow reopening of businesses, followed by avoidance of the workplace and other activities by households. These two factors accounted for declines in real GDP of 26.1 percent and 12.2 percent, respectively, in the first six months following the U.S. outbreak.
- Behavioral avoidance resulted in a decrease in activity of 40 percent to 65 percent across six domains, including air travel, local public transportation, shopping, dining out, events with large crowds, and recreation.
- Pent-up demand was found to be a significant factor in the recovery process, raising semi-annual growth by 6.9 percent above the baseline recovery trend by the end of 2023.
- Early rounds of fiscal policy stimulus packages were found to raise semi-annual GDP by a total of 8.9 percent by the second half of 2020. The overall beneficial effects of later rounds were hampered by such factors as businesses having to repay loans.

The researchers have developed an analytical framework that can be used not only to estimate economic consequences of pandemics, but other types of disasters, Rose adds. "The results can be used by policymakers to fine-tune countermeasures relating to aspects of a broad range of disasters, including mandatory business closures, stay-at-home orders, health policy, and stimulus packages."

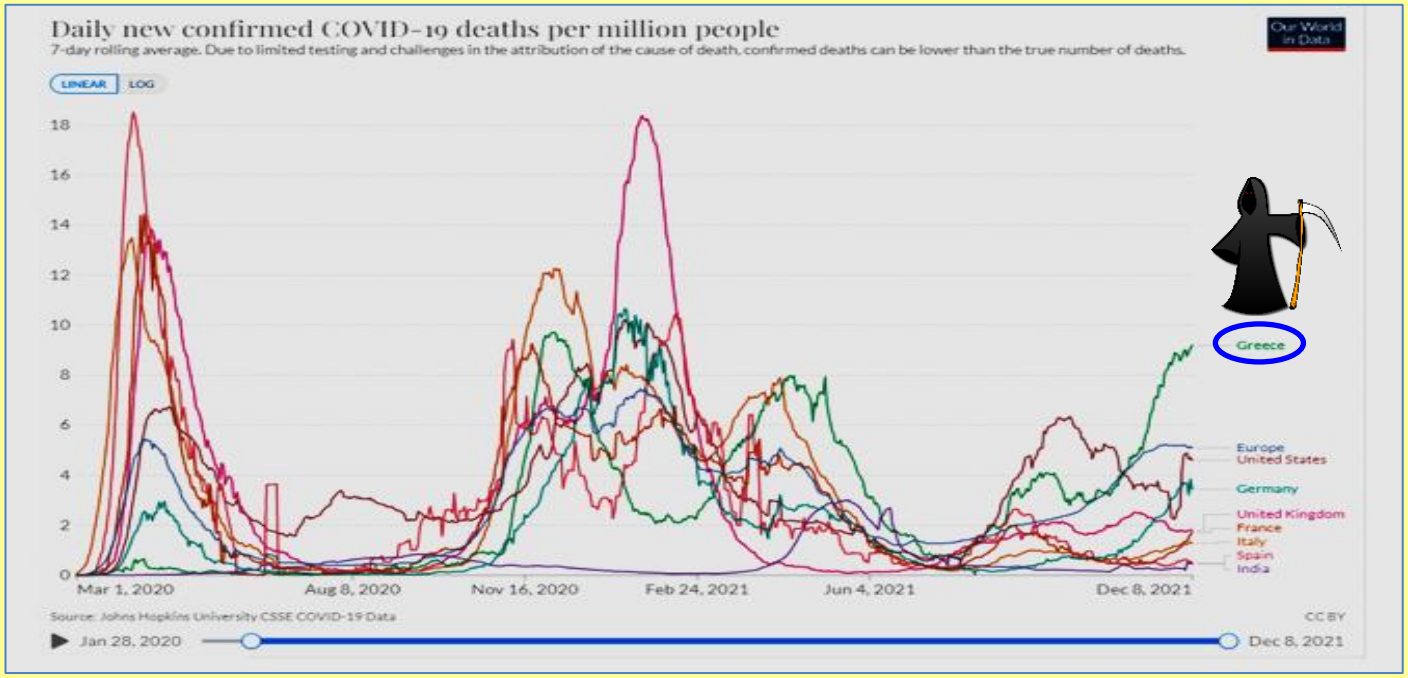
Update: Not Smallpox, those vials had Vaccinia

Source: https://cbrneworld.com/news/update-not-smallpox-those-vials-had-vaccinia

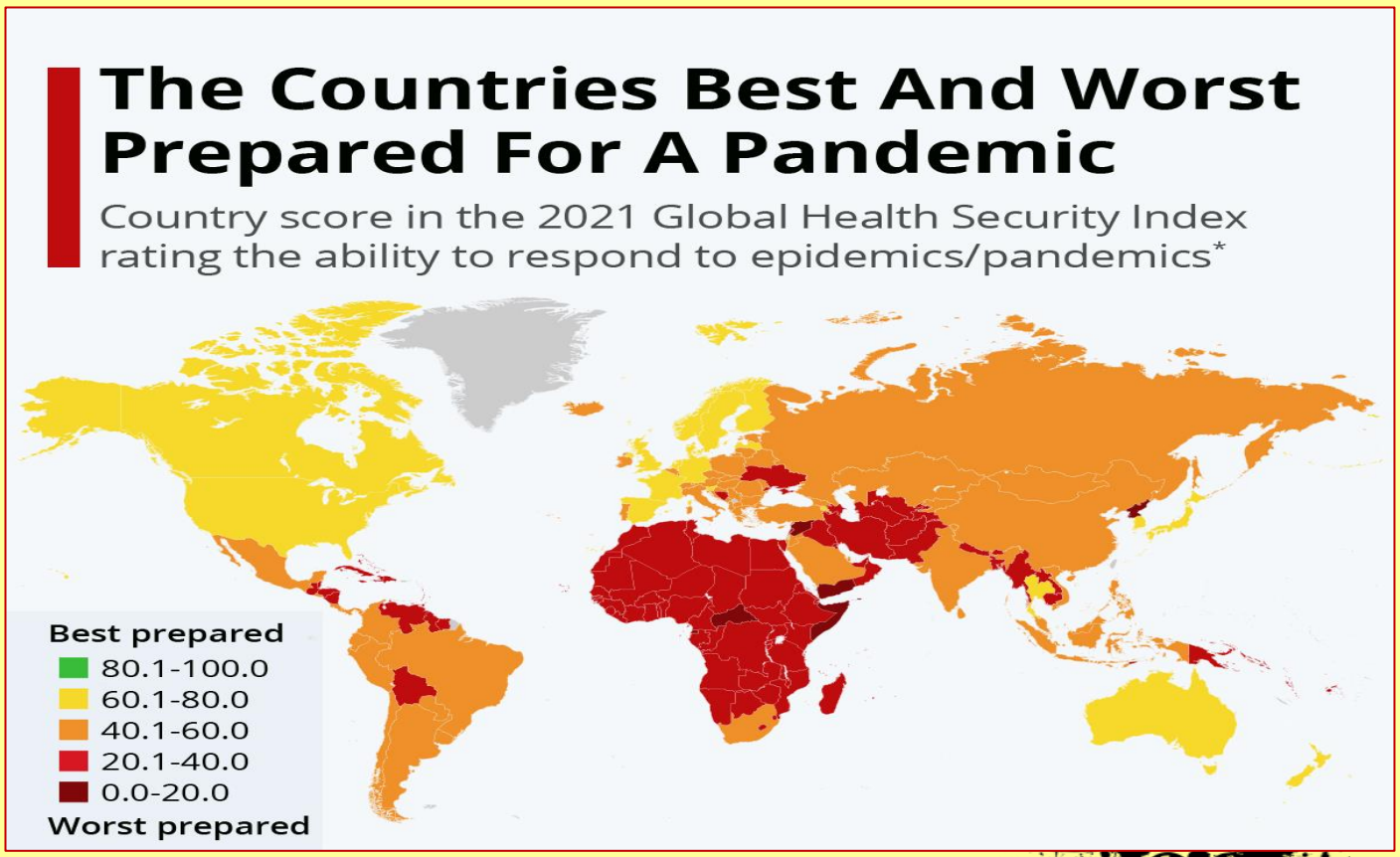
Nov 22 – Vials labeled as "Smallpox" that were found in a Pennsylvania vaccine research facility's freezer did not contain the virus that causes smallpox infection, the CDC has said.
They found that the vials actually contain "vaccinia, the virus used in smallpox vaccine," rather than the variola virus that can cause people to contract the historically deadly and infectious illness, the Associated Press reported.
"The freezer facility was immediately secured and staff followed standard protocols for notifying CDC of such a potential discovery. The vials were sent securely to CDC for testing on November 18 to determine what they contained," the CDC said in a statement.

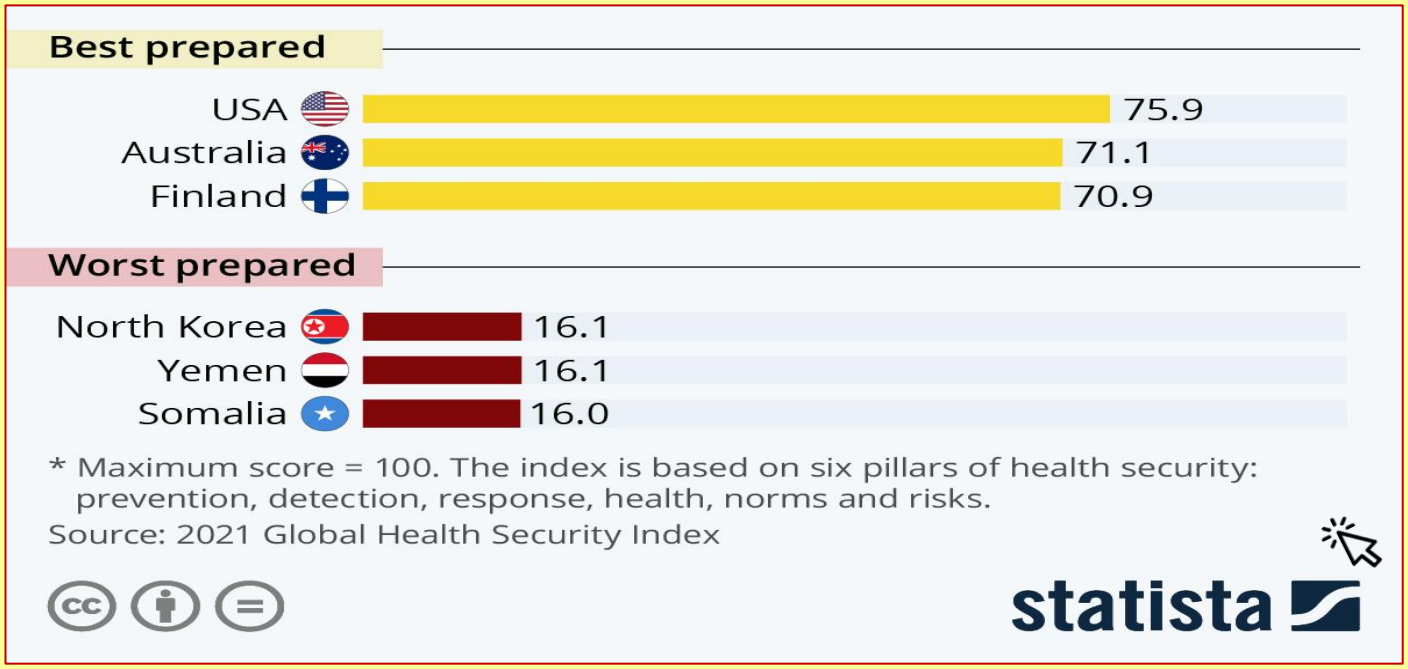
Upon investigation, health officials were able to determine that the vials "contain no trace of virus known to cause smallpox." The vaccinia virus that was detected inside the vials is used to produce smallpox vaccine and is the origin of the word "vaccine," CNN reported.

Greece: Why not copy & paste what others do?



Source: ourworldindata.org





COVID-19 vaccination: intramuscular injection technique

By Charlotte Gordon

British Journal of Nursing | Vol. 30, No. 6 Clinical Free Access

Source: https://www.magonlinelibrary.com/doi/full/10.12968/bjon.2021.30.6.350

***Charlotte Gordon** is a Vaccinator Trainer, Vaccinator and Senior Lecturer, Adult Nursing. Northumbria University, Newcastle upon Tyne, UK*

EDITOR'S COMMENT: A very detailed article regarding the vaccination process

Discussing Outpatient COVID-19 Treatments

By Neelesh Agarwal, PharmD, Kevin Nguyen, PharmD, and Seung Ha, PharmD

Source: https://www.contagionlive.com/view/covid-19-booster-reduces-delta-variant-mortality-by-90-

Dec 10 – The general progression of COVID-19 has led society into a whirlpool of clinical trials, data extrapolations, and literature critiques. Currently, highly effective vaccines from Pfizer, Moderna, and Johnson & Johnson have been introduced and have helped mitigate the spread of COVID-19; however, for the unvaccinated, as well as for the estimated millions of immunocompromised persons who are less likely to respond robustly to vaccination, treatment remains important.[1,2]

Patients hospitalized with COVID-19 and requiring oxygen supplementation have been treated with a myriad of cocktails including steroids, antivirals, and monoclonal antibodies. Though treatments have not been delineated first, second, or third lines in the treatment of this virus, they establish a groundwork to stratify patients into treatment protocols. Contrary to the inpatient side, in the outpatient setting, monoclonal antibodies have had a role in the management of COVID-19 in this patient population.[1,2]

Currently, the Infectious Diseases Society of America (IDSA) Guidelines on the Treatment and Management of Patients with COVID-19 recommend the use of bamlanivimab/etesevimab, casirivimab/imdevimab, and sotrovimab for mild to moderate outpatient cases of COVID-19. The problem that arises is the logistical issues involving procurement and the planning that goes into the administration of these monoclonal antibodies. Generally, patients are required to sit for an infusion (20-60 mins) and an observational period post-infusion (30-60 mins). This requires protective personal

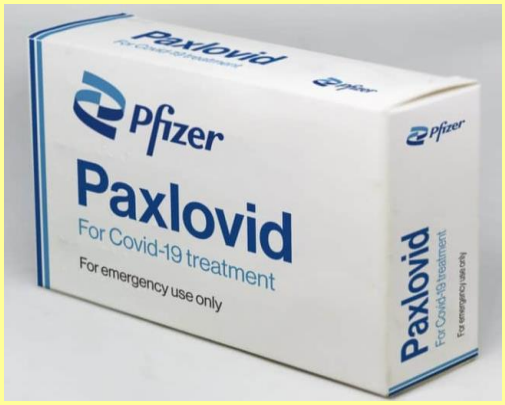
equipment, additional nursing requirements, and overall challenges for the health system from a logistics perspective.[1,2] New oral COVID-19 treatment alternatives provide simpler logistics and cost considerations overall.

The **COVID-19 Treatment Guidelines** published by the USA Health and Human Services recommends the use of **bamlanivimab** 700 mg plus **etesevimab** 1400 mg administered as an IV infusion or casirivimab 600 mg plus imdevimab 600 mg administered as subcutaneous (SQ) injections for post-exposure prophylaxis (PEP) for people who are at high risk of progressing to severe COVID-19 if infected with SARS-CoV-2 and who have the vaccination status and exposure history.[3] Of note, in clinical trials, only bamlanivimab monotherapy was used but the Emergency Use Authorization (EUA) was the combination product. Bamlanivimab was approved based on clinical data from the BLAZE-2 trial. This was a randomized, double-blind, phase 3 trial that enrolled 74 skilled nursing and assisted living facilities in the US for a total of 1175 patients. The patients were randomized in a 1:1 ratio to receive an IV infusion of either bamlanivimab monotherapy, 4200 mg, or placebo. In the entire population, there was a lower incidence of mild or worse COVID-19 in the bamlanivimab arm than in the placebo arm (8.5% vs. 15.2%; OR 0.43; 95% CI, 0.28–0.68; P < 0.001).[4] Moreover, in the resident subgroup, the incidence of mild or worse COVID-19 was significantly lower in the bamlanivimab arm than in the placebo arm (8.8% vs. 22.5%; OR 0.20; 95% CI, 0.08–0.49; P < 0.001).[4] Based on these results, the FDA approved bamlanivimab/etesevimab under the EUA on September 2.

Casirivimab/imdevimab was approved based on data from a phase 3 randomized, double-blind, placebo-controlled trial conducted in the United States, Romania, and Moldova. 1505 patients were randomized 1:1 to receive casirivimab 600 mg plus imdevimab 600 mg or placebo administered as 4 SQ injections. Results found that the use of casirivimab/imdevimab showed a risk reduction in the risk of symptomatic SARS-CoV-2 infection when compared with placebo (81.4% vs. 7.8%; OR 0.17; P < 0.001).5 Researchers found this risk reduction to be consistent from weeks 1-4. Additionally, casirivimab/imdevimab was associated with a significant risk reduction compared to placebo for symptomatic and asymptomatic infections (66.4% vs. 14.2%; OR 0.31; 95% CI, 0.21–0.46; P < 0.0001).[5] Based on these results casirivimab/imdevimab was granted an EUA by the FDA on November 21, 2020.

Molnupiravir (Lagevrio) is the first-ever investigational oral antiviral therapy for the treatment of COVID-19 in non-hospitalized adult patients. It is a potent ribonucleoside analog that blocks SARS-CoV-2 replication by acting as a competitive substrate of virally-encoded RNA-dependent RNA polymerase. Merck has applied for an FDA EUA, where it was previously reviewed on November 30.[6] Molnupiravir was recently approved, on November 4, 2021, in the UK by the Medicines and Healthcare products Regulatory Agency (MHRA) for the treatment of COVID-19. This renders positive considerations as a step forward in treating COVID-19 with more conventional therapies. This therapy's claim to fame is based on the interim analysis of the MOVe-OUT clinical trial.[6] Additionally, preclinical studies found the drug to be active against the delta, gamma, and mu variants. A Merck-funded phase 3 trial that investigated the efficacy and safety of molnupiravir in non-hospitalized adult patients with mild to moderate COVID-19.[6]

In the planned interim analysis of this phase 3 trial, a total of 775 patients who were initially enrolled in the MOVe-OUT trial, a phase 3 study, was formatted by 385 in the molnupiravir and 385 in the placebo group. Results show that molnupiravir reduced the risk of hospitalization or death by approximately 50% in all subgroups. 28 patients (7.3%) in the molnupiravir group were hospitalized through day 29 vs. 53 patients (14.1%) in the placebo group who were either hospitalized or died (p= 0.0012). With an absolute risk reduction (AAR) of 6.8%, relative risk reduction (RRR) of 48%, and number needed to treat (NNT) of 15, this agent provides compelling data to support its use in the management of COVID-19. [6]



PF-07321332, branded as **Paxlovid**, is an antiviral drug developed by Pfizer which acts as an orally active 3CL protease inhibitor. Co-administration with a low dose of ritonavir helps slow the metabolism, or breakdown, of PF-07321332 in order for it to remain active in the body for longer periods of time at higher concentrations to help combat the virus.[7]

On November 5, Pfizer released data based on an interim analysis of the Phase 2/3 EPIC-HR trial, claiming a significant reduction of hospitalizations and deaths. Similar to molnupiravir, this oral alternative looks to target non-hospitalized adult patients with COVID-19, who are at high risk of progressing to severe illness.[7] The primary endpoint looked at hospitalization or death from any cause compared to placebo in patients treated within three

days of symptom onset. The ERIC-HR trial showed patients who received Paxlovid resulted in 3/389 (0.8%) hospitalizations while individuals in the placebo arm reflected an endpoint of 27/385 (7.0%) hospitalizations. Of note, there were no deaths reported in the treatment arm however, 7 subsequent deaths were seen in the placebo group (p <0.0001). With an absolute risk reduction (AAR) of 6.2%, relative risk reduction (RRR) of 89%, and number needed to treat (NNT) of 17, this oral alternative adds to the growing surge of outpatient treatments in the management of COVID-19. In addition, similar reductions in COVID-19-related hospitalization or death were observed in patients treated within five and ten days of symptom onset. [7]

Fluvoxamine, a selective serotonin reuptake inhibitor, has gained some popularity recently for its potential in the use of COVID-19. Currently, it is FDA approved for the treatment of obsessive-compulsive disorder and depression. In vitro models have demonstrated fluvoxamine to express anti-inflammatory genes, ICAM1, VCAM1, COX2, and iNOS.[8] There was a prospective, nonrandomized, observational cohort study that evaluated fluvoxamine for the treatment of COVID-19. Late last year, a study was published in *JAMA*, outlining fluvoxamine to be effective vs placebo in preventing clinical deterioration in patients who were hospitalized with COVID-19 (0% vs 8.7%; 95 CI, 1.8%-16.4%;p=0.009).8,9

More recently in *The Lancet*, fluvoxamine was found to be effective in preventing hospitalization (defined as retention in a COVID-19 emergency setting or transfer to a tertiary hospital) vs placebo (11% vs. 16%; relative risk [RR] 0.68; 95% CI, 0.5-0.88). Although preliminary studies have demonstrated efficacy, the IDSA guidelines recommend the use of fluvoxamine only in the setting of a clinical trial similar to the HHS guidelines where there is insufficient evidence to recommend either for or against the use of ivermectin for the treatment of COVID-19.[10,11] To fully understand alternative treatments, more research needs to be done in a randomized controlled setting.

Another agent that has gained popularity in the media is **ivermectin**, for its possible role in COVID-19 treatment. Ivermectin is currently FDA approved for onchocerciasis and strongyloidiasis but is also used off-label for a variety of parasitic infections. In vitro studies have shown ivermectin to have anti-inflammatory effects. Most recently, there was a randomized, double-blind, placebo-controlled trial for the use of ivermectin vs. placebo for the treatment of mild COVID-19. Patients were randomized to get ivermectin 200 mg or placebo. Results showed no difference in time to resolution to resolution of symptoms vs placebo (10 vs. 12 days HR, 1.07; 95% CI, 0.87-1.32; p=0.53).5 COVID-19 symptoms were found in 82% of patients getting ivermectin vs. 79% in the placebo group by the end of week 3.[11] Other studies have demonstrated similar results in the use of ivermectin in COVID-19. Currently, the IDSA guidelines recommend against the use of ivermectin and the HHS guidelines mention there is insufficient evidence to recommend either for or against the use of ivermectin for the treatment of COVID-19.[1,2,11]

Many outpatient treatments have been tested and studied, but whether these clinical-trial success stories will translate into a global game-changer in the fight against the pandemic isn't yet clear. Even if lower-income countries can afford the medicine, they might not have the diagnostic capacity to treat patients early in the course of their illness, when treatment could make a difference.[1,8,11] Finally, vaccines are our first-line tool for preventing hospitalization, though outpatient oral options are important, herd immunity and primary vaccinations have consistently been shown to reduce the spread and virulence of this virus.

