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HZS C²BRNE DIARY

Dedicated to Global First Responders

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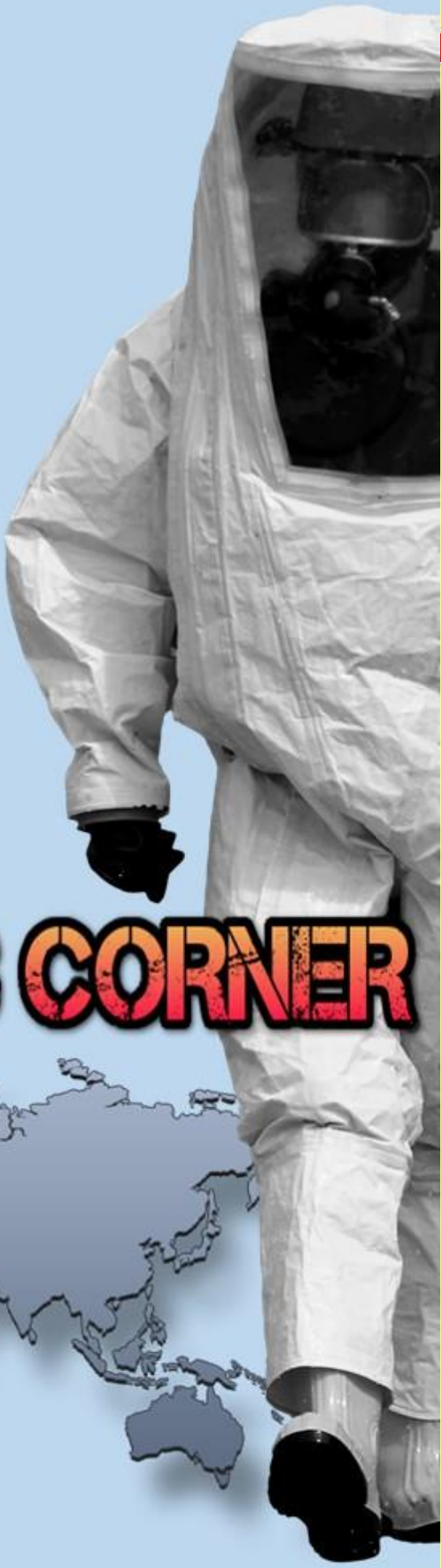


EDITOR'S CORNER

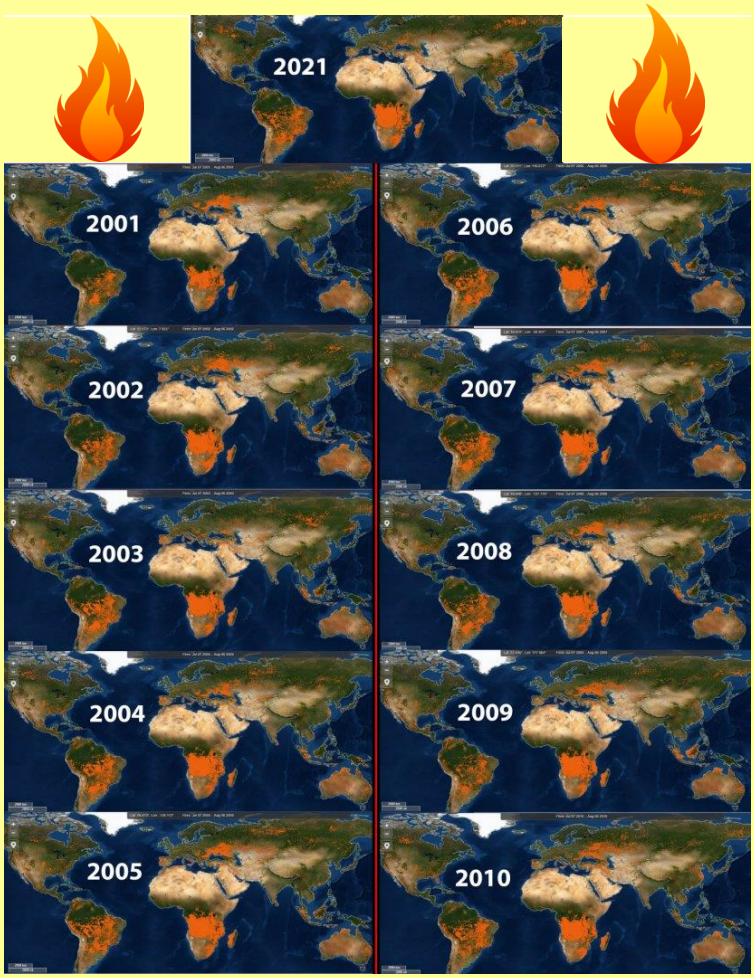
Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

In the old days, August was the month that we were all wishing "enjoy your holidays!" Well, not this August (due to the ongoing pandemic and the wild fires worldwide burning valuable flora and cost lives)!



Greece was one of the countries affected and following a week of high temperatures (~47^{0}C) more than 300,000 acres (~1.200.000m^2) were burned to ashes according to the European EFFIS. There was also one death – a volunteer firefighter who was killed in the line of duty! The village I am residing in was threatened once more but this time the fire wave was controlled on time due to huge efforts of both local and international firefighters. Many countries supported our efforts and we are grateful for their assistance (Cyprus, Croatia, France, Sweden, Romania, Czech Republic, Spain, Germany, Poland, Slovakia, Russia [Ilyushin Il-76; Beriev-200; Mi8], Ukraine, Israel, Switzerland, Qatar, UAE, Kuwait, UK, Austria, Egypt, Moldavia, Serbia). There was also a loud absence; the United States preferred to send two CH-47 Chinooks with fire fighting equipment to Turkey and a P-8 to Greece. Perhaps they are pissed because Greece is not entirely US-oriented but dares to speak with China as well! On the other hand, we must be patient with them because they are very upset after losing another war and 6.5 trillion USD (Afghanistan). Recently Germany stated that they will stop the financial support of Afghanistan if the Taliban take over the country. That was a universal surprise because Germans are not famous for their humor! The big issue is that a human tsunami is exiting Afghanistan dreaming of political asylum in Europe via Turkey and Greece. Just a small reminder that they are refugees when entering Iran and immigrants when entering other countries.

Greek wildfires are a good opportunity to review from scratch our national emergency response plans with a special focus on prevention. The Greek Prime Minister used the easy explanation of climate change to blame about everything related to wild fires but if you look at the comparative maps issued by the Fire Information for Resource Management System (FIRMS) of NASA it is easy to conclude that there are no significant changes in fires' density between 2001 and 2021. A contribution yes, but not as the main causative reason (at least for the time being).

Pandemic is progressing well and vaccines do not seem to be able to establish the infamous "herd immunity". During summertime, people behave as usual whether they are vaccinated or not and the world will pay the consequences when all these people will return home, schools will start again and people will be gathered in confined spaces. Authorities speak now for a third dose; vaccines are not available in poor countries; the Sputnik V vaccine is still in an EMA drawer (despite its said

effectiveness against α, β, γ, and δ variants) and most probably will stay there due to strictly political reasons that are irrelevant to European public health interests. Baaad Russians!

Tokyo2020/2021 was an indifferent interval into the bright history of the Olympic Games and was performed only to match the loss of money paid and invested in the games. The inclusion of new Olympic sports was hilarious – sport climbing? skateboarding? mixed 4X400 relay? – and most probably in Paris2024, we will experience some new additions like a wine tasting, haute cuisine, or boules (pétanque). The Editor thinks that it is time either to stop the games or rename them – something like "Planet Games"!

Writing about Paris2024 the same questing popped into my mind: how the International Olympic Committee selects the country that will host the Olympic Games. Is it only diplomacy and public relations on the basis that nothing bad will happen during the games (the 1972 Munich massacre has already been forgotten and the 1996 Olympic Park bombing in Atlanta was a misdemeanor)? Is the terrorist history of France (since 1970: 2,979 incidents; 448 deaths; 1,779 injuries) forgotten? Is the underlying social boiling fragility ignored? Are the "*No-Go [Sharia] Zones*" (*banlieue)* a joke or fake news? France2024 will be the first "Olympic Military Games" ever!

The Afghanistan case is very fresh to comment about it. But it has already provided the world two valuable lessons learned: (a) The United States does not care about a single other country but their own; and (b) it is time to start following our doctrines and modus operandi since adherence to American plans and doctrines has been a complete failure proved by several lost wars. In geopolitical chess, there are no friends; just occasional allies for profit. By the way, the Taliban took over in 3 months; how come the airport is under US (and Turkish?) control?

Usually, I add a small paragraph about Turkey but not this time or anymore. Wherever there is a problem there is a Turkish finder underneath; so what is the point of writing about boring things that everybody knows and accepts and does nothing about them?

Last but not least, I admire the patience of the Lebanese people that tolerate a bunch of indifferent politicians destroying their country. They do not deserve this and they should take their destiny into their own hands – today!

Despite all odds, I will wish you all a pleasant summertime with lots of sun and rest because a very difficult winter is ahead!

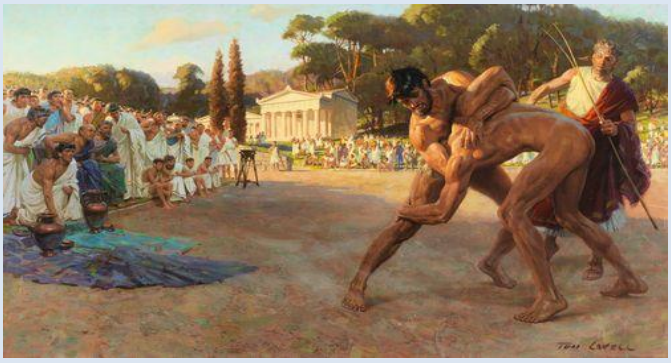
First Responders be prepared. The unexpected always happens!

The Editor-in-Chief

"Planet Games" instead of "Olympic Games"?

By the Editor-in-Chief *C²BRNE Diary*

What is the point to continue calling the games "Olympic" the moment that most of the old and new sports included in this sports' mega-event has nothing to do with the games held in Ancient Greece? "Olympic" is a trade name belonging to history and Greece. Therefore, it should be respected along with values that goes with it and not to be used for profit by international corporations, the defense industry, the athletes themselves and the hosting nation. Perhaps the name "Planet Games" or Universal Games" or "Global Games" would be more to the point of modern Olympics and its history and value.

Planet Games (33)	Traditional Olympic Games (6)
1. Aquatics (including swimming, diving and synchronized swimming, water polo) 2. Archery 3. Badminton 4. Baseball and Softball — will be held at the main venue of the Yokohama Stadium 5. Basketball (including 3x3 basketball) 6. Boxing 7. Canoe / Kayak 8. Cycling — including Track, Road, Mountain Bike and BMX — Track cycling and mountain bike events will take place 120km away from Tokyo in Izu. 9. Equestrian 10. Fencing 11. Football (soccer) 12. Golf 13. Gymnastics (Artistic, Rhythmic and Trampolining) 14. Handball 15. Hockey 16. Judo 17. Karate — six kumite and two kata categories. To be held at the Nippon Budokan in central Tokyo. 18. Modern Pentathlon (fencing; swimming; horse riding; combined running and shooting) 19. Rowing 20. Rugby 7s 21. Sailing 22. Shooting 23. Skateboarding — men and women's street and park skateboarding events 24. Sport Climbing — bouldering and lead and speed combined climbing 25. Surfing — men's and women's shortboard surfing, to be held about one hour from Tokyo at Shida Shita Point 26. Table Tennis 27. Taekwondo	**Running** ○ **Stade**, a straight-line sprint of just over 192 metres ○ **Diaulos** (lit. "double pipe"), or two-stade race, is recorded as being introduced at the 14th Olympiad in 724 BC ○ **Dolichos** ("long race"), was introduced in the next Olympiad. Accounts of the race's distance differ; it seems to have been from twenty to twenty-four laps of the track, around 7.5 km to 9 km ○ **Hoplitodromos**, or "hoplite race", introduced in 520 BC and traditionally run as the last race of the games. Competitors ran either a single or double *diaulos* (approximately 400 or 800 metres) in full military armour **Combat** ○ Wrestling (pale) ○ Boxing (pygmachia) ○ Pankration **Discus** **Long jump** **Pentathlon** **Five events:** running, long jump, discus throw, javelin throw, and wrestling **Equestrian events** Horse racing and 2 or 4 horses chariot racing 

28. Tennis 29. Track & Field 30. Triathlon 31. Volleyball — indoor and beach volleyball 32. Weightlifting 33. Wrestling (Greco-Roman and Freestyle)	

Advanced Technologies Securing Tokyo Olympic Games

Source: https://i-hls.com/archives/109717

July 23 – Japan's authorities have been employing advanced technology in order to maintain security and prevent the spread of the coronavirus during the Olympic Games in Tokyo. While a lot of concern about security at the Olympic Games has been focused on the pandemic, security measures were also deployed to confront other threats, such as terrorism or crime.

Facial-recognition and baggage-inspection systems were installed at the front gate and several other locations of the venue.

A high-precision camera takes photos of the faces of people trying to enter, and then the system checks if they match photos registered in advance. Unregistered people will not be allowed in, even if they are carrying a pass. The organizing committee says the Tokyo Games are the first to employ a system that verifies entrants' IDs using preregistered images of all people related to the Olympics.

Another device at the main gate helps guards check for explosives and other suspicious items on vehicles.

Security cameras and infrared sensors are mounted above a 2.5-meter wall encircling the gymnasium. Those devices can detect unauthorized people trying to enter the premises, according to www3.nhk.or.jp.

A total of **some 60,000 personnel will engage in security activities** such as guarding venues and dignitaries during the Olympics. Usually, routes connecting venues and nearby train stations are put on full alert as such "last mile" routes are prone to slip-and-fall accidents and terrorist attacks when they become crowded before and after events. But with spectators banned from most venues and public viewing events canceled in Tokyo, security staff will be dispatched mainly around venues and busy train stations, according to jen.jiji.com.

Many of the 43 Olympic and Paralympic venues are located in the Tokyo Bay area. The Japan Coast Guard has conducted an anti-terror drill in Tokyo Bay near the athletes' village in order to train in dealing with suspicious vessels. Two small high-mobility rubber boats sandwiched a suspicious ship that was running away at high speed to force it to stop. Officials also simulated a procedure of running their boats parallel with a suspicious vessel and boarding it to take control.

The Coast Guard plans to bring patrol vessels deployed across the country to Tokyo and provide around-the-clock security to key locations such as the athletes' village.

Senior coast guard official Sasaki Wataru says the risk of terror attacks does not change much even though the Games events will be held without spectators.

The Houthi Ecoterrorism of the Red Sea

Source: https://www.rieas.gr/images/editorial/huthi21.pdf

June 2021 – The Safer oil tanker often described by experts as a" ticking time bomb." An explosion or leak from the Safer would cause an environmental disaster with dire economic and humanitarian consequences, threatening millions of residents in the Idaho governorate in Yemen and the Red Sea riparian countries.... **Read more**

***Shaul Shay** is Senior research fellow at the International Institute for Counterterrorism (ICT) at the Interdisciplinary Center Herzliya and former deputy head of Israel's National Security Council).*

Summer wildfire angels!

03 Aug 2021 | Athens, Greece

Dante Apocalypse

03-04 August, 2021 | Athens, Greece

... the few and the brave!

Athens mega-fires, August 2021

Antiquities looting: an ongoing crisis as well as a shameful piece of history

Source: https://www.art-critique.com/en/2021/07/antiquities-looting-an-ongoing-crisis-as-well-as-a-shameful-piece-of-history/

July 21 - Western museums are, rightfully, facing increasing pressure to return art and artefacts looted during colonial times. Artefact theft is not merely a disgraceful part of the past, however, but is an ongoing problem which is occurring right now in dozens of places across the world.

Political instability has always created opportunities for looters and thieves, but the reprehensible practice has particularly flourished in the Middle East and North Africa during the chaos that followed the Arab Spring. The last decade saw a "gold rush" of artefact smuggling in countries like Syria, Libya, Iraq, Tunisia and Egypt, with looted valuables removed from museums and archaeological sites and sold abroad, often ending up on the European market.

Blood Antiquities

The past few years have shone a spotlight on the long history of the plundering of priceless art and artefacts. Earlier this year a number of Berlin museums decided to return hundreds of objects that were looted from the royal palace of the Kingdom of Benin, now part of Nigeria. The restitution of the so called "Benin Bronzes", which carried deep cultural significance in their country of origin, was hailed in the media as a turning point in Europe's post-colonial attitudes.

Even as hopes rose that other Western institutions might make similar moves, thousands of artefacts from African and Middle Eastern countries continued to find their way into European private collections. Indeed, the conflicts that arose in the wake of the Arab Spring have been a disaster for efforts to preserve antiquities and keep them out of smugglers' hands.

Syria and Iraq are among his hardest hit countries in this regard. The two nations sit at the centre of several ancient empires and are among the world's densest repositories of antiquities. Years of war compounded by the brief but ruinous rule of ISIS, however, have wrought immeasurable damage to their ancient sites. Under ISIS, the ransacking of ancient sites was done on such a scale that hundreds of illegal excavations were clearly visible on satellite images.

According to media reports, at the peak of the Islamic State's power the sale of artefacts constituted the second largest source of income for the terrorist organisation after oil. The extremist group looted with impunity, fencing their ill-gotten gains through a network of middlemen that stretched all the way from Raqqa and Aleppo to London and New York; the

looters eventually became so brazen as to sell the stolen objects openly on Facebook. Nor are terrorist groups the only ones profiting from conflict—in Syria, the Assad regime is known to have confiscated stolen artefacts from militias, only to put them up for sale later through similarly shady channels.

The Ongoing Looting of Libya

While Iraq and Syria have received much of the media attention surrounding the international traffic of looted artefacts, Libya has also become a smuggler's free-for-all in the wake of Muammar Gaddafi's 2011 ouster. Not only were hundreds of priceless artefacts, including the famed "Benghazi Treasure", looted from museums during the initial chaos, but the civil war that followed also gave "artefact poachers" the opportunity to ransack ancient ruins and other archaeological sites and steal objects that have laid buried since ancient times. Estimates put the number of artefacts smuggled out of the country since 2011 at around 8000.

In May of this year, an extremely rare Greek-era sculpture illegally excavated in 2012 from the ruins of Cyrene in Libya was recovered by British customs agents at Heathrow Airport. While dozens of other such valuables have been seized by authorities after popping up in European auction houses over the last decade, experts fear that they represent only a small portion of the total number of looted treasures and that many may have been lost forever.

The situation in Libya was further complicated by the influx of extremist groups to the country, including ISIS extremists which are as likely to destroy the "idolatrous" treasures of antiquity as they are to sell them on the black market. The threat of looting and destruction of cultural property receded somewhat after Field Marshal Khalifa Haftar and his Libyan National Army (LNA) carried out a highly effective campaign to push extremists out of their Libyan strongholds, but has returned with a vengeance after Turkey sent various mercenary groups, including fighters fresh out of the Syria conflict, to prop up the ineffective Tripoli-based Government of National Accord. The Turkish irregulars quickly built a reputation as looters, both of antiques and of mundane valuables taken from Libyan citizens.

These Turkish troops and mercenaries' continued presence in Libya also casts doubt over the chances for fair and free elections to take place in December. If elections are not held on time, this means that the current situation favouring looters and smugglers is unlikely to end any time soon. Turkey's continual refusal to remove its troops from Libya only means that valuable artefacts will continue to be looted with impunity. The only difference is that they will be most likely smuggled not to London, but to Ankara and Istanbul.

Repeating History

For many of the countries in question, the return of looted treasures is not only a moral issue, but an economic one as well. Egypt, for example, is heavily reliant on tourism and, now that the country has become stable again, the government is eager to restart the ever-so-important flux of visitors. The task, which became even more daunting within the post-pandemic world, is dependent on the rebuilding of the country's network of museums and attractions that has been seriously damaged in the last decade.

To that end, the Cairo government has ramped up its efforts to retrieve stolen antiquities, whether they were removed from the country in the 19th century or in the last decade. Thousands of objects were retrieved, but millions more remain in European museums or private hands.

Western countries must do more to stop the influx of stolen artefacts, both by returning artefacts stolen long ago and by addressing the conflicts and neo-colonial posturing that is allowing the looting to continue.

Deterring Terrorist Attacks in Sports Megaevents

Source: http://www.homelandsecuritynewswire.com/dr20210726-deterring-terrorist-attacks-in-sports-megaevents

July 26 – Sports mega-events, such as the upcoming Olympic Games, are ideal targets for terrorist attacks, due to their visibility, size, and number of people involved. Sports mega-events differ from other well-studied counter-terrorism analysis due to the defensive measures being made public and prioritizing deterrence against any attacks because of the breadth of the event. All concerns about security at the Tokyo Games have been focused on the pandemic, neglecting the risk associated with **terrorist attacks.**

A new research paper, published in *Risk Analysis*, stresses the relevance of the security preparedness.

The paper proposes a method to identify the best defense measures to minimize the chances of a terrorist attack during a sports mega-event. This method identifies how to

allocate defense resources to manage risk while considering multiple attack scenarios. The advantage of using this method is that the defense can understand the strategy of the attacker.
This method has been applied to real-world scenarios, such as planning for the 2016 Brazilian Olympic Games. The 2016 Olympic case study showed a non-linear relationship between deterrence and budget expenditure. It is possible that high levels of deterrence could be achieved with a small budget.
Sports-mega events remain an active target for terrorism and must be properly protected. This research develops guidelines for future counter-terrorism operations to not only protect the public, venues and athletes, but to reduce cost and increase defense efficiency.

'Racism, even in geography, cannot be tolerated': Dems crusade to rename places, mountains, rivers

Democratic lawmakers and Interior Secretary Deb Haaland want to change the names of more than 1,000 rivers, mountains and other places because they consider the names to be racist. Read More >

EDITOR'S COMMENT: Pure stupidity made in the USA …

Al Qaeda Releases "America Burns" Video, Framing U.S. as Nation in Crisis

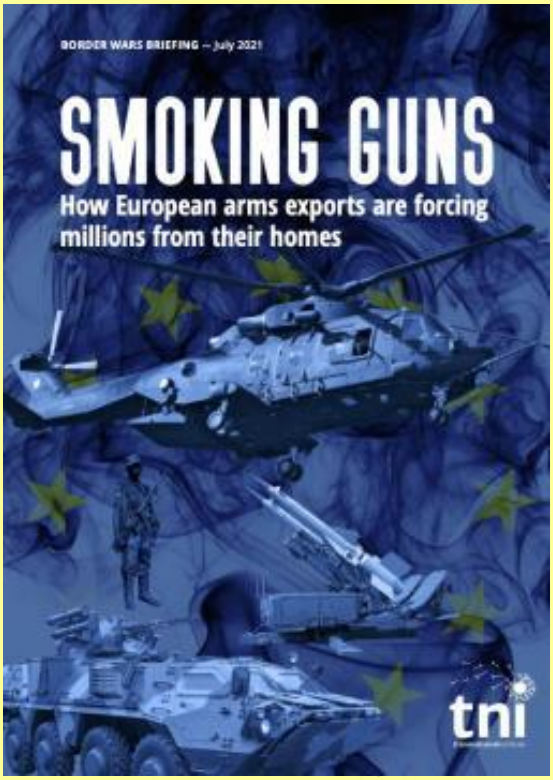
A new propaganda video released by Al Qaeda seeks to portray the United States as weakened, divided, and declining, while Al Qaeda and other extremist groups are positioned as ascendant. This propaganda provides two key pieces of information: first, that Al Qaeda continues to see attacking the U.S. as a critical objective in its overall mission, and, second, the video's references to lone wolf attacks implies that Al Qaeda may still lack the means to direct sustained attacks within the U.S., and instead hopes one or more individuals take the initiative on their own. **Read more**

Smoking guns

How European arms exports are forcing millions from their homes

By Apostolis Fotiadis and Niamh Ni Bhriain

Source: https://www.tni.org/files/publication-downloads/smokingguns-report-tni_final.pdf



July 28 – The nexus between the arms trade and forced displacement is rarely explored and the role of European arms trade policies that facilitate gross human rights violations in third countries is often absent from displacement and migration studies. This report joins the dots between Europe's arms trade and forced displacement and migration.

Key findings

- Arms and military equipment manufactured and licensed in Europe and sold to third countries provokes forced displacement and migration. This arms trade is motivated by how highly lucrative the industry is and current control and monitoring mechanisms facilitate rather than curtail problematic licensing and exportation.
- The arms trade is political and is driven by profit but is under-regulated. Although other sectors, such as food and agriculture, do not undermine the fundamental right to life and other human rights in the same way that the arms trade does, they are far more stringently regulated.
- It is possible to methodically trace arms, military equipment and technology, from the point of origin and export to where these were eventually used, and document their devastating impact on the local population. The report confirms beyond any

reasonable doubt that European arms are directly used not to defend populations or to enhance local or regional security as is often claimed, but to destabilise entire countries and regions.

- The arms industry is involved in clear violations of non-transfer clauses and end user agreements (EUAs) despite a supposedly robust system of controls. The evidence shows that once arms are traded, and although they may be traced, it is virtually impossible to control how they may eventually be used. Furthermore, although importing countries were known to have breached EUAs, EU member states continued to sell them arms and military equipment.
- Regardless of whether arms were exported to official state security forces or were eventually used by non-state armed actors, or whether EUAs and other control mechanisms were respected, the result was the same – European arms were used in military operations that led to destabilisation and resulting forced displacement and migration. The destabilisation, facilitated by arms supplied by Europe, then contributed to Europe hugely expanding its border security apparatus to respond to the apparent threat posed by refugees attempting to arrive and seek asylum.
- European countries are among the top exporters of lethal arms equipment worldwide, comprising approximately 26% of global arms exports since 2015. The top five European arms exporters are **France**, **Germany**, **Italy**, Spain and the **UK** – together accounting for 22% of global arms exports in the 2016–2020 period.
- Arms exports from **Bulgaria**, **Croatia** and **Romania** have soared in recent years, a large proportion of which is exported to **West Asian** countries. For example, before 2012, Croatia exported ammunition worth less than €1 million a year, but with the start of the Syrian war this surged every year to reach €82 million in 2016. The European Parliament called on Bulgaria and Romania to stop arms exports to **Saudi Arabia** and the **US** (if there was a risk that these arms may be diverted), so far to no avail.
- In **Syria** an estimated 13 million people need humanitarian assistance and more than half of the population remains displaced from their homes – including 6.6 million refugees living in neighbouring countries, such as Jordan and Lebanon, who subsequently attempt to flee to Europe in a reverse movement to the arms that displaced them. Another 6.7 million are internally displaced persons (IDPs) inside Syria.

Five case studies document that:

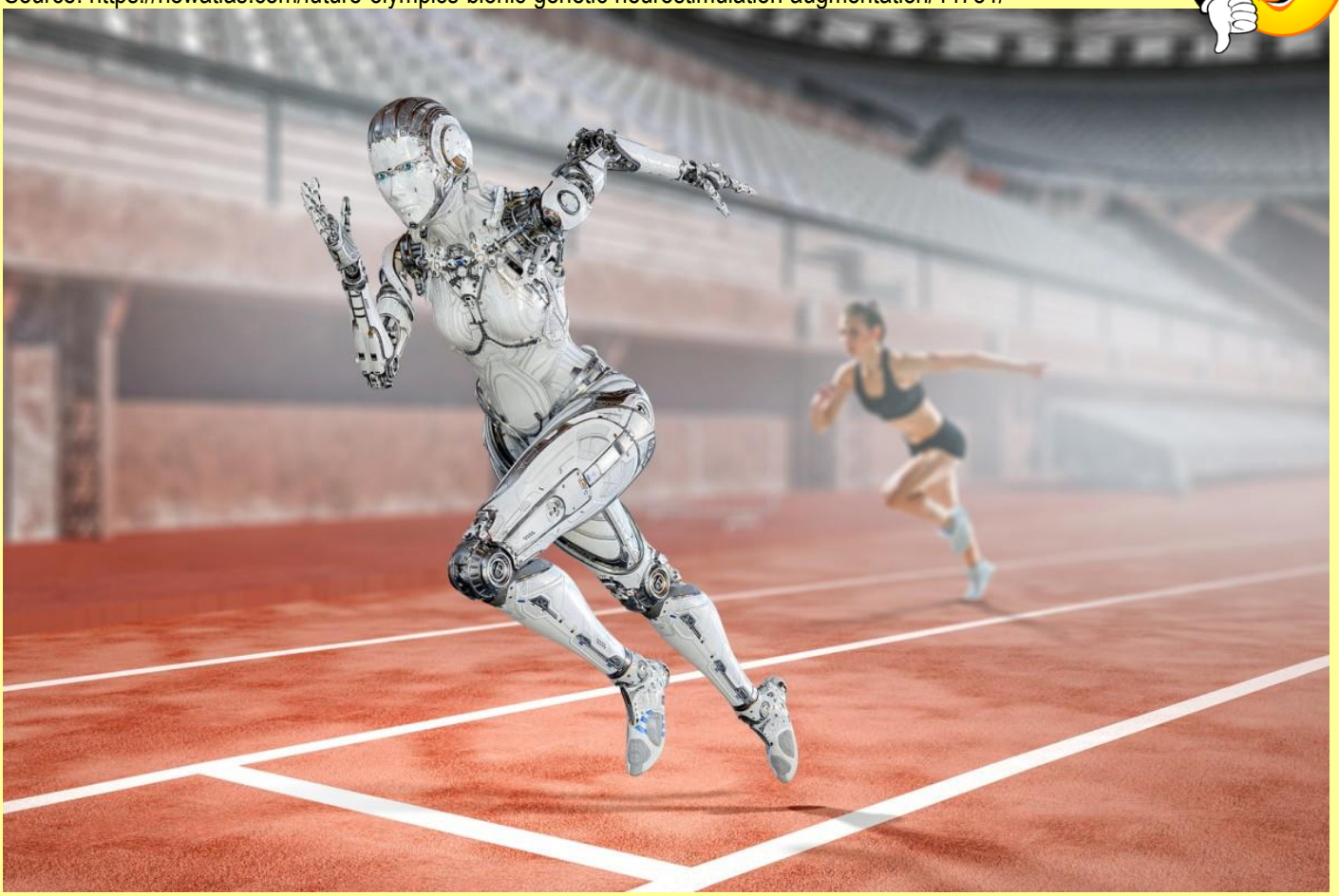
1. **Italian** T-129 ATAK helicopter components were exported to **Turkey** and used in 2018 and 2019 in two attacks in the district of Afrin in Northern **Syria** as part of Operation Olive Branch and in Operation Peace Spring on the Turkish–Syrian border. According to UN figures, **98,000 people were displaced** during the Afrin offensive between January and March 2018, while **180,000, of whom 80,000 were children, were displaced**, in October 2019 as a result of Operation Peace Spring.
2. **Bulgaria** exported missile tubes and rockets to **Saudi Arabia** and the **US**, which eventually ended up in the hands of IS fighters in **Iraq**. The equipment was diverted and used in Ramadi and the surrounding region, where the International Organisation for Migration reported that from April 2015, following the outbreak of the Ramadi crisis, over half a million people were displaced from Anbar province, of which Ramadi is the capital city, while **85,470** were displaced specifically from Ramadi City between November 2015 and February 2016. Around 80% of all housing in Ramadi was severely damaged after the offensive. In 2017 another missile tube originating in Bulgaria was found to have been used by IS forces in the town of Bartella, located to the east of Mosul. At least **200,000 people from minority groups were displaced** from the greater Mosul area between 2014 and January 2017. By July 2019, over two years after military operations had ended in Mosul, there were still over **300,000 people** displaced from the city.
3. **British**, **French**, and **German** components and production capacity, including missiles, missile batteries, and a bomb rack, were exported to **Turkey**, where they were mounted on Turkish-made drones and exported to **Azerbaijan**. These same drones, loaded with European-manufactured arms components, were used in the 44-day conflict in Naghorno- Karabakh, which provoked the **forced displacement of half of the region's Armenian population – approximately 90,000 people**.
4. Between 2012 and 2015 **Bulgaria** exported assault rifles, large-calibre artillery systems, light machine guns, hand-held under-barrel and mounted grenade launchers to the **Democratic Republic of Congo's (DRC)** national police and military. The conflict in DRC is one of the world's longest, yet Europe continues to supply arms that are used to perpetrate gross human rights violations. In 2017, **Serbia** exported 920 assault rifles and 114 light machine guns that were originally manufactured in **Bulgaria**. That same year, **2,166,000 people were forcibly displaced**, making it one of the worst since the conflict began. Specifically, Bulgarian weapons were in use in North Kivu in 2017 coinciding with the forced displacement of **523,000 people**.
5. At least four **Italian** Bigliani-class patrol boats were donated to **Libya** and used by its coastguard to forcibly pull back and detain migrants who were fleeing its shores. In 2019, the Libyan coastguard mounted a machine gun on at least one of these

boats and used it in the internal conflict against the Libyan National Army. Many of those fleeing Libya had most likely already fled other conflicts in other African and West Asian countries that may have purchased or were in receipt of European arms, so that at each step along their journey from displacement to migration, the European arms trade is making massive profits by firstly displacing them, and then later deterring and pushing them back.

The arms companies we identified in these case studies include: **Airbus** (Franco-German), **ARSENAL** (Bulgaria), **BAE Systems** (UK), **Baykar Makina** (Turkey), **EDO MBM** (UK), **Intermarine** (Italy), **Kintex** (Bulgaria), **Leonardo** (Italy), **Roketsan** (Turkey), SB **Aerospatiale** (France), **TDW** (Germany), **Turkish Aerospace Industry** (Turkey), and **Vazovski Mashinostroitelni Zavodi EAD** (Bulgaria).

What will the 2056 Olympics look like?

Source: https://newatlas.com/future-olympics-bionic-genetic-neurostimulation-augmentation/44781/



July 28 – As long as the name of the Olympics holds some kind of international prestige, people and countries are going to do whatever it takes to grab those gold medals. But with technology developing at a rapidly accelerating pace, what does that going to mean for the state of global athletics? Maybe it's a good time to dream ahead. Let's take a look at some technologies currently in development that could tilt the playing field for better or worse in 35 years' time.

Genetics: A Pandora's box of possibilities

Today, the Olympics is held up as a fair event because people come to compete with the genetics they were born with. But isn't superior genetic potential itself an unfair advantage? Why should a competitor be stuck with the limited potential their parents gave them?

The world of genetics has been upended in recent years by the discovery of CRISPR-Cas9, which, to grossly oversimplify, allows the precise editing of DNA in a living subject. Initially,

the focus of most research seems to be chopping out and replacing the bits of DNA responsible for hereditary diseases.
But it doesn't take much imagination to see how an individual or a national sports program might want to use this kind of technology once it's better understood. In theory, any genetic advantage you can pinpoint can be rolled out into another person's DNA – either before the point of conception with altered sperm and egg cells, or by editing the genetics of an already living person.
To start with, that could go some way toward leveling the Olympic playing field, but that's just the beginning. The days of the genetically edited 10-foot-tall basketballer, designer-built ultra-flexible gymnast or ultimate load-bearing weightlifter might not be that far away.
Who knows if it will be possible to test for edited DNA in the same ways we currently test for performance enhancing drugs. But is it even that different from the idea of government-influenced athlete breeding programs? Famously, China's seven-foot-six basketball prodigy Yao Ming was rumored to be the result of a program in which the Chinese government tracked and "encouraged unions" between its tallest athletes across several generations.
And then there's the genetic sequencing and selection of embryos, which will soon allow IVF parents to examine the genetics of dozens, or potentially hundreds of their own embryos before deciding which ones to implant. As deep-learning AI data analytics begins to uncover more and more about the effects of each gene, parents will get more and more information about each embryo in advance. It's hard to see people selecting against height, athleticism and many other factors that'll give their kids huge advantages in the sporting world and far beyond.
Perhaps the 2056 Olympics will need to see athletes separated into classes based on their genetic *status* (natural, selected or edited), in order to keep things as fair as possible. But figuring out which is which could be nearly impossible.
Perhaps instead, classes could be cut according to genetic *potential.* You could go weightlifting only against others with no significant genetic advantages over you. But would people be remotely interested in seeing anyone but the absolute best? The debate, and watching the open class competition, will sure be interesting.

Sensors and Augmented Reality

In many sports, information can be the key to success – or at least, an incredibly valuable training tool. Swimmers are already being fitted with sensors that can provide them with audio feedback to improve their technique. Real-time feedback like this can put you on track quicker than anything a coach can tell you.
Real time monitoring of nutrition levels, hormones and other medical signals could help athletes arrive at the starting line primed for peak performance, and we're already seeing the beginnings of that. Coaches should be able to monitor their athletes from a physiological perspective instead of just a performance one, helping work out the perfect time for substitutions and other interventions.
Likewise, we're starting to see the rise of augmented reality, in which information can be overlaid onto the world as we look at it, and it's not hard to see how that might be useful to an olympic athlete. Imagine AR glasses that predict the flight of an archer's arrow given the current orientation of the bow and the wind conditions, or that can give a marathon runner a bunch of live information about his competitors' pace and locations, or show a trap shooter exactly where to aim as the target flies past.
Presumably much of this functionality will be instantly banned, but the logistics will be difficult. It will be easy enough to check for smart contact lenses or the like, but what about Neuralink-style brain implants, which could conceivably display things directly onto a person's visual cortex without any external attachments, or give people an extra mind-control interface to their machinery? Will athletes need their heads scanned at events?
And who knows, as advanced sensors and augmented reality become more and more integrated into our normal lives, maybe allowing them into the Olympics will start looking like a more reasonable proposition.

Prosthetics and Bionics

There will come a time soon when Paralympic sprint times start to eclipse what "able bodied" Olympians are capable of. Today's prosthetic legs for amputees, for example, are already allowing them to occasionally mix it in the open class in a few different sports. Currently they're reasonably simple blade springs, but some people already consider those an unfair advantage.
Amputee sprinter and occasional murderer Oscar Pistorius was allowed to compete against able-bodied athletes in the 2012 Olympics, but only after a fascinating legal battle to prove his carbon sprinting blade legs didn't give him superhuman capabilities by storing and releasing more energy than human limbs, and that his performance still deteriorated with fatigue in the way that his competitors do.
Pistorius was able to prove that his prosthetics weren't an advantage, but powered knee and ankle joints are in development that will surely eventually outperform a human joint. There are already bionic lenses that claim to give you vision three times better than a natural eye.

Bionic hand technology is going gangbusters as well, with prototypes beginning to achieve mind control and touch sensitivity.
The venerable human heart itself could eventually be superseded by a bionic unit – potentially one that provides a constant flow of blood with no pulse per se. Imagine the athletic benefits of a tireless mechanical heart – and of course, the potential dangers.
It's easy to imagine a high-tech alternative Olympics in which the bionic technology is as important, or more important, than the human element, much like modern Formula One racing.
In fact, welcome to the future: it's already begun. In October 2016, ETH Zurich held the world's first Cyborg Olympics in Switzerland – the Cybathlon. Athletes competed using the latest prosthetic technology, brain-computer interfaces and even powered exoskeletons.
The Cybathlon is mainly still focused on bringing disabled humans as close as possible to "normal" capability using technology, but it won't be long before bionic athletes are far surpassing the natural abilities of the human body.

mRNA, the Microbiome and Mind-Altering Substances

Medical technology is advancing so quickly that it's impossible to tell what'll be coming down the pipe in 30 years' time, but there are a couple of key areas of research now that seem certain to make an impact on future athletic performance.
For starters, look at the mRNA vaccines that have leapt into prominence thanks to COVID-19. These ingenious treatments act like instruction codes for your body, telling the cytoplasm in your cells exactly which proteins to synthesize using the same language your body uses.
But you can imagine how these miniature mRNA manufacturing operations could be repurposed to produce a range of performance-enhancing proteins throughout the training process and all the way up to the Olympic finals. It's hard to know what kind of evidence these mRNA treatments might leave behind, should such things be banned in international competition. It's also not a cheap process to develop and test such things – but COVID has kickstarted an extraordinary new technology that's already finding a range of helpful ways to intervene in human life.
Another exploding area in next-gen medicine is the microbiome. We are legion; humans cannot exist without the help of billions of symbiotic organisms, each working toward its own benefit but serving a common good. The vast populations of bacteria and fungi in our intestinal tracts are much more than just passengers; we're rapidly learning just how much they can influence, from our moods to our allergies, our energy levels to our sleep, our immune systems to our inflammation levels and responsiveness to medical treatments.
It's crazy to think the microbiome won't play a key part in future Olympic preparations; if a human is really a team of billions, then you want your team stacked with the most helpful symbiotes you can get. Research is already underway, for example, on a species of lactic acid-gobbling bacteria called Veillonella atypica, which appears to help increase endurance in marathon runners. There will be many more species like this, and athletes looking for an edge against other people as psychotically dedicated to training as they are will need to marshal every bug they can.
And then there's the great mystery of the mind. Many decades of the drug war have robbed humanity of reams of research into the potential benefits of psychedelics and other mind-altering compounds found throughout the natural world and beyond. But things are opening up now, and research is already underway into the potential performance-enhancing effects of psychedelics.
Time and again, when the human body seems to reach its absolute physical limits, we see the "heart of a champion" kicking in; through willpower alone, people can find new reserves of strength and energy. The greatest Olympic moments place this extraordinary mental switch under the spotlight time and time again. And if the brain *can* convince your body to go into superhuman mode, perhaps there's ways to *help* the brain do it. Even to *make* the brain do it. Iron will in a pill. Heart of a champion in an injection. Wouldn't mind a bit myself.

Neurostimulation, the brain, and the Singularity

Already, even at previous Olympics, athletes have been trying to gain an advantage through neurostimulation. "Neuropriming" headsets are starting to emerge that electrically stimulate the brain to prepare it for activity, claiming both to improve the strength and organization of the signals sent to the muscles. This is said to give immediate performance results, but the technique is also proving effective at priming the brain to learn and acquire skills faster.
Of course, this is absolutely trivial compared to what could be achieved through direct brain stimulation, or even direct actuation of the muscles using external electrical pulses. Imagine the muscle memory benefits of having an autopilot-like system take your body through a thousand repetitions of a perfect gymnastics routine, swimming stroke or golf swing.
Perhaps a bigger thing to think about is the technological singularity – the point where we build a computer that's smarter than the smartest human brain. All human technology up to

this point is the product of the magnificent, but limited, squishy hardware we're born with. As somebody once said (I'd attribute this, but my flabby human brain can't remember where I read it), humans looking at the universe are like a dog looking at a telephone – we simply lack the mental machinery to understand it beyond a few trivial interactions that we see achieve certain results. But we're accelerating toward a point where we can build computers that have a greater ability to understand things than we do.

Futurists have been speculating for decades on what might become possible after we hit that moment of singularity, but one thing seems certain: the pace of technological development will accelerate wildly. When the human brain invents a machine smarter than itself, that machine will invent something smarter again, and so on and so forth, at an increasing rate of efficiency, wirelessly networked with other burgeoning artificial minds around the globe in the way the human brain could never replicate.

Ray Kurzweil, who popularized the concept of the Singularity in his 2006 book *The Singularity is Near*, has predicted we're going to hit this liminal moment in technological history in about 2045 – indeed, among experts, the median prediction is closer to 2040. Either way, by the time the 2056 Olympics roll around, enhanced biology should really be hitting its stride. Totally relevant, then.

But what to expect? By its very nature, the Singularity portends to take us far beyond the limits of what the human imagination can conjure. One key tenet is the idea of transhumanism – moving the human consciousness and experience out of the flawed, deteriorating, illness and injury-prone physical bodies and brains we've had to put up with for hundreds of thousands of years, and into some other form that can evolve as the technology itself evolves. Any mental or physical capability we were lacking can be built in, be it the ability to intuitively understand multidimensional space, or remember things perfectly, or interface directly with other minds, or fly, or use twelve yo-yos at once.

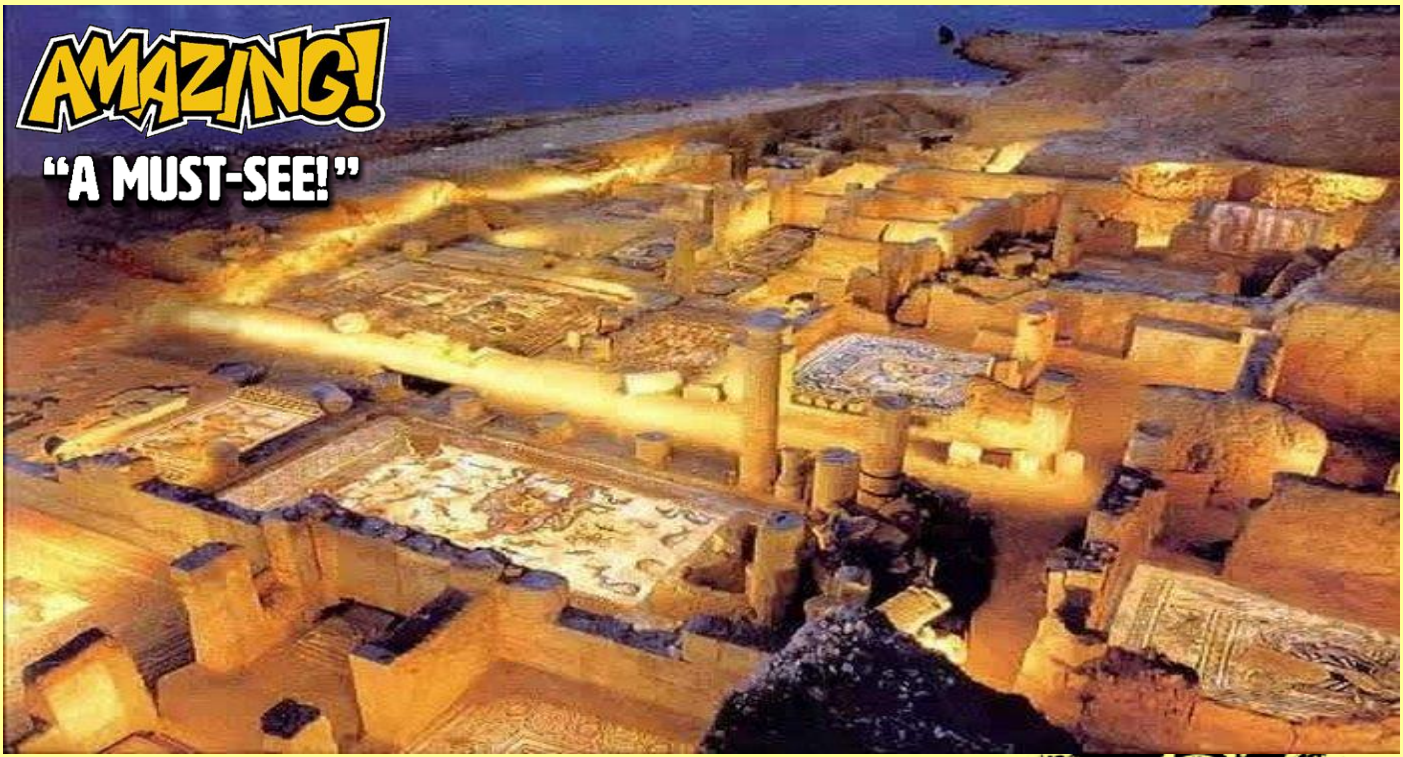
At which point, the concept of having a world-wide competition to see who can drag last year's model of meat-bag around a field the fastest will probably start to look a lot less interesting. Maybe we'll have evolved to the point where we value collaboration over competition. Or we may well be worrying more about other questions like what it actually means to be human, and how do we prevent an artificial intelligence far more brilliant than our own from circumventing our feeble-minded attempts to control it and mobilizing an army of nano-bots to enslave us all and turn us into biological batteries.

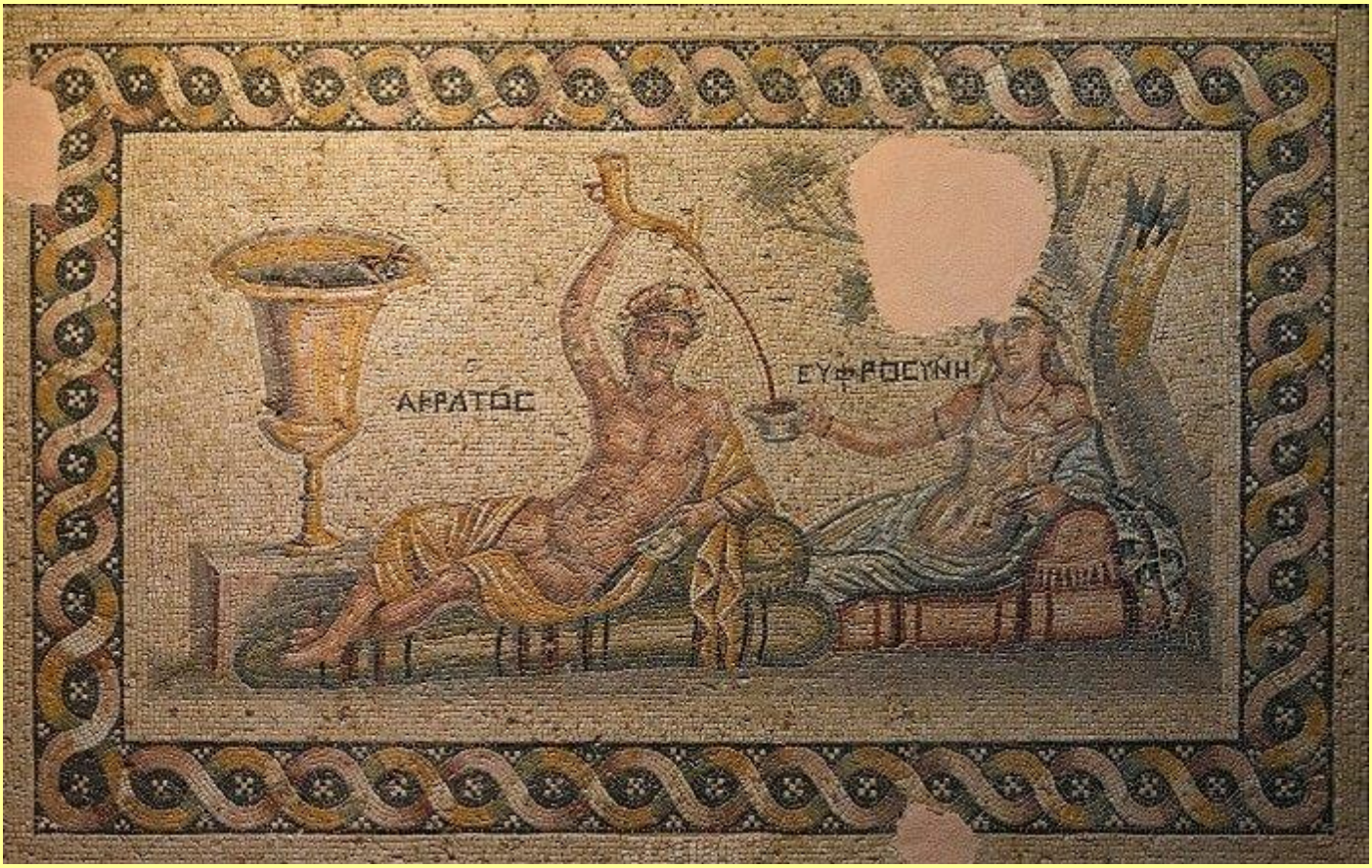
Or maybe we'll be watching the swimming. Who knows.

EDITOR'S COMMENT: In addition to my short article at the beginning of this chapter, the new name might be "**World Science Games**". What do you think?

The Stunning Greek Mosaics of Zeugma are Archaeological Treasures

Source: https://greekreporter.com/2021/06/01/the-greek-mosaics-of-zeugma/





Building Resilience against Agroterrorism, Agro-crime Threats

Source: http://www.homelandsecuritynewswire.com/dr20210802-building-resilience-against-agroterrorism-agrocrime-threats

Aug 02 – Agroterrorism and agro-crime constitute a considerable threat to animal health, the economy, biodiversity, food security and safety, and public health. In today's interconnected world, infectious diseases can spread easily across large areas and uncontained disease events in one region have the potential to develop into international crises. To effectively deal with agroterror or agro-crime using pathogens of animal origin, it is crucial that veterinary and law enforcement agencies are equipped to work together to jointly plan, prepare, and respond to animal disease outbreaks.

Under a three-year project funded by Global Affairs Canada to build resilience against agroterrorism and agro-crime, surveillance and evaluation tools, as well as laboratory mapping tools, are being developed and employed, and regional trainings and simulation exercises will be carried out in order to empower key stakeholders in target regions. The project is a collaborative effort between three organizations to build global capacity to respond to animal health emergencies that result from the intentional release of animal pathogenic biological agents. It brings together the Food and Agriculture Organization of the United Nations (FAO), with its field experience and technical background in emergency management, the World Organization for Animal Health (OIE) as a consensual editor of guidelines and international norms, and the International Criminal Police Organization (INTERPOL) with its vast experience in bio-threats investigations.

Under this project, in May 2021, a workshop was held in Tunisia to present to the country the future assessment mission as well as the phases of the project that will help develop a response to risks related to animal health and the use of animal pathogens. Following the workshop, a mission to Tunisia with the objective of identifying gaps and needs for the ordinary epidemiologic surveillance system and the specific surveillance system in response to agroterrorism and agro-crime threats. Surveillance targeting potential deliberate epizootics will be carried out and investigations relating to these events will be conducted. Efforts will be focused on strengthening collaboration between veterinary services and law enforcement authorities to improve their ability to sustainably respond to animal health emergencies.

Following the assessment phase, training and exercise materials will be tailored to local needs and available resources.
The FAO says that the project will also introduce a support kit that includes tools for Good Emergency Management Practices (GEMP) workshop facilitators and train-the-trainer workshops. These tools include a learning module on the intentional use of pathogens related to agro-crime or bioterrorism affecting animal health. North Africa, the Middle East and Southeast Asia are the three target regions that will benefit from this innovative project.

How Terrorists Could Proceed with the Next Physical Attack on Energy Infrastructure

By James Madia
Source: https://www.hstoday.us/subject-matter-areas/infrastructure-security/how-terrorists-could-proceed-with-the-next-physical-attack-on-energy-infrastructure/

Aug 03 – Power outages across much of Texas and rotating blackouts in California over the past year are reminders of the critical importance of reliable electric power. Past large-scale outages in the U.S. have resulted in loss of life, serious injury, social unrest, and economic impacts in the billions of dollars. The 2003 Northeast and 1977 New York blackouts are examples of consequences on this scale. What about intentional attacks on critical infrastructure? Could a malicious attack of the power grid lead to these types of catastrophic consequences? Are threat actors even motivated to conduct physical attacks against electric infrastructure (EI)? If so, can the experts quantify that threat and possibly predict which actors are most likely to conduct such attacks? I spent five years exploring these questions, which ultimately led to the completion of my doctoral dissertation at the Sol Price School of Public Policy at the University of Southern California. The following summarizes a portion of what I uncovered during my journey.
Over the past decade, the anecdotal evidence has suggested that the threat of a grid attack is serious, if not imminent. Experts from a wide range of disciplines have asserted that a host of terrorist groups and other sub-state actors are plotting to bring down the U.S. power grid with a coordinated attack. These claims have become a common theme in government reports, industry journals, and academic articles. The Center for the Study of the Presidency and Congress, in its 2014 report *Securing the U.S. Electrical Grid*, called the nation's power grid "an obvious target to a range of actors who would seek to strike at the U.S. homeland" (p. 4). The National Energy Technology Laboratory (2007) wrote, "The threat of both physical and cyber-attack is growing and a widespread attack against the infrastructure cannot be ruled out" (pp. A3-16). The National Research Council (2012) said that "terrorists could destroy key elements of the electricity generation and delivery system, causing blackouts that are unprecedented in this country in duration and extent" (p. 7). These and other alarming reports have influenced much of the electric utility industry's current regulation.
I was not satisfied with these anecdotal reports to support the underlying argument, as these reports did little to establish the scope of the threat or quantify the likelihood of future attacks. A more empirically based analysis was needed to better understand the threat, using a statistically valid sample of actual EI attacks.

Is the threat real and serious?
I researched terrorist attack data from 1970-2018 available through the University of Maryland National Consortium for the Study of Terrorism and Responses to Terrorism (START) Global Terrorism Database (GTD). This included 192,211 documented terrorist attacks against a wide range of targets worldwide. During that period, terrorist groups were responsible for 4,310 attacks against electric utilities. Considering the geopolitical shifts immediately preceding the 9/11 terrorist attacks and the trends since that time, I focused my specific analysis on the 1,198 EI attacks since 2000. This is not an insignificant number of attacks, which seems to support the assertion that the threat is serious, but this number is only about 1 percent of the 121,628 total terrorist attacks conducted during the same period. However, this only accounts for attacks involving groups defined by START as "terrorist groups" and does not include many attacks by nation states, lone wolves, other sub-state actors, or activist groups.
Some pundits have argued that these attacks only occur in conflict zones or countries described as failed states, with few or no attacks occurring in the United States. Conflict zones such as Iraq, Syria, Libya, and Yemen come to mind as locations where there have been many EI attacks. My primary research data sample identified attacks conducted by 71 different sub-state groups in 38 different countries located in 10 distinct regions of the world, including North America, Western Europe, the Middle East and Levant, North Africa, Central Asia, Southeast Asia, South America, Eastern Europe, Sub-Saharan Africa, and South Asia.
Aside from the statistical analysis, I found value in the examination of U.S. attacks from open-source reporting. The following table is a sample of attacks that have occurred in the United

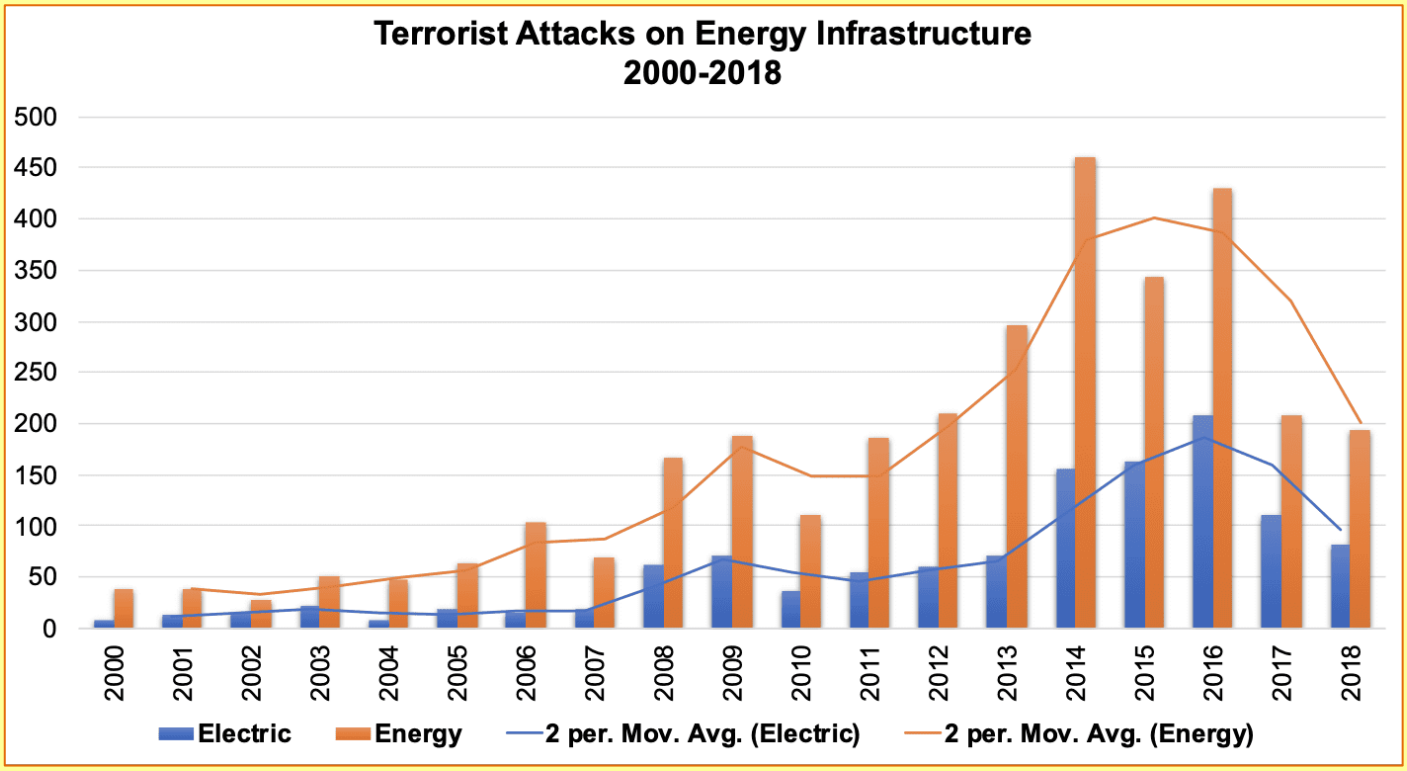
States since the 1980s. These and other attacks in the U.S. and other developed nations further support the theory that the threat is real.

Date	Location	Attack Summary
August 1987	Independence, Calif.	Million-volt transmission line carrying power across Pacific Intertie to Southern California was sabotaged when two transmission towers were toppled (Associated Press, 1987).
April 1990	Santa Cruz, Calif.	Pacific Gas & Electric transmission poles toppled over a two-day period, leaving 95,000 customers in Santa Cruz County and 92,000 customers near Watsonville without power. Group calling itself Earth Night Action Group claimed responsibility, citing Earth Day as its motive (Parrish, 1990).
October 2003	Oregon / California	Bolts removed from 500 kV transmission towers on the Pacific DC Intertie. FBI arrested a man who was sentenced to 27 months in federal prison (Lerten, 2003).
October 2004	Oak Creek, Wis.	High-voltage transmission towers knocked over, causing 17,000 customers to lose power and interrupted train service from Milwaukee to Chicago for 24 hours (Associated Press, 2004).
August – October 2013	Little Rock, Ark.	Transmission towers toppled and high-voltage line struck a moving train. Fire started at a substation causing outage to 10,000 customers. FBI arrested a man who was sentenced to 15 years in prison (FBI Bulletin, November 2013).
June 2014	Nogales, Ariz.	A homemade bomb found near a 50,000-gallon diesel storage tank at the Valencia power generation facility (Patel, 2014).
July 2013 – January 2014	New Jersey	Eight separate acts of sabotage committed at facilities in New Jersey over a seven-month period (N.J. ROIC, 2014).
November 2014	Franklin Township, Pa.	The shooting of electrical transformer results in $357,000 in damage (Associated Press, 2014).
March 2016	Tyngsborough, Mass.	Incendiary devices placed on high-voltage transmission lines, which detonated and caused a brush fire. Man is arrested and facing 20 years in prison. (U.S. Department of Justice, 2016).
September 2016	Kanab, Utah	Sniper attack on Garkane Energy substation affects 13,000 customers and costs $1 million (Walton, 2016).
April 2018	Lake Worth, Fla.	Possible shooting of a large transformer at a major substation causing blackout of 27,000 customers (Capozzi, 2018).
January 2019	Asheboro, N.C.	Man charged with shooting electrical transformer and causing power outage (Strange, 2019).