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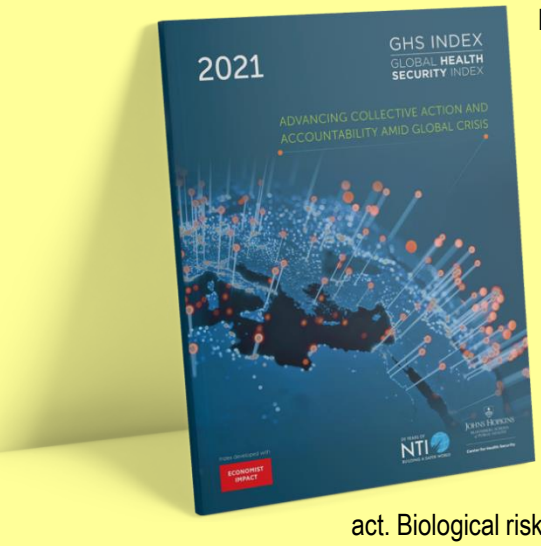
All Countries Remain Dangerously Unprepared for Future Epidemic, Pandemic Threats

Source: https://www.homelandsecuritynewswire.com/dr20211211-all-countries-remain-dangerously-unprepared-for-future-epidemic-pandemic-threats



Dec 11 – Despite important steps taken by countries to respond to the COVID-19 pandemic, all countries—across all income levels—remain dangerously unprepared to meet future epidemic and pandemic threats, according to the new 2021 Global Health Security (GHS) Index.

The report, released by the Nuclear Threat Initiative (NTI) and the Johns Hopkins Center for Health Security at the Bloomberg School of Public Health, with research by Economist Impact, measured the capacities of 195 countries to prepare for epidemics and pandemics. The data demonstrate that all countries have insufficient sustained health capacities, leaving the world acutely vulnerable to future health emergencies, including those potentially more devastating than COVID-19. The average overall 2021 GHS Index score is 38.9 out of a possible score of 100. No country scored in the top tier of rankings and no country scored above 75.9.

"COVID-19 offers a devastating illustration of how poor pandemic preparedness and response can impact health and security at every level—local, national and global," said NTI Co-Chair and CEO Ernest J. Moniz. "The stakes are high, and world leaders need to act. Biological risks are growing in frequency, and all countries need more investment in durable capabilities to address these risks."

The GHS Index is designed to inform leaders of the foundational elements that are necessary to prepare their countries for future outbreaks and where they should prioritize planning and durable funding. It is not a direct predictor of performance in the face of a health emergency; as COVID-19 has demonstrated—contextual social, political, and cultural phenomena also impact how well a country responds to a biological event.

"Leaders now have a choice," said Dr. Jennifer Nuzzo, senior scholar at the Johns Hopkins Center for Health Security. "They can make dedicated, sustainable investments in the new capacities created during the COVID-19 response to prepare their countries for the long term, or they can fall back into the decades-long cycle of panic-and-neglect that will leave the world at grave risk for inevitable future public health threats."

"One of the core principles of the GHS Index is that global health security is a collective responsibility," said NTI Interim Vice President for Biological Policy and Programs Dr. Margaret A. Hamburg. "The Index can help leaders, health officials, and practitioners identify gaps and build sustained preparedness in their home countries and those in their regions."

The conclusions of the 2021 GHS Index are the result of a revised framework and updated data collection conducted between August 2020 and June 2021 that allowed researchers to glean hard truths about preparedness for future threats while assessing health security capacities during the ongoing pandemic. The Index assessed countries across six categories, 37 indicators, and 171 questions using publicly available information. The Index benchmarks health security in the context of other factors critical to fighting outbreaks, such as political and security risks, the broader strength of the health system, and country adherence to global norms.

"It can be difficult for countries to know how best to use their very limited resources to meaningfully protect themselves against future pandemics," said Johns Hopkins Center for Health Security Deputy Director Anita Cicero. "The Global Health Security Index can be used as a guidepost to identify and address yawning preparedness gaps with the ultimate goal of reducing health and economic impacts when the next public health crisis comes along."

Top Findings

In addition to its overall finding that all countries remain dangerously unprepared for meeting future epidemic and pandemic threats, the GHS Index finds:

Most countries, including high-income nations, have not made dedicated financial investments in strengthening epidemic or pandemic preparedness.
155 out of 195 countries have not allocated national funds within the last three years to improve capacity, outside of public health emergencies, to address epidemic threats; and, among those who have, only two low-income countries have. Improving capacity requires a multi-year financial commitment, not just an increase in funding during a crisis.

Most countries saw little or no improvements in maintaining a robust, capable, and accessible health system for outbreak detection and response.
70% of countries show insufficient health capacity in clinics, hospitals, and community health centers.

Political and security risks have increased in nearly all countries, and those countries with the fewest resources have the highest risk and greatest preparedness gaps.
161 countries have low to moderate levels of public confidence in their government.

Countries are continuing to neglect the preparedness needs of vulnerable populations, exacerbating the impact of health security emergencies.
Only 33 countries have an overarching emergency preparedness and response plan in place that includes considerations for vulnerable populations.

Countries are not prepared to prevent globally catastrophic biological events that could cause damage on a larger scale than COVID-19.
176 countries have not published and implemented an overarching national public health emergency response plan for diseases with epidemic or pandemic potential.

Top Recommendations
Based on these findings, and building on the 2019 GHS Index, the 2021 GHS Index includes an action plan for countries, international organizations, the private sector, and philanthropies to improve capacities and ensure the world is prepared for the next pandemic. Top recommendations include: countries should allocate health security funds in national budgets and conduct assessments, using the 2021 GHS Index as a reference to developing a national plan to identify their risks and fill gaps; international organizations should use the Index to identify countries most in need of additional support; the private sector should use the Index to look for opportunities to partner with governments; and philanthropies and funders should develop new financing mechanisms and use the Index to prioritize resources.
This report is the second edition of the GHS Index. It was developed in consultation with an international panel of 18 experts from 13 countries. The project included a year-long data collection and validation process by 80 Economist Impact researchers located around the world and opportunities for governments to validate data.

Jabbed in the Back: Russian, Chinese COVID-19 Disinformation Campaigns

Source: https://www.homelandsecuritynewswire.com/dr20211211-jabbed-in-the-back-russian-chinese-covid19-disinformation-campaigns

Dec 11 – The public health and economic consequences of the COVID-19 pandemic have also become a battle about the nature of truth itself. From the emergence of the first reports of a virus in Wuhan, China, in December 2019, opportunistic leaders in China, Russia, and elsewhere have used the virus as a pretext to further erode democracy and wage information warfare. They have inundated an already polluted information environment with disinformation and propaganda about the virus's origins and cures, and, most recently, vaccines.
CEPA has just issued a report — Jabbed in the Back: Mapping Russian and Chinese Information Operations During COVID-19 – which traces and analyzes the COVID-related disinformation campaign conducted by Russia and China.
Here are the report's Executive Summary, Introduction, and Lesson Learned sections:

Executive Summary
- During the COVID-19 pandemic, the Chinese Communist Party (CCP) spread disinformation about the efficacy of vaccines and the virus's origins, a shift from Beijing's previous disinformation campaigns, which had a narrower focus on China-specific issues such as Tibet, Hong Kong, and Taiwan.
- Most of Beijing's COVID-19 narratives aimed at shaping perceptions of China's response to the pandemic and only rarely targeted other countries specifically.

- Russia recycled previous narratives and exacerbated tensions in Western society while attempting some propaganda about Russian scientific prowess.
- The Kremlin and the CCP learned from each other. While limited evidence exists of explicit cooperation, instances of narrative overlap and circular amplification of disinformation show that China is following a Russian playbook with Chinese characteristics. Russia is simultaneously learning from the Chinese approach.
- The largest difference between China's and Russia's information warfare tactics remains China's insistence on narrative consistency, compared with Russia's firehose of falsehoods strategy.[1] Even with substantially greater resources, this largely prevents Chinese narratives from swaying public opinion or polarizing societies.
- The two authoritarian countries' information operations have evolved over the last 18 months and will continue to do so with the spread of variants, vaccines, and inquiries into the virus's origins.

I. Introduction

The public health and economic catastrophe of the COVID-19 pandemic have also become a battle about the nature of truth itself. From the emergence of the first reports of a virus in Wuhan, China, in December 2019, opportunistic leaders in China, Russia, and elsewhere have used the virus as an excuse to further erode democracy and wage information warfare. They have inundated an already polluted information environment with disinformation and propaganda about the virus's origins and cures, and, most recently, vaccines. Russia largely followed its preexisting playbook of using crises to inflame tensions in foreign societies. China borrowed some tools from Russia but used them for different ends, sanitizing its own record and spreading conspiracy theories on a global scale. Little evidence suggests explicit cooperation despite some instances of narrative overlap and circular amplification between the two actors. Significant differences remain in Beijing's and Moscow's strategies and tactics in the information environment.

Building off of Information Bedlam,[2] CEPA's overview of academic and think tank literature written on Russian and Chinese information operations (IOs) during COVID-19, CEPA's researchers collected and analyzed original data to complement research conducted by other think tanks and academic institutions.[3] CEPA collected English-language website articles and social media messaging from Russian and Chinese government officials and state-backed media from March 2020 through March 2021. By determining rhetoric choices and the prioritization of narratives throughout the 144,000-piece database, we were able to isolate and analyze the unique tactics that Russia and China used to advance their information operations across the transatlantic space throughout the COVID-19 pandemic.

II. Lessons Learned

As the world experiences vaccinations and coronavirus variants at different rates, Russian and Chinese COVID-19 information operation(IO) narratives and tactics continue to evolve. Alongside the evolution of IOs in 2021, CEPA's data largely support the conclusions reached in Information Bedlam: The CCP deployed more destructive and conspiratorial narratives than in its previous to the information space, while Russia recycled previous narratives and didn't substantially change its approach from previous crises. Yet the data also raise new questions and prompt a reexamination of the extent to which China is following Russia's playbook in the information environment.

Since our last report examining the COVID-19 IO literature in March 2021, Russian and Chinese IOs have continued to evolve. Russia has innovated in spreading vaccine disinformation throughout Europe. In May 2021, social media influencers in France and Germany reported that a London-based group controlled from Moscow offered to pay them to spread disinformation about the Pfizer vaccine.[4] As vaccination campaigns in the US and UK increasingly encounter problems with demand instead of supply, Russia's misleading vaccine reporting may prove more successful.[5] Vaccine disinformation will also present serious challenges in developing countries where citizens already do not trust the West and where Russia and China often have large media presences.[6] Since the Biden administration asked the US intelligence community to provide a more conclusive report on the possibility that COVID-19 leaked from a Wuhan lab, the CCP has stepped up its efforts to spread conspiracies about the virus's origins, including recirculating disinformation from early in the pandemic about Fort Detrick, a US military lab.[7]

In 2020, while China aggressively defended its response to COVID-19 and criticized Western efforts to combat the virus, its narratives remained mostly positive, kept China at the center of attention, and showed remarkable consistency between state-backed outlets and diplomats. Even though Zhao Lijian, the spokesperson for China's foreign ministry, and others aggressively circulated disinformation on COVID-19's origins and Western vaccines, the transatlantic policy and research community focused more attention on China's destructive disinformation than the data suggest is warranted.[8] This is not surprising considering the increasing bipartisan and transatlantic consensus on the need to counter Chinese influence in the information

environment and, of disinformation, the shock of Chinese disinformation spreading globally for the first time during an international crisis.

While some policymakers are worried about Sino-Russian convergence in the information environment, this will be challenging because China insists on narrative consistency, while Russia opens a firehose of falsehoods.[9] State-owned Russian media contradicted not only one another on COVID-19 narratives but also official Russian sources like the foreign ministry. Even though official government sources largely stayed clear of promoting disinformation on the virus's origins, vaccines, or other COVID-19 topics, the broader pro-Kremlin information ecosystem showed no such restraint.[10] The rigidity of the CCP's control over the Chinese information environment ensures that disinformation and propaganda from state media will differ little from that spouted by government officials. Though this gives the CCP more control over its COVID-19 messaging, it also means the Chinese are much less successful than the Russians at targeting content to specific audiences, even with substantially more resources.

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Gene editing has the scary potential of being used as a 'zombification' tool by bioterrorists

By Francesca Johnson (Screen Shot's editorial assistant)
Source: https://screenshot-media.com/the-future/science/gene-editing-zombification/

Dec 11 – Picture this, a world full of zombies outside your door. You recognise one. It's your neighbour, the nice one who always smiles at you when you pass their house on your way back from your daily shop. They stayed inside the past couple of days due to a bug that got passed around and are now banging furiously on your door to feast on your brain. 'How did this happen?', you ask. I blame gene editing. Let me explain.

What is gene editing?

Gene editing—also known as genome editing—is defined as "the manipulation of the genetic material of a living organism by deleting, replacing, or inserting a DNA sequence, typically with the aim of improving a crop or farmed animal or correcting a genetic disorder." In simpler terms, just like an Instagram influencer might edit a selfie in Photoshop to smooth out some skin imperfections and make their waist appear smaller, scientists have managed to do the same thing to an organism's DNA strand and in turn modify it to their liking.

Several approaches to genome editing have been developed. A recent one is known as CRISPR-Cas9 (often shortened to CRISPR), a system which has generated a lot of excitement in the scientific community because it is faster, cheaper, more accurate, and more efficient than other existing gene editing methods.

Previous research using CRISPR has shown that it can turn normal fat into energy-burning cells and even led to the world's first genetically edited babies, 'made' by Chinese scientist He Jiankui. Long story short, gene editing and everything that it represents for the future is pretty crazy.

What could go wrong with gene editing?

Before we can even look into the risks that come along with genome editing, it's important we first explain who exactly would maliciously use such scientific progress. Introducing bioterrorism, "the intentional release of viruses, bacteria, or other germs that can sicken or kill people, livestock, or crops." Whether it might be from reading one too many science fiction novels or binge watching too many apocalypse films on movie night, the looming threat that one day humans will destroy ourselves is ever-present.

As stated in The Conversation, "With recent advances in gene editing, it may be possible for bioterrorists to design viruses capable of altering our behaviour, spreading such a disease and ultimately killing us. And chances are we still wouldn't be sufficiently prepared to deal with it."

While we do live in an age of conspiracy theories, wacky theorists may actually have a case here. Allow me to present you zombification—yet another concept horrifying enough to make your heart race.

What's zombification got to do with gene editing?

Currently, the COVID-19 pandemic has shown us just how unprepared we are for, well, *everything*. I mean, do you remember when people were stacking milk and toilet paper into their shopping carts with party hats taped to their mouths? This *War of the Worlds*-esque behaviour could in fact become even worse as we start turning into our own horror fiction villain.

What if the real threat wasn't COVID-19 anymore, but a "gene-edited pathogen designed to turn us into zombies," straight off the set of *The Walking Dead*, or "ghost-like, agitated creatures with little awareness of our surroundings?" pondered The Conversation.

In fact, zombification is already present in our world and occurs quite frequently within nature. Perhaps the most well known type is rabies—a contagious and fatal viral disease of dogs and other mammals, transmissible through the saliva to humans and causing madness, convulsions and death.

When it comes to CRISPR, the tech's ability to edit the human genome with unprecedented precision, replacing one single letter in the DNA—which is very tricky to do by the way—has shown its star power to treat genetic conditions such as sickle cell disease, beta thalassemia, and many others.

But CRISPR *could* be used for much darker purposes, such as bioterrorism. It has the ability to alter pathogens to make them more transmissible or even worse, fatal. It could also turn a harmless non-pathogen, such as the microbe, into an extremely aggressive virus. The technique even has the capability of altering a virus to make it a dangerous threat to a wider range of species than it currently infects, or make it resistant to antibiotics or antivirals as Pin Lean Lau, a Lecturer in Bio-Law at Brunel Law School, Brunel University London, posited.

You're probably thinking that a zombie-like disease, if it could be created, surely wouldn't make the dead pop back out of their graves as reawakened brain-hungry monsters. While you may be right there, an infection passed through saliva with an extremely high transmission and mortality rate, if it caused extreme agitation and destructive behaviour, or even death, wouldn't be far off from the horror that movie theatres capitalise on every time a new zombie blockbuster comes out. Such a virus travels from human to human without effort, similarly to diseases like the Ebola and Marburg viruses.

With this in mind, it's not at all surprising that the former Director of US National Intelligence, James Clapper, termed gene editing "weapons of mass destruction and proliferation" in 2016, as first noted in Insider. The Guardian also reported that Clapper had raised fears about "rogue scientists" possibly using this technology for their own maniacal pursuits the same year. In 2018, the US government put its foot down and released its first official bio-defence strategy, which involved a whole host of governmental agencies. The document detailed plans about everything from deliberate bioterror threats to "naturally occurring outbreaks and infectious diseases that escape a lab accidentally." Even more interesting, the US Department of Defence Strategic Command unit has issued a training programme called CONOP 8888 (Counter-Zombie Dominance), which actually simulates a zombie apocalypse scenario.

So, what can we do to stop a potential zombie apocalypse?

Before you lose hope and fall into despair, it's important for you to be aware of the fact that we do have international law conventions on biological and chemical toxins. In the US for example, there are strict laws that prohibit states from acquiring or retaining biological weapons. But do these really work against these new threats?

In June, a World Health Organisation (WHO) expert committee published two reports—the first offered a series of recommendations around gene editing, and the second set up a framework around governance—in order to put forward a set of ideas around how the human genome editing could be governed at the appropriate institutional, national and global level. The framework presented possible regulatory authorities or national guidelines regarding gene editing and similar technological techniques. For example, one section suggested that trusted ethics committees weigh in and review clinical trials and approvals in the area.

It must be noted that the WHO is not in a position to regulate genome editing in individual countries—these are unfortunately only suggestions, as sensible as they may be. Therefore, the fate of the future does lie within individual countries' judgment to implement these recommendations as part of their own national law—cue the eye roll. I definitely wouldn't hold my breath either, since another problem is already rearing its ugly head; the guidelines don't even touch the surface on the issue of safety or efficacy around how to handle gene editing—it was stated that this wasn't part of the scope of the review.

For now, these recommendations are the closest thing we have to a global framework of governance. As the technology continues to develop, it can only be hoped that it will also evolve accordingly. But ultimately, we may need to think about how to make such frameworks legally binding.

The future may not be entirely bleak, but we might have to start hitting the gym and brushing up on our survival skills—we might even have to start saving if we want to afford a billionaire doomsday bunker one day.

Doctors for Covid Ethics: An Interdisciplinary Symposium II - Sounding the Call

December 10, 2021

Is It Time to Change the Definition of 'Fully Vaccinated'?

Source: https://www.medscape.com/viewarticle/964195

Dec 06 – As more indoor venues require proof of vaccination for entrance and with winter — as well as omicron, a new covid variant — looming, scientists and public health officials are debating when it will be time to change the definition of "fully vaccinated" to include a booster shot.

It's been more than six months since many Americans finished their vaccination course against covid; statistically, their immunity is waning.

At the same time, cases of infections with the omicron variant have been reported in at least 17 states, as of Monday. Omicron is distinguished by at least 50 mutations, some of which

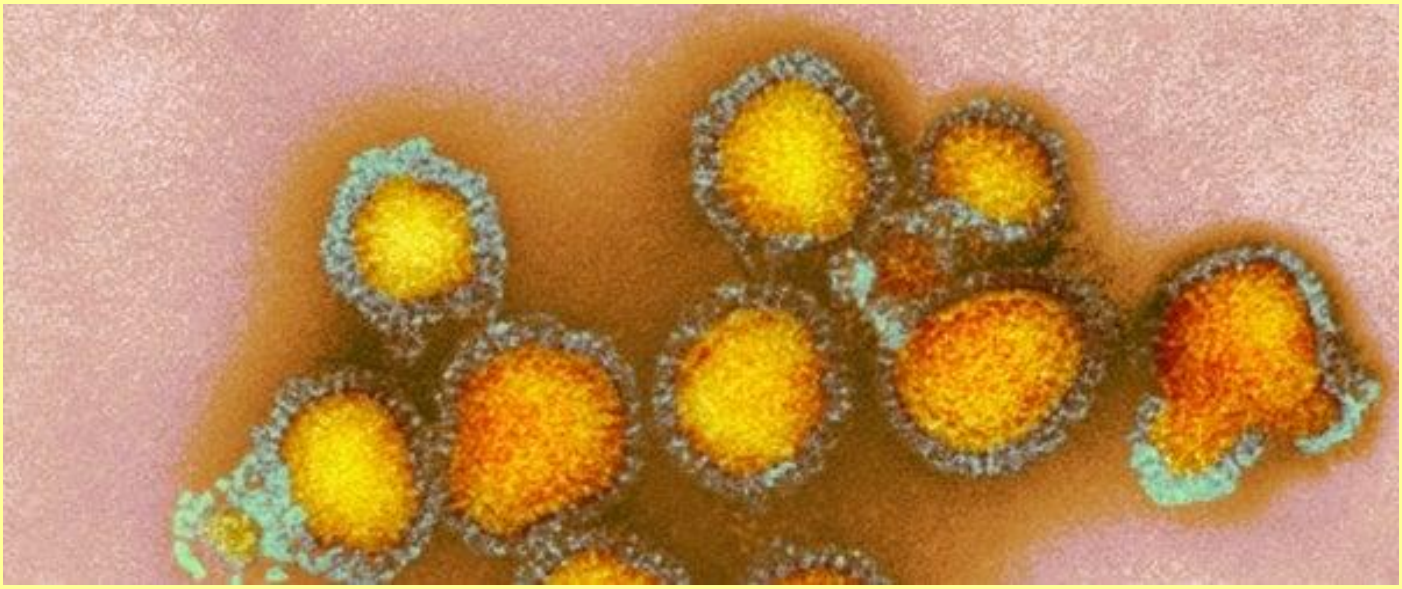
appear to be associated with increased transmissibility. The World Health Organization dubbed it a variant of concern on Nov. 26.
The Centers for Disease Control and Prevention has recommended that everyone 18 and older get a covid booster shot, revising its narrower guidance that only people 50 and up "should" get a shot while younger adults could choose whether or not to do so. Scientists assume the additional shots will offer significant protection from the new variant, though they do not know for certain how much.
Dr. Anthony Fauci, chief medical adviser to President Joe Biden, during a White House press briefing Wednesday was unequivocal in advising the public. "Get boosted now," Fauci said, adding urgency to the current federal guidance. About a quarter of U.S. adults have received additional vaccine doses.
"The definition of 'fully vaccinated' has not changed. That's, you know, after your second dose of a Pfizer or Moderna vaccine, after your single dose of a Johnson & Johnson vaccine," said the CDC's director, Dr. Rochelle Walensky, during Tuesday's White House briefing on covid. "We are absolutely encouraging those who are eligible for a boost six months after those mRNA doses to get your boost. But we are not changing the definition of 'fully vaccinated' right now." A booster is recommended two months after receiving the J&J shot.
But that, she noted, could change: "As that science evolves, we will look at whether we need to update our definition of 'fully vaccinated.'"
Still, the Democratic governors of Connecticut and New Mexico are sending a different signal in their states, as are some countries — such as Israel, which arguably has been the most aggressive nation in its approach. Some scientists point out that many vaccines involve three doses over six months for robust long-term protection, such as the shot against hepatitis. So "fully vaccinated" may need to include shot No. 3 to be considered a full course.
"In my view, if you were vaccinated more than six months ago, you're not fully vaccinated," Connecticut Gov. Ned Lamont said Nov. 18 during a press briefing. He was encouraging everyone to get boosted at that time, even before the federal government authorized extra shots for everyone.
New Mexico Gov. Michelle Lujan Grisham had a similar response in mid-November, saying she defined "fully vaccinated" as receiving three shots of the mRNA type. She also opened up booster eligibility to all of her state residents before the CDC and Food and Drug Administration did.
What do the varying views on the evolving science mean for vaccine requirements imposed on travelers, or by schools or workplaces? And what about businesses that have required patrons to provide proof of vaccination?
Dr. Paul Offit, director of the Vaccine Education Center at the Children's Hospital of Pennsylvania, said the CDC's stronger recommendation for everyone to get boosted signals to him that a booster is now part of the vaccine regimen. Yet Offit, who is also a member of the FDA's vaccine advisory committee, wrote a joint op-ed this week in which he and two other scientists argued that boosters were not yet needed for everyone and that healthy young people should wait to see whether an omicron-specific booster might be needed.
"I think when the CDC said they are recommending a third dose, they just made the statement that this is a three-dose vaccine series," Offit told KHN. "And, frankly, I think it's going to throw a wrench into mandates."
Yet to be determined is whether restaurants or other places of business will look more closely at vaccine cards for the booster.
Dr. Georges Benjamin, executive director of the American Public Health Association, said it's too early to say. "For now, businesses should stay focused on current guidelines," he said.
Dr. Marc Siegel, an associate professor of medicine at the George Washington School of Medicine and Health Sciences, said the question of whether you are fully vaccinated with just two doses or need a booster is a question of semantics. Covid immunity level is the more important issue.
Siegel said he thinks more suitable terminology would be to call someone "appropriately" or "adequately" vaccinated against covid rather than "fully" vaccinated since it's possible that more boosters could be needed in the future — making "full vaccination" a moving target.
But, as with so many aspects of the pandemic, ambiguity prevails — both in federal guidance on the definition of "fully vaccinated" and in entrance policies, which vary by state, school and business.
Right now, businesses don't appear to be checking for boosters, but that could change. So, it may be wise to first check the requirements — lest patrons present a two-shot vaccine passport, only to be turned away as inadequately protected.