The most serious U.S. electric utility incident occurred on April 16, 2013, when the Pacific Gas and Electric (PG&E) Metcalf Transmission Substation near San Jose, Calif., was attacked by a group of unknown armed assailants. Using what authorities determined to be assault rifles, the attackers severely damaged ten 500-kilovolt (kV) transformers, three 230kV transformers, and six 115kV circuit breakers. The attack cost PG&E $26 million in repair costs and environmental cleanup efforts and nearly blacked out parts of the Silicon Valley. Experts have debated the motivation for the attack since the attackers have never been identified. There has been no determination as to whether the attack was a terrorist operation, insider action, or something else (Department of Homeland Security & Department of Energy, 2014; Cicale, 2014; Parfomak, 2014; Smith, 2014; Pagliery, 2015). The Metcalf attack exposed the vulnerability of our nation's electric infrastructure and reignited longstanding fears that terrorists and other actors sought to attack the power grid.

Is the threat increasing?

During the analysis of the energy infrastructure and electric utility attacks occurring between 2000-2018, I identified a trend of increasing attack frequency. The graph below illustrates the rising number of global terrorist attacks against electric infrastructure specifically and energy infrastructure attacks more generally (gas, oil and electric combined) since 2000. At the beginning of the millennium, the frequency of attacks remained mostly unchanged year-over-year until 2008. In 2008, EI attacks increased by 244 percent from the previous year. After 2008, the overall statistical trend reflected a steep rise in attacks, peaking in 2016 with 209 EI attacks or 2,512 percent more attacks than in 2000. Even the highest year in the first decade of the millennium (2009 with 72 attacks) was 190 percent lower than the 2016 total. The number of overall energy and EI-specific attacks declined in 2017 and 2018, yet even after the peak, the number of attacks remained well above the millennium's early years. This 19-year attack trend can reasonably support a prediction of increasing threat.



Which factors influence decisions to attack electric infrastructure?

Numerous factors influence sub-state groups when they consider targets of interest. This is true of many targets, which includes decisions to attack EI. My research involved the use of an extensive list of decision factors synthesized from the terrorism literature. The literature included a range of quantitative and qualitative sources spanning a 40-year period. The most salient decision factors were identified using a form of blended meta-analysis. The analysis utilized a scoring method, conditioned upon a subjective numeric score (1-5) for each of three criteria. The overall scores were the sums of those individual criterion scores. The list below depicts the decision factors with the highest scores.

Decision Factors with Highest Scores

Group ideology	Past attacks of similar targets
Group size	Security environment in the region
Age/maturity of the group	Level of target protection

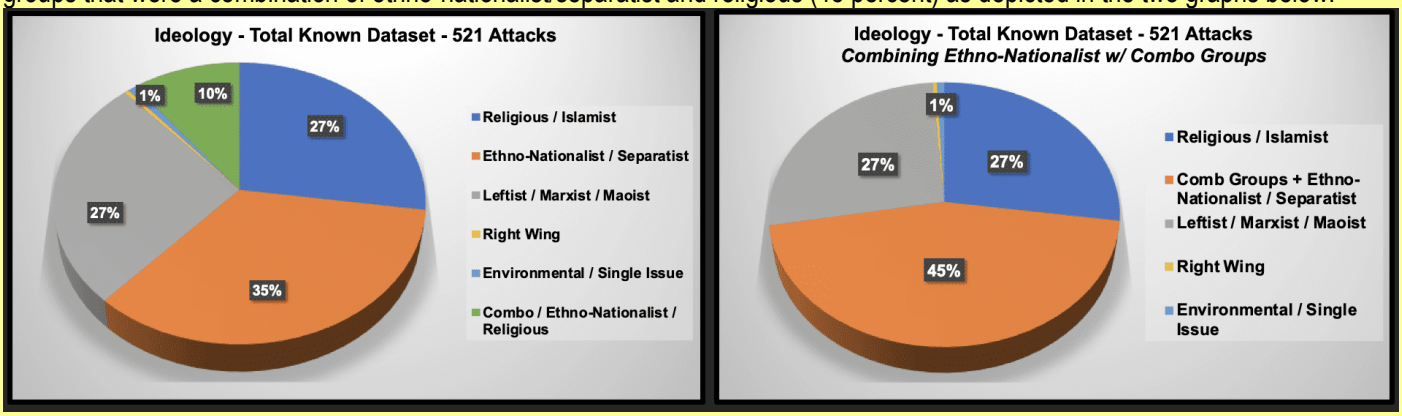
Leadership structure	Group's stated interest in the target
Terrorist group's operational resources	Target proximity to group's area of operation

Factors that scored high in the analysis include a group's stated interest in the target, the security level at the target, and the proximity of the target to the group's area of operation. Unfortunately, the START-GTD data did not capture this information, and the research necessary to code for these would have required more resources than were available for this work. Given the size of the dataset, it was impractical to code for all these factors. The remaining five factors (e.g., ideology, age, size, operational resources, and previous attacks of similar targets) were identified as the independent variables for the research and tested against the attack dataset.

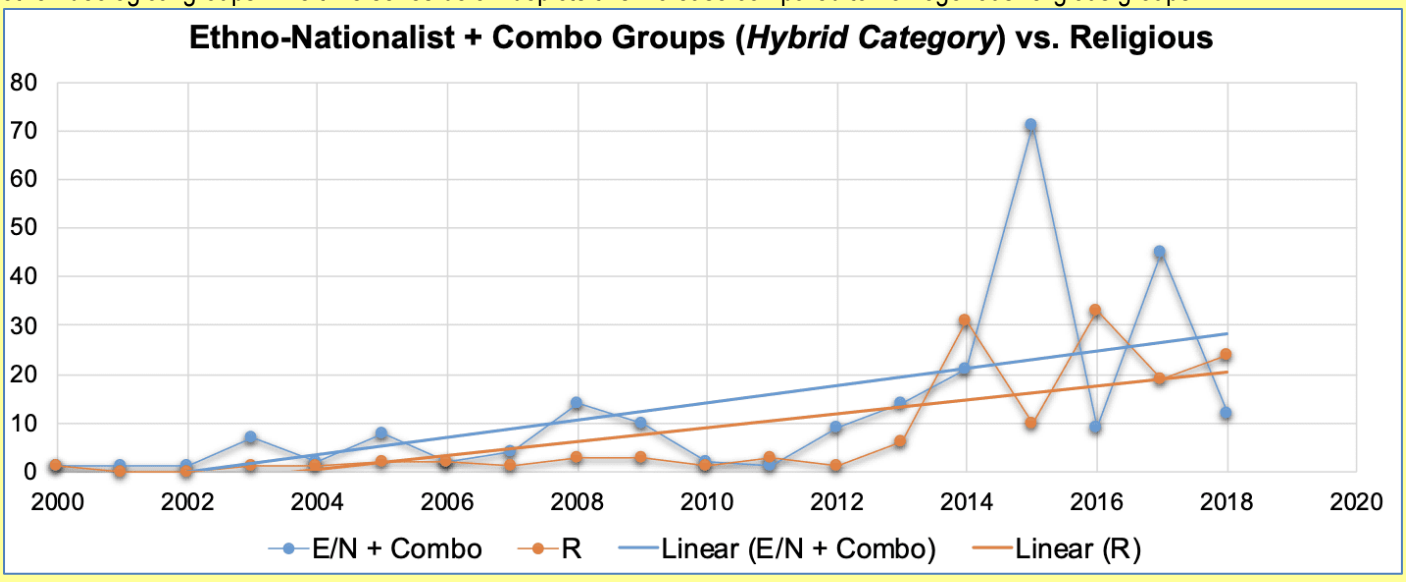
Which groups attack electric infrastructure?

The research yielded some insights regarding which groups tend to select EI as a target for attack. The analysis focused on the ideology, age, size, and operational resources of terrorist groups and how those factors influenced target selection, particularly attacks of EI. Similar analysis included the number of repeat attacks on EI targets by individual groups.

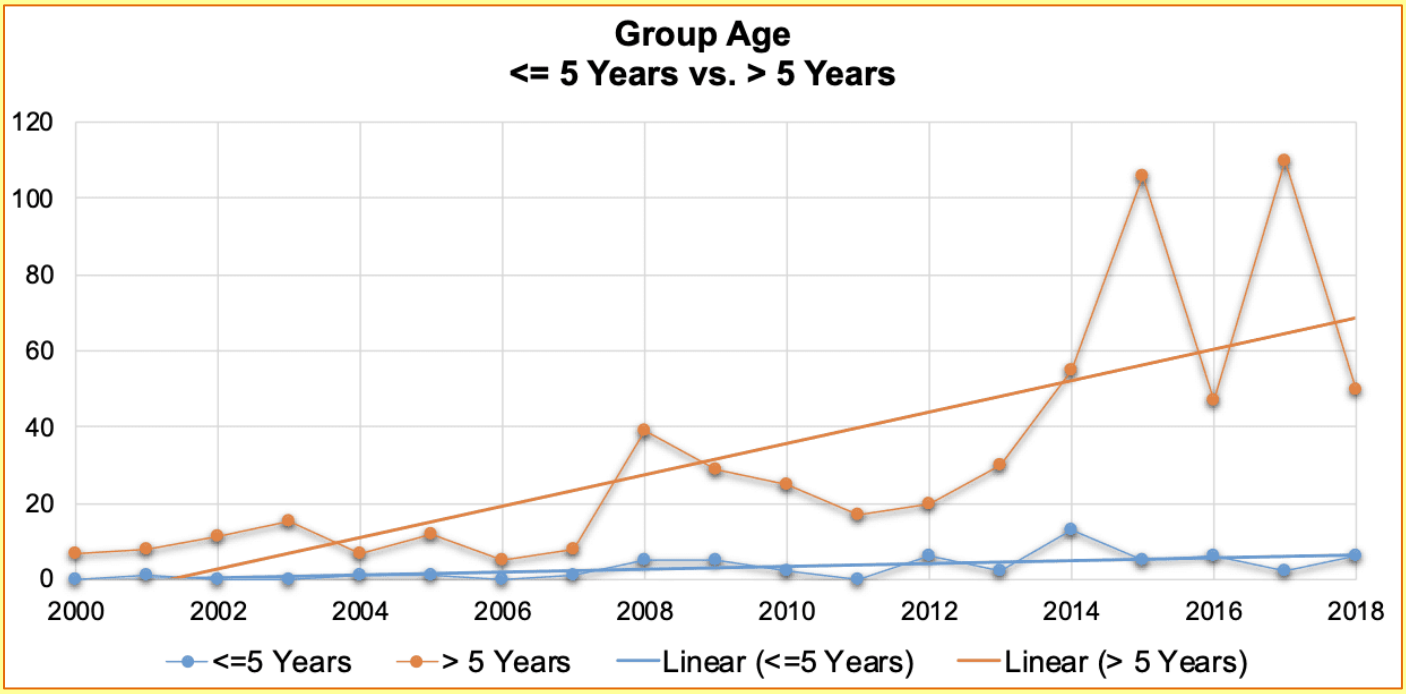
When quantifying EI attacks by ideology, most attacks were conducted by ethno-nationalist/separatist groups (35 percent) or blended groups that were a combination of ethno-nationalist/separatist and religious (45 percent) as depicted in the two graphs below.



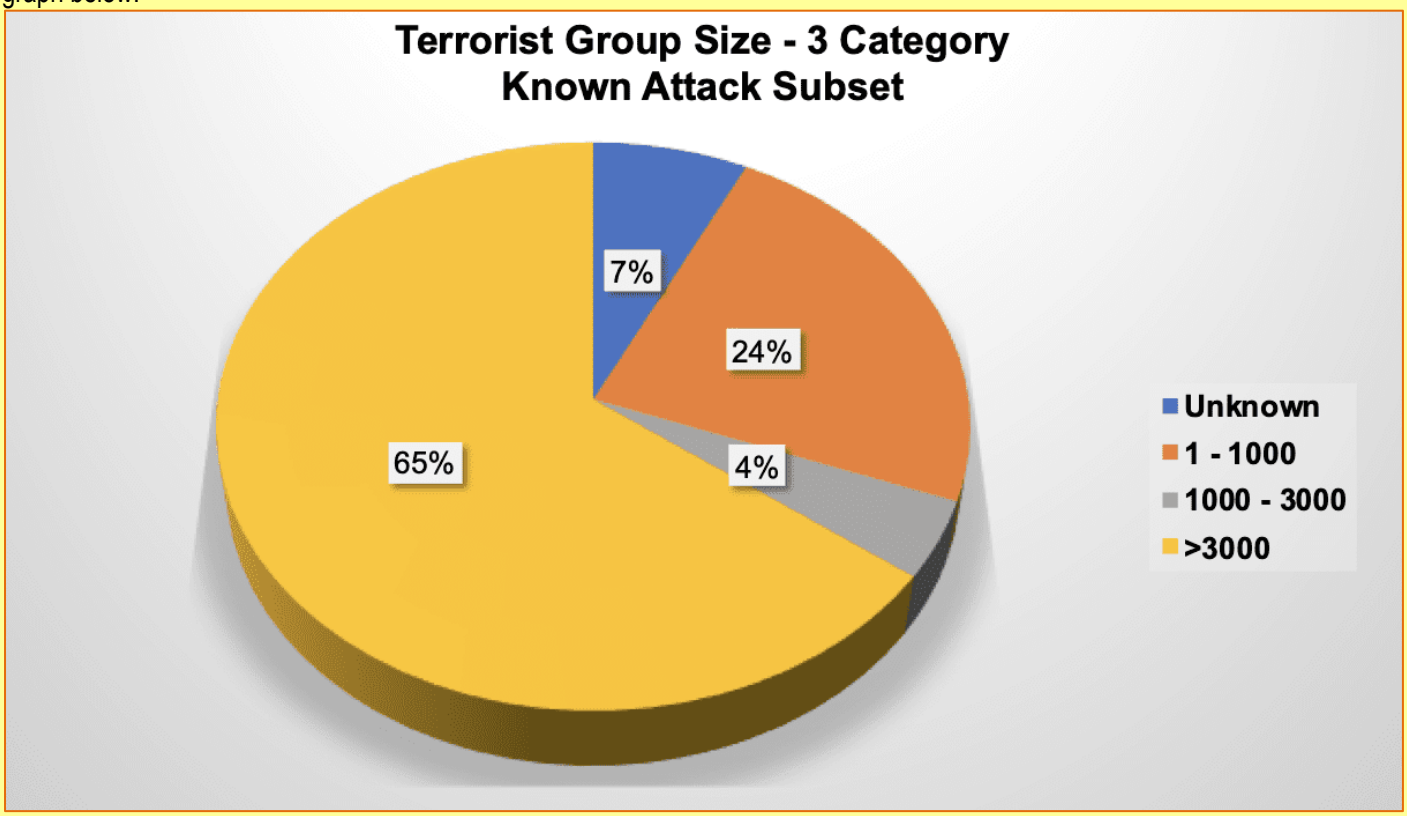
This propensity of ethno-nationalist and similar hybrid groups to conduct EI attacks appeared to increase over time in comparison to other ideological groups. The time series below depicts this increase compared to homogenous religious groups.



The vast majority of EI attacks were committed by groups that had been in existence for over 5 years, with groups 6-10 years old and those over 40 years old accounting for the greatest number of attacks. The graph below depicts the increase over time of EI attacks by groups more than 5 years old compared to the attack frequency of younger groups, which appears to have remained flat.

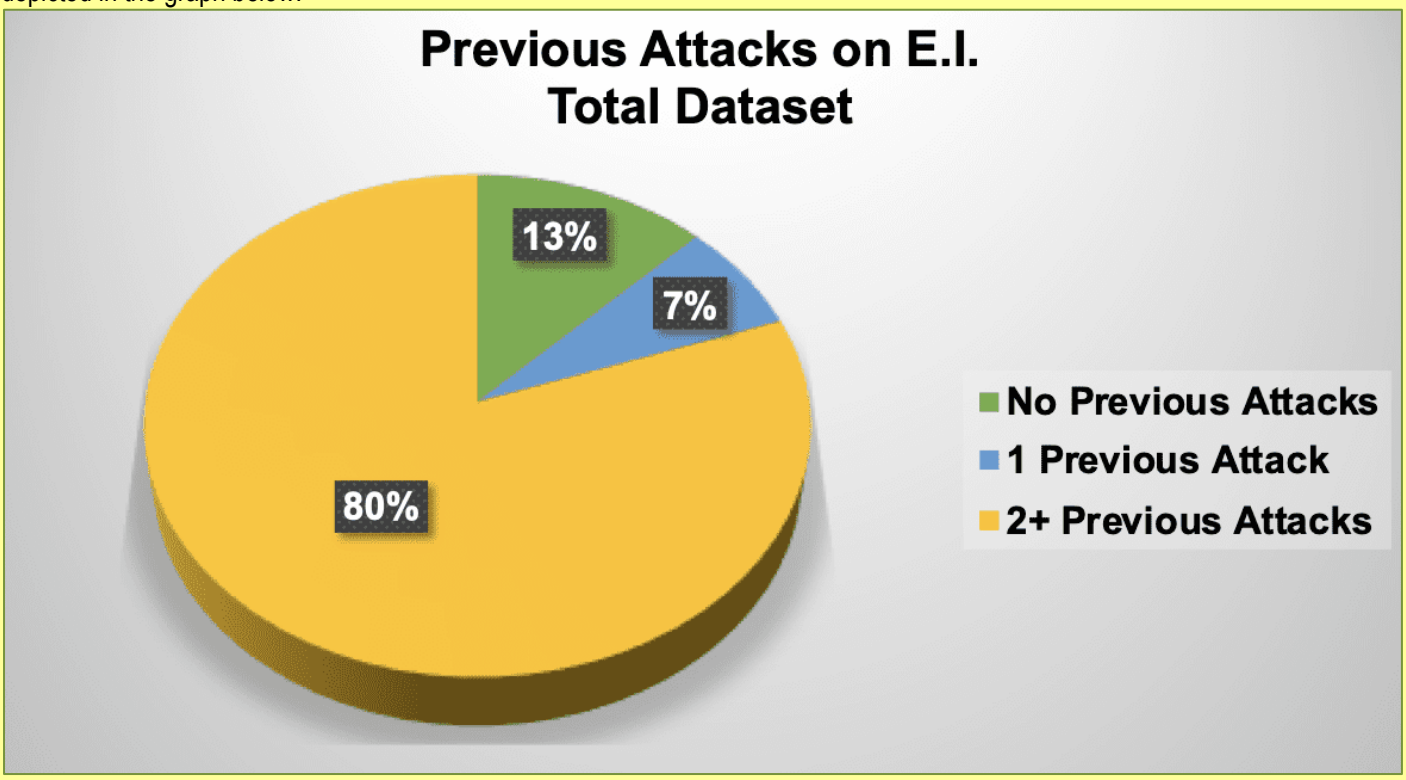


Large terrorist groups (more than 3,000 members) were responsible for 65 percent of EI attacks, which far exceeded the small terrorist groups (1-1,000 members) and medium-sized terrorist groups (1,000-3,000 members). This distribution is depicted in the graph below.



The literature strongly supported the notion that terrorist groups tend to repeat attacks on similar targets (Drake, 1998a; McCormick, 2003; Ackerman et al., 2007; Hoffman, 2017). It is common to find stories in the media of groups repeatedly striking similar targets. The findings in my research supported this assertion. Terrorist groups in the research sample were far more likely to conduct EI attacks if they had two or more previous attacks on similar

targets. The analysis showed that 80 percent of the EI attacks were conducted by groups with two or more previous attacks, as depicted in the graph below.



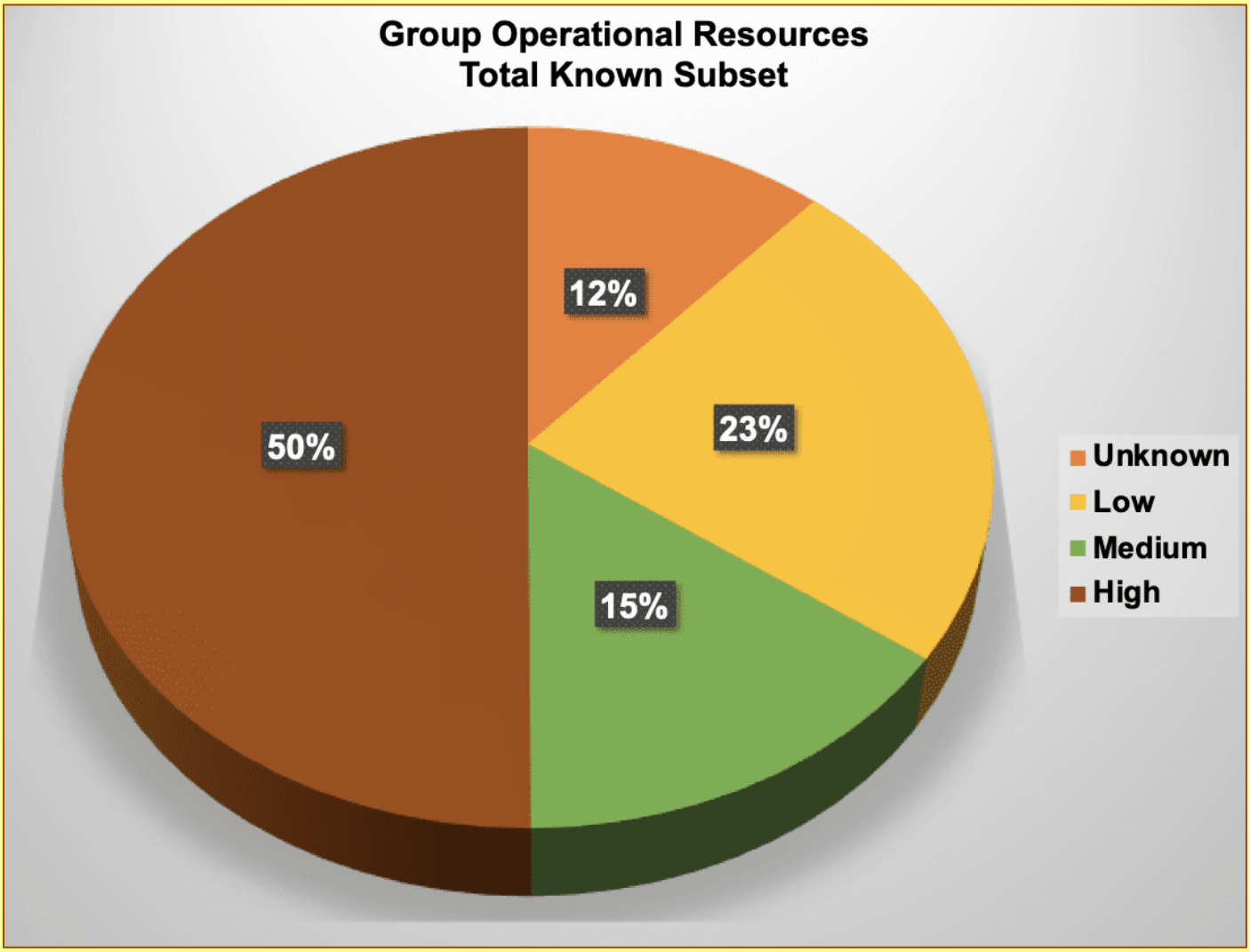
My analysis also examined the role of a group's operational capabilities and resources related to targeting decisions. Specifically, the question examined here is whether the lack or abundance of operational resources influenced the selection of EI as a target for attack. This question was analyzed using the frequency of previous EI attacks by groups with varying levels of operational resources. Each EI attack in the known subset was coded for the group's operational resources level.

Each group's operational resources were ranked using a 1-10 scale. The rankings were based on a subjective assessment and aggregation of the following elements:

- Annual revenue ($USD) – *if known*
- Sources of revenue
- Number of members
- Strength of leadership
- Access to weapons/type of weapons used
- State sponsorship
- Alliances w/other groups
- Support from the local population
- Access to and use of technology

The rankings exposed a wide disparity of monetary resources, including annual revenue ranging between tens of thousands of dollars up to over $1 billion per year. Similarly, some groups had only a few hundred fighters and poor access to weapons, while other groups had thousands of members and access to armored vehicles and guided rockets. These inequalities included differences in local support, patronage, state sponsorship, and access to sophisticated technologies. The assigned numeric value for each group was compared against the known attack subset to determine the statistical frequency of past attacks.

The largest proportion of EI attacks was conducted by terrorist groups with high operational resources (182 attacks). Groups with high resources (levels 8-10) accounted for 50 percent of the attacks and were much more likely to conduct attacks than any other single category, as depicted in the graph below.



Are EI attacks predictable?

The short answer is *no*. However, my research experimented with a Bayesian probabilistic tool to quantify estimated values, reduce uncertainty, and assess the threat from any specific group against a specific target, including EI, if the underlying statistical research is performed to establish prior probabilities and conditional probabilities. That said, in the absence of prior statistical frequency of previous attacks, these values can also be established through the elicitation of intelligence experts that have been well-calibrated to estimate probabilities. Experts will be well-calibrated when they can estimate probability ranges where they have at least 90 percent confidence that the actual probability for each factor falls within their stated range (Vogt, 2005; Hubbard & Seiersen, 2016).

Whether using the statistical frequency of past attacks, expert elicitation with a 90 percent confidence interval, or a combination of both techniques for establishing prior and conditional probabilities, the Bayesian tool shows promise for future application. The Bayesian tool also has the potential to predict the estimated timing of attacks or the likely tactics to be employed by the group(s) under consideration. The foundational statistics must be researched and established to identify the group's tendencies for when to conduct attacks or which tactics to employ. Once these steps are completed, the statistical frequencies can be combined with expert estimates to employ the tool.

Which groups will likely conduct EI attacks?

The statistical findings in my work suggest patterns concerning the proportion of previous EI attacks based on the decision factors. The analysis of the data specifically related to the age, size, and operational resources of a terrorist organization revealed discernible statistical tendencies. Similar observations were made when examining the number of repeat attacks on EI targets by individual groups.

The most likely future EI attacks will be conducted by large ethno-nationalist groups that have been in existence more than 5 years and demonstrate a high level of operational resources. Looking beyond political ideology, many terrorist groups that conducted EI attacks also tended to seize and control geographic territory, set up internal forms of government structure, and provide social services to the populations under their control. These groups will have strong central leadership and have committed EI attacks in the past. The EI targets will be geographically close to the group's area of operation and will have security vulnerabilities that the groups can exploit.

How is the research useful for homeland security?
Intelligence analysts can use this research to apply greater scrutiny to terrorist groups that score high in most or all the categories. This allows for more efficient resource allocation. Security personnel and planners can build better risk models using design-basis threat models to simulate potential attacks. Better intelligence, vulnerability assessment, risk modeling, and planning logically contribute to harder targets and better-prepared infrastructure operators.

Conclusion
The purpose of my research was to examine the likelihood that sub-state actors will attack EI. The work quantified some of the common assertions that the risk of an attack to the power grid is serious. The research focused heavily on a set of decision influences believed to shape target selection. These decision influences were identified and validated through a review of the literature and applied to a statistical analysis of EI attacks.
Through this analysis, a set of research questions was addressed, and hypotheses were tested. The use of this research method was presented as a heuristic to model an estimation of future attacks. This work was intended to further the protection of the electric power grid from malicious physical attacks.

▶▶ **Link to full dissertation**
https://www.proquest.com/openview/528dc91c69e3a6b361195a88ec0063ae/1?pq-origsite=gscholar&cbl=18750&diss=y

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National Security Agencies Must Include Climate Risks and Their Analyses

The Pentagon and other federal agencies were given a July deadline to draw up plans for potential climate risks, under an executive order by President Biden. Antonio Busalacchi and Sherri Goodman write that such plans are an essential first step, but the greater challenge for national security agencies is to continue to redirect their focus to changing climate conditions that pose a complex, two-pronged threat: social and political instability overseas and damage to U.S. infrastructure. **Read more**

Contrary to US hopes, the Taliban have not changed

Source: https://www.thenationalnews.com/opinion/editorial/2021/08/05/contrary-to-us-hopes-the-taliban-has-not-changed/

When the Taliban were last in power, girls above the age of 10 were banned from school, men were forced to grow beards, criminal punishments included amputation and public execution and international terrorist organisations found a safe haven in one of the most

oppressed countries on the planet. In 2001, and only after the situation led to an attack on American soil, a US-led coalition had enough, launching a campaign that quickly deposed the group.
Twenty years later, America has a different approach, withdrawing troops from Afghanistan and entering into negotiations with the Taliban, hoping that since the 1990s they, too, have changed.
Today, as the organisation tears through the Afghan countryside and besieges provincial capitals, such hope diminishes by the day. People who have fought the group predict impending catastrophe. Speaking to *The National,* British military officials have criticised US President Joe Biden's foreign policy, warning that the country will once again become a safe haven for terrorists, and that Kabul, the capital, will be overrun by "September or October at the latest".
Those facing the prospect of living under the Taliban also doubt that the group is any less dangerous. Since the start of 2021, about 330,000 people have been displaced fleeing fighting and the organisation's advances.

There are good grounds for this fear. Western embassies in the country are claiming that the Taliban might already have committed war crimes by carrying out revenge murders on civilians. There are also reports that the terror organisation is closing women's schools and medical facilities, forcing them to wear conservative clothing and even making girls as young as 13 marry fighters. On Wednesday, the Taliban claimed responsibility for an attack on the residence of the Minister of Defence, and vowed to carry out more attacks.
Since the Taliban were ousted, women have come to make up more than a quarter of parliamentarians. Now, the international community faces criticism for squandering this progress and abandoning Afghan women. Pashtana Durrani, an activist from Kandahar province, has criticised how gender rights in the country were used to justify war, only to be abandoned when countries wanted to pull out. “We were used as business cards," she says.
Some are more optimistic. Nicholas Kay, Britain’s former ambassador to the country, makes the case that Afghanistan itself is different from two decades ago, now being a "urbanised, youthful, modern, connected, Facebook Afghanistan”, and, he claims, potentially harder for the Taliban to control.
But even if those in the country are better able to resist, the wavering commitment of the country's western allies emboldens the Taliban even more. In its negotiations with the US in Doha, the group continues to assert that it deserves international recognition, denying any

of the atrocities attributed to it on the ground. The group's negotiators have even gone as far to say that they are not in full control of fighters affiliated to them. If that is the case, US talking with powerless representatives would surely be pointless.
Today, the West has a different approach to the Afghanistan, and Afghan society has changed since the 1990s. But in a country where chaos makes the headlines every day, only one thing seems certain: the Taliban are committed to their old ways.

Modern heroes!

Athens' wild fires Aug 2021 – She was serving others (seasonal firefighter)
the same moment that her own house was burnt to ashes!

Tokyo 2020, take a bow

Source: https://www.thenationalnews.com/opinion/editorial/2021/08/08/tokyo-olympics-2020-take-a-bow/

Even until a day before the Tokyo Olympics started on July 23, there was scepticism over whether the Games would go ahead – and questions asked about whether they should be held at all. Views diverged on this not just in Japan, where many thought that the decision to go ahead would put lives at unnecessary risk. Given the toll Covid-19 was continuing to extract, there was reason for the fear and anxiety felt across the world.
Besides the daily infections in Tokyo, there were cases of Covid-19 being diagnosed in the Olympic village. Athletes who tested positive returned home with their hopes dashed even before the opening ceremony. It added to a sense of foreboding about how much of a success the "silent" Games would be as no fans, international or domestic, were allowed in to most venues. The deck was clearly not stacked in the Games's favour. And yet, as the closing ceremony gets under way, the Japanese government, the International Olympics Committee, the organisers and all the participants can be rightly satisfied that the Games went off better than perhaps imagined even by the staunchest critic.

Given the precautions, the daily testing, the Olympic bubble, the requisite vaccinations, and the Games themselves largely being held behind closed doors, it is fair to say that Tokyo 2020 was a success. This is true not just in terms of sporting brilliance – as in the case of the gold won by Tunisia's 18-year-old swimmer Ahmed Hafnaoui and some stellar performances by the refugee team and athletes of the Middle East.

Despite the contextual hurdles, of the Games being held amid a pandemic, a notable legacy was created in other areas, in social and environmental terms. This year's Games were billed as the most gender equal, under the guidance of Tokyo 2020 President Seiko Hashimoto, with 49 per cent of participants being women. Massive strides were also made in other areas – such as mental health.

Even as she withdrew from her fifth Olympic final, Simone Biles, the American gymnast and one of the greatest in her field, created a much-needed global conversation. Struggling to vault over the pole, Biles confessed to being unable to orientate herself in mid-air. In her public sharing of a condition called the "twisties", she shone a light on the pressures even champions face to reach the top – and maintain that position.

The carbon-conscious aspect of Tokyo 2020 was another hallmark. As many parts of the world, from Germany to Turkey and Greece, battle floods and wildfires, the entire Olympic village being powered by hydrogen sets a precedent for the way forward. It tells us something about how integral a circular economy – where goods are recycled or repurposed, like the Olympic medals made of e-waste – will be in future. This summer's Olympics showed how there is an opportunity at every global event to tackle climate challenges. All in all, Tokyo 2020 after a year's delay and the months of apprehensions, has given Paris some ground to cover in 2024.

We don't know where the world will be in three years' time when eyes turn to the French capital, which has one less year to prepare for the next summer Olympics. Europe has had a head start with vaccinations and France is in the rare, elite position of being able to host the Games 100 years after they last did so in 1924 – coincidentally, not long after the last pandemic, the Spanish flu, devastated the world.

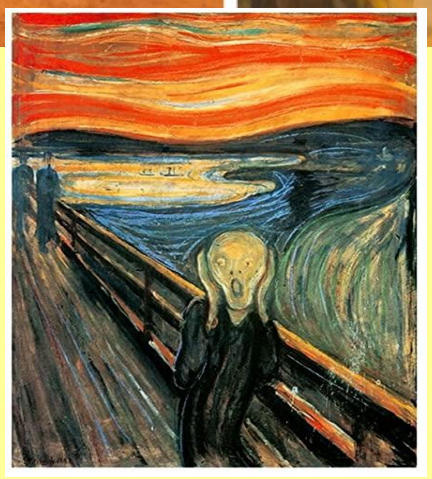
But despite essential logistics already in place, there can be no room for complacency. The recent protests in France by tens of thousands of people against vaccines could well be history in three years. But the world is likely to still be in the shadow of a recently abated pandemic. Japan pulled this off in the middle of a mutating Delta variant. It is in the hands of France now to take the baton further.

EDITOR'S COMMENT: The security threat for Tokyo2020/21 was minimal compared to the pandemic. But in Paris2024 the ratio would be just the opposite. Nobody seems to take into consideration the terrorism record of France. "Defense Games" to their best!

Could this be an Edvard Munch[1] painting?

Aug 2021 Evia Island (Greece) mega-fires: 81yo lady in desperation

(Left: Photographer Konstantinos Tsakalides; Right: Cartoonist Christos Papanikos)



[1] ***The Scream*** is the popular name given to a composition created by Norwegian Expressionist artist Edvard Munch in 1893. The original German title given by Munch to his work was *Der Schrei der Natur* (***The Scream of Nature***), and the Norwegian title is *Skrik* (***Shriek***). The agonized face in the painting has become one of the most iconic images of art, seen as symbolizing the anxiety of the human condition.

So sad for a great nation . . .

35,000,000 euro per year for three years . . .

How Has the Terrorism Threat Changed Twenty Years After 9/11?

By Bruce Hoffman

Source: http://www.homelandsecuritynewswire.com/dr20210812-how-has-the-terrorism-threat-changed-twenty-years-after-9-11

Aug 12 – The U.S. counterterrorism response to the September 11, 2001, attacks yielded some remarkable successes and disastrous failures in hunting al-Qaeda. The top terrorist threat today, though, is domestic rather than foreign.

How do al-Qaeda and its affiliates currently pose a threat to the United States and the rest of the world?

The al-Qaeda of today is nothing like it was on 9/11. Its founder and leader, Osama bin Laden, is long dead. With the notable exceptions of Ayman al-Zawahiri, a surgeon turned terrorist and the movement's current emir, and Saif al-Adel, a former Egyptian army officer and al-Zawahiri's most likely successor, every single senior al-Qaeda leader has been killed or captured. Seven of the movement's top commanders have been eliminated since 2019. Today, al-Zawahiri himself is said to be in poor health.

But the ideology and motivation espoused by al-Qaeda is, unfortunately, as strong as ever. For instance, there are now four times as many Salafi-jihadi terrorist groups designated by the U.S. State Department as foreign terrorist organizations than there were on 9/11. And the most recent report from the United Nations' monitoring team [PDF] points to al-Qaeda's unimpeded growth in Africa, entrenchment in Syria, and presence in at least fifteen Afghan provinces, as well as its continued close relations with the Taliban.

Americans also shouldn't be lulled into thinking that al-Qaeda no longer wishes to attack the United States. The 2019 attack by a Saudi sleeper agent at a U.S. Navy air base in

Pensacola, Florida, which killed three people and wounded eight others, was a reminder that al-Qaeda is still able to mount international terrorist operations by working through one of its dedicated, highly capable franchises—in this case, its Arabian Peninsula affiliate.

What were the greatest successes and failures of the U.S. counterterrorism response of the past twenty years?
The number one success was the government's thwarting al-Qaeda's every attempt to carry out another attack in the United States on the scale of 9/11—although the 2019 Pensacola shooting was an important warning against becoming too complacent.
The worst failure—beyond any doubt—was the 2003 invasion of Iraq, which diverted critical resources away from efforts to finish al-Qaeda off in South Asia during the best window of opportunity. The invasion also inadvertently set off the chain of events that led to the emergence of the self-proclaimed Islamic State, an even more violent and unconstrained version of al-Qaeda. It took an eighty-three-country coalition some five years to defeat the threat posed by the Islamic State.
During that period, the Islamic State executed and inspired deadly attacks on civilian targets in cities including Brussels, Nice, New York City, and Paris. The al-Qaeda splinter group also conducted the first successful terrorist attack in over a decade against a commercial aviation target, killing 259 people flying from Egypt to Russia. It also changed the nature of modern terrorism by pioneering the use of social media for recruitment, propaganda, and to encourage totally independent, lone-wolf attacks.
In the worst category, it must also be said that in the course of responding to the events of 9/11 and in seeking to defend the country from further attacks, the U.S. government abased some core American values and principles of justice. For instance, imprisoning people for decades without trial is something that the United States has always criticized nondemocratic governments for. Yet, several dozen detainees remain at the U.S. detention facility at Guantanamo Bay, many held indefinitely without charge. Similarly, the detainee abuse that occurred there, at CIA black sites, and at Abu Ghraib prison in Iraq tarnished the United States' reputation and generated worldwide condemnation.

The U.S. national security apparatus transformed significantly post-9/11. What were the most significant changes?
The vast counterterrorism bureaucracy created in the aftermath of the 9/11 attacks was the biggest and most enduring change. For instance, a 2010 *Washington Post* investigation revealed the existence of a vast counterterrorism archipelago of some 1,271 government entities and 1,931 private companies focused on counterterrorism. The war on terrorism also entailed increasing the number of people with top-secret security clearances to an estimated 854,000 and constructing more offices and secured facilities to accommodate them—an expansion equal to "almost three Pentagons or 22 U.S. Capitol buildings—about 17 million square feet of space."
But in securing and protecting any country from terrorist attack, a perennial question is how much is enough. As the above data implies, the United States potentially overreacted to the 9/11 attacks by creating redundancies or granting sweeping powers to various agencies. At the same time, it is indisputable that U.S. counterterrorism measures have succeeded in preventing anything like 9/11 from occurring again. The challenge going forward, especially at a time of competing national security challenges and diminished fiscal resources, is finding and maintaining a prudent balance in guarding against the terrorist threat while attending to other, perhaps more pressing security priorities.

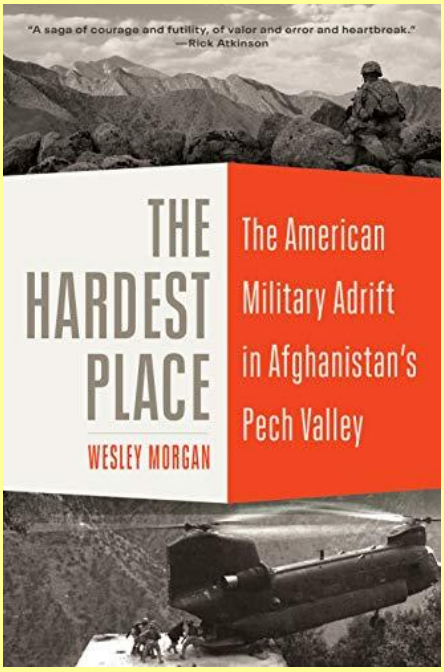
What are the main terrorist threats to the United States today, and what lessons does the 9/11 response provide for combating them?
Sadly, the terrorist threat to the United States has shifted from a mostly external one—which it was for nearly two decades after 9/11—to an internal one, as the Capitol Hill riots of January 6, 2021, highlighted. But the ongoing threats posed by the Islamic State and al-Qaeda have not disappeared. The challenge for the United States will be formulating a sufficiently agile and ambidextrous counterterrorism capability to defend against the full array of terrorist threats—both foreign and domestic—that will surely persist. Both the 2018 National Strategy for Counterterrorism and the first-ever National Strategy for Countering Domestic Terrorism, released in June 2021, provide clear exegeses of the holistic approach needed to protect the country from terrorism. However, the bitter partisan divisions that exist in the United States today could undermine the implementation of a coherent counterterrorism strategy. The unity, common purpose, and shared destiny that drew the country together after the 9/11 attacks no longer exist. In contrast, the current climate of political polarization could effectively paralyze the government in preparing for the next generation of threats.

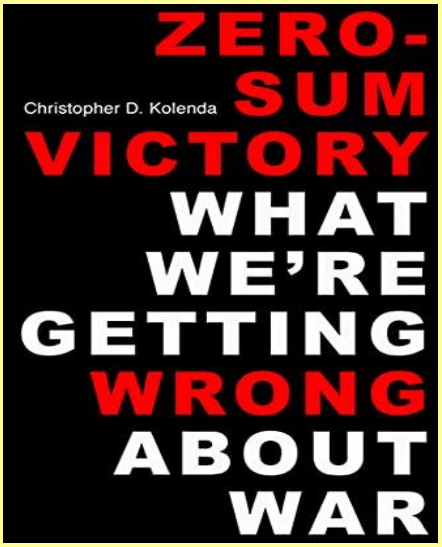
Bruce Hoffman *is the Shelby Cullom and Kathryn W. Davis Senior Fellow for Counterterrorism and Homeland Security at CFR (Council on Foreign Relations).*

What Went Wrong for the U.S. in Afghanistan

Source: http://www.homelandsecuritynewswire.com/dr20210812-what-went-wrong-for-the-u-s-in-afghanistan

Aug 12 – The Biden administration's decision to withdraw American troops from Afghanistan is an admission that the United States has failed in its costly war in Afghanistan. To be more precise, the United States succeeded in preventing al Qaeda from mounting another 9/11-like terrorist attack, and has decimated the organization's ranks, but the United States has failed to create the conditions in Afghanistan which would prevent the Taliban from taking over the country within weeks of the U.S. withdrawal, thus allowing al Qaeda, or other terrorist organizations, to use Afghanistan as a safe haven, as they did before 2001.





Why has the United States failed? Jason K. Dempsey, who was deployed to Afghanistan as part of the 2009 "surge," writes in *Just Security* that

> Luckily for those seeking to understand the dynamics of the fight in Kunar beyond the heavily reported battles, and for those wondering how all the heroism portrayed in those stories led to an overall outcome in Afghanistan that fell far short of U.S. aspirations, there are two new books that seek to make sense of the war. *The Hardest Place: The American Military Adrift in Afghanistan's Pech Valley* by Wesley Morgan and *Zero-Sum Victory: What We're Getting Wrong About War* by Christopher Kolenda will both serve as touchpoints for understanding American failures for years to come.

He adds:

> Morgan uses *The Hardest Place* to describe the arc of U.S. military efforts, from the daring hunt for Osama Bin Laden and his deputies in the immediate aftermath of 9/11, to the massive buildup of troops between 2009 and 2011, to the refined use of drones to continue the fight long after most American troops had left. Running through this arc is the evolution of the military's capability to kill and its attachment to that effort at the expense of the mission at hand. Originally the domain of small, classified special mission units, the concept of blending high-technology assets with specially trained strike forces expanded beyond secretive units to the military writ large over the course of the wars in Iraq and Afghanistan. Conceived, in Morgan's words, as a "global counterterrorist decapitation machine," by the end of U.S. involvement in Afghanistan, the military was using these assets on anyone that could be loosely defined as a threat. In that sense, the military's focus on targeting became not much more than an updated way to pursue a strategy of attrition and body counts, but without the negative baggage such terms had earned in Vietnam.
>
> But, like in Vietnam, the U.S. military could never kill its way to victory in Afghanistan, despite over a decade of massive, conventional military operations and "terrorist decapitation" efforts. Morgan quotes one U.S. Army Ranger, who, observing drone operations in the Pech late in the war, said, "You'll never run out of people to kill there."

Dempsey writes that the United States was also afflicted with political and cultural blindness which hampered U.S, efforts.

> By trying to create Afghan forces that were a mirror image of the U.S. military, the United States designed a national army for its own country, not Afghanistan. And instead of accounting for local politics and incentive structures, many U.S. officers assumed that the Afghans should naturally adhere to the chain of command structure that the U.S. military laid out for them and to follow the lead of Americans in tactical and operational decisions

Kolenda concentrates on the larger policy processes that drove U.S. decisions on Iraq and Afghanistan.

> In *Zero Sum*, Kolenda places the obliviousness of American military units when it comes to local Afghan political dynamics within the larger context of strategic narcissism, whereby the world is judged only in relation to American interests. He also deftly outlines how the U.S. military's focus on the goal of "winning decisively" leads, paradoxically, not to clean military victories but, in many ways, guarantees the kinds of quagmires we have seen in Iraq and

Afghanistan. Viewed in isolation, it is admirable that the military would seek to "win decisively" – but only if wars were decided primarily by tactical proficiency and set piece conventional battles.
Kolenda lays out a compelling argument that, in the case of our post-9/11wars, this outlook, unfortunately, led to "substituting destruction for negotiation."

Dempsey concludes:

Both Morgan and Kolenda clearly care deeply about the American military and its role in the world, and, with their books, have demonstrated that true respect leads to deep introspection and critical examination, of both policymakers and military leaders alike. That critical examination is the first key step by which the United States can learn from its mistakes and ensure that it pursues a foreign policy that merits the sacrifices and service of its soldiers.

EDITOR'S COMMENT: Just another lost war! No surprise; not at all! It would be useful to study the *modus operandi* of Alexander the Great when conquering new nations. They will learn a lot and spear the lives of many including their own!

Migration Is Rising, but So Do Border Barriers

By Gianna-Carina Grün

Source: http://www.homelandsecuritynewswire.com/dr20210813-migration-is-rising-but-so-do-border-barriers

Aug 13 – Although thousands of miles apart, Lithuania and the Dominican Republic have something very specific in common: Due to increasing migration from their respective neighboring countries, both recently decided to tightened their borders.

Both countries are showcases of an ongoing trend: The world today is seeing ever more refugees and asylum-seekers than two decades ago. Political conflicts and the effects of climate change are among factors forcibly displacing people around the world. And the situation looks set to continue along this path.

Whereas the global population grew by a quarter over the past 20 years, numbers of refugees and asylum-seekers doubled in the same time frame, according to United Nations data. Today, one in 97 people is forcibly displaced. In 2015, it was one in 175. Most of these displaced people have found refuge in countries in western Asia and North Africa, such as Turkey or Sudan.

Latin America and the Caribbean have seen the biggest increase in refugee numbers — more than 100-fold from 2000 levels (from 44,000 to 4.8 million), with Colombia, Chile and Peru witnessing the biggest increases. According to UNHCR, this is mostly due to the fact that 3.6 million Venezuelans displaced abroad have been included in the most recent figures.

This spike had the region catch up with other migration hot spots, such as sub-Saharan Africa, Europe and North America, where refugee numbers roughly doubled since 2000.

More Refugees, More Border Walls

The trend of rising migration parallels another trend that attempts to halt or at least manage the first: Between 2000 and 2021, the number of completed, started or announced border walls in the world more than quintupled, from 16 to more than 90 wall complexes, as data collected by DW shows.

Governments mostly cited illegal immigration as the main reason for building border walls, followed by illegal trade (i.e. the smuggling of goods, and trafficking of people or drugs) and terrorism concerns, according to a study headed by the Delàs Center for Peace Studies that analyzed border walls built between 1968 and 2018.

Barriers: Patchy or Highly Militarized

The effectiveness of border barriers against irregular migration, illegal trade or terrorism attacks is not always easy to assess, since there are often multiple interlinked factors at play.

One such factor determining the effectiveness of a border barrier is how it is constructed — which differs greatly in complexity and enforcement, as a study by policy researchers Victoria Vernon and Klaus Zimmermann documents: "Among the most serious borders is Kuwait/Iraq, made of electrified fencing and razor wire, braced by a 4.6-meter-wide and 4.6-meter-deep [15-foot-wide and -deep] trench, complete with a 3-meter-high dirt berm, and guarded by hundreds of soldiers, several patrol boats, and helicopters."

"Among relatively porous borders are fences between Malaysia/Thailand, and India/Bangladesh. Both are lightly patrolled and monitored, and thus not effective deterrents for migrants and smugglers who often use fake documents and bribes to cross between the two countries," Vernon and Zimmermann continue.

Migration, Security: Walls Not Universally Effective'

Scientific studies are divided on whether walls can prevent irregular migration. "There's no scientific consensus, which means that walls are not universally effective at deterring immigration," Sergi Pardos-Prado, a political scientist at the University of Glasgow, wrote to DW in an email.

"Sometimes migration finds alternative routes — sea or alternative, indirect land connections. Walls are slow and expensive constructions, sometimes you prevent access in a specific area but you incentivize access in a different area still under construction or less robust.

"It is rare to find a perfect, massive, solid, impenetrable block covering the whole length of the border."

Beyond preventing migration, another reason to build walls are concerns around security, such as stopping terrorism. But recent research efforts led by Pardos-Prado show that the construction of border barriers can actually increase the probability for terror attacks rather than prevent them — based on two conditions.

In case studies of the Saudi-Iraqi wall and the Israel-Egypt wall, the researchers traced how attitudes of people toward the other country significantly deteriorated after a wall was built. "The erection of the wall signals and intensifies conflict, even beyond the conflictual conditions that were already latent before the erection of the wall," said Pardos-Prado.

There is also a second condition for border walls to backfire: The presence of a large refugee group coming from countries where transnational terrorist organizations are located. This provides terrorists breeding ground for recruits, the researchers' theory goes.

"This means that if the refugee group size is large but they do not come from countries with terrorism, we don't observe the backfiring effect," Pardos-Prado said.

The researchers' analysis suggests that "this backfiring effect lasts, on average, between four and 11 years after the start of the construction of the wall."

Border Walls Also Hit Economy — More Than Once

Unwanted side effects can also be witnessed in the economic sector: While border barriers can reduce illegal trade like drug trafficking and smuggling, they are likely to curb legal trade as well.

Irrespective of the intended purpose of the wall, the legal trade of countries with a wall built between them plummeted by up to 31 percent, according to a study by the universities of Washington and Chicago that analyzed more than 50 barriers around the world.

Moreover, wall construction not only reduces trade, but it also brings additional costs: Beyond the bill for actual border construction, costs for companies to conduct legal trade and costs for civilians legally crossing borders are likely to increase as well.

"The economic question about the walls and fences is: do the benefits exceed the costs?" wrote economist Victoria Vernon in an email to DW.

"Or in other words: Is a wall worth it if it prevents 40,000 people from working in the US — when the costs of achieving it include $3 billion to build the wall, many more billions to maintain it, the hundreds of people who die crossing the border, criminal justice resources to patrol the border, and potential economic benefits of Mexican labor that US citizens are *not* receiving because migrant workers are not coming?"

Alternatives to Border Barriers

But if border walls and fences are no surefire measure for tackling irregular migration, damping down illegal trade and combatting terrorism — then what is?

"Economic literature overwhelmingly suggests that policies of more open borders, with less restrictive migration and trade, benefit domestic citizens more than walls," according to Vernon and Zimmermann.

"Economic policies are also more effective than walls in dealing with illegal trade and trafficking, while diplomacy is more effective than walls in addressing security," they point out in their study.

"Walls and fences can be a short-term instrument," economist Klaus Zimmermann wrote in an email to DW. But most social scientists working in the migration field "think that it is not a reasonable instrument," he added.

Border barriers are "mostly a political showcase for policymakers to impress voters in the short term," Zimmerman concluded.

***Gianna-Carina Grün** is head of Data-Driven Journalism at DW. Waleed Al-Bast, Emad Ghanim, Abdo Al-Mikhlafy, Yalda Zarbakhch, Daniel Bellut, Florian Meyer and Marina Baranovska contributed to this report.*

EDITOR'S COMMENT: Just another (German) propaganda article supporting open borders. It is great to live in a country without enemy neighbors and not in the front-line of the so-called European Union …

The Link Between Animal Cruelty and Human Violence

Source: https://www.hstoday.us/subject-matter-areas/law-enforcement-and-public-safety/the-link-between-animal-cruelty-and-human-violence/

Aug 11 – The roles animals play in society are widespread, ranging from beloved family pets providing comfort, to law enforcement dogs tracking missing persons, to service animals providing critical assistance. Animals are part of nearly everyone's life in some aspect. Unfortunately, as seen with children, without a voice of their own, animals are among the most vulnerable in society. This vulnerability places them at high risk for animal cruelty — intentional, harmful behavior such as neglecting or killing an animal.

Historically, animal cruelty has been considered an isolated issue, but recent research shows a well-documented link that it is a predictive or co-occurring crime with violence against humans (including intimate partners, children, and elders) and is associated with other types of violent offenses. Increased awareness of this linkage and a collaborative approach to these investigations strengthens the identification and reduction of such crimes.

Recognizing animal cruelty as a serious violent offense has slowly developed over time. In the late 19th century, child abuse and animal welfare were closely associated within independent programs. However, during the 20th century, the government began to oversee child protection services, and private humane societies undertook animal welfare. This separation hindered the acknowledgement of the correlation between animal cruelty and domestic violence. As time has progressed, an increasing number of fields have acknowledged the correlation and seriousness of these crimes.

▶▶ Read more at FBI Law Enforcement Bulletin

Saigon *vs.* Kabul

Afghanistan debacle message for US allies, including Israel - analysis

By Seth Frantzman

Source: https://www.jpost.com/middle-east/israel-other-us-allies-in-mideast-must-learn-from-afghanistan-analysis-676756

Aug 15 – The rapid fall of Afghanistan and the way in which US political and military officials, as well as experts from various think tanks, were shocked by the rapidity of the collapse is symbolic of a larger challenge facing the United States today.

After Afghanistan, the US will have to reassure allies and partners that it will remain somewhere in the world. As American officials speak about "forever wars" and wasting "treasure" around the world, there are concerns about what comes next.

This is particularly true in the Middle East, where America's partners and allies wonder if the US only sees countries here as "interests." The talk of the US taking a tougher line on Saudi Arabia and Egypt, two countries that once formed a pillar of US foreign policy, is leading to concerns.

US support for the Abraham Accords is also a key issue. The new US administration won't even call the Israeli peace deals by their name, but it has put out messaging praising the normalization Israel now has with Gulf states and Morocco.

Concerns about the US role in Iraq and Syria are on people's minds too. Will Afghanistan erode more confidence in Washington and its claims to still be committed to the region?

The US has a long track record of intervention in various countries over the last several decades. These conflicts, called "small wars" or "long wars," tended to be a result of the end of the Cold War and 9/11.

That means the US practiced humanitarian intervention and nation-building and then transitioned to preempting Iraq from acquiring weapons of mass destruction and fighting a global war on terrorism. Much of this turned out to be a myth, as has been seen in Afghanistan.

Nations were not built. Wherever the US has intervened, the countries have generally become chaotic, poor, Hobbesian disasters.

From Iraq to Syria, from Afghanistan to Somalia, from Haiti to Panama, the US has sent forces to many places, and they have generally not improved afterward. That may not be due to US intervention; the interventions may have simply been a symptom of chaotic world order, the rise of extremism and ungoverned spaces.

For instance, the chaos in Libya today may not be the fault of the intervention. Neither can the chaos in Yemen be blamed on the US. But the US is a factor, and its apparent

mismanagement, or its failed attempt to build local security forces, raises many questions. Where was the Afghan air force over the last month and a half?

US President Joe Biden in July said the Afghan army had 300,000 troops who were "as well equipped as any army in the world" and that it had an air force. But the air force was a handful of helicopters. In general, the US didn't bequeath a real air force.

Images from Afghanistan's provinces show poverty and neglect. Twenty years didn't result in much, it seems. Americans are wondering where the billions of dollars went. They see this as another example of Washington being misled or misleading them. They want the money spent at home on infrastructure.

America is not only talking more about isolationism, a theme that runs throughout US history and gained traction under the Trump administration's "Make America Great Again" slogan. American's Left and Right tend to agree it's time for the US to look inward and that foreign policy should focus narrowly on interests.

Is it in our interest? What are we doing, and why are we doing it? Those are questions being asked. As those questions are asked, the US appears to be jettisoning one after another of its partners, or at least putting them on notice that the clock is ticking. Show us that you're in our interests or you're done is the message.

This happened in Eastern Syria in 2018 and 2019. Driven partly by pro-Turkey elements in the US State Department who wanted to end US efforts in Syria in competition with US Central Command, the US policy ended up being a partial withdrawal.

Genocidal jihadists backed by Ankara invaded areas the US had help secure with the Syrian Democratic Forces. These SDF partners had helped liberate Raqqa from ISIS. But US officials called the partnership "temporary, tactical and transactional."

Even today, it's possible the US may leave Eastern Syria if it doesn't see some unnamed progress. That puts the people on edge, as the people in Kabul were, wondering what comes next and hedging their bets.

The US calls this "interests," but it's unclear why handing an area to US adversaries is in US interests. The political capital of having people trust and rely on Washington is important, but it is being squandered.

In Iraq, the US faces the same problem. US friends and partners are evaporating or hedging their bets. In the Kurdistan Region, which came into being partly with US air support in the 1990s, there are a lot of concerns that the US won't remain. Pro-Iranian militias have targeted Erbil, ISIS is still festering, and Turkey is bombing some areas.

Meanwhile, in the Gulf, the US is also facing concerns that it is not sufficiently supportive of the Abraham Accords. There appears to be some hedging now in Riyadh in regard to talks with Iran. Saudi Arabia is facing the Iranian-backed Houthis in Yemen. It may seek to find a deal.

Egypt may be shifting its outlook as well, seeking a greater role in Horn of Africa. Sudan may be patching things up with Turkey as it has wanted more support after it also agreed to relations with Israel. But it needs investment.

The US talks more these days of "near-peer" adversaries and a desire to confront Russia and China. However, many countries wonder what commitments the US has in return when it asks friends and partners to help it in this rivalry.

When the US refuses to even see countries as allies, but calls them "interests" and then asks them to help with confrontation with Russia and China, many countries wonder what happens when the US shifts policies, and the "interests" no longer align. These countries are asking themselves if it is in their "interest" to confront China or Russia or Iran.

This has ramifications for Israel because Israel views itself as a close ally of the US. The US-Israel relationship has also grown in recent years, and Israeli defense companies are now world leaders in technology, including artificial intelligence, drones, radar, optics, missiles, air defense and targeting pods.

Israeli companies partner with their US friends on a variety of projects. This is true now in how Rafael Advanced Defense Systems works with Raytheon, for instance. In July, Lockheed Martin and Israel Aerospace Industries said they had entered an MOU that will form part of a strategic agreement to work together on air defense. Elbit Systems supplies helmets for the F-35s. This is all very important.

On the surface, Israel-US relations are the best ever. There are more joint exercises than in the past. US officials frequently meet Israeli counterparts. This means the Afghanistan debacle doesn't have immediate implications. In fact, a smaller US footprint and less US bases ostensibly means the US needs Israel more than in the past.

A stronger Israel is now not just in US interests; it plays a greater role in the region. This is true also because so much of the region is made up of weak or failing states or places occupied by Iranian proxies. Israel sits on the doorstep of Lebanon, which is as good as bankrupt, and on the border with Syria, where conflict continues.

The US has a base at Tanf near the Jordanian border, not far from Israel. While US bases in Qatar, Bahrain and the UAE are not in doubt, there are questions about how close the US is to Riyadh and Cairo these days. Meanwhile, Israel and the UAE are fostering close relations with Greece and India, countries the US is also working with.

The big question after Afghanistan is how the US will show that it is really committed to stability and security, whether that is off the coast of Taiwan or off the coast of Oman, where a ship was recently attacked by a drone.
Countries are testing US resolve. The US looks to be in a bind after the debacle in Kabul. How did 300,000 Afghan soldiers disappear? Was it a ghost army? And if it was, what does that say about US training of Iraqi forces and of the Palestinian security forces, the latter of which was done through the USSC, or what was once called "Dayton's Army."
If the Palestinian Authority faces challenges, will the Palestinian security forces be up to the task? And what becomes of Eastern Syria and the SDF, another key force the US helped support? This matters because enemies, such as Iran, want to move into any power vacuum in the region and set up shop.
We know what that shop looks like in places like Lebanon. It's a bankrupt operation. The US needs to reassure allies that it will stick by the region in this difficult time.

Seth J. Frantzman *is Senior Middle East Correspondent and Middle East affairs analyst at The Jerusalem Post. He has covered the war against Islamic State, three Gaza wars, the conflict in Ukraine, the refugee crises in Eastern Europe and also reported from Iraq, Turkey, Jordan, Egypt, Senegal, the UAE, Ukraine and Russia. Born in Maine, he received his Ph.D from the Hebrew University of Jerusalem in 2010. He previously served as a research associate at the Rubin Center for Research in International Affairs at the Interdisciplinary Center, Herzliya and a lecturer in American Studies at Al-Quds University. Currently he is the Executive Director of The Middle East Center for Reporting and Analysis and a Ginsburg/Milstein Writing Fellow at the Middle East Forum. Frantzman has conducted research and worked for the JDC, The Shalem Center, the Jerusalem Institute for Market Studies and as a Post-Doctoral at the Hebrew University of Jerusalem. He was a Congressional intern for Congressman Jim Kolbe while studying at The University of Arizona.*

Read also:

- A Made-in-America Disaster
- Who Are the Taliban in Afghanistan?
- Taliban: A strategic analysis of the Islamist group's historic rise

America loses yet another war

By Doug Thompson (publisher & founder of Capitolhillblue)
Source: https://www.capitolhillblue.com/node/88237

Aug 13 – As a teenager and son of a Navy veteran who fought in World War II, I shared the illusion with many Americans that our nation had never lost a war and never would. While Korea ended with the nation split, our military remained to keep the North Koreans out of South Korea after a negotiated agreement.

America's war in Afghanistan: We came, we fought, we lost…as usual.

Vietnam, however, was another story. I was last in Saigon as a reporter and photojournalist shortly before America gave up South Vietnamese cause in a so-called "peace agreement" that ended with helicopters rescuing the American ambassador and his staff from the Embassy as troops and protestors were storming the gate.
For many who lost friends and family in that war, the ending was bitter, especially for those who came home to calls they were "baby killers" and other nasty epithets.
We had a brief victory in Grenada, of all places, in a rescue of American students in a medical school on that Caribbean Island, and the soldiers marched in a parade before George H.W. Bush along Pennsylvania Avenue afterwards. Then, his son, George W. Bishop, stood on a

ship with a victory banner that declared "Mission Accomplished." It was a lie, as was the claim that we went to war to destroy "weapons of mass destruction" that did not exist.
Victories are becoming harder to find with the American military, and some have suggested we should now declare American "loses it wars." We withdrew from Syria, leaving behind "allies" that were tortured and killed for aiding our effort.
When the Taliban became the declared enemy behind the terrorist destruction of the twin towers of the World Trade Center, an attack on the Pentagon and another headed for Washington to fly its hijacked plane into the Capitol or the White House, George W. Bush declared Afghanistan a target because it harbored the Taliban.
That began America's longest war, which ended with a withdrawal that began in May and ended this week with helicopters picking up Americans at the Embassy in Kabul as the Taliban reclaimed the nation in a record blitzkrieg that rivaled the massive tank invasions of Adolf Hitler.
We went into Afghanistan to eliminate the Taliban and kill its leader, Osama bin Laden. It took nearly 10 years to find and kill him in a raid by Navy SEALs. For a while, the Taliban was pushed back, but it was never defeated, and it was ready to take over as soon as the U.S. military pulled out.

Islamic Emirate of Afghanistan (Presidential Building in Kabul)

Reports The Washington Post:
The pace of the military collapse has stunned many American officials and other foreign observers, forcing the U.S. government to dramatically accelerate efforts to remove personnel from its embassy in Kabul.
The Taliban capitalized on the uncertainty caused by the February 2020 agreement reached in Doha, Qatar, between the militant group and the United States calling for a full American withdrawal from Afghanistan. Some Afghan forces realized they would soon no longer be able to count on American air power and other crucial battlefield support, and grew receptive to the Taliban's approaches.
In other words, we walked away from a mission that was far from complete.
An Afghan special forces officer who, for obvious reasons, doesn't wish to be identified says:
They saw that document as the end. The day the deal was signed, we saw the change. Everyone was just looking out for himself. It was like [the United States] left us to fail.
The same thing happened in Iraq. Without American troops in place, they had no one to step up when the under trained and unwilling local military was on its own.

C-17 Globemaster III (from Kabul to Doha – 823 passengers)

The New York Times reports:
In the end, even the evacuation of what one Defense Department official estimated could be 20,000 Americans and an untold number of Afghans somehow managed to reflect the story of the entire 20-year war: a disconnect between American diplomats and the reality on the ground.
That disconnect has been clear as a series of administrations presented a succession of optimistic prognoses: the Taliban was in retreat, the Afghan military was on the brink of assuming control of the country, and the government in Kabul was one step away from being able to provide security across the land. In the last four months, as U.S. troops packed up and left the country under orders from President Biden, administration officials said the staff at the American Embassy in Kabul and State Department headquarters in Washington hung on to hope that their presence in the country could instill some backbone in the Afghan government.
I was in Afghanistan early in the war as a reporter and photojournalist. A Marine in a forward base just shook his head when I asked, "how are things going?"
"We're wasting our time," he said. "We can't win here. The Russians tried for years and withdraw. Other nations came before them and pulled out. This will be a lost cause, just like the others."
He's home now after finishing his enlistment and multiple deployments in both Afghanistan and Iraq.
"We keep getting into wars where we don't understand the enemy," he told me last week. "My father fought in Vietnam and lost his arm there. He said they never understood the North Vietnamese or the culture of the nation. Neither did the officers. As long as we don't really understand the people of a nation at war, we can never achieve victory."
Even President Joe Biden, who should have known better, said:
There's going to be no circumstance where you see people being lifted off the roof of an embassy of the United States in Afghanistan The likelihood there's going to be the Taliban overrunning everything and owning the whole country is highly unlikely."
Welcome to America, Mr. President — the nation that now seems unable to win wars or even understand what would go wrong when they failed.

An Afghan woman in Kabul: 'Now I have to burn everything I achieved'

Source: https://www.theguardian.com/world/2021/aug/15/an-afghan-woman-in-kabul-now-i-have-to-burn-everything-i-achieved

Aug 15 – Early on Sunday morning I was heading to university for a class when a group of women came running out from the women's dormitory. I asked what had happened and one of them told me the police were evacuating them because the Taliban had arrived in Kabul, and they will beat women who do not have a burqa.
We all wanted to get home, but we couldn't use public transport. The drivers would not let us in their cars because they did not want to take responsibility for transporting a woman. It was even worse for the women from the dormitory, who are from outside Kabul and were scared and confused about where they should go.
Meanwhile, the men standing around were making fun of girls and women, laughing at our terror. "Go and put on your *chadari* [burqa]," one called out. "It is your last days of being out on the streets," said another. "I will marry four of you in one day," said a third.
With the government offices closed down, my sister ran for miles across town to get home. "I shut down the PC that helped to serve my people and community for four years with a lot of pain," she said. "I left my desk with tearful eyes and said goodbye to my colleagues. I knew it was the last day of my job."
I have nearly completed two simultaneous degrees from two of the best universities in Afghanistan. I should have graduated in November from the American University of Afghanistan and Kabul University, but this morning everything flashed before my eyes.
I worked for so many days and nights to become the person I am today, and this morning when I reached home, the very first thing my sisters and I did was hide our IDs, diplomas and certificates. It was devastating. Why should we hide the things that we should be proud of? In Afghanistan now we are not allowed to be known as the people we are.
As a woman, I feel like I am the victim of this political war that men started. I felt like I can no longer laugh out loud, I can no longer listen to my favourite songs, I can no longer meet my friends in our favourite cafe, I can no longer wear my favourite yellow dress or pink lipstick. And I can no longer go to my job or finish the university degree that I worked for years to achieve.

I loved doing my nails. Today, as I was on my way home, I glanced at the beauty salon where I used to go for manicures. The shop front, which had been decorated with beautiful pictures of girls, had been whitewashed overnight.
All I could see around me were the fearful and scared faces of women and ugly faces of men who hate women, who do not like women to get educated, work and have freedom. Most devastating to me were the ones who looked happy and made fun of women. Instead of standing by our side, they stand with the Taliban and give them even more power.
Afghan women sacrificed a lot for the little freedom they had. As an orphan I weaved carpets just to get an education. I faced a lot of financial challenges, but I had a lot of plans for my future. I did not expect everything to end up like this.
Now it looks like I have to burn everything I achieved in 24 years of my life. Having any ID card or awards from the American University is risky now; even if we keep them, we are not able to use them. There are no jobs for us in Afghanistan.
When the provinces collapsed one after another, I was thinking of my beautiful girlish dreams. My sisters and I could not sleep all night, remembering the stories my mother used to tell us about the Taliban era and the way they treated women.
I did not expect that we would be deprived of all our basic rights again and travel back to 20 years ago. That after 20 years of fighting for our rights and freedom, we should be hunting for burqas and hiding our identity.
During the last months, as the Taliban took control in the provinces, hundreds of people fled their houses and came to Kabul to save their girls and wives. They are living in parks or the open air. I was part of a group of American University students that tried to help them by collecting donations of cash, food and other necessities and distributing it to them.
I could not stop my tears when I heard the stories of some families. One had lost their son in the war and didn't have any money to pay the taxi fare to Kabul, so they gave their daughter-in-law away in exchange for transportation. How can the value of a woman be equal to the cost of a journey?
Then today, when I heard that the Taliban had reached Kabul, I felt I was going to be a slave. They can play with my life any way they want.
I also worked as a teacher at an English-language education centre. I cannot bear to think that I can no longer stand in front of the class, teaching them to sing their ABCs. Every time I remember that my beautiful little girl students should stop their education and stay at their home, my tears fall.

What if . . .?

By the Editor-in-Chief of C²BRNE Diary

- ✓ No Muslim or non-Muslim country recognizes the Islamic Emirate of Afghanistan?
- ✓ No country invests on Afghanistan?
- ✓ Pakistan stops providing arms to the Taliban?
- ✓ No Western country accepts Afghan immigrants or refugees (neighboring countries only)?
- ✓ All exports to Afghanistan (food; fuel; energy; medicinal products, etc.) canceled or postponed?
- ✓ US Air Force destroys all known poppy fields – this will be their last novel gesture dedicated to the citizens of the entire planet.

Do not worry …
All the above that will definitely kill a nation and innocent people will be the excuse for some nations to legalize the new Afghanistan – e.g., Turkey because is under every rock of evil; China because now is relaxed without the Americans in the neighborhood – though minerals (copper; gold; cobalt; niobium; REEs[2]) and oil/gas worthing more than 3 trillion USD are very attractive; Pakistan because

[2] The rare-earth elements (REEs), also called the rare-earth metals or (in context) rare-earth oxides, or the lanthanides (though yttrium and scandium are usually included as rare-earths) are a set of 17 nearly-indistinguishable lustrous silvery-white soft heavy metals. Scandium and yttrium are considered rare-earth elements because they tend to occur in the same ore deposits as the lanthanides and exhibit similar chemical properties, but have different electronic and magnetic properties. The rare earths have diverse applications in electrical and electronic components, lasers, glass, magnetic materials, and industrial processes, but since they do not occur as base metals or in lump or visible quantities like iron or aluminum, their names and properties are unfamiliar in everyday life. One of the most familiar may be unusually powerful neodymium magnets sold as novelties.

you never reject a good income; Russia indirectly and not from the very beginning; Albania because is following Turkish patron's steps and a few others to start with. And life will go on with a new start from the year 1994[3]. Some nations are not meant to be lucky enough to live in peace, prosper and enjoy life. *C'est la vie!*

. . . live and let them die!

Get Ready for Europe's Next Migrant Crisis

By Burak Bekdil

Source: https://www.meforum.org/62563/europes-next-migrant-crisis

Aug 17 – Locals in Istanbul were recently shocked to see hordes of young Afghan men in worn out uniforms, strolling aimlessly down neighborhoods that were already home to thousands of Syrian refugees. Later, Turkish police detained and

[3] The Taliban emerged in 1994 as one of the prominent factions in the Afghan Civil War and largely consisted of students (*talib*) from the Pashtun areas of eastern and southern Afghanistan who had been educated in traditional Islamic schools, and fought during the Soviet–Afghan War.

expelled nine of the men. Hundreds of others are communicating with their relatives and friends in Afghanistan and Iran and most likely updating them on the illegal migration routes into Turkey -- Afghans would typically pay smugglers $1,000 for the trip from Kabul to Van in eastern Turkey. With the victory of the Taliban and the collapse of the Afghan government, hundreds of thousands may be crossing via Iran into eastern Turkey, finally seeking the least dangerous (and least costly) route into European Union soil.

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

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

Western Islamists Welcome Taliban Takeover

Source: https://www.meforum.org/islamist-watch/62562/western-islamists-welcome-taliban-takeover

Aug 16 – While most American and European Muslims have expressed despair at the Taliban's swift and brutal takeover of Afghanistan, a distinct subset of Western Islamism -

primarily from Salafi and Deobandi traditions - have welcomed the murderous jihadists' proclamation of the "rebirth of the Islamic Emirate." We are maintaining a running list of the most striking examples:

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

Forbes

Cost of 20 years' Afghanistan War: 2,26 trillion USD | 300 mil/day
Deaths: 2,500 soldiers | 4,000 civilians (serving US forces)
Injured: 20,000 | medical cost in the long run 300-500 billion USD
Lending rates (war loans): 500 billion USD in interests already paid | by 2050: 6.5 trillion USD in interests (20,000 USD/US citizen)

EU to talk to Taliban to prevent 'migratory disaster'

Source: https://euobserver.com/world/152676

Aug 18 – The EU will engage in dialogue with the Taliban in Afghanistan to prevent a "**humanitarian and potential migratory disaster**", the bloc's foreign affairs chief Josep Borrell said on Tuesday (17 August) after an emergency video conference of 27 member states' foreign ministers. Borrell also said the focus of any dialogue would be to prevent Afghanistan from **becoming a hub for foreign terrorists**.

EDITOR'S COMMENT: Two first sentences; two hilarious opinions. And the funny thing is that you have to pay to read the entire article!

At Least 45 Christian Churches Set on Fire In Canada as Attacks Escalate

Source: https://www1.cbn.com/cbnnews/2021/july/number-of-canadian-christian-churches-vandalized-set-on-fire-rises-as-terror-campaign-continues

July 29 – An apparent ongoing anti-Christian campaign in Canada has resulted in a total of 45 churches being attacked with some of the buildings being burned to the ground.
As CBN News has reported, terrorists are responsible for the attacks against mainly **Roman Catholic** churches serving indigenous congregations.
The crimes stem from **far-left terrorists with a Marxist ideology** whose sole purpose is to strike fear in Canadians for practicing their faith.
CTV News reports indigenous leaders are calling for the church arsons to stop.
"Burning down churches is not in solidarity with us indigenous people. As I said we do not destroy people's places of worship," said Jenn Allan-Riley, an assistant Pentecostal minister at Living Waters Church during a press conference last week.
"We're concerned about the burning and defacing of churches bringing more strife, depression, and anxiety to those already in pain and mourning," she said.
Seventeen of the 45 church buildings attacked have suffered fire damage or completely burned to the ground.
Counter Signal.com reports the fires and the vandalism span six provinces and the Northwest Territories. Some of the attacks have been in the heartland of First Nation's territory.
The Royal Canadian Mounted Police (RCMP) said they are investigating the church fires to see if they are connected.
As CBN News reported, terrorists have also targeted other churches not affiliated with the Roman Catholic church. Last week, the building housing the House of Prayer Alliance Church in Calgary was set on fire.
Battalion Chief Keith Stahl told CBC News the fire was mostly confined to the outside of the building, but the interior did have heavy smoke damage. Police believe the fire was intentionally set, but have no suspects.
The congregation of 230 people has been unable to meet in the building due to the fire damage.
Keean Bexte tweeted CounterSignal.com's interview with the church's pastor.

"We are refugees. We escaped from Vietnam to come here to get more freedom, to live, and we think it was a good country – and now it happened to our church," Pastor Nguyen said. "Maybe it is not safe to be here in Canada compared to Vietnam."

The church fires were reported across Canada following the recent discoveries of unmarked graves on the sites of former boarding schools for Indigenous children, many of which were run by churches. The remains of nearly 1,000 bodies have been found so far, most of them Indigenous children.

The schools weren't just in Canada. The American Magazine, a Jesuit journal, reports by 1926 there were 357 schools in 30 states with more than 60,000 children. Catholic religious orders in the United States administered 84 of the schools. Jesuits managed four of them.

Since Catholic orders carried out similar missions in the U.S., and U.S. funding was even given to them, U.S. Secretary of the Interior Deb Haaland has now ordered an investigation into the history of these schools and a search for graves of children who may have perished at them.

On Tuesday, Canadian Prime Minister Justin Trudeau said his "heart breaks" after the discovery of more unmarked graves on the grounds of an Indigenous residential school in the southern Gulf Islands off the British Columbia coast.

The Penelakut Tribe says more than 160 undocumented and unmarked graves have been found on the site of the former Kuper Island Indian Industrial School.

"I recognize these findings only deepen the pain that families, survivors, and all Indigenous peoples and communities are already feeling as they reaffirm the truth that they have long known," Trudeau said during a news conference Tuesday in Ottawa.

"To members of the Penelakut Tribe, we are here for you. We cannot bring back those who are lost but we can and will continue to tell the truth," Trudeau said.

In an email to CBN News, Fraser Logan, media relations manager with the "K" Division of the RCMP in Alberta, responded to our inquiry about his district's ongoing church fire investigations.

The Bonnyville RCMP arrested and charged a teenager with arson on July 9 for setting fire to an old abandoned church building (Our Lady of Mercy) located on the Kehewin Cree Nation.

The Peace Regional RCMP, located in Peace River, is investigating the fire at Our Lady of Peace Catholic Church on July 3. The church received minor damages as a result of the fire and a broken window. No one was injured. Fire investigators have ruled the fire to be arson.

The Morinville RCMP is still investigating the structure fire which burned the St. Jean Baptiste Church building to the ground on June 30 and caused the evacuation of nearby homes and businesses.
The Gleichen RCMP is still investigating two church fires in its region. A fire was set at the Siksika First Nation Catholic Church on June 28, which has been ruled as arson. Fortunately, the fire was extinguished before any significant structural damage occurred. No one was in the church at the time of the incident and no one was injured.
There was also a break-in and the attempt to start a fire at the Siksika Anglican Church the very next day on June 29.
In an email to CBN News, the RCMP also provided information about recent reports of church arson in Manitoba.
The latest incident in that region was on July 5 in South Indian Lake in which the building of the United Church was destroyed by fire. No one was injured.
On July 3, 2021, Swan River RCMP received a report of arson at the Catholic Church in Pelican Rapids, Manitoba. The Pelican Rapids Fire Department was on the scene very quickly, and there was minor damage to the exterior and some smoke damage to the interior. There were no injuries.
The South Indian Lake RCMP also received a report on July 1 that someone had tried to burn the Catholic Church. A bystander was able to put out the fire before it spread but there was some damage to the back of the building.
The investigations into all of these cases are still ongoing and there have been no arrests.

They live among us!

NATO – Crisis Management School

The Four Stages of Crisis Management:

1. Nothing is going to happen.
2. Something might happen, but we should do nothing about it.
3. Maybe we should do something about it, but there is nothing we can do.
4. Maybe there was something we could have done, but is too late now.

Da Afghanistan Bank

Source: https://www.newsbomb.gr/oikonomia/story/1225132/oi-talimpan-kai-o-eykratidis-ta-kaysima-tis-dasopyrosvesis-kai-116-imeres-gia-mia-ypografi

The logo of the central bank of Afghanistan, which is literally a "patchwork" of historical periods that have characterized the country, bears the phrase "**ΒΑΣΙΛΕΩΣ ΜΕΓΑΛΟΥ ΕΥΚΡΑΤΙΔΟΥ** – in Greek for "of Eucratides the Mighty King" and there is a representation of Dioscuri, Castor and Polydeuces, holding branches of palm tree in the left hand and a spear on the right hand. Essentially, the bank's logo is an imprint of a side of a coin (silver tetradrachm) of the Hellenistic era, cut by Eucratides between 171-145 BC. Eucratides was a king of Bactria of Greek descent, whose throne he took in a revolutionary manner, turned against the king of northern Bactria, Demetrius I, who was absent on a campaign. Conquering the most fertile areas of the region and controlling the trade route that connected East Asia with the Mediterranean, Eucratides emerged as the most powerful monarch of Central Asia. This logo adorns the central bank of Afghanistan and the banknotes it has been printing from 1939 until today. And it would surprise us if it changed, as Eucratides belongs to a period in the history of Afghanistan that even the Taliban consider glorious.

▶▶ **Read also:** Did the NY Fed Confiscate $1.3 Billion in Afghan Gold: Striking Revelations from Afghanistan's Central Bank Chief

European Union Terrorism Situation and Trend report 2021 (TESAT)

Source: https://www.europol.europa.eu/activities-services/main-reports/european-union-terrorism-situation-and-trend-report-2021-tesat

J une 2021 – The EU Terrorism Situation and Trend Report (TE-SAT) 2021 provides figures on terrorist attacks and terrorism-related arrests in the European Union (EU) in 2020. It is based predominantly on information officially contributed to Europol by EU Member States. In addition, a number of Europol's cooperation partners were invited to provide information on the terrorism situation in their countries.

New Airport Security Technology Unveiled

Source: https://i-hls.com/archives/110302

Aug 18 – New technologies have been recently applied by the US Transportation Security Administration (TSA) at its checkpoints at airports, due to COVID-19 constraints.

A security game-changer ensures ID authentication, reservation verification, and Secure Flight pre-screening status are known in "near" real-time at the airport security checkpoint.

(Secure Flight program is the procedure whereby the TSA cross-references the information of airline passengers with a watch list at the time of booking).

As a step up from the familiar boarding pass scanner, thanks to a **credential authentication technology** called the CAT machine, you won't need to scan your boarding pass at the initial checkpoint. When CAT looks at your photo ID, it brings up the picture and it validates for the officer who they're talking to. A photo identification card can be used to real-time verify that you are who you say you are, and it also verifies that you have a flight today, according to the TSA.

CAT is linked electronically to the Secure Flight database, which confirms travelers' flight details.

Altogether, you will still have to show your boarding pass at the gate or the terminal entrance, but not to the TSA agent at the checkpoint.

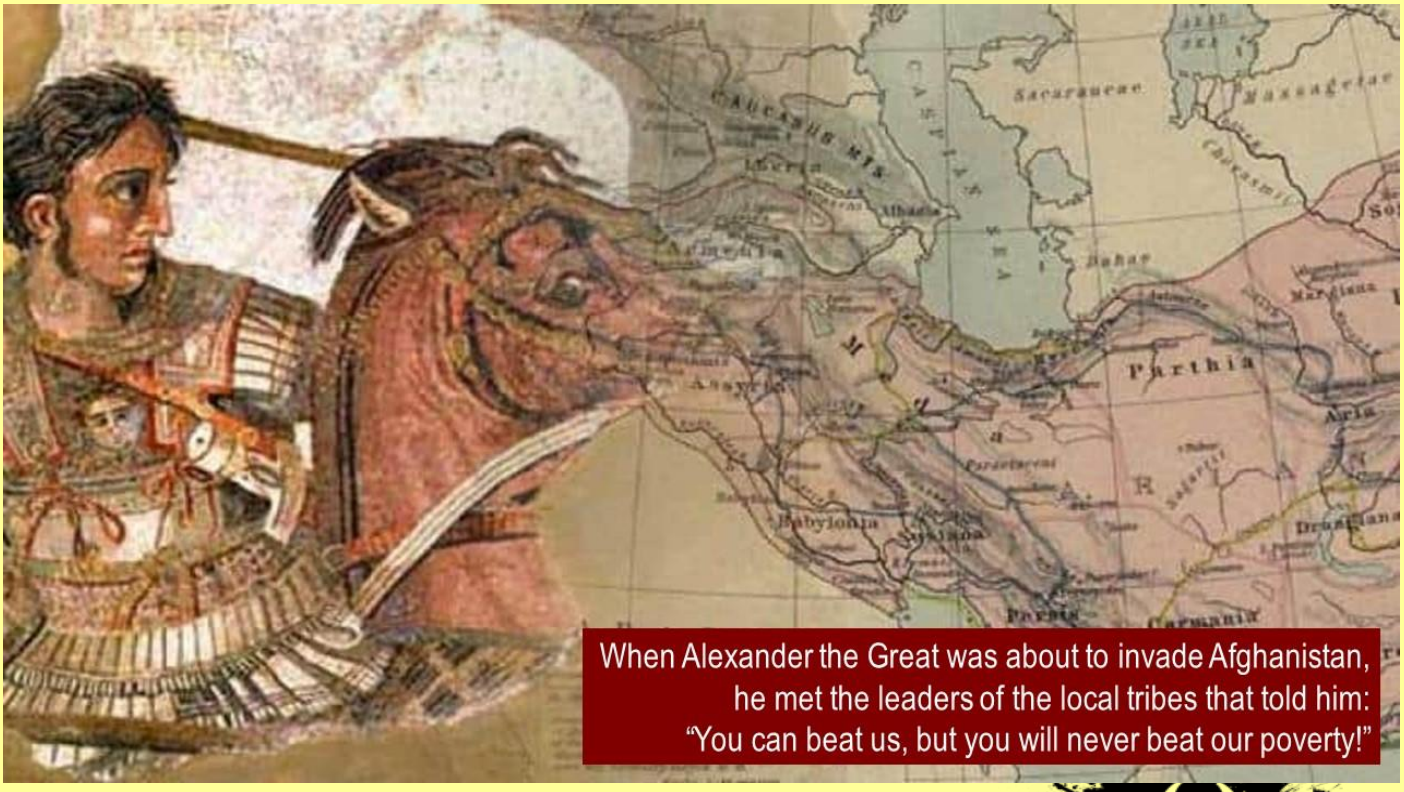
The new technology removes human error almost entirely, cutting down on wait times and eliminating some steps.

Continuously updated and thorough security at airports is a must. Having a firearm at the airport will mean getting law enforcement involved. Depending on the state of the firearm, if it's loaded, could mean going to jail, according to wtsp.com.

Taliban's sense of (propaganda) humor . . .

Badri 313 Battalion

Why it is wise to read history



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HOTZONE SOLUTIONS GROUP

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CHEM NEWS

Protecting the U.S. against WMD

Source: http://www.homelandsecuritynewswire.com/dr20210724-protecting-the-u-s-against-wmd

July 24 - The Government Accountability Office (GAO) has just issued a report, Countering Weapons of Mass Destruction, which assesses the capabilities of the Countering Weapons of Mass Destruction (CWMD) office, established in December 2018, to address the challenge of WMD.

The CWMD office reorganized several legacy offices, including the Domestic Nuclear Detection Office and Office of Health Affairs, into one. The CWMD office manages programs intended to enhance the U.S. ability to detect, deter, and defend against chemical, biological, radiological, and nuclear threats.

However, programs operated and managed by the CWMD office have faced longstanding challenges, some which predate the reorganization.

The GAO report describes the GAO's 2016 work related to the CWMD office formation and findings from past reports on countering WMD programs from 2009 through May 2021, including challenges and opportunities for the effective operations and implementation of key programs related to biodefense, nuclear security, and chemical security.

GAO says it reviewed relevant presidential directives, laws, regulations, policies, strategic plans, and other reports and interviewed federal, state, and industry officials, among others.

What GAO Found

In April 2016, GAO evaluated Department of Homeland Security (DHS) plans to consolidate chemical, biological, radiological, and nuclear security programs into the Countering Weapons of Mass Destruction (CWMD) office. GAO recommended DHS use, where appropriate, the key mergers and organizational transformation practices identified in prior work, such as conducting adequate stakeholder outreach. DHS agreed with and addressed the recommendation by soliciting employee feedback on the transformation and formed a leadership team for the consolidation, among other practices.

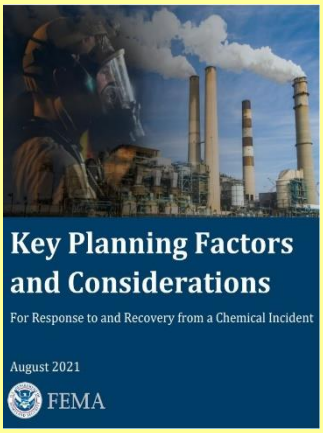
However, GAO observed that significant challenges remained at the CWMD office—such as low employee morale and questions about program efficacy. GAO has ongoing work evaluating these issues and plans to issue a report in early 2022.

Over the past decade, GAO has also conducted extensive work evaluating legacy and ongoing programs managed by the CWMD office and has identified program management challenges and opportunities for improvement in the following program areas:

- ***Biosurveillance programs*:** Since 2009, GAO has reported on progress and challenges with two of DHS's biosurveillance efforts—the National Biosurveillance Integration Center and the pursuit of replacements for the BioWatch program (aimed at detecting aerosolized biological attacks). For example, DHS faced challenges defining these programs' missions and acquiring suitable technologies. In December 2009 and September 2012, GAO highlighted the importance of following departmental policies and employing leading management practices to help ensure that the mission of each program is clearly and purposefully defined and that investments effectively respond to those missions. DHS agreed with and addressed these recommendations. Most recently, DHS agreed to a May 2021 GAO recommendation that it should follow best practices for conducting technology readiness assessments for a biodetection effort and described planned efforts to conduct one before the next key decision event.
- ***Nuclear/radiological detection*:** In May 2019, GAO found that the CWMD office lacked a clear basis for proposed changes to the strategies of the Securing the Cities program, which is designed to enhance the nuclear detection capabilities of federal and nonfederal agencies in select cities. GAO found the strategies were not based on threats or needs of the participating cities. DHS agreed with our recommendations aimed at improving communication and coordination with participating cities, but has not fully implemented them.
- **Chemical defense:** In August 2018, GAO found that DHS had not fully integrated and coordinated its chemical defense programs and activities, which could lead to a risk that DHS may miss an opportunity to leverage resources and share information. Improved program integration and coordination could lead to greater effectiveness addressing chemical threats. DHS agreed to develop a strategy and implementation plan to aid integration of programs, which it expects to finalize in September 2021.

What GAO Recommends

GAO made sixteen recommendations designed to address the challenges discussed in the report. As of July 2021, DHS has taken steps to address some, but not all of them. Of the sixteen recommendations GAO made, ten remain open, and GAO continues to monitor DHS's progress to implement them.



Key Planning Factors and Considerations for Response to and Recovery from a Chemical Incident

Source: https://www.fema.gov/sites/default/files/documents/fema_chemical-kpf_060321.pdf

August 2021 – Key Planning Factors and Considerations for Response to and Recovery from a Chemical Incident is written for response and recovery planners at the regional, state, local, tribal, and territorial levels. A coordinated response and recovery effort will include all levels of government in addition to the private sector, non-governmental organizations, and, potentially, international partners. Planning for a chemical incident requires additional considerations beyond all-hazard preparedness planning, so this document includes strategic and operational issues for consideration when developing response and recovery plans for a chemical incident.

Ghouta chemical attack: New study reveals involvement of Syrian rebels and not Assad, Obama wanted to bomb Syria in retaliation

Source: https://www.opindia.com/2021/07/new-study-reveals-syrian-rebels-executed-2013-ghouta-chemical-attack-aaron-mate/

July 27 – On August 21, 2013, rockets loaded with an extremely toxic chemical called Sarin struck the Ghouta suburb in the Damascus city of Syria. Sarin, which is classified as a weapon of mass destruction, resulted in the death of at least 281 to 1729 civilians. The rocket strike was considered the worst chemical attack since the Iraq-Iran war and infamously dubbed the 'Ghouta Chemical attack'.

An open-source study published by Rootclaim has revealed that the attack was orchestrated by the Syrian rebels and not the Bashar al-Assad-led Syrian government as previously believed. Journalist Aaron Maté reported about the explosive research in an article in Grayzone on Monday (July 26). When the deadly chemical attack took place in 2013 and led to several casualties, the US government and its allies blamed the Syrian government. The Obama administration had even planned to bomb Syria in retaliation but the plans were averted, following an agreement with Russia.

The new study found the impact locations of the attacks, based on the trajectories of the 7 rockets that were launched into Ghouta. It then traced the rockets back to a small area controlled by the Syrian rebels, located at a 2 km distance from the site of impact. The range was calculated by experts for the sarin-laden rockets used in the attack. The new revelation is compounded by previously discovered video footage that showed Liwa Al Islam rebels firing volcano rockets from a small field within their territory.

Syrian govt held terriorties were beyond the range of rockets used in chemical attack

The study on the 2013 Ghouta chemical attack was authored by Michael Kobs and Adam Larson. It built on the previous revelations that punctured US claims about the Syrian

government's involvement in the attack. The study was further supplemented by the research work done by MIT Professor Ted Postol and former UN Weapons Inspector Richard Lloyd. The duo concluded that the range of the sarin rockets was beyond the territory held by the Syrian government. As such, it was impossible for the government to execute the Ghouta chemical attack.

US, UK had prior information about the involvement of Syrian rebels

Another report, published by Seymour Hersh in the London Review of Books, revealed the US intelligence agencies had evidence that unearthed the role of Syrian rebels in the chemical attack. According to the Defense Intelligence Agency, al-Nusra in Syria had an advanced sarin production cell. It had highlighted the possibility of the acquisition of the chemical from Turkey by the rebels so as to trigger US military intervention.

To add to it, British military laboratory Porton Down discovered that the type of sarin used in the Ghouta attack did not match the ones available in the government's chemical arsenal. Despite this, the Obama administration wanted to target the chemical weapon arsenal of the Syrian government.

DoD Professor Develops Countermeasure to Deadly Nerve Agent

Source: https://www.dvidshub.net/news/401451/dod-professor-develops-countermeasure-deadly-nerve-agent

July 25 – Researchers led by Dr. Maria F. Braga, a professor in the School of Medicine at the Uniformed Services University of the Health Sciences (USU), have identified a neuroprotective combination therapy that is effective against organophosphate (OP) nerve agent exposure.

Nerve agents are deadly chemical weapons that present a serious and growing threat to military and civilian populations. Nerve agents were used in the Iraq-Iran war, against Kurdish civilians, in terrorist attacks in Japan, and most recently, against civilians in Syria and England. Without intervention, OP nerve agents can cause seizures, which can have serious effects such as brain damage, coma, and even death.

"Current Food and Drug Administration (FDA)-approved medical countermeasures, benzodiazepines, are inadequate in preventing brain damage or counteracting many of the acute intoxication symptoms of nerve agents, such as arresting seizures," said Braga. "Brain damage as a result of exposure can lead to long-term neurological and neuropsychiatric disorders."

Braga first investigated LY293558, or **Tezampanel**, as a stand-alone treatment for nerve agent exposure with support from the National Institute of Neurological Disorders and Stroke. After promising preclinical results, the Biomedical Advanced Research and Development Authority awarded an $89.5 million contract for the advanced research development of Tezampanel.

During their advanced development research, Braga's team found Tezampanel did not prevent brain damage six months after exposure. Therefore, to enhance neuroprotective efficacy, a **Tezampanel and Caramiphen** combination treatment was created by Braga and her research team. Caramiphen is a drug used to treat Parkinson's disease and has anticonvulsant and neuroprotective properties.

"We discovered that this combination therapy is highly effective and induced complete protection against brain damage up to six months after exposure," said Braga. "This therapy also allows the doses of LY293558 and Caramiphen to be reduced considerably, thus decreasing the incidence of side effects and increasing the tolerability of the proposed treatment in humans."

Another important aspect of this neuroprotective combination is that it extends the therapeutic window in a mass casualty scenario, with efficacy even when administered hours after exposure. In circumstances when it may take significant time to access and treat those affected, this capability may save lives.

Braga worked with the USU-Henry M. Jackson Foundation for the Advancement of Military Medicine (HJF) Joint Office of Technology Transfer to secure a patent for the discovery. HJF recently received notice of allowance for a patent from the United States Patent Office for this medical countermeasure to OP nerve agent exposure. Obtaining the patent is an important step in creating this combination therapy, however, Braga's team still has work to do in developing a product that's ready for use in the field.

"Our current goal is to acquire the remaining pre-clinical data necessary to pursue the advanced development of this very promising therapy," said Braga. "Since our treatment relies upon drugs that have not been individually approved previously for this use, further development will be pursued in accordance with FDA guidelines. We intend to engage regulatory experts and to work with the FDA from an early stage."

Acquiring these data and advancing this combination therapy into a field-ready product could be a tremendous step forward in protecting warfighters and civilians alike from the deadly chemical weapons that are OP nerve agents.

ISIS used chemical weapons on Iraqi prisoners, U.N. investigators find

Source: https://www.washingtonpost.com/national-security/isis-chemical-weapons-experiments-mosul/2021/05/13/bbfebfb0-b42e-11eb-a980-a60af976ed44_story.html

May 2021 – The Islamic State used Iraqi prisoners as human test subjects in experiments with chemical and possibly biological weapons, United Nations investigators conclude in a report that sheds new light on the terrorist group's forays into making a weapon of mass destruction. The previously unknown experiments happened sometime after 2014, when the Islamic State seized control of Mosul and commandeered the city's main university as a research center for new kinds of weapons, according to the report by a panel appointed by the U.N. Security Council to investigate war crimes by the extremist group. At least some of the prisoners died, the report said. The investigators examined reports of prisoners being exposed to thallium, a highly toxic chemical used historically as a rat poison, as well as nicotine, which is lethal in high doses. U.N. officials also are exploring the Islamic State's efforts to weaponize chlorine and manufacture sulfur mustard, the chemical weapon commonly known as mustard gas that was used to kill and maim thousands of soldiers in World War I. The new evidence came to light through an examination of computers and cellphones from killed or captured Islamic State operatives, according to the report presented to Security Council officials this week by the U.N. Investigative Team to Promote Accountability for Crimes Committed by Da'esh. Da'esh, along with ISIL and ISIS, is one of several names for the Islamic State. "Evidence already secured indicates that ISIL tested biological and chemical agents and conducted experiments on prisoners as part of this program, causing death," the report said. "Weaponized vesicants, nerve agents and toxic industrial compounds are suspected to have been considered under the program."

Experimental research in chemical warfare is a little-known facet of the Islamic State's ambitious campaign to create new weapons for fighting its regional enemies or using as terrorist weapons abroad. After capturing most of northern Iraq in 2014, the militants seized a large quantity of chlorine from Iraqi water purification plants and then used the chlorine in poison-gas attacks against Kurdish and Iraqi fighters. Later, Islamic State leaders recruited scientists and engineers — a mix of foreign experts and veterans of former Iraqi leader Saddam Hussein's chemical weapons factories — to help them produce sulfur mustard, using the laboratories of Mosul University as a research hub. International investigators confirmed that the effort partially succeeded: The Islamic State manufactured a kind of homemade sulfur mustard of relatively poor quality and dispersed it in battles using artillery rockets. The quality might have improved with time, analysts say. The program's top scientists were killed or captured in 2015 and 2016, in raids by the U.S.-led military coalition in Iraq. The group's main labs were destroyed in airstrikes in 2016 and during the fighting to liberate Mosul. Some of the group's chemical experts are believed to have escaped. The suggestion of possible biological weapons research — no specifics were given in the report — was viewed by experts as particularly worrisome, because the Islamic State is not known to have invested significant resources in creating a biological capability.

"The report signals an uptick in both capability and motivation," said Richard Pilch, director of the chemical and biological weapons program at the James Martin Center for Nonproliferation Studies in Monterey, Calif. If borne out, the finding could warrant a "shift in our force protection posture" to protect troops deployed in the region, he said. The U.N. findings are part of a broad inquiry into alleged atrocities carried out by the Islamic State, including the rape and killing of ethnic Yazidis and the executions of thousands of Iraqi soldiers, cadets and police officers who were captured as the group swept across the country in 2014. The investigation's leader, Karim Asad Ahmad Khan, told Security Council members that his group had found "clear and convincing evidence" of crimes of genocide by the Islamic State, especially against Iraq's Yazidi minority. He said the list of crimes documented included "murder, torture, cruel treatment and outrages upon personal dignity."

Dusty Agents and the Iraqi Chemical Weapons Arsenal

Source: https://www.nti.org/analysis/articles/dusty-agents-iraqi-chemical-weapons/

October 2002 – The New York Times recently reported that an Iraqi defector—known under the pseudonym of Ahmed al-Shemri—has provided the West additional intelligence on development activities in Iraq regarding nerve agents, including VX.[1] According to al-Shemri, since 1994, Iraq has devised and produced a solid VX formulation that could be described as a "dusty" agent. The properties of this agent include the ability to adhere and penetrate gaps in chemical-protective garments. Having a high persistency and the capacity to poison through the skin, such a preparation of VX could pose an extreme danger to U.S. troops, as well as complicating decontamination efforts.

This issue brief provides the relevant historical and technical background to properly assess the significance of this disturbing report. It first summarizes the history of Iraq's chemical agent production—including VX—and then details the key technical and military issues

related to the deployment and use of chemical agents more generally. The brief concludes by describing the exceptional toxicity of VX agents and the enhanced military utility of VX and other chemical weapons when they are "thickened" to make dusty agents.

Background of Iraqi CW Agent Production

During the Iran-Iraq War (1980-1988), Iraq developed, deployed, and used significant amounts of chemical weapons (CW) against Iranian forces, as well as civilian targets in Kurdish-held territories. Beginning in about 1984,[2] Iraq made extensive use of mustard (blister) and tabun (nerve agent), probably having chosen these compounds because they were the easiest to produce.[3] Throughout the conflict, Iraq used an estimated 3,000 tons of CW agents of various kinds, employing more than 100 tons in certain individual military operations.[4] Based on UN Special Commission (UNSCOM) inspections of Iraqi weapons following the Gulf War of 1991, Iraq also produced tons of VX and weaponized this CW agent into a variety of delivery platforms, including artillery rockets (e.g., 122 mm) and Scud warheads (see sidebar).

There is also considerable evidence that Iraq employed a "dusty" form of mustard in the war with Iran. This dusty formulation utilizes a solid carrier—such as silicon dioxide or talc—that can create breathable aerosols of mustard agent. It is not surprising that Iraq might direct its efforts towards new formulations for delivering CW agents, possibly including nerve (VX) agents.

Iraq's Strategy of Denial

Lying about its past and present chemical and biological weapons programs has been the constant strategy for Iraq over the past 20 years. For example, on April 1, 1985, after UN investigators concluded with solid physical evidence that Iraq had used chemical warfare against Iran, then-Foreign Minister Tariq Aziz flatly denied it at a press conference in Tokyo.[5] Similarly, when the United States and the United Nations had determined that Iraq had weaponized Scud warheads with VX nerve agent in 1998, the Iraqi Foreign Minister Mohammed Saeed al-Sahhaf called such an allegation an "imaginary monster they created in their sick minds."[6]

Although reportedly contradicted by tests carried out in France and Switzerland, the results of the U.S. laboratory tests on Iraqi VX scud warhead fragments offers incontrovertible evidence of not only VX, but also a substance used to keep the nerve agent stable—in other words, the nerve agent had been weaponized. (For more details, see "Iraq Special Collection: UNSCOM's Report on Iraqi VX Warheads," October 1998.)

Iraq had already declared in 1996 that it had produced VX at the Dhia plant in the Muthanna State Establishment, and that nearly four tons of VX had been manufactured. Iraq reported that all of this had been dumped in the "grave yard" at the Muthanna State Establishment. However, Iraq had consistently denied that it had ever weaponized VX.[7] Before they were discovered by UNSCOM inspectors, the VX from Scud metal remnants had been destroyed or decontaminated by the Iraqis in an attempt to get rid of the evidence; however, from the analysis of trace degradation products and other chemical compounds found on missile warhead fragments, the United Nations was able to determine that Iraq had loaded VX on "special warheads" with dicylohexyl carbodiimide (see below), a compound that has long been known as a VX stabilizing compound.[8]

Below are some details of the fragments that were tested, the chemicals that were found, and explanations of their significance.Of the fragments, RQX002 is representative. Among other breakdown products, this metal shard contained dicyclohexyl carbodiimide (CAS 538-75-0); its chemical structure is shown here:The other chemical compounds that were detected by the U.S. Army Laboratory in Aberdeen Proving Grounds, Maryland included O-ethyl methyl phosphonic ester (EMPA) and N'-diisopropyl aminoethyl sulphide (shown in the UNSCOM document at RSR). These two degradation products originally formed the original VX molecule, with EMPA shown here in red, and the other portion in blue:

VX molecule showing the O-ethyl methyl phosphonic ester portion (red) and the N'-diisopropyl aminoethyl sulphide (blue).

Because the sulfur portion of the molecule serves as the so-called "leaving group," it follows that VX would have degraded into these different compounds.

Difficulties in Weaponizing and Delivering CW

Both during and since World War I, many militaries have actively sought toxic compounds that could create more casualties on the battlefield. While poisons such as cyanide, arsenic, nicotine, and carbon monoxide have long been recognized, these were not effective as weapons in modern warfare. Indeed, due to various physical, chemical, and toxicological properties, most chemicals were limited in their ability to cause death or injury on the battlefield. They were either too volatile, as was the case of hydrogen cyanide, or were simply not toxic enough to do much damage.

Obviously, the technical difficulties encountered when delivering CW agents come as a result of the physical state of a given chemical compound. Depending upon whether a CW agent is solid, liquid, or gaseous at room temperature can determine the method of its delivery. For example, the first major success in a chemical attack involved the use of chlorine gas at

Ypres, Belgium, in 1915 during World War I. In this true "gas" attack, chlorine (Cl2) was brought to the front lines in liquid form, stored under pressure in metal cylinders. When the valves of the cylinders were released, the chlorine was allowed to rapidly evaporate into a gas. From the perspective of CW delivery, this approach had some drawbacks, however. In addition to the great effort required in transporting large quantities of chlorine-filled cylinders to the front, German military personnel carrying out this attack had to wait for suitable weather conditions, relying upon the wind to carry the gas to the enemy. Because chlorine is a gas at room temperature, it is naturally quite volatile. Chlorine also dissipates rapidly with air currents, and is not as toxic as many other CW agents that were devised later. But being heavier than air, chlorine drifted along the contours of the battlefield, filling trenches and revetments. In this first major chemical assault of World War I, chlorine gas probably killed about 800 Allied soldiers.

Other attempts during World War I and afterwards to use toxic chemicals have involved hydrogen cyanide (HCN), or prussic acid. This compound is nominally liquid at room temperature, but rapidly evaporates into the air. (Having the property of readily forming vapors made it an effective rodenticide for barns and other structures. It was from this usage that Zyklon B, the instrument of the Holocaust, was devised.) In fact, HCN evaporates so quickly that it carries away large amounts of heat while doing so. A drop of HCN on a flat surface at room temperature will convert to a small, congealed spot that freezes due to the cooling effect of its vaporization. In order to devise a weapon to deliver HCN, one must overcome the extremely volatile nature of this chemical in order to increase the concentrations of the poison gas. During World War I, the major belligerents tried to use HCN, without much in the way of practical results. During World War II, some Japanese soldiers were equipped with glass jars filled with liquid HCN that had been stabilized with copper or arsenic trichloride. (Frangible as these grenades were, just carrying them must have been an extreme hazard.) Again, we are not aware of any Allied deaths caused by these chemical "bombs."Thus, the problem of using CW agents has also largely been one of their persistence—or rather a lack of it. The trick has long been to deliver large enough concentrations of a CW agent in a given area, and for this concentration to remain potent over a long enough period of time to achieve the desired results. The initial successes in World War I with gases such as chlorine and phosgene quickly led both sides of the conflict to adopt protective measures. Literal "gas" warfare could then be defended against with improvised masks. (In the early days of CW during World War I, this often involved urinating on rags and holding these over the mouth.[9]) Once the Western militaries figured out that CW agents were being used in attacks, the implementation of simple protective measures (masks) made chlorine by itself largely ineffective throughout the rest of the war. Furthermore, being gaseous at room temperature, these toxic compounds quickly dissipated into the atmosphere. Until mustard was introduced in 1917, the myriad CW agents used at the time were largely incapable of causing much injury except through inhalation.

Liquids that do not easily form vapors can be delivered more effectively in the form of an aerosol—that is, a suspension of fine particles in the air—which can create larger concentrations over a target. One can generate aerosols by forcing liquids through a specially designed nozzle. Detonating an explosive shell containing a CW agent also creates a combination of aerosol and droplet-sized particles. Depending on the average diameter size of the particles, aerosols can drift and cover large areas, and in this sense, behave much like gases. Very tiny particles will remain aloft for considerable periods of time, depending upon the relative stability of airflows. While all objects eventually fall to the ground, very light particles—those weighing 1-2 microns—will fall less than one centimeter per minute due to air resistance.[10] For weapons designers, however, aerosols also pose some other challenges, namely that of wind drift.

Some CW agents developed during and since World War I have been solids at room temperature. In the latter stages of the war, the German military put great efforts into the production of diphenylcyanoarsine (DC), a so-called "arsenical" that was irritating in very small concentrations. One of the strategies involved in using this substance was to render gas masks ineffective. This was to be achieved by delivering DC in a fine aerosol, producing very small particles that would penetrate the filters used in protective masks at the time.[11] The goal would be the forced removal of the mask, thereby making the enemy vulnerable to further assault with other toxic agents. However, it proved difficult to deliver these sternutators, or "sneeze" gases, in particles small enough to achieve this effect, and in this regard, DC was not very successful.[12]

Because enemy defensive masks could not be defeated with arsenical compounds in World War I, the German military command investigated other alternatives. Mustard proved to be the answer. Sulfur mustard had been known since the 1880s as being a very toxic compound to exposed skin surfaces,[13] and as a contemporary historian wrote:

"...there was still another reason that led to the introduction of mustard gas in chemical warfare. This was the length of time mustard gas remains un-decomposed in the field. It is this quality which made it fit for defense. The decisive animal experiments on mustard gas [using cats and dogs] were made in September and October 1916. The valuable military qualities of this gas were already known, when the High Command of the German Army demanded a gas that could be used for the defense of the Western Front in the coming summer of 1917."[14]

Although described here as a gas, sulfur mustard is in fact an oily liquid. Sulfur mustard can cause injury by vapors, inhalation of aerosols, contact with contaminated surfaces—or a combination of all these. Mustard is fat-soluble and able to penetrate clothing (including some forms of rubber), making full-body protection necessary. The toxicological effects of mustard are furthermore insidious, causing blisters on the skin, temporary blindness (sometimes with permanent loss of vision), and life-threatening damage to the upper airways. Such symptoms occur within hours of exposure.

Even today, mustard remains one of the top CW agent threats, not just because of its versatility as a weapon, but because it is relatively cheap and easy to make. It is therefore not surprising that Iraq made extensive use of mustard against both Iranian forces and Kurdish elements during the Iran-Iraq War, from about 1983 to 1988. Although Western countries (led by the United States) cut off exports of mustard precursors to Iraq and Iran in 1984,[15] by adapting its own petroleum distillation capabilities, Iraq was able to indigenously produce sulfur mustard.[16]

For all of its strengths, however, mustard is not as toxic as the nerve agents developed in Germany during the 1930s, nor is it as fast-acting (hours in the case of mustard versus minutes for nerve agents).

Nerve Agents: G-series Compounds and V-agent Analogues

Discovered in the course of investigating novel organophosphate compounds for use as insecticides, German chemists synthesized tabun in 1937, which was later incorporated into the German chemical munitions stockpile during World War II. Later, sarin, soman, and other derivatives were synthesized. None of these was used, however, and the West only discovered their existence upon the end of the war.

In early 1951 during the Korean War, U.S. Army hygienists first noted strong resistance in lice to DDT when delousing North Korean POWs and refugees.[17] When DDT and other organochlorines lost their effectiveness, chemical firms such as Bayer and Imperial Chemical Industries sensed that the market was especially ripe for new and better replacements, including the use of organophosphorus compounds as insecticides.[18] When Ranajit Ghosh patented novel compounds that later formed the basic structure for VX in the early 1950s, the intent was to develop effective insecticides that were also safe for mammals. Some of his new inventions, however, were quite toxic to mammals as well as insects. The V-series of agents (V="venom") were clearly more geared for pests of the "two-legged variety."

Even for a nerve agent, the extreme toxicity of VX, as well as its physical properties, are quite exceptional. First, its lethality for a 70 kg man (155 lbs) is estimated somewhere between 10 and 15 milligrams, an extraordinarily small amount. Second, it is also quite persistent, and depending upon environmental conditions, will survive in its toxic form for days or weeks. However, being 12 times less volatile than mustard, VX does not readily form vapors. While it excels in its high persistency, it is difficult to do more than contaminate ground or materiel with VX. In order to expose larger numbers of enemy troops to VX, an aerosol would be more effective against unprotected troops than, for example, merely splashing large droplets of the agent on the ground.

Thickening Agents

Militaries have investigated ways to change the physical characteristics of a CW agent to improve its delivery performance. Part of the approach is to adjust certain behavioral traits of a given compound, using polymers and other chemical additives to change surface tension, densities, storage parameters, and shear rates (i.e., droplet formations from rapidly-moving delivery platforms).[19] These new formulations can also make decontamination more problematic for the enemy.

A number of compounds have also been utilized to make some agents thicker and thus more persistent. As in formulations of napalm since World War II, these additives can also be used to increase the capacity of CW agents to cling to people or materiel. In 1969, for example, the U.S. military applied for a patent to thicken a number of CW agents—including tabun, sarin, soman, and VX (nerve) as well as Lewisite, and Lewisite-mustard mixtures (vesicants)—with a polymer/thickener. Such a preparation promised to "provide a new and useful composition of matter particularly adapted to adhere to and prolong the level of contamination in the treated area."[20] Although probably not showing its most sophisticated repertoire, the Soviet Union's exhibition of its chemical weapons at Shikhany in 1987 may have come as somewhat of a surprise to Western observers who did not know that the Soviets had also thickened soman, VX, and even Lewisite with some sort of polymer.[21] There has also been the suggestion that U.S. binary nerve programs—canceled in the 1990s—would have involved thickeners for soman and VX.[22]

Having thus far involved liquids or jelly-like preparations, these above techniques can be used to make CW agents more persistent and less susceptible to decontamination. Dusty agents, on the other hand, involve the use of solid materials to produce aerosols. Not only do dusty agents increase the amount of agent that can be spread across an area, they can also frustrate and defeat chemical-protection measures. While it is possible that Iraq has continued work with dusty VX,[23] it may also have worked with other formulations to increase the persistence of VX.

Dusty Mustard and Dusty VX

The term "dusty mustard" or "dusty VX" refers to the use of a carrier particle such as talc or diatomaceous earth in order to form a particulate aerosol out of these liquid agents. There are commercial applications for similar preparations, such as insecticides used in households and gardens against pests such as ants, fleas, and ticks. Ortho® Ant-Stop, for example, uses an organophosphate (chlorpyrifos) insecticide impregnated on an inert carrier that is safe for use around mammals and people. This dust is prepared in a relatively fine particle size distribution,[24] and can be delivered into tight spaces. The dust finds its way into nooks and crannies that other types of delivery could not reach.

In CW, the use of carriers can be applied to bring about the dissemination of chemical agents in the form of aerosols. In this way, one can ensure a larger area of coverage with an agent. Although individual particles are quite small, and would not carry much in the way of agent dispersed as a large, concentrated cloud, many more particles will cumulatively impact upon enemy soldiers and equipment, contaminating both. For mustard and VX—both fat-soluble agents that can also cause injury through contact with skin—dusty agent formulations increase their ability to poison through the respiratory system, and also exploits weak points in chemical defensive gear. Although protective masks can prevent much of the inhalation hazard, the greatest danger is created by fine particulates making their way into gaps and spaces of clothing—no matter how well these are fitted.[25] Accumulations of fine dusts may defeat even full-body protective garments, and coupled with the dermal action of VX nerve agent, they represent a significant military threat.

In 1990, U.S. intelligence reported that Iraq had used mustard in a "particulate aerosol form" in its war with Iran during the 1980s. It further noted that Iraq could have also produced a dusty nerve agent formulation, but there was "no evidence that it has done so." One of the more menacing aspects of this information, albeit unconfirmed, was that a dusty V-agent could cause "fatalities ranging from 3 to 38 percent...for troops in full MOPP [NBC protective gear] if such an agent were used." [26] The U.S. Army then suggested that the wearing of a poncho over the NBC garment would aid in protecting against dusty agents, although one gets the sense that this was recommended in the face of few other options.[27] With a concern that dusty agents might defeat chemical protective masks and garment ensembles, U.S. military researchers subsequently looked to topical skin protectants for additional protection against dusty agents.[28]

A U.S. military report from 1991 noted the capture of Iraqi weapons stores that included dusty mustard ordnance. During the ground campaign of Desert Storm on February 26, 1991, inside the Kuwait theatre of operations, Task Force Ripper reported having found "dusty mustard found stored in bunker."[29] During the 1990s, however, UNSCOM inspections in Iraq did not turn up much more information on Iraqi work in dusty agents. According to an April 2002 report delivered by Robert D. Walpole, Special Assistant to the Director of Central Intelligence for Persian Gulf War Illnesses:

"UNSCOM information shows no research or production of dusty agents in the years prior to the war, although a handwritten note found by UNSCOM indicated that an Iraqi was considering the idea in the late 1980s. UNSCOM tested a DB-2 bomb in 1997 because of concern it was filled with dusty sarin, but found only that it had been incompletely decontaminated and that solids had formed from reaction of the bomb's metal casing with an impure sarin mixture."[30]

Conclusion

Because Iraq has proven artillery systems for chemical delivery, the alleged Iraqi development of a dusty VX formulation further increases the chemical exposure risks to U.S. troops that may be operating in theatre. Considering the very high toxicity and persistent nature of VX nerve agent, the hazard presented by dusty VX is significantly higher than VX delivered in the conventional manner. When it comes to force protection during actual fighting on the ground, the threat from dusty VX will only make U.S. military planners redouble their efforts to ensure that their protective suits and masks will sufficiently safeguard U.S. and allied troops.

EDITOR'S COMMENT: Although this is a 2002 article it contains some interesting insights related to chemical weapons.

OPCW assists Member States in protecting against chemical weapons and toxic industrial chemicals

Source: https://www.opcw.org/media-centre/news/2021/08/opcw-assists-member-states-protecting-against-chemical-weapons-and-toxic

Aug 02 – The Organisation for the Prohibition of Chemical Weapons (OPCW) continues to build the capacity of Russian speaking First Responders with the new modular online training programme: "Protection Against Chemical Weapon Agents and Toxic Industrial Chemicals."

A training session covering the second specialised training module – "Chemical Emergency Response: Devices and Equipment" – was held online from 28 July to 2 August.

Senior Programme Officer from the OPCW's Assistance and Protection Branch, Mr Anton Martyniuk, underlined: "Following the training held in May, the participants continue to strengthen their skills and gain the knowledge necessary for responding to accidents and incidents involving chemical weapons and toxic industrial chemicals."

Supported by a team of international instructors, the attendees developed their knowledge of chemical reconnaissance devices, detection and identification of unknown chemicals, and various equipment used while responding to chemical accidents and incidents.

The training, conducted with the International Rescuers Training Centre (IRT Centre) based in Belarus, supports the implementation of Article X of the Chemical Weapons Convention (CWC) on Assistance and Protection Against Chemical Weapons, despite the constraints resulting from the Covid-19 pandemic.

The new online training programme is a complementary learning tool supporting an eventual return to in-person training.

The digital offering currently encompasses one basic and several specialised modules to be studied over six months to strengthen national preparedness to respond to accidents and incidents involving chemical weapons or toxic industrial chemicals. The tool will build a sustainable set of theoretical knowledge and practical skills to help ensure First Responders provide a timely, effective, and safe response to such accidents and incidents.

The training was attended by 56 professionals from eight OPCW Member States: Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, and Ukraine.

Background

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

World's biggest tyre graveyard on fire with toxic black smoke seen from SPACE at site storing seven million wheels

Source: https://www.thesun.co.uk/news/15778161/worlds-biggest-graveyard-fire-smoke-space/

Aug 04 – Icredible images show toxic smoke billowing from the world's biggest tyre graveyard that can be seen from space.

Gigantic holes in dug out of sandy earth in the Sulaibiya area of Kuwait hold around seven million tyres.

Thick smoke from the blaze at the six acre facility has been captured on satellite.

The tyres are believed to be from both Kuwait and other countries which have paid for them to be taken away.

Four companies are in charge of the disposal and are thought to make a substantial amount from the disposal fees.

Many have questioned the wisdom of storing such combustible materials in a country where the temperatures brush 50C.

The government of Kuwait has begun to tackle the 30 year build up tyres in the desert that has seen 52 million dumped at various sites.

Toxic smoke

It a bid to make way for housing, there are plans to remove 95 per cent of the tyres to be recycled.

In 2012, five million tyres were deliberately set ablaze by a fire in another Kuwaiti tyre dump.

The local population was spared by sheer good fortune in that the wind blew the hazardous smoke across the Gulf.

Disposing of used tyres continues to be a problem for many countries.
Burning of tyres releases carcinogenic dioxins into the air and pollutants can trigger health problems including asthma.
In Britain, where an estimated 486,000 tonnes of tyres are discarded each year, nearly all are recycled or reused.
In the 1970s and 1980s efforts were made in the US and South East Asia to create artificial reefs using discarded tyres.
But they have become environmentally disastrous after tyres were dislodged during storms and damaged nearby coral.

Ecology Council considers Turkey's use of chemical weapons "as war crimes"

Source: https://hawarnews.com/en/haber/ecology-council-considers-turkeys-use-of-chemical-weapons-as-war-crimes-h26119.html

Aug 10 – On Tuesday, Ecology Council at Kongra Star in Rojava issued a statement to the public opinion, a copy of which we have received, regarding the targeting of capitalist countries, and in particular the Turkish occupation state, the environment through its use of chemical weapons in its attacks on the region.

He explained, "We note that the more technology advances and develops, causing massive destruction to the nature, similar to the fire that devours everything, as we saw a few years ago how the Amazon forests and others were set on fire, which is the best area in which the earth can breathe better, those fires were attributed to natural factors by the capitalists and industrialists, aiming to conceal and mislead their crimes and their war against nature, so that the scene would be repeated over and over again, but in different ways and goals."

The statement continued, saying, "The abuses carried out by the AKP government in the Kurdistan lands for years, which increase in brutality with the increase of occupation and terrorism, have occupied and launched the most violent attacks on the northern Syria, until today they have cut down many trees, foremost of which are olive trees that are thousands of years old, This is in pursuit of the geographical and climatic change in the region, in addition to destroying tourist and archaeological centers and burning agricultural lands to record the highest standards in its hostility to the environment with all its contents, trees, rivers, living creatures and killing humanity."

The statement noted that" in the legitimate defense zones, it (in reference to the Turkish state) every day burns the mountains and cuts down their trees, causing a geographic change and destroying an environment that includes dozens of species of animals, birds and herbs that affect the ecological balance. Huge fires were ignited in the tourist forests of Antalya and Marmaris and many other Turkish cities to reach more than 300 fires that entered the Greek lands as well to extend to Kurdistan and others, to devour the fires that they do not want to control dozens of populated cities and make them completely stricken, to equal their devastating impact the pandemic COVID 19" which claimed the lives of thousands of innocent people in exchange for achieving some economic and commercial interests.

At the conclusion of its statement, the Council called on all environmental institutions, organizations, activists and parties, as well as all parties and bodies concerned with protecting the rights of the environment and the climate, "to assume responsibility for maintaining the ecological balance and thus protecting the environment from climate changes fabricated by environmental terrorists who seek to achieve some dirty interests that will lead the planet to doom." If they continue with their environmental terrorism."