EDITOR'S COMMENT: Before proceeding to change the "full vaccinated" definition is would be proper to change the Pfizer/Moderna "emergency use authorization" to "FDA approved" and below is why:

FDA Approval: Before medicines are approved, they have to go through pre-clinical trials in animals to provide evidence of safety. Before trials can begin in humans, an Investigational New Drug (IND) application must be filed with the FDA. If the FDA grants the IND, clinical trials may begin. Healthy people volunteer for phase 1 clinical trials to determine medication safety and dosing. A larger group of volunteers is used for phase 2 clinical trials intended population to assess the safety and to make sure the medication works the right way. An even larger group of volunteers is chosen for phase 3 clinical trials to review safety, the effectiveness of the medicine, and any side effects. After the drug has passed the three phases of clinical trials a New Drug Application (NDA) or Biologics License Application (BLA) is submitted to the FDA for approval. If the drug is approved after a review of the NDA or BLA, safety monitoring is completed through the FDA MedWatch program where the general public can report side effects. Vaccines have a similar reporting program called the Vaccine Adverse Event Reporting System (VAERS).
Emergency Use Authorization (EUA): During a public health emergency, a EUA allows the FDA to make approved and unapproved medical supplies and medications (including vaccines and treatments) available. For emergency medical supplies and medications that have not been approved for use, the FDA allows the use of these products for the diagnosis, treatment, and prevention of life-threatening medical conditions and disease if the product meets certain criteria. The FDA requires safety and effectiveness data to review a EUA. The FDA reviews medical records, site visits for manufacturing facilities, previous compliance history, and compliance with good manufacturing practices to ensure safety post-EUA. The FDA looks at the risk versus the benefit of waiting for all the evidence needed for full approval. The FDA does not allow the use of a test, medical supply, or medication if they do not think it is safe.

Great News: An mRNA Flu Vaccine Just Delivered Positive Phase 1 Trial Results

Source: https://www.sciencealert.com/moderna-announces-positive-phase-1-trial-results-for-mrna-flu-vaccine



Artificially colored TEM image of H3N2 influenza. (CDC/SCIENCE PHOTO LIBRARY)

Dec 12 – US biotech company Moderna on Friday announced promising data from an early-stage human trial of its mRNA flu shot, based on the same technology used in its successful COVID-19 vaccine.
The experimental flu shot was found to be safe, and successfully evoked high levels of antibodies in 180 people at all dosage levels, in both younger and older adults.
"Even before the COVID-19 pandemic, approximately 3 million people died each year due to respiratory infections, and many more are hospitalized or become ill as a result of these viruses," said Moderna CEO Stephane Bancel in a statement hailing the result.
Side effects were mild, and occurred more often in younger than older adults. The most common included pain and tenderness at the injection site, as well as headaches, muscle and joint aches, and tiredness.

The next stage of the trial, involving 500 people, began last month, and aims to firm up the right dosage level and compare the Moderna flu vaccine to already-licensed shots developed using more traditional methods. Interim results are expected in early 2022. Later stages of the trial will assess the vaccine's efficacy.
The majority of current flu vaccines are based on inactivated viruses cultivated in chicken eggs.
Virus strains have to be selected six to nine months before the vaccines are intended to be used, and their efficacy is approximately 40 to 60 percent.
Moderna and other vaccine manufacturers, including Sanofi, hope that mRNA technology – which provokes an immune response by delivering genetic molecules containing the code for key parts of a pathogen into human cells – can accelerate immunization development and production, and heighten efficacy.
Several mRNA molecules that encode for different strains can also be delivered in the same shot, a more efficient vaccination method that could lessen the load on public health systems.
Moderna's experimental flu shot is "quadrivalent", meaning it targets four strains of flu: A/H1N1, A/H3N2, B/Yamagata and B/Victoria – selected based on recommendations by the World Health Organization.
The company is also developing other flu shots that expand strain coverage further still, including a "pan-respiratory booster" to cover COVID-19, flu, and respiratory syncytial virus (RSV), a common virus that causes the cold but can be more serious for infants and elderly people.

Nasal vaccines may induce broader viral protection than injections

Source: https://newatlas.com/health-wellbeing/yale-nasal-vaccines-broad-viral-protection-flu-coronavirus/

Dec 12 – Compelling new preclinical research led by scientists from Yale University has found intranasal vaccination may be much more effective at generating immunity against a number of respiratory viruses compared to more conventional injection-delivered vaccination.
The COVID-19 pandemic has rekindled great interest in delivering vaccines via inhalable nasal spray. Not only is this kind of vaccine delivery system much easier to administer but for several years researchers have hypothesized it to be potentially more effective against infections that initially take hold in the upper respiratory tract.
"The best immune defense happens at the gate, guarding against viruses trying to enter," explains senior author on the new study, Akiko Iwasaki.
Immunoglobulin A (IgA) antibodies are one of the immune system's frontline soldiers. These antibodies are primarily secreted by mucosal surfaces in the body, mostly seen in the nose, gut and lungs.
The idea behind a nasal vaccine is that it could directly train mucous membranes in the nose how to target certain airborne pathogens so an immune response can be mounted as soon as a virus enters a human body. This new study promisingly reveals nasal vaccines not only induce effective IgA responses but may promote broad immunity against more than just the single viral strain in a vaccine.
The study reports on a series of mouse experiments comparing the effects of an influenza vaccine delivered intranasally and more traditionally via injection. The researchers exposed the mice to a number of different influenza strains beyond the one the vaccine was designed to target. The findings revealed the animals receiving the nasal vaccine were much better protected from a broad variety of influenza strains compared to the mice receiving injections.
Focusing on IgA responses the researchers discovered not only did the nasal vaccine induce IgA responses in nasal mucous membranes, but significant levels of IgA secretion were detected in the lungs as well.
"When you look inside the lungs of nasal vs. parenteral primed mice 5 weeks later, nasal primed mice contain tons of plasma cells secreting IgA beneath the epithelium, and IgA is bathing the lumen of the lung," Iwaskai explains on Twitter. "These IgA secreting cells at 5 weeks post prime are mostly tissue-resident cells (meaning they sit within the lung and do not move around)."
And most significantly, these nasal and lung IgA responses were not seen in the animals receiving the vaccine by injection. Only intranasal vaccine administration generated this kind of immune response.
Iinfluenza vaccines were used in these current experiments, however, the researchers are now conducting similar tests in animals with COVID-19 vaccines. Iwasaki says the findings do suggest nasal vaccines could be more effective at producing immunity that is broadly protective against many variants of an individual virus.
"These results indicate that nasal vaccines induce IgA and promote better cross-protective immunity against viral variants, and suggest its utility in combating COVID-19 variants of concern," she adds.

A number of inhalable nasal COVID-19 vaccines are currently in development, and several are already in early human trial stages. But developing effective nasal vaccines has proved challenging, with several research dead-ends over the past decades suggesting the task could be easier said than done.

▶▶ **The new research was published in the journal** *Science Immunology*.

COVID-19 Vaccines with a Bit of Viral Polymerase May Work Longer

Researchers have identified rare, naturally occurring T cells that can target a protein found in SARS-CoV-2 and other coronaviruses. A component of this protein, a viral polymerase, could be added to COVID-19 vaccines to create a longer-lasting immune response and increase protection against new variants of the virus. **+ MORE**

Japanese scientists develop vaccine to eliminate cells behind aging

Source: https://www.japantimes.co.jp/news/2021/12/12/national/science-health/aging-vaccine/

Dec 12 – A Japanese research team said it developed a vaccine to remove so-called zombie cells that accumulate with age and damage nearby cells, causing aging-related diseases including arterial stiffening.

The team, including Juntendo University professor Toru Minamino, confirmed that mice administered with the vaccine showed decreases in the zombie cells, medically known as senescent cells, and in areas affected by arterial stiffening.

"We can expect that (the vaccine) will be applied to the treatment of arterial stiffening, diabetes and other aging-related diseases," Minamino said.

The results of the team's research were published in the online version of the journal Nature Aging on Friday.

Senescent cells refer to those that have stopped dividing but do not die. They damage nearby healthy cells by releasing chemicals that cause inflammation.

The team identified a protein found in senescent cells in humans and mice and created a peptide vaccine based on an amino acid that constitutes the protein. The vaccine enables the body to create antibodies that attach themselves to senescent cells, which are removed by white blood cells that adhere to the antibodies.

When the team administered the vaccine to mice with arterial stiffening, many accumulated senescent cells were removed and areas affected by the disease shrank. When administered to aged mice, their frailty progression was slower than that of unvaccinated mice, according to the team.

Many of the existing drugs to remove senescent cells are used as anti-cancer agents and may cause negative side effects. Side effects from the new vaccine were fewer, while its efficacy lasted longer, the team said.

Immunogenicity and safety of a third dose of CoronaVac, and immune persistence of a two-dose schedule, in healthy adults: interim results from two single-centre, double-blind, randomised, placebo-controlled phase 2 clinical trials

By Gang Zeng, PhD, Qianhui Wu, MPH, Hongxing Pan, MSc, et al.

Published: December 07, 2021

Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00681-2/fulltext

Large-scale vaccination against COVID-19 is being implemented in many countries with CoronaVac, an inactivated vaccine. We aimed to assess the immune persistence of a two-dose schedule of CoronaVac, and the immunogenicity and safety of a third dose of CoronaVac, in healthy adults aged 18 years and older. A third dose of CoronaVac in adults administered 8 months after a second dose effectively recalled specific immune responses to SARS-CoV-2, which had declined substantially 6 months after two doses of CoronaVac, resulting in a remarkable increase in the concentration of antibodies and indicating that a

two-dose schedule generates good immune memory, and a primary third dose given 2 months after the second dose induced slightly higher antibody titres than the primary two doses.

▶▶ **Read also:** Booster doses for inactivated COVID-19 vaccines: if, when, and for whom

A robust democracy and a well-organized state are emerging as the critical success factors in coping with the coronavirus pandemic and its aftermath.

By Christof Schiller (co-author of the study and governance expert at the Bertelsmann Stiftung)
Source: https://www.bertelsmann-stiftung.de/en/topics/latest-news/2021/december/well-organized-democracies-better-at-navigating-the-pandemic

Dec 10 – New Zealand, Sweden and Switzerland top the ranking of resilient democracies, while Poland, Hungary and Turkey rank at the bottom. The governments of these latter countries exploited the pandemic to institute restrictions placed on civil rights. These rights have been temporarily curtailed in other countries as well, notes Schiller. "However, the issue then becomes the extent to which governments commit to restoring these rights as quickly as possible or to compensate as best they can for the loss incurred. In this regard, Ireland, New Zealand, Sweden, Switzerland, Estonia, Greece, Portugal, and the United Kingdom were equipped with the most binding roadmaps."

The resilience of governance itself is also very important. South Korea was the only country surveyed to have featured a crisis management architecture that was prepared to handle a pandemic emergency. The country benefited from the experience it gained during the MERS pandemic. New Zealand caught up quickly, however, topping the rankings on the resilience of governance capacity as a result of its "go hard and go early" approach and its four-tiered COVID-19 alert system. Greece has also done quite well. The Netherlands, Portugal and France land in the midfield. The assignment of clear responsibilities and policy coordination posed problems for many states – not only the federally organized states such as Germany and Austria, both of which still ranked relatively well at 5th and 11th place, respectively. Crisis management arrangements in Mexico, Hungary and Poland received particularly low ratings, with Israel and the United States performing only marginally better. "Those states with the institutional capacity to prepare for a crisis and respond effectively to it while maintaining accountability will do better coming out of the pandemic. Being better prepared for future crises requires the regular adaptation of a state's crisis management architecture," says Schiller.

In the vast majority of countries, legislatures were also poorly integrated into crisis management systems. However, this was mostly a factor of time constraints, as leaders often had to respond with rapid fire to the situation. In New Zealand

and Denmark in particular, at least crisis communication proved effective, according to the experts. Hungary, the United States, Poland and Mexico received the worst scores in this regard during the crisis.

Well-organized democracies feature more robust economies and welfare states

In terms of the resilience of their economies as well as their welfare states, Sweden, Germany, and Denmark were best prepared in the first year of the pandemic. Unsurprisingly, Germany tops the ranking of the most resilient economies, thanks to its comprehensive short-time work schemes and fiscal policy preparedness. Sweden and Switzerland also receive high marks in this area. Japan and France land in the midfield. The United States ranks among the bottom third. And once again, Mexico brings up the rear. All states have taken on massive debt during the crisis. "Credit-financed support has in some cases helped cushion the short-term economic and social impacts of the crisis. However, this support has yet to contribute significantly to long-term challenges such as the sustainable transformation of an economy," says Thorsten Hellmann, a co-author of the study and economic expert at our foundation.

EDITOR'S COMMENT: I am not sure how the results published came out; what I know is that if you want to teach an example of bad pandemic crisis communication management, Greece is the perfect example. Greek electronic media used this study to emphatically announce that "Greece is among the top countries with the best pandemic management".

Creating Dangerous Viruses in the Lab Is a Bad Way to Guard against future Pandemics

Source: https://www.homelandsecuritynewswire.com/dr20211214-creating-dangerous-viruses-in-the-lab-is-a-bad-way-to-guard-against-future-pandemics

Dec 14 – In 2011, three top U.S. government scientists penned an opinion piece in the *Washington Post* arguing why research modifying highly pathogenic avian influenza (H5N1) was a worthy undertaking. At the time, the National Institutes of Health (NIH) was facing blowback over having funded experiments that modified the virus to be transmissible among ferrets. The scientists argued that eliciting potentially dangerous mutations in the virus was necessary to protect humanity, should those mutations evolve naturally. "We cannot predict whether or not something will arise naturally, nor when or where it might appear. Given these uncertainties, important information and insights can come from generating a potentially dangerous virus in the laboratory," wrote Anthony Fauci, the head of the National Institute of Allergy and Infectious Diseases, Francis Collins, the head of NIH, and Gary Nabel, then a top official at Fauci's institute.

Laura H. Kahn writes in the *Bulletin of the Atomic Scientists* that amid the controversy generated by this influenza research, the U.S. government implemented a "pause" on federal funding in 2014 for selected research reasonably anticipated to increase transmissibility or pathogenicity of influenza, SARS, and MERS viruses.

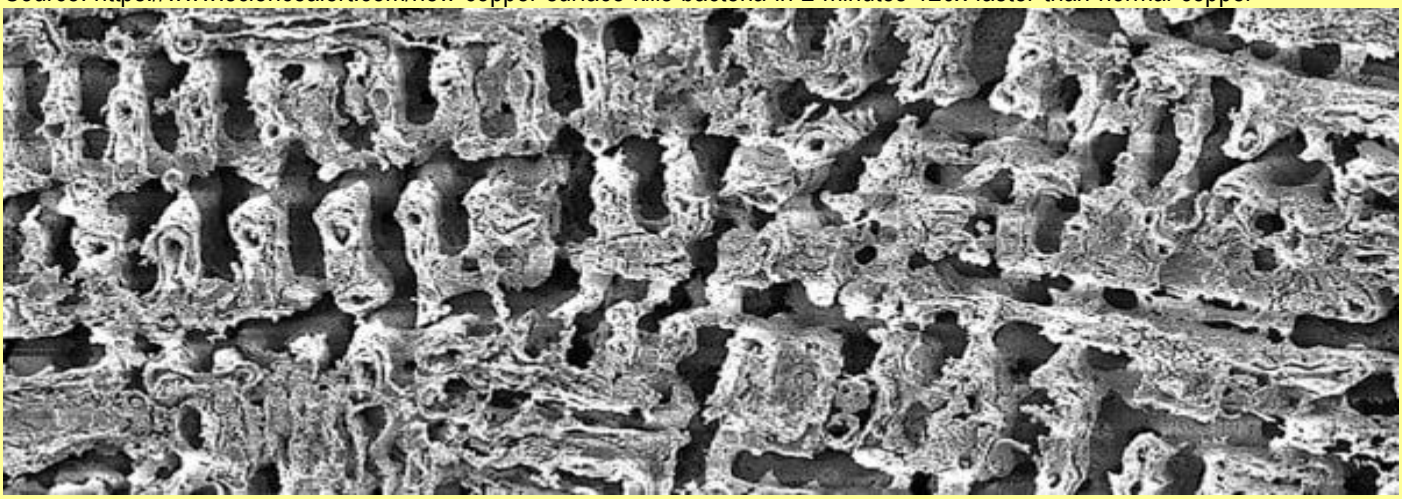
> These were experiments that fell within a subset of scientific study called "gain-of-function" research. In 2017, the government lifted the pause and put in place a requirement that the US Department of Health and Human Services conduct a risk-benefit assessment on research that could confer these attributes to potential pandemic pathogens.
>
> The federal government continues to fund such experimentation, but, as scientists, media, and online sleuths have delved into the origins of COVID-19, they have revealed weaknesses in past and current government oversight of projects modifying viruses. The revelations have underscored the degree to which gain-of-function research in the name of predicting pandemics is an idea that doesn't seem to fade.

Kahn concludes:

> There are other less risky ways of preventing pandemics than conducting gain-of-function research on pathogens. Many pathogens capable of causing human outbreaks originate in animals, and surveillance of wild and domestic animals for signs of illness makes sense. This is the One Health approach. With One Health, the goal is to prevent the spread of deadly zoonotic microbes into humans through improved communication and collaboration between human and veterinary medicine.
>
> Preventing pandemics through rapid identification and response is an important goal; the One Health approach that emphasizes animal and human health and disease surveillance is the key to doing this, not risky gain-of-function research.

New Maze-Like Surface Kills Bacteria in 2 Minutes: 120x Faster Than Normal Copper

Source: https://www.sciencealert.com/new-copper-surface-kills-bacteria-in-2-minutes-120x-faster-than-normal-copper

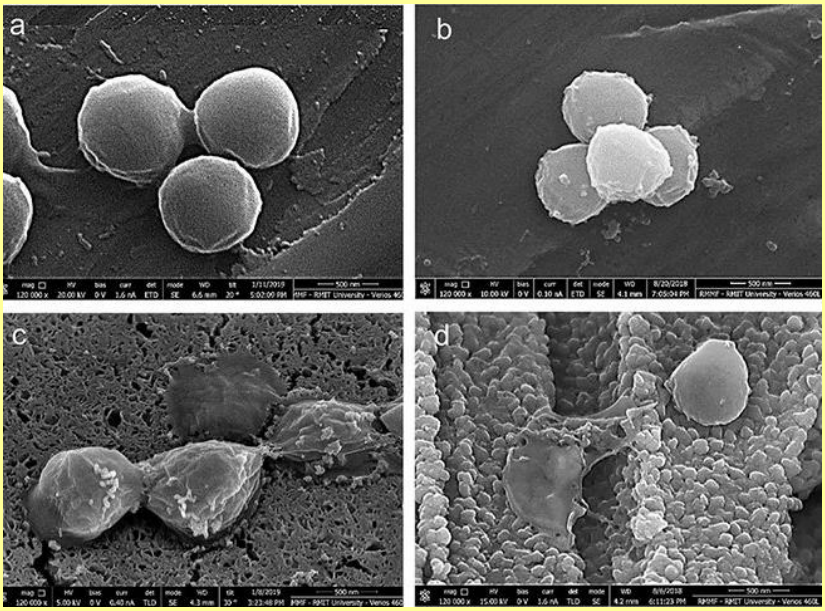


A microscopic close-up of the copper surface. (Smith et al., Biomaterials, 2021)

Dec 16 – Copper is well known for being able to kill off bacteria that it comes into contact with – the metal releases ions that are toxic to bacterial cells, punching through their outer membranes. However, this process usually takes several hours.

A newly developed copper surface does the job in just a couple of minutes, though, some 120 times faster than normal copper. The less time the bacteria hang around, of course, the safer that surfaces like door handles and worktops are going to be.

The scientists behind the new copper surface tested it against golden staph bacteria (*Staphylococcus aureus*), responsible for a wide variety of infections, and one of the five most common causes of infections picked up in hospitals.



"A standard copper surface will kill about 97 percent of golden staph within four hours," says materials engineer Ma Qian from the Royal Melbourne Institute of Technology (RMIT) in Australia.

Above: Golden staph bacteria cells after 2 minutes on a) polished stainless steel, b) polished copper, and c) and d) the team's micro-nano copper surface. (Smith et al., Biomaterials, 2021)

"Incredibly, when we placed golden staph bacteria on our specially designed copper surface, it destroyed more than 99.99 percent of the cells in just 2 minutes. Our copper structure has shown itself to be remarkably potent for such a common material."