Avon Protection Launches CH15 CBRN Escape Hood

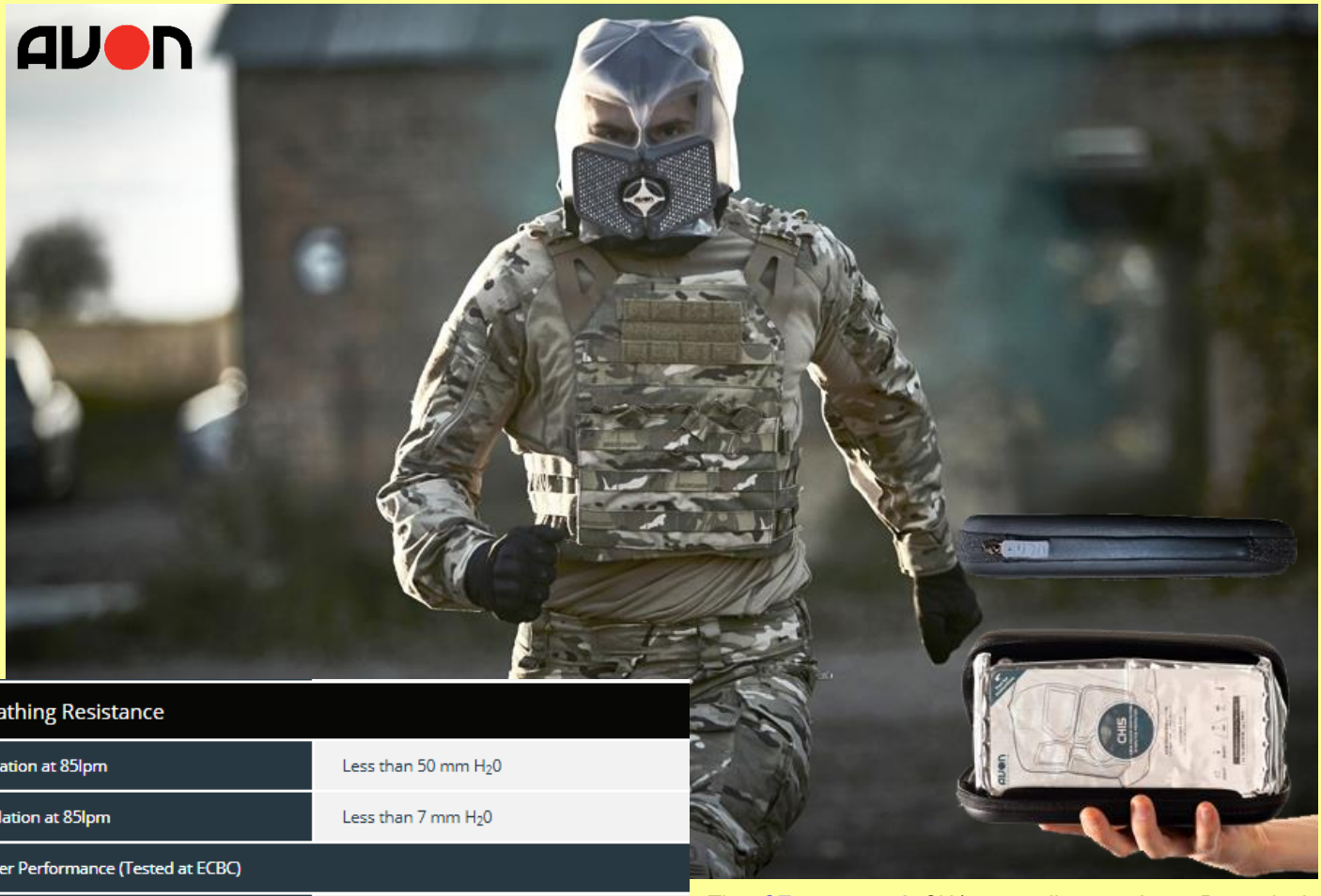
Source: https://www.joint-forces.com/defence-equipment-news/41386-avon-protection-launches-ch15-cbrn-escape-hood

Mar 10 – Avon Protection are pleased to announce the launch of the CH15, a revolutionary new, ultra-thin, single size portable escape hood that provides a minimum of 15 minutes of respiratory vision and facial protection against Chemical, Biological, Radiological and Nuclear threats.

The last decade has clearly demonstrated how the threat profile has changed significantly. Today most threats are unplanned, the CH15 is a development driven after an emerging requirement from specialist users to provide instant protection from all CBRN materials when in a live threat scenario. Developed in conjunction with The Combating Terrorism Technical Support Office (CTTSO), the CH15 escape hood provides rapid deployment respiratory protection for military, first responders and protective detail.

Commenting on the launch of the CH15, Justin Hine, Global Product Manager, said: "The CH15 offers a different approach to carrying respiratory protection, this device offers what no other traditional respirator can, a low profile, lightweight, **one size fits all** solution that is small and light enough to be carried at all times. This unique portable solution means the CH15 can always be on hand for the unexpected."

CH15 Escape Hood [©Avon Protection]



Breathing Resistance	
Inhalation at 85lpm	Less than 50 mm H_20
Exhalation at 85lpm	Less than 7 mm H_20
Barrier Performance (Tested at ECBC)	
GB	Greater than 30 minutes
HD	Greater than 30 minutes
Smartman Performance (Full System Test)	
GB	Greater than 30 minutes
HD	Greater than 30 minutes
Filter Performance	
Particulate Penetration	P3/P100 (Less than 0.03%)

The **CE approved** CH15 compliments Avon Protection's leading respiratory protection portfolio, adapting proven technology to create their most compact CBRN protection device to date.

Commenting on the launch of the CH15, James Wilcox, President – Military, at Avon Protection, said: "Capability and threats are always evolving, at Avon Protection we are continuously working with our customers worldwide to ensure we design, develop and deliver world leading solutions to ensure they always have the right protection available no matter what the threat."

Parasites Fight Chemical and Biological Weapons

Source: http://www.homelandsecuritynewswire.com/dr20210813-parasites-fight-chemical-and-biological-weapons

Aug 13 – Parasites could become part of the armor of military personnel and first responders to help them counter chemical and biological weapon attacks in war zones.

Professor Alex Loukas' and Dr Paul Giacomin's teams from the Australian Institute of Tropical Health at Medicine James Cook University, will receive nearly $2.5 million over five years to conduct research that builds on this work with parasitic helminth infections in human volunteers.

The funding is part of a $16.4 million contract awarded to US research and development company Charles River Analytics from the U.S. Government's Defense Advanced Research Projects Agency (DARPA).
AITHM molecular parasitologist Professor Loukas said the project is intended to reduce the burden of personal protective equipment worn or carried by members of the military and medical first responders in conflict zones to protect them against bio-terrorism agents.
"Capitalizing on recent advances in genetic modification of parasitic helminths using CRISPR-Cas9, the team will create parasitic helminths that secrete drugs that counteract bio-terrorism agents and thereby protect the parasite-infected subject against chemical and biological agents in a safe and well tolerated manner," Professor Loukas said.
To achieve this goal, the team will work with the U.S. Food and Drug Administration to obtain Investigational New Drug status for the use of genetically modified parasitic helminths in human volunteers.
He said as military technology and technology in general advances, these kinds of threats will become more common.
"It's clearly an advantage to have an internal biological solution to counter threats when they suddenly appear. We are thinking of parasitic helminths as internal molecular foundries, producing and delivering drugs within and throughout the body continuously, or on demand, if we so choose," Professor Loukas said.
Six other international universities and companies are involved in the multi-million program, which was initially conceived by JCU's Professor Loukas and his U.S. colleague Professor Paul Brindley at George Washington University.
"It's all cutting-edge work and JCU will be an integral part of it," Professor Loukas said.

Red China's Three-Pronged Nuclear-Biological-Chemical Weapons Attack

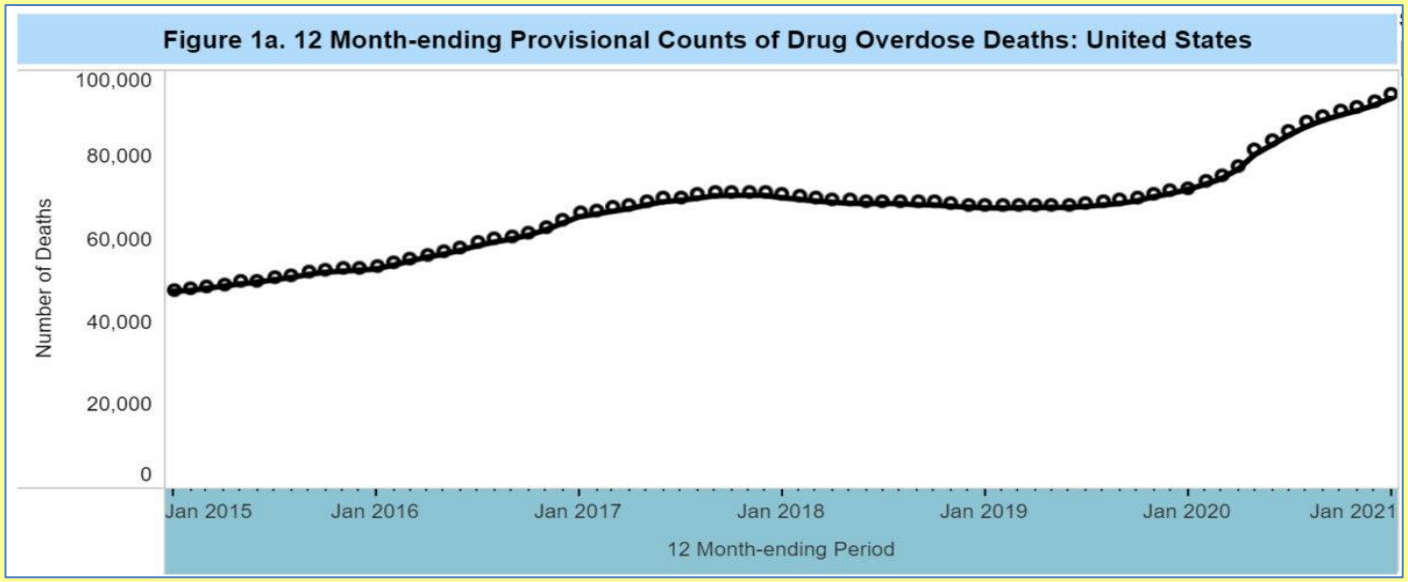
By Stu Cvrk
Source: https://www.theepochtimes.com/red-chinas-three-pronged-nbc-weapons-attack_3948982.html

Aug 15 – Before there were "weapons of mass destruction" (WMD), there were nuclear-biological-chemical (NBC) weapons. NBC warfare has been a Cold War euphemism for decades, but disarmament advocates prefer WMD because the phrase is more frightening and easier understood by the average person.
The militaries in NATO and the United States have written voluminous doctrines, tactics, techniques, and procedures on the conduct of NBC warfare. Such examples include "Allied Joint Doctrine for NBC" (pdf); "Chemical, Biological, Radiological, and Nuclear Response" (pdf); "Combat Skills of the Soldier" (chapter 5, pdf); and "Naval Warfare Publication." These and other related military publications are accessible online, and potential adversaries such as China's People's Liberation Army (PLA) have been studying and wargaming them for years. Other than simple prudence, there is a specific reason for PLA interest in studying Western NBC (or WMD) doctrine: Red China has embarked on a multi-pronged campaign involving NBC warfare that is finally coming into focus.
The Chinese Communists (ChiComs) are pursuing world domination in the economic and military spheres as they seek to return China to its historical prominence as a world leader. After all, China was once the most advanced civilization in the ancient world. As noted here, "China was once the standard-setter in an advanced civilization, the center point on which the economies and cultures of much of the Earth revolved." Since the Chinese Communist Party (CCP) gained control of mainland China in 1949, the ChiComs have embarked on a methodical plan to resume Chinese supremacy in all human endeavors. This effort involves displacing U.S. supremacy and the post-World War II-era international system with "Chinese methods," systems, and institutions.
The United States is the "main adversary" as far as the ChiComs and PLA are concerned. Beijing's plan has now moved from playing "economic catch-up" via exploitation of the existing international system to overt actions directed against the United States and its allies.
Two elements of NBC warfare have already been employed against the United States: chemical and biological. The third apex of the NBC triangle—nuclear intimidation and coercion—is well along the way to becoming reality.

Chemical

The first element of the ChiComs' NBC warfare campaign has been underway for years. There is enormous manufacture of fentanyl (by the tons) and other synthetic narcotics in China. As noted here, "China produces nearly all of the fentanyl, fentanyl analogues, and fentanyl precursors in the world." Fentanyl and other synthetic and addictive drugs are the chemical part of multi-prong Chinese approach to achieving world dominance.
What better way to destroy the United States from within than through drug addiction and the hopelessness that addiction engenders? Note the continuing rise in drug overdose

deaths in the United States in the below graphic from the CDC. Nearly half of those deaths are from fentanyl, and the year-to-year fentanyl deaths continue to increase dramatically as noted here.



Biological

SARS-CoV-2 (the virus that causes COVID-19) is nothing short of a biological attack on the United States and the rest of the world. The virus was lab-developed or lab-modified. Scientists suggest that the CGG-CGG amino acid sequence found in the ChiCom virus is manmade and can only have been inserted through gain-of-function research, as reported in The Wall Street Journal, as the CGG-CGG sequence is not found in nature. Additionally, British Professor Angus Dalgleish and Norwegian scientist Dr. Birger Sørensen completed a study that "claims that Chinese scientists created COVID-19 in a Wuhan lab," and that they had evidence in hand of Chinese "retro-engineering" for over a year.

The zoonotic origins theory promoted by the ChiComs over the last 20 months is no longer operative. The ChiComs have obfuscated its origins and denied access to complete records of the virus while continually fear-mongering and exaggerating its effects via their state-run media, as well as promoting authoritarian methods (unproven and unscientific) for controlling the virus.

A biological war is underway that is being exploited to the hilt by Beijing, and the results have probably exceeded its wildest dreams, including the continuing turbulence in the U.S. economy, the virtual paralyzing of the world economy, and also the ongoing attacks on Americans' constitutionally-guaranteed liberties by lockdown advocates.

Nuclear

According to Admiral Charles Richard, Commander of U.S. Strategic Command (STRATCOM), Red China is pursuing an unprecedented "nuclear breakout" through the accelerated production and deployment of nuclear missiles, warheads, and nuclear command and control infrastructure.

Three new missile fields totaling 230 intercontinental ballistic missile (ICBM) silos are being built in western China. With the multiple independently-targeted re-entry vehicles (MIRVs) and other nuclear technology stolen during the Clinton administration, the PLA-Rocket Forces will achieve nuclear parity with the United States within five years, as the New START Treaty limits the United States to "1,550 nuclear warheads on deployed ICBMs, deployed SLBMs [submarine-launched ballistic missiles], and deployed heavy bombers equipped for nuclear armaments."

And the ChiComs also have an air-launched ICBM under development that will complete their nuclear triad along with their strategic submarine force. So much for Beijing's professed "minimum nuclear deterrent" strategy.

Conclusion

The coming ChiCom nuclear intimidation and coercion will complete the NBC warfare triangular arrowhead aimed squarely at the United States. The ChiComs are positioning themselves to "win without fighting" a kinetic military war through their strategic three-pronged NBC weapons attack. Sun Tzu would be proud.

Views expressed in this article are the opinions of the author and do not necessarily reflect the views of The Epoch Times.

***Stu Cvrk** retired as a Captain after serving 30 years in the U.S. Navy in a variety of active and reserve capacities, with considerable operational experience in the Middle East and the Western Pacific. Through education and experience as an oceanographer and systems analyst, Stu is a graduate of the U.S. Naval Academy, where he received a classical liberal education that serves as the key foundation for his political commentary.*

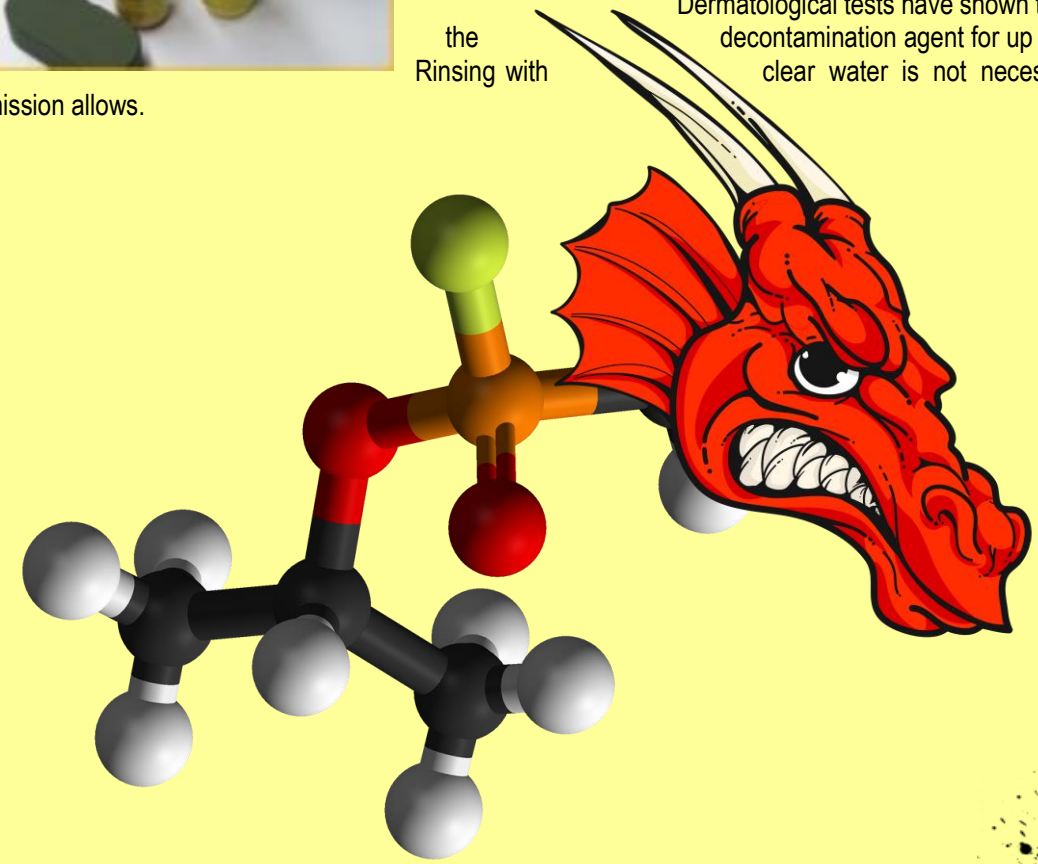
Alldecont® - SkinDeconSystem by OWR

Source: http://www.oshodefence.com/home/SD.php

Alldecont® is an OWR patented personal decontamination system for human skin. The intention is to provide fast and effective decontamination of uninjured skin during military missions or civil defense operations in the first minute.

Compared to other skin decon solutions, the Alldecont® formulation can dissolve and decompose chemical warfare agents and a large range of toxic industrial chemicals.

Dermatological tests have shown that human skin is unaffected by the decontamination agent for up to a residence time of 24 hours. Rinsing with clear water is not necessary but recommended if the mission allows.



2021 CBRNe-related conferences

NCT USA 2021

7-9 September 2021, USA

https://nct-events.com/event/nct-usa-2021

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

NCT Virtual Hub - Trends in the fight against IEDs

8 September, Online

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

NCT Europe 2021

5-7 October 2021, Italy

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

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

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

7 October, Online

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

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

TBD, Online

NCT Asia Pacific 2021

10-12 November 2021, Korea

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

NCT CBRNe Asia Pacific is coming to Seoul, Republic of Korea, for its third edition in the peninsula, organized in official partnership with the Korean Society of Chemical, Biological and Radiological Defense (KSCBRD). The event will kick start with a live capability

demonstration led by the ROK Army CBRN Defense Command and will be followed by an international conference and industry exhibition in the field of CBRNe.

NCT Virtual Hub - Future Trends in CBRN Decon

TBD, Online

CTX 2021

14-16 September 2021, London, UK

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

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

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

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

CBRNE Summit USA

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

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

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

During our international event you will hear perspectives from military and civil officials who deal with CBRNe incidents. Many government departments and agencies across the region have realised the importance of CBRNe capabilities and preparedness and budgets have been increased to deal with the new type of threats faced to civilians.

CBRNe Summit USA will focus on a number of key topics across the whole spectrum of the CBRNe domain such as local Nevada State CBRNe Response Capabilities, Chem-Bio Countermeasures and Response strategies, International CBRNe Response and Preparedness, U.S. Preparedness and Response to CBRNe Threats and Attacks, First Responder Techniques – Hazmat and Decon and Combating Infectious Diseases across the U.S.

To take part in our inaugural CBRNe Summit USA conference and exhibition as either a speaker, sponsor, exhibitor or delegate please contact us at events@intelligence-sec.com or call us at +44 7792 47 32 46.

NATO EOD Demonstration & Trials

13-14 October 2021, Slovakia

https://www.eodcoe.org/en/events/nato-eod-demonstrations-trials-2021/

We all recognize that we are in the era dealing with a range of prominent threats such as cyber or terrorism. Permanent constant technical development of engineering technology and related procedures are forcing action to seek constantly better solutions related to detection, neutralization and removal of all types of hazards.

The main idea of the **NATO EOD Demonstrations and Trials 2021** is *"Technological Innovations Influencing Future EOD and Related Capabilities"*, a challenge for EOD/IEDD experts, scientists, producers, industry and SMEs involved in the fight against terrorism.

The event is held under the sponsorship of the NATO HQ ESC (Emerging Security Challenging) Division and is organized by the NATO EOD Centre of Excellence, Slovakia.

CBRNE Summit Europe

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

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

Demining and EOD Seminar

7-9 September 2021, Sarajevo, B&H
https://intelligence-sec.com/events/deminingandeodseminar2021/
Demining operations are still taking place in Bosnia and Herzegovina and neighboring nations. We are pleased to be bringing our inaugural Demining and EOD Seminar to Sarajevo to review the current situation and the plan for the next few years to finally make Bosnia and Herzegovina a mine free country.
Many IGOs and NGOs are working tirelessly to clear the minefields in the region and there is a key importance on international cooperation in making the world mine clear by 2025. Technology in demining is also evolving with many new solutions being adopted to clear mines to help lower casualties. Solutions such as robotics and drones are now being used to assist with clearing mine sites especially in areas where it is difficult to detect mines.
Our Demining and EOD Seminar will bring together leading officials who are working on mine clearance in Bosnia and Herzegovina as well as across the Balkans. You will hear in-depth presentations and case studies from regional Mine Action Centres as well as other international organizations who are supporting local governments to clear the mine fields. To be part of our inaugural Demining and EOD Seminar in Sarajevo, Bosnia and Herzegovina on the 7th – 9th September 2021 either as a speaker, sponsor or delegate please contact us at events@intelligence-sec.com or +44 (0)1582 346 706.

IMEKO-TC17 International Measurement Federation TC17-VRISE2021: Topical VIRTUAL Event

CALL FOR ABSTRACT
EVENT DATE: Friday Oct 6th, 2021

Theme: TC17 VRISE2021 - Topical Event on Robotics for Risky Interventions and Environmental Surveillance

Abstract are solicited from prospective authors on topics related to the theme of Robotics for Risky Interventions and Environmental Surveillance for the TC17-VRISE2021: Topical Event

SCOPE and Topics
Measurement of CBRNE – related environmental risks Environmental surveillance (air quality, pollution, etc, Search and Rescue by incidents/accidents/disasters), Medical Management (teaching facilities, entertainment facilities, hospitality facilities, etc.) and Robotics Trends, Detection sensing systems

The abstracts are limited to only 450 words and limited to 2 pages (12 font Cambria for text). [No paper submission is required]

- ✓ Deadline to receive the abstract……**July 30th, 2021**
- ✓ Date for Approval to authors …….Aug 1st, 2021

Please note the following for the event

1) The number of presentations is limited to 15. The abstract selection committee will select the papers based on the quality and the relevance to the theme.
2) Only Abstract will be submitted by authors. A composite collection of abstracts for all presentations will be provided online to all attendees.
3) Registration for all video-attendees will be complimentary. All attendees will register using IEEE Vtools.
4) **A local physical participation is also foreseen. Fees 50€ (lunch/coffee) , information on accommodations and registrations on request**
5) All registrants will be provided ZOOM URL to login and only registrants will be allowed to attend this free event.
6) Authors of a number of selected presentations will be requested to submit papers after the event for possible IMEKO publication(optional) with no charges.

Event Coordinators
Prof em Y.Baudoin (ICI/RMA/ER KC) ,Vice-Chair TC17,
M.Y.Dubucq (Dir ICI), Prof O.Tokhi (CLAWAR), Dr Ir Zafar Taqvi (Chair IMEKO TC17

Advisers
Claude Lefebvre (General secretary FSF-IHCE)
Dr I. Galatas (Center for Security Studies (KEMEA), Athens
Dr F.Van Trimpont (General Secretary of European Council of Disaster Medicine)

Event Organizers Supporting the Event:

- ICI
- IEEE Galveston Bay Section, Region 5

PLEASE SEND YOUR ABSTRACT TO THE FOLLOWING

- ❖ Dr Zafar Taqvi, z.taqvi@ieee.org
- ❖ Prof Y. Baudoin, Yvan.Baudoin@ici-belgium.be

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 practice 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 practice. 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.

▶▶ **Abstract submission deadline:** 27 July 2021.

7th Crisis Management in Healthcare Sector

11-12 September 2021, Athens, Greece
Website: https://www.crisis-management2021.eu/
Abstract deadline: July 29, 2021


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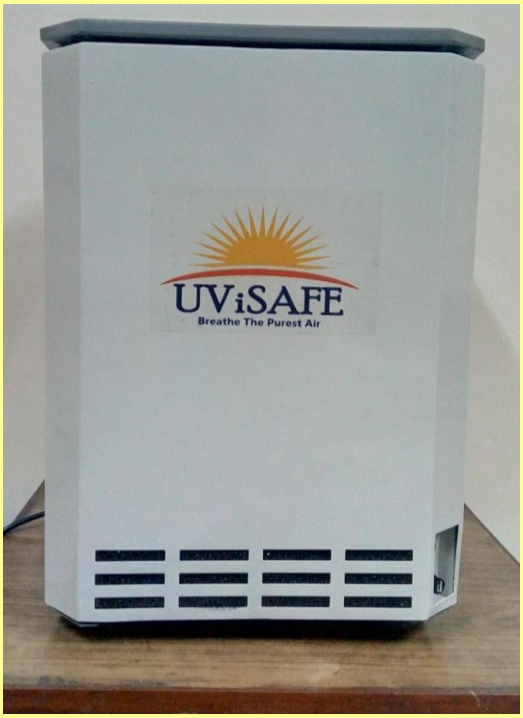
D
HOTZONE
SOLUTIONS
GROUP
C2BRNE
DIARY
BIO NEWS

India – UViSAFE disinfection

Source: https://oshohealth.com/uvi-safe-disinfectant.php



August 2021 – UViSAFE is developing innovative disinfectant solutions under Osho Healthcare & LifeSciences.

UViSAFE team is focused on developing products for Surface, Air and Water disinfection. This is done using UV technology which is highly effective against all pathogens (Bacteria, e-coli, SARS, Mold, Covid-19, etc.). It has wide range of applications in domestic, industrial, retail and clinical and can be used on all electronic devices, instruments, food, groceries, and fabrics.

UViSAFEsolutions / products are certified by CE (Medical Devices), ISO 13485 (Medical Devices), WHO-GMP, tested and validated at CSIR, ICAR and NABL accredited Labs.

UViSAFE is required everywhere or it would not be wrong to say under current global environmental conditions that "Wherever humans are, we require UViSAFE".

With UViSAFE Air Disinfectant, one can breathe the SAFEST, PUREST, CLEANEST Virus/ Bacteria free Air as UViSAFE kills all Viruses / Bacteria's, Fungi, Mold to smallest micron in size.

It is required in every hospital room, operation theatres, ICU, School / Collages Class rooms, Shops, Restaurants, Hotel Rooms, Ambulances, offices, homes, public washrooms etc.

As a result of the current Corona Pandemic, disinfection has become an even more important part of everyday lives. With disinfection rates of about 99.5% and more, UVC light (ultraviolet light) is an effective alternative to chemicals and heat - especially as no consumables are needed such as disinfection spray. In many cases, wet chemical disinfection is not practical – either because it is damaging material or the amount needed is very high and therefore not economical.

We are also designing the UViSAFE system for installation in the Air Conditioning Duct, so all places with a central AC system will have SAFEST, PUREST, CLEANEST Virus/ Bacteria free Air to breathe.

UViSAFE products are manufactured as per Government of India policy of Make In India with dynamic and young team to come up with innovative solutions.

We are committed to the environment and offer chemical free, environmentally friendly, and clean solutions for disinfection.

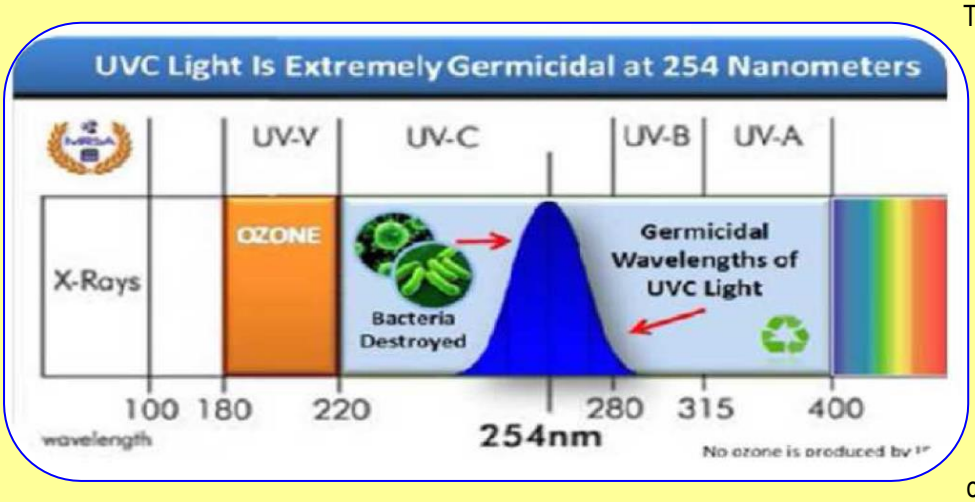
UViSAFEteam's strength is to act quickly in addressing the customer's needs, which help us come up with better and effective solutions.

Professional Air Disinfection : "Need of the hour"

UVi safe UV-C disinfection luminaries can be used to disinfect air in a wide range of applications. These include Hospitality areas, Schools, Offices, Retail outlets and Factories. Even on modes of transport such as Aircraft, Buses and Trains and Public Washrooms.

Type	UVi Safe Micro	UVi Safe Mini	UVi Safe Max
Dimension	132 x 132 x 456mm	320 x 320 x 536mm	393 x 427 x 1723mm
Max Power in W	39 W	151 W	403 W
Voltage	220 - 240 V AC	220 - 240 V AC	220 - 240 V AC
CADR*	100 m³/hr	300 m³/hr	1000 m³/hr
No. of Lamps used	1 No 8	No's 8	No's
Weight	2.5 kgs	8 kgs	35 kgs
Lamp Wattage	16 W	16 W	36 W
Filters	Washable Pre Filter	Washable Pre Filter	Washable Pre Filter
Body	Mild Steel	Mild Steel	Mild Steel

* Clean Air Delivery Rate



Test performed in a lab setting by Boston University using a Signify UV-C light source revealed that a dose of 5mJ/cm2 reduced 99% of SARS-CoV-2, the virus causing COVID-19, in just 6 seconds. Based on the data, it was determined that a dose of 22mJ/cm will result in a reduction of 99.9999% in 25 seconds. Research variables available upon request.

OshoHealth is the Healthcare and Pharma section of the OshoCorp Global Pvt. Ltd. OshoHealth has the capability to manufacture and supply quality healthcare products as Covid Solutions. OshoCorp Global Pvt. Ltd. is an premier Indian Defence company providing security solutions to improve sustainability and self-reliance of the Indian Armed Forces. As a reliable partner, OshoCorp supports thier client base with pioneering conceptual solutions.
UVi Safe product has been tested , certified at ICAR-CIBA(NABL accredited Lab, Govt. of India) and ICMR Gov India (**99.99998% viral load reduction**). OshoCorp Global Pvt. Ltd. is a ISO 9001:-2015 company with NCAGE No. 1691y(NATO).

Might CRISPR gene editing 'unleash dangerous mutants, designer babies and new weapons of mass destruction?'

Source: https://geneticliteracyproject.org/2021/07/26/viewpoint-might-crispr-gene-editing-unleash-dangerous-mutants-designer-babies-and-new-weapons-of-mass-destruction/

July 26 – Mankind has been manipulating genetics since early civilizations realized that certain traits of crops, animals and humans themselves were hereditary. The modern-day mapping of all human genes raised the prospects of learning precisely which genes control which traits and then directly altering their DNA codes. After years of hit-and-miss efforts, a gene-editing system called Crispr that's cheap, effective and easy to use promises to change our relationship with genetics — for better, worse or both. Its champions foresee using Crispr to control pests, increase food production and eliminate human diseases. They simultaneously worry that its use could unleash dangerous mutants, designer babies and new weapons of mass destruction.

By improving so-called gene drives, experimental systems that increase the chance a certain gene is inherited, Crispr might one day, for instance, ensure that mosquitos can no longer host the Zika virus. Yet theoretically, the modifications could also allow the bugs to spread a

more harmful pathogen. Germline editing raises similar issues. Potentially, a genetic disease could be eliminated from a family forever. But if something goes wrong, the consequences are potentially eternal, too, affecting future generations who would not have given their consent to the intervention.

▶▶ **Read also:** https://www.bloomberg.com/quicktake/gene-editing

UK study detects cognitive deficits in recovered COVID-19 patients

Source: https://newatlas.com/health-wellbeing/coronavirus-cognitive-deficits-brain-long-covid/

July 25 – A large new study published in *The Lancet* journal *EClinicalMedicine* has detected significant cognitive deficits in recovered COVID-19 patients. The research found the more severe the case, the greater the persistent cognitive problems, with hospitalized patients put on ventilators showing a decline equivalent to seven IQ points.

Early in 2020, before the pandemic kicked off, Imperial College London researcher Adam Hampshire was working with the BBC on a big, UK-wide cognitive survey. Called the Great British Intelligence Test, the project was designed to get a broad overview of the nation's intelligence.

As the year progressed Hampshire realized the ongoing project afforded him a unique opportunity to investigate how this new disease affected cognition. By May the researchers had incorporated questions regarding COVID-19 into the survey.

As of December 2020 the researchers had collected data from 81,337 subjects. Around 12,000 subjects surveyed reported contracting COVID-19.

After adjusting for a variety of factors the researchers detected a significant relationship between COVID-19 and cognitive deficits. The severity of cognitive problems was directly related to the severity of the acute infection, with the greatest deficits detected in subjects admitted to hospital and put on a ventilator.

"The scale of the observed deficit was not insubstantial," the researchers write in the newly published study. "The 0.47 SD [standard deviation] global composite score reduction for the hospitalized with ventilator sub-group was greater than the average 10-year decline in global performance between the ages of 20 to 70 within this dataset. It was larger than the mean deficit of 480 people who indicated they had previously suffered a stroke (-0.24SDs) and the 998 who reported learning disabilities (-0.38SDs). For comparison, in a classic intelligence test, 0.47 SDs equates to a 7-point difference in IQ."

The greatest cognitive deficits detected in the study were seen in tasks evaluating reasoning, planning and selective attention. The researchers note these findings fit with other long COVID studies citing problems with persistent "brain fog" and difficulties concentrating.

"There is a worrying association between COVID-19 illness and a broad range of higher cognitive function in the early chronic phase," Hampshire notes on Twitter. "More research is needed to determine how long these deficits last and their biological/physiological basis."

Mechanisms to explain the cognitive deficits are hypothesized in the study, including the possibility hypoxia is causing neurological damage. But the researchers are cautious to note there is still much to learn about the neurological effects of SARS-CoV-2 infection.

Derek Hill, a researcher from University College London (UCL), called the study "intriguing but inconclusive" when it was first published late last year on preprint servers. He noted several issues with the study, including the self-reported nature of the COVID-19 cases and the lack of data documenting how long these symptoms may be lasting post-infection. He particularly pointed out the cross-sectional nature of the study as prone to error.

"It does not look at whether COVID makes your cognition worse – it instead looks at whether people who have recovered from possible COVID do worse on the cognitive test than a control group," Hill explained. "This type of methodology is more subject to error than a longitudinal study that looks at the same people before and after an illness."

What is vital for researchers to unpack over the coming months and years is whether these post-COVID cognitive deficits are specifically due to SARS-CoV-2 infection, or whether they are related to the known cognitive dysfunctions that follow any kind of critical illness or viral infection. Respiratory diseases in particular have been linked with long-term cognitive impairments,

but the new study does note, "the scale of deficits in cases who were not put on a ventilator, particularly those who remained at home, was unexpected."
A study published in *Nature* journal *Neuropsychopharmacology* earlier this year found 81 percent of hospitalized COVID-19 patients reported some kind of persistent cognitive impairment following discharge. Again, it is unclear how long these impairments may last or what the underlying mechanism is, but UCL clinical researcher Christina Pagel suggests the growing evidence is worrisome if we are to broadly let the disease spread through a community.
"I worry that once again we are watching an unfolding disaster while waiting for unequivocal evidence," Pagel says on Twitter. "Unequivocal evidence on long term impacts will, by definition, take months or years. Maybe it never will – but so far, trajectory is towards more certain evidence not less. What if by the time there can be no doubt of long term problems in many people who've had cover, we've allowed millions more infections leaving hundreds of thousands more people affected."
Speaking to PsyPost, Hampshire is cautious not to overstate his new findings. He stresses the need for urgent research on the topic and reminds people that the best course of action currently is to get vaccinated.
"We need to be careful as it looks like the virus could be affecting our cognition," says Hampshire. "We do not fully understand how, why, or for how long, but we urgently need to find out. In the meantime, don't take unnecessary risks and do get vaccinated."

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

Lab Alert: Changes to CDC RT-PCR for SARS-CoV-2 Testing

Source: https://www.cdc.gov/csels/dls/locs/2021/07-21-2021-lab-alert-Changes_CDC_RT-PCR_SARS-CoV-2_Testing_1.html

July 21 – After December 31, 2021, CDC will **withdraw** the request to the U.S. Food and Drug Administration (FDA) for Emergency Use Authorization (EUA) of the CDC 2019-Novel Coronavirus (2019-nCoV) **Real-Time RT-PCR** Diagnostic Panel, the assay first introduced in February 2020 for detection of SARS-CoV-2 only. CDC is providing this advance notice for clinical laboratories to have adequate time to select and implement one of the many FDA-authorized alternatives.
Visit the FDA website for a list of authorized COVID-19 diagnostic methods. For a summary of the performance of FDA-authorized molecular methods with an FDA reference panel, visit this page.
In preparation for this change, CDC recommends clinical laboratories and testing sites that have been using the CDC 2019-nCoV RT-PCR assay select and begin their transition to another FDA-authorized COVID-19 test. CDC encourages laboratories to consider adoption of a multiplexed method that can facilitate detection and differentiation of SARS-CoV-2 and influenza viruses. Such assays can facilitate continued testing for both influenza and SARS-CoV-2 and can save both time and resources as we head into influenza season. Laboratories and testing sites should validate and verify their selected assay within their facility before beginning clinical testing. Opt in to receive updates from the CDC Laboratory Outreach Communication System (LOCS).

Existing drug is shown to inhibit SARS-CoV-2 virus

Source: https://pme.uchicago.edu/news/existing-drug-shown-inhibit-sars-cov-2-virus

July 21 – A new University of Chicago study has found that the drug **masitinib** may be effective in treating COVID-19.
The drug, which has undergone several clinical trials for human conditions but has not yet received approval to treat humans, inhibited the replication of SARS-CoV-2 in human cell cultures and in a mouse model, leading to much lower viral loads.
Researchers at UChicago's Pritzker School of Molecular Engineering (PME), working with collaborators at Argonne National Laboratory and around the world, also found that the drug

could be effective against many types of coronaviruses and picornaviruses. Because of the way it inhibits replication, it has also been shown to remain effective in the face of COVID-19 variants.

"Inhibitors of the main protease of SARS-CoV-2, like masitinib, could be a new potential way to treat COVID patients, especially in early stages of the disease," said Prof. Savas Tay, who led the research. "COVID-19 will likely be with us for many years, and novel coronaviruses will continue to arise. Finding existing drugs that have antiviral properties can be an essential part of treating these diseases." The results were published July 20 in *Science*.

A race to find COVID-19 treatments

When COVID-19 lockdowns began in March 2020, Tay and Nir Drayman, a postdoctoral fellow who specializes in virology, began to think about how they could help. To search for a better treatment for the disease, they began by screening a library of 1,900 clinically safe drugs against OC43, a coronavirus that causes the common cold and can be studied under regular biosafety conditions. They used cell cultures to determine the drugs' effect on infection.

They then gave the top 30 drug candidates to microbiology professor Glenn Randall, who tested them in cell cultures against the SARS-CoV-2 virus at the Howard Taylor Ricketts Laboratory, a BSL-3 facility at Argonne National Laboratory. Measurements in the high-containment lab revealed nearly 20 drugs that inhibit SARS-CoV-2.

They also sent the drug candidates to other collaborators to test against the 3CL protease, the enzyme within coronaviruses that allows them to replicate inside a cell. They found that of the drug candidates, masitinib completely inhibited the 3CL viral enzyme inside the cell, a fact that was confirmed by X-ray crystallography by Prof. Andrzej Joachimiak's group at Argonne. The drug specifically binds to the 3CL protease active site and inhibits further viral replication.

"That gave us a strong indication of how this drug works, and we became confident that it has a chance to work in humans," Drayman said.

Though masitinib is currently only approved to treat mast cell tumors in dogs, it has undergone human clinical trials for several diseases, including melanoma, Alzheimer's disease, multiple sclerosis, and asthma. It has been shown to be safe in humans but does cause side effects, including gastrointestinal disorders and edema, and could potentially raise a patient's risk for heart disease.

Drug effective against variants, other viruses

Next, the researchers worked with peers at the University of Louisville to test the drug in a mouse model. They found that it reduced the SARS-CoV-2 viral load by more than 99 percent and reduced inflammatory cytokine levels in mice.

In parallel, the researchers also began to test the drug in cell cultures against other viruses and found that it was also effective against picornaviruses, which include Hepatitis A, polio, and rhinoviruses that cause the common cold.

They also tested it in cell cultures against three SARS-CoV-2 variants, Alpha, Beta, and Gamma, and found that it worked equally well against them, since it binds to the protease and not to the surface of the virus.

Now, the team is working with the pharmaceutical company that developed the drug (AB Science) to tweak the drug to make it an even more effective antiviral. Meanwhile, masitinib itself could be taken to human clinical trials in the future to test it as a COVID-19 treatment.

"Masitinib has the potential to be an effective antiviral now, especially when someone is first infected and the antiviral properties of the drug will have the biggest effect," Drayman said. "This isn't the first novel coronavirus outbreak, and it's not going to be the last. In addition to vaccines, we need to have new treatments available to help those who have been infected."

Other authors on the paper include Jennifer K. DeMarco, Krysten A. Jones, Saara-Anne Azizi, Heather M. Froggatt, Kemin Tan, Natalia Ivanovna Maltseva, Siquan Chen, Vlad Nicolaescu, Steve Dvorkin, Kevin Furlong, Rahul S. Kathayat, Mason R. Firpo, Vincent Mastrodomenico, Emily A. Bruce, Madaline M. Schmidt, Robert Jedrzejczak, Miguel Á. Muñoz-Alía, Brooke Schuster, Vishnu Nair, Kyu-yeon Han, Amornrat O'Brien, Anastasia Tomatsidou, Bjoern Meyer, Marco Vignuzzi, Dominique Missiakas, Jason W. Botten, Christopher B. Brooke, Hyun Lee, Susan C. Baker, Bryan C. Mounce, Nicholas S. Heaton, William E Severson, Kenneth E Palmer, Bryan C. Dickinson, and Andrzej Joachimiak.

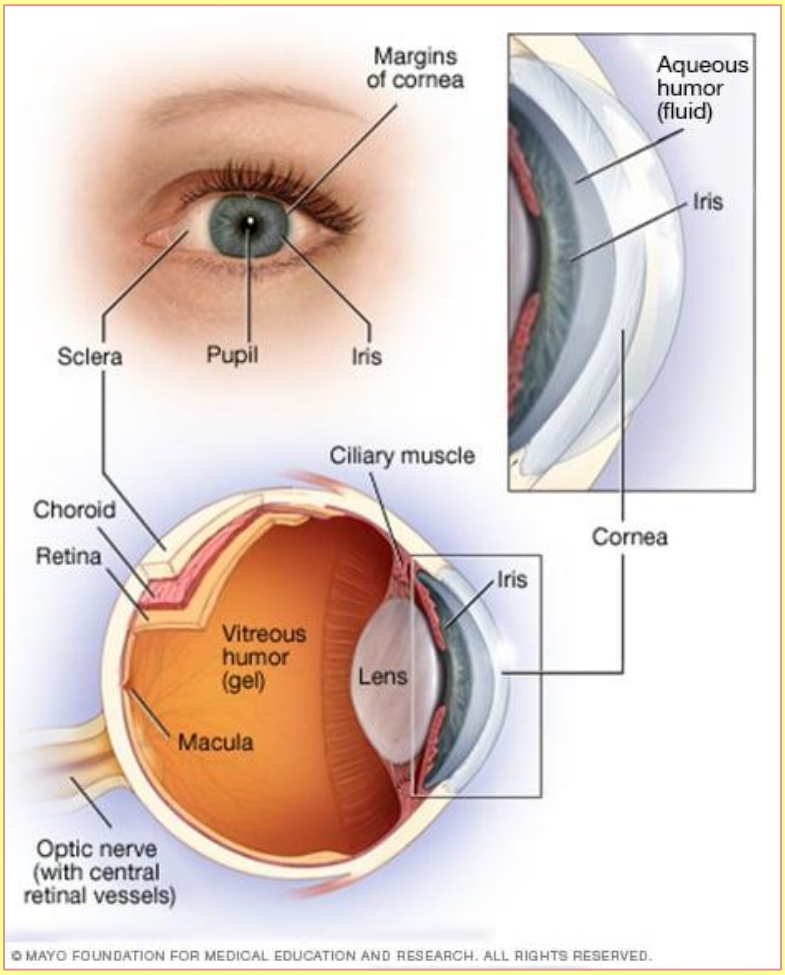
Citation: *"Masitinib is a broad coronavirus 3CL inhibitor that effectively blocks replication of SARS-CoV-2," Drayman et. al., July 20, 2021,* Science. *DOI: 10.1126/science.abg5827*

Something in Patients' Eyes Could Reveal The Presence of 'Long COVID', Doctors Say

Source: https://www.sciencealert.com/something-in-your-eyes-may-reveal-if-you-ve-got-long-covid-scientists-say

July 26 – The punishing symptoms of long COVID are largely invisible to the eye, but new research suggests one of the hallmarks of the disease could literally be staring us in the face.

Long COVID refers to a staggering range of debilitating symptoms that up to 30 percent of patients endure long after recovering from acute SARS-CoV-2 infection, including brain fog, headaches, fatigue, loss of taste and/or smell, and more.



Many of these discomforts aren't always obvious on the outside, but according to a new study, long COVID might actually be detectable in the eyes of patients, in the form of nerve damage that can be seen in the cornea.

The cornea is a transparent dome that forms the front surface of the eye, covering the iris and pupil.

Nerve damage in the cornea can be detected by a non-invasive laser technique called corneal confocal microscopy (CCM), which has been used by researchers to identify corneal abnormalities linked to a range of diseases, such as nerve damage from diabetes, multiple sclerosis, and fibromyalgia.

Here, the team used the same technique to see if CCM could identify corneal nerve damage and increased dendritic cells (DCs, a type of immune system cell) in cases of long COVID. They compared the results of 40 patients with previous COVID-19 infections against CCM observations of 30 healthy individuals who never had the disease.

According to the researchers, CCM can be used to help indicate long COVID, with corneal scans of a subset of the COVID-19 group (patients who reported ongoing neurological symptoms after recovery from the virus) showing greater corneal nerve fiber damage and loss, along with higher counts of dendritic cells, than healthy participants.

"To the best of our knowledge, this is the first study reporting corneal nerve loss and an increase in DC density in patients who have recovered from COVID-19, especially in subjects with persisting symptoms consistent with long COVID," the researchers, led by first author Gulfidan Bitirgen from Necmettin Erbakan University in Turkey, write in their paper.

While this is only a small study – and an observational study at that, which can't confirm that COVID-19 actually caused these patients' corneal abnormalities – the links here nonetheless amount to further evidence of how SARS-CoV-2 infection may contribute to neurological and neuropathic problems.

This could be due to potential disruptions to healthy nerve fiber development, leading to an increase in dendritic cells summoned as part of our immune response.

"These findings are consistent with an innate immune and inflammatory process characterized by the migration and accumulation of DCs in the central cornea in a number of immune mediated and inflammatory conditions," the team explains.

"Further study of the relative change in mature and immature DC density and corneal nerves in COVID-19 patients over time may provide insights into the contribution of immune and inflammatory pathways to nerve degeneration."

According to the results, the patients with more severe cases of COVID-19 tended to exhibit greater corneal nerve damage, so it's possible the eye abnormalities shown here all stem from the way the disease presents in patients, the researchers suggest.
As the team acknowledges, more research with much larger cohorts is needed to pursue these early leads, but for now it's yet another example of how closely eye health is linked to our wider health, which is why techniques like CCM could have great promise as future diagnostic aids.
"Corneal confocal microscopy may have clinical utility as a rapid objective ophthalmic test to evaluate patients with long COVID," the researchers say.

▶▶ **The findings are reported in** *British Journal of Ophthalmology*.

COVID-19: A Case for Bioterrorism Awareness

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/covid-19-a-case-for-bioterrorism-awareness/

July 25 – The Corona Virus Disease (COVID-19) pandemic demonstrates the devastation a biological agent can have on a globalized, modern society. The recent outbreak of COVID-19 highlights the impact bioweapons have on strategic assets and accentuates the shortcomings of the U.S. biodefense strategy and DOD (U.S. Department of Defense) response. This paper will describe COVID-19 impacts economically and to the U.S. military, examine gaps in the U.S. Biodefense plan, and outline the similarities of COVID-19 to emerging second generation synthetic biological threats.

The conclusion offers three areas upon which to focus future policies; leadership, biosurveillance, and homeland preparedness.

Late in 2019, a novel virus outbreak was discovered in Wuhan, China. Closely resembling Severe Acute Respiratory Syndrome – Associated Corona Virus (SARS-CoV), this new virus was titled SARS-CoV-2, with an associated disease termed COVID-19. Since the first known national case in Washington in January, COVID-19 has resulted in more than eight million confirmed cases and over 200,000 deaths in the United States as of October 2020. In addition to causing medical casualties the COVID-19 pandemic has caused an economic downturn, decreased military readiness and deployability, and has been detrimental to many manufacturing industries directly related to national defense. COVID-19 has shown the world the limited preparedness of the United States and others to deal with a bio-agent outbreak on a national level.
COVID-19 is a disease primarily spread via respiratory droplets between persons in close contact and has a global mortality rate (death per confirmed infection) of approximately 2.7%. Although a low mortality rate compared to some other viruses, such as Ebola (approx. 50%), the infection rate of COVID-19 is high due to the mechanism of transmission. This is what drives the extensive positive case numbers above. The COVID-19 pandemic was caused by a naturally occurring virus. This outbreak has proven the catastrophic effects and lasting devastation that would transpire if a man-made, engineered pathogen was released. Modern day science has, theoretically, made it possible to generate a bioweapon that pairs the transmission rate of COVID-19 with the mortality rate of Ebola. Instead of 200,000 deaths in the U.S., the nation would be facing more than four million dead, hospital and mortuary services would be overwhelmed, and a greater degradation to national security would occur.

▶▶ Read more at Countering WMD Journal

National Academies publishes guide to help public officials make sense of COVID-19 data

Source: https://www.washington.edu/news/2020/07/30/national-academies-covid19-data-guide/

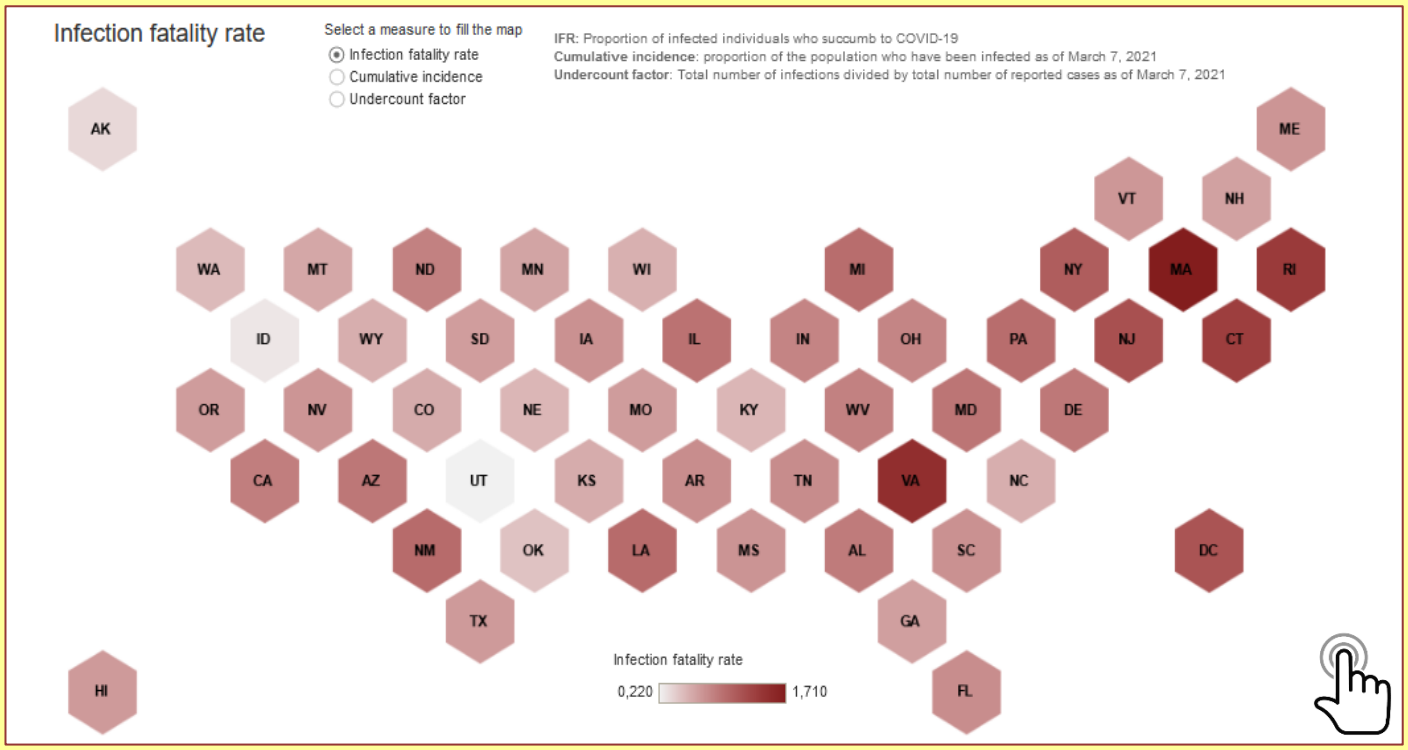
July 2020 – As the COVID-19 pandemic continues, officials across the country have had to make decisions about opening and closing schools, businesses and community facilities. They have relied in large part on information about the pandemic — from hospitalization statistics to test results — to inform these decisions. But different facts and figures about COVID-19 can paint different pictures of the pandemic, according to Adrian Raftery, a professor of statistics and sociology at the University of Washington.
"The COVID-19 pandemic is generating many different types of data about this disease in communities — things like the number of confirmed cases or the number of deaths in a particular area," said Raftery. "None of these data sources on their own are perfect in terms

of capturing a complete and accurate summary of the prevalence of COVID-19 and the risks of doing certain things like opening businesses or schools. All have their own strengths and weaknesses."

Raftery is lead author of a new guide published June 11 by the National Academies of Sciences, Engineering and Medicine that is intended to help officials nationwide make sense of these different COVID-19 data sources when making public health decisions.

Officials looking for COVID-19 statistics have plenty to choose from: confirmed cases, deaths, hospitalizations, intensive care unit occupancy, emergency room visits, antibody tests, nasal-swab tests and the ratio of positive test results – to name a few of the more common data points collected and distributed by hospitals and public health agencies. But officials don't necessarily have all of these statistics on hand when making decisions, or have enough information to interpret them.

"We intend for this guide to help these decision-makers and their advisors interpret the data on COVID-19 and understand the upsides and downsides of each data source," said Raftery.



Since the map is interactive, click on the map to watch the details by State and measure

For example, the number of positive test results for the novel coronavirus is likely an underestimate of its true prevalence in a community. Many people who have the virus are asymptomatic and aren't likely to seek out a test, and even people with symptoms may not have access to tests and medical care, according to Raftery. As another example, the number of COVID-19 deaths in a region does not reflect the disease's current prevalence because the number of deaths lag behind the number of cases by several weeks. In addition, some deaths may be misattributed to COVID-19, Raftery said.

The guide highlights some criteria for officials to take into account when assessing the usefulness of particular COVID-19 data points, including:

- Assessing how representative the data are for a community or region
- Whether there may be systemic biases in some data sources
- Thinking about the types of uncertainties in data sources, due to factors like sample size, how data were collected and the population surveyed
- Whether there's a time lag due to delays in reporting data, the course of the disease and other factors

"There are no perfect data sources, but all of these data sources are still useful for making decisions that directly impact public health," said Raftery.

Raftery has worked extensively on statistical methods to measure and estimate the prevalence of other viruses, including HIV in Africa. Though HIV and the novel coronavirus cause different types of diseases, there are similarities in how the two viruses spread among

susceptible populations, as well as how types of social distancing — condom use for HIV and physical distancing and mask usage for the novel coronavirus — can decrease transmission. COVID-19 is also generating the same types of data sources, with the same limitations, as HIV/AIDS, such as test results, hospitalization rates and deaths.

Over time, it may be possible to collect more revealing data about COVID-19 from what are known as "representative random samples" within a population. In representative sampling, people are surveyed at random for a disease, and certain populations can be more heavily sampled than others based on what scientists and officials have learned about a disease's prevalence and susceptibility. Representative sampling avoids biases and can more accurately estimate the disease's prevalence in a region, according to Raftery.

"As we learn more about COVID-19, how it spreads, how different populations are more or less susceptible, we may be able to move more in the direction of representative sampling," said Raftery. "The State of Indiana has already done a survey of this kind, and others should follow suit. But there is also a lot that officials can do with the statistics and data sources that hospitals and agencies are providing right now — provided that officials can be made aware of the strengths and weaknesses of each piece of data."

The guide is the first completed by the National Academies' Societal Experts Action Network — or SEAN — an eight-member committee tasked by the National Academies to provide rapid expert assistance on issues related to the social and behavioral sciences during the pandemic. Raftery is a member of the SEAN and spearheaded this inaugural project.

Co-authors on the guide are Janet Currie, a professor of economics and public affairs at Princeton University; Mary Bassett, a professor of public health at Harvard University; and Robert Groves, the provost of Georgetown University. The SEAN and its efforts are funded by the National Academies and the National Science Foundation.

UNSCOM and the future of WMD verification

By Henrietta Wilson and Filippa Lentzos

Source: https://thebulletin.org/premium/2021-07/introduction-unscom-and-the-future-of-wmd-verification/

July 21 – Many people will remember Colin Powell's historic speech to the UN Security Council describing Iraq's mobile production facilities for making biological weapons. Many will also remember that shortly after this, in March 2003, George W. Bush and Tony Blair went to war against Iraq on the basis of these "biological weapons factories on wheels and on rails"[1] and Iraq's illicit nuclear and chemical weapons—only to later find that these claims were incorrect, that the intelligence had been misrepresented,[2] and that, in fact, Iraq did not have any weapons of mass destruction (WMD). This revelation—that there were no WMD despite intelligence findings to the contrary—has come to dominate collective consciousness. Yet, it overlooks the long and complicated history of Iraq's acquisition and use of outlawed weapons and overshadows the work of international inspectors who successfully uncovered and destroyed these weapons in the decade leading up to 2003.

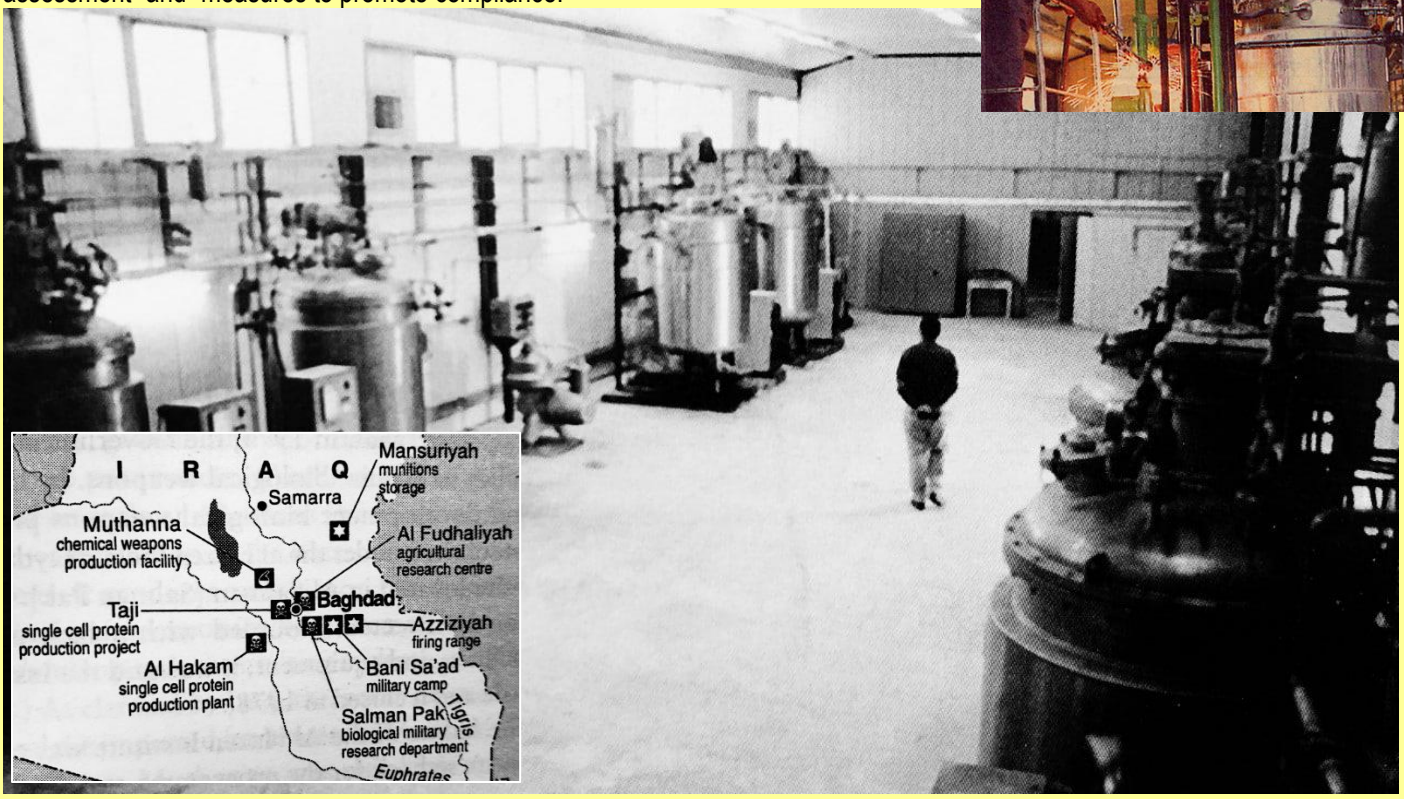
This special issue highlights this history, commemorating the 30th anniversary of the United Nations Special Commission on Iraq (UNSCOM), the organization set up after the 1991 Gulf War to oversee the elimination of Iraq's chemical and biological weapons and the long-range missiles that could disperse them. It focuses on UNSCOM's work to uncover Iraq's large, hidden biological warfare preparations and includes articles and interviews from people serving the range of UNSCOM roles—including its executive chair, deputy chair, commissioners, chief inspectors, spokesperson and official historian. Together, the collection captures memories, insights and lessons from some of the key people involved in

this unique disarmament undertaking. It does not aim to be a comprehensive account; rather it captures important viewpoints that add to the existing literature and analysis.[3]

UNSCOM's experiences in uncovering an illicit, covert biological weapons program remain relevant to today's policy makers, not least as they provide clarifications about the possibilities of, and challenges to, developing international measures to prevent biological weapons. Biological warfare—the weaponization of disease—is the subject of several international treaties, most significantly the 1972 Biological Weapons Convention (BWC), which bans the development, production, stockpiling and acquisition of biological weapons.

Since its inception, the BWC has been criticized for its lack of implementation measures, and debate has particularly focused on possibilities to establish systems for states parties to verify treaty compliance.[4] On the one hand, it is recognized that verifying the convention poses distinct challenges, because the components needed for a biological weapons program have many legitimate uses and could be hidden in a range of civilian and commercial enterprises. On the other hand, many people have concluded that despite these challenges, it is possible to develop systems that could provide sufficient confidence in treaty compliance.

This issue has divided the BWC states parties; some (notably the United States) are convinced that it is impossible to verify the convention's provisions, while others (including most European countries) feel that stronger compliance checks are both feasible and desirable. The difference in views has politicized the language, to the extent that the word "verification" has become associated with excessively intrusive systems, which are costly to run and raise concerns about the danger of espionage to legitimate defense and commercial enterprises. BWC "verification" is now rarely talked about by Western Group states; instead, they speak of "compliance assessment" and "measures to promote compliance."



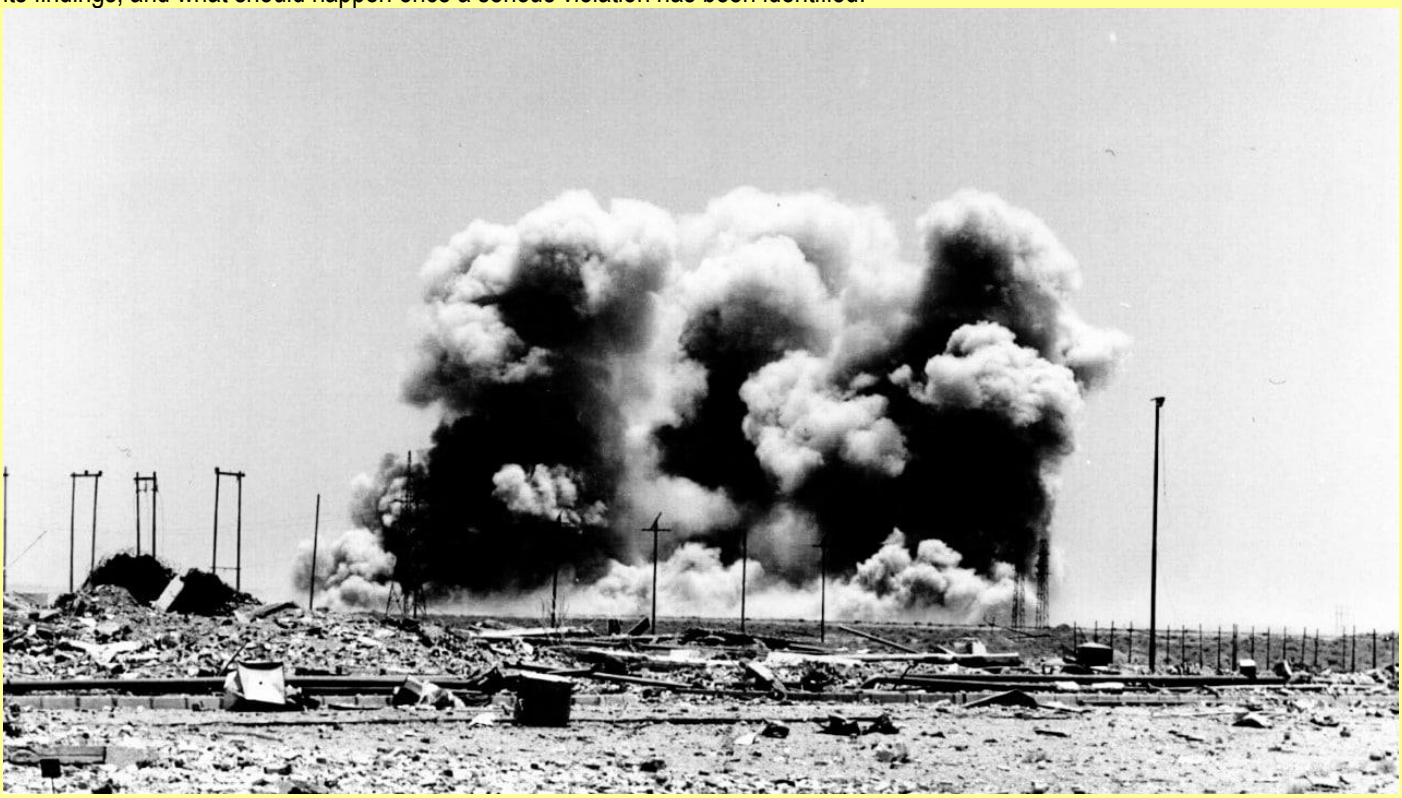
Fermenters at the Al Hakam biological weapons facility southwest of Baghdad.

UNSCOM provides important lessons to inform this debate and the wider efforts to maintain the strength of the regime against biological weapons. As detailed by articles in this issue, different people have different takeaways from the UNSCOM experience. Nikita Smidovich points out that the UNSCOM inspectors fulfilled a verification function that had previously been doubted by managing to discover a well-hidden biological weapons program despite serious obstacles from a determined proliferator. There are also suggestions, by Stephen Black for instance,[5] that UNSCOM

triggered renewed global efforts to strengthen the BWC, as it demonstrated that even in the most antagonistic circumstances international inspections can reveal an illicit biological weapons program. Åke Sellström presents a different account: that UNSCOM's work further entrenched a belief that effective BWC verification requires monitoring an unfeasibly large array of facilities, with an impractical degree of access, and this reinforced understanding ultimately led to the breakdown of negotiations to develop a legally binding instrument to strengthen the BWC in 2001.

These views reflect different strategic assumptions about international treaties and verification—including understandings about what verification includes and how it should be conducted. During and immediately after the Cold War, it was commonly assumed that good arms control treaties should include extensive verification, understood to involve systems precisely prescribing what information was needed, how it should be collected, checked, and processed, and how to deal with questions of non-compliance.

In the 30 years since UNSCOM, BWC states parties have moved on from this rigid monolithic approach. Instead, many now favor a more flexible system, incorporating voluntary measures through which they can demonstrate their own compliance, thereby building a picture of the overall health and robustness of the treaty.[6] On top of these changing views, verification techniques have also developed. Digital technologies have transformed global monitoring opportunities. It is now possible for many people to find and analyze information from a range of sources—including satellites and social media—and this greatly enhances the visibility of activities and artifacts around the globe.[7] Online open-source investigators use these opportunities to monitor a huge range of actions, including proliferation, financial corruption, and human rights abuses. But while this new capacity suggests possibilities for international verification, it also faces some of the fundamental challenges encountered by UNSCOM, including how to authenticate its findings, and what should happen once a serious violation has been identified.



UNSCOM oversaw the destruction of the Al Hakam bio-weapons facility in 1996.

UNSCOM remains relevant to contemporary efforts to minimize the risks of biological weapons. It faced enormous challenges in fulfilling its mandate—in the form of an Iraq determined to obstruct the international inspections—but its efforts nevertheless showed that internationally verified elimination of weapons of mass destruction is technically possible.

The contributions to this special issue provide useful reflections about UNSCOM's successes and how it achieved them. The papers are framed by a primer by Black and co-authors that overviews the historical contexts UNSCOM was working within, in terms of Iraq's pre-1991 violations of international norms, the disarmament and non-proliferation understandings and practices that informed UNSCOM's work, and the ways that UNSCOM developed its own

approaches—innovating and refining verification tools and techniques to achieve its mandate. Complementing this analysis, many of the issue's contributions provide personal accounts of what it was like to work for UNSCOM and the aspects of their individual histories that led them to work there (including the contributions from Dave Franz, Gabriele Kraatz-Wadsack, Sellström, and Terry Taylor).

Several articles also reflect on UNSCOM's legacy. Charles Duelfer, Franz, and Sellström, for instance, demonstrate that UNSCOM produced a set of highly skilled international inspectors who went on to contribute to later disarmament and non-proliferation exercises, including the Iraq Survey Group, the Nunn-Lugar Cooperative Threat Reduction Program, the Organization for the Prohibition of Chemical Weapons, the UN Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons, and international inspections on chemical weapons use in Syria. Duelfer also notes that the UNSCOM experience helped to design later international inspection efforts, including those in Syria and Iran. A companion essay by Ioan Tudor, of the UN Office of Disarmament Affairs, emphasizes the importance of several of these to current world security and stability.

Beyond overviews of UNSCOM's history and legacy, several themes run through the special issue. One prominent theme relates to people. Often verification activities are characterized as technical processes—systematic steps which, if followed closely, can lead to unambiguous outcomes. UNSCOM makes clear that there is also a social aspect to verification. Contributions from Kraatz-Wadsack, Taylor, and Tim Trevan, highlight that good inspections require a certain type of person: talented, meticulous, and inventive in looking for and finding solutions to sustained obstacles and challenges, while also prepared to collaborate and work within multidisciplinary teams. Smidovich notes the importance of training in cultivating specialized inspectors, and calls for an international WMD inspector training program. Many contributors write that UNSCOM's leadership was essential to its achievements, and in particular, name executive chair Ambassador Rolf Ekéus with gratitude, and as integral to UNSCOM's successes.

This issue also flags the many ways in which human connections and rapport facilitated UNSCOM's verification efforts. Franz writes that groups were able to build links across big cultural and ideological differences by speaking the same language. For example, a shared background in science facilitated connections between UNSCOM inspectors and Iraqi scientists, while UNSCOM translators and Iraqi minders developed friendships through their shared understanding of Arabic. Duelfer adds to this, pointing out that UNSCOM inspectors were able to unearth and interpret information through their inter-personal interactions. It is also clear that many UNSCOM inspectors already knew each other from contributing to previous efforts, including negotiations on the Chemical Weapons Convention, sometimes serving on opposing sides, but nevertheless building mutual respect.

In addition, the special issue explains why UNSCOM's organizational structure was important in enabling these necessary individual attributes to emerge. Trevan points out that Ekéus channelled current management wisdom ahead of its time, as he set up a "flat," non-hierarchical organizational structure, providing flexibility and autonomy to his staff, which enabled the creativity and innovation needed to solve the iterative obstacles Iraq threw up. Ekéus himself outlines how unique UNSCOM was, not least in being the first subsidiary body of the UN Security Council, and describes how he went about setting up this unprecedented organization.

A second theme relates to the verification tools that UNSCOM used and developed, and how these contributed to its successes. UNSCOM's ability to use overlapping verification techniques, and work across its different program areas, was fundamental to its discoveries. It also pioneered a range of novel verification approaches, as detailed in the contributions from Franz, Kraatz-Wadsack, Smidovich, Taylor, and Trevan. Underlying this detail, Smidovich recounts ways in which UNSCOM provides a set of insights about the fundamentals of verification design and objectives.

The development of multiple overlapping techniques was partly a response to Iraq's evasions and obfuscations. Black and his co-authors show that the need to go through successive rounds of checking declarations encouraged UNSCOM to be creative in how it found and processed information from multiple sources. The terms of the 1991 Gulf War ceasefire agreement obliged Iraq to provide declarations of all its WMD and designated missile holdings. The weapons that were in existence were to be turned over to UNSCOM for destruction, either under UNSCOM supervision or by UNSCOM itself, and then UNSCOM would undertake on-site inspections to verify the declarations and destruction activities. It seemed as though it should be fairly straightforward, but the reality was anything but. It quickly became clear that Iraq's declarations were inaccurate, and there followed iterations of UNSCOM revealing sufficient evidence of errors and anomalies to pressure Iraq into reluctantly admitting to more activities than it had previously declared. Ekéus, Sellström and Taylor detail the serious and ongoing impediments Iraq imposed on the inspection regimes.

A final theme concerns questions about 'how much verification is enough?' Ekéus notes that by the time he left UNSCOM in 1997, it was clear that Iraq's substantial WMD holdings had been found and destroyed. However, the evidence was not sufficient to convince all the members of the Security Council. Duelfer and Sellström explore the difficulties of arriving at a decisive conclusion that no "militarily significant" quantities remained. After the 2003 Iraq War, the Iraq Survey Group confirmed that Iraq had no remaining WMD and validated UNSCOM's findings, but as Duelfer puts it, at the time, "UNSCOM did not know how good it was." Ekéus reflects on how the international community's failure to recognize

this contributed to the disasters of the 2003 War. There are lessons here for future efforts to assess BWC compliance; among the most significant is the notion that bars should be set to a level that builds sufficient confidence that compliance is achieved, but not so high that they are unobtainable.
This special issue shines a light on UNSCOM's successes and, in doing so, provides many pertinent lessons for current and future efforts to prevent the development and acquisition of biological weapons. We are extremely grateful to our contributors and also aware that many of the people who made UNSCOM's achievements possible are no longer with us. We remember these chief inspectors in particular: Volker Beck, Achim Biermann, David Kelly, Annick Paul-Henriot, Johan Santesson, Richard (Dick) Spertzel, along with all others who contributed so much to UNSCOM's achievements. This issue is dedicated to their memory, and to the work of today and tomorrow that aims to minimize the dangers of biological warfare.

Footnotes

[1] https://www.theguardian.com/world/2003/feb/05/iraq.usa
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[6] Policy briefs series Revisiting BWC Verification by Jez Littlewood, James Revill and Filippa Lentzos. King's College London. 2018.
[7] Henrietta Wilson, Olamide Samuel and Dan Plesch. "Arms Control 2.0? With open source tools, desktop sleuths can go where governments won't". *Bulletin of the Atomic Scientists*. July 27 2020.

Henrietta Wilson *conducts policy-relevant research on armaments and arms regulations on a freelance and employed basis, and teaches undergraduate and postgraduate modules on politics and international relations at UK universities.* ***Filippa Lentzos*** *is a Senior Lecturer in Science & International Security at the Department of War Studies and Co-Director of the Centre for Science and Security Studies (CSSS) at King's College London. She is also an Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI) and a Non-Resident Scholar at the James Martin Center for Nonproliferation Studies (CNS). Her research focuses on biological threats and on the security and governance of emerging technologies in the life sciences. A biologist and social scientist by training, Dr Lentzos has researched and been actively involved in biological disarmament and non-proliferation for nearly 20 years.*

U.K. COVID "Pingdemic" Sparks Labor Shortage

By Nik Martin (freelance journalist)
Source: http://www.homelandsecuritynewswire.com/dr20210727-u-k-covid-pingdemic-sparks-labor-shortage

July 27 – The UK government is racing to address a major labor shortage exacerbated by the latest wave of the COVID-19 pandemic. Although more than 70% of the adult population (36 million people) has been double-vaccinated against the coronavirus, an easing of restrictions is fueling a new surge in cases and, therefore, mass self-isolation.
British media have said the country is in the midst of a "pingdemic," where rising numbers of people are alerted or pinged by the coronavirus warning app.
The app, which notifies users if they have come into contact with someone who has since tested positive for COVID, advises them to self-isolate for 10 days. In one week in mid-July, 618,903 people in England and Wales received the notification and were forced to leave work and quarantine.

Fresh Setback for Struggling Ffirms

The lack of staff is a major headache for several sectors of the British economy. For example, companies in the food supply chain that underpins the country's supermarket network have

reported entire production lines and driver fleets are halted. One report suggested that 90,000 truck drivers are currently unavailable for work.
Empty supermarket shelves are being witnessed all over the country, and in many other sectors, stores, pubs, restaurants and offices have had to close or reduce hours. Hospitals, too, are seeing a large number of staff absences, while rail and bus companies have cut services due to a lack of drivers.
The Centre for Economics and Business Research (CEBR) has forecast a £4.6 billion (€5.39 billion, $6.35 billion) hit to the UK economy from the pingdemic over the next month. The worker squeeze is being felt just as the UK's economic recovery from the pandemic is losing steam.
The country's purchasing manager's index (PMI) dropped from 62.2 to 57.7 in July. "Employment growth eased to its slowest since March, with survey respondents often citing a lack of candidates to fill vacancies and an unusually large number of staff departures," Duncan Brock, group director at the Chartered Institute of Procurement & Supply (CIPS), told DW. The PMI is produced by CIPS and research house IHS Markit.
A growing chorus of business leaders has urged the UK government to bring forward the end of self-isolation rules for contacts of positive COVID cases. The measure is due to run out on August 16, by when British newspaper *The Guardian* projected that as many as 2 million people could have tested COVID positive and up to 10 million workers — a third of the UK working population — may be forced to quarantine.

Limited Exemption Being Rolled Out

Rather than move the date forward, the government responded by exempting workers in several sectors from the need to quarantine. UK media reports that some 500 sites in the food sector have already been told that their staff no longer need to self-isolate. Instead, firms must carry out daily COVID testing of workers, which many companies say is too burdensome.
"[The] expansion of testing sites is not the solution for retail, certainly not the convenience sector that can't do daily testing on-site [just too small]," James Lowman, chief executive of the Association of Convenience Stores, which represents some 33,500 smaller food stores, wrote on Twitter.
Some unions, meanwhile, have advised their members to ignore any quarantine waiver, citing concerns that workplaces could become superspreader sites that lead even more staff to self-isolate.
"The decision taken by the government to introduce exemptions for critical workers from self-isolation guidance has been driven by resources, not by what is safe for the workers or their families," said Gary Smith, general secretary of the GMB union, which represents some 600,000 workers in several sectors including retail, social care and education.
"GMB is urging the Ministers to rethink their decision to gamble with the lives of our key workers, before it's too late."

Worst Labor Shortage Since 1997

Many business leaders say the pingdemic is aggravating the worst labor shortage in more than two decades which became evident during the rush to reopen businesses after the winter lockdown. Hundreds of thousands of staff who were laid off or furloughed have since found other work. Delays in hiring replacements are creating huge bottlenecks.
Meanwhile, the lack of overseas workers, due to immigration rules introduced following the UK's departure from the European Union in December, has added fuel to the fire.
"Many seasonal workers have stayed away because of Brexit and the barriers to entry," Duncan told DW. "The pandemic and restrictions on travel have also hampered numbers of workers to the UK."
Another factor is the summer holiday season. Large numbers of staff are currently taking long periods of annual leave, having delayed their vacations for several months due to the lockdown.

Further Inflation Spike Expected

The labor squeeze is also feeding into other economic bottlenecks created by the pandemic, including delays at container ports in China and other key export locations. The holdups have sparked a shortage of imported raw materials and goods, fueling a rise in inflation. Policymakers insist the spike is transitory, but some business leaders fear higher prices could be long-lasting.
"Businesses are paying higher wages to retain [or] attract talented, skilled staff," Duncan told DW. "This will lead to higher cost burdens for business and ultimately consumers as inflation rises."
He cited UK PMI data showing that manufacturing, construction and services sectors were seeing delays to orders as a result of the labor shortage just as firms were trying to forward buy stock to head off expected shortages in raw materials.

The hunt for an antiviral pill to treat COVID-19 at home

Source: https://newatlas.com/health-wellbeing/coronavirus-antiviral-pill-treat-covid19-at-home/

July 27 – As the US Government invests billions of dollars into COVID-19 antiviral research, scientists are racing to develop a pill that people can take at home to treat the disease in its earliest stages.

If last year was all about repurposing old drugs to target COVID-19 while developing vaccines, the focus of much research this year is certainly on producing novel antiviral drugs to help treat those sick with the disease. While many have reasonably focused on vaccines to help prevent hospitalizations and deaths, they are only one part of the armory necessary in battling this novel coronavirus. Not everyone can, or will, get vaccinated. For some people, such as the immunocompromised, vaccines are not particularly effective. And despite our best efforts, vaccines will never be 100 percent effective at stopping transmission or infection.

For now our COVID-19 vaccines are powerful tools helping save lives. They inarguably break the link between infection, hospitalization and death, turning a severe, deadly disease into something more manageable, albeit still not pleasant.

The $3-billion-dollar plan

In June the US government launched a new program called the Antiviral Program for Pandemics (APP), which will see over US$3 billion dollars invested in developing antiviral drugs to treat COVID-19.

As Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID), explains, the goal of the APP is to develop oral antiviral drugs that can be taken at home soon after symptoms develop.

"I wake up in the morning, I don't feel very well, my sense of smell and taste go away, I get a sore throat," Fauci explained to *The New York Times*. "I call up my doctor and I say, 'I have COVID and I need a prescription.'"

Antivirals aren't easy to design

Current treatments for patients sick with COVID-19 are relatively limited. A novel antibody treatment produced by pharma company Regeneron is one of the few COVID-specific treatments to appear so far, but it is expensive to produce and can only be administered by intravenous infusion.

Antiviral drugs are incredibly challenging to develop. The goal is to stop a virus replicating inside an infected host. But that is easier said than done.

Because viruses hijack our natural cellular functions to replicate, an effective antiviral drug needs to disrupt some part of a virus's lifecycle without messing up any mechanism vital to our health.

One of the most well known antiviral drugs developed to treat influenza is known as Tamiflu. It works by blocking the action of a protein the flu virus uses to move out of an infected cell. The efficacy of Tamiflu is still the source of much debate.

Remdesivir is an antiviral drug that received lots of attention over the past year as a possible treatment for COVID-19. It was originally developed to treat hepatitis C, and after failing to work against that virus it was repurposed to treat Ebola. It was mildly effective against Ebola.

Remdesivir was quickly repurposed to fight SARS-CoV-2 last year, but the results have been decidedly mixed. Although the US Food and Drug Administration has approved it to treat mild to severe hospitalized COVID-19 patients, the World Health Organization is still on the fence about its efficacy, claiming, "there is currently no evidence that remdesivir improves survival and other outcomes in these patients."

Plus, remdesivir is not a pill. It requires intravenous infusion, limiting its uses to those already sick in hospital.

So what is on the horizon?

Several dozen antiviral COVID-19 treatments are currently in development. Big pharma power players Merck and Pfizer unsurprisingly are closest to the finish line with a pair of oral antiviral COVID-19 treatments in advanced human clinical trials.

Merck's candidate is called molnupiravir. It was originally developed several years ago as an influenza antiviral, however, preclinical studies demonstrated promising efficacy against both SARS and MERS coronaviruses.

Molnupiravir is currently deep in large Phase 3 human trials. So far the data is so promising the US government recently put in a pre-order for 1.7 million courses of the drug, at a cost of $1.2 billion.

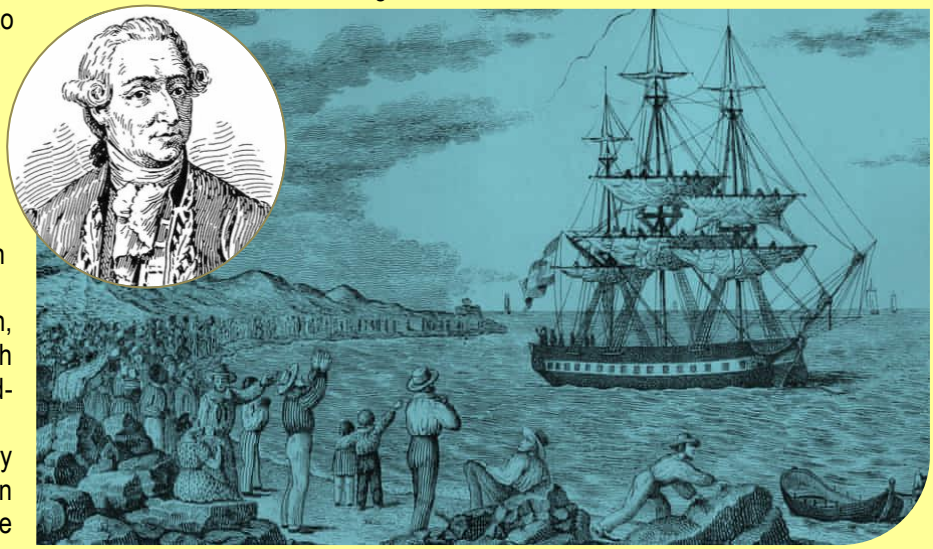
If all goes according to plan the company hopes the drug will be authorized for emergency use by the FDA and is available before the end of 2021.

Pfizer's big COVID-19 antiviral candidate is a little more unique. Currently dubbed PF-07321332, the drug is the first oral antiviral drug to reach human clinical trials that is specifically designed to target SARS-CoV-2.
While this particular molecule was developed in 2020 after the novel coronavirus appeared, a somewhat related drug called PF-00835231 has been in the works for several years, targeting the original SARS virus. The new candidate, PF-07321332, however, has been designed to be a simple pill that can be taken in non-hospital conditions at the very beginning of a SARS-CoV-2 infection.
"Protease inhibitors bind to a viral enzyme (called a protease), preventing the virus from replicating in the cell," says Pfizer, explaining the mechanism behind its novel antiviral drug. "Protease inhibitors have been effective at treating other viral pathogens such as HIV and hepatitis C virus, both alone and in combination with other antivirals. Currently marketed therapeutics that target viral proteases are not generally associated with toxicity and as such, this class of molecules may potentially provide well-tolerated treatments against COVID-19."
Phase 1 trials for the novel antiviral began early in 2021. No results have been officially announced but the company has recently posted details for a Phase 2/3 trial set to commence this month, suggesting promising early data.
By the end of the year it should be clear whether Pfizer's antiviral drug is working. And it isn't the only oral antiviral treatment specifically designed to target SARS-CoV-2.
A Japanese company called Shionogi is currently in Phase 1 trials testing a similar protease inhibitor for SARS-CoV-2. Called S-217622, this is another oral antiviral that is hoped to offer people an easy pill to take in the early stages of COVID-19.
The COVID-19 pandemic is far from over. The Delta variant has swiftly become the most prominent strain of SARS-CoV-2 around the world. Although our vaccines are still holding up it is clear we need more tools to fight this novel coronavirus. Delta will surely not be the last new SARS-CoV-2 variant we encounter.
Alongside vaccines that broadly prevent hospitalization and death, an effective antiviral to reduce the severity of disease in those infected would be a game-changer. A short course of pills taken at home at the first sign of disease may be the way out of this pandemic.

Exhibition tells story of Spanish children used as smallpox vaccine 'fridges' in 1803

Source: https://www.theguardian.com/world/2021/jul/27/spanish-museum-celebrates-pioneer-who-took-smallpox-vaccine-to-colonies

July 27 – When **Francisco Javier de Balmis** set off from Spain in 1803 to vaccinate the people in Spain's colonies against smallpox he had no means of keeping the vaccine fresh, so he used children as his "refrigerators".



An exhibition of documents relating to Balmis's voyage has opened at the *Archivo General de Indias* in Seville and will be on display until 15 September.
From the documents, we now know for the first time the names and ages of the children who made what was perhaps the first international humanitarian mission possible.
Manuel Álvarez, who curated the exhibition, described it as "a homage to all the health workers who have struggled against Covid-19".
Smallpox was killing millions in 18th century Europe but in 1796 the English physician Edward Jenner discovered that a bovine version of the disease worked as a vaccine.
Balmis, who was a military and court doctor, persuaded Spain's King Carlos IV, whose daughter had died of smallpox, to fund the royal philanthropic vaccine expedition to Spain's colonies.
The objective, visionary in its day, was not only to vaccinate the population but to set up vaccination centres in order to control any future outbreaks of the disease.

The expedition set off from A Coruña in north-west Spain with 22 orphans on board. The nine-year-old son of Isabel Zendal, who ran the local orphanage, was among them. Zendal served as nurse and carer on the trip.

The vaccine survived for only 12 days in vitro so Balmis's technique was to infect two children every 10 days with the bovine version of smallpox and then take the serum from their pustules to infect two more children, and so on until they arrived at their destination with fresh serum with which to vaccinate people. The children got sick but didn't die and, although it seems barbaric, at the time it was considered quite normal. Jenner himself first tested his vaccine on an eight-year-old boy.

The original 22 children stayed in Mexico, where Balmis recruited a further 26 for the trip from Acapulco to the Philippines. The documents show that the children, all Mexican boys aged from four to 14, were handed over by their parents in exchange for payment. Some are described as "Spanish" and others as *mestizos* (mixed blood).

Three are listed as of unknown parentage and in the case of five others only their mother's name appears in the documentation.

By the end of the campaign, about 300,000 people in the Canaries, Peru, Ecuador, Colombia, Venezuela, Mexico, the Philippines and China had received the vaccine for free.

"The strategy adopted by Balmis was a cheap, ingenious and pioneering solution to ensure that the vaccine arrived in the Americas in good condition," said Alberto García-Basteiro, an epidemiologist and associate professor at the University of Barcelona.

"It's likely that nowadays the strategy of using children to transport the vaccine would be criticised on ethical grounds, but the impact and benefits of the expedition cannot be denied."

The Madrid hospital named after Isabel Zendal has played a key role during the Covid-19 pandemic. In 2020, when the Madrid government dispatched 2,500 soldiers to disinfect the region's care homes, they dubbed it Operation Balmis.

Red Teaming for Disaster Preparedness

By Kole (KC) Campbell

Many companies and government offices were unprepared for the COVID-19 pandemic and sustained lockdowns, despite years of warnings and guidance from experts and the federal government. This lack of preparedness cost companies dearly, from delays in setting up work from home software to supply chain disruptions that could have been mitigated against – if not prevented. In addition to better business continuity planning, the use of red teaming could have possibly spared certain organizations' reputation hits and some monetary losses. Similarly, organizations can use red teaming or a red team mindset to bolster disaster preparedness.

Worms to protect troops from bio weapons

Source: https://au.news.yahoo.com/worms-protect-troops-bio-weapons-173030564.html

July 28 – Two leading Australian researchers have received nearly $US2.5 million ($A3.4 million) to conduct research into the use of parasites to help combat chemical and biological weapons.

Professor Alex Loukas and Dr Paul Giacomin from James Cook University are investigating the use of helminths to protect military personnel against bioterrorism agents.

Helminths are parasitic worms that live inside human bodies and have been known to infect up to two billion people in developing countries.

The funding comes from the US Government's Defense Advanced Research Projects Agency (DARPA).

"Your naturally occurring wild type 'bookworm' doesn't secrete anything that will naturally protect against bioterrorism agents such as anthrax or Ebola virus," Prof Loukas told AAP.

"We can engineer the worms genome so that it will secrete therapeutic molecules that will protect against those different bioterrorism agents."

Professor Loukas, a molecular parasitologist, says the project is intended to reduce the burden of personal equipment worn or carried by members of the military and medical first responders in conflict zones to protect them against bioterrorism agents.
He has been working on infecting human volunteers in Australia with hookworms for more than 10 years, but this new untested research is the first time genetically modified worms will be trialled.
"It's certainly a collaborative effort with our colleagues, particularly in the US and Europe who are doing the genetic engineering aspects," he said.
"Whereas we bring the expertise to the project with human experimental infections with parasitic worms."
He said with advancements in military technology, the threat of bioterrorism agents will become more common.
"It is clearly an advantage to have an internal biological solution to counter threats when they suddenly appear," he said.
Six other international universities and companies are involved in the multi-million dollar program, which was initially conceived by Prof Loukas and his US colleague Professor Paul Brindley at George Washington University.
JCU's funding is part of a $US16.4 million ($A22.3 million) contract awarded to research and development company Charles River Analytics from the US Government's DARPA.

In COVID's Shadow, Another Respiratory Virus Is Now Surging in Children

By Grace Roberts
Source: https://www.sciencealert.com/child-cases-of-rsv-are-surging-in-the-uk-here-s-what-that-means

July 29 – Hospitals in the UK are seeing a rise in children suffering from severe respiratory infections. This includes an unseasonal surge in an infection called the respiratory syncytial virus (RSV), in children as young as two months old.
It has resulted in growing numbers of hospital admissions for bronchiolitis, a lung inflammation similar to bronchitis.
So why is RSV, considered a winter illness, peaking in the summer of 2021?
Simply put, restrictions put in place for preventing the spread of COVID-19 held back other respiratory viruses too. As many countries are lifting these restrictions, many respiratory diseases are spreading again.
RSV is a common respiratory pathogen – so common in fact that nearly all of us are infected with it by the age of two. For the vast majority of people, this virus causes a mild disease resembling a heavy cold, with runny nose and cough. These symptoms normally resolve without treatment within a week or two.
However, in approximately one in three children, RSV can cause bronchiolitis, an inflammation of the bronchioles, the smallest tubes in our lungs. This restricts the airways, and patients experience raised temperatures and difficulty breathing, often making a wheezing sound when drawing air.
While bronchiolitis can often be dealt with without much more than fluids and paracetamol, it can sometimes develop into a serious illness. If a young person's breathing becomes severely restricted, symptoms can worsen, causing temperatures over 38 degrees Celsius, blue lips, and increased difficulty breathing.
In young children, this may result in refusing feeds and dry nappies for long periods. This is when many parents rightly make the decision to take their child to hospital.
Very young children – those in their first months of life – are the most susceptible to hospitalization due to having smaller airways.
While most cases can be controlled, bronchiolitis is sometimes fatal. Approximately 3.5 million children globally each year are hospitalized, with around 5 percent of these cases sadly resulting in death.

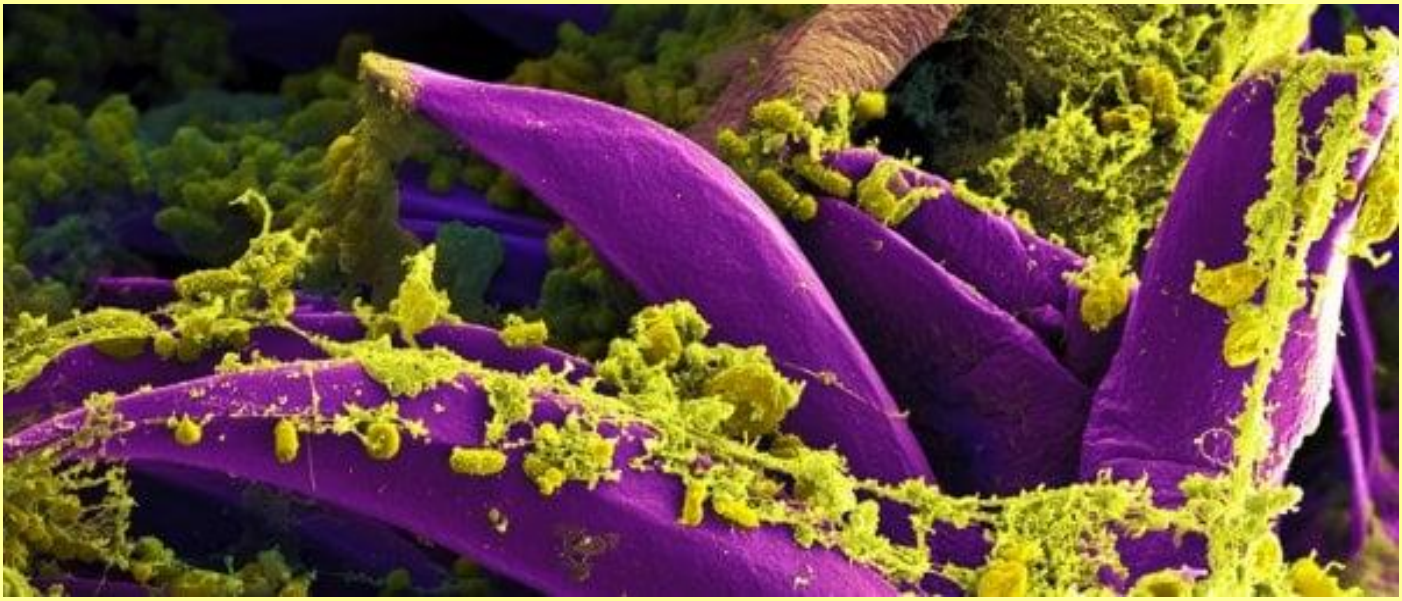
Delayed surge
It would appear that COVID responses like increased hand washing, mask wearing, and reducing close contact between people led to a greatly diminished flu season in winter 2020-21.
The same was true for RSV, with studies reporting 84 percent fewer hospitalizations due to bronchiolitis in northern hemisphere countries than in previous years. Dramatic reductions were also noted in Australia.
Now the opposite is happening, affecting a whole year of newborns who won't have encountered many respiratory viruses while restrictions were in place.
We don't know why some children infected with RSV experience mild symptoms and others fall gravely ill.
Many risk factors associated with severe RSV illness have been identified, including age (one-month-olds are at highest risk), gender (males are statistically more at risk than females), environmental factors like smoke exposure, underlying lung diseases, and some genetic factors.

Despite this knowledge, it is still not possible to definitively identify which children will develop bronchiolitis. However, in some countries, individuals are identified as high-risk through these known risk factors and are given prophylactic treatments.
As with all infectious agents, a robust immune response is key to clearing the infection. We know that high quantities of neutralizing antibodies (including maternal antibodies and antibody treatments such as palivizumab) are protective of severe illness.
Yet immunity to RSV isn't complete or particularly long-lasting, as most of us are reinfected throughout our lifetimes. This is part of the reason why, despite monumental efforts from many research groups, there are no vaccines currently available.
In addition, our immune systems can sometimes cause damage to our bodies when attempting to clear an infection. With RSV, certain immune responses have been shown to enhance disease severity and have been linked to the development of asthma.
Due to the widespread nature of both RSV and asthma in the UK, the connection between the two is widely studied, including in the Wellcome Trust-funded Breathing Together project on which I am currently working.
Any treatment or vaccine for RSV has to tread a fine line of being beneficial in terms of clearing the infection but without producing negative effects. Mistakes have been made in the past, with previous attempts at an RSV vaccine in the 1960s resulting in children falling severely ill.
But with RSV immunity being far better researched and understood now, vaccines are at least in development. Several are currently in clinical trials in the hope that we can finally protect all children from RSV-induced bronchiolitis.

***Grace C Roberts** is a Research Fellow in Virology @ Queen's University Belfast.*

Scientists Developed a New Vaccine For Plague, And It's Ready For Human Trials

Source: https://www.sciencealert.com/a-new-vaccine-for-plague-is-about-to-undergo-human-trials



Bubonic plague bacteria (yellow) on the spiny digestive system of a rat flea (purple). (NIAID)

July 29 – The University of Oxford has just launched a **Phase 1** trial to test a new vaccine against a very old enemy – plague – all based on technology that is helping humanity fight COVID.
And they want you to help: They're recruiting for volunteers who are happy to be jabbed in the name of science to test a new experimental vaccine.
While infamous for its historic outbreaks like the Black Death that swiftly killed around half of Europe's population in the 1300s, plague still ravages parts of Africa and occasionally breaks out elsewhere too. Only last week, a 10-year-old boy died of complications from plague in the US.
Caused by the bacteria *Yersinia pestis*, plague can be transferred from animals to humans via fleas, and then spreads through contaminated body fluids or other materials. Untreated, this horrific disease can be rapidly fatal, with as much as a 100 percent mortality rate depending on how it infects the body.

It can begin with flu-like symptoms – fevers, chills, aches, and fatigue – and in its most common form progresses to inflamed and painful lymph nodes, which are called buboes. This is where the term bubonic plague comes from.
If the bacteria multiply in your bloodstream, it causes septicemic plague, which can include vomiting, diarrhea, bleeding, and gangrene.
The least common form of plague is pneumonic plague, when *Y. pestis* infiltrates your lungs, the most dangerous form of the infection, which can progress to rapid respiratory failure and shock within two days of infection.

The number of plague cases has increased in 25 countries since the 1990s. Globally 3,248 cases, including 584 deaths, were reported between 2010 and 2015. The 2017 outbreak in Madagascar caused 2,119 confirmed and suspected cases, including 171 deaths.

The most effective way to treat plague is through the use of antibiotics, so a quick diagnosis is critical – particularly for the pneumonic form. Unfortunately, this is not always possible.
"Although antibiotics can be used to treat plague, many areas experiencing outbreaks are very remote locations," explained vaccinologist Christine Rollier from the University of Oxford.
"In such areas, an effective vaccine could offer a successful prevention strategy to combat the disease."
The Oxford Vaccine Group has developed an intramuscular vaccine using a modified cold virus (adenovirus) that can't multiply in humans, similar to the one used in the AstraZeneca COVID-19 shot.
The virus will be used to deliver the gene code for a protein from *Y. pestis* that is essential to its ability to infect us, in order to teach our immune system to recognize it as an invader – just like how many COVID-19 vaccines target its spike protein.
So far, the plague vaccine has only been tested on laboratory animals, but with promising results.
As with any vaccine, side effects could range from localized pain to more severe but rare allergic reactions, but all participants in the clinical trial will be closely monitored – particularly during the first week after the vaccination.
Most side effects should be temporary, but in "rare cases, side effects can be serious or prolonged, although no serious concerns have been raised in human trials for other similar virus-based vaccines," the research team explains in the Study Information Booklet.
In this booklet, the team also addresses the possibility of the rare blood clots that have been reported in connection to the AstraZeneca coronavirus vaccine.
The situation is being closely monitored by health authorities worldwide, but it appears to occur in five out of a million people who receive the vaccine. It is not known if this is connected to the coronavirus part of the vaccine, or another part of the ingredients – but the team notes no other clinical trials using this vaccine method have resulted in blood clots.
The team are looking for healthy people between 18 to 55 to participate in the year-long study, and are offering £630 (about US$880) to those who are recruited to take part.

Greener PPE: Inventors Tackle COVID-19 Plastic Waste Mountain

Source: https://www.medscape.com/viewarticle/955486

July 28 – From surgical masks and gloves to disposable hospital gowns and aprons, the COVID-19 pandemic is creating a mountain of plastic medical waste that is polluting the land and sea – alarming doctors and environmentalists alike.
One young entrepreneur in Mexico has now invented a range of reusable PPE (personal protective equipment) she hopes will stop tonnes of single-use medical wear ending up in landfill, incinerators and waterways – and save hospitals a fortune.

Tamara Chayo said disposable PPE not only caused environmental damage, but could spread the virus which survives up to three days on plastics – a particular concern in countries where medical waste management is poor.
"Most of my family are doctors and nurses. They think, ok, I'm saving humans, but I'm not saving the planet," Chayo told the Thomson Reuters Foundation.
"And if everything is thrown away it will create more disease, so it becomes a never-ending cycle."
Chayo, a 21-year-old chemical engineering student, co-founded MEDU Protection in mid-2020 to develop a sustainable suit to protect health professionals treating COVID-19 patients at a time when PPE was in short supply.

The garments are made from a fabric similar to the coating used on surfaces in viral research laboratories.
Chayo says a doctor can use four disposable gowns a day whereas her PPE can be worn all day and washed 50 times without losing its protective properties - meaning each garment saves 200 plastic items from landfills and incinerators.
"I'm really excited about this," said Chayo, many of whose family members have been working on the COVID-19 frontline.
"We're not just making medical apparel, we want to create a movement for a greener medical industry."

"Planet-saving PPE"
MEDU's garments are embedded with QR technology which informs health workers, via a smart phone app, how many times an item has been washed.
After 50 wears the PPE is returned to MEDU which disinfects it and converts it into cotton scrubs and bags for packaging its products.
Chayo, who plans to expand to the United States and France, estimated reusable medical apparel could slash hospital PPE spending by 90%.
Approximately 129 billion disposable masks, mostly made from plastic microfibres, and 65 billion disposable gloves have been used every month during the pandemic, according to a study in the journal Environmental Science and Technology.
The United Nations estimates about 75% of plastic generated by the pandemic - including medical waste and packaging from home deliveries during lockdowns - will likely end up in landfills or the sea.
The production of plastic which uses fossil fuels as a base material - and its incineration when discarded - is also a significant driver of climate change.
Tom Dawson, founder of Revolution-ZERO which has developed a range of "planet-saving PPE" in Britain, said the pandemic had reversed recent progress on cutting plastic use.
While there was "phenomenal" interest in reusable PPE, he said there were obstacles to its adoption.

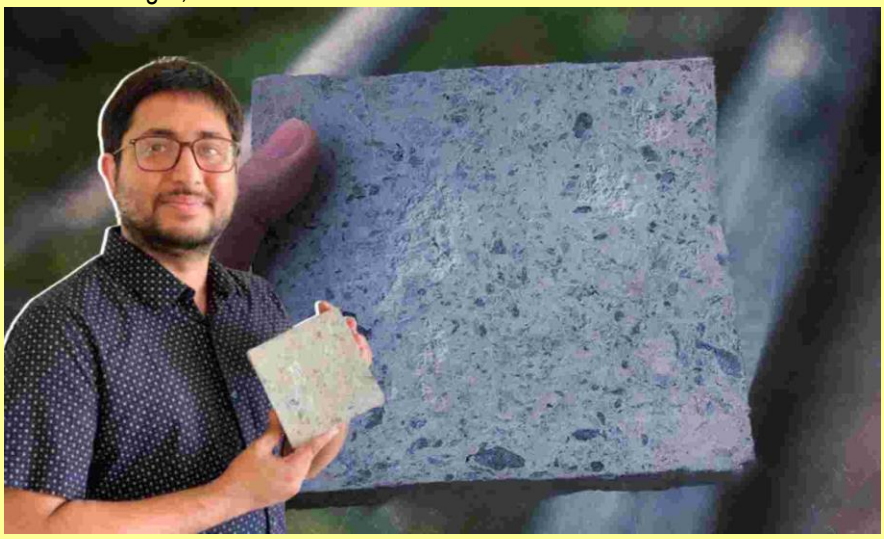
When the pandemic struck many governments stockpiled disposable PPE which they are supplying free, meaning hospitals have no economic incentive to buy reusable products.
Another problem is the lack of clinical grade laundries which have disappeared as hospitals switched to disposable PPE.

Masks into bricks
From Britain to India, entrepreneurs are also looking at how to recycle plastic PPE - turning it into everything from toolboxes to bricks.

In Wales, Thermal Compaction Group (TCG) makes machines about the size of a large American fridge that melt down hospital gowns, masks, hairnets, tray wraps and ward curtains into plastic bricks.
The plastic can be used to manufacture anything from school chairs to 3D printer filament and yarn for clothing.
"It takes what's designated as a single-use product and actually turns it into a multi-use product," said TCG managing director Mat Rapson.
The temperature inside TCG's Sterimelt and Curtainmelt machines exceeds 300 degrees Celsius (572°F), killing COVID-19 and other pathogens.
Five UK hospitals have begun using the machines with more placing orders. TCG is also liaising with distributors in Canada, Australia and Hungary among other countries.
About 6,500kg of CO2 emissions are saved for every 10,000kg of material processed, Rapson said – mostly due to savings on transporting and incinerating the waste.

Recycle man

In India, entrepreneur **Binish Desai** is turning PPE into grey bricks and construction panels to build low-cost housing and schools.
Desai, 27, who started making bricks from waste as a teenager, has invented a new brick made from disinfected and shredded masks and other PPE mixed with paper mill waste and binder.



The entrepreneur, nicknamed "The Recycle Man of India", said the bricks were three times stronger than earth bricks, twice the size and almost half the cost.
Some of the masks are collected from "eco-bins" installed in hospitals, restaurants and other public places.
Desai, whose story is being turned into a film by a major Indian production company, is looking to expand to Britain, the United States, Canada and Brazil.
The entrepreneur, who founded Eco-Eclectic Technologies in 2016, initially plans to export his bricks to Brazil, but eventually wants to build a plant there to process local waste.
"We believe in micro social enterprise so instead of having one big factory we have multiple factories across India so we create local jobs as well as recycle local waste," he said. Desai believes India - with its tradition of recycling and a less established throwaway culture than many Western countries - can become a global leader in zero waste technology. "Attitudes are changing – absolutely," he said. "The pandemic has made us far more aware of how much waste we're generating and that it's not sustainable."

Biodefence research two decades on: worth the investment?

By Carrie M Long, PhD and Andrea Marzi, PhD
The Lancet
Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00382-0/fulltext

Aug 01 – For the past 20 years, the notion of bioterror has been a source of considerable fear and panic worldwide. In response to the terror attacks of 2001 in the USA, extensive research funding was awarded to investigate bioterror-related pathogens. The global scientific legacy of this funding has extended into the present day, highlighted by the ongoing COVID-19 pandemic. Unsurprisingly, the surge in biodefence-related research and preparedness has been met with considerable apprehension and opposition. Here, we briefly outline the history of modern bioterror threats and biodefence research, describe the scientific legacy of biodefence research by highlighting advances pertaining to specific bacterial and viral pathogens, and summarise the future of biodefence research and its relevance today. We sought to address the sizeable question: have the past 20 years of investment into biodefence research and preparedness been worth it? The legacy of modern biodefence funding includes advancements in biosecurity, biosurveillence, diagnostics, medical countermeasures, and vaccines. In

summary, we feel that these advances justify the substantial biodefence funding trend of the past two decades and set a precedent for future funding.

Panel 1: Examples of bacterial pathogen-specific advancements resulting from biodefence funding, 2001–21

Bacillus anthracis

- 2007: an anthrax vaccine, BioThrax, was approved for use by the US Food and Drug Administration (FDA) as a post-exposure prophylaxis treatment for individuals exposed to *B anthracis*

Clostridium botulium (botulinum toxin)

- 2004–present: advances in botulinum toxin diagnostic testing were achieved since 2004, characterised by diagnostic immunoassays that yielded results in approximately 20 min, a large improvement from the previous standard of hours to days; additional advancements in clinical and environmental diagnostics included more sophisticated immunoassays (eg, ELISA, Luminex multiplex assay, immune-PCR, and microfluidic immunoassays), providing a quicker and more accessible alternative to the standard in-vivo mouse lethality bioassay
- 2013: a heptavalent botulinum antitoxin therapeutic was approved for use by the FDA as a post-exposure prophylaxis treatment for individuals exposed to botulinum toxin

Coxiella burnetiid

- 2009: the development of axenic media enabled large-scale genetic manipulation of this bacterium
- 2003–present: advancements in basic research have moved the field closer to a safe Q fever vaccine by way of lipopolysaccharide mimicking peptides, genetically altered whole-cell vaccines, and adjuvanted subunit vaccines

Fransicella tularensis

- 2016–18: F tularensis diagnostics progressed in 2016 when a rapid, point-of-care detection assay based on cartridge-based PCR was introduced; expanding the utility of this diagnostic advance, a multiplex Luminex-based immunoassay was developed in 2018 capable of detecting not only *F tularensis* but also *B anthracis* and *Yersinia pestis*.

Yersinia pestis

- 2018: a plague vaccine, rF1-V, was approved for use by the US FDA as an orphan drug for plague pre-exposure prophylaxis
- 2021: introduction of an adenovirus-based plague vaccine

Oxford study sheds light on level of antibodies needed to protect against COVID-19 symptoms

Source: https://www.news-medical.net/news/20210627/Oxford-study-sheds-light-on-level-of-antibodies-needed-to-protect-against-COVID-19-symptoms.aspx

June 27 – Vaccine efficacy of 80% against primary symptomatic COVID-19 was achieved with an IgG level of 40,923 arbitrary units (AU)/mL for anti-spike and 63,383 Au/mL for anti-RBD. For pseudovirus and live virus-neutralizing antibody titers, a vaccine efficacy of 80% against symptomatic infection was achieved at neutralizing titers of 185 and 247, respectively. By contrast, none of the serological values were correlated with protection against asymptomatic infection.

Animals and COVID-19

July 29, 2021

Source: https://www.hstoday.us/subject-matter-areas/pandemic-biohazard/animals-and-covid-19/

What You Need to Know

- We do not know the exact source of the current outbreak of COVID-19, but we know that it originally came from an animal, likely a bat.
- Based on the available information to date, the risk of animals spreading COVID-19 to people is considered to be low.
- We are still learning about this virus, but we know that it can spread from people to animals in some situations, especially during close contact.

- More studies are needed to understand if and how different animals could be affected by COVID-19.
- People with suspected or confirmed COVID-19 should avoid contact with animals, including pets, livestock, and wildlife.

For Pet Owners, Veterinarians, & Public Health Officials

- Pet Owners, Veterinarians, and Others Handling Animals
- COVID-19 Pets and Animals Frequently Asked Questions
- Animal Testing Guidance
- Toolkit for State Health Veterinarians and Public Health Officials

Coronaviruses are a large family of viruses. Some coronaviruses cause cold-like illnesses in people, while others cause illness in certain types of animals, such as cattle, camels, and bats. Some coronaviruses, such as canine and feline coronaviruses, infect only animals and do not infect people.

Risk of animals spreading COVID-19 to people

Based on the available information to date, the risk of animals spreading COVID-19 to people is considered to be low.

At this time, there is no evidence that animals play a significant role in spreading SARS-CoV-2, the virus that causes COVID-19, to people. More studies are needed to understand if and how different animals could be affected by SARS-CoV-2.

Some coronaviruses that infect animals can be spread to people and then spread between people, but this is rare. This is what happened with SARS-CoV-2, which likely originated in bats. Early reports of infections were linked to a live animal market in Wuhan, China, but the virus is now spreading from person to person.

Risk of people spreading SARS-CoV-2 to animals

People can spread SARS-CoV-2 to animals, especially during close contact.

There have been reports of animals infected with the virus worldwide. Most of these animals became infected after contact with people with COVID-19, including a small number of pet cats and dogs. We know that companion animals like cats and dogs, big cats in zoos or sanctuaries, gorillas in zoos, mink on farms, and a few other mammals can be infected with SARS-CoV-2, but we don't yet know all of the animals that can get infected.

A small number of pet cats and dogs have been reported to be infected with SARS-CoV-2 in several countries, including the United States. One ferret was reported positive for SARS-CoV-2 in Slovenia. Several animals in zoos and sanctuaries have tested positive for SARS-CoV-2, including big cats (lions, tigers, pumas, cougars, snow leopards) and non-human primates (gorillas) after showing signs of illness. It is suspected that these animals became sick after being exposed to an animal caretaker with COVID-19. In many situations, this happened despite the staff wearing personal protective equipment and following COVID-19 precautions.

For information on how to protect pets and animals:

- If You Have Pets
- Companion Animals with COVID-19: Toolkit for Health Officials
- Veterinary Clinics: Interim Infection Prevention and Control Guidance
- Reducing Risk of Spreading COVID-19 between People and Wildlife
- Interim recommendations for intake of companion animals from households where humans with COVID-19 are present

Mink and SARS-CoV-2

SARS-CoV-2 has been reported in farmed mink worldwide. Currently, there is no evidence that mink are playing a significant role in the spread of COVID-19 to people.

SARS-CoV-2 has been reported in mink on farms in multiple countries.

In the United States, respiratory disease and increases in mink deaths have been seen on most affected mink farms. However, some infected mink might also appear healthy. Infected workers likely introduced SARS-CoV-2 to mink on the farms, and the virus then began to

spread among the mink. Once the virus is introduced on a farm, spread can occur between mink, as well as from mink to other animals on the farm (dogs, cats). One wild mink found near an affected Utah farm was found to be infected with SARS-CoV-2.
Currently, there is no evidence that mink are playing a significant role in the spread of SARS-CoV-2 to people. However, there is a possibility of mink spreading SARS-CoV-2 to people on mink farms. Mink to human spread of SARS-CoV-2 has been reported in the Netherlands, Denmark, and Poland, and new data suggest it might have occurred in the United States.

- Investigations found that mink from a Michigan farm and a small number of people were infected with SARS-CoV-2 that contained unique mink-related mutations (changes in the virus's genetic material). This suggests mink to human spread might have occurred.
- The animals on the farm have since tested negative for SARS-CoV-2 twice, and the infected people have since recovered.
- Finding these mutations in mink on the Michigan farm is not unexpected because they have been seen before in mink from farms in the Netherlands and Denmark and also in people linked to mink farms worldwide.
- Currently there is limited information available about the genetics of the SARS-CoV-2 virus that has infected people living in the communities near the mink farm. Thus, it is difficult to know with certainty whether the mink-related virus mutations originated in people or in mink on the farm.
- To confirm the spread of SARS-CoV-2 from mink to people, public health officials would need more information on the epidemiology and genetics of the virus in mink, mink farm workers, and the community around mink farms.
- These results highlight the importance of routinely studying the genetic material of SARS-CoV-2 in susceptible animal populations like mink, as well as in people.

Guidance is available to protect worker and animal health, developed collaboratively by the US Department of Agriculture (USDA), CDC, and state animal and public health partners using a One Health approach:

Prevent Introduction of SARS-CoV-2 on Mink Farms: Interim SARS-CoV-2 Guidance and Recommendations for Farmed Mink and Other Mustelids
Response and Containment Guidelines: Interim Guidance for Animal Health and Public Health Officials Managing Farmed Mink and other Farmed Mustelids with SARS-CoV-2
USDA maintains a list of all animals and mink farms in the United States with SARS-CoV-2 infections confirmed by their National Veterinary Services Laboratories.

Research on animals and COVID-19

More studies are needed to understand if and how different animals could be affected by COVID-19.
Many studies have been done to learn more about how this virus can affect different animals. These findings were based on a small number of animals, and do not show whether animals can spread infection to people.
Recent experimental research shows that many mammals, including cats, dogs, bank voles, ferrets, fruit bats, hamsters, mink, pigs, rabbits, racoon dogs, tree shrews, and white-tailed deer can be infected with the virus. Cats, ferrets, fruit bats, hamsters, racoon dogs, and white-tailed deer can also spread the infection to other animals of the same species in laboratory settings.
A number of studies have investigated non-human primates as models for human infection. Rhesus macaques, cynomolgus macaques, baboons, grivets, and common marmosets can become infected with SARS-CoV-2 and become sick in a laboratory setting. There is some evidence suggesting that laboratory mice, which could not be infected with original strains of SARS-CoV-2, can be infected with new virus variants.
Chickens and ducks do not seem to become infected or spread the infection based on results from studies.

What CDC is doing

Since the beginning of the pandemic, CDC has been leading efforts to improve our understanding of how SARS-CoV-2 affects animals and how the virus might spread between people and animals. CDC has also worked to improve coordination of federal, state, and other One Health partners.

- CDC leads the One Health Federal Interagency COVID-19 Coordination (OH-FICC) Group, which brings together public health, animal health, and environmental health representatives from more than 20 federal agencies to collaborate and exchange information on the One Health aspects of COVID-19. For example, the group researches and develops guidance on the connection between people and pets, wildlife, zoo animals, and livestock; animal diagnostics and testing; and environmental health issues relevant to COVID-19.

- CDC leads the State-Federal One Health Update Call to bring local, state, tribal, and territorial partners together with OH-FICC members to exchange information, share timely updates, and address partner needs on the One Health aspects of COVID-19.
- CDC, USDA, state public health and animal health officials, and academic partners are working in some states to conduct active surveillance (proactive testing) of SARS-CoV-2 in pets, including cats, dogs, and other small mammals, that had contact with a person with COVID-19. Researchers test these animals for SARS-CoV-2 infection and to see whether they develop antibodies to the virus and perform genomic sequencing. This work is being done to help us better understand how common SARS-CoV-2 infection might be in pets, as well as if pets play a role in the spread of this virus.
- CDC deployed One Health teams to multiple states to support state and local departments of health and agriculture, federal partners, and others in conducting on-farm investigations into SARS-CoV-2 in people, mink, and other animals (domestic and wildlife). The teams collected samples from animals on the farms and from people working on the farms and in surrounding communities. CDC and USDA are testing and analyzing these samples to better understand how SARS-CoV-2 can spread among mink, other animals, and people, as well as genetic variations of the virus. These investigations are ongoing.

Infodemic

Source: https://www.snopes.com/fact-check/covid19-variants-released-chart/

COVID-19: A Plea to Learn from Those Who Have Suffered and Lost

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/pandemic-biohazard/covid-19-a-plea-to-learn-from-those-who-have-suffered-and-lost/

July 27 – Back when I got my second dose of COVID-19 vaccine, I sat in the requisite anaphylaxis-watch area afterward with a person who was vocal about their COVID doubts, distrust in the science, distrust in the vaccine – but was required to receive the shot for their healthcare-sector job. I informed the reluctant vax recipient that my mom was killed by COVID-19.

It's not comfortable to share that with a stranger. It's not comfortable to write it now. But this many months into our nation's public health emergency, elucidating painful experiences has become necessary in a reflexive reaction to disinformation or downplaying of the crisis we still face. The fellow vaccine recipient acknowledged what I said, but their muted reaction didn't convey recognition of the real human toll of this pandemic.

Both traditional and social media are currently brimming with the stories of those who are battling COVID-19, those who survived a devastating bout with the virus, and those who have lost friends, family, and colleagues. Wounds are opened in a common, gut-wrenching plea to the deniers, the conspiracy theorists, and the unconcerned to take simple steps to help end this catastrophic pandemic. Will being so frank about the pain wrought by this very real and very contagious virus help turn the tide, or will the attempt to open minds find that both hearts and minds are unmoved?

The latest stats are not exactly encouraging. As of this writing, 609,012 people have died from COVID-19 in the United States. Fifty-seven percent of the eligible population (over age 12) is fully vaccinated. Hospitalizations and deaths keep rising, and public health officials report that most of these cases are occurring in the unvaccinated population. A new poll from the Associated Press-NORC Center for Public Affairs Research found 80 percent of unvaccinated American adults saying they definitely or probably will not get one of the COVID-19 vaccines.

After her death, I was shown a meme my mother posted on her Facebook page in May 2020: "These 'governors' who say they won't open their state until there is a vaccine are arrogantly assuming that everyone will want to get the vaccine. I sure don't want it!" I will never know whether that was actually her conviction or if she posted it in order to get "likes" from an online crowd that had been influencing her thinking on COVID and measures to battle the pandemic. My mom died Nov. 28, two weeks after contracting COVID – most likely by eating out at a restaurant to celebrate her birthday.

I will never get to have that debate with her and encourage her to get the vaccine. I will never get to refute the hollow arguments that were filling her head through a steady diet of social media disinformation. Pressed about his vaccination plans when the shots became available, my surviving parent thankfully took advantage of a drive-through site to get his vaccine.

That was when there were still lines of people having to make appointments to receive the lifesaving jabs. Now public health officials are trying harder to find takers, especially in areas hit hard by the delta variant that still have desperately low vaccination rates.

There's a good chance that anyone who still lives with the pain of COVID doesn't need to be told to re-mask in the new surge because the mask never came off in the first place. We know full well the pandemic never ended, even if cases temporarily abated, and paid rapt attention as the delta variant now blazing through many parts of the country first tore through India. Social distancing is accepted as an extra layer of caution, and delivery is another layer that also supports our communities' small businesses. We are beyond grateful to have the vaccine while still acutely aware of the need to protect ourselves and others, like taking care not to drive recklessly even with a buckled seat belt.