Crucial to the bacteria-killing abilities of the new material is its porous nature, which significantly increases the surface area compared with smooth copper. That means more of the bacteria cells can be attacked at once when they land.

To make this copper as porous as possible, the team produced an alloy of copper and manganese atoms, before applying a cheap and scalable "dealloying" technique to remove the manganese atoms.

That left behind a maze-like copper surface full of very small holes for the bacteria to get trapped inside – and it actually makes it harder for bacteria cells to form in the first place.

No special drugs or other treatments are required for the copper material to work, and when water hits the surface, it forms a thin film rather than droplets. That again improves the effectiveness of the copper ions in wiping out bacteria.
"These combined effects not only cause structural degradation of bacterial cells, making them more vulnerable to the poisonous copper ions, but also facilitates uptake of copper ions into the bacterial cells," says RMIT researcher Jackson Leigh Smith.
"It's that combination of effects that results in greatly accelerated elimination of bacteria."
To take the example of a handle on a door, if bacteria can be killed in 2 minutes rather than 4 hours, then that's far fewer people who are going to be touching the handle in that time. The material could eventually find its way into schools, hospitals, homes, and public transport vehicles.
The researchers are now investigating how effective this copper surface could be against SARS-CoV-2, the virus that causes COVID-19 (normal copper seems to be reasonably effective, so the early signs are promising).
What's more, the copper could help in the fight against superbugs (like golden staph) that have developed antibiotic resistance – as bacteria build up protections against our drugs, alternative approaches to reducing infection and bacteria spread could be crucial in tackling the problem.
"Drug-resistant infections are on the rise, and with limited new antibiotics coming onto the market, the development of materials resistant to bacteria will likely play an important role in helping address the problem," says CSIRO research scientist Daniel Liang.

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

Keeping SARS-CoV-2 Reinfections at Bay

By Haseeb Ahsan, Jong Kyung Sonn, Young Sup Lee, Salman Ul Islam, and Saifullah Khan Khalil
Source: https://www.genengnews.com/immunology/keeping-sars-cov-2-reinfections-at-bay/

Must Read

Dec 14 – Coronavirus disease 2019 (COVID–19) cases, started in December 2019, caused by novel severe acute respiratory syndrome coronavirus (SARS-CoV-2), have spread across all the continents of the world making it a global emergency[72]. Infection due to SARS-COV-2 may cause a wide spectrum of symptoms, which may include mild upper respiratory tract infection and as severe as life-threatening sepsis. Microscopic examination of coronavirus reveals that it is enveloped, single-stranded RNA virus, anchored to host cell receptors via unique spikes (9 to 12 nm), giving it the appearance of solar corona. SARS-COV-2 is one of the three most notable corona viruses known for global spread of infection[20,38]. Bats are thought to be the natural host for SARS-CoV-2. Pangolins have also been considered a medium of infection[30,64].
It has been observed in many individuals that recruited lymphocytes and monocytes combat the infection. Upon destruction of maximum viral load at site, the immune response gradually diminishes and patients recover. In other patients, immune response becomes haphazard and infection might have very serious and fatal consequences.
Mortality related to COVID-19 is mainly due to acute respiratory distress syndrome (ARDS). Blood profiling of patients in intensive care unit showed that recruited and localized white blood cells generate an irregular release of multiple cytokines (interleukins [ILs]) such as IL-2, IL-6, IL-7, IL-10, tumor necrosis factor (TNF), and macrophage inflammatory protein 1α[35]. Cytokine storm, which is deadly uncontrolled systemic inflammatory response, contributes to the main mechanisms of ARDS[18,50]. It has been established that secretion of these cytokines increases myocardial injury and severity of infection[71]. The unusual response of body cells to cause cytokines storm and worsen the disease is shown in *Figure 1*.
Disease recurrence can be described as reinfection, relapse, or recrudescence. It is necessary to differentiate the term "reinfection" from other such similar words. *Figure 2* shows the basic differences in the meaning and use of these terms. According to the Center for Disease Control (CDC), reinfection refers to acquisition of new infection by a person after recovery from the first infection by the same causative agent[10]. A yardstick for confirmation of reinfection, by CDC, requires confirmation of initial and second infections in two time periods along with supporting evidence from genome sequencing from samples of both infections[9,12]. All reported cases of true or confirmed reinfections present genetic differences among samples collected from one person on two occasions of primary and reinfection.
Reinfections have now been reported from the Netherlands, Belgium, Ecuador, the United States, and India[23,47,60,62]. All these cases are confirmed reinfections verified through genetic sequencing. It is likely that more cases of reinfections will be reported as researchers are performing viral genome sequencing to differentiate prolonged viral shedding from reinfection.

Pertaining to relapse, no data of genomic sequencing have been presented so far, making them unlikely to fall under the definition of reinfection. Reasons for twice positive diagnosis via polymerase chain reaction (PCR) have been attributed to remnants of nonvirulent genetic matter after infection has been cleared.

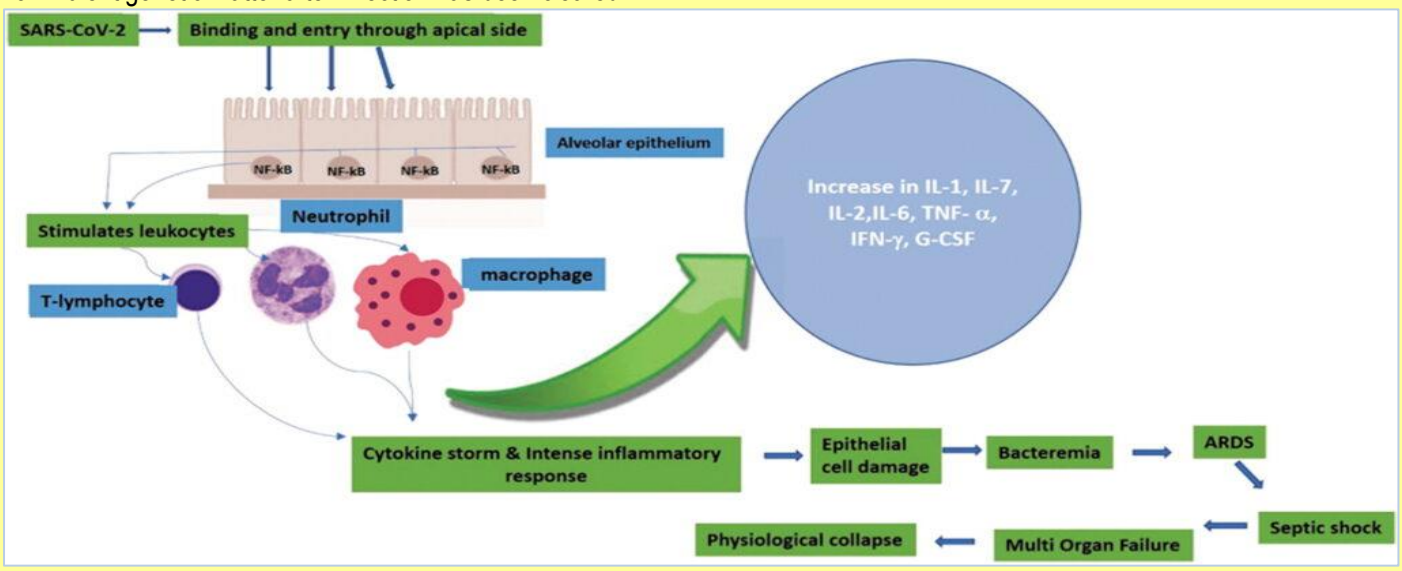


Figure 1. Cytokine storm produced in lungs' epithelial cells. ARDS, acute respiratory distress syndrome; G-CSF, granulocyte colony-stimulating factor; IFN-γ, interferon gamma; IL-1,2,6,7, interleukin 1,2,6,7; NF-κB, nuclear factor kappa B; TNF-α, tumor necrosis factor (alpha).

A false positive test, most probably due to mixing of samples, or consistent use of disposable equipment for sample collections can also contribute to double positive test with no symptomatic presentation and other injuries observed via imaging techniques[18]. One study presented PCR test results of patients using ORF1ab gene as primers generate variable results upon viral mutations[63]. We have assembled few representative cases of COVID-19 relapse in Table 1.

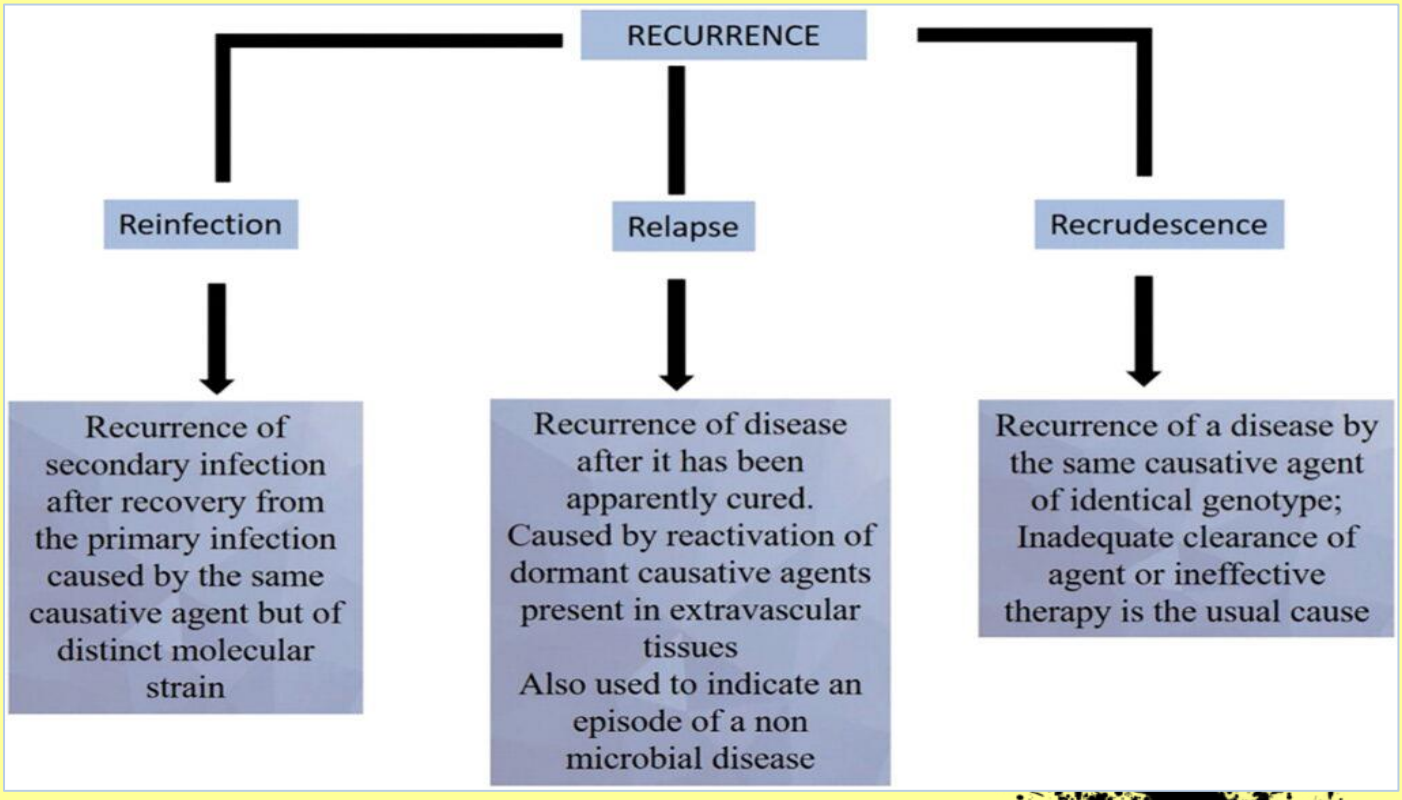


Figure 2. Types of recurrence with reference to infectious diseases.

TABLE 1. REPRESENTATIVE CASES OF CORONAVIRUS DISEASE 2019 RELAPSE OR UNCONFIRMED REINFECTIONS

Cases	*Age, years*	*Gender*	*Intermediate duration*	*Institution*	*Comments*	*References*
01	82	Male	48 days	Massachusetts General Hospital, Boston, USA	Positive RT-PCR test upon readmittance and bacterial pneumonia too; no data on viral strain	(17)
04	30–36	02 Males 02 Females	45–55 days	Zhongnan Hospital, Wuhan, China	Mild-to-moderate symptoms; possibility of false negative result at time of discharge is not excluded by the authors	(31)
27	22–77	20 Females 7 Males	16–20 days	Renmin Hospital, Wuhan, China	Some asymptomatic patients tested positive for SARS-CoV-2	(67)
03	84–90	Females	Several weeks	University Hospital of Saint-Etienne, France	All died after second infection	(29)
01	57	Female	68 days	Xixi Hospital of Hangzhou, China	Longest duration of viral shedding; hospitalized thrice	(36)
01	64	Female	Few weeks	Madaen Hospital, Tehran, Iran	Meningoencephalitis on relapse	(39)
01	39	Female	20 days	Guangzhou Eighth People's Hospital, China	Patient had SLE; SLE medications did not have adverse effect on COVID-19; patient visited Wuhan	(25)

COVID-19, coronavirus disease 2019; RT-PCR, real time polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus; SLE, systemic lupus erythematosus.

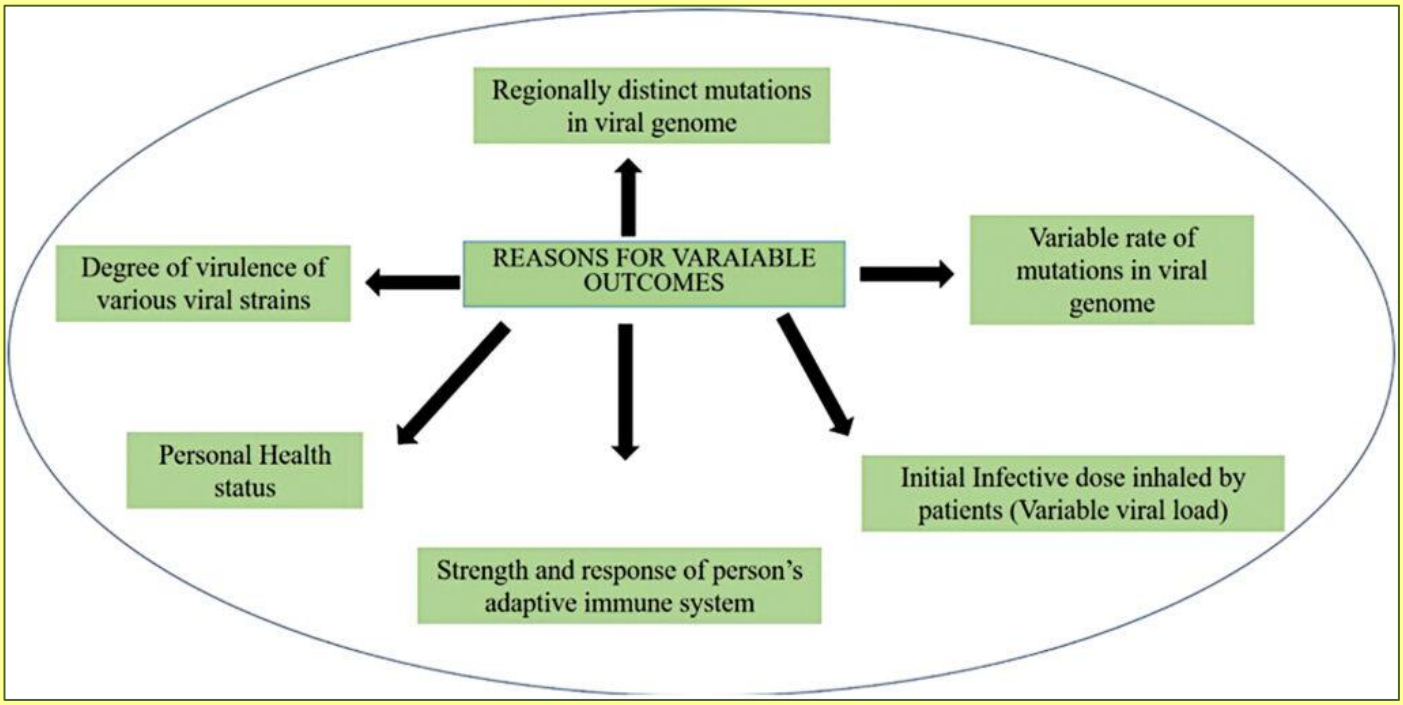


Figure 3. Possible factors involved in the production of variable physiological response to viral invasion.

Reinfection case histories with opposite outcomes

First ever case of SARS-CoV-2 reinfection was reported and documented by comparative viral genome analysis. This patient traveled to Europe for about 1 week and returned on August 15, 2020, when he was screened positive for SARS-CoV-2 at the airport inbound traveler screening program. As required by the legislation of the Hong Kong SAR, he was hospitalized for isolation. The patient had increased C-reactive protein level and

immunoglobulin G (IgG) seroconversion, which suggested that the patient had acute infection. Symptomatic presentation included mild-no symptoms of disease[11,45].

Another severe case of reinfection has been reported from Nevada state, USA. Patient was diagnosed with first infection in April 2020, followed by a second positive test at the end of May. The two positive tests were separated by one negative PCR test (indicates patient recovery). Nasopharyngeal swabs were analyzed for next-generation sequencing of SARS-CoV-2 genome at both instances. For confirmation that both samples were from similar sources, researcher used a short repeat tandem marker to analyze fragments. Differences in the genetic strains of the same virus suggested that patient was infected with genetically distinct strains of SARS-CoV-2 on different occasions[60].

These cases question the effectiveness of immunity acquired after natural infection of COVID-19. Different outcomes of reinfection can be due to many variables, which we have enumerated in *Figure 3*. All the factors ranging from personal health to immune status and viral specific characteristics are responsible for varied clinical manifestations. A recently reported study has published differenced in immune responses based on gender. Their results suggest that secretion and release of proinflammatory cytokines, which are also involved in producing cytokine storm, are higher in males. Moreover, T cell-mediated response was more robust and intense in females. These results show that males are more susceptible to develop more severe form of COVID-19 infection[58]. Associated comorbidities are also considered as potential risk factor to acquire infection and develop severe symptoms[70].

Role of Adaptive Immune System on Varied Clinical Presentation of COVID-19 Reinfection

Adaptive immunity is one of the most significant defensive lines of action against pathogens, antigens, and xenobiotics. It offers protection against subsequent exposures of the antigen causing infection on first exposure. It implies that adaptive immune system has memory of infections and their causative agents. Hence, their pivotal role in protection against repeated exposures of SARS-CoV-2 can be easily understood. It may be acquired after natural infection (measles) or deliberately by vaccination (small pox, polio). Components of adaptive immune system include humoral (antibodies) and cell-mediated immunity (T lymphocytes)[2]. Adaptive immune responses of other beta coronaviruses can be reviewed in relevant references[34].

Activated T and B lymphocytes, which express the receptors for antigen-presenting cells (APC), mediate adaptive immune responses. One of the significant APC is dendritic cells capable of activating itself and downstream lymphocytes upon viral entry into the body[13].

Rationale for the involvement of T cells in combating SARS-CoV-2 has been derived from autopsy results of affected patients that their lungs had greater deposition of T cells while the blood profiling depicted lymphopenia. These results indicate migration of lymphocytes from systemic circulation to site of infection (lungs) and also point toward their active involvement in generating immune response[59]. Another study wherein the researchers observed and mapped phenotypes of SARS-CoV-2 induced specific T cell responses in people with acute infections, exposed next of kin and unexposed relatives. The authors found that SARS-CoV-2 produces adequate and functionally abundant T cell responses, which are then memorized by memory T cells to counteract any future infections by the same agent. They also suggested that recurrence maybe prevented by natural infection[55]. Furthermore, weakened response of adaptive immune system cannot effectively halt the proinflammatory cytokines. This frailty of adaptive immune system can potentiate cytokine storm[1].

T cells are responsible for cell-mediated immunity. Cytotoxic T cells are especially responsible for their direct killing action on infected cells. Helper T cells do not take part in killing cells, but their role is of prime significance in amplifying the actions of cytotoxic T cells and B cells[59]. Moreover, recent experimental results obtained from rodents and other nonhuman primates have shown strong evidence of natural killer (NK) cells being part of adaptive immune system. In one study, researchers have suggested that NK cells respond strongly to viral invasion and also develop a memory of the invasion. Therefore, they can be considered and explored as prospective target for vaccine development[42]. Importance of T cells can be imagined from recent reports that severity of COVID-19 symptoms is directly proportional to the reduction in activity and number of helper T cells, cytotoxic T cells, and NK cells. Another study reports that common feature among severely affected patients was lymphopenia inclusive of enormous decline in helper T cells[49]. In a recently published study on the immune responses against SARS-CoV-2, the authors found that changes in the number of central and antigen-specific response T cells occur over a time period in individuals recovered from the infection. It was interesting to note that central memory T cells reduced over a period of 6 months after infection while the number of virus-specific response T cells increased over the mentioned time span. Active release of protective cytokines from CD4+ T cells was also present over 6 months. This suggests that cell-mediated immunity persists sufficiently in recovered patients. However, the authors have displayed their concerns that the conferred immunity becomes slightly weaker as time passes by[7].

The presence of comorbid conditions also affects the severity and outcome of adaptive immune responses. One recent study analyzed the relationship and interdependence of cell-

and antibody-mediated immune responses in the presence and absence of other metabolic disorders such as obesity and diabetes. One clinically significant observation of the researchers was that the coordination between T cells and antibodies was greater in non-comorbid patients. Hence, the authors strengthen the previously published views of other research groups that comorbidity poses a significant risk factor for adaptive immunity against SARS-CoV-2. Production of inflammatory cytokines in these metabolic disorders (persistently high blood glucose) is thought to be responsible for weakened adaptive immunity[28]. Another study observed the effects of immunosuppressive agents, given in inflammatory bowel disease, on the severity of SARS-CoV-2 infection. The authors reported that these medications delayed the development of adequate immune response in three of six patients. Older age of patients was also responsible for delayed immune response. Hence, comorbid conditions and their medications affect the progress and severity of infection[53].

Role of type I interferons IFNs have recently been highlighted in various studies; their significance correlates individual genetic makeup with resistance toward severity of SARS-CoV-2 infection. Significance of type I IFN has been reported in a study conducted on 659 patients with severe symptoms of SARS-CoV-2 infection. The aim of study was to link genetics with the symptomatic presentation of SARS-CoV-2 infection. Researchers correlated the symptoms severity with inborn genetic disorders in regulating type I and III IFNs. It was found that patients who have inborn antibodies against type I IFNs had severe symptoms while those with no such autoantibodies had milder forms of infection. The authors proposed that genes expressing Toll-like receptor 3 and IFN regulatory factor 7 are involved in production of type I IFNs[68]. Another study found that 101 tested patients with severe COVID-19 symptoms had genetic disorders that caused fluctuations in levels of type I IFNs. They found that autoimmunity against type I IFNs of all types was developed in patients with severe symptoms. The authors also suggested that SARS-CoV-2 infection activated the silent autoantibodies. Virus-induced activation of autoantibodies reduced the concentration of type I IFNs significantly that resulted in serious clinical manifestation of the disease in 101 patients. Hence, these studies might suggest that type 1 IFNs play role in developing adaptive immunity that might impart adequate protection against the reinfection too[6].

T cell memory and cross-reactive immunity

An important component of adaptive immunity is memory of T lymphocytes against antigens faced on first exposure. It is one of the important mechanisms of our body that can be manipulated or enhanced to increase the defensive power against the highly contagious nature of SARS-CoV-2. A study reported that recovered patients had established memory helper T cells and memory cytotoxic T cells' responses against SARS-CoV-2. The study also reported similar patterns of T cell memory in unexposed individuals suggesting development of cross-immunity to SARS-CoV-2 due to immune resistance to other coronaviruses[22]. Cross-reactive helper T cells have been detected in many unexposed individuals during many reported studies. However, the occurrence of cross-reactive immune B cells has been very rare. One study reviewed the effect of cross-reactivity of common coronaviruses and the ability of humoral immune system to develop neutralizing antibodies against SARS-CoV-2, in in vitro settings. The conclusion of their study was that cross-reactive humoral immunity from previous viral exposures is not produced[40]. Although cross-reactive immunity has been reported by other groups, the likelihood of its occurrence in the building of herd immunity is still a far-fetched notion[32,46]. A study reported their observations and analysis of 70 individuals 42 healthy, 28 patients for 5 months. Immune memory was present in previously infected individuals after 5 months. The immune memory cells were specific for spike protein. The authors also reported the presence of predominant cross-reactive CD4+ T cells in Indian population. Cross-reactive CD8+ T cells were minimal and had less conspicuous role in providing immunity. The authors believed that the presence of these cross-reactive CD4+ T cells have been responsible for lower disease severity in Indian population despite very high positive cases[3].

T cell exhaustion

It is a state which explains the behavior of T lymphocytes toward the specific antigen (virus) on chronic exposure. Exhausted T cells are functionally distinct from normal activated and memory T cells. Exhausted cells exhibit poor effector function and are usually characterized by higher expression of programmed cell death protein 1 (PD-1). A retrospective study conducted in Wuhan China revealed that patients admitted in intensive care unit displayed quite high levels of exhaustion marker PD-1 in helper and cytotoxic T cells. The study also reported that patients also exhibited very high IL-10 levels indicating that IL-10 has the capacity to induce T cell exhaustion[16,41]. A study conducted in Italy (severely affected during first wave of COVID-19 in Europe). reported higher expressions of PD-1 and CD57 on T cells. CD57 is marker of cell senescence showing reduced cellular defensive and proliferating potential[15]. Although T cell exhaustion is more common in chronic infections, its importance in SARS-CoV-2 infection cannot be undermined. Studies have revealed that T cell exhaustion is the result of massive cytokine storm produced during SARS-CoV-2 infection. Similar T cells were found in cerebrospinal fluids of SARS-CoV-2-infected patients experiencing neurological

symptoms. The authors reported that T cell exhaustion and less differentiated monocytic cells were responsible for weak antiviral adaptive immune responses that led to production of neurological complications[26].

Neutralizing antibodies

Neutralizing antibodies, formed against external antigens after first exposure, play pivotal role in fighting against the subsequent exposures of same causative agent. A study revealed that most of the recovered patients produced serum-neutralizing antibodies against SARS-CoV-2 surface proteins. The plasma levels of these antibodies were different in most individuals. This may be due to inter-individual differences in the physical health and immunity[65]. After reinfection, high avidity IgG and high titers of neutralizing antibody were found in patients' blood. This meant that the priming of immunity from the first episode has allowed more robust antibody response during the second episode. These findings also affirm with the results of reinfection in an animal model, in which SARS-CoV-2 re-challenge resulted in a more robust neutralizing antibody response than the primary infection[5,44]. Also, B cell maturation after primary infection can result in long-lived plasma cells and memory B cells. During reinfection, high-affinity antibodies are produced more rapidly by the differentiation of memory B cells into plasmablasts[61]. Binding sites, relative affinity, and easy access to membrane antigenic proteins are all important determinants of antibody's efficacy and spectrum. Based on these factors, design and development of therapeutic antibodies (by acquired passive immunity). will render sufficient immune response to curb the resurgence of this disease[69].

Barriers to the effectiveness of neutralizing antibodies

So far, the major target for producing antibodies, against viral antigen, has been spike S protein, which is involved in anchoring and cellular entry of virus in host cell. It is the most popular candidate for production of acquired active immunity via vaccines. A research group developed S protein nanoparticles and injected them into mice to observe the immunological response. They found that high levels of neutralizing antibodies in blood plasma of mice confirming high immunogenic nature of S protein. However, the immunity offered by these antibodies was homologous, which suggests that a generalized vaccine against all or many coronaviruses is unlikely to be produced from spike protein[14].

Most of the research is currently being focused on synthesis of neutralizing antibodies against the most easily accessible surface spike S protein. However, a single escape mutation in the S protein can drastically reduce the binding efficiency of antibody and render it less effective. A recently reported study showed that substitution of a single amino acid can cost adequate reduction in antibody's antiviral activity[37].

To counteract the loss of valuable financial resources and specialized professional facilities produced by escape mutations during the development of vaccine, a convergent effort toward discovery of highly immunogenic conserved sequence of viral proteins is dire need of the day. It has been reported that the amino acid sequence motif KRSFIEDLLFNKV, found in spike protein, is one of the conserved regions in coronaviridae family. The motif is partially associated with cellular entry of virus into host cell. Researchers consider this sequence as one of the most vulnerable yet conserved sequence in coronaviruses. Exploration regarding the role of this spike protein sequence is necessary to assess and confirm the degree of attachment of virus to host cell. It can be a valuable target for long-term immunity if destruction of this sequence stops viral entry into cell[51].

Developing immunity solely based on production of neutralizing antibodies can offer complications. Such complications were seen during vaccine development against HIV. Most of the resistance by HIV against antibodies has been offered by the protective mechanisms of viral envelope. Extensive glycosylation followed by high steric hindrance in the conserved regions of structural proteins make it very difficult for antibodies to bind virus[54]. Similar mechanisms that can hurdle the antibody attachment need to be studied in SARS-CoV-2. One advantageous factor in this virus regarding vaccine development is the position and abundance of spike proteins, which are present on the envelope and not spatially hindered[52]. However, developing a vaccine which targets multiple epitopes including the conserved regions of virus is the most effective long-term solution. Therefore, a vaccine that can induce the production of broad-spectrum antibodies is one of the pragmatic solutions to resolve the current pandemic crisis[8].

Immune enhancement

Elevated concentrations of virus specific antibodies, which are directly proportional to the severity of the disease, are suggestive of antibody-dependent immune enhancement. This peculiar behavior of antibody-mediated increase in disease severity has been observed in SARS and COVID-19[66]. Enhancement of immune system after infection with HIV, influenza, and SARS has been studied in tissue cultures and animals[4,33,43,57]. But it is best known for its influence on the immune response to the dengue virus[21,24]. The recent mechanisms explain that pathophysiological effect is produced via Fc-γ receptor. Viral entry and endocytosis are not mediated by angiotensin-converting enzyme 2 receptor, but by

binding of virus-bound antibody to Fc-γ receptor. After internalization, virus alters cellular response by reducing Th1 response and decreasing the production of IFN-γ, TNF-α, and inducible nitric oxide synthase (iNOS). iNOS concentrations are reduced via inhibition of STAT pathways[56]. Alleviation of these antiviral responses is followed by viral replication in host cell that will worsen the severity of inflammation and overall disease pathology, as shown in *Figure 4*[27].

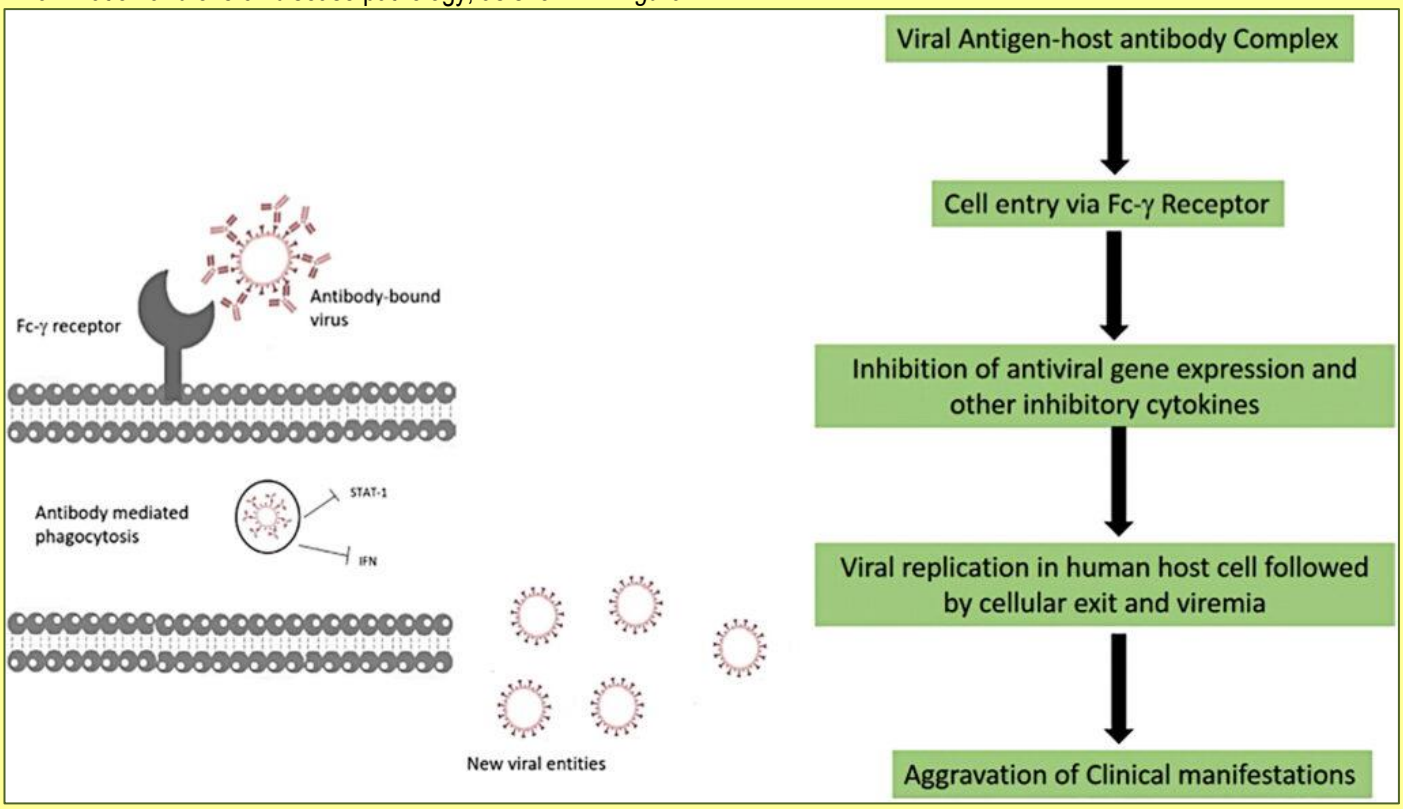


Figure 4. Immune enhancement mediated by SARS-CoV-2-specific antibodies facilitating viral entry and replication in host cells. SARS-CoV-2, severe acute respiratory syndrome coronavirus.

Herd immunity

Herd immunity is indirectly acquired immunity among susceptible individuals when present in a large group of immune individuals in the same population. It is necessary for herd immunity that immunity conferred upon by natural infection not only subsides clinical manifestations but also reduce/prevent its spread. Difficulty for the production of herd immunity in COVID-19 is due to the silent spread of disease through asymptomatic patients (not quarantined). A simple mathematical study model predicts that herd immunity in a closed community will prevail when 67% of total population is immune to the virus. Although this model is based on simple and absolute assumptions (homogeneous distribution of infection followed by acquisition of sterilizing immunity in population), the results of the model are helpful because they give us an approximate target value above which the spread of infection will halt. It is pertinent to mention that development of herd immunity will play pivotal role in warding off severe forms of reinfections[48]. A recent study also suggests that availability of vaccine will increase the number of immune individuals, create herd immunity, and therefore reduce the rate of transmission. However, distribution of vaccine should be prioritized to the most exposed population with highest transmission rates[19].

Conclusions

In light of the presented reports and data, we believe that we will remain vulnerable to resurgence and recurrence of this infection in the future. Inability to produce cross-reactive humoral immunity and variable strength of T cell-mediated immunity are one of the important factors, which have not been standardized yet. Also, the fact that even viral-specific antibodies might facilitate viral replication is another anticipated problem.

Pertaining to reinfections and other complications in the near future, there has been a big concern over the ability of virus to change its genomic sequence. The only and major glad tidings regarding the influence of reinfection on subsequent waves are the

scarcity of its incidence. Quite a few patients have been confirmed with true reinfection. Therefore, one can safely suggest that herd immunity is being developed in majority of population. Hence, our perspective is that reinfection will have lesser effect on the severity of pandemic as it statistically represents very minute proportion of individuals.
However, things should not be taken lightly because the disease may spread from immunocompetent carrier (asymptomatic) to an immunocompromised and elderly individual. **Carelessness of one individual can cost the life of another individual.** Verily, this pandemic has caused immense loss to families during these days of economic downfall. Therefore, until and unless the rate of development of immunocompetent individuals outpaces the rate of viral infectivity, we cannot recline and relieve ourselves from the ultimate risks of future.

▶▶ References available in *An Overview About the Role of Adaptive Immunity in Keeping SARS-CoV-2 Reinfections at Bay*.

Transmission of SARS-CoV-2 Delta Variant Among Vaccinated Healthcare Workers, Vietnam

By Nguyen Van Vinh Chau, Nghiem My Ngoc, Lam Anh Nguyet, et al.
Source: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3897733

Abstract

Background: Data on breakthrough SARS-CoV-2 Delta variant infections are limited.
Methods: We studied breakthrough infections among healthcare workers of a major infectious diseases' hospital in Vietnam. We collected demographics, vaccination history and results of PCR diagnosis alongside clinical data. We measured SARS-CoV-2 (neutralizing) antibodies at diagnosis, and at week 1, 2 and 3 after diagnosis. We sequenced the viruses using ARTIC protocol.
Findings: Between 11th–25th June 2021 (week 7–8 after dose 2), 69 healthcare workers were tested positive for SARS-CoV-2. 62 participated in the clinical study. 49 were (pre)symptomatic with one requiring oxygen supplementation. All recovered uneventfully. 23 complete-genome sequences were obtained. They all belonged to the Delta variant, and were phylogenetically distinct from the contemporary Delta variant sequences obtained from community transmission cases, suggestive of ongoing transmission between the workers. Viral loads of breakthrough Delta variant infection cases were **251 times higher** than those of cases infected with old strains detected between March-April 2020. Time from diagnosis to PCR negative was 8–33 days (median: 21). Neutralizing antibody levels after vaccination and at diagnosis of the cases were lower than those in the matched uninfected controls. There was no correlation between vaccine-induced neutralizing antibody levels and viral loads or the development of symptoms.

Interpretation: Breakthrough Delta variant infections are associated with high viral loads, prolonged PCR positivity, and low levels of vaccine-induced neutralizing antibodies, explaining the transmission between the vaccinated people. Physical distancing measures remain critical to reduce SARS-CoV-2 Delta variant transmission.

EDITOR'S COMMENT: In plain words: According to the study, the vaccine alleviates the symptoms of the infection, but it allows the vaccinated people to carry unusually high viral loads without getting sick at first, turning them into potentially symptomatic over-spreaders[3]! This phenomenon may be the answer to the rapid increase in cases recorded in countries with the highest vaccination rates.

[3] Mary Mallon (September 23, 1869 – November 11, 1938), commonly known as **Typhoid Mary**, was an Irish-born American cook believed to have infected 53 people with typhoid fever, three of whom died, and the first person in the United States identified as an asymptomatic carrier of the disease pathogen, *Salmonella typhi*. Because she persisted in working as a cook, by which she exposed others to the disease, she was twice forcibly quarantined by authorities, eventually for the final two decades of her life. Mallon died after a total of nearly 30 years in isolation.
▶ Read also: https://www.nature.com/articles/d41586-021-00460-x

Ancient Greek drug could cut COVID-19 deaths – Israeli scientist

Source: https://www.jpost.com/health-and-wellness/ancient-greek-drug-could-save-lives-of-covid-patients-israeli-scientist-688730

Dec 14 – An ancient Greek drug derived from the saffron plant could improve the treatment of people with severe COVID-19 and reduce the COVID mortality rate by as much as 50%, according to a report published earlier this month in the *European Journal of Internal Medicine* by an Israeli researcher from the Hebrew University of Jerusalem and Hadassah Medical School.

The drug, colchicine, dates back thousands of years to ancient Egypt, where it was known for its special healing properties. It is one of a few medicines that survived until modern times. Most recently, it has been used to treat and prevent inflammation caused by gout that can lead to painful arthritis and Familial Mediterranean Fever (FMF), which is common among Jewish people of North African descent.

Prof. Ami Schattner researched and analyzed all patients treated in controlled trials of this ancient drug for the past 20 years. He found that among its uses and potential uses, colchicine also appears effective in treating COVID-19.

So far, four controlled studies of around 6,000 coronavirus patients have been published on the effect of colchicine, Schattner said, each showing a "significant improvement in severe coronavirus indices and, most importantly, there was a decrease in mortality by about 50% compared to those who were not treated with colchicine."

The drug is cheap, a small half-milligram dose is needed per day, and it has already been proven safe to use, he said, making colchicine "an important discovery that could significantly contribute to improving the morbidity and mortality of many patients, if confirmed in further studies."
The drug is also well-tolerated, the doctor said. The only side-effects in some patients can be bouts of diarrhea; about 10% of patients discontinue the use of the drug for this reason.
The drug has been tested in the treatment of the COVID-19 pandemic around the world, including in Canada, Greece, South Africa, Spain and Brazil. Many of the tests were double-blind placebo studies, increasing their likelihood of accuracy.
"The results were impressive," he said.
Colchicine was first mentioned in an ancient Egyptian papyrus dating back to 1550 BC, even before the Jewish people left Egypt, according to the biblical story. Later, it was used by physicians in ancient Greece, in the Byzantine period and then by Arab physicians more than 1,000 years ago.
Some 50 years ago, using the drug to treat FMF was verified by researchers at Sheba Medical Center at Tel Hashomer and Hadassah, not only against the sharp attacks associated with the disease and their prevention, but also in protection against a serious complication of FMF – amyloidosis, which affects the kidneys.
More recently, several studies have started to prove its effectiveness in the treatment of acute pericarditis (swelling around the heart, and in the prevention of post-cardiac injury syndrome and atrial fibrillation following cardiac surgery.
"As is well known, patients who have had a heart attack are at a significantly increased risk of recurrence and stroke, and these are very many patients," Schattner said. "Studies from recent years have found that thanks to its anti-inflammatory activity on the atherosclerotic layers in the arteries, colchicine in small daily doses is able to effectively protect these patients.
"The level of protection was to the point of preventing about half of the recurrent events, and this impressive beneficial effect was also achieved in patients who had already undergone therapeutic catheterization and had taken optimal preventive treatment by aspirin and statins," he added. "This is important news for a very large number of patients."

When can the drug start being used to help COVID patients?
Further randomized controlled trials are needed to confirm these preliminary results, according to Schattner, which he believes will likely lead to expanding indications for low-dose colchicine. But he said there is no reason that the drug could not start being used right now.
"Even though initial data on the effect of colchicine on coronavirus patients is very promising, more patients need to be in randomized controlled trials," Schattner said. "But that would not prevent me from using the drug already in patients with high risk, to hopefully lower their chances of developing severe disease.
"The drug is low-cost for the patients and the community," he continued. "By using it in corona patients, we have nothing to lose and much to gain."

Small Myocarditis Risk Now Seen for Adenovirus-based COVID-19 Vaccine

Source: https://www.medscape.com/viewarticle/965000

Dec 16 – The first large population study to investigate the association between different COVID-19 vaccines types and cardiac effects and adverse events shows a small increase in the risk for acute myocarditis with both the mRNA-based vaccines and — in what may a first in the literature — an adenovirus-vector vaccine.
The excess risk was seen following the first dose of the ChAdOc1 (AstraZeneca/Oxford), the adenovirus-based vaccine, and the mRNA-based BNT162b2 (Pfizer/BioNTech). It was observed after first and second doses of the mRNA-1273 (Moderna) vaccine.
The incidence rate ratios (IRRs) for myocarditis 1 to 7 days after the first AstraZeneca, Pfizer, and Moderna injections were 1.76, 1.45, and 8.38, respectively, and 23.1 after the second dose of the Moderna vaccine.
"There's a bit more uncertainty and worry about mRNA vaccines because it's quite a new vector for vaccination and, therefore, there's been more focus on the potential side effects," said Nicholas Mills, MD.
"But it doesn't surprise me the signal is present for all types of vaccines because they're designed to generate a systemic immune response and that is, unfortunately, where you can cause small risks for immune-mediated illnesses like myocarditis," Mills, from the University of Edinburgh, United Kingdom, told *theheart.org | Medscape Cardiology*. Mills is a coauthor on the study, published December 14 in *Nature Medicine*.

To put the risks in context, the group estimated between 1 and 10 additional myocarditis hospitalizations or deaths per 1 million people vaccinated, but 40 excess myocarditis events per million following a SARS-CoV-2 positive test result.

As reported, rates of excess myocarditis events associated with a first dose were
- 2 per million injections of the AstraZeneca vaccine
- 1 per million for the Pfizer vaccine
- 6 per million with the Moderna vaccine

Following a second dose, there were 10 additional myocarditis events per million people receiving the Moderna vaccine and none among recipients of the AstraZeneca or Pfizer vaccines.

"It was particularly seen within the first 7 days of the first dose, which is very consistent with what we see in people who have viral myocarditis," Mills said. "So it looks like a real signal but it's very small."

The results are in line with previous studies of the Pfizer vaccine in Israel and studies of the Moderna vaccine in the United States, Biykem Bozkurt, MD, PhD, professor of medicine at Baylor College of Medicine, Houston, Texas, told *theheart.org | Medscape Cardiology*.

"What this paper does is confirm that cardiovascular complications — and they are only looking at a small component of those cardiovascular complications — are markedly higher with the COVID-19 infection than with the vaccines," she said.