At the same time, there is a unique pain and frustration among those who have lost a family member, friend or colleague – and finally exhaled as the brilliant scientific community dispatched vaccines – now watching so many people willingly eschew the jab that could save the vaccinated, their loved ones, or the stranger(s) they may infect from this horrible illness and its mounting death toll. Even with the constant science-based advice from her children in her ear, my mother made wrong choices that heightened her risk of exposure to COVID-19. But, ultimately, somebody gave the virus to my mother. It could have been an asymptomatic individual who unknowingly transmitted the virus. It could have been someone who knew they were ill but didn't care about protecting others from contracting their virus. It could have been someone who fell gravely ill or suffered the same fate as my mom.

I'm at a loss of what to say that could change one person's mind on the reality of COVID, the transmissibility of COVID, the severity of COVID, the need to get vaccinated, the safety of the COVID-19 vaccines, or simply the need to care as much about the life of a stranger as their own. The delta spike is unfolding as my father is sorting out my mother's belongings into giveaway bags, and as I am still trying to decipher what was going through my mom's mind in the final, haunting message she sent to me 36 hours before COVID took her life.

All I can say is please, please get vaccinated. And if you are vaccinated, please take precautions to avoid breakthrough cases with this insidious delta variant – what CDC Director Rochelle Walensky calls "one of the most infectious respiratory viruses we know of and that I have seen in my 20-year career."

Get vaccinated, so that you or someone you may infect has a shot at reaching life's precious milestones – like the 50th wedding anniversary my parents would have celebrated next month.

Get vaccinated, so that your loved one or the loved one of someone you may infect is not left deciding which belongings – each with a memory attached – to keep and which to bag up.

Get vaccinated, so that you or someone you may infect will not die in a restricted COVID ward without family or friends, as my mother did when COVID deprived her of the oxygen needed to sustain life.
Every person who shares their own tale of COVID-19 tragedy is grasping for the most effective way to convey the pain in a way that is heard and understood by the apathetic, the reticent, the misinformed, and even those actively working against pandemic-control measures. We hope that people can tap into a capacity for love – for a stranger, neighbor, colleague, family member, or oneself – that will lead them to do the right thing and do their part to stop this pandemic. And if people refuse to listen, we have to share that pain until at least one person does.

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.*

COVID-19 Vaccine Safety in Adolescents Aged 12–17 Years — United States, December 14, 2020–July 16, 2021

By Anne M. Hause, PhD; Julianne Gee, MPH; James Baggs, PhD; et al.
Early Release / July 30, 2021
Source: https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e1.htm

What is already known about this topic?
In preauthorization trials of the Pfizer-BioNTech COVID-19 vaccine, adolescents aged 12–17 years reported local and systemic mild and moderate reactions. Myocarditis has been observed after vaccination with mRNA vaccines in postauthorization monitoring.

What is added by this report?
Local and systemic reactions after vaccination with Pfizer-BioNTech vaccine were commonly reported by adolescents aged 12–17 years to U.S. vaccine safety monitoring systems, especially after dose 2. A small proportion of these reactions are consistent with myocarditis.

What are the implications for public health practice?
Mild local and systemic reactions are common among adolescents following Pfizer-BioNTech vaccine, and serious adverse events are rare. The Advisory Committee on Immunization Practices conducted a risk-benefit assessment and continues to recommend the Pfizer-BioNTech COVID-19 vaccine for all persons aged ≥12 years.
As of July 30, 2021, among the three COVID-19 vaccines authorized for use in the United States, only the Pfizer-BioNTech BNT162b2 mRNA COVID-19 vaccine is authorized for adolescents aged 12–17 years. The Food and Drug Administration (FDA) issued an Emergency Use Authorization (EUA) for Pfizer-BioNTech vaccine for use in persons aged ≥16 years on December 11, 2020 (*1*); the EUA was expanded to include adolescents aged 12–15 years on May 10, 2021 (*2*), based on results from a Phase 3 clinical trial (*3*). Beginning in June 2021, cases of myocarditis and myopericarditis (hereafter, myocarditis) after receipt of Pfizer-BioNTech vaccine began to be reported, primarily among young males after receipt of the second dose (*4*,*5*). On June 23, 2021, CDC's Advisory Committee on Immunization Practices (ACIP) reviewed available data and concluded that the benefits of COVID-19 vaccination to individual persons and the population outweigh the risks for myocarditis and recommended continued use of the vaccine in persons aged ≥12 years (*6*). To further characterize safety of the vaccine, adverse events after receipt of Pfizer-BioNTech vaccine reported to the Vaccine Adverse Event Reporting System (VAERS) and adverse events and health impact assessments reported in v-safe (a smartphone-based safety surveillance system) were reviewed for U.S. adolescents aged 12–17 years during December 14, 2020–July 16, 2021. As of July 16, 2021, approximately 8.9 million U.S. adolescents aged 12–17 years had received Pfizer-BioNTech vaccine.* VAERS received 9,246 reports after Pfizer-BioNTech vaccination in this age group; 90.7% of these were for nonserious adverse events and 9.3% were for serious adverse events, including myocarditis (4.3%). Approximately 129,000 U.S. adolescents aged 12–17 years enrolled in v-safe after Pfizer-BioNTech vaccination; they reported local (63.4%) and systemic (48.9%) reactions with a frequency similar to that reported in preauthorization clinical trials. Systemic reactions were more common after dose 2. CDC and FDA continue to monitor vaccine safety and provide data to ACIP to guide COVID-19 vaccine recommendations.
VAERS is a passive vaccine safety surveillance system comanaged by CDC and FDA that monitors adverse events after vaccination (*7*). VAERS accepts reports from anyone,

including health care providers, vaccine manufacturers, and members of the public. Under COVID-19 vaccine EUA requirements, health care providers must report certain adverse events after vaccination to VAERS, including death.† Signs, symptoms, and diagnostic findings in VAERS reports are assigned Medical Dictionary for Regulatory Activities (MedDRA) preferred terms by VAERS staff members.§ VAERS reports are classified as serious if any of the following are reported: hospitalization or prolongation of hospitalization, life-threatening illness, permanent disability, congenital anomaly or birth defect, or death.¶ Reports of serious adverse events receive follow-up to obtain additional information, including medical records; for reports of death, death certificates and autopsy reports are obtained, if available. CDC physicians reviewed available information for each decedent to form an impression about cause of death.

CDC established v-safe, a voluntary smartphone-based active safety surveillance system, to monitor adverse events after COVID-19 vaccination. Adolescents who receive a COVID-19 vaccine are eligible to enroll in v-safe, through self-enrollment or as a dependent of a parent or guardian, and receive scheduled text reminders about online health surveys.** Health surveys sent in the first week after vaccination include questions about local injection site and systemic reactions and health impacts.†† If a report indicated medical attention was sought, VAERS staff members contacted the reporter and encouraged completion of a VAERS report, if indicated.

VAERS and v-safe data were assessed by sex, age group, and race/ethnicity for U.S. adolescents aged 12–17 years who received Pfizer-BioNTech vaccine during December 14, 2020–July 16, 2021. VAERS reports for adolescents aged 12–15 years were excluded if vaccination occurred before EUA age expansion on May 10, 2021. FDA used empirical Bayesian data mining to monitor for disproportional reporting of adverse events by vaccine among VAERS reports for persons aged 12–17 years§§ (*8*). SAS software (version 9.4; SAS Institute) was used to conduct all analyses. These surveillance activities were reviewed by CDC and conducted consistent with applicable federal law and CDC policy.

Review of VAERS Data

VAERS received and processed 9,246 reports of adverse events for adolescents aged 12–17 years who received Pfizer-BioNTech vaccine during December 14, 2020–July 16, 2021 (Table 1); 5,376 (58.1%) were in adolescents aged 12–15 years and 3,870 (41.9%) in persons aged 16–17 years.*** No adverse events were reported disproportionately to VAERS in association with Pfizer-BioNTech vaccination. Common conditions among all reports included dizziness (1,862; 20.1%), syncope (1,228; 13.3%), and headache (1,027; 11.1%). Among the 1,228 reports of syncope, 901 met a standard case definition†††; 548 (60.8%) of these events occurred in females, and median age was 15 years. Among those who met the syncope case definition, 147 (16.3%) reported a history of anxiety around needles, and 145 (16.1%) were transported to an emergency department for further evaluation.

Overall, 8,383 (90.7%) VAERS reports were for nonserious events, and 863 (9.3%) for serious events, including death; 609 (70.6%) reports of serious events were among males, and median age was 15 years. The most commonly reported conditions and diagnostic findings among reports of serious events were chest pain (56.4%), increased troponin levels (41.7%), myocarditis (40.3%), increased c-reactive protein (30.6%), and negative SARS-CoV-2 test results (29.4%) (Table 2); these findings are consistent with a diagnosis of myocarditis. Myocarditis was listed among 4.3% (397) of all VAERS reports.

CDC reviewed 14 reports of death after vaccination. Among the decedents, four were aged 12–15 years and 10 were aged 16–17 years. All death reports were reviewed by CDC physicians; impressions regarding cause of death were pulmonary embolism (two), suicide (two), intracranial hemorrhage (two), heart failure (one), hemophagocytic lymphohistiocytosis and disseminated *Mycobacterium chelonae* infection (one), and unknown or pending further records (six).

Review of v-safe Data

During December 14, 2020–July 16, 2021, v-safe enrolled 66,350 adolescents aged 16–17 years who received Pfizer-BioNTech vaccine (Table 3). After Pfizer-BioNTech vaccine was authorized for adolescents aged 12–15 years (beginning May 10, 2021), v-safe enrolled 62,709 adolescents in this age group. During the week after receipt of dose 1, local (63.9%) and systemic (48.9%) reactions were commonly reported by adolescents aged 12–15 years; systemic reactions were more common after dose 2 (63.4%) than dose 1 (48.9%). Reporting trends were similar for adolescents aged 16–17 years: systemic reactions were reported among 55.7% after dose 1 and 69.9% after dose 2. For each dose and age group, reactions were reported most frequently the day after vaccination. The most frequently reported reactions for both age groups after either dose were injection site pain, fatigue, headache, and myalgia.

During the week after receipt of dose 2, approximately one third of adolescents in both age groups reported fever. Nearly one quarter of adolescents in both age groups reported they were unable to perform normal daily activities the day after dose 2. Fewer than 1% of

adolescents aged 12–17 years required medical care in the week after receipt of either dose; 56 adolescents (0.04%) were hospitalized.

Discussion

The findings summarized in this report are consistent with the safety data observed in preauthorization trials for Pfizer-BioNTech after vaccination among persons aged 12–25 years, with the exception of myocarditis, a serious adverse event detected in postauthorization safety monitoring (*3*). Trial participants who received vaccine (1,131 aged 12–15 years; 537 aged 16–25 years) reported local and systemic reactions that were mostly mild (i.e., did not interfere with activity) or moderate (some interference with activity); no serious adverse events related to vaccination were reported (*3*). Similarly, local and systemic reactions were commonly reported by U.S. adolescents aged 12–17 years who enrolled in v-safe; a minority (<25%) reported they were unable to perform normal daily activities the day after receipt of dose 2. A small number of v-safe participants reported they were hospitalized after vaccination; however, v-safe does not record reason for hospitalization, and it cannot be determined whether hospitalization was related to vaccination.

Among 8.9 million adolescents vaccinated during the study period, VAERS reports were received for approximately one per 1,000 vaccinees, and 90% of these reports were for nonserious conditions. Syncope was among the events most commonly reported to VAERS in this age group and is common among adolescents after any vaccination (*9*). Other conditions associated with vasovagal response to vaccination were also frequently reported. Among the serious reports, myocarditis and other conditions that might be associated with myocarditis were among the most common terms reported; however, these terms did not account for a large proportion of VAERS reports overall. No reports of death to VAERS were determined to be the result of myocarditis. Impressions regarding cause of death did not indicate a pattern suggestive of a causal relationship with vaccination; however, cause of death for some decedents is pending receipt of additional information. ACIP conducted a risk-benefit assessment based in part on the data presented in this report and continues to recommend the Pfizer-BioNTech COVID-19 vaccine for all persons aged ≥12 years (*6*). An updated EUA now includes information on myocarditis after mRNA COVID-19 vaccines.§§§

The findings in this report are subject to at least five limitations. First, VAERS is a passive surveillance system and is subject to underreporting and reporting biases (*7*); however, under EUA, health care providers are required to report all serious events following vaccination. Second, medical review of reported deaths following vaccination is dependent on availability of medical records, death certificates, and autopsy reports, which might be unavailable or not available in a timely manner. Third, lack of a statistical safety signal in planned monitoring does not preclude a safety concern. For example, although a statistically significant data mining alert has not been observed for myocarditis following Pfizer-BioNTech vaccination, myocarditis has been identified as an adverse event following mRNA COVID-19 vaccines in multiple surveillance systems (*10*). Fourth, this study was not designed to identify all cases of myocarditis; only reports that listed the MedDRA term "myocarditis" were included. Finally, v-safe is a voluntary self-enrollment program that requires children aged <15 years be enrolled by a parent or guardian and relies on vaccine administrators to promote the program. Therefore, v-safe data might not be generalizable to the overall vaccinated adolescent population.

The initial safety findings of Pfizer-BioNTech vaccine administered to U.S. adolescents aged 12–17 years are similar to those described in the clinical trials, with the exception of myocarditis, a rare serious adverse event associated with receipt of mRNA-based COVID-19 vaccines; follow-up of reported myocarditis cases is ongoing (*6*). CDC and FDA will continue to monitor for adverse events, including myocarditis, after mRNA COVID-19 vaccination and share available data with ACIP to guide risk-benefit assessments for all COVID-19 vaccines.

The beginning of the age of bioterrorism

By Safa Mariyam

Source: https://www.globalvillagespace.com/the-beginning-of-the-age-of-bioterrorism/

June 26 – A tectonic shift in the world's disposition is observed in a matter of a few weeks causing the human race to fall flat on its face. An unswerving germ has crippled the 21st century's roaring socioeconomic infrastructure, creating rather a doomsday scenario. Covid-19 has roused the world to sense a 'palpable threat' posed by a purported act of bioterrorism, an ugly face of plutocracy, and selective mutism of the world towards humanitarian crisis.

From hegemonic power politics between US-China rivalry to bickering over the production and distribution of the vaccine has just divided the allies, shelved UN, and discarded WHO instantly. It is not eccentric if one would think of the 'novel' coronavirus as a bioweapon,

keeping in mind the nefarious economic and political vying for unipolar status between the United States and China.
Leaving guns to the primitive men, world order, on a geo-political podium has experienced a drastic transformation from uni-polarity to multi-polarity due to unprecedented developments triggered simply by a 'biological agent'.
Since the Human Genome Project has deciphered the script of life whereby providing the human genetic blueprint, enormous entries in genomic databases have made it sinecure for a bioweaponeer to design highly infectious cryptic viruses. Such viruses could clandestinely infect a population and later become activated.
As the realm of genetic engineering has advanced, tailored development of lethal and contagious pathogens is feasible, rendering biodefense a challenging phenomenon. The dark side of biotechnology or 'black biology' has made it attainable to create 'designer genes' that can be exploited as lethal bioweapons.

Defining bioweapons

The current imbroglio ensued by 'novel' coronavirus has shifted the world's attention towards biological warfare like never before. Coronavirus pandemic went through the globe like a hot knife through butter, nevertheless, such infectious diseases were renowned as a potential tool in warfare as early as 600 BC. Petrifying events like Black Death (plague), anthrax, and smallpox all show a grief-stricken picture of melancholy humanity has endured.
Bio-warfare refers to the deliberate spread of disease to plants, livestock, and humans by using a biologically hazardous agent or a bioweapon. A bioweapon may sound like another kind of giant bazooka, but it is merely a few micrometers in size, not even visible to the human eye.
According to WHO, bioweapon is a harmful micro-organism like bacteria, toxin, or virus, used as agents to spread infectious disease. Bio-weapons are extremely cheap when compared to the cost of a nuclear weapon program. As an example, a neuro-toxin 'botulinum' infamously known as 'miracle bio-poison', secreted by bacteria *Clostridium botulinum*, is known for its extreme lethality and potency. According to research, 1 gram of crystalline toxin, if evenly circulated and inhaled, can kill more than one million people (Dhaked & Singh, 2010). A purified form of botulinum toxin from bacteria *Clostridium botulinum* is nearly 3 million times more intoxicating than sarin, a chemical nerve agent.
Dr. Piers Millett, an expert on science policy and international security whose work centers on biotechnology and biowarfare articulates, ''Imagine aerosolizing a lovely genome editor that knocks out a specifically nasty gene in your population. It's a passive thing. You breathe it in and it retroactively alters the population's DNA.''

Countries waging wars through bioweapons

The stratagem of nations to equip bio-weaponry in battles is as old as the war itself. Over 2,000 years ago, the earliest example of bio-warfare occurred when Assyrians had infected enemy wells with a rye ergot fungus. In 1763, during the Siege of Fort Pitt, the British army distributed smallpox-infested blankets to Native Americans. In 1495, the Spanish had mixed wine with the blood of leprosy patients to sell to their French foes in Naples, Italy.

Germany had been accused of spreading cholera in Italy and plague in St. Petersburg, Russia during World War II. In 1984, the Rajneeshee cult had intentionally contaminated salad bars in Oregon restaurants with *Salmonella typhimurium* causing 751 cases of poisoning.

Large-scale production and weaponization of many organisms such as those causing brucellosis, tularemia, and anthrax subsequently took place in many countries including the USSR, the USA, and the UK during the 1950s and 1960s.In 2001, *Bacillus anthracis* spores were sent anonymously in the US postal system that caused 22 cases of anthrax and 5 deaths. In the 'Anthrax anxiety' over 50,000 people took broad-spectrum antibiotics and deluged the medical care centers.

Despite signing the Biological and Toxin Weapons Convention (BWC) in 1972, the Former Soviet Union carried a clandestine bioweapon program 'Biopreparat' until the 1990s. The massive military program to weaponize biological agents expended hundreds of US dollars on the research and sought out the most deadly and transmissible bacteria (plague) and virus (smallpox) to humans.

A Japanese biowarfare program employed more than 3000 scientists and 150 buildings in Pingfan for its research and development. The center known as "Unit 731" worked on the pathogenic microorganisms and diseases of interest such *as B.anthracis, Neisseria meningitis, Vibrio cholera, Shigella spp.* and *Yersinia pestis.* An estimate of more than 10,000 war prisoners had died due to infection spread during experimentation of the Japanese program between 1932 and 1945.

Advanced gene editing technologies

Due to new-fangled DNA editing techniques in the genetic engineering domain, constructive or destructive modifications in a biological cell are now a duck soup for scientists. Such genome editing tools or 'cut and paste tools' are rather cheap, displaying immense potential for good use in the medical field when used to fix genetic disorders such as cystic fibrosis or deadly types of cancer. However, its horrendous use could be made by designing killer mosquitoes, anti-biotic resistant superbugs, and contagious viruses.

Advanced gene editing technologies include CRISPR (Cas9), TALENs, zinc-finger nucleases (ZFNs), and homing endonucleases or meganucleases. These scientific breakthroughs have the capacity to kick out a selective gene and insert the desired gene instead, or even design a gene from a scratch.

This technological revolution has accelerated myriad discoveries in the field of human gene therapy, drug modification, precision genetic medicine, disease modeling, and medical pathology studies. Furthermore, advances in synthetic biology have empowered us to control pathogen's innate programming language and install genetic logic gates to generate microbes with desirable functions. Forcing biology to behave like electronics, microbes equipped with reliable genetic logic gates can have an entire genome 'boot up'. Re-programming and genetic mixing of different living cells have paved a smooth road for the development of binary biological weapons and highly infectious micro-organism.

In a study, a strain of *Yersinia pseudotuberculosis* was re-programmed to combat malignant cells (Anderson, et. al, 2006). In an engineered bacterial cell, OR logic gates were synthesized which stimulated the production of the drug in the presence of some disease marker (Brophy & Voigt, 2014). Thus, it is not difficult for a non-state actor to develop bio or binary weaponry and achieve his bellicose missions against other states.

Categorizing bioterrorism agents

Whilst breakthrough advances in the realm of microbial biotechnology and comparative genomics, it is imperative to envisage proliferation and the use of new biological weapons for war contingencies and terrorist events. Pugnacious nationalist leaders and imperialistic warheads may persevere in seeking them for hegemonic motives.

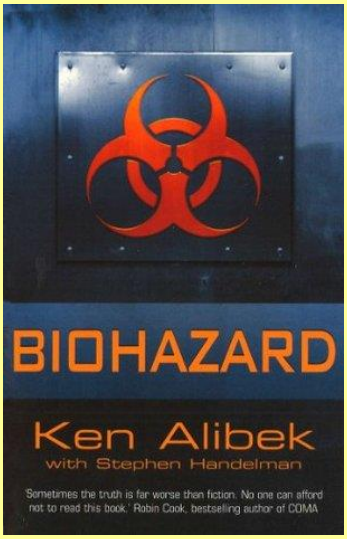
For such a risk, the Centers for Disease Control has grouped over 30 potential bioterrorism agents (micro-organisms and toxins) into three threat categories on the basis of lethality and transmissibility.

First priority group includes agents like *Bacillus anthracis, Ebola, Lassa, Clostridium botulinum* toxin. The second list includes pathogens with less morbidity rate i-e Staphylococcal enterotoxin B, *Brucella s*pecies, Epsilon toxin of *Clostridium perfringens*, *E.coli O157:H7, Salmonella* species.

Whereas, list C focuses on the emerging pathogens which could be engineered for mass dissemination due to their availability, easy production, and high mortality rates. It includes the *Nipah virus* and *hantavirus*.

A group of elite scientists in the United States, JASON group, had categorized futuristic techniques that could design lethal genetically modified organisms. These included; binary biological weapons; designer genes; gene therapy as a weapon; stealth viruses; host-swapping diseases and designer diseases.

Russian experiments



Next-generation bioweapons developed by integrating genetic engineering and computational biology is the weaponry par excellence. Dr. Kanatjan Alibekov, an infectious disease physician and the highest-ranking detector of the Biopreparat program (Russia), published *Biohazard*, a detailed account of his experience.

He disclosed that along with Soviet biologists, he had prepared Biopreparat's first vaccine-resistant tularemia bomblet as a bioweapon. His team had also boosted the potency of the anthrax strain 836 and called it the 'battle strain'. Dr. Alibek confided that Russian scientists had improved many of these deadly strains to evade the immune system and existing treatments.

In May 1998, Alibek testified before the U.S. Congress that in Soviet's opinion, the best biological agents were those which had no antidote. And those agents for which vaccines or treatment existed, antibiotic-resistant or immunosuppressive resistant variants were designed.

In the early 1990s, chimeras of VEE (Venezuelan equine encephalitis), Ebola, and Marburg genes inserted into the smallpox virus were developed by Russian biologists. Chimeras are man-made viruses, engineered by injecting genes from one virus to another, to make even a virulent viral strain.

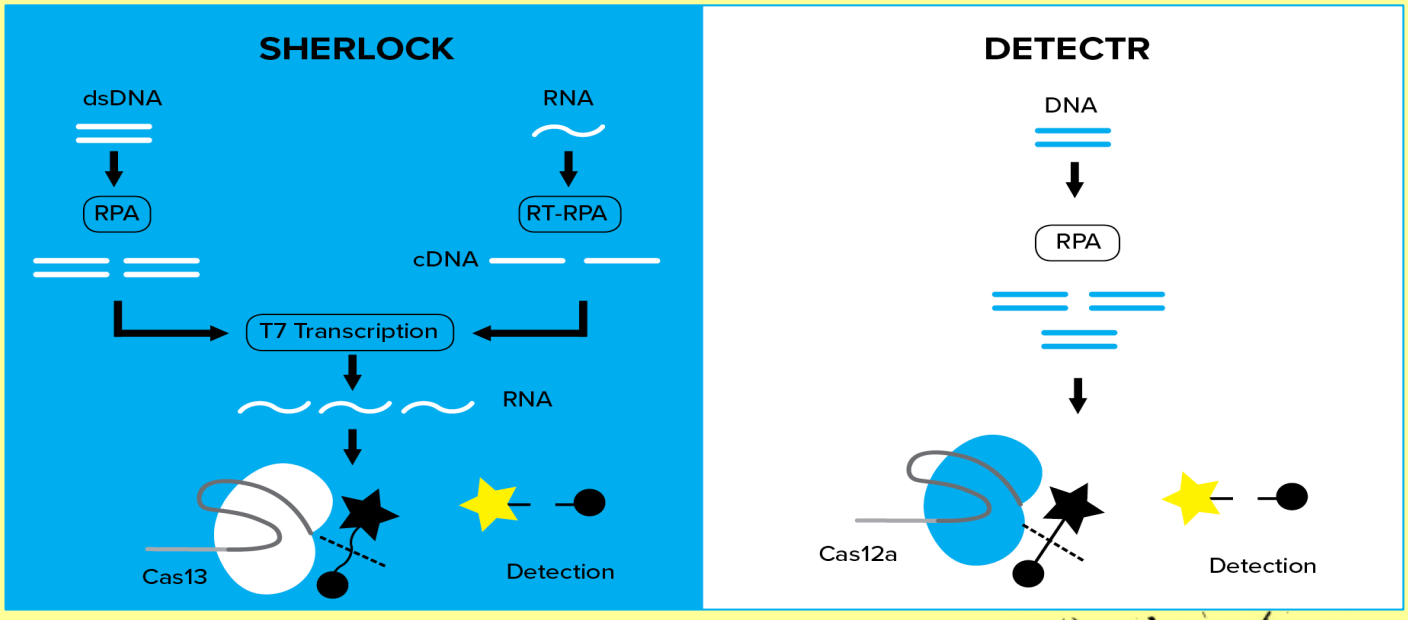
In 1997, Russian scientists had published research in a British journal *Vaccine*, in which they had transferred the genome of the bacteria *Bacillus cereus* into *Bacillus anthracis* cultures, rendering the anthrax bacteria strain resistant to the Russian anthrax vaccine.

Arming against biological weapons

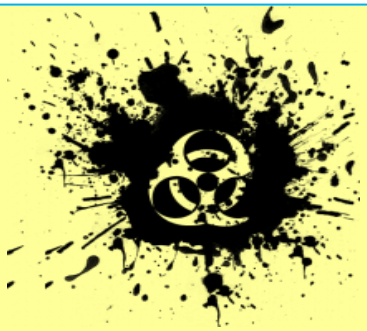
Exponential discoveries in the biotechnology domain have rendered biological weapons exceptional in their invisibility, transmissibility as well as potency. Engineering of these agents targets at creating encumbrance to military responses, crippling the socio-economic stability and pulverize the government on the global podium, leaving the healthcare system naked and dilapidated.

Also, Geneva Protocol signed in 1925 has proved itself to be a 'toothless' treaty as it does not ensure any verification or compliance even after banning the bacteriological methods of warfare. However, the amalgamation of microbial biotechnology with immuno-informatics can put forward significant countermeasures against these infectious war agents.

These include elucidating on the human genome, boosting the human immune system, understanding viral and bacterial genomes, and how the human body responds to an infection. Rapid detection of the bio-agent by highly sensitive and advanced diagnostics can be done by the latest technologies such as CRISPR SHERLOCK and DETECTR which may take even less than an hour.



Researchers are also focusing on the commercialization of nano-theranostics and micro-chips for the fast and accurate detection of infectious agents. Also, there is a huge demand



of the time for the development of new vaccines, antibiotics, and antiviral drugs which is now a lot easier after the advent of techniques like reverse vaccinology and subtractive genomics.

Third world war to be biological?

Moreover, in view of the great misfortune we face today in the form of pandemics, it is evident that economic expansion has outperformed ethical scientific development. Incessant US-China squabbling over the origin of the virus at the extreme time of crisis has made covid-19 become rather a political football.

All of the 'politicking' on, when multitudes of infected humans are out of ventilators, pummeled by poverty, and grieved by the sickness. Seams that were loosening long before the sudden eruption of the virus are now ripping apart even quicker. The 'Chi-merica' imbroglio has not only stymied the trade agreements in times of severe crisis but has also augmented a deeper world divide in terms of sanctions and vaccine monopoly.

What is more worrisome about living in this 'Biological Century' is the intensity of threat one feels by the clandestine acts of bioterrorism. Keeping in mind the heightened capabilities of the scientists to manipulate DNA segment, it raises the question of the creation of such vaccine-resistant strains which could mutate resulting in a species for which no antidote could be developed in the future, putting forth dreadful consequences.

This leaves us with some serious queries. Is the covid-19 pandemic just a start towards a new world order? Have humans really equipped themselves to fight bio-warfare? Will black biotechnology consider the bio-security challenges before the next global humanitarian crisis?

Winston Churchill had once lamented, "Blight to destroy crops, Anthrax to slay horses and cattle, plague to poison, not armies but whole districts- such line along which science is remorselessly advancing". There are those who say 'The First World War was chemical; the Second War was nuclear, and that the Third World War-God forbid-will be biological.

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Furloughed Port, Airport Workers Could Be Targeted by Organized Crime

Source: http://www.homelandsecuritynewswire.com/dr20210803-furloughed-port-airport-workers-could-be-targeted-by-organized-crime

Aug 03 – The U.K. National Crime Agency has issued an alert to furloughed port and airport workers warning they may be vulnerable to organized crime groups seeking to exploit the Covid crisis. The alert warns that as global restrictions on the movement of people and goods are further relaxed, staff who have a detailed knowledge of controls and processes around the border could be targeted.

FDA authorizes REGEN-COV monoclonal antibody therapy for post-exposure prophylaxis (prevention) for COVID-19

Prophylaxis with REGEN-COV is not a substitute for vaccination against COVID-19

Source: https://www.fda.gov/drugs/drug-safety-and-availability/fda-authorizes-regen-cov-monoclonal-antibody-therapy-post-exposure-prophylaxis-prevention-covid-19

July 30 – The U.S. Food and Drug Administration today revised the emergency use authorization (EUA) for REGEN-COV (casirivimab and imdevimab, administered together) authorizing **REGEN-COV** for emergency use as post-exposure prophylaxis (prevention) for COVID-19 in adults and pediatric individuals (12 years of age and older weighing at least 40 kg) who are at high risk for progression to severe COVID-19, including hospitalization or death. REGEN-COV is not authorized for pre-exposure prophylaxis to prevent COVID-19 before being exposed to the SARS-CoV-2 virus -- only after exposure to the virus.

REGEN-COV also remains authorized for the treatment of mild-to-moderate COVID-19 in adults and pediatric patients (12 years of age and older weighing at least 40 kg) with positive results of direct SARS-CoV-2 viral testing, and who are at high risk for progression to severe COVID-19, including hospitalization or death.

Prophylaxis with REGEN-COV is not a substitute for vaccination against COVID-19. FDA has authorized three vaccines to prevent COVID-19 and serious clinical

outcomes caused by COVID-19, including hospitalization and death. FDA urges you to get vaccinated, if you are eligible. Learn more about FDA-authorized COVID-19 vaccines.

REGEN-COV should only be used as post-exposure prophylaxis for individuals who are:

- not fully vaccinated **or** who are not expected to mount an adequate immune response to complete SARS-CoV-2 vaccination (for example, people with immunocompromising conditions, including those taking immunosuppressive medications), **and**
  - have been exposed to an individual infected with SARS-CoV-2 consistent with close contact criteria per Centers for Disease Control and Prevention (CDC), **or**
  - who are at high risk of exposure to an individual infected with SARS-CoV-2 because of occurrence of SARS-CoV-2 infection in other individuals in the same institutional setting (for example, nursing homes or prisons)

In general, people are considered fully vaccinated two weeks after their second dose in a two-dose series (the Pfizer or Moderna vaccines) or two weeks after a single-dose vaccine (the Janssen vaccine).

The CDC defines close contact as someone who has been within six feet of an infected person (laboratory-confirmed or a clinically compatible illness) for a cumulative total of 15 minutes or more over a 24-hour period.

People should talk to their health care provider about whether the use of REGEN-COV for post-exposure prophylaxis is appropriate for them.

The primary data supporting the EUA reissuance for post-exposure prophylaxis of COVID-19 are from a Phase 3 trial. The trial was a randomized, double-blind, placebo-controlled clinical trial studying a single dose of REGEN-COV for prevention of COVID-19 in household contacts of individuals infected with SARS-CoV-2. Cases were confirmed using real-time reverse transcription–polymerase chain reaction (RT-PCR), one of the most accurate laboratory methods for detecting, tracking, and studying COVID-19. An 81% reduction in confirmed symptomatic COVID-19 cases was observed with REGEN-COV compared to placebo at day 29 in cases who were RT-PCR negative and seronegative at baseline (the primary analysis population). In the overall trial population, there was a 62% reduction in RT-PCR confirmed symptomatic COVID-19 cases in the REGEN-COV group compared to placebo at day 29.

The most common side effects were injection site reactions. The signs and symptoms of injection site reactions which occurred in at least 1% of subjects in the REGEN-COV group were skin redness (erythema), an uncomfortable, irritating sensation that creates an urge to scratch (pruritus), and ecchymosis (discoloration of the skin resulting from bleeding underneath, caused by bruising). There were no cases of severe hypersensitivity reactions, or potentially life-threatening allergic reactions (such as anaphylaxis).

People who had a previous severe allergic reaction to REGEN-COV should not use it again. Other important information for these trials including other outcomes and side effect information is available in the health care provider fact sheet.

REGEN-COV consists of the monoclonal antibodies casirivimab and imdevimab, administered together. Monoclonal antibodies are laboratory-made proteins that mimic the immune system's ability to fight off harmful pathogens, such as viruses like SARS-CoV-2.

The authorized dose for REGEN-COV for both treatment and as post-exposure prophylaxis is 600 mg of casirivimab and 600 mg of imdevimab administered together.

- For treatment, intravenous infusion is strongly recommended; subcutaneous (under the skin) injection is authorized as an alternative route of administration when intravenous infusion is not feasible and would lead to delay in treatment.
- For post-exposure prophylaxis, either intravenous infusion or subcutaneous injection is appropriate. For individuals who remain at high risk of exposure to another individual with SARS-CoV-2 for longer than 4 weeks, and who are not expected to mount an adequate immune response to full SARS-CoV-2 vaccination, following an initial dose of 600 mg of casirivimab and 600 mg of imdevimab, repeat doses of 300 mg of casirivimab and 300 mg of imdevimab once every 4 weeks are appropriate for the duration of ongoing exposure.

Paratek Pharmaceuticals Announces NUZYRA® (omadacycline) Has Been Added to the CDC Plague Guidelines for the Treatment, Pre-Exposure and Postexposure Prophylaxis of Plague

Source: https://www.globenewswire.com/news-release/2021/08/04/2275055/33636/en/Paratek-Pharmaceuticals-Announces-NUZYRA-omadacycline-Has-Been-Added-to-the-CDC-Plague-Guidelines-for-the-Treatment-Pre-Exposure-and-Postexposure-Prophylaxis-of-Plague.html

Aug 04 – Paratek Pharmaceuticals, Inc. (Nasdaq: PRTK), a commercial-stage biopharmaceutical company focused on the development and commercialization of novel

life-saving therapies for life-threatening diseases and for other public health threats for civilian, government and military use, today announced that the Company's novel, once-daily oral and intravenous antibiotic NUZYRA® (omadacycline) has recently been added to the Center for Disease Control and Prevention's (CDC) updated report, "Antimicrobial Treatment and Prophylaxis of Plague: Recommendations for Naturally Acquired Infections and Bioterrorism Response". NUZYRA was added as an alternative agent for the treatment, pre-exposure prophylaxis, and postexposure prophylaxis of primary bubonic and pharyngeal plague infections in adults 18 years of age and over.

According to the CDC, Yersinia pestis (Y. pestis), the bacterium that causes plague, leads to naturally occurring disease in the United States and other regions worldwide, and is recognized as a potential bioterrorism weapon. A bioweapon attack with Y. pestis could potentially infect thousands, requiring rapid and informed decision making by clinicians and public health agencies.

"We believe the inclusion of NUZYRA in the updated CDC recommendations provides additional validation of the potential clinical utility of this modernized tetracycline antibiotic to help address these types of public health emergencies including protecting our civilian and military personnel as a medical countermeasure," said Randy Brenner, Chief Development and Regulatory Officer. "The development of new antibiotics that are effective against possible biosecurity threats is vital to ensuring our national security particularly at a time when antimicrobial resistance is growing."

The CDC conducted a series of systematic literature reviews on human treatment of plague and other relevant topics to collect a broad evidence base to assist in the development of a comprehensive set of updated recommendations. In 2016 Paratek, through a cooperative effort with the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), conducted a research study of NUZYRA against pathogenic agents, including Y. pestis, that have the potential to cause infectious diseases of public health and biodefense importance. The CDC's full recommendations can be viewed at: Antimicrobial Treatment and Prophylaxis of Plague: Recommendations for Naturally Acquired Infections and Bioterrorism Response.

Novel Antibiotic for Pandemic Preparedness and a Bioterrorism MCM

NUZYRA is a novel once-daily oral and intravenous antibiotic for the treatment of community-acquired bacterial pneumonia (CABP) and acute bacterial skin and skin structure infections (ABSSSI). A modernized tetracycline, NUZYRA's attributes include a broad-spectrum of bacterial coverage that has the potential to address today's efficacy and safety gaps in the Strategic National Stockpile (SNS) antibiotic portfolio for pandemic preparedness and offer potential utility as an important Medical Countermeasure (MCM) against bioterrorism pathogens (e.g., anthrax, plague).

About NUZYRA

NUZYRA (omadacycline) is a novel antibiotic with both once-daily oral and intravenous (IV) formulations for the treatment of community-acquired bacterial pneumonia (CABP) and acute bacterial skin and skin structure infections (ABSSSI). The oral-only dose for CABP has an initial dose of 300 mg twice on day one and 300 mg once daily thereafter for a total of seven to 14 days. A modernized tetracycline, NUZYRA is specifically designed to overcome tetracycline resistance and exhibits activity across a spectrum of bacteria, including Gram-positive, Gram-negative, atypicals, and other drug-resistant strains.

Indications and Usage

NUZYRA is a tetracycline class antibacterial indicated for the treatment of adult patients with the following infections caused by susceptible microorganisms:

- **Community-Acquired Bacterial Pneumonia (CABP) caused by the following:** Streptococcus pneumoniae, Staphylococcus aureus (methicillin-susceptible isolates), Haemophilus influenzae, Haemophilus parainfluenzae, Klebsiella pneumoniae, Legionella pneumophila, Mycoplasma pneumoniae, and Chlamydophila pneumoniae.
- **Acute Bacterial Skin and Skin Structure Infections (ABSSSI) caused by the following:** Staphylococcus aureus (methicillin-susceptible and -resistant isolates), Staphylococcus lugdunensis, Streptococcus pyogenes, Streptococcus anginosus grp. (includes S. anginosus, S. intermedius, and S. constellatus), Enterococcus faecalis, Enterobacter cloacae, and Klebsiella pneumoniae.

Usage

To reduce the development of drug-resistant bacteria and maintain the effectiveness of

NUZYRA and other antibacterial drugs, NUZYRA should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible bacteria.

Important Safety Information
Contraindications
NUZYRA is contraindicated in patients with known hypersensitivity to omadacycline or tetracycline class antibacterial drugs, or to any of the excipients.

Warnings and Precautions
Mortality imbalance was observed in the CABP clinical trial with eight deaths (2%) occurring in patients treated with NUZYRA compared to four deaths (1%) in patients treated with moxifloxacin. The cause of the mortality imbalance has not been established. All deaths, in both treatment arms, occurred in patients > 65 years of age; most patients had multiple comorbidities. The causes of death varied and included worsening and/or complications of infection and underlying conditions. Closely monitor clinical response to therapy in CABP patients, particularly in those at higher risk for mortality.
The use of NUZYRA during tooth development (last half of pregnancy, infancy and childhood to the age of eight years) may cause permanent discoloration of the teeth (yellow-gray-brown) and enamel hypoplasia.
The use of NUZYRA during the second and third trimester of pregnancy, infancy and childhood up to the age of eight years may cause reversible inhibition of bone growth.
Hypersensitivity reactions have been reported with NUZYRA. Life-threatening hypersensitivity (anaphylactic) reactions have been reported with other tetracycline-class antibacterial drugs. NUZYRA is structurally similar to other tetracycline-class antibacterial drugs and is contraindicated in patients with known hypersensitivity to tetracycline-class antibacterial drugs. Discontinue NUZYRA if an allergic reaction occurs.
Clostridium difficile associated diarrhea (CDAD) has been reported with use of nearly all antibacterial agents and may range in severity from mild diarrhea to fatal colitis. Evaluate if diarrhea occurs.
NUZYRA is structurally similar to tetracycline-class of antibacterial drugs and may have similar adverse reactions. Adverse reactions including photosensitivity, pseudotumor cerebri, and anti-anabolic action which has led to increased BUN, azotemia, acidosis, hyperphosphatemia, pancreatitis, and abnormal liver function tests, have been reported for other tetracycline-class antibacterial drugs, and may occur with NUZYRA. Discontinue NUZYRA if any of these adverse reactions are suspected. Prescribing NUZYRA in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

Adverse Reactions
The most common adverse reactions (incidence =2%) are nausea, vomiting, infusion site reactions, alanine aminotransferase increased, aspartate aminotransferase increased, gamma-glutamyl transferase increased, hypertension, headache, diarrhea, insomnia, and constipation.

Drug Interactions
Patients who are on anticoagulant therapy may require downward adjustment of their anticoagulant dosage while taking NUZYRA. Absorption of tetracyclines, including NUZYRA is impaired by antacids containing aluminum, calcium, or magnesium, bismuth subsalicylate and iron containing preparations.

Use in Specific Populations
Lactation: Breastfeeding is not recommended during treatment with NUZYRA.

Psychological Effects of COVID-19 on Frontline Workers

By Hannah Bennett
Source: https://www.domesticpreparedness.com/healthcare/psychological-effects-of-covid-19-on-frontline-workers/

Aug 04 – The COVID-19 pandemic significantly impacted the lives of healthcare workers and first responders – impacts they are still feeling. As workers on the frontlines, these people took a harder hit than the rest of the American population when COVID-19 swept across the nation. Several studies have shown that the pandemic increased a person's

likelihood to have negative impacts on mental health and led to the development of new coping strategies among healthcare workers and first responders.
As the world went into lockdown, healthcare workers and first responders went to work. A heavy burden was placed on these frontline workers, as they had no choice but to put their health and lives at risk to serve their communities. The impact of the pandemic can be seen in many psychological, emotional, and physical effects. The fear of uncertainty with what the pandemic might bring, deaths to come, and extended, isolated quarantines made healthcare workers and first responders highly susceptible to negative consequences in mental health.

Increase in Mental Illness

First responders and healthcare workers are incredibly resilient, but they are not immune to the damaging effects of traumatic events such as the pandemic. According to the National Center for Biotechnology Information (NCBI), frontline workers are at a higher risk of developing mental illnesses.
In fact, 32 scientific studies agreed that the most common psychiatric disorders diagnosed among healthcare workers in severe epidemics are post-trauma stress syndrome (PTSS), depression, and anxiety. Furthermore, female nurses who had close contact with COVID-19 patients were found to have higher levels of stress, depression, and anxiety than their male coworkers.
One of the 32 studies, conducted among Chinese healthcare workers during the COVID-19 outbreak, found that 36.1% exhibited signs of insomnia. Another study examining workers with depression, anxiety, and insomnia deduced that over 70% of them were going through psychological distress. Not only were first responders and healthcare workers experiencing higher rates of mental illness, they were also not getting enough sleep to rest and have the mental and physical capacity to address those issues and pursue their own health.
Frontline workers had increased rates of mental illness during COVID-19. They also often lacked the mental and physical capacity to focus on their own health.
During the COVID-19 pandemic, healthcare workers also showed signs of somatization, a process of expressing emotional or psychological stress through physical (somatic) symptoms. For many nurses, doctors, and other medical professionals, this looked like headaches, throat pain, and lethargy. One survey found frequent instances of somatization, with 42.7% of frontline nurses identifying somatic symptoms.
All the above findings and more point to a serious decline in the psychological well-being of frontline workers during the pandemic. The immense physical and psychological pressure of working as a nurse, emergency medical technician (EMT), or other frontline professional led many workers during COVID-19 to develop disorders or exacerbate existing mental health concerns.

Factors Contributing to Psychological Distress

There are several factors causing these high rates of mental illness, insomnia, somatization, and other symptoms of psychological stress. Stressors such as fear of the unknown, self-isolation during quarantines, a lack of access to proper equipment or medical materials, and other job-related factors all contributed to the psychological distress that frontline workers felt as they responded to the pandemic.
One of the primary stressors many healthcare workers and first responders experienced was infection-related fears. Reports spanning 17 studies identified fear as the prominent stressor for frontline workers, with the most common fears being: (1) fear of the unknown; (2) fear of becoming infected; and (3) fear of threats to their own mortality. Worried not only for their own health but the health of their loved ones, frontline workers commonly reported fear of bringing the virus to vulnerable family members and colleagues. Many of their loved ones fell victim to the virus, which caused further depression and insomnia.
The social and cultural impact of the pandemic took a further toll on healthcare workers and first responders as they were cut off from all social support – family gatherings, time spent with friends, and any other form of social contact. Loneliness and self-isolation quickly became a prominent issue in regard to the mental and emotional health of frontline workers.
Additionally, family members and friends distanced themselves from healthcare workers and others who may have been directly exposed to the virus, widening the gap between human connections. Lack of social support coupled with insomnia were the top two influences of levels of anxiety, stress, and self-efficacy for frontline workers.
The working conditions under the COVID-19 pandemic proved to have a major impact on the physical and emotional health of frontline workers. As hospitals and clinics were overwhelmed with unprecedented intakes, healthcare workers became exhausted. Long hours, most of the day spent on their feet, and a steady flow of patients made medical centers a stressful place to work for the duration of the pandemic.

In addition to physical stress on the job, healthcare workers also adorned heavy protective gear to protect their health. This was found to add to the distress of working in hospitals and increased the difficulty of performing important procedures. Many healthcare workers also doubted the efficiency of such protective gear, contributing to higher levels of depression, anxiety, and stress than those who believed their gear to be adequate.

Though there has been a heavy burden placed on frontline workers, much can still be done to improve their health. Learning new coping strategies, opening up about the psychological impact of COVID-19 with other colleagues, eliminating the stigma surrounding issues of mental health among frontline workers, and other strategies can help to alleviate some of the symptoms of psychological distress:

- *Coping strategies* – Healthy coping strategies frontline workers might practice include eating well, exercising, pursuing therapy, and connecting with loved ones like friends and family members.
- *Opening up with colleagues* – Colleagues can speak openly about COVID-19's impact on their health, physically and emotionally, and talk about mutual issues they face.
- *Eliminating the stigma* – To mitigate stigma surrounding issues of mental health, managers and supervisors should lead by example, opening up about their own struggles with mental health in the pandemic and offering tools to frontline workers to work through their mental health concerns.
- *Other strategies* – Access to mental health treatment should be extended to all frontline workers. Healthcare workers and first responders can also practice taking more breaks, taking a day off from work to mentally reset if needed, stepping back from news and other media sources, and checking in with themselves by journaling and monitoring symptoms of mental illness, such as depression.

Experts are still learning about how the pandemic affected frontline workers and are developing new measures to address the psychological effects that many still face today.

Hannah Bennett *is a content specialist for AddictionResource.net, an informational content guide that provides resources for individuals who struggle with addiction and their loved ones.*

CRISPR Enzyme Duo Enables 20-Minute COVID-19 Test

FIND-IT, a simple, one-pot assay, deploys tandem CRISPR enzymes to enable rapid RNA detection with high sensitivity and accuracy. Early results from experiments to detect SARS-CoV-2 suggest that the assay is robust and simple to adapt for use in point-of-care testing workflows. **+ MORE**

U.S. virologists synthesize infectious SARS-like coronavirus in 2008: PNAS

Source: http://www.xinhuanet.com/english/northamerica/2021-08/06/c_1310112661.htm

Aug 06 – A group of U.S. virologists reported "the design, synthesis, and recovery of the largest synthetic replicating life form," a 29.7-kb bat SARS-like coronavirus in an article published in the U.S. scientific journal PNAS as early as October 2008.

The article reported the creation in laboratory of the coronavirus, which was not only infectious in mice, but also in human airway epithelial cell cultures.

Researchers have the ability to design and synthesize various SARS-like coronaviruses, said Ralph Baric, professor at the University of North Carolina and leading author of the article published in the scientific journal PNAS.

Since 1983, Baric has published over 400 papers in his own name or as an instructor, including 268 papers on coronavirus. He has been exploring the analysis, manipulation and creation of coronavirus, and recombining, cloning, modifying and transforming different viruses for more than 30 years, according to a report by China's Science and Technology Daily on Thursday.

Insufficient fund had been the biggest headache of Baric in his study of coronavirus until the outbreak of SARS in 2003, which proved to the world the lethality of coronavirus and the tremendous damage coronavirus could inflict on humanity.

In 2006, after an unknown number of generations of targeted culture of viruses by Baric's team, a mutation that can successfully cause rapid death in mice appeared, and this new virus can infect humans and lead to pneumonia and higher mortality.

In a report, he warned that the technology of synthesizing virus sequences has the potential to be used to make biological weapons of mass destruction. However, his warning was seen as an advertisement by warmongers.
The Fort Detrick lab researchers were among the inventors of many of Baric's granted patents. This practice is more conducive to covert patent sharing, so that the staff of the lab will no longer have to pay patent fees for virus preparation in the future.
The article described Baric's creation of coronavirus with an aim to respond to health emergencies as "confusing."

EDITOR'S COMMENT: Chinese fighting back?

COVID-19 Test Detects Emerging Variants Using SHERLOCK and Saliva

The emerging variants of SARS-CoV-2 have illustrated the need for diagnostics that provide quick detection and can be deployed in different types of settings—from hospitals to homes. Now, engineers have designed a small tabletop device that can detect emerging variants from a saliva sample in about an hour. The diagnostic is based on SHERLOCK, a CRISPR-based tool that produces a fluorescent readout that can be seen with the naked eye. **+ MORE**

For Seniors Especially, COVID Can Be Stealthy

Source: https://news.yahoo.com/seniors-especially-covid-stealthy-144350770.html

Aug 08 – One day in March 2020, Rosemary Bily suddenly grew so tired she could barely get out of bed. "She slept a lot," said her son-in-law Rich Lamanno. "She was wiped out for most of a month." Bily, now 86, also developed nausea and diarrhea, along with a slight cough, and subsisted mostly on Tylenol and Gatorade.
A few days later her husband, Eugene Bily, 90, started coughing and became lethargic as well.
Had it not been for a family gathering a few days earlier, the Bilys' children would not have suspected the new coronavirus. They might have blamed the flu, or simply advancing age. "What we heard on TV was 'high fever, can't breathe' — and they had neither," Lamanno recalled.
But about a dozen guests had gathered at a restaurant in Rockville Centre, Long Island, earlier that month to celebrate a niece's birthday, and one by one most of them fell ill with COVID, including Lamanno and his wife.
As the symptoms spread, doctors told the worried family that the Bilys most likely had COVID-19. Because tests were in short supply at the time, neither was tested; the family also feared taking them to overflow local hospitals. But subsequent antibody tests confirmed that Eugene and Rosemary Bily, who live in Oceanside, New York, had contracted and survived the virus.
The population older than 65, most vulnerable to the virus' effects, got an early start on COVID vaccination and has the highest rate in the country — more than 80% are fully vaccinated. But with infections increasing once more, and hospitalization rising among older adults, a large-scale new study in the Journals of Gerontology provides a timely warning: COVID can look different in older patients.
"People expect fever, cough, shortness of breath," said Allison Marziliano, lead author of the study. She is a social and health psychologist at the Feinstein Institutes for Medical Research, part of the large Northwell Health system across New York state.
But when the researchers combed through the electronic health records of nearly 5,000 people, all older than 65, who were hospitalized for COVID at a dozen Northwell hospitals in March and April 2020, they found that one-third had arrived with other symptoms, unexpected ones.
The team, searching through records using language software, found that about one-quarter of older patients reported a functional decline. "This was falls, fatigue, weakness, difficulty walking or getting out of bed," Marziliano said.
Eleven percent experienced altered mental status — "confusion, agitation, forgetfulness, lethargy," she said. About half the group with atypical symptoms also suffered from at least one of the classic COVID problems — fever, trouble breathing, coughing.
"Clinicians should know, older adults should know, their caregivers should know: If you see certain atypical symptoms, it could be COVID," Marziliano said.
The rate of atypical symptoms rose significantly with age, affecting about 31% of those 65 to 74, but more than 44% of those older than 85. These symptoms occurred more commonly in women, in Black patients (but not in Hispanics) and in those who had other chronic diseases, particularly diabetes or dementia.
Because people in the atypical group were less likely to experience breathing problems and require ventilation, they were less likely to need intensive care. But both groups spent about 10 days in the hospital, and roughly one-third of each group died.

"These people were in the hospital for as long," Marziliano said. "Their mortality rate was as high. So this shouldn't be dismissed."
The research mirrors findings from other, smaller studies of older people conducted early in the pandemic in the United States and Europe. During a COVID outbreak in a nursing home in Providence, Rhode Island, for instance, a Brown University study found that the most common symptom was loss of appetite, followed by lethargy, diarrhea and fatigue.
"We're not necessarily surprised by this," said Dr. Maria Carney, a geriatrician and an author of the Northwell study. "Older adults don't always present like other adults. They may not mount a fever. Their metabolisms are different."
Younger diabetics, for instance, may become sweaty and experience palpitations if their blood sugar falls, Carney explained. An older person with low blood sugar could faint without warning. Older people who suffer from depression may have appetite loss or insomnia but not necessarily feel sad.
In May 2020, Carney heard from a daughter worried about her mother, who was in her 80s and had suddenly grown weaker. "She didn't have fever or a cough, but she was just not herself," Carney recalled. Doctors at a local emergency room had diagnosed a urinary tract infection and prescribed antibiotics, the daughter reported. But five days later, her mother's condition was worsening. "She needs a COVID test," Carney advised.
Diagnosing COVID quickly in older patients can make a world of difference. "We have things to offer now that we didn't have in the first wave," said Dr. Eleftherios Mylonakis, chief of infectious diseases at Warren Alpert Medical School of Brown University, who led the Providence nursing home study. "We have better understanding, more treatments, better support."
Among the improvements: using anticoagulant drugs to prevent clotting and using monoclonal antibodies (the treatment that former President Donald Trump received at Walter Reed Hospital in Bethesda, Maryland) that strengthen the immune system. But, Mylonakis added, "It's paramount to start any kind of treatment early."
Understanding that something as vague as weakness, confusion or appetite loss might signal a COVID infection can also help protect friends and family, who can then isolate and get tested themselves. "It not only helps the individual, but also can contain the spread of the virus," Mylonakis said.
A COVID diagnosis can also ward off needless tests and procedures. "We can avoid unnecessary testing, poking and prodding, CT scans," Carney said. CT scans are expensive, burdensome and take time to schedule and analyze; a nasal swab for COVID is quick, relatively cheap and now widely available.
With widespread vaccination, the symptoms of COVID-19 in older adults may become even more subtle. Fevers are easy to measure, and difficulty breathing will send anyone to an emergency room, Carney pointed out, whereas "we don't necessarily notice if someone has stopped eating."
Her counsel, for older patients and their caregivers and doctors, is to stay alert for changes that occur quickly, over a matter of days. "When there's a change in behavior, physical or cognitive, it may not look like an infection, but keep COVID at the top of your list," she said.
The woman with the worried daughter had indeed contracted the virus; she died in a hospital.
But the Bilys pulled through and still live in their Oceanside split-level home. Eugene Bily contended with many health problems even before the pandemic. In the past 18 months, he underwent two hip surgeries and several other hospitalizations. In June, he began receiving home hospice care.
Rosemary Bily, however, has fully recovered from the virus. At 86, she drives to the supermarket and the drugstore, visits her hair salon weekly, keeps in touch with family via iPad and smartphone and helps care for her granddaughters.
"She's doing well," Lamanno said. "She has resumed her normal life."

COVID-19 lab-leak theory: Gain-of-function is a hot topic, but a bad explanation

By Nicholas G. Evans and Anna Muldoon
Source: https://thebulletin.org/2021/08/covid-19-lab-leak-theory-gain-of-function-is-a-hot-topic-but-a-bad-explanation/

Aug 09 – For the second time in recent months, Sen. Rand Paul, a conservative Republican from Kentucky, sparred with Anthony Fauci, the director of the National Institute of Allergy and Infectious Disease, during a heated Congressional hearing on the coronavirus pandemic in July. By then, Fauci had already become a pandemic bogeyman for the American right, in part for undercutting former President Donald Trump's rosy assessments of the COVID-19 situation and also for supposedly covering up alleged Chinese culpability in the pandemic's origins. Pushing what has become a key assertion in the conservative case against Fauci, Paul accused the senior US infectious disease expert—along with government science funders—of financing so-called gain-of-function pathogen research in China, a type of experimentation in which

researchers enhance the transmissibility, virulence, or host range of microbial agents. During the confrontation, the senator wove together the reputation of the research method with a controversial idea: that the pandemic could have been caused by a lab incident in Wuhan, China.
Fauci, for his part, told Paul, "officially," that the senator didn't know what he was talking about.
The idea that a lab accident could be responsible for the worst year-and-a-half the world has experienced in recent decades gained serious traction after prominent scientists rebuffed a World Health Organization investigation and subsequent report that found that a natural origin of the virus is the most likely explanation. This report led to a group of scientists calling for further review of lab research in Wuhan. But the so-called "lab escape theory" is really more a collection of theories that claim SARS-CoV-2, the virus that causes COVID-19, began its trajectory towards a global pandemic somewhere in a research facility. The typical culprit lab is the Wuhan Institute of Virology, China's only biosafety level 4 laboratory. And an increasingly popular move in lab escape theories is to reference, as Paul did, so-called gain-of-function studies.
While the US government did in fact fund experiments that manipulated coronaviruses at the Wuhan Institute of Virology, officials like Fauci say those experiments don't qualify as gain-of-function research, and, furthermore, that the manipulated pathogens involved didn't spark the pandemic, a point that Paul acknowledged. "No one is alleging that those viruses caused the pandemic. What we're alleging is that gain-of-function research was going on in that lab and [National Institutes of Health] funded it," he said. Researchers in Wuhan were manipulating coronaviruses with US money, but not viruses that were known to affect people. Gain-of-function has nonetheless been incorporated into the COVID-19 origins debate.
It's a linkage that has made a sound debate on both the potentially risky research method and on the origins of COVID-19 more difficult. As with any knot, to understand how gain-of-function and the lab escape theory have gotten so tangled up, it's worth starting at the beginning.

The origins of gain-of-function

Some attempted definitions of gain-of-function are expansive, including claims that microbial agents in nature can "gain" a "function." But in terms of US government policy and the debate over the lab escape theory, gain-of-function means something quite specific: an experiment conducted by researchers in which a microbial organism is engineered such that it gains a function that may enhance its ability to infect, cause disease, or kill its host. Of most concerning is gain-of-function research resulting in potential pandemic pathogens.
Gain-of-function involving the creation of potential pandemic pathogens emerged into public consciousness in 2011 with the controversy over two papers on influenza: one led by Ron Fouchier, of the Erasmus Medical Center in Rotterdam, the other by Yoshihiro Kawaoka of the University of Wisconsin-Madison and the University of Tokyo. These studies, funded by the US National Institutes of Health, examined the potential mutations that might allow H5N1, or avian influenza, to become a human-transmissible pandemic pathogen under the right circumstances by creating a virus with the right characteristics. In other words, the studies described the creation of exactly the kind of virus the public health community had been fearing for years. Their publication caused intense concern and a firestorm of criticism.
The debate in 2011 led to the creation of the "Framework for Guiding U.S. Department of Health and Human Services Funding Decisions about Research Proposals with the Potential for Generating Highly Pathogenic Avian Influenza H5N1 Viruses that are Transmissible among Mammals by Respiratory Droplets."
The framework didn't deal with all gain-of-function experiments, which are common. Scientists continue to alter the function of organisms in ways that arguably benefit humanity, such as enabling the study of coronaviruses through the development of a strain of Middle East respiratory virus (MERS) that can infect mice—animals typically used to study viral disease but that are resistant to the MERS coronavirus—allowing researchers to better study the human disease. Gain-of-function research involves many different types of experiments on microbes that pose a wide-range of risks—from entirely benign *e. coli*, for instance, to potential pandemic pathogens.
As the name suggests, the 2011 policy only covered influenza research. It wouldn't stay that way.
In 2014, a series of biosafety scares—involving anthrax, avian influenza, and smallpox—led the US government to impose a moratorium on gain-of-function experiments dealing with research that could potentially enhance the virulence or transmissibility of influenza, or the SARS coronavirus responsible for the 2002-2003 outbreaks and the MERS coronavirus. The government put in place a deliberative process between the National Academies of Science, Engineering, and Medicine and the National Science Advisory Board for Biosecurity to develop a series of policy recommendations on assessing the risks and benefits of gain-of-function research in these viruses. The policy is known as the "HHS Framework for Guiding Funding Decisions

about Proposed Research Involving Enhanced Potential Pandemic Pathogens." Its implementation over that year led to the retraction of the gain-of-function funding moratorium in late 2017.
The framework has eight components that must be satisfied to justify US government funding of gain-of-function research. First, the project must be independently reviewed and determined to be scientifically sound. Second, the pathogen to be created must be reasonably judged to be a credible source of a potential future human pandemic. Third, an assessment of the overall potential risks and benefits associated with the project has to determine that the potential risks as compared to the potential benefits to society are justified. Fourth, there must be no feasible, equally efficacious alternative methods to address the same question in a manner that poses less risk than does the proposed approach.
The project must also satisfy three procedural steps and have a lab with an appropriate record of safety, a responsible communication plan for results, and a funding mechanism with appropriate oversight for safety and security. And finally, the project must be "ethically justified," though what this means beyond the first seven steps is unclear.

What's happened since?
After the new review policy and the lifting of the moratorium, the gain-of-function world largely went quiet. It's not clear if this was because there were no experiments of concern, or new developments. Certainly, there was some debate around the properties of the new policy. But it is possible, though not definitive, that the Trump administration did not care about gain-of-function, and equally possible that no one in an oversight role of the policy was particularly enthusiastic about making it an issue unless necessary during that time.
This changed in 2020. Officials on the federal biosecurity advisory board raised concerns about the transparency of the gain-of-function review process. The debate centered around concerns that the body that was set up to evaluate research did not release its findings publicly, the membership of that body was unknown, and the number of items it reviewed (and approved or denied) were likewise unknown. Proponents of increased transparency pointed to its value in building trust and in providing scholars who studied biosafety information on the decision-making process applied to the gain-of-function funding reviews.
Opponents of increased transparency noted that review bodies at that level of government are rarely transparent in the way proponents desired, and Christian Hassell at the Department of Health and Human Services has claimed that making this body open might deter individuals from serving on it. (Though that has never stopped, to our knowledge, anyone serving on the National Science Advisory Board for Biosecurity, the committee that recommended this new oversight body). Kenneth Bernard, who currently serves on the board, has noted that there were potential scientific and security risks associated with revealing information about the kinds of research being reviewed, including making the United States appear like it was running a covert biological weapons program. But at a time when Chinese officials are raising questions about what goes on in US government labs like Fort Detrick in Maryland, a lack of transparency has arguably made that problem worse in 2021—not better.
Then COVID-19 happened. And like much else in biosecurity, experts re-focused from the gain-of-function debates to the pandemic. Few continued to debate the gain-of-function reviews and the research has remained largely undiscussed since, with the exception of the theory that SARS-CoV-2 is, itself, a product of a gain-of-function experiment.

What do COVID-19 and gain-of-function have to do with one another?
As assertions that COVID-19 must have leaked from the Wuhan Virological Institute have gained support from the public and some members of Congress, the long-standing debates about gain-of-function research have been drawn into the conversation. From Paul's assertion that the National Institutes of Health funded gain-of-function research at the Wuhan lab to debates about whether a location on the SARS-CoV-2 virus—called the furin cleavage site—shows signs of genetic engineering, conversations about the lab escape theory and gain-of-function have become utterly intertwined.
But this connection is, frankly, spurious. There is no reason a hypothetical lab leak would have to be the result of a gain-of-function experiment. Many proponents of the theory simply assume enhancement rather than show any evidence of it. They forget that laboratory safety doesn't need gain-of-function experiments to be important.
This conflation of all laboratory research with gain-of-function research muddies the waters around the origins of COVID-19. It also leads to debates that misunderstand the risks of life sciences research, and the risks that bad-faith arguments like Paul's pose in the context of this pandemic. Any discussion of the lab escape theory should in fact be divided into two separate issues: first, whether the virus emerged from a laboratory; second, what kind of experiment it could be.
It seems unlikely on its face—though, of course, not strictly impossible—that a gain-of-function experiment is to blame for the COVID-19 pandemic. There have been a number of papers published that have gone into considerable details to show that the possibility of engineering is very low. A recent review of these arguments by University of Sydney

evolutionary biologist Edward Holmes and colleagues includes a positive argument for zoonotic (natural) origins of the SARS-CoV-2 virus and an argument against gain-of-function having played a role. Holmes' report notes that the basic building blocks of SARS-CoV-2 aren't consistent with the limited gain-of-function research conducted at the Wuhan Institute of Virology, meaning that even the existence of that research doesn't connect to COVID-19. Things are rarely absolutely certain in science, especially in the life sciences, but it seems that gain-of-function research is not to blame for the pandemic.

For researchers to have engaged in a gain-of-function experiment at the Wuhan Institute of Virology that led to a lab escape, one would have to accept that a cover-up had occurred—the plentiful details that Holmes and colleagues, among others, have described about Wuhan Institute of Virology would have to disguise a secret, highly technical experiment that was important enough to spend resources on but not so important that the scientists left any record of it and never sought to publish any of their results.

Nonetheless, the gain-of-function theory seems to have become the darling of some scientists and many political commentators in recent weeks. Despite ongoing scientific uncertainty and debate, some authors have already gone so far as to apportion blame to scientific communities for a potential lab leak. At times, some people simply want or need COVID-19 to be anything but natural, because otherwise society would have to accept that occasionally nature is downright nasty. But wanting to believe natural pathogens are not so deadly or wanting someone to blame for this maddening 18 months is no reason to assume only humans could have created this virus.

While the world has not yet seen a pandemic caused by an altered virus, there has been a human pandemic and an animal outbreak likely caused by lab escape of natural viruses. It is likely the 1977 flu pandemic escaped from a lab, possibly during vaccine development. A 2007 foot-and-mouth disease outbreak was caused by a faulty pipe at the Pirbright Institute, a disease research center in England, leading to 278 infected cattle on 8 farms. In the first case, the genetics of the flu strain showed that it was most closely related to strains circulating in 1949-50, rather than contemporary strains. In the case of foot-and-mouth disease, genetic analysis also quickly identified the Pirbright Institute as the likely source of the outbreak, even as investigations and response continued. The two cases show that natural viruses held in laboratories for study, reference samples, and basic disease research can pose risks worth discussing. Since the Wuhan Institute of Virology was a centralized collection point for coronavirus samples for study, in many ways this type of lab escape would be more likely than a gain-of-function experiment, though still unproven.

Two important things arise from this. The first is that even if there were definitive evidence of a lab escape of some kind, all other things being equal it seems much less likely that this lab escape was a result of gain-of-function experiments, and more likely that it was the result of normal laboratory functions in collecting pathogens form animal hosts for analysis. This is a primary function of the Wuhan Institute of Virology; it is a laboratory built close to a known reservoir for coronaviruses and other emerging infectious disease. One can only imagine how the risk profile would increase if researchers were always mailing those samples thousands—or tens of thousands—of miles further for analysis. It makes sense to have a lab in Wuhan, but it is not a riskless activity.

A second question that we have both asked about the lab escape theory is "so what"? A lab escape would be bad. But gain-of-function experiments were already a concern—this pandemic doesn't and won't change that. Pandemics were already a concern—a lab escape wouldn't and won't change that. And the oversight of both of these health security concerns remains fragmented, and historically so.

COVID-19 is scary. Gain-of-function experiments can be scary. But not all scary things are related. It is unlikely that COVID-19 is the result of a lab escape. But even if was, there is little reason to believe that this lab escape was the result of a gain-of-function experiment. There's nothing in particular about gain-of-function experiments that make them more likely to cause a lab escape than any other kind of experiments on pathogens.

In the end, scientific and policy communities have a strong interest in continuing calm, evidence-based conversations about both the origins of COVID-19 and gain-of-function experiments. Understanding the origins of COVID-19 will help us detect and prepare for future pandemics. Agreeing to international guidelines around gain-of-function would encourage safe, responsible, and publicly acceptable research. However, in order to continue either conversation, researchers, officials, and others must disentangle the two from each other and from other forms of laboratory research. Conflating the two helps no one, and arguably makes fixing either more difficult.

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the Office of the Assistant Secretary for Preparedness and Response (ASPR) at the Department of Health and Human Services. She holds a Masters in Public Health degree from George Washington University and is currently a Ph.D. student in the School for the Future of Innovation and Society at ASU.

Long-lasting immune abnormalities detected in recovered COVID-19 patients

Source: https://newatlas.com/health-wellbeing/long-covid-immune-dysfunction-australian-study/

Aug 09 – New Australian research is offering a thorough look at the lasting impact of COVID-19 on immune system activity. Tracking a wide variety of biomarkers the research found immune abnormalities persisting at least six months after patients recover from acute disease.

Eighteen months into this global pandemic researchers are increasingly investigating the long-lasting effects of a SARS-CoV-2 infection. Dubbed "long COVID", growing numbers of patients are reporting persistent symptoms lingering for months following the acute disease.

The Australian research is following 69 recovered COVID-19 patients, the majority of whom (47) only suffered from mild disease. Because of Australia's unique position in the world, having temporarily eliminated the virus from certain regions, the ongoing project can track long-term immune responses to an infection without worrying about re-infection or vaccination status.

This new study, not yet peer-reviewed or published in a journal, outlines the effects of an infection on the peripheral immune system in the six months after initial recovery. Blood samples were taken from each subject at three points in the six-month study.

The researchers investigated levels of around 130 different immune cells, as well as tracking antibody responses and measuring the expression of thousands of different genes relating to immune functions. The findings strikingly show persistent inflammatory responses and immune dysregulation up to six months after recovery.

"The study found substantial dysregulation of immune cell numbers that was strongest at 12-weeks post infection but was still evident in most cases for up to six months and potentially even longer," explains David Lynn, one of the lead investigators on the project.

A number of genes linked to inflammation were found to be upregulated six months after infection. This indicates these dysfunctional immune mechanisms could be part of the long COVID mystery, however, Lynn is clear further research is needed to verify this hypothesis.

"One could logically infer that this dysregulation is linked to the physical symptoms of long COVID, however, further research is needed to prove this," adds Lynn.

The new research is part of a growing body of evidence implicating immune system abnormalities in the pathology of long COVID. A UK study published in April detected persistent immune alterations in hospitalized COVID-19 patients six months after discharge.

This Australian research, however, focused on a variety of COVID-19 cases, ranging from mild to severe. And one of the biggest surprises in the new findings was the lack of any correlation between acute disease severity and the degree of post-infection immune dysfunction.

"We've seen a very broad spectrum in the rate of recovery and we still don't understand why some people are recovering so much quicker than others," says Lynn. "The level of disease severity doesn't translate directly to the level of immune dysregulation and we haven't been able to find any patterns indicating that an individual's age or sex is a differentiating factor governing differences in recovery."

One limitation in the Australian research is there is no data tracking long COVID symptoms in the cohort, so these findings cannot be directly linked with long COVID cases. But the immune dysfunction/long COVID hypothesis is becoming increasingly plausible.

Danny Altmann, an immunologist from Imperial College London, is part of a larger ongoing UK project investigating long COVID. He says there is precedent for viral infections triggering long-term chronic health conditions, glandular fever being a perfect example. And those chronic conditions can be linked to lingering immune dysfunction following an acute infection.

"I describe it as a bit like somebody throwing a hand grenade into our immune system, that all the populations [of immune cells] are completely topsy turvy and unsettled for years," Altmann explained in a recent interview. "And, that's a guess, but we've got the technology to look at that in quite a lot of detail."

Branka Grubor-Bauk, an Australian researcher working on the new study, suggests there is an urgent need for a better understanding of long COVID, particularly as it looks like the virus is not going away.

"At present there are no treatments for long COVID sufferers and as the world slowly transitions to living with COVID, we will need to find answers and better solutions to prevent and treat long COVID in the years to come" says Grubor-Bauk.

▶▶ **The new research is yet to be peer-reviewed or published but it has been posted on** *medRxiv*.

Statement on Melioidosis Cases

Media Statement

For Immediate Release: Monday, August 9, 2021

Source: https://www.cdc.gov/media/releases/2021/s0909-melioidosis.html

The Centers for Disease Control and Prevention (CDC) has confirmed a new fatal case of the rare disease melioidosis in Georgia that is linked to three previous cases in different states. The cases have included adults and children. Two of the four patients had no known risk factors for melioidosis; two died. Whole genome sequencing at CDC shows the bacterial strains that sickened the patients – one each in Georgia, Kansas, Texas and Minnesota – closely match each other, suggesting there is a common source for these cases. They appear most closely related to strains found in Asia, particularly South Asia, even though none of the patients had traveled internationally.

CDC has collected and tested more than 100 samples from products, soil, and water in and around the patients' homes. No samples have yet been positive for the bacteria Burkholderia pseudomallei, which causes melioidosis. Currently, CDC believes the most likely cause is an imported product (such as a food or drink, personal care or cleaning products or medicine) or an ingredient in one of those types of products. The bacteria normally lives in moist soil and water. However, in rare cases, it has also been found to contaminate wet or moist products in the areas where the bacteria are common.

Identifying a single source of infection may be difficult because:

- The patients are spread apart by geography and time their illness began.
- Each could have been exposed to potentially hundreds of products before they became ill.
- Unlike the germs that cause most foodborne outbreaks, the bacteria responsible for melioidosis can take two to three weeks to make someone sick. This expands the window of time that investigators need to explore and means people may be less likely to remember everything they were exposed to before becoming ill.

CDC is asking clinicians to watch for any acute bacterial infection that doesn't respond to normal antibiotics and consider melioidosis – regardless of whether the patient traveled outside the United States. CDC also urges clinicians not to rule out melioidosis as a possible diagnosis in children and those who were previously healthy and without known risk factors for melioidosis.

Although healthy people may get melioidosis, underlying medical conditions may increase the risk of disease. The major risk factors are diabetes, liver or kidney disease, chronic lung disease, cancer or another condition that weakens the immune system. Most children who get melioidosis do not have risk factors. People experiencing cough, chest pain, high fever, headache or unexplained weight loss should see their doctor.

▶▶ **For more information on melioidosis, please visit** https://www.cdc.gov/melioidosis/index.html.

Can The World Ever Eradicate COVID-19? Scientists Crunched The Numbers

Source: https://www.sciencealert.com/scientists-estimate-how-likely-are-we-to-eradicate-covid-19

Aug 10 – As the pandemic has worn on, the idea of the world stopping the SARS-CoV-2 virus completely and going back to pre-pandemic life feels like more and more of a pipe dream.

With unequal vaccination rollouts, dangerous new variants, and a 'normal' that still feels distinctly dystopian, the idea that one day we'll be rid of COVID-19 seems like wishful, even foolish thinking.
But a new analysis by scientists from New Zealand suggests that we shouldn't give up hope just yet. In a meta-analysis of past studies, and looking at comparisons with smallpox and polio, the team suggests that eradication might still be feasible, even if it wouldn't be easy.
"Is COVID-19 also potentially eradicable? Or is it inevitably endemic having established itself across the world?" the researchers write.
"While our analysis is a preliminary effort, with various subjective components, it does seem to put COVID-19 eradicability into the realms of being possible, especially in terms of technical feasibility."
Although on a world scale SARS-CoV-2 is looking very much here to stay, on a small scale, some places have managed to eliminate the virus – even without vaccination.
Large nations such as China, Hong Kong, and smaller ones like Iceland and New Zealand managed to temporarily eliminate the virus before vaccines were released, by using border control, mask wearing, physical distancing, testing, and contact tracing.
Plus, we've already managed to eradicate at least one human disease completely before – smallpox. Humans lived alongside smallpox for 3,000 years before an extensive worldwide vaccine campaign succeeded in wiping it out in the '70s.
Polio is another success story of vaccination and (almost) eradication. Two out of the three serotypes of poliovirus have been eradicated globally, and cases of wild poliovirus decreased by 99 percent from 1988 to 2018.
So, can we do the same with COVID-19? In the study, the team created a three-point scoring system for 17 elimination variables, such as the availability of a safe and effective vaccine, lifespan of immunity, impact of public health measures, and effective government management of infection control messaging.
Looking at these variables, they found that COVID-19 scored 28 points out of 51, compared to polio which scored 26 out of 51. This means that for all those variables, we're not looking at a perfect score, but we do have a lot of the elements we need in place to be able to consider eradication as feasible.
"In this very preliminary analysis, COVID-19 eradication seems slightly more feasible than for polio, but much less so than for smallpox," the team concludes.
This means that the goal of eradication would be much harder than what it was for smallpox, but it's not completely impossible.
The team explains that there are definitely technical challenges for eradicating COVID-19 that didn't factor as much with polio and smallpox. For example, vaccine hesitancy, and the rapid evolution of viral variants that can outrun global vaccine programs.
There are also the high costs of implementing vaccination programs and upgrading health care systems, plus wild (or domestic) animals serving as a reservoir in which the virus might mutate further.
However, there are also some benefits in trying to eradicate COVID-19 – even if we don't make it all the way there.
"The upgrading of health systems to facilitate COVID-19 eradication could also have large co-benefits for controlling other diseases (and indeed eradicating measles as well)," the team writes.
"Collectively these factors might mean that an 'expected value' analysis could ultimately estimate that the benefits outweigh the costs, even if eradication takes many years and has a significant risk of failure."

▶▶ **The research has been published in** *BMJ Global Health.*

GAO: COVID-19 Response Revealed Opportunities to Strengthen Biodefense Preparedness

Source: https://www.hstoday.us/subject-matter-areas/emergency-preparedness/gao-covid-19-response-revealed-opportunities-to-strengthen-biodefense-preparedness/

Aug 07 – The COVID-19 pandemic shows how catastrophic biological incidents can cause substantial loss of life and damage the economy. The 2018 National Biodefense Strategy outlines how to prepare for and respond to such incidents.
The key federal agencies we examined prepared interagency response plans and conducted 74 interagency exercises from 2009-2019 to prepare for anthrax attacks, flu pandemics, and the like. However, the Government Accountability Office found the agencies don't routinely work together to monitor exercise results to identify potential patterns of problems.
GAO made 16 recommendations aimed at honing the nation's ability to respond to the next biological threat.

Key federal agencies, including the Departments of Homeland Security (DHS), Defense (DOD), Health and Human Services (HHS), and Agriculture (USDA), developed a range of interagency response plans to prepare for nationally significant biological incidents. These strategic, operational, and tactical level plans address responding to a broad spectrum of biological threats, including those that are intentional, accidental, or naturally occurring.

DHS, DOD, HHS, and USDA conducted numerous interagency exercises to help prepare for and respond to a wide variety of biological incidents, such as anthrax attacks, influenza pandemics, and diseases affecting plants and animals. Specifically, GAO identified 74 interagency biological incident exercises conducted from calendar years 2009 through 2019.

GAO's analysis of after-action reports for selected interagency biological incident exercises and real-world incidents, as well as the COVID-19 response, identified long-standing biodefense challenges. GAO found that the nation lacked elements necessary for preparing for nationally significant biological incidents, including a process at the interagency level to assess and communicate priorities for exercising capabilities. Further, it determined that agencies do not routinely work together in monitoring results from exercises and real-world incidents to identify patterns and root causes for systemic challenges. Assessing and communicating exercise priorities and routinely monitoring the results of the exercises and incidents will help ensure the nation is better prepared to respond to the next biological threat.

GAO is making four recommendations each to DHS, DOD, HHS, and USDA, including that the secretaries work through the Biodefense Steering Committee to communicate exercise priorities and conduct monitoring. The departments generally concurred but in response to comments GAO modified the recommendations to reflect that the secretaries work through the Committee identified above.

▶▶ Read the GAO report

First Case of Marburg Virus Infection Detected in Guinea

Source: http://www.homelandsecuritynewswire.com/dr20210810-first-case-of-marburg-virus-infection-detected-in-guinea

Aug 10 – On Monday, 9 August, a case of an infection with the Marburg virus, an extremely dangerous disease causing hemorrhagic fever, was discovered in Guinea, the first in West Africa.

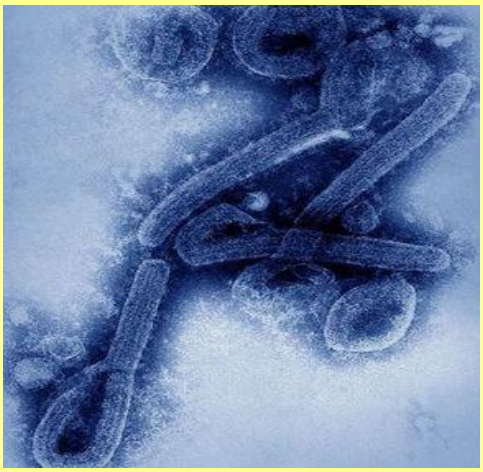
The World Health Organization (WHO), which announced the infection, said in a statement that the the Marburg virus was a "high" threat at the national and regional level, but a "weak" threat at the international level.

"Marburg virus disease, which belongs to the same family as the virus responsible for Ebola virus disease, was detected less than two months after Guinea declared the end of the Ebola epidemic which had erupted at the beginning of the year, "said the WHO Africa office.

The Guinean government on Monday night has confirmed the appearance of the Marburg virus in Guinea.

The case was detected in the Prefecture of Guéckedou, in the south of the country, in a village located in a forest area near the borders with Sierra Leone and Liberia. The infected man died on 2 August, and doctors reported that he began to exhibit symptoms of the disease on 25 July.

Le Monde reports that blood samples taken from the patient and tested by a Guéchadou field laboratory as well as by the Guinean National Hemorrhagic Fever Laboratory have been positive for Marburg virus. Complementary analyzes carried out by the Institut Pasteur of Senegal then confirmed this result. The patient had been treated in a Koundou clinic (Guéckedy Prefecture), where a team of medical investigators had been dispatched to study the case as his condition was worsening.



A team of ten WHO experts is already on the ground and provides support to the Guinean national health authorities, which are leading the investigation. Guinea has also announced that it was tightening cross-border surveillance.
Marburg virus disease is transmitted to humans by frugivorous bats and spreads among humans by direct contact with an infected person's body fluids, or by touching contaminated surfaces and materials, according to the WHO.
There were previous outbreaks of Marburg disease in Africa, with cases reported in South Africa, Angola, Kenya, Uganda, and the Democratic Republic of Congo. But this is the first time the virus is detected in West Africa.
The disease begins suddenly, with high fever, intense headaches, and general malaise. The lethality rates ranged from 24 percent to 88 percent, depending on the viral strain and case management. There are no vaccines or antiviral treatments, but oral or intravenous rehydration and the treatment of specific symptoms improve survival rates.

How Can We Unlock New Possibilities in Vaccine Development?

By Neeta Ratanghayra, MPharm
Source: https://www.technologynetworks.com/biopharma/articles/how-can-we-unlock-new-possibilities-in-vaccine-development-351106

Aug 06 – Vaccines are a critical tool to prevent infectious diseases and improve global health. Safe and efficacious vaccination has saved millions of lives, increasing the average life expectancy from 40 years in 1900 to more than 80 years today. Over time, the way that vaccines are developed has changed. Improved understanding of the immune system and the availability of advanced structural biology tools and genetic delivery systems have unlocked innovative concepts to vaccine design. The various vaccines developed for COVID-19 presents a great example of how innovation can transform the area of vaccinology. This article covers the challenges associated with conventional vaccine approaches and elaborates on some of the recent innovations which can help design better vaccines.

What are the challenges with conventional approaches?
Vaccines have traditionally been developed using the disease-causing pathogen in different forms – live, attenuated and at times killed or inactivated viruses. Newer vaccines are developed using recombinant technology and include conjugate vaccines, subunit vaccines and virus-like particles.
Virus-based vaccines can trigger a strong immune response, but there are some challenges that may restrict their use. Live-attenuated vaccines pose the risk of reversion to the pathogenic form, while inactivated vaccines may not be able to mount an adequate immune response. Subunit vaccines were designed to counter these challenges, but these vaccines may also trigger an insufficient immune response, inducing partial protection in most cases. Another point to consider with traditional virus-based vaccines and subunit vaccines is their long development timelines, which make them less useful in rapid response strategies such as pandemics.

How can we meet the new challenges of vaccine development?
Several promising vaccine technologies and novel strategies have been developed and many are being evaluated to meet the challenges of vaccine development.

Using novel vaccine technologies

Nucleic acid vaccines (RNA and DNA vaccines)
Nucleic acid vaccines, including RNA and DNA vaccines, are viewed as the next generation of vaccine technology. Nucleic acid vaccines are easy to design and manufacture, possess an excellent safety profile and are cost effective. Of these, RNA vaccine platforms have gained immense popularity due to the recent approval of two mRNA vaccines for COVID-19, which took barely a year to be developed. In December 2020, the UK's Medicines and Healthcare products Regulatory Agency (MHRA), became the first regulator in the world to grant authorization for the emergency use of Pfizer–BioNTech's

COVID-19 vaccine – the world's first mRNA vaccine to gain approval. Clinical trials that evaluated mRNA vaccines in COVID-19 found them to be highly effective and safe.
mRNA vaccines can be manufactured synthetically without the use of toxic chemicals or cell cultures, hence safety concerns regarding the presence of cell-derived impurities and viral contaminants are reduced. Furthermore, the manufacturing of mRNA can be done rapidly, and the process is easily scalable. These properties make them suitable for the development of rapid response platforms.
mRNA vaccine technology is also being harnessed to develop vaccines for other debilitating conditions such as that caused by human immunodeficiency virus (HIV). It has been more than three decades since HIV was first discovered as the cause of acquired immunodeficiency syndrome (AIDS), but scientists have had little success developing vaccines to prevent HIV infection. This contrasts the rapid development process we have witnessed with the COVID-19 vaccine. "Unlike COVID-19, where the SARS-CoV-2 virus was relatively straightforward with respect to vaccine design, as the spike protein (S) and its receptor-binding domain (RBD) were quite accessible targets for inducing neutralizing antibodies to generate protective immunity, HIV presents many challenges," says Wayne Koff, president and CEO of the Human Vaccines Project and adjunct professor of epidemiology at the Harvard T.H. Chan School of Public Health.
Explaining the challenges, Koff continues, "First and foremost is the hypervariability of HIV-1, which dwarfs that of variable influenza, which in turn dwarfs that of SARS-CoV-2. Thus, to develop a safe and effective HIV-1 vaccine, one likely needs to induce broadly neutralizing antibodies and potentially broadly reactive cellular immune responses. Other challenges for HIV-1 include the limitations of animal models in predicting vaccine efficacy; the fact that HIV-1 infects cells of the immune system. Lastly, HIV is a retrovirus that integrates into the genome, making clearance of infection extremely difficult."
The advantages offered by the mRNA vaccines and the success observed in COVID-19 brings hope that the applicability of RNA vaccine platforms will be widened for HIV and other infectious diseases. "Progress continues to be made on the discovery of antigens for inclusion in HIV-1 vaccines, and vaccine strategies such as sequential immunization of different immunogens to generate broadly neutralizing antibodies – but unfortunately, the field remains years away from the successful development of an HIV-1 vaccine. Vaccine platforms such as mRNA can accelerate AIDS vaccine development – as they offer the potential for rapid screening of immunogens," says Koff.
When asked if the mRNA vaccine platforms can be used to develop vaccines for cancer, Ben van der Zeijst, emeritus professor at the Leiden University Medical Center said, "Certainly yes. BioNTech started out with mRNA vaccines against cancer. There is presently much activity in this field."

Nanoparticle vaccines

Advances in chemical and biological engineering have paved the way for the development of vaccines based on nanoparticles. In nanoparticle vaccines, protein antigens and carrier molecules are chemically cross-linked to enhance immunogenicity and stability. The physicochemical properties of the nanoparticles including the size, shape, solubility, functionality and surface chemistry, can be regulated to develop vaccines with the desired biological properties.
Nanoparticles shield antigens, the most essential component of a vaccine, from proteolytic degradation. They also enhance the antigen delivery to antigen-presenting cells. Antigens can be incorporated into the nanoparticles via encapsulation or by conjugation. Stanford University researchers are developing a single-dose nanoparticle vaccine for COVID-19 that can be stored at room temperature. When tested in mice, the Stanford nanoparticle vaccine could produce SARS-CoV-2 immunity after just a single dose.

Using novel vaccine strategies

Structure-based vaccine design

With time, viruses evolve and generate host-evading mechanisms which may render them resistant to vaccines. A better knowledge of the viral structure, especially the antigen structure, can help decipher ways to understand and overcome the host-evading mechanisms and ultimately guide the design of novel vaccines against challenging viruses.
To better understand the structural details, advanced techniques such as X-ray crystallography, electron microscopy and computational biology are being used. These techniques can provide vital structural information about the viral envelope, protein conformation and antigenic epitopes which can help design antigens with better immunological features and biophysical characteristics.

"Quality by Design" framework to increase process robustness and scalability

The COVID-19 pandemic has highlighted the need for manufacturing technologies capable of producing large amounts of high-quality vaccines, quickly. Quality by Design (QbD) is a framework that can help in this regard.

The complexity and variability involved with the production of *vaccine and biopharma products make it* challenging to maintain product quality consistently in each batch. The current approach tests the product after it has been produced and if non-compliant to the quality standards, that batch is discarded. QbD is a systematic approach that integrates a novel qualitative methodology and a quantitative bioprocess model to support the development and consistent production of safe and efficacious vaccines. With QbD, safe, effective and high-quality vaccines as well as medicines can be produced consistently.

The implementation of the QbD framework follows an iterative development cycle. "The QbD framework supports both the development and operation of production processes and it follows an iterative development cycle to ensure continuous improvement through the product-process life cycle," says Zoltán Kis, research associate in the Future Vaccine Manufacturing Hub, Imperial College London.

The first step in the QbD framework is identifying the patients need, and then using a risk assessment type scoring, the critical quality attributes of the product is evaluated. Next, ways to control the production process are identified so that the product is produced consistently following all the critical quality attributes in the pre-defined ranges. "This allows for flexibility/adaptability in the production process, instead of running the cGMP production process at fixed settings (sometimes called "frozen" cGMP process)," says Kis. The QbD model can be used to predict undesired changes in product quality ahead of time. This allows corrective measures to be taken early to fix the predicted faults. Another approach is the use of "digital twins", in which QbD can be combined with models to better monitor and control the process. This is also called "Quality by Digital Design". Kis explains further, "The models (once validated and approved by the regulatory authorities) can in principle predict ahead in time how the product quality will change. For example, if the models predict that the product quality will go out of specifications in the next 5-10 minutes, the corrective measures can be taken at the present moment to correct/fix those quality deviations before these occur (thus fixing faults in the quality before these occur). This could replace (at least partially) quality by testing with quality by design. This means that the quality can be built into (or assured by) the design and operation/automation of the production process."

Artificial intelligence for vaccine development

Artificial intelligence (AI) can be an invaluable tool to design better vaccines. In fact, many of the COVID-19 vaccines owe their quick development to the power of AI.

"AI offers great potential for designing better vaccines- as the speed in which supercomputers, AI and machine learning, enables identification of novel sites of vulnerability on viral proteins such as HIV ENE and SARS-CoV-2 (S)," says Koff. Machine-learning systems and computational analyses can help understand the virus and its structure and predict which of its components can contribute to an immune response. AI approaches can also be used to study the virus's genetic mutations and understand how the virus evolves over time – this is especially relevant for conditions such as COVID-19, where several viral variants have emerged.

Though advantageous, AI alone is not sufficient. Koff explains, "AI alone will be less effective, at least in the short term, than coupling AI with structural modelling and wet-lab experimentation, to iteratively improve the AI models. In parallel, the generation of unprecedented scales of human immunity data, by the Human Vaccines Project and others, can help to facilitate the generation of initial AI models of human immunity – which will lead to future improvements of vaccine effectiveness in vulnerable populations, such as the elderly."

Newer modes of vaccine delivery

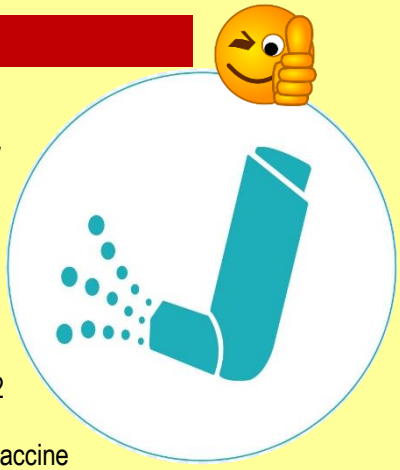
Delivery is an important issue because most vaccines currently used are still administered intramuscularly, subcutaneously or intradermally with a hypodermic needle. Nasal vaccines, jet injectors, microneedles and nanopatches are some promising modes of vaccine delivery that may offer a painless, cost-effective, safe, and convenient option. These delivery strategies may also avoid the need for expensive cold-chain transport and storage, an important issue in resource-constraint regions. Additionally, a painless delivery system can ensure better compliance with the vaccination schedule.

Intranasal vaccines offer a needle-free method of immunization that can be easier to use and distribute. "The need/benefit to using an aerosol vaccine will be directed by the indication of the type of immune response you need. If the infectious disease attacks the respiratory tract then it might be beneficial to have an aerosolized vaccine. If you need respiratory mucosal immunity an aerosolized vaccine could be beneficial," explains Aurelio Bonavia from the vaccine development group at Bill & Melinda Gates Medical Research Institute. SARS-CoV-2 infections are found to trigger both

systemic and mucosal immunity. Hence, administering vaccines through the nasal route is seen as a promising vaccine strategy. Another area where aerosol vaccines are being studied is tuberculosis.
Though an attractive mode of delivery, intranasal vaccines have gained little interest. But there are hopes that this perception may change once an internasal vaccine for COVID-19 is approved. Several challenges may hamper the development of intranasal vaccines. "Device, price, regulatory path, formulation, characterization of the aerosol particle and characterization of the immune response are some key challenges in developing an aerosolized vaccine,", says Bonavia.

What does the future hold?
Applying a structure-based approach, using new vaccine platforms and leveraging automation are key to circumvent the challenges associated with the current vaccine development strategy. COVID-19 is a remarkable example of how advances in technology can enable the development of vaccines with increased efficiency within shorter time frames. Hopes are high that these novel approaches and development strategies can pave the way to develop vaccines against diseases in which the traditional approaches have failed.

First data about COVID-19 aerosolised vaccine



Source: https://www.univadis.co.uk/viewarticle/first-data-about-covid-19-aerosolised-vaccine-748946

Aug 04 – The results of an open-label phase I trial, published in *The Lancet Infectious Diseases*, show that an aerosolised adenovirus-vectored COVID-19 vaccine (Ad5-nCoV) was well-tolerated, inducing similar humoral and cellular immune responses to intramuscular vaccination.
The analysis included 130 participants, who were randomly assigned into one of five groups to be vaccinated either via intramuscular injection (one or two doses), aerosol inhalation (high or low dose, two doses), or both (initial intramuscular dose followed by an aerosolised booster). The primary safety endpoint was the occurrence of adverse events within seven days after each vaccination. The primary immunogenicity outcome was anti-SARS-CoV-2 spike receptor IgG antibody and SARS-CoV-2 neutralising antibodies at day 28 after the last vaccination.
The results show that the most common adverse events reported seven days after the first or booster vaccine were fever, fatigue, and headache. More adverse events were reported in participants who received intramuscular vaccination, than those who received the aerosol vaccine.

One dose of aerosolised Ad5-nCoV, equal to a fifth of an intramuscular dose, induced a strong cellular response. A two-dose aerosolised Ad5-nCoV produced similar SARS-CoV-2 neutralising antibody titres as one dose of intramuscular vaccination.

These findings support further evaluation of the aerosolised Ad5-nCoV vaccine, the authors concluded.

Reference: *Wu S, Huang J, Zhang Z, Wu J, Zhang J, Hu H, et al. Safety, tolerability, and immunogenicity of an aerosolised adenovirus type-5 vector-based COVID-19 vaccine (Ad5-nCoV) in adults: preliminary report of an open-label and randomised phase 1 clinical trial. The Lancet Infectious Diseases 2021:S1473309921003960. https://doi.org/10.1016/S1473-3099(21)00396-0*

Study of 200,000 people shows Covid-19 vaccine 'zero threat' to fertility

Source: https://www.thenationalnews.com/uae/2021/08/11/study-of-200000-people-shows-covid-19-vaccine-zero-threat-to-fertility/

Aug 11 – Scientists have debunked myths circulating on social media that claim vaccines against Covid-19 could cause infertility.
Incorrect claims that the Pfizer vaccine could cause a woman's body to attack the placenta, leading to infertility, were dismissed by the Royal College of Obstetricians and Gynaecologists in the UK.
College spokeswoman, Prof Lucy Chappell, an obstetrician at King's College London, said there was "no plausible biological mechanism" by which the vaccine could affect fertility.
"When you get the vaccine you develop an antibody to the spike protein, similar to if you had a Covid-19 infection," Prof Chappell said.
"Those antibodies don't affect your fertility. There have been myths that the proteins are similar, but lots of proteins are similar.
"It doesn't mean that the vaccine can impact your fertility."

Pfizer vaccinations have been made available for women in their 13th week of pregnancy in Dubai since June.
The Dubai Health Authority recommends that expectant mothers consult their doctors before being inoculated.
Other similar vaccines, such as those used to fight flu or whooping cough, have for years been used safely by pregnant women or those trying to start a family.
Such non-live vaccines are proven to be safe.
During clinical trials for Covid-19 vaccines, data showed that the percentage of women who had been vaccinated and then became pregnant was the same as those who received placebos.
Researchers also monitored sperm counts for men who received the vaccines compared with those who did not.

Vaccines safe to take during pregnancy
Social media posts highlighted guidance issued by the UK government in the early stages of the vaccine campaign stating it was unknown if the Pfizer vaccine affected fertility.
The scientific description of "no evidence" was a result of no long-term research to support the vaccine.
That has since been amended in UK government advice, and updated to state that animal studies do not indicate any harmful effects on the reproductive system.
Anecdotal reports worldwide among women support medical statements that vaccines are safe during pregnancy, and for those trying for a baby.
A new £7.5 million ($10.39m) UK government study, led by St George's, University of London, will investigate and monitor the immune response in pregnant women and their babies to vaccination at different dose intervals.
Dr Pat O'Brien, vice president of the Royal College of Obstetricians and Gynaecologists, welcomed the trial, but emphasised that the current evidence shows women should not be concerned.
"We now have robust data of nearly 200,000 women from across the US and the UK, who have received the Covid-19 vaccine with no safety concerns," he said.
"This tells us that both the Moderna and Pfizer vaccines are safe in pregnancy."

WHO begins global trial testing trio of drugs to treat severe COVID-19

Source: https://newatlas.com/health-wellbeing/who-solidarity-plus-coronavirus-infliximab-artesunate-imatinib/

Aug 21 – The World Health Organization is launching a large-scale global clinical trial testing whether a trio of pre-existing drugs can be repurposed to treat those hospitalized with severe COVID-19. The project serves as the second phase of WHO's Solidarity project, which last year found four common antiviral medications did not help hospitalized COVID-19 patients.

In March last year, within weeks of the initial global spread of SARS-CoV-2, the WHO announced a massive international trial testing several pre-existing antiviral drugs as potential treatments for COVID-19. Dubbed Solidarity, the world's largest randomized controlled trial on COVID-19 therapeutics tested four drugs: remdesivir, hydroxychloroquine, lopinavir/ritonavir and interferon.
By the time the research concluded late in 2020, it had encompassed 405 hospitals across 30 countries and recruited over 11,000 participants. All

four antiviral treatments tested were found to have little to no effect on overall mortality or duration of hospital stay.

Now the WHO has kicked off the second phase of its global research program, named Solidarity Plus. This project will investigate three pre-existing drugs – artesunate, imatinib and infliximab.

Last year, as we learned more and more about this novel virus and the disease it causes, an old immunosuppressive drug called dexamethasone was turning out to be the most useful pre-existing drugs to help severe COVID-19 patients.

It was discovered that when hospitalized patients begin to rapidly deteriorate it is due to the body's natural immune defenses overreacting and triggering respiratory failure. So if an immunosuppressive drug can be administered at precise times before hospitalized patients really decline, then lives can be saved.

Importantly, these drugs do not help patients at earlier stages of disease. In fact, if immunosuppressive drugs are administered too early in the course of the disease it can make things much worse.

All three drugs being trialed share anti-inflammatory properties but act in very different ways. Infliximab, for example, is a monoclonal antibody treatment designed to inhibit an inflammatory protein called tumor necrosis factor alpha. It is commonly used to treat Crohn's disease and rheumatoid arthritis.

Imatinib is a cancer drug known as a small molecule tyrosine kinase inhibitor, and artesunate is an anti-malarial drug with known anti-inflammatory effects.

Infliximab and artesunate are both intravenously delivered drugs, while imatinib is an oral medication. The trial is designed to run alongside local standard of care in any given region, and patients enrolled will be randomly allocated one of the interventions soon after initial admission with a positive COVID-19 diagnosis.

The new phase of Solidarity will be bigger than its 2020 predecessor, this time encompassing 600 hospitals across 52 countries. The project aims to enroll over 14,000 patients over the coming weeks and months.

"Finding more effective and accessible therapeutics for COVID-19 patients remains a critical need, and WHO is proud to lead this global effort," says Director-General of the WHO, Tedros Adhanom Ghebreyesus. "I would like to thank the participating governments, pharmaceutical companies, hospitals, clinicians and patients, who have come together to do this in true global solidarity."

Methods to Detect Viruses Get a Boost, Thanks to the COVID-19 Response

Scientific progress has kept an unprecedented pace over the last year and a half. This is perhaps most evident in the near-miraculous development of several highly effective COVID-19 vaccines in under a year. progress has kept an unprecedented pace over the last year and a half. This is perhaps most evident in the near-miraculous development of several highly effective COVID-19 vaccines. **+ MORE**

UViSAFE Destroys Covid-19, H1N1 Viruses, Delivers Safest & Healthiest Air To Breathe

Press Release

Source: http://oshohealth.com/air-disinfectant-purifier.php

It's time to welcome and assure people returning to the workplace or children going back to the school classroom to give confidence to them that their work or school classroom environment is safe and they can breathe the safest, purest air.

You will be happy to note, UViSAFE has been tested and validated by **ICMR** as a Medical Device. UViSAFE was tested on SARS-CoV2 (Covid-19 Virus) and H1N1 (Swine Flu) virus, under ICMR guidance and as per ICMR testing protocols by Rajiv Gandhi Centre for Biotechnology, Ministry of Science and Technology, Department of Biotechnology, Govt. of India. UViSAFE reduces the viral load by **99.99998%** for both SARS-CoV2 and H1N1 viruses.

UViSAFE is required everywhere or it would not be wrong to say under current global environmental conditions that "Wherever humans are, we require UViSAFE".

With UVi SAFE Air Disinfectant, one can breathe the SAFEST, PUREST, CLEANEST Virus/ Bacteria free Air as UVi SAFE kills Airborne Viruses / Bacterias, Fungi, Mold to the smallest micron in size.
UViSAFE is required in every hospital room, operation theaters, ICU, School / Collages Classrooms, Shops, Restaurants, Hotel Rooms, Ambulances, offices, homes, public washrooms, etc.
UViSAFE is not a UV Lamp but an Air disinfectant / Purifier and **SAFE FOR HUMANS,** one can run UViSAFE devices for any nos of hrs in human presence. UViSAFE has no consumables and power consumption is very very low.

UViSAFE is has been tested and validated by labs accredited to:
▶ ICMR - ICAR - CSIR – NABL

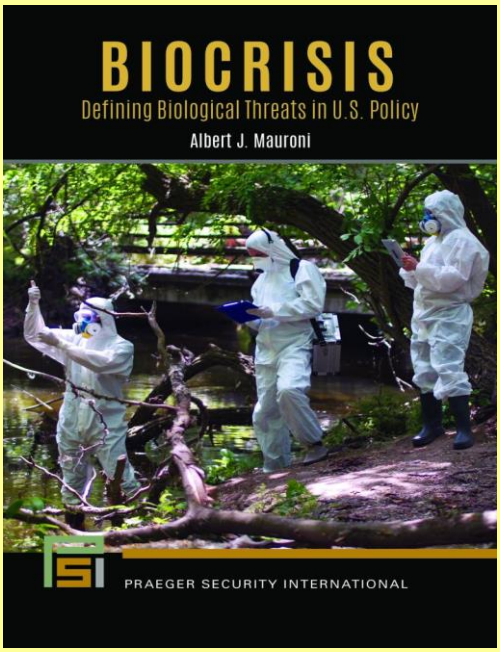
UViSAFE has received the following certifications and is currently being exported to UK, France, Italy, Germany, Ireland, etc.:
✓ ISO 13485 (Medical Device)
✓ CE (Medical Device)
✓ WHO-GMP
✓ ISO 9001

UViSAFE comes in 3 different models, as per area coverage for 150 sqft area / 300 sqft area / 1000 sqft area.

"BIOCRISIS: Defining Biological Threats in U.S. Policy"

Author: Al Mauroni (Director, US Air Force Center for Strategic Deterrence Studies)

▶ *To Be Published around February 2022*



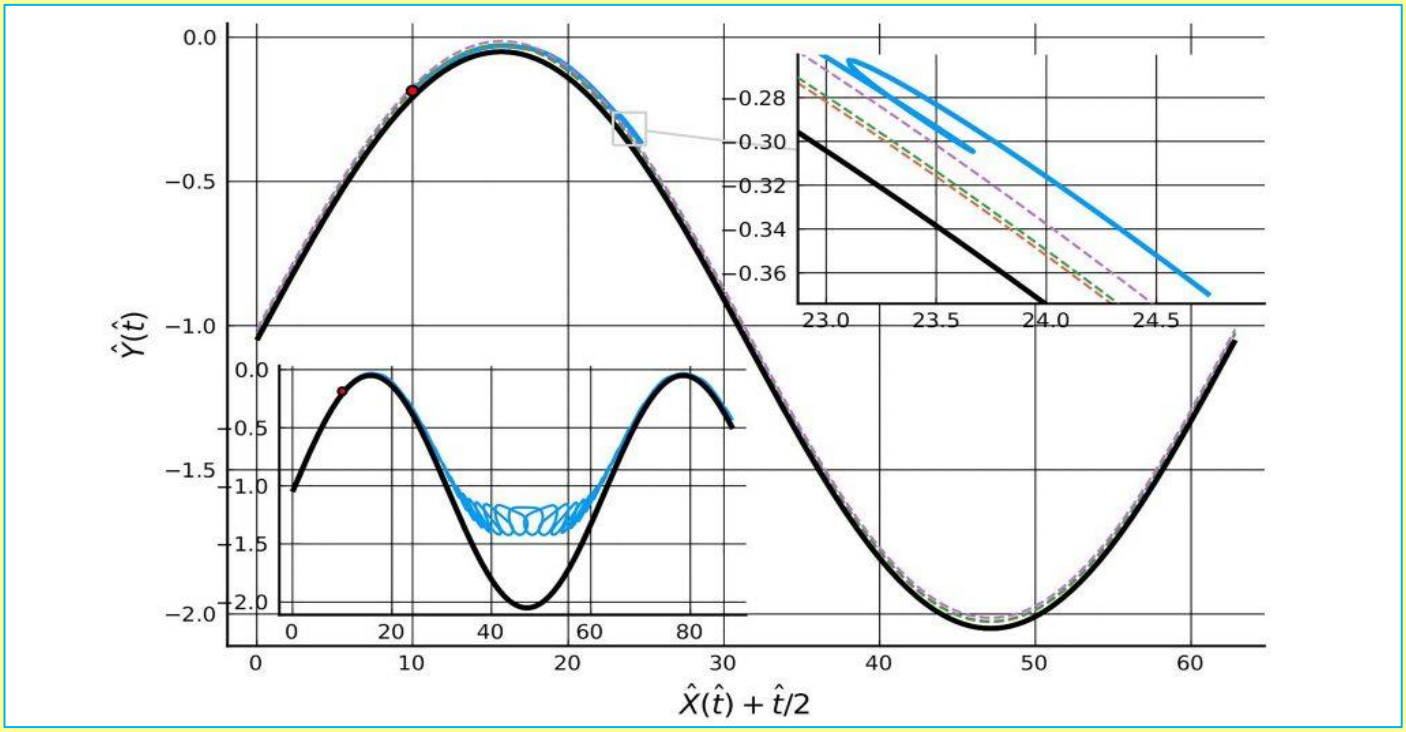
This book is designed to educate and inform policy makers as well as practitioners as to the challenge of developing federal policies addressing biological threats. The author explains how five areas are unique but overlapping areas of concentration - #diseaseprevention, #bioterrorism response, military #biodefense, #biosurety, and agricultural #biosecurity and food safety. While they all address biological threats, they have unique communities of interest. After demonstrating the different agendas, programs, agencies, and advocates for each of the five communities, the book offers a proposed way forward to improve the executive and legislative development of U.S. policy addressing #biological threats.

Wash Your Hands For 20 Seconds: Physics Shows Why

Source: https://publishing.aip.org/publications/latest-content/wash-your-hands-for-20-seconds-physics-shows-why/

Aug 17 — Though hand-washing is proven effective in combating the spread of disease and infection, the physics behind it has rarely been studied. But in Physics of Fluids, by AIP Publishing, researchers from Hammond Consulting Limited describe a simple model that captures the key mechanics of hand-washing.
By simulating hand-washing, they estimated the time scales on which particles, like viruses and bacteria, were removed from hands. The mathematical model acts in two dimensions, with one wavy surface moving past another wavy surface, and a thin film of liquid between the two. Wavy surfaces represent hands because they are rough on small spatial scales.
Particles are trapped on the rough surfaces of the hand in potential wells. In other words, they are at the bottom of a valley, and in order for them to escape, the energy from the water flow must be high enough to get them up and out of the valley.

The strength of the flowing liquid depends on the speed of the moving hands. A stronger flow removes particles more easily.
"Basically, the flow tells you about the forces on the particles," said author Paul Hammond. "Then you can work out how the particles move and figure out if they get removed."



One case of a particle's movement. It begins as the redpoint, resting on the surface of the hand (black wavy line).
It follows the blue path, escaping the hand and then moving freely through the hand-washing fluid. CREDIT: Paul Hammond

He likens the process to scrubbing a stain on a shirt: the faster the motion, the more likely it is to come out.
"If you move your hands too gently, too slowly, relative to one another, the forces created by the flowing fluid are not big enough to overcome the force holding the particle down," said Hammond.
Even when particles are removed, that process is not fast. Typical hand-washing guidelines, like those from the Centers for Disease Control and Prevention, suggest at least 20 seconds under the faucet.
Results from Hammond's model agree. It takes about 20 seconds of vigorous movement to dislodge potential viruses and bacteria.
The model does not consider chemical or biological processes that occur when using soap. However, knowing the mechanisms that physically remove particles from hands may provide clues to formulating more effective, environmentally friendly soaps.
"Nowadays, we need to be a bit more thoughtful about what happens to the wash chemicals when they go down the plughole and enter the environment," said Hammond.
Hammond said this is not the whole story of hand-washing, but it does answer important questions and lay the foundation for future research.

Long COVID Might Be The Manifestation of a Different Virus Reawakened in The Body

Source: https://www.sciencealert.com/mounting-evidence-suggests-many-covid-19-long-haulers-are-co-infected-with-epstein-barr

Aug 18 – People who struggle to recover from COVID-19 could be battling more than just SARS-CoV-2. Their immune systems might also be involved with another virus as well.
Ever since patients first started reporting long hauls of COVID-19, many of their lingering symptoms, such as fatigue and brain fog, have been compared to chronic fatigue syndrome or myalgic encephalomyelitis (CFS/ME).

New research suggests that's no coincidence. In some cases, both chronic illnesses might have similar roots. A recent study among 185 COVID-19 patients in the United States has found the majority of 'long haulers' the researchers tested were positive for **Epstein-Barr virus (EBV) reactivation.**

Recent research has found that a subset of CFS/ME patients show signs of EBV reactivation, and now, it seems that a potentially large percentage of people with long COVID do as well.

EBV is one of the most common viral infections out there. The vast majority of people around the world contract the virus at some point in their lives, and after the acute infection phase, an inactive version of the virus sticks around in the body for a lifetime.

Sometimes, EBV can reactivate and cause flu-like symptoms, such as during periods of psychological or physiological stress.

Like, say, a global pandemic.

"We ran Epstein-Barr virus serological tests on COVID-19 patients at least 90 days after testing positive for SARS-CoV-2 infection, comparing EBV reactivation rates of those with long COVID symptoms to those who never experienced long COVID symptoms," explains biologist Jeffrey Gold of World Organization.

"We found over 73 percent of COVID-19 patients who were experiencing long COVID symptoms were also positive for EBV reactivation."

What's more, many of the reported symptoms are very similar to those that arise from EBV reactivation, including extreme fatigue, frequent skin rashes and Raynaud's phenomenon, which causes decreased blood flow to the fingers and toes. In the past year, long haulers have even taken to calling their swollen and red extremities 'COVID toes'.

Although the size of the sample studied here is very small, the results suggest many long COVID symptoms may not actually arise from SARS-CoV-2 itself, but from EBV reactivation, potentially triggered by the widespread inflammation of COVID-19.

Among all 185 randomly selected COVID-19 patients, researchers found nearly a third experienced unshakeable symptoms that lasted for months, sometimes even more than a year.

In a random sample of the study subjects, nearly 67 percent of long haulers showed antibodies for EBV reactivation in their bloodwork. At the same time, only 10 percent of patients with no long-term symptoms tested positive for EBV reactivation.

The researchers also recruited a second group of people whose COVID-19 diagnoses had been received 21-90 days before. Even in these short-term subjects, the ratio of EBV reactivation was similar.

"We found similar rates of EBV reactivation in those who had long COVID symptoms for months, as in those with long COVID symptoms that began just weeks after testing positive for COVID-19," says molecular microbiologist David Hurley from the University of Georgia.

"This indicated to us that EBV reactivation likely occurs simultaneously or soon after COVID-19 infection."

Earlier this year in Wuhan, China, researchers also found evidence that EBV reactivation might be associated with COVID-19 in its earliest stages. Within two weeks of COVID-19 infection, more than 50 percent of all 67 COVID-19 patients in the study showed signs of EBV reactivation. And this co-infection of EBV and SARS-CoV-2 was associated with more severe symptoms.

As early as last year, another small ICU study in Europe showed that positive EBV DNA was observed in roughly 87 percent of the 104 COVID-19 patients examined.

If EBV does reactivate in such a large percentage of COVID-19 patients, it's worth understanding their relationship further.

The researchers behind this latest study think that it could even be worth testing new COVID patients for EBV antibodies. If these patients show signs of EBV reactivation, they could receive further medical treatment to protect them against the risk of developing severe or long forms of COVID-19.

Of course, not all long haulers will show EBV reactivation, and some recovered COVID-19 patients can show evidence of EBV reactivation without suffering from any lingering symptoms. That said, a test like this could help identify where health risks are greatest and help us plan accordingly.

While there is currently no drug that is licensed to specifically treat EBV reactivation, there are medications that can help reduce the viral load, giving the immune system a break.

A recent study from China, for instance, found that administering the antiviral drug, ganciclovir, can decrease the risk of severe illness developing among COVID-19 patients. A similar drug, known as valganciclovir, also appears to reduce some of the symptoms of CFS/ME, at least among patients who show antibodies for EBV, but research in this area is still in its infancy.

How EBV is connected to certain cases of CFS/ME is still hotly debated. There are those who think the virus can directly trigger this chronic illness, while others think the illness comes first before causing inflammation that can reactivate EBV infections.

While diseases and autoimmune conditions other than COVID-19 are known to trigger EBV reactivation, the authors say SARS-CoV-2 appears particularly good at poking this viral beast.
"While EBV reactivation may not be responsible for all cases of recurring fatigue or brain fog after recovering from COVID-19, evidence indicates that it likely plays a role in many or even most cases," the researchers explain.

▶▶ **The study was published in** *Pathogens*.

Kids' Nose Cells Are Primed to Fight Viruses, May Explain Milder COVID-19

When researchers compared the single-cell transcriptional landscape of the upper airways of adults and children, they found that children's cells are primed for the detection of viruses, which result in stronger early immune responses to SARS-CoV-2 infection. These findings may help to explain why children have a lower risk of being infected by SARS-CoV-2, and developing severe COVID-19 symptoms, than adults. **+ MORE**

Can the COVID vaccine affect your menstrual cycle or fertility?

Source: https://www.abc.net.au/news/health/2021-08-09/covid-19-vaccine-can-it-affect-period-fertility/100346746

Aug 08 – As COVID-19 vaccines continue to roll out around the world, a small but growing number of women have reported short-term changes in their menstrual cycle following vaccination.
Several women have contacted the ABC to say they've experienced a heavier period, heightened cramps, or an early, delayed or even absent period after their COVID-19 jab.
But drawing a connection between menstrual patterns and vaccination is far from straightforward.
Despite anecdotal reports, there is no scientific evidence that links menstrual irregularities to the coronavirus vaccines, and there are many factors that can affect menstruation, including stress.
"We're already on a baseline of people's cycles varying normally, and in the context of the pandemic, people's cycles have been varying more … and that almost certainly has to do with stress," said Victoria Male, a reproductive immunologist at Imperial College London.
Dr Male said there may be "biologically plausible ways" in which vaccines could temporarily impact menstrual cycles.
But other experts have cautioned drawing a link between the two, and say there are much more likely explanations for the uptick in anecdotal reports, which have little to do with the vaccines themselves.
So, what might be going on here?

What do anecdotal reports say?

Let's first take a look at the menstrual changes people have said they've noticed, most of which appear to be short-lived.
"The most common thing people report is a heavier period than usual, and the next most common thing is a later period," said Dr Male, who is running a study in the UK investigating whether these short-term changes could be linked to vaccination.
"Most people say that happens for one cycle … some people say they have two periods out of whack."
Dr Male said the changes did not appear to be associated with any single vaccine, and that they rarely extended beyond one or two cycles.
Similarly, researchers in the US (also studying anecdotal reports) have said the self-reported menstrual changes they've analysed also appear to be short-lived, but that people's experiences were highly variable.
"[Among those reporting changes], people on long-acting hormonal contraceptives, people on gender-affirming hormones and post-menopausal people were all reporting effectively surprise periods or breakthrough bleeding," Kate Clancy, an associate professor at the University of Illinois, told The Guardian.
Healthcare worker Kaye Kingham, 38, was recently taken by surprise when she noticed changes to her menstrual cycle after getting the second dose of the Pfizer vaccine.
Her period had come a week early, which was unusual given her regular cycle.
"Exactly 28 days, give or take a day — it was pretty clockwork," said the Victorian, who kept close tabs on her cycle after switching to a different type of contraceptive pill six months ago.
Then came other irregularities that were foreign to her experience since being on birth control.

"It was probably the most painful period I've had since being on the pill," she said. "I had spotting afterwards for a few days, which I've never had before too." Like most people, Kaye's period soon returned to its normal pattern.

How often is this happening?

Because COVID-19 vaccine clinical trials didn't track data on menstruation, researchers have been relying on vaccine safety-monitoring systems and self-reporting.

In the UK to date, a total of 27,510 reports of "a variety of menstrual disorders" have been reported, "including heavier than usual periods, delayed periods and unexpected vaginal bleeding" following COVID-19 vaccination.

That might sound like a lot — but it's on the background of 43.4 million COVID-19 vaccine doses being administered to women.

According to the UK's national drug regulator, the number of reports is, "low in relation to both the number of females who have received COVID-19 vaccines to date, and how common menstrual disorders generally are".

In other words, the regulator doesn't consider the number of "period problems" to be high (or higher than expected), given the normal rate of menstrual disorders seen in the wider population. Nevertheless, it says it's investigating the reports.

Leading reproductive immunologist Sarah Robertson said this wasn't to say reports of menstrual changes post-vaccination should be dismissed or minimised.

But she said it was important to separate instances of correlation (where two events coincide) from causation (where one thing causes another).

"There will be lots of people who link [vaccination and menstrual changes] together in their mind," said Professor Robertson of the University of Adelaide.

"We are all instinctively, constantly reviewing what's happening with our reproductive cycles, and so when there are unusual events or exposures, we sort of link that with the changes we see in our biology.

"But what it actually takes to prove a causal association is a really large study that's very well controlled to take into account other possible explanations — and no-one has done that."

Menstrual changes are common, and can be affected by stress

Patterns of menstruation can be influenced by a range of factors, including age, medication, illness, diet, exercise habits — and stress.

Professor Robertson said if menstrual changes were found to be occurring at higher rates than normal following COVID-19 vaccination, it was most likely the result of "pandemic-induced stress".

"COVID-19, and the stress that comes with [lockdowns] and the disruption to our normal social, family and working lives, can be quite severe," she said.

High rates of stress have been shown to suppress hormone levels in the brain that help to regulate ovarian function, and cause disruptions to the menstrual cycle through this pathway.

Professor Robertson said for some people, vaccination itself may be a particularly stressful or anxiety-provoking experience.

"There's an extra fear, unfortunately because of the way [Australia] has handled the rollout of the vaccination … that means at the particular day or week [someone] is having the vaccine, they're probably just that little bit more anxious," Professor Robertson said.

Could the vaccine itself cause changes?

Dr Male agreed it may be increased levels of stress — or simply coincidence — that meant some people were experiencing menstrual changes around the time of their vaccine.

But she said there were also "biologically plausible ways" in which the vaccines may be having a more direct impact (albeit temporary) that meant the link was "worth investigating".

"We know, for example, the immune response affects sex hormones, and sex hormones affect the immune response," she said.

"So we can imagine a situation where if you really sort of activate the immune response, then you might see some short-term changes to sex hormones that would have a knock-on effect on the menstrual cycle."

She said it was also possible a significant activation of the immune system could impact the immune cells in the lining of the uterus, which may have an effect on the heaviness and timing of bleeding.

But Professor Robertson disagreed, and said it was highly unlikely that the degree to which the immune system was activated by a vaccine would be enough to alter immune cells in the ovary or uterus (enough to change when or how you bleed), or to change sex hormone levels in "a meaningful way".

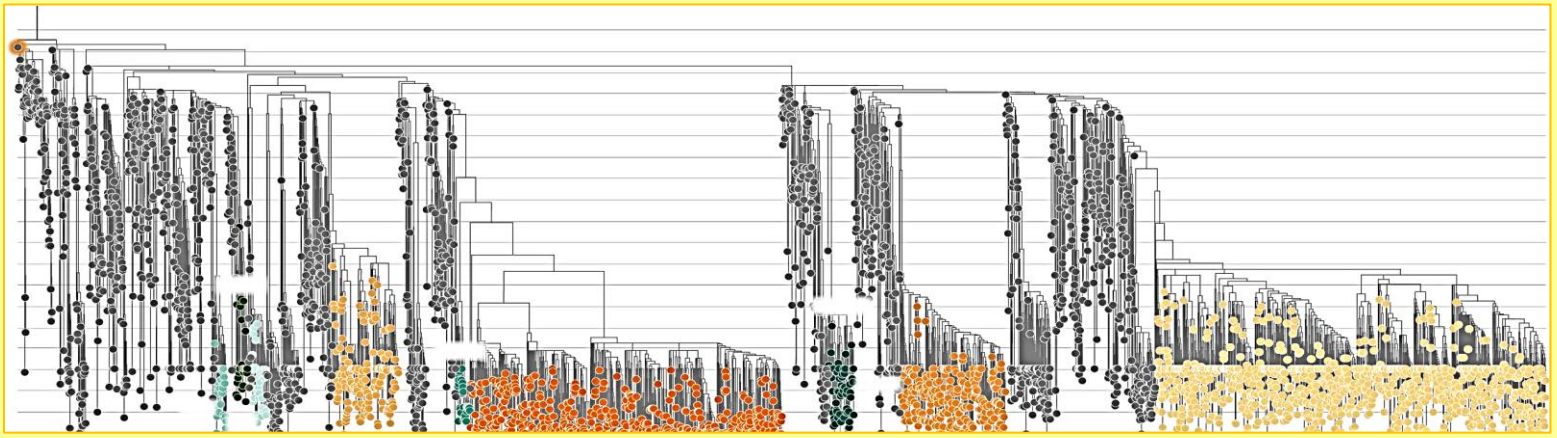
"The changes in the immune system in normal circumstances are too small, and too far away from these distant sites to cause any effects that would result in menstrual changes," she said.
"It is not beyond the realms of biological possibility that a severe response to a vaccination could cause small fluctuations to immune cells in the uterus or ovary … or brain tissue that controls the reproductive system.
"However, I think this is highly unlikely in all but the most rare cases.
"It's much more likely that other factors explain the menstrual changes that women report."

Research shows no impact on fertility

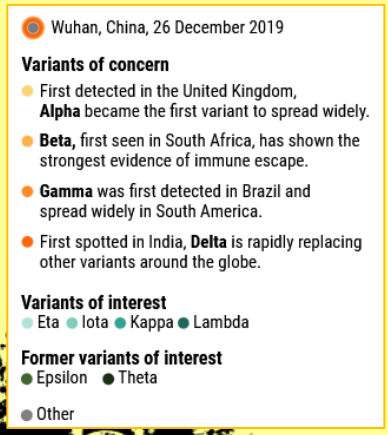
Both experts hastened to add that it was important not to confuse temporary menstrual changes with long-term fertility.
There is currently no evidence that COVID-19 vaccines cause any adverse effects on reproductive or pregnancy outcomes, and vaccination may even reduce the incidence of stillbirth.
A US study of over 35,000 pregnant women who received an mRNA-based vaccine (such as the Pfizer jab) found pregnant and non-pregnant women experienced similar side effects.
The chance of serious events like miscarriage and placental abnormalities occurred at a similar rate across both groups.
In Australia, pregnant women are recommended to get vaccinated against COVID-19 at any stage of pregnancy, and women who are breastfeeding or planning to get pregnant are also encouraged not to delay their vaccine.
Professor Robertson said large studies had consistently shown vaccines were safe, highly effective, and had no impact on fertility.
She urged pregnant women who face an increased risk of severe disease from COVID-19 to get vaccinated as soon as possible.
"When you weigh up the benefit of getting vaccinated compared to not getting vaccinated, it's a total no-brainer," she said.
"You're putting yourself and your baby at higher risk if you're not vaccinated when you could have been."