It also adds a new twist to the search for the mechanisms of myocarditis, which has focused on the immunogenicity of the RNA in the Pfizer and Moderna vaccines but also hypothesized that molecular mimicry between the SARS-CoV-2 spike glycoprotein and cell antigens, antibody production against cardiac proteins, and testosterone may play a role.

"But now it doesn't look like the risk is solely confined to the mRNA vaccine platform because it's also happening with the adenovirus," Bozkurt said. "The mechanisms require future experimental and clinical research and we'll need more granular data with cohorts that are closely followed up as well as subclinical follow-up."

James de Lemos, MD, professor of medicine at UT Southwestern Medical Center in Dallas, Texas, and co-chair of the American Heart Association's COVID-19 CVD Registry, said he was also not surprised by a myocarditis signal with AstraZeneca's adenovirus vaccine.

"Looking at relative risks has biological implications, but the clinical and public health implications are that the absolute risk with the adenovirus is trivial. And you see that with their estimations of absolute risk where it's literally sort of a needle in the haystack of one or two per million," he told *theheart.org | Medscape Cardiology*.

Large-scale Data

The investigators examined the rates of hospital admission or death from myocarditis, pericarditis, and cardiac arrhythmia in the 28 days following SARS-CoV-2 vaccination or infection by linking the English National Immunisation Database of COVID-19 vaccination with a national patient-level healthcare database of 38.6 million people, aged 16 years or older, vaccinated from December 1, 2020, to August 24, 2021.

The number of people admitted to the hospital or who died during the study period was 1615 for myocarditis, 1574 for pericarditis, and 385,508 for cardiac arrhythmia.

There was no evidence of an increased risk for pericarditis or cardiac arrhythmia following vaccination, except for arrhythmia in the 28 days following a second dose of the Moderna vaccine (IRR, 1.46).

In contrast, the risk was increased for pericarditis (IRR, 2.79) and cardiac arrhythmia (IRR, 5.35) in the 28 days following a positive SARS-CoV-2 test result.

Although the scale of the analysis allows for more precise estimates than what's been possible in smaller data sets, there is the challenge of diagnosing COVID-19 from billing codes and the potential for ascertainment bias, noted de Lemos.

"Having said that, I think it's a really important study, because it's the first study to put the incidence in context in the same general population the risks of myocarditis with various vaccines and with COVID-19," he said.

"That's really important and provides a lot of reassurance for those who are trying to balance the risks and benefits of vaccination."

Analyses by Sex and Age

A subgroup analysis by age showed increased risks for myocarditis with the mRNA vaccines only in those younger than 40, whereas no association was found with the Oxford adenovirus vaccine.

"We're not seeing any signal here that would make us change the recommendation for vaccination in children as a consequence of this risk," Mills said during a press briefing.

Bozkurt pointed out, however, that the estimated excess in myocarditis events following a second dose of the Moderna vaccine in these younger adults reportedly exceeded that for SARS-CoV-2 infection (15 per million vs 10 per million).
"For that age group, it's concerning and needs further clarification. This hasn't been seen before," she said.
The average age was 39 years for those receiving two doses of the Moderna vaccine and 55 for recipients of the Pfizer and Oxford vaccines. The Moderna vaccine wasn't rolled out until April 2021 in the United Kingdom, the authors note, so the number of patients who received this vaccine is lower.
Although reports have suggested young males are at greater risk for myocarditis after vaccination, an analysis by sex found that women had an increased risk for myocarditis after a first dose of the AstraZeneca (IRR, 1.40) and Pfizer (IRR, 1.54) vaccines and following a positive COVID-19 test result (IRR, 11.00).
"Women being at increased risk is rather a new message," Bozkurt said. "But the incidence rate ratios are being compared against the unvaccinated, so when you see the increase in women, it doesn't mean it's increased against men. It would be helpful for sex-specific incidence rate ratios to be reported for younger age subgroups, such as ages 16 to 20 and 20 to 30, to determine whether there's an increased risk for males compared to females at younger ages."
Age and sex differences are huge questions, but "I think we'll learn a lot about myocarditis in general from what is going to be an explosion of research into the vaccine-associated causes," de Lemos said.
"That will help us understand myocarditis more broadly and prepare us for the next generation of vaccines, which inevitably will be mRNA-based."

significantly measured mask-induced changes in scientific studies 2004-2020: • = p<0.05 ▪ = n≥50 %	Fabric Mask	Surgical Mask	N95-Mask	O2↓	CO2↑	Humidity↑	Temperature↑	Breathing Resistance↑	Respiratory Rate↑	Blood Pressure↑	Cerebral Vasodilation	Heart Rate↑	Respiratory Impairment	Exhaustion & Fatigue	Drowsiness	Dizziness	Headache	Psycho-vegetative Effect	Decrease in Empathy	Itch	Skin Irritation	Acne	Rhinitis	Voice Disorder	Fake Sense of Security	Bacterial Contamination	Fungal Contamination	Viral Contamination
Beder 2008		X		•								•																
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Butz 2005		X			•																							
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Epstein 2020		X	X		•																							
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Luckman 2020	X	X	X																						•			
Luksamijarulkul 2014		X																								•	•	
Matusiak 2020	X	X	X			•	•						•							•	•		•					
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Person 2018		X											•															
Pifarre 2020		X	X	•	•																							
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Prousa 2020	X	X	X															•										
Ramirez 2020		X	X														•											
Rebmann 2013		X	X	•	•							•	•	•	•		•											
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Scarano 2020		X	X			•	•						•								•							
Shenal 2012	X	X	X											•														
Smart 2020		X	X				•						•															
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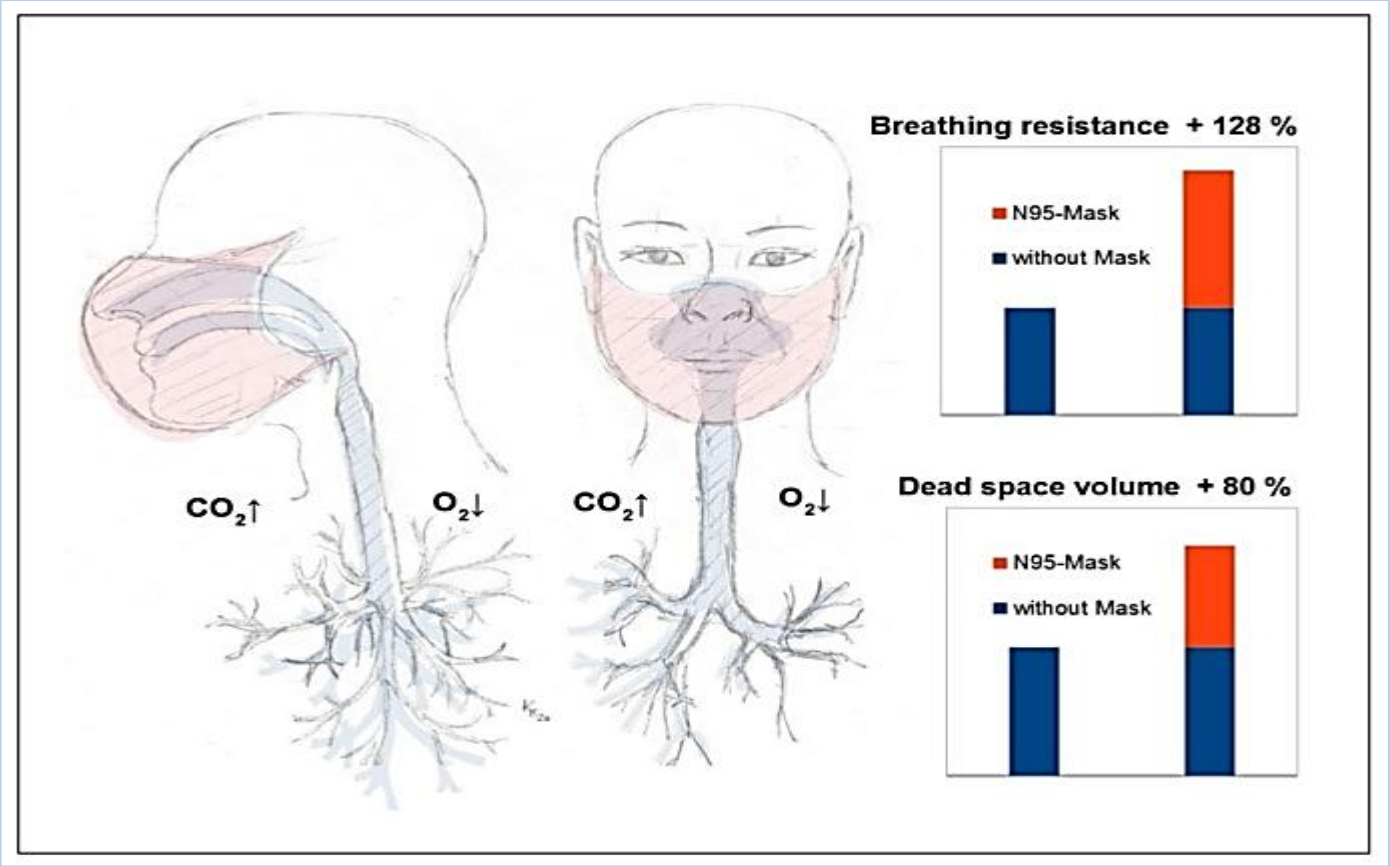
Zhiqing 2018		X																								•		

Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards?

By Kai Kisielinski, Paul Giboni, Andreas Prescher, et al.
Int J Environ Res Public Health. 2021 Apr; 18(8): 4344.
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8072811/

Many countries introduced the requirement to wear masks in public spaces for containing SARS-CoV-2 making it commonplace in 2020. Up until now, there has been no comprehensive investigation as to the adverse health effects masks can cause. The aim was to find, test, evaluate and compile scientifically proven related side effects of wearing masks. For a quantitative evaluation, 44 mostly experimental studies were referenced, and for a substantive evaluation, 65 publications were found. The literature revealed relevant adverse effects of masks in numerous disciplines. In this paper, we refer to the psychological and physical deterioration as well as multiple symptoms described because of their consistent, recurrent and uniform presentation from different disciplines as a Mask-Induced Exhaustion Syndrome (MIES). We objectified evaluation evidenced changes in respiratory physiology of mask wearers with significant correlation of O_2 drop and fatigue ($p < 0.05$), a clustered co-occurrence of respiratory impairment and O_2 drop (67%), N95 mask and CO_2 rise (82%), N95 mask and O_2 drop (72%), N95 mask and headache (60%), respiratory impairment and temperature rise (88%), but also temperature rise and moisture (100%)

under the masks. Extended mask-wearing by the general population could lead to relevant effects and consequences in many medical fields.



Pathophysiology of the mask (important physical and chemical effects): Illustration of the breathing resistance* and of the dead space volume of an N95 mask in an adult. When breathing, there is an overall significantly reduced possible gas exchange volume of the lungs of minus 37% caused by the mask (Lee 2011) according to a decrease in breathing depth and volume due to the greater breathing resistance of plus128%* (exertion when inhaling greater than when exhaling) and due to the increased dead space volume of plus80%°, which does not participate directly in the gas exchange and is being only partially mixed with the environment. (* = averaged inspiration and expiration according to Lee 2011 including moisture penetration according to Roberge 2010, ** = averaged values according to Xu 2015).

EDITOR'S COMMENT: The above-measured alterations, result in (1) an increase in humidity and temperature under the mask, thus favoring the development of microbial infections from viruses and fungi. (2) an increase in heart rate – blood pressure as well as fatigue even after light exercise (it is especially evident in athletes and children during the gym class). (3) hypoxia that causes the pulmonary artery to constrict and hypercapnia causing vasodilation of the blood vessels in the brain; thus, resulting in small pulmonary and cerebral edemas respectively, and people complaining of symptoms such as respiratory discomfort – dizziness – headache, and drowsiness.

Explained: COVID-19 PCR Testing and Cycle Thresholds

Source: https://www.publichealthontario.ca/en/about/blog/2021/explained-covid19-pcr-testing-and-cycle-thresholds

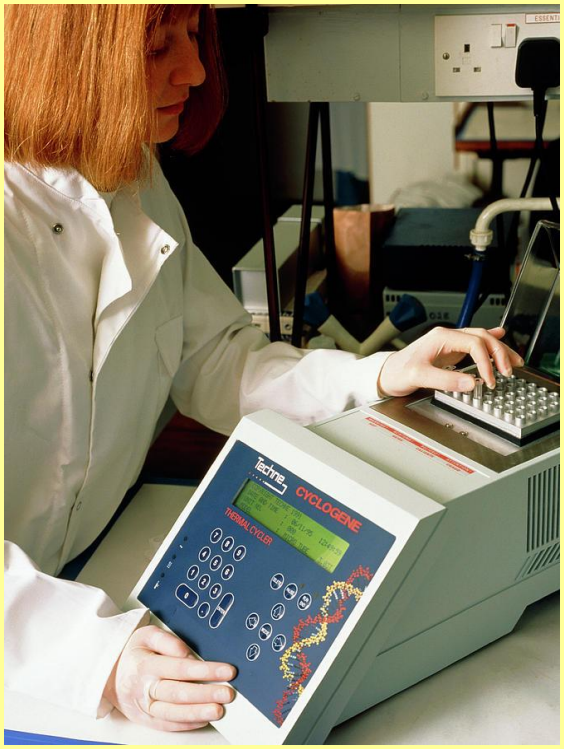
PCR, DNA, RNA, sensitivity, amplification, cycle thresholds?
There's a lot of information out there on COVID-19 testing and you've probably come across these words before. But what do they mean? Why are they important for COVID-19 testing? And how do they all fit together? We are going to break it all down for you.

Understanding COVID-19 terms

Before we start, it's important to understand some common terms.
Coronavirus: are a large family of viruses that cause disease in mammals and birds. In humans, they are known to cause respiratory illness such as the common cold, which is mostly caused by seasonal coronaviruses. Novel coronaviruses include the viruses that cause Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).
SARS-COV-2: is the name of the specific coronavirus responsible for the COVID-19 pandemic.
COVID-19: is the disease caused by SARS-CoV-2 virus.

Back to Basics: DNA and RNA

Let's go back to science class — remember all those lessons on DNA (deoxyribonucleic acid) and RNA (ribonucleic acid)? DNA and RNA are genetic material found in living things, including humans, animals, plants – and even viruses. They carry the specific blue print or building blocks for how living things are made and developed (the genetic code). The genetic blueprint in humans is coded in DNA. Viruses are different as most viruses either have DNA or RNA (not both). The genetic code for SARS-CoV-2 (which we will refer to from now on as the virus) is coded in RNA. So, why do we need to know this? Well, the COVID-19 lab test is actually looking for the genetic material of the virus (we'll get to that soon).



PCR Testing: The Gold Standard

PCR testing (also known as polymerase chain reaction testing) was developed over 35 years ago and is one of the most widely used lab tests for finding viruses (and other pathogens like bacteria, fungi and parasites) that cause diseases such as Ebola, SARS and now COVID-19 (SARS-CoV-2). The World Health Organization recommends Nucleic Acid Amplification Testing (which includes PCR testing) as the preferred testing method for COVID-19 and tells us if someone is infected with the virus.
The test requires a sample from a person, which is collected by a health care provider. The gold standard for sample collection method is the nasopharyngeal swab, a swab inserted deep into a person's nose. However, other sample types exist including combinations of a nose and throat swab and also saliva samples.
Now that you have a bit of background information, let's get into some of the most common questions people ask about PCR testing.

How does PCR actually detect COVID-19?

As we mentioned earlier, the PCR tests are designed to look for the virus' genetic material. Since coronaviruses don't have DNA, the first step of PCR testing is converting the virus's RNA into DNA in a process called reverse transcription. This is because DNA is a lot more stable than RNA. The PCR machine then makes millions of copies of the DNA by running multiple "cycles" (like a washing machine). This process is called amplification and is extremely important in finding even the smallest amounts of DNA. As more cycles are run, more copies of the DNA are made —doubling every time it is copied —and making it easier to find. If the piece of DNA cannot be copied, there is no virus in the sample, or there is such a low amount that even this very sensitive test cannot detect it.

How do you know when a COVID-19 test is positive?

PCR tests tell you if the virus is detected (positive) or not (negative). Each PCR test has cutoff points (the number of cycles it runs), which tells the machine to stop running the test. It is important to note that different brands who make the PCR tests may have different cutoff values based on how sensitive the test is and how the test is designed. Additionally, laboratories across the province involved in COVID-19 testing use different testing kits.
At PHO, we have developed a PCR test in our lab, with positive and negative cutoff points. The cutoff point for a positive result for PHO's developed lab test is 38 cycles. This means that if the virus is found at or before 38 cycles are completed, then the test is considered positive. The cutoff point for a negative result is 40 cycles. If the virus is detected between

38 and 40 cycles, we call this an indeterminate or inconclusive result. All inconclusive results are considered probable (likely) cases for public health reporting.

What are cycle threshold values?

The cycle threshold (Ct) value is the actual number of cycles it takes for the PCR test to detect the virus. It indicates an estimate of how much virus was likely in the sample to start with – not the actual amount. If the virus is found in a low number of cycles (Ct value under 30), it means that the virus was easier to find in sample and that the sample started out with a large amount of the virus. Think about it like the zoom button on your computer, if you only have to zoom in a little (zoom at 110%), it means that item was big to start with. If you have to zoom a lot (zoom at 180%), it means that the item was small to start with.

"Most samples that test positive at PHO are found after a low number of cycles are run. However, any indication of the virus in a sample is important, regardless of how many cycles it took to find."
— Samir Patel, Clinical Microbiologist and Deputy Chief Microbiology, Public Health Ontario

Can Ct values tell how serious an infection is?

Ct values are influenced by a number of factors including the PCR test kit, when the sample was collected, the machine used for testing, the technique of the health professional obtaining the sample and the type of sample (sampling method). In fact, different samples from the same person may result in different Ct values. Therefore, Ct values cannot actually tell you how severe of an infection you have or if you are more likely to develop severe disease – they simply indicate approximately how much virus was likely in the sample to start with. Several research studies are currently being done to look at the link between Ct values and severity of disease and infectiousness.

Although Ct values do not indicate the severity of disease, they may be able to provide important information for clinical and public health decision making when carefully analyzed with other factors such as type of test used, history of exposure to COVID-19, symptoms and individual characteristics of the patients. This analysis is completed by health care professionals and their testing laboratory, who have a deep understating of all factors being looked at.

Why aren't cycle threshold reported on test results?

Like with other PCR tests (including non-COVID-19 tests), it is not recommended to provide Ct values on test results in Ontario (and Canada). PCR tests tell us if the virus is present or not in the sample provided to the lab; however, there are other factors to consider in interpreting lab results. Ct values are not directly comparable from one PCR test kit to the next, and can change with increased transportation times, sample storage conditions, and sample collection method.

Because of this, Ct values can help support lab specialists in validating results as well as reviewing complex cases. However, they need to be considered alongside the other important factors we discussed earlier – like exposure history and individual characteristics. At PHO, Ct values are available to health care professionals upon request, and low level detected results (Ct value 35 to 38) are indicated on the laboratory report (since November 2020). We also have specialists who are available to health care professionals who have any questions on interpreting lab results or want to discuss complex cases. There is still a lot to learn about Ct values and more research is required to fully understand Ct values and their link to disease onset, severity and infectiousness.

▶▶ **Read also this PHE (UK) document:** Understanding cycle threshold (Ct) in SARS-CoV-2 RT-PCR

When will the Covid-19 pandemic become endemic?

Source: https://www.thenationalnews.com/uae/2021/12/19/when-will-the-covid-19-pandemic-become-endemic/

Dec 19 – You wake with a sore throat, a persistent cough and a mild fever. Feels like Covid, probably is.

You take a rapid home digital PCR test which confirms it. No matter. You can work from home for three days. Formal home isolation was already scrapped. And you've just had your annual booster shot.

Today, as the Omicron variant causes havoc in Europe and elsewhere, such a scenario seems a long way off. Yet some experts think the coronavirus will become only one of many respiratory infections that infects each of us periodically.

It will become endemic – meaning that it continues to exist and to infect people, but with fewer consequences for most. An expected reduction in virulence, deaths and a strengthening of immunity will help to explain the change.
There is much uncertainty on how long this will take but it is likely to be measured in years rather than months.

Will the coronavirus infect us indefinitely?
Prof Paul Hunter, a professor in medicine and infectious diseases specialist at the University of East Anglia in the UK, says the coronavirus will "get less and less severe" but will continue to reinfect people.
"Our grandchildren's grandchildren will catch Covid, but it won't cause the same level of harm," he said. "Even without new variants, we would expect to see waves and surges as we approach the endemic equilibrium."
Endemic equilibrium occurs when case numbers become approximately stable, although new variants will further upset the equilibrium.
"If it hadn't been for Omicron, I would suppose we were getting close to endemicity. Omicron has thrown that out," he said.
It is not considered possible to eliminate the coronavirus, not least because although they reduce transmission, vaccines do not stop it completely, so "herd immunity" – where existing immunity prevents spread – is regarded as unachievable.

Cars wait in line at a Covid-19 drive-through testing site at Tropical Park in Miami just before Christmas. Reuters

What can we learn from the Russian flu?
The "Russian flu" pandemic began in 1889 and caused several waves of disease in subsequent years, with people suffering similar symptoms to those associated with Covid-19. An estimated one million people died.
Although called the Russian flu, scientists have proposed that this pandemic was actually caused by a coronavirus.
The virus may have been OC43, a human coronavirus that continues to circulate but typically without causing severe disease.

"Most of the time it's asymptomatic or it's another cause of the common cold," said Prof Hunter.
Today, people are typically infected with OC43 every three to six years, Prof Hunter said, and in certain years infection rates are higher than others, probably because a new variant has developed.
The coronavirus pandemic may follow a similar trajectory and, as with OC43, people will stop worrying about waves of infections because the symptoms will become less severe.
"With the virus, particularly new variants that can escape immune control, we will see big surges, but each surge should, in theory, be associated with fewer severe cases. So far that looks like what's happening, even with Omicron," he said.
"We'll almost certainly have another wave, but probably even less severe than this one. Ultimately, we'll stop caring about waves because they will just be causing the common cold, like other coronaviruses."

Will the transition to endemicity be smooth?
New variants, most recently Omicron, could throw into turmoil hopes that the coronavirus will become less of a burden on society in the next couple of years.
Prof Eskild Petersen, of Aarhus University Hospital in Denmark and chairman of the European Society of Clinical Microbiology and Infectious Diseases, said new variants make it "impossible to say" when life will return to normal.
Omicron has, he said, "really changed the story", because immunity from previous infection or immunisation appears to offer much less protection. Cases in many countries, including Denmark, are rising fast.
"Maybe in 10 years' time, everyone will have a background immunity. Until that happens, you will have outbreaks," he said.
"What we see with influenza is we have a background immunity. We've been exposed [since] birth."
He said it would take "several years" to build up a similar level of immunity in society against the coronavirus.
In countries with low vaccination rates, researchers have noted that populations remain susceptible to severe disease because far fewer people have antibodies against Covid-19. There is also a greater risk of the numbers of infections rising fast in these nations. Therefore vaccinating the most medically vulnerable people across the world is seen as a continued priority.