New SARS-CoV-2 variants have changed the pandemic. What will the virus do next?

By Kai Kupferschmidt
Source: https://www.sciencemag.org/news/2021/08/new-sars-cov-2-variants-have-changed-pandemic-what-will-virus-do-next



Aug 19 – Edward Holmes does not like making predictions, but last year he hazarded a few. Again and again, people had asked Holmes, an expert on viral evolution at the University of Sydney, how he expected SARS-CoV-2 to change. In May 2020, 5 months into the pandemic, he started to include a slide with his best guesses in his talks. The virus would probably evolve to avoid at least some human immunity, he suggested. But it would likely make people less sick over time, he said, and there would be little change in its infectivity. In short, it sounded like evolution would not play a major role in the pandemic's near future.
"A year on I've been proven pretty much wrong on all of it," Holmes says.
Well, not all: SARS-CoV-2 did evolve to better avoid human antibodies. But it has also become a bit more virulent and a lot more infectious, causing more people to fall ill. That has had an enormous influence on the course of the pandemic.



The Delta strain circulating now—one of four "variants of concern" identified by the World Health Organization, along with four "variants of interest"—is so radically different from the virus that appeared in Wuhan, China, in late 2019 that many countries have been forced to change their pandemic planning. Governments are scrambling to accelerate vaccination programs while prolonging or even reintroducing mask wearing and other public health measures. As to the goal of reaching herd immunity—vaccinating so many people that the virus simply has nowhere to go—"With the emergence of Delta, I realized that it's just impossible to reach that," says Müge Çevik, an infectious disease specialist at the University of St. Andrews.

Yet the most tumultuous period in SARS-CoV-2's evolution may still be ahead of us, says Aris Katzourakis, an evolutionary biologist at the University of Oxford. There's now enough immunity in the human population to ratchet up an evolutionary competition, pressuring the virus to adapt further. At the same time, much of the world is still overwhelmed with infections, giving the virus plenty of chances to replicate and throw up new mutations.

Predicting where those worrisome factors will lead is just as tricky as it was a year and a half ago, however. "We're much better at explaining the past than predicting the future," says Andrew Read, an evolutionary biologist at Pennsylvania State University, University Park. Evolution, after all, is driven by random mutations, which are impossible to predict. "It's very, very tricky to know what's possible, until it happens," Read says. "It's not physics. It doesn't happen on a billiard table."

Still, experience with other viruses gives evolutionary biologists some clues about where SARS-CoV-2 may be headed. The courses of past outbreaks show the coronavirus could well become even more infectious than Delta is now, Read says: "I think there's every expectation that this virus will continue to adapt to humans and will get better and better at us." Far from making people less sick, it could also evolve to become even deadlier, as some previous viruses including the 1918 flu have. And although COVID-19 vaccines have held up well so far, history shows the virus could evolve further to elude their protective effect—although a recent study in another coronavirus suggests that could take many years, which would leave more time to adapt vaccines to the changing threat.

Explaining the past

Holmes himself uploaded one of the first SARS-CoV-2 genomes to the internet on 10 January 2020. Since then, more than 2 million genomes have been sequenced and published, painting an exquisitely detailed picture of a changing virus. "I don't think we've ever seen that level of precision in watching an evolutionary process," Holmes says.

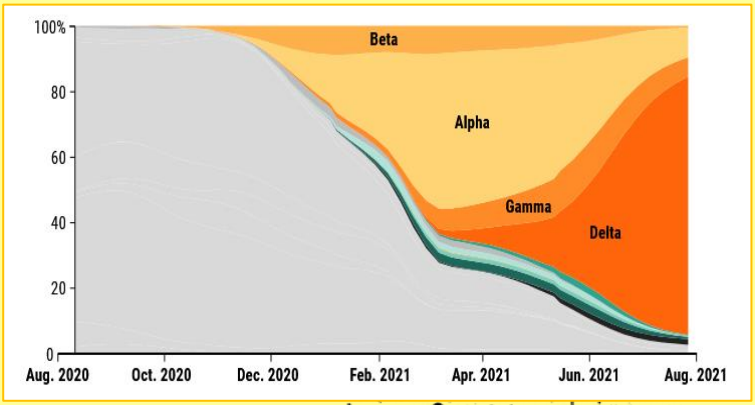
Making sense of the endless stream of mutations is complicated. Each is just a tiny tweak in the instructions for how to make proteins. Which mutations end up spreading depends on how the viruses carrying those tweaked proteins fare in the real world.

The vast majority of mutations give the virus no advantage at all, and identifying the ones that do is difficult. There are obvious candidates, such as mutations that change the part of the spike protein—which sits on the surface of the virus—that binds to human cells. But changes elsewhere in the genome may be just as crucial—yet are harder to interpret. Some genes' functions aren't even clear, let alone what a change in their sequence could mean. The impact of any one change on the virus' fitness also depends on other changes it has already accumulated. That means scientists need real-world data to see which variants appear to be taking off. Only then can they investigate, in cell cultures and animal experiments, what might explain that viral success.

The most eye-popping change in SARS-CoV-2 so far has been its improved ability to spread between humans. At some point early in the pandemic, SARS-CoV-2 acquired a mutation called D614G that made it a bit more infectious. That version spread around the world; almost all current viruses are descended from it. Then in late 2020, scientists identified a new variant, now called Alpha, in patients in Kent, U.K., that was about 50% more transmissible. Delta, first seen in India and now conquering the world, is another 40% to 60% more transmissible than Alpha.

Hostile takeovers

SARS-CoV-2 variants began to emerge in 2020. Alpha surged in many countries in early 2021, then was largely replaced by Delta. Two other variants of concern, Beta and Gamma, account for a smaller number of cases.



Delta Alpha Beta Gamma Aug. 2020 Oct. 2020 Dec. 2020 Feb. 2021 Apr. 2021 Jun. 2021 Aug. 2021 0 20 40 60 80 100% (Graphic) N. Desai/*Science*; (Data) NextStrain; GISAID

Read says the pattern is no surprise. "The only way you could not get infectiousness rising would be if the virus popped into humans as perfect at infecting humans as it could be, and

the chance of that happening is incredibly small," he says. But Holmes was startled. "This virus has gone up three notches in effectively a year and that, I think, was the biggest surprise to me," Holmes says. "I didn't quite appreciate how much further the virus could get."

Bette Korber at Los Alamos National Laboratory and her colleagues first suggested that D614G, the early mutation, was taking over because it made the virus better at spreading. She says skepticism about the virus' ability to evolve was common in the early days of the pandemic, with some researchers saying D614G's apparent advantage might be sheer luck. "There was extraordinary resistance in the scientific community to the idea this virus could evolve as the pandemic grew in seriousness in spring of 2020," Korber says.

Researchers had never watched a completely novel virus spread so widely and evolve in humans, after all. "We're used to dealing with pathogens that have been in humanity for centuries, and their evolutionary course is set in the context of having been a human pathogen for many, many years," says Jeremy Farrar, head of the Wellcome Trust. Katzourakis agrees. "This may have affected our priors and conditioned many to think in a particular way," he says.

Another, more practical problem is that real-world advantages for the virus don't always show up in cell culture or animal models. "There is no way anyone would have noticed anything special about Alpha from laboratory data alone," says Christian Drosten, a virologist at the Charité University Hospital in Berlin. He and others are still figuring out what, at the molecular level, gives Alpha and Delta an edge.

Alpha seems to bind more strongly to the human ACE2 receptor, the virus' target on the cell surface, partly because of a mutation in the spike protein called N501Y. It may also be better at countering interferons, molecules that are part of the body's viral immune defenses. Together those changes may lower the amount of virus needed to infect someone—the infectious dose. In Delta, one of the most important changes may be near the furin cleavage site on spike, where a human enzyme cuts the protein, a key step enabling the virus to invade human cells. A mutation called P681R in that region makes cleavage more efficient, which may allow the virus to enter more cells faster and lead to greater numbers of virus particles in an infected person. In July, Chinese researchers posted a preprint showing Delta could lead to virus levels in patient samples 1000 times higher than for previous variants. Evidence is accumulating that infected people not only spread the virus more efficiently, but also faster, allowing the variant to spread even more rapidly.

Deadly trade-offs

The new variants of SARS-CoV-2 may also cause more severe disease. For example, a study in Scotland found that an infection with Delta was about twice as likely to lead to hospital admission than with Alpha.

It wouldn't be the first time a newly emerging disease quickly became more serious. The 1918–19 influenza pandemic also appears to have caused more serious illness as time went on, says Lone Simonsen, an epidemiologist at Roskilde University who studies past pandemics. "Our data from Denmark suggests it was six times deadlier in the second wave."

A popular notion holds that viruses tend to evolve over time to become less dangerous, allowing the host to live longer and spread the virus more widely. But that idea is too simplistic, Holmes says. "The evolution of virulence has proven to be quicksand for evolutionary biologists," he says. "It's not a simple thing."

The myxoma virus was released in Australia in 1950 to control rabbits after trials at this test site on Wardang Island. It has evolved to become less virulent over time, but not all viruses do. National Archives of Australia

Two of the best studied examples of viral evolution are myxoma virus and rabbit hemorrhagic disease virus, which were released in Australia in 1960 and 1996, respectively, to decimate populations of European rabbits that were destroying croplands and wreaking ecological havoc. Myxoma virus initially killed more than 99% of infected rabbits, but then less pathogenic strains evolved, likely because the virus was killing many animals before they had a chance to pass it on. (Rabbits also evolved to be less susceptible.)

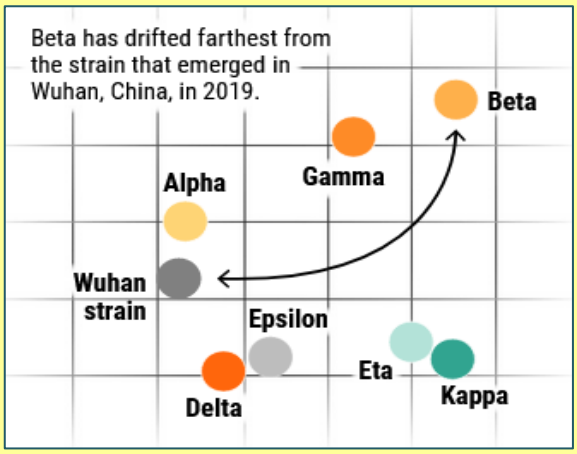
Rabbit hemorrhagic disease virus, by contrast, got more deadly over time, probably because the virus is spread by blow flies feeding on rabbit carcasses, and quicker death accelerated its spread.
Other factors loosen the constraints on deadliness. For example, a virus variant that can outgrow other variants within a host can end up dominating even if it makes the host sicker and reduces the likelihood of transmission. And an assumption about human respiratory diseases may not always hold: that a milder virus—one that doesn't make you crawl into bed, say—might allow an infected person to spread the virus further. In SARS-CoV-2, most transmission happens early on, when the virus is replicating in the upper airways, whereas serious disease, if it develops, comes later, when the virus infects the lower airways. As a result, a variant that makes the host sicker might spread just as fast as before.

Evasive measures

From the start of the pandemic, researchers have worried about a third type of viral change, perhaps the most unsettling of all: that SARS-CoV-2 might evolve to evade immunity triggered by natural infections or vaccines. Already, several variants have emerged sporting changes in the surface of the spike protein that make it less easily recognized by antibodies. But although news of these variants has caused widespread fear, their impact has so far been limited.

Viral cartography

On this "antigenic map," produced by Derek Smith, David Montefiori, and colleagues, the distance between two variants indicates how well antibodies against one neutralize the other.



Beta has drifted farthest from the strain that emerged in Wuhan, China, in 2019. (Graphic) N. Desai/*Science*; (Data) Derek Smith/University of Cambridge; David Montefiori/Duke University

Derek Smith, an evolutionary biologist at the University of Cambridge, has worked for decades on visualizing immune evasion in the influenza virus in so-called antigenic maps. The farther apart two variants are on Smith's maps, the less well antibodies against one virus protect against the other.
In a recently published preprint, Smith's group, together with David Montefiori's group at Duke University, has applied the approach to mapping the most important variants of SARS-CoV-2 (see graphic, right).
The new maps place the Alpha variant very close to the original Wuhan virus, which means antibodies against one still neutralize the other. The Delta variant, however, has drifted farther away, even though it doesn't completely evade immunity. "It's not an immune escape in the way people think of an escape in slightly cartoonish terms," Katzourakis says. But Delta is slightly more likely to infect fully vaccinated people than previous variants. "It shows the possible beginning of a trajectory and that's what worries me," Katzourakis says.
Other variants have evolved more antigenic distance from the original virus than Delta. Beta, which first appeared in South Africa, has traveled the farthest on the map, although natural or vaccine-induced immunity still largely protects against it. And Beta's attempts to get away may come at a price, as Delta has outstripped it worldwide. "It's probably the case that when a virus changes to escape immunity, it loses other aspects of its fitness," Smith says.
The map shows that for now, the virus is not moving in any particular direction. If the original Wuhan virus is like a town on Smith's map, the virus has been taking local trains to explore the surrounding area, but it has not traveled to the next city—not yet.

Predicting the future

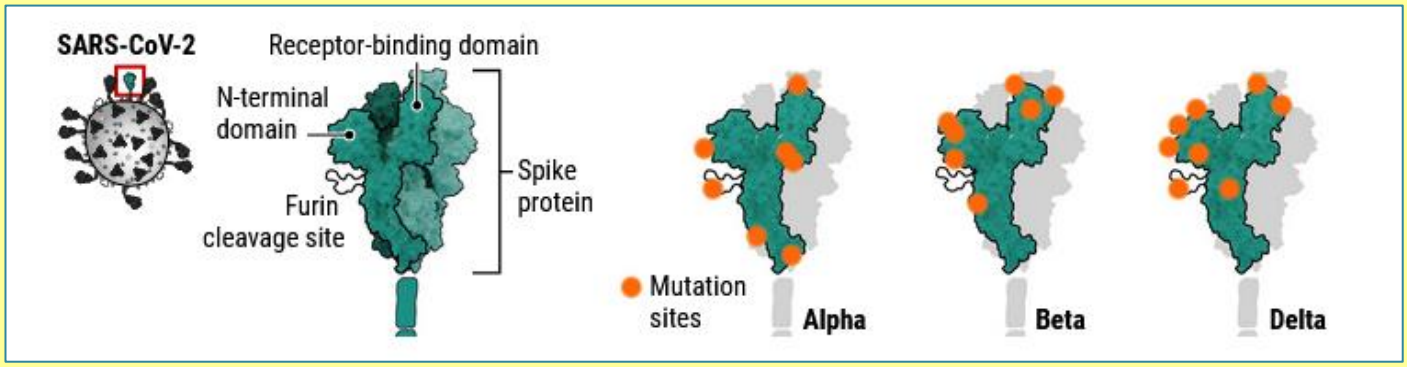
Although it's impossible to predict exactly how infectiousness, virulence, and immune evasion will develop in the coming months, some of the factors that will influence the virus' trajectory are clear.
One is the immunity that is now rapidly building in the human population. On one hand, immunity reduces the likelihood of people getting infected, and may hamper viral replication even when they are. "That means there will be fewer mutations emerging if we vaccinate more people," Çevik says. On the other hand, any immune escape variant now has a huge advantage over other variants.
In fact, the world is probably at a tipping point, Holmes says: With more than 2 billion people having received at least one vaccine dose and hundreds of millions more having recovered from COVID-19, variants that evade immunity may now have a bigger leg up than those that

are more infectious. Something similar appears to have happened when a new H1N1 influenza strain emerged in 2009 and caused a pandemic, says Katia Kölle, an evolutionary biologist at Emory University. A 2015 paper found that changes in the virus in the first 2 years appeared to make the virus more adept at human-to-human transmission, whereas changes after 2011 were mostly to avoid human immunity.

It may already be getting harder for SARS-CoV-2 to make big gains in infectiousness. "There are some fundamental limits to exactly how good a virus can get at transmitting and at some point SARS-CoV-2 will hit that plateau," says Jesse Bloom, an evolutionary biologist at the Fred Hutchinson Cancer Research Center. "I think it's very hard to say if this is already where we are, or is it still going to happen." Evolutionary virologist Kristian Andersen of Scripps Research guesses the virus still has space to evolve greater transmissibility. "The known limit in the viral universe is measles, which is about three times more transmissible than what we have now with Delta," he says.

Scratching the surface

Researchers trying to understand which genetic changes make SARS-CoV-2 variants more successful have focused on the spike protein, which studs the viral surface and binds to human cells. Alpha, Beta, and Delta have mutations in three key areas of the protein that may affect the virus' infectiousness and its ability to elude the immune system.



Spike protein Mutation sites Furin cleavage site Delta Beta SARS-CoV-2 Alpha Receptor-binding domain N-terminal domain – (Graphic) N. Desai/*Science*; (Data) E. Wall *et al.*, *The Lancet*, 397:10292, 2331 (2021)

The limits of immune escape are equally uncertain. Smith's antigenic maps show the space the virus has explored so far. But can it go much farther? If the variants on the map are like towns, then where are the country's natural boundaries—where does the ocean start? A crucial clue will be where the next few variants appear on the map, Smith says. Beta evolved in one direction away from the original virus and Delta in another. "It's too soon to say this now, but we might be heading for a world where there are two serotypes of this virus that would also both have to be considered in any vaccines," Drosten says.

Immune escape is so worrying because it could force humanity to update its vaccines continually, as happens for flu. Yet the vaccines against many other diseases—measles, polio, and yellow fever, for example—have remained effective for decades without updates, even in the rare cases where immune-evading variants appeared. "There was big alarm around 2000 that maybe we'd need to replace the hepatitis B vaccines," because an escape variant had popped up, Read says. But the variant has not spread around the world: It is able to infect close contacts of an infected person, but then peters out. The virus apparently faces a trade-off between transmissibility and immune escape. Such trade-offs likely exist for SARS-CoV-2 as well.

Some clues about SARS-CoV-2's future path may come from coronaviruses with a much longer history in humans: those that cause common colds. Some are known to reinfect people, but until recently it was unclear whether that's because immunity in recovered people wanes, or because the virus changes its surface to evade immunity. In a study published in April in *PLOS Pathogens*, Bloom and other researchers compared the ability of human sera taken at different times in the past decades to block virus isolated at the same time or later. They showed that the samples could neutralize strains of a coronavirus named 229E isolated around the same time, but weren't always effective against virus from 10 years or more later. The virus had evidently evolved to evade human immunity, but it had taken 10 years or more.

"Immune escape conjures this catastrophic failure of immunity when it is really immune erosion," Bloom says. "Right now it seems like SARS-CoV-2, at least in terms of antibody escape, is actually behaving a lot like coronavirus 229E."

Others are probing SARS-CoV-2 itself. In a preprint published this month, researchers tinkered with the virus to learn how much it has to change to evade the antibodies generated

in vaccine recipients and recovered patients. They found that it took 20 changes to the spike protein to escape current antibody responses almost completely. That means the bar for complete escape is high, says one of the authors, virologist Paul Bieniasz of Rockefeller University. "But it's very difficult to look into a crystal ball and say whether that is going to be easy for the virus to acquire or not," he says.

"It seems plausible that true immune escape is hard," concludes William Hanage of the Harvard T.H. Chan School of Public Health. "However, the counterargument is that natural selection is a hell of a problem solver and the virus is only beginning to experience real pressure to evade immunity."

And the virus has tricks up its sleeve. Coronaviruses are good at recombining, for instance, which could allow new variants to emerge suddenly by combining the genomes—and the properties—of two different variants. In pigs, recombination of a coronavirus named porcine epidemic diarrhea virus with attenuated vaccine strains of another coronavirus has led to more virulent variants of PEDV. "Given the biology of these viruses, recombination may well factor into the continuing evolution of SARS-CoV-2," Korber says.

Given all that uncertainty, it's worrisome that humanity hasn't done a great job of limiting the spread of SARS-CoV-2, says Eugene Koonin, a researcher at the U.S. National Center for Biotechnology Information. Some dangerous variants may only be possible if the virus hits on a very rare, winning combination of mutations, he says. It might have to replicate an astronomical number of times to get there. "But with all these millions of infected people, it may very well find that combination."

Indeed, Katzourakis adds, the past 20 months are a warning to never underestimate viral evolution. "Many still see Alpha and Delta as being as bad as things are ever going to get," he says. "It would be wise to consider them as steps on a possible trajectory that may challenge our public health response further."

Do chronic infections breed dangerous new variants?

New variants of SARS-CoV-2 have major impacts around the globe, driving up COVID-19 case and mortality numbers (see main story, above). But each of those viruses picks up its crucial changes as it divides in the cells of an infected human being. The nature of those infections—how fast the virus replicates and for how long—may determine the odds that they will give rise to new and more troublesome mutants, researchers say.

After someone is infected, the virus starts to multiply at a dizzying rate, producing billions of viral particles within days. Because small copy mistakes happen during every replication cycle, a huge variety of slightly different genomes quickly emerges. With SARS-CoV-2's genome spanning just 30,000 nucleotides, and only three ways to change any one position, every possible mutation likely arises in an infected individual.

The vast majority of those changes offer the virus no benefit, and even those that do only have a small chance of being passed on to the next person. A paper published in 2020 estimated that about 1000 viral particles are transmitted when one person infected another, but a reanalysis by Katia Kölle of Emory University and a colleague, published as a preprint in February, concluded that 99% of all successful transmissions come from three or fewer virus particles. A study published in *Science* in April by evolutionary biologist Katrina Lythgoe at the University of Oxford put the number of transmitted virus particles at infection between one and eight. This means that, unless a mutation arises early and gives the virus so big an advantage that it quickly becomes dominant in the host, it has a low chance of being transmitted, which puts the brake on virus evolution. "It's generally thought that when transmission bottlenecks are tight, that slows adaptive evolution at the population level," Kölle explains.

That may sound like good news for humanity, but it is offset by the huge number of SARS-CoV-2 infections globally, says Jesse Bloom, an evolutionary biologist at the Fred Hutchinson Cancer Research Center. Besides, the virus may have a shortcut. In most people, the immune system curbs the infection within days, but a few develop a chronic infection lasting for months. That gives time for mutations to accumulate and become dominant, increasing their chances of transmission. In a short-lived acute infection, evolution is "more like roulette," Kölle says, but in chronic cases, "you have the time needed to adapt to that environment."

Chronic infections may explain why the Alpha variant, first seen in the United Kingdom in late 2020, appeared to emerge with a slew of mutations all at once. In theory, Alpha could have picked up those changes one by one before arriving in the country, says Andrew Rambaut of the University of Edinburgh, but the fact that most of its genome resembles other U.K. viruses at the time suggests instead that a local virus underwent extended evolution in a single patient. "I am still reasonably confident that a chronic infection is the best explanation," Rambaut says.

COVID-19 treatments may accelerate evolution in chronic patients. In July, researchers in Germany published data on six immunocompromised patients treated with a monoclonal antibody that targeted SARS-CoV-2. In five of them, the virus acquired E484K, a mutation known to help it elude the immune system, and the virus rebounded in all five patients.

Still, the evidence that chronic patients are the source of new variants is circumstantial, Bloom cautions. People who don't develop chronic infections but do take longer than

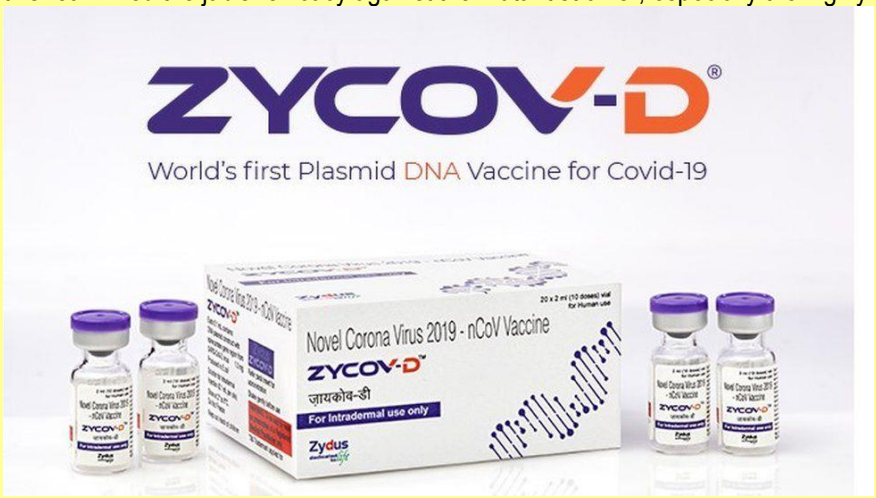
average to clear SARS-CoV-2 could also generate and spread mutants, Lythgoe says—and they are more numerous. “Are these the infections that really drive the evolution of acute viruses like SARS-CoV-2? There’s really interesting questions there.”

***Kai Kupferschmidt** is a contributing correspondent for* Science *magazine based in Berlin, Germany.*

India approves world's first DNA Covid vaccine

Source: https://www.bbc.com/news/world-asia-india-57774294

Aug 21 – India's drug regulator has approved the world's first DNA vaccine against Covid-19 for emergency use.
The three-dose ZyCoV-D vaccine prevented symptomatic disease in 66% of those vaccinated, according to an interim study quoted by the vaccine maker Cadila Healthcare.
The firm plans to make up to 120 million doses of India's second home-grown vaccine every year.
Previous DNA vaccines have worked well in animals but not humans.
India has so far given more than 570 million doses of three previously approved vaccines - Covishield, Covaxin and Sputnik V.
About 13% of adults have been fully vaccinated and 47% have received at least one shot since the beginning of the drive in January.
Cadila Healthcare said it had conducted the largest clinical trial for the vaccine in India so far, involving 28,000 volunteers in more than 50 centres.
This is also the first time, the firm claimed, a Covid-19 vaccine had been tested in young people in India - 1,000 people belonging to the 12-18 age group. The jab was found to be "safe and very well tolerated" in this age group.
The key third phase of clinical trials was conducted at the peak of the deadly second wave of the virus. The vaccine maker believes this reaffirmed the jab's "efficacy against the mutant strains", especially the highly infectious Delta variant.



"I am quite excited about the vaccine because it offers a lot of good potential. If this jab works, the future of vaccination becomes logistically simpler," said Prof Shahid Jameel, a well-known virologist.

How does this vaccine work?

DNA and RNA are building blocks of life. They are molecules that carry that genetic information which are passed on from parents to children.
Like other vaccines, a DNA vaccine, once administered, teaches the body's immune system to fight the real virus.
ZyCoV-D uses plasmids or small rings of DNA, that contain genetic information, to deliver the jab between two layers of the skin.
The plasmids carry information to the cells to make the "spike protein", which the virus uses to latch on and enter human cells.
Most Covid-19 vaccines work by giving the body instructions to make a fragment of the spike protein so it can trigger a person's immune system to produce antibodies and teach itself to fight off the virus.

What makes this vaccine different?

This is the world's first human DNA vaccine against Covid-19.
There are a number of DNA vaccines approved in the US, for example, for use in animals, including a vaccine for a disease in horses and a skin cancer vaccine for dogs.
However, more than 160 different DNA vaccines are being tested in human clinical trials in the US. Most are devoted to treating existing cancers, and a third of the vaccines were for treating HIV.
ZyCov-D is also India's first needle-free Covid-19 jab.

It is administered with a disposable needle-free injector, which uses a narrow stream of the fluid to penetrate the skin and deliver the jab to the proper tissue.

How some of the Covid-19 vaccines compare

Company	Doses	Storage
RNA		
Pfizer (BioNTech)	2	-80 to -60°C (6 months) and 2 to 8°C (for up to 5 days)
Moderna	2	-25 to -15°C (6 months) and 2 to 8°C (for 30 days)
Viral vector		
Oxford-AstraZeneca	2	2 to 8°C (6 months)
Sputnik V (Gamaleya)	2	-18.5°C (liquid form) 2 to 8°C (dry form)
Johnson & Johnson (Janssen)	1	2 to 8°C (3 months)
Inactivated virus		
CoronaVac (Sinovac)	2	2 to 8°C
Sinopharm	2	2 to 8°C
Covaxin (Bharat Biotech)	2	2 to 8°C
Protein-based		
Novavax	2	2 to 8°C

Source: Wellcome Trust, BBC research BBC

"To have a DNA vaccine which works against an infection is a big deal. If it gives good protection this is something India will be proud of," said Dr Gagandeep Kang, a virologist and the first Indian woman to be elected Fellow of the Royal Society of London.

What are the advantages of a DNA vaccine?

Scientists say DNA vaccines are relatively cheap, safe and stable.

They can also be stored at higher temperatures - 2 to 8C.

Cadila Healthcare claims that their vaccine had shown "good stability" at 25C for at least three months - this would help the vaccine to be transported and stored easily.

What are the drawbacks of a DNA vaccine?

DNA vaccines developed for infectious diseases in humans have failed in the past.

"The problem is they work well in animals. But they don't end up offering the same level of immune response protection in humans," said Dr Kang.

The challenge, according to Dr Kang, was how to push the plasmid DNA into the human cell so that it gives a durable immune response.

Dr Jeremy Kamil, a virologist at Louisiana State University Health Sciences Center in Shreveport, echoed a similar sentiment.

"Plasmid DNA vaccines have been tried in the past. But we know it's very difficult to get plasmid DNA into the nucleus of human cells, especially in adults," Dr Kamil told me.

mRNA vaccines - which use messenger RNA, a molecule, to make the proteins - like Pfizer or Moderna do not need to reach the nucleus of the cell to be effective and offer higher efficacy and are likely to produce longer lasting immunity.

The other potential drawback is that ZyCoV-D requires three doses, instead of two for the other two candidates being used in India. The vaccine maker says it is evaluating at a two-dose jab.

"I would be delighted that a vaccine company overcame the immense challenges to make it work. But it's imperative that the efficacy data be vetted independently," said Dr Kamil.

How to Pick the Best Face Masks for Kids, according to the Experts

Source: https://www.medscape.com/viewarticle/956933

Aug 19 – One essential back-to-school item for kids this fall is a face mask — the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics both recommend them — but finding one that's actually protective for a child is not a straightforward task, as many parents can attest.

There's little in the way of official guidance or research to inform evidence-based recommendations on what type of face masks works best for kids.

Search for children's face masks on Amazon and you'll run into a smorgasbord of options: masks with three, four, or five layers, different designs, and different materials. There's one company selling a mask it calls an m95 model, a term the company devised.

It's almost impossible to verify many of the claims being made by the manufacturers, or to know if they will fit your child's face until you order some, which can get expensive.
But it's worth looking for a good mask. A large study of more than 1 million people being conducted online by Facebook and Carnegie Mellon University found that students who wore face masks in school had a reduced risk for testing positive for the virus and getting sick with COVID symptoms. The study was published in June in the journal *Science*.

Delta More Contagious
The Delta variant of the new coronavirus is much more contagious than previous versions of the virus. Studies have shown that infected people carry 1000 times more virus in their nose and throat than with the viruses that circulated last winter and spring. They shed more viral particles into the air when they talk or yell or sing, making this COVID-19–causing virus much more transmissible that in the past.

KN-95 mask

What that means says Kimberly Prather, PhD, an aerosol scientist and distinguished professor at the Scripps Institution of Oceanography in La Jolla, California, is that if it once took about 15 minutes of proximity to an infected person to catch the infection, that window of risk is now much shorter.

"If you believe the 15-minute magical number, now if you take 1000 times the viral load, basically in 1 second you could inhale that same amount of virus. So it's gone from 15 minutes to 1 second," Prather said in an online seminar on school safety she helped to organize.

KF-94 mask

A Better Mask
What that means is that we need to upgrade our face masks, switching away from ill-fitting fabric masks, which can offer varying degrees of protection depending on the number of layers and type of fabric that's used, to more highly protective surgical masks or better yet, N95 respirators, which provide the highest level of filtration.
That's harder to do for kids, who have much smaller faces.
Any masks that gapes around the edges isn't going to work well, no matter how well it filters.
"**N95s are not made to fit kids**. They do not come in kid sizes, so I do not recommend N95s for kids," said Linsey Marr, an environmental engineer at Virginia Tech, who tests face masks in her lab.
Marr says parents need to consider the attributes masks in this order of priority:

1. **Comfort:** "If your kid won't wear it, it's not helping at all," she said.

2. **Fit:** "Leaks around the sides are like having a hole in your mask and aerosols carrying the virus can get right through," Marr said.
3. **Filtration:** How well the mask blocks small particles

One option to improve fit is to layer a fabric mask over a surgical mask. The fabric mask helps to hold the edges of the surgical mask more tightly to a person's face. The surgical mask creates better filtration.

Marr said KF94 or KN95 masks, which are being manufactured in China and Korea, are good choices. They offer nearly the same degree of filtration as an N95, and they fit closely to the face, to minimize leaks.

N-95	KN-95 (China)	KF-94 (S. Korea)
✓ **Percentage of aerosol particulates filtered**: 95% ✓ **NIOSH-approved**: Yes ✓ **Who should wear one**: Health care workers only	✓ **Percentage of aerosol particulates filtered**: 95% ✓ **NIOSH-approved**: No ✓ **Who should wear one**: Anyone can wear these masks in low- to moderate-risk environments, such as going to the grocery store or an outdoor gathering.	✓ **Percentage of aerosol particulates filtered**: 94% ✓ **NIOSH-approved**: No ✓ **Who should wear one**: Anyone can wear these masks in low- to moderate-risk environments, such as going to the grocery store or an outdoor gathering.

Certification/ Class (Standard)	N95 (NIOSH-42C FR84)	FFP2 (EN 149-2001)	KN95 (GB2626-2006)	P2 (AS/NZ 1716:2012)	Korea 1st Class (KMOEL - 2017-64)	DS (Japan JMHLW-Notification 214, 2018)
Filter performance – (must be ≥ X% efficient)	≥ 95%	≥ 94%	≥ 95%	≥ 94%	≥ 94%	≥ 95%
Test agent	NaCl	NaCl and paraffin oil	NaCl	NaCl	NaCl and paraffin oil	NaCl
Flow rate	85 L/min	95 L/min	85 L/min	95 L/min	95 L/min	85 L/min
Total inward leakage (TIL)* – tested on human subjects each performing exercises	N/A	≤ 8% leakage (arithmetic mean)	≤ 8% leakage (arithmetic mean)	≤ 8% leakage (individual and arithmetic mean)	≤ 8% leakage (arithmetic mean)	Inward Leakage measured and included in User Instructions
Inhalation resistance – max pressure drop	≤ 343 Pa	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min) ≤ 500 Pa (clogging)	≤ 350 Pa	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min)	≤ 70 Pa (at 30 L/min) ≤ 240 Pa (at 95 L/min)	≤ 70 Pa (w/valve) ≤ 50 Pa (no valve)
Flow rate	85 L/min	Varied – see above	85 L/min	Varied – see above	Varied – see above	40 L/min
Exhalation resistance - max pressure drop	≤ 245 Pa	≤ 300 Pa	≤ 250 Pa	≤ 120 Pa	≤ 300 Pa	≤ 70 Pa (w/valve) ≤ 50 Pa (no valve)
Flow rate	85 L/min	160 L/min	85 L/min	85 L/min	160 L/min	40 L/min
Exhalation valve leakage requirement	Leak rate ≤ 30 mL/min	N/A	Depressurization to 0 Pa ≥ 20 sec	Leak rate ≤ 30 mL/min	visual inspection after 300 L /min for 30 sec	Depressurization to 0 Pa ≥ 15 sec
Force applied	-245 Pa	N/A	-1180 Pa	-250 Pa	N/A	-1,470 Pa
CO_2 clearance requirement	N/A	≤ 1%	≤ 1%	≤ 1%	≤ 1%	≤ 1%

*Japan JMHLW-Notification 214 requires an Inward Leakage test rather than a TIL test.

Check for Counterfeits

The KF94 and KN95 masks for children are widely available, but Marr said parents do need to watch out for counterfeits, which don't perform as well.

The National Institute for Occupational Safety and Health gives examples of counterfeit products here.

There's also a type of cloth mask that has a built-in, edge-to-edge filter layer that is made for children.

"Some of these filters cut more than 99 percent of particles and those can be very effective, if they fit well," Marr said.
Marr has compiled and publicly posted a list of her recommendations for masks for children.
There's also a new standard for face masks. It's called ASTM F3502-21, and it's published by an international organization that sets voluntary standards for thousands of products. In order to claim that a mask meets this standard, a manufacturer has to have its mask tested and demonstrate that it provides a certain level of filtration and breathability.
Not everyone agrees that the standard is adequate, though.
"It's pretty much useless. The max category is 50% filtration efficiency," said Aaron Collins, who calls himself @masknerd on Twitter.
"That might have been OK for the original coronavirus but "now that we're talking about Alpha and the Delta on top of that, it's not even applicable anymore," he said. "We've passed that standard."
Collins is a mechanical engineer in Minneapolis, MN, with expertise in aerosols who started testing face masks last year as a way to find a good, protective one for himself. The project soon grew. Now he posts the results of his testing and debunks common myths about masks (yes, if you can smell through it, it is still protective. Smells are vapors, not particles, he explains) on YouTube.
He had stopped his testing over the summer but said parents have been bombarding him with questions about masks for kids, so he started testing them again. He has a 5-year-old son.
"We have a huge problem in the US, and that is that here is no general population standard for face masks," said Collins. "Now we have this problem, that we need kids with better masks, and we have no standard."
NIOSH sets standards for occupational masks, like the N95. But their standards don't apply to people who need them for general use. Collins said it would likely fall to the US Food and Drug Administration (FDA) to set a standard like that and more importantly, to enforce it.
Based on his testing he recommends that parents try to find a KF94 mask, from South Korea. He said their performance is nearly equivalent to an N95, and he's run into fewer instances of counterfeits with these kinds of masks.
If KF94s are sold out, as they often are, he recommends looking for a KN95 mask from one of the companies that once had an emergency use authorization (EUA) from the FDA for healthcare workers. That EUA has been revoked as supply of N95 masks has increased, but he said the masks on that list are pretty reliable.

Mounting evidence suggests Sputnik COVID vaccine is safe and effective

Source: https://www.nature.com/articles/d41586-021-01813-2

July 2021 – Russia's COVID-19 vaccine, Sputnik, has been the subject of fascination and controversy since the Russian government authorized its use last year, before early-stage trial results were even published. Evidence from Russia and many other countries now suggests it is safe and effective — but questions remain about the quality of surveillance for possible rare side effects.
Sputnik V — also known as Gam-COVID-Vac — was the first COVID-19 vaccine to be registered for use in any nation, and it has since been approved in 67 countries, including Brazil, Hungary, India and the Philippines. But the vaccine — and its one-dose sibling Sputnik Light — has yet to receive approval for emergency use from the European Medicines Agency (EMA) or the World Health Organization (WHO). Approval by the WHO is crucial for widespread distribution through the COVID-19 Vaccines Global Access (COVAX) initiative, which is providing doses for lower-income nations.
Developed by scientists at the Gamaleya National Research Center of Epidemiology and Microbiology in Moscow, the vaccine was authorized for use by the Russian Ministry of Health on 11 August 2020, more than a month before phase I and II trial results were published, and before the phase III trial had even begun.
The scientific community greeted Russian President Vladimir Putin's announcement of the vaccine's registration with outrage. "If the government's going to approve a vaccine before they even know the results of the trial, that does not build confidence," said epidemiologist Michael Toole at the Burnet Institute in Melbourne, Australia.

Access to full data

Some of that concern was allayed when the phase III trial results[1], published in February by the vaccine's developers, suggested that it is 91.6% effective at preventing symptomatic COVID-19 infection and 100% effective at preventing severe infection. However, some scientists criticized the authors for failing to provide access to the full raw data from the early-stage trials, and also voiced concerns about changes in the vaccine's administration protocol and inconsistencies in the data.
The authors responded by saying that they had provided the regulatory authorities with all the data necessary for obtaining approval, and that the data included with the paper[2] were

enough for readers to confirm the reported vaccine efficacy. They also addressed the protocol queries, and said numerical inconsistencies were "simple typing errors that were formally corrected".
Despite the absence of approval from the EMA or the WHO, several countries, including South Korea, Argentina and India, are already manufacturing Sputnik V. And India plans to pump out at least 850 million doses, to help speed up the vaccination of its embattled population. Many other countries, such as Hungary and Iran, are importing Sputnik V, and it has become a key plank of their vaccination campaigns.
But it hasn't all been plain sailing. Brazil's health regulator rejected an application to import Sputnik V in April over concerns at a lack of data on safety, quality and effectiveness. That decision was reversed in June, but the vaccine has been approved only for healthy adults.

Two viral vectors are better than one?
Sputnik V is an adenovirus vaccine, which means that it uses an engineered adenovirus — a family of viruses that generally cause only mild illness — as a delivery mechanism for inserting the genetic code for the SARS-CoV-2 spike protein into human cells.
It is similar to the Oxford–AstraZeneca and Johnson & Johnson vaccines. But instead of using one engineered adenovirus, as those two vaccines do, Sputnik V uses different adenoviruses, called rAd26 and rAd5, for the first and second doses, respectively.
Dmitry Kulish, a biotechnology researcher at the Skolkovo Institute of Science and Technology in Moscow, who is not involved in the development of Sputnik V, says the scientific reasoning would have been to increase efficacy. The two adenoviruses have slightly different methods of introducing their genetic material into a host cell, he says, which would theoretically improve the success rate of getting the viral genetic material where it needs to go.
The two preliminary studies from the vaccine developers, published in September 2020[2], involved 76 healthy adults who received the two doses with different viral vectors three weeks apart. All participants produced antibodies to the SARS-CoV-2 spike protein, and adverse events reported were mainly mild pain at the injection site, fever, headache, fatigue and muscle aches — adverse events typical of other SARS-CoV-2 vaccines.
In the randomized phase III trial, published in interim form in February, 14,964 adults received the two-dose vaccine and 4,902 received two doses of placebo. Only 16 subjects in the vaccine group developed symptomatic COVID-19, compared with 62 in the placebo group, representing a vaccine efficacy of 91.6%. Furthermore, there were no cases of moderate to severe disease in the vaccine group, but 20 in the placebo group.
Unpublished data on 3.8 million Russians vaccinated with two doses also point to an efficacy of 97.6%, according to an April press release from the Gamaleya Institute. Figures released by the United Arab Emirates Ministry of Health, on some 81,000 individuals who had received two doses of the vaccine, suggested 97.8% efficacy in preventing symptomatic COVID-19 and 100% efficacy in preventing severe disease.
Russia's phase III study also found that even one dose was 73.6% effective at preventing moderate to severe disease. This led the Russian health authorities to approve the one-dose Sputnik Light — which uses the rAd26 vector — in May, on the basis of data from the country's own vaccination programme, which suggested that it was 79.4% effective at preventing symptomatic disease.
Since then, an as-yet unpublished study from the Buenos Aires health ministry in Argentina, involving 40,387 vaccinated and 146,194 unvaccinated people aged 60–79, found that a single dose of Sputnik Light reduced symptomatic infections by 78.6%, hospitalizations by 87.6% and deaths by 84.7%.

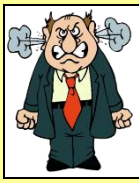
Side-effect questions
Sputnik's side effects are also becoming clearer; studies so far suggest that they are similar to those of the other adenovirus vaccines, with the notable exception of rare blood-clotting conditions. Unlike for both the Oxford–AstraZeneca and Johnson & Johnson vaccines, there have been no reports of these disorders from Russian health authorities or from the other nations using Sputnik V.
A preprint[3] from the Italian Hospital of Buenos Aires in Argentina reported no cases of clotting disorders or adverse events of special interest among 683 health-care workers vaccinated with Sputnik V. And an analysis of 2.8 million doses of Sputnik V administered in Argentina reported no deaths associated with vaccination, and mostly mild adverse events. Furthermore, a study posted as a preprint in May, from the republic of San Marino, found no serious adverse events in 2,558 adults who received one dose of Sputnik V and 1,288 who received two doses[4].
Virologist Alyson Kelvin at Dalhousie University in Halifax, Canada, says there is a theory that the clotting disorder is associated with viral-vector vaccines, but adds, "I don't think we have exact causation of what component of those vaccines are causing it", or whether Sputnik might also be affected. She notes that although the phase III study of Sputnik V

enrolled only 21,977 people, and thus was too small to pick up rare adverse events, the vaccine is now in widespread use globally, which means that reports should appear "if a safety signal comes up".
It is not clear whether Russia is in a position to detect such rare events. Those associated with the Oxford–AstraZeneca vaccine first came to light through adverse-event monitoring in Austria, which prompted the EMA to review the vaccine's safety.
But Russia's adverse-event monitoring might be less effective, Kulish argues, partly because of a cultural resistance to seeking medical care. "Most Russian people will call [the] doctor only when they cannot breathe any more," he quips. Furthermore, doctors in remote regions of Russia might not connect a stroke caused by blood clots, for example, to a recent vaccination, he says.
Argentina has not reported any clotting events, despite receiving more than four million doses of the vaccine, Kulish notes. Serbia, which has also been using Sputnik V widely, has so far reported no cases of the blood-clotting condition reported with other adenovirus vaccines.

WHO and EMA wait to authorize Sputnik

Scientists say that concerns over side-effect monitoring could be why the WHO and EMA are yet to issue emergency-use authorization. The WHO has requested more data from the Gamaleya Institute, and inspections by the agency of Russia's vaccine-manufacturing and clinical-trial facilities are ongoing. So far, nine sites have been inspected, and the WHO has flagged concerns over one manufacturing site. Similarly, the EMA lists the vaccine's authorization as being under "rolling review".
Sputnik's developers have accused the European Union of being biased, citing a comment from EU internal-market commissioner Thierry Breton in March that the EU has "absolutely no need of Sputnik V".
Kulish suggests there is also a "pro-Pfizer" stance within the EMA that is hampering Sputnik's quest for authorization — a reference to the Pfizer–BioNTech vaccine co-developed by Pfizer in New York City and BioNTech in Mainz, Germany. A spokesperson for the EMA responded to that suggestion by pointing out that "the same standards" apply to all COVID-19 vaccine applicants, "no matter where in the world they are located".
Toole says he suspects the EMA's main concern is that "they're not that comfortable" with Russia's adverse-event surveillance.

There are also concerns about Sputnik in Russia, which has high rates of COVID-vaccine hesitancy. A survey in March suggested that 62% of Russians did not plan to get vaccinated, and Russia is now introducing mandatory vaccinations for some government and other workers to boost vaccination rates. As of 28 June, only around 15% of Russia's population of more than 140 million had received one dose of a vaccine.
Several other studies are currently underway in countries that have approved Sputnik, including in Argentina, Venezuela, Russia, and Turkey, which should help to build a more accurate picture of the vaccine's safety and efficacy.



EDITOR'S COMMENT: WHO is about to test three drugs for Covid-19 (artesunate, a treatment for severe malaria; imatinib, a drug for certain cancers; and infliximab, a treatment for immune system disorders such as Crohn's disease). They have the time and will to do this but no time/will for Sputnik V that is in their drawers for many months. EMA follows the same pathway. European citizens demand to have a positive or negative evaluation. They demand to rank public health ahead of profit and politics.

Which countries are vaccinating children against Covid-19?

Source: https://www.thenationalnews.com/uae/health/2021/08/03/which-countries-are-vaccinating-children-against-covid-19/

Aug 23 – The UAE government on Sunday urged parents to vaccinate children over the age of three ahead of the new school year. A major inoculation drive was launched as more than one million pupils prepare to get back to classes on August 29. After a 30-day grace period from August 29 to September 29, unvaccinated pupils over 12 will be tested every week.
Unvaccinated children under 12 will be tested once per month - likely with a saliva test rather than nasal swab - as will vaccinated children over 12.
The announcement, by a federal government spokeswoman live on television on Sunday, was for "all schools".
But private school regulators, including in Dubai, are expected to set out their own rules in the coming days.

In early August, the authorities approved the use of the Sinopharm Covid-19 vaccine for children aged 3 to 17. The decision by the Ministry of Health and Prevention came after a trial involving 900 children in Abu Dhabi.
Along with China, the Emirates would be among the first nation to vaccinate under 12s.
In May, the UAE approved the Pfizer-BioNTech Covid-19 vaccine for children aged 12 to 15 on an emergency basis after successful clinical trials and assessments.

The National takes a look at the global approach to immunising children during the pandemic.

China

China approved emergency use of the Sinovac vaccine in those aged between 3 and 17 on June 3. Preliminary results from clinical trials showed the vaccine could trigger immune response in 3 to 17-year-olds, and most adverse reactions were mild.

Indonesia

The country approved the China's Sinovac vaccine for children aged 12 to 17 on June 28.

Singapore

The city state widened its vaccination programme on June 1 to include people aged from 12 to 18.

Hong Kong

Hong Kong began distributing the Pfizer-BioNTech vaccine to children aged 12 to 15 from June 11. Officials said the shot would initially be offered to about 240,000 children as part of a drive to bolster immunisation rates.

Japan

In June, Japan announced plans to vaccinate children aged 12 to 15 against Covid-19 during the summer break from school. The Japanese Health Ministry lowered the minimum age for Pfizer-BioNTech's vaccine to 12 the previous month.

The Philippines

The Philippines on May 26 decided to allow Pfizer-BioNTech's vaccine for emergency use in children aged 12 to 15.

India

One of the country's hardest hit by the pandemic is likely to start vaccinating children this month, its Health Minister Mansukh Mandaviya said. India has battled a surge in Covid-19 infections in recent months which has threatened to overwhelm its health services.

New Zealand

New Zealand's medicines regulator approved use of Pfizer-BioNTech's vaccine for 12 to 15 year olds, Prime Minister Jacinda Ardern said on June 21.

United States

US regulators authorised the Pfizer-BioNTech vaccine for children aged between 12 and 15 in May, in a step regarded as crucial to allowing schools to reopen safely. US President Joe Biden described the decision as a "promising development in our fight against the virus".

Canada

Canada authorised the Pfizer-BioNTech shot for children aged 12 to 15 on May 5.

Mexico

The Central American nation with a population of more than 127 million approved the Pfizer-BioNTech vaccine for children aged 12 and older on June 24.

Brazil

Brazil – which has recorded one of the highest number of global cases of about 20 million to date – authorised the Pfizer-BioNTech vaccine for those aged 12 and older on June 11.

Chile

Chile approved the Pfizer-BioNTech vaccine for 12 to 16-year-olds on May 31, after granting emergency approval for its use in those aged 17 in December, 2020.

Paraguay

Paraguay is administering the Pfizer-BioNTech vaccine to children aged 12 to 17 with underlying health conditions.

Israel

Israel began vaccinating 12- to 15-year-old with the Pfizer-BioNTech drug in June as part of one of the world's fastest immunisation programmes. Initial data from 200,000 inoculated Israeli children published last month indicated that the vaccine had no major side effects and almost none in general. However, the report said more data was needed with a larger sample to draw definitive conclusions.

European Union countries

Denmark began to administer Pfizer-BioNTech vaccines for children aged 12-15 in July.
France started vaccinating those aged 12 and older in June, provided they had parental consent.
Germany announced on Monday it was to start offering coronavirus vaccinations for all children aged 12 and older. German Health Minister Jens Spahn said the country had enough vaccines to cover all age groups.
Austria aims to have more than 340,000 children aged 12-15 vaccinated by the end of the month, the news site *Vindobona* reported.
Estonia is vaccinating children aged between 12 and 17 with the Pfizer-BioNTech drug with the aim of immunising large numbers before schools resume in September.
Hungary started vaccinating children aged 12 and older in June, having administered the shot to the 16-18 age group from the end of May.
Italy agreed to immunise children aged 12 to 15 with the Pfizer-BioNTech vaccine in June, while regulators endorsed the use of the Moderna vaccine for 12 to 17 year olds late last month.
Lithuania's Prime Minister Ingrida Simonyte said the country could start vaccinating children from age 12 in June, news site *Delfi* reported.
Spain's Health Minister Carolina Darias said in June that the country aimed to start vaccinating those aged 12 to 17 about two weeks before the start of the new school year in September.

Non-EU countries

United Kingdom

The UK said children at higher risk of Covid-19 infection would be offered the Pfizer-BioNTech vaccine but the majority of children would not be immunised.
The decision was made after a review by the UK's Joint Committee on Vaccination and Immunisation.
It recommended vaccinating children aged 12-15 if they are at higher risk of Covid due to factors such as profound learning difficulties, severe neurodisabilities and severely weakened immune systems.

Switzerland

Switzerland approved vaccinating 12 to 15 year olds with the Pfizer-BioNTech drug on June 4.

Norway

The Norwegian Institute of Public Health recommended that 16 and 17 year olds were offered a vaccine, as soon as all over-18s are fully vaccinated. A final decision is expected next month.

San Marino

San Marino is offering vaccination for children aged 12 to 15, reported San Marino RTV, citing its Institute for Social Security.

Miraculous drug!

Preparing for a Hurricane

Follow these important hurricane preparedness tips from CDC:

- Prepare for a hurricane: Take basic steps now to ensure your safety should a storm hit.
- Get a COVID-19 vaccine as soon as you can. COVID-19 vaccines help protect you from getting sick or severely ill with COVID-19 and may also help protect people around you.
- Get emergency supplies: Stock your home and your car with supplies. Give yourself more time than usual to prepare your emergency food, water, and medicine supplies. Home delivery is the safest choice for buying disaster supplies; however, that may not be an option for everyone. If in-person shopping is your only choice, take steps to protect your and others' health when running essential errands.
- Make a plan: Create a family disaster plan.
- Prepare to evacuate: Never ignore an evacuation order. Pay attention to local guidance about updated plans for evacuations and shelters, including shelters for your pets.

"Game-changing" antibody cocktail prevents COVID-19 in the chronically ill

Source: https://newatlas.com/health-wellbeing/astrazeneca-antibody-coronavirus-phase3-trial-results/

Aug 22 – A new monoclonal antibody treatment has been found to protect chronically ill adults from developing COVID-19. The Phase 3 trial results suggest the novel antibody cocktail, delivered by intramuscular injection, could offer up to 12 months protection.
Antibodies are like our immune system's front-line soldiers. They constantly circulate around a body, on the hunt for whatever specific pathogen they have been trained to target.
In early 2020 researchers at Vanderbilt University Medical Center homed in on a handful of particularly potent antibodies, isolated from some of the earliest detected COVID-19 patients. The antibodies were subsequently licensed by pharma company **AstraZeneca** and turned into monoclonal antibody treatments designed to prevent symptomatic COVID-19 infections.
The new treatment has been dubbed **AZD7442** and the latest clinical trial results announced by AstraZeneca indicate it could play an important role in helping protect the most vulnerable from severe COVID-19.
The company's recent announcement details results from a trial called **Provent**, which commenced in late 2020. The trial enrolled over 5,000 subjects, focusing on those most at risk of severe COVID-19 either due to chronic pre-existing illness or at risk of a weak response to vaccination due to being immunocompromised.
The newly announced results come from a primary analysis of the recently completed trial and are yet to be peer-reviewed or published in a journal. Over the course of a six-month follow-up period the trial saw no cases of severe COVID-19 or death in those patients receiving AZD7442. This compares to the placebo group that saw three severe COVID-19 cases, two of which led to death. Overall, AstraZeneca indicates there were 25 symptomatic COVID-19 cases detected in the total trial cohort. AZD7442 was found to reduce a chronically ill person's risk of symptomatic COVID-19 by 77 percent.
Provent is not the only clinical trial testing AZD7442, but it is the first to deliver promisingly positive data. Another trial, dubbed **Storm Chaser**, recently failed to meet its primary endpoint.
Storm Chaser was testing the same antibody cocktail as a post-exposure tool in those who had potentially been recently exposed to SARS-CoV-2 but had yet to test positive to the virus. After enrolling over 1,000 subjects in the Storm Chaser trial, AstraZeneca announced in June it had found no statistically significant difference in COVID-19 cases between placebo and AZD7442 groups.
Penny Ward, a researcher from King's College London who did not work on these AstraZeneca trials, hypothesizes the different results between the two trials could be due to the fact AZD7442 is administered by intramuscular (IM) injection, which may be slower to take effect than if the treatment were delivered by intravenous infusion.
"What the Storm Chaser trial tells us is that IM injection does not provide an immediate level of antibody sufficient to cut off viral replication and prevent disease among individuals exposed to the virus who are already infected," says Ward. "It would be interesting to see if earlier administration using an IV infusion would be more successful than IM injection in this setting."
The simplicity of delivering this treatment by intramuscular injection is one of the factors that sets it apart from other recent monoclonal antibody treatments under investigation for COVID-19. Another novel feature of this monoclonal antibody treatment is its potential long-term efficacy.
AstraZeneca worked to optimize the half-life of these monoclonal antibodies and initial studies indicate a single treatment may produce effective protection for up to 12 months. This preliminary data analysis for the Provent trial covers six months of follow-up, with another nine months of observation to follow.
James Crowe Jr., from the Vanderbilt Vaccine Center, says this new treatment may be a game-changer for vulnerable subjects who don't respond well to vaccines. Crowe Jr. was part of the Vanderbilt team working on the isolation of these potent antibodies in early 2020.
"It's deeply gratifying to see the antibodies we isolated under challenging circumstances, in the middle of the international lockdown last spring, protecting the most vulnerable amongst us," says Crowe Jr. "This single-shot prevention is likely to be a game changer for at-risk patients."
Although the Provent trial took place prior to the emergence of the Delta variant, preliminary preclinical research indicates these monoclonal antibodies should still be effective at neutralizing current SARS-CoV-2 variants. AstraZeneca says it is preparing submissions to regulatory bodies for emergency use authorization of AZD7442.
Ward points out that until the full trial data is peer-reviewed and published the optimal method of administration for this novel monoclonal antibody in clinical practice is unclear. However, she does stress these findings are good news for those vulnerable patients worried their vaccination has not been completely effective.

"This could be very important as an option for patients at high risk from COVID infection who have responded poorly to vaccination or who must take immune-suppressing treatment for other disease (cancer, post-transplant, autoimmune disease etc)," says Ward. "Indeed, it could potentially be game changing for these individuals, who are currently being advised to continue to shield despite being fully vaccinated."

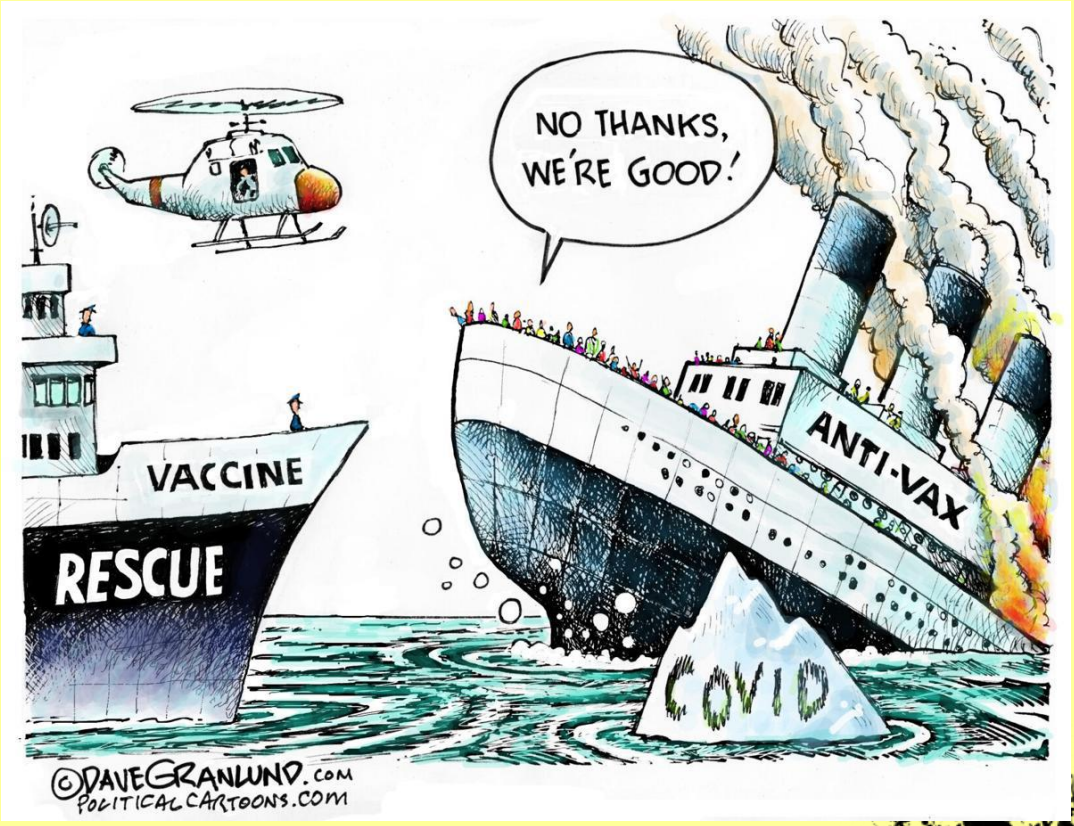
Risk assessment of airborne COVID-19 exposure in social settings

By Chin Chun Ooi, Ady Suwardi, Zhong Liang Ou Yang, et al.

Physics of Fluids 33, 087118 (2021)

Source: https://doi.org/10.1063/5.0055547

The COVID-19 pandemic has led to many countries oscillating between various states of lock-down as they seek to balance keeping the economy and essential services running and minimizing the risk of further transmission. Decisions are made about which activities to keep open across a range of social settings and venues guided only by *ad hoc* heuristics regarding social distancing and personal hygiene. Hence, we propose the dual use of computational fluid dynamic simulations and surrogate aerosol measurements for location-specific assessment of risk of infection across different real-world settings. We propose a 3-tiered risk assessment scheme to facilitate classification of scenarios into risk levels based on simulations and experiments. Threshold values of <54 and >840 viral copies and <5% and >40% of original aerosol concentration are chosen to stratify low, medium, and high risk. This can help prioritize allowable activities and guide implementation of phased lockdowns or re-opening. Using a public bus in Singapore as a case study, we evaluate the relative risk of infection across scenarios such as different activities and passenger positions and demonstrate the effectiveness of our risk assessment methodology as a simple and easily interpretable framework. For example, this study revealed that the bus's air-conditioning greatly influences dispersion and increases the risk of certain seats and that talking can result in similar relative risk to coughing for passengers around an infected person. Both numerical and experimental approaches show similar relative risk levels with a Spearman's correlation coefficient of 0.74 despite differing observables, demonstrating applicability of this risk assessment methodology to other scenarios.



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