Will testing and quarantine become a thing of the past?
While regulations vary from country to country, coronavirus tests have often become a part of life for people who are travelling, entering sporting events or entertainment venues or who have Covid-19 symptoms.
They will become "redundant", at least at the current level of "urgency and scale", says Ian Jones, a professor of virology at the University of Reading in the UK.
"I suppose because the tests are so well developed, they will remain a standard test for some time, but I don't think there will be the advice [as there is for some people in the UK] to take a lateral flow test twice a week. That will fade away," Prof Jones said.
"There are such tests for flu, but the average person on the street won't know about it because they're not told to focus on it as they are for Covid."
He said Covid-19 was likely to continue to be monitored, particularly during winter months, as is influenza.
"But it won't be any more than one of a bunch. It won't require the focus it's currently got," he said.
Quarantine requirements are also likely to lessen or be eliminated over time as the virus becomes one of many endemic infections.
Also, if the coronavirus becomes less dangerous, as some expect, and immunity strengthens because of previous infections, booster vaccination doses may not be needed indefinitely, Prof Jones suggested.
Results from Hong Kong this week indicating that Omicron replicates more readily than other variants in the upper respiratory tract, but does not travel down to the lungs so much, may indicate the virus is already becoming less pathogenic, he said.
"We may be seeing the beginning of the virus attenuating – of getting weaker in terms of disease, but more successful in transmission," he said.

that's it!

Developed in Germany, Manufactured by Osho Healthcare & LifeSciences – India
Source: http://www.oshohealth.com/

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- ✓ Particularly **effective against corona,** influenza and multi-resistant bacteria (MRSA) **for up to 1 year**

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- ✓ Seals surfaces and **makes >99.98%** of all enveloped viruses and bacteria harmless
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SARS-CoV-2 Neutralized by Antibody-Like Proteins from Sharks

Potential COVID-19 treatment could be found in Single-domain Variable New Antigen Receptors (VNARs) derived from the immune system of sharks. In a new study, these unique, antibody-like proteins prevented variants of SARS-CoV-2, and related coronaviruses, from infecting human cells. Indeed, the neutralization "rivaled or exceeded" other antibody treatments. Although not yet tested in humans, researchers hope VNARs can be used for future Coronavirus outbreaks. **+ MORE**

Fridge-Free COVID-19 Vaccines a Possibility

Stablepharma officials claim their patented StablevaX™ technology can thermally stabilize and deliver a wide range of vaccines without the requirement for refrigeration. They say their stabilized vaccine solution could eliminate the need for the cold chain and enable stockpiling anywhere in the world. StablevaX is designed to enhance the performance of existing and new vaccines, according to the company. **+ MORE**

Third mRNA COVID vaccine dose in young kids tested after two doses fail

Pfizer is reporting two small doses of mRNA COVID-19 vaccine do not generate effective immune responses in two to five-year-olds. The trial is being amended to add a third dose, but it's unlikely the vaccine will be available before well into 2022. **Read more**

Biodefense and Countering Disease with Neutralizing Antibodies

Source: https://globalbiodefense.com/2021/12/15/biodefense-and-countering-disease-with-neutralizing-antibodies/

Sandia National Laboratories

Dec 15 – Scientists at Sandia National Laboratories have created a platform for discovering, designing and engineering novel antibody countermeasures for emerging viruses.

This new process of screening for nanobodies that "neutralize" or disable the virus represents a faster, more effective approach to developing nanobody therapies that prevent or treat viral infection.

Traditionally used to treat a variety of conditions, including cancer, autoimmune and inflammatory diseases, nanobodies are smaller components of conventional antibodies — a vital element of the body's immune system that defends against disease-causing viruses or bacteria.

"The coronavirus pandemic has made evident the need for a broad range of preventive and therapeutic strategies to control diseases associated with novel viruses," said Craig Tewell, director of Sandia's Chemical, Biological, Radiological, and Nuclear (CBRN) Defense and Energy Technologies Center.

With a rich history of biodefense research, Sandia helps protect the nation and the world from threats presented by bioterrorism and naturally occurring diseases, Tewell said.

"With a deep understanding of how infectious disease develops and spreads, as well as how the immune system defends from infection," Tewell said, "our researchers are in a unique position to advance the creation of a wide array of disease-fighting tools, including nanobodies."

Virologist Brooke Harmon leads Sandia's nanobody research, a new and growing area of bioscience.

"Vaccines are very good at preventing infection, but they can take a long time to be developed and move through the regulatory process," Harmon said. "We saw a critical need to create effective therapies that can be rapidly developed and deployed."

Once the protein sequence, or genetic coding, of a virus, has been identified, Sandia researchers have shown they can produce a nanobody-based countermeasure within 90 days. The method has not yet been tested on humans. Speeding up the discovery of neutralizing antibodies could reduce the impact of future viral outbreaks.

"Under current practice, virologists rely upon patients' blood samples to build an antibody library that we can then screen for potential treatments. This means we have to wait, either for people to become infected or for those who are vaccinated to build an immune response," Harmon said. "Sandia's new method is more forward-thinking. Because we have already

built a highly diverse, proprietary library, we can begin to screen for extremely potent neutralizing nanobodies as soon as the genetic coding of a virus has been identified."

Nanobodies' Diverse Attributes

Neutralizing nanobodies represent an attractive strategy, Harmon said, due to their ability to work effectively against an entire family of viruses or variants.

"We can take advantage of the fact that virus families tend to interact with immune response in the same way," Harmon said. "This makes our treatments rapidly adaptable to all variants of a virus."

Nanobodies are modular, meaning they can be combined with other nanobodies to increase their ability to bind to the virus or target specific tissues. Nanobodies can also be produced as smaller versions of conventional antibodies with the ability to engage the immune response.

Additionally, due to the small size of the nanobodies, they can be released into the blood and penetrate tissues more thoroughly than conventional antibodies. Nanobody therapies can also target an infection site directly, decreasing the dose needed and increasing efficacy.

Nanobodies can also be administered via aerosol, so they can be given to a patient orally or in an inhalable form. Conventional antibody treatments are less versatile and must be received through injection only.

"All of these qualities and features of nanobodies make nanobody therapies more effective than current solutions. These treatments are also easier and cheaper to manufacture," Harmon said, "making Sandia's method for developing and characterizing novel neutralizing antibodies an invaluable addition to the toolset for combatting the COVID-19 pandemic and future health crises."

Royal Caribbean ship docks at Miami port with 48 cases of COVID

Source: https://www.miamiherald.com/news/business/tourism-cruises/article256719962.html

Dec 20 – Forty-eight passengers and crew members tested positive for COVID-19 on **Royal Caribbean's Symphony of the Seas ship**, which docked at PortMiami on Saturday, the cruise company said. The four dozen cases on the massive cruise ship, where vaccination was required for the vast majority of passengers 12 and over, are prompting worries and speculation that cruising may see a repeat of the disastrous spread of COVID-19 that occurred at the onset of the pandemic — and the subsequent shutdown of the industry for more than a year. In a statement on Sunday, Miami-based Royal Caribbean said that each person who tested positive immediately went into quarantine. Six people who tested positive disembarked the ship mid-voyage and were transported home. The ship that pulled into Miami the day before left port on Dec. 11 with 6,091 passengers and crew on board,

95% of whom were fully vaccinated. Of the 48 who tested positive for COVID-19, 98% were fully vaccinated. Royal Caribbean said in a statement that the passengers who tested positive were either asymptomatic or had mild symptoms. However, passengers noted that was not the case. James Johnson and Connor O'Dell, an engaged couple who live in

Orlando, were on Symphony of the Seas with a group of 12 family members. All members of their party were fully vaccinated. Johnson's aunt started feeling very ill with a sore throat and an earache and later developed a strong cough. After testing positive for COVID-19, Johnson said she only received an oxygen and temperature check and was told that the medical staff was too overwhelmed to monitor her more closely. The couple and the rest of their party, who had been in close contact with Johnson's aunt and had gone to the ship's crowded night club, said that they received conflicting information from Royal Caribbean about whether they needed to quarantine and that initially they would not give them coronavirus tests. "We did our research and read their COVID policies, on their site they say they have excellent testing capabilities, that's why we thought it was safe to go," Johnson continued. "They failed their safety standards." "I bought into the safety aspect," added O'Dell, whose dad also tested positive and is now getting Regeneron's antibody therapy at his home in Tampa. "I was reading the literature they have online and thought, 'how much safer can you get?' Everyone's vaccinated and has to get tested. And then you get on board and find yourself in the middle of the outbreak." The voyage that resulted in 48 positive cases of COVID-19 was a seven-night Caribbean itinerary leaving from Miami and visiting St. Maarten; St. Thomas in the U.S. Virgin Islands; and CocoCay, the cruise line's private island in the Bahamas. The new cases come as the omicron variant is quickly spreading across the United States, potentially throwing a wrench in holiday travel plans. Royal Caribbean said that Symphony of the Sea's future trips would not be affected. The ship has already left Miami for a new trip to Mexico, according to vesselfinder.com. Royal Caribbean requires that all passengers on the Symphony of the Seas who are 12 or older be fully vaccinated. All passengers must take a COVID test before boarding. Crew members are required to be fully vaccinated and are tested weekly. While the breakthrough cases may be a setback for the cruise industry, which only began restarting over the past six months, it's still too soon to know the damage that omicron will do. The variant was only identified about a month ago in South Africa and scientists are still searching for answers about how contagious and severe it is, and how it affects vaccinated people. Cruise industry leaders say that being on a cruise ship is the safest kind of vacation travelers can take at the moment because of the controlled environment where they can mandate vaccines. But breakthrough infections have the potential to put the industry in a bad spot again. Cruises were COVID-19 hot spots at the onset of the pandemic, causing the industry to completely shut down for over a year. Many cruise lines had to take on massive debts while they were unable to make any revenue for the better part of a year and a half. Julia Simpson, the president and CEO of the World Travel & Tourism Council, a global tourism industry body, said she hopes that the tourism sector can continue operating through the holidays, for now, warning of the economic impact of shutting down travel again. The U.S. lost 5.5 million tourism-sector jobs during the pandemic, a WTTC economic impact study found.

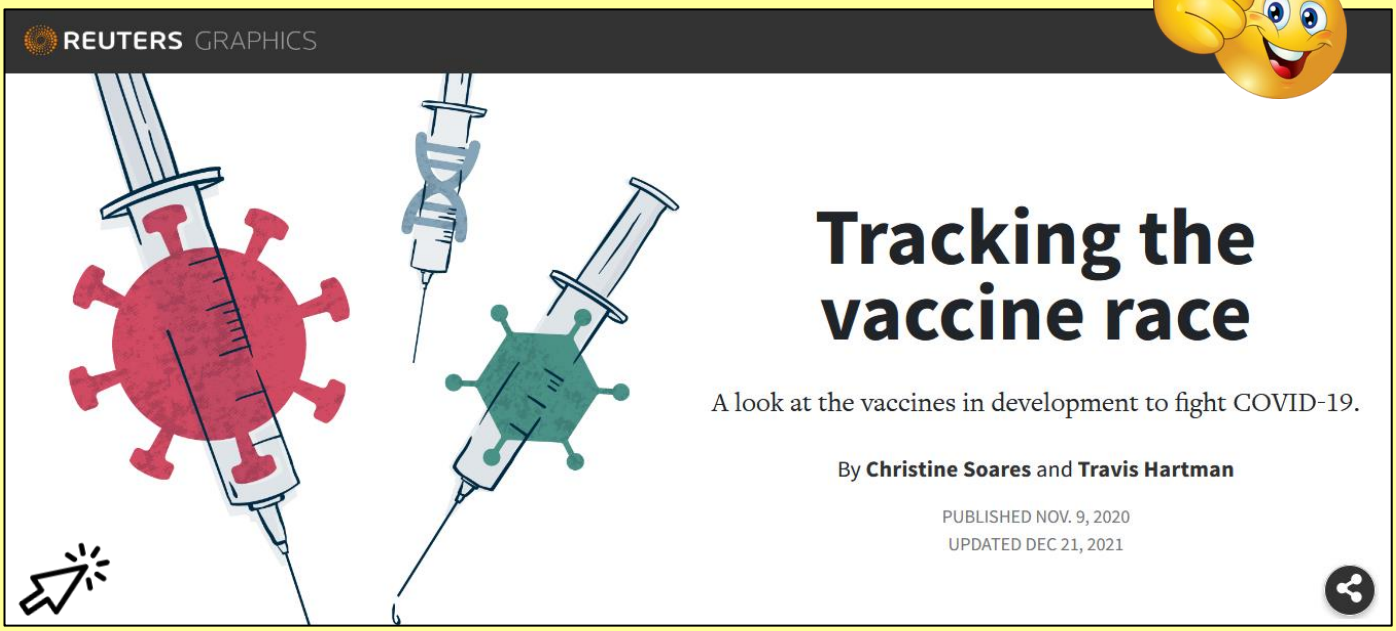
"The WTTC believes that fully vaccinated travelers, during this precious time to see family and friends, should be able to travel freely," she said. "It's been proven that closing borders do not decrease the spread. If they close borders for the holiday season, it will be a serious blow to the travel and tourism sector."

EMA current vaccines status – Dec 2021

Currently under a rolling review	Marketing authorization application submitted	Authorized for use in the European Union
• **Sputnik V, Gam-COVID-Vac** (Gamaleya Institute) • **COVID-19 Vaccine (Vero Cell) Inactivated** (Sinovac) • **Vidprevtyn** (Sanofi Pasteur) • **VLA2001** (Valneva)	No applications currently under evaluation	• Comirnaty (BioNTech and Pfizer) • Nuvaxovid (Novavax) • Spikevax (Moderna) • Vaxzevria (AstraZeneca) • COVID-19 Vaccine Janssen

Pfizer CEO Albert Bourla Admits the Presence of 'Biological Chip' in Vaccines? Viral Video Fuels 'Microchip' Conspiracy Theory

▶▶ **Read also:** https://www.snopes.com/fact-check/pfizer-bourla-vaccine-microchip/



The race to create vaccines against the novel coronavirus is entering a critical stretch, with several candidates that were first out of the gate beginning to release late-stage trial data and possibly seeking early regulatory approval. Multiple "winners" are likely to make it to the market, and success will depend on several factors reflected in this tracker.

Anthrax toxin may be the key to new pain-blocking therapies

Source: https://newatlas.com/medical/harvard-anthrax-toxin-pain-blocking-therapy/

Dec 20 – Early preclinical work led by researchers from Harvard Medical School has found **certain elements in a toxin produced by the anthrax bacterium can silence activity in pain-signaling brain neurons.** The research proposes this could be a new model for future pain therapeutics.

Anthrax toxins are composed of several molecules secreted by the anthrax bacterium. On their own each protein is non-toxic, but in combination they can be lethal. This new research first set out to understand how these anthrax toxins affect neurons in the brain.

The research first discovered specific pain-sensing neurons in the dorsal root ganglion (DRG) seem to carry receptors with a high affinity for binding to anthrax toxins. Across a series of impressive experiments the researchers demonstrated exactly how two particular anthrax proteins altered signaling inside nerve cells.

There are two kinds of anthrax toxins – edema toxin and lethal toxin. Both toxins share a key protein in common, called PA (protective antigen). PA has been likened to a Trojan horse, helping to ferry either the edema factor (EF) protein or the lethal factor (LF) protein into a cell.

The new research compellingly demonstrated how the **edema toxin** (composed of PA and EF) can selectively target and silence pain-signaling neurons in the dorsal root ganglion.

Mouse experiments showed when these two proteins were injected into the animals' spine they effectively homed in on certain neurons in the brain and blocked pain sensations.
"This molecular platform of using a bacterial toxin to deliver substances into neurons and modulate their function represents a new way to target pain-mediating neurons," says Isaac Chiu, senior investigator on the research.
Because these anthrax proteins are so accurate in the neurons they specifically target, the researchers experimented with using them as a novel carrier system. In this instance botulinum toxin, known to suppress pain signaling, was hidden inside this anthrax protein delivery system. In mice this unique approach also effectively blocked pain sensations.
"We took parts of the anthrax toxin and fused them to the protein cargo that we wanted it to deliver," explains Nicole Yang, first author on the new study. "In the future, one could think of different kinds of proteins to deliver targeted treatments."
Of course, it is very early days for this kind of research and lots more work will be needed before a potential new therapy moves from the lab to the clinic. The researchers are confident by delivering this edema toxin to the brain through the spine, called intrathecal administration, it will avoid potential toxicity problems in the rest of the body. However, further research is obviously needed to better understand any broader effects this toxin could have on the brain directly.
So far the early signs are this toxin's activity on the brain is highly targeted and there were no indications in the animal tests to suggest there were disruptions to other mechanisms such as motor function. The researchers intriguingly hypothesize that this incredible specificity of the toxin's activity in the brain could be an evolutionary adaptation helping the anthrax bacterium avoid detection in organisms it infects.
A common feature of anthrax is black skin lesions that are frequently described as painless by patients. Chiu speculates this pain-blocking mechanism may explain that strange analgesic phenomenon. He also points out this research is a perfect example of how the natural world can help scientists develop new ways of treating pain.
"Bringing a bacterial therapeutic to treat pain raises the question 'Can we mine the natural world and the microbial world for analgesics?'" adds Chiu. "Doing so can increase the range and diversity of the types of substances we look to in search for solutions."

▶▶ **The new study was published in the journal** *Nature Neuroscience*.

Sperm quality and absence of SARS-CoV-2 RNA in semen after COVID-19 infection: a prospective, observational study and validation of the SpermCOVID test

By Gilbert G.G. Donders, M.D., Ph.D., Eugene Bosmans, Pharm.D., Jente Reumers, M.Sc, R.N., et al.
J Fertility & Sterility | December 2021
Source: https://www.fertstert.org/article/S0015-0282(21)02156-7/fulltext

To study the contagiousness of sperm and its influence on fertility after recovery from COVID-19 infection.

Design

Prospective cohort study.

Setting

University medical center.

Patient(s)

One hundred twenty Belgian men who had recovered from proven COVID-19 infection.

Main outcome measure(s)

Sermm quality was assessed using the World Health Organisation criteria. DNA damage to sperm cells was assessed by quantifying the DNA fragmentation index and the high density stainability. Finally antibodies against SARS-CoV2 spike-1 antigen, nuclear and S1-receptor binding domain were measured by Elisa and chemilumenscent microparticle immunoassays, repsectively.

Result(s)

SARS-CoV-2 RNA was not detected in semen during the period shortly after infection nor at a later time. Mean progressive motility was reduced in 60% of men tested shortly (<1 month) after COVID-19 infection, 37% of men tested 1 to 2 months after COVID-19 infection, and 28% of men tested >2 months after COVID-19 infection. Mean sperm count was reduced in 37% of men tested shortly (<1 month) after COVID-19 infection, 29% of men tested 1 to 2 months after COVID-19 infection, and 6% of men tested >2 months after COVID-19 infection. The severity of COVID-19 infection and the presence of fever were not correlated with sperm characteristics, but there were strong correlations between sperm abnormalities and the titers of SARS-CoV-2

IgG antibody against spike 1 and the receptor- binding domain of spike 1, but not against nucleotide, in serum. High levels of antisperm antibodies developed in three men (2.5%).

Conclusion(s)

Semen is not infectious with SARS-CoV-2 at 1 week or more after COVID-19 infection (mean, 53 days). **However**, couples with a desire for pregnancy should be warned that sperm quality after COVID-19 infection can be suboptimal. The estimated recovery time is 3 months, but further follow-up studies are under way to confirm this and to determine if permanent damage occurred in a minority of men.

Vaccine Industry Applies Lessons from the COVID-19 Response

Source: https://www.genengnews.com/virology/coronavirus/vaccine-industry-applies-lessons-from-the-covid-19-response/

Dec 03 – The vaccine industry recognized the potential of mRNA vaccines as far back as the 1980s.[1] It anticipated that mRNA molecules could be synthesized in large quantities more quickly and cheaply than proteins.[2] And it also knew that mRNA vaccines would help patients avoid infection risks of the sort posed by live attenuated viral vaccines. Eventually, experimental mRNA vaccines advanced to preclinical studies. For example, mRNA vaccines were evaluated in animal models of rabies,[3] influenza,[4] Ebola, and Zika.[5] Until recently, however, challenges associated with delivery and stability hindered development.[6]

Then, last year, COVID-19 changed everything. The disease inspired so much collaboration and lent such urgency to development that longstanding obstacles to development were swept aside.

"COVID-19 drove innovation, academic and industrial collaborations, and new ways of working," says Katarina Stenklo, enterprise solutions commercial activation leader, Cytiva. "Significant funding made it possible to develop new vaccine technologies such as mRNA, to run phases of clinical trials in parallel, and to accelerate regulatory approvals.

"Regulatory bodies created a fast lane for COVID-19 vaccines, enabling the acceleration of their processes. They didn't have any less rigor around review and approvals, but they found ways to reduce timelines through the parallelization of activities. For example, regulators started reviewing results periodically from clinical trials as they became available, instead of waiting for the completion of the full report."

Infrastructure efforts

COVID-19 also helped create the infrastructure needed to work with mRNA. Moderna and Pfizer/BioNtech started planning for large-scale mRNA vaccine production last year. The companies began adding internal capacity[7] and arranging deals with contractors. Behind the scenes, significant efforts were initiated to standardize and modularize production platforms and facilities.

"Investments have been made in building manufacturing capacity in parallel with product development and clinical trials, resulting in rapid and deployable access to vaccine manufacturing capacity," Stenklo observes. "COVID-19 challenged the materials sourcing for vaccine suppliers and manufacturers. Manufacturers wanted large quantities of the same products at the same time, so suppliers ramped up their manufacturing capacity or built new capacity to meet the demand.

"This is where the vaccine manufacturers must consider speed and flexibility. Continuous planning, which calls for close relationships and regular communications between suppliers and manufacturers, is critical to delivering for customers."

Besides offering encouragement to the mRNA vaccine sector, the successes seen with mRNA vaccines auger well for the wider vaccine industry. "Given the efficacy of these new vaccines," Stenklo remarks, "we will likely see the new modalities such as mRNA being studied in other disease categories."

Manufacturing changes

The COVID-19 response has proved to patients, governments, and the vaccine industry that mRNA-based shots are effective and have commercial potential. But the rush to develop and supply vaccines to slow and potentially stop the pandemic did not give the industry time to optimize production methods, which is what must happen now.

"For the first approved vaccines, manufacturers likely used a process that had worked before and scaled up what was good enough," Stenklo suggests. "Not much time was spent on optimizing the processes for manufacturability. I think that with new generations of vaccines, we will see more optimized and intensified processes, and a focus on process economy."

Stenklo adds that any changes in vaccine production that have occurred since the COVID-19 pandemic are mostly limited to the production of lipid-nanoparticle-encapsulated mRNA

vaccines. For other vaccines, such as vaccines based on viral vectors and recombinant proteins, manufacturing processes remain much the same.

The speedy distribution of COVID-19 vaccines is dramatized by this image, which shows a shipping container full of Pfizer/BioNTech COVID-19 vaccine being hustled through a sorting facility

Wider lessons

For vaccine developers not directly involved in the fight against COVID-19, the pandemic's main impact has been to highlight weaknesses in production methods and supply chains. For Damini Patel, a field application scientist at biotech instrument developer InDevR, the biggest lesson was the need for better analytical technologies.

"Time is of the essence when it comes to vaccine development and production," Patel insists. "The coronavirus pandemic has shown everyone the importance of speed, but for those of us in the vaccine industry, the importance of speed is nothing new. For example, producers of influenza vaccines face short development timelines twice a year." (The World Health Organization's recommendations for the Northern Hemisphere's vaccine are issued in February; those for the Southern Hemisphere's vaccine are issued in September.)

"Slow, laborious, and often imprecise analytical techniques can be replaced by faster and better ones to help speed up the development and production process," Patel argues. At present, techniques that could stand improvement include single radial immunodiffusion (SRID)—a common means of estimating antigen concentration. "SRID is not sensitive enough in work with low concentration ranges and some recombinant sample types," she points out. "And it can take two to three days to complete an SRID run."

She also says that vaccine developers need better enzyme-linked immunosorbent assays (ELISAs). According to Patel, ELISA problems include variability, long preparation times, and the need for large sample volumes.

"High variability can result in erroneous data or require that tests be repeated, taking up extra time," she continues. "Older, single-plex techniques simply require more tests to be run, and that requires more trained personnel, which is hard to come by and adds cost."

Investment decisions

The pandemic has also impacted how investors approach decisions over manufacturing capacity. Usually, large-scale manufacturing capacity is established during late-stage development when the risk of failure is low. Developers calculate capacity based on forecasted demand, building in flexibility to cope with fluctuations.

COVID-19 prompted organizations like the WHO,[8] the EMA,[9] and CEPI[10] to reconsider how investment decisions are made. They suggested that instead of following the usual approach, the industry could invest in idle capacity. Then the industry would have capacity that could be brought online when needed. It would be better positioned to fight future pandemics and improve access to vaccines in general.

The advantages of idle capacity are clear, even though there are obvious economic difficulties. In addition, there are serious technological challenges.

Stenklo puts these challenges in the form of questions: "How do you invest in uncertainty? How do you know what's coming next? What's the product that will be manufactured? What will be the appropriate manufacturing scale, and how does a company make the correct manufacturing investments? What will be the size of the market for the next product? What scales are needed to support that market, and how urgent will this need be?"

"One specific challenge is knowing what manufacturing processes to invest in given the different types of vaccines," she continues. "Companies must have an ear to the ground, and they must keep their scientists informed and engaged. They must consider material suitability and product quality attributes early in the development stage. And they must always be thinking about scalability and manufacturability."

Stenklo suggests a flexible approach, specifically, the use of modular manufacturing technologies that can be reconfigured for each run or project. She explains that this approach would make it "easy to scale up and have a plan for expansion when it is needed."

Vaccine developers seeking flexibility are likely to outsource production. Outsourcing, Stenklo says, usually makes the most sense for smaller companies. "For a small or start-up company, it can be a challenge to get through the clinical trials," she elaborates. "This is where the large, established actors can be helpful. They already have experienced regulatory teams that can support clients throughout the trial process."

According to Stenklo, factors favoring the use of contract development and manufacturing organizations (CDMOs) in vaccine production include the global impact of COVID-19 and the likelihood that future disease outbreaks will affect multiple countries. "I think the CDMOs will definitely play a role going forward," she says. "They can be engaged for clinical-phase manufacturing but can also provide extra capacity when needed. A global CDMO will be able to support manufacturing in different parts of the world if the originator is a manufacturer without a global presence."

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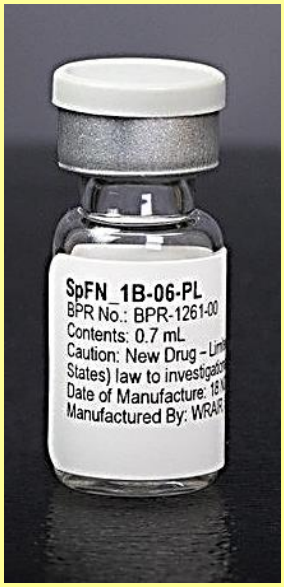
US Army testing a universal vaccine to target all coronavirus variants

Source: https://www.scmp.com/news/world/united-states-canada/article/3160730/coronavirus-us-army-testing-universal-vaccine

Dec 21 – The US Army is wrapping up early clinical trials on a vaccine it hopes will target all existing coronavirus variants.

Named **SpFN, for Spike Ferritin Nanoparticle**, it has shown promise in non-human primate trials and early human trial results are expected "this month," according to a press release from the US Army Walter Reed Army Institute of Research released Thursday.

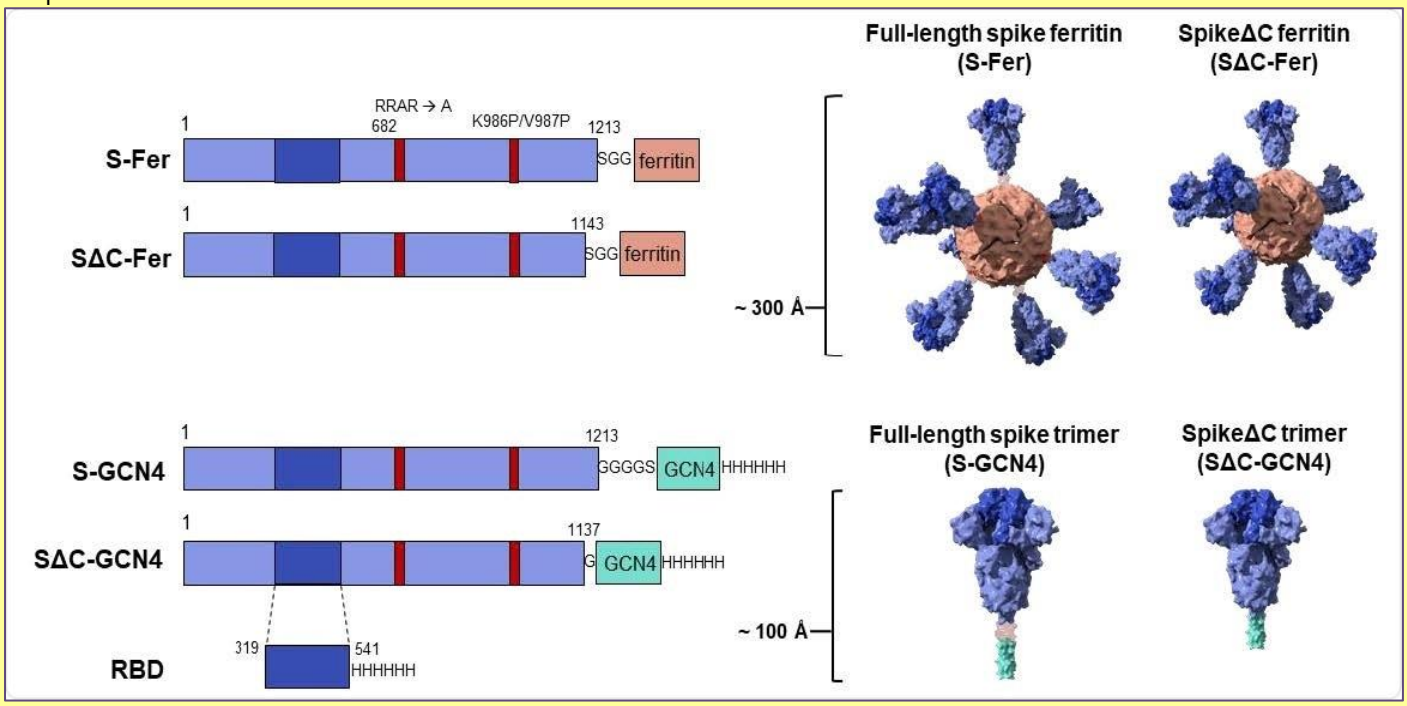
The jab could also help protect against other coronaviruses beyond Covid-19, which could offer hope against future pandemics.



A vial of spike ferritin nanoparticle (SpFN), WRAIR's Covid-19 vaccine. Photo: US Army

The vaccine is designed on a **new platform called "self-assembling protein nanoparticle**." Unlike most currently available vaccines, which use mRNA to trigger the immune system, this shot would work by injecting a molecule that looks a little like a **24-faced soccer ball**, according to defence One.

Each face of the "ball" would carry a bit of the spike protein that can trigger the body to mount a protective immune response. This allows scientists to attach the spikes of multiple coronavirus strains on different faces of the "ball," so the body could protect against several variants at once, instead of having to take a separate dose for each variant.



Construct design for SARS-CoV-2 spike-functionalized ferritin nanoparticles. All constructs are based on the Wuhan-Hu-1 amino acid sequence (GenBank MN9089473) of SARS-CoV-2 spike. Spike-functionalized ferritin constructs were made by fusing spike ectodomain (residues 1-1213) or spikeΔC (residues 1-1143) to the H. pylori ferritin subunit separated by an SGG linker. A structural representation based on the spike trimer cryo-EM structure (PDB 6VXX) and the H. pylori ferritin crystal structure (PDB 3BVE) depicts the 24-subunit particle displaying spike or spikeΔC on the surface. The estimated size of the spike-functionalized ferritin particles based on structural data is ~ 300 Å. The S-GCN4 and SΔC-GCN4 trimer constructs were made by fusing either the full-length spike residues (1-1213) or spikeΔC (1-1137) to a modified GCN4 trimerization domain followed by a hexahistidine tag. A structural representation of the spike trimers based on the cryo-EM structure (PDB 6VXX) is shown with an estimated length of ~ 100 Å. The RBD spans residues 319-541 of the spike protein and is preceded by the native signal peptide (not shown) and followed by a hexahistidine tag.

Early results in primates suggest the shot could work against Covid-19 variants and against other coronaviruses as well, the Army said.
According to a study published in the peer-reviewed journal Science Translational Medicine on Thursday, SpFN protected non-human primates from disease caused by the original variant of the Covid-19 coronavirus. **Two doses given 28 days apart** also triggered strong immune responses **against Alpha, Beta, Gamma, and Delta variants.**
Results from very early clinical trials of SpFN in humans, called Phase 1, are expected to be released "this month," the Army said in the press release.
In primates, SpFN was also able to trigger a strong immune response against Sars-CoV-1, a relative of the Covid-19 coronavirus responsible for the Sars outbreak that killed 774 people in 2002 and 2003.
The hope is that this shot could be an effective "pan-coronavirus" vaccine, which could target all sorts of coronaviruses.
The Army is not the only institute developing designs for pan-coronavirus vaccines. Such a vaccine could also be useful to prevent future pandemics, which are expected to be driven by other kinds of coronaviruses.
"The accelerating emergence of human coronaviruses throughout the past two decades and the rise of Sars-CoV-2 variants, including most recently Omicron, underscore the continued need for next-generation pre-emptive vaccines that confer broad protection against coronavirus diseases," said Dr Kayvon Modjarrad, Director of the Emerging Infectious Diseases Branch at WRAIR, co-inventor of the vaccine and the US Army lead for SpFN, in the press release.

People who are vaccinated in the afternoon have more antibodies

Source: https://newsfounded.com/romaniaeng/people-who-are-vaccinated-in-the-afternoon-have-more-antibodies-explanation-by-researchers/

Dec 13 – People who received the injection in the afternoon had certain antibodies that protected them from Sars-Cov2, according to one of the study's authors, Drs. Elizabeth Klerman, of Massachusetts General Hospital (USA). Klerman is an expert in the study of circadian rhythms and has also conducted tests for cancer patients who respond differently to the treatment. "Studies have shown that the administration of chemotherapeutic agents at a specific time of day effectively targets cancer cells, but reduces toxicity to other cells," the doctor said.
This is currently an observational **study** involving nearly 2,200 employees in the UK healthcare system. There are asymptomatic individuals for whom blood samples were taken after vaccination. Age, gender, and time of vaccination are taken into account.
In general, all subjects vaccinated **in the afternoon had more antibodies** after two or even ten weeks than those vaccinated in the morning. In addition, the test results show that Pfizer serum produced more antibodies in women and adolescents, in addition to the side effects associated with vaccination time.
One of the authors of the study, Dr. Elizabeth Klerman, believes that vaccination according to the body's biological rhythms can help streamline the vaccination campaign. It also draws attention to the fact that a stronger immune response can also cause side effects.

FDA authorizes first pill to treat Covid-19

Source: https://edition.cnn.com/2021/12/22/health/pfizer-antiviral-pill-authorized/index.html

Dec 22 – The US Food and Drug Administration on Wednesday authorized Pfizer's antiviral pill, **Paxlovid**, to treat Covid-19 in high-risk individuals **age 12 and older who weigh at least 88 pounds.**
This is the first antiviral Covid-19 pill authorized for ill people to take at home, before they get sick enough to be hospitalized.
"Today's authorization of PAXLOVID represents another tremendous example of how science will help us ultimately defeat this pandemic, which, even two years in, continues to disrupt and devastate lives across the world. This breakthrough therapy, which has been shown to significantly reduce hospitalizations and deaths and can be taken at home, will change the way we treat COVID-19, and hopefully help reduce some of the significant pressures facing our healthcare and hospital systems," Pfizer Chairman and CEO Albert Bourla said in a statement. "Pfizer stands ready to begin delivery in the U.S. immediately to help get PAXLOVID into the hands of appropriate patients as quickly as possible."
Paxlovid combines a new antiviral drug named nirmatrelvir and an older one called ritonavir.
Last week, Pfizer released updated results that showed the treatment cut the risk of hospitalization or death by 89% if given to high-risk adults within a few days of their first symptoms. If given within the first five days of symptoms, the efficacy was similar: 88%.

In November, the Biden administration announced that it would purchase 10 million treatment courses for $5.295 billion. A five-day course of Paxlovid includes three pills given twice a day. President Biden said he was encouraged by the "promising data" from Pfizer and said the drug would "mark a significant step forward in our path out of the pandemic."
He called Paxlovid a "potentially powerful tool in our fight against the virus, including the Omicron variant," but stressed that getting vaccinated and receiving a booster shot remained "the most important tools we have to save lives."
Separately, Merck has requested emergency use authorization for its antiviral pill, molnupiravir. It was narrowly recommended by FDA's advisers in a 13-10 vote at the end of November after data showed it cut the risk of hospitalization or death by 30% among high-risk adults. This was lower than an earlier analysis suggesting that number could be around 50%. The FDA has not announced whether it will authorize the treatment.
Remdesivir, sold under the brand name Veklury, is the only antiviral approved by FDA for treatment of Covid-19. It's given intravenously, not as a pill that can be taken at home.

Airplane Passengers At Least Twice As Likely To Catch Covid-19 Because Of Omicron, Airline Trade Body Says

Source: https://www.forbes.com/sites/siladityaray/2021/12/22/airplane-passengers-at-least-twice-as-likely-to-catch-covid-19-because-of-omicron-airline-trade-body-says/
Dec 23 – The omicron variant of the coronavirus raises the risk of infection on board a passenger plane by two or even three-fold, according to the airline industry's biggest trade body, a finding that may foreshadow an exponential increase in cases as millions of travelers take to the skies to be with their families during the holiday season.

Key Facts
In an interview with Bloomberg, the International Air Transport Association's (IATA) medical adviser David Powell claimed that the risk of transmission on board a plane remains much lower than crowded places on the ground due to the use of hospital-grade air filters.

While encouraging passengers to maintain social distancing and mask-wearing, Powell said that a modern passenger jet is a "high-flow airflow environment," which he said lowers the relative risk compared to places like pubs, gymnasiums, shopping centers or even airports.
Despite the purported higher risk of infection due to omicron, Powell said he believes getting a booster shot is more beneficial than not flying at all.
Powell also stated that leaving middle rows empty or having cabin crew wear full protective suits is unlikely to provide much benefit.

Crucial Quote
"The greatest protection you can give yourself is to be vaccinated and boosted. The protection that you give yourself from an extra mask or a different type of mask, or not flying at all, frankly, is probably less than the benefit you would get from just being fully boosted," Powell told Bloomberg.

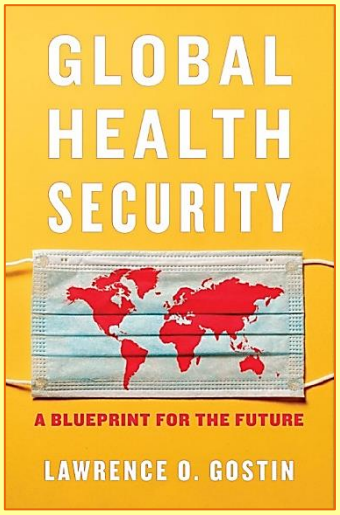
Tangent
Last week, top executives from the major U.S. airlines—all IATA members—addressed a U.S. Senate Committee where all seemed to imply that wearing masks on flights may be unnecessary. Southwest Airlines CEO Gary Kelly told the Senate Committee on Commerce, Science, and Transportation that "masks don't add much" on planes. This is a departure from what Powell told Bloomberg on Tuesday where he implied that masking was a key mitigation measure against infections.

Key Background

Concerns about omicron have not led to a drop in domestic travel with United Airlines CEO Scott Kirby noting on Monday that the next two weeks will be the busiest for the airline since the start of the pandemic. Earlier this month, the American Automobile Association (AAA) also predicted that 6.4 million people will travel by air between December 23 and January 2—a 184% increase over the 2020 holiday season. The busy travel season has raised concerns that the ongoing omicron-fueled pandemic surge may see exponential growth at the start of the new year. On Monday, the Centers for Disease Control and Prevention announced that omicron has become the dominant variant in the U.S., accounting for 73.2% of new cases.

Surprising Fact

Online search trends on Google show that far fewer people in the U.S. are searching for the phrase "cancel flight" during this holiday season compared to August when the delta variant surge took hold across the U.S.



Global Health Security

Author: **Lawrence O. Gostin**
Harvard Univ. Press (2021)
Source: https://www.nature.com/articles/d41586-021-03816-5

"No one is safe from infectious diseases unless everyone is safe," says World Health Organization adviser Lawrence Gostin. Discouraged but inspired by COVID-19, his wide-ranging study analyses the science and politics of past and present global disease, with hypothetical exercises about a new influenza, bioterrorism and cholera. He recommends steps to reduce pandemic risk, such as increasing surveillance of animal pathogens and their movement. Above all, he calls for a "new politics", free from nationalistic populism.

Drug Combinations as a First Line of Defense against Coronaviruses and Other Emerging Viruses

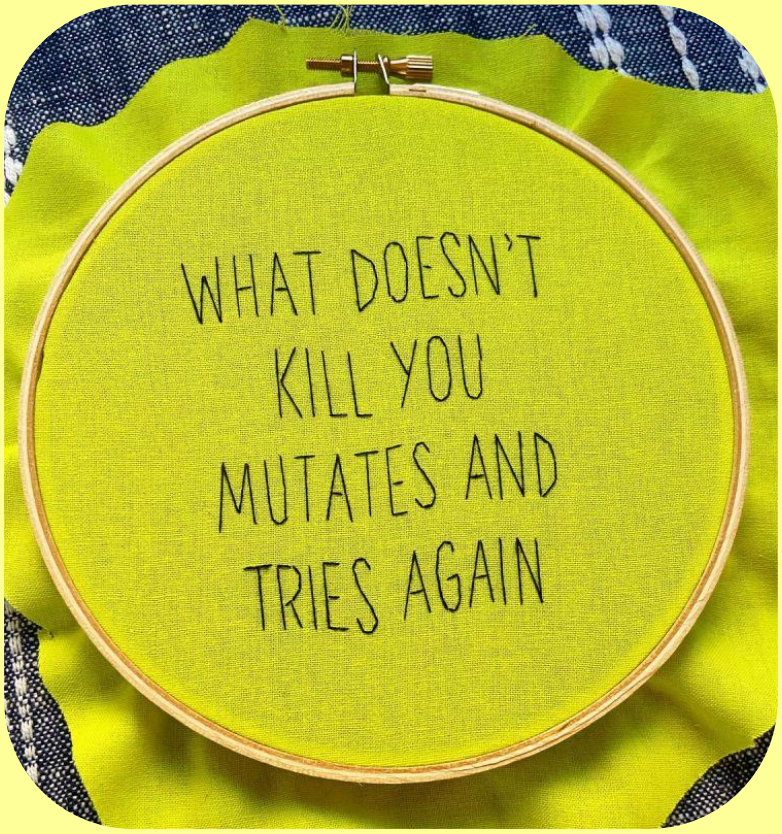
By Judith M. White, Joshua T. Schiffer, Rachel A. Bender Ignacio, et al.
Antimicrobial Chemotherapy, Minireview | Vol 12(6); 21 December 2021
Source: https://journals.asm.org/doi/10.1128/mbio.03347-21

The world was unprepared for coronavirus disease 2019 (COVID-19) and remains ill-equipped for future pandemics. While unprecedented strides have been made developing vaccines and treatments for COVID-19, there remains a need for highly effective and widely available regimens for ambulatory use for novel coronaviruses and other viral pathogens. We posit that a priority is to develop pan-family drug cocktails to enhance potency, limit toxicity, and avoid drug resistance. We urge cocktail development for all viruses with pandemic potential both in the short term (<1 to 2 years) and longer term with pairs of drugs in advanced clinical testing or repurposed agents approved for other indications. While significant efforts were launched against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), *in vitro* and in the clinic, many studies employed solo drugs and had disappointing results. Here, we review drug combination studies against SARS-CoV-2 and other viruses and introduce a model-driven approach to assess drug pairs with the highest likelihood of clinical efficacy. Where component agents lack sufficient potency, we advocate for synergistic combinations to achieve therapeutic levels. We also discuss issues that stymied therapeutic progress against COVID-19, including testing of agents with low likelihood of efficacy late in clinical disease and lack of focus on developing virologic surrogate endpoints. There is a need to expedite efficient clinical trials testing drug combinations that could be taken at home by recently infected individuals and exposed contacts as early as possible during the next pandemic, whether caused by a coronavirus or another viral pathogen. The approach herein represents a proactive plan for global viral pandemic preparedness.

The researchers proposed a five-point plan to better adapt their proposed strategy, asking healthcare systems to:

1. Prioritize medicines that people could take at home, either orally or by inhalation.
2. Focus on drug combinations and not on individual drugs
3. Prioritize drugs that are already approved or advanced clinical trials

4. Focus on drugs that can be safely administered to patients without suffering from toxic side effects
5. Use advanced computer models to identify useful drug combinations and accelerate growth.



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